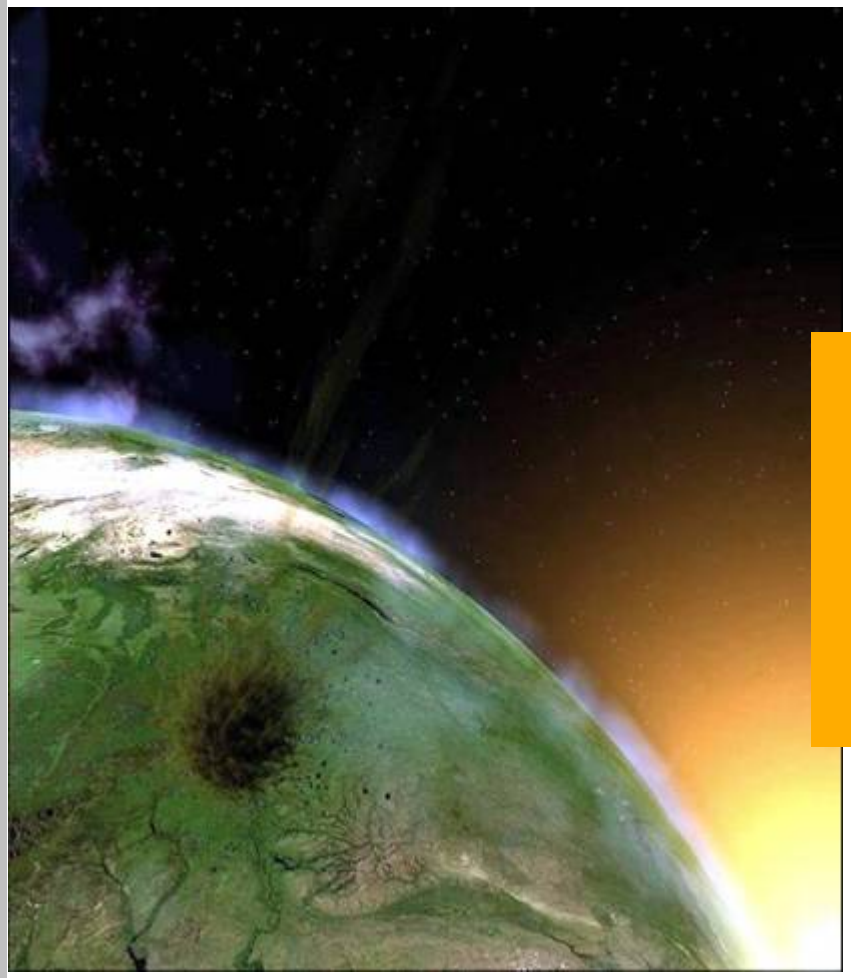
Aachen, November 7, 2007

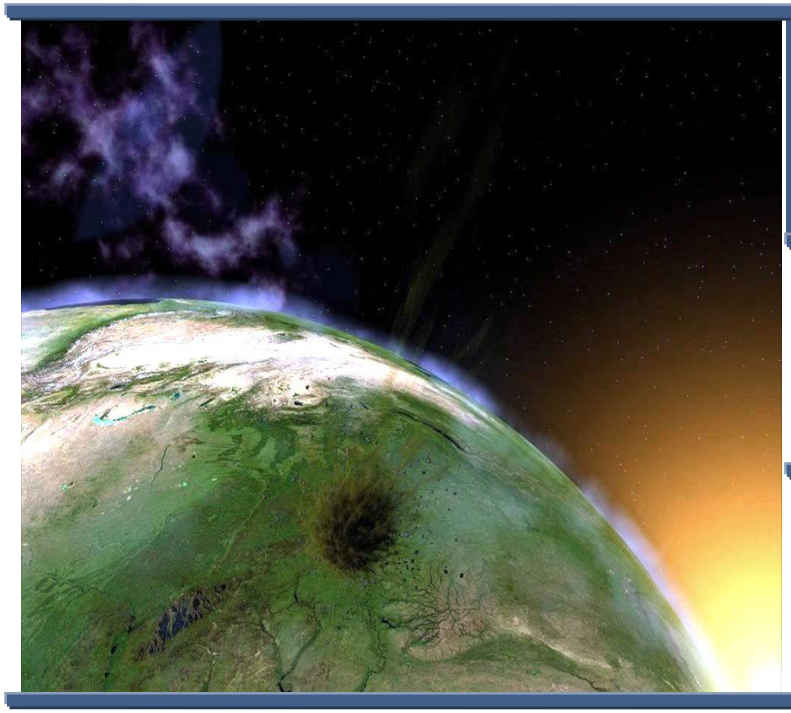


VERTRAULICH

Climate change – risks and opportunities

Conference Presentation

Today's discussion



Why is climate action important from a business perspective?

What are the fundamental market dynamics and drivers?

The real challenges for Germany

Why it is a topic?

Increasing political will
- Establishment of (binding) targets
- Establishment of mechanisms: rules/regulation, taxes/subsidies, cap&trade system

Increasing economic necessity
- Opportunities through new markets
- Changes to existing business model

Increasing implied risks
- Investor pressure
- Legal exposure

Companies are forced to act on climate change in and outside Europe

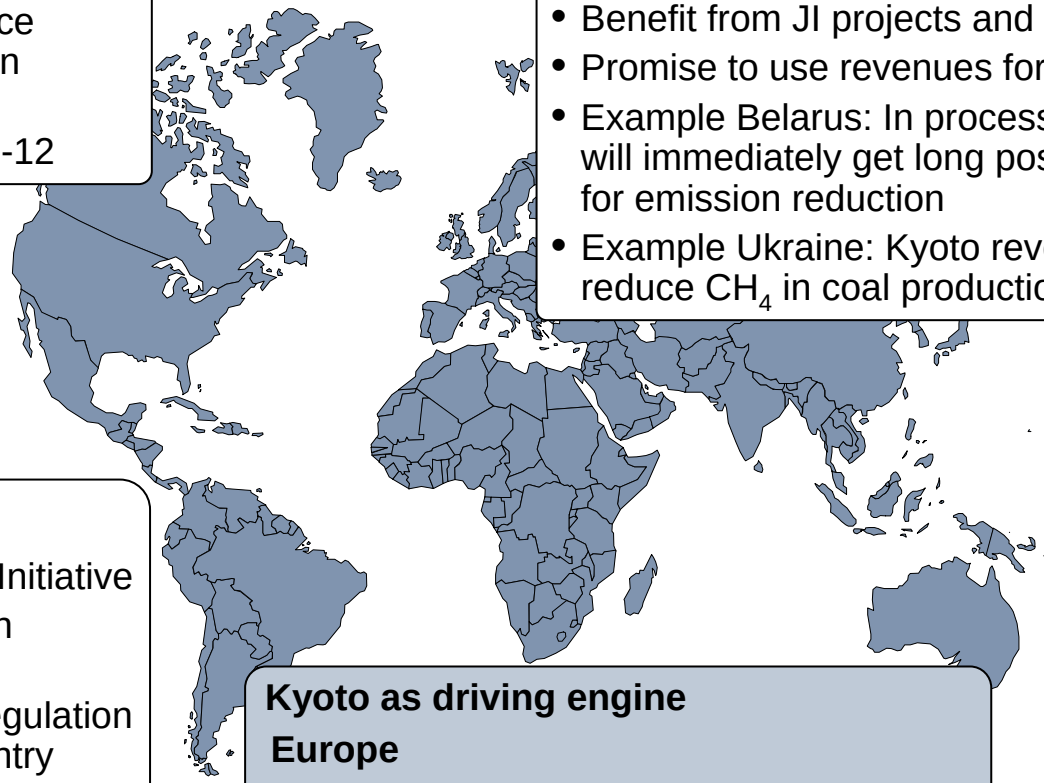
Increasing political will across the world

Canada

- Kyoto compliance under discussion
- Cost of € 2.7 billion p.a. 2008-12

Former Soviet Union

- Benefit from JI projects and potentially sale of hot air
- Promise to use revenues for further emission reduction
- Example Belarus: In process of ratifying Kyoto now; will immediately get long position; revenues to be used for emission reduction
- Example Ukraine: Kyoto revenues might be used to reduce CH_4 in coal production



Parallel to Kyoto track

US

- Regional GHG Initiative
- Tough targets in California
- Patchwork of regulation around the country
- Pressure for federal regulation by EPA

Australia

- Various programs to meet Kyoto target
- ETS in draft

Kyoto as driving engine

Europe

- EU ETS started 2005
- Additional programs

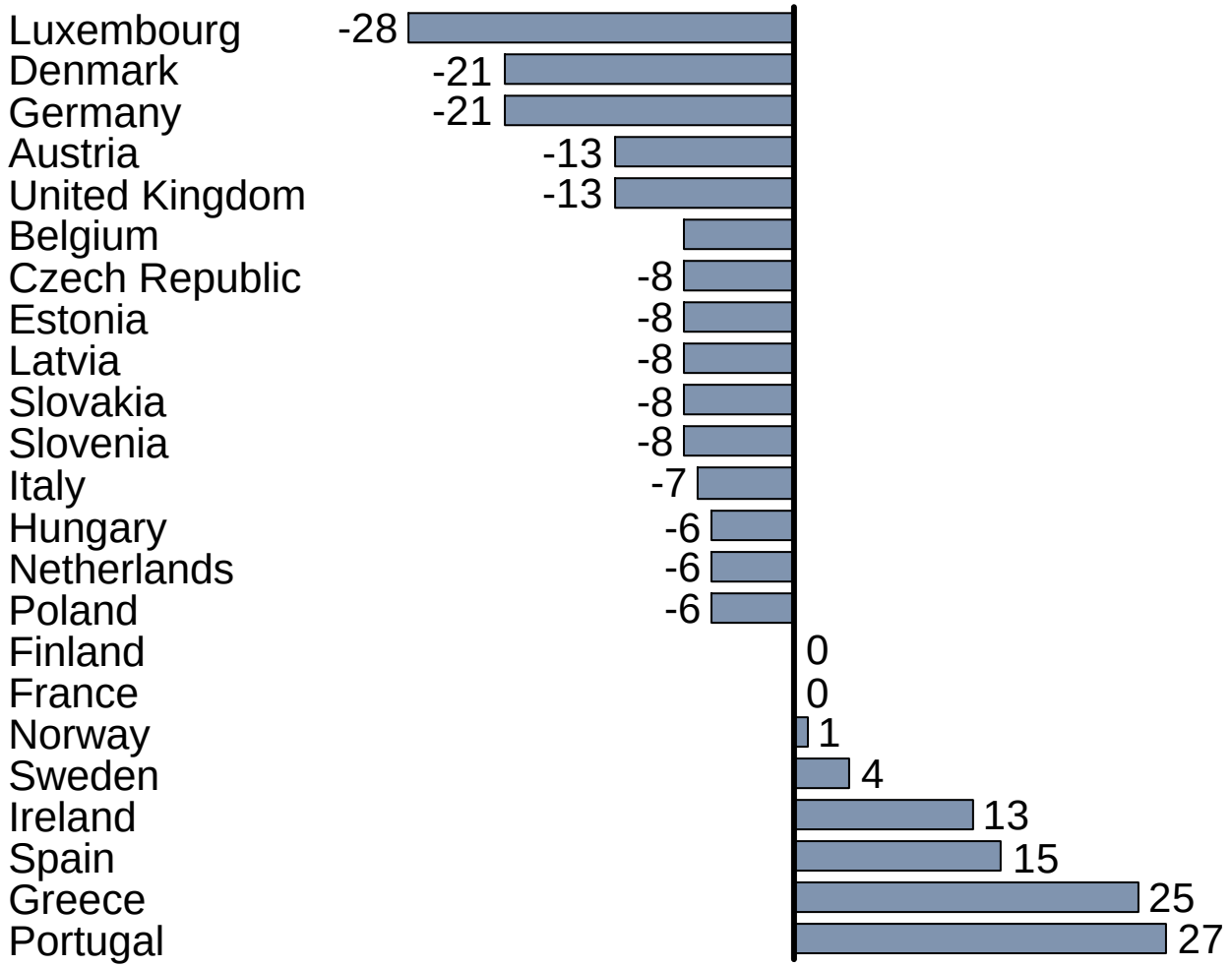
Japan

- Various programs (€8 billion in 2007)

Economies in transition (China, India, Brazil, etc.)

- Are heavily developing CDM projects now (e.g. 164 project approved by China with ~ 100 Mtons emission reduction)
- Run own efficiency improvement programs
- Will eventually take on voluntary emission targets later

Establishment of binding targets – burden sharing agreement Europe



Source: UNFCCC

Different activity also in the US

Washington: New plants >25 MW or rerated old plants must offset 20% of expected CO_2 over 30 years**

Oregon: New plants have to offset their emissions by 17% against the best performing CCGT over 30 years. Target: 10% below 90 by 2020; 75% cut by 2020

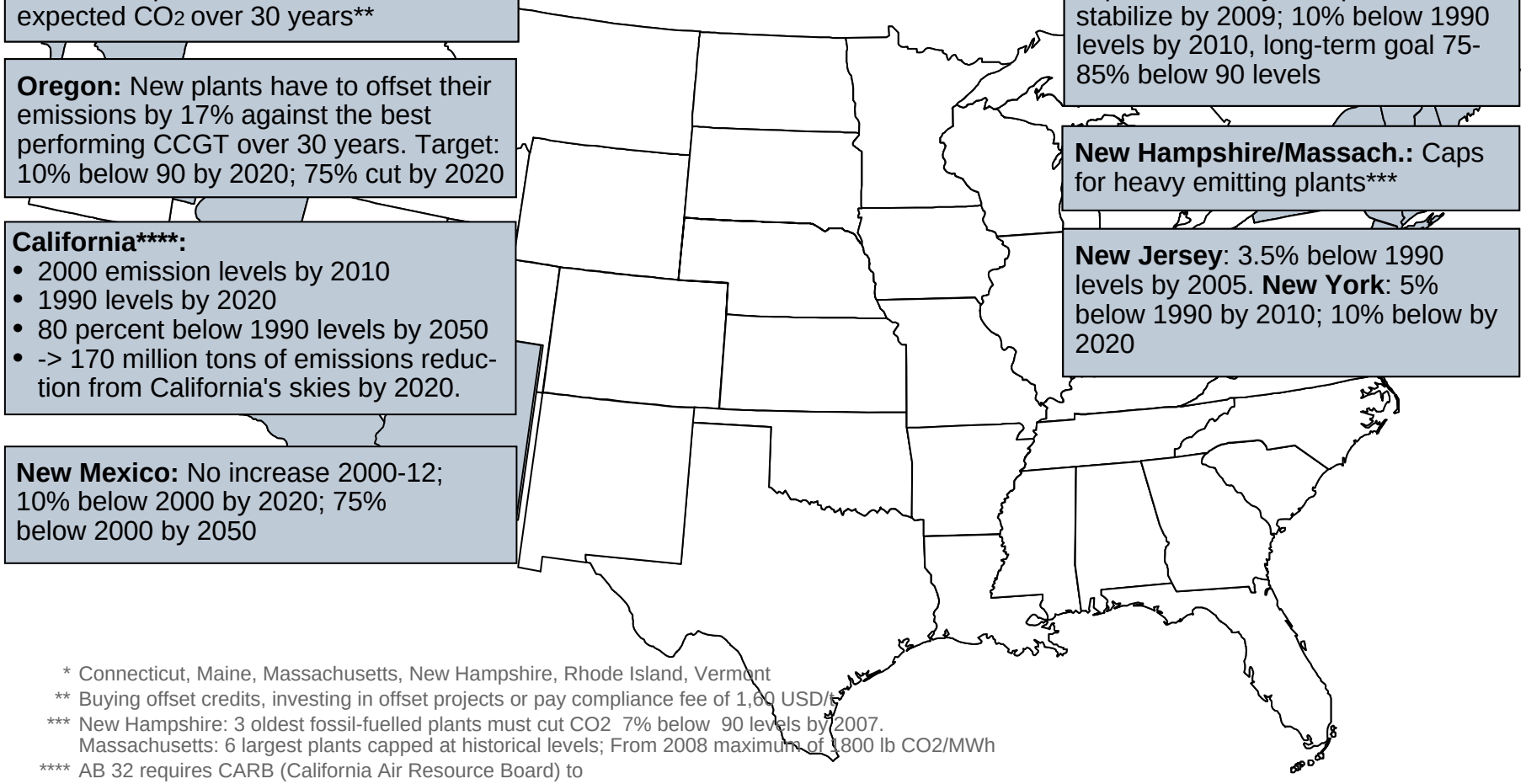
California**:**
- 2000 emission levels by 2010
- 1990 levels by 2020
- 80 percent below 1990 levels by 2050
- -> 170 million tons of emissions reduc-tion from California's skies by 2020.

New Mexico: No increase 2000-12; 10% below 2000 by 2020; 75% below 2000 by 2050

6 New-England states*: RGGI: cap and trade system planned; stabilize by 2009; 10% below 1990 levels by 2010, long-term goal 75-85% below 90 levels

New Hampshire/Massach.: Caps for heavy emitting plants***

New Jersey: 3.5% below 1990 levels by 2005. **New York**: 5% below 1990 by 2010; 10% below by 2020



* Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont

** Buying offset credits, investing in offset projects or pay compliance fee of 1,60 USD/t

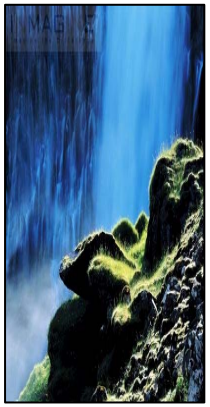
*** New Hampshire: 3 oldest fossil-fuelled plants must cut CO2 7% below 90 levels by 2007.
Massachusetts: 6 largest plants capped at historical levels; From 2008 maximum of 1800 lb CO2/MWh

**** AB 32 requires CARB (California Air Resource Board) to
1) Establish a statewide GHG emissions cap for 2020, based on 1990 emissions by January 1, 2008
2) Adopt mandatory reporting rules for significant GHG sources, and a plan indicating how emissions reductions will be achieved, by Jan. 1, 2009.
3) Adopt regulations by January 1, 2011 to achieve the maximum technologically feasible and cost-effective reductions in greenhouse gas, including provisions for market mechanisms and alternative compliance mechanisms.
Mandatory caps will begin in 2012 for significant sources and ratchet down to meet the 2020 goals.

Source: Argus Global Emissions 8/2005; gov.ca.gov

Economic opportunities – New and/or larger market places are developing

EU Emissions Trading Scheme (EU ETS)
- Trading market on EUR 30 billion allowances allocated p.a.



JI/CDM* project development
- Over 50 funds have raised USD 7 billion (Sept. 2006)
- Recent announcements of additional USD 4 billion
  - Institutional investors
  - Utilities

Clean power plant construction/carbon capture and storage (CCS)
- Technology innovation is on the landscape again
- 40% increase versus BAU

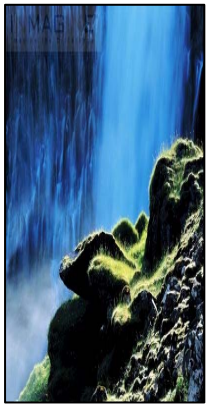
Renewable electricity generation
- USD 38 billion US investment in renewables globally in 2005
- Ambitious plans by utilities

* Joint Implementation/Clean Development Mechanism

Source: Press clippings; New Energy Finance

Economic opportunities – Groundbreaking new market places have been created

EU Emissions Trading Scheme (EU ETS)
- Operating since Jan. 2005
- 45% of European emissions
- **EUR 30 billion allowances** allocated p.a.



JI/CDM* project development
- Over **50 funds** have raised **USD 7 billion** (Sept. 2006)
  - $3.1 billion US public money
  - $3.9 billion US private money
- Recent announcements of **additional USD 4 billion**
  - USD 3 billion US over next 5 years by Morgan Stanley (Oct. 26, 2006)
  - Endesa considering purchase of add. 100 million tons (USD ~900 million) (Oct. 25. 2006)
  - RWE allocates USD 190 million US to JI/CDM projects (Oct. 27, 2006)

Clean power plant construction/carbon capture and storage (CCS)
- Vattenfall started construction of a 30 MW pilot plant
- RWE will invest **$ 1.3 billion in 360 MW plant** with CCS to go online in 2014
- Enel will spend $ 0.4 billion in CCS demonstration plant

Renewable electricity generation
- **USD 38 billion US investment** in renewables globally in 2005
- Ambitious plans by players:
  - Enel will invest $ 4.3 billion in renewables (1,700 MW) over next five years
  - RWE will invest $ 0.8 billion in renewables
  - Dong will invest $ 1 billion in renewables

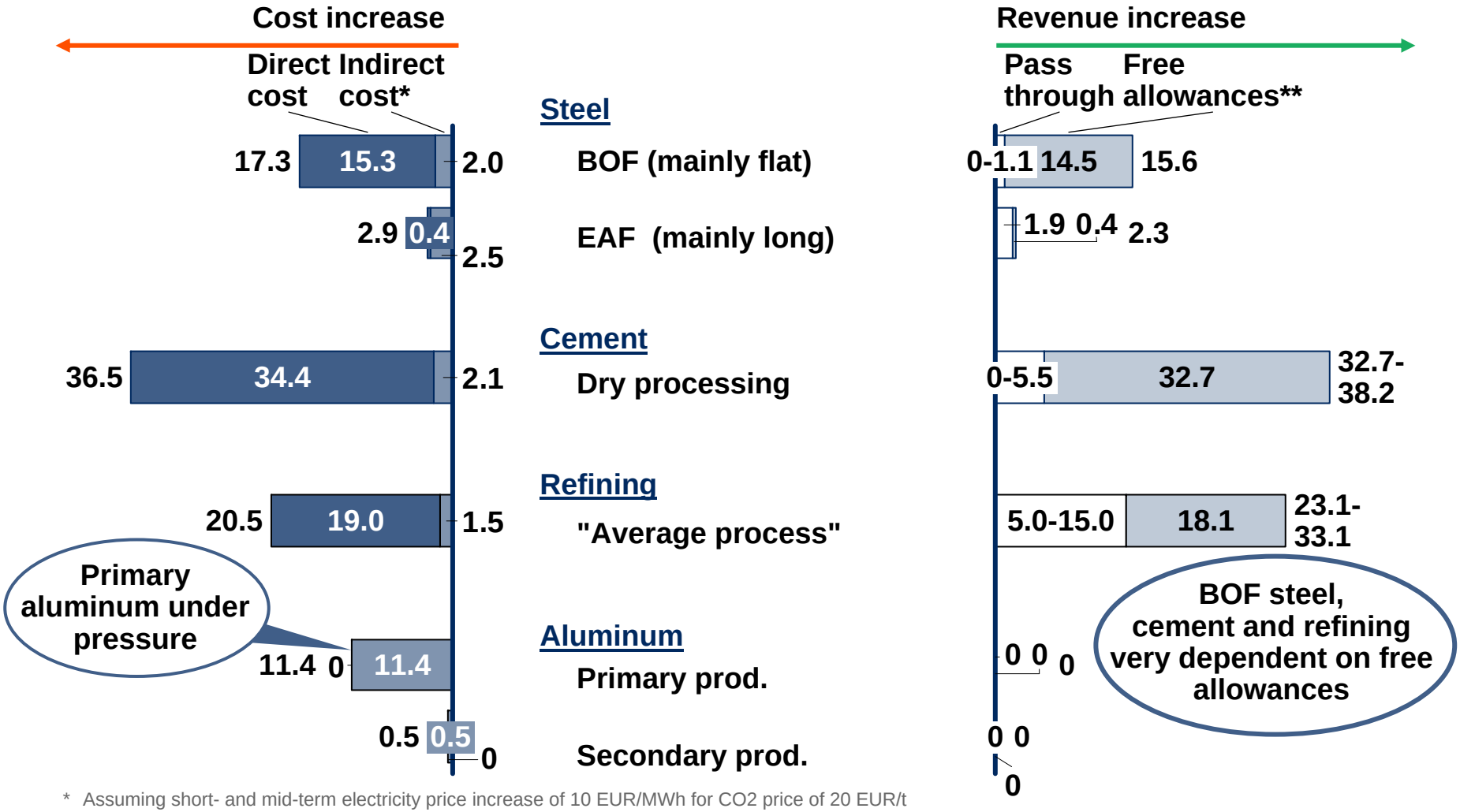
* Joint Implementation/Clean Development Mechanism

Source: Press clippings; New Energy Finance

Impact on business model – Changes in cost structure of affect companies

Average short- and mid-term impact of EU ETS on other industry sectors

Percent of total costs



* Assuming short- and mid-term electricity price increase of 10 EUR/MWh for CO2 price of 20 EUR/t

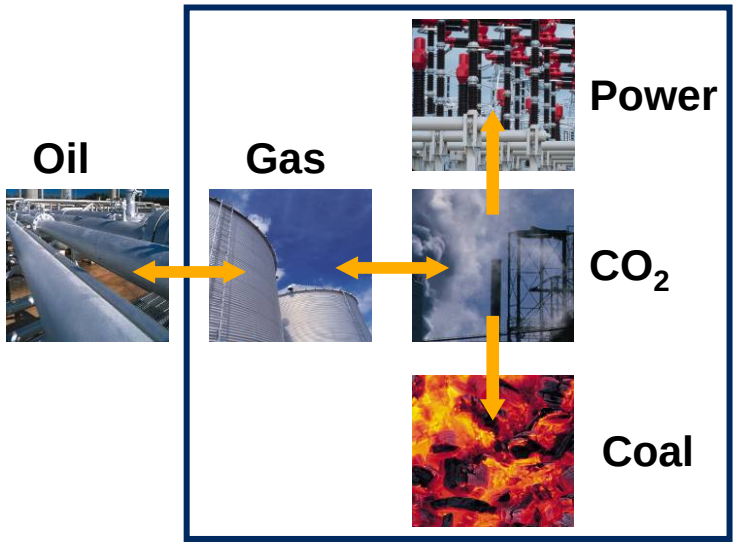
** At 95% free allocation relative to desired amount

Source: Team analysis

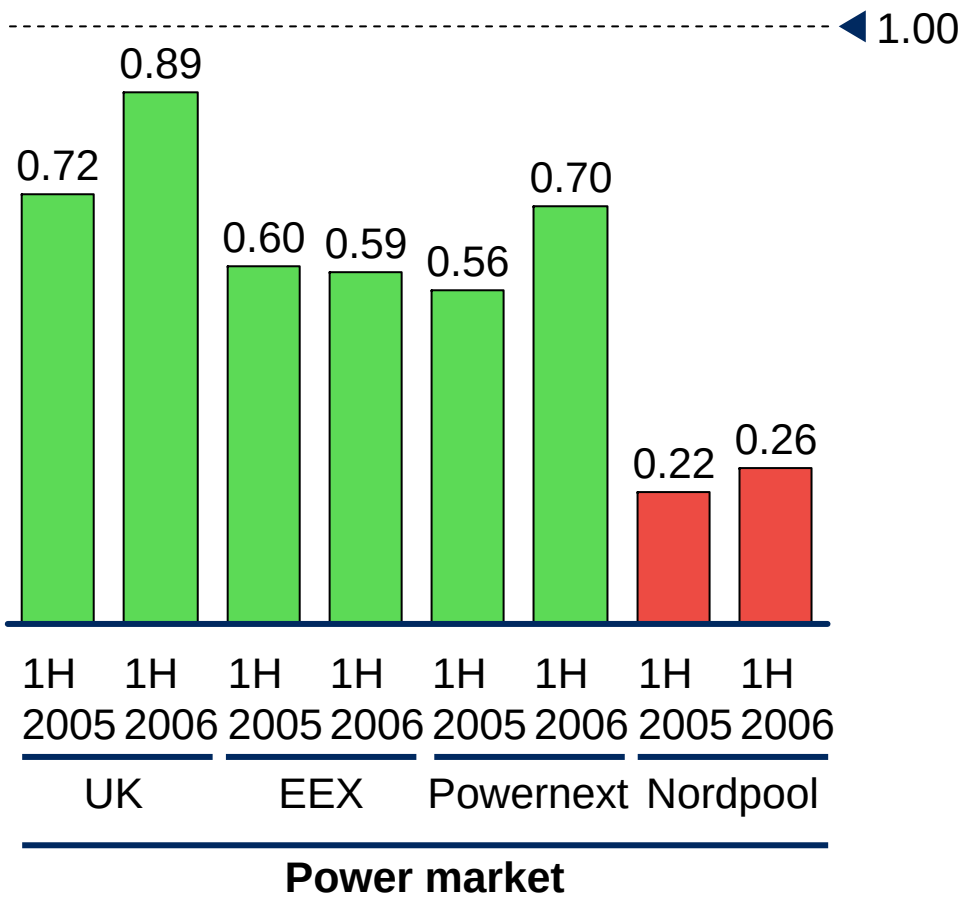
Impact on business model – Gas and power markets converging due to introduction of emission trading

Fundamental changes in European power due to emission trading

- Before 2005 linkages and correlations between most commodity markets were weak
- Due to emission trading, power, gas, and coal markets get linked and markets are converging

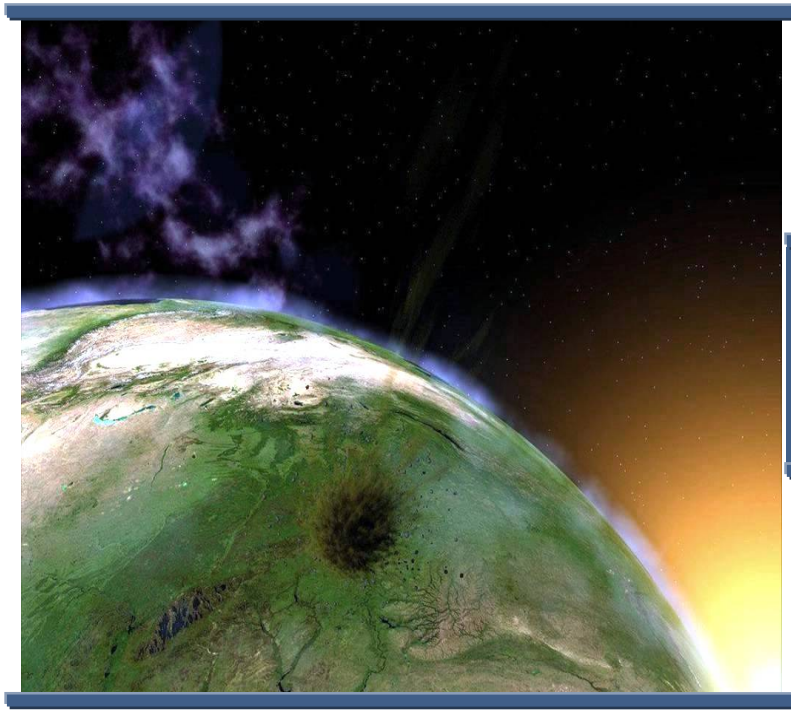


Correlation of power and gas – base load power vs. gas NBP, UK



Source: Exchanges, McKinsey

Today's discussion



Why is climate action important from a business perspective?

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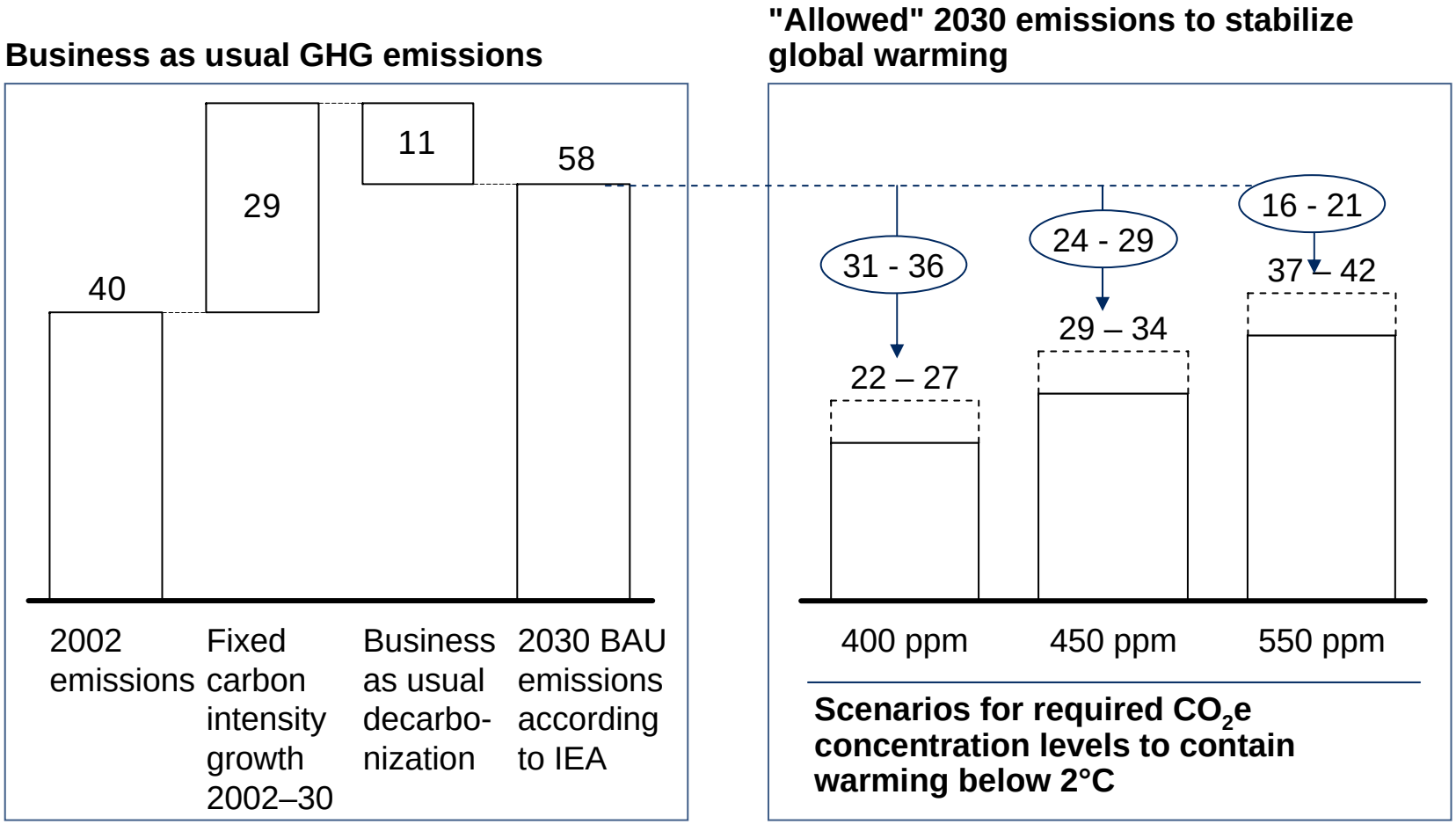
Abatement demand as a consequence of political targets

CO2e emissions per year

Gton

Abatement required beyond business as usual 2030, Gton



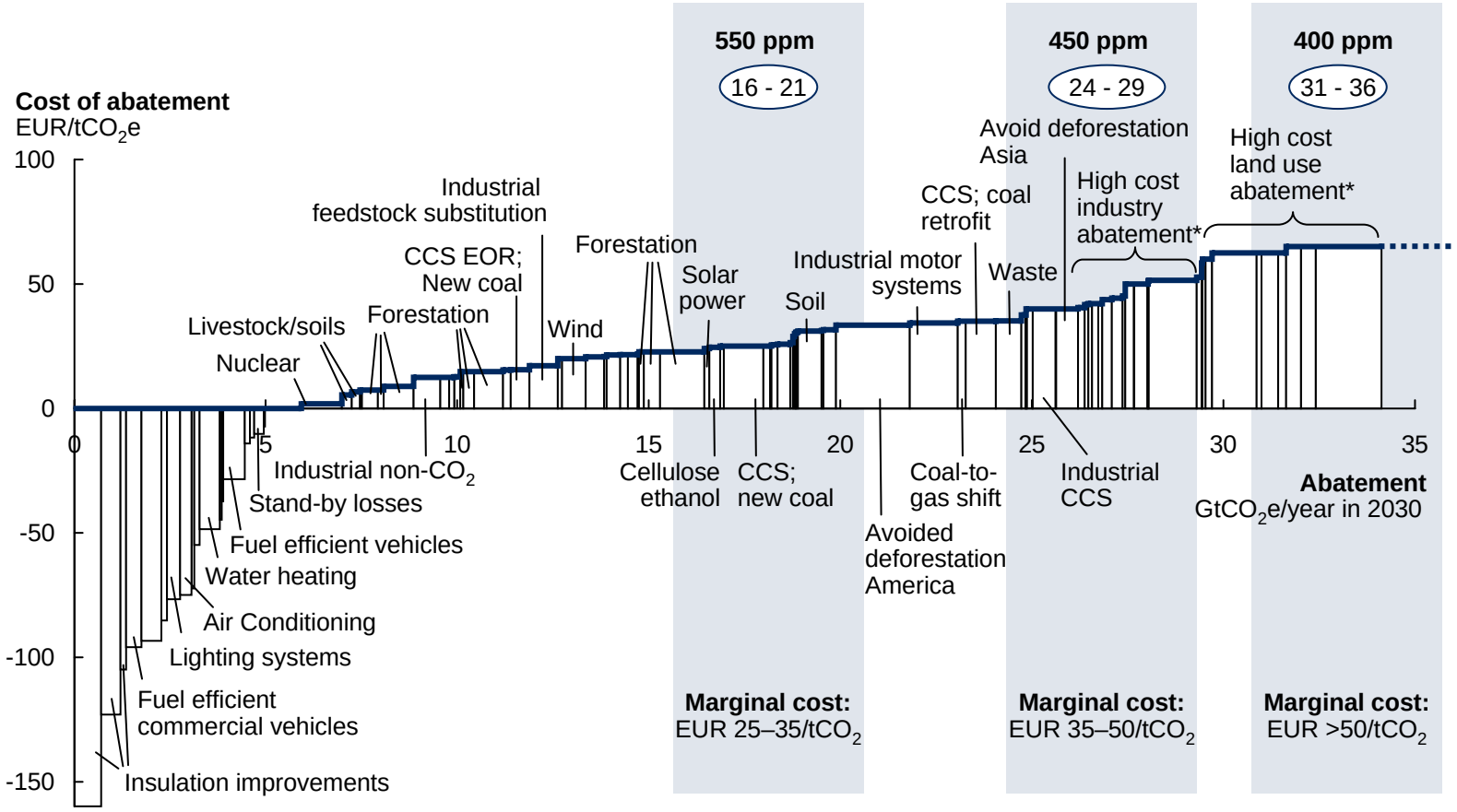
Requirement corresponds to doubling-tripling in the rate of CO_2 productivity, from 1.4% to >3% per year

Source: Team analysis

Marginal abatement supply and cost in the different scenarios*

X–Y Abatement required beyond business as usual 2030, Gton

2030



- **Technically possible to achieve 400 - 550 ppm stabilization paths only addressing measures below EUR 40–50/tCO_2e**
- **However, politically very challenging, due to fragmentation of opportunities across sectors and regions**

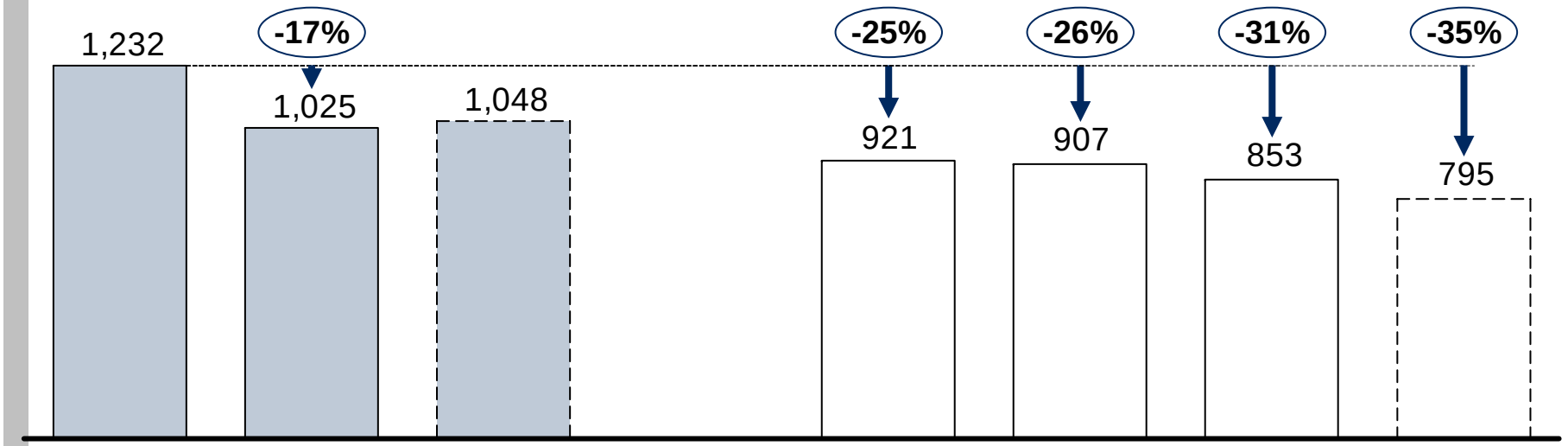
* Assuming opportunities are addressed in order of increasing cost

Source: Team analysis

Abatement potential – Germany 2020*

DECISION-MAKER PERSPECTIVE

Mt CO2e



Base year	2004	"State of the art techno-logy" pro-jection 2020	After implemen-tation of economic levers	Plus implemen-tation of levers @ EUR 0 - 20/ t CO_2e	Plus change in energy mix (ø EUR 64/ t CO_2e***)	Plus implemen-tation of all other levers (ø EUR 430/ t CO_2e
Abatement potential compared to "State of the art technology" projection 2020			**127**	**14**	**54****	**58**

* Maintaining nuclear phase-out

** Including 6 Mt CO2e from CCS pilot projects in power generation

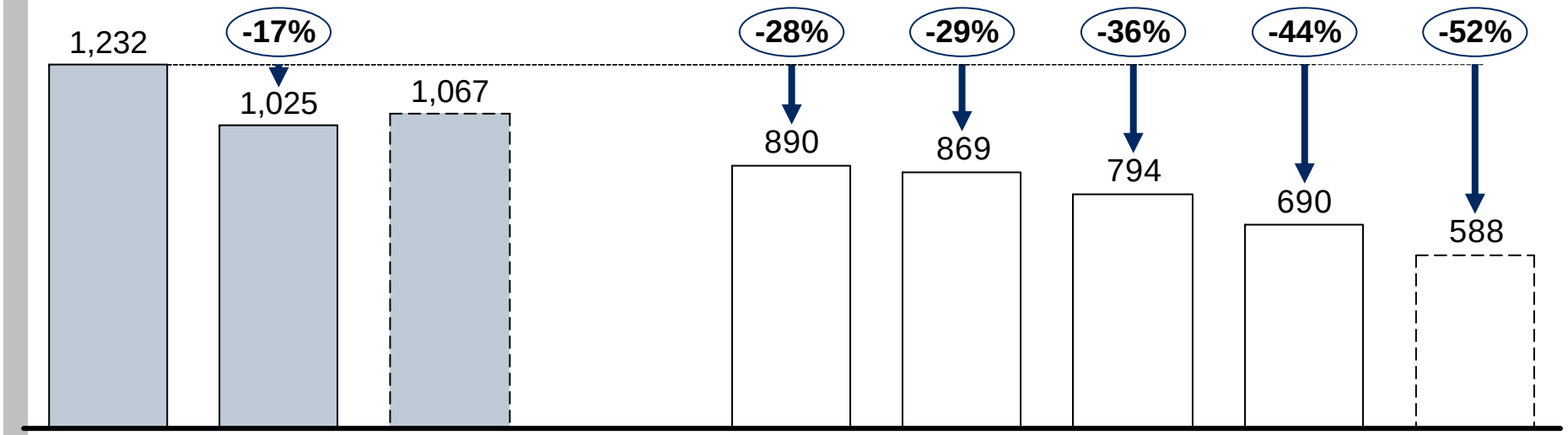
*** Power generation: ø EUR 32/t CO2e; biofuels: ø EUR 175/t CO2e; both considering the applicable subsidy rates in each case, taxes, and customs

Source: Report "Kosten und Potenziale der Vermeidung von Treibhaushasemissionen in Deutschland" by McKinsey & Company, Inc. on behalf of "BDI initiativ – Wirtschaft für Klimaschutz"

Abatement potential – Germany 2030*

DECISION-MAKER PERSPECTIVE

Mt CO2e



Abatement potential compared to "State of the art technology" projection 2030

177	21	75	104	102

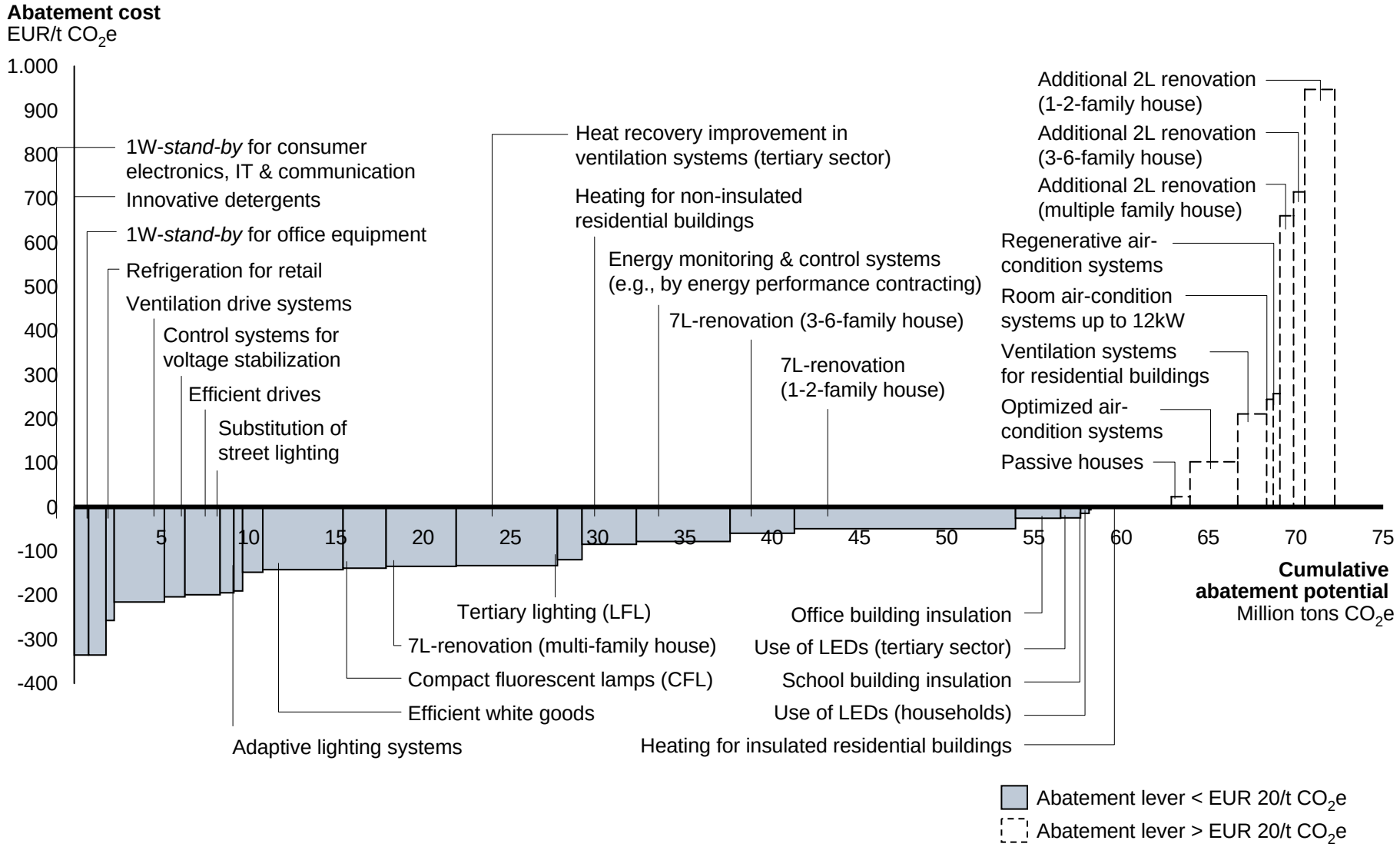
* Maintaining nuclear phase-out

** Power generation: ø EUR 31/t CO2e; biofuels: ø EUR 95/t CO2e; both considering the applicable subsidy rates in each case, taxes, and custom

Source: Report "Kosten und Potenziale der Vermeidung von Treibhaushasemissionen in Deutschland" by McKinsey & Company, Inc. on behalf of "BDI initiativ – Wirtschaft für Klimaschutz"

Buildings sector: Abatement cost curve – Germany 2020

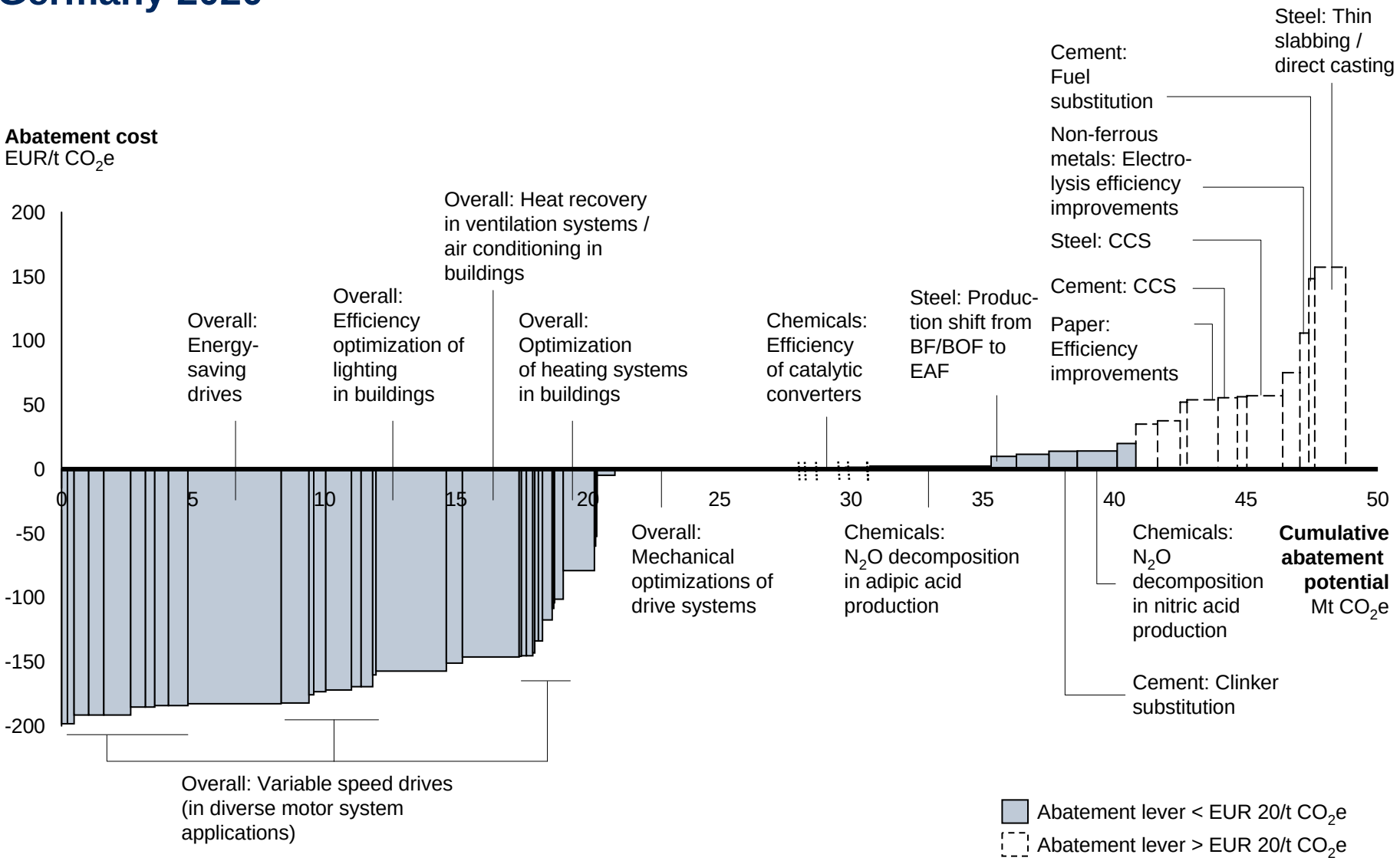
DECISION-MAKER PERSPECTIVE



Source: Report "Kosten und Potenziale der Vermeidung von Treibhausgasemissionen in Deutschland" by McKinsey & Company, Inc. on behalf of "BDI initiativ – Wirtschaft für Klimaschutz"

Industrial sector: Abatement cost curve – Germany 2020

DECISION-MAKER PERSPECTIVE

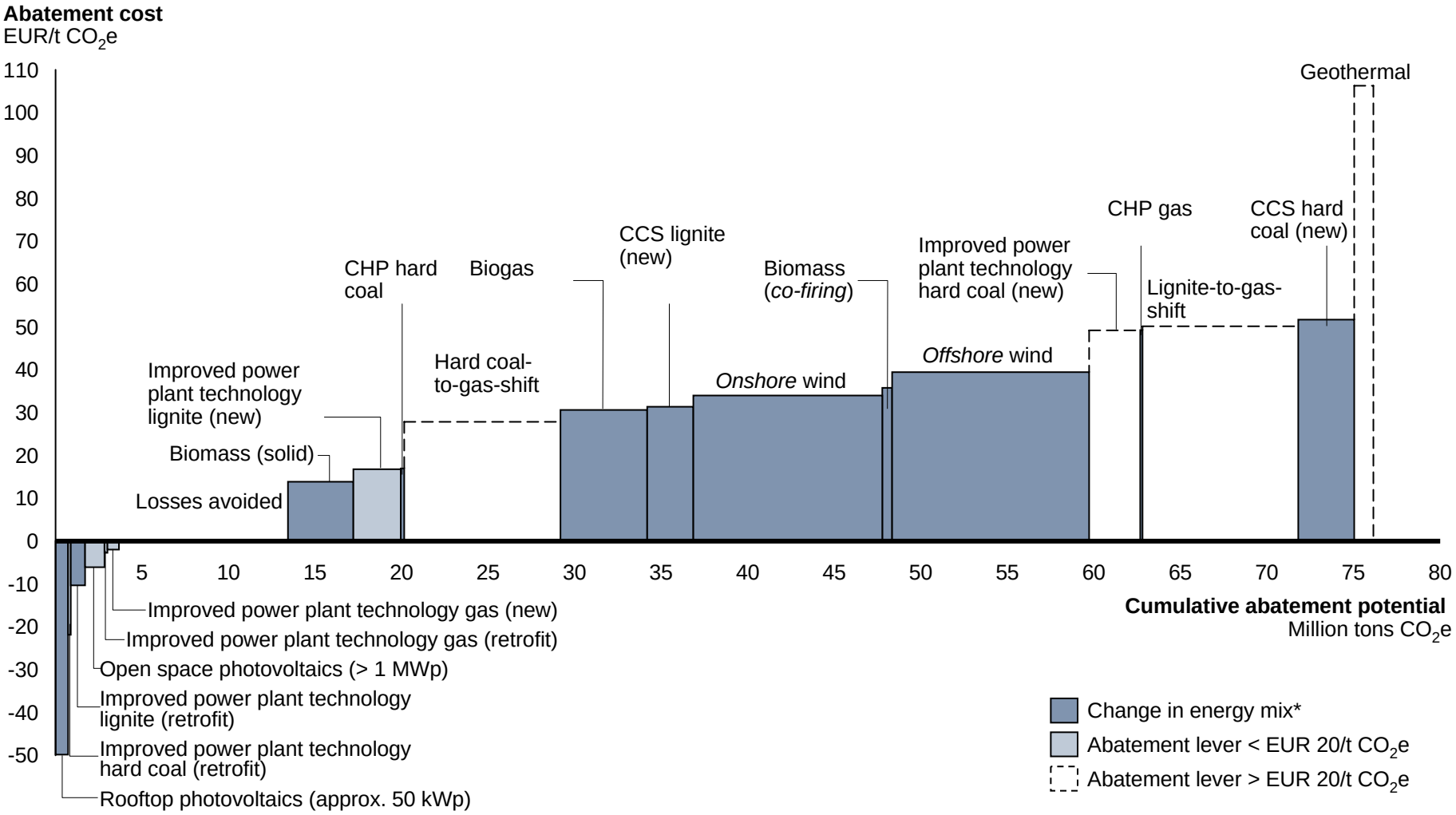


Source: Report "Kosten und Potenziale der Vermeidung von Treibhausgasemissionen in Deutschland" by McKinsey & Company, Inc. on behalf of "BDI initiativ – Wirtschaft für Klimaschutz"

Energy sector: Abatement cost curve – Germany 2020*

DECISION-MAKER PERSPECTIVE

BASIC SCENARIO 2020

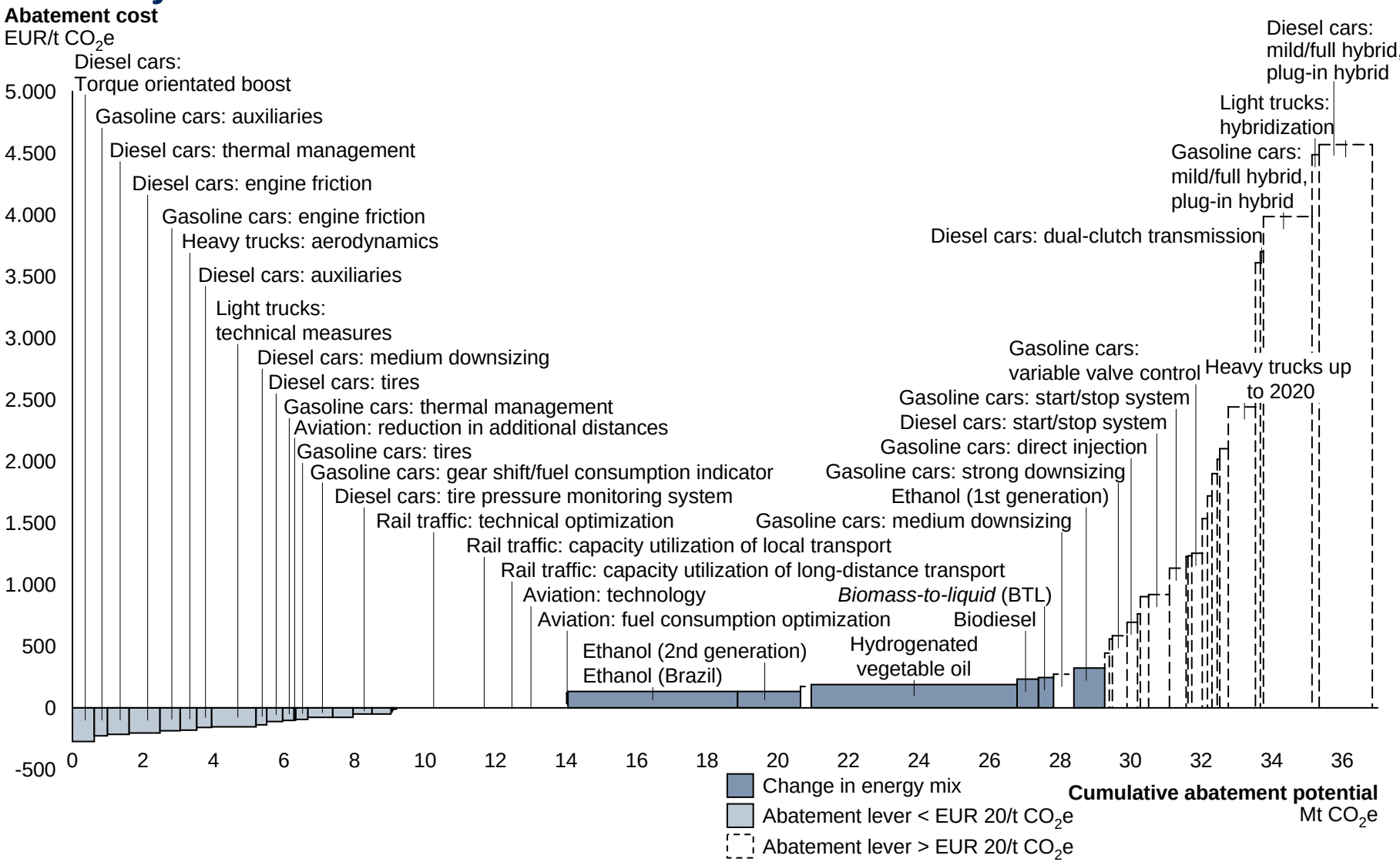


* Maintaining exit from nuclear power and considering promotion for renewable energies (EEG)

Source: Report "Kosten und Potenziale der Vermeidung von Treibhausgasemissionen in Deutschland" by McKinsey & Company, Inc. on behalf of "BDI initiativ – Wirtschaft für Klimaschutz"

Transport sector: Abatement cost curve – Germany 2020

DECISION-MAKER PERSPECTIVE

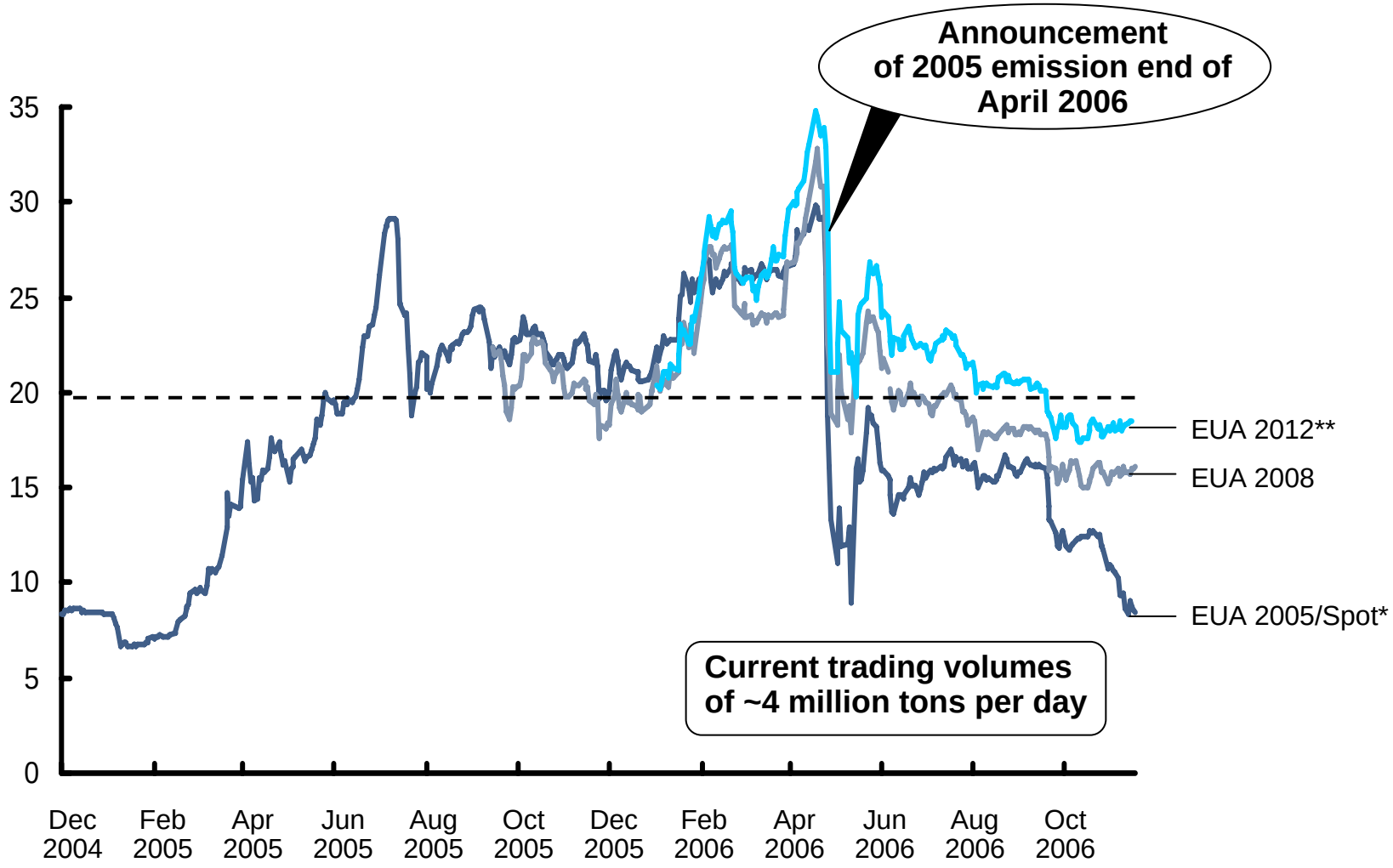


Source: Report "Kosten und Potenziale der Vermeidung von Treibhausgasemissionen in Deutschland" by McKinsey & Company, Inc. on behalf of "BDI initiativ – Wirtschaft für Klimaschutz"

Recent CO_2 prices in the order of 4 Euro/t for 2005 and 15 Euro/t for 2008

CO2 prices in EU ETS, OTC trades

EUR/t



* Spot since Sept 2005; before Sept 2005 forwards on EUA 2005

** EEX futures

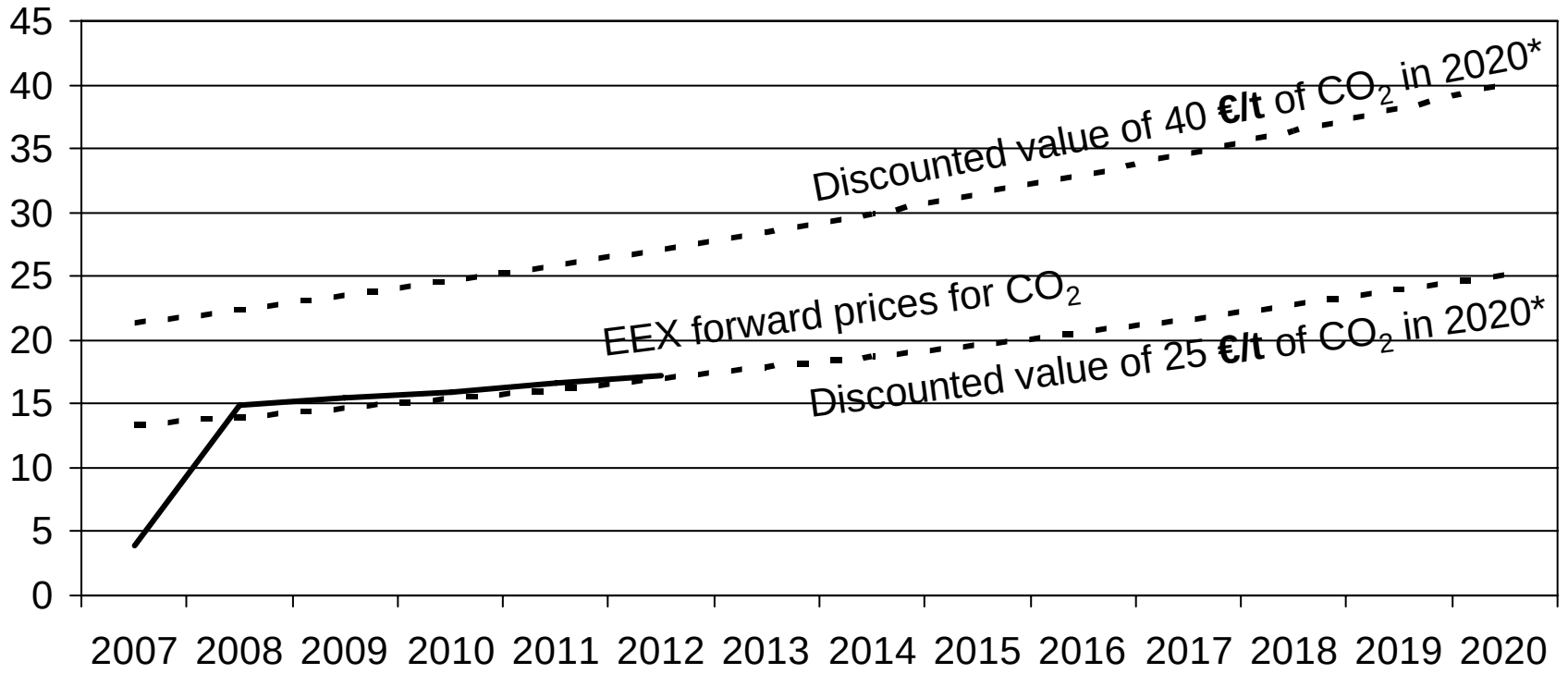
Source: PointCarbon, EEX

Current EEX forward price well in line with discounted future CCS costs because of banking opportunity from 2012 onwards

Discounted 2020 CCS costs of 25-40 €/t vs. forward prices

Euro/t of CO2

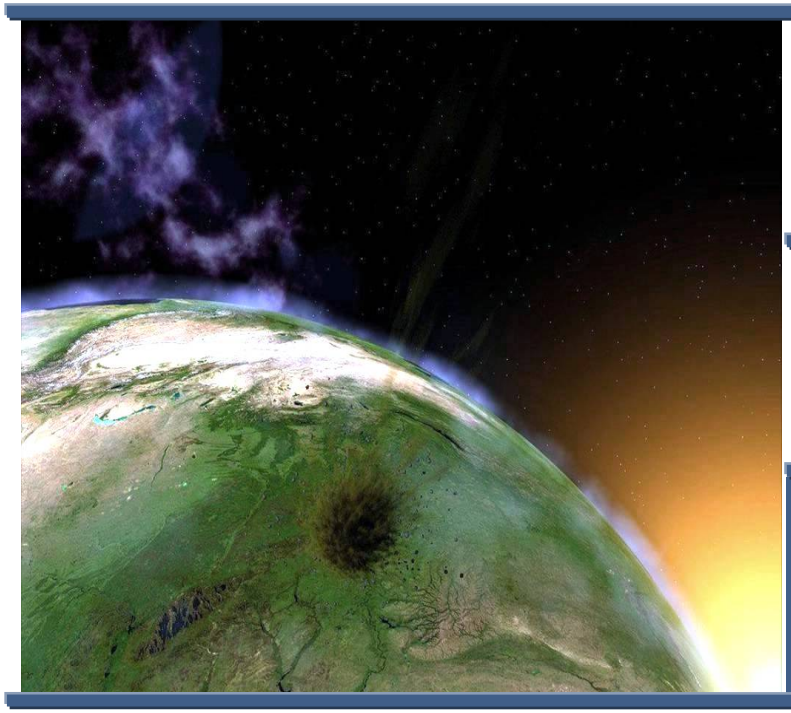
STATUS JAN 10, 2007



* Discounted at 5% p.a.; current implied discount rate at EEX until 2012 is 3.4% p.a. but long-term interest rates are higher

Source: McKinsey, EEX

Today's discussion



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The real challenges for Germany

Number of challenges to be adressed

Political challenges

- Target (political)
- Timing
- Technology post 2020
- Integration of concepts

Economic challenges

- Mitigating risk
- Seizing opportunities
- New business systems

Source: Team analysis