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Inclusion of Consumption in Emission Trading

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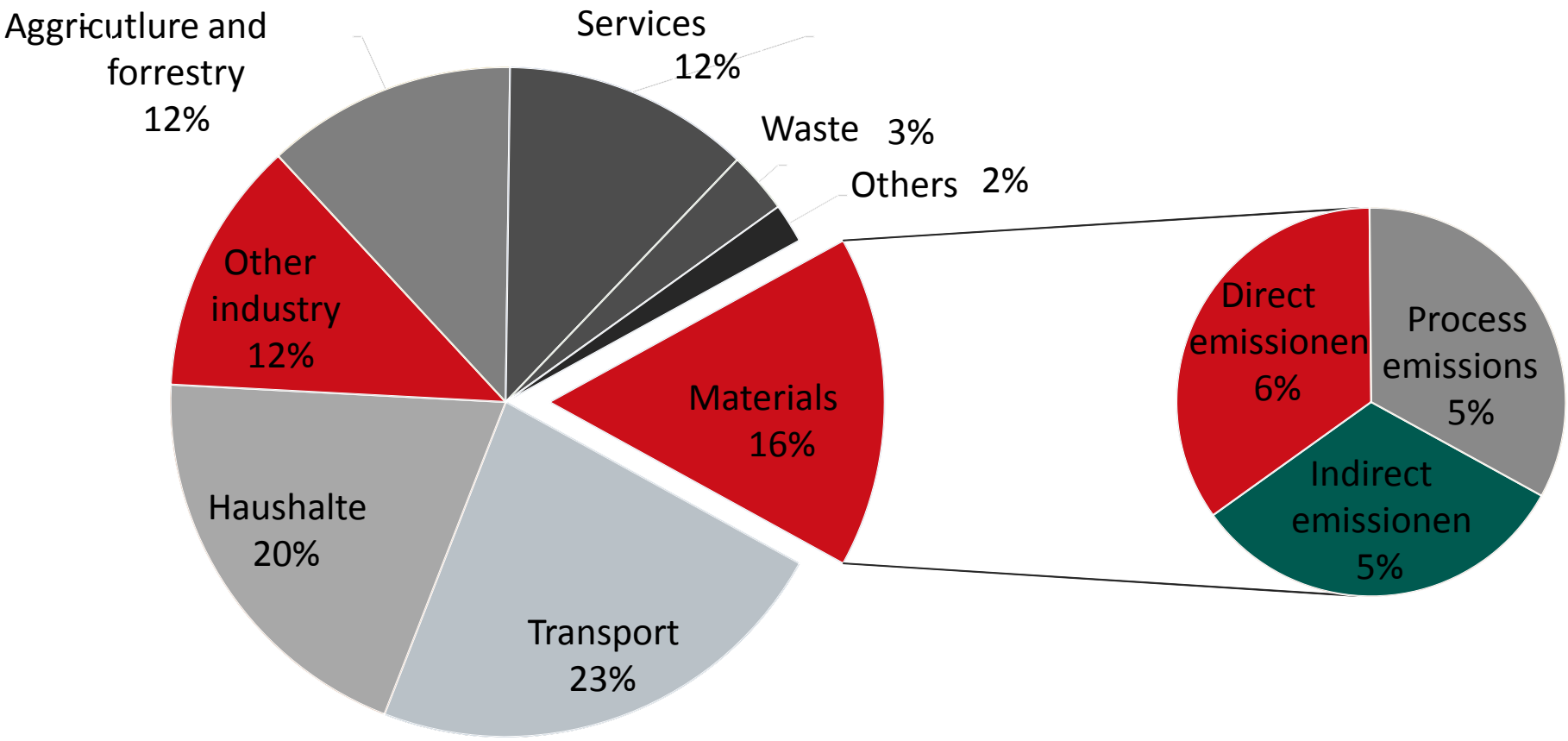
Based on Work in the Climate Strategies Project with Roland Ismer – University Erlangen-Nürnberg, William Acworth – Adelphi, Andrzej Ancygier – Hertie School of Governance, Manuel Haußner – University Erlangen-Nürnberg, Carolyn Fischer – Resources for the Future and FEEM, Hanna-Liisa Kangas – Finnish Environment Institute, Yong-Gun Kim – Korean Environment Institute, Clayton Munnings – Resources for the Future, Anne Owen – Leeds University, Stephan Pauliuk – University Freiburg, Oliver Sartor – Institute for Sustainable Development and International Relations, Misato Sato – London School of Economics and Political Sciences, Thomas Sterner – University of Gothenburg, Jan Stede – DIW Berlin, Richard Wood – Norwegian University of Science and Technology, Zhang Xiliang – Tsinghua University, Lars Zetterberg – Swedish Environmental Research Institute, Vera Zipperer – DIW Berlin

1 Basic materials = 16% of EU green house gas emissions

Share of EU greenhousegas emissions

power sector emissions are attributed aas indirect emissions to electricity use



Quelle: Basierend auf Statistik der EEA für 2010, Zuordnung der indirekten Emissionen entsprechend UNFCCC 2010d

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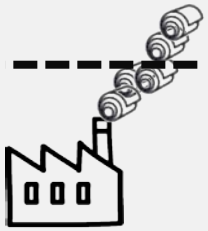
2 Carbon price not „active“ for most mitigation opportunities

Incentive for modernization/ emissions reductions	Role that carbon pricing can play:	Free allocation + Limited Price pass through
Fuel shifting and production efficiency	Savings with more efficient production	
Carbon focused process innovation	Extra Innovation funding	
	Long-term cost allocation	
Material efficiency and substitution	Savings with efficient / lower-carbon material use	

Incentive from: Upstream EU ETS

3 How does Inclusion of Consumption in EU ETS work?

Installation coverage for producitno of materials



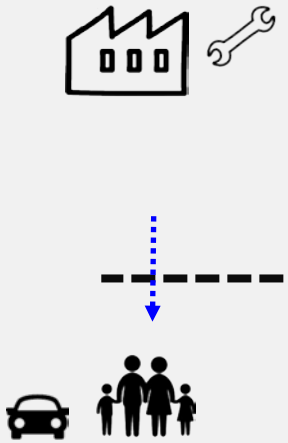
Liable for one allowance per tone of CO2 emitted

Free allowances allocation per tone of material produced at benchmark

Incentive for climate friendly material production and carbon leakage protection

Consumers contribute to carbon cost: Essential for viabiliy of technologies with incremental cost

Consumption charge for use of materials use



Charge for material in final product sold to European consumer (benchmark * weight * EU ETS price)

- Irrespective of material/product origin
- Irrespective of material production process

Incentives for efficient material use and substitution: Saves European consumers the consumption charge

http://climatestrategies.org/projects/inclusion-of-consumption-in-emissions-trading/

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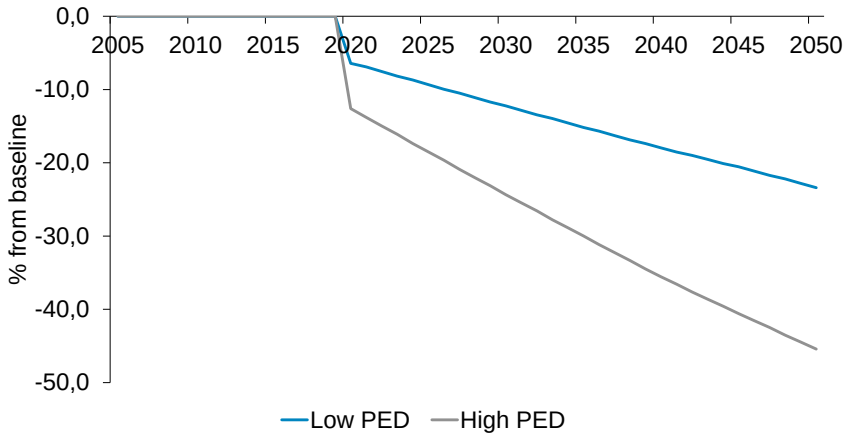
4 Economic assessment of Inclusion of Consumption in EU ETS

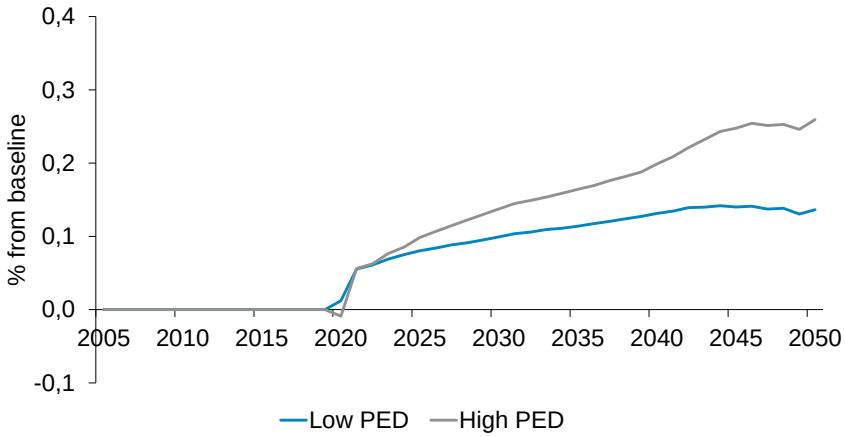
- Base line: 2015 World Energy Outlook current policies
- EU detailed in line with PRIMES (EC 2013)
- CO2 price increasing 2020 to 2050 from 20€ to 80€/t
- Demand elasticity basic materials assumed: LPED -0,5 und HPED -1
- Interaction with process innovation not simulated

Carbon-CAP
Consumption-based Accounting and Policy

CO_2 emissions metals and non metals



GDP



Corresponds to 10% of EU Emissions

Results from Cambridge Econometrics as part if EU Projektes C-CAP.

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5 Finding from technical reports

What to learn from international experience (Japan, Korea, China, Australia)?

-> Engaging consumers can unlock unexpected potentials (Japan)

-> **Inclusion of power consumption established in Korea and China**

What is the legal basis?

-> IoC can be part of EU ETS Directive and deliver environmental objectives

-> IoC is consumption based and thus on good side of WTO law

What administrative approach can limit public and private costs?

-> small fraud risk because no pay-out and value only fraction of product price

-> simplified procedures possible, e.g. aggregate quarterly reporting

What can we learn from quantifying the impact across product categories?

-> focus on basic materials: steel, clinker, aluminum (plastics, pulp&paper)

-> de-minimis rules possible, excluding e.g. 80% of imported products

6 Conclusion on Inclusion of Consumption of carbon intensive materials in EUETS

IoC restores carbon price signal to be effective for all mitigation opportunities

-> More mitigation opportunities can be realized at lower cost

IoC creates different administration requirements

-> Fraud risk is limited, allowing for simplified administrative procedures

Effective carbon price provides clarity for strategic choices of companies

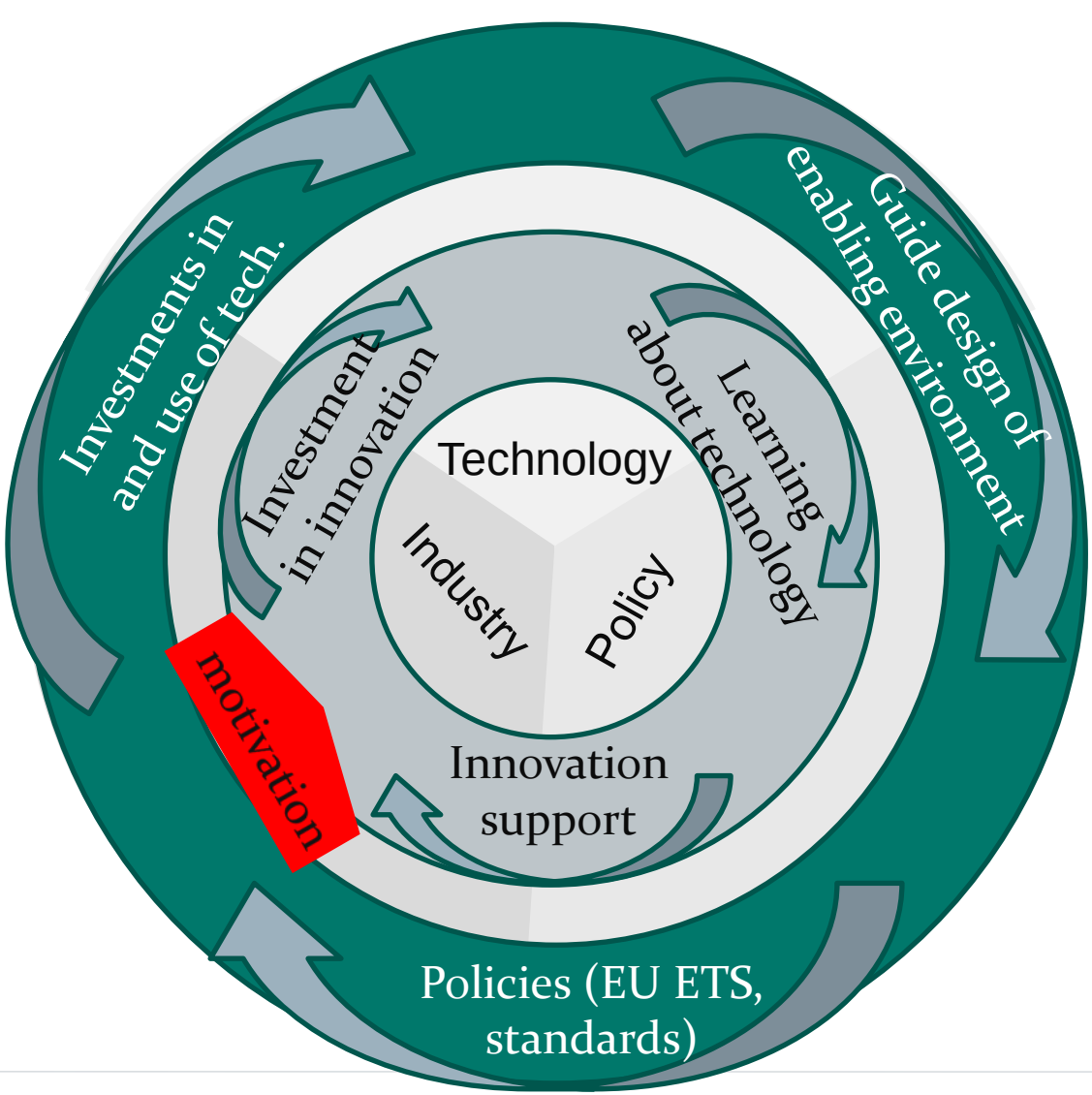
-> EU ETS becomes more effective in supporting innovation and investment

IoC builds on international experience and avoids lock-in with national systems

-> Once carbon prices converge, free allocation with IoC can be easily abandoned

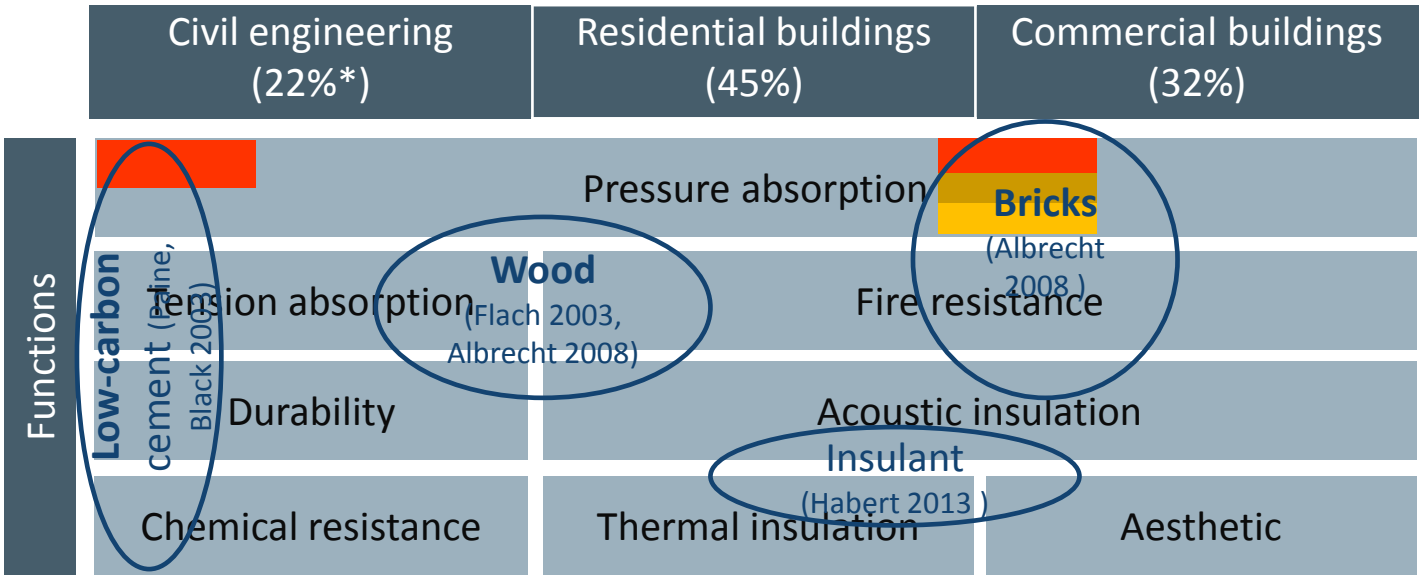
IoC can make carbon pricing effective for the materials sector

Link policies for innovation and use of climate friendly materials



II Example: Efficient cement use & substitute building materials

- Top down estimate: 20% emission savings
  - Based on 40 €/t CO2 carbon price ~ 50% cement price increase
  - Price elasticity -0,5: Cour & Møllgaard (2002) -0.3; Roller & Steen (2006) -0.5 – 1.5; Jans & Rosenbaum (1997) -0.8; Ryan (2005) -3
- Bottom up illustration of opportunities



*Turnover shares based on European Cement Association

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Example: Development of alternatives to cement

Cement companies are moving cautiously on low-carbon cement options

New production techniques	Magnesium silicates rather than limestone	Calcium sulfo-aluminate belite binders	Dolomite rock	Geopolymer	Sialites	Belite-Calcium sulfoaluminate
Celitement (Schwenk/ KIT)	Novacim (UK) Calix TecEco	Calera				

Challenge:

- Customers are conservative and market does not demand alternatives
- Each alternative to cement will only meet some characteristics of cement
- Current cement is too cheap

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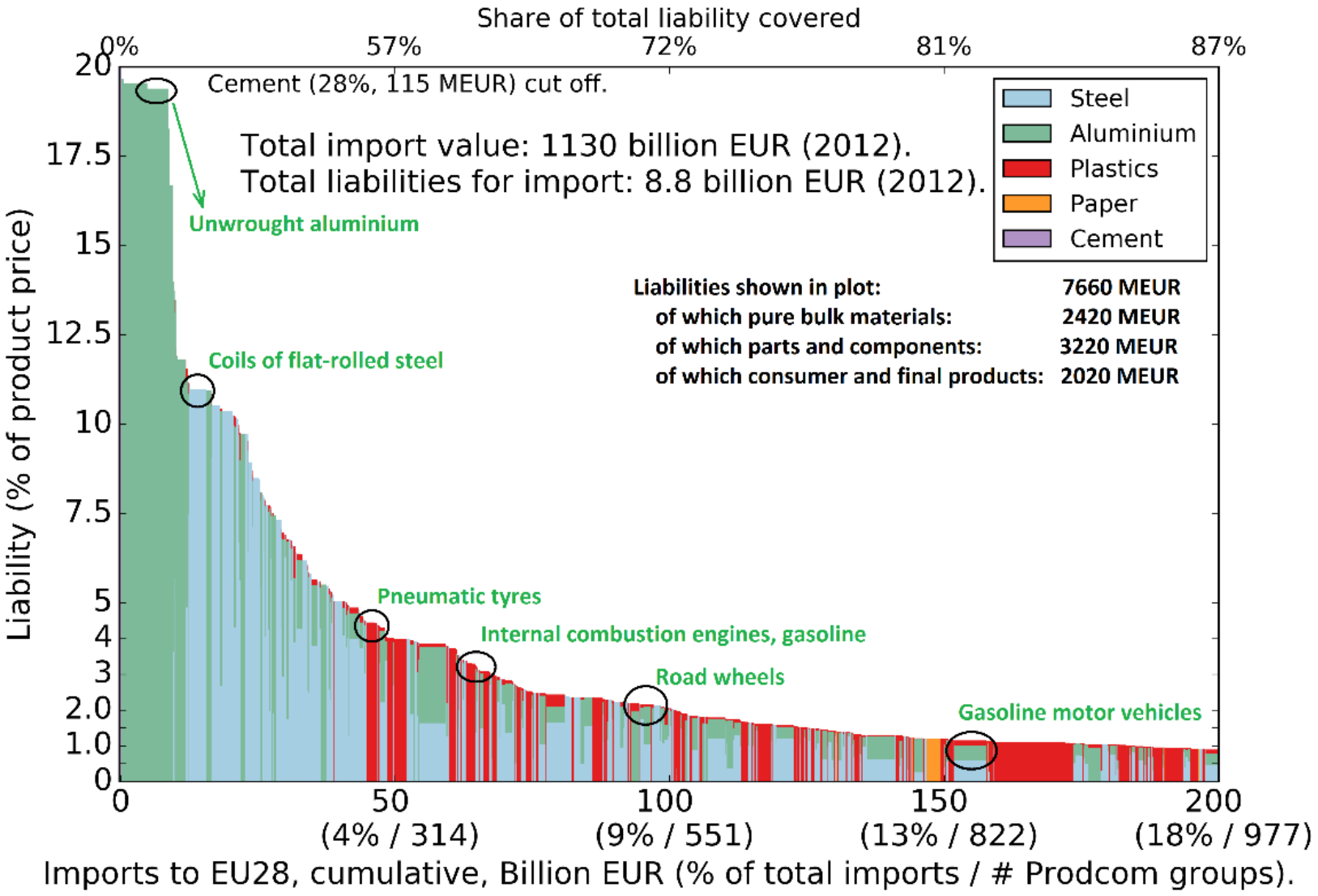
IV 1. Quantification of trade categories, value and carbon covered



Analysis by Stepfan Pauliuk, University of Freiburg

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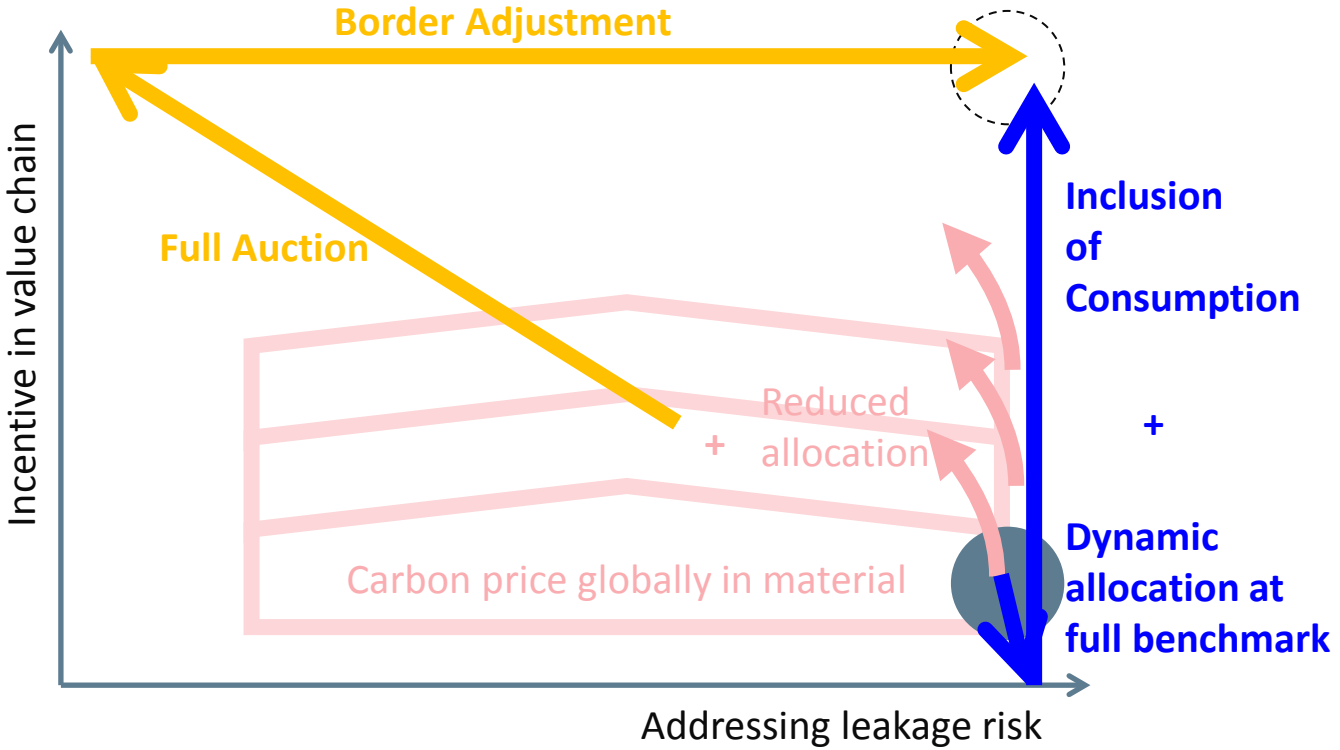
V Perspectives for carbon pricing in value chain

- Carbon focused process innovation
- Material efficiency and substitution



- Production efficiency and fuel shifting

Basic options for leakage protection in post Paris world of differentiated carbon prices:

1. Iterative increase of carbon price in traded materials with reduction of allocation
2. Full auctioning for incentives backed by Border Adjustment for leakage protection
3. Free allocation for leakage protection & Inclusion of Consumption for incentives

Success also requires carbon price level and innovation support (funding, procurement …)