

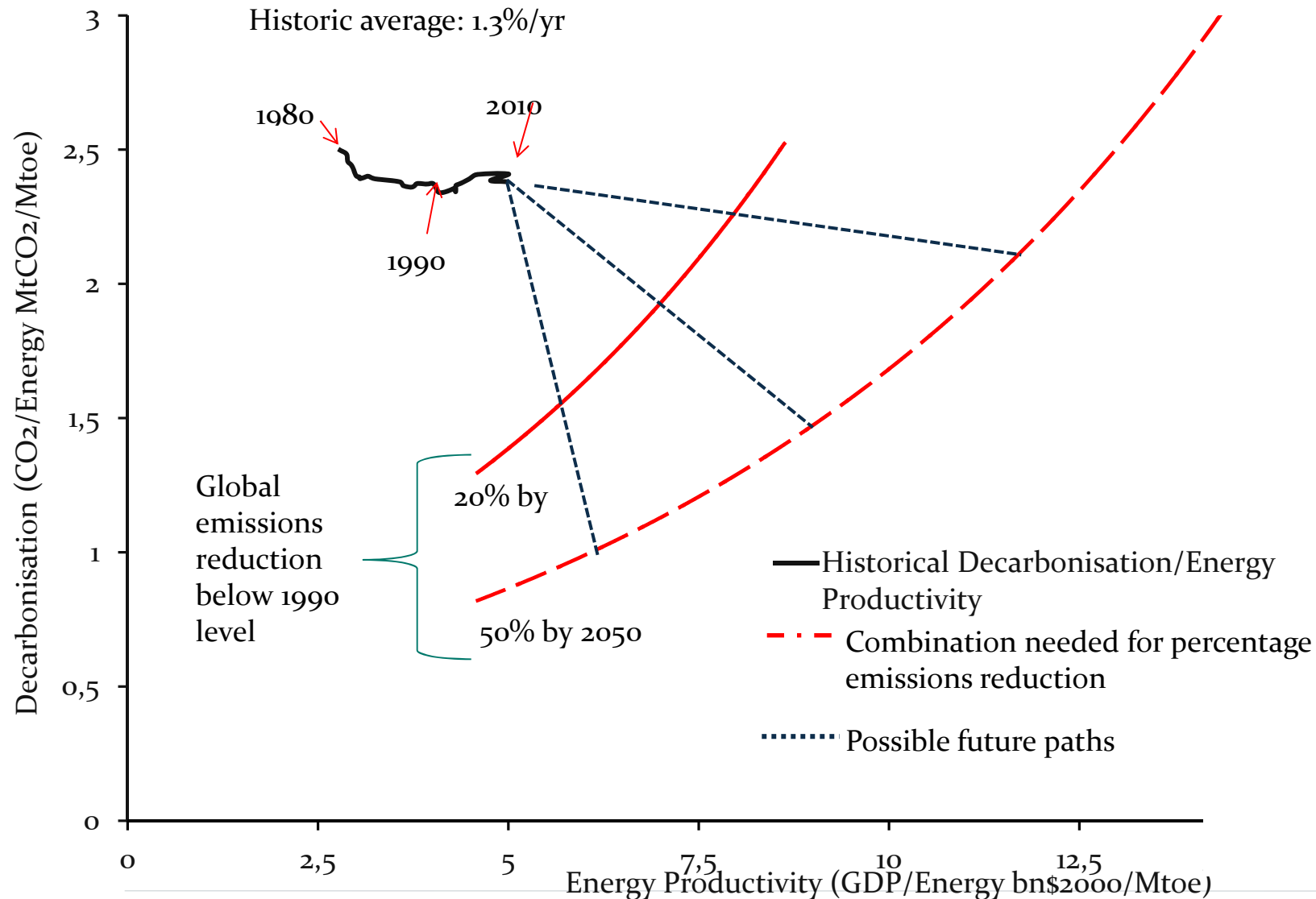
Centre d'économie industrielle - Cerna, Mines ParisTech

Distributional Effects of Energy Transition: Impacts of Renewable Electricity Support in Germany

Karsten Neuhoff
Paris, 9.4.2014

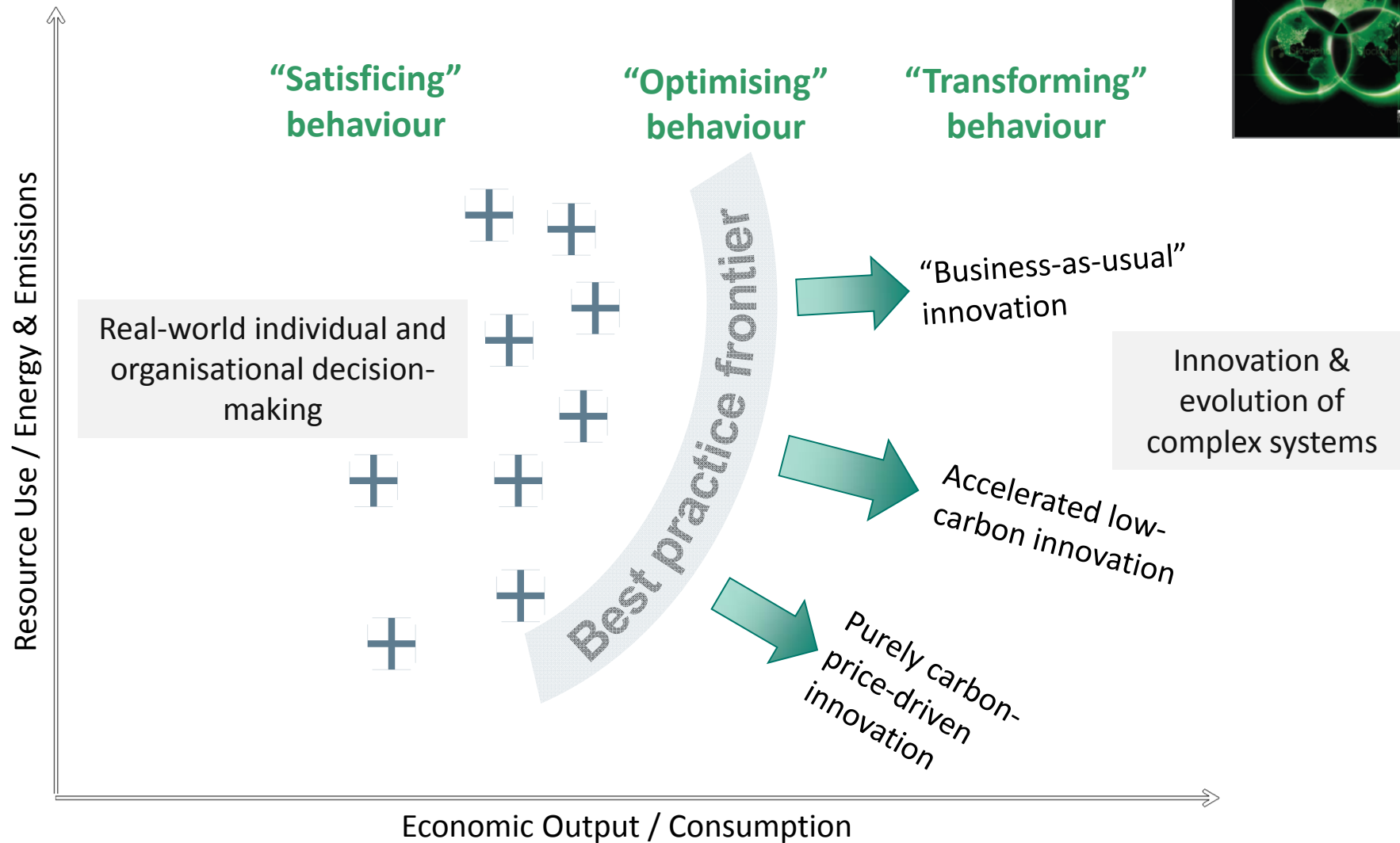
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The energy challenge of decarbonisation



Source: Grubb, Hourcade & Neuhoﬀ (2014): Planetary Economics, Energy, Climate Change and the three domains of sustainable development. Routledge.

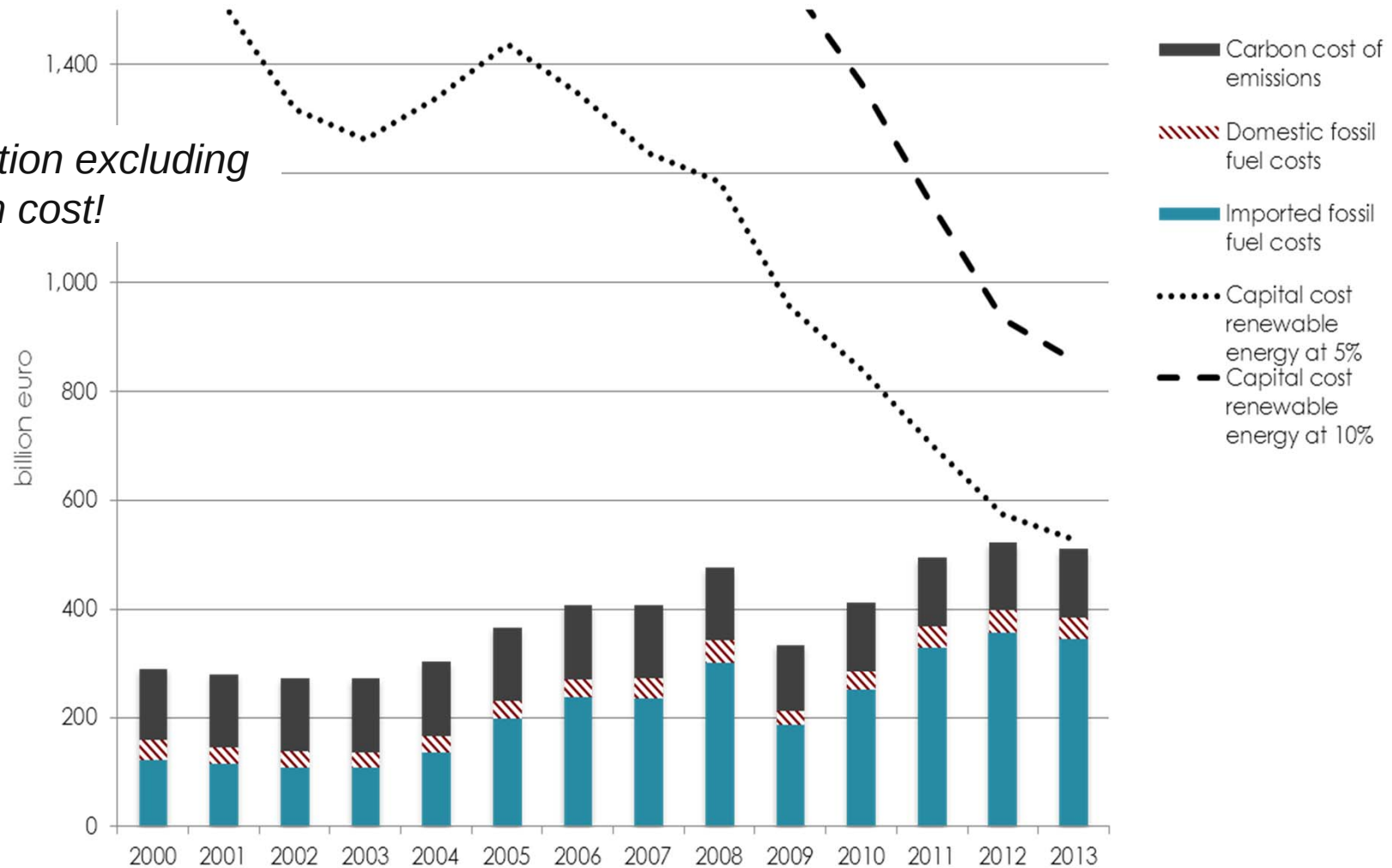
Three domains of policies



Source: Grubb, Hourcade & Neuhoff (2014): Planetary Economics, Energy, Climate Change and the three domains of sustainable development. Routledge.

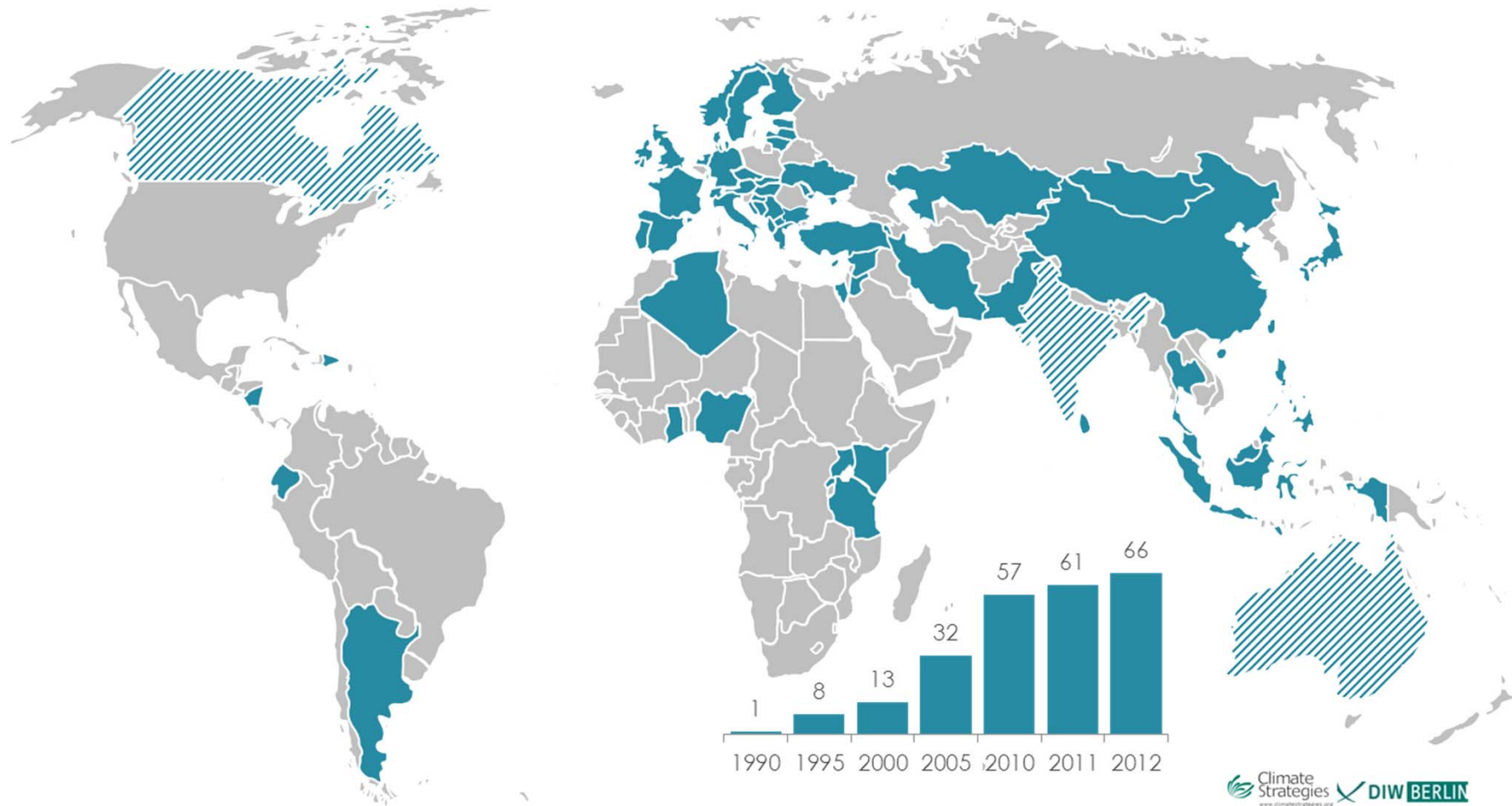
The annuitized costs of new Renewable Investments - compared to fossil fuel import bills

*Illustration excluding
system cost!*



Assumptions: 2% Inflation, Fossil conversion losses 50% 66% of energy from on-shore Wind and 33% Solar

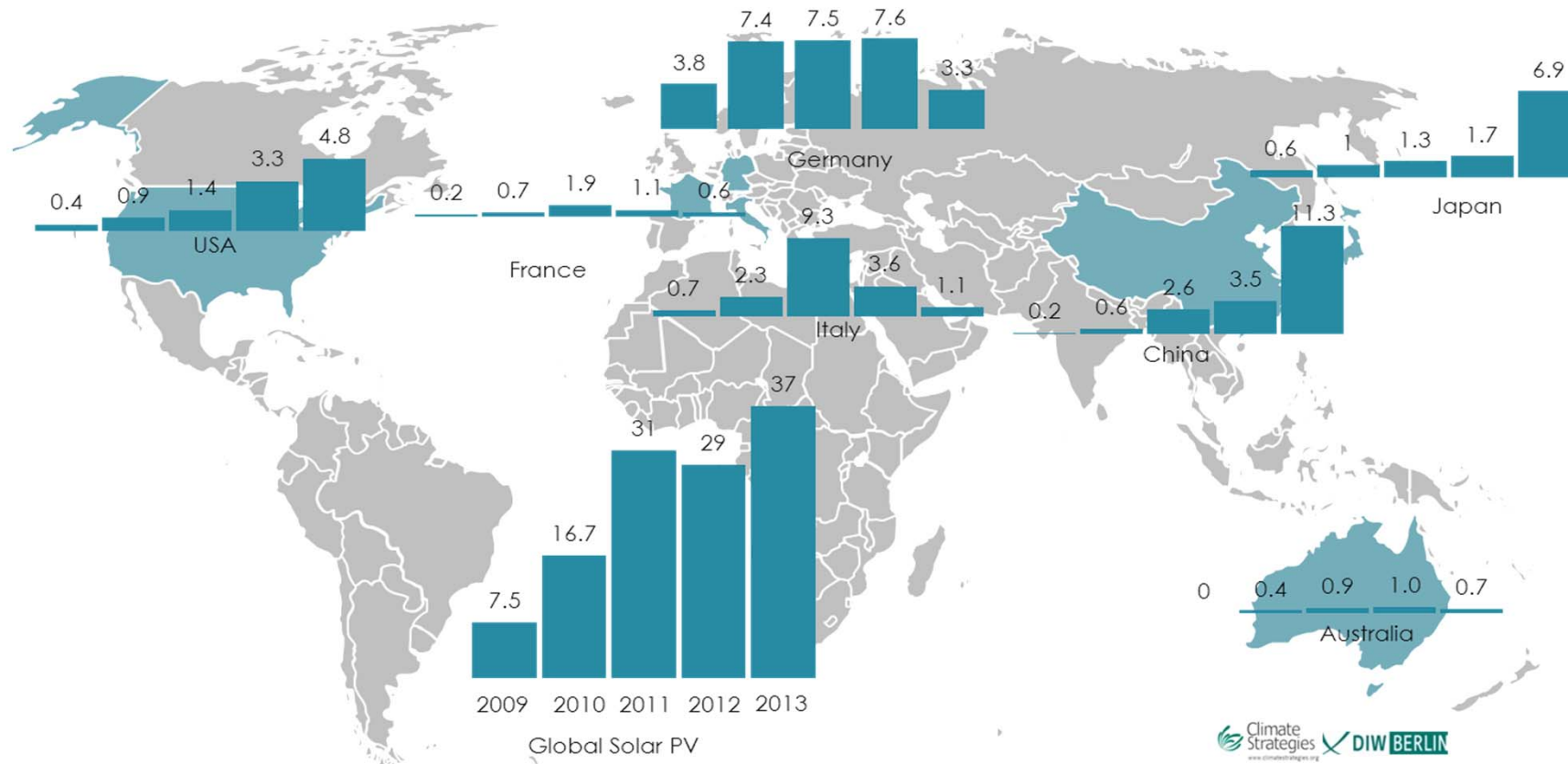
A leading group of countries facilitates investments in renewable energy Example: Feed-in tariffs



DIW Berlin Calculations based on REN 21, 2013.

A leading group of countries is modernizing energy provision and use: Annual construction of photovoltaic 2009-2013.

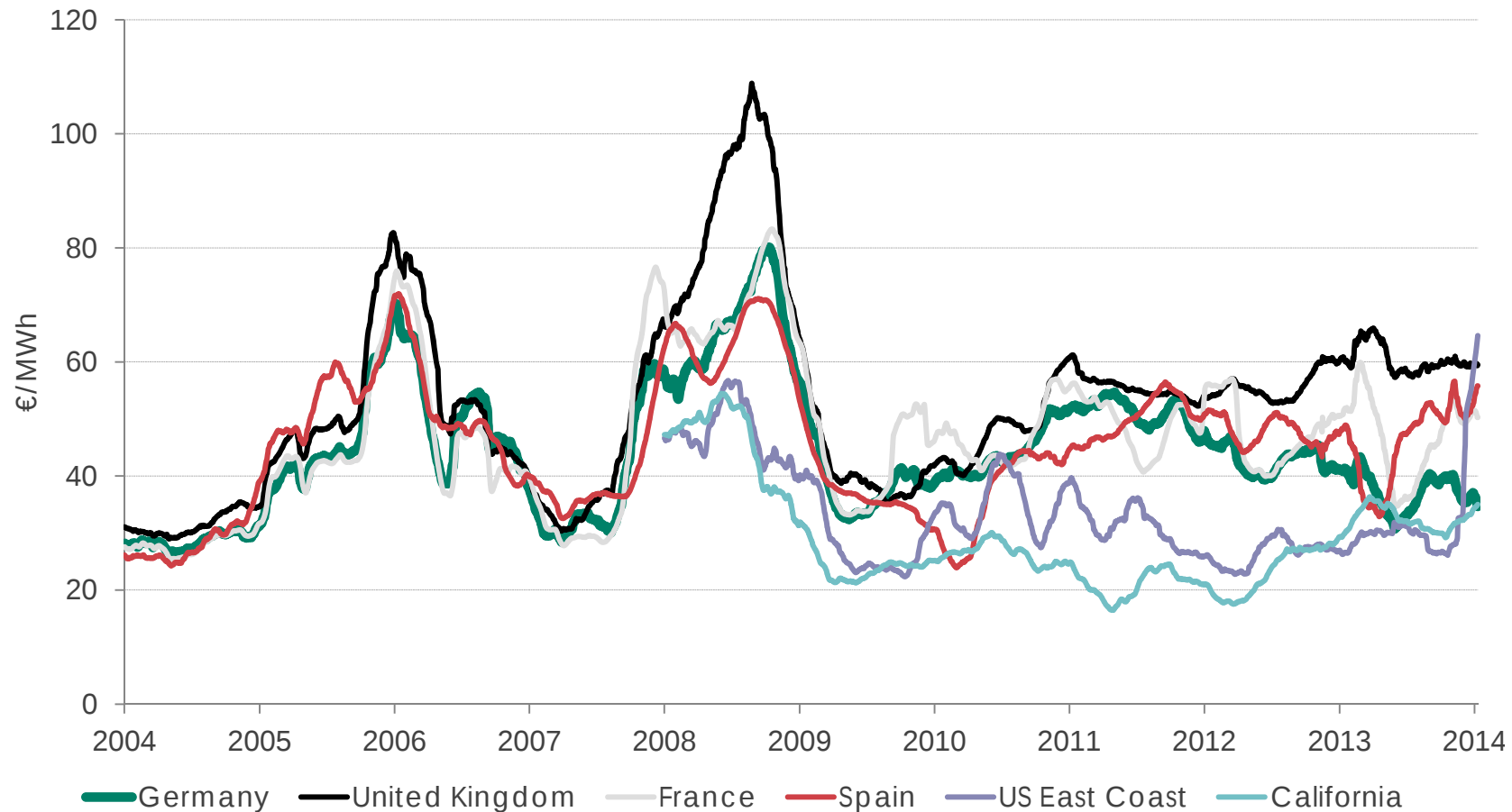
In 2013 70% of solar deployment was outside of Europe.



Source: Neuhoff et al. (2014): Staying with the Leaders: Europe's path to a low carbon economy. www.climatestrategies.org.
DIW Berlin Calculations based on REN 21, 2013; EPIA, 2014; Clean Energy Regulator, 2014.

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The price of electricity: Development of wholesale price

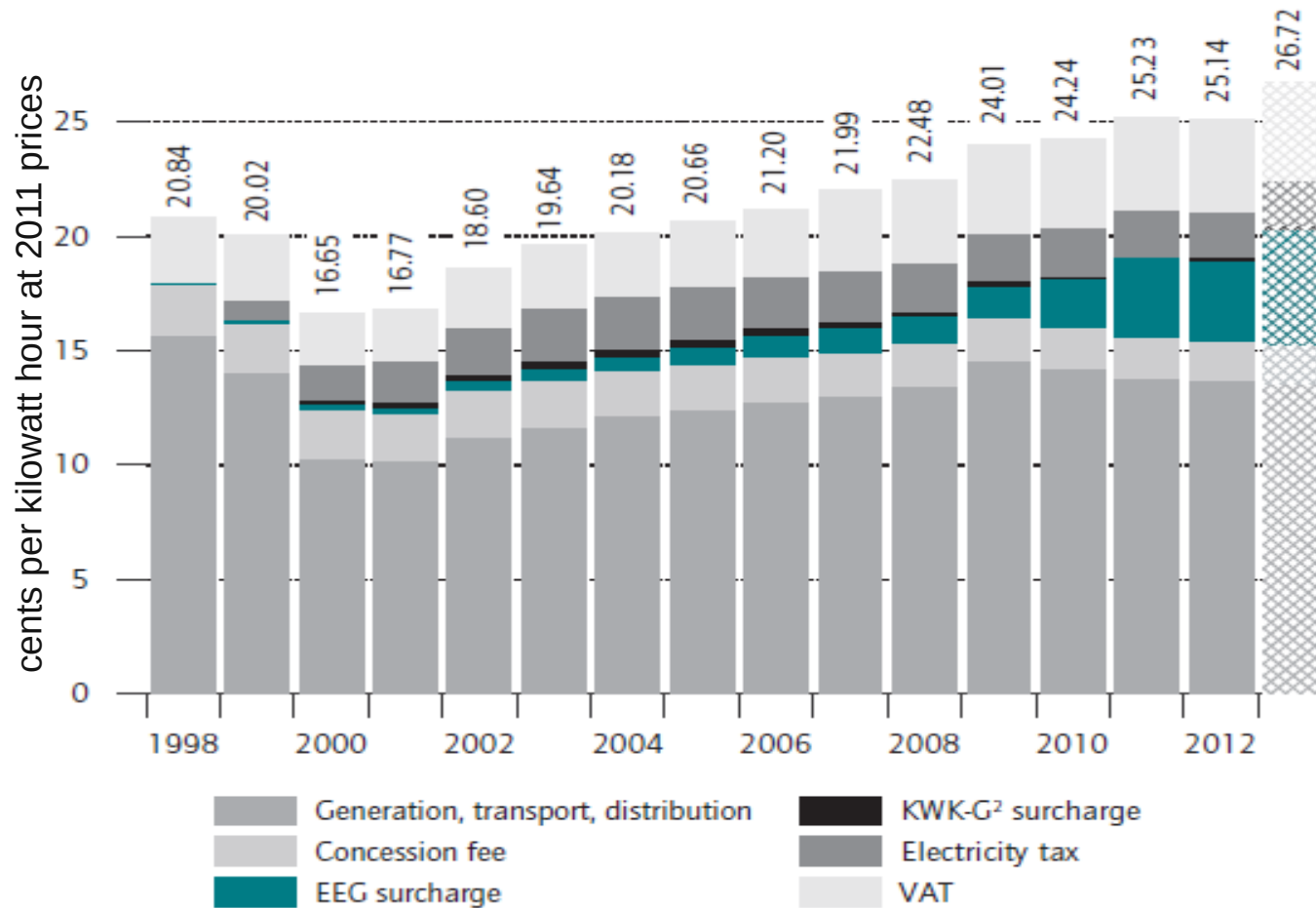


Source: Neuhoﬀ et al. (2014): Staying with the Leaders: Europe's path to a low carbon economy.

www.climatestrategies.org. DIW Berlin Calculations based on REN 21, 2013; EPIA, 2014; Clean Energy Regulator, 2014.

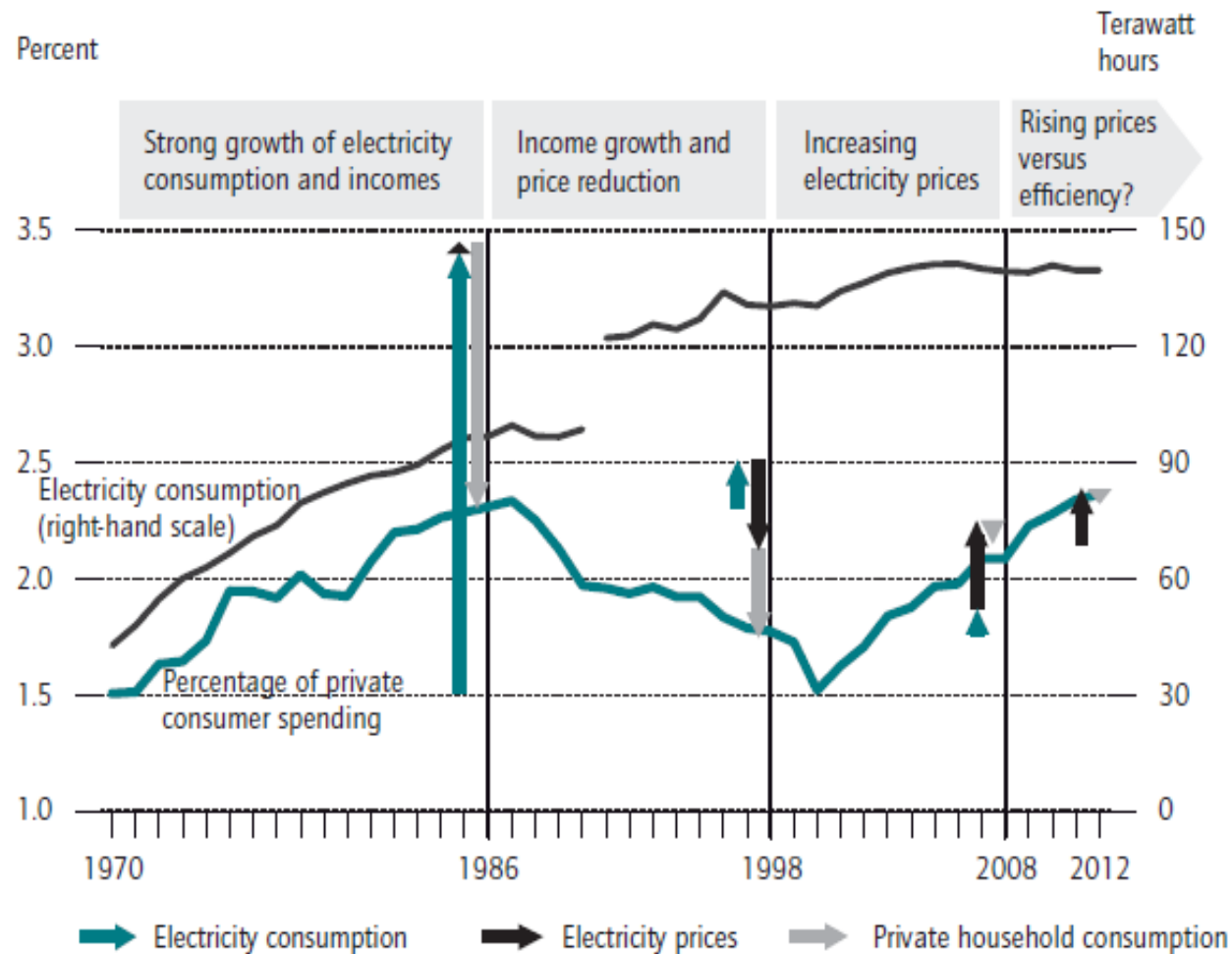
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Development of the Electricity Price for Households

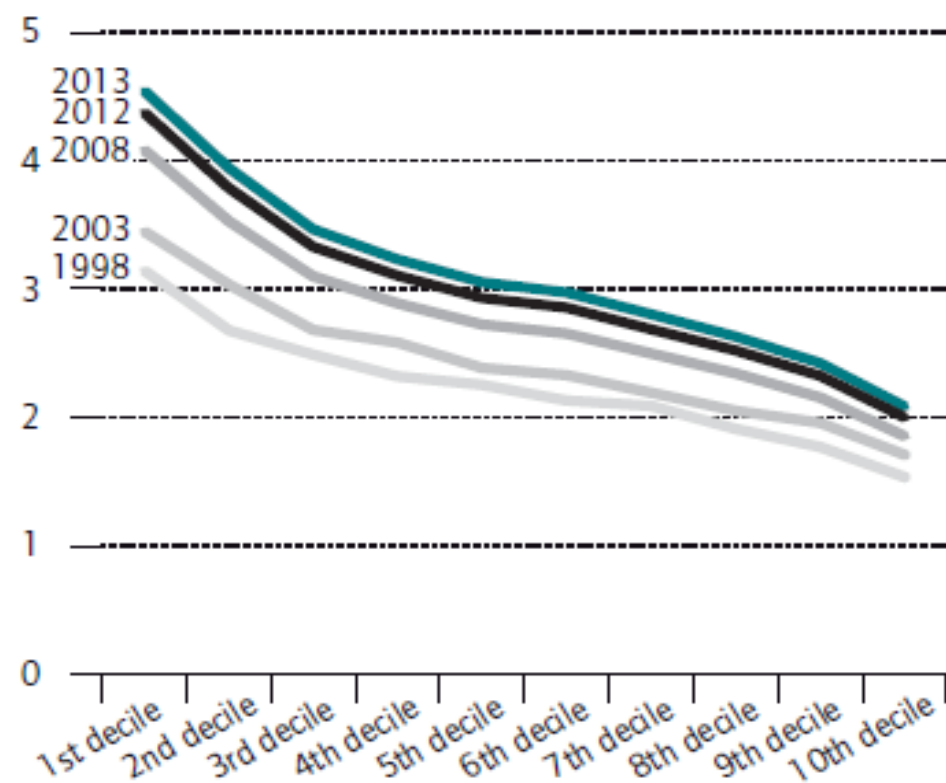


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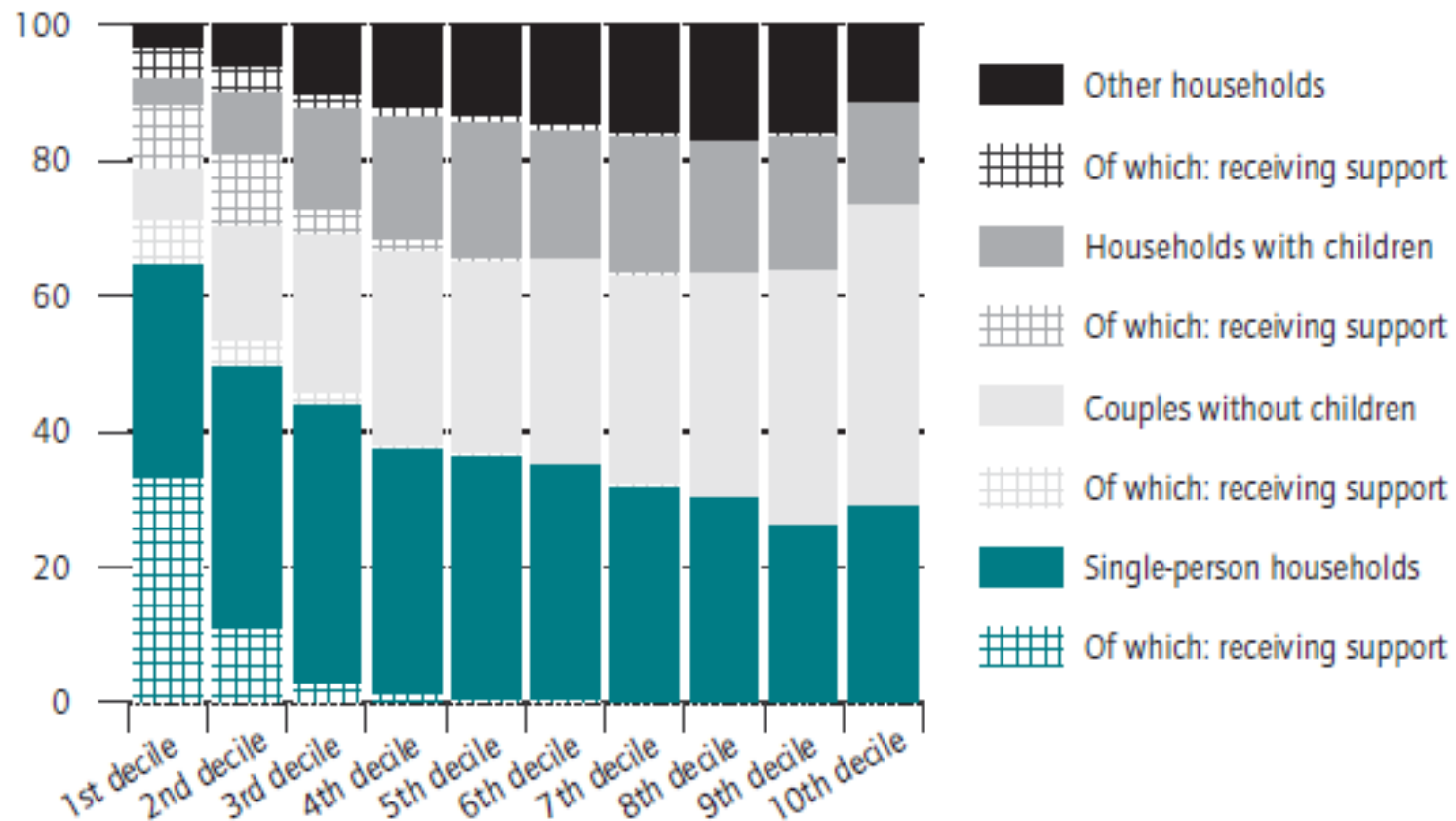
Electricity Consumption and share of Consumer Spending



Figures in percent



Structure of Households by Household Types and Income



4

Option 2: Basic Tax-Free Allowance for Electricity Tax

		Treshhold of (electricity-tax) free power		
		500 KWh/a	1000 KWh/a	1500 KWh/A
Compensate increase due to feed-in	Foregone electricity tax	404 Mio € (von 2,7 Mrd €)	792 Mio €	1,14 Mrd €
	Compensation 1st Dezile	-21,7 % (47,5 Mio €)	-41,7 % (91,2 Mio €)	-57,7 % (126,3 Mio €)
Compensate increase due to feed-in + Adjustment of Means tested benefits	Foregone electricity tax + extra costs	608,9 Mio €	953 Mio €	1,26 Mrd €
	Compensation 1st Dezile	-65,1 % (142,4 Mio €)	-74,1 % (162,1 Mio €)	-81,2 % (177,7 Mio €)

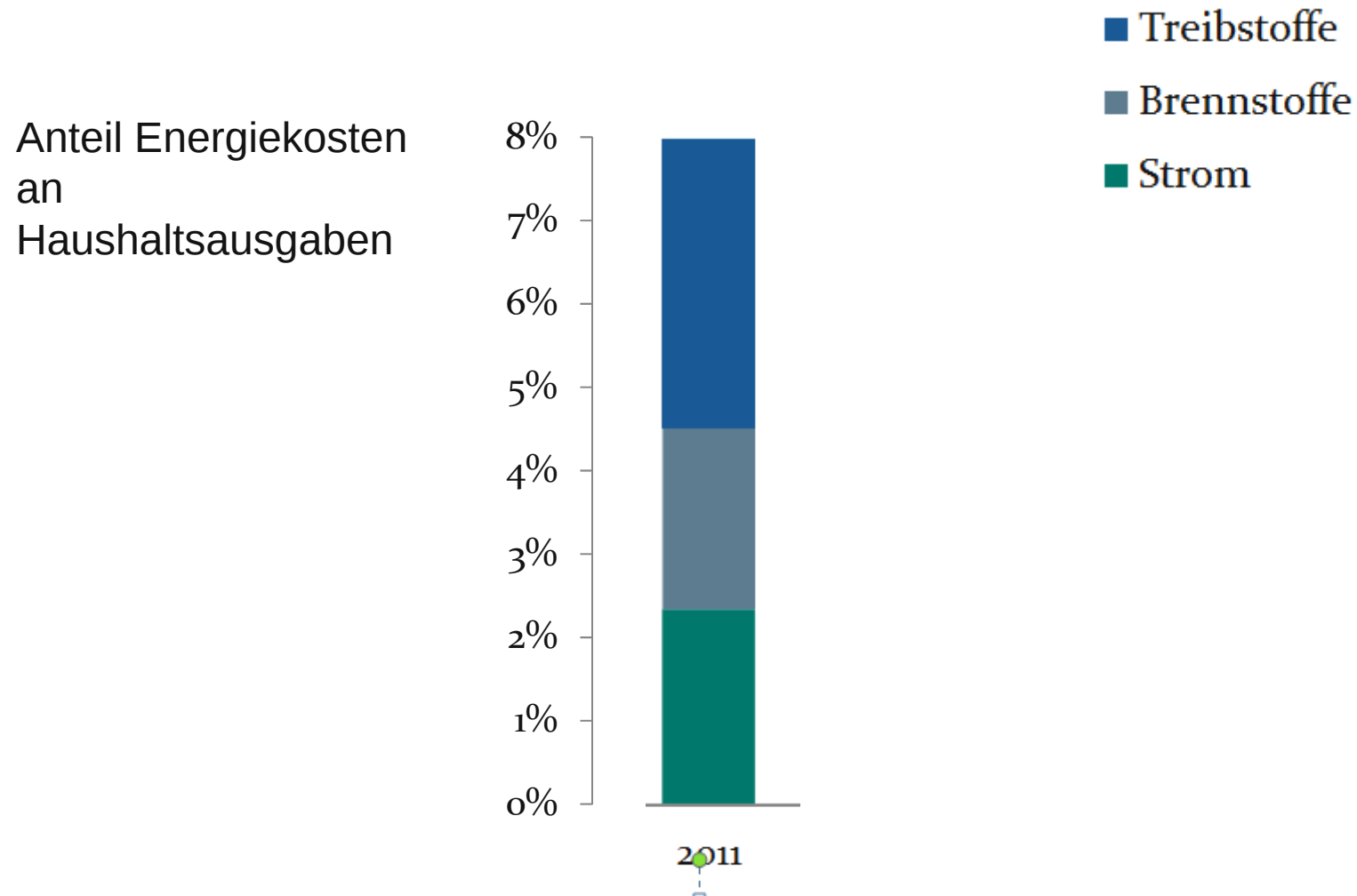
VAT Additional income on feed-in tariff: 2012 937 Mio. Euro

(BMF auf Kleine Anfrage der Linken)

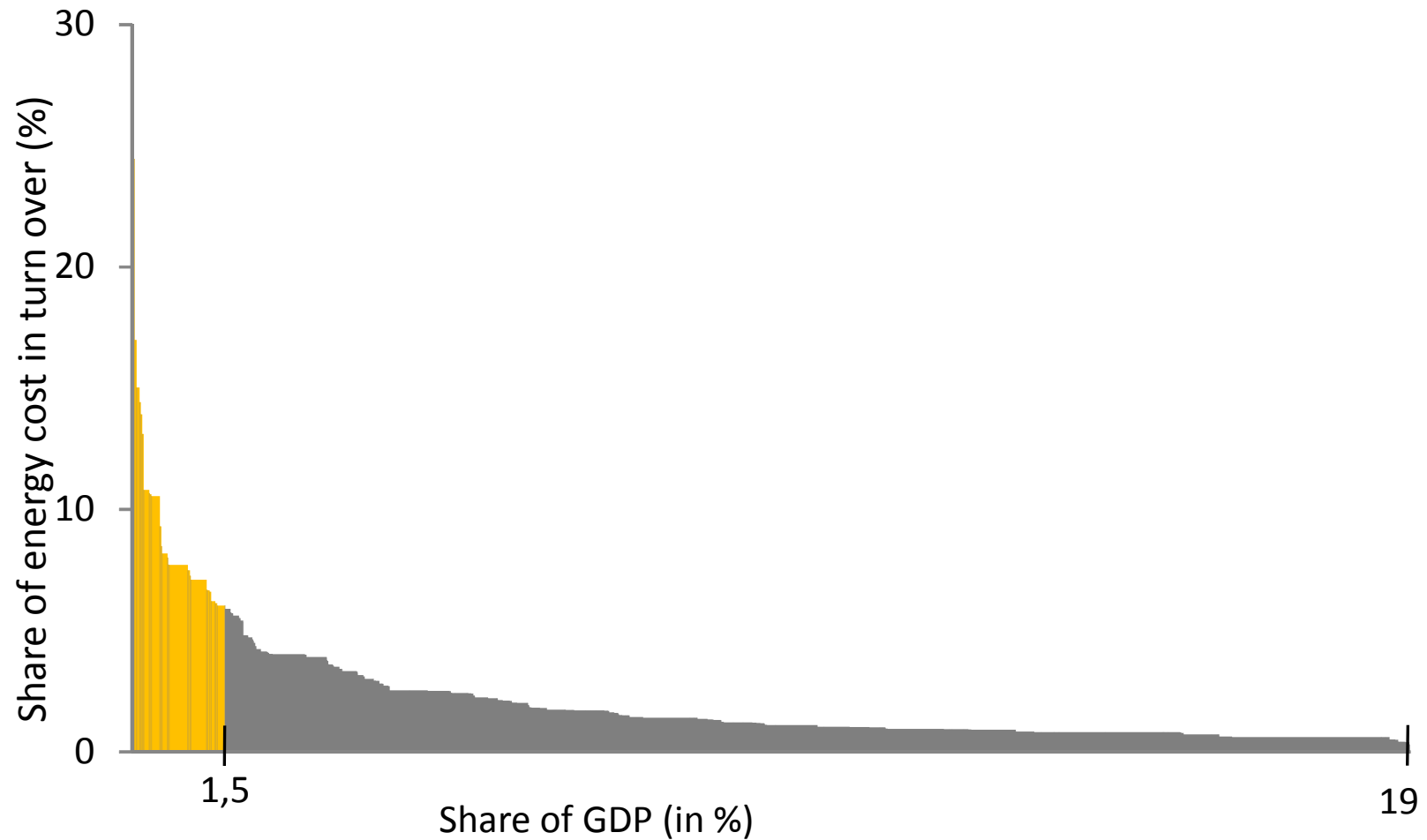
- Energy advice – 16% savings
- Support poor HH with fridge replacement with A++
 - $\frac{1}{4}$ older than 9 years -> 70% power savings, 64 Euro/year
 - $\frac{1}{4}$ 5-9 years -> savings, 40 Euro/year
- 300 Euro investment costs pay back in 5 and 8 years
 - With 150 grant – pay back in 2.5 and 4 years
 - One-off public expenditure of 560 Mio E ($\frac{1}{2}$ of 7.6 Mio HH)

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Electricity constitutes less than 1/3 of energy bill for HH

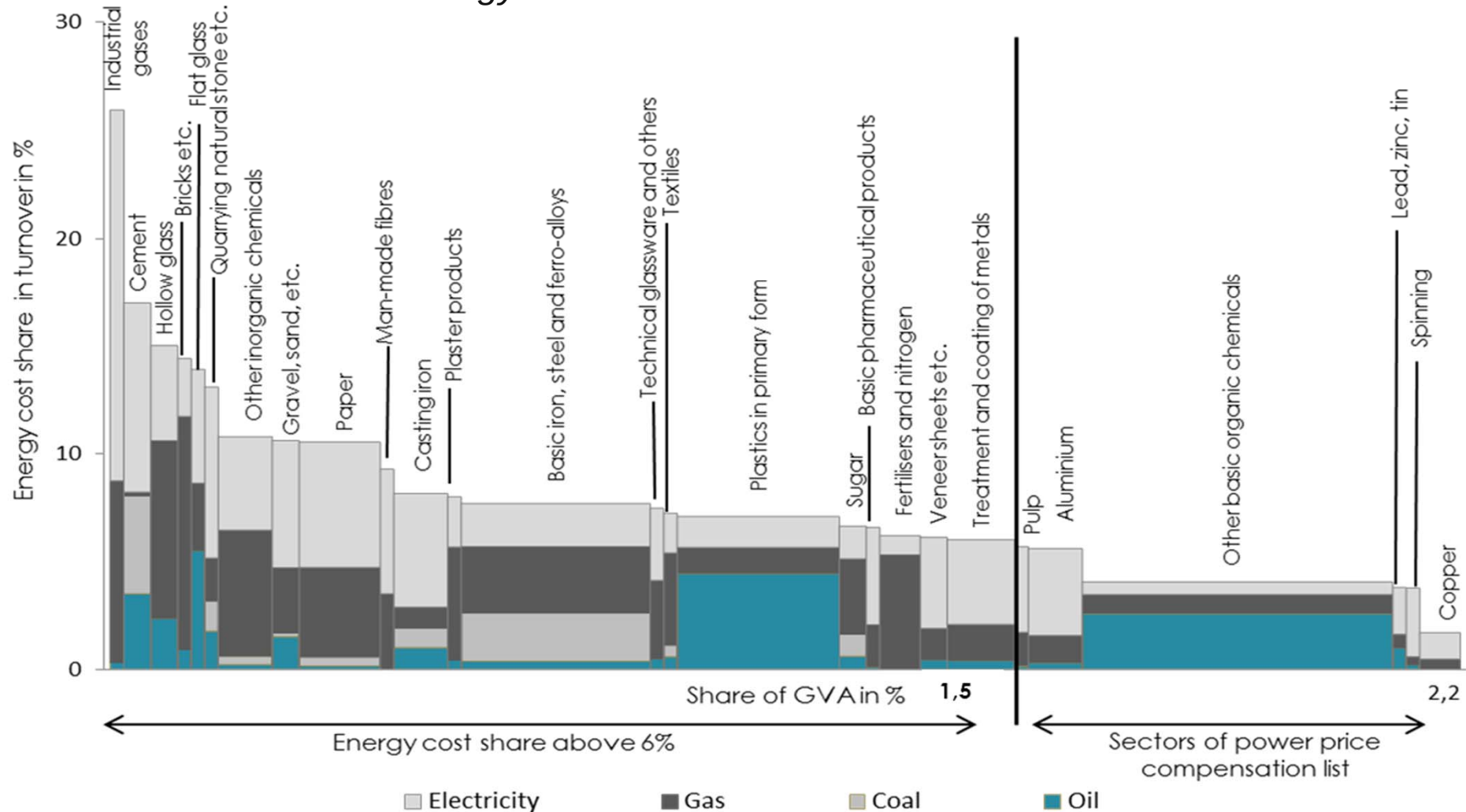


Berechnung für Brennstoffe aufbauend auf: AG Energiebilanz, IEA Energy Prices and Taxes, BMWi Energiestatistik, Stat. Bundesamt



Discussion needs to differ between very energy intensive and other activities Illustration: Energy cost as share of turnover by energy carrier

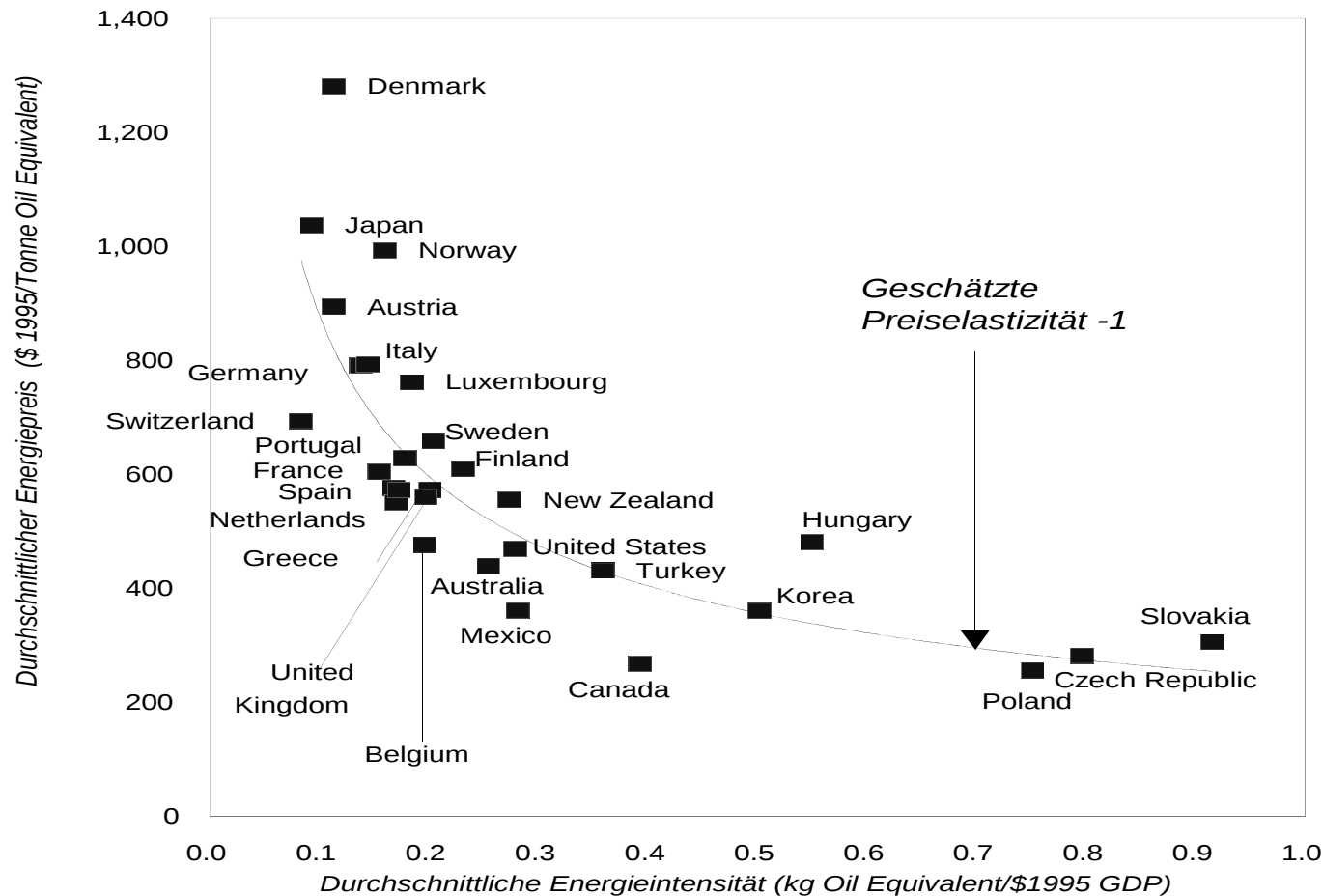
Sectors with energy costs above 6% account for less than 2% of German GVA.



Source: DIW calculations based on Destatis.

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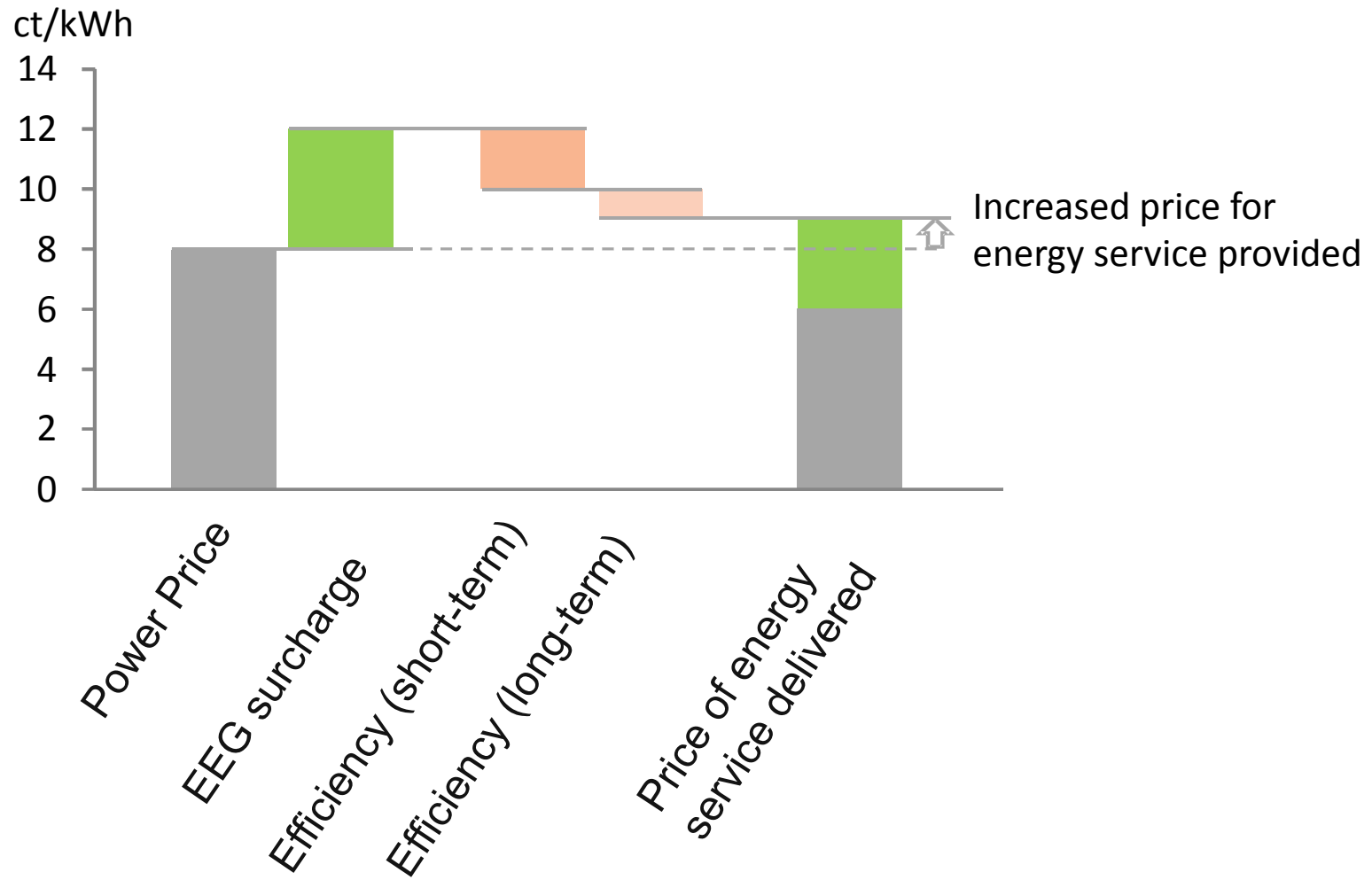
Implied costs – foregone efficiency improvements



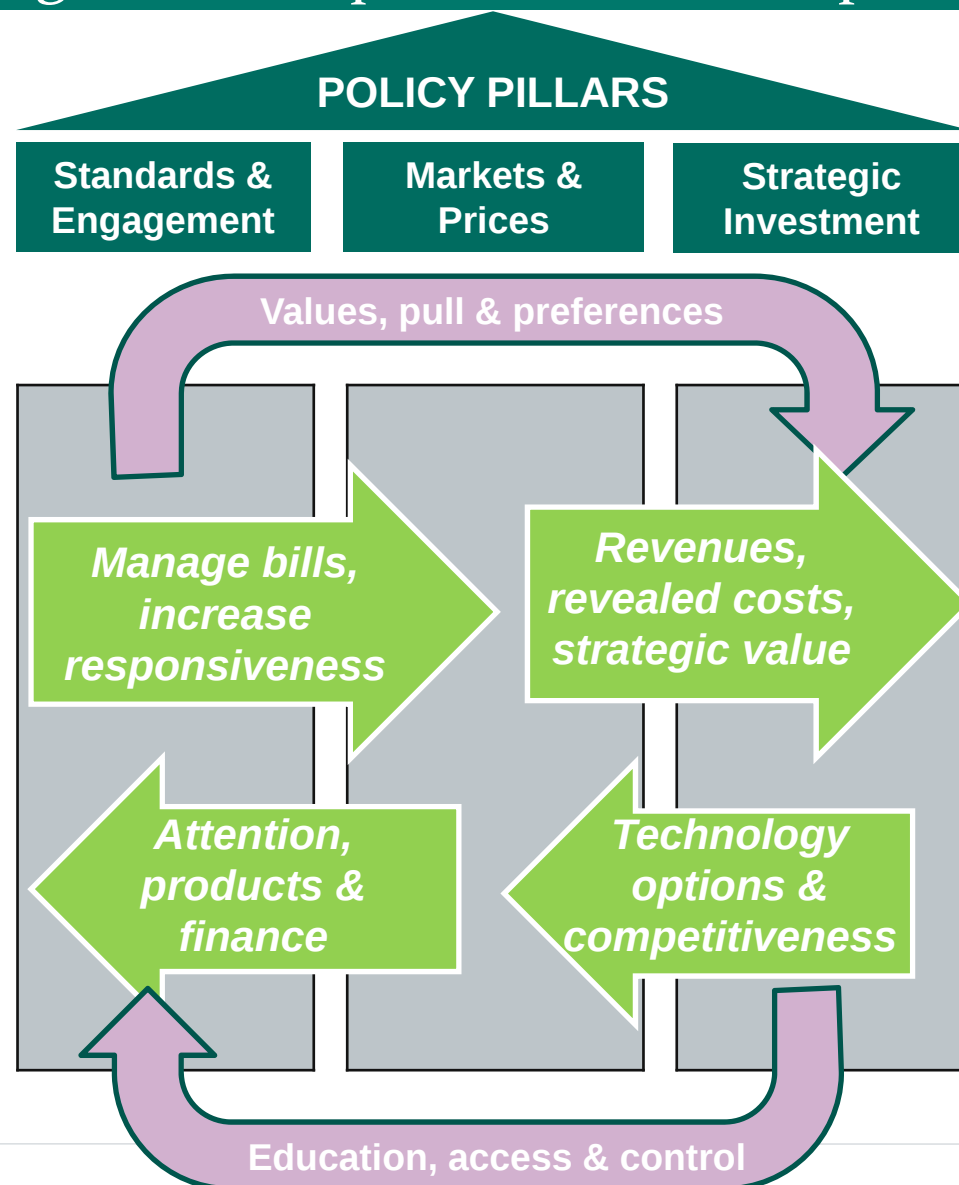
Source – Newbery 2003

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Foregone efficiency savings



Distributional Effects of Energy Transition: Changing course requires a sustained package



Source: Grubb, Hourcade & Neuhoﬀ (2014): Planetary Economics, Energy, Climate Change and the three domains of sustainable development. *Routledge*.