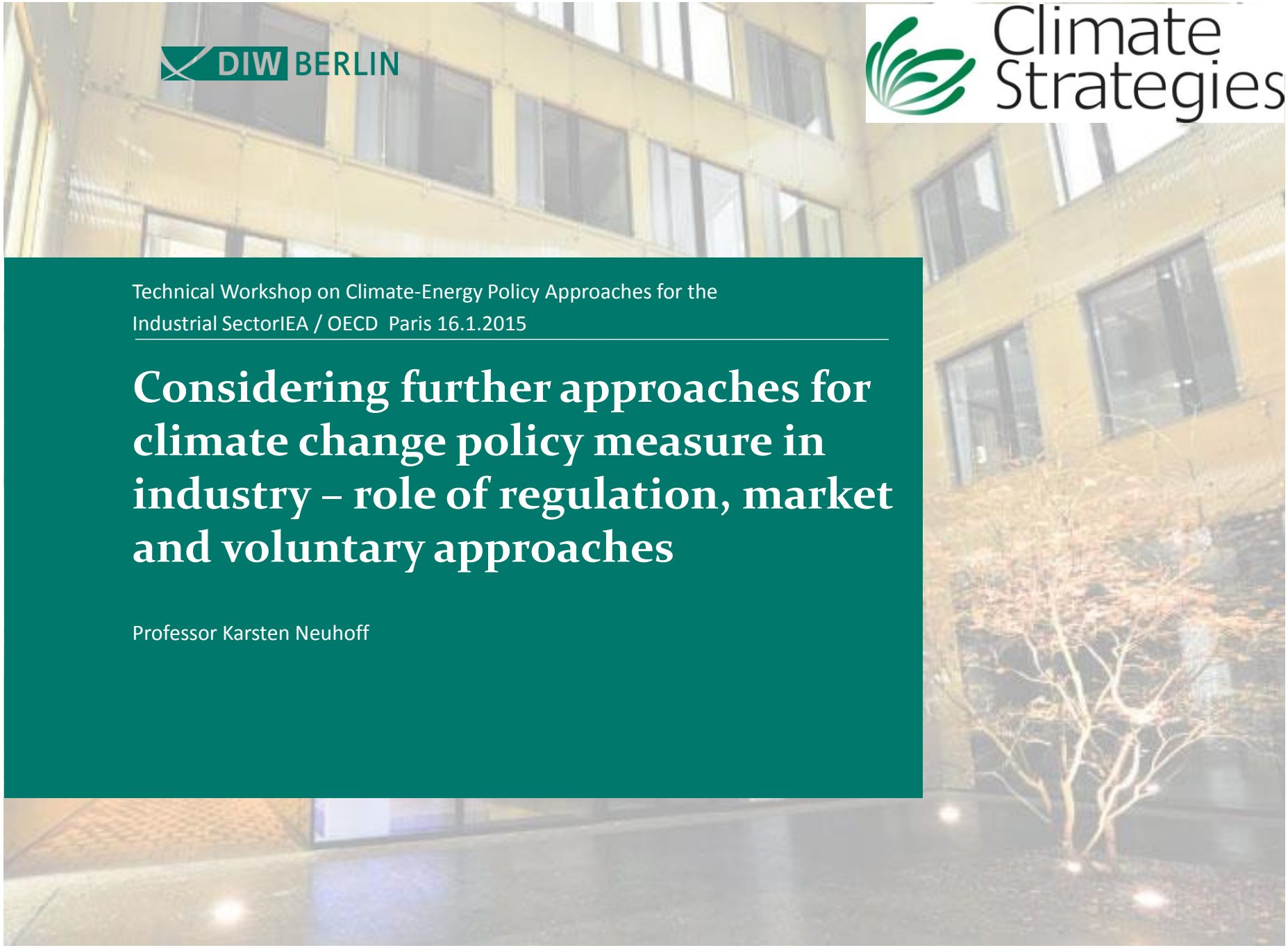
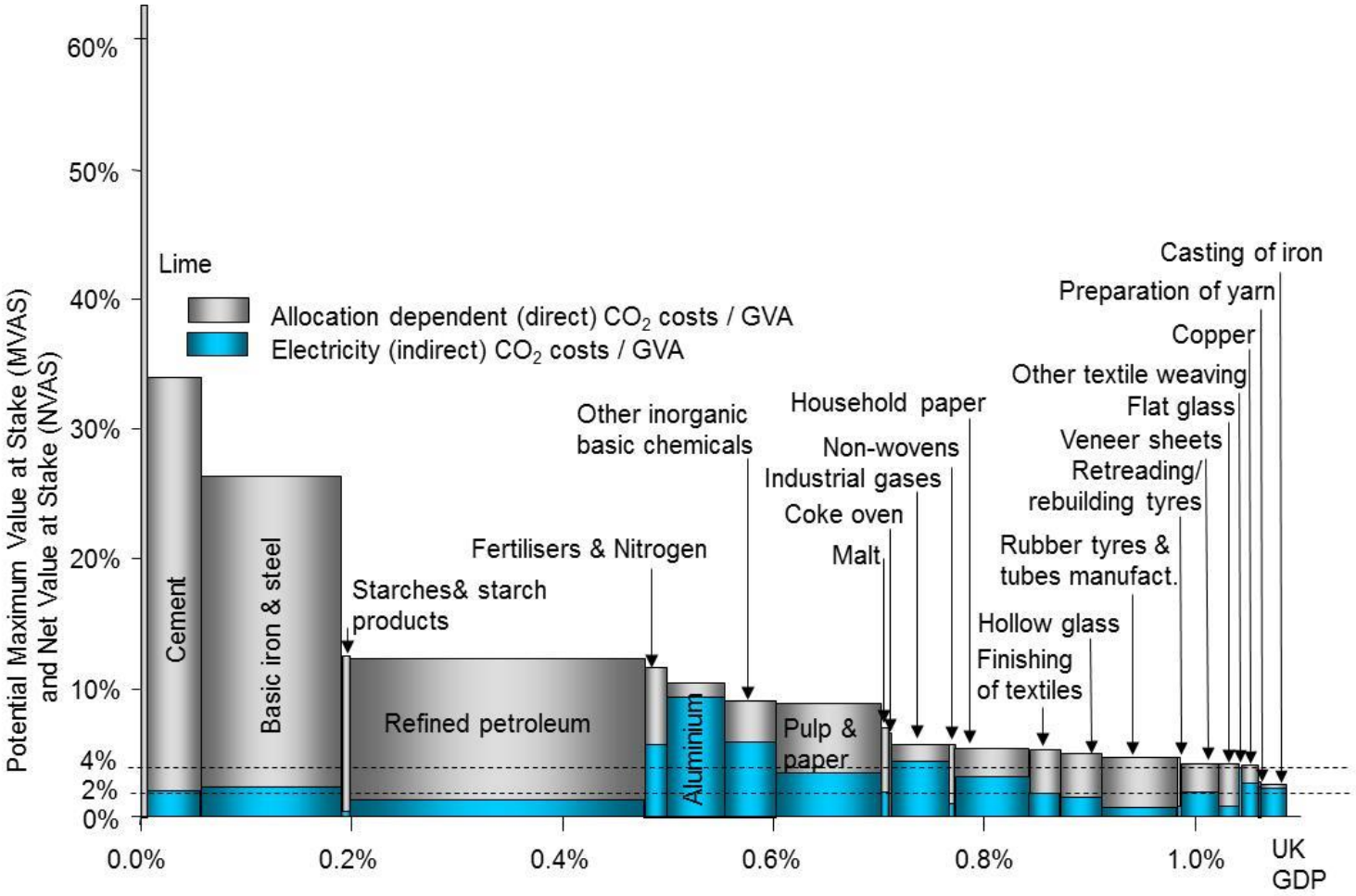


Technical Workshop on Climate-Energy Policy Approaches for the Industrial SectorIEA / OECD Paris 16.1.2015

Considering further approaches for climate change policy measure in industry – role of regulation, market and voluntary approaches

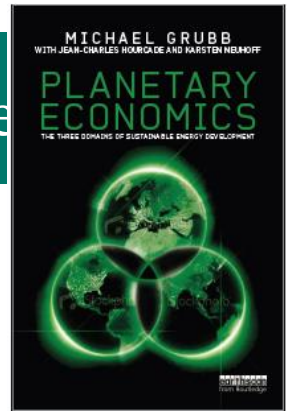
Professor Karsten Neuhoff

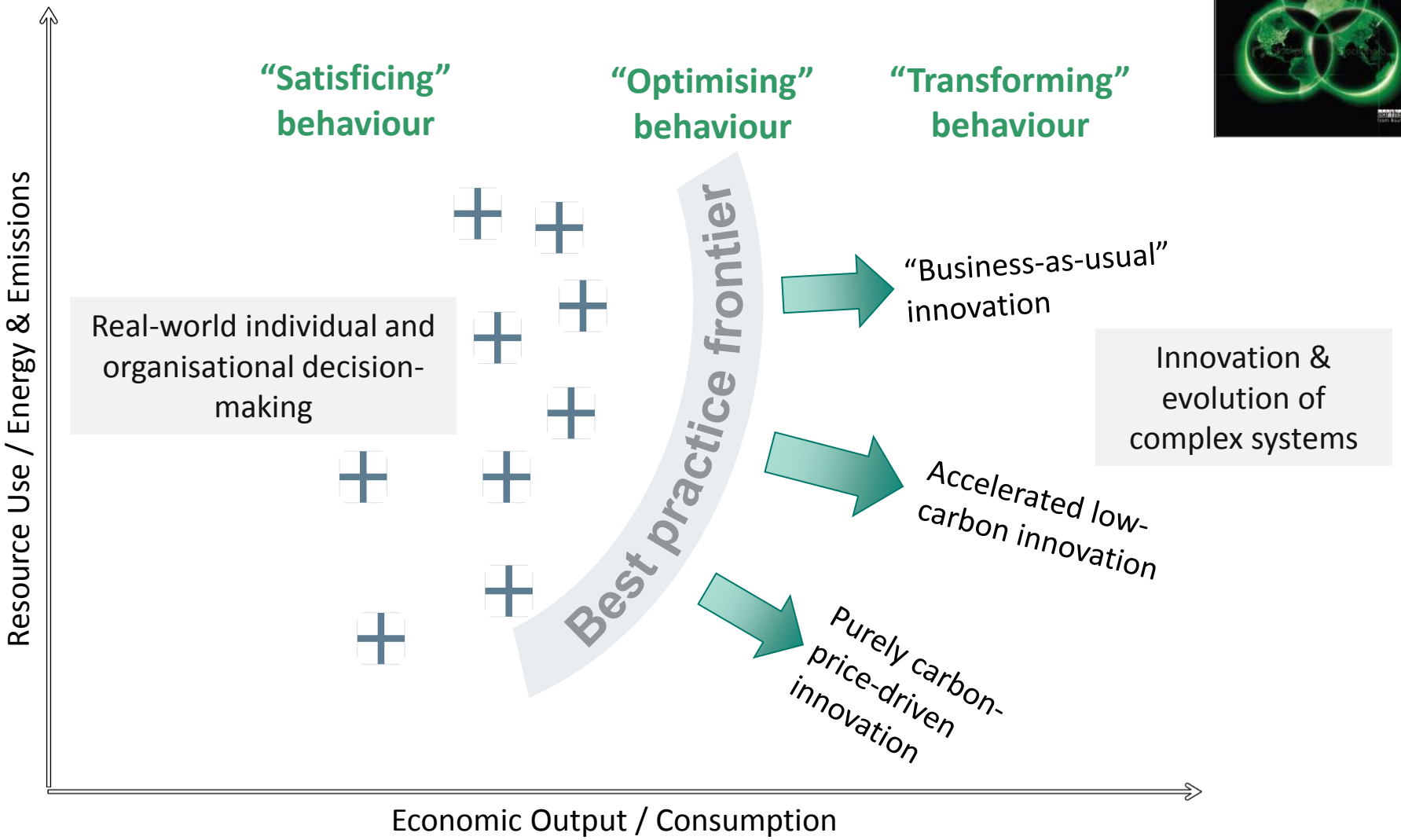
1 Sector specific discussion: Focus on few materials



Industrial activities with the highest cost increase from carbon pricing, and their contribution to UK GDP, assumed carbon price increase 20 €/t CO_2, electricity price increase 10 €/MWh.

2 Conceptual – building on three domains of policie

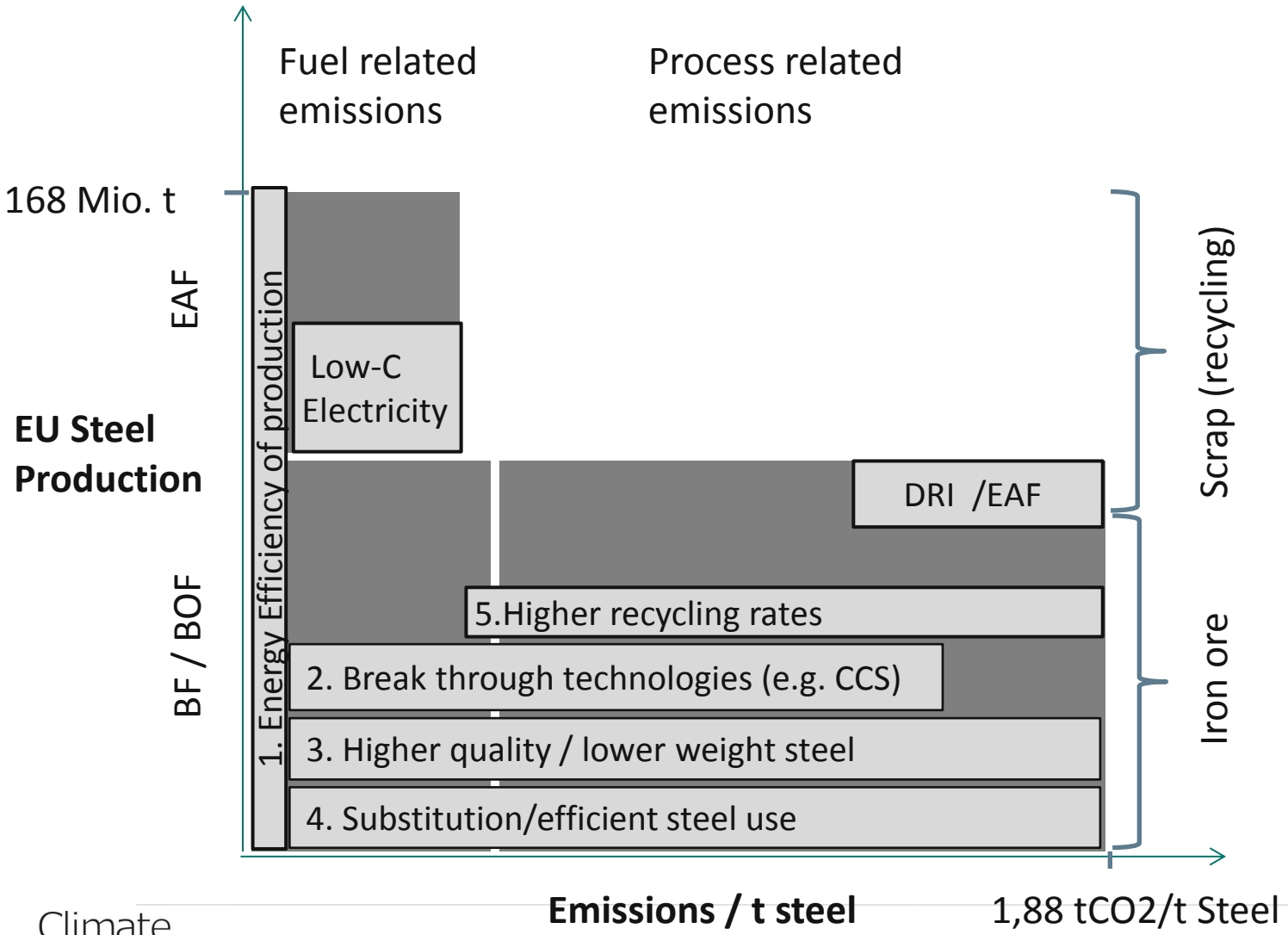




Source: Grubb, Hourcade & Neuhoff (2014): Planetary Economics, Energy, Climate Change and the three domains of sustainable development. *Routledge*.

3 CO_2 abatement opportunities in steel

Illustration



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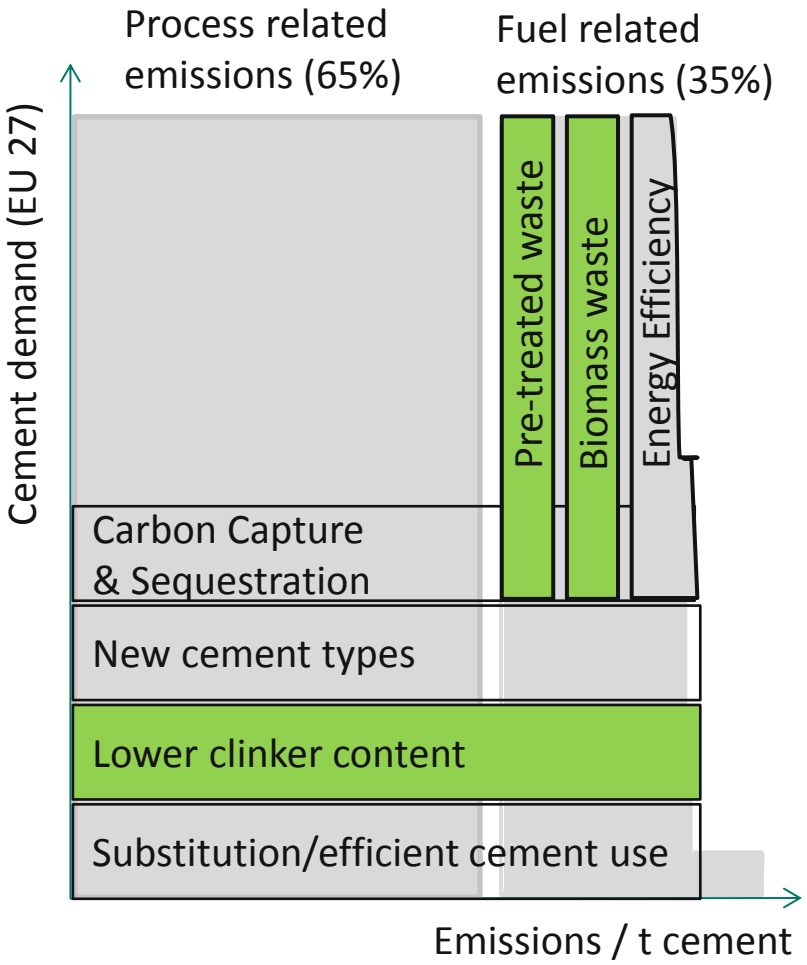
4 Policy requirements for investment in modernization

	Strengthening ETS	Carbon price along value chain	Engagement of all actors	Funding of technology innovation
Unlocking efficiency potential	x			
Business case for break-through technologies like CCS	x	x		x
Higher value steel products and efficient use	x	x	x	x
Increasing recycling rates			x	

5 CO2 abatement opportunities in cement

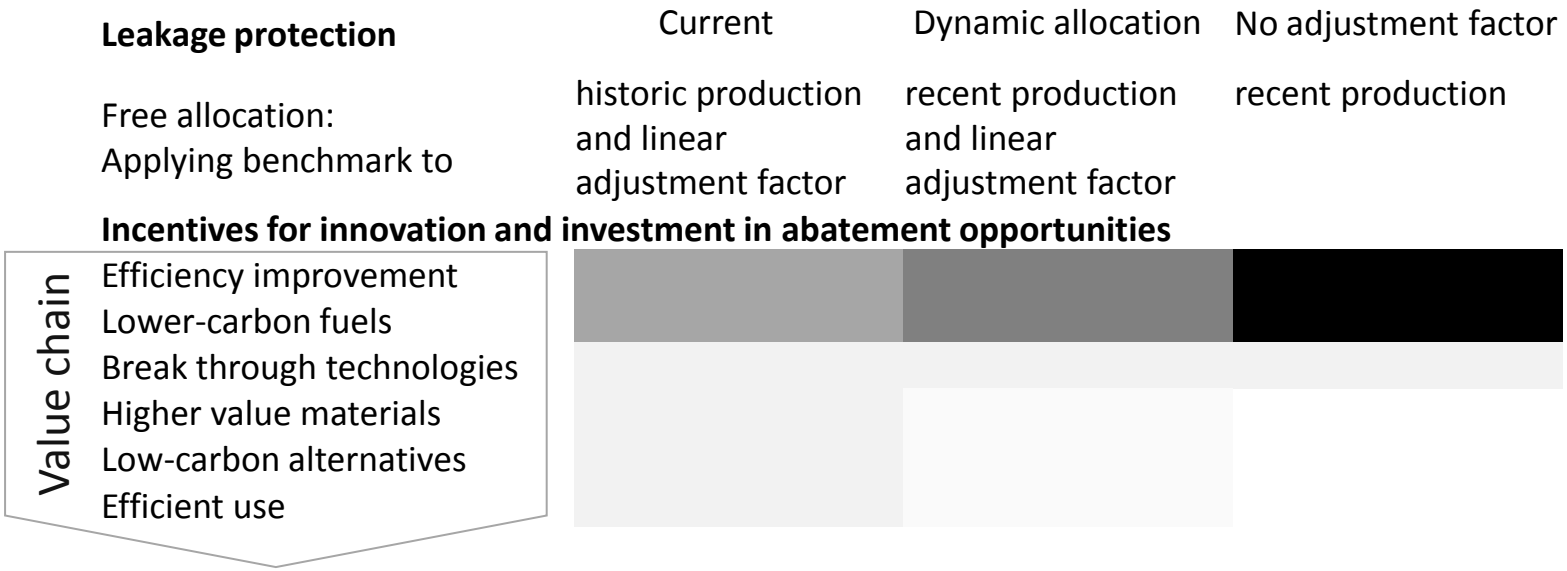


6 Policy requirements for investment in modernization

	Strengthening ETS	Carbon price along value chain	Engagement of all actors & regulation	Funding of technology innovation
Biomass and fossil waste	x		x	
Unlocking efficiency potential	x			
Clinker substitution	X	x	x	
Business case for break-through technologies like CCS	x	x		x
Low-carbon cement and efficient use (building practices, etc.)	x	x	X	x

7 The challenge: ETS and carbon intensive commodities

- Opportunities for innovation and investment exist along the value chain
- But leakage protection with free allocation limts carbon price in value chain
- Thus ETS can only incentivice up-stream efficiency and fuel shift
- Reinforced with dynamic allocation or removal of linear adjustment factor
- Creating uncertainty about new policy for abatement in value chain.



2 The new idea: Inclusion of consumption in ETS

What:
- Charge levy with release of carbon intensive materials for domestic consumption
- Weight (e.g. tons of steel) * production benchmark * ETS allowance price
- Also covers materials in goods (e.g. steel in cars)

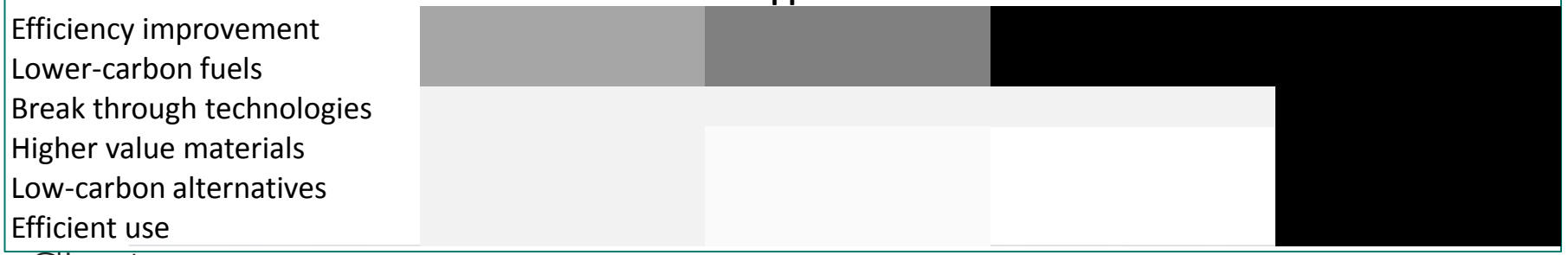
Why:
- Create incentives in value chain (e.g. to reduce clinker content in cement)
- Recover value of free upstream allocation to fund climate action

How:
- Replicate computerised system used for alcohol, tabbacco, energy
- Create liability with production per tone of steel (or other covered material)
- Acquire liability with Import and acquit liability with export
- Pass liability with on-sale of steel (or good containing steel)
- Pay levy to national trust fund with steel (containing good) for EU consumption

3 The deal: Inclusion of consumption and full benchmark

- Full carbon price along value chain to incentivize abatement opportunities
  - implementation at consumption end avoids leakage concerns
- Long-term clarity on allocation at full benchmark level
  - With inclusion of consumption value of free allocation is recoverd
- Alignment of interests of different actors
  - Contributes long-term stability to support innovation and investment

Leakage protection	Current	Dynamic allocation	No adjustment factor	The Deal
Free allocation: Applying benchmark to	historic production and linear adjustment factor	recent production and linear adjustment factor	recent production	recent production and inclusion of consumption
Incentives for innovation and investment in abatement opportunities				
Efficiency improvement				
Lower-carbon fuels				
Break through technologies				
Higher value materials				
Low-carbon alternatives				
Efficient use				



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Analysis based on the following work available at www.climatestrategies.org:

Carbon Control and Competitiveness Post 2020: Cement Report

Karsten Neuhoff, Arjan van Rooij, Misato Sato, Oliver Sartor , Manuel Haussner, Andrzej Ancygier, Ian Christmas, Anne Schopp, William Acworth Phlilippe Quirion, Ayse Tugba Atasoy, Bruno Vanderborght , Benedikt Mack, Nagore Sabio, Jean-Pierre Ponssard

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