

## **Beschlussempfehlung und Bericht**

### **des Ausschusses für Verkehr, Bau und Stadtentwicklung (15. Ausschuss)**

**zu der Unterrichtung durch die Bundesregierung  
– Drucksache 16/12188 Nr. A.26 –**

**Vorschlag für eine Richtlinie des Europäischen Parlaments und des Rates über die Gesamtenergieeffizienz von Gebäuden (Neufassung)  
(inkl. 15929/08 ADD 1 bis 15929/08 ADD 7)  
(ADD 1 und ADD 3 bis ADD 7 in Englisch)  
KOM(2008) 780 endg.; Ratsdok. 15929/08**

#### **A. Problem**

Der Vorschlag für die Novellierung der Richtlinie des Europäischen Parlaments und des Rates über die Gesamtenergieeffizienz von Gebäuden ist ein weiterer Baustein zur konsequenten Umsetzung der europäischen Energie- und Klimaschutzpolitik. Mit einem Anteil von fast 40 Prozent am Gesamtenergieverbrauch hat der Gebäudesektor eine herausragende energie- und klimapolitische Bedeutung. Vielfach lässt sich der Energiebedarf von bestehenden Gebäuden durch Steigerung der Energieeffizienz wirtschaftlich um die Hälfte reduzieren. Der bereits erreichte positive Trend in Deutschland steht in Verbindung mit der erfolgreichen Kombination von zielgerichteten Förderprogrammen, ordnungsrechtlichen Anforderungen sowie Informationen.

Die vorliegende Novelle hat das Ziel, dass zukünftig europaweit energetische Anforderungen nahe der Wirtschaftlichkeitsschwelle gelten. Dieses Ziel wird in Deutschland bereits seit langem mit dem Energieeinsparrecht erfolgreich umgesetzt. Wie das deutsche Beispiel zeigt, ist hierfür allerdings nicht der Aufbau einer zusätzlichen, aufwendigen Bürokratie erforderlich.

So würde sich für den Vollzug der neuen Richtlinie ein erheblicher bürokratischer Mehraufwand ergeben, mit höheren Kosten in den Mitgliedstaaten, ohne dass ein zusätzlicher Nutzen zu erwarten wäre. Zudem sind offensichtlich bislang im Entwurf der Europäischen Kommission die Grundsätze der Subsidiarität und der Verhältnismäßigkeit der Mittel nicht hinreichend beachtet worden.

#### **B. Lösung**

Annahme einer Entschließung, mit der der Deutsche Bundestag die Bundesregierung auffordert, gemäß Ziffer II.4. der Vereinbarung zwischen dem Deutschen Bundestag und der Bundesregierung über die Zusammenarbeit in Angelegenheiten der Europäischen Union vom 20. September 2006 in den Verhandlungen im Rat darauf hinzuwirken, dass die von der Kommission vorgeschlagenen Maßnahmen, die der Erreichung der Klimaschutzziele dienen

sollen, das Prinzip der Wirtschaftlichkeit gewährleistet und Maßnahmen zur Energieeinsparung den Bürgerinnen und Bürgern vermittelbar sein müssen, dass für die vorgeschlagene, von der Kommission noch zu entwickelnde EU-einheitliche Vergleichsmethode zur Berechnung der kostenoptimalen Mindestanforderungen an die Gesamtenergieeffizienz von Gebäuden ein angemessener Zeitraum zur Abstimmung eingeräumt wird, dass die Berechnungsmethode lediglich eine Vergleichsmethode sein soll, um den Mitgliedstaaten als Benchmark zu dienen, dass die Regelungen über etwaige Rechtswirkungen der Energieausweise und sonstige Wirkungen der Ausweise auch weiterhin in der Verantwortung der Mitgliedstaaten liegen, dass Energieausweise ein wichtiges Instrument der Information sind und bleiben, dass keine zusätzlichen, unangemessenen Bürokratiekosten durch die Anforderungen der Novelle entstehen und umfangreiche neue Berichtspflichten der Mitgliedstaaten gegenüber der Kommission abgelehnt werden sollten und dass alternativ zu dem mit hohem Umsetzungsaufwand verbundenen geforderten „Kontrollsystem für Energieausweise und Inspektionsberichte“ gleichwertige Lösungen zur Sicherstellung der Qualität zugelassen werden sollen (z. B. entsprechend EnEV 2009), dass die Qualifikation von Ausstellern von Energieausweisen sichergestellt wird, ohne ein Zulassungs- und Zertifizierungssystem vorzuschreiben und den Mitgliedstaaten die Möglichkeit gegeben werden soll, ein eigenes Zulassungs- und Zertifizierungssystem aufzubauen oder alternative Qualitätssicherungen vorzusehen, dass die Empfehlungen zur kostengünstigen Verbesserung der Gesamtenergieeffizienz weiterhin nur eine Einschätzung von möglichen Maßnahmen darstellen und diese nicht eine detaillierte freiwillige Energieberatung ersetzen sollen, dass die Aushangpflicht für öffentliche Gebäude ab 1 000 m<sup>2</sup> Gesamtnutzfläche nicht auf 250 m<sup>2</sup> reduziert wird und auf Gebäude mit größerem Publikumsverkehr beschränkt bleiben soll, dass die Richtlinie den Mitgliedstaaten nicht vorschreiben soll, Quoten für den Anteil bestimmter energetischer Standards bei Gebäuden festzulegen, da diese nicht mit einem freien Immobilienmarkt unter Wahrung der Eigentumsrechte vereinbar sind und dass die Umsetzungsfrist der Richtlinie um mindestens ein Jahr verlängert werden soll.

**Annahme einer Entschließung mit den Stimmen der Fraktionen der CDU/CSU, SPD und FDP gegen die Stimmen der Fraktionen DIE LINKE. und BÜNDNIS 90/DIE GRÜNEN**

#### **C. Alternativen**

Nur Kenntnisnahme.

#### **D. Kosten**

Wurden nicht erörtert.

## Beschlussempfehlung

Der Bundestag wolle beschließen,

in Kenntnis der Unterrichtung durch die Bundesregierung auf Drucksache 16/12188 Nr. A.26 folgende Entschließung anzunehmen:

„I. Der Deutsche Bundestag stellt fest:

Der Vorschlag für die Novellierung der Richtlinie des Europäischen Parlaments und des Rates über die Gesamtenergieeffizienz von Gebäuden ist ein weiterer Baustein zur konsequenten Umsetzung der europäischen Energie- und Klimaschutzpolitik. Der von der Kommission verfolgte Ansatz, die langfristige und nachhaltige Steigerung der Energieeffizienz von Gebäuden, wird ausdrücklich unterstützt. Mit einem Anteil von fast 40 Prozent am Gesamtenergieverbrauch hat der Gebäudesektor eine herausragende energie- und klimapolitische Bedeutung. Vielfach lässt sich der Energiebedarf von bestehenden Gebäuden durch Steigerung der Energieeffizienz wirtschaftlich um die Hälfte reduzieren. Der bereits erreichte positive Trend in Deutschland steht in Verbindung mit der erfolgreichen Kombination von zielgerichteten Förderprogrammen, ordnungsrechtlichen Anforderungen sowie Informationen.

Die vorliegende Novelle hat das Ziel, dass zukünftig europaweit energetische Anforderungen nahe der Wirtschaftlichkeitsschwelle gelten. Dieses Ziel wird in Deutschland bereits seit langem mit dem Energieeinsparrecht erfolgreich umgesetzt. Wie das deutsche Beispiel zeigt, ist hierfür allerdings nicht der Aufbau einer zusätzlichen, aufwendigen Bürokratie erforderlich.

So würde sich für den Vollzug der neuen Richtlinie ein erheblicher bürokratischer Mehraufwand ergeben, mit höheren Kosten in den Mitgliedstaaten, ohne dass ein zusätzlicher Nutzen zu erwarten wäre. Zudem sind offensichtlich bislang im Entwurf der Europäischen Kommission die Grundsätze der Subsidiarität und der Verhältnismäßigkeit der Mittel nicht hinreichend beachtet worden.

II. Der Deutsche Bundestag begrüßt

das Ziel, die Energieeffizienz von Gebäuden weiter zu verbessern. Der Klimawandel ist eine globale Herausforderung, der sich auch Deutschland und Europa im 21. Jahrhundert zu stellen haben. Wir müssen und wollen die negativen Auswirkungen des sich abzeichnenden Klimawandels stoppen, um unsere Welt auch für unsere Kinder und Enkelkinder lebenswert zu erhalten. Der Weg zu mehr Klimaschutz fordert ein Umdenken auch im Bereich des Bauens und Wohnens zu einer nachhaltigen Bauqualität. Dabei hat die Senkung des Energieverbrauchs und Entwicklung von Alternativen zu den fossilen Brennstoffen zentrale Bedeutung. Im Zeichen steigender Energiepreise ist dies besonders wichtig, um bezahlbares Wohnen für alle Bürgerinnen und Bürger zu sichern.

III. Der Deutsche Bundestag fordert die Bundesregierung auf,

gemäß Ziffer II.4. der Vereinbarung zwischen dem Deutschen Bundestag und der Bundesregierung über die Zusammenarbeit in Angelegenheiten der Europäischen Union vom 20. September 2006 in den Verhandlungen im Rat darauf hinzuwirken, dass

- die von der Kommission vorgeschlagenen Maßnahmen, die der Erreichung der Klimaschutzziele dienen sollen, das Prinzip der Wirtschaftlichkeit gewährleisten. Maßnahmen zur Energieeinsparung müssen den Bürgerinnen und Bürgern vermittelbar sein;

- für die vorgeschlagene, von der Kommission noch zu entwickelnde, EU-einheitliche Vergleichsmethode zur Berechnung der kostenoptimalen Mindestanforderungen an die Gesamtenergieeffizienz von Gebäuden ein angemessener Zeitraum zur Abstimmung eingeräumt wird. Die Berechnungsmethode sollte lediglich eine Vergleichsmethode sein, um den Mitgliedstaaten als Benchmark zu dienen;
- Regelungen über etwaige Rechtswirkungen der Energieausweise und sonstige Wirkungen der Ausweise auch weiterhin in der Verantwortung der Mitgliedstaaten liegen. Energieausweise sind und bleiben ein wichtiges Instrument der Information;
- keine zusätzlichen, unangemessenen Bürokratiekosten durch die Anforderungen der Novelle entstehen. Umfangreiche neue Berichtspflichten der Mitgliedstaaten gegenüber der Kommission sollten abgelehnt werden. Alternativ zu dem mit hohem Umsetzungsaufwand verbundenen geforderten „Kontrollsystem für Energieausweise und Inspektionsberichte“ sollen gleichwertige Lösungen zur Sicherstellung der Qualität zugelassen werden (z. B. entsprechend EnEV 2009);
- die Qualifikation von Ausstellern von Energieausweisen sichergestellt wird, ohne ein Zulassungs- und Zertifizierungssystem vorzuschreiben. Den Mitgliedstaaten soll die Möglichkeit gegeben werden ein eigenes Zulassungs- und Zertifizierungssystem aufzubauen oder alternative Qualitätssicherungen vorzusehen;
- die Empfehlungen zur kostengünstigen Verbesserung der Gesamtenergieeffizienz weiterhin nur eine Einschätzung von möglichen Maßnahmen darstellen und diese nicht eine detaillierte freiwillige Energieberatung ersetzen;
- die Aushangpflicht für öffentliche Gebäude ab 1 000 m<sup>2</sup> Gesamtnutzfläche nicht auf 250 m<sup>2</sup> reduziert wird und auf Gebäude mit größerem Publikumsverkehr beschränkt bleibt;
- die Richtlinie den Mitgliedstaaten nicht vorschreibt, Quoten für den Anteil bestimmter energetischer Standards bei Gebäuden festzulegen, da diese nicht mit einem freien Immobilienmarkt unter Wahrung der Eigentumsrechte vereinbar sind;
- die Umsetzungsfrist der Richtlinie um mindestens ein Jahr verlängert wird.“

Berlin, den 17. Juni 2009

#### **Der Ausschuss für Verkehr, Bau und Stadtentwicklung**

**Dr. Klaus W. Lippold**  
Vorsitzender

**Volkmar Uwe Vogel**  
Berichtersteller

## Bericht des Abgeordneten Volkmar Uwe Vogel

### I. Überweisung

Die Unterrichtung durch die Bundesregierung auf **Drucksache 16/12188 Nr. A.26** wurde am 9. März 2009 gemäß § 93 der Geschäftsordnung an den Ausschuss für Verkehr, Bau und Stadtentwicklung zur federführenden Beratung sowie an den Ausschuss für Ernährung, Landwirtschaft und Verbraucherschutz und den Ausschuss für Umwelt, Naturschutz und Reaktorsicherheit zur Mitberatung überwiesen.

### II. Wesentlicher Inhalt der Vorlage

Langfristig sollen alle EU-Mitgliedstaaten Mindesteffizienzstandards für Gebäude nahe des wirtschaftlich Optimalen festschreiben. Die Richtlinie soll bei größeren Renovierungen künftig auch für Gebäude unter 1 000 qm Nutzfläche gelten (in Deutschland bereits geltendes Recht); Stärkung der Bestimmungen zu Energieausweisen und Erweiterung der Aushangpflicht; Pflicht zu Zulassungsverfahren bei Energieausweisausstellern; Inspektion von Heizungen und Klimaanlageanlagen auch über die bisherige Obergrenze von 100 kW hinaus. Bereitstellung eines Berechnungsinstruments, mit dem die nationalen Mindesteffizienzstandards hinsichtlich eines kostenoptimalen Niveaus verglichen werden können. Erhöhung des Anteils von Gebäuden, deren Energiebedarf und CO<sub>2</sub>-Emissionen gering oder gleich null sind. Regelungen zur Vorbildfunktion des öffentlichen Sektors.

### III. Stellungnahmen der mitberatenden Ausschüsse

Der **Ausschuss für Wirtschaft und Technologie** hat die Vorlage in seiner 98. Sitzung am 17. Juni 2009 beraten und empfiehlt deren Kenntnisnahme.

Der **Ausschuss für Ernährung, Landwirtschaft und Verbraucherschutz** hat die Vorlage in seiner 101. Sitzung am 25. März 2009 beraten und empfiehlt deren Kenntnisnahme.

Der **Ausschuss für Umwelt, Naturschutz und Reaktorsicherheit** hat die Vorlage in seiner 87. Sitzung am 25. März 2009 beraten und empfiehlt deren Kenntnisnahme.

### IV. Beratungsverlauf und -ergebnis im federführenden Ausschuss

Der Ausschuss für Verkehr, Bau und Stadtentwicklung hat die Vorlage in seiner 93. Sitzung am 17. Juni 2009 beraten.

Zu dieser Sitzung haben die Fraktionen der CDU/CSU und der SPD einen Entschließungsantrag (Ausschussdrucksache 16(15)1427) eingebracht, dessen Inhalt sich aus der Beschlussempfehlung ergibt.

Zu dieser Sitzung hat die Fraktion der FDP den folgenden Entschließungsantrag (Ausschussdrucksache 16(15)1361) eingebracht:

*I. Der Ausschuss für Verkehr, Bau und Stadtentwicklung stellt fest:*

*Mit dem vorliegenden Entwurf für eine Richtlinie des Europäischen Parlaments und des Rates über die Gesamtenergieeffizienz von Gebäuden unternimmt die Kommission den richtigen Versuch, die Steigerung der Energieeffizienz im Gebäudebereich in den Mitgliedstaaten zu befördern und zu erleichtern. Dabei beschränkt die Kommission sich weitestgehend auf die Schaffung einheitlicher Rahmenbedingungen, die auszufüllen den einzelnen Mitgliedstaaten überlassen bleibt. Sowohl unter dem Gesichtspunkt der Subsidiarität als auch in Anbetracht der deutlichen regionalen und nationalen Unterschiede hinsichtlich der Nutzungsgewohnheiten, des Klimas und der Bautradition ist diese Herangehensweise sehr zu begrüßen. In wesentlichen Punkten führen die Vorschläge der Kommission allerdings zu ineffizienten Strukturen, Rechtsunsicherheiten und erheblichen Belastungen für die Mitgliedstaaten und Gebäudeeigentümer bei fraglichem Nutzen.*

*II. Der Ausschuss für Verkehr, Bau und Stadtentwicklung fordert die Bundesregierung auf, gemäß Ziffer II der Vereinbarung zwischen dem Deutschen Bundestag und der Bundesregierung über die Zusammenarbeit in Angelegenheiten der Europäischen Union vom 20. September 2006 in den Verhandlungen im Rat darauf hinzuwirken, dass*

*1. Artikel 4 Absatz 3 der Richtlinie klar und eindeutig in der Form gefasst wird, dass eine Förderung unter der Bedingung erfolgt, dass die zu Erfüllung der Mindestanforderungen an die Gesamtenergieeffizienz erforderlichen Maßnahmen umgesetzt werden, soweit sie dem Wirtschaftlichkeitsgebot entsprechen.*

*2. auf die Einführung von Wirtschaftlichkeitsberechnungen zur Verbesserung der Energieeffizienz im Rahmen der Energieausweise verzichtet wird.*

*3. die verpflichtende Aufnahme von Energiekennwerten aus dem Energieausweis in Vermietungs- oder Verkaufsanzeigen zurückgenommen oder zumindest klargestellt wird, dass Energieausweise grundsätzlich nur der Information dienen und sonstige Wirkungen dieser Ausweise sich nach einzelstaatlichen Vorschriften bestimmen. In diesem Zusammenhang sollte zur Wahrung des einheitlichen Sprachgebrauchs und um die bestehende Wahlfreiheit für bedarfs- und verbrauchsabhängige Energieausweise deutlich zu machen die Gesamtenergieeffizienz von Gebäuden in der gesamten Richtlinie und ihren Anhängen als „berechnete oder tatsächlich verbrauchte Energie“ definiert werden.*

*4. keine zusätzlichen Inspektions- und Berichtspflichten für Heizungsanlagen und keine Wirtschaftlichkeitsberechnungen für die Inspektionsberichte eingeführt werden.*

*5. auf die Schaffung eines doppelten Kontrollsystems für Heizungsinspektionen und Energieausweise verzichtet wird.*

*III. Begründung:*

*Artikel 4 Absatz 3 ist mehrdeutig formuliert. Nach der jetzigen Fassung kann die Voraussetzung für die Förderung des*

Baus oder der Renovierung von Gebäuden sich sowohl auf den energetischen Zustand des Gebäudes als auch auf das Ergebnis der Bau- bzw. Renovierungsmaßnahme beziehen. Der Bezug auf den Gebäudezustand wäre gegebenenfalls zwingend abzulehnen, da dies die jegliche Sanierung ab 2014 wesentlich behindern würde. Die Fördervoraussetzungen müssen sich vielmehr zwingend an dem durch eine energetische Sanierung herbeigeführten Standard und dem Wirtschaftlichkeitsgebot orientieren. Ein Förderungsausschluss für Maßnahmen, die zu einer wesentlichen Verbesserung des energetischen Standards eines Gebäudes führen allerdings nicht zur Gänze die Mindestanforderungen an die Gesamtenergieeffizienz erfüllen, da die dazu erforderlichen Maßnahmen nicht dem Wirtschaftlichkeitsgebot entsprechen, ist auch aus ökologischen Gründen nicht sinnvoll.

Die in Artikel 10 Absatz 2 und 3 des Richtlinienvorschlag vorgesehene Einführung von Wirtschaftlichkeitsberechnungen zur Verbesserung der Energieeffizienz im Rahmen der Energieausweise ist nicht sachgerecht. Eine standardisierte Ermittlung der Einsparpotentiale und der zu empfehlenden Maßnahmen gehen allzu oft an den realen Bedingungen vorbei. Die Volatilität entsprechender Berechnungen lässt sich bereits an der großen Bandbreite ersehen, die in der Messung der Energieeffizienz einzelner Gebäude durch unterschiedliche Gutachter auftreten. Hinzu kommt, dass die Ermittlung der für den Eigentümer ökonomisch sinnvollsten Maßnahmen in vielen Fällen eine zusätzliche Qualifikation der Gutachter erfordert, etwa über die Kosten und Amortisationsbedingungen unterschiedlicher Renovierungsmaßnahmen.

Die in Artikel 11, Absatz 3 und 4 vorgesehene zwingende Veröffentlichung des numerischen Indikators der Gesamtenergieeffizienz aus dem Energieausweis bei Anzeigen zum Verkauf oder zur Vermietung eines Gebäudes oder Gebäudeteiles kann, ohne eine rechtliche Einschränkung der Energieausweise auf die Information des Mieters oder Käufers, Rechtswirkungen auf die Miet- oder Kaufverträge entfalten, etwa wegen fehlerhafter Information oder Vorliegen eines Mangels. Da der Energieausweis nur einen abstrakten Wert abbildet, der auf einer Reihe von Annahmen beruht, die bei der Ermittlung der Energieeffizienz eine Schwankungsbreite von 40 Prozent zulassen, kann es in der Realität zu deutlichen Abweichungen kommen, die zum Beispiel den Vorwurf „fahrlässiger Falschinformation“ begründen.

Zusätzliche Berichts- und Inspektionspflichten, wie nach Artikel 13 vorgesehen, führen in Deutschland zu redundanten Strukturen und einer überflüssigen Mehrfachbelastung von Hauseigentümern. Der praktische Wert ist außerdem gering, da die Inspektion bezogen auf die einzelne Heizungsanlage nur geringe Erkenntnisse bezogen auf die Gesamtenergieeffizienz eines Gebäudes verspricht. In diesem Zusammenhang ist auch die Einführung von Wirtschaftlichkeitsberechnungen für die Inspektionsberichte nach Artikel 15 abzulehnen.

Die gleichzeitige Zertifizierung der Ersteller von Energieausweisen und die Einführung zusätzlicher Stichprobenprüfungen bei Energieausweisen und Inspektionsberichten sowie eines zentralen Melderegisters nach Artikel 16 und 17 wird abgelehnt. Die zu erwartenden Kosten in Höhe von acht Milliarden Euro zur Entwicklung und Unterhaltung des

Kontrollsystems für die Mitgliedsländer sind angesichts des fraglichen Nutzens einer solchen Doppelstruktur unverhältnismäßig. Hinzu kommt, dass aufgrund der erwähnten Bandbreite der Messungen bei der Erstellung eines Energieausweises die Energieausweise nur bedingt einer belastbaren Überprüfung unterzogen werden können. Hinzu treten Bedenken über den damit verbundenen Eingriff in die Grundrecht der Eigentümer die zur Überprüfung des Energieausweisen oder Inspektionsberichtes alle relevanten gebäudebezogenen Daten weitergeben müssen.

Dieser Antrag wurde noch im Verlauf der 93. Sitzung zurückgezogen.

Weiterhin hat zu dieser Sitzung die Fraktion BÜNDNIS 90/DIE GRÜNEN den folgenden Entschließungsantrag (Ausschussdrucksache 16(15)1405) eingebracht:

*Der Deutsche Bundestag wolle beschließen:*

*Der Deutsche Bundestag stellt fest:*

*Der vorliegende Entwurf des Europäischen Parlaments für eine Richtlinie über die Gesamtenergieeffizienz von Gebäuden leitet die nächste Stufe zur Steigerung der Energieeffizienz im Gebäudebereich in der Europäischen Union ein. Wie schon die EU-Gebäuderichtlinie 2002, die den Energieausweis in den europäischen Mitgliedsstaaten einführt, werden auch von der neuen Richtlinie wichtige Impulse für die europäischen Mitgliedsstaaten zur CO<sub>2</sub>-Einsparung und Energieeffizienzsteigerung erwartet.*

*Der Gebäudebereich trägt erheblich zu den CO<sub>2</sub>-Emissionen bei. In Deutschland wird etwa ein Drittel der Gesamtenergie im Gebäudebereich verbraucht.*

*Sowohl beim Neubau, als auch bei der Sanierung von Gebäuden, werden für viele Jahrzehnte die Weichen für den Energieverbrauch gestellt. Deshalb sind hier strenge Vorgaben förderlich, um die CO<sub>2</sub>-Emissionen und den Energieverbrauch zu reduzieren. Ein erster wichtiger Schritt war die Einführung des Energieausweises. Der Energieausweis ermöglicht es potenziellen Mietern und Eigentümern, Informationen über den Energiestandard einer Immobilie zu erhalten.*

*Als nächster Schritt muss eine Verbesserung der Energiestandards der Gebäude erfolgen und damit sowohl die Verringerung des Energieverbrauchs als auch der CO<sub>2</sub>-Emissionen. Schwerpunkt ist dabei die energetische Gebäudesanierung. Der Fokus muss allerdings von der Betrachtung des reinen Energieverbrauchs auf die Energiebilanz des gesamten Gebäudes erweitert werden. Denn Energie wird nicht nur bei der Nutzung des Gebäudes verbraucht, sondern auch bei dessen Bau bzw. der Herstellung der Baustoffe. Die verschiedenen Baumaterialien weisen sehr unterschiedliche Energiebilanzen auf. Auch der Einsatz der verbauten Materialien aus der jeweiligen Region sollte in die Bewertung einfließen. Hier gilt es zukünftig ökologisch sinnvolle und nachwachsende Baustoffe verstärkt zum Einsatz zu bringen. Sie sind nicht nur energiesparender in der Herstellung und Gewinnung, sondern sie lassen sich auch nach Ende der Gebäudenutzung besser wiederverwerten.*

*Der Deutsche Bundestag fordert die Bundesregierung auf, in den Verhandlungen im Rat darauf hinzuwirken, dass*

- 1. bei der energetische Betrachtung und Bewertung von Gebäuden zukünftig die Energiebilanz des gesamten Gebäudes einbezogen wird, d.h. sowohl der Energieverbrauch des Gebäudes, als auch die Energiebilanz der verbauten Baumaterialien und -verfahren;*
- 2. der Einsatz ökologischer Baustoffe durch neue Förderprogramme gestärkt und ihr Einsatz erprobt werden;*
- 3. der Bedarfsausweis in allen Mitgliedsstaaten verpflichtend eingeführt und der Verbrauchsausweis abgeschafft wird;*
- 4. der Energieausweis bei Neuvermietung oder Verkauf einer Immobilie verpflichtend vorgelegt wird, damit auch beim Wohnen der „Verbrauch“ eine wichtige Größe zur Entscheidungsfindung wird;*
- 5. zur Steigerung der energetischen Gebäudesanierung die Länder Informationsinitiativen bei den Haus- und Wohnungseigentümern starten sollen;*
- 6. die Bürger über alltägliche Energiesparmöglichkeiten, z. B. beim Heizen und Lüften, verstärkt informiert werden.*

Die **Fraktion der CDU/CSU** kritisiert, dass die Richtlinie eine Ausweitung und Verschärfung bestehender Bestimmungen beinhalte. Sie fordert, dass das Wirtschaftlichkeitsgebot gewahrt werden müsse und bemängelte, dass ein zusätzlicher Bürokratieaufwand entstände, um die Einhaltung

der Bestimmungen zu kontrollieren. Die Vorgaben der EU dürften lediglich eine Art Benchmark für eine Umsetzung in nationales Recht sein.

Die **Fraktion der SPD** sieht die energetische Gebäudesanierung als einen zentralen Punkt in der Klimaschutzdebatte. Sie kritisiert jedoch die überbordende Regelungsflut der Richtlinie, die weit über das hinausgehe, was sinnvoll und nützlich sei.

Die **Fraktion BÜNDNIS 90/DIE GRÜNEN** erklärt, für sie stelle sich der Inhalt des Entwurfes in Teilen als kontraproduktiv dar. Die Hürden seien so hoch, dass die Gefahr bestehe, dass nichts mehr passiert.

Der Ausschuss für Verkehr, Bau und Stadtentwicklung hat den Entschließungsantrag der Fraktionen der CDU/CSU und SPD auf Ausschussdrucksache 16(15)1427 mit den Stimmen der Fraktionen der CDU/CSU, SPD und FDP gegen die Stimmen der Fraktionen DIE LINKE. und BÜNDNIS 90/DIE GRÜNEN angenommen.

Den Entschließungsantrag der Fraktion BÜNDNIS 90/DIE GRÜNEN auf Ausschussdrucksache 16(15)1405 hat er mit den Stimmen der Fraktionen der CDU/CSU, SPD und FDP gegen die Stimmen der Fraktionen DIE LINKE. und BÜNDNIS 90/DIE GRÜNEN abgelehnt.

Die Unterrichtung hat der **Ausschuss für Verkehr, Bau und Stadtentwicklung** zur Kenntnis genommen.

Berlin, den 17. Juni 2009

**Volkmar Uwe Vogel**  
Berichterstatter





Anlage



**RAT DER  
EUROPÄISCHEN UNION**

**Brüssel, den 19. November 2008 (15.01)  
(OR. en)**

**15929/08**

**Interinstitutionelles Dossier:  
2008/0223 (COD)**

**ENER 398  
ENV 850  
CODEC 1592**

**VORSCHLAG**

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der:	Kommission
vom:	17. November 2008
Betr.:	Vorschlag für eine Richtlinie des Europäischen Parlaments und des Rates über die Gesamtenergieeffizienz von Gebäuden (Neufassung)

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Die Delegationen erhalten in der Anlage den mit Schreiben von Herrn Jordi AYET PUIGARNAU, Direktor, an den Generalsekretär/Hohen Vertreter, Herrn Javier SOLANA, übermittelten Vorschlag der Kommission.

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Anl.: KOM(2008) 780 endgültig



KOMMISSION DER EUROPÄISCHEN GEMEINSCHAFTEN

Brüssel, den 13.11.2008  
KOM(2008) 780 endgültig

2008/0223 (COD)

Vorschlag für eine

**RICHTLINIE DES EUROPÄISCHEN PARLAMENTS UND DES RATES**

**über die Gesamtenergieeffizienz von Gebäuden**

**(Neufassung)**

(von der Kommission vorgelegt)

{SEC(2008) 2864}

{SEC(2008) 2865}

## BEGRÜNDUNG

### **1. HINTERGRUND DES VORSCHLAGS**

#### **1.1. Ziel**

Mit der Neufassung der Richtlinie 2002/91/EG des Europäischen Parlaments und des Rates vom 16. Dezember 2002 über die Gesamtenergieeffizienz von Gebäuden<sup>1</sup>, nachstehend „GEEG-Richtlinie“, sollen einige Bestimmungen klarer gefasst und vereinfacht, der Geltungsbereich der Richtlinie ausgeweitet und einige Bestimmungen gestärkt werden, damit ihre Wirksamkeit erhöht und der führenden Rolle des öffentlichen Sektors Rechnung getragen wird. Damit sollen Umsetzung und Durchführung der GEEG-Richtlinie erleichtert werden, so dass ein erheblicher Teil des verbleibenden kostenwirksamen Potenzials im Gebäudebereich realisiert wird. Gleichzeitig werden die Zielsetzung und die Grundsätze der derzeitigen Richtlinie beibehalten und es bleibt weiterhin den Mitgliedstaaten überlassen, wie zuvor die konkreten Anforderungen und Wege zur Durchführung festzulegen.

#### **1.2. Politische Ziele der EU und der Gebäudesektor**

Im Januar 2007 hatte die Kommission ein umfassendes Klima- und Energiepaket<sup>2</sup> vorgeschlagen, das bis 2020 eine Verringerung des Energieverbrauchs um 20 %, eine Senkung der Treibhausgasemissionen um 20 % und eine Steigerung des Anteils erneuerbarer Energien auf 20 % („Zielsetzung 20-20-20“) vorsah. Dies wurde auf der Frühjahrstagung des Europäischen Rats 2007 gutgeheißen. Diese Ziele wurden angesichts zunehmender wissenschaftlicher Belege für die Klimaänderung, hoher Energiepreise und einer wachsenden Abhängigkeit von Energieeinfuhren und deren möglichen geopolitischen Konsequenzen gesetzt. Eindeutig kann eine Verringerung des Energieverbrauchs einen maßgeblichen Beitrag zur Erreichung dieser Ziele leisten. Der Gebäudesektor bietet viele kostenwirksame Handlungsmöglichkeiten und Chancen, zum Wohlergehen der Bürger der EU beizutragen.

Der Gebäudesektor (Wohn- und Gewerbegebäude) ist der größte Energieverbraucher und Verursacher von CO<sub>2</sub>-Emissionen in der EU: Auf ihn entfallen rund 40 % des Endenergieverbrauchs und der Kohlendioxidemissionen in der EU. Der Sektor weist ein erhebliches, nicht ausgeschöpftes Potenzial für kostenwirksame Energieeinsparungen auf, das – wenn es realisiert wird – im Jahr 2020 eine Einsparung an Endenergie in der EU um 11 % bedeuten würde. Dies ist wiederum mit mehreren Vorteilen verbunden, etwa mit einem niedrigeren Energiebedarf, einer geringeren Abhängigkeit von Einfuhren und weniger ausgeprägten Klimaauswirkungen, niedrigeren Energierechnungen, mehr Arbeitsplätzen und Anreizen zur lokalen Entwicklung.

Gebäude entsprechen im Wesentlichen den Bedürfnissen und Präferenzen der Bürger Europas in ihrem jeweiligen Umfeld und werden daher häufig als ureigenste Kompetenz der lokalen, regionalen und nationalen Behörden angesehen. Gleichzeitig machen Produkte, Geräte und Dienstleistungen der Bauwirtschaft einen wichtigen Teil des EU-Binnenmarkts aus. Heutzutage sind viele Arbeitnehmer und Unternehmen in ihrer Tätigkeit nicht auf ein einzelnes Land beschränkt. Darüber hinaus ist der Gebäudesektor von ausschlaggebender

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<sup>1</sup> ABl. L 1 vom 4.1.2003, S. 65.

<sup>2</sup> KOM(2007) 1.

Bedeutung, wenn es um die Erfüllung der Energie- und Klimaziele zu den geringstmöglichen Kosten für Einzelpersonen und die Gesellschaft in allen Ländern geht. Der zusätzliche Nutzen gemeinsamer Anstrengungen ist beträchtlich. Dies ist eine weitere Rechtfertigung für Maßnahmen auf Ebene der EU.

## **2. GELTENDE RECHTSVORSCHRIFTEN DER GEMEINSCHAFT**

### **2.1. Richtlinie über die Gesamtenergieeffizienz von Gebäuden**

Die GEEG-Richtlinie ist das maßgebende Rechtsinstrument der Gemeinschaft, das einen gesamtheitlichen Ansatz für die effiziente Energienutzung im Gebäudesektor verfolgt. Hauptziel der GEEG-Richtlinie ist es, die kostenwirksame Verbesserung der Gesamtenergieeffizienz von Gebäuden zu fördern. Die Bestimmungen der Richtlinie betreffen den Energiebedarf für Raumheizung und Warmwasserbereitung, Kühlung, Lüftung und Beleuchtung für neue und bestehende Wohngebäude und anderen Zwecken dienende Gebäude. Die meisten der bestehenden Bestimmungen gelten für alle Gebäude unabhängig von ihrer Größe und unabhängig davon, ob sie zu Wohnzwecken oder zu anderen Zwecken genutzt werden. Einige Bestimmungen beziehen sich auf bestimmte Gebäudearten. In der Richtlinie werden in einer Rechtsvorschrift verschiedene regulatorische Instrumente (etwa das Erfordernis, dass die Mitgliedstaaten Energieeffizienzanforderungen für neue Gebäude und große bestehende Gebäude, die in größerem Umfang renoviert werden, festlegen) mit Instrumenten kombiniert, die der Information dienen (etwa Ausweise über die Gesamtenergieeffizienz, Anforderungen bezüglich der Inspektion von Heizungs- und Klimaanlage).

Die GEEG-Richtlinie legt keine EU-weiten Niveaus fest, sondern verlangt von den Mitgliedstaaten, die konkreten Anforderungen und einschlägigen Verfahren festzulegen. Bei diesem Ansatz wird somit nationalen/regionalen Randbedingungen, wie dem Klima und den einzelnen Bautraditionen, im vollen Umfang Rechnung getragen. Die Mitgliedstaaten können über die Mindestanforderungen der Richtlinie hinausgehen und ehrgeizigere Ziele verfolgen. Bei der Durchführung der GEEG-Richtlinie hat es Verzögerungen gegeben, inzwischen haben aber 22 Mitgliedstaaten die vollständige Umsetzung mitgeteilt (wird derzeit von der Kommission geprüft). Eine der wesentlichen Errungenschaften der GEEG-Richtlinie war bislang, das Thema der Energieeffizienz von Gebäuden auf die politische Agenda zu setzen, es in den Bauvorschriften zu verankern und den Bürgern bewusst zu machen.

### **2.2. Sonstige Rechtsinstrumente**

Außer der GEEG-Richtlinie befasst sich eine Reihe anderer Richtlinien mit Energieaspekten im Zusammenhang mit Gebäuden, z. B. die Richtlinie über die umweltgerechte Gestaltung energiebetriebener Produkte (2005/32/EG)<sup>3</sup>, die Richtlinie zur Förderung der Kraft-Wärme-Kopplung (2004/8/EG)<sup>4</sup>, die Richtlinie über Endenergieeffizienz und Energiedienstleistungen (2006/32/EG)<sup>5</sup> und die vorgeschlagene Richtlinie zur Förderung der Nutzung von Energie aus erneuerbaren Quellen<sup>6</sup>. Einschlägige Bestimmungen zu Gebäuden sind auch in der Richtlinie

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<sup>3</sup> ABl. L 191 vom 22.7.2005, S. 29.

<sup>4</sup> ABl. L 52 vom 21.2.2004, S. 50.

<sup>5</sup> ABl. L 114 vom 27.4.2006, S. 64.

<sup>6</sup> KOM(2008) 30.

zu Bauprodukten (89/106/EWG)<sup>7</sup> und im Aktionsplan für Nachhaltigkeit in Produktion und Verbrauch sowie für eine nachhaltige Industriepolitik<sup>8</sup> zu finden.

Wenngleich diese Richtlinien auch nicht ausdrücklich im Vorschlag angeführt werden, da dies nicht der Rechtspraxis entspricht, sind sie doch untrennbarer Bestandteil eines Instrumentariums zur Förderung der Nachhaltigkeit bei der Schaffung und Nutzung des EU-Gebäudebestands, und die Mitgliedstaaten haben bei der Ausarbeitung ihrer Politik für diesen Sektor auch diese Richtlinien umfassend zu berücksichtigen.

### **2.3. Weiterer Handlungsbedarf?**

Trotz der bereits ergriffenen Maßnahmen ist ein sehr großes Potenzial für die kostenwirksame Energieeinsparung auch weiterhin nicht ausgeschöpft. Das bedeutet, dass viele der potenziellen gesellschaftlichen, wirtschaftlichen und ökologischen Vorteile auf nationaler und EU-Ebene nicht umfassend zur Geltung kommen. Gründe dafür sind die Komplexität des Sektors und das Vorliegen eines Marktversagens, aber auch einige Beschränkungen aufgrund der Formulierung und des Geltungsbereichs einiger Bestimmungen der geltenden GEEG-Richtlinie und der geringe Ehrgeiz einiger Mitgliedstaaten bei der Durchführung.

## **3. ANHÖRUNG INTERESSIERTER KREISE UND FOLGENABSCHÄTZUNG**

### **3.1. Anhörungen, Datensammlung und Nutzung von Expertenwissen**

Der Vorschlag zur Neufassung der GEEG-Richtlinie wurde auf der Grundlage einer breiten Palette an Beiträgen der Mitgliedstaaten und interessierten Kreise ausgearbeitet, die zu verschiedenen Gelegenheiten, einschließlich öffentlicher Online-Konsultationen, eingeholt wurden. Die Auswirkungen der verschiedenen vorgeschlagenen Optionen wurden umfassend analysiert und dabei ihre wirtschaftlichen, gesellschaftlichen und ökologischen Folgen berücksichtigt, ebenso das Subsidiaritätsprinzip und der Grundsatz der Verhältnismäßigkeit.

### **3.2. Folgenabschätzung**

Die Folgenabschätzung hat eindeutig ergeben, dass die Überarbeitung der GEEG-Richtlinie die geeignete Maßnahme zur Erfüllung der politischen Ziele der EU ist. Die geltende Richtlinie stellt den Ausgangspunkt und das Gerüst dafür dar. Hervorzuheben ist jedoch, dass die Lösung in einer integrierten Kombination von Politikinstrumenten liegt. Daher sind andere, nichtregulatorische Maßnahmen, die für sich allein genommen nicht ausreichend wären, ergänzend bei der Durchführung der Richtlinie erforderlich. Aus diesem Grund sollten die Bemühungen, mehr Informationen bereitzustellen, Fachleute auszubilden und freiwillige Maßnahmen zu vereinbaren, weiter fortgesetzt und ausgebaut werden. Außerdem sind Anstrengungen nötig, finanzielle und steuerliche Anreize auf dem richtigen Niveau zu schaffen, um eine effiziente Ressourcennutzung zu fördern.

In der Folgenabschätzung wurde die Schlussfolgerung gezogen, dass verschiedene Aspekte der GEEG-Richtlinie auf zwei Arten anzugehen sind: Erstens sollten unklare Formulierungen klargestellt werden. Auch wurde eine Neufassung (statt einer Änderung) vorgeschlagen. Zweitens müssen die Hauptpfeiler der geltenden Richtlinie (Anforderungen an die

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<sup>7</sup> ABl. L 40 vom 11.2.1989, S. 12.

<sup>8</sup> KOM (2008) 397/3.

Gesamtenergieeffizienz neuer Gebäude und von bestehenden Gebäuden, die einer größeren Renovierung unterzogen werden, Ausweise über die Gesamtenergieeffizienz und die Inspektion von Heizungs- und Klimaanlage) gestärkt werden. Die innerhalb eines jeden Pfeilers analysierten Optionen umfassen eine Kombination von Politikinstrumenten und schließen auch nichtregulatorische Alternativen ein. Sie würden es ermöglichen, das Potenzial der derzeitigen GEEG-Richtlinie umfassend zu verwirklichen und ihre Wirkung auszuweiten.

Die Mindestwirkung der Optionen, die als besonders vorteilhaft erkannt und deshalb in den Vorschlag für die Neufassung aufgenommen wurden und die sich beziffern lassen, ist erheblich:

- 60 bis 80 Mio. t RÖE/Jahr an Energieeinsparungen bis 2020, d. h. eine Verringerung des Endenergieverbrauchs in der EU um 5 bis 6 % im Jahr 2020;
- 160 bis 210 Mio. t/Jahr an eingesparten CO<sub>2</sub>-Emissionen bis 2020, d. h. eine Verringerung der gesamten CO<sub>2</sub>-Emissionen in der EU um 4 bis 5 % im Jahr 2020;
- potenziell 280 000 (bis 450 000) neue Arbeitsplätze bis 2020, hauptsächlich in der Bauwirtschaft, bei Energiezertifizierern und Auditoren sowie Prüfern von Heizungs- und Klimaanlage. Die Schaffung neuer Arbeitsplätze würde auch angeregt durch den Bedarf an Produkten, Komponenten und Materialien, die in energieeffizienteren Gebäuden verwendet oder eingebaut werden (dies wurde in der Folgenabschätzung nicht beziffert).

Der Investitionsbedarf und die Verwaltungskosten sind im Vergleich zum Nutzen und den zu erzielenden Renditen recht gering. So würde die Abschaffung des Schwellenwerts von 1000 m<sup>2</sup> in Artikel 6 der geltenden GEEG-Richtlinie zusätzliche Anlageinvestitionen von 8 Mrd. €/Jahr verursachen, aber bis 2020 zu Einsparungen bei den Energiekosten von 25 Mrd. €/Jahr führen, was auch eine erhebliche Verringerung der CO<sub>2</sub>-Minderungskosten bedeutet. Diese Berechnungen beruhen auf konservativen Ölpreisschätzungen.

Die erforderlichen Investitionen sind nicht gleichmäßig auf die EU-Bürger verteilt, d. h. es werden zusätzliche Kosten für diejenigen anfallen, die größere Renovierungen an ihren Gebäuden vornehmen oder an Grundstückstransaktionen beteiligt sind. Bei hohen Energiepreisen werden diese anfänglichen Investitionen zu attraktiven Renditen führen und die Energierechnungen senken. Dies wird positive direkte und indirekte Auswirkungen auf die gesamte Wirtschaft haben.

Der Gesamtnutzen für die Gesellschaft aufgrund des niedrigeren Energieverbrauchs und der damit einhergehenden geringeren CO<sub>2</sub>-Emissionen und der geringeren Abhängigkeit von Energieeinfuhren, der Schaffung von Arbeitsplätzen sowie der positiven Auswirkungen auf die Gesundheit und die Arbeitsproduktivität überwiegen bei weitem die Kosten der analysierten Maßnahmen. Investitionen für Energieeinsparungen, die sich bezahlt machen, indem sie eine effizientere Primärenergienutzung ermöglichen, führen auch zur Wohlstandssteigerung.

Einige Anforderungen könnten sich jedoch belastend auf Haushalte mit geringem Einkommen auswirken. Die Verbesserung der Gebäudequalität ist ein wichtiger Weg, um langfristige Lösungen für das Problem hoher Energierechnungen und für eine bessere Lebensqualität zu erreichen. Weitere Maßnahmen, die den Mitgliedstaaten zur Verfügung stehen, sollten genutzt werden, um denjenigen zu helfen, die einer solchen Unterstützung bedürfen. In der geänderten Richtlinie werden Instrumente für die gezielte Finanzierung unterstützt. Beispielsweise wird

darin die Grundlage gelegt, Verbesserungen der Energieeffizienz, die in den Empfehlungen zum Ausweis über die Energieeffizienz vorgeschlagen werden, mit finanziellen Anreizen zu verknüpfen.

Das veröffentlichte Dokument zur Folgenabschätzung und dessen Anhänge enthalten detaillierte Informationen zu den verschiedenen untersuchten Optionen und deren Auswirkungen sowie zur Bewertungsmethodik.

#### **4. AUSWIRKUNGEN AUF DEN HAUSHALT**

Die Mitgliedstaaten haben in ihren Antworten auf einen Fragebogen, den die Kommission im Hinblick auf die Überarbeitung ausgearbeitet hatte, die Haushaltsauswirkungen der Richtlinie als nicht zu umfangreich eingeschätzt. Auch die Verwaltungsauswirkungen sind moderat. Die Verringerung eines unproduktiven Primärenergieverbrauchs im Gebäudesektor wird zu Ausgabenminderungen für Privathaushalte, Unternehmen und öffentliche Stellen führen, die solche Gebäude verwalten und nutzen. Die monetären und wirtschaftlichen Vorteile werden die zusätzlichen Kosten der Investitionen für die Energieeinsparung überwiegen. Die Verwaltungskosten und die erforderlichen Investitionen werden im Einzelnen in der Folgenabschätzung erörtert. Für den Haushalt der Gemeinschaft ergeben sich keine maßgeblichen Kosten.

Die erhöhten Anforderungen würden zu einer höheren Arbeitsbelastung der Kommission führen und zusätzliches Personal erfordern (rund drei Vollzeitbeamte).

#### **5. RECHTLICHE ELEMENTE DES VORSCHLAGS**

##### **5.1. Zusammenfassung der vorgeschlagenen Maßnahmen**

In dem Vorschlag werden die Zielsetzung und die hauptsächlichen Grundsätze der derzeitigen GEEG-Richtlinie beibehalten, auch die Rolle der Mitgliedstaaten bei der Festlegung der konkreten Anforderungen bleibt gegenüber der derzeitigen Richtlinie unverändert. Der Verwaltungsaufwand wird auf das Mindestmaß beschränkt; da eine möglichst große Wirkung erzielt werden soll, steigt er jedoch. Von wesentlicher Bedeutung ist eine ordnungsgemäße und pünktliche Durchführung der geltenden GEEG-Richtlinie. Dieser Vorschlag sollte nicht dazu dienen, eine verspätete Durchführung der geltenden Richtlinie zu entschuldigen. Der Vorschlag verdeutlicht und stärkt die Bestimmungen der geltenden GEEG-Richtlinie und weitet ihren Anwendungsbereich aus durch

- klarere Formulierung gewisser Bestimmungen;
- Ausweitung des Anwendungsbereichs der Bestimmungen, wonach die Mitgliedstaaten Anforderungen an die Mindestenergieeffizienz für den Fall festlegen müssen, dass eine größere Renovierung erfolgt;
- Stärkung der Bestimmungen zu Ausweisen über die Gesamtenergieeffizienz, Inspektionen von Heizungs- und Klimaanlage, Anforderungen an die Gesamtenergieeffizienz, Informationen und unabhängiges Fachpersonal;
- Bereitstellung eines Berechnungsinstruments zu Vergleichszwecken für die Mitgliedstaaten und interessierten Kreise, mit dem die national/regional festgelegten

Mindestanforderungen an die Gesamtenergieeffizienz hinsichtlich eines kostenoptimalen Niveaus verglichen werden können;

- Stimulierung der Mitgliedstaaten, einen Rahmen für eine stärkere Marktakzeptanz von Gebäuden, deren Energieverbrauch und CO<sub>2</sub>-Emissionen gering oder gleich Null sind, zu schaffen;
- Ermutigung zu einem beispielhaften Vorgehen des öffentlichen Sektors durch dessen aktivere Beteiligung.

## **5.2. Rechtsgrundlage**

Die Gesamtenergieeffizienz von Gebäuden nimmt eine wichtige Stellung in der Umweltpolitik der Gemeinschaft ein. Die derzeitige GEEG-Richtlinie war daher auf Artikel 175 Absatz 1 EG-Vertrag gegründet. Dies bleibt unverändert.

## **5.3. Recht zum Tätigwerden der EU, Subsidiarität und Verhältnismäßigkeit**

Die auf EU-Ebene erlassenen Instrumente zur Energieeffizienz spiegeln die wachsende Bedeutung der Energie als politische und wirtschaftliche Herausforderung und ihr enges Zusammenspiel mit den Politikbereichen Sicherheit der Energieversorgung, Klimaänderung, Nachhaltigkeit, Umwelt, Binnenmarkt und wirtschaftliche Entwicklung wider.

Der Gebäudesektor ist für etwa die Hälfte der CO<sub>2</sub>-Emissionen verantwortlich, die nicht vom Handelssystem für Emissionsrechte erfasst werden, und weist ein erhebliches Potenzial für die Verringerung des CO<sub>2</sub>-Ausstoßes zu negativen oder geringen Minderungskosten auf. Aufgrund der Eigentümlichkeiten des Gebäudesektors ist die Geschwindigkeit, mit der Fortschritte bei der Energieeffizienz erzielt werden können, beschränkt. Bauprodukte, Geräte und Dienstleistungen im Zusammenhang mit Gebäuden sind ein wichtiger Teil des EU-Binnenmarkts. Ohne die Gewissheit, dass die EU-weiten Marktbedingungen fest etabliert sind und langfristig Bestand haben, werden die Unternehmen nicht schnell auf die steigende Nachfrage nach energieeffizienten Dienstleistungen reagieren. Außerdem würden angesichts der zunehmenden Mobilität der Arbeitnehmer und der steigenden Zahl der Unternehmen, die in mehreren EU-Ländern tätig sind, Maßnahmen zur Schaffung besser vergleichbarer nationaler Rechtsvorschriften die Verwaltungslasten senken und größere Chancen auf Produktivitätsgewinne eröffnen.

Energieeffizienzziele konnten bislang nicht im ausreichenden Maß von den Mitgliedstaaten allein erreicht werden, so dass ein Tätigwerden auf der Ebene der Gemeinschaft erforderlich ist, um Maßnahmen auf nationaler Ebene zu erleichtern und zu unterstützen. Die Hauptelemente der derzeitigen GEEG-Richtlinie wurden bereits im Hinblick auf das Subsidiaritätsprinzip und den Grundsatz der Verhältnismäßigkeit geprüft, und die Praxis hat die Angemessenheit des Ansatzes erwiesen. Im vorgeschlagenen Text wurden beide Grundsätze beachtet. Der Schwerpunkt liegt auf der Etablierung eines einheitlichen Ansatzes, der die Grundlage für zusammenhängende und einander verstärkende Mechanismen für Energieeffizienzverbesserungen schafft, und bei dem gleichzeitig die Mitgliedstaaten die Kontrolle über die Festlegung der individuellen Anforderungen und Methoden zu deren Durchführung behalten.



#### **5.4. Wahl des Rechtsinstruments**

Die Neufassung der Richtlinie über die Gesamtenergieeffizienz von Gebäuden ist Teil der Kommissionsstrategie für eine bessere Rechtsetzung, insbesondere des Aktionsplans „Vereinfachung und Verbesserung des Regelungsumfelds“<sup>9</sup>. Vorgeschlagen wird rechtsetzungstechnisch die Neufassung, da damit die Lesbarkeit erhöht und das Verständnis erleichtert wird.

#### **6. INHALT DES RICHTLINIENVORSCHLAGS**

Es wird eine Reihe von Änderungen des Textes vorgenommen, von denen einige Anpassungen, Verdeutlichungen und geringfügige Korrekturen des Textes darstellen, während andere der Einführung neuer Bestimmungen dienen. Letztere sind im Folgenden dargelegt.

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<sup>9</sup> KOM(2002) 278 endg.

**Präambel**

Einige Erwägungsgründe werden aktualisiert oder angepasst.

**Artikel 1 Gegenstand**

Es wird Bezug genommen auf neue Anforderungen für i) nationale Pläne für die Erhöhung der Zahl der Gebäude, deren CO<sub>2</sub>-Emissionen als auch Primärenergieverbrauch niedrig oder gleich Null sind, und ii) unabhängige Kontrollsysteme für die Ausweise über die Gesamtenergieeffizienz und die Inspektionsberichte.

**Artikel 2 Begriffsbestimmungen**

Mehrere Begriffe werden deutlicher gefasst und, wo nötig, neue Begriffsbestimmungen hinzugefügt.

**Artikel 3 Festlegung einer Berechnungsmethode**

Der Text wird angepasst und die darin enthaltenen technischen Einzelheiten in Anhang I verschoben.

**Artikel 4 Festlegung von Mindestanforderungen an die Gesamtenergieeffizienz**

Gegenwärtig unterscheiden sich die Anforderungen an die Gesamtenergieeffizienz, die von den Mitgliedstaaten festgelegt werden, erheblich hinsichtlich des von ihnen angestrebten Niveaus, und einige sind weit von einem kostenoptimalen Niveau entfernt. Dies bedeutet, dass die Chance zur Verbesserung der Energieeffizienz eines Gebäudes auf wirtschaftliche Weise und zur Verringerung künftiger Energierechnungen bei vielen Bauvorhaben und umfangreichen Renovierungen ungenutzt bleibt.

Der Text wurde geändert, um sicherzustellen, dass die von den Mitgliedstaaten festgelegten Mindestanforderungen an die Gesamtenergieeffizienz von Gebäuden sich allmählich einem kostenoptimalen Niveau nähern. Es wird ein vierstufiges Konzept vorgeschlagen:

- (1) Die Mitgliedstaaten sollten ihre Anforderungen unter Zugrundelegung ihrer eigenen Berechnungsmethode im Hinblick darauf festlegen, das von ihnen ermittelte kostenoptimale Niveau zu erreichen.
- (2) Die Kommission wird eine Vergleichsmethode entwickeln, die die Mitgliedstaaten nur zu Vergleichszwecken verwenden müssen und über deren Ergebnisse sie gemäß Artikel 5 zu berichten haben.
- (3) Ab dem 30. Juni 2014 können die Mitgliedstaaten keine Anreize mehr für den Bau oder die Renovierung von Gebäuden gewähren, die nicht den Mindestanforderungen an die Gesamtenergieeffizienz entsprechen und die Ergebnisse der Vergleichsrechnung nach Artikel 5 erreichen.
- (4) Ab dem 30. Juni 2017 haben die Mitgliedstaaten bei einer Änderung ihrer Mindestanforderungen an die Gesamtenergieeffizienz von Gebäuden zu gewährleisten, dass diese Anforderungen die Ergebnisse der Berechnung nach Artikel 5 Absatz 2 erzielen.

**Artikel 5 Berechnung kostenoptimaler Mindestanforderungen an die Gesamtenergieeffizienz**

Die oben genannte Vergleichsmethode würde eine Berechnungsmethode umfassen, die von der Kommission ausgearbeitet wurde und kostenoptimale Kriterien für verschiedene Variablen berücksichtigt (wie Investitionskosten, Betriebs- und Instandhaltungskosten, einschließlich Energiekosten). Die Mitgliedstaaten wären gehalten, diese Methodik anzuwenden, um die kostenoptimalen Anforderungen zu berechnen, wobei sie von ihnen festgelegte Variablen verwenden. Die Ergebnisse sollten dann mit den tatsächlich in den Mitgliedstaaten festgelegten Anforderungen verglichen werden, wobei sich eindeutig ergibt, wie nahe die nationalen Anforderungen an ein kostenoptimales Niveau heranreichen.

Die Mitgliedstaaten haben die spezifizierten Variablen, die Ergebnisse der Vergleichsrechnungen und den Vergleich mit den festgelegten Anforderungen der Kommission mitzuteilen, die Fortschrittsberichte veröffentlichen wird.

**Artikel 6 Neue Gebäude**

Die Verpflichtung, alternative Systeme für neue Gebäude in Betracht zu ziehen, wird auf alle Gebäude erweitert. Damit wird der Geltungsbereich der GEEG-Richtlinie ausgeweitet und die Zielsetzung der EU hinsichtlich erneuerbarer Energien unterstützt.

Wenngleich dies nicht angegeben ist, hat die Durchführung der Bestimmungen über die Bewertung der alternativen Systeme gemäß den Anforderungen der Richtlinie zur Förderung der Nutzung von Energie aus erneuerbarer Quellen (KOM(2008) 19 endg.) zu erfolgen.

Artikel 6 Absatz 2 wird angefügt, um sicherzustellen, dass die Analyse der alternativen Systeme faktisch durchgeführt wird und dies auf transparente Weise erfolgt.

**Artikel 7 Bestehende Gebäude**

Der Schwellenwert von 1000 m<sup>2</sup> für die Einhaltung der nationalen/regionalen Mindestanforderungen an die Energieeffizienz, wenn Gebäude im größeren Ausmaß renoviert werden, wird gestrichen. Aufgrund dieses Schwellenwerts der geltenden GEEG-Richtlinie sind 72 % des Gebäudebestands ausgenommen, weshalb ein erhebliches kostenwirksames Energieeinsparpotenzial brach liegt. Der beste Zeitpunkt zur Durchführung von Maßnahmen zur Steigerung der Energieeffizienz ist sicherlich dann, wenn das Gebäude im größeren Ausmaß renoviert wird (etwa alle 25 bis 40 Jahre). Der zusätzliche Investitionsbedarf ist dann nicht hoch und amortisiert sich aufgrund der Energieeinsparung innerhalb der Lebensdauer der Maßnahmen.

Die Begriffsbestimmung „größere Renovierung“ wird beibehalten und erhält stärkeres Gewicht, indem sie von der Präambel nach Artikel 2 verschoben wird. Demnach sollte die Investition mehr als 25 % des gesamten Gebäudewerts (ohne Grundstück) betreffen, etwa des Versicherungswerts, oder es sollten mehr als 25 % der Gebäudehülle einer strukturellen Renovierung unterzogen werden.

**Artikel 8 Gebäudetechnische Systeme in bestehenden Gebäuden**

Die Mitgliedstaaten haben Mindestanforderungen an die Energieeffizienz für den Einbau neuer oder den Ersatz bestehender gebäudetechnischer Systeme oder deren größere Nachrüstung festzulegen. Diese sollten mit den Rechtsvorschriften vereinbar sein, die für die

Produkte gelten, aus denen sich das System zusammensetzt, und auf einer ordnungsgemäßen Installation der Systemkomponenten und deren angemessener Einstellung und Dimensionierung beruhen. Damit wird eine höhere Effizienz ganzer Systeme angestrebt. Das ist erforderlich, weil bei unkorrektem Einbau oder unzureichender Einstellung der Einzelkomponenten des Systems auch bei hoher Effizienz der Einzelkomponenten das Gesamtsystem möglicherweise keine hohe Effizienz erreicht.

#### **Artikel 9 Gebäude, deren Kohlendioxidemissionen und Primärenergieverbrauch gering oder gleich Null sind**

Die Mitgliedstaaten werden verpflichtet, eine höhere Marktdurchsetzung solcher Gebäude aktiv zu fördern, indem sie nationale Pläne mit eindeutigen Definitionen und Zielen für die Annahme durch den Markt erstellen. Die Mitgliedstaaten sollten die führende Rolle öffentlicher Behörden bei der Festlegung spezifischer Ziele für die von ihnen genutzten Gebäude nachweisen. Auf der Grundlage der Informationen der Mitgliedstaaten legt die Kommission gemeinsame Grundsätze zur Definition solcher Gebäude fest. Die Kommission wird über den Fortschritt der Mitgliedstaaten Bericht erstatten und auf dieser Grundlage eine Strategie sowie nötigenfalls weitere Maßnahmen ausarbeiten.

#### **Artikel 10 Ausweise über die Gesamtenergieeffizienz**

Das Gewicht der Empfehlungen des Ausweises über die Gesamtenergieeffizienz wird erhöht und verdeutlicht, indem hervorgehoben wird, dass sie ein unverzichtbarer Teil des Ausweises sind, und indem Bestimmungen zu den Informationen, die sie zu enthalten haben, aufgenommen werden.

#### **Artikel 11 Ausstellung von Ausweisen über die Gesamtenergieeffizienz**

Die Anforderungen bezüglich der Ausstellung der Ausweise werden neu gefasst, um sicherzustellen, dass die Ausweise bei jeder Immobilientransaktion erstellt werden und der mögliche Käufer oder Mieter über die Energieeffizienz des Gebäudes (oder von Gebäudeteilen) frühzeitig (d. h. in Verkaufs-/Vermietankündigungen) informiert wird.

Es wird die Anforderung eingeführt, dass ein Ausweis bis 31. Dezember 2010 auszustellen ist, wenn eine Gesamtnutzfläche über 250 m<sup>2</sup> eines Gebäudes von öffentlichen Behörden genutzt wird.

#### **Artikel 12 Anbringung von Ausweisen über die Gesamtenergieeffizienz**

Der Anwendungsbereich der Verpflichtung zur Anbringung des Ausweises wird ausgeweitet: Wenn die Gesamtnutzfläche eines Gebäudes, das von einer öffentlichen Behörde genutzt wird oder starken Publikumsverkehr aufweist, über 250 m<sup>2</sup> beträgt, muss der Ausweis an einer für die Öffentlichkeit gut sichtbaren Stelle angebracht werden. Im letzteren Fall gilt die Anforderung nur, wenn der Ausweis bereits vorhanden ist.

#### **Artikel 13 Inspektion von Heizungsanlagen**

Die Häufigkeit der Inspektionen wird deutlicher gefasst, um der Verhältnismäßigkeit von Inspektionskosten und zu erwartenden Energieeinsparungen, die durch die Inspektion bewirkt werden, Gewicht zu verleihen.

Es wird eine Anforderung bezüglich eines unabhängigen Kontrollsystems für die Inspektionsberichte eingeführt, bei dem die Qualität stichprobenartig geprüft wird.

#### **Artikel 14 Inspektion von Klimaanlage**

Ähnlich wie in Artikel 13 Verdeutlichung der Häufigkeit der Inspektionen.

#### **Artikel 15 Berichte über die Inspektion von Heizungs- und Klimaanlage**

Es wird die Anforderung eingeführt, dass der Inspektionsbericht dem Gebäudeeigentümer oder -mieter auszuhändigen ist, damit diese auf geeignete Weise über das Inspektionsergebnis und Empfehlungen zu kostenwirksamen Verbesserungen informiert werden.

#### **Artikel 16 Unabhängiges Fachpersonal**

Es wird eine Anforderung hinzugefügt, dass bei der Zulassung die fachlichen Fähigkeiten des Fachpersonals, das die Ausweise ausstellt und Inspektionen durchführt, sowie dessen Fähigkeit, die Dienstleistungen in unabhängiger Weise durchzuführen, berücksichtigt wird.

Derzeit beschränken einige Mitgliedstaaten die Zulassung von Fachpersonal auf bestimmte Berufsgruppen oder Unternehmen, wodurch deren Kompetenz nicht gewährleistet wird und andere befähigte Fachleute, z. B. Energiedienstleistungsunternehmen und Energieagenturen, am Markteintritt gehindert werden, was den Wettbewerb einschränkt.

#### **Artikel 17 Unabhängiges Kontrollsystem**

Es wird eine Anforderung bezüglich eines unabhängigen Kontrollsystems für die Ausweise über die Gesamtenergieeffizienz und die Inspektionsberichte für Heizungs- und Klimaanlage eingeführt, bei dem die Qualität stichprobenartig geprüft wird.

Die Ausweise und Inspektionsberichte sind auf Anforderung zu registrieren.

#### **Artikel 18 Überprüfung**

Aktualisiert.

#### **Artikel 19 Information**

Die Mitgliedstaaten haben den Gebäudeeigentümern oder –mietern Informationen über Ausweise über die Gesamtenergieeffizienz und die Inspektion von Heizungs- und Klimaanlage bereitzustellen. Bei der Durchführung der geltenden Richtlinie hat sich gezeigt, dass sich die Bevölkerung nicht immer ihrer Rolle und ihres Beitrags bewusst ist. Wenn dies nicht verstanden wird und lediglich als weitere administrative Anforderung betrachtet wird, lässt sich die potenzielle positive Wirkung nicht erreichen. Daher sind von den Mitgliedstaaten umfassende Informationskampagnen einzuleiten.

#### **Artikel 20 Anpassung von Anhang I an den technischen Fortschritt**

Angepasst.

#### **Artikel 21 Ausschuss**

Geändert entsprechend den Anpassungen für das Regelungsverfahren mit Kontrolle.

**Artikel 22 Sanktionen**

Die Mitgliedstaaten sind verpflichtet, Regeln zur Ahndung von Verstößen gegen die nach dieser Richtlinie erlassenen nationalen Vorschriften festzulegen und anzuwenden. Die Strafe kann vom Energieverbrauch oder vom Energiebedarf des Gebäudes, für das der Ausweis ausgestellt wurde, bzw. der effektiven Leistung der inspizierten Heizungs-/Klimaanlage abhängig gemacht werden.

Der Wortlaut ist an Artikel 20 (Sanktionen) der Richtlinie 2005/32/EG angelehnt.

**Artikel 23 Umsetzung**

Die Fristen werden angepasst, so dass die Mitgliedstaaten ausreichend Zeit für die Umsetzung (bis 31. Dezember 2010) und umfassende Durchführung (bis 31. Januar 2012) der geänderten/neuen Bestimmungen haben. Um die wichtige Vorreiterrolle des öffentlichen Sektors zu stärken, ist die für die öffentlichen Behörden geltende Frist zur Durchführung der Bestimmung kürzer (bis 31. Dezember 2010).

**Artikel 24 Aufhebung**

Hier eingefügt zur Unterscheidung zwischen den Bestimmungen der geltenden GEEG-Richtlinie und ihrer Neufassung.

**Artikel 25 Inkrafttreten**

Angepasst.

**Artikel 26**

Keine Änderungen.

**Anhang I**

Eine Abschätzung der „tatsächlichen“ Auswirkungen des Gebäudebetriebs auf den Gesamtenergieverbrauch und auf die Umwelt ist wichtig, dazu sind ein Indikator für den Primärenergieverbrauch und ein Indikator für die CO<sub>2</sub>-Emissionen zu verwenden.

Die jährlichen Energieeffizienzdaten sind zur Bewertung zu nutzen, damit die Bedeutung der unterschiedlichen Energienutzung im Jahresverlauf hervorgehoben und der Kühlbedarf besser berücksichtigt wird.

Es wurde auf Europäische Normen Bezug genommen, um die Harmonisierung der Methodik zur Berechnung der nationalen/regionalen Mindestanforderungen an die Energieeffizienz zu unterstützen.

**Anhang II**

Umfasst eine Beschreibung des unabhängigen Kontrollsystems für Ausweise über die Gesamtenergieeffizienz und Inspektionsberichte.

**Anhang III**

Gemäß Artikel 23 angefügt.

**Anhang IV**

Entsprechungstabelle.

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↓ 2002/91
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2008/0223 (COD)

Vorschlag für eine

**RICHTLINIE DES EUROPÄISCHEN PARLAMENTS UND DES RATES****über die Gesamtenergieeffizienz von Gebäuden**

(Neufassung)

DAS EUROPÄISCHE PARLAMENT UND DER RAT DER EUROPÄISCHEN UNION –

gestützt auf den Vertrag zur Gründung der Europäischen Gemeinschaft, insbesondere auf Artikel 175 Absatz 1,

auf Vorschlag der Kommission,

nach Stellungnahme des Europäischen Wirtschafts- und Sozialausschusses<sup>10</sup>,nach Stellungnahme des Ausschusses der Regionen<sup>11</sup>,gemäß dem Verfahren des Artikels 251 EG-Vertrag<sup>12</sup>,

in Erwägung nachstehender Gründe:

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↓ neu
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- (1) Die Richtlinie 2002/91/EG des Europäischen Parlaments und des Rates vom 16. Dezember 2002 über die Gesamtenergieeffizienz von Gebäuden<sup>13</sup> ist geändert worden<sup>14</sup>. Aus Gründen der Klarheit empfiehlt es sich, im Rahmen der jetzt anstehenden wesentlichen Änderungen eine Neufassung dieser Richtlinie vorzunehmen.

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<sup>10</sup> ABl. C [...] vom [...], S. [...].

<sup>11</sup> ABl. C [...] vom [...], S. [...].

<sup>12</sup> ABl. C [...] vom [...], S. [...].

<sup>13</sup> ABl. L 1 vom 4.1.2003, S. 65.

<sup>14</sup> Siehe Anhang IV Teil A.



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↓ 2002/91 (angepasst)	Erwägung	1
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~~(1) Nach Artikel 6 des Vertrags müssen die Erfordernisse des Umweltschutzes bei der Festlegung und Durchführung der Gemeinschaftspolitiken und -maßnahmen einbezogen werden.~~

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↓ 2002/91 Erwägung 2
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(2) Zu den natürlichen Ressourcen, auf deren umsichtige und rationelle Verwendung in Artikel 174 des Vertrags Bezug genommen wird, gehören Mineralöl, Erdgas und feste Brennstoffe, die wichtige Energiequellen darstellen, aber auch die größten Verursacher von Kohlendioxidemissionen sind.

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↓ 2002/91 Erwägung 3
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~~Die Steigerung der Energieeffizienz ist wesentlicher Bestandteil der politischen Strategien und Maßnahmen, die zur Erfüllung der im Rahmen des Kyoto-Protokolls eingegangenen Verpflichtungen erforderlich sind, und sollte in jedes politische Konzept zur Erfüllung weiterer Verpflichtungen einbezogen werden.~~

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↕ neu
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(3) Die Senkung des Energieverbrauchs im Gebäudesektor ist ein wesentliches Element des Maßnahmenbündels, das zur Verringerung der Treibhausgasemissionen und zur Einhaltung des Kyoto-Protokolls zum Rahmenübereinkommen der Vereinten Nationen über Klimaänderungen und weiterer europäischer und internationaler Verpflichtungen zur Senkung der Treibhausgasemissionen über das Jahr 2012 hinaus benötigt wird. Ein geringerer Energieverbrauch spielt auch eine wichtige Rolle bei der Stärkung der Energieversorgungssicherheit, der Förderung der technologischen Entwicklung sowie der Schaffung von Beschäftigungsmöglichkeiten und von Möglichkeiten der regionalen Entwicklung, vor allem in ländlichen Gebieten.

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↓ 2002/91 Erwägung 4
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(4) Die Steuerung der Energienachfrage ist ein wichtiges Instrument für die Gemeinschaft, um auf den globalen Energiemarkt und damit auf die mittel- und langfristige Sicherheit der Energieversorgung Einfluss zu nehmen.

↓ 2002/91 (angepasst) ⇒ neu	Erwägung	5
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~~(5) In seinen Schlussfolgerungen vom 30. Mai 2000 und vom 5. Dezember 2000 billigte der Rat den Aktionsplan der Kommission zur Verbesserung der Energieeffizienz und forderte spezifische Maßnahmen für den Gebäudebereich.~~

↓ neu
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(5) Der Europäische Rat hat auf seiner Tagung im März 2007 auf die Notwendigkeit einer Steigerung der Energieeffizienz in der Gemeinschaft hingewiesen, um auf diese Weise den Energieverbrauch in der Gemeinschaft bis 2020 um 20 % zu senken, und rief dazu auf, die Prioritäten, die in der Mitteilung der Kommission „Aktionsplan für Energieeffizienz: Das Potenzial ausschöpfen“<sup>15</sup> genannt werden, umfassend und rasch umzusetzen. In diesem Aktionsplan wurde auf das erhebliche Potenzial für kostenwirksame Energieeinsparungen im Gebäudesektor hingewiesen. Das Europäische Parlament hat in seiner EntschlieÙung vom 31. Januar 2008 dazu aufgerufen, die Bestimmungen der Richtlinie 2002/91/EG zu verschärfen.

↓ 2002/91 (angepasst)	Erwägung	6
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(6) Der Wohn- und der Tertiärsektor, der zum größten Teil aus Gebäuden besteht, ist für ~~über~~  etwa  40 % des Endenergieverbrauchs in der Gemeinschaft verantwortlich; da dieser Sektor in Expansion begriffen ist, werden auch sein Energieverbrauch und somit seine Kohlendioxidemissionen steigen.

↓ 2002/91 (angepasst)	Erwägung	7
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~~(7) Die Richtlinie 93/76/EWG des Rates vom 13. September 1993 zur Begrenzung der Kohlendioxidemissionen durch eine effizientere Energienutzung (SAVE)(5), nach der die Mitgliedstaaten Programme zur Energieeffizienz für den Gebäudebereich entwickeln und durchführen und über diese Programme Bericht erstatten sollen, führt jetzt zu ersten wichtigen Ergebnissen. Ein ergänzendes Rechtsinstrument ist jedoch erforderlich, um  Es ist notwendig,  konkretere Maßnahmen im Hinblick auf das große ungenutzte Potenzial für Energieeinsparungen  in Gebäuden  und eine Verringerung der ~~die~~ bedeutenden Unterschiede zwischen den Erfolgen der Mitgliedstaaten auf diesem Gebiet festzulegen.~~

<sup>15</sup> KOM(2006) 545 endg.

↓ 2002/91 Erwägung 8
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~~(8) — Nach der Richtlinie 89/106/EWG des Rates vom 21. Dezember 1988 zur Angleichung der Rechts- und Verwaltungsvorschriften der Mitgliedstaaten über Bauprodukte(6) sind Bauwerke und ihre Heizungs-, Kühlungs- und Lüftungseinrichtungen derart zu entwerfen und auszuführen, dass unter Berücksichtigung der klimatischen Gegebenheiten des Standorts und der Bedürfnisse der Bewohner der Energieverbrauch bei ihrer Nutzung gering gehalten wird.~~

↓ 2002/91	Erwägung	9
(angepasst)		
⇒ neu		

(8) Bei Maßnahmen zur weiteren Verbesserung der Gesamtenergieeffizienz von Gebäuden sollte den klimatischen und lokalen Bedingungen sowie dem Innenraumklima und der Kostenwirksamkeit Rechnung getragen werden. ☒ Diese Maßnahmen ☒ Sie sollten anderen ~~grundlegenden~~ Anforderungen an Gebäude, wie beispielsweise Zugänglichkeit, Sicherheit und beabsichtigter Nutzung des Gebäudes, nicht entgegenstehen.

↓ 2002/91	Erwägung	10
(angepasst)		
⇒ neu		

(9) Die Gesamtenergieeffizienz von Gebäuden sollte nach einer Methode berechnet werden, die ☒ national und ☒ regional differenziert werden kann und bei der zusätzlich ~~zur Wärmedämmung~~ ☒ zu den Wärmeeigenschaften ☒ auch andere Faktoren von wachsender Bedeutung einbezogen werden, z. B. Heizungssysteme und Klimaanlage, Nutzung erneuerbarer Energieträger ☒, passive Heizung und Kühlelemente, Sonnenschutz, Raumluftqualität, angemessene natürliche Beleuchtung ☒ und Konstruktionsart des Gebäudes. ☒ Bei der Methode zur Berechnung der Energieeffizienz sollte nicht nur die Heizperiode eines Jahres, sondern die jährliche Gesamtenergieeffizienz eines Gebäudes zugrunde gelegt werden. ☒

↓ 2002/91	Erwägung	22
(angepasst)		
⇒ neu		

(10) ☒ Die Mitgliedstaaten sollten Mindestanforderungen an die Gesamtenergieeffizienz von Gebäuden festlegen. Die Anforderungen sollten so gewählt werden, dass ein kostenoptimales Verhältnis zwischen den zu tätigen Investitionen und den über den gesamten Lebenszyklus des Gebäudes eingesparten Energiekosten erreicht wird. ☒ Es sollten entsprechende Vorkehrungen getroffen werden, damit ~~die Berechnungsmethode rasch angepasst werden kann~~ und die Mitgliedstaaten die ☒ ihre ☒ Mindestanforderungen an die Gesamtenergieeffizienz von Gebäuden regelmäßig im Hinblick auf den technischen

~~Fortschritt, unter anderem in Bezug auf die Dämmeigenschaften (oder Qualität) der Baumaterialien, und künftige Entwicklungen der Normung überprüfen können.~~

↓ neu

- (11) Diese Richtlinie gilt unbeschadet der Artikel 87 und 88 EG-Vertrag. Der in dieser Richtlinie verwendete Begriff des Anreizes ist daher nicht so zu verstehen, dass darin auch staatliche Beihilfen enthalten sind.

↓ neu

- (12) Die Kommission sollte eine Vergleichsmethode zur Berechnung kostenoptimaler Mindestanforderungen an die Gesamtenergieeffizienz von Gebäuden bestimmen. Die Mitgliedstaaten sollten diese Vergleichsmethode gebrauchen, um die Ergebnisse mit den von ihnen festgelegten Mindestanforderungen an die Gesamtenergieeffizienz zu vergleichen. Über die Ergebnisse dieses Vergleichs und die dabei zugrunde gelegten Daten sollte der Kommission regelmäßig Bericht erstattet werden. Diese Berichte sollten der Kommission die Möglichkeit geben, die Fortschritte der Mitgliedstaaten bei der Erreichung kostenoptimaler Mindestanforderungen an die Gesamtenergieeffizienz zu beurteilen und darüber Bericht zu erstatten. Nach einer Übergangszeit sollten die Mitgliedstaaten diese Vergleichsmethode, wenn sie ihre Mindestanforderungen an die Gesamtenergieeffizienz überprüfen, gebrauchen.

↓ 2002/91 Erwägung 12  
(angepasst)  
⇒ neu

- (13) Gebäude haben Auswirkungen auf den langfristigen Energieverbrauch; daher sollten neue Gebäude bestimmten Mindestanforderungen an die Gesamtenergieeffizienz genügen, die ~~auf die~~ ☒ den ☒ klimatischen ~~Verhältnisse~~ Verhältnissen vor Ort ~~zugeschnitten~~ ☒ angepasst ☒ sind. ~~In diesem Zusammenhang sollten bewährte Verfahren auf eine optimale Nutzung der Faktoren ausgerichtet werden, die zur Verbesserung der Gesamtenergieeffizienz von Bedeutung sind.~~ Da die Einsatzmöglichkeiten alternativer Energieversorgungssysteme in der Regel nicht voll ausgeschöpft werden, sollte die technische, ökologische und wirtschaftliche Einsetzbarkeit alternativer Energieversorgungssysteme ⇒ , unabhängig von der Gebäudegröße, ⇐ geprüft werden, ~~dies kann einmalig durch den betreffenden Mitgliedstaat anhand einer Studie erfolgen, die zur Aufstellung einer Liste von Energieeinsparungsmaßnahmen für durchschnittliche örtliche Marktbedingungen unter Einhaltung von Kosteneffizienzkriterien führt. Vor Baubeginn können gegebenenfalls spezifische Studien angefordert werden, wenn die Maßnahme bzw. die Maßnahmen als durchführbar gilt bzw. gelten.~~

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↓ 2002/91 (angepasst) ⇒ neu	Erwägung	13
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(14) ~~Auch größere~~ Größere Renovierungen bestehender Gebäude, ⇒ unabhängig von ihrer Größe, ⇐ ~~ab einer bestimmten Größe sollten als~~ ☒ stellen eine ☒ Gelegenheit für kosteneffektive Maßnahmen zur Verbesserung der Gesamtenergieeffizienz ☒ dar ☒ betrachtet werden. ~~Größere Renovierungen sind solche, bei denen die Gesamtkosten der Arbeiten an der Gebäudehülle und/oder den Energieeinrichtungen wie Heizung, Warmwasserversorgung, Klimatisierung, Belüftung und Beleuchtung 25 % des Gebäudewerts, den Wert des Grundstücks auf dem das Gebäude errichtet wurde, nicht mitgerechnet übersteigen, oder bei denen mehr als 25 % der Gebäudehülle einer Renovierung unterzogen werden.~~ ⇒ Aus Gründen der Kosteneffizienz sollte es möglich sein, die Mindestanforderungen an die Gesamtenergieeffizienz auf diejenigen renovierten Teile zu beschränken, die für die Energieeffizienz des Gebäudes am wichtigsten sind. ⇐

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↓ 2002/91 Erwägung 11
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~~(11) Die Kommission beabsichtigt eine Weiterentwicklung von Normen wie EN 832 und prEN 13790, auch unter Berücksichtigung von Klimaanlagen und Beleuchtung.~~

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↓ neu
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(15) Um die Zahl der Gebäude zu erhöhen, die nicht nur die geltenden Mindestanforderungen an die Gesamtenergieeffizienz erfüllen, sondern noch energieeffizienter sind, müssen Maßnahmen ergriffen werden. Zu diesem Zweck sollten die Mitgliedstaaten nationale Pläne erstellen, um die Zahl der Gebäude zu erhöhen, deren Kohlendioxidemissionen und Primärenergieverbrauch gering oder gleich Null sind, und der Kommission darüber regelmäßig Bericht erstatten.

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↓ neu
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(16) Um den Meldeaufwand für die Mitgliedstaaten zu verringern, sollten die in dieser Richtlinie geforderten Berichte in die Energieeffizienz-Aktionspläne gemäß Artikel 14 Absatz 2 der Richtlinie 2006/32/EG des Europäischen Parlaments und des Rates vom 5. April 2006 über Endenergieeffizienz und Energiedienstleistungen und zur Aufhebung der Richtlinie 93/76/EWG<sup>16</sup> des Rates integriert werden können. Der öffentliche Sektor in den Mitgliedstaaten sollte auf dem Gebiet der Gesamtenergieeffizienz von Gebäuden eine Vorreiterrolle übernehmen, und die nationalen Pläne sollten daher für Gebäude, die von Behörden genutzt werden, ehrgeizigere Ziele beinhalten.

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<sup>16</sup> ABl. L 114 vom 27.4.2006, S. 64.

↓ neu
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(17) Der Ausweis über die Gesamtenergieeffizienz sollte potenziellen Käufern und Mietern von Gebäuden oder Gebäudeteilen zutreffende Informationen über die Energieeffizienz des Gebäudes sowie praktische Hinweise zu deren Verbesserung liefern. Zudem sollte der Ausweis Angaben darüber enthalten, wie sich Heizung und Kühlung auf den Energiebedarf des Gebäudes sowie auf dessen Primärenergieverbrauch und die Kohlendioxidemissionen auswirken.

↓ 2002/91 (angepasst) ⇒ neu	Erwägung	16
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~~(18) Die Erstellung von Energieausweisen kann durch Programme unterstützt werden, mit denen ein gerechter Zugang zur Verbesserung der Gesamtenergieeffizienz erleichtert werden soll, oder auf der Grundlage von Vereinbarungen zwischen Organisationen von Betroffenen und einer von dem jeweiligen Mitgliedstaat benannten Stelle erfolgen oder von Energiedienstleistungsunternehmen vorgenommen werden, die sich dazu verpflichten, die ermittelten Investitionen zu tätigen. Die angenommenen Systeme sollten der Aufsicht und Kontrolle des Mitgliedstaats unterliegen, der auch den Einsatz von Anreizsystemen erleichtern sollte. Soweit möglich, sollte der Energieausweis eine Beschreibung der tatsächlichen Gesamtenergieeffizienz des Gebäudes enthalten; er kann entsprechend überarbeitet werden. Behördengebäude ☒ Gebäude, die von Behörden genutzt werden, ☒ und Gebäude mit starkem Publikumsverkehr sollten ⇒ können ⇐ durch Einbeziehung von Umwelt- und Energieaspekten ein Vorbild ⇒ darstellen ⇐ geben, und daher sollten weshalb regelmäßig Energieausweise für sie erstellt werden sollten. Die Unterrichtung der Öffentlichkeit über die Gesamtenergieeffizienz sollte durch Anbringung der Energieausweise an gut sichtbaren Stellen unterstützt werden. Außerdem dürfte die Angabe der offiziell empfohlenen Raumtemperaturen zusammen mit der tatsächlich gemessenen Temperatur einem ineffizienten Betrieb von Heizsystemen, Klima- und Belüftungsanlagen vorbeugen. Dies sollte dazu beitragen, die Verschwendung von Energie zu vermeiden und ein angenehmes Raumklima (thermische Behaglichkeit) im Verhältnis zur jeweiligen Außentemperatur zu gewährleisten.~~

↓ 2002/91 Erwägung 18
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(19) In den letzten Jahren ist eine zunehmende Verwendung von Klimaanlage in den ~~südlichen~~ Ländern Europas zu verzeichnen. Dies führt zu großen Problemen ~~bei den~~ zu Spitzenlastzeiten in den Ländern mit der Folge, dass die Stromkosten steigen und die Energiebilanz dieser Länder beeinträchtigt wird. ~~Vorrang sollte Strategien eingeräumt werden, die zur Verbesserung des thermischen Verhaltens der Gebäude in der Sommerperiode beitragen. Weiterzuentwickeln sind hierzu die Techniken der passiven Kühlung und insbesondere jene Techniken, die zur Verbesserung der Qualität des Raumklimas sowie zur Verbesserung des Mikroklimas in der Umgebung von Gebäuden beitragen.~~

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↓ 2002/91 Erwägung 14

~~(14) Die Verbesserung der Gesamtenergieeffizienz eines bestehenden Gebäudes setzt zwar nicht unbedingt eine vollständige Renovierung des Gebäudes voraus, sie könnte sich aber auf die Teile beschränken, die am wichtigsten für die Gesamtenergieeffizienz des Gebäudes und kosteneffizient sind.~~

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↓ 2002/91 Erwägung 15  
(angepasst)

~~(15) Die Anforderungen an die Renovierung bestehender Gebäude sollten nicht mit der beabsichtigten Nutzung dieser Gebäude oder deren Qualität oder Charakter unvereinbar sein. Es sollte möglich sein, bei einer solchen Renovierung anfallende Zusatzkosten binnen einer im Verhältnis zur technischen Lebensdauer der Investition vertretbaren Frist durch verstärkte Energieeinsparungen zu amortisieren.~~

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↓ 2002/91 Erwägung 17

~~(17) Die Mitgliedstaaten können auch andere, nicht in dieser Richtlinie vorgesehene Instrumente/Maßnahmen zur Förderung der Verbesserung der Energieeffizienz anwenden. Die Mitgliedstaaten sollten gutes Energiemanagement unter Berücksichtigung der Intensität der Gebäudenutzung fördern.~~

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↓ 2002/91 Erwägung 19  
(angepasst)  
⇒ neu

(20) Die regelmäßige ⇒ Inspektion ⇐ ~~Wartung~~ von ~~Heizungskesseln~~ ⇒ Heizungs- ⇐ und Klimaanlage durch qualifiziertes Personal trägt zu einem korrekten Betrieb gemäß der Produktspezifikation bei und gewährleistet damit eine optimale Leistung aus ökologischer, sicherheitstechnischer und energetischer Sicht. Eine unabhängige Prüfung der gesamten ~~Heizungsanlage~~ Heizungs- und ⇒ Kühlungsanlage sollte während ihrer gesamten Lebensdauer in regelmäßigen Abständen erfolgen, insbesondere vor einem Austausch oder einer Modernisierung. ⇐ ~~ist angebracht, wenn eine Erneuerung auf Grundlage der Kosteneffizienz in Betracht kommt.~~

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↓ 2002/91 Erwägung 20

~~(20) Die Umlegung der Kosten für Heizung, Klimatisierung und Warmwasser entsprechend dem tatsächlichen Verbrauch auf die Nutzer der Gebäude könnte zur Einsparung von Energie im Wohnungsbereich beitragen. Die Nutzer sollten den Eigenverbrauch an Heizung und Warmwasser selbst regeln können, soweit diese Maßnahmen kosteneffizient sind.~~

↓ 2002/91 (angepasst) ⇒ neu	Erwägung	10
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- (21) Ein gemeinsamer Ansatz bei ~~diesem Prozess~~ ☒ der Erstellung von Energieausweisen für Gebäude und der Inspektion von Heizungs- und Klimaanlage durch ☒ ~~und der Einsatz von~~ qualifiziertes~~m~~ und/oder zugelassenes~~m~~ Fachpersonal, dessen Unabhängigkeit auf der Grundlage objektiver Kriterien zu gewährleisten ist, werden dazu beitragen, gleiche Bedingungen für die Anstrengungen in den Mitgliedstaaten bei Energieeinsparungen im Gebäudesektor zu schaffen, und werden für die künftigen Besitzer oder Nutzer auf dem europäischen Immobilienmarkt hinsichtlich der Gesamtenergieeffizienz für Transparenz sorgen. ⇒ Um die Qualität der Ausweise über die Gesamtenergieeffizienz und der Inspektion von Heizungs- und Klimaanlage in der gesamten Gemeinschaft zu gewährleisten, sollte in jedem Mitgliedstaat ein unabhängiges Kontrollsystem eingerichtet werden. ⇐

↓ 2002/91	Erwägung	23
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- (22) Die Maßnahmen, die zur Umsetzung dieser Richtlinie erforderlich sind, sollten gemäß dem Beschluss 1999/468/EG des Rates vom 28. Juni 1999 zur Festlegung der Modalitäten für die Ausübung der der Kommission übertragenen Durchführungsbefugnisse erlassen werden<sup>17</sup>.

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↓ neu
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- (23) Die Kommission sollte insbesondere die Befugnis erhalten, bestimmte Teile des allgemeinen Rahmens in Anhang I an den technischen Fortschritt anzupassen, eine Methode zur Berechnung kostenoptimaler Mindestanforderungen an die Energieeffizienz von Gebäuden zu bestimmen und gemeinsame Grundsätze für die Definition von Gebäuden festzulegen, deren Kohlendioxidemissionen und Primärenergieverbrauch gering oder gleich Null sind. Da es sich hierbei um Maßnahmen von allgemeiner Tragweite handelt, die eine Änderung nicht wesentlicher Bestimmungen der vorliegenden Richtlinie bewirken, sind sie nach dem Regelungsverfahren mit Kontrolle des Artikels 5a des Beschlusses 1999/468/EG zu erlassen.

↓ 2002/91 (angepasst) ⇒ neu	Erwägung	21
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- (24) ⇒ Da das Ziel einer Verbesserung der Gesamtenergieeffizienz von Gebäuden wegen der komplexen Struktur des Gebäudesektors und des Unvermögens der nationalen Immobilienmärkte, den Herausforderungen auf dem Gebiet der Energieeffizienz hinreichend

<sup>17</sup> ABl. L 184 vom 17.7.1999, S. 23.



zu begegnen, auf Ebene der Mitgliedstaaten nicht ausreichend verwirklicht werden kann und daher wegen des Umfangs und der Wirkungen der Maßnahme besser auf Gemeinschaftsebene zu erreichen ist,  $\Leftrightarrow$  kann die Gemeinschaft gemäß dem Subsidiaritätsprinzip ~~und dem Grundsatz der Verhältnismäßigkeit~~ im Sinne von Artikel 5 des Vertrags  $\Rightarrow$  tätig werden  $\Leftrightarrow$  ~~sollten auf Gemeinschaftsebene allgemeine Grundsätze für ein System von Anforderungen und Zielen für Gesamtenergieeffizienz festgelegt werden; die detaillierte Umsetzung sollte jedoch den Mitgliedstaaten überlassen bleiben, um jedem Mitgliedstaat die Möglichkeit zu geben, entsprechend seiner jeweiligen Situation das optimale System zu wählen.~~  
 $\boxtimes$  Entsprechend dem in demselben Artikel niedergelegten Grundsatz der Verhältnismäßigkeit geht  $\boxtimes$  Diese Richtlinie ~~beschränkt sich auf die zur Erreichung dieser Ziele erforderlichen Mindestvorschriften und geht nicht über das dazu erforderliche Maß~~  
 $\boxtimes$  zur Erreichung dieses Ziels erforderliche Maß hinaus  $\boxtimes$ .

↓ neu

(25) Die Verpflichtung zur Umsetzung dieser Richtlinie in innerstaatliches Recht sollte nur jene Bestimmungen betreffen, die im Vergleich zu der bisherigen Richtlinie inhaltlich geändert wurden. Die Pflicht zur Umsetzung der inhaltlich unveränderten Bestimmungen ergibt sich aus der bisherigen Richtlinie.

(26) Die vorliegende Richtlinie sollte die Pflichten der Mitgliedstaaten hinsichtlich der Fristen für die Umsetzung der in Anhang III Teil B genannten Richtlinie in innerstaatliches Recht und für deren Anwendung unberührt lassen –

↓ 2002/91 (angepasst)  
 $\Rightarrow$  neu

HABEN FOLGENDE RICHTLINIE ERLASSEN:

*Artikel 1*  
~~Ziel~~  $\boxtimes$  *Gegenstand*  $\boxtimes$

~~Ziel dieser~~ Diese Richtlinie ~~ist es,~~  $\boxtimes$  unterstützt  $\boxtimes$  die Verbesserung der Gesamtenergieeffizienz von Gebäuden in der Gemeinschaft unter Berücksichtigung der jeweiligen äußeren klimatischen und lokalen Bedingungen sowie der Anforderungen an das Innenraumklima und der Kostenwirksamkeit ~~zu unterstützen.~~

Diese Richtlinie enthält Anforderungen hinsichtlich

- (a) des allgemeinen Rahmens für eine Methode zur Berechnung der integrierten Gesamtenergieeffizienz von Gebäuden  $\boxtimes$  und Gebäudeteilen  $\boxtimes$ ,
- (b) der Anwendung von Mindestanforderungen an die Gesamtenergieeffizienz neuer Gebäude  $\boxtimes$  und Gebäudeteile  $\boxtimes$ ,
- (c) der Anwendung von Mindestanforderungen an die Gesamtenergieeffizienz bestehender ~~großer~~ Gebäude  $\boxtimes$  und Gebäudeteile  $\boxtimes$ , die einer größeren Renovierung unterzogen werden sollen,

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↓ neu

- (d) nationaler Pläne zur Erhöhung der Zahl der Gebäude, deren Kohlendioxidemissionen und Primärenergieverbrauch gering oder gleich Null sind,

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↓ 2002/91 (angepasst)  
⇒ neu

- ~~(d)(e)~~ der Erstellung von Energieausweisen für Gebäude ☒ oder Gebäudeteile ☒, ~~und~~  
~~(e)(f)~~ regelmäßiger Inspektionen von ~~Heizkesseln~~ ⇒ Heizungs- ⇐ und Klimaanlage in Gebäuden ~~und einer Überprüfung der gesamten Heizungsanlage, wenn deren Kessel älter als 15 Jahre sind.~~

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↓ neu

- (g) unabhängiger Kontrollsysteme für Ausweise über die Gesamtenergieeffizienz und Inspektionsberichte.

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↓ 2002/91  
⇒ neu

### *Artikel 2 Begriffsbestimmungen*

Im Sinne dieser Richtlinie bezeichnet der Ausdruck

- (1) „Gebäude“ eine Konstruktion mit Dach und Wänden, deren Innenraumklima unter Einsatz von Energie konditioniert wird; ~~mit "Gebäude" können ein Gebäude als Ganzes oder Teile des Gebäudes, die als eigene Nutzungseinheiten konzipiert oder umgebaut wurden, bezeichnet werden;~~

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↓ neu

- (2) „gebäudetechnische Systeme“ die technische Ausrüstung für Heizung, Kühlung, Lüftung, Warmwasserbereitung, Beleuchtung und Stromerzeugung oder einer Kombination daraus;

↓ 2002/91 (angepasst)  
⇒ neu

~~(2)~~(3) „Gesamtenergieeffizienz eines Gebäudes“ die  berechnete oder gemessene  Energiemenge, die ~~tatsächlich verbraucht oder veranschlagt~~  benötigt  wird, um ~~den unterschiedlichen Erfordernissen~~  dem Energiebedarf  im Rahmen der ~~Standardnutzung~~  üblichen Nutzung  des Gebäudes (u. a. ~~etwa~~ Heizung, Warmwasserbereitung, Kühlung, Lüftung und Beleuchtung) gerecht zu werden;

↓ neu

- (4) „Primärenergie“ erneuerbare und nicht erneuerbare Energie, die keinem Umwandlungsprozess unterzogen wurde;
- (5) „Gebäudehülle“ die Teile eines Gebäudes, die dessen Innenbereich von der Außenumgebung trennen, u. a. Fenster, Wände, Fundament, Grundplatte, Decke, Dach und Isolierung;
- (6) „größere Renovierung“ die Renovierung eines Gebäudes, bei der
- die Gesamtkosten der Arbeiten an der Gebäudehülle oder den gebäudetechnischen Systemen 25 % des Gebäudewerts - den Wert des Grundstücks, auf dem das Gebäude errichtet wurde, nicht mitgerechnet - übersteigen, oder
  - mehr als 25 % der Gebäudehülle einer Renovierung unterzogen werden;
- (7) „Europäische Norm“ eine Norm, die vom Europäischen Komitee für Normung, dem Europäischen Komitee für elektrotechnische Normung oder dem Europäischen Institut für Telekommunikationsnormen verabschiedet und zur öffentlichen Verwendung bereitgestellt wurde;

↓ 2002/91 (angepasst)  
⇒ neu

~~(3)~~(8) „Ausweis über die Gesamtenergieeffizienz ~~eines Gebäudes~~“ einen von dem Mitgliedstaat oder einer von ihm benannten juristischen Person anerkannten Ausweis, der die Gesamtenergieeffizienz eines Gebäudes  oder von Gebäudeteilen  , berechnet nach einer  gemäß Artikel 3 festgelegten  Methode ~~auf der Grundlage des im Anhang festgelegten allgemeinen Rahmens~~, angibt;

↓ 2002/91

~~(4) "KWK (Kraft-Wärme-Kopplung)" die gleichzeitige Umwandlung von Primärenergie in mechanische oder elektrische und thermische Energie unter Einhaltung bestimmter Qualitätskriterien hinsichtlich der Energieeffizienz;~~

↓ neu

- (9) „Kraft-Wärme-Kopplung“ die gleichzeitige Erzeugung thermischer Energie und elektrischer und/oder mechanischer Energie in einem Prozess;
- (10) „kostenoptimales Niveau“ das niedrigste Kostenniveau während des Gebäude-Lebenszyklus, das unter Berücksichtigung von Investitionskosten, Instandhaltungs- und Betriebskosten (einschließlich Energiekosten) sowie gegebenenfalls Einnahmen aus der Energieerzeugung und Entsorgungskosten bestimmt wird;

↓ 2002/91 (angepasst)  
⇒ neu

~~(5)(11) „Klimaanlage“ eine Kombination sämtlicher  der  Bauteile, die für eine Form der Luftbehandlung  ⇒ Raumluftbehandlung  , einschließlich Belüftung,  erforderlich sind, bei der die Temperatur, eventuell gemeinsam mit der Belüftung, der Feuchtigkeit und der Luftreinheit, geregelt wird oder gesenkt werden kann;~~

~~(6)(12) „Heizkessel“ die kombinierte Einheit aus Gehäuse und Brenner zur Abgabe der Verbrennungswärme an Wasser  ⇒ eine Flüssigkeit  ;~~

~~(7)(13) „Nennleistung (in kW)“ die maximale Wärmeleistung  in kW  , die vom Hersteller für den kontinuierlichen Betrieb angegeben und garantiert wird, bei Einhaltung des von ihm angegebenen Wirkungsgrads;~~

~~(8)(14) „Wärmepumpe“ eine Einrichtung oder Anlage, die der Luft, dem Wasser oder dem Boden bei niedriger Temperatur Wärmeenergie entzieht und diese dem Gebäude zuführt.~~

### Artikel 3

Festlegung einer ~~Berechnungs~~ Methode  zur Berechnung der Gesamtenergieeffizienz von Gebäuden

↓ PE-CO\_S 3654/08 (2002/91)  
angepasst) (angepasst)

Zur Berechnung der Gesamtenergieeffizienz von Gebäuden wenden die Mitgliedstaaten ~~auf nationaler oder regionaler Ebene~~ eine Methode an, die ~~sich auf den im~~  mit dem in

Anhang I festgelegten allgemeinen Rahmen  im Einklang steht  ~~stützt. Die Kommission passt die Teile 1 und 2 dieses Anhangs unter Berücksichtigung der Standards oder Normen des nationalen Rechts an den technischen Fortschritt an. Diese Maßnahmen zur Änderung nicht wesentlicher Bestimmungen dieser Richtlinie werden nach dem in Artikel 14 Absatz 2 genannten Regelungsverfahren mit Kontrolle erlassen.~~

↓ 2002/91 (angepasst)  
⇒ neu

Diese Methode wird auf nationaler oder regionaler Ebene festgelegt  verabschiedet .

~~Die Gesamtenergieeffizienz eines Gebäudes ist in transparenter Weise anzugeben und kann einen Indikator für CO<sub>2</sub>-Emissionen beinhalten.~~

↓ 2002/91 (angepasst)  
⇒ neu

#### Artikel 4

Festlegung von ~~Anforderungen~~  Mindestanforderungen  an die Gesamtenergieeffizienz

1. Die Mitgliedstaaten treffen die erforderlichen Maßnahmen, um sicherzustellen, dass  
⇒ im Hinblick auf die Erreichung kostenoptimaler Niveaus ⇐ ~~nach der in Artikel 3 genannten Methode~~ Mindestanforderungen an die Gesamtenergieeffizienz von Gebäuden  nach der in Artikel 3 genannten Methode berechnet und  festgelegt werden.

Bei der Festlegung der Anforderungen können die Mitgliedstaaten zwischen neuen und bestehenden Gebäuden und unterschiedlichen Gebäudekategorien unterscheiden.

Diese Anforderungen tragen den allgemeinen Innenraumklimabedingungen Rechnung, um mögliche negative Auswirkungen, wie unzureichende Belüftung, zu vermeiden, und berücksichtigen die örtlichen Gegebenheiten, die angegebene Nutzung sowie das Alter des Gebäudes.

Die Anforderungen sind in regelmäßigen Zeitabständen, die fünf Jahre nicht überschreiten ~~sollten~~, zu überprüfen und erforderlichenfalls zu aktualisieren, um dem technischen Fortschritt in der Bauwirtschaft Rechnung zu tragen.

- ~~2. Die Anforderungen an die Gesamtenergieeffizienz werden gemäß den Artikeln 5 und 6 angewandt.~~

- 3.2. Die Mitgliedstaaten können beschließen, die in Absatz 1 genannten Anforderungen bei den folgenden Gebäudekategorien nicht festzulegen oder anzuwenden:

(a) Gebäude ~~und Baudenkmäler~~, die als Teil eines ausgewiesenen Umfelds oder aufgrund ihres besonderen architektonischen oder historischen Werts offiziell geschützt sind, wenn die Einhaltung der ~~Anforderungen~~

⊗ Mindestanforderungen an die Gesamtenergieeffizienz ⊗ eine unannehmbare Veränderung ihrer Eigenart oder ihrer äußeren Erscheinung bedeuten würde;

- (b) Gebäude, die für Gottesdienst und religiöse Zwecke genutzt werden;
- (c) provisorische Gebäude mit einer geplanten Nutzungsdauer bis einschließlich zwei Jahren, Industrieanlagen, Werkstätten und landwirtschaftliche Nutzgebäude mit niedrigem Energiebedarf sowie landwirtschaftliche Nutzgebäude, die in einem Sektor genutzt werden, auf den ein nationales sektorspezifisches Abkommen über die Gesamtenergieeffizienz Anwendung findet;
- (d) Wohngebäude, die für eine Nutzungsdauer von weniger als vier Monaten jährlich bestimmt sind;
- (e) frei stehende Gebäude mit einer Gesamtnutzfläche von weniger als 50 m<sup>2</sup>.

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↓ neu

3. Ab 30. Juni 2014 bieten die Mitgliedstaaten keine Anreize mehr für den Bau oder die Renovierung von Gebäuden oder Gebäudeteilen, die die Mindestanforderungen an die Energieeffizienz, die zu den Ergebnissen der in Artikel 5 Absatz 2 genannten Berechnung führen, nicht erfüllen.

4. Ab 30. Juni 2017 stellen die Mitgliedstaaten bei der Überprüfung ihrer gemäß Absatz 1 festgelegten Mindestanforderungen an die Gesamtenergieeffizienz sicher, dass diese Anforderungen zu den Ergebnissen der in Artikel 5 Absatz 2 genannten Berechnung führen.

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↓ neu

#### *Artikel 5*

##### *Berechnung kostenoptimaler Mindestanforderungen an die Gesamtenergieeffizienz*

1. Die Kommission erstellt bis zum 31. Dezember 2010 eine Vergleichsmethode zur Berechnung kostenoptimaler Mindestanforderungen an die Gesamtenergieeffizienz von Gebäuden oder Gebäudeteilen. Bei dieser Vergleichsmethode wird zwischen neuen und bestehenden Gebäuden und unterschiedlichen Gebäudekategorien unterschieden.

Die Maßnahmen zur Änderung nicht wesentlicher Bestimmungen dieser Richtlinie durch Ergänzung werden nach dem Verfahren gemäß Artikel 19 Absatz 2 erlassen.

2. Die Mitgliedstaaten berechnen kostenoptimale Mindestanforderungen an die Gesamtenergieeffizienz von Gebäuden unter Verwendung der gemäß Absatz 1 festgelegten Vergleichsmethode und einschlägiger Parameter, beispielsweise

klimatische Gegebenheiten, und vergleichen die Ergebnisse mit den von ihnen festgelegten Mindestanforderungen an die Gesamtenergieeffizienz.

Über die Ergebnisse dieser Berechnung und die dabei zugrunde gelegten Daten und Annahmen erstatten sie der Kommission regelmäßig Bericht. Der Bericht kann den Energieeffizienz-Aktionsplänen gemäß Artikel 14 Absatz 2 der Richtlinie 2006/32/EG beigelegt werden. Die Mitgliedstaaten legen der Kommission diese Berichte alle drei Jahre vor. Der erste Bericht ist bis spätestens 30. Juni 2011 zu übermitteln.

3. Die Kommission veröffentlicht einen Bericht über die Fortschritte der Mitgliedstaaten bei der Erreichung kostenoptimaler Mindestanforderungen an die Gesamtenergieeffizienz von Gebäuden.

↓ 2002/91 (angepasst)

*Artikel ~~5~~6  
Neue Gebäude*

1. Die Mitgliedstaaten treffen die erforderlichen Maßnahmen, um sicherzustellen, dass neue Gebäude die ~~in~~  nach  Artikel 4 ~~genannten~~  festgelegten  Mindestanforderungen an die Gesamtenergieeffizienz erfüllen.

Bei neuen Gebäuden ~~mit einer Gesamtnutzfläche von mehr als 1000 m<sup>2</sup>~~ gewährleisten die Mitgliedstaaten, dass  vor Baubeginn  die technische, ökologische und wirtschaftliche Einsetzbarkeit  folgender  alternativer Systeme  berücksichtigt wird:  ~~, wie~~

- a) ~~dezentrale~~  Energieversorgungssysteme auf der Grundlage von erneuerbaren Energieträgern,
- b) ~~KWK~~  Kraft-Wärme-Kopplung ,
- c) Fern-/Blockheizung oder Fern-/Blockkühlung, sofern vorhanden,
- d) Wärmepumpen, ~~unter bestimmten Bedingungen,~~  
~~vor Baubeginn berücksichtigt wird.~~

↓ neu

2. Die Mitgliedstaaten sorgen dafür, dass die Prüfung der in Absatz 1 genannten alternativen Systeme in dem Antrag auf Baugenehmigung oder endgültige Abnahme der Bauleistungen transparent dokumentiert ist.

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↓ 2002/91 (angepasst)

*Artikel ~~6~~7*  
*Bestehende Gebäude*

Die Mitgliedstaaten treffen die erforderlichen Maßnahmen, um sicherzustellen, dass die Gesamtenergieeffizienz von Gebäuden ~~mit einer Gesamtnutzfläche von über 1000 m<sup>2</sup>~~, die einer größeren Renovierung unterzogen werden, an die Mindestanforderungen  an die Gesamtenergieeffizienz  angepasst werden, sofern dies technisch, funktionell und wirtschaftlich realisierbar ist. Die Mitgliedstaaten ~~leiten~~  legen  diese Mindestanforderungen an die Gesamtenergieeffizienz ~~von den~~ gemäß Artikel 4  fest  ~~festgelegten Anforderungen an die Gesamtenergieeffizienz von Gebäuden ab~~. Die Anforderungen können entweder für das renovierte Gebäude als Ganzes oder für die renovierten Systeme oder Bestandteile festgelegt werden, wenn diese Teil einer Renovierung sind, die binnen eines begrenzten Zeitraums mit dem ~~oben genannten~~ Ziel durchgeführt werden soll, die Gesamtenergieeffizienz des Gebäudes  oder von Gebäudeteilen  zu verbessern.

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↓ neu

*Artikel 8*

*Gebäudetechnische Systeme*

1. Die Mitgliedstaaten legen für gebäudetechnische Systeme, die in Gebäuden installiert werden, Mindestanforderungen an die Gesamtenergieeffizienz fest. Die Anforderungen gelten für neue, ausgetauschte und nachgerüstete gebäudetechnische Systeme und Teile davon.

Die Anforderungen gelten insbesondere für folgende Bestandteile:

- a) Heizkessel oder sonstige Wärmeerzeuger von Heizungssystemen,
  - b) Warmwasserbereiter in Warmwasseranlagen,
  - c) zentrale Kühleinheiten oder Kälteerzeuger in Klimaanlage.
2. Die nach Absatz 1 festgelegten Mindestanforderungen an die Gesamtenergieeffizienz stehen mit den gesetzlichen Vorschriften im Einklang, die für die Produkte gelten, aus denen das System besteht, und setzen die korrekte Installation der Produkte sowie die ordnungsgemäße Einstellung und Überwachung des gebäudetechnischen Systems voraus. Mit den Anforderungen wird insbesondere gewährleistet, dass bei Warmwasserheizungsanlagen ein angemessener hydraulischer Abgleich erfolgt und dass Produktgröße und -typ entsprechend dem Verwendungszweck des gebäudetechnischen Systems gewählt werden.



*Artikel 9**Gebäude, deren Kohlendioxidemissionen und Primärenergieverbrauch gering oder gleich Null sind*

1. Die Mitgliedstaaten erstellen nationale Pläne zur Erhöhung der Zahl der Gebäude, deren Kohlendioxidemissionen und Primärenergieverbrauch gering oder gleich Null sind. Sie legen als Zielvorgabe für das Jahr 2020 einen Prozentwert fest, den der Anteil dieser Gebäude an der Gesamtzahl der Gebäude und der Gesamtnutzfläche mindestens betragen muss.

Für folgende Gebäude werden Einzelziele festgelegt:

- a) neue und renovierte Wohngebäude,
- b) neue und renovierte Nichtwohngebäude,
- c) von Behörden genutzte Gebäude.

Die Mitgliedstaaten legen die unter Buchstabe c genannten Ziele unter Berücksichtigung der Vorreiterrolle fest, die der öffentlichen Verwaltung auf dem Gebiet der Gesamtenergieeffizienz von Gebäuden zukommt.

2. Die in Absatz 1 genannten nationalen Pläne beinhalten unter anderem folgende Angaben:
  - a) die Definition der Mitgliedstaaten für Gebäude, deren Kohlendioxidemissionen und Primärenergieverbrauch gering oder gleich Null sind;
  - b) Zwischenziele in Form eines Prozentwerts, den der Anteil dieser Gebäude an der Gesamtzahl der Gebäude und der Gesamtnutzfläche im Jahr 2015 mindestens betragen muss.
  - c) Informationen über die zur Förderung dieser Gebäude ergriffenen Maßnahmen.
3. Die Mitgliedstaaten teilen der Kommission die in Absatz 1 genannten Pläne spätestens bis 30. Juni 2011 mit und erstatten der Kommission alle drei Jahre Bericht über die bei der Umsetzung ihrer nationalen Pläne erzielten Fortschritte. Die nationalen Pläne und die Fortschrittsberichte können den Energieeffizienz-Aktionsplänen gemäß Artikel 14 Absatz 2 der Richtlinie 2006/32/EG beigelegt werden.
4. Die Kommission legt gemeinsame Grundsätze für die Definition der Gebäude fest, deren Kohlendioxidemissionen und Primärenergieverbrauch gering oder gleich Null sind.

Die Maßnahmen zur Änderung nicht wesentlicher Bestimmungen dieser Richtlinie durch Ergänzung werden nach dem Verfahren gemäß Artikel 21 Absatz 2 erlassen.

5. Die Kommission veröffentlicht einen Bericht über die Fortschritte der Mitgliedstaaten hinsichtlich der Erhöhung der Zahl der Gebäude, deren Kohlendioxidemissionen und Primärenergieverbrauch gering oder gleich Null sind.

Auf der Grundlage dieses Berichts erarbeitet die Kommission eine Strategie und schlägt erforderlichenfalls Maßnahmen zur Erhöhung der Zahl dieser Gebäude vor.

↓ 2002/91 (angepasst)  
⇒ neu

Artikel ~~7~~10

~~Ausweis~~ ☒ Ausweise ☒ über die Gesamtenergieeffizienz

~~2.1.~~ ⇒ Die Mitgliedstaaten legen die erforderlichen Maßnahmen fest, um ein System für die Erstellung von Ausweisen über die Gesamtenergieeffizienz von Gebäuden einzurichten. ☐ Der Ausweis über die Gesamtenergieeffizienz ~~von Gebäuden~~ muss ☒ die Gesamtenergieeffizienz von Gebäuden und ☒ Referenzwerte wie ~~gültige Rechtsnormen und Vergleichswerte~~ ⇒ Mindestanforderungen an die Gesamtenergieeffizienz ☐ enthalten, ☒ um den Eigentümern oder Mietern von Gebäuden oder Gebäudeteilen ☒ Verbrauchern einen Vergleich und eine Beurteilung ~~der~~ ☒ ihrer ☒ Gesamtenergieeffizienz ~~des Gebäudes~~ zu ermöglichen.

2. ~~Dem~~ Der Energieausweis ~~sind~~ ☒ muss ☒ Empfehlungen für die kostengünstige Verbesserung der Gesamtenergieeffizienz ☒ des Gebäudes oder von Gebäudeteilen enthalten ☒ ~~beizufügen.~~

Die in dem Ausweis über die Gesamtenergieeffizienz enthaltenen Empfehlungen beziehen sich auf

- a) Maßnahmen im Zusammenhang mit einer größeren Renovierung der Gebäudehülle oder der gebäudetechnischen Systeme,
- b) Maßnahmen für einzelne Bereiche oder Teile eines Gebäudes, die unabhängig von einer größeren Renovierung der Gebäudehülle oder der gebäudetechnischen Systeme durchgeführt werden.

↓ neu

3. Die Empfehlungen des Ausweises über die Gesamtenergieeffizienz sind an dem betreffenden Gebäude technisch durchführbar und enthalten transparente Angaben zu ihrer Kosteneffizienz. Die Kosteneffizienz wird anhand einer Reihe von Standardbedingungen bestimmt, u. a. einer Bewertung der Energieeinsparungen, der zugrunde liegenden Energiepreise und der Zinssätze für die zur Umsetzung der Empfehlungen notwendigen Investitionen.

4. Der Ausweis über die Gesamtenergieeffizienz enthält Hinweise darauf, wo der Eigentümer oder der Mieter genauere Angaben zu den in dem Ausweis enthaltenen Empfehlungen erhalten kann. Zudem enthält der Ausweis Informationen über die für die Umsetzung der Empfehlungen zu unternehmenden Schritte.

- ⇒ 5. ⇐ In Gebäudekomplexen kann der Energieausweis für Wohnungen oder Einheiten, die für eine gesonderte Nutzung ausgelegt sind,
- ⇒ (a) ⇐ im Fall von Gebäudekomplexen mit einer gemeinsamen Heizungsanlage auf der Grundlage eines gemeinsamen Energieausweises für das gesamte Gebäude oder
- ⇒ (b) ⇐ auf der Grundlage der Bewertung einer anderen vergleichbaren Wohnung in demselben Gebäudekomplex ausgestellt werden.

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↓ neu

6. Für Einfamilienhäuser kann der Energieausweis auf der Grundlage der Bewertung eines anderen vergleichbaren Gebäudes von ähnlicher Gestaltung, Größe und Energieeffizienz ausgestellt werden, sofern diese Ähnlichkeit von dem Sachverständigen, der den Ausweis über die Gesamtenergieeffizienz ausstellt, garantiert werden kann.

7. Die Gültigkeitsdauer des ⇒ Ausweises über die Gesamtenergieeffizienz ⇐ darf zehn Jahre nicht überschreiten.

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↓ 2002/91 (angepasst)

### Artikel 11

#### ⊗ Ausstellung von Ausweisen über die Gesamtenergieeffizienz ⊗

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↓ neu

⇒ neu

1. Die Mitgliedstaaten stellen sicher, dass für Gebäude oder Gebäudeteile, die gebaut, verkauft oder vermietet werden, sowie für Gebäude, in denen mehr als 250 m<sup>2</sup> Gesamtnutzfläche von Behörden genutzt werden, ein Ausweis über die Gesamtenergieeffizienz ausgestellt wird.

2. Die Mitgliedstaaten ~~stellen sicher~~ ⇒ verlangen ⇐, dass beim Bau, ~~beim Verkauf oder bei der Vermietung~~ von Gebäuden ⇒ oder Gebäudeteilen ⇐ dem Eigentümer ~~bzw. dem potenziellen Käufer oder Mieter vom Eigentümer~~ ⇒ von dem in Artikel 16 genannten unabhängigen Sachverständigen, der den Ausweis ausstellt, oder vom Verkäufer ⇐ ein Ausweis über die Gesamtenergieeffizienz ~~vorgelegt~~ ⇒ ausgehändigt ⇐ wird.

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↓ neu

3. Die Mitgliedstaaten verlangen, dass beim Verkauf von Gebäuden oder Gebäudeteilen in den entsprechenden Verkaufsanzeigen der in dem Ausweis über die Gesamtenergieeffizienz

angegebene numerische Indikator der Gesamtenergieeffizienz genannt wird und dem potenziellen Käufer der Ausweis über die Gesamtenergieeffizienz vorgelegt wird.

Spätestens bei Abschluss des Kaufvertrags wird dem Käufer vom Verkäufer der Ausweis über die Gesamtenergieeffizienz ausgehändigt.

4. Die Mitgliedstaaten verlangen, dass bei der Vermietung von Gebäuden oder Gebäudeteilen in den entsprechenden Vermietungsanzeigen der in dem Ausweis über die Gesamtenergieeffizienz angegebene numerische Indikator der Gesamtenergieeffizienz genannt wird und dem potenziellen Mieter der Ausweis über die Gesamtenergieeffizienz vorgelegt wird.

Spätestens bei Abschluss des Mietvertrags wird dem Mieter vom Vermieter der Ausweis über die Gesamtenergieeffizienz ausgehändigt.

↓ 2002/91 (angepasst)  
⇒ neu

5. Die Mitgliedstaaten können die in Artikel 4 Absatz 32 genannten ~~Kategorien~~  Gebäudekategorien  von der Anwendung ~~dieses Absatzes~~ der Absätze 1, 2, 3 und 4 ausnehmen.

~~Die Energieausweise dienen lediglich der Information; etwaige Rechtswirkungen oder sonstige Wirkungen dieser Ausweise bestimmen sich nach den einzelstaatlichen Vorschriften.~~

### Artikel 12

#### Anbringung von Ausweisen über die Gesamtenergieeffizienz

~~3.1.~~ Die Mitgliedstaaten treffen Maßnahmen, um sicherzustellen, dass bei Gebäuden , in denen mehr als  ~~mit einer Gesamtnutzfläche von über 1000~~  $\Rightarrow$  250  $\Leftarrow$  m<sup>2</sup>  Gesamtnutzfläche , die von Behörden ~~und von Einrichtungen~~ genutzt werden, die für eine große Anzahl von Menschen öffentliche Dienstleistungen erbringen und die deshalb von diesen Menschen häufig aufgesucht werden, ein höchstens zehn Jahre alter  der  Ausweis über die Gesamtenergieeffizienz an einer für die Öffentlichkeit gut sichtbaren Stelle angebracht wird.

↓ neu

2. Die Mitgliedstaaten treffen Maßnahmen, um sicherzustellen, dass bei Gebäuden, für die gemäß Artikel 11 Absatz 1 ein Ausweis über die Gesamtenergieeffizienz ausgestellt wurde und in denen auf mehr als 250 m<sup>2</sup> Gesamtnutzfläche ein starker Publikumsverkehr herrscht, ein Ausweis über die Gesamtenergieeffizienz an einer für die Öffentlichkeit gut sichtbaren Stelle angebracht wird.

↓ 2002/91 (angepasst)  
⇒ neu

~~2. Die Bandbreite der empfohlenen und aktuellen Innentemperaturen und gegebenenfalls weitere relevante Klimaparameter können deutlich sichtbar angegeben werden.~~

### Artikel ~~8~~13

#### Inspektion von ~~Heizkesseln~~ ⇒ Heizungsanlagen ⇐

~~Zur Senkung des Energieverbrauchs und zur Begrenzung der Kohlendioxidemissionen gehen die Mitgliedstaaten nach einer der folgenden Alternativen vor:~~

1. ~~Die Mitgliedstaaten~~ treffen die erforderlichen Maßnahmen, um die regelmäßige Inspektion von ~~mit nicht-erneuerbaren flüssigen oder festen Brennstoffen befeuerten Heizkesseln~~ mit einer Nennleistung von ~~☒~~ mehr als ~~☒~~ 20 ~~bis~~ 100 kW zu gewährleisten. ~~Auf der Grundlage dieser ☒~~ Diese ~~☒~~ Inspektion umfasst auch die die Prüfung des Wirkungsgrads der Kessel und der Kesseldimensionierung im Verhältnis zum Heizbedarf des Gebäudes. ~~Diese Inspektion kann auch auf Heizkessel angewandt werden, die mit anderen Brennstoffen befeuert werden.~~

↓ neu

2. Je nach Bauart und Nennleistung der Heizkessel können die Mitgliedstaaten unterschiedliche Inspektionsintervalle festlegen. Bei der Festlegung der Intervalle berücksichtigen die Mitgliedstaaten die Kosten für die Inspektion der Heizungsanlage und die voraussichtlichen Einsparungen bei den Energiekosten, die sich aus der Inspektion ergeben können.

↓ 2002/91  
⇒ neu

- ⇒ 3. Heizungsanlagen mit ⇐ Heizkesseln, ~~mit einer deren~~ Nennleistung ~~von~~ mehr als 100 kW ~~beträgt~~, sind mindestens alle zwei Jahre einer Inspektion zu unterziehen.

Bei Gasheizkesseln kann diese Frist auf vier Jahre verlängert werden.

↓ neu

~~Für Heizungsanlagen mit Kesseln mit einer Nennleistung über 20 kW, die älter als 15 Jahre sind, treffen die Mitgliedstaaten die erforderlichen Maßnahmen für eine einmalige Inspektion der gesamten Heizungsanlage. Auf der Grundlage dieser Inspektion, die auch die Prüfung des Wirkungsgrads der Kessel und der Kesseldimensionierung im Verhältnis zum Heizbedarf des Gebäudes umfasst, geben die Fachleute den Nutzern Ratschläge für den Austausch der Kessel, für sonstige Veränderungen am Heizungssystem und für Alternativlösungen; or~~

~~(b)~~ ⇒ 4. ⇐ ⇒ Abweichend von den Absätzen 1, 2 und 3 können die Mitgliedstaaten ⇐ ~~sie treffen~~ Maßnahmen ⇒ beschließen ⇐ , um sicherzustellen, dass die Nutzer Ratschläge für den Austausch der Kessel, für sonstige Veränderungen am Heizungssystem und für Alternativlösungen erhalten; ~~hierzu können Inspektionen zählen~~, um den Wirkungsgrad und die Zweckmäßigkeit der Dimensionierung des Heizkessels zu beurteilen. Die Gesamtauswirkungen dieses Ansatzes ~~sollten im Wesentlichen~~ ⇒ müssen ⇐ die gleichen sein wie bei Anwendung ~~des Buchstaben a)~~ ⇒ der Absätze 1, 2 und 3 ⇐ .

⇒ Entscheiden die ⇐ Mitgliedstaaten, ~~die diese Option wählen~~ ⇒ sich für die Anwendung der im ersten Unterabsatz dieses Absatzes genannten Maßnahmen ⇐ , so unterbreiten sie der Kommission bis spätestens 30. Juni 2011 einen Bericht über die Gleichwertigkeit ⇒ jener Maßnahmen mit denen der Absätze 1, 2 und 3. Die Mitgliedstaaten legen der Kommission diese Berichte alle drei Jahre vor. Die Berichte können den Energieeffizienz-Aktionsplänen gemäß Artikel 14 Absatz 2 der Richtlinie 2006/32/EG beigefügt werden. ⇐ ~~ihres Ansatzes.~~

↓ 2002/91 (angepasst)  
⇒ neu

*Artikel ~~9~~14*  
*Inspektion von Klimaanlage*

~~1. Zur Senkung des Energieverbrauchs und zur Begrenzung der Kohlendioxidemissionen treffen~~ ~~Die Mitgliedstaaten ergreifen~~ die erforderlichen Maßnahmen, um die regelmäßige Inspektion von Klimaanlage mit einer Nennleistung von mehr als 12 kW zu gewährleisten. ~~Diese~~ ☒ Die ☒ Inspektion umfasst eine Prüfung des Wirkungsgrads der Anlage und der Anlagendimensionierung im Verhältnis zum Kühlbedarf des Gebäudes. ~~Die Nutzer erhalten geeignete Ratschläge für mögliche Verbesserungen oder für den Austausch der Klimaanlage und für Alternativlösungen.~~

↓ neu

2. Je nach Bauart und Nennleistung der Klimaanlage können die Mitgliedstaaten unterschiedliche Inspektionsintervalle festlegen. Bei der Festlegung der Intervalle berücksichtigen die Mitgliedstaaten die Kosten für die Inspektion der Klimaanlage und die voraussichtlichen Einsparungen bei den Energiekosten, die sich aus der Inspektion ergeben können.

↓ neu

*Artikel 15*  
*Berichte über die Inspektion von Heizungs- und Klimaanlage*

1. Dieser Artikel bezieht sich auf Berichte über die Inspektion von Heizungs- und Klimaanlage.

2. Für jede kontrollierte Anlage sind regelmäßig entsprechende Inspektionsberichte zu erstellen. Der Inspektionsbericht enthält folgende Angaben:
- a) einen Vergleich zwischen der Energieeffizienz der kontrollierten Anlage und der Energieeffizienz
    - i) der besten verfügbaren und realisierbaren Anlage,
    - ii) einer Anlage ähnlicher Bauart, deren relevante Bestandteile die nach den geltenden Vorschriften geforderte Energieeffizienz aufweisen;
  - b) Empfehlungen für kostenwirksame Verbesserungen der Energieeffizienz der Anlage des Gebäudes oder von Gebäudeteilen.

Die Empfehlungen gemäß Buchstabe b sind speziell auf die jeweilige Anlage zugeschnitten und enthalten transparente Angaben zu ihrer Kosteneffizienz. Die Kosteneffizienz wird anhand einer Reihe von Standardbedingungen bestimmt, u. a. einer Bewertung der Energieeinsparungen, der zugrunde liegenden Energiepreise und der Zinssätze für Investitionen.

3. Der Inspektionsbericht wird dem Eigentümer oder dem Mieter des Gebäudes vom Prüfer ausgehändigt.

↓ 2002/91 (angepasst)  
⇒ neu

*Artikel ~~10~~ 16*  
*Unabhängiges Fachpersonal*

Die Mitgliedstaaten stellen sicher, dass die Erstellung des ~~Energieausweises~~  Ausweises über die Gesamtenergieeffizienz  von Gebäuden, ~~sowie die Erstellung der begleitenden Empfehlungen und~~ die Inspektion von ~~Heizkesseln~~  Heizungs- und  sowie Klimaanlagen in unabhängiger Weise ~~von~~ von ~~durch~~ durch qualifizierten ~~und/oder~~ und/oder zugelassenen ~~Fachleuten~~ Fachleuten durchgeführt wird erfolgt, die entweder ~~selbstständige Unternehmer~~  selbstständig  oder ~~Angestellte von~~ Angestellte von bei Behörden oder privaten Stellen  angestellt  sein können.

↓ neu

Die Zulassung der Fachleute erfolgt unter Berücksichtigung ihrer Fachkenntnis und Unabhängigkeit.

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↓ neu
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*Artikel 17*  
*Unabhängiges Kontrollsystem*

1. Die Mitgliedstaaten sorgen dafür, dass für die Ausweise über die Gesamtenergieeffizienz und die Inspektionsberichte für Heizungs- und Klimaanlage ein unabhängiges Kontrollsystem gemäß Anhang II eingerichtet wird.

2. Die Mitgliedstaaten können die Zuständigkeiten für die Einrichtung der unabhängigen Kontrollsysteme delegieren.

In diesem Fall kontrollieren die Mitgliedstaaten, dass die Einrichtung der unabhängigen Kontrollsysteme nach Maßgabe von Anhang II erfolgt.

3. Die Mitgliedstaaten verlangen, dass die in Absatz 1 genannten Ausweise über die Gesamtenergieeffizienz und Inspektionsberichte registriert oder den zuständigen Behörden oder den Stellen, die von den zuständigen Behörden mit der Einrichtung der unabhängigen Kontrollsysteme beauftragt wurden, auf Aufforderung zur Verfügung gestellt werden.

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↓ 2002/91 ⇒ neu
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*Artikel ~~118~~*  
*Überprüfung*

Die Kommission nimmt mit Unterstützung des gemäß Artikel ~~1421~~ eingesetzten Ausschusses eine Bewertung dieser Richtlinie aufgrund der bei ihrer Anwendung gesammelten Erfahrungen vor und unterbreitet gegebenenfalls Vorschläge unter anderem zu folgenden Punkten:

~~a) mögliche ergänzende Maßnahmen in Bezug auf Renovierungsarbeiten in Gebäuden mit einer Gesamtnutzfläche unter 1000 m<sup>2</sup>;~~

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↓ neu ⇒ neu
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a) Methoden für die Einstufung der Gesamtenergieeffizienz von Gebäuden auf der Grundlage des Primärenergieverbrauchs und der Kohlendioxidemissionen;

b) allgemeine Anreize für weitere Maßnahmen im Bereich der Energieeffizienz von Gebäuden.



*Artikel 19*  
*Information*

Die Mitgliedstaaten ~~können~~ ⇒ ergreifen ⇐ die erforderlichen Maßnahmen ~~treffen~~, um die ~~Nutzer~~ ⇒ Eigentümer oder Mieter ⇐ von Gebäuden ⇒ oder Gebäudeteilen ⇐ über die verschiedenen Methoden und praktischen Verfahren zur Verbesserung der Gesamtenergieeffizienz zu informieren.

↓ neu

Die Mitgliedstaaten informieren die Eigentümer oder Mieter von Gebäuden insbesondere über Ausweise über die Gesamtenergieeffizienz und Inspektionsberichte, ihren Zweck und ihre Ziele, über kostenwirksame Maßnahmen zur Verbesserung der Gesamtenergieeffizienz des Gebäudes sowie die mittel- bis langfristigen finanziellen Folgen für den Fall, dass keine Maßnahmen dieser Art unternommen werden.

↓ 2002/91 (angepasst)  
⇒ neu

⇒ Zur Anwendung des ersten und zweiten Unterabsatzes ⇐ ~~Auf Ersuchen~~ unterstützt die Kommission die Mitgliedstaaten auf deren Ersuchen bei der Durchführung ~~der betreffenden~~ ☒ von ☒ Informationskampagnen, die Gegenstand von Gemeinschaftsprogrammen sein können.

↓ neu

*Artikel 20*  
*Anpassung ~~des Rahmens~~ ⇒ von Anhang I an den technischen Fortschritt ⇐*

~~Die Teile 1 und 2 des Anhangs werden regelmäßig im Abstand von mindestens zwei Jahren überprüft.~~

↓ PE-CO\_S 3654/08 (2002/91  
angepasst) (angepasst)  
⇒ neu

☒ Die Kommission passt die ☒ ~~Anpassungen der~~ Teile 13 und 24 ~~des~~ von Anhangs I ~~dieser Richtlinie~~ an den technischen Fortschritt an.

Diese Maßnahmen zur Änderung nicht wesentlicher Bestimmungen dieser Richtlinie werden nach dem in Artikel 1421 Absatz 2 genannten Regelungsverfahren mit Kontrolle erlassen.

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↓ PE-CO\_S 3654/08 (2002/91  
angepasst)

*Artikel ~~14~~ 21  
Ausschussverfahren*

1. Die Kommission wird von einem Ausschuss unterstützt.
2. Wird auf diesen Absatz Bezug genommen, so gelten Artikel 5a Absätze 1 bis 4 und Artikel 7 des Beschlusses 1999/468/EG unter Beachtung von dessen Artikel 8.

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↓ neu

*Artikel 22  
Sanktionen*

Die Mitgliedstaaten legen fest, welche Sanktionen bei einem Verstoß gegen die innerstaatlichen Vorschriften zur Umsetzung dieser Richtlinie zu verhängen sind, und treffen die zu deren Durchsetzung erforderlichen Maßnahmen. Die Sanktionen müssen wirksam, verhältnismäßig und abschreckend sein. Die Mitgliedstaaten teilen der Kommission diese Vorschriften bis spätestens 31. Dezember 2010 mit und unterrichten sie unverzüglich über alle späteren Änderungen dieser Vorschriften.

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↓ 2002/91 (angepasst)

*Artikel ~~23~~ 15  
Umsetzung*

~~1. Die Mitgliedstaaten setzen die Rechts- und Verwaltungsvorschriften in Kraft, die erforderlich sind, um dieser Richtlinie spätestens am 4. Januar 2006 nachzukommen. Sie teilen der Kommission unverzüglich diese Vorschriften mit.~~

~~Wenn die Mitgliedstaaten diese Vorschriften erlassen, nehmen sie in den Vorschriften selbst oder durch einen Hinweis bei der amtlichen Veröffentlichung auf diese Richtlinie Bezug. Die Mitgliedstaaten regeln die Einzelheiten der Bezugnahme.~~

~~2. Falls qualifiziertes und/oder zugelassenes Fachpersonal nicht oder nicht in ausreichendem Maße zur Verfügung steht, können die Mitgliedstaaten für die vollständige Anwendung der Artikel 7, 8 und 9 eine zusätzliche Frist von drei Jahren in Anspruch nehmen. Mitgliedstaaten, die von dieser Möglichkeit Gebrauch machen, teilen dies der Kommission unter Angabe der jeweiligen Gründe und zusammen mit einem Zeitplan für die weitere Umsetzung dieser Richtlinie mit.~~

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↓ neu
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1. Die Mitgliedstaaten erlassen und veröffentlichen spätestens am 31. Dezember 2010 die erforderlichen Rechts- und Verwaltungsvorschriften, um den Artikeln 2 bis 17, 19 und 21 sowie den Anhängen I und II dieser Richtlinie nachzukommen. Sie teilen der Kommission unverzüglich den Wortlaut dieser Vorschriften mit und fügen eine Tabelle mit den Entsprechungen zwischen der Richtlinie und diesen innerstaatlichen Vorschriften bei.

Sie wenden die Vorschriften, die die Artikel 2, 3, 9, 10 bis 12, 16, 17, 19 und 22 betreffen, spätestens ab 31. Dezember 2010 an.

Sie wenden die Vorschriften, die die Artikel 4 bis 8, 13 bis 15 und 17 betreffen, spätestens ab 31. Dezember 2010 auf Gebäude an, die von Behörden genutzt werden, und spätestens ab 31. Januar 2012 auf alle übrigen Gebäude.

Bei Erlass dieser Vorschriften nehmen die Mitgliedstaaten in den Vorschriften selbst oder durch einen Hinweis bei der amtlichen Veröffentlichung auf die vorliegende Richtlinie Bezug. In diese Vorschriften fügen sie die Erklärung ein, dass Bezugnahmen in den geltenden Rechts- und Verwaltungsvorschriften auf die durch die vorliegende Richtlinie geänderte Richtlinie als Bezugnahmen auf die vorliegende Richtlinie gelten. Die Mitgliedstaaten regeln die Einzelheiten dieser Bezugnahme und die Formulierung dieser Erklärung.

2. Die Mitgliedstaaten teilen der Kommission den Wortlaut der wichtigsten innerstaatlichen Rechtsvorschriften mit, die sie auf dem unter diese Richtlinie fallenden Gebiet erlassen.

*Artikel 24  
Aufhebung*

Die Richtlinie 2002/91/EG in der Fassung der in Anhang III Teil A aufgeführten Verordnung wird unbeschadet der Verpflichtungen der Mitgliedstaaten hinsichtlich der in Anhang III Teil B genannten Fristen für die Umsetzung der dort genannten Richtlinie in innerstaatliches Recht und deren Anwendung mit Wirkung vom 1. Februar 2012 aufgehoben.

Bezugnahmen auf die aufgehobene Richtlinie gelten als Bezugnahmen auf die vorliegende Richtlinie und sind nach Maßgabe der Entsprechungstabelle in Anhang IV zu lesen.

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↓ 2002/91 (angepasst) ⇒ neu
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*Artikel ~~25~~ 16  
Inkrafttreten*

Diese Richtlinie tritt am  zwanzigsten  Tag  nach  ihrer Veröffentlichung im *Amtsblatt der Europäischen ~~Union~~ Gemeinschaften* in Kraft.

*Artikel ~~172~~6*

Diese Richtlinie ist an die Mitgliedstaaten gerichtet.

Geschehen zu [...].

*Im Namen des Europäischen Parlaments*

*Der Präsident [...]*

*[...]*

*Im Namen des Rates*

*Der Präsident [...]*

*[...]*

↓ 2002/91  
⇒ neu

## ANHANG I

### **Allgemeiner Rahmen für die Berechnung der Gesamtenergieeffizienz von Gebäuden** (⇒ gemäß ⇐ Artikel 3)

↓ neu

1. Die Gesamtenergieeffizienz eines Gebäudes ist anhand der Energiemenge zu bestimmen, die rechnerisch oder tatsächlich verbraucht wird, um den unterschiedlichen Erfordernissen im Rahmen der üblichen Nutzung des Gebäudes gerecht zu werden, und wird durch den Energiebedarf für Heizung und Kühlung (Vermeidung von übermäßiger Erwärmung) zur Aufrechterhaltung der gewünschten Gebäudetemperatur dargestellt.

2. Die Gesamtenergieeffizienz eines Gebäudes ist auf transparente Weise darzustellen und muss zudem numerische Indikatoren für die Kohlendioxidemissionen und den Primärenergieverbrauch enthalten.

Bei der Berechnung der Gesamtenergieeffizienz von Gebäuden ist auf Europäische Normen zurückzugreifen.

↓ 2002/91 (angepasst)  
⇒ neu

~~13.~~  Bei der Festlegung der Berechnungsmethode  ~~Die Methode zur Berechnung der Gesamtenergieeffizienz von Gebäuden umfasst~~ sind mindestens folgende Aspekte zu berücksichtigen:

- a) ⇒ die nachstehenden tatsächlichen ⇐ thermischen ~~Charakteristika~~ Eigenschaften des Gebäudes (~~Gebäudehülle~~, ⇒ einschließlich der ⇐ Innenwände ~~usw.~~):

↓ neu

- i) Wärmekapazität
- ii) Isolierung
- iii) passive Heizung
- iv) Kühlelemente
- v) Wärmebrücken,

↓ 2002/91 (angepasst)  
⇒ neu

~~Dies kann auch die Luftdichtheit umfassen,~~

- b) Heizungsanlage und Warmwasserversorgung, einschließlich ihrer Dämmcharakteristik,
- c) Klimaanlagen,
- d)  natürliche oder mechanische  Belüftung  , die auch die Luftdichtheit umfassen kann .

↓ 2002/91 (angepasst)  
⇒ neu

- e) eingebaute Beleuchtung (hauptsächlich bei Nichtwohngebäuden),
- f) ⇒ Gestaltung, ⇐ Lage und Ausrichtung ~~der Gebäude~~  des Gebäudes  , einschließlich des Außenklimas,
- g) passive Solarsysteme und Sonnenschutz,
- ~~h) natürliche Belüftung,~~
- ih) Innenraumklimabedingungen, einschließlich des Innenraum-Sollklimas z.

↓ neu

- i) interne Lasten.

↓ 2002/91 (angepasst)  
⇒ neu

24. Bei der Berechnung wird, soweit relevant, der positive Einfluss folgender Aspekte berücksichtigt:

- a) ⇒ lokale Sonnenexposition, ⇐ aktive Solarsysteme und andere Systeme zur Erzeugung von Wärme und Elektrizität auf der Grundlage erneuerbarer Energieträger,
- b) Elektrizitätsgewinnung durch ~~KWK~~  Kraft-Wärme-Kopplung  ,
- c) Fern-/Blockheizung und Fern-/Blockkühlung,
- d) natürliche Beleuchtung.

35. Für die Berechnung sollten die Gebäude angemessen in  folgende  Kategorien unterteilt werden, ~~wie z. B.:~~

- a) Einfamilienhäuser verschiedener Bauarten,
- b) Mehrfamilienhäuser,
- c) Bürogebäude,
- d) Unterrichtsgebäude,
- e) Krankenhäuser,
- f) Hotels und Gaststätten,
- g) Sportanlagen,
- h) Gebäude des Groß- und Einzelhandels,
- i) sonstige Arten Energie verbrauchender Gebäude.

↓ neu
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## ANHANG II

### **Unabhängiges Kontrollsystem für Ausweise über die Gesamtenergieeffizienz und Inspektionsberichte**

1. Die zuständigen Behörden oder die Stellen, denen die Zuständigkeit für die Anwendung des unabhängigen Kontrollsystems von den zuständigen Behörden übertragen wurde, nehmen eine Stichprobe von mindestens 0,5 % aller jährlich ausgestellten Ausweise über die Gesamtenergieeffizienz und unterziehen diese einer Überprüfung. Die Überprüfung ist auf einer der drei nachstehend angegebenen Stufen durchzuführen, wobei jede Überprüfungsstufe für einen statistisch signifikanten Teil der ausgewählten Ausweise durchzuführen ist:

- a) Validitätsprüfung der Input-Gebäudedaten, die zur Ausstellung des Ausweises der Gesamtenergieeffizienz verwendet wurden, und der im Ausweis angegebenen Ergebnisse;
- b) Prüfung der Input-Daten und Überprüfung der Ergebnisse des Ausweises, einschließlich der abgegebenen Empfehlungen;
- c) vollständige Prüfung der Input-Gebäudedaten, die zur Ausstellung des Ausweises über die Gesamtenergieeffizienz verwendet wurden, vollständige Überprüfung der im Ausweis angegebenen Ergebnisse, einschließlich der abgegebenen Empfehlungen, und Inaugenscheinnahme des Gebäudes zur Prüfung der Übereinstimmung zwischen den im Ausweis über die Gesamtenergieeffizienz angegebenen Spezifikationen mit dem Gebäude, für das der Ausweis erstellt wurde.

2. Die zuständigen Behörden oder die Stellen, denen die Zuständigkeit für die Anwendung des unabhängigen Kontrollsystems von den zuständigen Behörden übertragen wurde, nehmen eine Stichprobe von mindestens 0,1 % aller jährlich ausgestellten Inspektionsberichte und unterziehen diese einer Überprüfung. Die Überprüfung ist auf einer der drei nachstehend angegebenen Stufen durchzuführen, wobei jede Überprüfungsstufe für einen statistisch signifikanten Teil der ausgewählten Inspektionsberichte durchzuführen ist:

- a) Validitätsprüfung der Input-Daten des gebäudetechnischen Systems, die zur Ausstellung des Inspektionsberichts verwendet wurden, und der im Inspektionsbericht angegebenen Ergebnisse;
- b) Prüfung der Input-Daten und Überprüfung der Ergebnisse des Inspektionsberichts, einschließlich der abgegebenen Empfehlungen;
- c) vollständige Prüfung der Input-Daten des gebäudetechnischen Systems, die zur Ausstellung des Inspektionsberichts verwendet wurden, vollständige Überprüfung der im Inspektionsbericht angegebenen Ergebnisse, einschließlich der abgegebenen Empfehlungen, und Inaugenscheinnahme des Gebäudes zur Prüfung der Übereinstimmung zwischen den im Inspektionsbericht angegebenen Spezifikationen mit dem inspizierten gebäudetechnischen System.



↓ 2002/91  
⇒ neu

### ANHANG III

#### Teil A

Aufgehobene Richtlinie mit ihren nachfolgenden Änderungen  
(gemäß Artikel 24)

Richtlinie 2002/91/EG des Europäischen Parlaments und  
des Rates  
(ABl. L 1 vom 4.1.2003, S. 65)

Verordnung [...] des Europäischen Parlaments und    Nur Nummer 9.9 des Anhangs  
des Rates  
(ABl. [...])

#### Teil B

Fristen für die Umsetzung in innerstaatliches Recht und die Anwendung  
(gemäß Artikel 24)

Richtlinie	Umsetzungsfrist	Datum der Anwendung
2002/91/EG	4. Januar 2006	4. Januar 2009, nur Artikel 7, 8 und 9

ANHANG IV

## ENTSPRECHUNGSTABELLE

Richtlinie 2002/91/EG	Vorliegende Richtlinie
Artikel 1	Artikel 1
Artikel 2 Einleitung	Artikel 2 Einleitung
Artikel 2 Nummer 1	Artikel 2 Absatz 1
-	Artikel 2 Absatz 2
Artikel 2 Nummer 2	Artikel 2 Absatz 3 und Anhang I
-	Artikel 2 Absätze 4, 5, 6 und 7
Artikel 2 Nummer 3	Artikel 2 Absatz 8
Artikel 2 Nummer 4	Artikel 2 Absatz 9
-	Artikel 2 Absatz 10
Artikel 2 Nummer 5	Artikel 2 Absatz 11
Artikel 2 Nummer 6	Artikel 2 Absatz 12
Artikel 2 Nummer 7	Artikel 2 Absatz 13
Artikel 2 Nummer 8	Artikel 2 Absatz 14
Artikel 3	Artikel 19 und Anhang I
Artikel 4 Absatz 1	Artikel 4 Absatz 1
Artikel 4 Absatz 2	-
Artikel 4 Absatz 3	Artikel 4 Absatz 2
-	Artikel 4 Absatz 3
-	Artikel 4 Absatz 4
-	Artikel 5
Artikel 5	Artikel 6 Absatz 1
-	Artikel 6 Absatz 2
Artikel 6	Artikel 7

-	Artikel 8
-	Artikel 9
Artikel 7 Absatz 1	Artikel 10 Absatz 5, Artikel 11 Absätze 1, 2, 3, 5 und 6
Artikel 7 Absatz 2	Artikel 10 Absätze 1 und 2
Artikel 7 Absatz 3	Artikel 12
-	Artikel 11 Absätze 4, 7 und 8
Artikel 8 Einleitung	Artikel 13 Einleitung
Artikel 8 Buchstabe a	Artikel 13 Absätze 1 und 3
-	Artikel 13 Absatz 2
Artikel 8 Buchstabe b	Artikel 13 Absatz 4
Artikel 9	Artikel 14 Absatz 1
-	Artikel 14 Absatz 2
-	Artikel 15
Artikel 10	Artikel 16
-	Artikel 17
Artikel 11 Einleitung	Artikel 18 Einleitung
Artikel 11 Buchstabe a	-
-	Artikel 18 Buchstabe a
Artikel 11 Buchstabe b	Artikel 18 Buchstabe b
Artikel 12	Artikel 19
Artikel 13	Artikel 20
Artikel 14 Absatz 1	Artikel 21 Absatz 1
Artikel 14 Absatz 2	Artikel 21 Absatz 2
Artikel 14 Absatz 3	-
-	Artikel 22
Artikel 15 Absatz 1	Artikel 23 Absätze 1 und 2

Artikel 15 Absatz 2

-

Artikel 16

Artikel 17

Anhang

-

-

Artikel 24

Artikel 25

Artikel 26

Anhang I

Anhänge II bis IV

**FINANZBOGEN****1. BEZEICHNUNG DES VORGESCHLAGENEN RECHTSAKTS:**

Vorschlag für eine Richtlinie des Europäischen Parlaments und des Rates über die Gesamtenergieeffizienz von Gebäuden

**2. ABM/ABB-RAHMEN**

Politikbereich(e) und Tätigkeit(en):

06: Energie und Verkehr

**3. HAUSHALTSLINIEN****3.1. Haushaltslinien (operative Linien sowie Linien für entsprechende technische und administrative Unterstützung (vormalige BA-Linien)), mit Bezeichnung:**

06 01 01: Ausgaben für Personal im aktiven Dienst des Politikbereichs „Energie und Verkehr“

**3.2. Dauer der Maßnahme und ihrer finanziellen Auswirkungen:**

Beginn 2010, Ende offen.

**3.3. Haushaltstechnische Merkmale**

Haushalt linie	Art der Ausgaben		Neu	EFTA-Beitrag	Beiträge von Bewerberländer n	Rubrik des mehrjährige n Finanzrahme ns
06 01 01	NOA	NGM	Nein	Nein	Nein	No 5



**Angaben zur Kofinanzierung**

Sieht der Vorschlag eine Kofinanzierung durch die Mitgliedstaaten oder sonstige Einrichtungen vor (bitte auflisten), so ist in der nachstehenden Tabelle die voraussichtliche Höhe der entsprechenden Beiträge anzugeben (beteiligen sich mehrere Einrichtungen an der Kofinanzierung, so können Zeilen in die Tabelle eingefügt werden):

in Mio. EUR (3 Dezimalstellen)

Kofinanzierung durch		Jahr n	n + 1	n + 2	n + 3	n + 4	n + 5 und Folge jahre	Insgesamt
.....	f							
ZE insgesamt, einschließlich Kofinanzierung	a+c +d +e +f	0,366	0,366	0,366	0,366	0,366	0,366	2,196

4.1.2. *Vereinbarkeit mit der Finanzplanung*

- Der Vorschlag ist mit der derzeitigen Finanzplanung vereinbar.
- Der Vorschlag macht eine Anpassung der betreffenden Rubrik des mehrjährigen Finanzrahmens erforderlich.
- Der Vorschlag erfordert möglicherweise eine Anwendung der Interinstitutionellen Vereinbarung (z. B. Inanspruchnahme des Flexibilitätsinstruments oder Änderung des mehrjährigen Finanzrahmens).

4.1.3. *Finanzielle Auswirkungen auf die Einnahmen*

- Der Vorschlag hat keine finanziellen Auswirkungen auf die Einnahmen.
- Folgende finanzielle Auswirkungen auf die Einnahmen sind zu erwarten:

in Mio. EUR (1 Dezimalstelle)

Haushaltslinie	Einnahmen	Prior to action [Year n-1]	Stand nach der Maßnahme					
			[Jahr n]	[n+1]	[n+2]	[n+3 ]	[n+4]	[n+5] 18
	a) Einnahmen nominal							
	b) Veränderung	Δ						

**4.2. Personalbedarf (Vollzeitäquivalent - Beamte, Zeitbedienstete und externes Personal) - Einzelheiten hierzu siehe Abschnitt 8.2.1**

Jährlicher Bedarf	Jahr n	n + 1	n + 2	n + 3	n + 4	n + 5 und Folgejahre
Personalbedarf insgesamt						

**5. MERKMALE UND ZIELE**

Einzelheiten zum Hintergrund des vorgeschlagenen Rechtsakts werden in der Begründung dargelegt. Dieser Abschnitt des Finanzbogens sollte folgende ergänzende Informationen enthalten:

**5.1. Kurz- oder längerfristig zu deckender Bedarf:**

In der Richtlinie ist vorgesehen, dass die Kommission eine Methode zur Berechnung kostenoptimaler Mindestanforderungen an die Gesamtenergieeffizienz von Gebäuden erarbeitet und anwendet. Diese Methode muss spätestens am 31. Dezember 2010 einsatzbereit sein. Ferner muss die Kommission Grundsätze für die Definition von Gebäuden mit Niedrig- oder Nullwerten bei Energieverbrauch/Kohlendioxidemissionen festlegen.

Die Richtlinie sieht vor, dass die Mitgliedstaaten die vorgenannte Methode anwenden und über die damit erzielten Ergebnisse erstmals am 30. Juni 2011 und danach alle drei Jahre Bericht erstatten. Ferner müssen die Mitgliedstaaten ihre nationalen Pläne in Bezug auf Gebäude mit Niedrig- oder Nullwerten bei Energieverbrauch/Kohlendioxidemissionen mitteilen. Die Kommission unterzieht diese Pläne einer Prüfung und erstellt anschließend einen Fortschrittsbericht. Zudem werden die Mitgliedstaaten verpflichtet, über die Gleichwertigkeit informativer und freiwilliger Maßnahmen bezüglich Heizungssystemen und Inspektionsprogrammen Bericht zu erstatten.

**5.2. Durch die Gemeinschaftsintervention bedingter Mehrwert, Kohärenz des Vorschlags mit anderen Finanzinstrumenten sowie mögliche Synergieeffekte:**

Der Gebäudesektor ist für rund 40 % des Endenergieverbrauchs und des CO<sub>2</sub>-Ausstoßes in der Gemeinschaft verantwortlich und damit der größte Energieverbraucher und größte Verursacher von Kohlendioxidemissionen in der EU. In dem Sektor besteht ein erhebliches ungenutztes Potenzial für kostenwirksame Energieeinsparungen, bei dessen Ausschöpfung der Endenergieverbrauch in der EU bis 2020 um 11 % sinken könnte.



**5.3. Ziele, erwartete Ergebnisse und entsprechende Indikatoren im Rahmen der ABM-Methodik:**

Ziel der Richtlinie ist die Einsparung von Energie und die Verringerung von Treibhausgasemissionen im Gebäudesektor.

**5.4. Durchführungsmodalitäten (indikative Angaben):**

Nachstehend ist darzulegen, welche Methode(n) für die praktische Durchführung der Maßnahme gewählt wurde(n):

***Zentrale Verwaltung***

X direkt durch die Kommission

indirekt im Wege der Befugnisübertragung an:

Exekutivagenturen

die von den Gemeinschaften geschaffenen Einrichtungen im Sinne von Artikel 185 der Haushaltsordnung

X einzelstaatliche öffentliche Einrichtungen bzw. privatrechtliche Einrichtungen, die im öffentlichen Auftrag tätig werden

***Geteilte oder dezentrale Verwaltung***

mit Mitgliedstaaten

mit Drittländern

***Gemeinsame Verwaltung mit internationalen Organisationen (bitte auflisten)***

Bemerkungen:

## **6. ÜBERWACHUNG UND BEWERTUNG**

### **6.1. Überwachungssystem**

*Standardtext*

### **6.2. Bewertung**

6.2.1. *Ex-ante-Bewertung:*

6.2.2. *Maßnahmen im Anschluss an Zwischen-/Ex-post-Bewertungen (unter Zugrundelegung früherer Erfahrungen):*

6.2.3. *Modalitäten und Periodizität der vorgesehenen Bewertungen:*

## **7. BETRUGSBEKÄMPFUNGSMABNAHMEN**

*Standardtext*

**8. RESSOURCEN IM EINZELNEN**

**8.1. Ziele des Vorschlags und Finanzbedarf**

Verpflichtungsermächtigungen, in Mio. EUR (3 Dezimalstellen)

Ziele, Maßnahmen und Outputs (bitte angeben)	Art der Outputs	Durchschnittskosten	Jahr n		Jahr n+1		Jahr n+2		Jahr n+3		Jahr n+4		Jahr n+5 und Folgejahre		INSGESAMT	
			Zahl der Outputs	Gesamtkosten	Zahl der Outputs	Gesamtkosten	Zahl der Outputs	Gesamtkosten	Zahl der Outputs	Gesamtkosten	Zahl der Outputs	Gesamtkosten	Zahl der Outputs	Gesamtkosten	Zahl der Outputs	Gesamtkosten
OPERATIVES ZIEL Nr. 1 <sup>19</sup> ...																
Maßnahme 1 .....																
- Output 1																
- Output 2																
Maßnahme 2 .....																
- Output 1																
Ziel 1 insgesamt																
OPERATIVES ZIEL Nr. 2 <sup>19</sup> ...																
Maßnahme 1 .....																

<sup>19</sup> Wie in Abschnitt 5.3 beschrieben.



## 8.2. Verwaltungskosten

### 8.2.1. Art und Anzahl des erforderlichen Personals

Art der Stellen		Zur Verwaltung der Maßnahme einzusetzendes, vorhandenes und/oder zusätzliches Personal (Stellenzahl/Vollzeitäquivalent)					
		Jahr n	Jahr n+1	Jahr n+2	Jahr n+3	Jahr n+4	Jahr n+5
Beamte	AD	3	3	3	3	3	3
	B*, C*/AST						
Aus Artikel XX 01 02 finanziertes Personal							
Sonstiges aus Artikel XX 01 02 finanziertes Personal							
<b>INSGESAMT</b>		3	3	3	3	3	3

### 8.2.2. Beschreibung der Aufgaben, die im Zuge der vorgeschlagenen Maßnahme auszuführen sind

Ausarbeitung und Überwachung einer Methode zur Berechnung kostenoptimaler Mindestanforderungen an die Gesamtenergieeffizienz von Gebäuden.

Überwachung der Anwendung der Richtlinie durch die Mitgliedstaaten und Berichterstattung. Vorbereitung, Ausrichtung und Nachbereitung von Sitzungen des (Komitologie-)Ausschusses.

### 8.2.3. Zuordnung der Stellen des damit betrauten Statutspersonals

- derzeit für die Verwaltung des Programms, das ersetzt oder verlängert werden soll, zugewiesene Stellen
- im Rahmen des JSP/HVE-Verfahrens für das Jahr n vorab zugewiesene Stellen
- im Rahmen des anstehenden neuen JSP/HVE-Verfahrens anzufordernde Stellen
- innerhalb des für die Verwaltung zuständigen Dienstes neu zu verteilende vorhandene Stellen (interne Personalumsetzung)
- für das Jahr n erforderliche, jedoch im Rahmen des JSP/HVE-Verfahrens für dieses Jahr nicht vorgesehene neue Stellen

8.2.4. *Sonstige im Höchstbetrag enthaltene Verwaltungsausgaben (XX 01 04/05 - Verwaltungsausgaben)*

in Mio. EUR (3 Dezimalstellen)

Haushaltslinie (Nummer und Bezeichnung)	Jahr n	Jahr n+1	Jahr n+2	Jahr n+3	Jahr n+4	Jahr n+5 und Folgejahre	INSGESAMT
<b>1. Technische und administrative Unterstützung (einschließlich Personalkosten)</b>							
Exekutivagenturen <sup>20</sup>							
Sonstige technische und administrative Unterstützung							
- <i>intra muros</i>							
- <i>extra muros</i>							
<b>Technische und administrative Unterstützung insgesamt</b>							

8.2.5. *Im Höchstbetrag nicht enthaltene Personal- und Nebenkosten*

in Mio. EUR (3 Dezimalstellen)

Art des Personals	Jahr n	Jahr n+1	Jahr n+2	Jahr n+3	Jahr n+4	Jahr n+5 und Folgejahre
Beamte und Bedienstete auf Zeit (XX 01 01)	0,366	0,366	0,366	0,366	0,366	0,366
Aus Artikel XX 01 02 finanziertes Personal (Hilfskräfte, ANS, Vertragspersonal usw.)  (Angabe der Haushaltslinie)						
<b>Personal- und Nebenkosten insgesamt (NICHT im Höchstbetrag enthalten)</b>	0,366	0,366	0,366	0,366	0,366	0,366

<sup>20</sup>

Hier ist auf den Finanzbogen zum Gründungsrechtsakt der Agentur zu verweisen.

Berechnung – *Beamte und Bedienstete auf Zeit*

Ab dem Jahr n: 3 AD-Beamte (

Berechnung – *Aus Artikel XX 01 02 finanziertes Personal*

8.2.6. Sonstige nicht im Höchstbetrag enthaltene Verwaltungsausgaben

in Mio. EUR (3 Dezimalstellen)

	Jahr n	Jahr n+1	Jahr n+2	Jahr n+3	Jahr n+4	Jahr n+5 und Folgejahre	INSGESAMT
XX 01 02 11 01 – Dienstreisen							
XX 01 02 11 02 – Sitzungen und Konferenzen							
XX 01 02 11 03 – Ausschüsse <sup>21</sup>							
XX 01 02 11 04 – Studien und Konsultationen							
XX 01 02 11 05 – Informationssysteme							
<b>2. Gesamtbetrag der sonstigen Ausgaben für den Dienstbetrieb (XX 01 02 11)</b>							
<b>3. Sonstige Ausgaben administrativer Art (Angabe mit Hinweis auf die betreffende Haushaltslinie)</b>							
<b>Gesamtbetrag der Verwaltungsausgaben ausgenommen Personal- und Nebenkosten (NICHT im Höchstbetrag enthalten)</b>							

<sup>21</sup> Angabe des jeweiligen Ausschusses sowie der Gruppe, der dieser angehört.

Berechnung – ***Sonstige nicht im Höchstbetrag enthaltene Verwaltungsausgaben***

*Der Bedarf an Humanressourcen und Verwaltungsmitteln wird mit den Mitteln gedeckt, die der zuständigen GD im Rahmen des jährlichen Haushaltsverfahrens in Abhängigkeit von den verfügbaren Mitteln zugeteilt werden können.*





**COUNCIL OF  
THE EUROPEAN UNION**

**Brussels, 19 November 2008**

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**Interinstitutional File:  
2008/0223 (COD)**

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**15929/08  
ADD 1**

**ENER 398  
ENV 850  
CODEC 1592**

**COVER NOTE**

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from: Secretary-General of the European Commission,  
signed by Mr Jordi AYET PUIGARNAU, Director

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to: Mr Javier SOLANA, Secretary-General/High Representative

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Subject: Communication Staff Working Document

- Accompanying document to the Proposal for a recast of the energy performance of buildings Directive (2002/91/EC)
- = Impact assessment

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Delegations will find attached Commission document SEC(2008) 2864 .

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COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 13-XI-2008  
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**COMMUNICATION STAFF WORKING DOCUMENT**

*Accompanying document to the*

**PROPOSAL FOR A RECAST OF THE  
ENERGY PERFORMANCE OF BUILDINGS DIRECTIVE (2002/91/EC)**

**IMPACT ASSESSMENT**

{COM(2008) 780 final}  
{SEC(2008) 2865}

**Lead DG:** DG TREN

**Other involved services:** SG, DG ECFIN, DG ENTR, DG ENV, DG EMPL, DG RTD, DG  
JRC, DG JLS

**CLWP reference:** 2008/TREN048

## COMMUNICATION FROM THE COMMISSION

### IMPACT ASSESSMENT SUMMARY

#### *EU buildings sector and EU policy objectives*

Energy use in residential and commercial buildings represents the lion's share, about 40%, of the EU's total final energy consumption and CO<sub>2</sub> emissions. Activities related to buildings represent a large part of the EU economy, about 9% of EU GDP and 7-8% of EU employment, and the importance of the sector in terms of social, cultural and historic value is enormous. Therefore, the EU buildings sector can play a key role in achieving EU growth, energy and climate policy objectives, while contributing to an improved level of comfort and lower energy bills for citizens.

Energy efficiency of buildings is an important part of broader initiatives on achieving EU energy and climate change objectives, as outlined in the Commission Communication *Energy policy for Europe*<sup>1</sup>, and plays a role in limiting the negative impact of high energy prices<sup>2</sup>. The European Council in its Presidency conclusions<sup>3</sup>, and the European Parliament in two of its resolutions<sup>4</sup>, have urged the Member States and the Commission to follow a proactive approach towards realizing the energy savings potential. In response, the Commission has continued its work on strategic initiatives, also on energy efficiency, with buildings being a basic element.

The potential for cost-effective energy savings is about 30% of the whole sector's expected energy consumption by 2020, which would lead to significant economic, social and environmental benefits. The savings stimulated by the main current EU measures are estimated to result in about 15% total energy savings. Thus, an additional potential of a further 15% energy savings has been identified. This potential can be realized at very low or even negative CO<sub>2</sub> abatement costs, because of the relatively low cost of energy relevant investments (when combined with other construction and renovation works in a building) and the very high value of energy savings compared to the other sectors, making energy saving a very attractive approach for tackling the climate change challenge.

Buildings are often regarded as a "local" issue. Nevertheless, the buildings sector is crucial for meeting the EU policy objectives and the EU added value of energy savings is significant. Buildings concern every EU citizen and with the high energy prices and their volatility energy efficiency is now becoming an important issue. EU action on building could provide for more and better information on the energy savings possibilities. The 'holistic approach' in this direction could also provide for improvements for the lowest quality houses in a proactive manner, as support from the national budgets for subsidising energy bills could now be targeted to long-term solutions for quality improvements in buildings.

#### *EU legislative action*

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<sup>1</sup> COM(2007) 1

<sup>2</sup> COM(2008) 384

<sup>3</sup> 11018/1/08, REV 1 and 7224/1/07, REV 1

<sup>4</sup> 2006/2113(INI) and (2007/2106(INI))

The existing EU core instruments in this context, e.g. Energy Performance of Buildings Directive (EPBD), Eco-design of Energy-using Products Directive, and Energy End-use Efficiency and Energy Services Directive, have proved to be a solid basis for achieving and supporting energy savings in the buildings sector. Amongst them, the EPBD is the main tool that provides for a holistic approach towards efficient energy use in the buildings sector.

The main objective of the EPBD is to promote cost-effective improvement of the overall energy performance of buildings, whilst taking into account local conditions and requirements. The Directive covers the energy needs for space and water heating, cooling, ventilation and lighting. It provides for a holistic view on the energy use of buildings and combines in a legal text different regulatory (i.e. minimum energy performance requirements) and information based instruments (i.e. certificates and inspection requirements):

- Member States have to set up minimum energy performance requirements for new buildings and for large existing ones that undergo major renovation. This means that these buildings shall meet certain national and regionally determined minimum energy performance levels, with the aim of achieving improved energy performance, thermal comfort and lower energy bills.
- Member States have to introduce an energy performance certification scheme that provides information on the energy needs of a building and on what can be improved. It should be presented to potential buyers/tenants so that they have an independent assessment of the energy-use aspects of the buildings, enabling informed decisions to be taken.
- Member States shall establish a system for inspection of medium- and large-size heating and air-conditioning systems at regular intervals so that their energy performance can be monitored and optimized. These systems are specially targeted as they dispose of very high energy savings potential. Promotion campaigns can be undertaken by Member States as an alternative to inspections, provided it can be demonstrated that this approach would be of equal impact.

These three main instruments take effect at different times of a building's lifetime. Minimum energy performance requirements are to be met at the time of construction or major renovation (i.e. every 25-40 years approx.). An energy performance certificate is required only when buildings are newly constructed, sold or rented out and is valid for a maximum of 10 years. The inspections of heating and air-conditioning systems are carried out more frequently, this being a function of the system size and fuel source. For instance, in the case of medium-sized boilers and air conditioning systems Member States are entitled to decide on the frequency of inspections regardless of whether or not the building is for sale or rent (as is the case for the energy performance certificate), whereas for large boilers it should be every two years, etc..

Member States also have to develop their own methodology, or use European standards<sup>5</sup>, for calculating the energy characteristics and performance of buildings, whilst also ensuring that there are enough qualified experts to carry out the certifications and inspections.

The EPBD does not fix concrete EU-wide energy performance requirements, but obliges Member States to lay down holistic methodologies, requirements, and inspection and

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<sup>5</sup> European standards are adopted by a European standardisation body (CEN) and made available to the public. A package of 31 EPBD has been prepared by CEN acting on a mandate by the European Commission to support Member States for the national implementation of the EPBD.

certification regimes to rate the energy performance of buildings at a national/regional level. Thus, its approach takes national/regional boundary conditions, like outdoor climate and individual building traditions, fully into consideration and respects the subsidiarity and proportionality principles. Member States can go beyond the minimum prescriptions laid down in the Directive and be more ambitious.

Before the adoption of the EPBD in 2002, many Member States did not have energy efficiency requirements or promotional instruments in their regulations and building codes. Therefore, in a number of countries the EPBD implementation has been a significant challenge but also, in parallel, an opportunity to improve the quality of their building stock. These challenges led to delay in transposition and a number of infringement cases (21 cases at their maximum) and support actions were initiated by the Commission. There has been positive reaction by the Member States and now 22 of them declare full transposition (which is still under evaluation by the Commission). Nevertheless, the implementation is a continuous process and there are still a number of challenges to be resolved, such as low level of ambition, ambiguous interpretations, and poor enforcement by some Member States.

The main contribution of the EPBD, so far, has been in bringing the subject of the energy efficiency of buildings onto political agendas, into building codes and to the attention of citizens. In terms of implementation costs, several Member States reported moderate costs, but with significant improvements in terms of energy savings in the buildings sector stimulated by the Directive.

#### *Need for further activities?*

Despite the actions already undertaken within the buildings sector, the main problem is that there is still a large cost-efficient energy saving potential that remains unutilized. Whilst the available data does not allow for a full assessment of the impacts of the current directive, rough calculations show that, if fully and properly implemented, the energy savings from the EPBD can be as much as 96 Mtoe final energy in 2020, this being 6.5% of EU final energy demand. However, its wording and the 'openness' of its provisions allow for various interpretations in its implementation. This would probably mean that its full impact may not be realized.

Many of the potential social, economic and environmental benefits at national and EU level are being neither fully explored nor fully exploited. This is due not only to the complexity of the sector and the existence of market failures, but also to limitations of the current EPBD. The possible alternative ways of tackling the challenges are: (i) repealing the EPBD and replacing it by 'soft' instruments, (ii) business as usual through use of the existing instruments without adaptation, and (iii) EU action by complemented and improved instruments of the current EPBD.

The first alternative, which is to repeal the EPBD and rely on 'soft law' instruments, such as information, voluntary activities, financing measures, etc., would entail pro-active and ambitious actions from Member States wherein the Commission would monitor and support the progress. However, the specifics of the sector, insufficient measures in many Member States, the high cost of "soft" instruments, and the fact that there is already a functioning Directive at EU level, all lead to the conclusion that this alternative would not solve the problems at acceptable cost. In addition, repealing the EPBD would send a very negative signal regarding the EU ambitions to pursue its policy objectives on energy efficiency.

The second alternative is to continue with the 'business as usual' or 'do nothing more' than the existing measures, besides continued and improved implementation. If such an approach were adopted a large potential, currently outside of the EPBD, would remain untapped. Also, due to the limitations in the wording of the current EPBD, the full expected potential would not be realized. On the contrary, because of the vagueness of some provisions there may even be a negative connotation. For instance, because of the lack of provisions on monitoring and compliance, the certificates might be of very poor quality in some countries and considered as a useless bureaucratic burden imposed from Brussels.

The third alternative is to revise the EPBD. The main provisions of the current Directive would be kept, as they are already delivering, but their efficiency would be significantly improved and their scope extended. By building on its current structure and provisions, as well as the implementing measures already undertaken in Member States, the transposition - and indeed the comprehension of these measures by all stakeholders - would be eased, whilst at the same time provision could be made for tapping a larger share of the energy saving potential and other related benefits. The setting up of the concrete levels, requirements and mechanisms would, as under the current EPBD, be left to the national/regional authorities in respect of the principles of subsidiarity and proportionality.

The conclusion drawn from the three policy alternatives was that the largest contribution towards meeting the EU policy goals can be achieved through revision of the EPBD. This can be done with modifications of the current provisions that would keep the principles and their essence, but would significantly improve their efficiency. In this case, the current Directive will be the starting point for the revised instrument and will constitute its 'backbone'. Therefore, the continued implementation of the EPBD is of crucial importance.

However, it should be emphasized that the solution is an integrated mix of policy instruments and thus other non-regulatory measures, although not sufficient on their own, are necessary to complement the implementation of the Directive. Therefore, the efforts in providing more financial and fiscal incentives, information, training of experts, and agreeing on voluntary actions should be strengthened. The 'soft law' instruments already contained in the current EPBD should be further developed.

#### ***EU's right for undertaking these activities***

Climate change, security of energy supply and environmental protection are challenges that cannot be sufficiently addressed at national level only. Energy efficiency provides part of the solution of these problems and the instruments on energy efficiency that have already been adopted at EU level, based on Art. 6 of the Treaty (environmental protection), reflect this need for Community action.

The buildings sector is responsible for about 36 % of the EU's total CO<sub>2</sub> emissions and for about half of the CO<sub>2</sub> emissions which are not covered by the Emission Trading System. It disposes of a considerable cost-effective energy savings potential which can hardly be found in any other area and which is attainable at comparatively low costs. Therefore, it becomes evident that every country needs to urgently save energy in buildings but not all dispose of the knowledge needed.

The buildings sector is also highly disaggregated and is experiencing a number of market failures (e.g.: partial internalization of externalities in energy prices; principal-agent problems; split incentives; lack of appropriate information, education and training; low uptake

of new and innovative technologies; etc.) which have limited the rate of energy efficiency gains in the sector. Indicators show that while for example the energy consumption of industry is decreasing, that of households is constantly on the rise. Construction products, appliances and services related to buildings are an important part of the EU internal market. In addition, with the increasing mobility of people and number of businesses with operations across the EU, a similar way to measure, for example, the energy performance of buildings would decrease the administrative burden for them.

As energy efficiency objectives could not thus far be achieved by Member States to a sufficient extent, then action at Community level is appropriate to facilitate and support the uptake of activities at national level.

The main elements of the current EPBD have already been discussed from the point of view of the principles of subsidiarity and proportionality when the Directive was tabled in 2001 and adopted in 2002. Furthermore, they have also been tested in practice, demonstrating the appropriateness of the approach. Since then the need for common action to tackle the challenges of climate change and energy dependency have become even more apparent. In this Impact Assessment, subsidiarity and proportionality were guiding principles when developing the initial screening of options. Nevertheless, some options, which could possibly not be in line with these two principles, were discussed in the text as they have high potential for energy and CO<sub>2</sub> reductions. In this case appropriate indication has been given in the text.

#### ***What options for a better EPBD?***

The Impact Assessment concluded that several aspects of the current EPBD could be improved. These in general refer, firstly, to the improvement of some ambiguous wording (in particular of definitions) and, secondly, to each of the main pillars of the current Directive. Within each pillar several options were chosen, based on a broad discussion with stakeholders and observations from the implementation of the current EPBD.

The options were analysed in view of their economic, social and environmental impacts. For the analysis, the BEAM model (see Annex IV) and data/assumptions available in a large number of studies were used, as well as the knowledge and observations accumulated by following the implementation of the EPBD and discussion/inputs from Member States and stakeholders. The calculation of the impacts is bottom-up (i.e. based on following the construction, demolition and renovation rates, and energy-efficiency measures in building retrofits). The baseline is the latest update (September 2007) of the PRIMES model of DG TREN which includes policies and measures implemented in the Member-States until the end of 2006. The latest policy developments for the ETS and non-ETS sectors are not included in the baseline. For some options, only qualification of the impacts was possible, due to limitations in the available quantitative data.

The options discussed include a mix of policy instruments, including regulatory and also non-regulatory alternatives, like information and other soft measures.

The main areas where action is required and within which various options needed to be discussed were:

**General: Clarification and simplification**

This is essential for proper implementation of the EPBD. The need for action in this direction surfaced during discussions with representatives from Member States and via inputs from stakeholders. Two actions are key in this direction: (i) to clarify and simplify the text itself (i.e. certain definitions and provisions), and (ii) to choose the proper legal format of the proposed revised text (recast vs. amendment).

**A: 1000 m<sup>2</sup> threshold for existing buildings when they undergo major renovation**

The current EPBD provision that only existing buildings above 1000m<sup>2</sup> should meet certain energy performance requirements when undergoing major renovation (for which either the investment is above 25% of the whole building value, excluding the land, or the renovation concerns more than 25% of the building shell), means that only about 29% of the EU buildings sector falls within the scope of this provision. The best moment for the introduction of energy efficiency measures is when a building anyhow undergoes major renovation, which is approximately every 25 years. At that stage, the additional investment needed is not high and -as the investment also leads to energy savings- it is usually repaid during its lifetime.

This provision therefore limits the impact of the Directive.

Three possible options on the extension of the EPBD were analysed:

*Option A1: Lowering the threshold to 500 m<sup>2</sup>, (all medium sized buildings).*

*Option A2: Lowering the threshold to 200 m<sup>2</sup>, (all buildings apart from small ones (mainly single family houses)).*

*Option A3: Abolishing the 1000 m<sup>2</sup> threshold (all buildings).*

For all options the current exceptions listed in Art.4 (3) for certain buildings (for example, buildings officially protected because of their architectural or historical merit, the stand-alone buildings smaller than 50 m<sup>2</sup>, etc), are considered to remain. Also, the possibility for Member States to go beyond the requirements, i.e. below 500 or 200 m<sup>2</sup> would remain.

It should be highlighted that within the discussed options, Member States would still be responsible to set up the individual requirements of energy performance and thus the subsidiarity principle will be respected. Also, the definition of major renovation would be retained as in the current EPBD, which means that, for example, renovation of an apartment in a large multifamily building would, in most cases, not be covered by the requirements. The effect on individual households would be limited further by the fact that renovations are usually made 'step by step'. The current EPBD also entails that for existing buildings, when they undergo major renovation of a certain part, the energy performance requirements are to be met only for this part and not for the whole building. For example, if the building shell is renovated this would not mean that the heating system should mandatorily be changed.

A summary of the calculated impacts of the three options is provided in the table below.

	Option A1	Option A2	Option A3
Final energy savings in 2020 (Mtoe/a)	3	5	20



	Option A1	Option A2	Option A3
CO <sub>2</sub> emission reductions in 2020 (Mt/a)	8	14	51
Capital costs in 2020 (billion €/a)	1 (but 3 saved energy costs)	2 (but 7 saved energy costs)	<b>8 (but 25 saved energy costs)</b>
Job creation in 2020	10,000	21,000	<b>75,000</b>
Administrative costs	Low	Low	<b>Medium</b>

The analysis indicates that option A3 could most significantly contribute to the realization of the EU policy objectives in question.

### **B: Energy performance certificates**

The certificates, which are already mandatory under the current EPBD when buildings are constructed, sold or rented out, can be a powerful tool to create a demand-driven market for energy efficient buildings, as they allow economic agents to estimate costs in relation to energy consumption and efficiency. However, observations show that some certificates issued in some Member States are not of satisfactory quality, or they are not systematically made available during property transactions, thus significantly restricting their real impact at the present time. Higher uptake of the recommendations, as shown on the certificates, for energy improvements of the buildings can stimulate further energy savings. Therefore, several options have been analysed:

*Option B1: Quality and compliance requirements for certificates.* It is proposed that a requirement for random sampling checks of the quality of energy performance certificates and compliance with the building energy codes is carried out by public authorities or accredited institutions. This regulatory instrument would ensure that the information on the certificates is of good quality and reliable. It is also expected that it would trigger an increase in the rate of renovations, and thus high energy savings as, due to the improved quality, people would be more aware of the possibilities for improvements and of their cost-effectiveness. Proposing such requirements can be justified from a proportionality point of view as, from the current practice, it has been evident that the low quality of certificates is one of the key factors for the credibility and market uptake of the certificates in a number of Member States.

*Option B2: Requiring that the recommended cost-effective measures of the certificate are realized within a certain time period.* The proposal is to require that the cost-effective recommendations on the certificate are implemented within a certain period of time. The setting up of a definition for 'cost-effective' and the period of time are to be decided at national or regional level. This regulatory instrument can be introduced either for all buildings or only for those of the public administration. Due to data availability limitations, the introduction of such a requirement was only analyzed for tertiary sector buildings. This would be a significant financial burden for EU citizens and businesses, and therefore such action would not be justified at EU level if no sufficient financial mechanisms are ensured.

*Option B3: Making certificates a mandatory part of property advertisement and/or property transaction documents.* This would entail that information on the energy performance of a building is included in advertisements and publicity for property transactions and that with each transaction the certificate has to be presented. The former is an information tool that would increase the awareness about the certificates and energy efficiency. Such a requirement

at EU level has already been made for the display of CO<sub>2</sub> emissions of cars and, taking into account the important contribution such action may have, its introduction would be in line with both the subsidiarity and proportionality principles. The latter is a regulatory measure that would limit the interpretations of the current text of the EPBD which already states that a certificate should be 'made available', but for which, nevertheless, there are some interpretations which mean that the certificates are not *de facto* presented.

*Option B4: Requiring the linking of the certificates with other support or discouragement mechanisms.* It is suggested that the energy efficiency improvements of a building, which are achieved as a result of a financial incentive, are demonstrated or justified using the certificate. For example, if a certificate is made before and after the investment, the financial support may be given only if there are improvements to the ranking of the building. This will help property owners/tenants to make informed decisions about the cost-effectiveness of their investments and there will be a proof that the funding provided would really lead to energy savings. However, such a requirement would not be in line with the subsidiarity principle, as it would touch upon issues of national budget spending. Furthermore, introducing such a text into a Directive based on Art. 175 (environmental protection) of the Treaty may not be possible from a legal point of view.

A summary of the calculated impacts of the three options is provided in the following table.

	Option B1	Option B2 *	Option B3	Option B4
Final energy savings in 2020 (Mtoe/a)	21	12	++ (lower than B2)	++ (lower than B2)
CO <sub>2</sub> emission reductions in 2020 (Mt/a)	57	33	++ (lower than B2)	++ (lower than B2)
Capital costs in 2020 (billion €/a)	8 (but 26 saved energy costs)	5 (but 9 saved energy costs)	Very low	Strongly depends on type of measures
Job creation in 2020	60,000	100,000	++	++
Administrative costs	Low - medium	High	Very low	Medium
Comments	CO <sub>2</sub> abatement costs of about -315 €/ton.	High one-off investments; legal constraints		Measures outside EPBD, legal constraints

\* Impact quantified for the tertiary buildings sector only, so figures do not contain the potential of the residential sector.

The analysis indicates that options B1 and B3 could significantly contribute to the realization of the EU policy objectives in question. Option B4 could also be further developed outside the scope of the EPBD.

### **C: Inspection of heating and air-conditioning systems**

These systems have a very high energy saving potential, up to 40-60% of their total energy use. At present, the current EPBD requires that a regular inspection be performed on systems above certain thresholds, although it is very unclear what the outcomes of these inspections are and furthermore their quality is not always satisfactory. As a result, it is estimated that the EPBD as it is today can bring only 10% energy savings in this field by 2020. There is significant room for further savings, for which two options have been discussed:

*Option C1: Requiring an 'inspection report' for heating and air-conditioning systems.* It is proposed that an 'inspection report', to be drawn up by an independent expert, is given to the building owner. It would include an energy efficiency rating of the heating/cooling system and recommendations for cost-effective measures. This information tool aims at providing practical and useful results to building owners when deciding on retrofitting and would therefore increase the impact of the current EPBD provisions. In this context, existing CEN standards for inspections could be further developed to allow for an efficiency rating of the installation systems. The recast EPBD could therefore refer to European standards and make the efficiency rating part of the inspection report. Minimum energy efficiency installation requirements could then be set by Member States. This would link the EPBD with the Eco-design Directive. The inspection report would be an important upgrading to the existing requirements for inspection and would help consumers in identifying important possibilities for cost-effective energy savings and, hence, is justified from the point of view of proportionality.

*Option C2: Introducing compliance requirements.* It is proposed that random sampling checks of inspection reports (presented in option C1) of different levels of detail and frequency could be introduced. This regulatory tool could ensure that the inspections are carried out regularly and are of satisfactory quality (which is not always the case at present). Similarly to option B1, proposing such requirements can be justified from a proportionality point of view as, given the evidence from the current practice, it has been witnessed that without compliance checks the usefulness and credibility of inspections is drawn into question.

A summary of the calculated impacts of the two options is provided in the table below.

	<b>Option C1</b>	<b>Option C2</b>
Final energy savings in 2020 (Mtoe/a)	<b>5</b>	<b>++ - +++ (higher than C1)</b>
CO <sub>2</sub> emission reductions in 2020 (Mt/a)	<b>15 – 20</b>	<b>++ - +++ (higher than C1)</b>
Capital costs in 2020 (billion €/a)	<b>Net benefits (investments minus energy savings) estimated to €2 billion per year.</b>	<b>In the same magnitude as C1</b>
Job creation in 2020	<b>46,000</b>	<b>23,000</b>
Administrative costs	<b>Low</b>	<b>Medium</b>
Comment	<b>CO<sub>2</sub> abatement costs estimated to be around -133€/ton.</b>	<b>CO<sub>2</sub> abatement costs estimated to be in the same magnitude as option C1.</b>

The analysis indicates that taken together both options C1 and C2 could significantly contribute to the realization of the EU policy objectives in question, without leading to negative social or administrative implications.

### **D: Energy performance requirements**

At present, Member States determine individual energy performance requirements and their levels of ambition. These vary widely across the EU, even within similar climatic zones. In many Member States cost-optimal levels are not yet achieved, which means that the cost-efficient energy savings and CO<sub>2</sub> emission reduction possibilities are not fully utilized. Furthermore, cross-border comparisons of how Member States have advanced in this respect are difficult due to diverse national/regional approaches of calculation and setting up of the

underlying parameters. Therefore, further stimulation at Community level, while respecting the subsidiarity and proportionality principles, could realize additional energy savings.

Four options have been identified:

*Option D1: Specifying EU-wide energy performance requirements.* The proposal would entail that specific energy performance requirement levels are proposed as an Annex to the revised EPBD, based on robust calculations that have to take into consideration various factors, for example, different climate zones and building types for residential and non-residential buildings. This regulatory instrument would allow for a large part of the energy savings potential to be reaped, as in some countries the requirements are below cost-optimal level, but would require a high level of regulation at EU-level. It would ease cross-border operating businesses and support the internal market of energy efficiency related construction materials and appliances. However, determining these levels would be a very demanding and highly disputed task. Such concrete regulation at EU level would not be in line with the principles of subsidiarity and proportionality.

*Option D2: Introducing a benchmarking mechanism.* The proposal is to include in the EPBD (i.e. as an Annex) principal parameters to calculate the cost-optimal level of energy performance requirements for buildings which can be used to compare the Member States' level of ambition in the implementation. The current provisions of the EPBD would not be changed regarding the minimum energy performance requirements, i.e. Member States would still have to set up the individual levels based on their national circumstances. In addition there would be a calculation methodology proposed, for example, by the Commission, which would allow for a cross-check of how close national/local requirements are to the optimal levels. In order for this comparison to be carried out, Member States would have to provide input data or to calculate the levels for themselves but report the results. This would clearly indicate whether Member States are below the optimal levels, which would mean that money from energy savings is lost every time national or local regulations are applied, or whether Member States are too ambitious in their requirements and place an unjustified burden on their citizens.

This is a "soft law" instrument and would not impose any requirement for the Member States to correct their levels and thus would be in line with the proportionality and subsidiarity principles. However, it is believed that it would create significant peer-pressure from the front runner countries, as well as from the construction industry and other stakeholders, and would ultimately move all Member States towards optimal energy efficiency requirements. The impact that is measured is the maximum possible, i.e. meaning that Member States would gradually correct their national levels, with half of them would adjusting their national levels to cost-optimal ones by 2020 and the remainder, possibly, by 2030.

*Option D3: Requiring an evolving improvement scheme for the buildings stock focussing on the worst performing buildings (a kind of top-runner approach).* It is proposed that Member States monitor their building stock and lay down Action Plans on how to increase the refurbishment rate and the energy performance of the worst performing buildings. This mix of instruments could tackle the most cost-effective potential. However, it would require that a significant quantity of presently unavailable good quality statistical information on the building stock is collected, thus implying high administrative costs. Such an approach would also be a considerable burden for the owners (some of them with low incomes) of the poorly performing buildings and this would also entail that Member States would have to provide

financial support mechanisms. This approach would not be in line with the subsidiarity principle as it would touch upon issues of national budget spending.

*Option D4: Setting up EU-wide low or zero energy/carbon buildings/passive house requirements.* It is proposed that a requirement is introduced that all newly constructed buildings must meet the low energy building requirements from a certain date onwards. Alternatively, Member States can be encouraged to set a definition and strategy for achieving the low energy building standard where the final and intermediary target years are clearly mentioned. These actions would lead to very well performing new buildings and foster innovation.

However, such a requirement would pose a significant challenge to the construction industry to build such houses and would increase houses prices by 7% to 15%. It would also not respect the subsidiarity and proportionality principle, as it would require investments that are not in all cases cost-efficient and would create burden for the national budgets as they would have to support households that could not afford to build such low energy homes. Therefore, a softer approach can be taken which is to include an obligation for the development of 'roadmaps', wherein Member States would show their commitment toward achieving low energy/emission houses in the future and the concrete measures they plan to undertake.

A summary of the calculated impacts of the four options is provided in the table below.

	Option D1	Option D2	Option D3	Option D4
Final energy savings in 2020 (Mtoe/a)	10	5 (up to 10 in 2030)	+	15 (if required for all new-build) + (if gradually with roadmaps)
CO <sub>2</sub> emission reductions in 2020 (Mt/a)	24	13 (up to 24 in 2030)	+	41 (if required for all new-build) + (if gradually with roadmaps)
Capital costs in 2020 (billion €/a)	6 (but 12 saved energy costs)	3 (but 6 saved energy costs)	++	50 – 120 (if required for all new-build)
Job creation in 2020	82,000	up to 82,000	+	+++
Administrative costs	Very high	Very low	High	Low
Comment	CO <sub>2</sub> abatement costs of about - 250 €/ton. subsidiarity concerns	CO <sub>2</sub> abatement costs of about - 250 €/ton.		Very high one-off investments if required for all new-build

The analysis indicates that option D2 could significantly and quickly contribute to the realization of the EU policy objectives in question. Option D3 could be taken on board by Member States when starting national activities, in particular related to the National Energy Efficiency Action Plans. Option D4 could, due to economic and legal constraints be considered in a less prescribed form, i.e. by national visions/roadmaps.

Furthermore, the role of the public sector to act as a leading example in energy efficiency is dealt with in the Impact Assessment by proposing stricter deadlines for the public sector than for other sectors to comply with EPBD obligations and by proposing an obligatory realization of energy efficiency measures which are recommended in the energy performance certificate of a building.

### *Conclusions*

The results for the most cost-effective and beneficial options (indicated in bold in the tables above), with all available quantifications, **show significant positive impacts which are possible if the Directive is revised, that would make use of a large part of the remaining potential in the buildings sector and would also contribute to the realization of the full potential of the current EPBD.** Furthermore, such a revision would create a simplified and improved framework for energy savings. The minimum total impact of the options identified as being most beneficial and for which quantification was possible, is:

- 60 – 80 Mtoe/year energy savings in 2020, i.e. reduction of 5-6% of the EU final energy consumption in 2020;
- 160 to 210 Mt/year CO<sub>2</sub> savings in 2020, i.e. 4-5% from EU total CO<sub>2</sub> emissions in 2020;

The impact on the labour market would also be important. It is expected that 280,000 (to 450,000) potential new jobs will be created by 2020 by the revised EPBD. This would mainly be in the construction sector itself as well as for the services of energy certifiers, auditors and inspectors of heating and air-conditioning systems.

The investment requirements and the administrative costs of the measures were analysed and are relatively low compared to the benefits and the returns. For example, abolishing the 1000 m<sup>2</sup> threshold on an EU scale would lead to €8 billion/year additional capital investments but would trigger €25 billion/year energy cost savings in 2020, which also means considerably negative CO<sub>2</sub> abatement costs. These calculations have been made on the basis of conservative estimations about oil prices (e.g. 55\$ per barrel oil in 2005, 100\$ in 2020 and 119 \$ in 2030 in year 2005 prices). With higher oil prices it can be expected that returns on investment would be in even shorter periods and the potential would be even higher.

The investment needs differ substantially across Europe depending on the social and economic conditions, on the initial state of property and on the type of renovations people undertake. They are not equally distributed amongst EU citizens, i.e. there will be additional costs for those who make major renovations of their buildings or are engaged in property transactions. However, with the high oil prices these initial investments will have attractive returns. The overall benefits for society in terms of reduction of energy consumption and thus reduced CO<sub>2</sub> emissions and energy import dependency, job creation, especially at local and regional level, positive health and labour productivity far exceed the costs of the measures analysed.

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## *ANNEXES*

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- II Summary of the survey to the Member States

- III Summary report of the consultation meeting
- IV Main methods and assumptions
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## 1. PROCEDURAL ISSUES AND CONSULTATION

### 1.1. Organisation and timing

The Energy Efficiency Action Plan of 2006<sup>6</sup>, endorsed at the Spring 2007 European Council<sup>7</sup> and further supported by the June 2008 European Council, details a plan for achieving 20% energy saving by 2020 and highlights the importance of the buildings sector to this end. One possible measure with significant potential that is discussed and evaluated in the Action Plan and its Impact Assessment<sup>8</sup> is the strengthening of existing policies, and in particular, of the Energy Performance of Buildings Directive (hereinafter EPBD) 2002/91/EC. Possible action in this direction features on the Commission Legislative Work Programme of 2008 as one of the four strategic priorities on energy<sup>9</sup> and on the Commission Simplification Rolling Programme for 2008-2009<sup>10</sup> aimed at better regulation and lawmaking.

Energy efficiency of buildings is an important part of broader initiatives on achieving EU energy and climate change objectives as outlined in the Commission Communication *Energy policy for Europe*<sup>11</sup> and on limiting the negative impact of high energy prices<sup>12</sup>. The European Council in its Presidency conclusions<sup>13</sup>, and the European Parliament in two of its resolutions<sup>14</sup>, has urged the Member States and the Commission for a proactive approach towards realizing the energy savings potential. In response the Commission is preparing an encompassing Strategic energy review 2 package to be adopted by the Commission in November 2008. Action on buildings, as discussed in this Impact Assessment, would be part of this package.

The Impact Assessment has been prepared in the first half of 2008 to evaluate options that could be explored in this area. It does not prejudge the final form of any decision to be taken by the Commission.

### 1.2. Consultation and expertise

The impact assessment is based on a wide range of information sources such as material from the Member States, experts, stakeholders, as well as from conferences, public consultations and studies. The process was supported inside the Commission by an Inter Service Steering Group, lead by DG Energy and Transport (DG TREN).

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<sup>6</sup> COM(2006)545

<sup>7</sup> 7224/1/07, REV 1

<sup>8</sup> SEC(2006)1174

<sup>9</sup> COM(2007) 640 final

<sup>10</sup> COM(2008) 33 final

<sup>11</sup> COM(2007) 1

<sup>12</sup> COM(2008) 384

<sup>13</sup> 11018/1/08, REV 1 and 7224/1/07, REV 1

<sup>14</sup> 2006/2113(INI) and (2007/2106(INI))



### *1.2.1. Member States and Stakeholder consultations*

DG TREN has a very good understanding of the challenges encountered by the Member States with the implementation of the EPBD at national/regional level, as there has been a continuous exchange of information based on regular contacts since the existing Directive was adopted in 2002. While DG TREN closely follows the transposition of the EPBD into national legislation, it also extensively discusses the implementation with national representatives in regular meetings. The Energy Demand Management Committee is one such discussion platform to follow the status of implementation and challenges of the Directive between Member States and the Commission which usually meets twice a year (a summary of Member States' input on the impacts of the EPBD and need/possibilities for its modification is included in Annex II).

Further intensive discussions were held in the context of two dedicated initiatives, so-called Concerted Actions (01/2005-06/2007 and 12/2007-11/2010), which were initiated under the Intelligent Energy Europe Programme of the EU (implemented by the Executive Agency for Competitiveness and Innovation (EACI)) to provide support to the Member States for transposing and implementing the EPBD. The Concerted Actions consist of regular 2 - 3 day meetings (about twice a year) of all Member States' representatives - involving around 100 participants of national authorities and institutions directly in charge of implementation of the Directive in each Member State. Best practices and detailed questions on transposition are discussed in the plenary sessions and parallel workshops held therein. The exchange of information continues in between the meetings via working groups, internet meetings, newsletters and a supporting web based service platform.

DG TREN has many bilateral contacts with stakeholders, such as property and industry associations, banks and energy services companies to assess how the EPBD impacted their businesses. Some major stakeholders contributed with position papers presenting their ideas on how to increase energy efficiency of buildings in the framework of the EPBD.

At the beginning of 2008, DG TREN organized, with the support of the EPBD Buildings Platform, the "Energy Performance of Buildings Directive: Next steps" Conference as part of the EU Sustainable Energy Week. The objectives were to present DG TREN's preliminary ideas for gaining more energy saving from buildings and to initiate a consultation on the elements of the Directive which could be revised (see Annex III for its summary). The conference was attended by more than 150 participants and the ideas for the challenges and possibilities for further steps were discussed and in general very well accepted.

To further widen the scope of ideas on how to upgrade the energy performance of buildings, DG TREN also launched an online consultation for a period of eight weeks, starting from April 25<sup>15</sup>. There were in total 246 responses, of which 82% organizations and 18% citizens, originating from 22 Member States and several countries outside the EU (for summary see Annex I). There has been a strong support of the revision of the EPBD (more than 75%). The answers indicate a clear wish for clarification or simplification to extend the scope of the existing Directive concerning e.g. specific definitions or lowering/abolishing of existing thresholds, and strengthening the role of its instruments, e.g. the Energy Performance Certificate. Furthermore, suggestions were made for a better European harmonization that

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<sup>15</sup> It was in the form of questionnaire and was published on the Commission's webpage 'Your voice in Europe' and on the webpage of DG TREN

would ease cross-country comparisons and improve business environment. Also a stronger role of the public sector to act as a leading example was clearly proposed.

### **1.2.2. Studies**

Broad knowledge exists on the different economic, social and environmental dimensions associated with the energy performance of buildings, and is well documented in various studies, including those supported by the EU within its Intelligent Energy Europe Programme and the Framework Programmes for Research and Development. However, these studies, many of which arise from grass-roots initiatives supported at European or national level, are fragmented with regards to the issues discussed and countries covered. Hence, this impact assessment considers the results of a large number of studies having very different scopes.

The National Energy Efficiency Action Plans of the Member States, submitted within the reporting obligations of the Energy end-use efficiency and energy services Directive (2006/32/EC), were also consulted for information on the energy efficiency measures taken in the buildings sector of Member States.

In addition to the literature already available, the assessments made in this document are also based on the analyses and data provided by an external consultant, who was contracted by DG TREN to provide support with the quantification of the various impacts resulting from the options discussed in this impact assessment. The task of the consultant was to screen available studies for best practice examples and foremost to provide estimates for costs and benefits based on official statistical data and modelling tools.

### **1.2.3. Opinion of the Impact Assessment Board**

This Impact Assessment has been on the agenda of the Impact Assessment Board hearing on 16 July 2008 and a written procedure in September 2008.

All items of the Impact Assessment Board opinion of 22 July 2008 were comprehensively addressed in a revised version of the Impact Assessment resubmitted on 4 September 2008. In its second opinion the Impact Assessment Board asked for new modifications of the document mainly on: (i) further in-depth analysis of subsidiarity aspects; (ii) another clarification on the analysis of costs and benefits of the options analysed; (iii) assessing administrative costs of the options analysed using the EU Standard Cost Model; (iv) further clarification of the problem definition; and (v) possibility for a discussion of the other foreseen EU measures which possibly target on energy efficiency of buildings.

Points (i), (ii) and (iv) have been addressed in this Impact Assessment by adding and further explaining the text. The administrative costs have been analysed based on available studies, referred in the text. As the request in point (iii) to use the EU Standard Cost Model came at a very late stage it was not met. The same applies for point (v).

## **2. PROBLEM DEFINITION**

### **2.1. Overarching problem definition**

The EU buildings sector can play a key role in achieving EU growth, energy and climate policy objectives, while contributing to an improved level of comfort and lower energy bills for citizens. To meet the common policy targets on energy and climate change Member States

need to act in all fields, ETS and non-ETS. The policy frame for non-ETS is also given in the EEAP of which buildings constitute an important element.

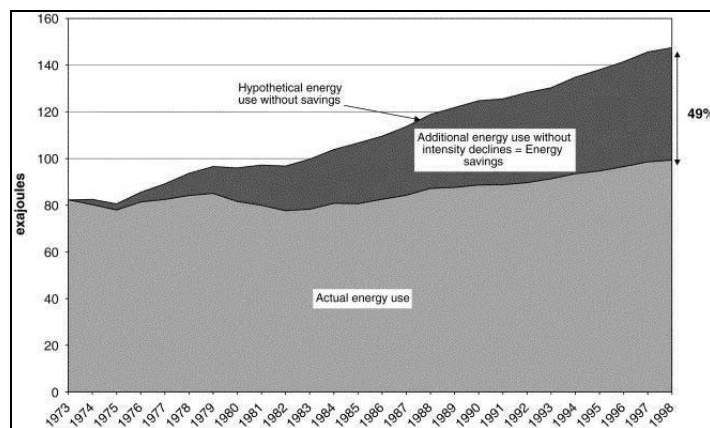
However, **the problem is that a large part of the cost-effective<sup>27</sup> energy efficiency potential is not realised in practice.** The potential of the buildings sector is estimated at the possibility for 28% cost-efficient energy savings by 2020 for the sector (or 143Mtoe final energy) which could be translated in 11% reduction of the total EU final energy consumption and 11% reduction of EU total CO<sub>2</sub> emissions. This potential is for both existing and newly constructed buildings. This will result in a number of other benefits (see Annex V).

Narrowing of the gap between the realisable potential and its real uptake is the Commission's main motivation for initiating a discussion and analyzing the possible options.

Before proceeding to identifying the concrete problems and suggestions for actions it is important that a good understanding of the buildings sector is developed and of the existing policy that was developed to partially tackle the problem. This presentation is provided in Annex V and the following Section 2.2. Taking these actions into account a discussion of the remaining problems is included in Section 0.

## 2.2. Actions in the EU

After the oil crises of the 1970s, many governments around the world realized the impacts energy supply disturbances can have on their economies and the benefits of decreasing their energy needs. As a consequence, significant energy efficiency gains were realized which, for example, resulted in about 30% reduction of the energy intensity of households and service sector by 1990 compared to 1973 in the biggest eleven OECD countries<sup>16</sup>.



**Figure 1.** The impact of energy efficiency improvements on energy use in several OECD countries. Source: Geller *et. al* 2006

The instruments varied from country to country but included building codes, financial and fiscal initiatives, research and development programmes, and information and education campaigns. From the frontrunners, Sweden and Denmark were the first to introduce energy

<sup>16</sup> Geller *et. al.* Policies for increasing energy efficiency: Thirty years of experience in OECD countries. *Energy Policy* 34, 556–573. Data refer to 11 OECD countries Australia, Denmark, Finland, France, Germany, Italy, Japan, Norway, Sweden, United Kingdom, and the United States, 2006.

efficiency requirements in their buildings codes in 1947 and 1961, respectively, and requirement for provision of information on the energy consumption of buildings as a certificate in 1997<sup>17</sup>. The introduction of thermal insulation requirements reduced the heating energy consumption per unit of floor area in Germany by 30% over 1978-1993 period. However, at that time, fewer activities were carried out in other Central and in Eastern European countries, which is also true for many EU-15 countries. In the 1990s, energy efficiency gains slowed worldwide and only recently there was a new upsurge of attention and dedicated policy.

At EU level, several energy policy measures have been introduced since 1970's, but the major policy initiative was the adoption of the Energy Performance of Buildings Directive 2002/91/EC (EPBD) in 2002.

### **2.2.1. Energy Performance of Buildings Directive (EPBD) (2002/91/EC)**

The main objective of the EPBD is to promote cost-effective improvement of the overall energy performance of buildings, while taking into account local conditions and requirements. The Directive covers the energy needs for space and hot water heating, cooling and lighting and has three main pillars: energy performance requirements for new buildings and for existing that undergo major renovation, energy performance certificates, and the inspection of boilers and air-conditioning systems. The Directive sets the basic principles and recruitments and **leaves significant room for Member States** to establish the concrete mechanisms and numeric requirements and ways to implement them. To this end **Member States shall**:

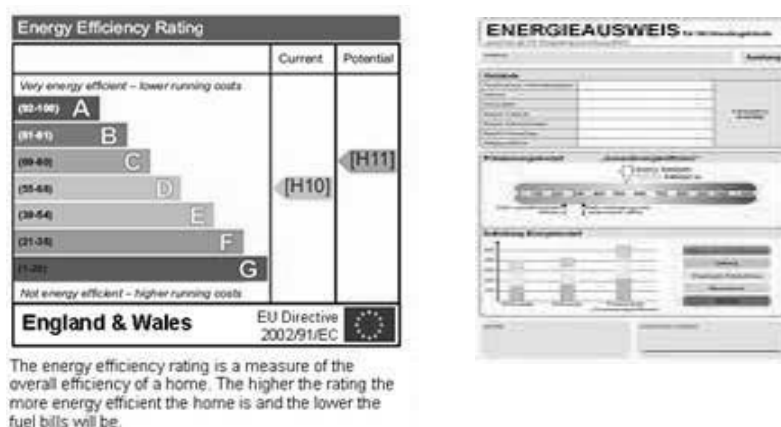
- Set up **minimum energy performance requirements** following their national/local situation. This means that whenever a new building is constructed or a **large existing one (above 1000m<sup>2</sup>) undergoes major renovation**<sup>18</sup> certain nationally or regionally determined minimum levels of energy efficiency should be met. This level for new build may be, for example, one value that represents the maximum permissible energy consumption or CO<sub>2</sub> emissions of a building. For existing buildings it may refer to a value for certain components. For instance, if the windows are replaced then only the efficiency of this component should meet the national or regional minimum requirements and not the other components (such as roof, façade, floor, heating/cooling system) or the whole building. The holistic approach for new-build gives maximum flexibility for the choice of system or design to reach the value and thus stimulates innovation. In parallel, the component approach for existing buildings provides that owners/tenants are not burdened with huge expenses when they want to carry out partial renovation. To promote further innovation for **all new buildings above 1000 m<sup>2</sup> the feasibility of alternative systems** (i.e. renewables, co-generation, district heating and cooling, and heat pumps, under certain conditions) is to be considered and taken into account.
- Establish a national scheme for energy labelling of the buildings (see examples from Germany and England & Wales below; similar for example to the energy efficiency labelling of household appliances). This **Energy Performance Certificate** shall include

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<sup>17</sup> Laustsen. Energy efficiency requirements in building codes, energy efficiency policies for new buildings. IEA Energy Efficiency Working Party note by the Secretariat, 2007

<sup>18</sup> Major renovations are cases such as those where the total cost of the renovation related to the building shell and/or energy installations such as heating, hot water supply, air-conditioning, ventilation and lighting is higher than 25 % of the value of the building, excluding the value of the land upon which the building is situated, or those where more than 25 % of the building shell undergoes renovation.

information on the energy consumption needs of a building, its rating compared to other buildings, and recommendations for cost-effective improvements. The Certificate shall be provided to the (potential) buyer/tenant when buildings are constructed, sold or rented out by their owner. The aim is to provide information so that informed choices can be made and also to provide with guidance on the cost-efficiency and savings possibilities for possible improvements of the property. All **public buildings** or buildings frequently visited by the public above 1000 m<sup>2</sup> should have certificates that are to be displayed in a place that is visible to the general public.



**Figure 2.** Examples of Member States Energy Performance Certificates

- Introduce **inspection requirements so that heating and air-conditioning systems** above certain thresholds should be regularly checked for their efficiency<sup>19</sup>. Boilers and air-conditioning systems are addressed because they play a significant role for the building's energy consumption and their efficiency can be improved considerably. Instead of inspection requirements, boilers may have a promotion scheme that should have the same savings effect as the inspection schemes.

These three main instruments take effect at different times of a building's lifetime. Minimum energy performance requirements are to be met when buildings are built or they undergo major renovation (i.e. every 25-40 years). The energy performance certificate is required only when buildings are newly constructed, sold or rented out and is valid for a maximum of 10 years. The inspections of heating and air-conditioning systems are more often. The regularity is a function of the size and fuel source (e.g. for medium sized boilers and air conditioning systems Member States should decide on the regularity, for large boilers it should be every two years, etc.) and the inspections are independent of the sale or rent of a building.

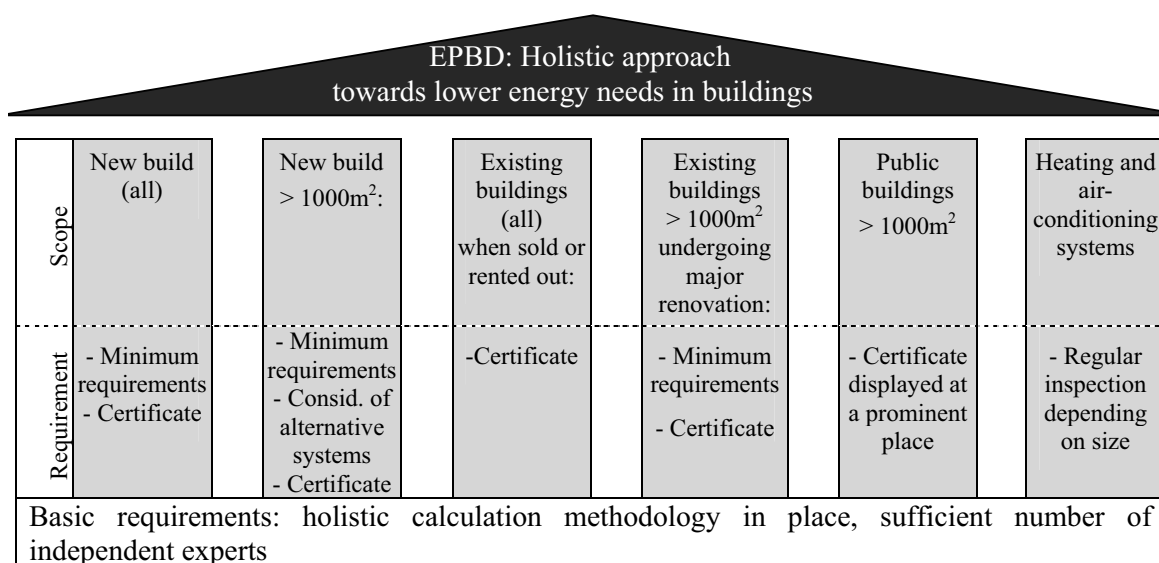
In this way the Directive calls for setting up a regulatory policy instruments measures (i.e. minimum requirements) along with informative ones (i.e. the certificates and inspections). The use of mix of policy instruments provides for means of addressing various challenges of the sector and developing a coherent approach towards problem solution.

<sup>19</sup> For boilers fired by non-renewable liquid or solid fuel with rated output of 20 kW to 100 kW – regular inspection, for boilers above 100 kW – inspection every two years (with possibility for expansion to four years for gas boilers). For all heating installation with boilers of effective rated output of more than 20 kW older than 15 years – a one-off inspection is required. For air-conditioning systems with effective rated output of more than 12 kW – regular inspection required.

To achieve the above-mentioned requirements the Member States should:

- Establish (or use the relevant CEN standards) a **methodology for calculation of energy performance of buildings**. Such is needed for the calculation of energy performance requirements and carrying out of the certifications. This includes calculations on the quality of insulation of the building, the efficiency of heating, cooling and lighting installations, ventilation needs, position and orientation of the building, heat recovery, active and passive solar gains and other renewable energy sources, and also takes into account local conditions, such as climate and economic aspects (e.g. labour costs).
- Ensure that **certification and inspections requirements** implemented in practice are carried out in an independent manner by qualified and accredited experts.

Summary of the main provisions of the EPBD are included in the following figure.



The deadline for the **implementation** of the provisions on energy performance requirements was January 4, 2006, whilst for certification and inspection - due to the challenges that MS have with training and accrediting experts to carry out the certifications and inspections - a justified derogation of up to three years (until January 4, 2009) was allowed of which most of the Member States took advantage of<sup>20</sup>.

Before the adoption of the EPBD the majority of Member States did not have energy efficiency requirements in their regulations and building codes, nor did they have long running, sustained instruments for their promotion. Therefore, the implementation in a number of Member States has been a huge challenge, but also in parallel an opportunity for improving the quality of their buildings stock. The complex nature of the Directive requires framework legislations as well as in many cases individual pieces of legislation for each of its main provisions. Also, the development of standards and software has been required for the proper implementation of several provisions. Furthermore, in some countries the EPBD is to be implemented at regional level. For example, this means that in Austria there should be transposition of all Articles in all nine Länder, in Italy in all twenty regions, whilst in the UK

<sup>20</sup> In total, 23 Member States have opted for the additional three-year extension to apply Art. 7, 8 and 9 of the EPBD, as provided for by Art. 15 *ibid*.

apart from in England and Wales, Scotland, and Northern Ireland, enforcing legislation is also needed for Gibraltar.

These challenges led to delay in transposition and a number of infringement cases (at their maximum 21) and support actions were initiated by the Commission to speed up the process. Since 2006, the transposition has improved tremendously and now all Member States have at least framework legislation on the issue. By August 2008 twenty two Member States have reported that their EPBD transposition is complete. The Commission is now in the process of review of the notified legislation and considering closing some of the seventeen ongoing infringements. Nevertheless, if it identifies that there is no full conformity on all Articles or lack of full implementation in all regions, the cases will be kept open and will advance in their stages. Apart from legal conformity, the real and ambitious implementation of certain articles is questionable in some Member States which is due to, as described in Section 2.3.2, the ambiguous EPBD wording and large room for various interpretations, poor enforcement, and the lack of possibility for comparisons between the national/regional implementing measures (i.e. setting up of requirements that are far from the optimal levels).

Building on the EPBD, some countries have even gone beyond its requirements. For example, about one third of the EU Member States have extended the requirements to all existing buildings that undergo major renovations, whilst several Member States have set targets to reach low energy/passive house standards for new build. In some countries or regions, the installation of renewable systems, or the implementation of the cost-effective recommendations on the certificates with specified pay-back time, are made mandatory for all or certain types of buildings. More good practices are included as examples in the discussions of Section 5.

**The main contribution, so far, of the EPBD is in bringing the subject of the energy efficiency of building onto political agendas, into buildings codes and to the attention of citizens.** Nevertheless, it is early and very difficult to quantify the real impact of the Directive for the whole Community because of highly disaggregated nature of the sector, the complementarity of energy improvements to other policy objectives, slow transposition, and lack of proper monitoring. Still, calculations<sup>21</sup> of EPBD expected impact show that, if fully and properly implemented, the energy savings from the EPBD can be as much as 130 Mtoe<sup>22</sup> or 7% reduction of the total EU primary energy supply in 2020 (or 96 Mtoe final energy), evidently a very high figure. Therefore the current EPBD is already contributing considerably to the EU energy policy objectives. However, there are a number of limitations arising from the low level of ambition to its implementation and also from its wording. These remaining challenges are discussed in Section 0.

### **2.2.2. Other regulatory instruments**

In addition to the Energy Performance of Buildings Directive, there is a comprehensive set of legislation in place on both the European and the national level, the requirements of which impact on the energy performance of buildings. The following table presents the main pieces of legislation interacting with the EPBD and offering complementary requirements to enhance energy efficiency in buildings. These activities in an energy consuming and GHG emitting

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<sup>21</sup> SEC(2006)1174

<sup>22</sup> In the EEAP IA the figure: 125 Mtoe for EU-25 is provided. 130 Mtoe is an extrapolation to EU-27. The conversion factor used is 1.35 as included in Annex IV.

sector (buildings), which is not covered by the EU Emission Trading System (ETS), are also an important part of the response to the climate change challenge: due to the enormous cost-effective energy and CO<sub>2</sub> emission savings potential of the buildings sector, it is evident to take action in this field in order to achieve the EU's overall CO<sub>2</sub> abatement targets in the macro economically optimum and therefore cheapest way, which would not occur if CO<sub>2</sub> abatement measures were limited to the ETS sectors.



Table 1: Main legislation influencing the energy performance of buildings

Directive	Purpose	Requirements influencing the energy performance of buildings
<b>Energy end-use efficiency and energy services Directive (ESD) (2006/32/EC)</b>	Enhance cost-effective improvement of energy end-use efficiency in the Member States (in non ETS-sector)	To achieve the indicative fixed energy savings target in 2016, the Member States can opt for energy efficiency measures in the residential and tertiary sector such as improving heating and cooling systems, insulation and ventilation, hot water installations and lighting. The use of standards and norms improving the energy efficiency of buildings are also eligible measures (Article 4 and Annex 3). The funds foreseen by the ESD can be used to finance energy audits and to provide financing (loans, grants, etc.) for energy efficiency improvement measures. The funds are open to all providers of energy efficiency improvements measures (Article 11). ESD requires the MS to ensure the availability of high-quality energy audits (Article 12).
<b>Directive on the promotion of cogeneration (2004/8/EC)</b>	Creates a framework for promotion and development of high efficiency cogeneration of heat and power.	According to Article 5 of the EPBD, the feasibility for the use of cogeneration of heat and power in new buildings (>1000 m <sup>2</sup> ) has to be considered and taken into account before construction starts.
<b>Eco-design of energy-using products Directive (2005/32/EC)</b>	Establishes a framework for setting Eco-design requirements for all energy using products in the residential, tertiary and industrial sectors.	A set of implementing measures establishing eco-design requirements are in preparation for a range of energy using products, which have a decisive impact on the energy performance of buildings, such as boilers, water heaters, office lighting, residential room conditioning appliances, electric motors in commercial buildings and domestic lighting.
<b>Construction products Directive (89/106/EEC)</b>	Ensure that declaration of performance accompanying the product is accurate and reliable.	Developing specific standards for buildings products and components such as insulation and windows concerning the declaration of conformity.
<b>Promotion of the use of energy from renewable sources (Proposal COM(2008) 30 final)</b>	Establishes a common framework for the promotion of energy from renewable sources.	With respect to their building regulations and codes, Member States shall promote the use of renewable energy in heating and cooling systems and equipment that achieve a significant reduction of fossil energy consumption and they shall use energy or eco-labels or other appropriate certificates or standards developed at national or European level, where these exist, as the basis for encouraging such systems and equipment.
<b>Sustainable Production and Consumption and Sustainable Industrial Policy Action Plan (Proposal)</b>	New dynamic framework to improve the energy and environmental performances of products.	The proposals to extend the Eco-Design Directive as well as the Energy Efficiency Labelling Directive to cover more products and to promote Green Public Procurement will impact on buildings products.
<b>Community guidelines on state aid for environmental protection (2008/C 82/01)</b>	Apply to State aid for environmental protection.	Investment and/or operating aid enabling undertakings to achieve energy savings will be considered compatible with the common market within the meaning of Article 87(3)(c) of the EC Treaty, if certain conditions are fulfilled.

### 2.2.3. *Provision of information and expertise*

The European Commission has started many activities to promote and support energy saving in buildings. These also give a good understanding of the challenges and opportunities that Member States, industries, and citizens are faced with.

Activities on **exchange of information and experience** include the Concerted Action I and II that provide fora for discussion of specific challenges and exchange of best practices among representatives of Member States. Furthermore the EPBD Buildings Platform is established - a dynamic web portal that aims at disseminating information on the energy efficiency of buildings and related activities and at providing support on the EPBD implementation via a helpdesk and more detailed and targeted information to all interested stakeholders and citizens. Many **events** have also been organized to discuss the opportunities and challenges with a large number of experts and stakeholders.

**Research** on the possibility for improved energy efficiency of buildings and the development of sustainable communities has been carried out within the EU Research and Development Framework Programmes and the barriers and possibilities for energy saving policy and solutions have been revealed within the **Intelligent Energy Europe Programme** which in the recent years has supported about 70 projects related to energy aspects of buildings. In addition, the Commission mandated the European standardization body – CEN to develop a set of 31 EPBD **CEN standards** which cover different elements of the calculation procedures for evaluating energy performance of a building and of its various systems and components, heating and air-conditioning systems inspection procedures and other relevant procedures. The work on all standards is completed now and only few are not officially published yet.

Furthermore, the EU's dissemination activities like ManagEnergy and Sustainable Energy Europe initiate many actions to promote energy efficiency in buildings.

### 2.2.4. *Financial and fiscal instruments*

The largest energy saving potential in the buildings sector lies with the existing buildings when they undergo major renovations. The lack of information and lack of financing appears to be one major limitation for reaping this energy savings potential but also for carrying out renovations. Due to the importance of energy consumption in buildings, but also because of the sector's social and employment impacts, many countries have established financial and fiscal schemes to stimulate energy saving investments.

At the European level, the financial schemes include such as the **Cohesion Fund**. For the 2007-2013 period, EUR 4.2 billion of the Cohesion policy funding have been allocated to energy efficiency for the housing sector projects in Bulgaria, Cyprus, the Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia and Slovenia. A change in the minimum energy performance requirements for existing and new buildings will increase the investment needs for the buildings' owners but reduce energy costs.

Member States are also allowed to apply a reduced VAT rate until 31/12/2010 (VAT Directive 2006/112/CE) to a specific list of labour intensive services, including the renovation and repairing of private dwellings. On 7 July 2008 the Commission adopted a proposal on reduced VAT rates. This Proposal provides for the option for Member States to apply reduced VAT rates to the whole housing sector and certain services relating to some non commercial buildings (including the supply and construction of housing, the renovation, repair, alteration, maintenance and cleaning of housing and of places of worship and of

cultural heritage and historical monuments recognised by the Member States concerned). This Proposal is currently under discussion in the Council.

Consequently, the supply of services including the combined supply and installation of equipment which aims at increasing energy efficiency and saving or using sustainably generated energy relating to the buildings mentioned, would be eligible for reduced rates, if the Proposal is adopted by the Council.

Additionally, the Commission is currently analysing the possibility of applying reduced VAT rates to environmentally friendly goods and services not mentioned above, as well as the abolition of the possibility to apply reduced rates to environmentally harmful products. In the near future the results of the Commission's analyses will be presented, as a part of a more global communication on the role of taxation in energy and environmental policy, accompanied by relevant proposals and recommendations.

Under the revised Community Guidelines on State Aid for Environmental Protection which were announced as part of the Climate Action package of January 23, 2008, energy savings are eligible for state aid. It is up to the Member States to develop schemes for the support of energy savings activities.

### 2.3. Remaining problems

**Major energy savings potential in the buildings sector is still available.** Various factors limit the utilisation of the potential. Some come from the complexity of the sector and the existence of market failures, while others stem from limitations of the regulatory framework.

#### 2.3.1. *General challenges of the sector and market failures*

The EU's buildings sector is a true example of the EU's diverse nature. Different climates, building traditions and cultural, historic and economic factors have resulted in significant variations between the EU Member States and even between their regions. Therefore, detailed regulation and complete harmonization at EU level is not possible and is not sought. However, a certain level of harmonization of the approaches and certain instruments are needed in order to ensure that energy aspects are considered seriously, that there can be a possibility for comparison of the achievements and transfer of experience, but also to facilitate the companies that operate at EU level. This **diversity and disaggregation of the buildings sector** also poses significant difficulties in obtaining quantitative data about the sector.

The other significant barrier is the existence of imperfect market conditions or **market failures**. A typical example for such failure is the lack of complete internalization of all **externalities in energy prices**. In many countries, this has led to a low priority for energy efficiency in buildings as energy demand is distorted. Although most of the investments in energy efficiency improvements have low pay-back times, especially if done within the renovation cycle, they still require substantial upfront costs for many European citizens and companies. Therefore both the lack of sufficient initial investments and the low priority of energy considerations are some of the main challenges. The EU and a number of individual Member States have realised, or are starting to comprehend, that there are societal benefits that may have a high private cost. To partially compensate for these market failures, some

financial and fiscal support mechanisms are already established (as described in Section 2.2.4), but **new and additional financing tools are needed**.

Another market failure that is very relevant for the sector is **imperfect information**, i.e. the general lack of good quality and understandable information on energy performance of buildings and on potential energy savings. The problem is further exacerbated by the 'principal-agent problem' or the fact that it is of seller's or leaser's advantage not to provide information on energy consumption if the property they offer is of poor energy performance quality.

Furthermore, as the tenant normally pays the energy bill, then the incentive for the owner to invest in energy efficiency is weak. This also relates to another market failure, the so-called **split incentives**. For instance, in the Netherlands, this problem is relevant to 40% of the total energy use in the commercial sectors and 41% of energy use for heating in the residential sector<sup>23</sup>. There only about 40% of private and 59% of social rental residential buildings have proper roof insulation, while for the privately owned sector, this figure is up to 70%.

Therefore, provision of clear and reliable information at affordable cost, at the correct time and at low transaction costs to prospective tenants and buyers is crucial for making energy efficiency investments more attractive. Some requirements for information provision are already included in the EPBD (i.e. Energy Performance Certificates). However, there are certain problems in interpretation and ambition that limit their full impact.

The **low uptake of new and innovative technologies** is one of the main consequences of the two problems mentioned above. The lack of sufficient information limits the uptake of these technologies and the cost of some is prohibitive for their higher market uptake.

Other commonly recognized problems are related to the **low number of trained professionals** (such as architects, energy auditors, builders, installers) that can successfully integrate, evaluate, construct and maintain a low energy consuming building. Also, the **behavior of the inhabitants** is of significant importance as even a zero energy house can turn into an energy waster. The rebound effect of having bigger houses occupied by less people but also subject to excessive heating or cooling are other general problems that, although very important, are also very difficult to tackle.

### **2.3.2. Regulatory limitations**

Limitations of the existing regulatory framework, in particular EPBD and the national/regional measures that implement it, are also preventing the higher reductions of energy consumption. These originate, firstly, from lack of clarity and the complexity of certain provisions of the EPBD and, secondly, from the low level of ambition in its implantation.

Representatives of Member States and stakeholders claim that there are some **definitions and wording** of the Directive that are not clear enough, and create confusion and difficulties in implementation, resulting in differences between Member States and even between their regions. For example, the term 'public building' is explained in the preamble and Article 7 of the Directive in two different ways. Also, the requirements for provision of the

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<sup>23</sup> IEA. Mind the gap: Quantifying Principal-Agent Problems in Energy Efficiency. IEA: Paris, 2007

recommendations from the Energy Performance Certification are not very clear to stakeholders and national or local policy-makers. This leads to a situation that the recommendations on how energy efficiency can be improved, are not shown to the tenants/buyers.

Another limitation comes from the **thresholds** that are set in the Directive. As mentioned in Section 2.2.1, EPBD provisions call on Member States to require that certain minimum energy performance levels are met when existing buildings above 1000 m<sup>2</sup> undergo a major renovation. Because of this 1000 m<sup>2</sup> threshold for existing buildings, the EPBD covers only about 28% of the EU-15 buildings stock<sup>24</sup>. In introducing energy efficiency measures when retrofitting, the costs are on average between two and three times less than when done separately. This in general means that, with renovations below 1000 m<sup>2</sup>, an opportunity for cost-effective energy savings for the owner might be lost. However, in a number of Member States, this 1000 m<sup>2</sup> threshold has been lowered or abolished so that all buildings that undergo major renovation have to fulfil certain energy performance requirements.

There are a number of limitations that stem from the **low ambition in the implementation**. For instance, the experience with the **Certificate** shows that in some cases they are **of very poor quality** and do not provide sufficient and correct information. This raises questions regarding the usefulness of the certificates. Furthermore, the currently required **inspections of boilers and air-conditioning systems have limited impact** on their energy performance improvement, as their objective is not included in the Directive and due to missing specifications and requirements. This is the experience of Member States that have already implemented an inspection scheme. **The energy performance requirements set by Member States do neither fully meet expectation with regard to their level of ambition.** If they were set in a cost-optimal way (i.e. taking into account a number of parameters, such as climate, oil prices, labour and products costs) this would mean that once a building is constructed, or an existing large one is undergoing major renovation, the result is the optimal of what is available at market and a reasonable pay-back times. At present there are many Member States that do not have cost-optimal requirements. This means that the occupier of the building pays more for their energy bill than is economically reasonable.

More detailed explanations of these shortcomings and limitations are provided as background information when the policy options are discussed.

### 3. OBJECTIVES

#### 3.1. EU policy objectives

The EU has set ambitious targets in *Energy Policy for Europe*<sup>25</sup> of 20/20/20% for reduction of energy consumption and greenhouse gas emissions, and increased share of renewables by 2020. Urgent actions are needed in the light of the mounting scientific evidence of climate change<sup>26</sup> and high oil prices and the ever growing energy dependency. The buildings sector

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<sup>24</sup> Ecofys for Eurima. Mitigation of CO<sub>2</sub> Emissions from the Building Stock - Beyond the EU Directive on the Energy Performance of Buildings, 2004

<sup>25</sup> as outlined in the Commission Communication An Energy Policy for Europe COM (2007) 1

<sup>26</sup> as outlined in the latest report of the Intergovernmental Panel on Climate Change of 2007 the preceding report of Sir Nicholas Stern on the economic costs for non-action (reference)

has significant untapped potential for cost-effective<sup>27</sup> energy savings. Thus it can contribute to all the energy policy targets.

The objective here is to harness the unrealized, cost-effective energy saving potential. The important role of the buildings sector was recognized with the adoption of the *SAVE Directive*<sup>28</sup> in 1993 and later through a holistic approach as laid down in the *Energy Performance of Buildings Directive of 2002*. Consultation on possible further actions for its realization was initiated in the Commission's *Green Paper on Energy Efficiency: Doing More with Less*<sup>29</sup> of 2005. The outcomes resulted in the adoption by the Commission of the *Energy Efficiency Action Plan*<sup>30</sup> in November 2006. In the action plan, making buildings more energy efficient was identified as one of the five priority actions, with the strengthening of the EPBD identified as playing a key role with highest positive impact. The Action Plan was endorsed at the spring 2007 European Council.

From the *Renewed EU Sustainable Development Strategy*<sup>31</sup>, the buildings sector can support the fulfilment of its objectives on climate change and clean energy, sustainable consumption and production, but also on social inclusion, demography and migration. A possible revision of the EPBD will be complementary to the actions included in the recently adopted Sustainable Consumption and Production package.

In the light of the growing energy prices and related social consequences, the energy use reduction of the buildings sector is key area to be tackled as it would ease the difficulties for many EU citizens to pay their bills by providing a long-term solution and not only short-term fixes through, for example, energy subsidies. Therefore, actions in this area, esp. the revision of the EPBD to further help Member States in developing policies on the issue, are included in the Commission's Communication *Facing the challenge of higher oil prices* of April 2008<sup>32</sup>.

### 3.2. Specific policy objectives

The following specific objectives can be identified based on the problems of energy efficiency in the buildings sector and while taking into account existing measures:

- Provide a simple and unambiguous legal framework that will provide clear guidance and ease the transposition and implementation
- Ensure that the policy instruments used stimulate further energy savings

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<sup>27</sup> Cost-effective can be interpreted in different ways. In a study (Boonekamp 2006) for the Energy Efficiency Action Plan it is mentioned that the World Energy Assessment 2000 (Jochem, 2000) has been used and it refers to the term 'life cycle costs'. This suggests that the pay-back time of the investment can be equal to the technical lifetime of the saving measure. However, this is an extended definition of cost effectiveness compared to other sources, e.g. the 3, 5 or 8 year pay-back time that is currently used in the Netherlands (Menkveld et al, 2005).

<sup>28</sup> Council Directive 93/76/EEC of 13 September 1993 to limit carbon dioxide emissions by improving energy efficiency (SAVE). Repealed by Directive 2006/32/EC.

<sup>29</sup> COM(2005) 265

<sup>30</sup> COM(2006)545

<sup>31</sup> 10917/06,

<sup>32</sup> COM(2008) 384

- Ensure that the measures have a wider coverage of the EU buildings stock and relevant energy consumption but are at low additional cost
- Ensure that buyers/tenants/owners receive good quality information at a reasonable cost on the energy performance of buildings and about the performance of their heating and air-conditioning systems
- Establish a base for cost-effective energy performance requirements for buildings or for their comparison
- Stimulate the public sector to show good example in buildings' energy efficiency.

### 3.3. EU's right to act

The EU's actions regarding energy performance of buildings are primarily based on article 6 of the Treaty,<sup>33</sup> which states that environmental protection requirements must be integrated into the definition and implementation of the Community policies and activities, in particular with a view to promoting sustainable development. This requirement has to be seen in the light of article 174(1) of the Treaty, which specifies that the Community policy on the environment shall contribute to preserving, protecting and improving the quality of the environment and the prudent and rational utilisation of natural resources.

The importance of coordinated action in energy efficiency has been stressed in previous legislative documents, such as the Council Decision of 29 October 1991 concerning the promotion of energy efficiency in the Community (SAVE programme)<sup>34</sup> and Council Directive 93/76/EEC of 13 September 1993 to limit carbon dioxide emissions by improving energy efficiency (SAVE).<sup>35</sup> These considerations led to the EPBD Directive which was adopted on the legal basis of article 175(1) of the Treaty. In the framework of a possible revision of the current EPBD Directive, **these legal bases for EU action remain unchanged.**

### 3.4. EU value added

Climate change, security of energy supply and environmental protection are challenges that cannot be sufficiently addressed at national level only. Energy efficiency provides part of the solution of these problems and the instruments on energy efficiency that have already been adopted at EU level reflect this need for Community action.

The buildings sector is responsible for about 36 % of the EU's total CO<sub>2</sub> emissions and for about half of the CO<sub>2</sub> emissions which are not covered by the Emission Trading Scheme. It disposes of a considerable cost-effective energy savings potential which can hardly be found in any other area and which is attainable at comparatively low costs. Therefore, it becomes evident that every country needs to urgently save energy in buildings but not all dispose of the knowledge needed.

The buildings sector is also highly disaggregated and is experiencing a number of market failures (e.g.: partial internalization of externalities in energy prices; principal-agent problems; split incentives; lack of appropriate information, education and training; low uptake

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<sup>33</sup> Recital 1 of the EPBD.

<sup>34</sup> Decision 91/565/EEC.

<sup>35</sup> Repealed by Directive 2006/32/EC.

of new and innovative technologies; etc.) which have limited the rate of energy efficiency gains in the sector. Indicators show that while for example the energy consumption of industry is decreasing, that of households is constantly on the rise. Construction products, appliances and services related to buildings are an important part of the EU internal market. In addition, with the increasing mobility of people and number of businesses with operations across the EU, a similar way to measure, for example, the energy performance of buildings would decrease the administrative burden for them. Member States also stimulated the Commission to take action in order to ease tackling the potential at national level in this complex and highly fragmented area by common EU efforts (see Annex III).

Due to the identified market failures the proposed revised directive justifies the action on energy performance of buildings also in the framework of the Climate and Energy package proposals (not approved yet). Moreover, the revision of the EPBD will lead also to clarification and simplification of an existing directive. In tackling a sector with high reduction potential at relatively low cost, the revised EPBD will reinforce the effects of the Climate and Energy package.

Buildings are often regarded as a "local" matter. Local people/legal entities own buildings and these are controlled by national/regional legislation. The buildings sector is nevertheless crucial for meeting the EU policy objectives stated above and the EU added value of energy savings is significant which justifies action at EU level, since:

- Although buildings are stationary, the construction products and services and the heating, air-conditioning and lighting devices and systems sectors are important part of the EU internal market. Furthermore, nowadays the everyday activities of many people and businesses are not limited to a single country. Increasing the rate of renovation rates and the quality of building (resulting thus in increased sales of insulation materials, windows, heating and air-conditioning systems, etc.), would have a positive effect across the related business sector. In addition, with the increasing number of Europeans that live in a country other than their native one and companies that have their businesses activities across the EU, similar ways to measure, for example the energy performance of the buildings they rent or buy, would mean significant decrease of administrative burden. Not surprisingly requests for EU unification of methods and even complete harmonization of individual requirements come from owners of service-providing chains (such as supermarkets, hotels, etc.) and from construction materials and products manufacturing industries.
- It would contribute to national and EU security of supply policy objectives. Energy savings lead to decreased energy demand and reduced need for generation capacity, or the so called Nega Watts (or negative Watts, coming from the analogy with Mega Watts (MW), of installed capacity and meaning that with the decrease of energy demand less power plants will be needed). These Nega Watts would lead to the decreased energy dependency of the Union. Furthermore, it is rational to have an EU-wide approach on efficiency given the EU energy policy priorities for creating an internal energy market and the common approach on energy security.
- It might direct Member States to a sector that has significant potential for cheap CO<sub>2</sub> and thus will contribute significantly towards climate change mitigation and adaptation. Traditionally there is a focus on CO<sub>2</sub> reductions on the supply side and from large consuming units. The buildings sector with its disaggregated nature and underestimated positive impacts is often overlooked. However, if the greenhouse gas reduction and renewables increase objectives are to be met, action in the sector is a must.



- It could stimulate sustained activities on national energy efficiency improvements in the buildings sector that need to be taken in all EU Member States. This has been proven by the impact of the current EPBD. As mentioned, before 2002 only a limited number of Member States had embarked on adopting policy measures to improve the efficiency of their building stock (see Section 2.2.1).
- EU experience could serve as a leading international example and establish the Union as a forerunner in the area, this also being beneficial for EU businesses. In a time of emerging pressure for action on reduced energy consumption the activities at EU level are closely followed worldwide. Developed and developing countries are starting to adopt similar approaches to the EPBD, which will contribute to lower global CO<sub>2</sub> emissions. Therefore, the EU can show leadership on sustainable building policy and be a recognized player on the international scene (as shown by the findings of the 2008 Impact Assessment on the recast of Directive 92/75/EEC on the indication by labelling and standard product information of the consumption of energy and other resources by household appliances, Annex 7).
- It might create peer-pressure for improvements of the building stock within all Member States and also internationally which could possibly lead to faster adoption of policies, but also stimulate innovation and cost-reductions. This would be facilitated by an EU-wide system for the comparison of the different national requirements.

### 3.5. Subsidiarity and proportionality

Given the national importance of this sector, **EU policies have added value beyond the confines of subsidiarity and proportionality.**

The main elements of the current EPBD have already been discussed from the point of view of the principles of subsidiarity and proportionality when the Directive was tabled in 2001 and adopted in 2002. Furthermore, they have also been tested in practice, demonstrating the appropriateness of the approach. Since then the need for common action to tackle the challenges of climate change and energy dependency have become even more apparent.

National differences cannot be ignored. EU action has to take into account the specificity of each Member State and the diverse nature of its building stock, climatic and economic circumstances and, thus, the fact that it is not possible nor necessary to set up the exact requirements at a EU-level. Emphasis should therefore **focus on the establishment of a harmonized approach which creates the basis for coherent and mutually reinforcing mechanisms** for energy efficiency improvements in the sector, while at the same time **Member States retain control over setting, in a transparent and comparable way, the individual levels.**

These have already been the main guiding principles of the current EPBD and should be kept in any action that is to be undertaken. Its preamble refers to the subsidiarity principle and clearly delineates the borderline between national/regional action and Community one:

*“In accordance with the principles of subsidiarity and proportionality as set out in Article 5 of the Treaty, general principles providing for a system of energy performance requirements and its objectives should be established at Community level, but the detailed implementation should be left to Member States, thus allowing each Member State to choose the regime which corresponds best to its particular situation. This Directive confines itself to the minimum*

*required in order to achieve those objectives and does not go beyond what is necessary for that purpose.”*

#### **4. POLICY OPTIONS**

A number of activities have been initiated to reap the potential benefits of the buildings sector. Legislation promoting energy efficiency of buildings exists at EU level. However, there is still large room for improvements (as discussed in Section 0). The fundamental question concerns the best approach to address the remaining challenges and barriers and to achieve the relevant EU objectives. In this respect three alternative approaches can be considered: (i) repealing the EPBD and replacing it with ‘soft’ instruments, (ii) business as usual through use of the existing instruments without adaptation, and (iii) EU action by complemented and improved instruments.

##### **4.1. Repealing the EPBD and replacing it by ‘soft’ instruments**

Soft instruments, such as the open method of coordination, voluntary agreements, provision of information, financial incentives, etc. are an alternative approach to the use of legal requirements. This would entail proactive and ambitious actions from Member States while the Commission would monitor and support the progress. If the actions undertaken are sufficient to achieve the EU policy objectives at low social and economic cost and to provide EU citizens and businesses with lower energy bills at the same or better levels of comfort, then the existing legislation, especially the EPBD, can be repealed.

The method of open coordination refers to the use of “soft law mechanisms”, such as guidelines and indicators, benchmarking and sharing of best practice. Its success is very much dependant on the willingness of each individual Member State to adopt appropriate measures as there are no sanctions, but only possible peer pressure and naming and shaming. As mentioned in Section 3.3 activities on energy performance improvements of the buildings sector are justified on environmental, but also on internal market grounds. The energy savings, environmental and security of supply benefits were often overlooked in many EU Member States, one of the reasons being that actions dealing with ‘my home – my castle’ may not be appealing to the voters even if they are beneficial and cost-effective but, nevertheless, require some additional up-front investments and time. Also the energy prices have not been a major challenge to the citizens for many years, although fuel poverty exists in all Member States. Now with the high oil prices and climate change manifestation, the governments are starting to realize the importance of the sector.

Voluntary agreements can be another efficient tool for achieving policy objectives without the need for governmental intervention but on the grounds of good dialogue and understanding from all parties. For example, these could be agreements between governments and buildings industry or property owners so that all new buildings or all major renovations of the existing building stock meet certain energy performance requirements, or that good quality information on energy performance of buildings is always provided when transactions occur. Today, such agreements are used in some limited cases when authorities want to go beyond the existing, already ambitious, legally binding minimum requirements set within the EPBD and in countries where there is a tradition of such type of instrument, e.g. in the Netherlands where they are used to reach the standards of energy 'neutral buildings' by 2020.

The observed very limited use of voluntary agreements on improving energy performance of buildings is due to the specificities of the sector (such as the high share of individual

ownership and the large number of SMEs in the construction sector) that would entail significant transaction costs for a negotiation of and compliance checks. Also it is not in the interest of the building owner to provide adequate information on the energy efficiency of their property that is to be rented out or sold, especially, if it is not satisfactory.

Providing good quality and understandable information that reach citizens and stakeholders **at the right moment** is an important factor behind the success of energy savings policy objectives and a number of initiatives in this direction have been initiated (some of those at Community level were described in Section 2.3.3). However, for such measures to have a high impact, several conditions should be met, i.e.: (i) the information should reach a very large number of people around the EU; (ii) as property transactions are happening all the time, any campaign should be maintained over long periods of time; (iii) information provided should be regularly updated as the cost-effectiveness of measures can change within short periods of time. Meeting these three conditions will mean very high costs and an additional burden to the national budgets.

Increased provision of financial support could be another 'soft law' approach. In this case, Member States should provide financial means to property owners or tenants to increase the energy efficiency of their buildings or fiscal incentives, such as for instance, the German KfW programmes. This would trigger energy savings, but to achieve significant impact it would require substantial financial resources to be provided that may be a serious burden to the national/regional budgets. At present, there are some subsidy programmes that provide financial assistance to fuel poor households to pay their energy bills. However, this approach is not sustainable in long-term as it does not reduce energy bills and can have only limited impact.

Some countries, such as the UK and its Energy Efficiency Commitment, have introduced an obligation on the suppliers (but can also be on producers or distributors) to achieve certain savings at their consumers (usually including a proportion of fuel poor households). This is done through investing, in most of the cases, in the lowest cost measures. The costs are born by all consumers and if they are not high this instrument (also called white certificates) can be very efficient. However, it cannot be used to achieve the significant potential as it would dramatically increase the energy prices.

The specifics of the sector, slow uptake of national measures, if not supported at EU level, and the high cost of “soft” instruments, together with the fact that there is already a functioning Directive at EU level leads to the conclusion that it is not appropriate to repeal the EPBD and depend only on “soft law” to solve the problems and objectives as outlined in Sections 2 and 3. In addition, repealing the EPBD would send a very negative signal regarding the EU's ambitions to pursue its policy objectives, both within its Member States and also internationally. The EPBD has certain limitations but it has already laid the basis for action and this has been recognized as an EU achievement. Its transposition has been a challenge but is progressing well and Member States are starting to see its importance. In the times when energy efficiency action is requested by all, repealing of a well-established legal document cannot be justified.

#### **4.2. Business as usual**

The 'business as usual' or 'do nothing more' alternative implies that there is no need for additional measures beyond the existing ones, including continued implementation of the current EPBD and all related regulatory and non-regulatory instruments (described in Section

2.2), which, combined with the normal market operation, are to deliver the cost-effective level of energy performance. This approach can be supported with measures that can maximize the impact of the EPBD by encouraging its full transposition. The Commission has already relied heavily on infringements to strongly move forward EPBD implementation, has already won one case against a Member State and has several others brought before the Court or at the final stage of the infringement process. As mentioned in Section 2.2.1 this had a very positive impact on accelerating the adoption of needed legislation and now most of the Member States declare complete transposition. The Commission has also already undertaken a number of additional activities, i.e. by funding projects on information exchange and research of the best practices, and the development of standards, to support the implementation.

The full impact of the existing EPBD in 2020 is estimated to be a reduction of about 96 Mtoe of final energy consumption<sup>36</sup>, while the remaining cost-effective potential in the buildings sector, not covered by the existing Directive, is an additional saving amount of 143 Mtoe (final energy) as mentioned (see Section 2.1).

This would mean that even if the EPBD is fully implemented **a large potential would still remain unutilized** (which equals about 11% of EU total final energy consumption and CO<sub>2</sub> emissions, see Annex V).

In addition, if this approach is adopted, the **limitations of the current legislation will remain** and may even have a negative influence on the possibilities for achieving EU energy and climate change policy objectives. For example, if no measures are adopted to tackle the problem with the very poor quality energy performance certificates that are issued in some Member States only to fulfill the legal requirements, they may become a “useless administrative burden” set by Brussels and have even a negative impact on the perception for energy savings and for any future measures.

#### 4.3. EU action by complemented and improved instruments

A third alternative is to improve the existing regulatory instruments. An encompassing regulatory framework has already been developed at EU level, and although it has some limitations, it can serve a good base upon which one can build and thus the efforts should be focused on its improvement. From the number of adopted legal documents (some listed in Section 2.2), the EPBD is the one that deals in a holistic way with energy use of buildings<sup>37</sup>. They have emphasized the need and benefits of strengthening the EPBD. This option scored first amongst all options discussed in terms of potential energy savings and high in terms of cumulative effect.

While building on the current EPBD, the measures already undertaken by national and regional authorities for its implementation would be the base which will be upgraded. This would ease the transposition and understanding of the measures by all stakeholders while at the same time tapping a larger share of potential and related benefits. For this reasons the original EPBD requirements and basic structure should be kept and improved or extended for

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<sup>36</sup> SEC(2006)1174 the data there provided for primary energy or 125 Mtoe for EU-25 is extrapolated to EU-27 and converted into final energy. Due to lack of ambition of implementation of the EPBD or lack of clarity of some provisions this potential may not be fully realized. However, it is not possible at present to calculate what would be the impact of this.

<sup>37</sup> i.e. RES directive, EuP implementing measures, Construction Products Directive that are under discussion now.

the cases when this is proven necessary and beneficial. This is the underlying principle for each of the options that are analyzed in the text to follow.

This approach allows for the use of a combination of policy instruments, such as regulatory, provision of information, comparisons between Member States instruments. Still, the concrete levels, requirements and mechanisms are determined at national/local level so that the subsidiary and proportionality are respected.

Based on the knowledge gathered, analysis and broad consultation, a conclusion was reached that several aspects of the EPBD need to be tackled in order to reach the specific policy objectives. These in general refer, firstly, to the issues of improvement of the wording and, secondly, to each of the four main pillars of the current Directive, namely: (i) 1000 m<sup>2</sup> threshold for existing buildings when they undergo major renovation; (ii) energy performance certificates; (iii) inspection of boilers and air-conditioning systems; and (iv) energy performance requirements. Within each pillar several options are discussed. The selection of the options is a result of pre-screening of a larger number of options that were raised in the last several years by Member States' representatives and stakeholders based on observations of EPBD implementation and various analyses of possible actions (see Section 1.2).

Under all main pillars of EPBD the improvement options comprise all type of measures (in line, like combining approaches in 4.1, 4.2 and 4.3). The options are:

- General: Clarification and simplification
- 1000 m<sup>2</sup> threshold for existing buildings when they undergo major renovation
  - Option A1: Lowering the threshold to 500 m<sup>2</sup>, to include all medium sized buildings.
  - Option A2: Lowering the threshold to 200 m<sup>2</sup>, to include all buildings apart from small ones (mainly single family houses).
  - Option A3: Abolishing the 1000 m<sup>2</sup> threshold to include all buildings.
- Energy performance certificates
  - Option B1: Quality and compliance requirements.
  - Option B2: Requiring the recommended cost-effective measures of the certificate are realized within a certain time period.
  - Option B3: Making certificates a mandatory part of property advertisement and/or property transaction documents.
  - Option B4: Requiring the linking of the certificates with other support or discouragement mechanisms.
- Inspection of boilers and air-conditioning systems
  - Option C1: Requiring an 'inspection report' for heating and air-conditioning systems.

- Option C1: Introducing compliance requirements.
- Energy performance requirements
  - Option D1: Specifying EU – wide energy performance requirements.
  - Option D2: Introducing a benchmarking mechanism.
  - Option D3: Requiring an evolving improvement scheme for the buildings stock focussing on the worst performing buildings (a kind of top-runner approach).
  - Option D4: Setting up EU-wide low or zero energy/carbon buildings/passive house requirements.

**As a conclusion from the three discussed policy alternatives the revision of the EPBD is the appropriate action to meet the EU policy objectives** given the problems and the ways they are tackled at present. In this case the current Directive will be the starting point and the 'backbone' of the revision. Therefore, the **continued implementation of the EPBD is of crucial importance**.

However, it should be emphasized that **the solution is in an integrated mix of policy instruments** and thus other non-regulatory measures, which otherwise would not be sufficient on their own, are necessary to complement the implementation of the Directive. Therefore the efforts in providing more financial and fiscal incentives, and information, training of experts, and agreeing on voluntary actions should be continued and further developed.

## 5. ANALYSIS OF IMPACTS

For each of the options presented in the previous section, a general description is provided followed by explanation of what is proposed, and evaluation of the benefits and limitations in terms of their economic, social and environmental impacts.

### 5.1. Main analytical approach

For the baseline the latest available update (September 2007) of the PRIMES model of DG TREN was used. It includes policies and measures implemented in the Member States up to the end of 2006 and was used in order to ensure consistency with other impact assessments and publications of the European Commission on energy. The Ecofys BEAM model was used by the consultant to this Impact Assessment for the calculations of the economic, social and environmental impacts. Building up on PRIMES, the EU building stock was replicated by the model to calculate the impact of the individual options. The calculation of the impacts is bottom-up (i.e. based on following the construction, demolition and renovation rates, and energy-efficiency measures in retrofits). BEAM is a holistic model that reproduces the building stock by using reference buildings. With regard to all factors quantified, the calculations of the BEAM model take the interactions between the individual measures/options analysed into consideration and eliminates overlaps in the results. The individual options analysed were not calculated independently by the model but within connected loop model runs. Additionally, where modelling of the impacts was not possible by the BEAM model, the results of the studies available were used and extrapolated to EU-27.

Out of the BEAM model and study results, the CO<sub>2</sub> abatement costs are calculated (annual capital costs of a measure in 2020 minus annual energy cost savings of a measure in 2020 divided by annual CO<sub>2</sub> emission savings of a measure in 2020) and are consistent through the whole text. The year 2009 was assumed to be the starting year of measures analysed. This e.g. means, assuming the annual renovation rate of 2.5% in the buildings sector, by 2020 27.5% of all existing buildings would be renovated (11 \* 2.5%), therefore be subject to annual capital costs for the renovation presented under this option and achieve the energy cost and CO<sub>2</sub> emission savings presented.

For some of the options only qualification of the impacts was possible due to limitation of the available quantitative data and the complexity of the issues. If data are not reliable or missing, but there is enough evidence from experience and practice, only qualitative conclusions are made. In addition, as there are few studies that include the whole EU, extrapolation is often needed.

The calculations were made for year 2020 as the 20% target for energy consumption reduction is for the year 2020. However, the benefits would continue to increase in the future. To demonstrate this, projections for the year 2030 were also occasionally presented.

For further details and assumptions see Annex IV and footnotes in the text.

## **5.2. General: Clarification and simplification**

The simplification and clarification is essential for proper implementation of the EPBD. The need for action in this direction surfaced in discussions with the Member States at the Energy Demand Management Committee (see also the summary of a questionnaire in Annex II) and Concerted Action meetings, and inputs from stakeholders. Such actions have also been requested by a majority of the respondents to the public consultation.

Two actions are essential in this direction. The first action is the choice of proper legal format of the proposed revised text. The second is to clarify and simplify the text itself i.e. certain definitions and provisions. These shall be an inseparable part of the EPBD revision and be carried out to support its smooth and complete transposition and implementation.

### **5.2.1. Simplification through the use of appropriate legal form (recasting vs amendment)**

Energy efficiency in buildings is part of the Commission's Better Regulation Strategy, in particular of the Action plan "Simplifying and improving the regulatory environment"<sup>38</sup>. Although the policy options will remain the same, the measures would be strengthened and clarified.

The choice of a legal form for the final text of the Directive to be proposed is important from the point of view of simplification, as it can provide for improved understanding and simplified implementation. In this respect the two possible instruments of revision at disposal are: amendment or recasting. The main difference between them is that in the recasting, the new text of the Directive will be a consolidation, in other words it will be a single new legal document, and not a second one that includes only the revised parts, as in the case of

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<sup>38</sup>

COM/2002/0278 final

amendment. This will improve readability and will facilitate comprehension for both implementing authorities and affected stakeholders alike.

As the principles of the existing EPBD should be kept, the recasting is an opportunity to develop further EU and national policies and measures related to energy efficiency in the buildings sector, based on what has been learnt from the implementation of the current EPBD, and on the ambitions implied by the EU and national targets. It is crucial that the current EPBD be properly implemented and on time. The forthcoming recasting should not be an excuse for delay in implementation of the current Directive.

### *5.2.2. Clarifying and simplifying certain provisions*

One of the factors that limit the full realisation of the energy saving potential intended by the EPBD is the wording of some of its provisions and definitions. The Directive could achieve a higher degree of consolidation, legal certainty and simplification of legislation by being more unambiguously worded on certain aspects. This has been detected by responsible national authorities in the EPBD Concerted Action, based on their experience with implementing the existing Directive. National implementing bodies should therefore be provided with a clear legal framework which ensures better overall coherence of their legislations and thereby simplifies its implementation and application for involved parties, such as the construction sector, designers, energy services companies, installers and building owners.

There is room for improvement of several EPBD definitions, such as 'public buildings', for which special EPBD provisions apply, inter alia the display of the energy performance certificate at a prominent place: The definition of public buildings in EPBD recital 16 shall also be used in Article 7(3), instead of having two different wordings. 'Major renovation', 'alternative systems' and 'air-conditioning systems' are further terms, whereof the existing Directive contains vague or ambiguous descriptions. "Passive heating" and "passive cooling" are elements which, although implicitly brought up in the existing Directive (recitals 8, 10, and 18, article 3 and its reference to Annex part 1), could be highlighted and stressed more in the text of the Directive. This would also reflect the relevant proposal for stimulating "passive heating and cooling" of the Commission's Energy Efficiency Action Plan (Annex, part 1)<sup>6</sup>. Furthermore, clarification of certain provisions could be made, where it has not been made clear in the existing EPBD what exactly is required to be done, at what time, and by whom: i.e. with regard to the required recommendations within the energy performance certificate of a building and how/when exactly it is to be made available to an interested buyer or tenant of a building or building unit (Article 7 of the existing EPBD). Wherever available (e.g. as for air-conditioning systems), these definitions in the EPBD should now be taken from the relevant, recently developed 31 CEN standards, in order to further simplify the implementation of the EPBD provisions.

In order to address the **public sector** as a leading example more strongly than in the existing EPBD, this sector could be required to comply with obligations of the revised EPBD earlier and in a stricter way than the private sector has to. This would be in line with the relevant activity announced in the Commission's Energy Efficiency Action Plan 2006 and with the Commission's Green Public Procurement initiative of 2008. Furthermore, the public sector could be required to realize cost-effective measures which are recommended in the energy performance certificate of a building (see option B2 in chapter 5.4) within a certain period.



### 5.3. 1000 m<sup>2</sup> threshold for existing buildings when they undergo major renovation

*Current situation:* The EPBD requires that owners of buildings larger than 1000 m<sup>2</sup> upgrade the energy performance of their buildings to meet the nationally set requirements, when these undergo major renovations<sup>39</sup>. In relation to the total EU-27 building stock, this means that only 29% of the total conditioned floor area and 27% of CO<sub>2</sub> emissions caused from total space heating are covered by the above mentioned legal provision. If the figures for the residential and commercial buildings are considered separately, it shows that mostly residential house owners do not have to meet any minimum energy requirements when renovating, as 86% of the residential floor area is left out of the scope of the Directive (see Figure 2). On the other hand, since commercial buildings are usually larger than residential ones, almost two third of the commercial floor area is already covered by the legal provision for major renovations. This means that large part of the existing buildings do not fall within the scope of the EPBD and therefore the possibilities for the realization of energy savings and CO<sub>2</sub> emission reductions potentials that lie with them are not exploited.

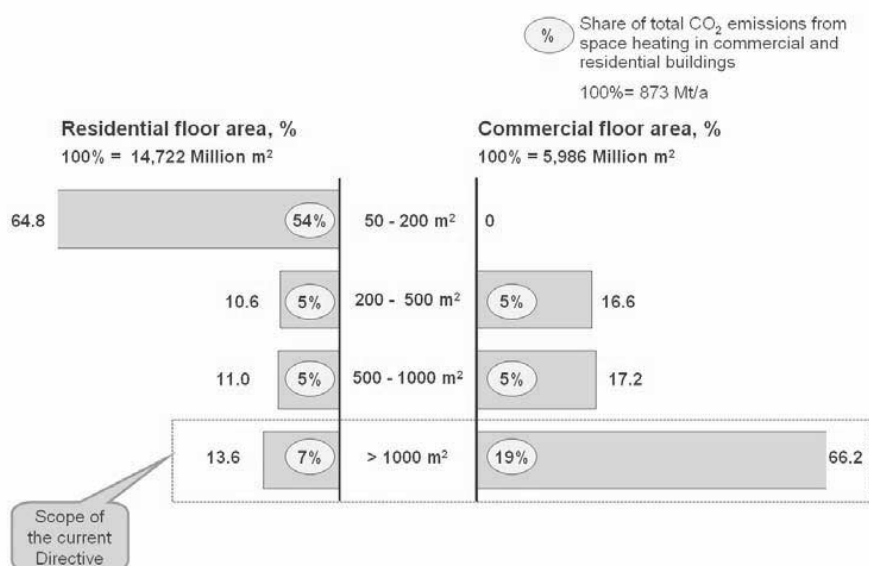


Figure 2. Floor area distribution and CO<sub>2</sub> emissions by threshold categories in 2005 (Source: BEAM)

However, at least 9 Member States<sup>40</sup> transposed the EPBD without a 1000 m<sup>2</sup> threshold, hence requiring energy performance upgrades for all existing buildings<sup>41</sup> undergoing (major) renovations. The national reasons for not introducing a 1000 m<sup>2</sup> limit were diverse. For instance, Denmark and Germany had already in place strong regulation and introducing a threshold would have weakened existing building legislation. Finland e.g., stated that 40% of the heating energy consumption of the building stock would have been excluded with such a

<sup>39</sup> See endnote 18

<sup>40</sup> K. Engelund Thomson et al and Member States answers to the questionnaire circulated at the Committee meeting in March 2008 (see Annex X): Thresholds related to renovation of buildings (not published yet): The following countries do not have a minimum 1000 m<sup>2</sup> threshold: Flemish Region of Belgium, Czech Republic, Denmark, Finland, Germany, Latvia, Portugal, Slovak Republic and Sweden.

<sup>41</sup> Most countries do have a minimum m<sup>2</sup> threshold, usually equivalent to the smallest type of building, such as 10, 40 or 50 m<sup>2</sup>.

threshold. Portugal on the other hand argued that energy savings measures are cost-effective for every building and therefore no exception should be made for smaller ones. On the other hand, Cyprus opted for a 1000 m<sup>2</sup> threshold, because it had no experience with similar buildings regulations in the past and therefore wanted to set a threshold in accordance to common practice in the construction industry. However, even the less experienced Member States now dispose of a couple of years of experience on this topic since the EPBD has been adopted in 2002.

*Proposal:* Keeping in mind that buildings with less than 1000 m<sup>2</sup> are responsible for 73% of total CO<sub>2</sub> emissions caused by the building stock, it seems appropriate to discuss whether abolishing this threshold, or at least lowering it to cover more buildings, are feasible options to increase the amount of energy saved in the buildings sector in a cost-effective way.

The following three options are looked into for more details:

- Option A1: Lowering the threshold to 500 m<sup>2</sup> to include all medium sized buildings.

A 500 m<sup>2</sup> threshold would cover 81% more residential (i.e. 25% of total) and 26% more commercial (i.e. 83% of total) floor area as with the current threshold in the Directive. Buildings between 500 m<sup>2</sup> and up to 1000 m<sup>2</sup> are medium sized multifamily houses and medium sized office buildings.

- Option A2: Lowering the threshold to 200 m<sup>2</sup> to include all buildings apart from small ones.

With this option, mainly just the owners of single family houses will not have to consider minimum energy performance requirements while refurbishing their homes. This threshold would then cover almost 100% of the commercial and 35% of the residential floor area.

- Option A3: Abolishing the 1000 m<sup>2</sup> threshold to include all buildings.

The minimum conditioned area of a stand-alone building is usually about 50 m<sup>2</sup>. Abolishing the 1000 m<sup>2</sup> would mean that all buildings with an area of more than 50 m<sup>2</sup> are subject to legal requirements when undergoing major renovations.

It should be highlighted that within the discussed options, Member States would still be responsible to set up the individual requirements of energy performance and thus the subsidiarity principle will be respected. Also, the definition of major renovation would be retained as in the current EPBD, which means that, for example, renovation of an apartment in a large multifamily building would, in most cases, not be covered by the requirements. The effect on individual households would be limited further by the fact that renovations are usually made 'step by step'. The current EPBD also entails that for existing buildings, when they undergo major renovation of a certain part, the energy performance requirements are to be met only for this part and not for the whole building. For example, if the building shell is renovated this would not mean that the heating system should mandatorily be changed.

Eliminating or lowering the 1000 m<sup>2</sup> threshold for buildings undergoing major renovation will not change the overall framework of the EPBD, nor the possible exceptions foreseen for certain categories of buildings, such as stand-alone buildings smaller than 50 m<sup>2</sup>. In order to assess the three options presented above, it is necessary to weight the gains made in terms of energy savings, reduction of CO<sub>2</sub> emissions and job creation against the energy related investment costs for the owners of the smaller buildings and for the administration to implement and control this new legal requirement.

*Impact:* The most meaningful indicator is the total costs savings, as it shows the difference between the energy costs saved in a specific year and the costs of capital raised (interest rate and amortization) for carrying out an energy performance upgrade in the context of a major renovation. In the very short term, i.e. in 2010, introducing lower or no thresholds will not have any decisive additional impact on the total costs savings, since only a small proportion of the buildings stock will by then have undergone major renovation. However, the accumulation of energy savings from energy related renovations of an increasing number of buildings will by 2020 have a decisive impact: 19.8 Mtoe or 4 % of the final energy consumed by the residential and service sectors (510 Mtoe in 2020 according to PRIMES) in the EU-27 can be saved additionally if the threshold is abolished (option A3). Furthermore, the total costs savings from this option will amount to an additional €17 billion per year compared to those reached through the current EPBD.

The economic benefits for the buildings industry can be derived from a higher demand for energy saving appliances such as insulation material, multi-glazed windows or more energy efficient boilers, heating and cooling systems. The impact on the labour market in terms of additional employments created was assessed based on turnover values in the buildings industry.<sup>42</sup> According to these calculations, approximately 75.000 additional jobs in EU-27 could be created and maintained in 2020 when eliminating the 1000 m<sup>2</sup> threshold (see Table 1). See Annex IV for the assumptions.

Table 1. Impact on job creation in terms of additional jobs created in 2020, by threshold option, compared to the 'business as usual' scenario (BAU), Source: Ecofys

Scenario	Jobs in 2020	Change compared to BAU
BAU (existing EPBD (> 1000 m <sup>2</sup> ))	149 000	--
Option A1 (EPBD > 500 m <sup>2</sup> )	159 000	+ 10 000
Option A2 (EPBD > 200 m <sup>2</sup> )	170 000	+ 21 000
Option A3 (EPBD > 50 m <sup>2</sup> )	224 000	+ 75 000

The economic and environmental impacts have been quantified based on the Ecofys Building Area Model (BEAM), which provides estimates for final energy savings, energy related investment costs, annual capital costs, saved annual energy costs and total costs savings for the three threshold options and for the years 2010, 2020 and 2030<sup>43</sup>. The results are presented in terms of additional costs and benefits compared to the business as usual scenario (BAU), which is the current Directive.

Table 2. Estimated impacts of different thresholds for minimum energy performance requirements for major renovations, Source: BEAM model (see Annex IV)

Impacts for EU-27	2010	2020	2030
<b>Final energy savings, Mtoe/a</b>			
BAU (EPBD > 1000 m <sup>2</sup> ) compared to 2009	4.4	47.1	75.8

<sup>42</sup> The estimates are based on a simplified method neglecting smaller effects but offering a good indication of possible employment related impacts of energy efficiency measures. For this purpose, the assumed additional turnover from energy efficiency projects is divided by the average turnover per employee in the construction sector and multiplied by a specific factor 1. This factor depends on the labour intensity of the measures carried out. For this impact assessment, it was assumed that the additional turnover is caused by the usual mix of material and labour costs as presently observed in the building industry of the EU-27.

<sup>43</sup> See Annex IV for more information on the BEAM and the assumptions made for compiling the estimates.

<b>Additional impact compared to BAU:</b>			
Option A1 (EPBD >500 m <sup>2</sup> )	0.3	2.8	3.2
Option A2 (EPBD >200 m <sup>2</sup> )	0.5	5.4	5.7
Option A3 (EPBD >50 m <sup>2</sup> )	2.0	19.8	21.2
<b>CO<sub>2</sub> emissions, Mt/a</b>			
BAU (EPBD > 1000 m <sup>2</sup> ) compared to 2009	12	129	204
<b>Additional impact compared to BAU:</b>			
Option A1 (EPBD >500 m <sup>2</sup> )	1	8	9
Option A2 (EPBD >200 m <sup>2</sup> )	1	14	15
Option A3 (EPBD >50 m <sup>2</sup> )	5	51	55
<b>Energy related investment costs, billion €/a</b>			
<b>Additional impact compared to BAU:</b>			
Option A1 (EPBD >500 m <sup>2</sup> )	2	1	1
Option A2 (EPBD >200 m <sup>2</sup> )	4	3	2
Option A3 (EPBD >50 m <sup>2</sup> )	12	11	7
<b>Annual capital costs for energy related investments, billion €/a</b>			
<b>Additional impact compared to BAU:</b>			
Option A1 (EPBD >500 m <sup>2</sup> )	0	1	2
Option A2 (EPBD >200 m <sup>2</sup> )	0	2	4
Option A3 (EPBD >50 m <sup>2</sup> )	1	8	13
<b>Saved energy costs, billion €/a</b>			
<b>Additional impact compared to BAU:</b>			
Option A1 (EPBD >500 m <sup>2</sup> )	0	3	4
Option A2 (EPBD >200 m <sup>2</sup> )	0	7	8
Option A3 (EPBD >50 m <sup>2</sup> )	2	25	31
<b>Total cost-savings, billion €/a (Saved energy costs - capital costs)</b>			
<b>Additional impact compared to BAU:</b>			
Option A1 (EPBD >500 m <sup>2</sup> )	0	2	2
Option A2 (EPBD >200 m <sup>2</sup> )	0	5	4
Option A3 (EPBD >50 m <sup>2</sup> )	1	17	18

The CO<sub>2</sub> abatement costs (total cost savings per year divided by annual CO<sub>2</sub> savings of an option) and annual capital costs per saved ton CO<sub>2</sub> can be calculated out of the table above, which results e.g. for option A3 ("EPBD >50") in the following values:

Option A3 (EPBD >50)	2010	2020	2030
Abatement costs in € per saved ton CO <sub>2</sub>	-200	-333	-327
Annual capital costs in € per saved ton CO <sub>2</sub>	200	157	236

It should be noted that the annual capital costs per saved ton CO<sub>2</sub> presented in the table above cannot simply be compared to e.g. those of investments in renewable energy techniques, as this would neglect the benefits (energy cost savings) which are linked to energy efficiency measures. So the presented CO<sub>2</sub> abatement costs are the appropriate indicator for cross-comparisons of the economy of measures, although negative abatement costs have to be interpreted with care in general.

Regarding the additional administrative burden which a change in the threshold would cause, a survey undertaken<sup>44</sup> in the framework of the Buildings Platform has revealed that most Member States assessed the current administrative burden as moderate or small. Extending the legal requirements for major renovations to the entire building stock should not considerably impact on the administrative burden.

At the level of citizens, the impacts materialize at the moment of a major renovation as they need to meet the national building code requirements. This could mean for instance the moment when a building/refurbishment permit is needed. Realizing energy efficiency measures when retrofitting costs, on average, between two and three times less than when done separately. This in general means that by every renovation below 1000m<sup>2</sup> which is not combined with efficiency measures, a unique opportunity for cost-efficient energy savings is lost for the owner. The level of requirements and the related additional costs vary from one country to another but normally remain moderate when planned properly.

The investment needs differ substantially across Europe depending on the social and economic conditions, on the initial state of the property and on the type of renovations people undertake. For example purchasing a high efficient boiler would require about €800 additional to the price of an average boiler sold today on the market. However, in 4-5 years these would be reaped from the savings on the energy bill and afterwards the household would save €250-300 annually until the end of the lifetime of the boiler (15 years). An example from the UK shows that if there is no loft insulation in a building and in a renovation the recommended 270mm are installed, then the investment costs for the household would be about €600. Annually €150 would be saved on the energy bill so the payback time will be only about 4 years. If there is already 50 mm insulation, the investments would be the same but energy savings only €40 and thus the payback time about 16 years.

Well insulated and acclimatized buildings have a probable positive effect on the persons working, learning or living in them. Increasing the amount of buildings subject to minimum energy performance requirements when undergoing major renovations, will reinforce this effect. Although this impact cannot easily be quantified as it is often perceived as very subjective, some studies have shown e.g. that a better insulated building can have a positive impact on the learning environment of students in terms of better results.

Based on the available estimates and the positive experiences made in countries without a 1000 m<sup>2</sup> threshold for existing building undergoing a major renovation, the removal of minimum area thresholds to cover all buildings is the most appropriate option in terms of cost-effectiveness and impact on final energy demand.

#### **5.4. Energy performance certificates**

The certificates, which are already mandatory under the current EPBD when buildings are constructed, sold or rented out, can be a powerful tool to create a demand-driven market for energy efficient buildings, as they allow economic agents to estimate costs in relation to energy consumption and efficiency. The aim of the Certificate is to make the complex issue of the energy performance of a building transparent to non-energy experts (such as average building owners and tenants) and therefore tackles the lack of information market failure. The possible impact of the certificates in some countries is estimated at annual 2 % energy savings

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<sup>44</sup> Thomson *et al.*: Thresholds related to renovation of buildings (not published yet)

in the buildings sector when a proper certification scheme is implemented<sup>45</sup>. Although the first Member State introduced energy performance certificates as early as of 1997 and made positive experience, only few other Member States started similar requirements, that is why the Commission initiated action at Community level and made certificates part of the existing EPBD requirements.

At present, Member States have already implemented, or transposed, or are currently setting up regimes and administrative preconditions for the energy performance certificate for buildings, when a building is constructed, newly rented out or sold, at national level as requested by the EPBD. The certificates shall be issued by accredited experts. The qualification needs of these experts are fixed at national level, not in the EPBD. The majority of Member States start in practice not before summer 2008.

The observations from some of the Member States which have already introduced the certificate show that some are not of satisfactory quality, or that there is insufficient bottom-up uptake to ensure that they are systematically made available during property transactions. In addition, higher realization of recommendations for energy improvements of the buildings can stimulate further energy savings. These prompted the need for improvements of the provision on the Certificates in the EPBD so that the market failures of lack, or low quality, of information and to tackle the remaining energy savings potential.

In order to respect the principle of subsidiarity, the objective of the energy performance certificates will still remain limited to the provision of information and any effects of these certificates in terms of legal proceedings or otherwise shall be decided in accordance with national rules, as is stated in the EPBD, for all the following options B1 to B4.

#### **5.4.1. Option B1: Quality and compliance requirements for certificates**

*Current situation:* There are no provisions in the EPBD requiring that Member States set up a quality check of the certificate. The lack of such a system in some countries has resulted in bad quality certificates being issued. Also, compliance with the requirements for issuing of the certificates and for meeting of the minimum energy performance requirements is not satisfactory. Although the implementation is still in its early stage numerous complaints were already sent to the Commission in 2007 and 2008 about unsatisfactory quality of energy performance certificates.

The procedure of issuing of certificates, as developed in some Member States, often starts with an on site check of the building by an expert to gather information on its technical properties, based on which a calculation of the energy rating of the building is performed. This proceeding usually leads to high quality certificates, assuming that the training of the experts is sufficient. Alternatively, in some Member States the building owner is providing technical information on the building's properties to an expert, who prepares a certificate only based on this information and using many simplified and standardised assumptions depending on the building type without visiting the site. This does not always reflect the actual situation and therefore can lead to incorrect rating results and inappropriate recommendations in the certificate, but leads to low costs for certification. Furthermore, it allows for incorrect and false input to 'sugar-coat' the rating result, which is not always easy to detect afterwards by

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<sup>45</sup> Minna Sunikka, Discussion on the potential impact of the energy certificate on existing housing: the UK as a case study, 2005

e.g. a future prospective buyer or tenant of a building. Moreover, the independence, required by the existing EPBD, and quality of these experts varies widely within the EU. Consequently, the quality of currently issued certificates varies widely as well.

The certification of a building could also be linked to compliance criteria on building regulations to improve the compliance rate and realize higher energy savings. Several stakeholders<sup>46</sup>, experts and energy agencies<sup>47</sup> have asked for effective control regimes to be put in place in order to increase compliance with building regulations. Ideally, sufficient quality of energy performance certificates could also contribute to better compliance on buildings regulations. The check of EPBD building certificates by a compliance control scheme could be such an efficient instrument. A similar control regime is i.e. currently developed in the Flemish Region of Belgium. Denmark already introduced a regime for systematic quality control of certificates in 2006. Such a control scheme should be as effective and as less administrative as possible.

*Proposal:* Introduction of a requirement that random sampling checks of the quality of energy performance certificates and the compliance with the building energy codes is carried out by public authorities or accredited institutions.

A random control of the real outcomes, validity and quality of certificates, could be required for certificates in the EPBD recasting<sup>48</sup>. Checks at different levels of detail and frequency could therefore be introduced as a new requirement by the EPBD recasting. These levels of random sampling regime could range from validity checks of input and/or result data for certificates to on-site checks of buildings certified.

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<sup>46</sup> In position papers and studies, such as European Construction Industry Federation FIEC: FIEC Memorandum - The impact of buildings on climate change, 2007 (amended version 2008); European Energy Network EnR: Implementation of the EU Energy Performance of Buildings Directive - a snapshot report, 2008

<sup>47</sup> As e.g. presented at the 2<sup>nd</sup> Sustainable Energy Week event 'Energy Performance of Buildings Directive - Next Steps' in January 2008.

<sup>48</sup> For similar objectives, Denmark already revised its certification procedure in 2006, firstly introduced in 1997, to 'quality level' 5 and 6 respectively in its 2<sup>nd</sup> generation certification scheme: In a range from 1 to 6, 1 being lowest quality which only consists of "Meter reading reported by the building owner and the utility companies", whilst 5 and 6 mean "Computation by energy consultants based on building envelope inspection" and " Computation by energy consultants combined with meter reading".

The revision of the Danish provisions was based on several years of experience since 1997, which also underlined the importance of quality control within the certification scheme (subsequently also named as 'label'/'labelling scheme'). The analysis of Jensen et al conclude that "Confidence in the energy label is the most important factor in achieving the main aim of the labelling scheme - energy savings. The user must at all times have confidence in the registrations made, the calculations, the label itself, and especially that the suggested energy saving measures are viable and will result in improved economy. Thus, it is essential to maintain a high level of quality in the energy labelling scheme. If quality is poor, the users will lose confidence in the labels. [...] Credibility may be lost very fast as a few poor labels can do a lot of damage. The quality control of the Danish energy labelling scheme takes place at all levels of the scheme.", taken out of: Ole Michael Jensen, Morten Tony Hansen, Kirsten Engelund Thomsen, Kim Wittchen: Development of a 2nd generation energy certificate scheme – Danish experience, 2007

Random sampling checks could take place for e.g. 0.5% of certificates annually issued<sup>49</sup> with 3 levels of detail: A certain share of these checks could be requested to be done by a validity check of input data and rating outcome of energy performance certificates only. Another (lower) share could be requested to be checked (stricter) for input data and be recalculated by a controller. And another (very low) share of random sampling checks could consist of the aforementioned proposal plus control of the building on site for compliance with building regulations and correspondence with the certificate.

*Impact:* Detailed analyses of the various impacts of the certificates (stimulation of more renovations and improvement of compliance with building codes) were made with the BEAM model calculations (for details on the model: see Annex IV). According to that it results in 21 Mtoe/year energy savings and 57 Mt CO<sub>2</sub> emission savings in 2020 for EU-27. This is linked to annual capital costs of €8 billion, but causes annual energy cost savings of €26 billion. Consequently, properly carried out energy performance certificates may bring along up to 20,000 new jobs<sup>50</sup> for certifiers and up to 40,000 new jobs in the construction and refurbishment sector by 2020 (see Annex IV for the assumptions). This is confirmed by data known for the UK<sup>51</sup> (and some limited data for Germany which is in the range of that for the UK<sup>52</sup>). For the UK it is estimated that 8 to 12% of cost effective energy efficiency measures are realized<sup>53</sup>. The UK figures simply extrapolated to EU-27 level would mean an increase of 10 to 29 Mtoe/year realized energy savings and of 24 to 84 Mt/year CO<sub>2</sub> emission savings in 2020<sup>54</sup>.

The costs for a thorough quality control system appear manageable. For example, the total yearly costs of the Danish administration of the scheme paid by the consumers amount to about €0.8 million for the development of the system<sup>55</sup> and about €0.3 million annual

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<sup>49</sup> Underlying that an accredited expert, specialised on issuing energy performance certificates for buildings, compiles one certificate per working day, so about 200 certificates a year. A random sampling check of 0.5 % of certificates would therefore mean that accredited experts face with one control per year on average.

<sup>50</sup> In full time equivalents. Actual jobs may fluctuate because of anticipated certification in rental sector and EPC saturation. Based on 4.8 to 9.3 hours per EPC, calculated from several country reports of the IMPACT project.

<sup>51</sup> Calculated from data originating from Department for Communities and Local Government, 2007. “Regulatory Impact Assessment Energy Performance of Buildings Directive Articles 7-10”. Carbon saved claimed for EPCs in first year of implementation, electricity use excluded in PRIMES reference emissions.

<sup>52</sup> For example, for the UK the savings equal 0.9% of the existing residential building stock’s emissions. For comparison: in Germany, the certificates are projected to help avoid 0.35% of the existing residential building stock’s emission (calculated from: Forschungszentrum Jülich, 2005. “Evaluierung der CO<sub>2</sub>-Minderungsmaßnahmen im Gebäudebereich”, p. 20. Carbon saved claimed for EPCs after three years of implementation, electricity use excluded in PRIMES reference emissions).

<sup>53</sup> Calculated from data originating from Department for Communities and Local Government, 2007. “Regulatory Impact Assessment Energy Performance of Buildings Directive Articles 7-10”. Savings claimed exclusively for EPCs, i.e. additional to EEC savings. Applies for first year of full implementation (2009) to 2020, only when EPC is available. This range may differ from figures mentioned below because of non-additionality and different time frames. No information is available on the effect of certification on the renovation rate of buildings

<sup>54</sup> Of course, conditions in other Member States differ from the UK in terms of savings potential (size, profitability) and complementary policies.

<sup>55</sup> Jens Laustsen (Danish Energy Authority) & Kirstine Lorenzen (COWI), 2003. “Danish Experience in Energy Labelling in Buildings”, p. 20. For comparison, for the UK one-off administration costs are



maintenance cost. These amounts include the quality assessment control, the registration of data and the development of facilities to help improve and minimise the work for the consultants as well as some training activities for the consultants. Based on extrapolations of the Danish approach the overall administrative cost of random sample checks in the EU-27 are of the magnitude of 5 to 16 M€ per year<sup>56</sup>. In general, costs of a more elaborate quality control scheme could add up to 10 to 32 M€ administrative costs per year<sup>57</sup>.

Moreover, this control regime could also guarantee a sufficient quality of experts issuing the certificates as an indirect consequence.

Proposing such requirements can be justified from a proportionality point of view as, from the current practice, it has been evident that the low quality of certificates is one of the key factors for the questionable credibility and market uptake of the certificates in a number of Member States.

#### **5.4.2. Option B2: Requiring the recommended cost-effective measures of the certificate are realized within a certain time period**

*Current situation:* According to the EPBD the energy performance certificate shall be accompanied by a list of recommendations for cost-effective improvement of the energy performance. There are no requirements in the EPBD that some of these recommendations, such as those with short pay-back time, are to be realized. However, if there is no uptake of these recommendations a significant possibility for energy reductions is not achieved. This possibility prompted criticism by some stakeholders who argue that in this way the potential may not be tackled and asking that the cost-effective recommendations are implemented. For example, the European Energy Network in its report<sup>58</sup> suggests that recommendations with 7 years pay-back time are to be mandatorily implemented.

It is difficult to evaluate from practice what is the rate of uptake of these recommendations in the certificates as there is no sufficient experience in most of the Member States. The lack of such information has been highlighted in a study carried out within the Buildings Platform for which only one respondent to a questionnaire sent to experts from all EU Member States provided estimation that an uptake of up to 20% of low and non-cost measures for the service sector<sup>59</sup>.

Some Member States have also already included such provisions in their legislation. For example, in Portugal for the non-residential buildings the cost-effective opportunities with a payback smaller than 8 years must be implemented within 3 years. There are severe financial penalties if these are not realized. In Denmark all buildings owned by public administration

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estimated at app. 2 M€, and yearly enforcement costs at 14 M€ (all sectors, excluding communication). Calculated from data originating from Department for Communities and Local Government, 2007.

<sup>56</sup> Extrapolation of the Danish approach: one out of 500 EPCs is fully re-issued. In addition, one out of 100 data forms is reviewed. Costs of random checks are thus approximately 0.25% (1/400) of the total costs of issuing the EPCs.

<sup>57</sup> Quality checks costs equal to 0.5% of EPC issuing costs (information given orally by the IA consultant on, 23 June 2008).

<sup>58</sup> EnR. Implementation of the EU Energy Performance of Buildings Directive - a snapshot report, 2008

<sup>59</sup> BRE. Impact of the Energy Certificates on the energy savings in the existing buildings in the MS (EPBD article 7). Draft June 2008

(government, regions, municipalities) shall be certified and the cost-effective recommendations with a pay-back time of 5 years or less shall be implemented.

*Proposal:* A requirement can be introduced that the cost-effective recommendations of the certificate are to be implemented within a certain period of time. Such requirement can be for the owners of all buildings or for some parts of them based on the division: residential, commercial and public buildings. In case of purchase the investment requirement may be on the new owner. The setting up of a definition for 'cost-effective' and the period of time are to be decided at national or regional level.

*Impact:* Unfortunately, the evaluation of the impact of requiring that the cost-efficient recommendations of the Certificate are realized within a certain time cannot be based on the countries that have adopted certain requirements in this aspect, i.e. Denmark and Portugal, as there are no impact assessments available. Still, it has been evaluated that if requirements are included solely for the buildings of the **tertiary sector**, this may already lead to final energy demand saving of approximately 12 Mtoe, i.e. 3% reduction in 2020 in the EU-27 buildings sector; to a CO<sub>2</sub> emission reduction of about 33 Mt, i.e. 1% reduction in 2020 in overall EU-27 CO<sub>2</sub> emissions.

However, although from the data available it is not possible to make estimations on the investment requirements for the whole buildings sector (tertiary only), it can be expected that meeting the costs can be a significant challenge for some property-owners, especially those with restricted budgets, or housing associations that own a large number of properties. To ease the burden on this segment, targeted financial support mechanisms could be established by Member States (see option B4).

For the purpose of requesting the realization of the recommendations of the certificates, their quality would have to be sufficiently good such that no economically wrong investments are required. Currently, the experience of some countries shows that as there is a drive towards very low cost of certificates, they do not provide reliable and sufficient information for these principle investment decisions.

In addition, the results of the STABLE<sup>60</sup> project do not show a clear need for adopting a mandatory approach. In its activities the perceptions of professional parties<sup>61</sup> of whether they will act upon the recommendations if they are mandatory or voluntary was evaluated. The results show that 58% of respondents said they would increase their investment in energy efficiency measures if the recommendations on the certificate were voluntary, whilst 64% believe they would do so if the recommendations were made mandatory.

From a subsidiarity point of view, introducing such a requirement would be a significant financial burden for EU citizens and businesses and therefore such action would not be justified at EU level. To varying degrees Member States also use market-based instruments such as taxes on energy products used for heating to incentivize efficiency measures in the housing sector. For subsidiarity reasons Member States should continue to be able to choose a

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<sup>60</sup> Motiva Oy *et al.* 2007, *Securing The Take-off of Building Energy Certification: Improving Market Attractiveness through Building Owner Involvement*, STABLE final report, cited at <http://stable.motiva.fi/about/> STABLE, stands for Securing the take-off of Building Energy Certification. The project has been co-funded under the Intelligent Energy Europe Programme

<sup>61</sup> Professional parties include large owners, suppliers to owners, associations of users, the sample includes 466 respondents from Austria, Belgium, Bulgaria, Finland, Greece, Sweden, and Netherlands

combination of market-based and command and control measures, which would no longer be the case if every price increase would automatically trigger higher minimum standards.

Nevertheless, the public authorities should lead the way in demonstrating best practices in energy efficiency improvements. Therefore, setting up of a requirement that for the buildings occupied by the **public sector** the cost-efficient recommendations should be implemented can be a good step for showing such an exemplary role. This has also been proposed by several organizations that have responded to the public consultation.

#### **5.4.3. Option B3: Making certificates a mandatory part of property advertisement and/or property transaction documents**

*Current situation:* The EPBD only specifies that the certificate "has to be made available" to the potential owner (for newly built constructions), the prospective buyer or tenant. When and how this information has to be communicated, is not specified. In certain situations this information is only disclosed as one of the many annexes to a contract ready to be signed. At such a moment the information on energy performance can no longer influence the decision of the prospective buyer or tenant and it consequently loses its added value.

In order to use the full potential of the energy performance certificate, the information related to the energy performance of a building has to be disclosed as early as possible. In this way information on the energy performance can determine the choice for a particular building. Such information is already provided by some real estate agencies, for example in the UK, which include the 'rainbow' rating from the Certificate in the ads that are at displayed in their offices and in the websites.

*Proposal:* To require that the energy performance certificate is displayed in the publicity for property transactions when a property is on sale or for rent and to require that it is included as part of the property transaction documentation.

The information on energy performance of a building should be integrated in all publicity for property transactions. A similar requirement at EU level has already been made for the disclosure of fuel economy and CO<sub>2</sub> emissions for the marketing of new passenger cars. In order to have an effect, this information should be explicitly mentioned on any contract for a property transaction. In this it can be considered as any objective information regarding a building such as the surface or the material description.

*Impact:* Making energy performance part of the marketing process can, over time, add market value to good performing buildings, which will have a competitive advantage over similar buildings with the same price but performing less efficiently. Integrating energy performance information in publicity and marketing tools could also raise the awareness of the general public. Not only will potential buyers or tenants be able to compare the efficiency of their possible choices, the general public will familiarise itself with the concept of energy efficiency of buildings. Home owners could perceive this as an incentive to establish the energy performance of their own property and act accordingly.

As the preparation and presentation of the certificates are already required in the current EPBD the costs for the consumers will be mainly for displaying the information (printing and including it in websites) while the costs for Member States will be for monitoring the compliance. However, the added value of the information for the real estate market could compensate possible additional cost. No quantification on the impacts on energy savings and

CO<sub>2</sub> emission reductions are available but they can be considered relatively high and increasing in time as the role of the certificate will be considerably strengthened.

Taking into account the important contribution of a requirement that would make certificates a mandatory part of property advertisement and the fact that similar approach at EU level has already been adopted in other sectors (i.e. CO<sub>2</sub> emissions for the marketing of new passenger cars), the proposal would be inline with both the subsidiarity and proportionality principles. Making the certificate a mandatory part of property advertisement and/or property transaction documents would limit the interpretations of the current text of the EPBD which already states that a certificate should be 'made available' but nevertheless there are some interpretations that it does not mean that the certificates are *de facto* presented or handed over.

#### **5.4.4. Option B4. Requiring the linking of the certificates with other support or discouragement mechanisms**

*Current situation:* There are no requirements in the EPBD that stipulates that support mechanism should be linked with the certificate. Some of the possibilities that are available at EU level for general support schemes which could be linked to the certificate were listed in Section 2.2.4 and there are a number of examples from around the Europe of well functioning support schemes, although at present these do not necessarily include all of those which are needed.

In the residential and commercial buildings chapter of the fourth Assessment Report of the Intergovernmental Panel on Climate Change<sup>62</sup>, it is stated that there is no single policy instrument that can capture the entire potential for GHG mitigation. Due to the especially strong and diverse barriers in the residential and commercial sectors, overcoming these is only possible through a diverse portfolio of policy instruments for effective and far-reaching GHG abatement and for taking advantage of synergistic effects. Since climate change literacy, awareness of technological, cultural and behavioural choices and their impacts on emissions are important preconditions to fully operating policies, these policy approaches need to go hand in hand with programmes that increase consumer access to information, awareness and knowledge (*high agreement, medium evidence*). This is confirmed by the summary report of the "Active Implementation of the European Directive on Energy Efficiency" (AID-EE).

Nevertheless, such approach has already been adopted in several EU Member States. For example, in the Netherlands there is a green mortgage which house owners can use to implement energy saving measures during renovation. The size of the loan is coupled to the improvement of the energy performance label. This means that in cases where more energy saving measures are implemented the energy performance of the house is further approved and more money can be borrowed against favourable conditions (see Table 3). In general the interest is 1% lower than the market interest. The scheme is in force since May 2008, so there is no assessment available yet of its possible impacts<sup>63</sup>.

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<sup>62</sup> IPCC, Levine, M., D. Ürge-Vorsatz, K. Blok, L. Geng, D. Harvey, S. Lang, G. Levermore, A. Mongameli Mehlwana, S. Mirasgedis, A. Novikova, J. Rilling, H. Yoshino, 2007: *Residential and commercial buildings. In Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer (eds)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

<sup>63</sup> VROM. Adjustment regulation Green investments, Ministry of Finance and Ministry of Housing, Spatial Planning and Environment, 22 April 2008

Table 3. Improvements to the energy performance (in terms of energy rating) and amount provided for green mortgage in the Netherlands

From label	To label	Number of steps	Maximal green mortgage (EUR)
F	D	2	25 000
F	B	4	50 000
F	A	5	100 000

In Portugal energy conservation measures will be financially supported by tax benefits, this scheme will in the near future be coupled to energy performance certificates<sup>64</sup>.

Interesting examples of linking energy certificates to complementary financial or fiscal mechanisms are to be found outside the built environment. For example, in 2006, a bonus-malus (or ‘feebate’) mechanism was introduced for new automobiles in the Netherlands. The objective of the scheme is to shift market shares from inefficient vehicles towards more efficient ones. The scheme entails a fiscal bonus (re-ward) or malus (penalty) for buyers of vehicles. The size of the bonuses or penalties is proportionate to the energy label of the car, which is considered an indicator of its CO<sub>2</sub>-emissions.

An evaluation of the scheme showed that a considerable shift in market shares had in fact taken place. Meanwhile, the costs of execution of the scheme are characterized as ‘relatively modest’. After all, an existing tax scheme for motorized vehicles was used as a platform for additional incentives for efficiency. Early 2008, the bonuses and maluses were increased to higher amounts, in order to shift market shares further against virtually no additional cost<sup>65</sup>.

The case of energy labelling of appliances in the Netherlands constitutes another interesting example. It can be questioned whether labelling as a single instrument would have had a substantial impact in the Netherlands. High efficient appliances are more expensive and are probably not attractive for consumers without additional policies (subsidies and/or eco-tax). What happened after the introduction of the energy label -and a subsidy scheme linked to it- was that the market share of energy efficient appliances increased rapidly and inefficient appliances were removed from the market. This happened at higher pace in the Netherlands than elsewhere in Europe. In this case the policy package counts up to success. In Sweden no subsidy scheme was linked to the labelling. Current penetration of high efficient appliances is comparable with penetration in the Netherlands. Market transformation, however, came at a later stage and might have benefited from policies introduced in other countries<sup>66</sup>.

*Proposal:* It can be required (or recommended) that a link with the energy performance improvements is made when financial or fiscal support by Member States is provided to property owners (or tenants).

<sup>64</sup> Information provided by Eduardo Maldonado, Universtiy of Porto, Portugal, email and telephone call 13 and 17 June 2008

<sup>65</sup> VROM. Cijfers over wonen 2006 (Statistics on housing 2006), a report issued by the Dutch Ministry of Housing, Spatial Planning and Environment. The Hague, April 2007

<sup>66</sup> Kahn *et al.* From Theory Based Policy Evaluation to SMART Policy Design. Summary report of the Active Implementation of the European Directive on Energy Efficiency”(AID-EE) project, within the framework of the EU Intelligent Energy by Jamil Khan (Lund University), Mirjam Harmelink, Robert Harmsen (both Ecofys Netherlands), Wolfgang Irrek (Wuppertal Institute) and Nicola Labanca (Politecnico), April 2007

There are various tools Member States can use to provide economic incentives for promoting energy efficiency measures in buildings and to respect subsidiarity the exact support should be decided on national or regional level. One option could be to link financial instruments such as subsidies, preferential loans or fiscal deductions with the use of energy performance certificates. For this option, energy auditors would determine the energy performance of a building and identify cost-effective energy savings measures accordingly. If the owner decides to carry out the suggested energy efficiency measures, he/she could get financial support when decisively upgrading the energy performance of his building from e.g. a D to a B grade. A new certificate would then be issued to document the savings reached after the implementation of the savings measures.

*Impact:* The impacts of linking of the certificates with other support or discouragement mechanisms are difficult to quantify as they are very dependant on the specifics of the support system that is to be devised by individual Member States. However, it would require significant state funds (some also coming from the Structural and Cohesion funds).

Provision of financial stimuli will inevitably lead to energy efficiency improvements. For example, the above-mentioned STABLE project concluded, among others, that the most important factor which would influence the uptake of energy saving measures was the availability of investment grants and subsidies. Nearly all respondents (93%) consider that if implementation were to be supported by financial mechanisms, this would stimulate them to realize the cost-effective recommendations of the energy performance certificate.

However, such a requirement would not be in line with the subsidiarity principle as it would touch issues of national budget spending. Furthermore, the introduction of such a text into a Directive based on Art. 6 (environmental protection) of the Treaty may not be possible from a legal point of view.

### **5.5. Inspection of heating and air-conditioning systems**

The EPBD requires organising regular inspections of heating and air-conditioning systems. These systems have a very high energy saving potential, up to 40-60% of their total energy use. In this context, the current EPBD's inspection requirement is estimated to result in just 10% energy savings<sup>67</sup>. So there is significant room for further savings. The need for further action is even more important because of the significant increase of air-conditioning systems throughout Europe. As the components of heating and air-conditioning systems are tradable goods, an initiative which is as much harmonized as possible within the EU is desirable (i.a. to ease internal market activity), that is why action at Community level is deemed to be appropriate.

#### **5.5.1. Option C1: Requiring an 'inspection report' for heating and air-conditioning systems**

*Current situation:* The existing EPBD inspection requirements generally aim at energy and CO<sub>2</sub> savings, but they do not specify the inspections' content and deliverables. Therefore, some of the Member States' inspection schemes are imprecise and give limited energy

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<sup>67</sup> Estimations made corresponding to current Danish action plans, for new buildings. According to Scholten et al. about 10% of energy savings are expected as result of an average increase of heating system efficiency from 76% to 86%. Source: *Toothless tiger? Is the EU action plan on energy efficiency sufficient to reach its target?*, A. Scholten, S. Lechtenböhmer, D. Mitze and S. Thomas, 2007

savings. In many Member States inspections are not sufficiently prescribed or are only based on safety checks (i.e. in France, The Netherlands), so they do not directly lead to energy savings. Besides, few Member States have organised systematic information, promotion, and advice campaigns to date, as requested by article 8(b) of the EPBD.

Consumers and building owners need more information. Better operation and control of systems and retrofit of old systems and components by more efficient ones, brings big savings. Proper and regular inspection and maintenance of the heating and air-conditioning systems accompanied by adequate information/advice to building owners for retrofitting can significantly stimulate and accelerate these savings<sup>68</sup>.

*Proposal:* An inspection report should be given to building owner after the inspection. This should include an energy efficiency rating of the heating/cooling systems, e.g. compared to up-to-date and/or best technology available, and recommendations for cost-effective improvement measures.

Furthermore, it could be requested that these recommendations contain an estimate of the costs for replacing the existing boiler, water heater, or cooling system with a new one that complies with the Eco-design<sup>69</sup> minimum requirements, or 'A' class under Energy Labelling<sup>70</sup>.

An inspection report including recommendations for system improvement would not need to be made with the same frequency as the inspection of the systems themselves, as its rating and recommendation results remain valid for a longer period of time.

The relevant CEN standards for inspections could be further developed. These would allow an efficiency rating of the installations. They could represent an overarching guideline which supports Member States' implementation of an inspection report<sup>71</sup>. The EPBD recasting could therefore directly refer to these CEN standards and minimum energy efficiency installation requirements could be set by Member States based on these standards.

As a further step, the recommended saving measures in the inspection report could be requested to be realized. Measures with short payback periods could be required to be implemented faster than the ones with a longer payback period. Therefore, the inspection report should have clear information on economic information to building owners.

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<sup>68</sup> Due to boiler replacement combustion efficiency increased on average by 7 % in Italy (mainly gas boilers) and 5 % in Finland (mainly oil boilers); Fuel saving due to a more frequent regular maintenance (yearly instead of customary average) was calculated between 1.3 % and 2.5 % (Ireland); Statements by Marcello Antonucci, Krzysztof Klobut in presentation 'How to evaluate the impact of inspections and advice programmes for boilers' at 9th World Congress Clima2007, Helsinki, June 2007 ([http://www.rehva.com/projects/clima2007/WSs/WS7/WS7\\_pSUMMARY.pdf](http://www.rehva.com/projects/clima2007/WSs/WS7/WS7_pSUMMARY.pdf))

<sup>69</sup> Directive 2006/32/EC of the European Parliament and of the Council of 6 July 2005 establishing a framework for the setting of ecodesign requirements for energy-using products and amending Council Directive 92/42/EEC and Directives 96/57/EC and 2000/55/EC of the European Parliament and of the Council, *OJ L 191*, 22/07/2005 p. 29 -58

<sup>70</sup> Council Directive 92/75/EEC of 22 September 1992 on the indication by labelling and standard product information of the consumption of energy and other resources by household appliances, *OJ L 297*, 13/10/1992, p. 16–19

<sup>71</sup> The outcomes of relevant projects under the EU IEE programme, such as AUDITAC and HARMONAC, can be of further support.

*Impact:* In average, the inspection report could bring about 30% of building owners inspected to follow the advice, e.g. in France, the impact of individual energy advice has been estimated at 30%, and in Sweden incentives on individual oil boilers substitution resulted in 30% renovation<sup>72</sup>. Assuming an average inspection frequency of 3.3 years, the requirement for an inspection report would therefore lead to an annual renovation rate of 9.1% per year (30% / 3.3). The current renovation rate is about 6.7% per year (assuming an average boiler lifetime of about 15 years). Thus the inspection report could lead to about 2.4 % additional replacements/retrofits of the stock of boilers and combi-water heaters per year. As a consequence, not only 80% of the stock of boilers and combi-water heaters would be replaced by 2020 (as is the case with current replacement rate), but 100 % of the stock would be replaced by more efficient products. Realistically, this figure might be lower at 95 % due to market imperfections, to calculate conservatively. The additional annual savings in 2020 caused by the inspection report requirement would therefore be around 5 Mtoe final energy, 15 to 20 Mt CO<sub>2</sub>, or €2 billion (net of extra cost of replacement)<sup>73</sup>.

Inspections of heating and cooling systems can furthermore - apart from energy savings - achieve co-benefits, such as decrease of discomfort hours caused by non-properly operating heating/cooling systems, as examined by Bory *et al*<sup>74</sup>.

In addition, the new system could help manufacturers to produce heating and air-conditioning systems for the entire EU market which are easier to inspect, which could therefore improve the companies' competitiveness. Furthermore, inspection of heating systems is linked to creation of jobs, which can be estimated at 195,000 jobs (inspectors and energy consultants) in EU-27<sup>75</sup> in 2020 if made properly and if including the inspection report requirement. This means about 25% or 40,000 more inspectors than currently needed for the existing EPBD heating system inspection requirement. For air-conditioning systems, it can be estimated at around 30,000 (inspectors and energy consultants) in EU-27<sup>76</sup> in 2020, which means about 6,000 more inspectors than currently needed for the existing EPBD air-conditioning system inspection requirements (see Annex IV for the assumptions).

Additional cost to the Member States and their consumers of the inspection report should be low, as the information on the existing boiler, and system etc. should already be available from the building certificate and boiler/cooling inspection. The extra cost will be selecting the right size and technical specification of a replacement and cost of installation system. Given a well designed system, the add-on cost to the inspector should be low (less than 10% of inspection cost e.g. every 4 to 6 years).

Finally, as is the case for recommendations from the buildings certificate, national subsidy schemes could and should support the investments that originate from the inspection report.

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<sup>72</sup> 'Summary of WS : How to evaluate the impact of inspections and advice programmes for boilers' at 9<sup>th</sup> World Congress Clima07, Helsinki, 2007, [www.rehva.com/projects/clima2007/WSs/WS7/WS7\\_pSUMMARY.pdf](http://www.rehva.com/projects/clima2007/WSs/WS7/WS7_pSUMMARY.pdf)

<sup>73</sup> VHK EcoDesign of boilers and combi-boilers study, 2007 and DG TREN model based calculations built on the VHK study.

<sup>74</sup> Daniela Bory, Jerome Adnot, Carmelo Greco, Dominique Marchio: Auditing the European room air-conditioning systems and potential energy savings, 2007

<sup>75</sup> VHK EcoDesign of boilers and combi-boilers study, 2007, task 2 and extrapolated from EU-25 to EU-27 by BIO Intelligence Service S.A.S. (using calculation methodology according to Jerome Adnot)

<sup>76</sup> In 2017, based on extrapolation out of Roger Hitchin, Jerome Adnot, Maxime Dupont: 'Issues of the implementation of the EPBD article 9', 2005



The inspection report would be an important upgrading to the existing requirements for inspection and would help consumers in identifying important possibilities for cost-effective energy savings and therefore it is justified from proportionality point of view.

### **5.5.2. Option C2: Introducing quality check and compliance requirements for inspections**

*Current situation:* Member States have introduced very different requirements with regard to educational preconditions and training of the independent experts which are allowed to execute inspections. The actual independence, required by the existing EPBD, and quality of inspectors therefore varies widely within the EU.

Where there is currently little or no compliance control of inspections and inspection outcomes of heating and air-conditioning systems, the implemented national inspection schemes are unlikely to contribute a lot to the realization of the energy saving potential of installations: The technical saving potential for heating systems is estimated to be very high, at 30%<sup>77</sup>, which correspond to around 66 Mtoe final energy savings, reduction of €55 billion of costs and 252 Mt CO<sub>2</sub> emission savings per year in 2020. Similarly regarding the air-conditioning systems, technical energy savings potential can reach a maximum of 50% of their final energy use<sup>74</sup>.

Without control of the inspection outcomes of heating and air-conditioning systems, the national inspection schemes are unlikely to achieve sufficient energy efficiency improvements. Analysis of stakeholders and experienced Member States<sup>78</sup> (e.g. Sweden, Germany, France, Italy) recommend ensuring that effective enforcement systems are in place for compliance and to regularly and independently assess whether the control regimes are effective. The importance of compliance controls is also underlined by numerous contributions to the public consultation on the EPBD recasting: About one third of all contributors asked explicitly for compliance control requirements for inspection in an EPBD revision, whereof about 90 % of them are representing big European associations.

For example, for air-conditioning systems the energy savings of the compliance requirements can be estimated at up to 20% of their total energy saving potential, which correspond to around 0.5 Mtoe final (electricity) energy savings<sup>79</sup>, reduction of €1.1 billion of costs and 5.7 Mt CO<sub>2</sub>e emissions savings per year in 2020.

Member States have introduced very different requirements with regard to educational preconditions and training of the independent experts who are allowed to execute inspections. Their actual independence, required by the existing EPBD, and quality therefore varies widely within the EU.

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<sup>77</sup> VHK EcoDesign of boilers and combi-boilers study, 2007, task 6, p. 36 (data correspond to scenario for design option 3 for XL boilers).

<sup>78</sup> As e.g. presented at the 2nd Sustainable Energy Week event 'Energy Performance of Buildings Directive - Next Steps' in January 2008 and as demonstrated in a Swedish case study of 2007 (see European Energy Network EnR: Implementation of the Energy Performance of Buildings Directive - a snapshot report, 2008), In Sweden, energy monitoring must be undertaken for a period of two years after the building has been completed, to demonstrate compliance on the ground. The policy was introduced in mid-2006 and results will begin to emerge soon. Large property developers have expressed their support for the initiative

<sup>79</sup> Based on extrapolation out of data originating from 'Energy Efficiency and Certification of Central Air Conditioners' (EECCAC), 2003.

The importance of compliance controls is also underlined by numerous contributions to the public consultation on the EPBD recasting: About one third of all contributors asked explicitly for compliance control requirements for inspection in an EPBD revision, whereof about 90 % of them are representing big European associations.

Any compliance control scheme for inspections should be well balanced with regard to control costs and achievable benefits in terms of energy and emission savings and their gross economic costs. Such a control scheme has to be as effective as possible at low administrative efforts. In doing so, a positive balance between benefits and control costs (in terms of improved quality and saved energy and emissions) can be achieved

*Proposal:* Similar to what has been presented under option B1 on energy performance certificates for buildings, random sampling checks of inspection reports (presented in option C1) of different levels of detail and frequency could therefore be introduced as a new requirement. The levels of the random sampling regime could range from validity checks of input and/or result data for inspection reports to on-site checks of heating and air-conditioning systems inspected.

The compliance control regime could also guarantee a sufficient quality of experts carrying out the inspections<sup>80</sup>, leaving it to the Member States to lay down training requirements and educational preconditions for inspectors. However, as an indirect consequence, by a control of the inspection report a sufficient quality of inspectors would be checked automatically at the same time.

Member States could be requested to establish random sampling checks, for e.g. 0.1 % of annually carried out inspections<sup>81</sup>, at 3 levels of detail: A certain share of these checks could be requested to be done by a validity check of input data and given recommendations of inspection reports only. Another (lower) share could be requested to be checked (stricter) for input data and the recommendations could be recalculated by a controller. And another (very low) share of random sampling checks could consist of the aforementioned proposal plus control of the heating/air-conditioning system on site for correspondence with the certificate.

*Impact:* Similar to what has been described under option B1 on certificates, a random sampling control of inspection results/reports is an option to improve the quality of inspections; guarantee a sufficient quality of information on energy efficiency improvement measures provided to the owner of a building by the inspection report and therefore increase the retrofitting rate of heating and air-conditioning systems; and ensure a sufficient quality of inspectors at the same time for reasonably low administrative efforts and costs.

A random sampling check of the inspection outcomes for heating and air-conditioning systems does have positive effect on creation of jobs: i.e. in Portugal, the quality of the certificates is checked every five years on 10% of the total. For inspections, random sampling

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<sup>80</sup> *ibid* 48

<sup>81</sup> Underlying that an accredited expert, specialised on issuing energy performance certificates for buildings, compiles one certificate per working day, so about 200 certificates a year. A random sampling check of 0.5 % of certificates would therefore mean that accredited experts face with one control per year on average.

rate can be assumed as similar, which could result in 23,000 jobs<sup>82</sup> (inspectors and energy consultants) for EU-27 by the year 2020.

Similar to option B1 proposing such requirements can be justified from a proportionality point of view as, from the current practice, it has been evident that without compliance checks the usefulness and credibility of inspections is in question.

### 5.6. Minimum energy performance requirements

The present energy performance requirements<sup>83</sup> and their levels of ambition vary widely across the Member States, even within similar climatic zones. Cross-border comparisons of fixed requirements are difficult due to very different basic approaches regarding how energy performance requirements are calculated and expressed. In addition, a multitude of different parameters are used for calculation purposes. Furthermore, with regard these parameters, very different definitions exist in Member States<sup>84</sup>. Moreover, some Member States focus on fixing the transmission losses of a building by setting minimum requirements for individual components, such as windows, others have established holistic energy performance rating methodologies, fixing e.g. the maximum allowed primary energy demand and/or CO<sub>2</sub> emission for a building, fully or partly based on relevant CEN standards. These incorporate, inter alia, energy consumption for lighting, ventilation and domestic hot water.

This fragmented situation is the result of many years of development of building regulations in the Member States, each having different starting points, dates (some started decades ago, some recently) and executive bodies. The existing performance requirements and methodologies also regularly undergo revision. Furthermore, the performance requirements have to be in line with other, non-energy national building regulations, which are outside the scope of the EPBD. An all-embracing project<sup>85</sup> was launched in autumn 2007 in order to assess these differences and to analyse how cross-border comparisons can be made in principle. The project consists of 16 international partners from across the EU and is scheduled to run for 2.5 years.

The overarching aim of an EU legal activity on energy performance requirements in the buildings sector is to achieve optimum performance requirements, which are feasible, cost-effective and in balance with provoked energy savings, technical and environmental feasibility and subsidiarity<sup>86</sup>. Cost-optimal levels are not yet achieved European-wide by

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<sup>82</sup> Based on Roger Hitchin, Jerome Adnot, Maxime Dupont: 'Issues of the implementation of the EPBD article 9', 2005; see Annex IV for further information.

<sup>83</sup> Energy performance requirements: meaning regulations which limit the energy use of buildings under standardised conditions, expressed as a fixed limit of e.g. the annual final or primary energy use in kilowatt hours per square meter useful floor area of a building [kWh/m<sup>2</sup>.a]

<sup>84</sup> Such as e.g. "useful floor area", a common value on which the energy performance of a building is based on: Energy consumption in kWh per m<sup>2</sup> useful floor area, varying up to +/-10 - 15 % across Member States, see e.g. information paper P65 "Comparing Energy Performance Requirements over Europe" at the Commission's Buildings Platform ([www.buildingsplatform.eu](http://www.buildingsplatform.eu)).

<sup>85</sup> ASIEPI project - Assessment and Improvement of the EPBD Impact, project under the Intelligent Energy Europe Programme, 10/2007 to 3/2010

<sup>86</sup> Ambitious energy performance requirements for buildings (insulation and reduction of uncontrolled ventilation by improved air-tightness) sometimes have been blamed for a degradation of the indoor environment and increase in problems in connection with moisture and dampness in buildings. Several studies, such as the comprehensive Swedish survey about health, well being and energy efficient buildings (Energy efficient and healthy buildings, M. Gullberg, ÅF Process Sweden, E. Öfverholm,

nationally fixed energy performance requirements, which is why further stimulation at **Community level** could realize additional energy savings. It is also important for regulation to encourage and not hamper innovation in the buildings sector. The existing EPBD respects this by requesting the Member States to set a holistic methodology (instead of fixing very specific details of each component of a building) and any change in legislation must recognise the importance of this approach<sup>87</sup>.

The options for energy performance requirements below reflect these fundamentals.

### **5.6.1. Option D1: Establish EU energy performance requirements**

*Current situation:* Member States individually fix energy performance requirements for buildings at different levels, based on different methodologies and covering different scale of influencing factors<sup>88</sup>, as stated above in the introduction to options D. European CEN standards for energy aspects in the buildings sector, initiated by the Commission in 2004 to support Member States implementing the existing EPBD, only reduced this variety to a certain extent. Furthermore, not all Member States make broad use of them. One option to achieve ambitious requirements EU wide and to harmonize them could therefore be to fully lay down binding methodologies and levels of requirements at EU level.

The principle structure of Member States' legislation on buildings differs widely. Energy performance requirements are often embedded in complex national building regulations and rarely laid down separately without interconnections to other legislation. These building regulations often also go beyond energy aspects, such as health requirements on indoor air quality, static requirements, structural fire protection or noise control etc. Member States' notifications on the implementation of the existing EPBD confirm these common legal cross correlations. Furthermore, Member States insist on the subsidiarity principle when it comes to specifying individual building requirements.

To set minimum energy performance requirements for buildings at EU level would therefore require (i) either to unbundle national building regulations in order to separate and fix energy aspects with one harmonized approach (ii) or to develop an approach at EU level which is

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Swedish Energy Agency, M. Bengtsson and N. Tolstoy, National Board of Housing, Building and Planning, 2005) disproved this claim. Health aspects in buildings are rather a question of proper construction work and pattern of use, independent of the level of energy performance requirements on the construction, notably that adding envelope insulation and improving air-tightness need to be made together with correct natural or adjusted mechanical ventilation.

<sup>87</sup> In this regard, e.g. an overall limitation of the building's primary energy demand calculated according to the aforementioned holistic methodology by a building regulation leaves full room for best technical solutions how to comply with these requirements, so which combination of e.g. insulation levels, boiler efficiency level and use of renewable energy sources ensures to keep the overall primary energy limit of a building. A counter-example would be to define exactly in the building regulation what type/level of insulation has to be used for the building envelope or which type of boiler is allowed to be installed etc in order to limit the energy consumption of the building.

<sup>88</sup> See several comparison studies, such as: Scottish Building Standards Agency, "International comparison of energy standards in building regulations: Denmark, Finland, Norway, Scotland, and Sweden", Scotland, 2007; Belgium Building Research Institute, "Energy performance regulations: small scale comparison between Flanders, the Netherlands, Germany and France", Belgium, announced to be published in summer 2008; Department of the Environment, Heritage and Local Government, 'Consultancy study of energy efficiency regulations for new dwellings and options for improvement', Ireland, 2007; ASIEPI project - Assessment and Improvement of the EPBD Impact, project under the Intelligent Energy Europe Programme, 10/2007 to 3/2010.

able to take implicitly into consideration all existing national interconnections to other building legislations for consistency reasons.

*Proposal: Specifying EU-wide energy performance requirements for buildings in the EPBD, taking into consideration various factors, for example, different climate zones and building types (residential and non-residential buildings)*

Setting harmonised energy performance requirements at EU level, e.g. expressed as maximum annual primary energy use per useful floor area of a building [kWh/m<sup>2</sup>.a] in dependence of the outdoor climate, could ensure more ambitious, cost-optimal energy efficiency levels throughout the EU. As the design and use of buildings is widely varying and does have significant influence on the energy needs, a differentiation of building types would also be necessary when fixing these requirements, as is practice today in almost all Member States.

*Impact:* The energy savings potential of this option D1 in 2020 can be estimated at 9.5 Mtoe per year for EU-27 (see Annex IV for assumptions made for the potential calculations). This means a potential of 24 Mt CO<sub>2</sub> emission savings per year. It incurs annual capital costs of €6 billion per year for investments and results in annual energy cost savings of €12 billion in 2020. The number of newly created jobs within the buildings sector can be estimated at 82,000. These figures are based on currently laid down levels of energy performance requirements in the Member States compared to newly fixed cost-optimal requirements at EU level, which would be more ambitious on average.

Furthermore, it would ease cross border comparisons and the achievement of equal levels of ambition in all Member States. It could help construction companies, construction products manufacturers and energy services companies to understand and to comply with building regulations all over the EU and therefore stimulate the internal market for this sector.

Setting harmonized minimum energy performance requirements at EU level could be difficult with regard to concerns of Member States, which claimed that it is in Member States competence to specify detailed building regulations. Furthermore, it could hamper Member States from laying down even stricter energy performance requirements which were already announced to come. Moreover, an EU-wide regulation would become very complex in order to reflect all national particularities in a fair way and therefore could become indefinite in practice and take a very long time to be fixed.

#### **5.6.2. Option D2: Introducing methodology for benchmarking**

*Current situation:* As analysed in the previous option, a uniform EU wide energy performance setting is very challenging, that is why other possibilities also need to be verified. Benchmarking is one common instrument whenever complex issues need to be tackled or assessed without specifying all the underlying (technical) details and requirements. It is a results-oriented methodology in order to rate the achieved or aspired level of a matter. Benchmarking of energy performance requirements can e.g. be the comparison of existing national requirements with a set of similar regulations laid down in other countries or with e.g. cost-optimal energy performance requirements. Hence, it can steer Member States towards best practice or cost-optimal solutions and create competition amongst Member States towards the best or most ambitious energy performance requirements. Real estate companies, chain store companies and institutions/authorities often use benchmarking methods when managing a large number of buildings. So an objective benchmarking mechanism could guide and support Member States towards setting cost-optimal holistic

energy performance requirements. Currently, only a few Member States fix their levels of requirements based on national economic impact assessments, as stated in answers to the questionnaire which has been sent to Member States in spring 2008 (see Annex II).

*Proposal:* Include in the EPBD (i.e. as an annex) a methodology showing how to calculate the cost-optimal level of energy performance requirements for buildings of which Member States shall make use of as a benchmarking instrument and present the calculation and results of the benchmarking to the Commission by reports and/or in the EPBD Comitology Committee.

National energy performance requirements for buildings could be geared to cost-optimal requirements by **providing Member States with a methodology for benchmarking**. The cost-optimal requirements (= best economic balance of investment costs versus energy savings) could therefore be specified by an objective methodology allowing implicit consideration of all boundary conditions by parameters. This methodology should be based on EPBD CEN standards, which already fulfil these requirements. The parameters used inter alia consist of outdoor climate, energy prices, labour costs, material (e.g. insulation), product (e.g. windows, heating systems) and service costs, as these vary within the EU and influence the cost-optimal level of energy performance requirements for buildings.

Such a benchmarking mechanism, consisting of a CEN based calculation methodology for cost-optimal energy performance requirements, could be introduced to the EPBD. It would contain all relevant parameters (e.g. underlying construction product costs, energy costs, taxes etc.). The specific parameters would have to be fixed at national level (only for benchmarking purposes), not in the EPBD and therefore with respect to the subsidiarity principle. In practice, Member States could then be requested by the EPBD to recalculate (i) their nationally fixed energy performance requirements and (ii) the cost-optimal level of requirements with the aforementioned new EPBD methodology in order to benchmark. The calculation results and the specific parameters used could then be required by the Commission to be published in reports and/or EPBD Comitology committee meetings.

**In doing so, Member States would not be asked to change their** (complex and widely varying) **national methodologies** to set their requirements, but would be asked to carry out a **comparison calculation** with the aforementioned new EPBD benchmarking methodology, in order to check whether their level of fixed requirements is at the cost-optimal level or not. Therefore, the ambition of energy performance requirements that Member States actually set would be made transparent, which is very difficult to rate at present. Furthermore, this could also help to make cross-country comparisons for levels of ambition of fixed energy performance requirements, as the calculation methodology and all parameters used would be made public. So the benchmarking instrument is just a "translator" of complex, widely varying energy performance requirements fixed at national levels to an EU-wide identical methodology for comparison purposes, not for regulating the levels of requirements at EU-level. This would clearly indicate whether Member States are below the optimal levels which would mean that money from potential energy savings are lost every time regulations are applied or whether Member States are too ambitious in their requirements and pose an unjustified burden on their citizens.

*Impact:* Based on current energy performance requirements in the Member States, the long-term impact of the described new benchmarking system in terms of energy savings (current level versus theoretically cost-optimum level) can be identical to option D1, being estimated at 5 Mtoe for EU-27 in 2020 and 9.5 Mtoe in 2030 on a yearly basis in residential and non residential buildings. This also means a potential ranging from 13 Mt CO<sub>2</sub> emission savings

on a yearly basis in 2020 to 24 Mt CO<sub>2</sub> emission savings per year in 2030<sup>89</sup>. The figures represent the maximum possible impact, i.e. meaning that Member States would gradually correct their national levels and half of them would adjust their national levels to cost-optimal ones by 2020 and all Member States would do so by 2030.

Furthermore, the potential number of new jobs (all tackled sectors together, so construction and installation sector, manufacturers and energy services) can be estimated at 82,000<sup>90</sup> in the long run if minimum energy performance requirements for new and refurbishment of existing buildings were individually lifted to cost-optimal levels in all Member States. The administrative costs of this benchmarking mechanism would be very low, as only a recalculation of nationally fixed requirements would be requested (plus publication of fixed parameters used).

Furthermore, administrative costs within the EU could be kept to a minimum by providing Member States with a uniform, objective benchmarking methodology within the EPBD. At present, Member States develop national approaches on how to fix the requirements. Frequently new economic analysis is undertaken for each revision of energy performance requirements.

Introducing a benchmarking methodology for fixing energy performance requirements for buildings in the EPBD could simultaneously:

- support Member States in laying down cost-optimal levels of holistic energy performance requirements in an objective manner,
- lead to more transparency for all parties involved whenever energy performance requirements are fixed by Member States, as a fully transparent and public methodology would be introduced which allows for validating the fixed levels of energy performance requirements,
- provide Member States with a method which does not have to be revised as frequently as the requirements themselves and therefore offers planning certainty to Member States and all parties involved, and
- keep the integral administrative costs for the EU and for Member States to a minimum for this complex issue.

The disadvantage of this option is its soft, rather voluntary nature, as Member States would not be forced to fix their energy performance requirements at the cost-optimal level, but just to benchmark them. So the success of this option cannot be guaranteed. However, it is believed that it would create significant peer-pressure from the front runner countries, as well as from the construction industry and other stakeholders, and would ultimately move all Member States towards cost-optimal energy efficiency requirements.

This is a "soft law" instrument and would not impose any requirement for the Member States to correct their levels and this will be in line with the proportionality and subsidiarity principles.

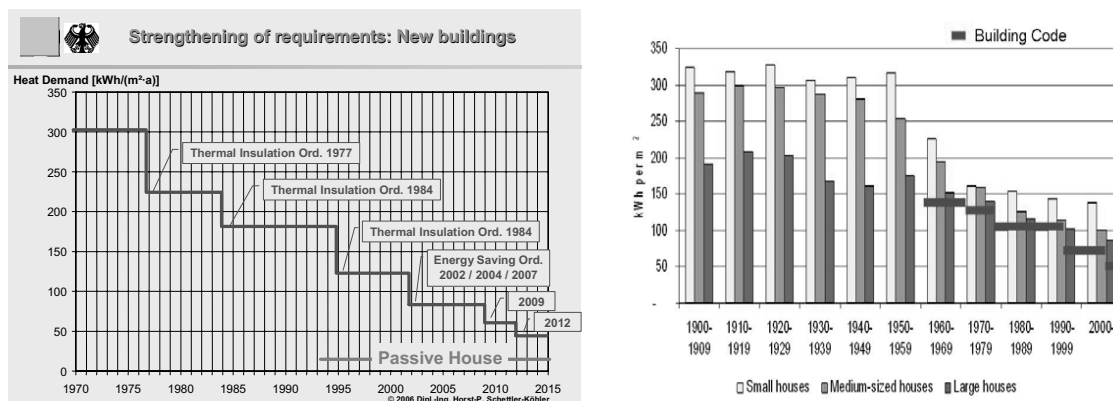
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<sup>89</sup> Provided by consultant, based on PRIMES model calculation.

<sup>90</sup> Provided by consultant, based on EURIMA estimates, corrected for current variables.

**5.6.3. Option D3: Develop an evolving improvement scheme for the buildings stock focussing on the worst performing buildings (a kind of top-runner approach)**

*Current situation:* Buildings' life cycle ranges from several years to several centuries. The energy performance standard significantly varies by the age of the building. This is caused by the evolution of construction methods and the coming into force of building regulations:

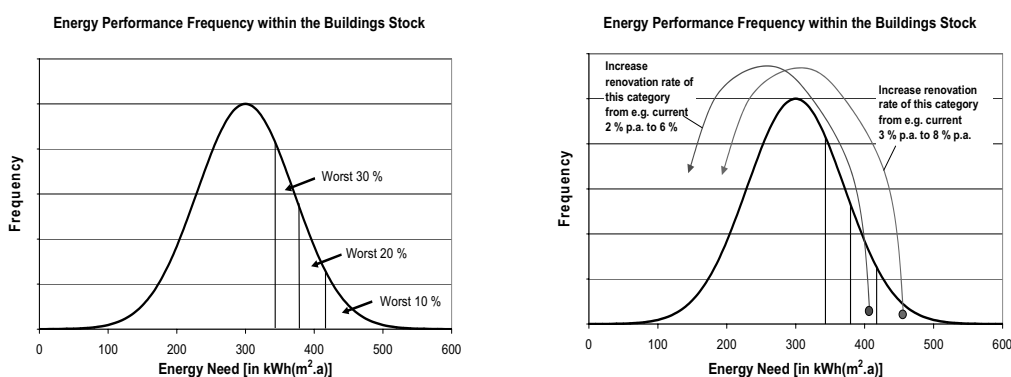


**Figure 3.** Development of strengthened building codes, German (left) and Danish (right) example

Furthermore, the energy performance differs by building type and the location, due to traditionally different methods of construction in individual Member States.

*Proposal:* Requirement for Member States to monitor the buildings stock and lay down Action Plans how to increase the refurbishment rate and the energy performance of the worst performing buildings

A countrywise monitoring of the building stock looking at the distribution of energy performance levels is proposed to help identify the worst performing buildings. Initiatives and measures to improve the energy efficiency could then be focussed on specific buildings, i.e. those with a performance below a specified threshold (see Figure 4).



**Figure 4.** Illustration of the revolving stock concept



Sufficient statistical data on the national building stocks is a precondition for this approach, which aims at shifting poorly performing buildings towards better performance. According to analysis of the European ODYSSEE project<sup>91</sup>, the level of available statistics on the building stock today varies widely within the EU. The distribution frequency of energy performance levels for building types is not known in numerous Member States<sup>92</sup>. This situation hampers a systematic regulatory action to focus on worst performing buildings. Member States could be asked to improve the situation by developing detailed statistics on their buildings stock. Based on experience with most advanced countries, this is likely to take several years. On the other hand, Member States are asked to create detailed sectorial energy statistics for other purposes anyway, such as for the National Energy Efficiency Action Plans, which are required by the Energy End Use and Services Directive (2006/32/EC). This could help Member State to focus their financial support initiatives especially on the worst performing buildings where the ratio of saved energy or saved ton CO<sub>2</sub> per € spent is best and therefore could create highest economic, social and environmental benefits.

*Impact:* This 'evolving buildings stock' approach is a qualitative one which focuses on worst performing buildings. Measures tend to be of high cost-effectiveness in particular for these buildings. Nonetheless, a quantification of such an approach in terms of energy and emission savings, job creation and social and administrative impacts is very difficult as its detailed implementation and scope still need to be further specified and no EU-wide harmonized statistical data is available. Tentative estimations could be given only. Administrative costs can be estimated to be high as the statistical monitoring of the complex and fragmented buildings stock would have to be done in many Member States first.

Such a requirement would have substantial budgetary implication for Member States if they have to provide funding for the poor performing buildings (which would especially be needed if they are occupied by low income people). Therefore, such an intervention would not fully respect the subsidiarity principle.

#### **5.6.4. Option D4:** Setting up EU-wide low or zero energy/carbon buildings/passive house requirements.

*Current situation:* The buildings that are designed in a way that significantly decreases their energy needs, but providing adequate level of comfort are known under different names; low energy house, zero energy house, high-performance house, passive house<sup>93</sup>, etc.

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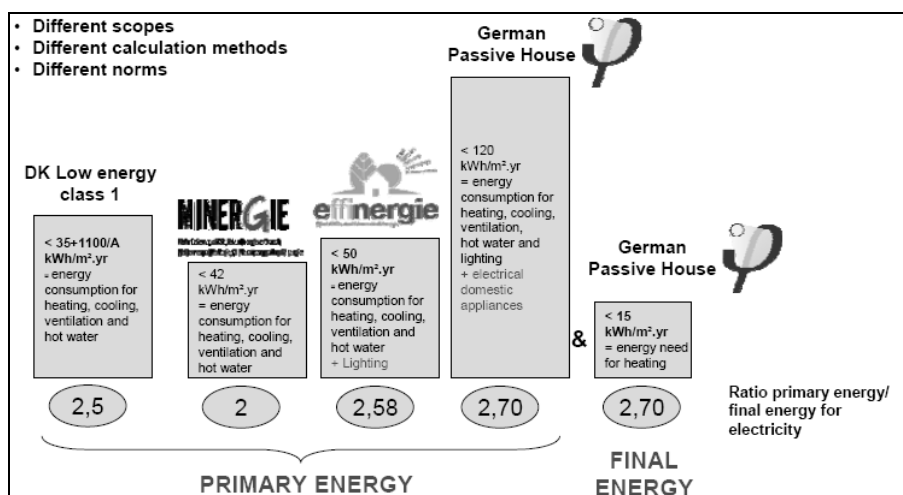
<sup>91</sup> ODYSSEE - Energy Efficiency Indicators in Europe: Project under the Intelligent Energy Europe Programme of the Commission, started in 1993, still ongoing (<http://www.odyssee-indicators.org/>)

<sup>92</sup> 11 Member States of EU-25 do not dispose of sufficient energy efficiency indicators and data for the household and services sectors according to a presentation of Didier Bosseboeuf, ADEME (ODYSSEE project partner) at workshop 'New energy indicators for buildings and appliances: the way forward' of the International Energy Agency, Paris, 25-26 October 2007.

<sup>93</sup> The passive house concept was developed in Germany and refers to buildings that assure a comfortable indoor climate in winter without the need for a conventional heating system (with annual demand for space heating of 15 kWh/(m<sup>2</sup>a)) which means that they roughly use 85% less energy to heat that a house built to existing German building regulations. The extra costs of construction are repaid over a reasonable time period through the reduced heating bills in a typical Northern European climate. The application of this definition has some limitations for Southern climates where the air-conditioning demand is high and cannot be applied. (<http://www.passive-on.org/en/details.php>) For convenience in the document hereinafter the term low energy buildings is used.

The definitions and calculations methodologies differ a lot between EU Member States (i.e. seven Member States have official definitions and further seven are currently developing them).

**Figure 5.** illustrates well the different approaches used in Denmark (DK low energy class 1), Switzerland (Minergie), France (effnergie) and Germany (passive house)<sup>94</sup>.



Several Member States<sup>95</sup> have made ambitious policy statements and have set up long-term targets for achieving the low energy standards for new houses. For example, in the Netherlands there is a voluntary agreement with industry to reduce energy consumption compared to the present building codes by 25% in 2011 and 50% in 2015 (which is close to passive house) and to have energy neutral buildings in 2020. In the UK the ambition is to have zero carbon homes by 2016. In France by 2012 all new buildings should comply with "low-consumption" standard, and by 2020 be energy positive, i.e. produce energy. However, the concrete details for the realization of some of these plans are still under development.

The European Parliament<sup>96</sup>, stakeholder organizations and some respondents to the public consultation have called for the introduction of very low energy requirements (passive house standard) for new buildings in the revised EPBD.

However, so far the uptake of these houses has been limited, i.e. in the whole EU there are only 12-13,000 passive houses of which approximately 9-10,000 are located in Germany and 2,000 in Austria<sup>97</sup>.

*Proposal:* A requirement can be introduced in the revised EPBD that all newly constructed buildings must meet the low energy building requirements from a certain date.

<sup>94</sup> Effnergie presentation, March 2007. Adapted from EUROACE SBI Survey, March 2008: European national strategies to move towards very low energy buildings

<sup>95</sup> Engelund Thomsen, SBI and Wittchen, SBI, for EuroACE European national strategies to move towards very low energy buildings, 2008

<sup>96</sup> P6\_TA(2008)0033

<sup>97</sup> Mission report VB EACI

Alternatively, Member States can be encouraged to set a definition and strategy for achieving the low energy building standard where the final and intermediary target years are clearly mentioned.

*Impact:* The benefits to the decrease of energy consumption, CO<sub>2</sub> emission reductions can be considerably high, roughly estimated at 15 Mtoe energy savings and 41 Mt CO<sub>2</sub> savings per year by 2020 (if a full uptake is considered to start in 2012 for all new buildings). However, the investment needs for such change are also substantial. In general, studies suggest that the price increase of houses would be in the range of 7 to 15%<sup>98</sup>.

In addition, to achieve a full market transformation, so that each year about 210 million m<sup>2</sup> of new residential and commercial buildings in the EU-27 meet this standard would be a huge challenge and would require a substantial change in the construction and buildings market. The full accumulation of necessary knowledge, training of relevant experts, such as architects, constructors, auditors, and availability of construction products and technologies will take about 10 to 15 years.

Investment costs for passive housing are also substantial. To construct all new build up to passive house requirements every year in the EU would cost between €50 billion to €120 billion a year<sup>99</sup> on top of regular construction costs for new buildings. This would lead to very high employment creation with the potential of creating from 240,000 to 580,000 jobs for the passive housing construction sector (i.e. architects, consultants, specialized construction firms and workers). It is important to note that these numbers are purely indicative as the realization of 210 million m<sup>2</sup> of passive housing a year is currently not feasible. Thus job creation must be understood to be proportional to the extent to which passive housing expansion occurs.

Therefore, although the environmental and security of supply benefits of having all new buildings consuming minimal quantities of energy are self evident, it may not be practical to introduce low energy buildings requirements in a short-term in all member States. This is due to the low penetration rates in Europe, higher costs, lack of trained professionals and low readiness of the construction industry to deliver large quantities of low energy buildings in all EU Member States. Furthermore, such requirements would also not respect the subsidiarity and proportionality principle as they would require investments that are not in all cases cost-efficient and would create a burden for the national budgets since they would have to support households that would not be able to afford to build such low energy homes, which are more expensive than cost-optimal ones.

If Member States are encouraged to set a vision for achieving the low energy building standard, this will send a strong signal to the construction industry that a market transformation is sought. In response they shall plan and act accordingly but would also allow for the national differences to be taken into account by each Member State. In addition, the public sector can play exemplary role in promoting low energy buildings concepts. This can possibly be achieved by including more rigorous provisions for the sector in these strategies,

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<sup>98</sup> For example, <http://www.communities.gov.uk/documents/planningandbuilding/pdf/153125.pdf>Audenart (energy policy), <http://www.passive-on.org/en/details.php>

<sup>99</sup> Calculation assumptions: 100 kWh/m<sup>2</sup> lower total final energy need of these type of buildings than the ones required in a business as usual. Average prices of newly constructed square meter taken are based on ADEME figures (<http://www2.ademe.fr/servlet/KBaseShow?sort=-1&cid=96&m=3&catid=15019>), and calculated extra costs (7% -15%) associated with passive housing and the benchmarking goals of 210 million m<sup>2</sup> per year.

i.e. by introducing earlier dates at which new public buildings will meet the low energy requirements. This suggestion is in line with the thinking of some of the major stakeholders and responses from the public consultation.

## 6. COMPARING THE OPTIONS

Energy efficiency in the buildings sector is an effective means to fight climate change and to achieve EU energy policy objectives. Even though many measures have been taken, a very important savings potential still remains to be harnessed. In looking for ways to achieve additional savings, three alternative policy approaches have been studied. The first one was to repeal the existing legal framework, in particular the EPBD, and use only 'soft' instruments. The second approach was to 'do nothing more' than the existing measures, but to strengthen their uptake. Thirdly, the possibility of adding EU action by complemented and improved instruments of the current EPBD was discussed (Section 4).

The impact analyses showed that completion of the regulatory framework including, notably the Energy Performance of Buildings Directive EPBD, the main EU legal tool, is the appropriate action to address the existing problems. In order to improve the effectiveness of the Directive, the first step taken was to obtain certain clarifications and analyse possible simplifications. In addition, a set of possibilities for the improvement of each of the main pillars of the EPBD were discussed in Section 5.

For each option an evaluation of its economic, social and environment implications was made, based on the availability of data and the inputs provided by Member States and a number of stakeholders. As energy efficiency is a key driver, the impacts on energy savings have been quantified for most of the options. However, this has not always been the case of the investment needs or administrative costs and job creation. Wherever possible, quantitative data has been provided. However, due to limitations of data availability in some cases qualitative indications of the impact have been made.

The impacts of each option are presented in the tables in relation to the baseline (i.e. based on following the construction, demolition and renovation rates, and energy-efficiency measures in retrofits). However, if there was no possibility for quantification their relative impact compared to the other options was included. The summing up of the individual impacts has been done on the basis of the BEAM model and studies. The BEAM model is a holistic, closed calculation instrument that reproduces the building stock by reference buildings. In this context and with regard to quantified energy and CO<sub>2</sub> saving impacts, overlapping effects of the individual options analysed were taken into consideration and overlaps in the results were eliminated. The individual options analysed were not calculated independently by the model but within connected loop model runs. Additionally, where modelling of the impacts was not possible by the BEAM model, the results of the studies available were used and extrapolated to EU-27.

For some of the following tables, not all options were fully quantifiable and therefore contain symbols which mean:

- +++: very high energy/CO<sub>2</sub> saving potential, very low capital costs or very high job potential, comparable to the highest figures which were quantified for other options.
- ++: high energy/CO<sub>2</sub> saving potential, low capital costs or high job potential, at about 25 – 50% lower than the highest figures which were quantified for other options.
- +: energy/CO<sub>2</sub> saving potential, moderate capital costs or job potential, about 75% lower than the highest figures which were quantified for other options.

**A: 1000 m<sup>2</sup> threshold for existing buildings when they undergo major renovation**

(regarding minimum energy performance requirements)

Three options were studied under this pillar:

Option A1: Lowering the threshold to 500 m<sup>2</sup>, to include all medium sized buildings.

Option A2: Lowering the threshold to 200 m<sup>2</sup>, to include all buildings apart from small ones (mainly single family houses).

Option A3: Abolishing the 1000 m<sup>2</sup> threshold to include all buildings.

The table below includes a summary of their EU-27 impacts compared to the business as usual scenario (full implementation of existing EPBD).

	Option A1	Option A2	Option A3
Final energy savings in 2020 (Mtoe/a)	3	5	<b>20</b>
CO <sub>2</sub> emission reductions in 2020 (Mt/a)	8	14	<b>51</b>
Capital costs in 2020 (billion €/a)	1 / 3	2 / 7	<b>8 / 25</b>
Job creation in 2020	10,000	21,000	<b>75,000</b>
Comment	CO <sub>2</sub> abatement costs of about -250 €/ton. Low administrative costs as the threshold (regardless whether A1, A2 or A3) can easily be embedded in existing national legislation. Executive bodies have to deal with a slightly higher number of cases (e.g. refurbishment permits).	CO <sub>2</sub> abatement costs of about -357 €/ton. See remark on A1. Executive bodies have to deal with a higher number of cases (e.g. refurbishment permits).	<b>CO<sub>2</sub> abatement costs of about -333 €/ton. See remark on A1. Executive bodies have to deal with a considerably higher number of cases (e.g. refurbishment permits).</b>

The analysis indicates that option A3 could most significantly contribute to the realization of the EU policy objectives in question, followed by A2.

**B: Energy performance certificates**

Four options were studied under this pillar:

Option B1: Quality and compliance requirements for certificates

Option B2: Requiring the recommended cost-effective measures of the certificate are realized within a certain time period

Option B3: Making certificates a mandatory part of property advertisement and/or property transaction documents

Option B4: Requiring a linking of certificates with other support/discouragement mechanisms

The table below includes a summary of their EU-27 impacts compared to the business as usual scenario (full implementation of existing EPBD).

	Option B1	Option B2 <sup>100</sup>	Option B3	Option B4
Final energy savings in 2020 (Mtoe/a)	<b>21</b>	12	+++ <sup>101</sup>	++ <sup>102</sup>
CO <sub>2</sub> emission reductions in 2020 (Mt/a)	<b>57</b>	33	+++ <sup>101</sup>	++ <sup>102</sup>
Capital costs in 2020 (billion €/a)	<b>8 (but about 26 saved energy costs)</b>	About 5.3 (but about 9.3 saved energy costs) <sup>103</sup>	<b>Very low</b> <sup>104</sup>	Depends very much on type and scope of measures <sup>105</sup>
Job creation in 2020	<b>60,000 (by 2020)</b>	About 100,000 (by 2020; see footnote on capital costs)	+++ <sup>106</sup>	++ <sup>102</sup>
Comment	<b>CO<sub>2</sub> abatement costs of about -315 €/ton. Highly beneficial proportion of administrative costs (10 – 32M€) and saved energy costs. High and reliable quality is a key element for the functioning of the certification instrument.</b>	Compliance control could lead to considerable administrative costs. This requirement could lead to challenges for those who cannot afford the one-off investment, although the economic benefits would outbalance in the long run.	<b>Similar low administrative costs and similar positive effect to end consumers as the broadly known requirement to display the fuel consumption and CO<sub>2</sub> emissions in advertisements and transaction articles for cars.</b>	Low administrative costs (Member States only need to link the EPBD to support measures). Impact depends on applied support measures, e.g. the scope of financing instruments. Specification of measures is outside the scope of this Directive.

<sup>100</sup> Impact quantified for the tertiary buildings sector only, so figures do not contain potential of residential sector.

<sup>101</sup> Expected to be very high due to creating more awareness and a demand driven market for energy efficient buildings throughout the society by giving transparent information on the energy performance of a building.

<sup>102</sup> Expected to be high, based on experience of Member States which use already similar instruments.

<sup>103</sup> Proposed option stimulates refurbishments. Capital costs and job creation (not specified in Section 5) can therefore approximately be quantified by same factor of costs and jobs per energy savings as in option A1 to A3 and are extrapolated in this way.

<sup>104</sup> For citizens and administration, as information needed for this action can be taken out of existing certificates.

<sup>105</sup> Experienced Member States such as Germany e.g. show that the amount of given subsidies is outbalanced by stimulated investments and additional tax incomes related.

<sup>106</sup> Expected to be very high due to indirect stimulation of constructions/refurbishments of higher quality in order to improve the energy rating of a building in the certificate.

The analysis indicates that options B1 and B3 could significantly contribute to the realization of the EU policy objectives in question. Option B4 could also be further developed outside the scope of the EPBD.

### C: Inspection of boilers and air-conditioning systems

Two options were studied under this pillar:

Option C1: Requiring an 'inspection report' for heating and air-conditioning systems

Option C2: Quality and compliance requirements for inspections

The table below includes a summary of their EU-27 impacts compared to the business as usual scenario (full implementation of existing EPBD).

	Option C1	Option C2
Final energy savings in 2020 (Mtoe/a)	5	++ - +++ <sup>107</sup> (estimated to be even higher than option C1)
CO <sub>2</sub> emission reductions in 2020 (Mt/a)	15 - 20	++ - +++ <sup>107</sup> (estimated to be even higher than option C1)
Capital costs in 2020 (billion €/a)	Net benefits (investment minus energy savings) estimated at €2 billion per year. Admin. costs expected to be low, as information needed should mainly be available from existing obligations (certificates and inspections).	Expected to be of the same magnitude as the similar option B1 on certificates.
Job creation in 2020	46,000	23,000
Comment	CO <sub>2</sub> abatement costs of about -133 €/ton. Administrative costs can be kept low when Member States embed the inspection report regime into the existing regime for energy performance certificates for buildings.	CO <sub>2</sub> abatement costs estimated to be of the same magnitude as option C1. Highly beneficial proportion of administrative costs and savings.  High and reliable quality is a key element for the functioning of the inspection instrument.

The analysis indicates that options C1 and C2 together (option C2 requires option C1) could significantly contribute to the realization of the EU policy objectives in question without leading to negative social or administrative implications.

<sup>107</sup>

Contributes to realize the high total technical savings potential for heating and air-conditioning systems of about 70 Mtoe energy and more than 250 Mt CO<sub>2</sub> per year.



**D: Energy performance requirements**

Option D1: Specifying EU – wide energy performance requirements

Option D2: Introducing a benchmarking mechanism

Option D3: Requiring an evolving improvement scheme for the buildings stock focussing on the worst performing buildings (a kind of top-runner approach)

Option D4: Setting up EU-wide low or zero energy/carbon buildings/passive house requirements.

The table below includes a summary of their EU-27 impacts compared to the business as usual scenario (full implementation of existing EPBD).

	Option D1	Option D2	Option D3	Option D4
Final energy savings in 2020 (Mtoe/a)	9.5	<b>5 (up to 9.5 in 2030)</b>	+ <sup>108</sup>	Up to 15 (cutting the energy needs of newly constructed buildings to 0 – 20 % of today's average energy requirements)
CO <sub>2</sub> emission reductions in 2020 (Mt/a)	24	<b>13 (up to 24 in 2030)</b>	+ <sup>108</sup>	Up to 41 (cutting the CO <sub>2</sub> emissions of newly constructed buildings to 0 – 20 % of today's requirements)
Capital costs in 2020 (billion €/a)	6 / 12	<b>3 / 6 (up to 6 / 12 in 2030)</b>	Highly beneficial LLCC capital costs to savings ratio	50 - 120
Job creation in 2020	82,000	<b>up to 82,000</b>	+ <sup>109</sup>	+++
Comment	CO <sub>2</sub> abatement costs of about -250 €/ton. Very high administrative costs expected due to dramatic changes to complex national building regulations. Complex, long-lasting task; strong concerns of Member States expected with regard to subsidiarity.	<b>CO<sub>2</sub> abatement costs of about -250 €/ton. Very low administrative costs as the instrument is a guide/ support tool for public authorities. Presupposed that the 'guiding' benchmarking actually leads Member States to strengthen their requirements to cost-optimal (LLCC) levels.</b>	High administrative costs. Soft instrument, leaving lot of freedom to Member States. Should be embedded in activities on National Energy Efficiency Action Plans, requested by Directive 2006/32/EC.	Low administrative costs expected (can be embedded in existing national building regulations).

The analysis indicates that option D2 could significantly and quickly contribute to the realization of the EU policy objectives in question. Option D3 could be taken on board by Member States when starting national activities, in particular related to the National Energy

<sup>108</sup> Contributes to realize the high cost-effective savings potential of the sector of about 143 Mtoe/a (final) or 382 Mt/a CO<sub>2</sub>.

<sup>109</sup> Can contribute to the potential number of 82,000 new jobs presented under D1 and D2.

Efficiency Action Plans. Option D4 could be considered, due to economic and legal constraints, in a less prescribed form, i.e. by national visions/roadmaps.

The Impact Assessment identified the recast of the Energy Performance of Buildings Directive as the most appropriate way to enhance energy efficiency in buildings in a cost-effective way and to achieve the EU energy and climate change policy objectives, as outlined in sections 4.3 and 5. The recast could introduce clarifications and simplifications to facilitate the implementation of the Directive and furthermore (i) abolish the 1000 m<sup>2</sup> threshold for existing buildings when they undergo major renovation (option A3) (ii) require quality and compliance control schemes for energy performance certificates (option B1) and make certificates a mandatory part of property advertisement and/or property transaction documents (option B3); (iii) for the inspections of heating and air-conditioning systems, to require an inspection report being handed over to building owners (option C1) and requiring quality and compliance control schemes (option C2); and (iv) to introduce a benchmarking mechanism for energy performance requirements (option D2). In line with the holistic approach of the Directive, these proposed completions should be accompanied by other policy tools on financing (e.g. as presented under option B4), by public buildings acting as a leading example (see Section 5.2.2) and roadmaps on low/zero energy/carbon buildings (presented under option D4).

The results for the most cost-effective and beneficial options (indicated in bold in the tables above) with quantifications available **show significant positive impacts which are possible if the Directive is revised, that would make use of a large part of the remaining potential in the buildings sector and would also contribute to the realization of the full potential of the current EPBD.** Furthermore, such a revision would create a simplified and improved framework for energy savings. The minimum total impact of the options identified as being most beneficial and for which quantification was possible, is:

- 60 – 80 Mtoe/year energy savings in 2020, i.e. reduction of 5-6% of the EU final energy in 2020;
- 160 to 210 Mt/year CO<sub>2</sub> savings in 2020, i.e. 4-5% from EU total CO<sub>2</sub> emissions in 2020;

The impact on the labour market would also be important. It is expected that 280,000 (to 450,000) potential new jobs will be created by 2020 by the revised EPBD. This would mainly be in the construction sector and for the services of energy certifiers and auditors and inspectors of heating and air-conditioning systems.

The investment requirements and the administrative costs of the measures were analysed and are relatively low compared to the benefits and the returns. For example, abolishing the 1000 m<sup>2</sup> threshold would lead to €8 billion/year additional capital investments but would trigger €25 billion/year energy cost savings by 2020, which in return means considerably negative CO<sub>2</sub> abatement costs. These calculations have been made on the basis of conservative estimates about the oil price (e.g. 55\$ per barrel oil in 2005, 100\$ in 2020 and 119 \$ in 2030 in year 2005 prices).

The investment needs differ substantially across Europe depending on the social and economic conditions, on the initial state of the property and on the type of renovations people undertake. They are not equally distributed to EU citizens, i.e. there will be additional costs for those who make major renovation of their buildings or are engaged in property transaction. However, with increasing oil prices these initial investments will have attractive returns.

The overall benefits for society in terms of reduced energy consumption and hence reduced CO<sub>2</sub> emissions and energy import dependency, job creation, especially at local and regional level, positive health and labour productivity exceed the costs of the measures proposed.

Finally, it needs to be underlined that the implementation of the current legislation remains a priority. Any legal framework also needs the support from other non-regulatory policy measures. Financing, fiscal, information and communication tools are indispensable.

## **7. MONITORING AND EVALUATION**

The Directorate-General for Energy and Transport will continue its assessment on the legal transposition of the EPBD. However, there is a general lack of comprehensive data on the EU buildings and their energy use, which is a serious limitation when it comes to monitoring the implementation of the EPBD and evaluating the progress made in terms of energy savings. Such data should be provided in the framework of the existing Community structures, i.e. Eurostat. These, for example, can include data on energy savings and CO<sub>2</sub> emissions, the number of certificates, energy related renovation, number of trained experts.

A link with the reporting requirements of the Energy Services Directive (ESD) shall be better established. For this purpose, it will be necessary to further explore how and what information on energy efficiency in the buildings sector could be provided in the next National Energy Efficiency Action Plans. Some specific data, for example on uptake of cost-efficient recommendations of certificate and inspection reports and of low energy houses, can be carried out within projects supported within the EU Intelligent Energy Europe programme.



**RAT DER  
EUROPÄISCHEN UNION**

**Brüssel, den 19. November 2008 (16.01)  
(OR. en)**

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**Interinstitutionelles Dossier:  
2008/0223 (COD)**

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ADD 2**

**ENER 398  
ENV 850  
CODEC 1592**

**ÜBERMITTLUNGSVERMERK**

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Absender: Herr Jordi AYET PUIGARNAU, Direktor, im Auftrag des  
Generalsekretärs der Europäischen Kommission

Eingangsdatum: 17. November 2008

Empfänger: der Generalsekretär/Hohe Vertreter, Herr Javier SOLANA

Betr.: Arbeitsdokument der Kommissionsdienststellen  
- Begleitpapier zum Vorschlag für eine Neufassung der Richtlinie über  
die Gesamtenergieeffizienz bei Gebäuden (2002/91/EG)  
= Zusammenfassung der Folgenabschätzung

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Die Delegationen erhalten in der Anlage das Kommissionsdokument - SEK(2008) 2865.

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Anl.: SEK(2008) 2865



KOMMISSION DER EUROPÄISCHEN GEMEINSCHAFTEN

Brüssel, den 13.11.2008  
SEK(2008) 2865

**ARBEITSDOKUMENT DER KOMMISSIONSDIENSTSTELLEN**

*Begleitpapier zum*

**VORSCHLAG FÜR EINE NEUFASSUNG DER  
RICHTLINIE ÜBER DIE GESAMTENERGIEEFFIZIENZ BEI GEBÄUDEN  
(2002/91/EG)**

**ZUSAMMENFASSUNG DER FOLGENABSCHÄTZUNG**

{KOM(2008) 780 endgültig}  
{SEK(2008) 2864}

## ZUSAMMENFASSUNG DER FOLGENABSCHÄTZUNG

### *Der Gebäudesektor in der EU und die Ziele der EU-Politik*

Der Energieverbrauch in Privat- und Geschäftsgebäuden hat mit etwa 40 % einen wesentlichen Anteil am gesamten Endenergieverbrauch der EU und an ihren CO<sub>2</sub>-Emissionen. Tätigkeiten im Gebäudebereich sind ein bedeutender Faktor der EU-Wirtschaft mit einem Anteil von etwa 9 % am BIP und von 7 – 8 % an der Beschäftigung in der EU. Es besteht ein beträchtliches Potenzial für kostenwirksame Energieeinsparungen, die für Wirtschaft, Gesellschaft und Umwelt erheblichen Nutzen mit sich bringen würden. Der Gebäudesektor der EU kann daher eine Schlüsselrolle für das Erreichen der Wachstums-, Energie- und Klimaziele der EU spielen und dazu beitragen, den Bürgern zu mehr Komfort und niedrigeren Energiekosten zu verhelfen. Die Energieeffizienz von Gebäuden ist auch eine wichtige Komponente bei den wichtigsten Initiativen zur Erreichung der Energie- und Klimaziele der EU, die in der Mitteilung der Kommission *Eine Energiepolitik für Europa*<sup>1</sup> dargelegt sind.

### *Rechtsetzungsmaßnahmen der EU*

Unter den bestehenden zentralen Instrumenten der EU ist die Richtlinie über die Gesamtenergieeffizienz bei Gebäuden das wichtigste, das einen ganzheitlichen Ansatz für eine effiziente Energienutzung im Gebäudesektor verfolgt. Sie berücksichtigt den Energiebedarf für Heizung, Warmwasserbereitung, Kühlung, Lüftung und Beleuchtung.

Die Richtlinie vereint in einem Rechtstext mehrere Regulierungsinstrumente (d.h. Anforderungen an die Energieeffizienz) und Instrumente auf Informationsbasis (d.h. Energieausweise und Inspektionen):

- Die Mitgliedstaaten müssen Mindestanforderungen an die Gesamtenergieeffizienz neuer Gebäude und bestehender großer Gebäude, die einer größeren Renovierung unterzogen werden sollen, festlegen.
- Die Mitgliedstaaten müssen ein System für Ausweise über die Gesamtenergieeffizienz entwickeln, das Aufschluss über die Qualität der Energieeffizienz eines Gebäudes sowie über Ansatzpunkte für Verbesserungen gibt. Die Ausweise gelten 10 Jahre und sollten potenziellen Käufern/Mietern vorgelegt werden.
- Die Mitgliedstaaten müssen ein System für die regelmäßige Inspektion mittlerer und großer Heizungs- und Kühlanlagen einrichten, damit deren Energieeffizienz überwacht und optimiert werden kann. Alternativ können die Mitgliedstaaten Sensibilisierungskampagnen durchführen, wenn sie nachweisen, dass diese Kampagnen genauso effektiv sind wie die Inspektionen.

Die Richtlinie legt keine EU-weiten Standards fest, sondern verpflichtet die Mitgliedstaaten zur Schaffung der für die Umsetzung ihrer Bestimmungen erforderlichen Mechanismen. Die Mitgliedstaaten müssen auch ihre eigenen Verfahren entwickeln oder bestehende europäische Normen für die Berechnung der Gesamtenergieeffizienz von Gebäuden anwenden und dafür

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<sup>1</sup> KOM(2007) 1

sorgen, dass es ausreichend qualifizierte Experten für die Erstellung der Energieausweise und die Durchführung der Inspektionen gibt.

Der bisher wichtigste Erfolg der Richtlinie über die Gesamtenergieeffizienz besteht darin, dass durch sie das Thema der Energieeffizienz von Gebäuden Eingang in die politische Agenda, in die Bauvorschriften und in das Bewusstsein der Bürger gefunden hat. Die Umsetzung der Richtlinie war für viele Mitgliedstaaten eine echte Herausforderung, aber bisher erklären 22 von ihnen, dass sie die Richtlinie vollständig umgesetzt haben (wird derzeit geprüft). Zu den Kosten der Umsetzung gaben mehrere Mitgliedstaaten an, dass dank der Richtlinie bei nur moderaten Kosten erhebliche Energieeinsparungen im Gebäudebereich erzielt werden konnten.

### ***Weiterer Handlungsbedarf?***

Trotz der im Gebäudebereich bereits durchgeführten Maßnahmen bleiben beträchtliche Energiesparpotenziale nach wie vor ungenutzt. Der Grund dafür sind die komplexe Struktur des Sektors und Fälle von Marktversagen (z.B. unvollständige Internalisierung externer Faktoren bei Energiepreisen, Probleme zwischen Mieter und Vermieter, unvollständige Informationen und zögerliche Verbreitung neuer und innovativer Technologien), aber auch Mängel im Wortlaut der derzeitigen Richtlinie und zu geringer Ehrgeiz bei ihrer Umsetzung.

Alternativen zur Bewältigung der Herausforderungen:

- Aufhebung der Richtlinie und Einführung „weicher“ Politikinstrumente an ihrer Stelle. Diese Lösung würde proaktive und sehr ehrgeizige Maßnahmen von allen Mitgliedstaaten verlangen und ihnen sehr hohe Kosten aufbürden.
- Unveränderte Politik oder „keine weiteren Maßnahmen“, einschließlich Fortsetzung und Verbesserung der Umsetzung. In diesem Falle würden weder das Potenzial außerhalb der Richtlinie noch die Möglichkeiten der Richtlinie selbst ausgeschöpft.
- Maßnahmen der EU in Form ergänzender und verbesserter Instrumente zusätzlich zur gegenwärtigen Richtlinie.

Von den drei genannten Alternativen bietet eine Überarbeitung der Richtlinie die besten Aussichten, den Zielen der EU-Politik ein gutes Stück näher zu kommen. Die Überarbeitung kann in Form von Änderungen der geltenden Bestimmungen geschehen, um ihre Wirksamkeit deutlich zu verbessern, ohne die Grundsätze in ihrem Wesen anzutasten. Dies würde die Umsetzung und das Verständnis der vorgeschlagenen Änderungen erleichtern. Gleichzeitig könnten größere Potenziale erschlossen und entsprechende Nutzeffekte freigesetzt werden. Die weitere Umsetzung der Richtlinie ist von zentraler Bedeutung.

Das Mittel der Wahl ist jedoch ein integrierter Mix von Politikinstrumenten und anderen nicht regulatorischen Maßnahmen, die zwar als solche nicht ausreichend sind, aber ergänzend zur Umsetzung der Richtlinie notwendig. Die Anstrengungen zur Einführung weiterer finanzieller und steuerlicher Anreize, Verbesserung der Information, Schulung von Experten und Vereinbarung freiwilliger Maßnahmen sollten verstärkt werden. Die bereits in der Richtlinie enthaltenen „Soft law“-Instrumente sollten weiterentwickelt werden.

### ***Die Grundlage für ein Tätigwerden der EU***

Klimaänderung, Sicherheit der Energieversorgung und Umweltschutz sind Probleme, die ein koordiniertes Handeln auf EU-Ebene verlangen. Die Energieeffizienz ist ein Beitrag zur Lösung dieser Probleme und die in diesem Bereich auf EU-Ebene bereits verabschiedeten Instrumente verdeutlichen die Notwendigkeit eines Handelns auf Gemeinschaftsebene.

Der Gebäudebereich verursacht etwa die Hälfte der CO<sub>2</sub>-Emissionen, die nicht in den Emissionshandel einbezogen sind, und bietet ein beträchtliches Potenzial für die Reduzierung der CO<sub>2</sub>-Emissionen bei keinerlei oder geringen Kosten. Die besonderen Merkmale des Gebäudesektors bestimmen das Ausmaß der Energieeffizienzgewinne, und die Bauprodukte, Ausrüstungen und Dienstleistungen für Gebäude sind ein wichtiger Teil des EU-Binnenmarktes. Angesichts der zunehmenden Mobilität der Bürger und der steigenden Zahl von Unternehmen mit Niederlassungen in der gesamten EU würden vergleichbare Maßnahmen den Verwaltungsaufwand für die Betroffenen senken.

Die Ziele im Bereich der Energieeffizienz könnten also von den Mitgliedstaaten allein nicht in ausreichendem Maße erreicht werden, und ein Handeln auf Gemeinschaftsebene ist notwendig, um die Übernahme von Maßnahmen auf nationaler Ebene zu erleichtern und zu unterstützen. Die wichtigsten Komponenten der derzeitigen Richtlinie wurden unter dem Gesichtspunkt des Prinzips der Subsidiarität und der Verhältnismäßigkeit bereits erörtert, als die Richtlinie 2002 verabschiedet wurde, und haben in der Praxis die Angemessenheit des Konzepts unter Beweis gestellt.

#### *Welche Optionen bestehen für die Verbesserung der Richtlinie?*

Die Folgenabschätzung hat gezeigt, dass die Richtlinie in mehrfacher Hinsicht verbessert werden kann. Dabei geht es zum einen um die Korrektur missverständlicher Formulierungen und zum anderen um die einzelnen Hauptkomponenten der Richtlinie in ihrer jetzigen Form. Für jede Hauptkomponente wurden mehrere Optionen im Hinblick auf ihre wirtschaftliche, gesellschaftliche und ökologische Wirkung und ihre Auswirkungen in Bezug auf Subsidiarität und Verhältnismäßigkeit untersucht.

Für diese Analyse wurde ein umfangreiches Daten- und Informationsmaterial hinzugezogen: z.B. Ausgangsdaten und Projektionen nach dem PRIMES-Modell der GD TREN, das BEAM-Modell von Ecofys, über 35 Studien, die Erfahrungen bei der Umsetzung der derzeitigen Richtlinie sowie Material der Mitgliedstaaten und der betroffenen Interessengruppen.

Die geprüften Optionen umfassen einen Mix von Politikinstrumenten und nicht regulatorische Alternativen wie Information und andere „weiche“ Maßnahmen. Es wurden fünf Hauptbereiche für Maßnahmen ermittelt:

#### **Klärung und Vereinfachung**

Diese sind für eine ordnungsgemäße Umsetzung der Richtlinie entscheidend. Dieser Bereich umfasst zwei Hauptmaßnahmen: (i) Klärung und Vereinfachung des eigentlichen Textes und (ii) Wahl der geeigneten Rechtsform (Neufassung oder Änderung).

#### **A: Grenzwert von 1000 m<sup>2</sup> für bestehende Gebäude, die einer größeren Renovierung unterzogen werden sollen**

Mit den derzeitigen Bestimmungen der Richtlinie, wonach nur bestehende Gebäude über 1000 m<sup>2</sup> bestimmten Anforderungen an die Energieeffizienz genügen müssen, wenn sie einer größeren Renovierung unterzogen werden (d.h. entweder bei Investitionen über 25 % des



gesamten Gebäudewerts, den Wert des Grundstücks nicht mitgerechnet, oder bei Renovierungen, die über 25 % der Gebäudehülle betreffen), wird der Gebäudesektor in der EU nur zu etwa 29 % erfasst. Natürlich eignet sich der Zeitpunkt einer größeren Renovierung am besten für Maßnahmen zur Verbesserung der Energieeffizienz (ca. alle 25 - 40 Jahre). Der Bedarf an zusätzlichen Investitionen ist dann nicht hoch und die Aufwendungen amortisieren sich dank der Energieeinsparungen innerhalb der Wirkungsdauer der Maßnahmen.

Für eine etwaige Erweiterung des Geltungsbereichs der Richtlinie wurden drei Optionen untersucht:

*Option A1: Senkung des Grenzwertes auf 500 m<sup>2</sup>*

*Option A2: Senkung des Grenzwertes auf 200 m<sup>2</sup>*

*Option A3: Abschaffung des Grenzwertes von 1000 m<sup>2</sup>*

Bei jeder Option müssten die Mitgliedstaaten nach wie vor die einzelnen Anforderungen an die Energieeffizienz festlegen, die Definition des Begriffs „größere Renovierung“ würde beibehalten.

Die Analyse ergab, dass Option A3 den größten Nutzeffekt hätte.

### **B: Ausweise über die Gesamtenergieeffizienz**

Die gemäß der bisherigen Richtlinie bereits vorgeschriebenen Ausweise können ein sehr effizientes Instrument sein, um einen nachfragegesteuerten Markt für energieeffiziente Gebäude zu schaffen, da die Ausweise es den Wirtschaftsakteuren ermöglichen, die Kosten für Energieverbrauch und -effizienz abzuschätzen. In der Praxis erweist sich jedoch die Qualität mancher Ausweise als unzureichend, auch werden die Ausweise bei Gebäudeverkäufen nicht systematisch zur Verfügung gestellt. Diese Mängel beeinträchtigen den konkreten Nutzen der Ausweise erheblich.

*Option B1: Anforderungen an die Ausweise im Hinblick auf Qualität und Einhaltung der Vorschriften.* Es soll vorgeschlagen werden, dass Behörden oder zugelassene Einrichtungen stichprobenartig kontrollieren müssen, ob die Ausweise den Qualitätsanforderungen und den Bauvorschriften im energietechnischen Bereich entsprechen. So ließe sich gewährleisten, dass die Angaben in den Ausweisen von guter Qualität und zuverlässig sind. Es wird erwartet, dass diese Maßnahme zu einer Zunahme der Renovierungen und damit höheren Energieeinsparungen führen wird.

*Option B2: Einführung einer Frist für die Durchführung der im Ausweis empfohlenen kostenwirksamen Maßnahmen.* Eine solche Vorschrift würde zu hohen Energieeinsparungen führen, aber auch Bürgern und Unternehmen in der EU beträchtliche Kosten aufbürden, da die betreffenden Maßnahmen dann unter Umständen nicht mit einer „größeren Renovierung“ zu kombinieren wären – die Vorschrift wäre daher nicht auf EU-Ebene zu rechtfertigen.

*Option B3: Erklärung der Energieausweise zu verbindlichen Dokumenten bei der Immobilienwerbung und/oder bei Gebäudeverkäufen.* Dies würde dazu führen, dass die Angaben zur Gesamtenergieeffizienz eines Gebäudes in die Immobilienwerbung einbezogen werden (ähnlich wie die Angaben zu den CO<sub>2</sub>-Emissionen bei Neuwagen) und dass der Ausweis bei jedem Gebäudeverkauf vorzulegen ist.

*Option B4: Anforderung einer Kombination der Energieausweise mit anderen Unterstützungs- oder Abschreckungsmechanismen.* Es wird vorgeschlagen, die aufgrund eines finanziellen Anreizes an einem Gebäude durchgeführten Verbesserungen der Energieeffizienz im Energieausweis nachzuweisen oder zu begründen. Dies würde Eigentümern/Mietern fundierte Entscheidungen über die Kostenwirksamkeit ihrer Investitionen erleichtern, und es wäre ein Nachweis vorhanden, dass die Mittel tatsächlich Energieeinsparungen ermöglicht haben. Diese Anforderung verstößt jedoch unter Umständen gegen das Subsidiaritätsprinzip und könnte eine Änderung bei der Rechtsgrundlage der Richtlinie erfordern.

Die Analyse ergab, dass die Optionen B1 und B3 wesentlich zum Erreichen der betreffenden Politikziele der EU beitragen könnten. Option B4 könnte auch außerhalb des Rahmens der Richtlinie weiter entwickelt werden.

### **C: Inspektion von Heizungs- und Klimaanlage**

Diese Anlagen haben sehr hohe Energieeinsparpotenziale von bis zu 40–60 % ihres gesamten Energieverbrauchs. Zur Zeit schreibt die Richtlinie regelmäßige Inspektionen ab einem bestimmten Grenzwert vor, ist jedoch nicht sehr präzise in Bezug auf die Ergebnisse. Auch die Qualität der Inspektionen ist nicht immer zufrieden stellend. Daher wird geschätzt, dass die Richtlinie in ihrer derzeitigen Form bis 2010 nur Energieeinsparungen von etwa 10 % in diesem Bereich bewirken kann. Aber es ist wesentlich mehr möglich.

*Option C1: Vorschrift zur Erstellung eines „Inspektionsberichts“ für Heizungs- und Klimaanlage.* Es wird vorgeschlagen, einen „Inspektionsbericht“ mit Angabe der Energieeffizienzklasse der Heizungs-/Klimaanlage und Verbesserungsempfehlungen durch einen unabhängigen Experten erstellen zu lassen und dem Gebäudeeigentümer zu übergeben. Der Bericht wäre eine wichtige Ergänzung der bestehenden Auflagen und würde es den Verbrauchern erleichtern, relevante Ansatzpunkte für kostenwirksame Energieeinsparungen festzustellen.

*Option C2: Einführung von Auflagen zur Einhaltung der Vorschriften.* Es wird vorgeschlagen, Stichprobenkontrollen mit unterschiedlichem Detaillierungsgrad bei den Inspektionsberichten einzuführen. So könnte sichergestellt werden, dass die Inspektionen regelmäßig und in ausreichender Qualität durchgeführt werden.

Die Analyse ergab, dass die Optionen C1 und C2 im Zusammenwirken den größten Nutzeffekt haben.

### **D: Anforderungen an die Energieeffizienz**

Derzeit legen die Mitgliedstaaten die einzelnen Anforderungen an die Energieeffizienz und ihre Erfolgsziele fest. Diese sind innerhalb der EU sehr unterschiedlich, selbst innerhalb gleicher Klimazonen, und in vielen Mitgliedstaaten wird ein kostenoptimales Niveau noch nicht erreicht. Vergleiche über die Grenzen hinweg gestalten sich aufgrund der unterschiedlichen Berechnungsansätze und verwendeten Parameter schwierig. Daher könnten weitere Anreize auf Gemeinschaftsebene zusätzliche Energieeinsparungen erleichtern.

*Option D1: Festlegung EU-weiter Anforderungen an die Energieeffizienz.* Dies bedeutet, dass spezifische Anforderungen an die Energieeffizienz vorgeschlagen werden. Dadurch könnte ein großer Teil des Potenzials an Energieeinsparungen ausgeschöpft werden, würde grenzüberschreitend tätigen Unternehmen der Betrieb erleichtert und der Binnenmarkt für die

entsprechenden Baumaterialien und Ausrüstungen gefördert. Die Festlegung dieser Anforderungen wäre jedoch eine sehr anspruchsvolle und kontroverse Aufgabe und mit einem sehr hohen Maß an Regulierung auf EU-Ebene verbunden.

*Option D2: Einführung eines Benchmarking-Mechanismus.* Es wird vorgeschlagen, einen Benchmarking-Mechanismus in die Hauptmethodik der Richtlinie einzubeziehen, um das kostenoptimale Niveau der Anforderungen an die Energieeffizienz von Gebäuden zu berechnen. Die derzeitigen Bestimmungen der Richtlinie blieben unverändert und die Mitgliedstaaten müssten nach wie vor die Höhe ihrer eigenen Anforderungen bestimmen. Ein Benchmarking-Mechanismus würde eindeutig Aufschluss darüber geben, welche Mitgliedstaaten unter dem optimalen Niveau liegen, d. h. wenn bei Anwendung der Bauvorschriften finanzielle Mittel für Energieeinsparungen nicht effizient genutzt werden. Es handelt sich hier um ein „weiches“ Instrument, das aber erheblichen „Gruppenzwang“ Druck auslösen könnte, der letztendlich alle Mitgliedstaaten dazu bringt, optimale und damit wesentlich ehrgeizigere Niveaus festzulegen.

*Option D3: Forderung nach einem dynamischen Plan für Verbesserungen beim Gebäudebestand, der zuerst bei den Gebäuden mit den größten Mängeln ansetzt.* Es wird vorgeschlagen, dass die Mitgliedstaaten in Aktionsplänen festlegen, wie die Sanierung der Gebäude mit den größten Mängeln vorangetrieben und ihre Energieeffizienz verbessert werden soll. Ein solches Vorgehen würde den Mitgliedstaaten hohe Verwaltungskosten aufbürden und auch erhebliche Belastung für die Eigentümer der mangelhaften Gebäude mit sich bringen.

*Option D4: EU-weite Festlegung von Anforderungen für Niedrig- oder Nullwerte bei Energieverbrauch/Kohlenstoffemissionen für Gebäude/Passivhäuser.* Die Einführung dieser Anforderung für Neubauten ab einem bestimmten Datum würde zu neuen Gebäuden mit sehr guten Leistungsprofilen führen und auch die Innovation begünstigen. Allerdings würden auch die Immobilienpreise steigen und die zusätzlichen Investitionen könnten eventuell durch die Einsparungen bei den Energiekosten nicht ganz ausgeglichen werden, woraus sich eine erhebliche Belastung für Bürger und Staatshaushalte ergeben würde. Es wäre jedoch ein behutsameres Vorgehen denkbar, nämlich die Einführung der Verpflichtung, „Fahrpläne“ aufzustellen, in denen die Mitgliedstaaten ihren Willen zum Ausdruck bringen könnten, den Energieverbrauch und die Emissionen von Gebäuden nachhaltig zu senken.

Die Analyse zeigt, dass Option D2 wesentlich dazu beitragen könnte, kostenoptimale Niveaus zu erreichen. Für Option D3 könnten sich Mitgliedstaaten entscheiden, deren nationale Maßnahmen noch am Anfang stehen, insbesondere im Zusammenhang mit den nationalen Energieeffizienz-Aktionsplänen. Option D4 könnte auch in gelockerter Form umgesetzt werden, z.B. über nationale Fahrpläne.

Um die Vorbildrolle des öffentlichen Sektors zu stärken, soll die Aushangpflicht für den Energieausweis verschärft werden, und der öffentliche Sektor soll kürzere Fristen als die anderen Sektoren für die Erfüllung der überarbeiteten Bestimmungen erhalten.

### ***Schlussfolgerungen***

**Von der Überarbeitung der Richtlinie sind deutliche positive Auswirkungen zu erwarten. So würde ein großer Teil des noch vorhandenen Verbesserungspotenzials im Gebäudebereich ausgeschöpft, und es würden bessere Voraussetzungen geschaffen, um die in der bisherigen Richtlinie angelegten Möglichkeiten auch wirklich zu nutzen.**

Gleichzeitig würde ein vereinfachter und verbesserter Rahmen für Energieeinsparungen vorgegeben.

Die erfolgversprechendsten Optionen, deren Effekte sich beziffern lassen, könnten mindestens folgende Gesamtwirkung ermöglichen:

- Energieeinsparungen von jährlich 60 - 80 Mio. t RÖE bis 2020, d.h. eine Verringerung des Endenergieverbrauchs der EU um 5 – 6 % im Jahr 2020;
- Vermeidung von 160 – 210 Mio. CO<sub>2</sub>-Emissionen jährlich bis 2020, d.h. von 4 - 5 % der gesamten CO<sub>2</sub>-Emissionen in der EU im Jahr 2020;
- Möglichkeit der Schaffung von 280 000 (bis 450 000) neuen Arbeitsstellen bis 2020, vor allem im Bausektor und in den Bereichen der Erstellung von Energieausweisen, der Energieaudits und der Inspektion von Heizungs- und Klimaanlageanlagen.

Der Investitionsbedarf und die Verwaltungskosten der Maßnahmen wurden analysiert und sind relativ gering gemessen an den Nutzeffekten und Ergebnissen. So würde zum Beispiel die EU-weite Abschaffung des Grenzwertes von 1000 m<sup>2</sup> zusätzliche Kapitalkosten von 8 Mrd. EUR jährlich nach sich ziehen, aber auch bis 2020 Energiekosteneinsparungen von 25 Mrd. EUR ermöglichen und daher zu „negativen“ Kosten für die Minderung von CO<sub>2</sub>-Emissionen führen.

Der Investitionsbedarf innerhalb Europas ist sehr unterschiedlich und abhängig von den gesellschaftlichen und wirtschaftlichen Verhältnissen, dem Ausgangszustand der Gebäude und der Art der durchzuführenden Renovierungen. Die Kosten sind nicht gleichmäßig auf die EU-Bürger verteilt, d.h. zusätzliche Kosten werden entstehen für diejenigen, die größere Renovierungen ihrer Gebäude durchführen oder die Gebäude verkaufen oder kaufen. Angesichts der hohen Ölpreise werden sich diese Anfangsinvestitionen jedoch bald rentieren.

Der Gesamtnutzen für die Gesellschaft durch einen geringeren Energieverbrauch und damit niedrigere CO<sub>2</sub>-Emissionen, durch eine geringere Abhängigkeit von importierter Energie, die Schaffung neuer Arbeitsplätze vor allem auf lokaler und regionaler Ebene, und durch positive Auswirkungen für Gesundheit und Arbeitsproduktivität gehen bei weitem über die Kosten der analysierten Maßnahmen hinaus.



**COUNCIL OF  
THE EUROPEAN UNION**

**Brussels, 20 January 2009**

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**Interinstitutional File:  
2008/0223 (COD)**

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**15929/08  
ADD 3**

**ENER 398  
ENV 850  
CODEC 1592**

**COVER NOTE**

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from: Secretary-General of the European Commission,  
signed by Mr Jordi AYET PUIGARNAU, Director

date of receipt: 17 November 2008

to: Mr Javier SOLANA, Secretary-General/High Representative

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Subject: Annex 1 to Communication Staff Working Document  
- Accompanying document to the Proposal for a recast of the energy  
performance of buildings Directive (2002/91/EC)  
= Impact assessment

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Delegations will find attached Commission document SEC(2008) 2864 Annex 1 Volume 1.

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Encl.: SEC(2008) 2864 Annex 1 Volume 1



COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 13.11.2008  
SEC(2008) 2864  
VOLUME 1

## **Annex 1 to**

**COMMUNICATION STAFF WORKING DOCUMENT**

*Accompanying document to the*

**PROPOSAL FOR A RECAST OF THE  
ENERGY PERFORMANCE OF BUILDINGS DIRECTIVE (2002/91/EC)**

**IMPACT ASSESSMENT**

{COM(2008) 780 final}  
{SEC(2008) 2865}



**EUROPEAN COMMISSION**

DIRECTORATE-GENERAL FOR ENERGY AND TRANSPORT

DIRECTORATE D - New and Renewable Energy Sources, Energy Efficiency & Innovation  
**Energy Efficiency**

## **ANNEX I**

# **Results of the Public Consultation on the Recast of the Energy Performance of Buildings Directive (EPBD) (2002/91/EC)**

**European Commission  
Directorate-General Transport and Energy  
Directorate D – New and Renewable Energy Sources, Energy Efficiency &  
Innovation  
Unit D4 - Energy Efficiency**

**[http://ec.europa.eu/dgs/energy\\_transport/home/consultation/energy\\_en.htm](http://ec.europa.eu/dgs/energy_transport/home/consultation/energy_en.htm)**

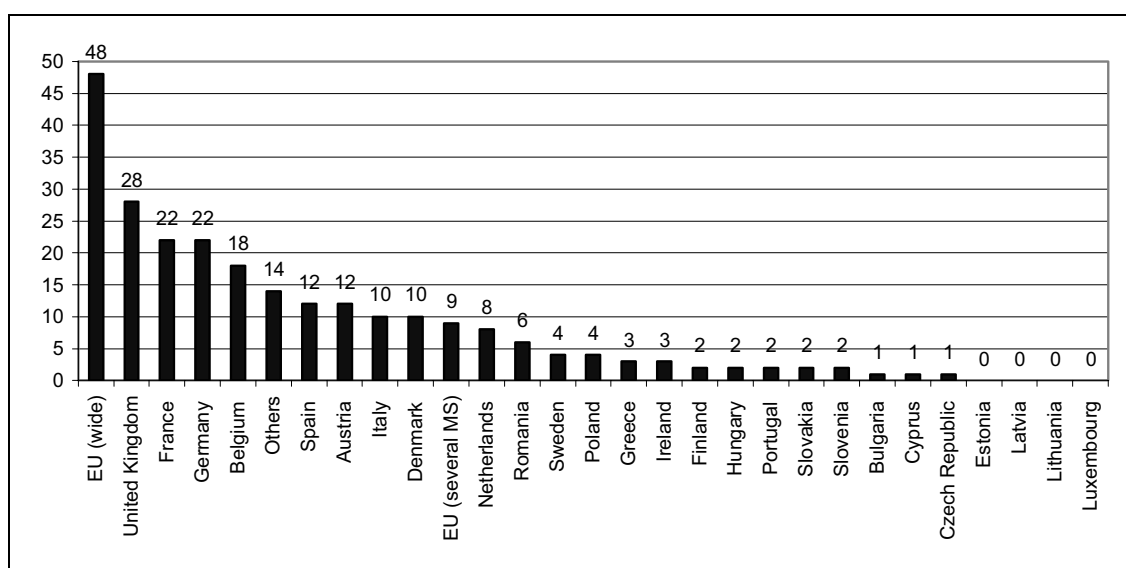
## 1. INTRODUCTION

The Public Consultation exercise on the recasting of the Energy Performance of Buildings Directive (EPBD) 2002/91/EC was organised by the Directorate General for Energy and Transport (DG TREN) of the European Commission in the second trimester of 2008. A background document (Appendix I) and a questionnaire (Appendix II) were made available for comments for a period of 8 weeks, starting from 25th of April 2008. The summarized comments are presented at the end of this document (Appendix III). The questionnaire was published on the Commission's webpage 'Your voice in Europe', as well as on the webpage of DG TREN.

In addition to the website, announcements about this public consultation were made during the Commission's European Sustainable Energy Week (EUSEW) in Brussels in January 2008, in the EPBD Energy Demand Management Committee meeting in March 2008, and at the meetings of the EPBD Concerted Action, on the Commission's Buildings Platform information service ([www.buildingsplatform.eu](http://www.buildingsplatform.eu)) and several other stakeholders' conferences and workshops in spring 2008.

## 2. STATISTICS

A total of 274 responses were received from this online consultation exercise. Due to double submissions (i.e. when different branches of a company sent identical inputs), the actual number amounted to 246. The opinions of a further number of organisations (7) which sent their positions without using the online questionnaire, i.e. in paper copy, have also been evaluated and taken into account, but have not been considered in the following figures. As shown in *Figure 1*, 175 responses originated from 22 different Member States (MS). There were 48 responses registered from EU-wide organisations; 9 responses recorded from organisations covering only some Member States, and 14 responses from other countries outside of EU-27 or which were not further specified (marked as "others" in Figure 1).



*Figure 1: Breakdown of the responses per country of origin*



Of these responses, 94% (232) came from EU Member States and 6% were from either outside of EU-27 or were not further specified. 11% of all responses originated from the United Kingdom, whilst an equal share of 9% came from France and Germany, followed by Belgium with 7%. An equal share of 5% each can be reported from Spain and Austria and 4% each from Italy and Denmark, followed by the Netherlands (3%), Romania, Sweden and Poland (with 2% each). An equal share of 1% came from Greece, Finland, Hungary, Portugal, Slovakia and Slovenia. One response each was recorded from Bulgaria, Cyprus, and the Czech Republic.

It is noted that the breakdown of responses, i.e. the share of responses between citizens and organisations, differs from one country to another. For both Portugal and Slovakia all the responses came from citizens. In France, Germany, Spain, Greece, Italy, the Netherlands, Sweden, United Kingdom, Austria, Belgium, Denmark, Poland and other countries outside of EU-27, or which were not further specified, the majority of responses come from organisations.

As previously said the highest proportion of responses came from EU-wide organisations. It should be noted that most of these organisations desire a recast of the Directive and therefore had a certain interest to participate in the public consultation. The number of individual citizens can be explained by the fact that every single house owner in the EU could be affected by national legislation implemented due to a recast of the Directive and that many issues concerning energy efficiency for buildings have been published in a significant number of press releases in the past (e.g. about Energy Performance Certificates). Most of the responses came from Member States which have already introduced standards for the energy performance of buildings in the past and count amongst the most developed countries in Europe regarding their energy policy for buildings. Some of these countries already have practical experience on the implementation of the EPBD and new ideas to change and improve it. Quite a few responses have been received from new Member States, acceding countries or countries outside the EU-27 (as e.g. Norway or Switzerland).

Respond category	Number	Sub-category	Total Number
Citizens	44	Citizens	44
Institutions/Member States	7	Government (nat/reg/loc)	24
	1	European institution or body	
	2	International organisations	
		Parliament	
		Press/publishing	
	4	Public sector body	
	5	Scientific/Research Institutes	
	1	Educational establishment	
	2	University	
	2	Energy Agency (national, regional, local)	
Non-profit associations	57	NGO's	90
	33	Associations	
Industry/private sector	30	Private Company	83
	2	Trade union	
	41	Industry and business	
	3	Employers' organisation	
	3	Consultancy/Lobbying	
	4	Chamber of Commerce	
Other	5	Other	5
<b>Total</b>			<b>246</b>

Table 2: Breakdown of responses per type of organisation/legal status

As shown in Table 2, and as previously indicated, roughly 18% of the responses originated from EU-citizens, whilst the remaining 82% came from organisations. Responses from institutions/Member States amounted to 10%, whilst non-profit associations, which includes the following sectors: energy supply, construction products, policy and legislation, building services and engineering equipment / maintenance, real estate, public housing and other non profit-associations accounted for about 37%. Industry and the private sector accounted for about 34% and others for 2%.

Responses originating from NGOs and other non-profit associations accounted for 23% and 13%, respectively. These aside, 17% came from Industry/business, a further 12% came from private companies, 3% from governments and 2% from Scientific/research Institutes, Public sector bodies and Chambers of Commerce. Around 1% each was recorded from European institutions or bodies, international organisations, educational establishments, universities, energy agencies, trade unions, employers' organisations or consultancy/lobbying.

Even if a considerable number of citizens responded (44), it is evident that this group does not represent the average opinion in the EU-Member States. Nevertheless, some citizens from very different parts of Europe, with very different backgrounds, raised some interesting ideas and practical hints for a possible recast of the Directive. Per type of organisation/legal status, the highest proportion of responses came from NGOs and non-profit associations (90). Many of them are linked with the building sector, but there are also organisations that have broader social-economic or environmental objectives.

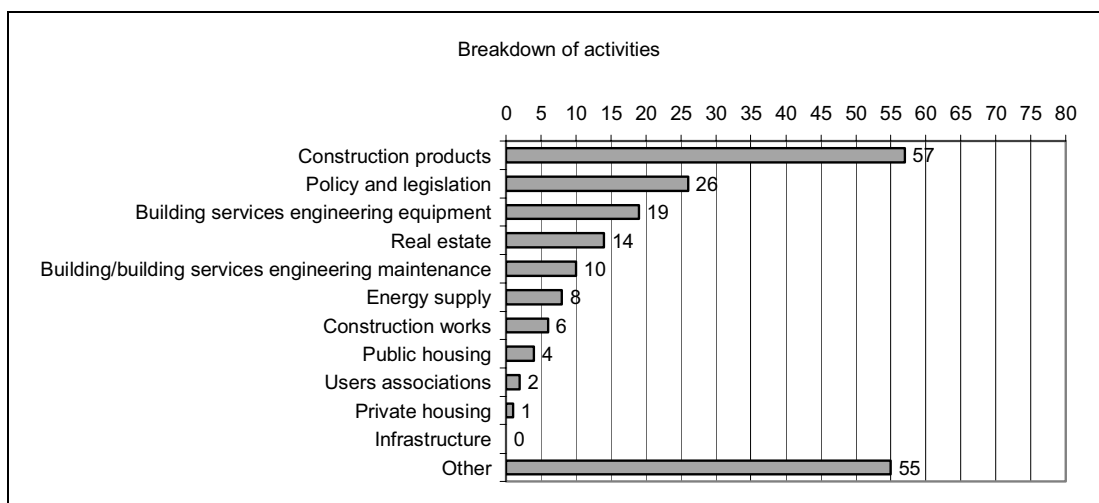
The aforementioned result is followed by the industry/private sector (83). The large number of industry and business or private companies which participated could certainly be attributed to the specific interest of this sector on higher standards and further investment in buildings. Furthermore, it must be specifically taken into account that

tenants and consumer organisations are highly underrepresented in the figures and statistics. It is evident that this group does not have a clearly organized structure and of course faces challenges to speak "with one voice".

It is in the nature of a public consultation that the positions of consumer organisations are proportionally of a small number. The analysis of the responses is, therefore, neither considered as a representative average "European" opinion, nor should it be transposed one-to-one in the recast of the Directive. Nevertheless, it gives an indication of possible directions towards a recast, whilst highlighting where a clear accord of opinions exists and where positions differ. Hence the analysis has been limited to the evaluation of the overarching and most relevant items and cannot show further details.

### 3. CONTENT ANALYSIS

This section details the comments and recommendations on the specific questions posed in the consultation. *Figure 3* shows the breakdown of the respondents per field of activity declared.



*Figure 3: Breakdown of activities of the respondents.*

Nearly 78% (191/246) of all respondents specified their activities. The breakdown of respondents per field of operation shows that about 23% declared activities related to construction products, 11% on policy/legislation, 8% on building services engineering equipment, 6% on real estate activities, 4% on building services engineering maintenance, 2% on construction works and public housing, around 1% each on private housing and users associations, whilst 22% (55/246) declared other activities<sup>1</sup>.

<sup>1</sup> Other includes a wide range of activities and fields, e.g: Environmental; Energy; Engineering; Renewable and sustainable energy; Energy efficiency auditing and certification; Lightning; Insulation; Research; Ventilation systems, Heating systems; Architecture; Consultancy; Products production and trade, etc.

### 3.1. CLARIFICATION and SIMPLIFICATION ASPECTS

*Full realization of the objective of the Directive to reduce energy consumption in the buildings sector could fail due to unclear, imprecise or excessively complex definitions and requirements in the current text.*

Question 1. Which of the definition(s) or requirement(s) of the existing Directive should be clarified or simplified? Please choose the part(s) of the Directive you refer to: (compulsory)

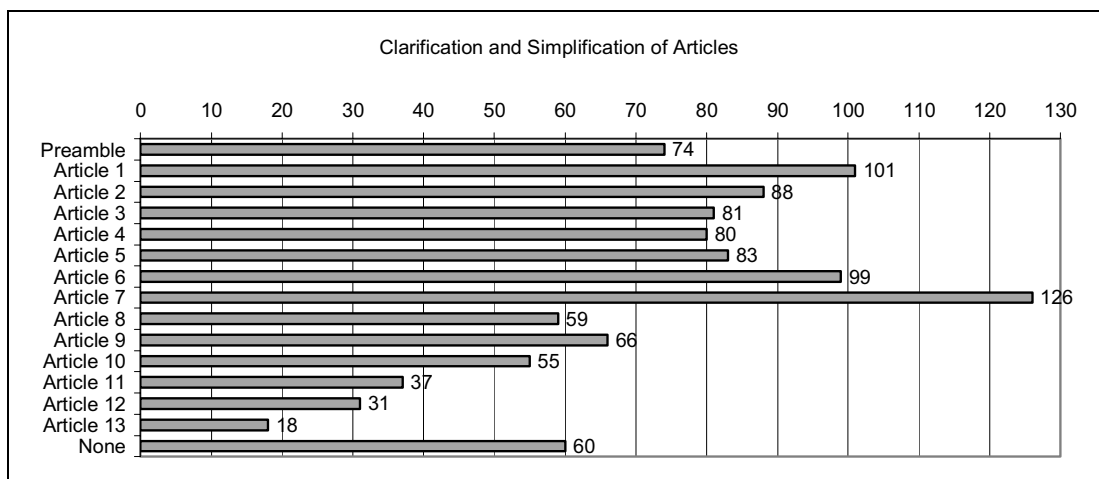


Figure 4: Clarification and Simplification

Clarification or simplification of one or more Articles is desired by a majority of 76% (186/246) of the respondents, whereas 26% (60/246) stated that none of the definition(s) or requirement(s) of the existing Directive should be clarified or simplified.

A vast majority of the organisations (163/202) and most citizens (23/44) wish a simplification or clarification of one or more Articles. A reason for this option could be seen in the fear of citizens that this could lead to stronger regulations linked with more bureaucracy and costs. The large support of the organisations for simplification or clarification of the EPBD could be explained due to the positive aspects which will probably occur through new investments and the connection to a rising economy in the buildings sector. Even if there were 21 citizens and 39 organisations which did not urge for clarification or simplification of any Article, some of them anyhow support a change/strengthening of the Directive. Only a few (<10) did not wish for a change at all.

For further information, refer to the table at the end of this document (Appendix III), which summarizes the basic points of the respondents' proposals for simplification and clarification, insofar as these relate to the preamble and each individual Article. For each of these, the percentage of respondents who answered each question is shown, together with the number of citizens or organizations who commented.

### 3.2. THRESHOLDS WITHIN THE DIRECTIVE

*The obligations of the current Directive on minimum energy performance requirements and inspections respectively cover existing buildings above 1000 m<sup>2</sup> total useful floor area that undergo major renovation, and all new buildings, as well as boilers and air-*

*conditioning systems above a certain rated output (in kW) respectively.*

*Please provide an answer to each of the following questions and, if possible, justify it by quantifying the environmental, social and economic impact of your proposal.*

Question 2.1. Do you propose that the 1000 m<sup>2</sup> total useful floor area threshold for existing buildings that undergo **major renovation** (article 6 of the Directive) be changed or eliminated? (compulsory)

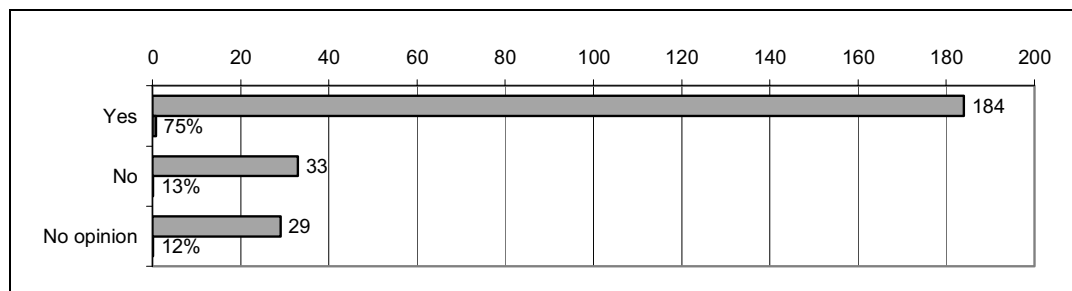


Figure 5: Changing of the 1000m<sup>2</sup>-threshold (Art. 6)

A vast majority and most of the respondents, 75%, voted for a change or abolishment of the threshold. 12% of the respondents opposed a change and about 13% of them had no opinion. Support comes from both citizens and organisations. A vast majority of EU-wide organisations (85%) voted for a change to this threshold.

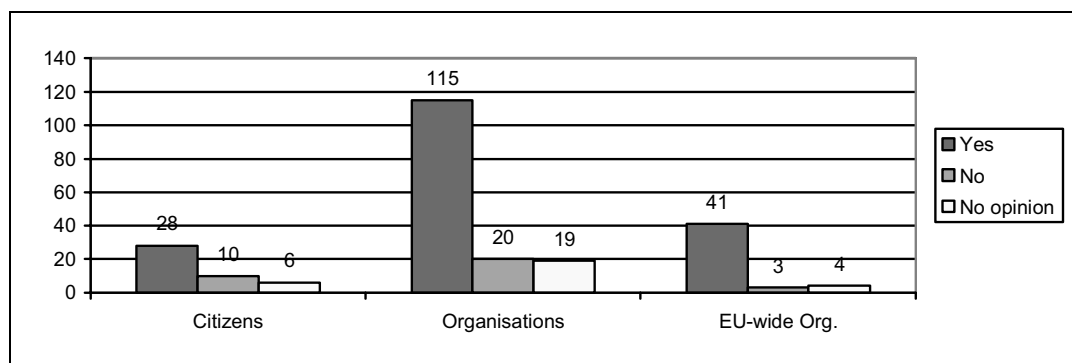


Figure 5a: Spreading on citizens, organisations and EU-wide organisations

Looking at the differences between the three categories (on Figure 5a), one could mention a wide accordance between all groups to lower or abolish the threshold and an eye-catching support from a vast majority of most EU-wide organisations.

Which threshold do you propose and why?  
(Max. 1000 characters) (compulsory)

Most of the respondents suggest abolishing the threshold due to the fact that the current EPBD does not tackle a significant amount of existing buildings and, in relation to the aims for CO<sub>2</sub> emission reductions, because its scope should be extended as far as possible. Besides that, it is seen as not being technically justified to retain this threshold. The energy

saving potential in the building stock is considered enormous, and the right moment to invest in efficiency is seen during renovation. There are several proposals of thresholds. The proposed thresholds per respondent are shown in Figure 5b.

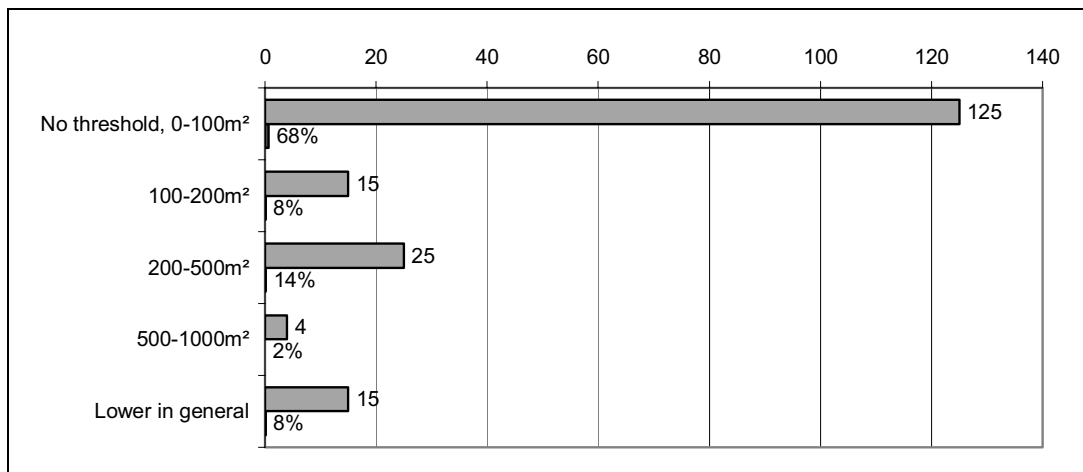


Figure 5b: Spreading of the different proposed thresholds

By far the majority, nearly 68%, of these proponents wish to abolish the threshold completely and 21 of the 125 proponents wish to include all relevant existing buildings, proposing a threshold between 50 and 100m<sup>2</sup>. Approximately 8% proposed a threshold of 100m<sup>2</sup>-200m<sup>2</sup>, which would include most single family houses or at least the bigger ones, 14% between 200m<sup>2</sup>-500m<sup>2</sup>, which would mean that single family houses were mostly excluded, 2% between 500m<sup>2</sup>-1000m<sup>2</sup> and 8% wished to lower the threshold in general without quantifying their proposal. Under these proponents nearly 85% are organisations and 15% citizens. The complete abolishment is also favoured by a vast majority of the EU-wide organisations. It should be mentioned that most of these organisations represent mainly industrial interests.

Question 2.2. Do you propose that the 1000 m<sup>2</sup> total useful floor area threshold for the requirements on **'alternative systems'** (article 5 of the Directive) and/or on the display of the energy performance certificate (article 7(3) of the Directive) be changed or eliminated? (compulsory)

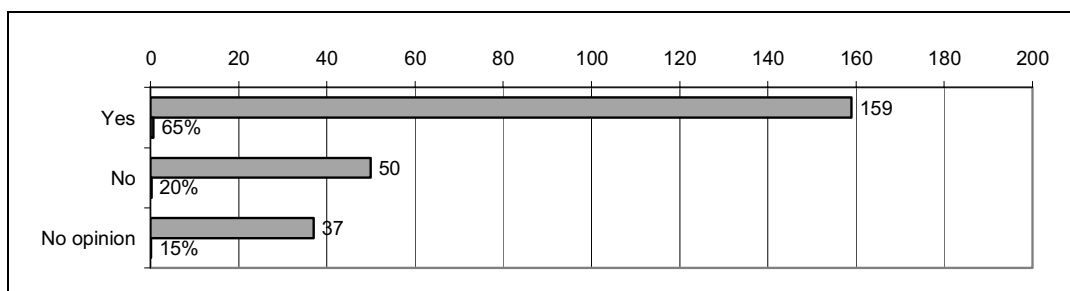


Figure 6: Changing of the 1000m<sup>2</sup>-threshold (Art. 5 and 7(3))

A vast majority of the respondents, 65%, voted for a change or an abolishment of the threshold, whilst 20% of the answers opposed a change or abolishment. About 15% of the respondents had no opinion. The voting for changing/elimination of the threshold of the articles 5 and 7 (3) was similar to that for the threshold of Article 6.

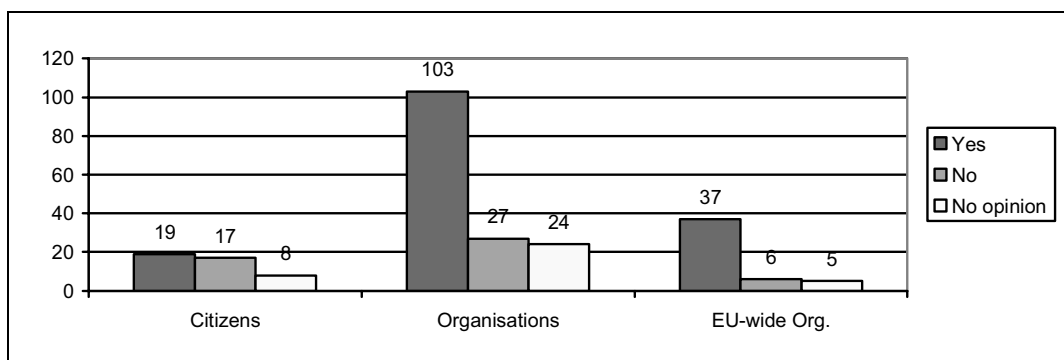


Figure 6a: Spreading on citizens, organisations and EU-wide organisations

Looking at the differences between the three categories (on the Figure 6a), one could mention a wide accordance between organisations and EU-wide organisations to change or abolish the threshold. Citizens have no clear affirmation for or against a change.

Which threshold do you propose and why?

(Max. 1000 characters) (compulsory)

Most of the respondents suggest abolishing or changing the threshold. A few of the responses expressed the wish for a lowering of the threshold to 500m<sup>2</sup> or even 300 m<sup>2</sup>, 250m<sup>2</sup> or 200m<sup>2</sup> in order to increase the number of buildings falling within the scope of the Directive. A few respondents wish to lower the threshold for public buildings beyond that for other buildings. Some respondents consider making "alternative systems" mandatory for existing buildings when refurbished and adequate incentives could stimulate the development of alternative systems. It is mentioned that it should be ensured that the technical, environmental and economic feasibility is taken into account before the construction of new buildings starts. Some of the organisations expressed the opinion that that EPBD should simply demand a CO<sub>2</sub>- and primary energy target.

The proposed thresholds:

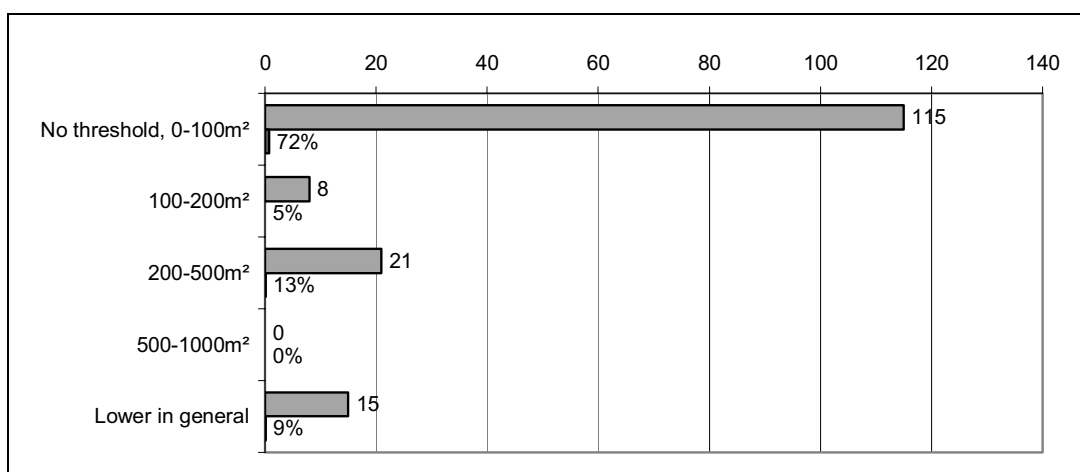


Figure 6b: Spreading of the different thresholds

By far the majority, nearly 72%, of the proponents wish to abolish the threshold completely and 9 of the 115 proponents wish to include all relevant existing buildings, proposing a threshold between 50 and 100m<sup>2</sup>. Approximately 5% of respondents

proposed a threshold of 100m<sup>2</sup>-200m<sup>2</sup>, 13% between 200m<sup>2</sup>-500m<sup>2</sup>, 0% between 500m<sup>2</sup>-1000m<sup>2</sup> and 9% expressed a wish for a lowering of the threshold in general without quantifying their proposal. Under these proponents nearly 85% are organisations and 15% citizens.

Question 2.3. Do you propose that the thresholds on the rated output of boilers and/or air-conditioning systems subject to regular inspections (article 8 and article 9 of the Directive) be changed or eliminated? (compulsory)

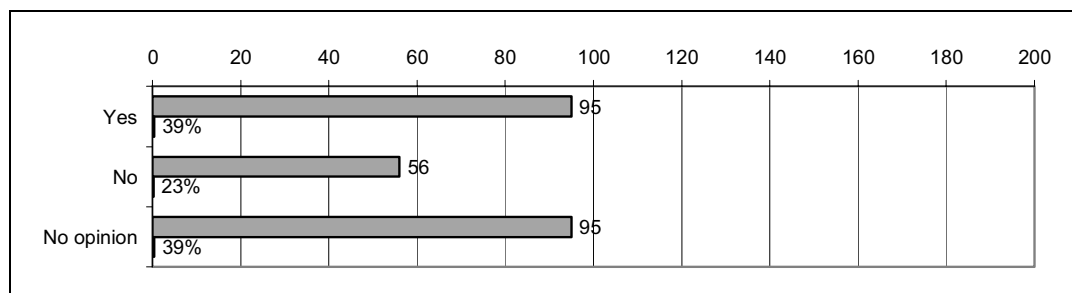


Figure 7: Thresholds on boilers and/or air-conditioning systems (Art. 8/9)

The respondents' vote to lower or abolish the threshold for the inspection of heating and air-conditioning systems (articles 8 and 9) indicates clearly opposing preferences. There was an equal share between affirmative responses and those expressing no opinion (39% each), but also a large number of respondents which disagree to a change of the threshold (23%). There is no definite preference to be seen.

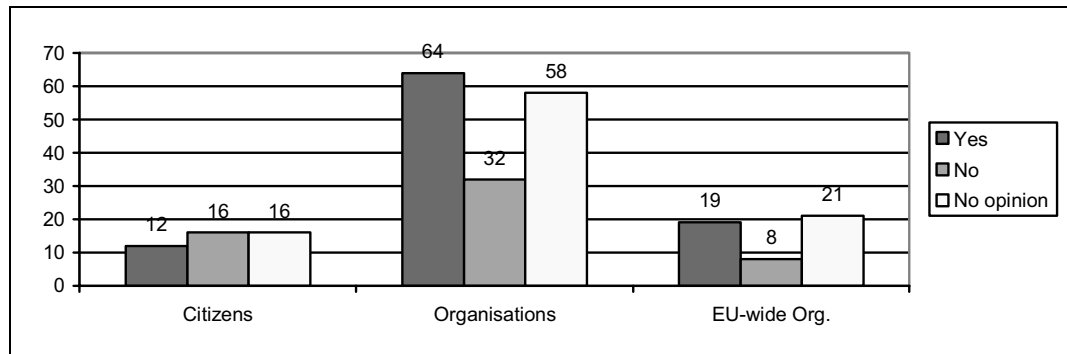


Figure 7a: Spreading on citizens, organisations and EU-wide organisations

Looking at the differences between the three categories (on the Figure 7a), one could mention a wide accordance across the different groups. However, it is also conspicuous that in every group there is no clear agreement or negative response, but a great expression of uncertainty is evident ("no opinion"), even for the EU-wide organisations.

Which threshold do you propose and why?  
(Max. 1000 characters) (compulsory)

The responses which indicated a wish for a change to, or the abolishment of, the threshold indicated different underlying reasons. Most of the respondents stated that the system, rather than the product, should be considered. There is a wish to add new technologies, while others suggest lowering the threshold according to the best practice and update it regularly. Some of the responses proposed the introduction of binding, regular inspections



on systems (independent of size), whilst a request to abolish the threshold for air-conditioning systems is expressed by some of the respondents. From a few responses it can be seen that some believe there is overregulation in this field.

#### 4. STRENGTHENING OF REQUIREMENTS

*The existing Directive gives room for implementation at national/regional levels. Some national, regional or local authorities have laid down requirements which go beyond the Directive's requirements, e.g. on control schemes, link to financial incentives or on the realization of energy efficiency improvement measures.*

*Please provide an answer to each of the following questions and, if possible, justify it by quantifying the environmental, social and economic impact of your proposal.*

Question 3.1. Which new/changed requirement(s) or content concerning the energy performance certificate (article 7 of the Directive) do you consider to have a high impact on realizing energy savings in the buildings sector? (Max. 2000 characters) (optional)

Concerning the energy performance certificate (EPC), most of the national/regional organisations (78%), and an even higher proportion of EU-wide organisations (85%), consider that a change in article 7 could have a high impact on realizing energy savings in the buildings sector.

The energy performance certificate is seen as a strong tool of the EPBD and should be used as an important instrument. Property owner organisations see the certification as a crucial driver in energy efficiency improvement, but find it too early to make a final judgement (deadline of implementation in January 2009).

Some respondents have concern about how well the certificates will be working and they doubt the feasibility of making cost-effective recommendations compulsory in the certificates. Many companies and property owner organizations support a European wide harmonisation of the EPC and its calculation method in order to enable comparisons between Member States. It was also mentioned very often that the recommendations on certificates should be ranked according to the estimated savings potential and cost-effectiveness, and that there should be just one calculation method for both new and existing buildings.

It was also often mentioned that EPCs should be displayed in more buildings, renewed more often and should show a longer period of the past performance. In addition, the position has also been stated that the monitoring of real energy consumption in kWh/m<sup>2</sup> year is considered to have more impact than only theoretical asset rating.

Furthermore, the EPC should be used as a better instrument to inform tenant and owner on the performance of the building. Various organisations defend the position that the EPC should focus on the calculated primary energy demand and include a CO<sub>2</sub>-indicator (this is also supported from property owner organisations).

Some respondents asked for a mandatory introduction of a benchmarking system both for cross-country comparisons of certificates and for minimum energy performance requirements. Several respondents propose an integrated approach of recommendations and incentives (e.g. subventions, state aid, reduced VAT rate etc.).

Question 3.2. Which new/changed requirement(s) concerning the inspection of boilers (article 8 of the Directive) do you consider to have a high impact on realizing energy savings in the buildings sector?  
(Max. 2000 characters) (optional)

It was mentioned by most of the EU-wide organisations participating in the consultation that Article 8 should not only refer to certain components of a system, but to the entire system in general and that inspections should control this issue better.

The article on inspection of boilers seems to present some problems to the respondents. According to many of the organisations which responded, there is still insufficient control on the replacement of old boilers. Furthermore, many of the organisations stated that minimum standards for heating and cooling should be developed keeping in mind other Directives (e.g. EuP<sup>1</sup>). Organisations also propose that inspections should be held more often and should be binding, whilst some respondents propose mandatory installation of best technology of boilers.

Question 3.3. Which new/changed requirement(s) concerning the inspection of air-conditioning systems (article 9 of the Directive) do you consider to have a high impact on realizing energy savings in the buildings sector?  
(Max. 2000 characters) (optional)

Some of the answers to this question state that air-conditioning systems are increasing in southern parts of Europe and that the air-conditioning system control and inspection are very important. Some of the answers request a clarification on whether or not ventilation systems are addressed, because these impact both indoor air quality and energy. It was mentioned by a few respondents that in terms of sustainability, new buildings should be designed and built completely without cooling equipment.

Question 3.4. Due to the complexity and variation of boundary conditions in the 27 Member States (e.g. with regard to the existing building stock, outdoor climate conditions, costs of energy, labour and material, taxes, etc.), minimum energy performance requirements are not stipulated at EU level in the existing Directive. They are left for the Member States to define as regards both their definition and parameters instead. What type of approach do you consider feasible and effective which could be laid down at EU level with regard to minimum energy performance requirements for buildings? (Max. 2000 characters) (optional)

Setting minimum requirements at low energy, passive-house (or even plus-energy) level, was mentioned by many responding organisations, whilst property owner organisations doubt the feasibility of covering minimum requirements in the Directive. It was mentioned in some responses that the main objective of the minimum energy performance standards should be to allow an EU-wide comparison between the various national systems, taking into account e.g. a definition of a "very low energy" house. Insurance of a level playing field set by national or European Standards for thermal insulation, lighting, ventilation and heating/cooling is also mentioned rather often. It is also frequently mentioned, that

minimum requirements should depend on their economic (e.g. cost-optimal) level and, hence, be set only if economically feasible. One option could be to define a "global scale" taking into account the different areas with different minimal targets. It is mentioned by some respondents that cooling, as well as heating consumption, should be taken into account.

A further proposal was that users should be forced to report the actual energy consumption and be requested to reduce this consumption annually by a specific percentage. One proposal defends the position that the requirements should be based on primary energy demand, but be technologically neutral. Minimum standards should be expressed in absolute as well as in relative values and should be in line with other Directives (e.g. EuP<sup>2</sup>). It is very often mentioned that there should be a single harmonised calculation method. Some responses mention that an obligation should be introduced to organisations in order to benchmark the requirements to the requirements of neighbouring countries.

Question 3.5. Which other requirement(s) do you consider to need strengthening, and in which way?

(Max. 2000 characters) (optional)

Many of the responses propose the introduction of a CO<sub>2</sub>-emission indicator on the EPC or a harmonised calculation standard on EU-level. Official training for inspectors is another point mentioned quite often. Some respondents suggested the harmonisation of training programmes and accreditation to implement the mentioned recommendations (to allow professionals to work across countries), as well as the existence of mandatory information about Energy Efficiency recommendations to be shown to the tenants. It was also mentioned that users play an important role in energy efficiency, and for that they need to be better educated and informed about how to correctly use the HVAC-systems. It has been stated that there remains potential for further studies on the comparison of theoretical energy performance and practical implementation and use. A few respondents suggested that it should be a requirement for public sector and non-residential buildings to be upgraded with the recommendations indicated on the EPC. It was also mentioned that financial incentives, in order to improve the existing buildings, could be a solution to ensure implementation of the recommendations. It was also mentioned that requirements should be set at the level of primary energy requirement (including winter and summer behaviour) and that mobility and recycling of buildings should be considered.

### 5. THE ROLE OF THE PUBLIC SECTOR

*The public sector is often seen as an important actor to raise broad awareness on energy efficiency in buildings and which can therefore also contribute to stimulating energy savings by acting as a leading example.*

*Please, if possible, justify your answer by quantifying the environmental, social and economic impact of your proposal.*

Besides the current requirement of the Energy Performance of Buildings Directive for the public sector to display the energy performance certificate in a prominent place: Do you consider the public sector should play a stronger role to act as a leading example for energy savings in buildings? (compulsory)

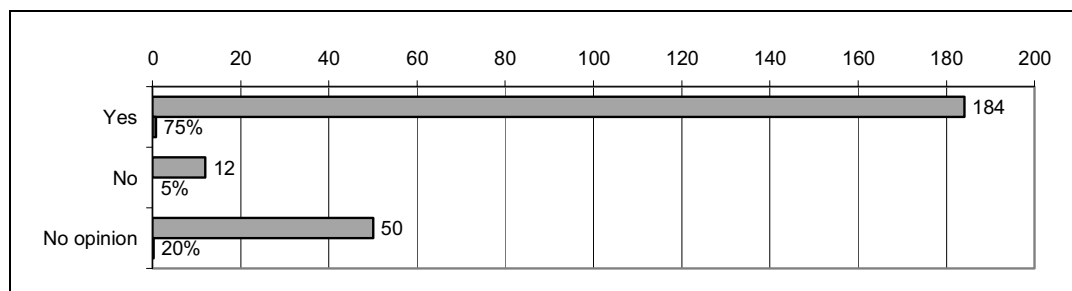


Figure 8: Stronger role of the public sector

A vast majority and most of the respondents, 75%, voted for a stronger role of the public sector to act as a leading example. Only 5% denied and did not see the public sector in such a responsibility. A notable amount of about 20% of the respondents had no opinion.

It is clearly seen from Figure 8, that the general opinion was that the role of the public sector should be intensified and that it should be much more prominent as a leading example.

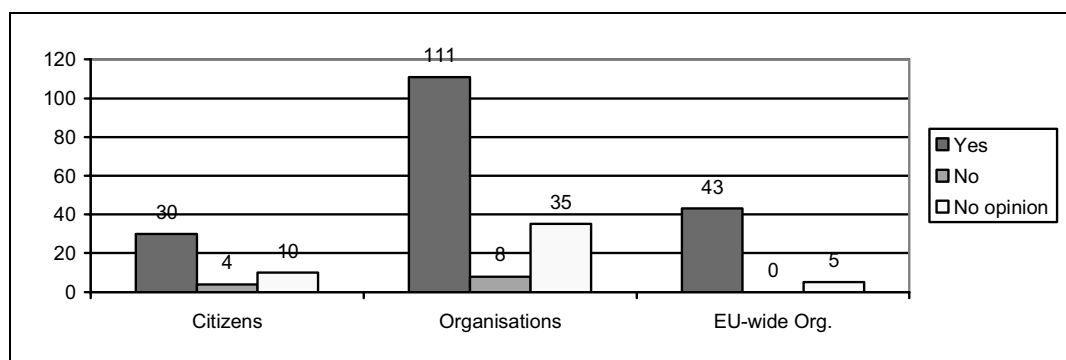


Figure 8a: Spreading on citizens, organisations and EU-wide organisations

What further requirement(s) would you propose to include in the Directive for the public sector in order to act as a leading example for energy savings in buildings? (Max. 1000 characters) (compulsory)

A vast majority of the respondents voted for a stronger role of the public sector to act as a leading example. Most of these respondents state that public buildings should introduce higher energy performance standards and should have to display the energy performance certificate at a prominent place in the building in more cases. It is mentioned from several large EU-wide organisations that it could be an obligation for public buildings to implement some of the recommended measures listed in the energy performance certificate within a certain timeframe. Energy Performance Certificates for public buildings should include estimates of pay-back periods for investments in energy efficiency to enforce the investment and, hence, implementation of the measure. It was also mentioned that national targets should be set towards "very low energy buildings" to make them the default standard and introduce investments in renewable energy technologies. Only 5% opposed the stronger role of the public sector and 20% had no opinion on that question.

**6. OTHER**

Question 5.1. Do you consider that climate adaptation should significantly influence the level of requirements laid down by buildings regulation? (compulsory)

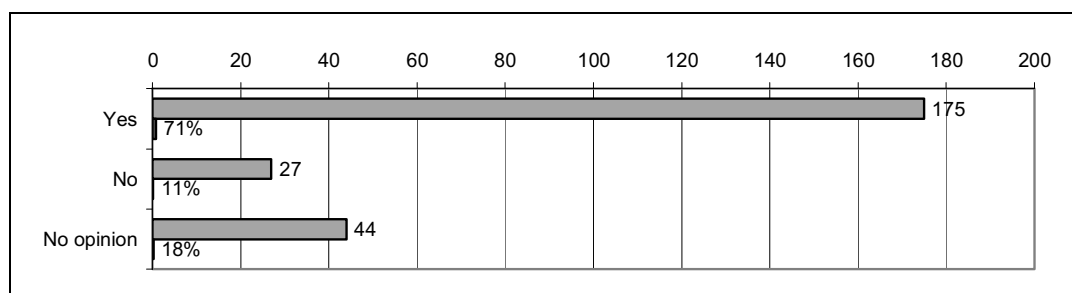


Figure 9: Level of requirements should be influenced by climate adaptation

A vast majority of the responses, 71%, stated that the level of requirements should significantly be influenced by climate adaptation. 11% of the responses opposed this approach, whilst about 18% of the respondents had no opinion.

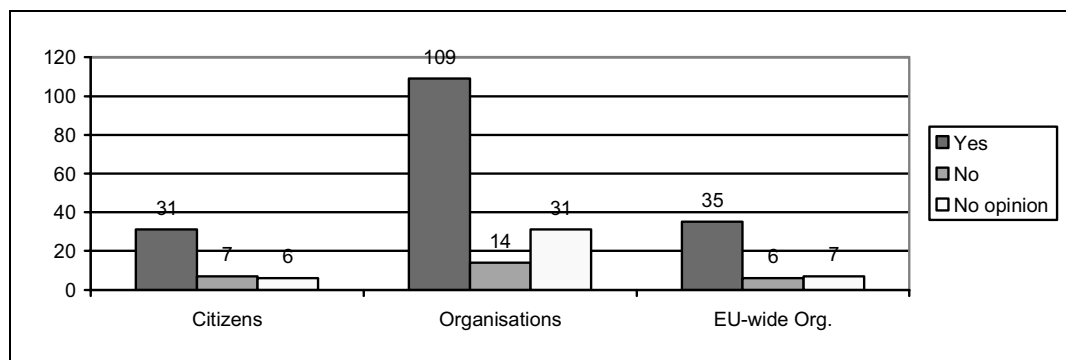
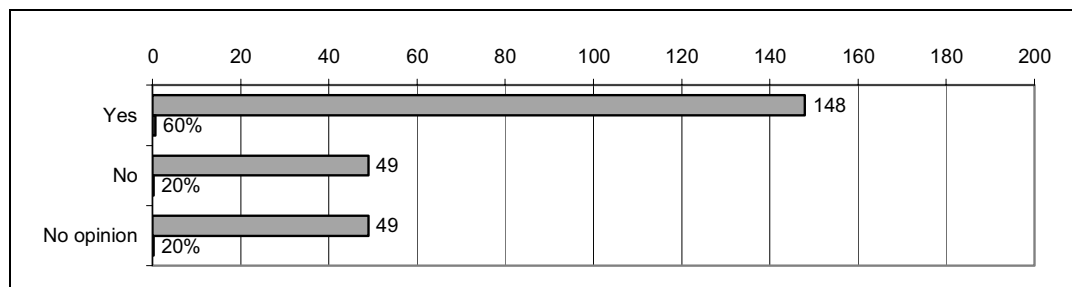


Figure 9a: Spreading on citizens, organisations and EU-wide organisations

Question 5.2. Do you propose other aspects/ideas than the aforementioned to be included in the recasting of the Energy Performance of Buildings Directive? (compulsory)

Figure 10: Proposal of other aspects/ideas to be included



Most of the respondents, 60%, propose other aspects/ideas. 20% of the respondents opposed this, whilst about 20% of the respondents had no opinion on this question.

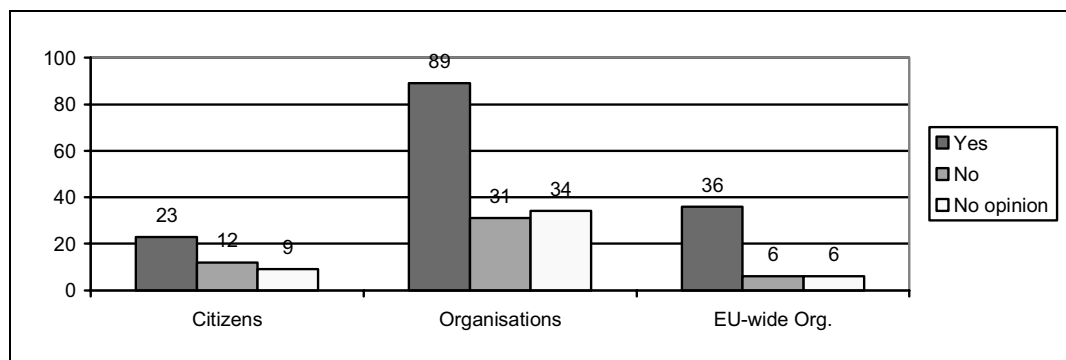


Figure 10a: Spreading on citizens, organisations and EU-wide organisations

What other requirement(s) do you propose? (Max. 1000 characters) Please provide an answer and, if possible, justify it by quantifying the environmental, social and economic impact of your proposal. (compulsory)

A majority of the respondents (71%) stated that climate adaptation should significantly influence the level of energy performance requirements laid down by building regulations. 11% disagreed with this and about 18% had no opinion. Some (about 5%) of the answers mentioned the remaining lack of systematic comparison and check of (i) theoretical energy performance and (ii) actual energy use of buildings.

Some (about 5%) of the responses from organisation mentioned that it should be stated that Member States should authorise the EPBD CEN standards as optional calculation methods in the building codes, because this will lead to a higher benefit e.g. for European industry. Some more respondents (5-10%) asked the independence criteria for experts issuing the energy performance certificates and carrying out inspections for heating and air-conditioning systems (Article 10) to be defined more clearly.

## 7. CONCLUSIONS

The huge interest in the online consultation of the possible recast of the EPBD, with contributions from all over Europe, is a further indication of the important role that buildings play in the field of energy savings and energy efficiency. Naturally Member States being more experienced in this field lead with their interest in this sector, but still it should be noted that awareness on "energy saving" has increased significantly, that it is a popular issue of public concern and is now becoming higher on the agenda, playing a decisive role in the policy of all European countries. Not least due to oil prices increases and their high volatility, energy savings are the best way of saving exhaustible raw materials, saving money for the homeowners, enterprises and administrations alike, and avoiding greenhouse gas emissions. Besides, new investments in this sector will work as a motor for jobs and produce new technologies for building a sustainable future for our future generations. The Directive 2002/91/EC has already shown that it is one supporting pillar in this context.

It is somehow also clear, that the Commission must play the leading role and with its policy be well prepared for the future. Therefore, taking into account the impact of the buildings sector in relation to the quality of life of citizens, the economy and the energy and environmental impact, it is not astonishing that a clear majority of responses to the public consultation on the EPBD recast, from across the board, want the Commission to enhance and strengthen this Directive with a vision for an energy efficient and climate-friendly future.

It is about time to balance the positive and negative effects in a very long lasting and sustainable way and introduce the changes at those points where it is necessary and future oriented.

## APPENDIX I



### EUROPEAN COMMISSION

DIRECTORATE-GENERAL FOR ENERGY AND TRANSPORT

DIRECTORATE D - New and Renewable Energy Sources, Energy Efficiency & Innovation

**Energy Efficiency**

**Background Information Paper for the  
Public Consultation on the  
Recasting of the Energy Performance of Buildings Directive  
(EPBD) (2002/91/EC)**

**Note:**

**This background paper is being circulated for consultation to all parties concerned by the recasting of the EPBD.**

**The sole purpose of the consultation is to contribute to the debate, collect relevant information and help the Commission develop its thinking in this area.**

**This document does not necessarily reflect the views of the Commission of the European Communities, and should not be interpreted as a commitment by the Commission to any official initiative in this area.**

**Parties concerned are invited to submit their comments no later than  
20 June 2008 by means of the online questionnaire, available at:**

**[http://ec.europa.eu/dgs/energy\\_transport/home/consultation/energy\\_en.htm](http://ec.europa.eu/dgs/energy_transport/home/consultation/energy_en.htm)**



## 1. EU BUILDINGS SECTOR

Energy use in the buildings sector (residential and commercial) is responsible for about 40% of final energy consumption in the EU. The cost efficient energy savings potential is estimated at 28% by 2020, which in turn can reduce total EU final energy consumption by around 11%<sup>2</sup>.

According to the last IPCC report<sup>3</sup>, about 30% of the projected greenhouse gas emissions worldwide in the buildings sector can be avoided with net economic benefit by 2030. In addition, the measures in the buildings sector are those with the lowest abatement cost for greenhouse gas reduction<sup>4</sup>.

Therefore the buildings sector is key in addressing the challenges of increasing EU energy dependence and growing CO<sub>2</sub> emissions, but also provides additional employment and business opportunities and cost-effectively supports local development and thus the EU Lisbon objectives.

The share of buildings in EU wealth in terms of capital but also social, cultural and historic value and business opportunities is enormous. Once constructed nearly all buildings remain for decades, and therefore all measures undertaken by EPBD and its recasting will have a very long-term impact and thus need careful consideration.

## 2. THE BUILDINGS SECTOR AND EU POLICY OBJECTIVES

The buildings sector can offer significant reductions in energy consumption and therefore addressing the potential in this sector is essential for achieving the ambitious 20/20/20% targets for energy consumption and greenhouse gas emission reductions, and the increased share of renewables by 2020, as endorsed by the Heads of State and Governments during the spring 2007 European Council<sup>5</sup>.

Reaping the energy savings potential in the buildings sector will lead to achieving in a cost-effective manner:

- (i) increased independence from energy imports which will contribute to the EU security of supply objectives;
- (ii) contribute to EU economic growth and job creation;
- (iii) contribute to the reduction of greenhouse gas emissions and of the harmful impact of energy generation on the environment; and
- (iv) improved living conditions and comfort for citizens.

Therefore the sector is of prime importance for realizing strategic objectives of European Energy Policy, as outlined in the Commission Communication *An Energy Policy for Europe*<sup>6</sup>.

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<sup>2</sup> The data are for 2005. Due to the increase of fossil fuel prices the reduction may have been even greater.

<sup>3</sup> IPCC 2007

<sup>4</sup> McKinsey for Vattenfall 2007

<sup>5</sup> 7224/1/07, REV 1

<sup>6</sup> COM (2007) 1

### 3. MAIN PROVISIONS OF THE CURRENT EPBD

A holistic and innovative approach towards the energy performance of buildings has been adopted through the Energy Performance of Buildings Directive 2002/91/EC (EPBD)<sup>7</sup>. The main objective of the EPBD is to promote improvement of the energy performance of buildings within the Community, taking into account outdoor climatic and other local conditions, as well as indoor climate requirements and cost-effectiveness.

The main provisions of the current EPBD are:

- Establishing a methodology for calculating the energy performance of a building, taking account of local climatic conditions, inter alia;
- Minimum standards for energy quality to be determined by Member States and applied to all new buildings and – mostly on a different level - to major refurbishments of existing large buildings (above 1000m<sup>2</sup>);
- Development of certification for buildings to make energy consumption levels visible to owners, tenants and users, and to raise awareness, whenever a building is constructed, sold or newly rented out;
- Inspection of boilers and air-conditioning systems above minimum sizes to reduce their energy consumption and greenhouse gas emissions.

The deadline for the implementation of the first two provisions was January 4, 2006 and for the last two - due to the challenges facing Member States as regards training and accreditation of experts to carry out the certifications and inspections - a further grace period of up to three years (i.e. until January 4, 2009) was allowed.

### 4. CURRENT IMPLEMENTATION OF THE EPBD

The EPBD is complex in nature and requires substantial efforts by Member States and a large number of legislative measures to be adopted by them for its full transposition. A number of countries have transposed the Directive, but a large number are still lagging behind. As of April 2008, the Commission has initiated 17 infringement cases against Member States that have failed completely or partially to notify national implementing measures or properly to implement the EPBD. Of these, two countries have been referred to the Court of Justice, and against one there has been already a ruling in favour of the Commission.

Despite the slow progress on transposition and implementation of the EPBD in a considerable number of Member States, there are good examples of successful policy approaches to be found across the Union.

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<sup>7</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32002L0091:EN:NOT>

## 5. WHY EPBD NEEDS RECASTING?

The EU buildings sector can play a key role in achieving EU policy objectives, while contributing to an improved level of comfort for citizens (as mentioned in Section 2).

**However, a large part of the cost-efficient energy efficiency measures available in the sector are not realised in practice.** The narrowing of the gap between the realisable potential of the buildings sector and its real utilisation is the Commission's main motivation for recasting the EPBD.

There are various factor that limit utilisation of this potential. Some come from the present wording and level of ambition in implementing the EPBD. Other stem from general challenges in the sector.

The first group includes challenges arising from:

- (i) Vague formulation of some articles and insufficiently clear definitions;
- (ii) Limited scope of the EPBD in relation to existing buildings which undergo major renovation;
- (iii) The only partially realised potential of those of its requirements which can lead to improvement of energy efficiency in the buildings sector;
- (iv) Insufficient realisation of the potential in public buildings, which can serve as a leading example.

These issues might be tackled in the recasting.

The second group is related to challenges which are well-acknowledged but difficult to solve, such as the tenant-owner problem, lack of financing for energy efficiency improvements of buildings, and the fragmented and heterogeneous nature of both building stock and ownership, which require very different instruments. Although solutions for these problems are needed, they may not be possible through the recasting of the EPBD. The Commission has taken and is going on with a number of additional steps in the area of financing in order to support Member States in addressing these problems.

### 5.1. Simplification and clarification

#### 5.1.1. Choice of legal instrument

The choice of the legal procedure to be used for the revision will aim at simplification and clarification. The main difference between recasting and amendment is that in the recasting, the new text of the Directive will be a consolidation, in other words it will be a single new legal document, and not a second one that includes only the revised parts, as in the case of amendment. This will improve readability and will facilitate comprehension for implementing authorities as for affected stakeholders.

As the principles of the current EPBD will be kept, and the new EPBD will build on it, the recasting will be an opportunity to develop further EU and national policies and measures

related to the energy efficiency in the buildings sector based on what has been learnt by implementation of the current EPBD, and on the ambitions implied by the EU and national targets. Therefore, it is crucial that the current EPBD be properly implemented and on time. The forthcoming recasting should not be an excuse for delay in implementing of the current Directive.

#### 5.1.2. Definitions and wording

Some of the definition and wording of the existing text are not clear enough, and create confusion and differences in implementation. A number of issues have been identified based on the implementation of the current EPBD. For example, there is room for improvement of several definitions (such as public buildings, air-conditioning systems) and for clarification of certain provisions (such as the provision of recommendations for the energy performance certificate, when the certificate is to be made available).

### 5.2. Scope of the current EPBD

At present, the EPBD provisions call on Member States to set minimum energy performance requirements for all newly constructed buildings, and for those with a floor area of above 1000m<sup>2</sup> and which undergo a major renovation (Art. 6).

Because of the 1000m<sup>2</sup> threshold for existing buildings the EPBD now covers only about 30% of the EU buildings stock<sup>8</sup>. Taking into account that introducing energy efficiency measures when retrofitting costs on average between two and three times less than if when done separately, this in general means that with every renovation below 1000m<sup>2</sup> a unique opportunity for cost-efficient energy savings for the owner might be lost. However, in a number of Member States the 1000m<sup>2</sup> threshold has not been introduced, so that all buildings that undergo major renovation have to fulfil certain energy performance requirements.

Other thresholds that are included in the EPBD are those which require feasibility of alternative systems to be considered for new buildings above 1000m<sup>2</sup> (Art. 5) and the minimum effective rated output requirements for inspections of boilers (Art. 8) and of air-conditioning systems (Art. 9).

### 5.3. Need for strengthening of certain requirements

Based on observations from implementation of the current EPBD, and according to a number of studies, there is a potential for strengthening of several requirements of the EPBD.

#### 5.3.1. Energy performance certificates

One of the main reasons for market imperfections as regards investment in energy efficiency on the rental market is the fact that the owner and tenant of a building, dwelling or office have different interests. As the tenant normally pays the energy bill the incentive for the owner to

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<sup>8</sup> Ecofys for Eurima VII study 2007

invest in energy efficiency is weak. The seller of a house is not interested to provide information that the property's energy performance is mediocre.

The best way to make energy efficiency investments more attractive is to provide clear and reliable information to prospective tenants and buyers. It should be made clear to all actors involved that failure to act on cost-effective energy efficiency improvements recommended in the energy performance certificate is a waste of money. Therefore, the energy performance certificates required by the Directive (Art. 7) can be a powerful tool to inform citizens about energy saving options, including information on the economic impact, and to create a demand-driven market for energy efficient buildings and services regarding energy efficiency.

Some of the observations show that some certificates issued in Member States are not of satisfactory quality, or that there is not enough bottom-up to ensure that they are systematically made available during property transactions. In some countries, the recommendations with a finite payback time are mandatory either for some parts of the buildings sector or throughout.

### 5.3.2. Requirements on boilers and air-conditioning systems

As for the energy performance certificate, the requirements on inspection of boilers and air-conditioning systems or for equivalent publicity measures for boilers, can be an effective way for informing EU citizens about the opportunities for energy efficiency improvements, and for savings on their energy bill. However, based on experience some of the currently required inspections of boilers and air-conditioning systems have limited impact on energy performance improvement. One of the reasons for this is missing specifications, requirements and objectives for the inspections in the Directive itself.

### 5.3.3. Minimum energy performance requirements

Setting optimal cost-effective energy performance requirements is of crucial importance, as they have an impact over the whole building lifetime. Once buildings are constructed or renovated, changes become more expensive, and thus the opportunity for low cost improvements is much more limited.

At present, EU Member States are required to ensure that energy performance requirements be set (Art. 4), and methodology for their calculation developed (Art. 3). A limited number of Member States have announced commitments to introduce passive house or low energy house requirements in the future.

There are differences between the values for energy performance requirements for the different Member States and regions. However, cross-border comparison between the different values is difficult because of the different underlying calculation methodologies, definitions and reference values (as demonstrated in the ASIEPI project). Some studies demonstrate that certain existing requirements for the building shell are not cost-optimal. However, fixing performance requirements is very complex and challenging if it is to be done at the EU level.

A benchmarking system which can provide common ground for comparison of various requirements in the Member States might be a useful tool for improved transparency and a

good opportunity for public authorities from different Member States to make comparisons and to share experience.

#### **5.4. Leading role of the public sector**

The public sector can and should have an exemplary role motivating other property owners to carry out energy efficiency improvements. At present, there is a requirement that buildings above 1000m<sup>2</sup> occupied by public authorities, and to institutions providing public service to a large number of persons, and therefore are frequently visited by these persons should have an energy performance certificate displayed in a clearly visible place. The role of the public sector could be further strengthened beyond this information stage.

#### **5.5. EU support measures**

The Commission is working on a number of other instruments to support implementation of the EPBD and of its revised version. These cannot be included in the recasting, but are activities to provide support for the process.

To accelerate implementation of the Directive, the European Commission is continuing to support the transformation process with several measures:

- Continuation of the Concerted Action – a forum where Member States' representatives can meet and exchange their experience with the implementation with as well as best practices;
- Initiating and financing an extensive package of 31 CEN standards for calculation and rating methodologies for the energy performance of buildings;
- The EPBD Buildings Platform<sup>9</sup> – an information service on the Directive for practitioners and consultants, experts in energy agencies, interest groups, and national policy makers on the state of play, lessons learnt and best practice examples;
- Intelligent Energy Europe Programme<sup>10</sup> – a number of projects are dedicated to aspects concerning the EPBD.

The main actions addressing the problem of insufficient financing are:

- Energy efficiency investments are now eligible for state aid;
- Member States are allowed to apply a reduced VAT rate to a specific list of labour-intensive services, incl. renovation of private dwellings (this expires on 31/12/2010 but extension under consideration);
- The Commission has suggested that Member States should use some of the revenues generated by the Emission Trading Scheme (ETS) auctions for energy efficiency purposes;
- The Commission is considering revision of Cohesion policy guidelines to offer the opportunity to all Member States to use Community co-financing for energy efficiency;

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<sup>9</sup> <http://www.buildingsplatform.eu/cms/>

<sup>10</sup> [http://ec.europa.eu/energy/intelligent/index\\_en.html](http://ec.europa.eu/energy/intelligent/index_en.html)

- The Commission is in constant dialogue with financing organizations and Member States to discuss better coordination of energy efficiency financing activities and increased support for them.

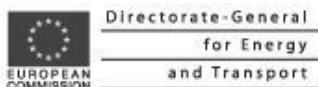
## **6. POSSIBLE ISSUES FOR CONSIDERATION FOR THE RECASTING**

A brief, but not exhaustive overview, of some of the challenges arising out of implementation of the current EPBD and identified in a number of studies and by various stakeholders, were set out in the previous section. In general, the options considered can broadly be grouped into three main categories:

- Simplifying and clarifying the text to facilitate implementation;
- Extending the scope to cover a larger proportion of EU buildings (when they undergo major renovation);
- Strengthening certain requirements.

More specific questions related to these areas are included in the online questionnaire, available at: [http://ec.europa.eu/yourvoice/index\\_en.htm](http://ec.europa.eu/yourvoice/index_en.htm)

## APPENDIX II

**Online Questionnaire for the Public Consultation on the Recasting of the Energy Performance of Buildings Directive (EPBD) 2002/91/EC:****Recasting of the Energy Performance of Buildings Directive 2002/91/EC****► Useful links - Background documents**

The EU has committed itself at highest level on targets of 20 % energy efficiency improvement, 20 % greenhouse gas emission reductions, and 20 % share of renewables by 2020. These targets aim at ensuring the security of energy supply, improving competitiveness and counteracting climate change at the same time.

The buildings sector is responsible for 40 % of the EU's energy consumption. It is commonly seen as one of the most important ones to contribute to the aforementioned targets. The sector's cost-effective energy saving potential is estimated at 28 % by 2020. Further activities on energy savings in this area could have multiple benefits: boosting the industry and the service sector and creating new jobs at national, regional and municipal level; improving the comfort and quality of buildings while reducing their operational costs; achieving the energy and climate change targets at lowest macro-economic costs possible;

EU buildings regulations affect governments at all levels, various industries and, in the end, all EU citizens. The Commission therefore seeks the views of stakeholders at an early stage in the context of the development of new or adjusted legislation, which have to be put in place in order to realize the targets of the Energy and Climate Change Package.

The Energy Performance of Buildings Directive of December 2002 is one such legal instrument. Although it already brought considerable energy efficiency improvements, further opportunities for strengthening the impact of the Directive have been identified by the Commission, the Member States and the stakeholders. This potential for improving the impact of the Energy Performance of Buildings Directive will be the basis for a recasting. The Commission's proposal for recasting the Directive is planned to be adopted at the end of 2008.

This internet consultation will support preparation of the recasting and aims to collect views from interested parties on how best the EU may contribute to improving the energy performance of buildings. Your answers will remain confidential and, be used only for the preparation of the recasting of the Energy Performance of Buildings Directive by the European Commission. Only the summary results of this internet consultation, including an analysis of all the replies, will be published.

The public consultation will last 8 weeks. **The closing date is thus 20 June 2008.**



Please note that:

- Replies in free text questions are limited to maximum 1000 and 2000 characters (spaces included) respectively.
- The session time is limited to 1 hour 30 min, which means that you should submit your reply within this allotted time. If you exceed this timeframe, your replies will unfortunately be lost.
- If your replies need to be co-ordinated internally, we suggest that you print the blank questionnaire, circulate it among your colleagues/ departments and draft your reply off-line (e.g. in a word processor of your choice). A designated person should then enter the answers online (you can of course simply "copy/paste" text already prepared).
- After you have clicked on "submit", you should see a confirmation page stating that your reply has been recorded. If this is not the case, and if the survey page is re-loaded instead, please check that you have filled in all compulsory questions correctly and you have not exceeded the maximum number of characters for free text questions. In this case, an error message appears next to the question for which something is wrong or missing.

## GENERAL INFORMATION

Your profile (compulsory)



Citizen



Organisation

Region (compulsory)



European Union



Europe outside European Union



Other

 Which European Union country? (optional)



Austria




Greece




Portugal

- |                                         |                                      |                                                                         |
|-----------------------------------------|--------------------------------------|-------------------------------------------------------------------------|
| <input type="checkbox"/> Belgium        | <input type="checkbox"/> Hungary     | <input type="checkbox"/> Romania                                        |
| <input type="checkbox"/> Bulgaria       | <input type="checkbox"/> Ireland     | <input type="checkbox"/> Slovakia                                       |
| <input type="checkbox"/> Cyprus         | <input type="checkbox"/> Italy       | <input type="checkbox"/> Slovenia                                       |
| <input type="checkbox"/> Czech Republic | <input type="checkbox"/> Latvia      | <input type="checkbox"/> Spain                                          |
| <input type="checkbox"/> Denmark        | <input type="checkbox"/> Lithuania   | <input type="checkbox"/> Sweden                                         |
| <input type="checkbox"/> Estonia        | <input type="checkbox"/> Luxembourg  | <input type="checkbox"/> United Kingdom                                 |
| <input type="checkbox"/> Finland        | <input type="checkbox"/> Malta       | <input type="checkbox"/> EU as a whole (for organisations only)         |
| <input type="checkbox"/> France         | <input type="checkbox"/> Netherlands | <input type="checkbox"/> Some EU Member States (for organisations only) |
| <input type="checkbox"/> Germany        | <input type="checkbox"/> Poland      |                                                                         |

- |                                                                |                                        |                                             |
|----------------------------------------------------------------|----------------------------------------|---------------------------------------------|
| <input type="checkbox"/> Albania                               | <input type="checkbox"/> Georgia       | <input type="checkbox"/> San Marino         |
| <input type="checkbox"/> Andorra                               | <input type="checkbox"/> Iceland       | <input type="checkbox"/> Serbia             |
| <input type="checkbox"/> Armenia                               | <input type="checkbox"/> Liechtenstein | <input type="checkbox"/> Switzerland        |
| <input type="checkbox"/> Azerbaijan                            | <input type="checkbox"/> Moldova       | <input type="checkbox"/> Turkey             |
| <input type="checkbox"/> Belarus                               | <input type="checkbox"/> Monaco        | <input type="checkbox"/> Ukraine            |
| <input type="checkbox"/> Bosnia and Herzegovina                | <input type="checkbox"/> Montenegro    | <input type="checkbox"/> Vatican City State |
| <input type="checkbox"/> Croatia                               | <input type="checkbox"/> Norway        |                                             |
| <input type="checkbox"/> Former Yugoslav Republic of Macedonia | <input type="checkbox"/> Russia        |                                             |

 Organisation name (optional)

 Organisation type (compulsory)

Association/Non-governmental organisation (NGO)

Chamber of commerce

Consultancy/Lobbying

Educational establishment

Employers' organisation

Energy Agency (national, regional, local)

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codes.International organisation government

government


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profit association

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from editing field codes.Private from editing field codes.Public from editing field codes.Publishing  
company sector body

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government codes.Scientific/research institute union

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codes.University

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 Main field of activity (compulsory)

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created from editing field created from editing field be created from be created from  
codes.Building or building codes.Construction works editing field editing field  
services engineering codes.Policy and codes.Real estate  
maintenance legislation

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codes.Building services codes.Energy supply editing field editing field  
engineering equipment codes.Private housing codes.Users  
associations

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codes.Construction products codes.Infrastructure editing field editing field  
codes.Public housing codes.OTHER

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## 1. CLARIFICATION and SIMPLIFICATION ASPECTS

*Full realization of the Directive's objective to reduce energy consumption in the buildings sector could fail due to unclear, imprecise or excessively complex definitions and requirements in the current text.*

1. Which of the definition(s) or requirement(s) of the existing Directive should be clarified or simplified? Please choose the part(s) of the Directive you refer to: (compulsory)


Error! Objects cannot be created from editing field codes.None      Error! Objects cannot be created from editing field codes.Article 4      Error! Objects cannot be created from editing field codes.Article 9

Error! Objects cannot be created from editing field codes.Preamble      Error! Objects cannot be created from editing field codes.Article 5      Error! Objects cannot be created from editing field codes.Article 10

Error! Objects cannot be created from editing field codes.Article 1      Error! Objects cannot be created from editing field codes.Article 6      Error! Objects cannot be created from editing field codes.Article 11

Error! Objects cannot be created from editing field codes.Article 2      Error! Objects cannot be created from editing field codes.Article 7      Error! Objects cannot be created from editing field codes.Article 12

Error! Objects cannot be created from editing field codes.Article 3      Error! Objects cannot be created from editing field codes.Article 8      Error! Objects cannot be created from editing field codes.Article 13

 What do you propose to clarify or simplify in the preamble of the Directive? Please structure your answer by recital(s) of the preamble you refer to. (Max. 2000 characters) (compulsory)

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## 2. THRESHOLDS WITHIN THE DIRECTIVE

*The obligations of the current Directive on minimum energy performance requirements and inspections respectively cover existing buildings above 1000 m<sup>2</sup> total useful floor area that undergo major renovation, and all new buildings, as well as boilers and air-conditioning systems above a certain rated output (in kW) respectively.*

*Please provide an answer to each of the following questions and, if possible, justify it by quantifying the environmental, social and economic impact of your proposal.*

2.1. Do you propose that the 1000 m<sup>2</sup> total useful floor area threshold for existing buildings that undergo major renovation (article 6 of the Directive) be changed or eliminated? (compulsory)

Error! Objects cannot be created from editing field codes.Yes      Error! Objects cannot be created from editing field codes.No      Error! Objects cannot be created from editing field codes.No opinion


 Which threshold do you propose and why?

(Max. 1000 characters) (compulsory)

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2.2. Do you propose that the 1000 m<sup>2</sup> total useful floor area threshold for the requirements on 'alternative systems' (article 5 of the Directive) and/or on the display of the energy performance certificate (article 7(3) of the Directive) be changed or eliminated? (compulsory)

Error! Objects cannot be created from editing field codes.Yes      Error! Objects cannot be created from editing field codes.No      Error! Objects cannot be created from editing field codes.No opinion


 Which threshold do you propose and why?

(Max. 1000 characters) (compulsory)

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2.3. Do you propose that the thresholds on the rated output of boilers and/or air-conditioning systems subject to regular inspections (article 8 and article 9 of the Directive) be changed or eliminated? (compulsory)

Error! Objects cannot be created from editing field codes.Yes      Error! Objects cannot be created from editing field codes.No      Error! Objects cannot be created from editing field codes.No opinion

 Which threshold do you propose and why?

(Max. 1000 characters) (compulsory)

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### 3. STRENGTHENING OF REQUIREMENTS

*The existing Directive gives room for implementation at national/regional levels. Some national, regional or local authorities have laid down requirements which go beyond the Directive's requirements, e.g. on control schemes, link to financial incentives or on the realization of energy efficiency improvement measures.*

*Please provide an answer to each of the following questions and, if possible, justify it by quantifying the environmental, social and economic impact of your proposal.*

3.1. Which new/changed requirement(s) or content concerning the energy performance certificate (article 7 of the Directive) do you consider to have a high impact on realizing energy savings in the buildings sector?

(Max. 2000 characters) (optional)

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3.2. Which new/changed requirement(s) concerning the inspection of boilers (article 8 of the Directive) do you consider to have a high impact on realizing energy savings in the buildings sector?  
(Max. 2000 characters) (optional)

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3.3. Which new/changed requirement(s) concerning the inspection of air-conditioning systems (article 9 of the Directive) do you consider to have a high impact on realizing energy savings in the buildings sector?

(Max. 2000 characters) (optional)

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3.4. Due to the complexity and variation of boundary conditions in the 27 Member States (e.g. with regard to the existing buildings stock, outdoor climate conditions, costs of energy, labour and material, taxes, etc.), minimum energy performance requirements are not stipulated at EU level in the existing Directive. They are left for the Member States to define as regards both their definition and parameters instead.

What type of approach do you consider feasible and effective which could be laid down at EU level with regard to minimum energy performance requirements for buildings?

(Max. 2000 characters) (optional)

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3.5. Which other requirement(s) do you consider to need strengthening, and in which way?  
(Max. 2000 characters) (optional)

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#### 4. THE ROLE OF THE PUBLIC SECTOR


*The public sector is often seen as an important actor to raise broad awareness on energy efficiency in buildings and which can therefore also contribute to stimulating energy savings by acting as a leading example.*

*Please, if possible, justify your answer by quantifying the environmental, social and economic impact of your proposal.*

Besides the current requirement of the Energy Performance of Buildings Directive for the public sector to display the energy performance certificate in a prominent place:

Do you consider the public sector should play a stronger role to act as a leading example for energy savings in buildings? (compulsory)

**Error! Objects cannot be created from editing field codes.** Yes      **Error! Objects cannot be created from editing field codes.** No      **Error! Objects cannot be created from editing field codes.** No opinion

 What further requirement(s) would you propose to include in the Directive for the public sector in order to act as a leading example for energy savings in buildings?  
(Max. 1000 characters) (compulsory)

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#### 5. OTHER


5.1. Do you consider that climate adaptation should significantly influence the level of requirements laid down by buildings regulation? (compulsory)



Error! Objects cannot be created from editing field codes. Yes  
Error! Objects cannot be created from editing field codes. No  
Error! Objects cannot be created from editing field codes. No opinion

5.2. Do you propose other aspects/ideas than the aforementioned to be included in the recasting of the Energy Performance of Buildings Directive? (compulsory)

Error! Objects cannot be created from editing field codes. Yes  
Error! Objects cannot be created from editing field codes. No  
Error! Objects cannot be created from editing field codes. No opinion

 What other requirement(s) do you propose? (Max. 1000 characters)

Please provide an answer and, if possible, justify it by quantifying the environmental, social and economic impact of your proposal. (compulsory)

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## APPENDIX III

Table 3 – Summary of the proposals for simplification and clarification according to the responses to the questionnaire, related to the preamble and each article.

	<b>Proposal</b>	<b>Response rate (%)</b>	<b>Respondents</b>
Preamble	<ul style="list-style-type: none"> <li>• Clarification of definitions such as "major renovation", "public building", "design" or "value of the building";</li> <li>• Requirements for new buildings/renovations should also take into account the technical, environmental and economic feasibility;</li> <li>• Calculation methods should be defined at European level (primary energy or CO<sub>2</sub>);</li> <li>• Common software should be established;</li> <li>• The certificate should better describe the actual performance situation (i.e. actual consumption);</li> <li>• Promote 'education' of the user, e.g. by monitoring of the energy performance;</li> <li>• Ventilation should be a separate subject.</li> </ul>	40	<p><b>9</b> citizens</p> <p><b>65</b> organisations</p>
Article 1	<ul style="list-style-type: none"> <li>• Clarify expressions such as "large building";</li> <li>• Directive should apply to ALL buildings which are subject of "major renovations" (also existing buildings);</li> <li>• There should be a direct focus on "indoor air quality";</li> <li>• All systems (not only boilers) should be controlled regularly.</li> </ul>	54	<p><b>10</b> citizens</p> <p><b>91</b> organisations</p>
Article 2	<ul style="list-style-type: none"> <li>• Clarify at what level the energy performance of a building is defined either estimated (calculated) or actually consumed;</li> <li>• Definitions should be in line with international and/or European standards;</li> <li>• The "standard methodology" should be clearly defined;</li> <li>• Add a definition to "ventilation", to provide an acceptable indoor climate and protect against humidity damage;</li> <li>• Add some other definitions - e.g. "total useful floor area", "renewables";</li> <li>• Lighting should be taken into account.</li> </ul>	47	<p><b>7</b> citizen</p> <p><b>81</b> organisations</p>

Article 3	<ul style="list-style-type: none"> <li>• Set a standard methodology of calculation at a European level taking the different climate zones into account and based on the CEN standards;</li> <li>• Consider the building usage within the methodology;</li> <li>• Include a CO<sub>2</sub>-indicator (in the certificate) and bind primary energy requirements;</li> <li>• Establish detailed guidelines;</li> <li>• Replace or reinforce the Annex;</li> <li>• Remove the reference to the Member States legislation.</li> </ul>	44	<p>7 citizens</p> <p><b>74</b> organisations</p>
Article 4	<ul style="list-style-type: none"> <li>• Set the Energy performance requirements (based on cost-effectiveness) similar in all Member States at European level to make them comparable;</li> <li>• The minimum requirements should be coordinated with other initiatives/Directives such as the Energy Using Products Directive (EUP)<sup>11</sup> especially concerning controls;</li> <li>• Create a level of "passive houses standards" for new buildings by 2015;</li> <li>• Member States MUST differentiate (not "may") between new and existing buildings and different categories;</li> <li>• Reinforce taking into account indoor climate conditions;</li> <li>• Real energy consumption and ventilation rates should be rated instead of theoretical calculations;</li> <li>• Clarify what is excluded from the scope in general.</li> </ul>	43	<p>9 citizen</p> <p><b>71</b> organisations</p>
Article 5	<ul style="list-style-type: none"> <li>• Abolish or lower the threshold (relative to Option B3/B4 of the Impact Assessment document);</li> <li>• Create minimum requirements for all new buildings;</li> <li>• Clarify some definitions (such as "economic feasibility");</li> <li>• Introduce a national strategic plan to ensure all new buildings as "very low energy buildings" (e.g. by setting guidelines);</li> <li>• Create an integrated approach (e.g. energy concept as a whole based on a calculated heat and cooling load).</li> </ul>	45	<p>7 citizens</p> <p><b>76</b> organisations</p>

<sup>11</sup> Directive 2006/32/EC of the European Parliament and of the Council of 6 July 2005 establishing a framework for the setting of ecodesign requirements for energy-using products and amending Council Directive 92/42/EEC and Directives 96/57/EC and 2000/55/EC of the European Parliament and of the Council, *OJ L 191, 22/07/2005 p. 29 -58*

Article 6	<ul style="list-style-type: none"> <li>• Abolish or lower the threshold;</li> <li>• Clarify the minimum performance requirements (if economically feasible) for "major renovations" and "renovation of individual components/systems";</li> <li>• The level of a "major renovation" should be better defined;</li> <li>• Indoor air quality should be taken into account.</li> </ul>	53	<p style="text-align: center;"><b>8</b> citizen</p> <p style="text-align: center;"><b>91</b> organisations</p>
Article 7	<ul style="list-style-type: none"> <li>• Mandatory introduction of a benchmarking system for cross-country comparisons of certificates, as well as for an integrated approach on incentives;</li> <li>• Each certificate should have an operational and asset rating and shall be expressed in terms of theoretical energy demand based on primary energy and quantified CO<sub>2</sub>-emissions;</li> <li>• Lower or abolish the threshold;</li> <li>• The certificate should be a shared responsibility of the owner and tenant, and mandatory for owners to inform tenants about the recommendations;</li> <li>• The ranking of the recommendations should be according to estimated savings potential and the cost-effectiveness of measures;</li> <li>• The quality of the recommendations should be ensured;</li> <li>• The certification of the software used for calculation should be on the basis of objective criteria;</li> <li>• Public sector and non-residential buildings should be upgraded in line with the recommendations received;</li> <li>• Clarify the Certificate for big apartment blocks (certification for the whole building or for each apartment);</li> <li>• Renew and display the certificate more often;</li> <li>• The moment of presentation of the certificate should be clearly defined;</li> <li>• A statistical feedback should be collected at national level by national authorities;</li> <li>• Indoor air quality should be taken into account.</li> </ul>	68	<p style="text-align: center;"><b>15</b> citizens</p> <p style="text-align: center;"><b>111</b> organisations</p>
Article 8	<ul style="list-style-type: none"> <li>• Inspections should take into account the whole system and not only components;</li> <li>• Art. 8 should be coherent with Art. 9 and vice versa;</li> <li>• According to the respondents' vote to lower or abolish the threshold for the inspection of heating and air-conditioning systems (articles 8 and 9) a large number of responses disagree to a change of the threshold;</li> <li>• The alternative contained in paragraph (b) should be deleted.</li> </ul>	32	<p style="text-align: center;"><b>3</b> citizens</p> <p style="text-align: center;"><b>56</b> organisations</p>

Article 9	<ul style="list-style-type: none"> <li>• According to the respondents' vote to lower or abolish the threshold for the inspection of heating and air-conditioning systems (articles 8 and 9) a large number of responses disagree to change the threshold;</li> <li>• Make energy audits of the system more complete and effective;</li> <li>• Inspections should take into account the whole system and not only components;</li> <li>• Make improved and more effective control (compliance) systems;</li> <li>• Clarify and lower the 12kW limit;</li> <li>• Clarify the relationship between ventilation and air-conditioning;</li> <li>• Indoor air quality should be taken into account.</li> </ul>	35	<p><b>6</b> citizen</p> <p><b>60</b> organisations</p>
Article 10	<ul style="list-style-type: none"> <li>• Clarify and strengthen the qualification and the independency of experts and put in place comprehensive support mechanisms (training/education);</li> <li>• Energy Performance Certificates should be as cost-effective as possible;</li> <li>• Experts of all Member States should have the same expertise to allow cross-border exchange.</li> </ul>	30	<p>7 citizens</p> <p><b>48</b> organisations</p>
Article 11	<ul style="list-style-type: none"> <li>• Accelerate the implementation in practice;</li> <li>• Remove barriers to market entry for energy efficient solutions and providers;</li> <li>• Oblige Member States to introduce fiscal incentives (not supported by all organisations);</li> </ul>	20	<p><b>5</b> citizens</p> <p><b>32</b> organisations</p>
Article 12	<ul style="list-style-type: none"> <li>• Improve public information campaigns;</li> <li>• Accelerate the implementation in practice (e.g. by introduction of guidelines);</li> <li>• Clarify some expressions and strengthening (e.g. change "may" into "shall")</li> </ul>	17	<p>2 citizens</p> <p><b>29</b> organisations</p>
Article 13	<ul style="list-style-type: none"> <li>• Improve public information campaigns;</li> <li>• Accelerate the implementation in practice (e.g. by introduction of guidelines);</li> </ul>	10	<p>2 citizens</p> <p><b>16</b> organisations</p>



**COUNCIL OF  
THE EUROPEAN UNION**

**Brussels, 20 January 2009**

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**Interinstitutional File:  
2008/0223 (COD)**

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**15929/08  
ADD 4**

**ENER 398  
ENV 850  
CODEC 1592**

**COVER NOTE**

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from: Secretary-General of the European Commission,  
signed by Mr Jordi AYET PUIGARNAU, Director

date of receipt: 17 November 2009

to: Mr Javier SOLANA, Secretary-General/High Representative

Subject: Annex 2 to Communication Staff Working Document  
- Accompanying document to the Proposal for a recast of the energy  
performance of buildings Directive (2002/91/EC)  
= Impact assessment

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Delegations will find attached Commission document SEC(2008) 2864 Annex 2 Volume 2.

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Encl.: SEC(2008) 2864 Annex 2 Volume 2



COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 13.11.2008  
SEC(2008) 2864  
VOLUME 2

## **Annex 2 to**

**COMMUNICATION STAFF WORKING DOCUMENT**

*Accompanying document to the*

**PROPOSAL FOR A RECAST OF THE  
ENERGY PERFORMANCE OF BUILDINGS DIRECTIVE (2002/91/EC)**

**IMPACT ASSESSMENT**

{COM(2008) 780 final}  
{SEC(2008) 2865}

## ANNEX II

**SUMMARY OF THE MEMBER STATES' RESPONSES TO A  
QUESTIONNAIRE ON THE CURRENT EPBD AND ITS REVISION**

In general, Member States agree that energy efficiency of buildings is one of the most important tools to reach the EU's energy policy targets. Information available suggests that Member States discern considerable potential remaining for improving energy efficiency in the existing building stock.

Both in the Energy Demand Management Committee meeting on 31 March 2008 and in responses to a corresponding questionnaire to Committee members (provided at the end of the document), related feedback was provided by a majority of Member States. It is true that the information thus collected does not fully reflect the current situation regarding the implementation and transposition of the EPBD across the entire EU. Nevertheless, the Member States' responses and contributions constitute an interesting snapshot of the concerns and experiences at the practical level. Some of the Member States who had studied the EPBD's impact and had evaluated their implementing experience gained thus far, provided brief summaries of these studies.

The questionnaire was structured along the following main issues: The impact of the EPBD, proposals to amend or add definitions, the current situation as regards the thresholds, control schemes and inspections, Energy Performance Certificates and energy performance requirements. A summary of the Member States' reactions in the context of the Energy Demand Management Committee (EDMC) is given below.

**The impact of the EPBD in energy, economic, social and/or environmental terms**

In the framework of the EDMC-meeting on 31 March 2008, and with the corresponding questionnaire, the Commission asked if (economic) impact assessment (or other analysis) had been carried out, and if Member States could provide brief summaries of their outcomes, in particular with a focus on expected and achieved energy and emission savings, economic costs and benefits, and also on newly created jobs.

According to the replies received, Member States have made a broad analysis, to varying degrees, on the EPBD's actual impact. In turn, others argue that, since they have not yet fully implemented the EPBD, such analysis could only be made at a later stage. However, reports thus far available indicate that the EPBD might help reduce energy consumption and CO<sub>2</sub>-emissions significantly. As regards the technical potential to save energy in the buildings covered by the Directive, perception in the domains concerned (homeowners and construction industry) appears to be rather positive. For instance, Energy Performance Certificates could become a criterion in real estate portfolio analysis. Information also indicates that financing the extra investment for energy efficient installations could be a considerable burden on homeowners. Further, based on information submitted by Member States, there are indications that implementing the EPBD might create additional employment in the range of several thousand jobs in the long term, i.e. over 20 years of implementation.



### **Administrative costs**

The Commission further asked Member States if they had identified administrative costs linked to the transposition and/or implementation of the EPBD. Responses confirm that almost all Member States have identified related administrative costs, borne by citizens, business and public authorities. However, the orders of magnitude, time spans concerned as well as cost categories vary significantly between Member States. Detailed estimates will only be available at a later stage of the EPBD's implementation. According to information available, costs borne by the Member States' budgets may mainly relate to support initiatives, such as bonus payments, interest rate subsidies, tax credits, the preparatory studies and the development of tools, certification schemes, monitoring, communication activities to the public and the market, and for public registries. There are also costs borne by citizens and business, notably certification and inspection costs, training and accreditation of experts and their entry in public registers.

### **Clarifying and simplifying certain provisions – Member States' proposals to add definitions to Art. 2 EPBD**

The Commission asked Member States which definitions they would add and/or modify in Art. 2 of the EPBD. According to the responses, most Member States already identified EPBD provisions which raise questions of interpretation, technical justification and/or cost-effectiveness. Information provided by the Member States indicates that the majority proposes new or refined definitions, while very few consider the existing definitions appropriate. Some find that it is yet too early to amend Art. 2 of the Directive. Information available suggests that, among others, the definitions of "major renovation", "independent expert", "air conditioning system", "boiler", "heat pump", "public building", and "public authority", could be improved or set. Furthermore, it appears that clear definitions of "economic efficiency", "cost-effectiveness", and "economic feasibility of modernisation" were felt to be lacking.

### **Current situation as regards the 1000 m<sup>2</sup> threshold for minimum energy performance requirements for existing buildings when they undergo major renovations (Art. 6 EPBD)**

Responses provided by Member States as to whether or not they apply the 1000 m<sup>2</sup> -or any other threshold- in their EPBD transposition vary considerably. In general, a considerable number of Member States do not apply the 1000 m<sup>2</sup> threshold. Some of the Member States who do not provide for any thresholds set energy efficiency values for any renovation, meaning that, as rule, all major renovations need to meet the same (specific) energy performance requirements as new buildings. However, available information suggests that rules on minor renovation works and very small buildings apply in the absence of thresholds.

### **Control schemes for Energy Performance Certificates and for inspections (Art. 7, 8, 9 EPBD)**

A further question put to Member States was if they had established control schemes for Energy Performance Certificates and for inspections. On the one hand, the majority of Member States who have responded have already established some control schemes, or are presently considering organising them. According to available information, the majority of Member States have already gained sufficient, or even significant, experience with enforcing energy performance requirements. Nevertheless, many Member States feel that it is yet too

early to draw definite conclusions from practical experience with such control schemes. Nevertheless, information received indicates that there is a need to continue with measuring the impact of control schemes and inspections, as well as with discussing methods, future solutions and sharing experiences.

### **Recommendations of the Energy Performance Certificate for buildings – compulsory implementation**

The Commission enquired in which Member States it is compulsory to realize the recommendations of the Energy Performance Certificate for buildings. The majority of Member States who responded to the Commission's enquiry do not consider an obligatory realisation as an appropriate tool. Obligatory implementation of such recommendations is required in some Member States, however in situations where public aid for energy performance improvement can be sought or as regards public buildings.

### **Energy performance requirements**

The Commission asked Member States if they had carried out an (economic) impact assessment (or other analysis) in order to fix the level of such requirements.

Some Member States reported that the following aspects were considered in varying extent and depth: economic feasibility, technical feasibility, environmental impact, extra construction costs, category of building, size, energy consumption, building practice, compatibility with urban development and architectural design, equipment and materials well established on the market or in the process of market penetration, economic impact on the different building markets (and on the owners), number and capacity of the workforce, health consequences, acceptance by the market, availability of proven technology, risk on obstruction of innovative technologies due to too rigid regulation.

**Energy Demand Management Committee (Buildings Formation) Meeting****March 31, 2008****Questions regarding the Energy Performance of Buildings Directive (2002/91/EC)**

- (1) What is the situation of transposition and implementation of the Directive in your country in general:
  - (a) Have you identified administrative costs linked to its transposition and/or implementation?
  - (b) In which domain and of which kind are the administrative costs to the government? What are their impacts in absolute/relative terms?
  - (c) Have you run any broader analysis on its actual impact (in energy, economic, social and/or environmental terms)?
- (2) Which definitions would you add/modify in Art. 2?
- (3) Regarding the 1000 m<sup>2</sup> threshold for minimum energy performance requirements for existing buildings when they undergo major renovations (Art. 6):
  - (a) Did you include this or another threshold in your transposition and why?
  - (b) Was an impact assessment or other analysis made? Could you provide us with those analyses or references to them and summarise in about two paragraphs their outcomes, in particular with a focus on expected (ex ante) and on achieved (ex post):
    - (i) energy and emission savings, (ii) economic costs, and benefits and (iii) newly created jobs for different threshold scenarios?
  - (c) Were there other aspects that influenced the decision of your country?
- (4) Specifying minimum energy performance requirements for (i) new buildings and (ii) existing building that undergo major renovations:
  - (a) Was an (economic) impact assessment (or other analysis) carried out in order to fix the level of requirements? Could you provide us with these assessments or references to them and summarise in two paragraphs their outcomes, in particular with a focus on expected and on achieved (i) energy and emission savings, (ii) economic costs and benefits and (iii) newly created jobs?
  - (b) Were there other aspects that influenced your decision?
- (5) Control schemes for Energy Performance Certificates and for inspections (Art. 7, 8, 9):
  - (a) Have you established any?
  - (b) What is your current experience with regard to compliance with each of these articles in practice?

- (c) Has an impact assessment (or any other study) been made to analyse the (non-) compliance rate and the impact in practice of the certification and inspection scheme? Could you provide us with these assessments or references to them? Could you summarise in two paragraphs their outcomes, in particular with a focus on expected and on achieved (i) energy and emission savings, (ii) economic costs and benefits and (iii) newly created jobs?
- (d) Were there other measures introduced to guarantee compliance with these articles?
- (6) Is it compulsory to realize recommendations of the Energy Performance Certificate for buildings?  
If so, did you analyse the expected and achieved additional energy and emission savings, the necessary investments, and the amount of newly created jobs? Could you provide us with those analyses or references to them?
- (7) Are there other aspects you consider important to achieve energy savings that could be realized by extending or strengthening the existing articles of the EPBD?



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**Brussels, 20 January 2009**

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ADD 5**

**ENER 398  
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**COVER NOTE**

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from: Secretary-General of the European Commission,  
signed by Mr Jordi AYET PUIGARNAU, Director

date of receipt: 17 November 2008

to: Mr Javier SOLANA, Secretary-General/High Representative

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Subject: Annex 3 to Communication Staff Working Document

- Accompanying document to the Proposal for a recast of the energy performance of buildings Directive (2002/91/EC)
- = Impact assessment

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Delegations will find attached Commission document SEC(2008) 2864 Annex 3 Volume 3.

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Encl.: SEC(2008) 2864 Annex 3 Volume 3



COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 13.11.2008  
SEC(2008) 2864  
VOLUME 3

## **Annex 3 to**

**COMMUNICATION STAFF WORKING DOCUMENT**

*Accompanying document to the*

**PROPOSAL FOR A RECAST OF THE  
ENERGY PERFORMANCE OF BUILDINGS DIRECTIVE (2002/91/EC)**

**IMPACT ASSESSMENT**

{COM(2008) 780 final}  
{SEC(2008) 2865}

## ANNEX III

**THE ENERGY PERFORMANCE OF BUILDINGS DIRECTIVE CONFERENCE:  
NEXT STEPS  
EU SUSTAINABLE ENERGY WEEK, JANUARY 31, 2008, BRUSSELS**

**CONFERENCE SUMMARY**

**Context - Background**

The conference was organized by DG TREN with support of the EPBD Buildings Platform as part of the EU Sustainable Energy Week which took place from January 28 to February 1, 2008 in Brussels.

The buildings sector consumes 40% of the final energy in the EU. There is a 28% cost-effective potential which could translate into reduction of 11% of the total EU final energy consumption. To reap this potential the Energy Performance of Buildings Directive (EPBD 2002/91/EC) was adopted in 2002. But still, there remains a considerable unutilized potential. The reinforcement of the EPBD is a strategic objective of the Commission for 2008.



**Scope**

- Announcement of the preliminary ideas of DG TREN for the strengthening of the EPBD;
- Initial consultation with the stakeholders;
- Current state of the implementation of the Directive.

**Participants**

There was significant interest in the Conference, with some 360 registrations, the participants being:

- Officials from the European Commission
- Representatives of national governments - members of the Energy Demand Management Committee (Art 14)
- Representatives of industry organizations, property owners and managers associations, energy agencies, banks, and consulting organizations

**Content**

The conference was split up in 5 parts:

1. EPBD: Reaping the potential in the buildings sector
2. Lessons from the current implementation of the EPBD
3. Cutting of the 1000 m<sup>2</sup> threshold – Can it work in practice?
4. Setting minimum EU energy performance requirements?
5. Fiscal and financial incentives

Web streaming of the whole conference was available through the ManagEnergy program and each presentation can be viewed on [www.managenergy.tv](http://www.managenergy.tv) or on the web streaming page of the EPBD Buildings Platform website, where additional information is also given (<http://www.buildingsplatform.org/cms/index.php?id=216>).

## **PART 1 - EPBD: REAPING THE POTENTIAL IN THE BUILDINGS SECTOR**

### **Opening: Energy efficiency improvements in the buildings sector - The next steps**

**Mr. Fabrizio Barbato, Deputy Director-General of DG Energy and Transport (DG TREN), and Acting Director of Directorate D** described the overall context regarding the environmental and energy challenges, paying specific attention on the European environmental policy and the important role of the buildings sector.

### **Presentation: Potential, current implementation, and initial ideas for reinforcing the EPBD**

**Mrs. Pirjo-Liisa Koskimäki, Head of unit D4, Energy Efficiency, DG TREN**, introduced the significance of the buildings sector for EU energy policy objectives of 20/20/20 by 2020 (20% reduction of greenhouse gases, 20% share of renewable energy in final energy consumption and 20% savings in energy consumption). She gave an overview of the current implementation of the EPBD and possible options to be considered regarding its recast:

- Abolishing or lowering the 1000 m<sup>2</sup> threshold for existing buildings and major renovation
- Strengthening the content and the role of the Energy Performance Certificate
- Strengthening the content and the role of inspections
- Specifying minimum energy performance requirements

The current Directive should be fully transposed and properly implemented, whilst its main principles should not be changed. Provisional timetable: several years will be required for the Commission's proposal to be adopted by the Council and the European Parliament and an additional few years to be transposed and implemented by the Member States (MS).

**Mr. Stefan Lechtenböhrer, Co-Director Energy, Transport and Climate Policy, Wuppertal Institute (WI)**: - contributed to the presentation of Mrs. Koskimäki, by pointing out in his presentation the following facts:

- EU-25 relevance of energy used in buildings is significant and is projected to remain stable, i.e. 40% of total final energy use and 38% of all CO<sub>2</sub> emissions come from this sector
- a huge cost efficient potential for CO<sub>2</sub> reduction by improving Energy Efficiency (EE) exists (including: improvement of building shell, heating systems, installed equipment and appliances)
- a huge share of the building stock needs to be refurbished
- standards of new and refurbished buildings have to increase
- substantial investment has to be stimulated

Ranking of technologies for energy efficiency measures (WI: 2005, 2006 and Primes 2006)

1. Refurbishment of existing buildings (long lifetime of measures)
2. High efficient heating systems
3. High efficient appliances



#### 4. Low energy / passive house for new buildings (long lifetime of measures)

Currently covered by the EPBD:

- New buildings
- Maintenance of heating systems and of air conditioning systems
- Existing buildings: Only covered regarding labels and above 1000m<sup>2</sup>

- for major renovation additional costs for energetic optimization are "marginal" (14€ bln/y)  
- payback is relatively short, however full costs of renovation cannot be covered by energy savings

- potential of energy savings in buildings is huge: 40% to 60% of the energy efficiency targets (WI: 2008). So the energetic optimization of buildings is one of the most cost efficient solutions to climate change

Actions are split into several sectors and areas:

- Residential / Non residential sector
- Building shell
- Heating systems (plus alternative systems)
- Appliances

A mix of specific instruments is needed, e.g.:

- Minimum standards should be set (buildings, appliances, integrated planning)
- Quality should be assured
- Buildings refurbishment should accelerate

#### **Presentation: Main challenges, gaps and opportunities of the current implementation**

**Mr. Eduardo Maldonado, Coordinator of EPBD Concerted Action** ([www.epbd-ca.org](http://www.epbd-ca.org))

Since the beginning of 2005, the EPBD Concerted Action is one of the major initiatives of the European Commission for supporting the Member States (MS) in the EPBD implementation and for moving towards a certain degree of harmonization on a voluntary basis. It is a forum where MS exchange their experience and discuss the best practice examples and the challenges.

Positive aspects from the EPBD are visible:

- New, more demanding building regulations are in force throughout the EU, new software tools are available.
- New summer requirements have been introduced for the first time in many MS.
- Many MS have established a working administrative system for issuing certificates and inspecting boilers and air-conditioners, as well as train and/or recognize qualified experts, bringing a clear improvement to the level of technical expertise acting in this area throughout the EU.
- There are now clear targets for what can be considered high-performance buildings in most MS.
- Awareness of the importance of building energy efficiency is now much higher throughout the EU.

Weak points of the EPBD:

- The technical annex is complex and very ambitious and it should be made realistic.
- Direct comparisons of building performance among different MS will be quite difficult due to the adoption of different sets of simplifications at national level.
- Mandatory periodic inspection of small boilers and air-conditioners, and even of larger units in mild climates, can be easily shown not to be cost-effective. The lack of an

“option b)” for inspections of air-conditioners, as offered by the EPBD for boiler inspection, is commonly considered as highly desirable.

- Some definitions (e.g., “Public Buildings”, “air-conditioning system”, “ventilation system”, “12 kW limit for AC per building or per unit”, etc.) are too vague and allow quite a large degree of variation for application by MS.
- The concept of “independence” of the qualified experts and inspectors is also quite vague.

#### Main Gaps of the EPBD:

- Promotion of passive solutions is seen as lacking in the EPBD. Building regulations promoting better summer design and prevention of overheating may have a more important potential for producing energy savings than inspections of small air-conditioners, of doubtful cost-effectiveness.
- New requirements set up by MS, especially for major renovations, often cause significant difficulties to building owners. Financial support schemes are clearly desirable.
- Information and awareness campaigns are essential and they should be addressed in a more systematic way.
- Monitoring requirements and reporting contents are clearly needed.

#### Other Urgent Actions:

- CEN standards addressing difficult technical issues such as integration of renewable Energies, thermal bridges, natural ventilation, day lighting, cogeneration, etc., pose difficulties for practical implementation. More practical standards are needed.
- CEN standards addressing inspections of boilers and air-conditioners also need a quick revision. As they stand, they are of very limited use.
- Every MS agrees that costs for certification and inspections are of paramount importance. MS must make compromises between costs and accuracy need to be carefully balanced and differentiated by building type.
- The provision of advice in the Certificates and after inspections is also quite vague, as cost-effectiveness criteria are not precisely defined.
- Standardized software tools must be made available to experts and inspectors, at a national or regional level, to enable consistency and reproducibility in advice.

Also, building regulations should not place limits on innovation!

## PART 2 - LESSONS FROM THE CURRENT IMPLEMENTATION OF THE EPBD

In this session, the focus was on the present experiences with the EPBD implementation and the lessons learned.

To show the advancement and challenges of the implementation of the current Directive three Member States (MS) made presentations.

### **Presentation: Lessons learned - perspectives from Germany**

**Mr. Horst-P. Schettler-Köhler, Federal Office for Buildings and Regional Planning, Germany** gave an overview of the German experience in implementing energy methods:

Situation 2002:

- Before 2002 holistic methods with overall approach were already in use
- to meet the standards of the EPBD: only two aspects (Lighting and cooling) had to be included (inclusion was not possible with EN 832)

Building stock:

- Catalogue of measures, in case of which requirements have to be met with list of maximum U-values for fabric elements
- "bagatelle margin", no 1000m<sup>2</sup> threshold, all buildings were treated in the same way
- All new heating equipment had to meet the new requirement for new buildings
- Mandatory upgrade of old boilers, thermal insulation of pipes and upper ceilings/roof

Certificates:

- Energy certificates (new buildings and certain major renovation) were mandatory since 1995 (but not all aspects of EPBD), voluntary for existing buildings
- Inspection scheme for Boilers in force since 20 years, but no mandatory of heating-systems and air-conditioning appliances

Approach:

- 1:1 implementation of the "missing parts"
- The Energy savings Ordinance 2007 was adopted in summer 2007
- Next steps: Strengthening the requirements of new buildings (PassiveHouse Standard)
- 2009: further 30% cut for new buildings, 2012: repeat of the exercise

### **Lessons learned:**

- The lifetime of energy-saving regulations gets shorter, but building reality reacts slowly
- Experts have to learn, software for certification must be ready for use
- The energy performance of building products has to improve
- The building costs must be taken into account: the costs decrease, when a level of requirements is in force for a certain time
- Requirements on energy performance, on renewable energy, on building products and on boilers are subject of different European directives as well as national issues, but have to be merged in national implementation
- Citizens prefer a predictable energy-saving policy, people do not welcome a new ordinance or amendment every year!
- If different requirements, methods and schemes are due for change, it is better to wait a little, collect the issues and do all together with one amendment

### **Presentation: Lessons learned - perspectives in the Czech Republic**

**Mrs. Irena Plocková, Senior official, Ministry of Industry and Trade, Czech Republic,**

More than 30 years of experience in calculation, evaluation and verification of heat and energy consumption of all types of buildings. Since 2001 a scheme is operational with energy certificate of buildings, but only with indicators of heat consumption. Direct energy is calculated for the whole building not for individual units or flats. The Ministry certifies the energy auditors.

The expected annual energy savings in the households by the end of 2010 is higher than 914 GWh and 6048 GWh by the end of 2016. Potential for savings is more than 30% of all energy consumption in the Czech Republic. Savings in the tertiary sector are 800 GWh by the end of 2010 and 3100 GWh by the end of 2016. The potential of savings in this sector is more than 16% of all energy consumption in the Czech Republic.

**Lessons learned:**

- Voluntary processes are not effective and legislation is needed to realize the potential of energy savings
- The implementation of EPBD is very effective to achieve energy savings potential
- Methodology for the inspections of boilers and air conditioning systems. The Czech Republic needs more technical standards and best practice or guidelines.

**Presentation: Lessons learned - perspectives in France****Mrs. Marie-Christine Roger, Head of prevention and technical quality office, Ministry for Ecology, Sustainable development and Spatial Planning, France****Lessons learned:**

Energy performance certificates:

- Mandatory for sales since November 2006
- Mandatory for rentals since July 2007
- Many experts were needed in a short time
  - Good point : About 5 000 experts today
  - Point to improve: Certification level not very high
- For a cheap certificate :
  - Simplified method : to be improved
  - Energy consumption based on the bills: good point
- Question of reliability/credibility of the certificates

Existing buildings:

- Buildings >1000 m<sup>2</sup> and cost of works >25% cost of building. The most difficult measure to implement
- Issues :
  - Diversity of the building stock (age, construction type, ...)
  - Data and measurements are hardly available for old buildings
  - Consumption difficult to assess
  - It has been necessary to develop a new and appropriate calculation methodology
- The idea in France is that certificates could be used to lay down a regulation:
  - To delete class G from the building stock
  - Can works be mandatory when the house is sold? Could the certificate be used in this case?
  - This implies that the certificate has to be more accurate and has to be closer to the reality
  - What kind of incentives? How to involve the banks in the process?
  - Develop efficient solutions to certain types of buildings (feasibility, cost...)

**Presentation: EnR Report on the implementation of the EPBD**

**Mr. Simon Green and Mr. Eion Lees, EnR – (European Energy Network, [www.enr-network.eu](http://www.enr-network.eu)) “EnR Report on the implementation of the EPBD”**

**EnR recommendations for EU:**

- Set out a timeframe by which all new buildings will require to have net zero energy requirements or net zero carbon emissions when averaged over the year (case study UK);
- Encourage Member States to provide incentives or rewards for new buildings or renovation which go beyond their national or regional building standards until such times as the net zero house is mandatory (case studies Germany & UK)
- Require all buildings undergoing major renovations to meet minimum performance requirements and to lower the size threshold to include individual houses (Sweden will lower threshold from January 2009)
- Ensure that there are enforcement systems in place and assess regularly and independently whether enforcement is effective (case study Sweden)
- Use EUP Directive to maximum effect for end use appliances used in buildings and which are traded across the EU e.g. lighting, air conditioning etc.
- Within 7 years, make cost effective energy efficiency measures and alternative energy sources mandatory when selling or renting buildings (Portugal has mandatory solar water heating in new build since July 2007)
- Ensure harmonized reporting of the energy and/or carbon savings arising from the EPBD if they are not forthcoming from Member States reporting under the EU Directive on End-Use Efficiency and Energy Services
- Amend the EU Structural Fund rules such that all cost effective energy efficiency measures must be carried out in any building which receives support for installation of renewable energy sources
- Implement demonstration projects for net zero energy or net zero carbon buildings, and for refurbishment of existing buildings (case study Germany)

**EnR recommendations for MS:**

- Set minimum performance requirements for buildings components, such as windows, roof insulation, ventilation, office lighting and boilers, which should be fulfilled when these components are changed or are renovated and signal tightening of requirements through time
- Ensure the take-off of building energy performance certificates by information and awareness campaigns to building owners and training campaigns targeted at all market agents in the buildings sector (happening in Germany, Portugal, France, Netherlands)
- Establish effective enforcement systems to ensure that the Building regulations on new build and major refurbishments of existing buildings are actually met
- Lead by example in deploying and, where appropriate, demonstrating new building designs, construction and technologies and renovation strategies in public buildings (Netherlands for renovation)
- Step up efforts to change attitudes and behavior to energy use without which the maximum benefit of sustainable energy technologies will not be achieved
- Implement mechanisms and incentives for building residents and owners to improve their energy performance through linking into EPBD requirements such as EPCs at key trigger points e.g. sale, major renovation, rent levels, mortgages etc. (Netherlands and many other countries working towards this)

**PART 3 - CUTTING ON THE 1000m<sup>2</sup> THRESHOLD - CAN IT WORK IN PRACTICE?****Presentation: Cost-effectiveness, added value and examples from the EU Member States****Kevin O'Rourke, Head of Built Environment at Sustainable Energy, Ireland (SEI)****Suggested further investigations:**

- Establish baseline energy efficiency penetration status across MS (reduces potential)
- Cover all relevant energy efficiency buildings technologies (not only thermal, increases potential)
- Differentiate with more refinement between:
  - Different MS in same climatic zone: technical, economic, institutional
  - Housing and non-residential (including public) sectors
- Seek more clear convincing cost effectiveness evidence to investors
- Examine alternative and/or reinforcing options to extended regulation
- Examine practical and organizational issues in depth (lessons from current EPBD)

**Conclusions:**

- Upgrading small buildings is important, but can be difficult
- A wide technology potential to be harvested
  - Mechanical & electrical hardware may be more cost-effective than building fabric measures
  - But not all may be suitable for regulation
- Cost-effectiveness: apparently
  - Net public gains justified in societal terms
  - Private gains and priorities may not be convincing
- Value added of amending the 1000 m<sup>2</sup> threshold :
  - Potential to treble impact of current EP renovation, but:
  - Actions already taken may mean that differential impact could be much less
  - Pace of realization slow, gains evolve cumulatively
- Enforcement of such a new requirement is a challenge
- Under ESD, every MS must have an Energy Efficiency Action Plan
  - Existing buildings must be part of that agenda
  - May be by regulatory or other means
- EPBD seems to be driving MS towards similar systematic approaches to energy efficiency, pulled by the early movers
- Complex, diverse conditions apply across the EU
- A harmonized EP criterion for renovation: may not be important
- Regulation can drive innovation – demand for new skills, energy efficiency materials, products and services
- Further investigation needed to inform processes of negotiation and (if adopted) MS implementation
- Article 6: EP requirements for “major renovation” of existing buildings over 1000 m<sup>2</sup> – “in so far as this is technically, functionally and economically feasible” – very slippery phrase which allows escaping from obligations.
- Buildings > 1000 m<sup>2</sup> represent only 28% of total area.

**Presentation: Costs for implementing and monitoring compliance**

**Mr. Frans van Ekerschot, Coordinator EPBD, Ministry of Housing, Spatial Planning and the Environment, the Netherlands.**

## Requirements on component level

- Component requirements:
  - Easier to deal with by the market
  - CO<sub>2</sub> impact is limited to the building parts to be renovated
  - Integrated in the execution of the renovation (cheaper)
  - Legal frame can be simpler (restricted to the measures themselves)
  - Assessment method can be simpler
  - Can be controlled/monitored easier

## Requirements on building level

- Building requirements:
  - Require a full building assessment
  - Impact relates to building as a whole
  - Not or partly integrated energy saving measures are often more expensive
  - Legal frame is more complex because it extends beyond the renovated part and therefore complexity is added
  - Should be controlled/monitored on the whole building level

## Combining both approaches:

- Starting from the component level
  - Set requirements on component level
  - Use the building requirements as a lower threshold, to avoid poor buildings not to be considered as a whole
- Starting from the building level
  - Set requirements on building level
  - Use the component requirements as a lower threshold, to avoid replacement or renovation of components on a poor level

## Recommendations:

- Realizing an effective and cost efficient implementation requires:
  - A national vision on the most effective and practical approach
  - A national vision on the future use of this policy instrument
- This requires flexibility in the way the EPBD can be implemented:
  - Regarding component or building requirements
  - Regarding the definition of major renovation and feasibility
- The flexibility in article 6
  - Provides the opportunity to develop a effective approach on national level.
  - Requires explicating the effectiveness of the chosen national approach.
- The EC should be transparent about the way article 6 can be interpreted including where freedom of interpretation is allowed.

**Panel discussion****Interventions by Member States:****Mr. Wolfgang Ornth, Ministry of Building, Transport and Urban affairs, Germany;**

- Germany: 80% of buildings are less than 1000 m<sup>2</sup>
- The potential is great, because buildings of this size also tend to be in bad energy conditions
- But: It should be taken into account what is economic from a global point of view and desirable (what maybe would make sense) on one hand and what the market will provide and people are willing to pay for on the other hand.
- Where there are high rents nobody will pay for energy savings
- A big issue is: how people in smaller buildings could be motivated to invest. The energetic renovation costs thousands of Euros. Even with the financial incentives (look presentation of KFW-Bankengruppe) Germany has still difficulties to motivate private investments.

**Interventions by different stakeholders:****Mr. Hubert Despretz ADEME, Agency for Energy and Environment, France (www.ademe.fr);**

- Presented results of a study on the costs of feasibility studies (required under Art. 5 – new buildings above 1000 m<sup>2</sup>). The conclusions are that below certain area (500 m<sup>2</sup>) the costs for the study are not necessary economically interesting as the study does not depend so much on the size but on the complexity of the job.
- There are not enough experts to do the feasibility studies if the limit is abolished. Maybe one of the solutions is to progressively bring the limits down and gradually involve more and more buildings as energy prices go up. The feasibility studies on renovation will become a better economic option.

**Mr. Olivier Loebel, CEETB, European Technical Contractors Committee for the Construction Industry (www.ceetb.eu);**

- 72% of the building stock is excluded from the scope of EPBD and at the same time 1 to 2% of the building stock is replaced every year, so the focus is on existing buildings.
- New provisions have to be in compliance with forthcoming Directive for Renewable Energy, which will impose certain obligations.
- 1000 m<sup>2</sup> threshold requirement is certainly too high and can not really be justified.
  - 100 m<sup>2</sup> is realistic, exclusion for buildings which are rarely used (weekend and holiday houses).
- MS must be free to go down from 100 m<sup>2</sup> to 0 m<sup>2</sup>.
- Renovation it is usually done step by step and Directive should follow this approach by introducing minimum energy requirements for components and for equipment
- EPC should be obligatory for all public buildings
- Need of combined legal obligations and incentives (encourage and make).



**Mr. Olli Seppanen, president of REHVA, Federation of European Heating and Air Conditioning associations ([www.rehva.com](http://www.rehva.com));**

- Position regarding Art. 5:
  - Regarding the new building the limit of 1000 m<sup>2</sup> can be omitted so that requirement will apply also to smaller buildings, but “alternative systems” should be changed to “energy efficient system in respect of low carbon emission and primary energy use”
  - The list of examples should be changed accordingly, and moved to appendix
  - The last sentence in Art. 5: it is too late to consider any alternate systems “before construction starts” instead formulate it “at design stage”
- Position regarding Art. 6:
  - 1000 m<sup>2</sup> limit should be reduced but not so the all requirements of energy efficiency for new buildings are mandatory. Such kind of requirement would delay many necessary refurbishments but
  - the requirements can be set “for the renovated systems or components when these are part of a renovation to be implemented within a limited time period”
- When the requirements are extended to the buildings smaller than 1000 m<sup>2</sup> the following issue should be addressed:
  - Indoor air quality (IAQ) should be considered always when remodeling avoid sick building syndrome
  - Gross national product per capita to be considered within EU-countries when setting requirements
  - LCC analysis to be used when selecting the renovation and presenting examples on national level – no need to include examples in directive, maybe in appendix
  - CO<sub>2</sub> analysis is preferred instead of primary, final or end-use (delivered) energy
  - Housing area per person could have an influence on the requirements regarding residential buildings
- Position regarding Art. 7:
  - No reason why this article couldn't be extended to all buildings occupied by public authorities and by institutions providing public services
- Conclusions:
  - It is feasible to reduce 1000m<sup>2</sup> limit with some reservations
  - At the same time tools and guidelines should be developed and published how to select “best” measures in renovation for improvement of energy efficiency
  - These guidelines should be published simultaneously with the revised directive

**Mr. Stratos Paradias, President of UIPI (International Union of Property Owners);**

- Property owners have to be respected in all the relevant discussions, and also informed about proposed amendments of EPBD.
- Property owners need to be convinced that it is a right way to follow and assisted in order to overcome the difficulties with the implementation of EPBD.
- The building owners are those who are going to pay high costs of the implementation of the Directive.
  - Especially problematic in private renting sector is that the owner has to invest in energy saving and that their tenant can profit from this investment.

- The expenses for making alternation in buildings are eligible within community framework.
- MSs should take concrete measures to assist property owners with implementation (if not situation will not improve).

**Mr. Peter Bach, Energy Authority, Denmark;**

- Denmark has implemented a target for major renovation (>25% of the surface of the building) that covers all kind of buildings (no 1000m<sup>2</sup>-treshold), but as well components (roof-, wall-insulation, windows etc.) could be changed without being forced to renovate the whole house. Therefore there are still practical problems need to be solved removing the 1000m<sup>2</sup>-treshold.
- Cost-effectiveness of renovations is not easy to find out (without experts)

**Mr. Martin Elsbergers in reply to Denmark;**

- EPBD has to be clarified, there seems to be questionable interpretation of the requirements of the Directive in practical term
- It is not the intention of EPBD to force owners to do things which are not cost effective
- From the current EPBD it is clear that the energy performance requirements are to be met only for the components that are renovated and not the whole building

**Mr. Horst-P. Schettler-Köhler, Federal Office for Buildings and Regional Planning, Germany;**

- In Germany experience of 20 years of requirements about individual measures that had to be adopted and market reacts to that. The requirements became self-fulfilling as the owners of the building have to buy particular kind and that is what people start selling.

**Short summary by the moderator Mr. Eduardo Maldonado:**

- Market regulation is really important. National governments can take positive action in controlling that type of reaction.
- Cutting 1000m<sup>2</sup> threshold is something what has been long discussed. Also during EPBD (2002/91/EC) the 1000m<sup>2</sup> threshold was not the first choice, it was already a compromise. Everybody agrees that 1000m<sup>2</sup> is arbitrary. 0 m<sup>2</sup> or more careful propositions consider eventually financing or technical problems. To do it by component could be basically the message and not to do it on the scale of the building.
- If there is a political decision solutions will be found for technical problems.

## **PART 4 - SETTING MINIMUM EU ENERGY PERFORMANCE REQUIREMENTS**

### **Presentation: Initial ideas on setting minimum energy performance requirements**

**Mr. Martin Elsberger**, Policy Officer at DG TREN. Presentation on the Initial ideas regarding specifying EU minimum energy performance requirements.

Reasons for specifying minimum requirements:

- Setting cost-optimum requirements
- Leading all Member States to more ambitious, cost-optimal requirements
- Giving long-term planning certainty to governments, building owners, industry etc.
- Speeding up the realization of the savings potential – considering the long life-cycle of buildings

Possible options to be considered:

- Overall energy/CO2 limitation (EU setting the values or establishes the basis for a benchmarking)
- Subdivided technical requirements (building shell component and buildings services engineering approach)
- Reference buildings approach (for non-commercial)
- “Evolving building stocks” - eliminate the worst first
- 

There are number of boundary conditions that will limit the applicability of some of these options, including:

- High complexity of national/local boundary conditions, building types and building services engineering
- Calculation of cost-optimal requirements depend on national boundary conditions
- Standard of improvement of classification for renovations not feasible because of non-uniform scales
- Definition of reference buildings diverse - EU-wide definition of reference buildings and its principles not yet available
- Lack of Data/statistics on national building stocks

### **Presentation: Feasibility, limitations and benefits**

**Mr. Thomas Boermans**, Senior Consultant at ECOFYS GmbH, Germany

Background:

- Building stock in Europe represents a high potential to benefit from energy efficiency

Objectives of the study:

- Describe the initial position and define an optimum of objectives and guide values in terms of best cost-value ratio
- Improve energy efficiency of buildings through better Isolation (mainly in the southern part of Europe) for winter and summer conditions
- Because of rapidly increasing Energy consumption for buildings and Energy prices, the objectives for 2020 are realistic and should be much more ambitious for 2050.

Conclusions:

- Energy savings objectives and good cost-value ratio are not mutually exclusive

- In 2007, most requirements for U-values for wall, roof and floor in new buildings are below the economic optimum  
-> Cost saving opportunities are lost for households as well as for society
- U-values recommended in the study are valid for new as well as for existing buildings  
-> There is room for improvement for new AND for existing buildings
- Almost identical recommended U-values, for maximum cost effectiveness and for post Kyoto targets  
-> Good economy and climate protection are not contradictory. Fast action needed for 2020/2050 targets
- Insulation (especially roof and wall) reduces energy demand for cooling of residential buildings  
-> This adds a new perspective to insulation in Southern Europe
- Studies can be downloaded at the homepages of ECOFYS ([www.ecofys.de](http://www.ecofys.de)) and EURIMA ([www.eurima.org](http://www.eurima.org))

### **Panel discussion**

#### **Interventions by Member States:**

##### **Mr. Ted King, United Kingdom;**

- Overall energy/CO2 limitation has very serious drawbacks because of the diverse EU climate, construction culture, heating, social culture and various other parameters.
- Some of the other options seem to be a lot more promising, but all of them need a deal of work before hard up on them and go through firm strategy.
- As for the U-values and cost-effectiveness calculations: one of the dangers of focusing on these types of calculation is that you fail sufficiently to take account of the actual practice of constructing a wall to given U-value.
- Any analysis that we do must actually be anchored down to what ordinary constructors around the Union can do in practice.

##### **Mr. Eduardo Maldonado, Portugal;**

- We have to take into account how people really use their buildings. For example, in most parts of southern Europe we do not heat the buildings from October, 1st April, 31 continuously. We only do it when it is necessary. So
- Economics are different. It is nice to have these rough indicators (U-value) but not to take them as the law. So as the criteria for cost-effectiveness it has implications in the way industry builds. So all this has to be taken into consideration in fixing the right level.

##### **Mr. Wolfgang Jilek, Austria;**

- New legislation to limit energy demand shall be within a certain limit as open as possible and as well flexible to the constructors. They must to be able to choose their way to construct it. Planners should then follow this development and react with their design.

##### **Mrs. Edita Meskauskiene, Lithuania;**

- Construction products directive: The Commission services (DG TREN / DG ENTR) should cooperate to get quicker solutions.

**Mr. Tom Eisschen, Luxembourg;**

- Asks whether DG TREN considers specifying U-values at the EU level?

**Mr. Martin Elsbergers in reply to Luxembourg;**

- This could be one of the options. However, it would be very challenging to do it.
- The values have to be tailored to the specific outdoor conditions plus take into consideration some national boundary conditions.
- One unified U-value for all over Europe will not be possible and is no point of discussion.
- But at least some kind of principle should be found where there is a basis fixed (e.g. same cost-effectiveness standards of U-values of neighbor-countries with the same climate conditions).
- More transparency is needed

**Mr. Kevin O'Rourke, Ireland;**

- Revision of building regulations was made 2 years ago, come into force in 2008
- Use of electricity is quite big and it is not controlled by building regulation in Ireland
- Energy intensity and CO2 emissions are greater in non-residential sector. Sometimes the use of the buildings is unclear in this sector – more methodological studies and approaches are needed.

**Interventions by different stakeholders:****Mr. Chris Hamans, EURIMA, the European Insulation Manufacturers Association (www.eurima.org);**

Potential of recasting of the EPBD is big to use it as a motor for EU Energy policy. ECOFYS-Study Nr. 7 says: that costs if nothing is to be done for new residential buildings are extremely high and around EUR 1 billion / per year will be wasted (a barrel of oil: USD 100). Support of a revised EPBD with minimum performance requirements in their proper context:

- Integrated Concept of a) total energy efficiency and b) components is the most cost effective one
- Performance requirements as close as possible at economical optimum.
- Minimum performance requirements ensure that life cycle costs for energy consumption and energy investment are optimized in buildings.
- Priority shall be given to the building envelope: most cost-effective measures for maximum demand reduction.
- Individual minimum performance requirements for roofs, walls, floors and windows are basic in the design for calculating total heating and cooling demand (kWh/M2/yr) requirements for buildings.
- Minimum component and integrated building envelope requirements can be applied to both new buildings and to renovations.

**Mrs. Kerstin Kallmann , FEDARENE, the European Federation of Regional Energy and Environment Agencies ([www.fedarene.org](http://www.fedarene.org));**

Fedarene supports the recasting of the EPBD, especially the fixing of minimum standards as presented from the European Commission. Fedarene will send a summary of ideas of the European Member regions in the following weeks to the European Commission.

- Revision of EPBD setting minimum performance requirements is supported
- The regional and country framework (climate) shall be taken into account.
- The refurbishment rates shall be improved.
- Public building shall serve as an example.
- Consultation with those affected is needed.

**Mr Derk Welling, ICSC, the International Council of Shopping Centers;**

- The Shopping Centers support the recasting of the EPBD but the Shopping Centers want be able to compare with others
- Energy consumption must be monitored and made comparable.
- It must be clear which amount of energy the shops consume.
- Only 30% of retailers are aware of EPBD, more information is needed because they must apply for energy savings (not the developers or investors)
- To set minimum energy performance requirements for shopping centers is very difficult because there is a big variety of energy consumption in different types of shops (e.g. energy use of groceries higher than for clothes shops) and regions.
- That would produce costs for the investor but the retailer will benefit. Contracts could manage this but legislation is needed in the background to set this into force.
- Minimum requirements should be on component basis, not all of the building because only the shell is rented not the content and chattels
- Need of legal requirements to put penalties. Set minimum requirements to make it visible to the users.

**Mr. Jerry Percy, RICS, the Royal Institution of Chartered Surveyors ([www.rics.org](http://www.rics.org));**

Conclusion: It can be done:

- Harmonization of approach but not of requirements
- Overall buildings approach is needed
- Overall comprehensive understanding of cost and value
- Consent required not compromise
- EU can set the standards but it is up to MS to achieve them

**Mrs. Marleen Spiekman; TNO, the Netherlands Organization for Applied Scientific Research;**

- To set minimal requirements for all MS is very difficult because of the diversity of MS
- The definition of requirement is much more easy than the implementation
- Two approaches: a) setting the requirements on the level of the whole building (optimal freedom of choice, cost effectiveness, stimulation of innovation); requirements on the level of building's needs; b) requirements on component level.
- Focus should lie not on rules but on benchmarking in comparing with neighbor MS.

- Quality control is important and the monitoring of it
- The target should be: Energy saving.

**Conclusions by the moderator Mr. Martin Elsberger:**

The recasting of the EPBD with its obligations must be organized very well in the MS. Holistic view of energy use is important. The tenant/owner problem is remarked as a cost-benefit problem. Benchmarking system could be one good choice to set comparability in between MS. Neighbor MS could compare their costs and effectiveness of measures.

## **PART 5 - FISCAL AND FINANCIAL INCENTIVES**

### **Presentation: Taxation and fiscal incentives**

**Mr. Alexander Wiedow, Director at DG Taxation and Customs Union**

Background:

- Taxation or fiscal incentives are proved and tested instruments to promote non-popular aims in the EU market.

Objectives:

- What do we want to achieve and whom do we want to address?
- Change/promote behavior by correcting market

Examples:

- Consumer taxes, Direct taxation, other taxes/charges, direct subsidy

Conclusions:

- Lowering Consumer taxes (e.g. VAT) could boost consumption but least good instrument because of wide and unspecific target group
- Direct taxation can in some cases be appropriate
- Other taxes/charges are potential candidates
- Direct subsidy is in general easy to target, hardly disadvantages, so that could be a good instrument,

Barriers:

- Need to be financed
- Complicates administration
- Other aspects to be taken into account:
- lack of fiscal coherence; attention on contradictorily signals/messages
- Incentives may lead to higher taxation in another area (e.g. investment made – higher value for property tax; problem also: higher rentals!)

### **Presentation: Financial measures to support the realization of the energy efficiency potential of the buildings sector in Central and Eastern Europe**

**Mr. Richard Jones, Principal Policy Manager, European Bank for Reconstruction and Development (EBRD).**

Background:

- Financial measures to support the realization of the energy efficiency potential of the buildings sector in Central and Eastern Europe through ESCOs (municipal sector), commercial banks (residential sector) or other mechanisms
- Members: 9 MSs, 6 candidates (Western Balkan), 12 FSU countries (including Russia and Mongolia)

- Major Problem: High energy intensity of buildings

Objectives:

- Information, technical assistance, reducing barriers, force investments; complying with EU legislation (e.g. EPBD)

Examples:

- ESCOs (Lender – ESCO - Energy End user – Lender)
- Commercial banks (EBRD – participating bank (several options) – Subborrower) Donor Funded Contract; Consultation of the bank; Independent Energy Expert
- Others: Energy efficiency Revolving Funds, Guarantee funds, Green mortgages, PPP, Green Investment Schemes

Conclusions:

- Key is better information, sensitization, marketing

Barriers:

- Misunderstanding of financiers (client has enough expertise to assess optimal technology alternative; modern facilities do not need any EE technical assistance; EE increases costs; EE has poor profitability)
- Multiple stakeholders have different knowledge and awareness of the problem

**Presentation: KfW's best practice experience in Germany and its financing/advisory initiatives in the new Member States**

**Mrs. Tatjana Bruns, Senior Project Manager at the German KfW Bankengruppe.**

Background:

- The KfW Bank is the biggest Promotional bank in Europe with a total balance sheet of about 400 billion € (Sept. 07) and around 4.000 employees.

Objectives:

- Promotion of housing, environment and climate protection with long term loans with favorable or subsidized interest rates (e.g. maturity 30 years, interest rate 10 years fixed, lowest interest rate around 2%)
- The higher the effect of Energy efficiency is the higher incentives should be, lower interest rates promotes more investment

Examples:

- Ecological construction program for new buildings (innovations in low energy, passive energy, model-projects, renewable energy-systems etc.)
- housing modernization program (functional value, energy efficiency investments)
- CO<sub>2</sub>-building rehabilitation program (predefined investment to reduce CO<sub>2</sub> emissions (objective: level of a new building)

Conclusions:

- Energy Efficiency measures activated 40 billion € of loans in around 2,5 million homes (1990-2005), Reductions of 1 million tons of CO<sub>2</sub> emissions (2006), 220.000 jobs safeguarded (2006)
- 2007-2013: Structural funds used for housing modernization and energy efficiency measures within financial instruments (loans, guarantees, risk capital) in new MSs

Implementations of loan funds have advantages compared to distribution of grants (e.g. creating revolving funds, assume risks to private investors, etc.)

**Panel discussion**

**Interventions by Member States:**



**Mr. Kevin O'Rourke, Ireland:**

- Outlining the philosophy behind different options for tax breaks or subsidies linked with the challenge of upgrading the existing building stock the question is: if a) you set a regulatory for new buildings this excludes any subsidy or tax breaks because you cannot be incentivised to comply with what is a mandatory requirement; b) one transmit this logic to the building stock: how is it then possible to persuade the ministries of finance for tax breaks or subsidies?
- The whole question of compatibility of regulation and incentives is a potential point of tension which needs to be resolved.

**Mr. Alexander Wiedow, Director at DG Taxation and Customs Union:**

- Agrees with Mr. O'Rourke but situations might be different if the regulation is not catching all the situations at one go at one time. This is probably the case if you introduce minimum standard requirements for buildings of a certain age. You cannot have improvements happen from one to another year. A timeframe is needed to come forward with the standards at a given time.
- There is room for fiscal incentives in order to push the people in the earliest moment rather than wait for the latest moment.
- Tax incentives could be very helpful in forcing people to invest earlier and not wait until the expiration of this time frame.

**Interventions by different stakeholders:****Mr. Paul Louis Marty, CECODHAS, the European Liaison committee for social housing ([www.cecodhas](http://www.cecodhas));**

CECODHAS agrees to the importance of the Directive and its recasting. But the recast should have the following requirements:

- Balance of success/failure of impacts of the existing Directive
- Differentiation of New and existing buildings
- Financing one of most important requirements (Structural funds not open for old MSs)
- Directive should have simple not bureaucratic, reliable concerted methods for all MSs, the positions of experts are desirable
- All involved persons should be trained
- Outcomes of the Directive should be evaluated with Follow-up

**Mr. Michael MacBrien, European Property Federation ([www.epf-fepi.com](http://www.epf-fepi.com));**

Represents 800 billions € of Real Estate Management. He stressed on the importance of this sector:

- Strongly supports the suggestions of the EU-Commission for the recast of the EPBD. He stressed on the point that everybody now is pulling together where only five years before the situation was different.
- Reason for that: a) Members woke up that they could play a central role in this; b) beginning of the realization of the fact that money could be made out of this
- Now it is a perfect time to act!

**Mr. Andrew Warren, EuroACE, the European Alliance of companies for energy efficiency in buildings ([www.euroace.org](http://www.euroace.org));**

- Focus on "Lowest energy buildings"

- Removal of the 1000m<sup>2</sup> threshold.
- Refurbishment must result in increased EE (best components)
- MS should develop financial instruments (total unity is not possible).
- Stricter enforcement oversight within MS
- Harmonization of training program for Inspectors.
- Harmonization of certification process for non-residential buildings
- Inspections should cover entire system (not only boilers).
- EPC permanently displayed in buildings visited by public. When certificate is received the tenant should know what to do with it.

**Mr. John Goodall, FIEC, the European Construction Industry Federation (www.fiec.org);**

- Budget resources should quickly be transmitted to the sector for the realization of energy efficiency measure
- Refurbishment is the most effective and cost-efficient solution to save the planet
- Deceleration of the economic system is not suspected. Directive has not enough bite
- Proposals: a) reduce the level of VAT for energy saving products, b) make energy more expensive for them who use more of it, c) built new system with reduction of property taxes for those who invest in energy saving

**Mr. Constant van Aerschot, World Business Council for Sustainable Development (WCBSD);**

- There is variable interest by country regarding energy efficiency of buildings
- Environmental impact underestimated, while
- Cost premium for the realization of these measures is overestimated
- No direct relation have been established between building cost and energy efficiency
- Energy bill is often not significant compared to other costs for commercial buildings
- the most important aspects are: provision of financing, changing of the behavior, applying holistic approach. a) the incentives for owners should point on the relation owner/tenant which is a legal problem not a problem of the incentives, b) costs (cash-flow) is still priority Nr.1, c) incentives should be made by steps (at the beginning: more money, at the end: less money).

**Mr. Stratos Paradias, President of UIPI (International Union of Property Owners);**

Represents property owners of 23 Member States

- There is still a lot of confusion for European property owners and advantages of a recast of the EPBD are not to be seen. What is seen is only: new regulations and new legislation with a lot of financial impacts on them.
- But: Where is the money for that? Where is a realistic answer on the question of concrete meanings for subsidies..
- He reclaimed not to be able to give an answer to the European people how the EU will help them to shoulder impacts of new legislation.
- Only one big question: How can one really lower or abolish the 1000m<sup>2</sup>-treshold if one does not give a concrete answer on the incentives for the people of Europe!

**Mr. Christian Cornwall, World Business Council for Sustainable Development** made conclusions on the last session:

- Regarding taxation: Using taxation and financial incentives is way to promote or to make change in behavior, to correct market failure. That is very clear. Taxing the bad things and rewarding the good products is a very carrying idea. Good things to do: direct subsidy as a very efficient way to reach out and have effects while VAT was not as good. And the direct taxation had the whole question of burden issue carry on it that you have to take into account as well as there could be the lack of coherences in taxing systems if you just add new taxes.
- Regarding EBRD: interesting to see their way of promoting and reaching out into their market is based on policy dialogue, on demonstration of products, skill improvements, technical support but also that they need new business models. The ESCOs in which we may have put hope in are having mixed results in this region which we also found in our approach in other parts of the world.
- Regarding KfW: we could see how effective money can actually promote and mobilize other money and create private public partnerships and other types of models. We took note on your record of supporting 2.5 millions of homes.

## CONCLUSIONS BY THE EUROPEAN COMMISSION - DG TREN

**Mrs. Pirjo-Liisa Koskimäki, Head of unit, DG TREN** concluded the conference:

It has been a successful day and there are many good ideas which we might be able to take on board.

- Nobody was opposing that we should take the climate change very seriously, and we should act for the improvement of energy efficiency. The sector of buildings needs to play a key role here. This is a challenging task.
- There is general support on working further on the Buildings Directive. But: MS should continue their efforts for proper transposition and implementation of the existing Directive.
- We need to clarify, simplify the current Directive as much as possible, also introducing some clarification regarding standards.
- Refurbishment of the building stock is still the most effective and cost-efficient solution for new energy standards. Buildings over 1000 m<sup>2</sup> represent only 28% of total EU buildings stock. The problem of the 1000m<sup>2</sup> threshold has to be somehow addressed. We are aware that if we remove the threshold the burden put on house owners should be portable.
- For the energy performance certificates there is support for their enforcement. They could play more active and operational role to lead to improved energy efficiency.
- Minimum energy performance requirement. We need kind of clarification and possibly some kind of benchmarking.
- Inspections – we need encouragement to better use of inspections, immediate energy efficiency results can be found here. A good training for inspectors is needed.
- Financing incentives leading to energy efficiency measures. Macro and micro economic reflections they are not always totally identical but we should do our best to come to good proposal there. Of course fully respecting that taxation is remaining in a very large amount in the competences of MSs.



**COUNCIL OF  
THE EUROPEAN UNION**

**Brussels, 20 January 2009**

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**Interinstitutional File:  
2008/0223 (COD)**

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**COVER NOTE**

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from: Secretary-General of the European Commission,  
signed by Mr Jordi AYET PUIGARNAU, Director

date of receipt: 17 November 2008

to: Mr Javier SOLANA, Secretary-General/High Representative

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Subject: Annex 4 to Communication Staff Working Document  
- Accompanying document to the Proposal for a recast of the energy  
performance of buildings Directive (2002/91/EC)  
= Impact assessment

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Delegations will find attached Commission document SEC(2008) 2864 Annex 4 Volume 4.

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Encl.: SEC(2008) 2864 Annex 4 Volume 4



COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 13.11.2008  
SEC(2008) 2864  
VOLUME 4

## **Annex 4 to**

**COMMUNICATION STAFF WORKING DOCUMENT**

*Accompanying document to the*

**PROPOSAL FOR A RECAST OF THE  
ENERGY PERFORMANCE OF BUILDINGS DIRECTIVE (2002/91/EC)**

**IMPACT ASSESSMENT**

{COM(2008) 780 final}  
{SEC(2008) 2865}

**ANNEX IV**

**Preparatory Study for the Recasting of the Energy Performance of Buildings Directive  
(EPBD) 2002/91/EC  
Under DG TREN Framework Contract**

This document should be used as background information. The content of this document remains under the sole responsibility of the consultant.

# Preparatory Study for the Recasting of the Energy Performance of Buildings Directive (EPBD) 2002/91/EC

Under DG TREN Framework Contract  
TREN/A2/143-2007

Final Report

10 October 2008



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# 1 Introduction

This report presents the findings of a consortium of partners led by ECORYS NL on the Preparatory Study for the Recasting of the Energy Performance of Buildings Directive (EPBD) 2002/91/EC. The consortium was composed of Ecorys NL, Ecofys and BioIntelligence Service. The structure of this breaks down into four main chapters:

- Chapter 2 focuses on different threshold options for energy efficiency in buildings. In addition chapter 2 touches on energy performance requirements;
- Chapter 3 focuses on options relating to energy performance certificates;
- Chapter 4 analyzes options related to the inspection of boilers and air-conditioning systems;
- Chapter 5 delves into energy performance requirement options in buildings. As mentioned above, these issues are also tackled in chapter 2 (see section 2.3)

Given that sections of the following report were undertaken separately by different consortium partners, and that each section of this report is a stand alone product, each chapter is presented in its original form done by each consortium partner so as to provide the clearest presentation for interpretation by DG TREN.

## 2 Effects from different options for the EPBD Information provided for Impact assessment.

### 2.1 Background and methodology

The information described in the following chapters was assessed within the context of the preparatory study for the recasting of the EPBD under DG TREN framework contract TREN/A2/143-2007. The content was prepared by use of the Ecofys built environment analysis model (BEAM).

#### **BEAM – Built environment analysis model**

Ecofys GmbH developed over the last years a model for the European building stock (covering the EU-15 and Eastern European countries), called BEAM (Built Environment Analysis Model). Results of the model are energy demand, CO<sub>2</sub>-emissions and energy costs for space heating in the built environment which then can be presented for different types of buildings, building ages, climate zones etc. Input to the model calculation is a database containing the EU-27 building stock distinguished by climatic regions, building type/size, building age, insulation level, energy supply, energy carrier, energy costs and emission factors. This can be applied in a scenario tool used for calculating the development over time of the building stock as a function of demolition rate, new building activity, renovation and energy-efficiency measures in retrofits.

The complexity of the building stock had to be simplified by examining five standard buildings with eight insulation standards, which are assigned to building age and renovation status. Furthermore, 6 climatic regions (3 for Western and Central Europe, 3 for Eastern Europe) were distinguished for the calculation of the energy demand for space heating. For these building types the energy demand and CO<sub>2</sub> - emissions from space heating were calculated according to the principles of the European Norm EN 832. The resulting model describes the building stock in a complex but still simplified manner. This has to be taken into account when evaluating the accuracy of the results. However, the results provide safe indicators for the size of energy-saving potentials. For the modelling of the European building stock 6 standard houses can be taken into account:

Model house 1: Two-storey terrace-end-house (living area: 120m<sup>2</sup>);

Model house 2: small apartment house (200 – 500 m<sup>2</sup>);

Model house 3: medium apartment house (500-1,000m<sup>2</sup>)

Model house 4: large apartment house (larger than 1,000m<sup>2</sup>)

Small office building (<500m<sup>2</sup>), medium (500-1,000m<sup>2</sup>) and large office building (> 1,000m<sup>2</sup>)

The building stock is subdivided into three building age groups, which differ substantially due to the respective national or regional regulations and the insulation standard connected to them.

Buildings erected before 1975 (subdivided into buildings that have already been energetically improved and buildings still in their initial condition).

Buildings erected between 1975 and 1990.

Buildings erected after 1990.

According to climatic zone and building age groups, different insulation standards and their respective U-values can be applied. For the different model buildings which were subdivided according to building type, building age group, insulation standard and weather condition, the respective saving potentials can be determined. In order to calculate CO<sub>2</sub>-emissions, the average annual efficiency of heating systems is taken into account for each energy carrier depending whether it is an old or new system and CO<sub>2</sub> emission-factors of the global-emissions-model GEMIS are applied. The factors used describe the direct CO<sub>2</sub>-emissions from fuel combustion. This is in line with approaches according IPCC/Kyoto, where CO<sub>2</sub>-emissions (and other greenhouse gases) during extraction, conversion, transport etc. of the fuels are assigned to the energy supply sector. A difference was made for electricity, where emissions for electricity production are taken into account. The BEAM-tool was developed and used e.g. in the following projects:

U-values for better energy performance of buildings. Study for European mineral wool association EURIMA, Boermans, Petersdorff et al., November 2007.

Energy efficiency in the existing building stock in the BEEN countries – Synopsis providing overview on energy consumption and saving potentials in the BSR building stock. Study in the framework of the Baltic energy efficiency network (BEEN) for German Federal Ministry of Transport, Building and Urban Affairs, Petersdorff 2007

HVAC-market in Europe – energy demand and supply systems, for European manufacturer, Thomas Boermans et al., 2007

Cost-Effective Climate Protection in the Building Stock of the New EU Member States  
Report for EURIMA-European insulation manufacturers association  
Carsten Petersdorff, Thomas Boermans et al. 2005

Cost-Effective Climate Protection in the EU Building Stock  
Report for EURIMA-European insulation manufacturers association  
Carsten Petersdorff, Thomas Boermans et al. 2005

Mitigation of CO<sub>2</sub>-emissions from the building stock –  
beyond the EU directive on the energy performance of buildings  
Report for EURIMA and EuroACE, Carsten Petersdorff, Thomas Boermans et al. 2004

The input of the model and methodology used is based on previous studies on the EU15 and Eastern Europe (Ecofys 2004, 2005a and 2005b) and is described in full in the mentioned reports.

However during the current analysis on possible impacts from a revised EPBD, the following adaptations and updates to the model were made.

*Scope enlarged*

In previous studies for EURIMA (Ecofys 2004, 2005a and 2005b), the building stocks of the EU15 and NEW8 countries have been assessed. For this impact assessment, the scope of the countries was enlarged to the EU27.

*Additional division in size classes*

The category 200 – 1.000 m<sup>2</sup>, as assessed in above mentioned reports, was split into size classes 200-500 and 500-1.000m<sup>2</sup> on basis of information derived from several country statistics as far as available.

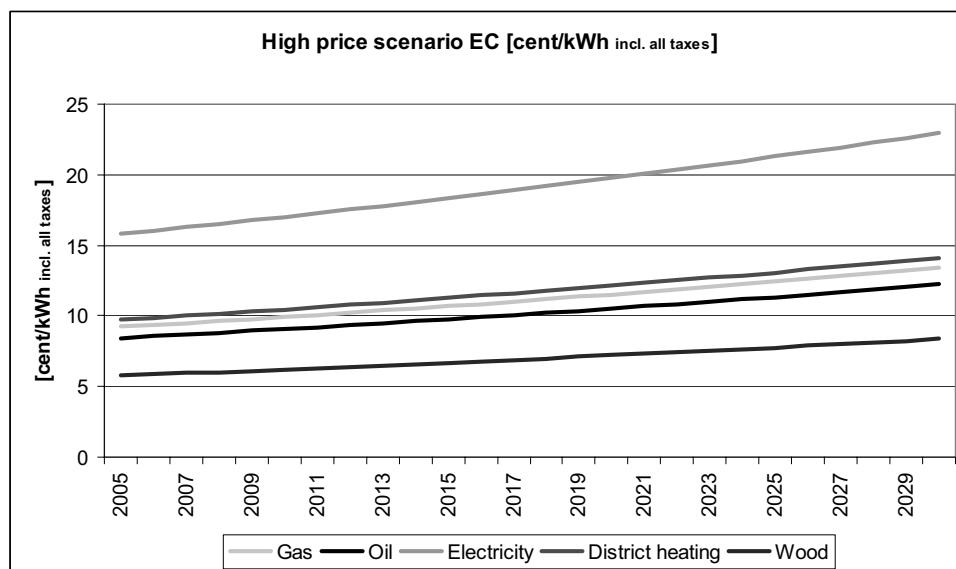
*Update of investment costs*

The increase in construction prices of the last years was taken into account by use of price indices for the construction sector supplied by EUROSTAT. The investment costs reflect the average situation in the building stock (differentiated by climate zones) regarding insulation of external surfaces (facade, roof, ground floor), replacement of windows and upgrade of heating systems, depending on the targeted efficiency level.

*Update of price scenario*

The price scenarios used in studies Ecofys 2004 and 2005 was updated to the high price scenario supplied by the EC (55\$ per barrel oil in 2005, 100\$ in 2020 and 119 \$ in 2030 in year 2005 prices which results at an average of approximately 97\$ per barrel for the period 2009-2030). The dollar exchange rate is assumed to equal 1.25 \$/EURO during the whole time horizon). This results in the following scenario:

Figure 2.1 Price scenario used for the impact assessment



*Adaption to PRIMES data*

Input data regarding end energy consumption of residential and tertiary sector were adapted to data supplied from PRIMES for 2005.

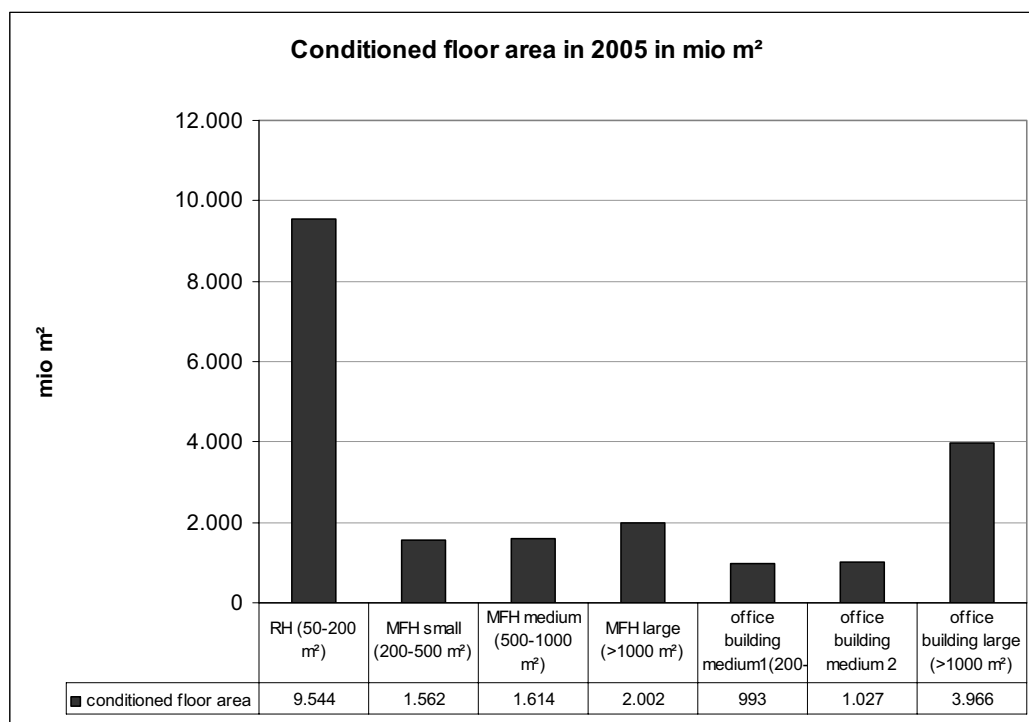


## 2.2 Description of building stock

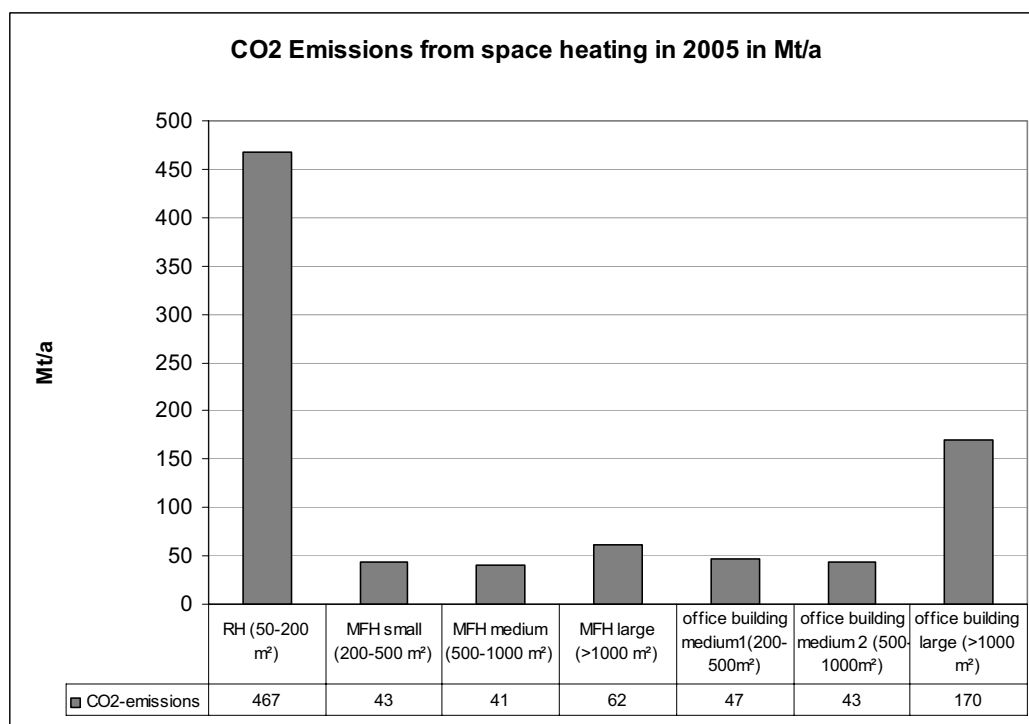
### 2.2.1 Current building stock EU27

The total number of dwellings in the EU 2007 was 207 million in 2005 according to PRIMES. The following graph describes the conditioned floor area of different building types and size classes (residential and non-residential) as used in the BEAM model.

Figure 2.2 Areas residential and non-residential buildings in the EU27 in 2005



The CO<sub>2</sub>-emissions from space heating of the stock in 2005 are described in the following figure.

Figure 2.3 CO<sub>2</sub>-emissions from space heating, residential and non-residential buildings in the EU27 in 2005

### 2.2.2 Development of the building stock

The building stock develops over time due to new building activities, demolition and retrofit. The according changes can be described as % rates for the respective changes in the building stock per year related to the overall stock. According rates vary significantly in different countries. The following table described the average rates in two clusters, as used in the BEAM model.

Table 2.1 Development rates of the EU27 building stock

	EU15	Eastern EU
New building rate	1%	1%
Demolition rate	0,5%	0,5%
Retrofit rate of buildings not affected by the current EPBD	0,7%	0,4%
Retrofit rate of buildings affected by the current EPBD	1,8%	1,0%

The model also takes into account that a share of the existing stock is subject to limitations regarding energy efficient refurbished due to ornamental facades etc. The share of these buildings was assumed with 15% (EU15) respective 10% (Eastern EU) of the total existing stock.

### 2.3 The assessed scenarios

During the impact assessment, 3 groups of scenarios have been assessed with the Ecofys Built Environment Analysis Model (BEAM).

#### *Scenarios on different threshold options:*

The scenarios on different threshold options assume different size classes to be included in the scope of the directive, esp. regarding retrofit requirements.

Table 2.2 Scenarios threshold options

Scenario	Description
Original EPBD >1000 m <sup>2</sup>	Original EPBD as from 2006 with 1.000 m <sup>2</sup> threshold
EPBD >500 m <sup>2</sup>	Original EPBD in 2006, threshold of 500 m <sup>2</sup> as from 2009
EPBD >200 m <sup>2</sup>	Original EPBD in 2006, threshold of 200 m <sup>2</sup> as from 2009
EPBD >50 m <sup>2</sup>	Original EPBD in 2006, threshold of 50 m <sup>2</sup> as from 2009

#### *Scenarios with higher retrofit rates due to improved certification and compliance*

The scenarios assume a higher retrofit rate of 2,5% per year to be achieved by improved certifications schemes and compliance measures.

Table 2.3 Scenarios high retrofit rate

Scenario	Description
EPBD >500 m <sup>2</sup> , high retrofit	As according scenario above, with improved retrofit rate
EPBD >200 m <sup>2</sup> , high retrofit	As according scenario above, with improved retrofit rate
EPBD >50 m <sup>2</sup> , high retrofit	As according scenario above, with improved retrofit rate

#### *Scenarios with improved thermal standards due to cost optimal requirements*

The scenarios assume that a benchmark system and/or methodology to assess cost optimal energy performance requirements can lead to cost optimal requirements for buildings in the future.

Such an effect has been calculated by assuming cost optimal U-values (as assessed for a 100\$ per barrel oil scenario during the project “U-values for better energy performance of buildings” for EURIMA, see Ecofys 2007) to be applied in retrofit actions and new buildings. The values assumed in the different scenarios are described in the following table:

Table 2.4 Overview U-values

<b>U-values [W/m<sup>2</sup>K] assumed for EPBD implementation (new buildings and retrofit)</b>						
	EU 15			EU Eastern		
	north	moderate	south	north	moderate	South
roof	0,13	0,23	0,43	0,20	0,23	0,23
wall	0,17	0,38	0,48	0,26	0,18	0,35
floor	0,17	0,41	0,48	0,29	0,60	0,46
<b>Cost optimum requirements 100\$ per barrel scenario (new buildings and retrofit)</b>						
	EU 15			EU Eastern		
	north	moderate	south	north	moderate	South
roof	0,12	0,14	0,20	0,15	0,16	0,18
wall	0,15	0,18	0,26	0,17	0,18	0,20
floor	0,18	0,22	0,58	0,21	0,23	0,26

Cost optimal requirements on building level would additionally affect energy supply systems, windows, ventilation systems with heat recovery, improved regulation and other energy efficiency measures. Cost optimal requirements for these parameters and/or packages of measures have not been assessed yet on EU level (this would be the results of an EU benchmarking system). Therefore the current assessment on cost optimal requirements is limited to thermal insulation which however represents one of the crucial measures for energy efficient buildings.

Table 2.5 Scenarios improved thermal standards

<b>Scenario</b>	<b>Description</b>
EPBD >500 m <sup>2</sup> , high retrofit, low energy	As according scenario above with improved thermal standards
EPBD >200 m <sup>2</sup> , high retrofit, low energy	As according scenario above with improved thermal standards
EPBD >50 m <sup>2</sup> , high retrofit, low energy	As according scenario above with improved thermal standards

The BEAM model calculates the theoretical potential of these options regarding end-energy and CO<sub>2</sub>-emissions, investments and energy costs for space heating. According results are described in tables and graphs of the following chapters. It can be assumed that additional effects of the EPBD and possible revisions are also achieved for household electricity, domestic hot water and space cooling. However these effects can be considered as minor in comparison to the effects on space-heating, which puts the results described hereinafter on the save side.

Several countries do not have (or abolished) the threshold of 1.000 m<sup>2</sup> in case of retrofits, such as Germany, Denmark, Portugal, Finland, Czech Republic, Latvia etc. These countries represent ca. 1/3 of the EU27 emissions from the household and tertiary sector. Accordingly the additional savings for the Scenarios with a lowered threshold are actually reduced. This effect has been estimated in a simplified approach. According results for the threshold scenarios are described below the figures on the theoretical potential.

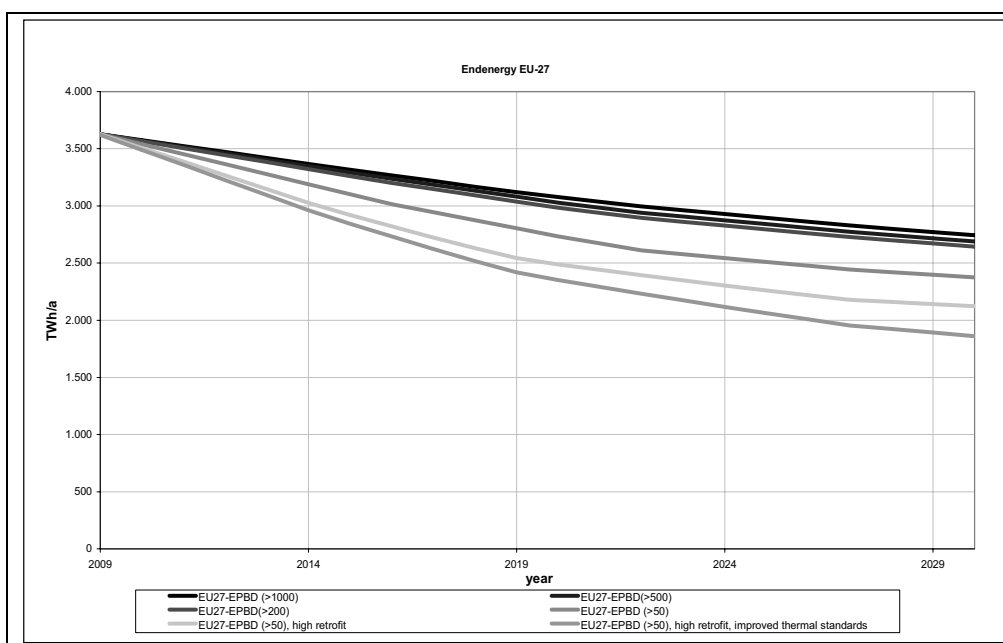
**Please note:**

For the scenarios concerning higher retrofit rates and improved thermal requirements, only the results that take into account that some countries already did abolish the threshold are described in the following chapters.

## 2.4 Environmental effects

The following graph shows an overview of the effects of the scenarios in terms of total end energy consumed in the EU 27. To arrive at primary energy, the value can be multiplied with an average primary energy factor of 1,35<sup>1</sup>.

Figure 2.4 End energy consumption of different scenarios



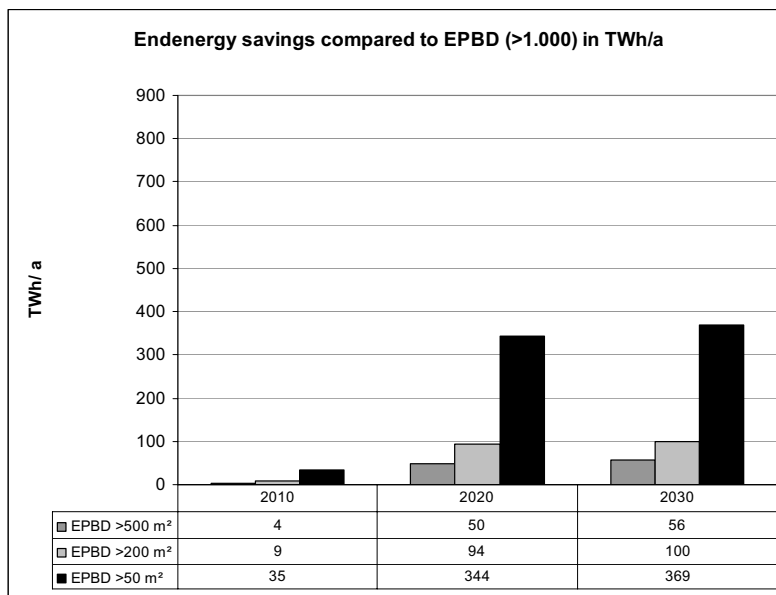
It is visible, that lowering the thresholds and an increase of the retrofit rate result in considerable savings. Additional effects can be achieved by improved of thermal standards.

The effects on end energy consumption and related CO<sub>2</sub>-emissions in the EU27 compared to the current EPBD (> 1000 m<sup>2</sup>) in the years 2010, 2020 and 2030 are described in the following graphs.

<sup>1</sup> Calculated on basis of the assumed energy mix and data from GEMIS.

2.4.1 Effect of different threshold options

Figure 2.5 End energy savings compared to current EPBD from different threshold options



The effects of lowering thresholds are clearly visible and also increase during the years with the number of buildings refurbished.

When looking at the situation in 2030 compared to 2020, the gap between the current EPBD and the assessed scenarios does not develop that fast any more. This is caused by the fact, that by then the eldest part of the building stock of the building size classes that are included in the directive has been renovated, and further renovations deal with buildings that have been already built at higher standards, e.g. in the 80s or 90s whereas the scenario of the current EPBD (only affecting regarding retrofit buildings beyond 1000 m<sup>2</sup>) is mainly still dealing with elder buildings that show higher savings potentials. However when looking at Figure 2.4, it is clearly visible which option can be preferred to reduce the total energy demand in the EU27.

Figure 2.6 End energy savings compared to current EPBD from different threshold options, threshold already partially abolished

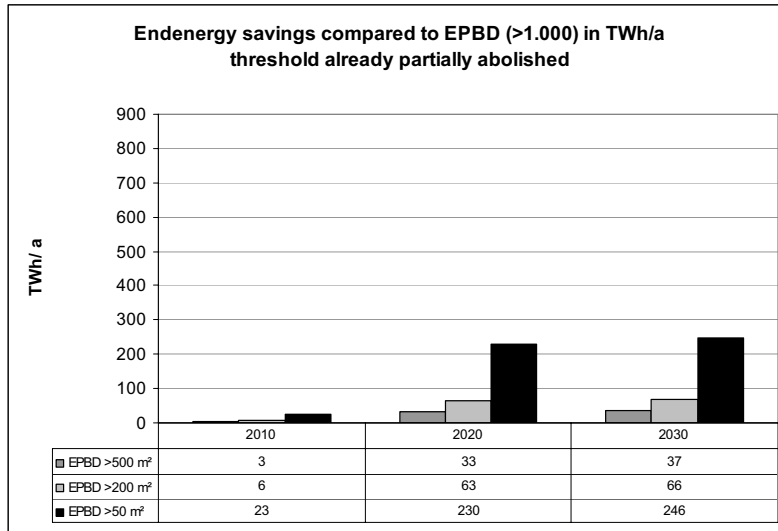


Figure 2.7 CO<sub>2</sub> savings compared to current EPBD from different threshold options

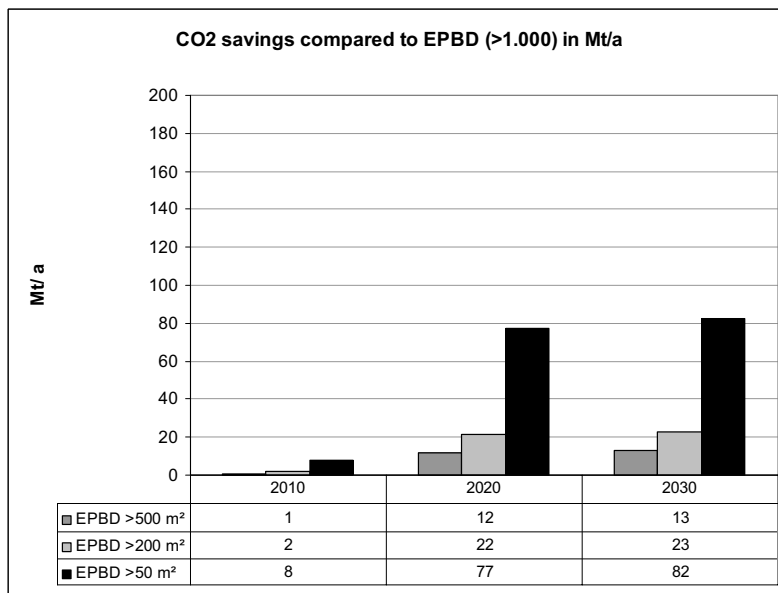
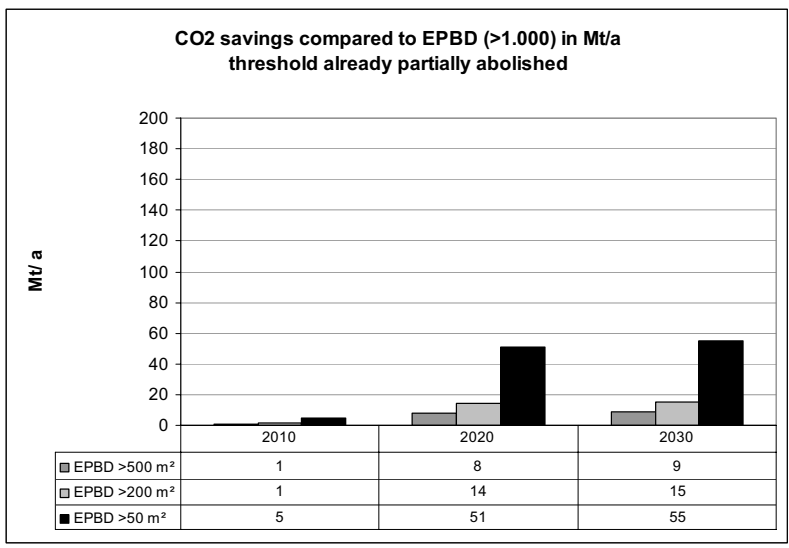


Figure 2.8 CO<sub>2</sub> savings compared to current EPBD from different threshold options, threshold already partially abolished



2.4.2 Effect of high retrofit rates due to improved certification and compliance

The effect of higher retrofit rates is described in the following graphs.

Figure 2.9 End energy savings compared to current EPBD from higher retrofit rates, threshold already partially abolished

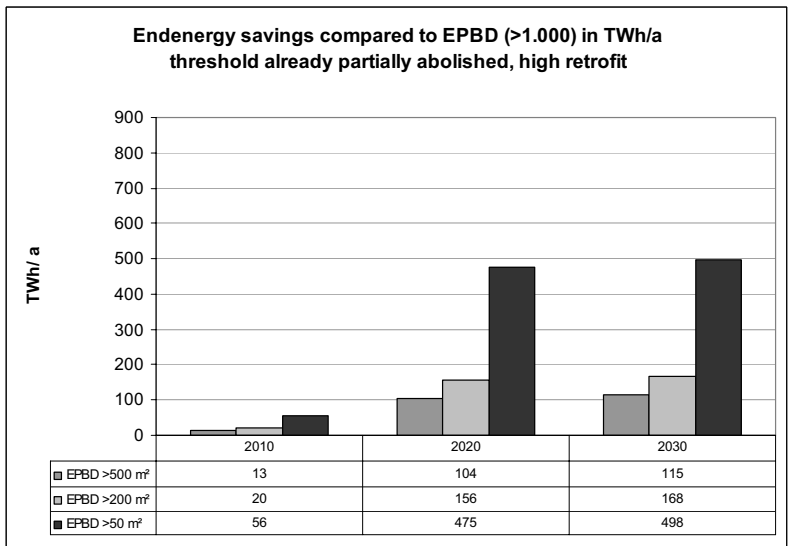
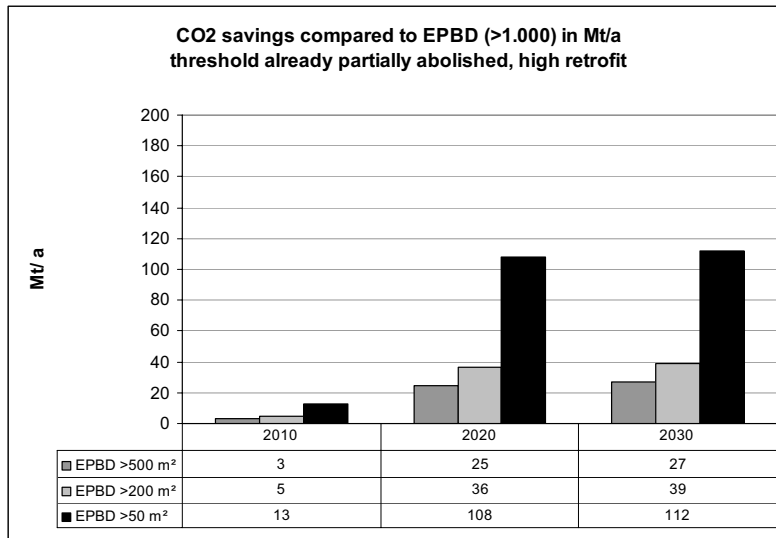




Figure 2.10 CO<sub>2</sub> savings compared to current EPBD from higher retrofit rates, threshold already partially abolished



### 2.4.3 Effect of improved thermal standards due to cost optimal requirements

The effect of cost optimal U-values is described in the following graphs.

Figure 2.11 End energy savings compared to current EPBD from higher retrofit rates and improved thermal standards, threshold already partially abolished

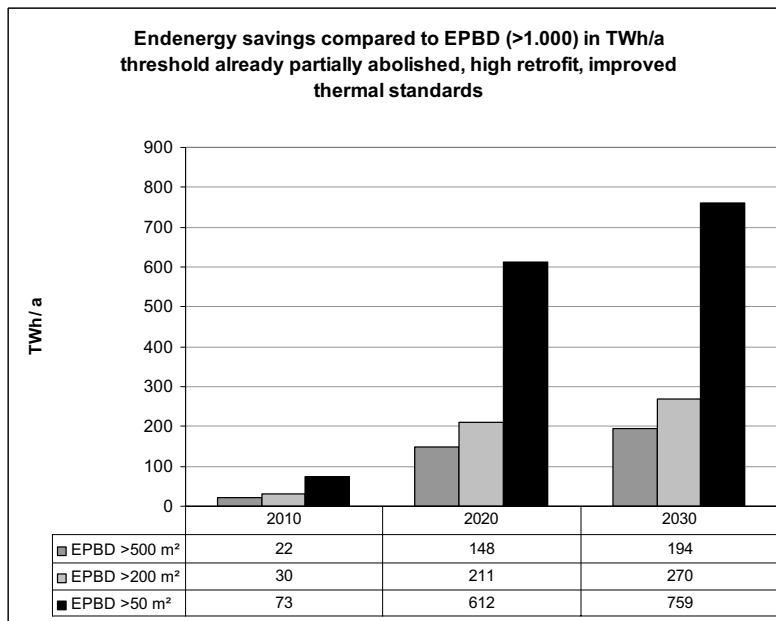
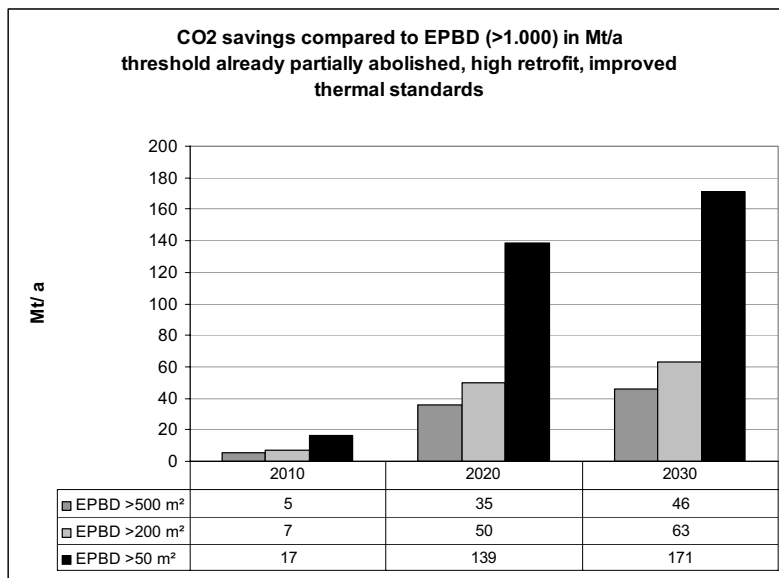


Figure 2.12 CO<sub>2</sub> savings compared to current EPBD from higher retrofit rates and improved thermal standards, threshold already partially abolished



## 2.5 Economic effects

The effects in the EU27 on additional investments (additional energy related costs of refurbishment measures that exceed the costs of non-energy related maintenance<sup>2</sup>), according annual additional investment costs (annual costs for interest and amortization of these investments) energy costs savings compared to the business as usual scenario are described in the following tables and graphs.

<sup>2</sup> The additional energy related investments can be taken into account if retrofit measures can be coupled to anyway due renovation measures. Given the assumed retrofit rates, this is realistic and highly recommended. If energy efficiency measures cannot be coupled to maintenance measures, the total costs of the measure would need to be taken into account.

2.5.1 Effect of different threshold options

Figure 2.13 Additional investment costs compared to current EPBD from different threshold options

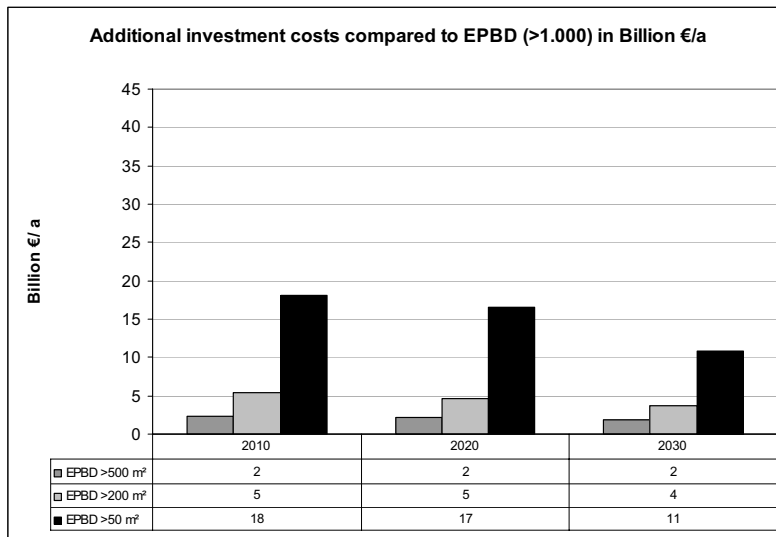


Figure 2.14 Additional investment costs compared to current EPBD from different threshold options, threshold already partially abolished

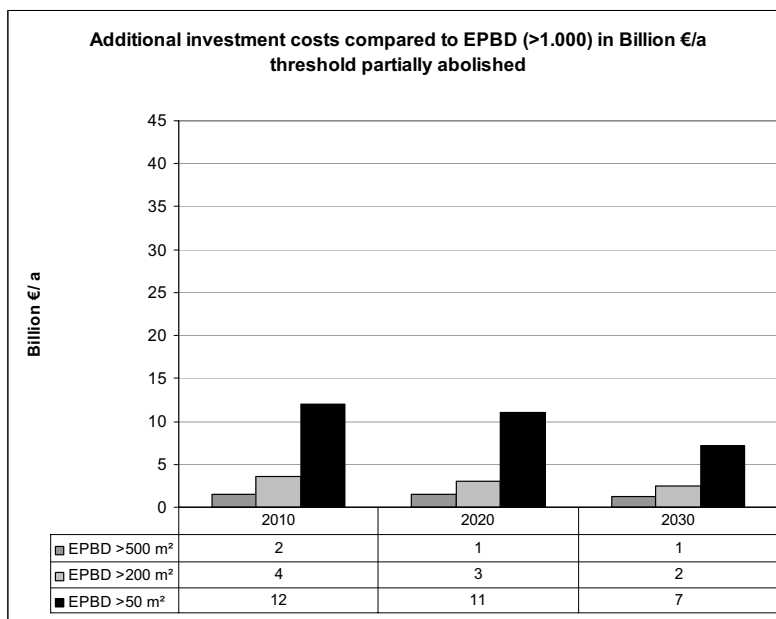


Figure 2.15 Additional annual capital costs compared to current EPBD from different threshold options

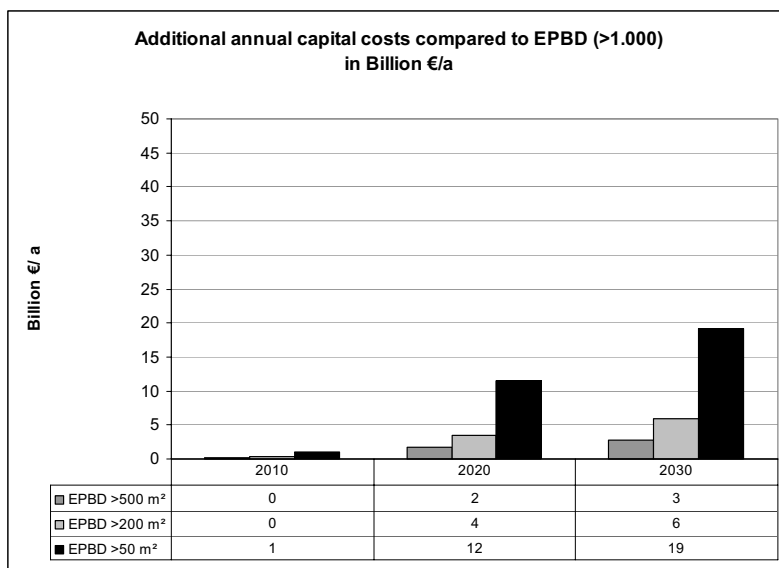


Figure 2.16 Additional annual capital costs compared to current EPBD from different threshold options, threshold already partially abolished

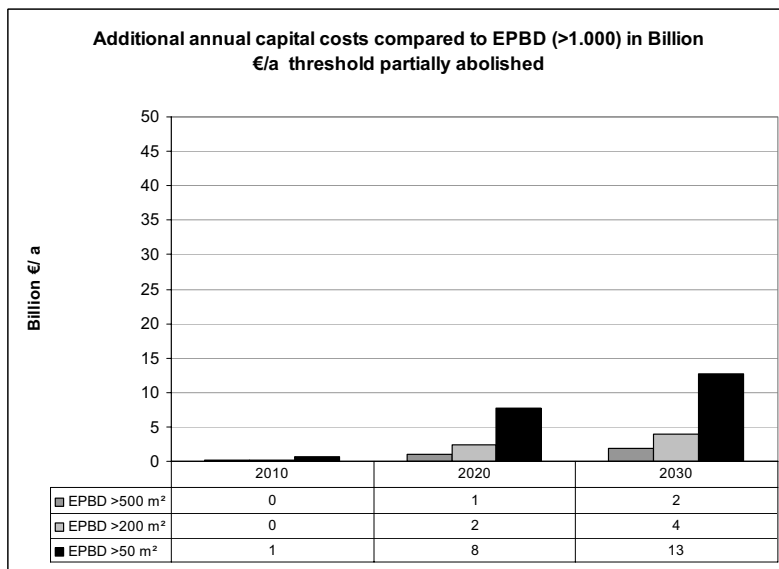


Figure 2.17 Annual energy cost savings compared to current EPBD from different threshold options

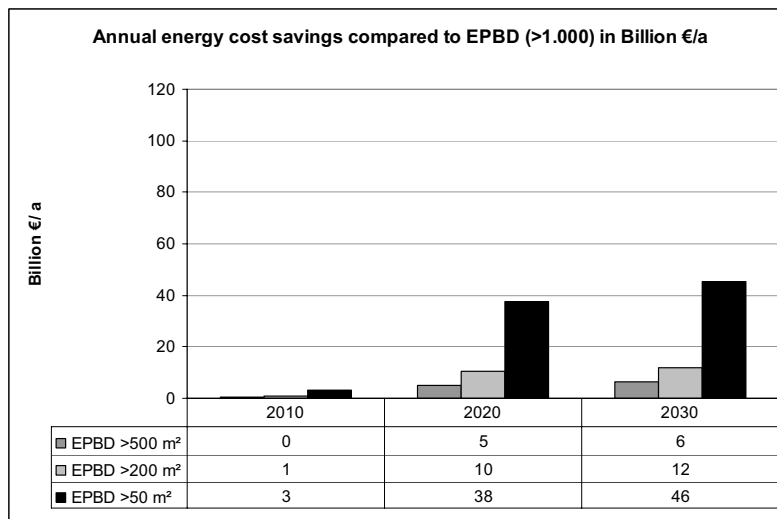
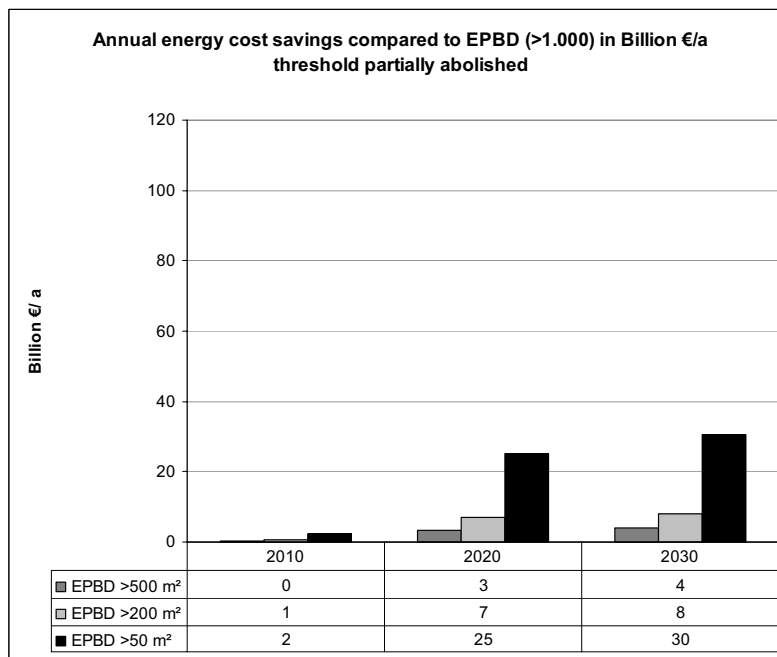


Figure 2.18 Annual energy cost savings compared to current EPBD from different threshold options, threshold already partially abolished



By subtracting annual additional investment costs from energy cost savings, the annual profit can be calculated. A positive value means that energy costs savings exceed annual investment costs in the framework of the assumed investments, interest rates and energy price development.

Figure 2.19 Total annual profit compared to current EPBD from different threshold options

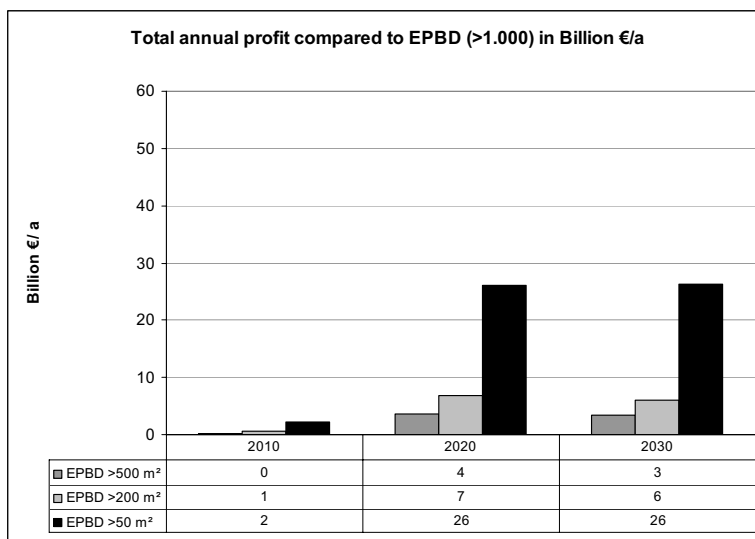
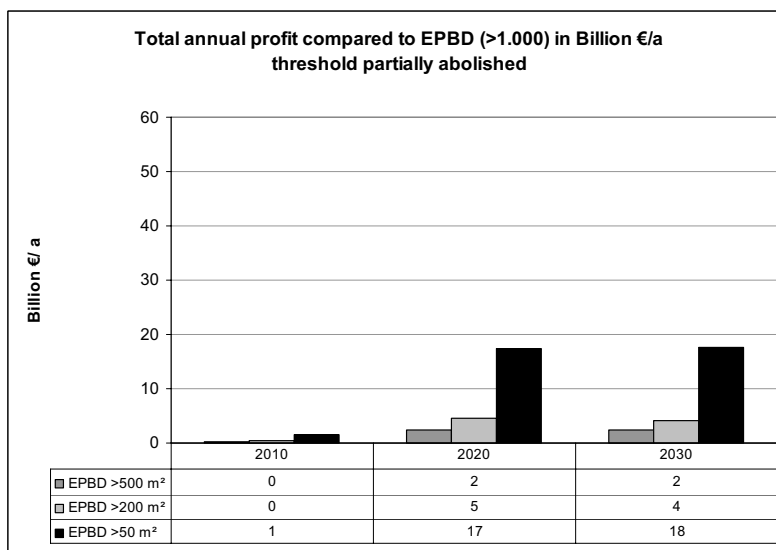


Figure 2.20 Total annual profit compared to current EPBD from different threshold options, threshold already partially abolished



2.5.2 Effect of high retrofit rates due to improved certification and compliance

The effect of higher retrofit rates is described in the following graphs.

Figure 2.21 Additional investment costs compared to current EPBD from higher retrofit rates, threshold already partially abolished

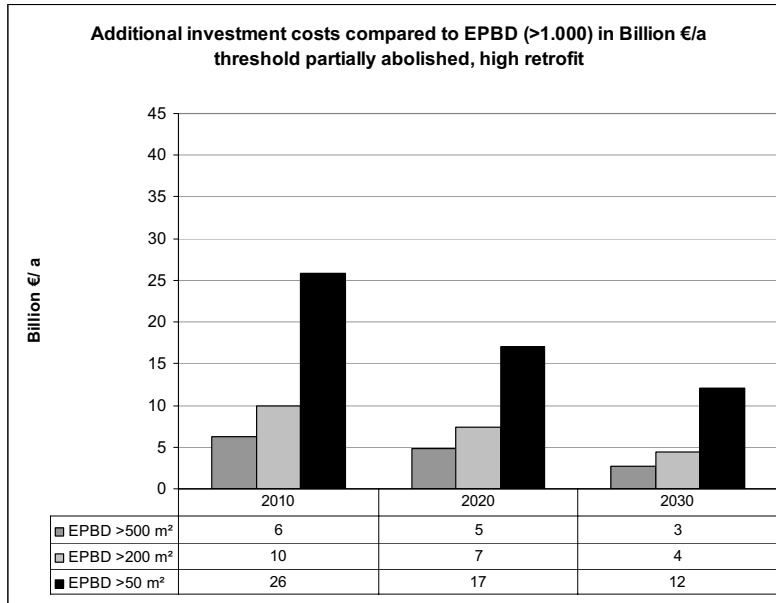


Figure 2.22 Additional annual capital costs compared to current EPBD from higher retrofit rates, threshold already partially abolished

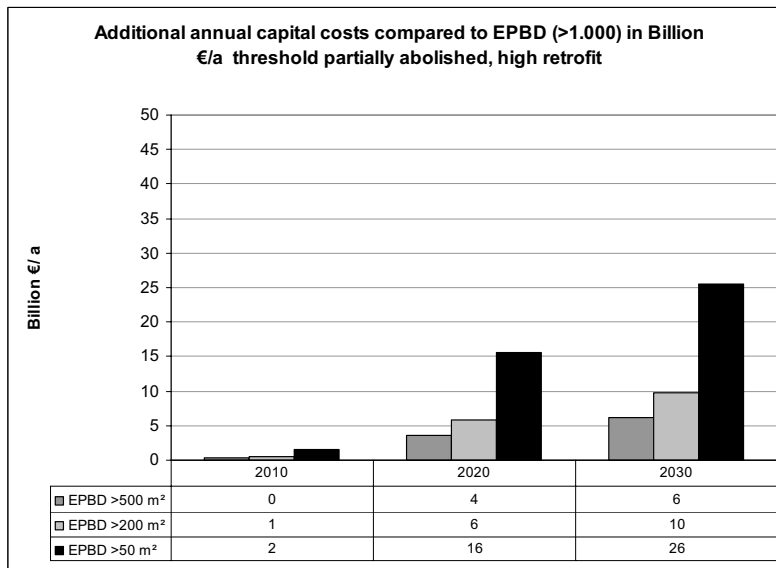


Figure 2.23 Annual energy cost savings compared to current EPBD from higher retrofit rates, threshold already partially abolished

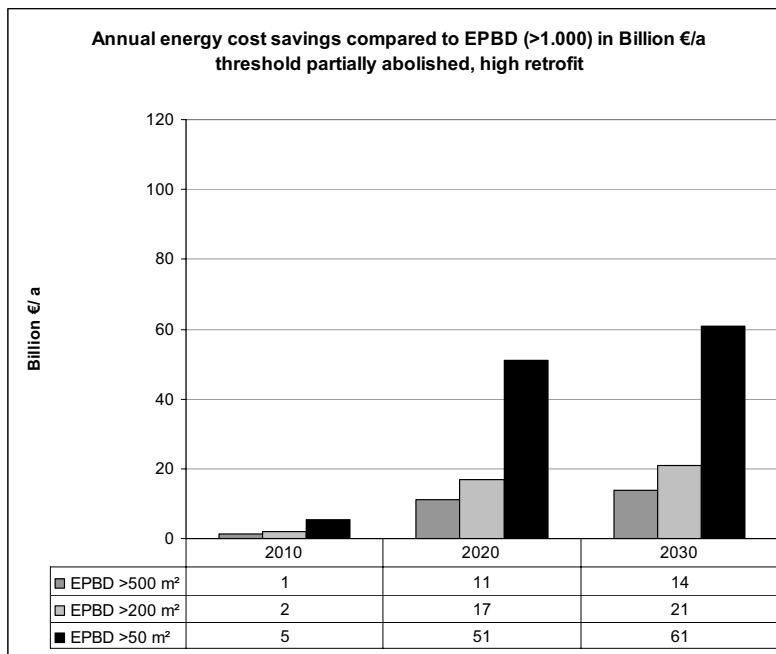
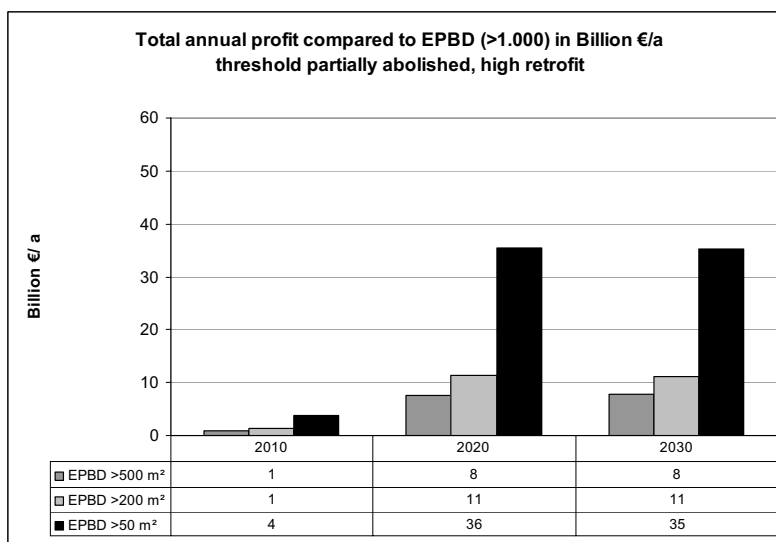


Figure 2.24 Total annual profit compared to current EPBD from higher retrofit rates, threshold already partially abolished



### 2.5.3 Effect of improved thermal standards due to cost optimal requirements

The effect of higher retrofit rates combined with improved thermal standards is described in the following graphs.



Figure 2.25 Additional investment costs compared to current EPBD from higher retrofit rates and improved thermal standards, threshold already partially abolished

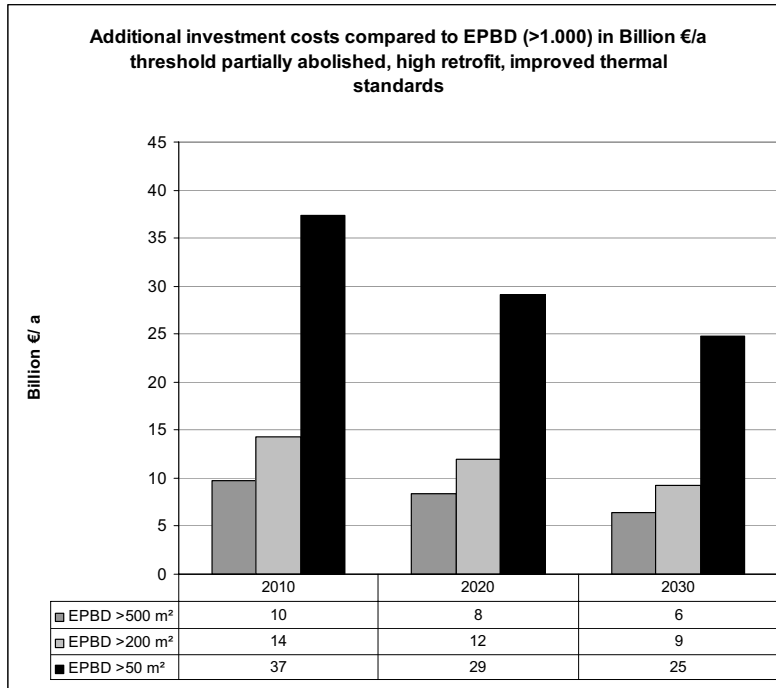


Figure 2.26 Additional annual capital costs compared to current EPBD from higher retrofit rates and improved thermal standards, threshold already partially abolished

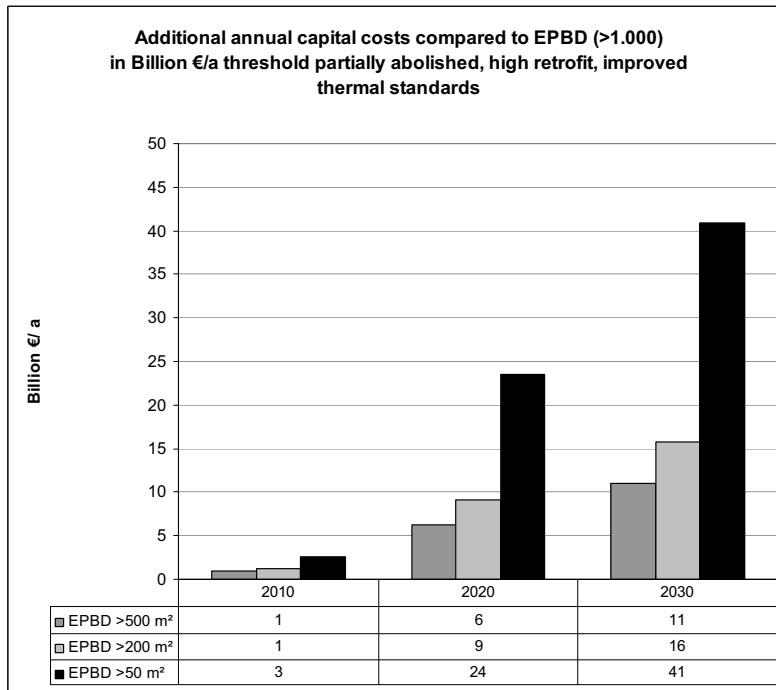


Figure 2.27 Annual energy cost savings compared to current EPBD from higher retrofit rates and improved thermal standards, threshold already partially abolished

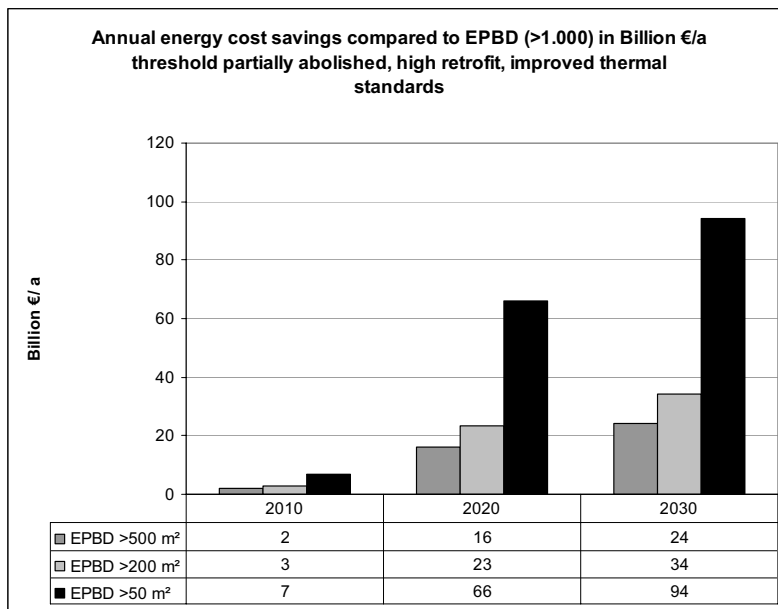
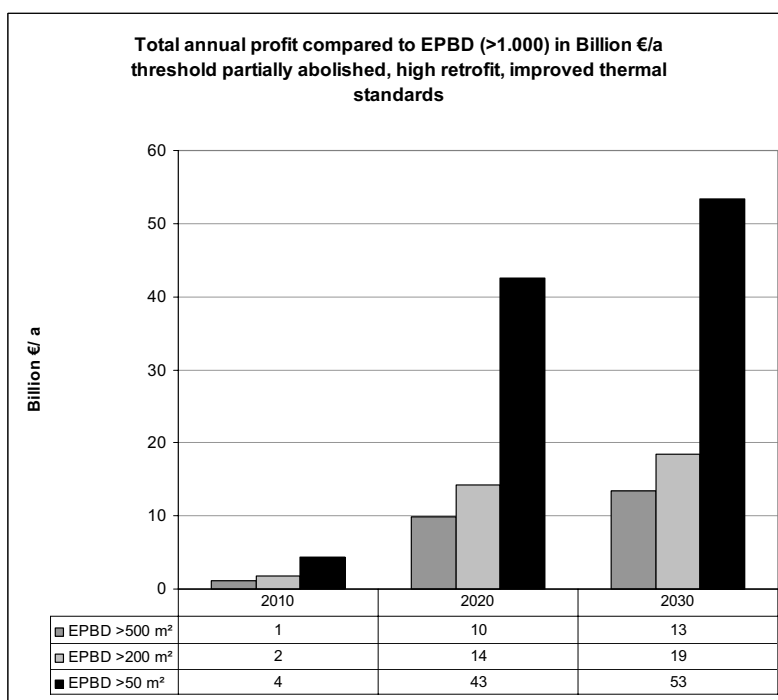


Figure 2.28 Total annual profit compared to current EPBD from higher retrofit rates and improved thermal standards, threshold already partially abolished



It is visible, that the total annual profit can be further improved by the introduction of cost optimal U-values.

## 2.6 Societal effects - job creation

The impact of energy efficiency measures on job creation is influenced by various dependencies and specific market situations, tax systems etc. per country. A detailed analysis would demand quite complex models including input – output analyses of all sectors, a task which would be out of the scope of the current assessment.

However a simplified method can be chosen that neglects smaller effects but still offers a good indication of possible employment related impacts of energy efficiency measures. Thereby the assumed additional turnover from energy efficiency projects is divided by the average turnover per employee in the construction sector and multiplied by a specific factor, a methodology which has been used e.g. in [Ecofys 2004], [Ecofys 2005] and [Wuppertal Institut 2006]

$$job\_creation = \frac{additional\_turnover}{turnover\_per\_employee} * factor$$

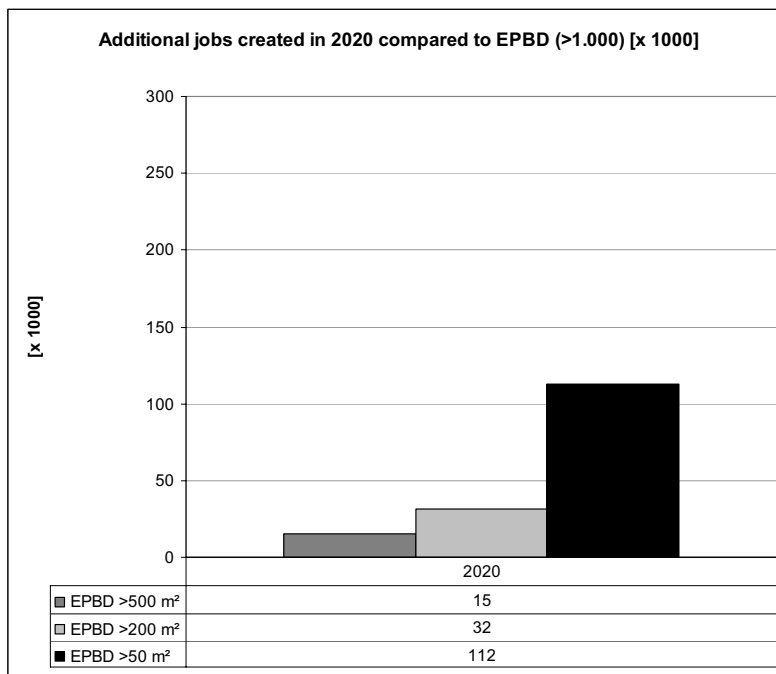
This factor depends on the specific labour intensity of the measures carried out. Depending on exact kind of activities, this factor may vary between 0,5 (share of material costs of energy efficiency measures twice as high as the usual mix of material and labour costs as presently observed in the building industry of the EU27) and 1,0 (share of material costs according to usual mix). In the present study, the factor was therefore assumed to be 0,7.

According to EUROSTAT, the average turnover per employee in the construction sector of the EU27 in 2005 was 103 thousand EURO per employee and year.

New jobs are created with the additional investments triggered as from 2009 and can be maintained for several years. However, as the investments are decreasing over time (due to the fact that parts of the building stock will be renovated after a certain time) it is reasonable to calculate the average employment effect on basis of the additional investments in 2020. Applying the turnover per employee and the additional investments in 2020 according Figure 2.13, Figure 2.14, Figure 2.21 and Figure 2.25, the following job effects in the EU27 can be estimated.

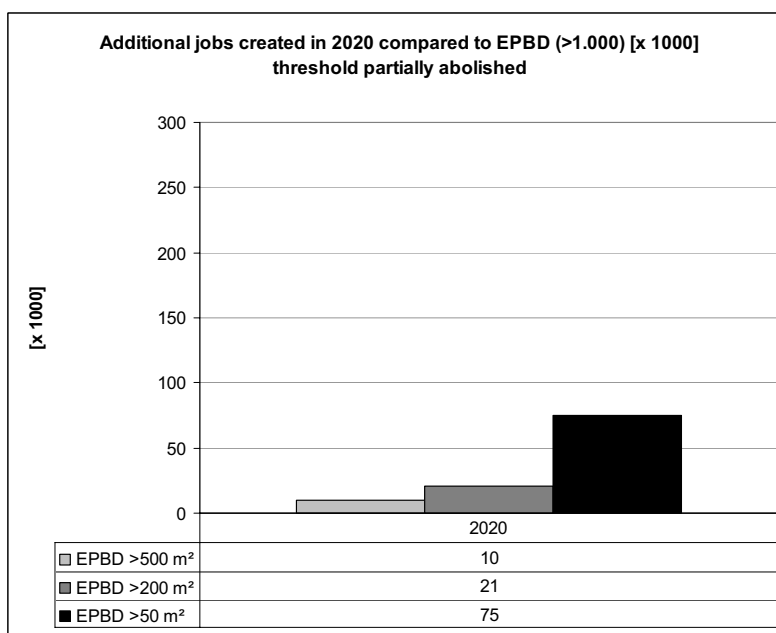
2.6.1 Effect of different threshold options

Figure 2.29 Job effects compared to current EPBD from different threshold options



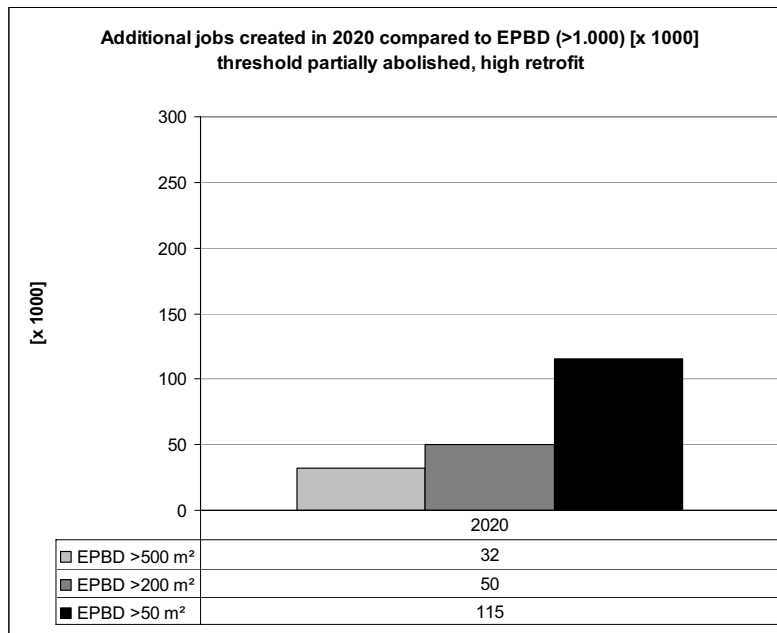
This means e.g. that after lowering the threshold to 50 m<sup>2</sup>, ca. 112.000 additional new jobs can be created and maintained (by the investments in the following years) compared to the current EPBD.

Figure 2.30 Job effects compared to current EPBD from different threshold options, threshold already partially abolished



2.6.2 Effect of high retrofit rates due to improved certification and compliance

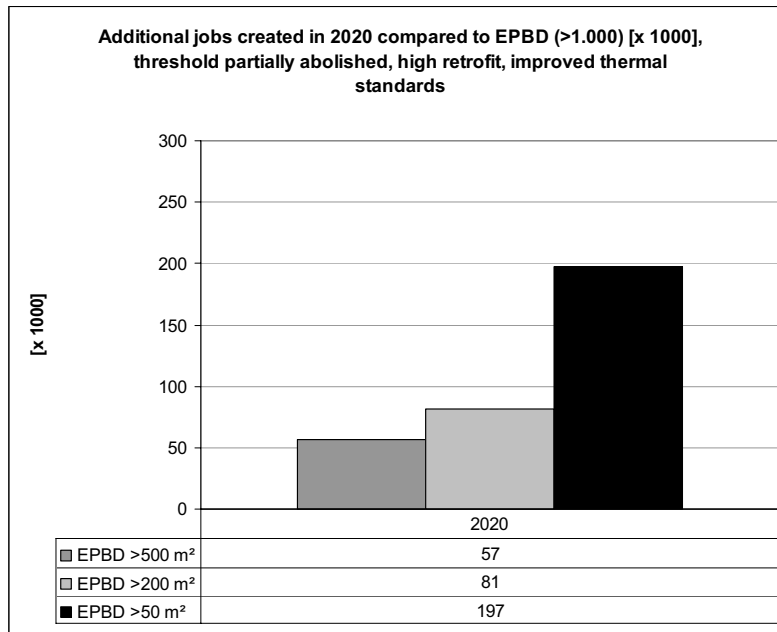
Figure 2.31 Job effects compared to current EPBD from higher retrofit rates, threshold already partially abolished



2.6.3 Effect of improved thermal standards due to cost optimal requirements

The effect of higher retrofit rates combined with improved thermal standards is described in the following graph.

Figure 2.32 Job effects compared to current EPBD from higher retrofit rates and improved thermal standards, threshold already partially abolished



## 3 Focus strengthening of Energy performance Certificates

### 3.1 Introduction

This document reflects the input provided by Ecofys Nederland to the Commission regarding the Commission staff working document, accompanying the Proposal for a recasting of the energy performance of buildings directive (2002/91/EC) – impact assessment.

In the following chapters methods, assumptions and results are presented for the options that have been reviewed. Inputs by Ecofys Netherlands, either new or adoptions of earlier input, are several times marked by italics.

### 3.2 Assessment of policy options for EPBD

#### 3.2.1 Extrapolation Mc Kinsey study

A study on costs and potentials for CO<sub>2</sub> abatements in Germany concludes that 63 Mt CO<sub>2</sub> savings can be achieved annually by *low or even negative abatement* in the buildings sector. At the level of EU-27 this could mean 500 Mt CO<sub>2</sub> emission reduction by 2020.

#### *Method and main underlying assumptions*

The calculations are based on information of the Mc Kinsey report (especially page 38 and 39) [Mc Kinsey, 2007]. A distinction is made between measures which mainly have an impact on fuel demand and measures which mainly have an impact on electricity demand. As such, the CO<sub>2</sub> saving German percentage for 2020 is divided over CO<sub>2</sub> emission reduction by fuel saving and by electricity saving. These percentages are used to extrapolate the figures for Germany to the CO<sub>2</sub> emission reductions of all the EU-27 MS (source PRIMES data).

This means 500 Mt CO<sub>2</sub> emission reduction includes CO<sub>2</sub> emission reductions by business as usual and cost effective fuel and electricity saving measures by 2020.

*Comment:* the 63 Mt can be achieved by measures costing less 20 euro/save ton CO<sub>2</sub>, so suggestion to change text in low or even negative abatement costs.

### 3.3 Quality and compliance requirements

*Current landscape:* Although the implementation is still in its early stage a notable amount of complaints were already submitted to the Commission in 2007 and 2008 with regards to unsatisfactory quality of energy performance certificates from Member State which already started. Such a view is also reflected in the public consultation on the EPBD recasting, where the request for improvement and/or strengthening of the EPBD article on certificates is the top ranked issue. The number of complaints on low-quality certificates will most likely increase considerably in near future, when more national certification regimes are fully operational.

With regards to the procedure on issuing certificates, some of the national certification regimes require an on site check of the building by the expert to gather information on its technical shape, followed by a calculation of the energy rating of the building based on this information. This procedure usually leads to high quality certificates, assuming that the quality of the expert is sufficient. Others alternatives also allow for the building owner to give technical information (which could be of apocryphal quality due to non-expertise) on the building to the expert, who prepares a certificate only based on this information and using many simplified and standardised assumptions depending on the building type without visiting the site. This does not always reflect the actual shape of a building and therefore can lead to incorrect rating results and inappropriate recommendations in the certificate, but leads to low costs for certification. Furthermore, it allows for incorrect and false input to sugar-coat the rating result, which is not always easy to detect on an ad-hoc basis by a third party (e.g. a future prospective buyer or tenant of a building).

The certification of a building could also be linked to compliance criteria on building regulations: Aspired energy savings in the buildings sector presuppose compliance with relevant building regulations/codes. In fact, the non-compliance rate on building codes (with regard to energy aspects) varies between 26 to 33 % for new buildings and even 40 to 50 % for refurbishment of existing buildings in EU-27 when no proper control is in place<sup>3</sup>. **The impact of these non-compliance rates can be quantified to 2.3 to 4.2 Mtoe wasted and 2.5 to 4.7 billion € avoidable energy costs between 2009 and 2020<sup>4</sup> in the EU-27.**

Several stakeholders<sup>5</sup>, experts and energy agencies<sup>6</sup> require having **effective control regimes** in place in order to increase compliance with building regulations. The important impact of compliance control was also expressed by stakeholders and their contributions to the public consultation on the EPBD recasting. Furthermore, the Commission also

<sup>3</sup> S. Lechtenböhrer, A. Schüring, T. Hanke (Wuppertal Institute): Scenarios on the Demand for Space Heating in Residential and Tertiary Sector Buildings in the EU27 and EEA Countries, Germany, 2008

<sup>4</sup> Relative to 100% compliance. Based on extrapolation of savings in the UK estimated by DCLG, 2007. "Regulatory Impact Assessment Energy Performance of Buildings Directive Articles 7-10". Based on averaged energy price in 2015 for gas, oil, district heating and wood.

<sup>5</sup> In position papers and studies, such as European Construction Industry Federation FIEC: FIEC Memorandum - The impact of buildings on climate change, 2007 (amended version 2008); European Energy Network EnR: Implementation of the EU Energy Performance of Buildings Directive - a snapshot report, 2008

<sup>6</sup> As e.g. presented at the 2<sup>nd</sup> Sustainable Energy Week event 'Energy Performance of Buildings Directive - Next Steps' in January 2008 and as demonstrated in a Swedish case study of 2007 (European Energy Network EnR: Implementation of the EU Energy Performance of Buildings Directive - a snapshot report, 2008),



receives a considerable number of citizens and experts complaints on lack of compliance in practice coming from Member States where no control regime exists.

So ideally, sufficient quality of energy performance certificates and high compliance rates of construction and refurbishment works with building regulations are guaranteed at the same time with a single instrument.

*Suggested policy option to explore:*

**The check of EPBD building certificates by a compliance control scheme could be such a smart instrument.** A similar control regime is i.e. currently developed in the Flemish Region of Belgium. Denmark introduced a regime for systematic quality control of certificates already in 2006.

Such a control scheme should be as effective and as least administratively cumbersome as possible. In doing so, a justified balance between control costs and benefits (in terms of improved quality and saved energy and emissions) can be achieved. **Random sampling checks of certificates of 3 different levels of detail and frequency** could therefore be introduced as a new requirement by the EPBD recasting as the adequate approach. **Such** random sampling regime could range from validity checks of input and/or result data for certificates to on-site checks of buildings certified.

Moreover, this type of (compliance) control regime could also guarantee a sufficient quality of experts issuing the certificates: Member States have introduced varied requirements with regard to qualification (educational requirements and training) of independent experts which are entitled to certify buildings. The independence, required by the existing EPBD and quality of these experts therefore broadly varies within the EU. As such, the quality of currently issued certificates varies broadly as well. However, the EPBD's objective is not to fix national job requirements for certification issuers.

Provisions that would be desirable but difficult to implement are:

- control of all energy performance certificates;
- controlling all construction works for compliance with building regulations and;
- prescribing the qualification needs for experts issuing the certificate at EU level.

In order to achieve the full impact of these provisions, a random control of the real outcomes (validity and quality of certificates and construction/refurbishment works) at national level could be made mandatory by random sampling checks for certificates in the EPBD recasting<sup>7</sup>. This approach would also reflect the subsidiarity principle with regard

<sup>7</sup> For similar objectives, Denmark already revised its certification procedure in 2006, firstly introduced in 1997, to 'quality level' 5 and 6 respectively in its 2<sup>nd</sup> generation certification scheme: In a range from 1 to 6, 1 being lowest quality which only consists of "Meter reading reported by the building owner and the utility companies", whilst 5 and 6 mean "Computation by energy consultants based on building envelope inspection" and "Computation by energy consultants combined with meter reading". The revision of the Danish provisions was based on several years of experience since 1997, which also underlined the importance of quality control within the certification scheme (subsequently also named as 'label/labelling scheme'). The analysis of Jensen et al conclude that "Confidence in the energy label is the most important factor in achieving the main aim of the labelling scheme - energy savings. The user must at all times have confidence in the registrations made, the calculations, the label itself, and especially that the suggested energy saving measures are viable and will result in improved economy. Thus, it is essential to maintain a high level of quality in the energy labelling scheme. If quality is poor,

to laid down training requirements and educational preconditions for certification issuers, which are in the competence of the Member States.

Member States could be requested by an EPBD recasting to establish random sampling checks for 0.5 % of annually issued certificates<sup>8</sup> of 3 levels of detail: A certain share of these 0.5 % checks could requested to be done by a validity check of input data and rating outcome of energy performance certificates only. Another (lower) share could requested be checked (stricter) for input data and be recalculated by a controller. And another (very low) share of random sampling checks could consist of the aforementioned proposal plus control of the building on site for compliance with building regulations and correspondence with the certificate. *The overall cost of random sample checks in the EU-27 according to this proposal are estimated at between 75 and 78 M€ from 2009 through to 2020<sup>9</sup>.*

*The estimated impact in terms of energy savings is derived from an existing national assessment on EPCs in the UK<sup>10</sup>. The estimated impact of properly made energy performance certificates is that 8 to 12% of cost effective energy efficiency measures are realized<sup>11</sup>. These savings equal 0.9% of the United Kingdom's existing residential building stock's emissions<sup>12</sup>. No information is available on the effect of certification on the renovation rate of buildings.*

*When the UK impact estimate is extrapolated to the EU27 as a whole<sup>13</sup>, the following impacts are estimated. When no proper control mechanism is in place, the impact of EPCs is projected to range from 16.3 to 25.3 Mtoe in 2020 and from 31.3 to 48.5 Mtoe in 2030. In terms of emission reductions, this equals 45.7 to 70.9 Mton in 2020 and 87.6 to 135.7 Mton in 2030.*

*When compliance is increased through moderately strengthened regulations<sup>14</sup>, an additional impact ranging from 0.9 to 1.3 Mtoe in 2020 and from 1.5 to 2.3 Mtoe in 2030 is generated. This equals an additional emission reduction of 2.3 to 3.5 Mton in 2020 and 2.4 to 6.6 Mton in 2030.*

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the users will lose confidence in the labels. [...] Credibility may be lost very fast as a few poor labels can do a lot of damage. The quality control of the Danish energy labelling scheme takes place at all levels of the scheme.", taken out of: Ole Michael Jensen, Morten Tony Hansen, Kirsten Engelund Thomsen, Kim Wittchen: Development of a 2nd generation energy certificate scheme – Danish experience, 2007

<sup>8</sup> Underlying that an accredited expert, specialised on issuing energy performance certificates for buildings, compiles one certificate per working day, so about 200 certificates a year. A random sampling check of 0.5 % of certificates would therefore mean that accredited experts face with one control per year on average.

<sup>9</sup> Quality checks costs equal to 0.5% of EPC issuing costs (as discussed with ms. Miladinova, 23.6.2008).

<sup>10</sup> Calculated from data originating from DCLG [2007]. Carbon saved claimed for EPCs in first year of implementation, electricity use excluded in PRIMES reference emissions.

<sup>11</sup> Calculated from data originating from DCLG [2007]. Savings claimed exclusively for EPCs, i.e. additional to EEC savings. Applies to first year of implementation, only when EPC is available. This range may differ from figures mentioned below because of non-additionality and different time frames.

<sup>12</sup> For comparison: in Germany, the certificates are projected to help avoid 0.35% of the existing residential building stock's emission (calculated from: ForschungsZentrum Jülich, 2005. "Evaluierung der CO<sub>2</sub>-Minderungsmaßnahmen im Gebäudebereich", p. 20. Carbon saved claimed for EPCs after three years of implementation, electricity use excluded in PRIMES reference emissions).

<sup>13</sup> Of course, conditions in other Member States might differ from those in the UK in terms of savings potential (size, profitability) and complementary policies.

<sup>14</sup> Based on compliance rates mentioned by Lechtenböhrer, Schüring & Hanke, 2008. "Scenarios on the Demand for Space Heating in Residential and Tertiary Sector Buildings in the EU27 and EEA Countries", Germany, 2008.

Consequently, properly carried out energy performance certificates may bring along 7 to 16 thousands of new jobs. Although the type of job created is expected to differ among member states, the majority of the jobs will consist of architects, engineers, and/or specialised energy advisors.

The costs for a thorough quality control system appear manageable. The total one-time costs of the development of an administrative system are estimated at around 6.4 M€. For comparison, costs in the United Kingdom have been estimated at 1.9 M€ (or 1.5 M£). In case separate administrative systems are developed in every individual member state, total costs could run up to around 50 M€.

The recurring costs of performing administrative activities are usually covered in the price of an EPC. For example, the total yearly costs of the Danish administration of the scheme paid by the consumers amount to about €0.8 million. These costs cover the quality assessment control, the registration of data and the development of facilities to help improve and minimise the work for the consultants as well as some training activities for the consultants<sup>15</sup>.

Costs of performing random quality checks for the EU27 would range between 75 and 78 M€ from 2009 through to 2020, and between 144 and 149 M€ from 2009 through to 2030.

Note however that quality control, when it is separated from compliance control, only applies to EPCs that have been issued. In Denmark, in 30% of sales an EPC was, although required, not made available (non-compliance)<sup>16</sup>. In these cases, there is no EPC to perform a random quality check on.

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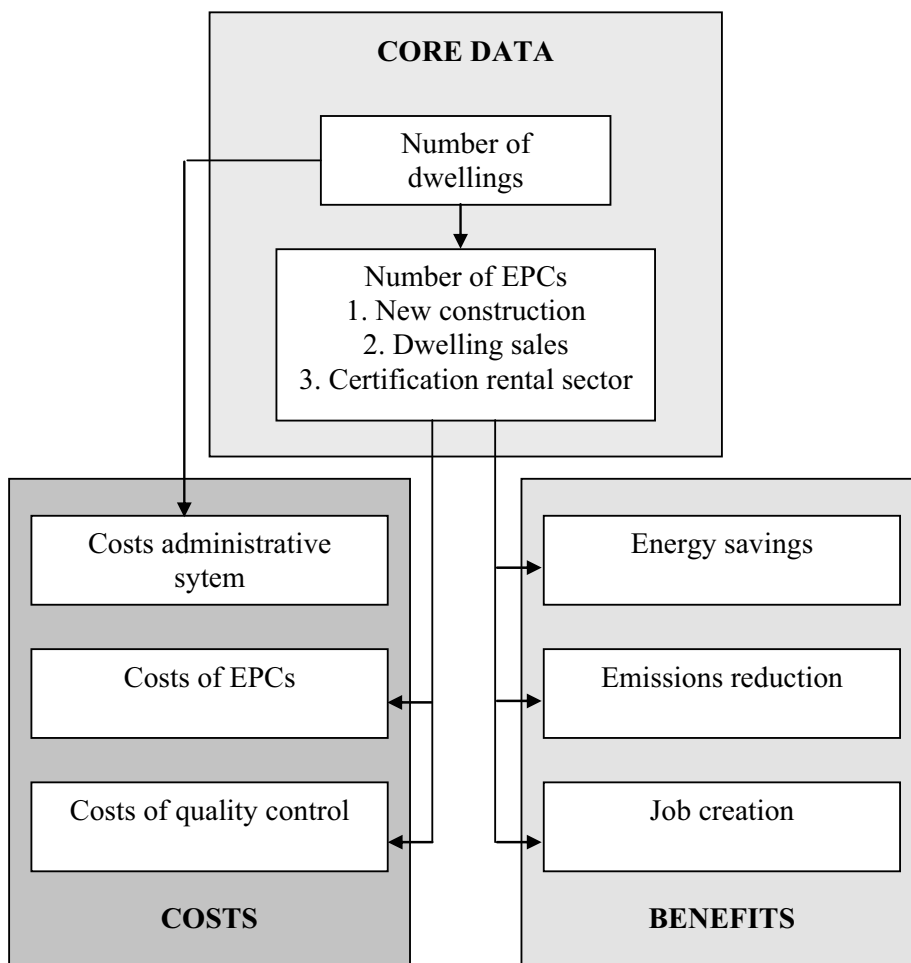
<sup>15</sup> Jens Laustsen (Danish Energy Authority) & Kirstine Lorenzen (COWI), 2003. "Danish Experience in Energy Labelling in Buildings", p. 20.

<sup>16</sup> Compliance rate of 70% in single family dwellings. "Danish Experience in Energy Labelling in Buildings", p. 24.

*Methodology, main underlying assumptions and results*

In this section, the methodology that has been used to perform the assessment for quality and compliance requirements is presented. A schematic overview of this methodology is depicted below. Moreover, results are listed in addition to those presented in the text on the previous pages.

Figure 3.33 Methodology for the impact assessment of option B1.



Number of dwellings

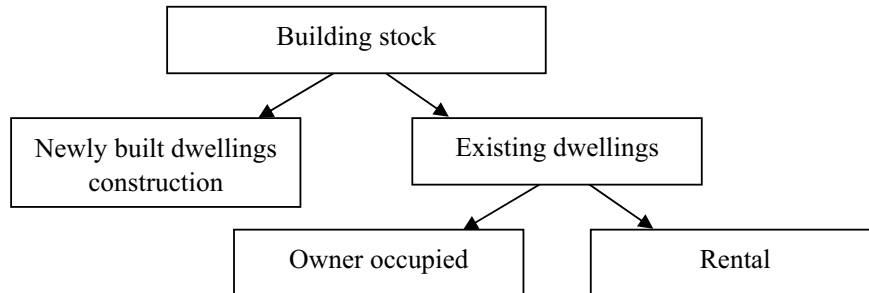
*Method*

The size of the building stock in all EU25 countries was assessed based on recent statistical data [Federcasa, 2006]. Additional statistics for Bulgaria and Romania were added in order to reach a complete basis for the EU27 stock.

Based on statistics concerning the number of demolished and newly constructed dwellings [Federcasa, 2006], an annual demolition rate (0.11%) and an annual construction rate (1.2%) were established for the EU27. Projection of these rates resulted in an update of the building stock size to the starting year 2009. Further extrapolation into the future resulted in an outlook on the size of the EU27 building stock until the year 2030.

The shares of owner-occupied and rental dwellings in the total EU27 building stock were estimated based on an average of statistics available for 15 European countries<sup>17</sup> [Eurostat, 2008].

Figure 3.34 Breakdown of the EU building stock used in the analysis



Main underlying assumptions:

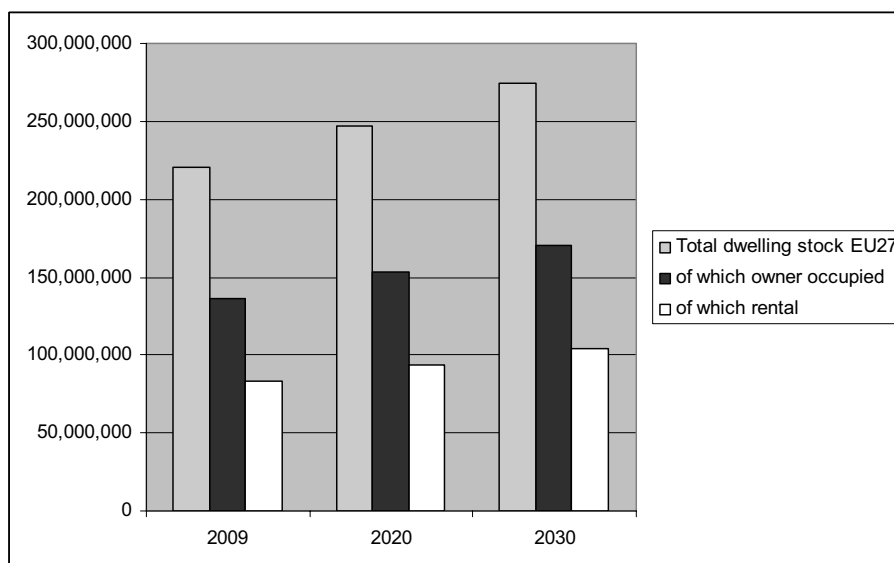
- Building stock dynamics (construction and demolition rates) will remain stable until the year 2030;
- Building stock composition (share owner-occupied, share rental) will remain unchanged until the year 2030;
- The evolution of the building stock in the countries mentioned above reflects current and future dynamics in the EU27 as a whole.

#### Results

In the year 2009, the EU27 building stock will consist of around 220 million dwellings. The majority of 137 million dwellings are owner-occupied. The remaining 84 million are rental dwellings. The development of the building stock over the years is shown below.

<sup>17</sup> More specifically: Belgium, Denmark, Germany, Greece, Spain, France, Ireland, Italy, Luxembourg, Netherlands, Austria, Portugal, Finland, Sweden and the United Kingdom.

Figure 3.35 Number of dwellings in the EU27 building stock.



### Number of energy performance certificates

#### *Method*

In order to calculate the number of EPCs issued annually, three categories were distinguished:

#### 1. Newly constructed dwellings

Since an EPC is required for all newly constructed dwellings, the aforementioned construction rate was used to calculate the number of constructed buildings in the EU27.

Compliance: for newly constructed dwellings, ranges of non-compliance rates were used: 26 to 33 % when no proper control is in place, and 17 to 23 % with moderately strengthened regulations [Wuppertal Institute, 2008].

#### 2. Sold existing dwellings

Based on the number of sales of existing dwellings in the UK, Germany, France, Italy, Spain, The Netherlands and Denmark [RICS, 2007; VROM, 2007; INE, 2008; and various country reports of the Impact project], a weighted average sale rate of 2.2% (relative to the entire stock, i.e. including rental dwellings) was obtained.

In order to avoid double counting of dwellings that are re-sold within the 10 year EPC validity period, a profile of sales over time was established [similar to the profile used for DCLG, 2007; see Annex I].

Compliance: for sold existing dwellings, ranges of non-compliance rates were used: 40 to 50 % when no proper control is in place, and 25 to 35 % with moderately strengthened regulations [Wuppertal Institute, 2008].

### 3. Transferred rental dwellings

A profile of certification activities over time was assumed for lessors. Again, the profile is similar to that used for the rental sector in DCLG [2007]. This approach is based on the assumption that lessors will implement the certification of their property on a building portfolio level, rather than on the level of transfers of individual tenants. As a result, the method used is not in line with the number of EPCs that are legally required over time in the rental sector. Instead, the possibility that rental dwellings have a certificate, even when this is not (yet) legally required, is taken into account.

Compliance: for transferred rental dwellings, no compliance rates were included in the calculations. The underlying assumption is that the number of certificates obtained by lessors on a building portfolio level will equal or exceed the number of required certificates. As a result, lessors will dispose of fully certified portfolios within ten years from the starting year. This would enable lessors to reach a compliance rate of 100%.

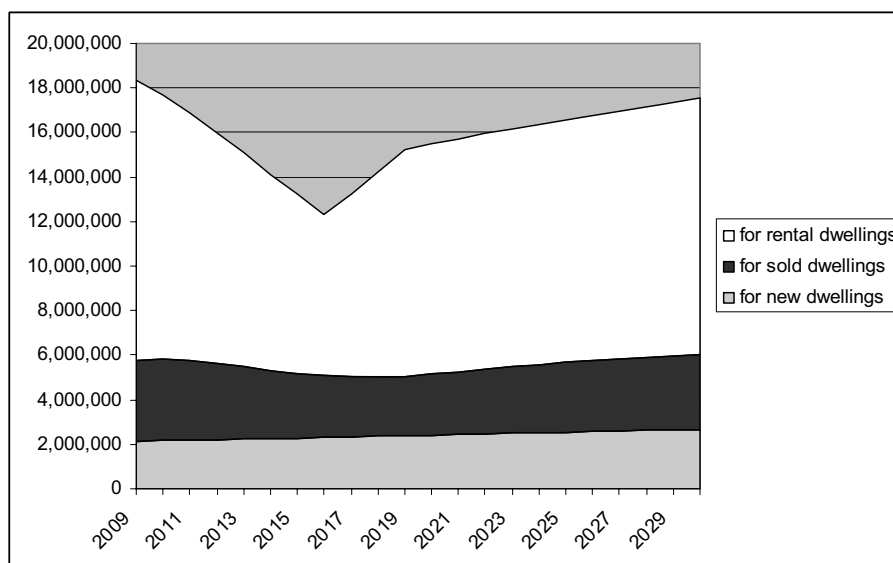
Main underlying assumptions:

- EPCs are valid for a period of 10 years
- It is assumed that a certificate is available for all owner-occupied buildings that are re-sold within ten years of an earlier sale. In other words, the non-compliance rate is neglected when correcting for double-counting;
- Lessors will implement the certification of their property on a building portfolio level, rather than on the level of transfers of individual tenants (see Annex I);
- The profile over certification activities by lessors is such that the number of certificates obtained by lessors on a building portfolio level will equal or exceed the number of required EPCs. As a result, lessors will dispose of fully certified portfolios within ten years from the starting year;
- The behaviour of private lessors could be expected to differ from that of institutional lessors (housing associations, municipal bodies, etc). Also, in the private subsector some non-compliance is likely to occur. These deviations are not taken into account. Instead, portfolio-based certification by institutional lessors is assumed to represent proceedings in the rental sector as a whole.

#### *Results*

Based on the assumptions mentioned above, the number of EPCs issued is as indicated in the Figure below. From 2009 through to 2020, the cumulative number of EPCs is found to range from 164 million (no proper control, low end compliance) to 182 million (proper control, high end compliance). When projected from 2009 through to 2030, the cumulative number of EPCs ranges from 315 to 348 million, respectively.

Figure 3.36 Number of EPC issued in the EU27, assuming proper control in place and high end compliance estimates.



### Energy savings and emission reduction

#### *Method*

In the EPBD impact assessment for the UK [DCLG, 2007], assumptions were made regarding the additional penetration of energy saving measures due to energy performance certification. These assumptions imply that the impact of an individual EPC is that, on average, around 10% of the cost effective annual savings potential in a dwelling is realized. Similarly, average carbon savings per energy performance certificate were assessed.

The impacts, as assumed for the UK, were assumed to apply to all sold existing dwellings and rental dwellings with an energy performance certificate. Subsequently, both impacts were projected on the EU27 building stock. A range is assumed (20% bandwidth on either side) in order to evaluate the sensitivity of the results.

#### Main underlying assumptions:

- An impact of certification is assumed only for sold existing dwellings and for rental dwellings. The energy performance of newly built dwellings is assumed to be influenced by dedicated normative legislation, rather than by certification;
- The assumed impact of EPCs in the United Kingdom (in terms of savings and emission reduction) is similar to the impact of EPCs in other EU27 countries. A 20% bandwidth on both sides is assumed to cover differences, if any, in e.g. cost-effective savings potentials, fuel use and complementary energy policies;
- No electricity savings are assumed to result from energy performance certification;
- As a result of the lifetime of the applied energy saving measures, the assumed impact of the EPCs persists until the years 2020 and 2030;
- The average amount of savings induced per EPC is assumed to remain constant between 2009 and 2030.



Because the impact assumed in the United Kingdom is vital to the results of the current analysis, it was compared to findings for the German context. In Germany in 2010, the annual emission reduction due to energy performance certification is projected to range from 0.42 (no double counting) to 1.04 MtCO<sub>2</sub>/a (including the effect of additional monetary incentives) [ForschungsZentrum Jülich, 2005]. These German projections correspond to 0.2 to 0.5 tCO<sub>2</sub>/EPC, respectively. The assessed impact for the United Kingdom, 0.4 tCO<sub>2</sub>/EPC, lies within that range.

#### *Results*

When no proper control mechanism is in place, the impact of EPCs is projected to range from 16.3 to 25.3 Mtoe in 2020 and from 31.3 to 48.5 Mtoe in 2030. In terms of emission reductions, this equals 45.7 to 70.9 Mton in 2020 and 87.6 to 135.7 Mton in 2030.

When compliance is increased through moderately strengthened regulations, an additional impact ranging from 0.9 to 1.3 Mtoe in 2020 and from 1.5 to 2.3 Mtoe in 2030 is generated. This equals an additional emission reduction of 2.3 to 3.5 Mton in 2020 and 2.4 to 6.6 Mton in 2030.

#### Costs of energy performance certification

##### *Method*

The costs of an EPC were assessed based on data available for seven European countries<sup>18</sup> [Impact, 2006; COWI, 2003; DCLG, 2007 and VROM, 2008c]. On average, costs are found to lie within a range of 241 to 448 €/EPC. Based on these costs, a range was calculated for the EU27 as a whole.

Total costs were calculated by multiplying the average price with the number of EPCs issued. However, an additional correction was made in order to take into account economies of scale. Such economies of scale occur when a single energy performance evaluation is valid for multiple buildings. For instance, a large number of identical dwellings can be certified at lower costs on the basis of reference dwellings.

##### Main underlying assumptions:

- The average cost of an EPC in the countries for which data was available is assumed to represent the cost of an EPC in EU15 countries. For the EU10 plus Bulgaria and Romania, costs are assumed to be 20% lower than in the EU15. Still for the EU10 this might be a bit too high. Lets discuss it next week.
- The same price is assumed for certification of newly built dwellings, sold existing dwellings and dwellings in the rental sector.
- Economies of scale are quantified by the assumption that one single building evaluation accounts for:
  - 2 EPCs issued for new dwellings
  - 2 EPCs issued for sold existing dwellings
  - 10 EPCs issued for rental dwellings

<sup>18</sup> More specifically: the United Kingdom, Germany, France, Spain, The Netherlands, Denmark and Belgium.

### *Results*

In absence of proper control mechanism, the total cost of EPCs issued between 2009 and 2020 would range from 7.7 to 15.8 billion €. For those issued between 2009 and 2030 a cost of 14.7 to 30.0 billion € would be incurred.

When compliance is increased through moderately strengthened regulations, additional costs of EPCs issued between 2009 and 2020 would range from 1.2 to 2.1 billion €. For those issued between 2009 and 2030 a cost of 2.2 to 4.0 billion € would be incurred.

### Administrative costs

#### *Method*

With regard to administrative costs, the distinction is made between three categories:

#### 1. Costs of the development of an administrative system

The cost of setting up an administrative system is estimated based on data that is available from the impact assessment in the UK [DCLG, 2007]. Based on assumptions on the cost structure and on the relative sizes of the dwelling stocks in the UK and the EU27, a cost estimation is performed.

#### 2. Costs of using the administrative system

The administrative system is mainly used for the registration of data. Data in the database are e.g. used to evaluate compliance rates, the number of proposals, the investments and the possible savings and other information from the scheme [COWI, 2003]. Costs that are incurred for the registration of data in an administrative system are covered in the cost of an EPC [COWI, 2003]. Therefore, in order to avoid double counting, no specific costs are calculated for registration.

#### 3. Costs of the performance of quality control (random checks)

The random quality checks of EPCs are assumed to be carried out as proposed in the text of the impact assessment. In total, that is, 0.5 % of the issued certificates are checked. More precisely, 0.3% is assumed to undergo a validity check of input data and rating outcome of energy performance certificates only. A lower share of 0.15% checked (stricter) for input data and is recalculated by a controller. Finally, 0.05% is assumed to be checked (stricter) for input data, recalculated and controlled for compliance with building regulations on site.

The quality control checks are linked with compliance control. Once the required EPC is found to be available in a certain situation, the EPC might be subjected to a random check. Therefore, no additional costs for compliance control (i.e. on top of the costs for quality control) are included in the costs presented in the results.

Finally, the existence of random quality control checks implies that a proper control mechanism is in place. Therefore, costs were calculated based on the compliance rates mentioned for these circumstances by [Wuppertal Institute, 2008].

Main underlying assumptions:

- Two thirds of the costs of an administrative system are assumed fixed, regardless of the number of dwellings involved. The remaining third is assumed to be linearly proportional to the number of dwellings involved;

- Costs for administrative systems for EU10 countries plus Bulgaria and Romania are assumed to be 20% below those in EU15 countries;
- The random quality checks of EPCs are assumed to be carried out as proposed in the text of the impact assessment;
- The costs of compliance control are assumed to be included in the quality control mechanism based on random checking;
- The average time needed is assumed to be: 0.5 hours for a quick random check, 1.5 hours for a random check plus recalculation, and 6 hours for full data control, recalculation and on site inspection;
- The hourly rates of employees involved in quality control are assumed to be 70 €/hr for EU15 countries. The rates for EU10, Bulgaria and Romania are assumed to be 20% lower compared to those in the EU15;
- Costs for the registration of data in an administrative system are assumed to be accounted for in the price of energy performance certificates [as noted in COWI, 2003].

#### *Results*

Based on the aforementioned assumptions, the total one-time costs of the development of an administrative system are estimated at around 6.4 M€. For comparison, costs in the United Kingdom have been estimated at 1.9 M€ (or 1.5 M£). In case separate administrative systems are developed in every member state, total costs could run up to around 50 M€.

Costs of performing random quality checks would range between 75 and 78 M€ from 2009 through to 2020, and between 144 and 149 M€ from 2009 through to 2030.

#### Job creation

##### *Method*

In order to determine the number of jobs that are created by the energy performance certification, a simplified method is chosen, similar to the one used in the assesment of job creation as a result of the threshold options:

$$job\_creation = \frac{additional\_turnover}{turnover\_per\_employee} * factor$$

The additional turnover is represented by the total costs of issued EPCs. The average turnover per employee in the sector ‘architectural and engineering activities and related technical consultancy; technical testing and analysis’ (NACE code K742\_K743) of 22 European countries in 2006 was 101 k€ per employed person<sup>19</sup> and year [Eurostat, 2008]. Although the type of professional that issues EPCs differs strongly among countries<sup>20</sup> [Impact, 2006], this NACE category is believed to adequately represent the involved workers in the EU27 and is therefore used in the analysis. The factor depends on the labour intensity of the work that is carried out. In the present study it was assumed that the additional turnover is generated through energy performance certification, which has

<sup>19</sup> Note that, statistically, the concept ‘employed person’ could differ from ‘employee’.

<sup>20</sup> Whereas in some Member States, for instance, only architects and engineers are eligible to issue certificates, in others a broader array of professionals are active in this field

a labour intensity that is similar what is usually observed in the NACE category at hand. Therefore, a factor of 1 is used in the calculations.

#### *Results*

*In terms of employment, the certification generates around 6.9 to 14.2 thousands of jobs. Moderately strengthening the control mechanism would generate an additional number of 1.1 to 1.9 thousands of jobs. In either case, the type of job generated will differ somewhat from one member state to another. At present, the Intelligent Energy Europe project ‘Impact’ has shown that mainly architects, engineers, and/or specialised energy advisors are eligible for energy performance certification. In some member states, however, work will be carried out by advisors not primarily educated in the building field) or by craftsmen [Impact, 2006].*

*The income used in the calculations represents “architectural and engineering activities and related technical consultancy; technical testing and analysis”. This NACE category most closely represents the certifiers in most member states. However, as mentioned, in some member states will be carried out by advisors not primarily educated in the building field or by craftsmen.*

*The figures presented relate to the number of steady jobs in the year 2020. Depending on the variability of the number of EPCs issued annually - when, for instance, the profile in the rental sector differs from the one assumed in Annex I - some variations might exist over time.*

*The results on additional job creation due to the strengthened control mechanism are based on the compliance rates from Wuppertal Institute [2008]. If the certification scheme works ideally in all member states, i.e. with a 100% compliance rate, the result would range between 10 and 20 thousands of jobs.*

The apparently limited number of jobs is explained to a large extent by the fact that economies of scale in the process of certification have been taken into account. This means that a considerable share of EPCs can be based on reference dwellings, and therefore do not require the full capacity of a certifier.

### 3.4 Requiring that the recommended cost-effective measures of the certificate are realized within a certain time period

Unfortunately, the evaluation of the impact of requiring that the cost-efficient recommendations of the Certificate are realized within a certain time cannot be based on the countries that have adopted certain requirements in this aspect, i.e. Denmark and Portugal, as there are no impact assessments available. Still, experts evaluate that if requirements are included this may lead to the following indicative impact for EU-27:

- Final energy demand saving of approximately 12 Mtoe, i.e. 3% reduction by 2020 in the EU-27 building sector
- CO<sub>2</sub> emission reduction of about 50 Mt, i.e. 1% reduction by 2020 in overall EU-27 MS CO<sub>2</sub> emissions. *[based on literature sources mentioned in paragraph method and main underlying assumptions].*

However, *although from the data available it is not possible to make estimations on the investments requirements*, it can be expected that meeting the costs can be a significant challenges for some property-owners, especially those with restrained budgets, or housing associations that own a large number of properties.

The estimated investments requirements for services buildings are estimated in the range of 2000 and 30000 Meuro. These investments correspond to saving figures mentioned above.

#### *Method and main underlying assumptions*

The information is based on provided information in telephone calls with representatives of Denmark and Portugal [SBI, 2008; University of Porto, 2008]. Other sources are: [IPPC, 2007; Ecofys, 2001; McKinsey, 2007; Ecofys, 2008a]

Main assumptions are that: 1) potential is available in 40% to 50% of the services buildings; 2) in these buildings, 20% to 25% of the final energy demand can be saved by cost-effective measures and 3) by 2020 the majority of the potential can be realized.

The calculations of the investment costs are based on available information of cost per saved ton CO<sub>2</sub> for typical cost-effective measures such as insulation and high efficient boilers [Ecofys, 2008a; SenterNovem, 2007].

### 3.5 Making certificates a mandatory part of property advertisement and/or property transaction documents

*Comparison with similar approach used for fuel consumption and CO<sub>2</sub> emissions in advertisements of new cars.*

Making certificates a mandatory part of property advertisement and or property transaction documents has similarities with the labelling Directive 1999/94/EC which requires the display of a label on fuel consumption and CO<sub>2</sub> emissions on all new cars, the publication of national guides on the fuel efficiency of new cars, the display of posters at the dealerships and the inclusion of fuel efficiency information in printed promotional literature. From a study in 2005 on the effectiveness of this directive it appears that is considered a useful tool in raising awareness but its impact has not been visible, with labels of strongly varying quality in different Member States [COM2007, 19 final; ADAC, 2005].

The recent performed evaluation of the tax incentive based on fuel consumption label system in the Netherlands confirms these outcomes. Since 1 January 2006 private cars with a green A and B label are eligible for a discount on the purchase tax (BPM) of respectively 1000 euro and 500 euro, while relative high energy consuming cars with a label D, E, F or G are surcharged by respectively 135, 270, 405 and 540 euro<sup>21</sup>. The aimed targets are achieved, a shift towards purchase of low energy cars is observed. The

<sup>21</sup> Since 1 February 2008 the bonus and malus amounts are intensified.

CO<sub>2</sub> emission reduction of the implemented bonus/malus incentive on energy labels is estimated to reduce 0,1 Mton CO<sub>2</sub> in 2011. However, the causal correlation between the incentive and this impact can not be demonstrated [ANWB et al , 2008].

*Certificates in property advertisements*

There are initiatives by real estate agencies, real estate branch organisations and housing associations to provide insight in the energy performance of buildings based on the certificate system in property advertisements [Chancellors, 2008; Funda, 2008; SenterNovem, 2008]. We contacted several agencies for more detailed information, till now the response is very low.

The energy label of a house is included as a separate item on the website of the Dutch branch organisation of real estate agencies (www.funda.nl). Their policy is to inform their customers as completely and transparently as possible. According to their estimation the energy label information is currently available for 2 a 3 % of the buildings on their website. The estimated cost for ICT related activities (programming software etc.) for the current display are around 10000 euro. These are costs for simple adjustments (i.e. purely display of energy label, no further explanation) of the software only, other cost are administrative (data collection and supply, see text below), estimation of these costs can only be made roughly, for instance approximately 5 to 15 minutes labour cost per certificate. Furthermore, there are costs for the data collection. At the moment, the data collection is decentralized: included in the housing information of individual real estate agencies (820 in total). There is an initiative for using the central energy label database of the Dutch energy agency in the future. The advantages of this approach are that the information is more reliable and that it offers the opportunity to visualise the energy costs as well. On the other hand, the branch organisation has to pay for this information [Funda, 2008]

Currently, most Dutch housing associations are busy with energy labeling their housing stock. Several of them consider to inform tenants besides rent, and energy performance/label also on energy costs. In this way tenants can take housing conditions, rent and energy cost into account in their choice for renting a particular building [SenterNovem, 2008; Ecofys, 2008b].

*Is it legally possible to make the certificates a mandatory part of the property advertisement?*

According to the Dutch Ministry of Housing, Spatial Planning and the Environment this is possible. They refer to requirements for warnings/information in place for tobacco, loans, investments products etc. However, the question presents itself if legislation is really necessary. What are the odds that market will uptake this option on voluntary basis? In the Netherlands, Funda and several other housing sites have in principal already included the energy label in their information provision. The experiences learn that in general the market takes over this type of initiatives. For properly functioning of this option, the accessibility of reliable energy performance data on time is a cause of concern. [VROM, 2008a]

*Is possible to require energy performance improvements at transaction moments?*

These type of requirements conflict with legislation on free transaction of goods and the right of ownership as established by the European Convention on Human Rights.

[VROM, 2008a]

Additional contacts are currently outstanding [e.g. Chancellors, 2008] in order to provide additional information regarding the issue of property advertisement.

*Concluding*

Making certificates a mandatory part of the property advertisement and/or property transaction documents certainly is useful with respect to raising awareness, so that environmental issues can be taken into account during decision making. However, as stand-alone measure it will not generate much impact, it has to be regarded as an essential condition to enforce the overall impact of energy performance certificates. Prerequisites for proper functioning of this option are that the energy performance data are reliable and accessible on time.

### 3.6 Requiring the linking of the certificates with other support or discouragement mechanisms

Linkages of the certificates with other support or discouragement mechanisms have already been adopted in several EU Member States. For example, in the Netherlands there is a green mortgage which house owners can use to implement energy saving measures during renovation. The size of the loan is coupled to the improvement of the energy performance label. This means that in case more energy saving measures are implemented the energy performance of the house is further approved and more money can be borrowed against favourable conditions (see table 3.1). In general the interest is 1% lower than the market interest. The scheme is in force since May 2008, so there is no assessment available yet of its possible impacts [VROM, 2008b].

Table 3.6 Improvements to the energy performance (in terms of energy rating) and amount provided for green mortgage in the Netherlands

From label	To label	Number of steps	Maximal green mortgage (EUR)
F	D	2	25 000
F	B	4	50 000
F	A	5	100 000

In Portugal, energy conservation measures will be financially supported by tax benefits, this scheme will in the nearby future be coupled to energy performance certificates [University of Porto, 2008].

#### **An example of a fiscal mechanism linked to energy labelling in the mobility sector**

Interesting examples of linking energy certificates to complementary financial or fiscal mechanisms are to be found outside the built environment. For example, in 2006, a bonus-malus (or 'feebate') mechanism was introduced for new automobiles in the Netherlands. The objective of the scheme is to shift market shares from inefficient vehicles towards more efficient ones. The scheme entails a fiscal

bonus (reward) or malus (penalty) for buyers of vehicles. The size of the bonuses or penalties is proportionate to the energy label of the car, which is considered an indicator of its CO<sub>2</sub>-emissions. An evaluation of the scheme showed that a considerable shift in market shares had in fact taken place. Meanwhile, the costs of execution of the scheme are characterized as 'relatively modest'. After all, an existing tax scheme for motorized vehicles was used as a platform for additional incentives for efficiency. Early 2008, the bonuses and maluses were increased to higher amounts, in order to shift market shares further against virtually no additional cost. [VROM, 2007]

In the summary report of the Active Implementation of the European Directive on Energy Efficiency”(AID-EE) project is concluded that sometimes it is difficult to determine the isolated impact of a single instrument in a policy package. Informative instruments, which are generally implemented to support other instruments, constitute a good example. Their isolated impact is generally small or even zero. However, both regulatory and financial instruments as well as voluntary agreements would not be so effective without informing target groups on their obligations, financial benefits etc. An example is presented in the box below.

**An example of the impact of the policy package versus the impact of an individual instrument**

The case of energy labelling of appliances in the Netherlands constitutes an interesting example. It can be questioned whether labelling as a single instrument would have had a substantial impact in the Netherlands. High efficient appliances are more expensive and are probably not attractive for consumers without additional policies (subsidies and/or eco-tax). What happened after the introduction of the energy label -and a subsidy scheme linked to it- was that the market share of energy efficient appliances increased rapidly and inefficient appliances were removed from the market. This happened at higher pace in the Netherlands than elsewhere in Europe. In this case the policy package counts up to success. In Sweden no subsidy scheme was linked to the labelling. Current penetration of high efficient appliances is comparable with penetration in the Netherlands. Market transformation, however, came at a later stage and might have benefitted from policies introduced in other countries [Kahn et al, 2007]

In the Residential and commercial buildings chapter of the fourth Assessment Report of the Intergovernmental Panel on Climate Change, it is stated that there is no single policy instrument that can capture the entire potential for GHG mitigation. Due to the especially strong and diverse barriers in the residential and commercial sectors, overcoming these is only possible through a diverse portfolio of policy instruments for effective and far-reaching GHG abatement and for taking advantage of synergistic effects. Since climate change literacy, awareness of technological, cultural and behavioural choices and their impacts on emissions are important preconditions to fully operating policies, these policy approaches need to go hand in hand with programmes that increase consumer access to information, awareness and knowledge (*high agreement, medium evidence*) [IPCC, 2007]



Annex I Assumed profiles for certification in rental sector and housing sales.

<b>Assumed profile for certification in rental sector</b>													
Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2030
% certified in year x	15%	14%	13%	12%	11%	10%	9%	8%	9%	10%	11%	11%	11%
<b>Assumed profile for house sales</b>													
Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2030
% sold after x years	0.21	3.48	5.89	6.07	6.36	5.55	5.18	4.53	3.68	3.48	3.13	2.96	1.50

## 4 Inspection of boilers and air-conditioning systems

### 4.1 Background assumptions for job creations

#### 4.1.1 Estimation of job creation by 2020 for heating systems: between 125 000 and 195 000 jobs

*Methodology:*

To calculate the impacts on jobs creation for heating systems, we calculate first the stock of boilers in 2020 (Source: VHK Ecodesign of boilers and combi-boilers study, 2007). Then we assess the number of each type of boiler: the category between >15 years and >20kW requires one inspection every two years, whereas the others require one inspection every four years. Finally, we made an extrapolation for EU 27.

*Comment:*

Result depending on the hypothesis of the people in charge of inspection: 200 inspections per year for “inspectors” (without engineering expertise) / 100 inspections per year for “energy experts, consultants”. The figure 195 000 corresponds to the hypothesis that >15 years and >20kW inspections are made by consultants because of the high complexity of the boiler type.

#### 4.1.2 Estimation of job creation by 2020 for air-conditioning systems: between 25 000 and 35 000 jobs

*Methodology:*

To calculate the impacts on jobs creation for air-conditioning systems, we calculate first the number of inspections for the five majors’ countries in 2020 (Source: Roger Hitchin, Jerome Adnot, Maxime Dupont: 'Issues of the implementation of the EPBD article 9', 2005). Then we extrapolate for EU-27.

*Comment:*

Result depending on the hypothesis of the people in charge of inspection: 200 inspections per year for “inspectors” (without engineering expertise) / 100 inspections per year for “energy experts, consultants”. The figure 35 000 corresponds to half inspectors and half experts.

## 4.2 Inspection of boilers and air-conditioning systems

EPBD requires undergoing regular inspections of heating and air-conditioning systems. These systems have very important energy saving potential, up to 40-60% of their total energy use. The current EPBD is estimated to result in 10 % energy savings. There is thus substantial margin for further savings. The need for further action is all the more important because of the enormous increase of air-conditioning systems throughout Europe.

### 4.2.1 Requiring an 'inspection report' for heating and air-conditioning systems

*Current situation:*

The existing EPBD inspection requirements broadly aim at energy and CO<sub>2</sub> savings, but they do not specify the inspections' content and deliverables. Therefore, some of the Member States' inspection schemes are inaccurate and give limited energy savings. In many Member States inspections are not sufficiently prescribed or only based on safety checks (i.e. in France), so they do not directly lead to energy savings. Further, few Member States have organised systematic information, promotion, and advice campaigns to date, as requested by article 8(b) of the EPBD.

Consumers and house should have access to better information. Better operation and control of systems and retrofit of old systems and components by more efficient ones, generates substantial savings. Proper and regular inspection and maintenance of the heating and cooling systems accompanied by adequate information/advice to building owners for retrofitting can significantly stimulate and accelerate these savings.

*Suggested policy option to explore:*

An inspection report should be given to building owner after the inspection. This should include an energy efficiency rating of the heating/cooling systems, e.g. compared to up-to-date and/or best technology available, and recommendations for cost-effective improvement measures.

An additional requirement could be introduced to provide an estimate of the cost of replacing the existing boiler, water heater, or cooling system with that required under Ecodesign minimum requirements, or 'A' class under Energy Labelling.

An inspection report including recommendations for system improvement would not need to be made in the same frequency as the inspection of the systems itself, as its rating and recommendation results remain valid for a longer period of time.

The relevant CEN standards for inspections could be further developed. These would allow an efficiency rating of the installations. They could represent an overarching guideline which supports Member States' implementation of an inspection report. The EPBD recasting could therefore directly refer to these CEN standards and minimum energy efficiency installation requirements could be set by Member States based on these standards.

As a further step, the recommended saving measures in the inspection report could be requested to be realized. Measures with short payback periods could be required to be implemented faster than the ones with a longer payback period. Therefore, the inspection report should have clear information on economic information to building owners.

*Impact:*

In average, the inspection report could bring about 30% of building owners inspected to follow the advice, e.g. in France, the impact of individual energy advice has been estimated at 30%, and in Sweden incentives on individual oil boilers substitution resulted in 30% renovation. The inspection report could lead to about 3-4% additional replacements of the stock of boilers and combi-water heaters by 2020. The annual savings by 2020 would be around 90 TWh (324 000 millions of MJ) primary energy, 20 Mt CO<sub>2</sub>, or €2 billion (net of extra cost of replacement).

Inspections of heating and cooling systems can furthermore - apart from energy savings - achieve co-benefits, such as decrease of discomfort hours caused by non-properly operating heating/cooling systems, as examined by Bory et al. In addition, the new system could help manufacturers to produce heating and air-conditioning systems for the EU market which are easier to inspect, what could therefore improve the companies' competitiveness. Furthermore, inspection of heating systems is linked to creation of jobs, which can be estimated at 195,000 jobs (inspectors and energy consultants) in EU-27 in 2020. For air-conditioning systems, it can be estimated at around 35,000 jobs (inspectors and energy consultants) in EU-27 in 2020.

Additional cost to the Member States and their consumers of the inspection report should be low, as the information on the existing boiler, and system etc. should already be available from the building certificate and boiler/cooling inspection. Extra cost will be selecting the right size and technical specification of replacement and cost of installation system. Given a well designed system, the add-on cost to the inspector should be low (less than 10% of inspection cost e.g. every 4 to 6 years).

Finally, as is the case for recommendations from the buildings certificate, national subsidy schemes could and should support the investments that originate from the inspection report.

#### 4.2.2 Introducing quality check and compliance requirements

*Current situation:*

The technical saving potential of the compliance requirements is estimated very high, to 30%, which correspond to around 840 TWh primary energy savings (3 024 000 millions of MJ), reduction of €55 billion of costs and 252 Mt CO<sub>2</sub>e emissions savings for heating systems per year by 2020. Similarly regarding the air-conditioning systems, technical energy savings potential can reach a maximum of 50%. The energy savings of the compliance requirements can thus be estimated at around 20%, which correspond to around 16 TWh (57 600 millions of MJ) primary energy savings, reduction of €1.1 billion of costs and 5.7 Mt CO<sub>2</sub>e emissions savings per year by 2020.

Without control, the inspection outcomes of heating and air-conditioning systems, the national inspection schemes unlikely achieve sufficient energy efficiency improvements. Analysis of stakeholders and experienced Member States (e.g. Sweden, Germany, France, Italy) recommend to ensure that effective enforcement systems are in place for compliance and to assess regularly and independently whether the control regimes are effective.

Member States have introduced substantially different requirements with regard to educational preconditions and training of the independent experts who are allowed to execute inspections. Their actual independence, required by the existing EPBD, and quality therefore broadly varies within the EU.

The importance of compliance controls is also underlined by numerous contributions to the public consultation on the EPBD recasting: About one third of all contributors asked explicitly for compliance control requirements for inspection in an EPBD revision, whereof about 90 % of them are representing big European associations. Any compliance control scheme for inspections should be well balanced with regard to control costs and achievable benefits in terms of energy and emission savings and their gross economic costs. Such a control scheme has to be as effective possible at low administrative efforts. In doing so, a positive balance between benefits and control costs (in terms of improved quality and saved energy and emissions) can be achieved.

*Suggested policy option to explore:*

Random sampling checks of inspection reports (presented in option “Requiring an ‘inspection report’ for heating and air-conditioning systems”) of different levels of detail and frequency could therefore be introduced as a new requirement. These levels of random sampling regime could range from validity checks of input and/or result data for inspection reports to on-site checks of heating and air-conditioning systems inspected. The compliance control regime could also guarantee a sufficient quality of experts carrying out the inspections leaving for the Member States to lay down training requirements and educational preconditions for inspectors. However, by a control of the inspection report a sufficient quality of inspectors would be checked automatically at the same time.

Member States could be requested to establish random sampling checks for e.g. 0.1 % of annually inspections carried out of 3 levels of detail: A certain share of these checks could requested to be done by a validity check of input data and given recommendations of inspection reports only. Another (lower) share could requested be checked (stricter) for input data and the recommendations could be recalculated by a controller. And another (very low) share of random sampling checks could consist of the aforementioned proposal plus control of the heating/air-conditioning system on site for correspondence with the certificate.

*Results:*

So similar to what has been described under the option regarding Quality and compliance requirements of certificates a random sampling control of inspection results/reports is an option to improve the quality of inspections; guarantee a sufficient quality of information on energy efficiency improvement measures provided to the owner of a building by the inspection report and therefore increase the retrofitting rate of heating and air-conditioning systems and; ensure a sufficient quality of inspectors at the same time for reasonably low administrative efforts and costs.

A random sampling check of the inspection outcomes for heating and air-conditioning systems does have positive effect on creation of jobs: I.e. in Portugal, the quality of the certificates is checked every five years on 10% of the total. For inspections, random sampling rate can be assumed as similar, what could result in 23,000 jobs (inspectors and energy consultants) for EU-27 in 2020.

#### 4.2.3 Minimum energy performance requirements

The present energy performance requirements and their levels of ambition broadly vary across the Member States, even within similar climatic zones. Cross-border comparisons of requirements fixed are difficult due to very different basic approaches regarding how energy performance requirements are calculated and expressed. In addition, a multitude of different parameters are used for calculation purposes. Furthermore, with regard these parameters, very different definitions exist in Member States. Moreover, some Member States focus on fixing the transmission losses of a building by setting minimum requirements for individual components, such as windows, others have established holistic energy performance rating methodologies, fixing e.g. the maximum allowed primary energy demand and/or CO<sub>2</sub> emission for a building. These may inter alia incorporate energy consumption for lighting, ventilation and domestic hot water.

This fragmented situation is the result of many years of development of building regulations in the Member States, each having different starting points, dates (some started decades ago, some recently) and executive bodies. The existing performance requirements and methodologies also regularly undergo revision. Furthermore, the performance requirements have to be in line with other, non-energy national building regulations, which are outside the scope of the EPBD. An all-embracing research project was launched in autumn 2007 in order to assess these differences and to analyse how cross-border comparisons can be made in principle. The project consists of 16 international partners from across the EU and is scheduled to run for 2.5 years.

The overarching aim of an EU legal activity on energy performance requirements in the buildings sector is to achieve optimum performance requirements, which are feasible, cost effective and in balance with provoked energy savings, technical and environmental feasibility and subsidiarity. It is also important for regulation to encourage and not hamper innovation in the buildings sector. The existing EPBD respects this by setting the frame with a holistic methodology (instead of fixing very specific details of each component of a building) and any change in legislation must recognise the importance of this approach.

## 5 Minimum energy performance requirements

This section provides analysis possible benchmarking schemes throughout the EU as an input for the European Commission's impact assessment for the recasting of the EPBD. Options explored in this option are also covered in chapter 2 (see section 2.3).

### 5.1 Establish EU energy performance requirements

This option proposes to specify EU-wide energy performance requirements for buildings in the EPBD taking into consideration central factors such as different climate zones and buildings types (residential and non-residential buildings). This option is essentially a top down approach stemming from the supranational level and extending to national and sub-national remits. This option explicitly addresses the uneven and often sub-optimal energy efficiency legislation in buildings throughout the EU, by imposing binding, harmonized and cost-optimal requirements to be applied throughout the EU.

Such an approach to improving energy efficiency in buildings is promising in terms of rendering cross national comparisons easier, easing compliance through standardization, and in the long term removing administrative and regulatory barriers to the European single market. On the whole, a set, binding directive on energy efficiency performance requirements in buildings could provide the Commission with a clear "level playing field" to assess, monitor, and enforce the EPBD.

However, such binding and uniform requirements run a twofold risk. Firstly, given the multifarious configuration of the building stock throughout the EU, as well as the different variables affecting energy consumption (climate zone, related regulations, new vs old buildings etc.), elaborating a cost-optimum standard set of requirement to fit the specific particularities of all EU-27 member states would prove quite trying indeed. Furthermore, it would anchor such requirements in a rigid way in the recasted EPBD directive, by leaving little or no room for future manoeuvre with regards to the evolution of energy efficiency practices in national building stock policies.

Finally, lessons learnt from past European regulation in issues not directly pertaining to the single market (e.g the broad agenda set out in the Lisbon agenda of 2000) points to providing more flexible compliance standards in forums such as the Open Method. Envisaging having national action plans laying out the configuration of the building stock, the energy efficiency goals to be reached and a coherent and realistic method for achieving these goals in a giving timeframe seems to be a more suitable approach to this particular directive in light of the items mentioned above.

## 5.2 Introducing a benchmarking mechanism

### *National energy performance requirement comparison*

It is notoriously hard to draw definite conclusions from comparing national energy performance (EP) practices. Such is the case even among member states in similar climate zones. In particular, there is substantial uncertainty with regards to the extent to which one or several building references and system configurations are representative of the average of all new and old building stocks. Indeed, a great number of minor and sometimes random variables may have a determining impact on calculation outcomes and overall conclusions. For instance, even if energy consumption is expressed in kWh/m<sup>2</sup>, national conventions on the definition of the reference floor area are a variable to account for. Other examples making it impossible to accurately, although not meaningfully compare various national practices include differences in variables included in calculations such as the energy use of electrical appliances, different calculation methodologies for occupancy, hot water use, internal heat gains, treatment of thermal bridging etc. Focusing on establishing comparable benchmarks should thus be a priority and a locus of attention of the current recasting of the EPBD. Although Member States are already following principles laid out in the applicable European standards (CEN specifically), a guiding benchmarking system established in this present recasting has the potential to improve progress in achieving energy efficiency at the corresponding cost-optimum levels.

Although it is not possible to obtain clear results in comparing various national benchmarking systems among one another, drawing comparisons among national energy performance in building practices can provide useful lessons, not least in the current context of the recasting of the EPBD. Indeed such cross national comparisons may bring to light differences in calculation methods and thus inform the European Commission on what applicable and transferable “best practices” may be of use in the context of establishing benchmarking mechanisms throughout the EU. Furthermore, setbacks and undesired effects in examining national practices can also inform future policy approaches in energy performance requirements in buildings at the supranational level. An assessment of the level of compliance in national legislation of energy performance requirements can inform the ongoing discussion with regards to tightening the requirements, together with considerations related to the economically optimal energy performance, the degree of compliance with the requirements, the maturity of the market, etc. Below is an overview of existing benchmarking systems in some of the best performing European Member States.

### 5.2.1 Suggestions for establishing an EU wide benchmarking system

Based on consultation with national experts, comparison among countries often demands a specific methodology for each case and cross national evaluation, with emphasis put on accounting for the most important differences among countries (methodologies, climate etc.). However, using a “common denominator” to adjust and adapt existing calculation methodologies can bring one closer to comparing, and ultimately evaluating varying national practices in the energy performance of buildings.



Comparing two or more countries among each other may rely on establishing or referring to Standard Assessment Procedure (SAP 2005), a calculation methodology that complies with the EPBD and is based on standardised assumptions about occupancy and heating patterns. Given that a number of EU countries are already relying on the SAP calculations, it is useful to think of a possible benchmarking mechanism that identifies EU wide common practices as founding pillar for building an adaptable and transferable benchmarking system for the whole of the EU-27.

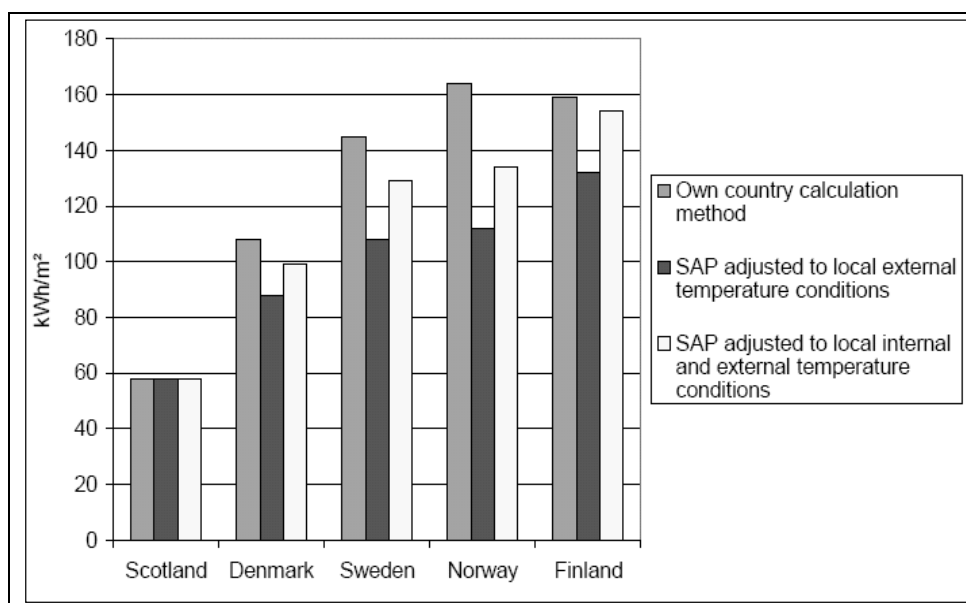
#### *Denmark*

Calculation standards in Denmark use a common EU denomination of calculated energy use, which is expressed in kWh/m<sup>2</sup>. The methodology accounts for the efficiency of the heating installations, heat losses from heat distribution systems, energy for water heating and overall energy for household electricity multiplied by a factor of 2.5. In order to compare Danish performances to other EU countries, relying on the SAP calculations and the items included in it (space heating, water heating, mechanical ventilation and in some cases, lighting) is an important step to lay the base for comparison. Such a process can be anchored in a standardized EU wide benchmarking mechanism. For instance, although “internal” Danish calculations (i.e. not aiming at an cross national comparison scheme) initially express energy/ m<sup>2</sup> on the basis of external dimensions for the floor area, they may be adjusted to internal dimensions in order to provide meaningful comparison with other countries which use an adjusted methodology.

Based on the above mentioned cross national harmonization tools, namely building on the SAP calculation, the SBSA 2007 report provides an adjusted benchmarking tool to compare several countries among each other based on their national calculations – provided adequate disclaimers on the ultimate accuracy of the results is taken into account (see Figure 5.1).

In order for a meaningful comparison to take place in countries located in different climate zones, the benchmarking developed in the SBSA report used a reference dwelling and the SAP methodology, as well as degree-day data (the difference between the mean internal and external temperature obtained on a daily basis and summer over the heating season). In other words, in an EU wide benchmarking system, *space heating requirements are adjusted and directly proportional to degree-days*. Figure 5.1 shows the process of “raw” national calculations that evolve into a benchmarking system to compare various national performances and methodologies.

Figure 5.1 Comparison of energy required (kWh/m<sup>2</sup>) for space heating of benchmark building using a) country calculation methods, b) SAP 2005 adjusted for external temperature and c) SAP 2005 adjusted for both external and internal temperature assumptions of each country



Adapted from SBSA 2007: International comparison of energy standards in building regulations: Denmark, Finland, Norway, Scotland and Sweden

It is important to bear in mind that although mitigating climate differences in calculation may be feasible, one should always proceed with caution by directly comparing energy performances of buildings among different countries, given the assumptions of national methods, even when SAP standards are applied. Indeed, although fixed values are set for building features in EU countries, such values may appear deceptively comparable. In an illustrative example, the BBR 2008 study notes that “the diameter of the pipes to the bath and shower in the semi-detached dwelling in this study [Flanders] is 18 mm, whereas in the NL such pipes are generally much smaller. So in the Dutch methodology the largest pipe diameter is the category “> 10 mm”, which implicitly calculates with a fixed value of 13 mm.”

Other obstacles in obtaining direct comparisons are factors such as energy use for electrical appliances and other energy using products (boilers and water heaters in particular), hot water use and other different inherent assumptions.

On the whole however, the closest methodology to be developed for an EU wide benchmarking mechanisms can build on the SBSA 2007 report, as well as the analysis and observations made in similar exercises in comparing cross national energy performance of buildings.

#### *Administrative Costs*

A side effect of national implementation measures of energy efficiency standards is a drive up in the administrative costs of fragmented policies and requirements. For instance, the costs of obtaining Energy Performance Certificates at the national level increases the burden of such a procedure, in terms of paperwork, time, and financial

costs. For instance, although the Netherlands already meets EPBD requirements on a number of points, issues still requiring compliance are being adapted and incorporated into Dutch law (Article 7 - Energy performance certificate), or measures are brought under the attention of the end-users via another route (Article 8 - Inspections of boilers and Article 9 - Inspections of air-conditioning systems). Like the European Union, the Dutch government has an active policy to keep the administrative costs for citizens minimised. For this reason, the costs for obtaining a certificate are kept to a minimum. There is little available data on the administrative costs of national measures on building energy efficiency. However it is clear that a more uniform and harmonized approach at the EU level has the potential to significantly decrease costs.

5.2.2 Building on existing policies and incentives

Beyond the calculation methodology to be devised for establishing a benchmarking system, taking into account the practical aspect of implementation to reach goals set out in a recasted EPBD are important to consider. Namely, integrating existing and best performing practices of certain member states as standards and guidelines into an EU-wide policy should be considered. A study for the EURIMA Blueprint Project mapped an exhaustive list of common and best performing practices in renovation and energy performance improvement thrusts throughout the EU.

Table 5.1 Implementing instruments for energy efficiency in buildings policies in the EU

Regulatory instruments	Regulatory benefits for above-standard energy performance Above-standard requirements for government buildings Mandatory environmental performance evaluation with minimum requirements Energy upgrading requirements when renovating buildings
Economic instruments	Preferential loan for significant (above-standard) energy performance improvements Tax credits for installing energy saving products
Communicative instruments	Building energy performance audits Demonstrating projects Voluntary energy conservation agreements
Organizational instruments	Independent energy audits with organisational support Professional management for multi-family housing Independent verification of sustainable real estate investments Energy service contracts

Source: Klinckenberg & Sunikka 2006

### 5.3 Setting up EU wide low or zero energy or carbon buildings/passive house requirements

In June 2008, the town Council of Marburg in Germany took the decision of obliging all new and old buildings undergoing renovations to have solar panels installed in view of turning the town into a zero energy town. A penalty of 1.000 Euros for non-compliance was also enacted. While this example is extreme, it comes to show how central the notion of passive house requirements has become, ranging from the supranational to the local level.

The revised Energy Performance of Buildings Directive (EPBD – 2002/91/EC) could provide auspicious ground for the European Commission to introduce requirements that set targets to make the use of low energy homes a widespread and sustainable practice in the European Union.

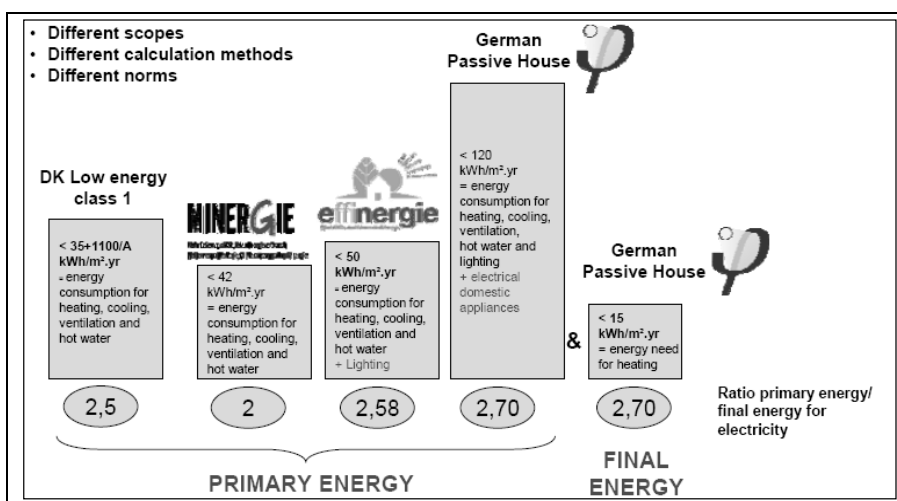
#### 5.3.1 Measures for passive housing requirements in a recasted EPBD

The most up to date mapping of the current situation of initiatives aiming at introducing larger scale passive housing was undertaken by the European Alliance of Companies for Energy Efficiency in Buildings (EuroACE) in the Spring of 2008. Although many European countries are taking steps towards implementing requirements for very low energy housing over a 5-12 year timeframe, few intend to strengthen the requirements for existing buildings, which is an important step towards achieving a major reduction in the overall energy used for buildings. In order to do this effectively, the recasting of the EPBD should request that Member States define very low energy housing at national level, draw up a national strategy towards this level of energy performance, and start to focus on upgrading the energy performance of the existing building stock. Such a policy option could in fact be a complimentary addition to a benchmarking mechanism, using similar Open Method type approaches combined with strict monitoring and evaluation practices.

##### *Defining very low energy buildings*

In order to establish a requirement for passive housing in the EU, a common definition may be desirable, although specify minimal requirements for passive building design such as for the thermal envelope could prove more practical. Indeed in the EU, although requirements are present in certain forms in a number of member states, definitions of what constitutes passive housing differ, sometimes significantly. Seven out of twenty seven EU countries have an official definition of passive housing: Austria, the Czech Republic, Denmark, Finland, France, Germany and the United Kingdom - England and Wales. Future planned official definitions are in the pipeline in Belgium, Luxembourg, Romania, Slovakia, Norway, Sweden, and Switzerland. EuroAce observed that countries in the EU in general have different definitions, scopes and importantly, calculation methods. Figure 1.2 provides an example of different calculation methods between Denmark, Switzerland, France and Germany.

Figure 4.2 Comparison of different performance standards



Source: Effnergie presentation, March 2007. Adapted from EUROACE SBI Survey, March 2008: European national strategies to move towards very low energy buildings

Determining the primary energy consumption of a given building is usually the goal of calculation methodologies. Yet, as mentioned above, several factors, even under this broad methodology, produce different results. Indeed, the definition and thus the calculation of primary energy consumption depends on the chosen boundary for calculations (i.e. at which point in the energy consumption cycle of building to make calculations). In most EU countries, primary energy calculations take place between the point of extraction of the energy source and the entry of energy into a given building. Therefore, conversion losses of energy vary depending on which point is chosen. The thermal envelope of a building also constitutes a boundary level for calculations.

The ongoing Assessment and Improvement of the EPBD Impact (ASIEPI) is currently elaborating a benchmarking method to compare and assess national energy performance requirements in Member States.

### 5.3.2 Job creation and associated costs for EU passive housing requirements

Under this option, costs associated with expanding passive housing in the EU are remarkably high. Job creation is tightly linked with inspection schemes in the EU, as well as skilled job development in remits such as heating and cooling systems. As such, figures available on inspection as well as heating and cooling are taken into account.

#### Costs

Investment costs for passive housing are substantial. A stated goal of rendering 210 million  $m^2$  of newly constructed commercial and residential buildings into passive housing every year in the EU, i.e the quasi totality of newly constructed commercial and residential buildings in the EU (as an indication, this is more than 1/4 of the entire residential building stock of France) would cost between €50 billion and €120 billion a year on top of regular construction costs for new buildings. The substantial costs involved in expanding passive housing, as well as the differing national definitions of passive

housing, tends to point to a flexible and less constraining application and requirements from the EU level.

#### *Jobs*

Given that the above goal of rendering 210 million m<sup>2</sup> of newly constructed residential and commercial buildings into passive housing is only indicative (it is not realizable even in the medium term), jobs creation associated with a thrust in passive housing promotion would encompass those jobs created in certification inspections, up to 80.000 by 2020 (given that such a scheme would be a pre-requisite for a well functioning passive housing policy). In addition, specialization in passive housing construction (architects, consultants, specialized construction firms and workers) has the potential to create up to 120.000 jobs, depending on the extent to which passive housing is widespread. These numbers take into account ECOFYS' methodology, whereby turnover from energy efficiency projects is divided by the average turnover per employee in the construction sector and multiplied by a specific factor. Here, a lower factor (0.5) is used given that energy efficiency costs for passive housing are higher. As such, job creation is not projected to be as high as for less costly (in terms of additional investments) policies (e.g. option A and B). It is important to note that these numbers are purely indicative as the realization of 210m<sup>2</sup> of passive housing a year is not currently feasible. Thus job creation, must be understood to be proportional to the extent to which passive housing expansion occurs.

Finally, the less constraining nature of passive housing requirements also give room for less stringent applications and ultimately, job creations.

We took average prices of newly constructed square meter based on ADEME figures (<http://www2.ademe.fr/servlet/KBaseShow?sort=-1&cid=96&m=3&catid=15019>), and calculated extra costs (7% -15%) associated with passive housing and the benchmarking goals of 210m<sup>2</sup> per year.

See, Option B1 in DG TREN IA

Extrapolations based on skilled jobs required for option B and C in the IA as well as on EURIMA studies.

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## Annex II

\$ per barrel	2005	2020	2030
EC, high price scenario	54,5	100,1	119

According price scenario in cent/kWh incl. taxes		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Gas	cent/kWh	9,8	9,9	10,1	10,2	10,4	10,5	10,7	10,9	11,0	11,2	11,4	11,5	11,7	11,9	12,1	12,2	12,4	12,6	12,8	13,0	13,2	13,4
Oil	cent/kWh	8,9	9,1	9,2	9,3	9,5	9,6	9,8	9,9	10,1	10,2	10,4	10,5	10,7	10,8	11,0	11,2	11,3	11,5	11,7	11,9	12,0	12,2
Electricity	cent/kWh	16,8	17,0	17,3	17,5	17,8	18,1	18,3	18,6	18,9	19,2	19,5	19,8	20,1	20,4	20,7	21,0	21,3	21,6	21,9	22,3	22,6	22,9
District heating	cent/kWh	10,3	10,5	10,6	10,8	10,9	11,1	11,3	11,4	11,6	11,8	12,0	12,1	12,3	12,5	12,7	12,9	13,1	13,3	13,5	13,7	13,9	14,1
Wood	cent/kWh	6,1	6,2	6,3	6,4	6,5	6,6	6,7	6,8	6,9	7,0	7,1	7,2	7,3	7,4	7,5	7,6	7,8	7,9	8,0	8,1	8,2	8,4

- i. Estimations made corresponding to current Danish action plans, for new buildings.
- ii. Due to boiler replacement combustion efficiency increased on average by 7 % in Italy (mainly gas boilers) and 5 % in Finland (mainly oil boilers); Fuel saving due to a more frequent regular maintenance (yearly instead of customary average) was calculated between 1.3 % and 2.5 % (Ireland); Statements by Marcello Antonucci, Krzysztof Klobut in presentation 'How to evaluate the impact of inspections and advice programmes for boilers' at 9th World Congress Clima2007, Helsinki, June 2007 ([http://www.rehva.com/projects/clima2007/WSs/WS7/WS7\\_pSUMMARY.pdf](http://www.rehva.com/projects/clima2007/WSs/WS7/WS7_pSUMMARY.pdf))
- iii. Directive 2006/32/EC of the European Parliament and of the Council of 6 July 2005 establishing a framework for the setting of ecodesign requirements for energy-using products and amending Council Directive 92/42/EEC and Directives 96/57/EC and 2000/55/EC of the European Parliament and of the Council, OJ L 191, 22/07/2005 p. 29 -58
- iv. Council Directive 92/75/EEC of 22 September 1992 on the indication by labelling and standard product information of the consumption of energy and other resources by household appliances, OJ L 297, 13/10/1992, p. 16–19
- v. The outcomes of relevant projects under the SAVE programme, such as AUDITAC and HARMONAC, can be of further support.
- vi. 'Summary of WS : How to evaluate the impact of inspections and advice programmes for boilers' at 9th World Congress Clima07, Helsinki, 2007, [www.rehva.com/projects/clima2007/WSs/WS7/WS7\\_pSUMMARY.pdf](http://www.rehva.com/projects/clima2007/WSs/WS7/WS7_pSUMMARY.pdf)
- vii. VHK EcoDesign of boilers and combi-boilers study, 2007 and DG TREN model based calculations built on the VHK study.
- viii. Daniela Bory, Jerome Adnot, Carmelo Greco, Dominique Marchio: Auditing the European room air-conditioning systems and potential energy savings, 2007
- ix. VHK EcoDesign of boilers and combi-boilers study, 2007, task 2 and extrapolated from EU-25 to EU-27 by BIO Intelligence Service S.A.S. (using calculation methodology according to Jerome Adnot)
- x. In 2017, based on extrapolation out of Roger Hitchin, Jerome Adnot, Maxime Dupont: 'Issues of the implementation of the EPBD article 9', 2005
- xi. VHK EcoDesign of boilers and combi-boilers study, 2007, task 6, p. 36 (data correspond to scenario for design option 3 for XL boilers).
- xii. Daniela Bory, Jerome Adnot, Carmelo Greco, Dominique Marchio: Auditing the European room air-conditioning systems and potential energy savings, 2007.
- xiii. Based on extrapolation out of data originating from 'Energy Efficiency and Certification of Central Air Conditioners' (EECCAC), 2003.
- xiv. As e.g. presented at the 2nd Sustainable Energy Week event 'Energy Performance of Buildings Directive - Next Steps' in January 2008 and as demonstrated in a Swedish case study of 2007 (see European Energy Network EnR: Implementation of the Energy Performance of Buildings Directive - a snapshot report, 2008),
- xv. Example presented at the 2nd Sustainable Energy Week event 'Energy Performance of Buildings Directive - Next Steps' in January 2008 and as demonstrated in a Swedish case study of 2007 (see European Energy Network EnR: Implementation of the Energy Performance of Buildings Directive - a snapshot report, 2008). In Sweden, energy monitoring must be undertaken for a period of two years after the building has been completed, to demonstrate compliance on the ground. The policy was introduced in mid-2006 and results will begin to emerge soon..Large property developers have expressed their support for the initiative.
- xvi. Provided by ECORYS
- xvii. For similar objectives, Denmark already revised its certification procedure in 2006, firstly introduced in 1997, to 'quality level' 5 and 6 respectively in its 2nd generation certification scheme:

- xviii. In a range from 1 to 6, 1 being lowest quality which only consists of "Meter reading reported by the building owner and the utility companies", whilst 5 and 6 mean "Computation by energy consultants based on building envelope inspection" and " Computation by energy consultants combined with meter reading".
- xix. The revision of the Danish provisions was based on several years of experience since 1997, which also underlined the importance of quality control within the certification scheme (subsequently also named as 'label'/labelling scheme'). The analysis of Jensen et al conclude that "Confidence in the energy label is the most important factor in achieving the main aim of the labelling scheme - energy savings. The user must at all times have confidence in the registrations made, the calculations, the label itself, and especially that the suggested energy saving measures are viable and will result in improved economy. Thus, it is essential to maintain a high level of quality in the energy labelling scheme. If quality is poor, the users will lose confidence in the labels. [...] Credibility may be lost very fast as a few poor labels can do a lot of damage. The quality control of the Danish energy labelling scheme takes place at all levels of the scheme.", taken out of: Ole Michael Jensen, Morten Tony Hansen, Kirsten Engelund Thomsen, Kim Wittchen: Development of a 2nd generation energy certificate scheme – Danish experience, 2007
- xx. Underlying that an accredited expert, specialised on issuing energy performance certificates for buildings, compiles one certificate per working day, so about 200 certificates a year. A random sampling check of 0.5 % of certificates would therefore mean that accredited experts face with one control per year on average.
- xxi. Provided by ECORYS/BioIntelligence
- xxii. Energy performance requirements: meaning regulations which limit the energy use of buildings under standardised conditions, expressed as a fixed limit of e.g. the annual final or primary energy use in kilowatt hours per square meter useful floor area of a building [kWh/m<sup>2</sup>.a]
- xxiii. Such as e.g. "useful floor area", a common value on which the energy performance of a building is based on: Energy consumption in kWh per m<sup>2</sup> useful floor area, varying up to +/-10 - 15 % across Member States, see e.g. information paper P65 "Comparing Energy Performance Requirements over Europe" at the Commission's Buildings Platform ([www.buildingsplatform.eu](http://www.buildingsplatform.eu)).
- xxiv. ASIEPI project - Assessment and Improvement of the EPBD Impact, project under the Intelligent Energy Europe Programme, 10/2007 to 3/2010
- xxv. Ambitious energy performance requirements for buildings (insulation and reduction of uncontrolled ventilation by improved air-tightness) sometimes have been blamed for a degradation of the indoor environment and increase in problems in connection with moisture and dampness in buildings. Several studies, such as the comprehensive Swedish survey about health, well being and energy efficient buildings (Energy efficient and healthy buildings, M. Gullberg, ÅF Process Sweden, E. Öfverholm, Swedish Energy Agency, M. Bengtsson and N. Tolstoy, National Board of Housing, Building and Planning, 2005) disproved this claim. Health aspects in buildings are rather a question of proper construction work and pattern of use, independent of the level of energy performance requirements on the construction, notably that adding envelope insulation and improving air-tightness need to be made together with correct ventilation and air-conditioning systems.
- xxvi. In this regard, e.g. an overall limitation of the building's primary energy demand calculated according to the aforementioned holistic methodology by a building regulation leaves full room for best technical solutions how to comply with these requirements, so which combination of e.g. insulation levels, boiler efficiency level and use of renewable energy sources ensures to keep the overall primary energy limit of a building. A counter-example would be to define exactly in the building regulation what type/level of insulation has to be used for the building envelope or which type of boiler is allowed to be installed etc in order to limit the energy consumption of the building.



**COUNCIL OF  
THE EUROPEAN UNION**

**Brussels, 20 January 2009**

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**Interinstitutional File:  
2008/0223 (COD)**

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**15929/08  
ADD 7**

**ENER 398  
ENV 850  
CODEC 1592**

**COVER NOTE**

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from: Secretary-General of the European Commission,  
signed by Mr Jordi AYET PUIGARNAU, Director

date of receipt: 17 November 2008

to: Mr Javier SOLANA, Secretary-General/High Representative

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Subject: Annex 5 to Communication Staff Working Document

- Accompanying document to the Proposal for a recast of the energy performance of buildings Directive (2002/91/EC)
- = Impact assessment

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Delegations will find attached Commission document SEC(2008) 2864 Annex 5 Volume 5.

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Encl.: SEC(2008) 2864 Annex 5 Volume 5



COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 13.11.2008  
SEC(2008) 2864  
VOLUME 5

## **Annex 5 to**

**COMMUNICATION STAFF WORKING DOCUMENT**

*Accompanying document to the*

**PROPOSAL FOR A RECAST OF THE  
ENERGY PERFORMANCE OF BUILDINGS DIRECTIVE (2002/91/EC)**

**IMPACT ASSESSMENT**

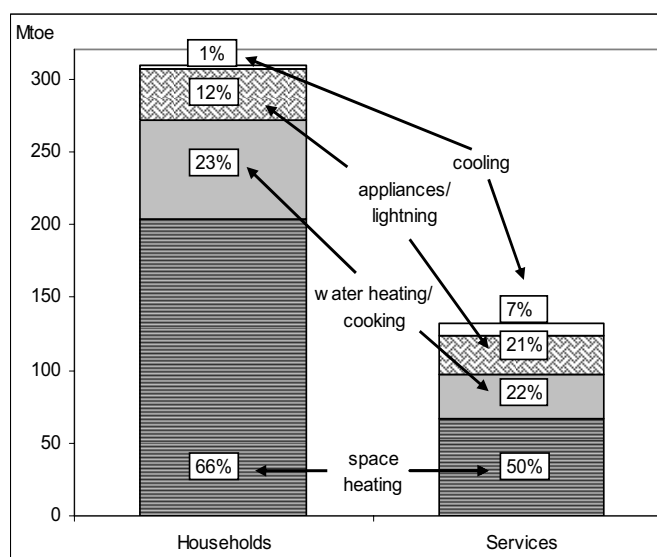
{COM(2008) 780 final}  
{SEC(2008) 2865}

## ANNEX V

**EU buildings sector**

The importance of the buildings sector in EU wealth in terms of capital, but also social, cultural and historic value and business opportunities, is enormous. The EU's 480 million citizens live in approximately 209 million households, with a total conditioned floor area of about 15 000 km<sup>2</sup> and work in offices with conditioned floor area of about 6 000 km<sup>2</sup> (or altogether a bit more than the surface area of Slovenia)<sup>1</sup>. Buildings constructed today will be there for the next 50 to 100 years. For example, 92% of the building stock from 2005 will still be there in 2020 and 75% in 2050. This is due to the very low demolition rates (about 0.5% p.a.) and new build construction rates (about 1.0% p.a.).

Energy use in the building sector (residential and commercial) is responsible for **the lion's share – 40% – of EU total final energy consumption and of EU total CO<sub>2</sub> emissions – 36%, from which there is significant potential for energy savings.** The main energy use is for space and water heating and cooking. The energy consumption in these two sectors has increased over the period from 1990-2005 by about 1.0% per year<sup>2</sup>. The PRIMES<sup>3</sup> baseline scenario shows further growth in energy demand. As mentioned above, there is significant potential for energy savings.



**Figure 1.** Final energy use in the buildings sector, Source: PRIMES, data for 2005

The measures in the buildings sector have the **lowest abatement cost for greenhouse gas reduction which in many cases are at low, and even negative levels, due to the energy use cost reductions**, as shown in Figure 2<sup>4</sup>. According to the last IPCC report<sup>5</sup>, about 30% of the

<sup>1</sup> Ecofys study for DG TREN, 2008 (data for 2005, the data for the offices does not include those in industry and agricultural sectors)

<sup>2</sup> Data from European Energy and Transport: Trends to 2030 – Update 2007

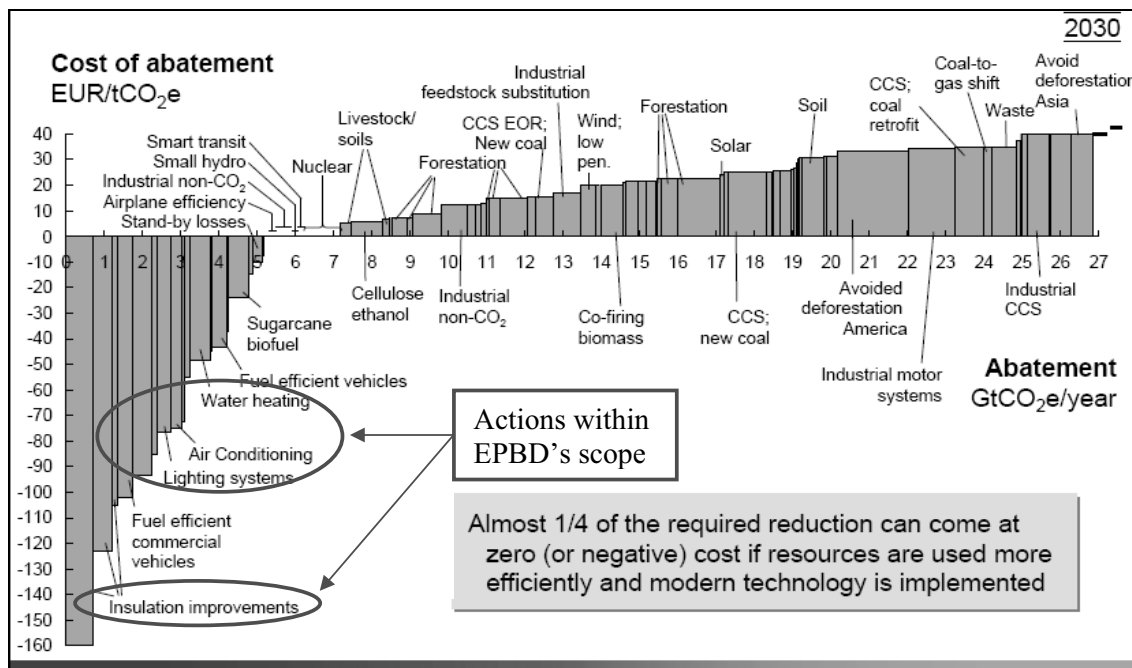
<sup>3</sup> PRIMES is an energy system model, started in 1993 and funded by the European Commission

<sup>4</sup> McKinsey. Kosten und Potenziale der Vermeidung von Treibhausgasemissionen in Deutschland: Eine Studie von McKinsey & Company, Inc., erstellt im Auftrag von „BDI initiativ – Wirtschaft für Klimaschutz“ 2007



projected greenhouse gas emissions worldwide in the buildings sector can be with net economic benefit by 2030. A study on costs and potentials for CO<sub>2</sub> abatements in Germany<sup>6</sup> concludes that annually 63Mt CO<sub>2</sub> savings can be achieved at costs below 20 EUR/t CO<sub>2</sub> (or at a prices lower than the spotmarket, e.g. 27 EUR/t on July 15, 2008). At the level of EU-27 this could mean 500Mt CO<sub>2</sub> emission reduction by 2020.

**Figure 2.** Abatement costs of various greenhouse gas emission reduction measures



Source: McKinsey for Vattenfall 2007, based on 2005 energy prices

Buildings provide shelter and protection. In addition, studies show a clear and strong link between negative health impacts and a country's thermal efficiency housing requirements<sup>7</sup>. On the other hand, improved thermal comfort and energy characteristics of buildings are beneficial for health as well as for labour productivity.

Activities related to buildings represent a **large share of the EU economy**. The construction, real estate, and manufacturing of construction products sectors represent about 9% of EU GDP and about 7-8% (or approximately 15 million people) of EU total employment with an annual turnover of about EUR 2 trillion<sup>8</sup>. Furthermore, the majority of firms engaged in construction activities and the real estate sector are SMEs, with for example, more than 88% of employment provided in construction sector being in SMEs, and 67% for the real estate sector, correspondingly. This signifies the important contribution the sector has to the EU's growth and job creation at local and regional level.

It is very likely that increased activities in the energy efficiency of buildings may create **additional social benefits**. Decreases in expenditure on energy bills will free revenues to be

<sup>5</sup> IPCC report, Contribution of Working Group III to the Fourth Assessment Report, 2007

<sup>6</sup> Costs and Potentials for the Abatement of Greenhouse Gases in Germany (Kosten und Potenziale der Vermeidung von Treibhausgasemissionen in Deutschland), study of McKinsey & Company, Inc. for German Industry Association 'BDI initiativ – Wirtschaft für Klimaschutz', 2007

<sup>7</sup> Healy, Excess winter mortality in Europe: a cross country analysis identifying key risk factors, Journal of Epidemiology and Community Health 2003;57:784-789

<sup>8</sup> For construction and real estate sector: data are from Eurostat and for 2005. For manufacturing of construction products: data from the Impact Assessment, 2007 for the revision of the Construction Products Directive

spent on other activities and goods. It is also common that low income people live in dwellings with bad energy performance characteristics, which also means higher energy bills and a poor comfort levels. Better energy efficiency can therefore bring considerable benefits especially to these people.



