



**Forschungsstelle für Umweltpolitik
Environmental Policy Research Centre**



Deutscher Bundestag

Enquete-Kommission

Wachstum, Wohlstand, Lebensqualität

Kommissionsdrucksache

17(26)30

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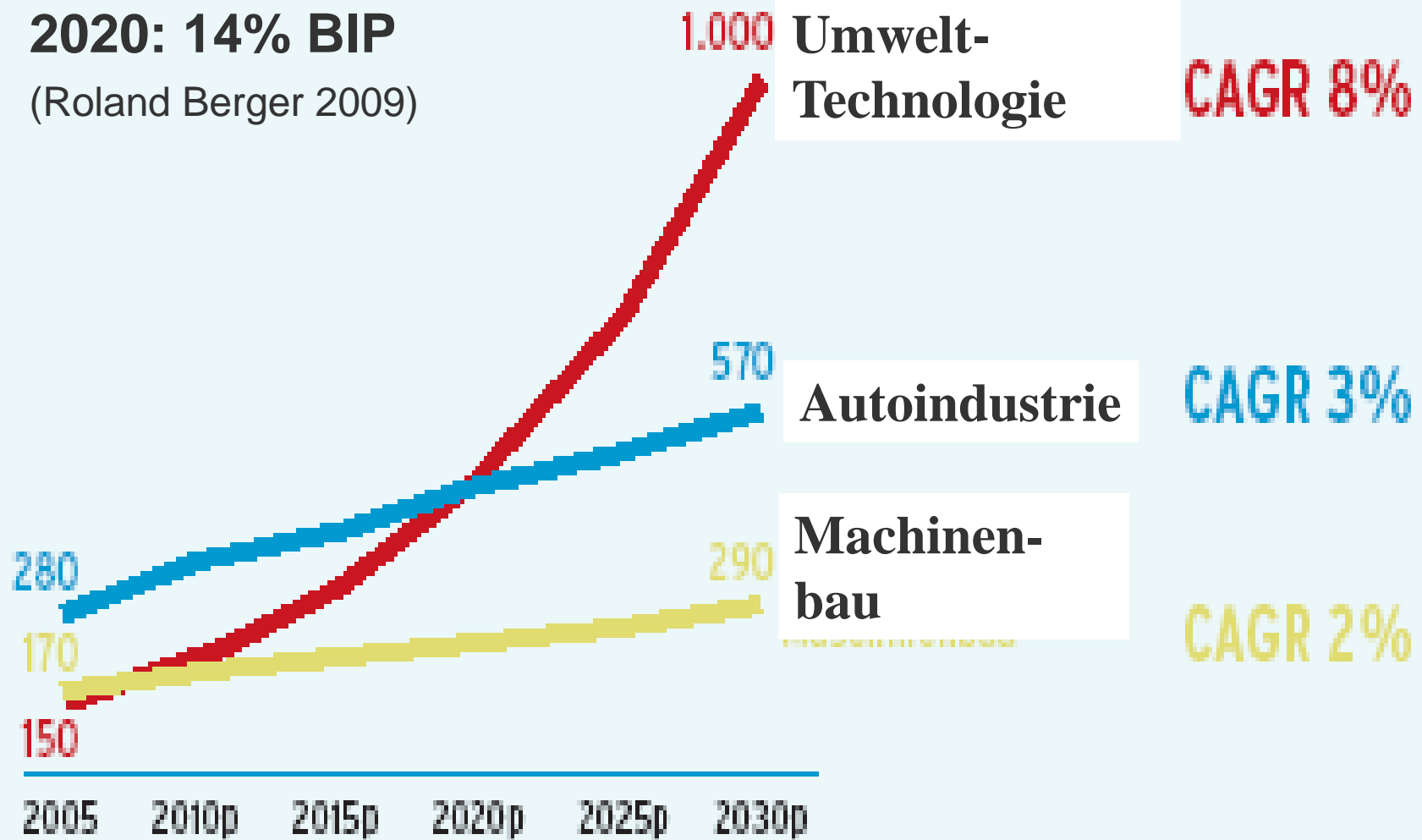


„Green Growth“ in der aktuellen Wachstumsdiskussion

Vortrag Berlin 4. 4. 2011

Wachstum der deutschen Umwelt- industrie (Umsatz) (Source: Roland Berger 2006)

2007: 8% BIP
2020: 14% BIP
(Roland Berger 2009)



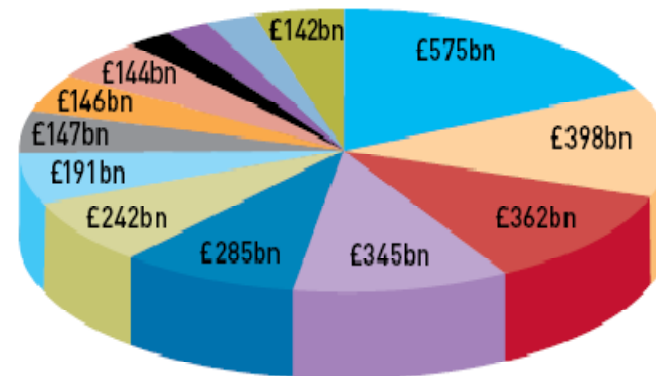
Struktur und Wachstum der deutschen „GreenTech“ Industrie (BMU 2009)

	Weltmarkt- anteil der GreenTech	Jährl. Umsatz- wachstum 2005-2007	Erwartetes Jährl. Umsatz- wachstum 2008-10
Umweltfreundliche Energieversorgung	30 %	29 %	35 %
Energieeffizienz	12 %	20 %	22 %
Materialeffizienz	6 %	21 %	24 %
Recycling	24 %	18 %	16 %
Nachhaltige Wasserversorgung	10 %	15 %	14 %
Nachhaltige Mobilität	18 %	15 %	17 %

Der globale Markt für Klima- und umweltfreundliche Güter + Dienstleistungen (Innovas 2010)

Figure four - Global low-carbon and environmental goods and services by sub-sector 2008/09, £bn¹⁸

- Alternative Fuels
- Building Technologies
- Wind
- Alternative Fuel Vehicle
- Geothermal
- Water Supply and Waste Water Treatment
- Recovery and Recycling
- Photovoltaic
- Waste Management
- Biomass
- Energy Management
- Carbon Finance
- Additional Energy Sources
- Other



Source: Innovas Low Carbon and Environmental Goods & Services: an industry analysis 2009

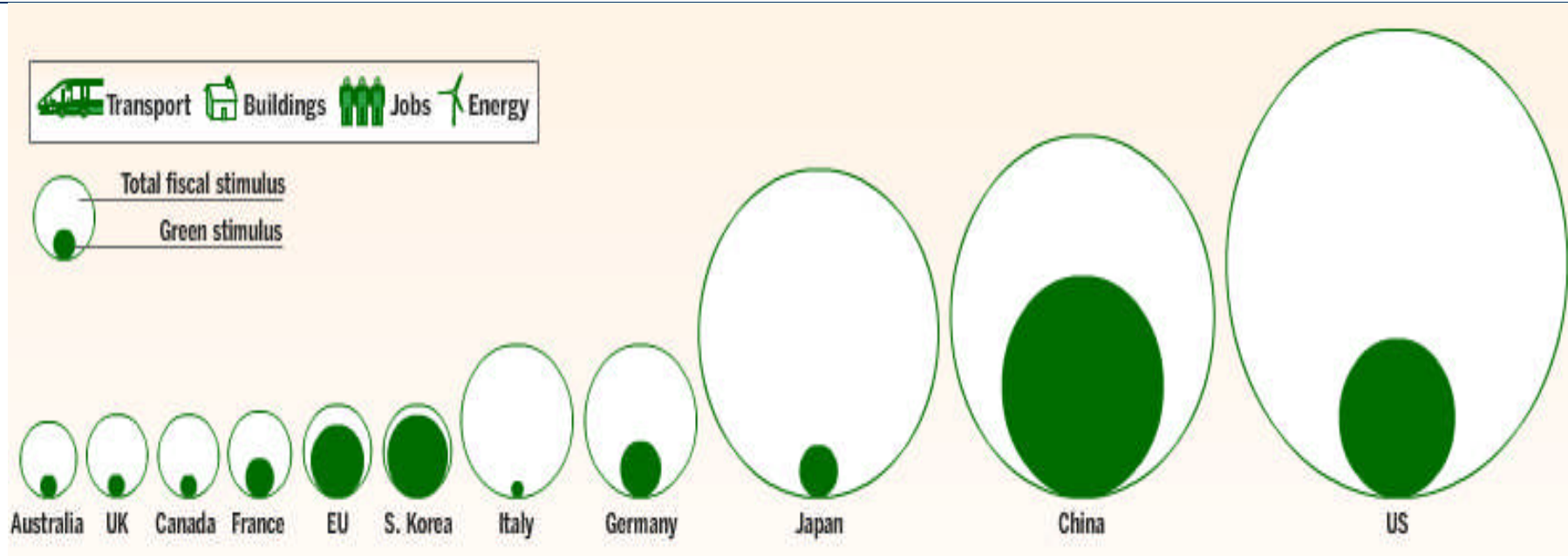
Gesamtvolumen 2008/9: 5,1 Bn.\$ (Innovas 2010)

¹⁶ Innovas (2010) Low Carbon and Environmental Goods & Services: an industry analysis . Update for 2008/2009.

¹⁷ The UK Low Carbon Industrial Strategy. July 2009 is available at <http://www.bis.gov.uk/files/file52002.pdf>

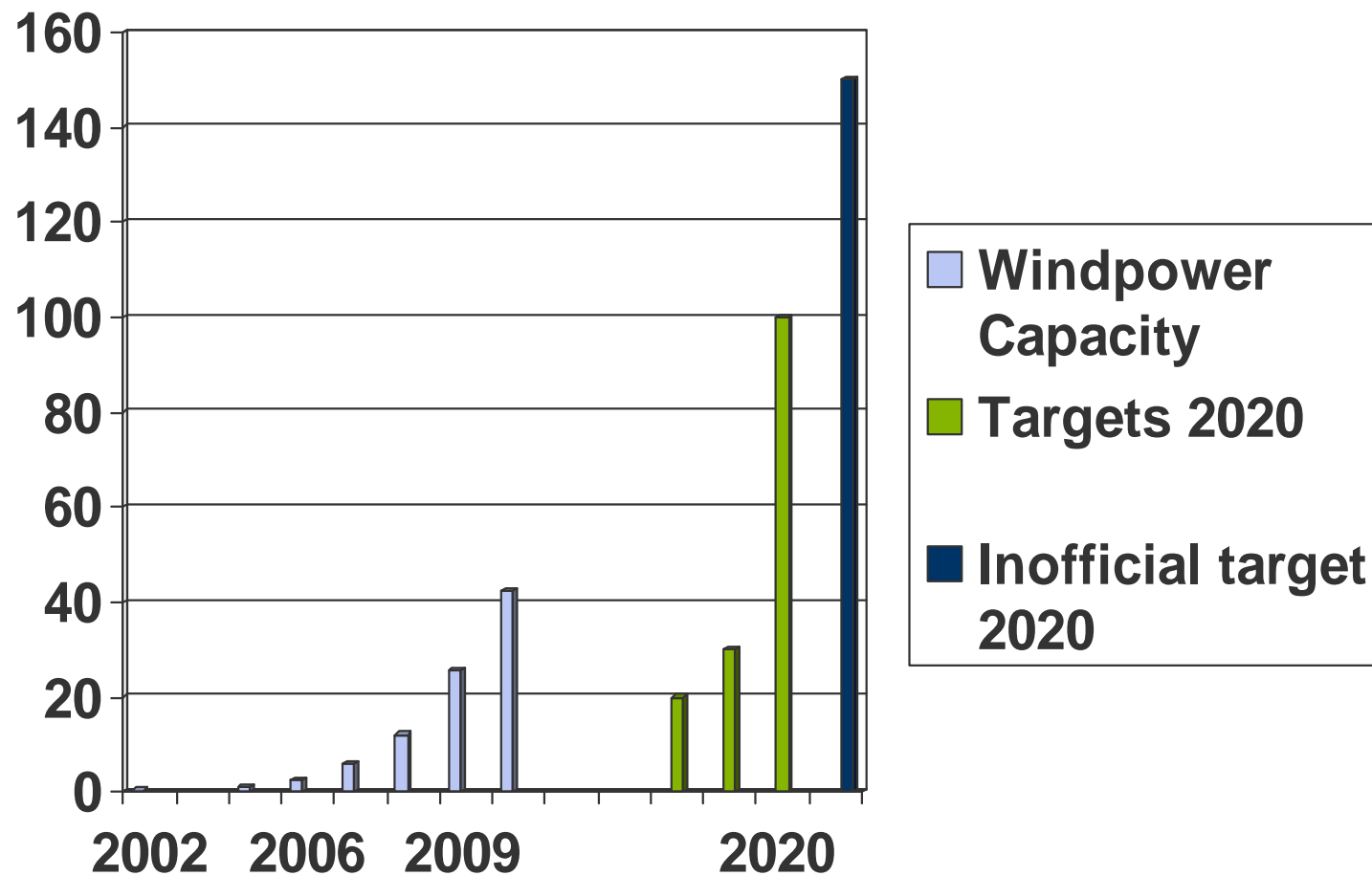
Erstmals: Global koordinierte Investitionsprogramme mit grüner Komponente (2009)

(St. Bernard et al. 2009, FT 6.3.09)

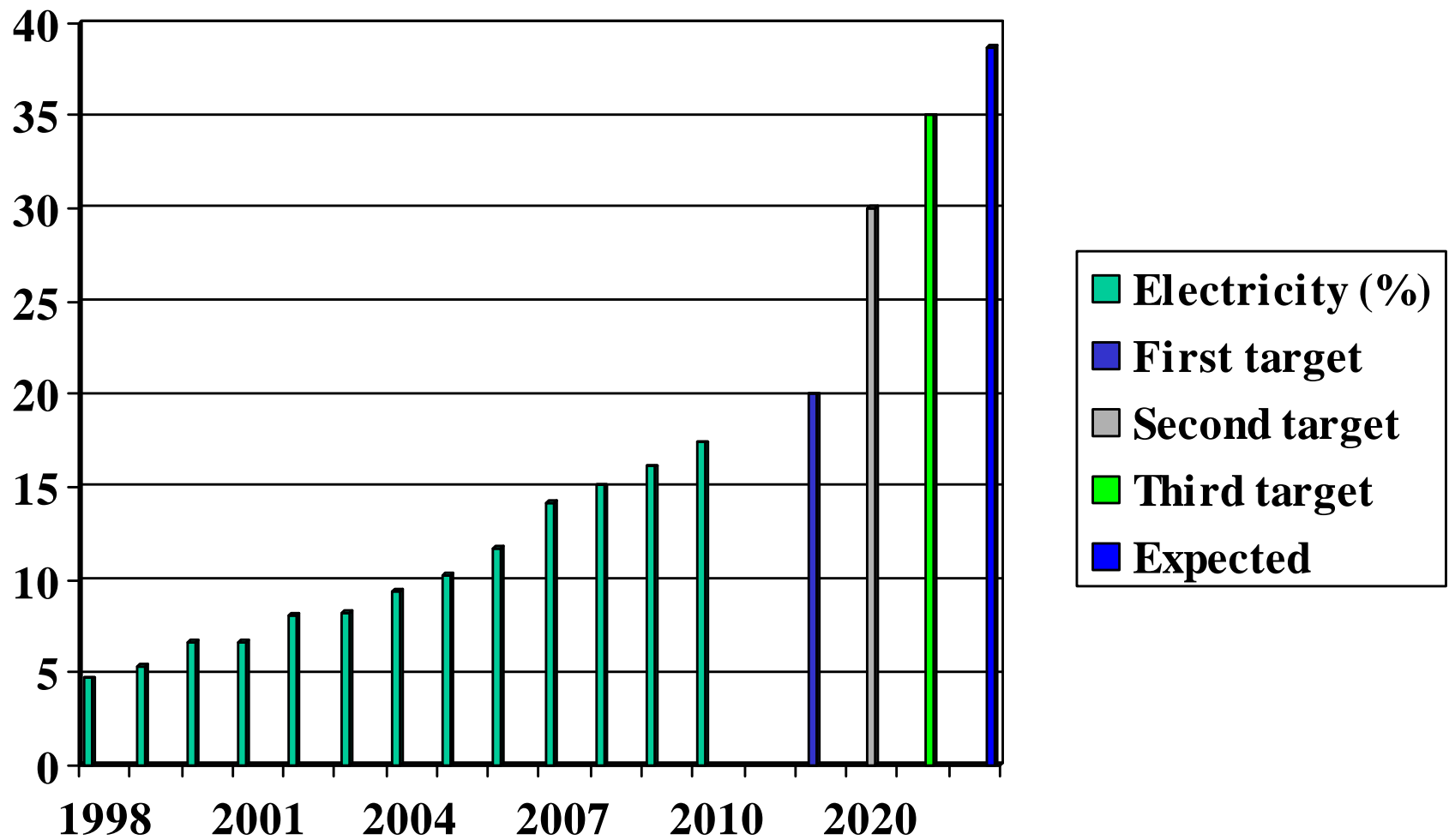


The "green stimulus" provided by the G20 so far amounts to US\$446bn, or about 16 per cent of their total economic recovery packages (ENDS 3/4/09)

Windenergie-Kapacity in China: Trend 2002-2010 und Ziele für 2020 (GW)



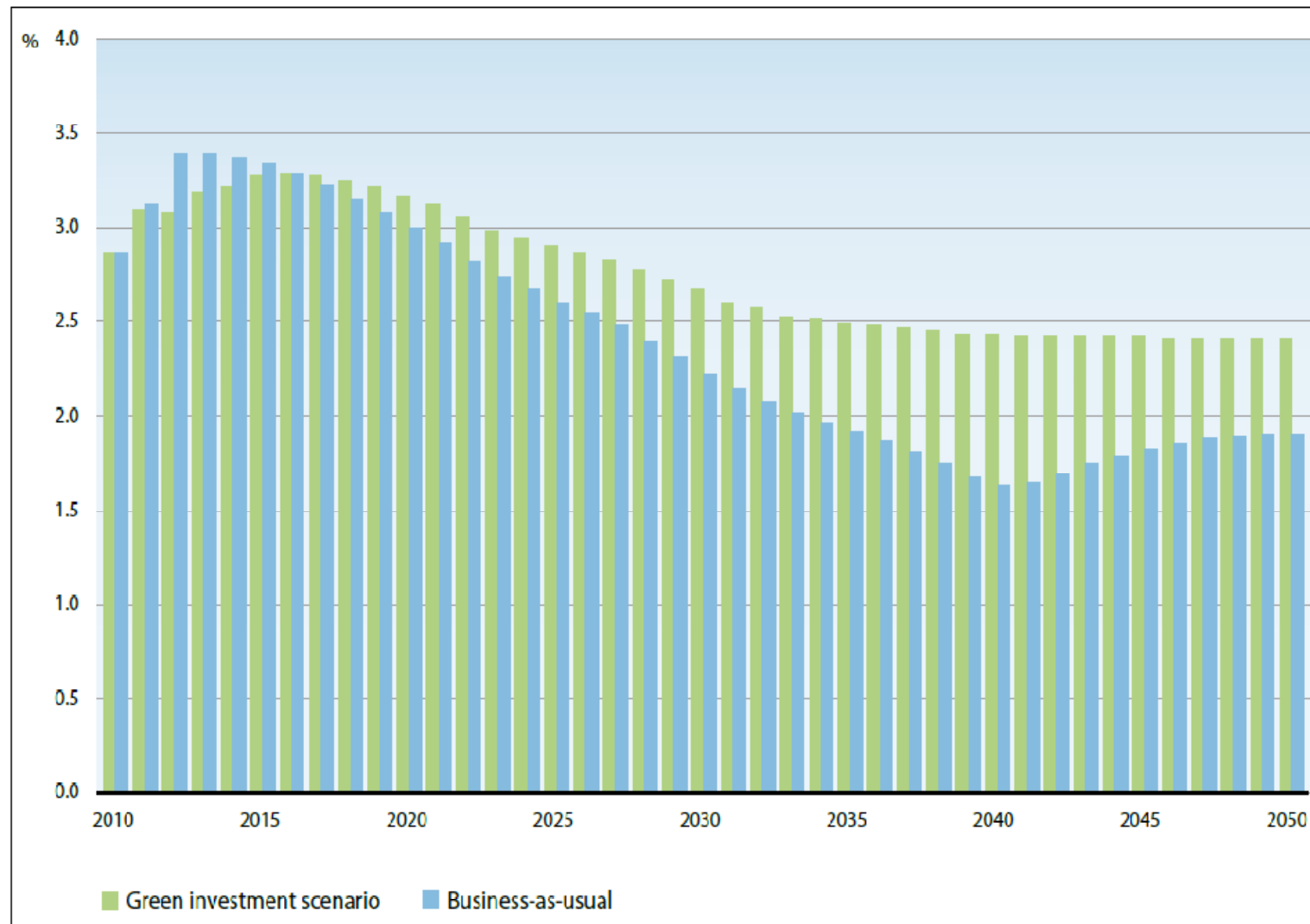
Anteil erneuerbarer Energien in Deutschland 1998-2010, Ziele 2020 und Prognosen (Source: BMU 2010)



Saved CO₂-Emissions 2009: 112,5 mt.

UNEP: Green Economy (2011)

Figure 9. Projected trends in annual GDP growth rate.



UNEP: Green Economy (2011): Beschäftigung im Energiesektor 1990-2050 in einem "2% Green Investment Szenario"

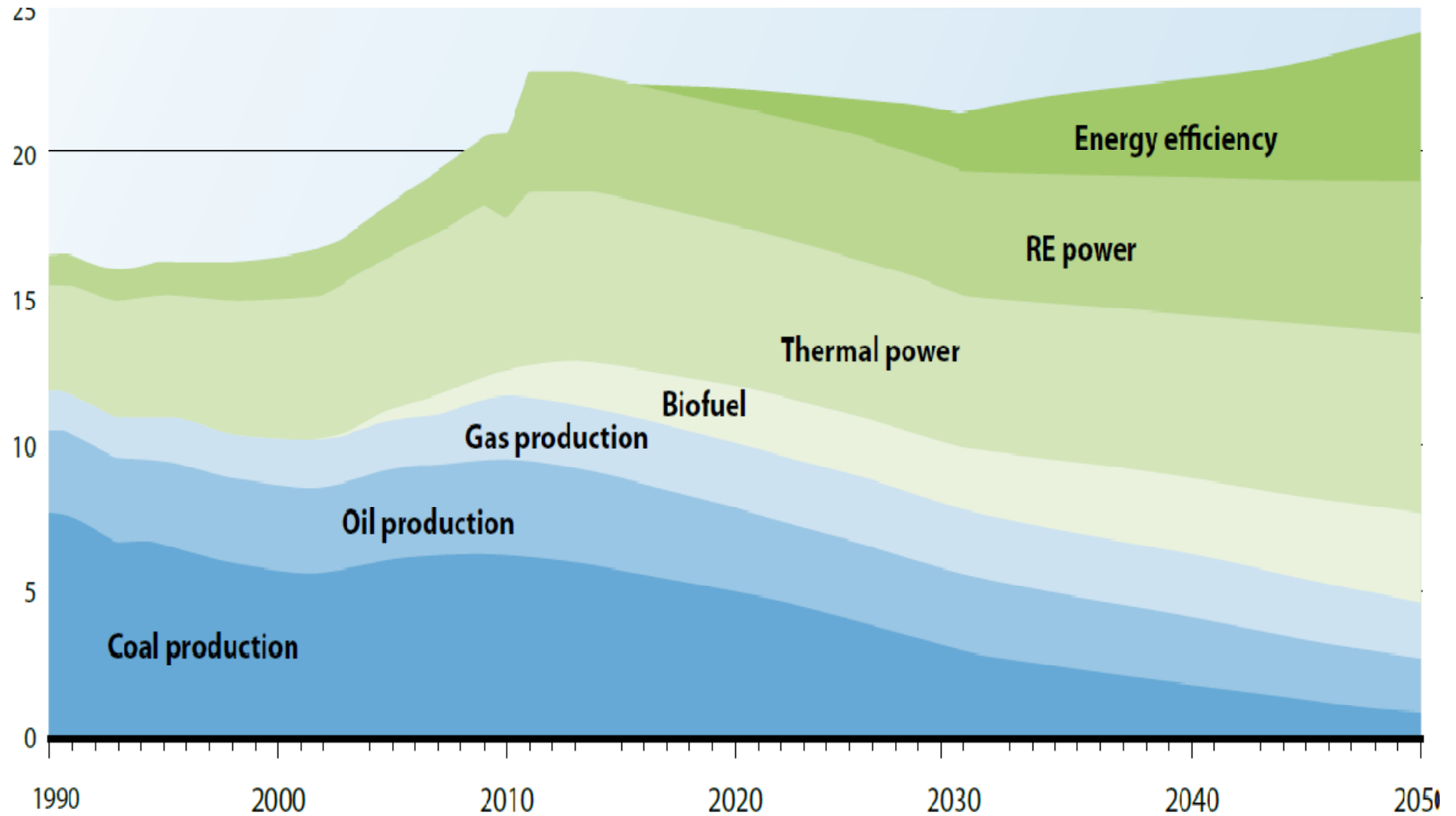
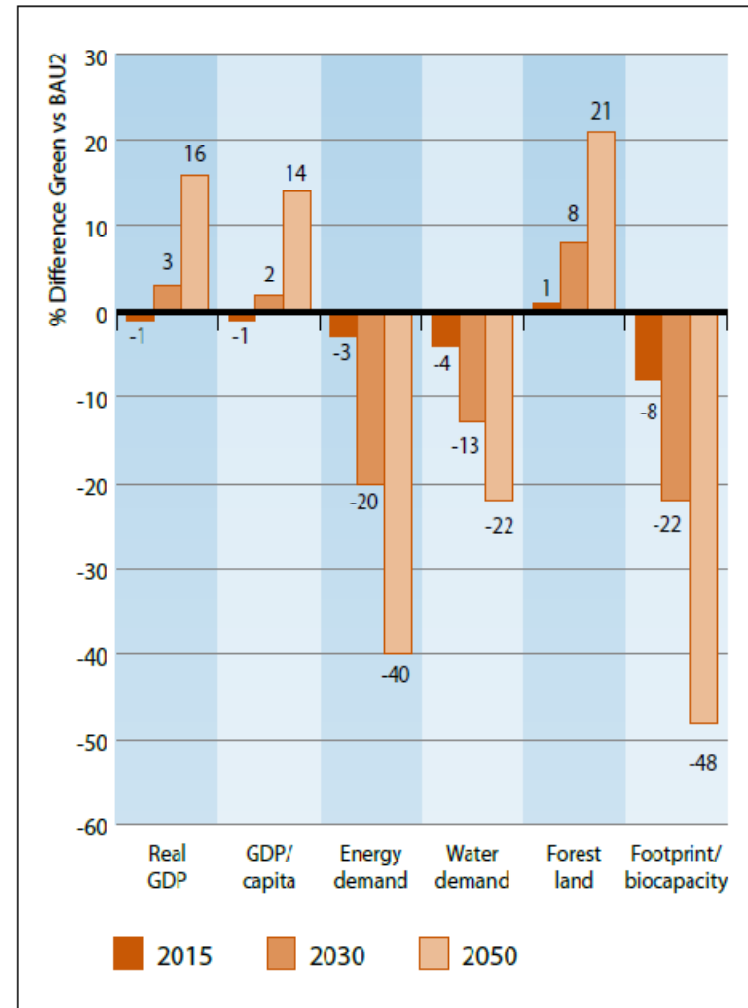


Figure 10. Impacts of the green investment scenario relative to business as usual for selected variables (per cent + / -).



EU-Wachstumsstudie “A New Growth Path for Europe” (PIK et al. 2011)

- Annahme f. d. EU-Klimaziel 2020: 30 statt 20%
- Steigerung der Investitionsrate von 18 auf 22%
- Wachstumsdifferenz 0,6%
- Beschäftigungseffekt 6 Mio.

Wachstumstreiber von “Green Growth”

- **Staatlich induzierte Investitionen**, staatlich gefördertes Marktwachstum, Umrüstung des Produktionsapparates (UNEP 2011, Jaeger et al. 2011).
- **Hohe Refinanzierung durch Effizienzgewinne** / Höhere Ressourcenproduktivität / Vermiedene Schadenskosten Negativen Differenzkosten bei klimafreundlichen Technologien
- **Innovationen / Innovationswettbewerb / Wissensintensität:** Nirgendwo sonst wird die Bedeutung von Innovationen so betont wie im Bereich Umwelt- und Klimaschutz
- **Erfolge auf “grünen Zukunftsmärkten”**

Ein neues Verständnis von “Green Growth”

- “Green Growth” nicht mehr das Wachstum des Umweltsektors.
- Nunmehr geht es um **Wachstumseffekte einer umfassenden Umrüstung des Produktionssektors.**
- Green Economy: Ein neues Verständnis von nachhaltigem Wirtschaften; nun auch mit einem sozialen Nachhaltigkeitskriterium

Beispiel EU 2020: “*Smart growth*: developing an economy based on knowledge and innovation; *Sustainable growth*: promoting a more resource efficient, greener and more competitive economy; *Inclusive growth*: fostering a high-employment economy delivering social and territorial cohesion”.

Vielen Dank!

Annex III: Impacts of Allocating an Additional 2% of GDP towards Greening the Global Economy Relative to 2% in Business as usual

	2011	2015		2020		2030		2050	
		BAU2	Green (%)	BAU2	Green (%)	BAU2	Green (%)	BAU2	Green (%)
GDP (US\$, real)	69,344	79,306	-0.8	92,583	-0.4	119,307	2.7	172,049	15.7
GDP per capita	9,992	10,959	-0.8	12,205	-0.4	14,577	2.4	19,476	13.9
Total employment (millions)	3,187	3,419	0.6	3,722	-0.6	4,204	-1.5	4,836	0.6
Calories per capita	2,787	2,857	0.3	2,946	0.3	3,050	1.4	3,273	3.4
Forest land (Bn ha)	3.94	3.92	1.4	3.89	3.2	3.83	7.9	3.71	21.0
Water demand (km ³ /Yr)	4,864	5,275	-3.7	5,792	-7.2	6,784	-13.2	8,434	-21.6
Total landfill (Bn tons)	7.88	8.40	-4.9	9.02	-15.1	10.23	-38.3	12.29	-87.2
Footprint/bioproductivity ratio	1.51	1.60	-7.5	1.68	-12.5	1.84	-21.5	2.23	-47.9
Primary energy demand (Mtoe/Yr)	12,549	13,674	-3.1	15,086	-9.1	17,755	-19.6	21,687	-39.8
Renewable energy share of primary demand (%)	13	13	15	13	17	12	19	12	27

Notes: All dollar figures are in constant 2010 US dollars. "Green" column represents the percent difference (+/-) of the green investment scenario relative to business as usual projections, in which an additional 2% of global GDP is allocated to extend existing investment trends, except for rows where the units are in percentage terms. In this case the "green" column refers to the percentage value under the green investment scenario. For a full explanation of the business as usual and green investment scenarios, see the GER modelling chapter.

UNEP: Green Economy (2011)

Figure 11. Energy-related CO₂ emissions – breakdown of reductions achieved in a 2% green investment scenario relative to baseline business as usual projections.

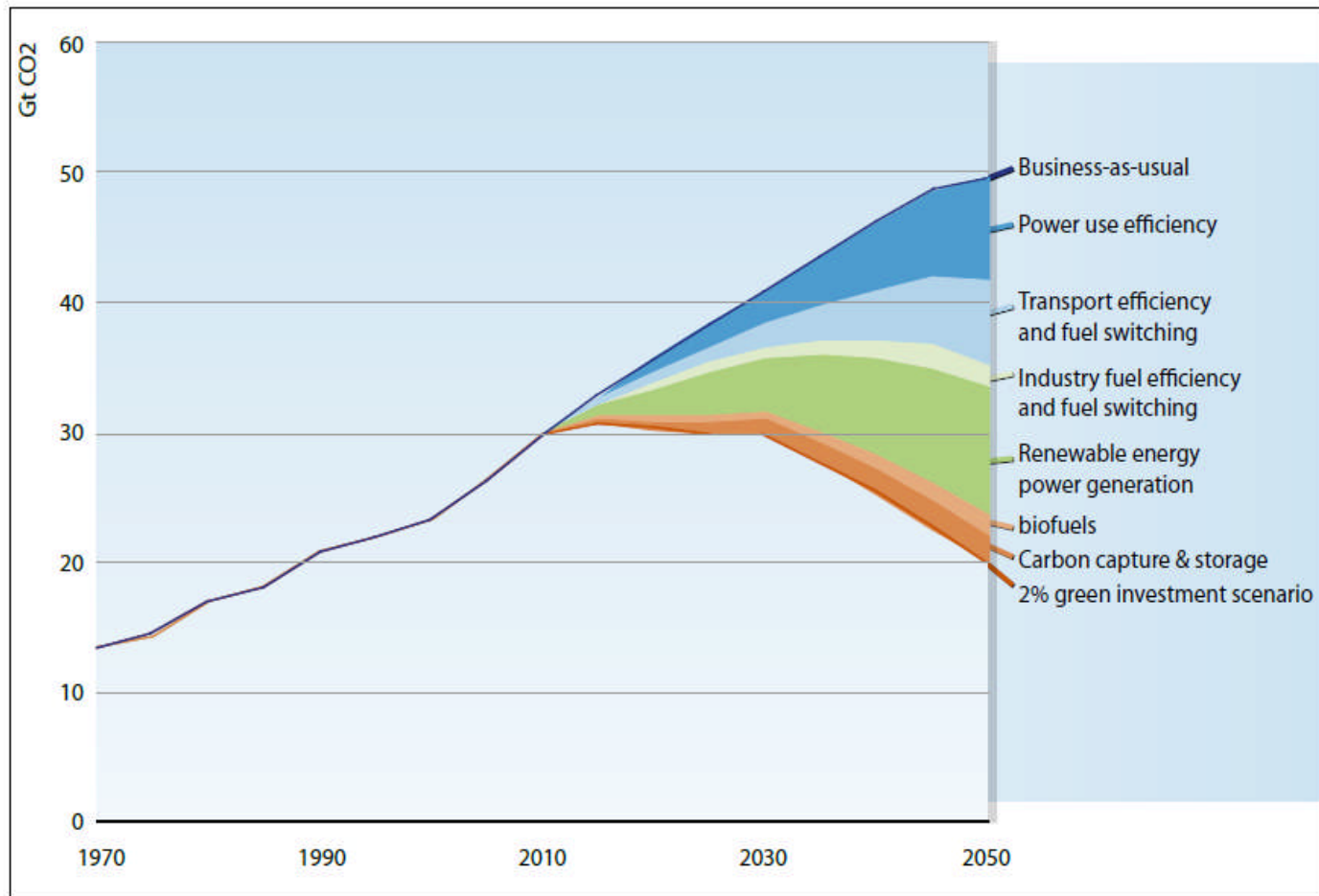


Figure 1. Projection of the global demand for water and, under a business as usual scenario, the amount that can be expected to be met from supply augmentation and improvements in technical water use efficiency (productivity).

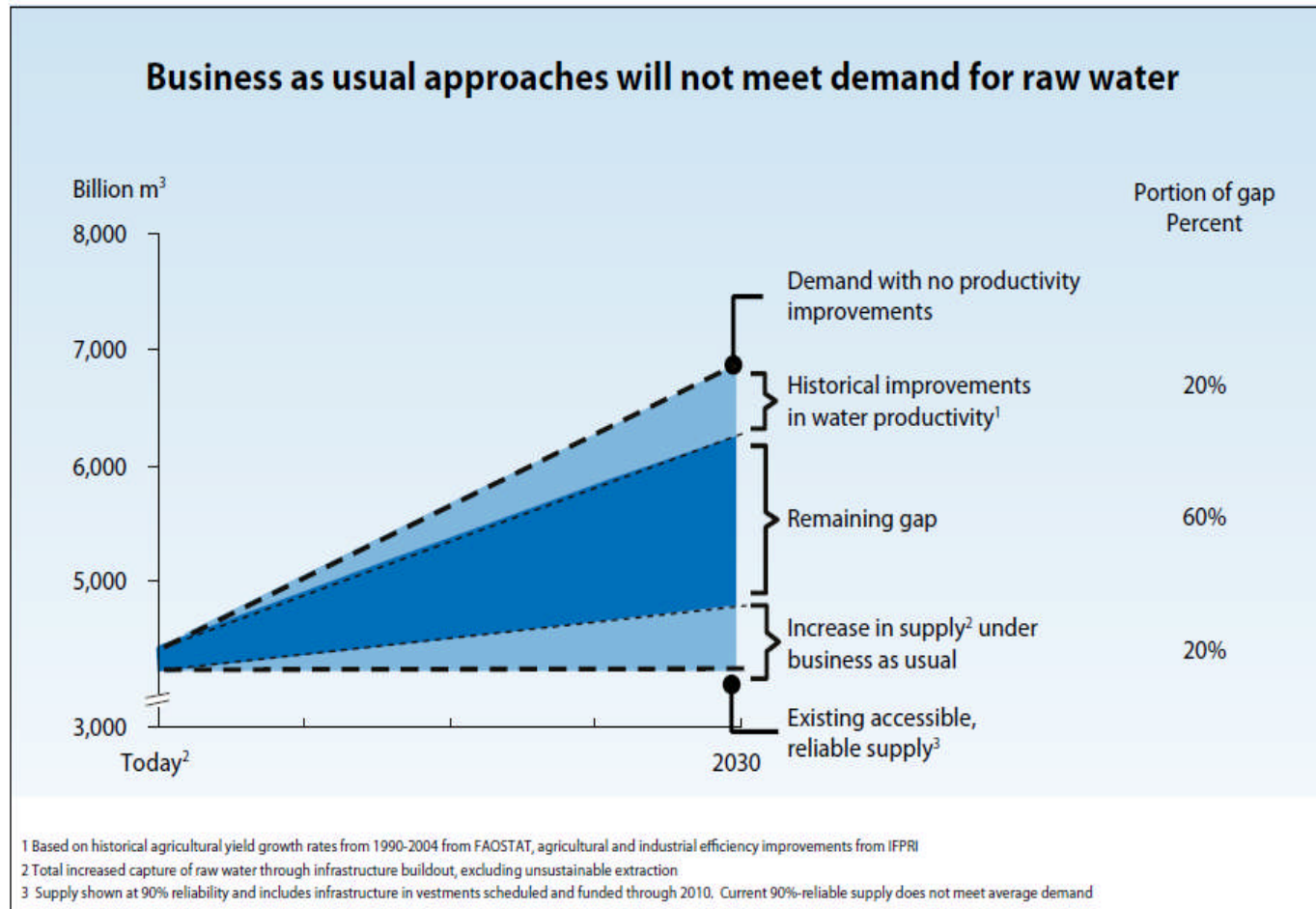


Table 1. Natural Capital: Underlying Components and Illustrative Services and Values

Biodiversity	Ecosystem goods and services (examples)	Economic values (examples)
Ecosystems (variety & extent/area)	<ul style="list-style-type: none"> • Recreation • Water regulation • Carbon storage 	Avoiding GHG emissions by conserving forests: US\$ 3.7 trillion (NPV) ²³
Species (diversity & abundance)	<ul style="list-style-type: none"> • Food, fibre, fuel • Design inspiration • Pollination 	Contribution of insect pollinators to agricultural output: ~US\$ 190 billion/year ²⁴
Genes (variability & population)	<ul style="list-style-type: none"> • Medicinal discovery • Disease resistance • Adaptive capacity 	25-50% of the US\$ 640 billion pharmaceutical market is derived from genetic resources ²⁵

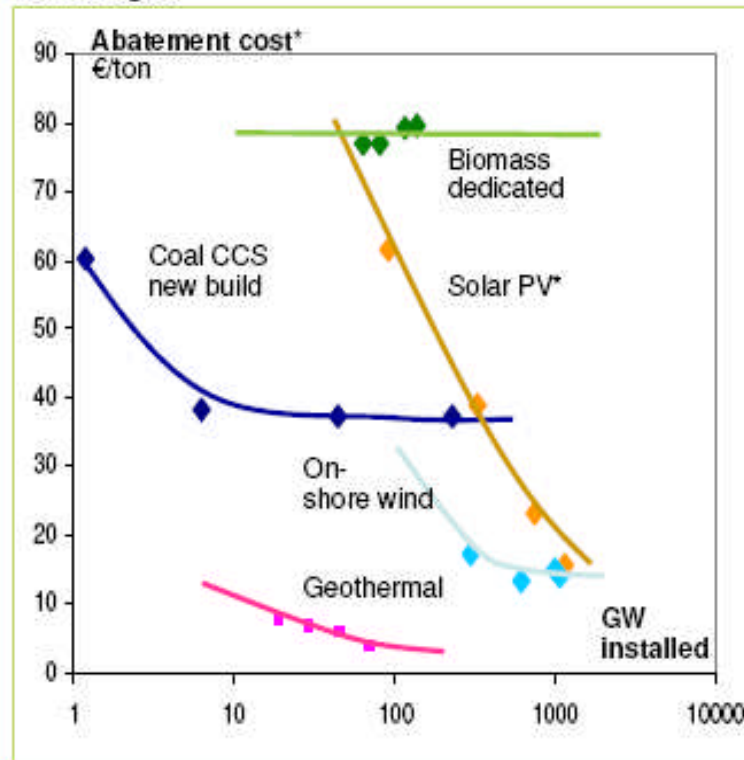
Table 2. Trends in Forest Cover and Deforestation

Forest Cover	1990	2010
World forest area (hectares)	4.17 billion	4.03 billion
World planted forest area (hectares)	178 million	264 million
Deforestation	1990-2000	2000-2010
Annual net forest loss (hectares/year)	8.3 million	5.2 million
Annual deforestation (hectares/year)	16 million	13 million
Annual increase in planted forest (hectares/year)	3.36 million*	5 million

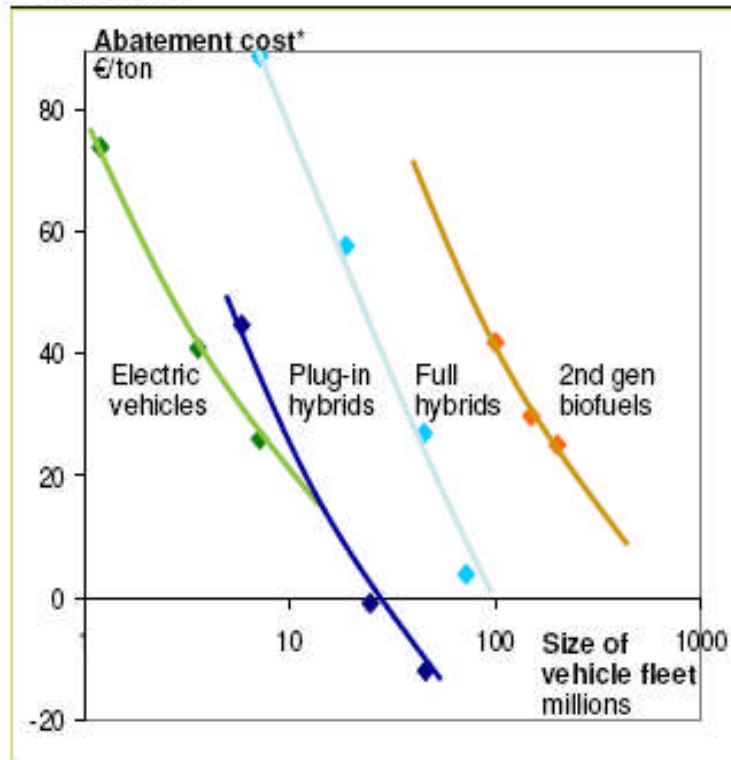
Source: *Global Forest Resource Assessment 2010*, FAO; *Carle and Holmgren, 2008.

Mit dem Wachstum „grüner“ Märkte sinken die Kosten (project catalyst 2009)

Learning curves of selected clean power technologies



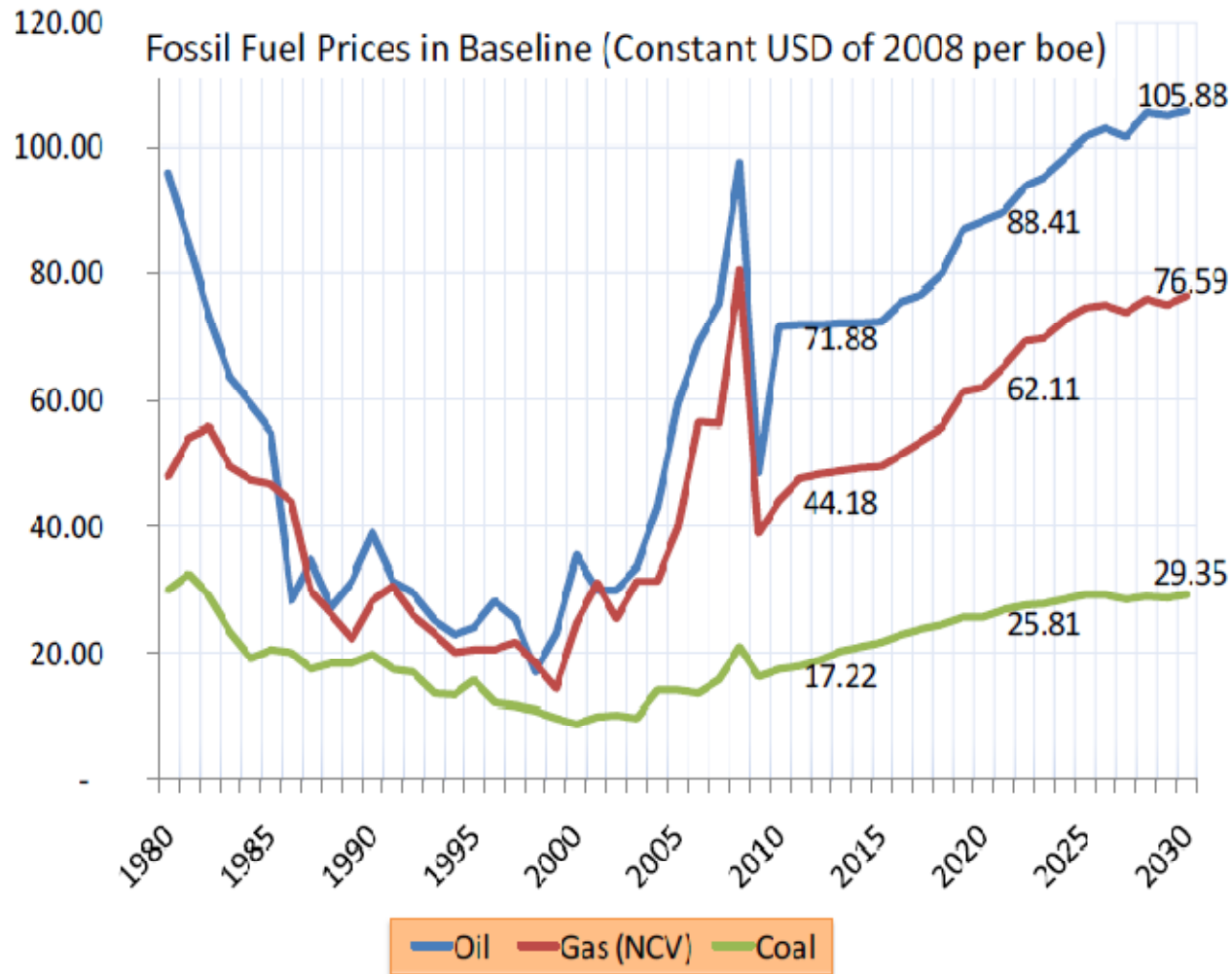
Learning curves of selected transportation technologies



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* Costs shown are global weighted averages across geographies
Source:McKinsey solar knowledge effort, Cost-curve V2.0

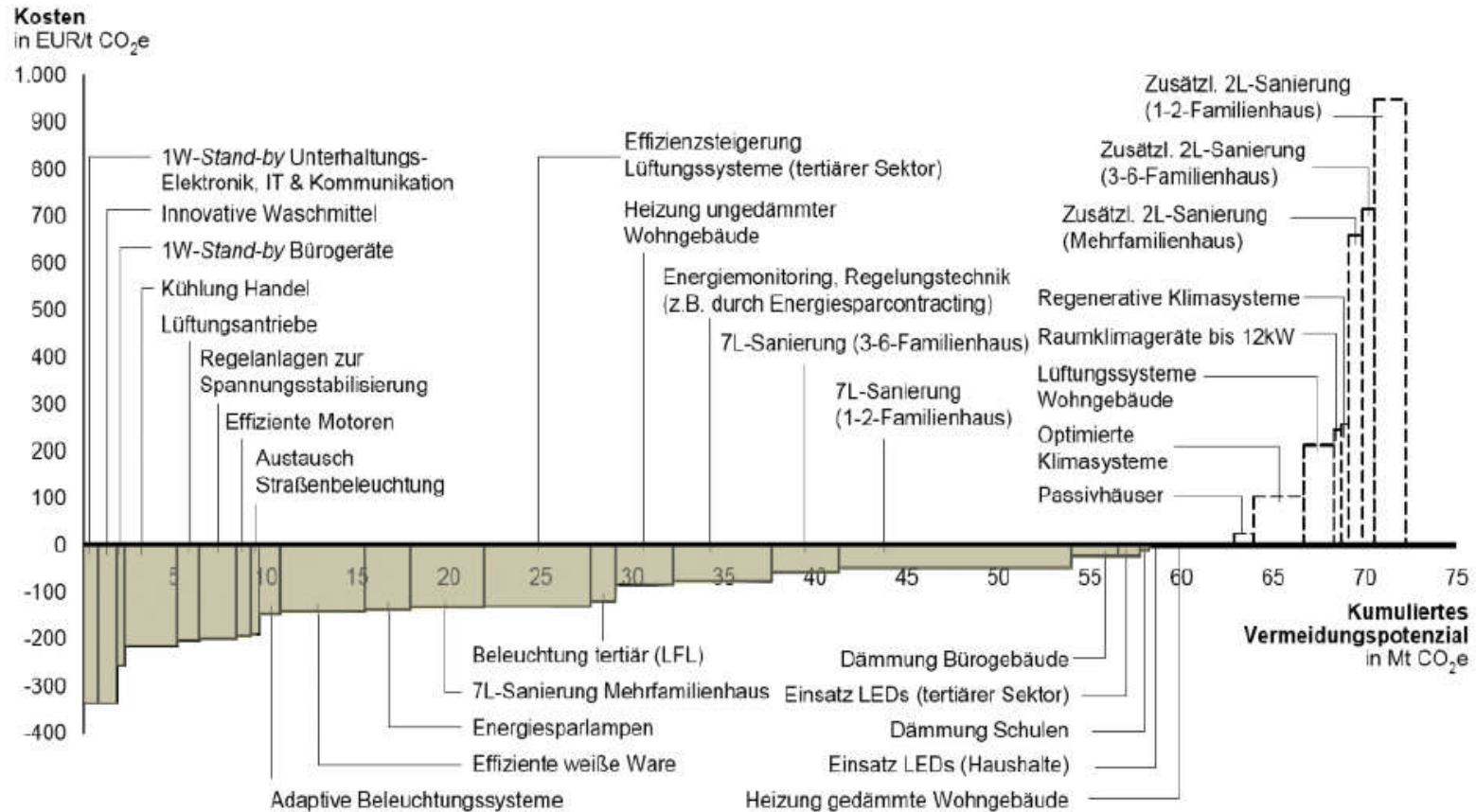
World Fossil Fuel Prices (EC 2010)



Kostenkurve von Klimaschutzmaßnahmen in Deutschland (Fraunhofer 2010)

Energiekonzept 2050 • Transformation des heutigen Energiesystems zum nachhaltigen Energiesystem 2050

Energiekonzept 2050



Quelle: McKinsey & Company, Inc. Im Auftrag von „BDI initiativ- Wirtschaft und Klimaschutz“ - AG Gebäude

■ Vermeidungshebel < 20 EUR/t CO₂e
 □ Vermeidungshebel > 20 EUR/t CO₂e