eceee Industrial Efficiency, Berlin, September 12-14, 2016

Including consumption of bulk materials into the EU-ETS: A way to re-establish incentives for material efficiency and to avoid carbon leakage

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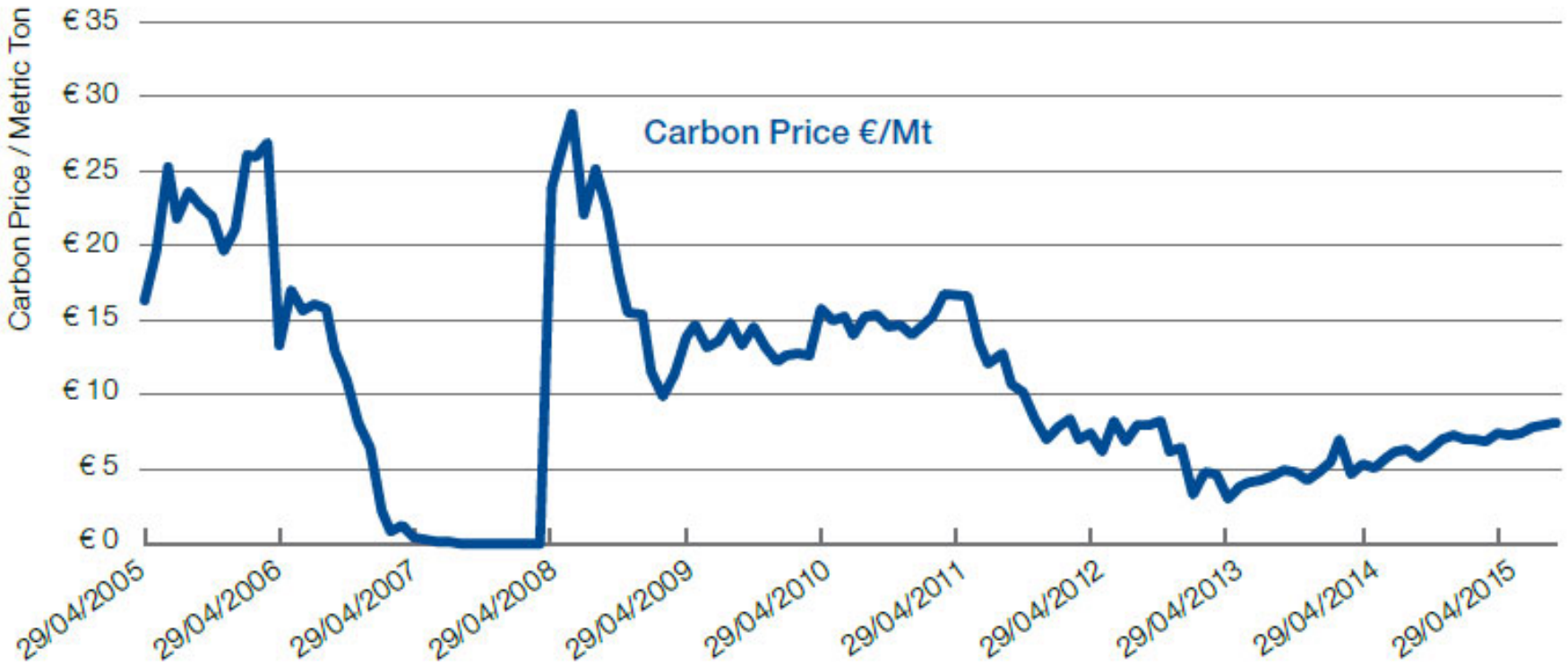
Carbon pricing options along th value chain

A consumption-based charge for material-intensive commod

Does the EU Emissions Trading System actually work?

Fig. 1: EU ETS, EUR price of carbon per metric ton



Common criticisms of the EU-ETS include:

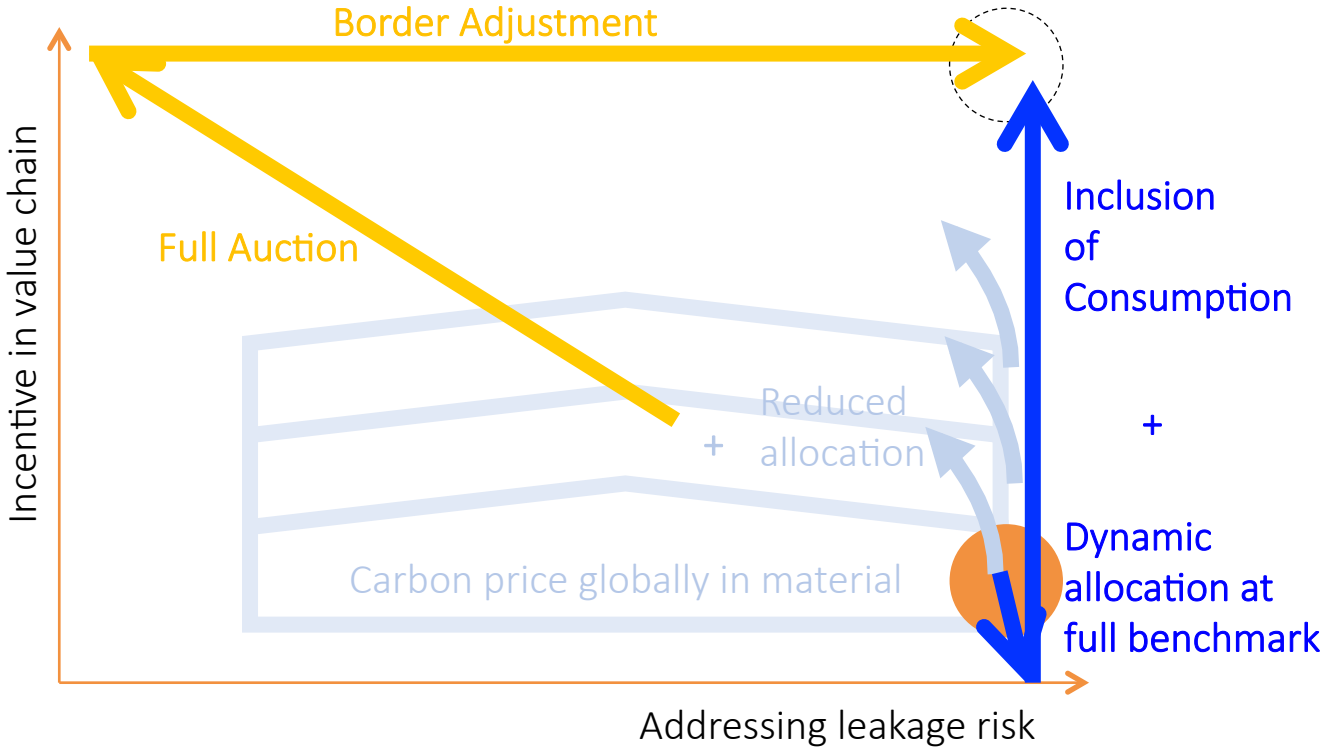
- Over-allocation of allowances, cap may be too high, thus voiding incentives for emissions reduction
- Free allocation and resulting windfall profits
- No coverage of imported products and materials

→ **The EU-ETS is continuously being improved!**

www.man.com/NO/why-cop21-could-solve-global-carbon-dilemma

Carbon pricing options along the value chain

- Carbon focused process innovation
- Material efficiency and substitution



- Production efficiency and fuel shifting

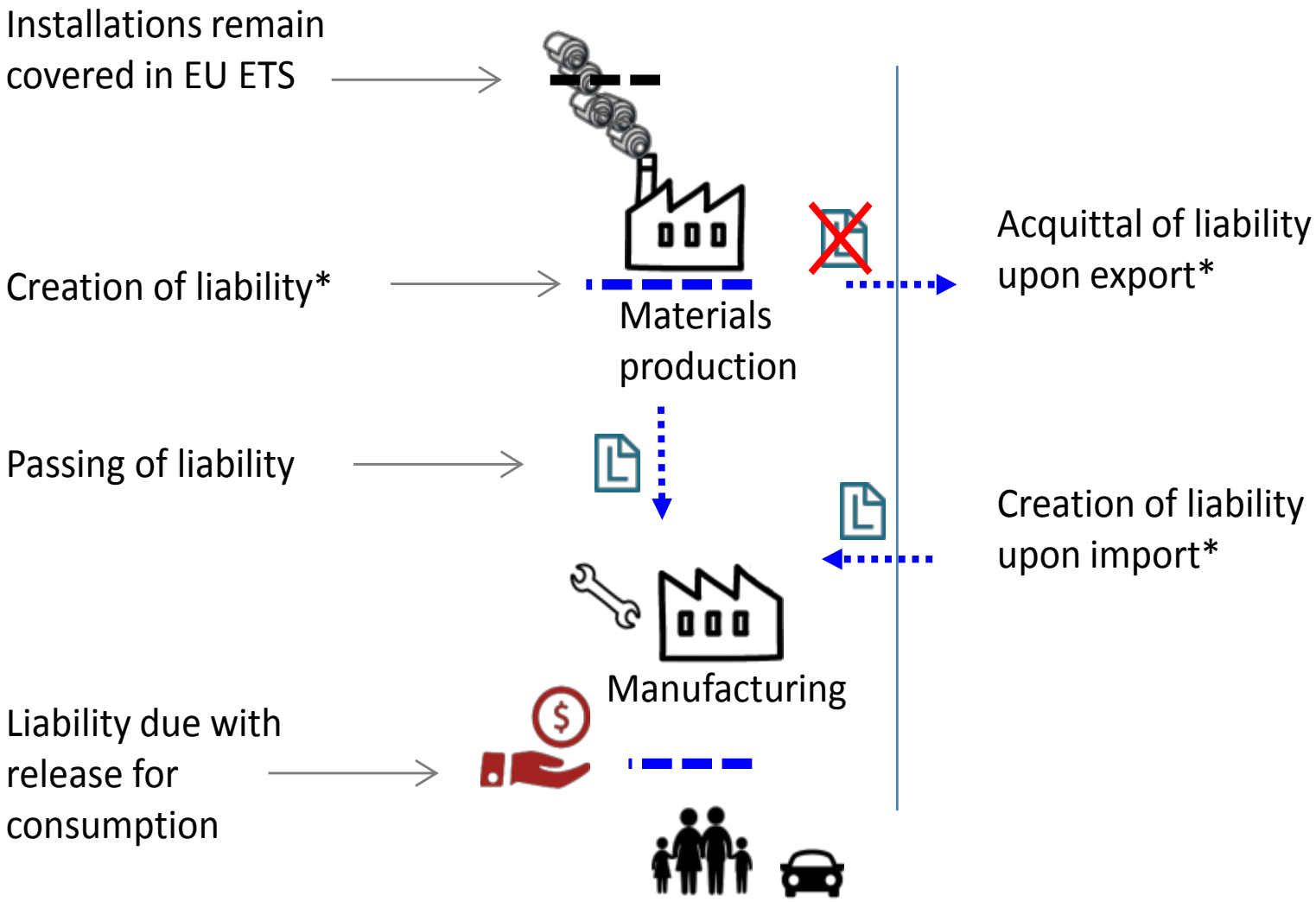
Basic options for leakage protection in post Paris world of differentiated carbon prices:

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 …)

Draft report IoC, Neuhoff et al. (2016)

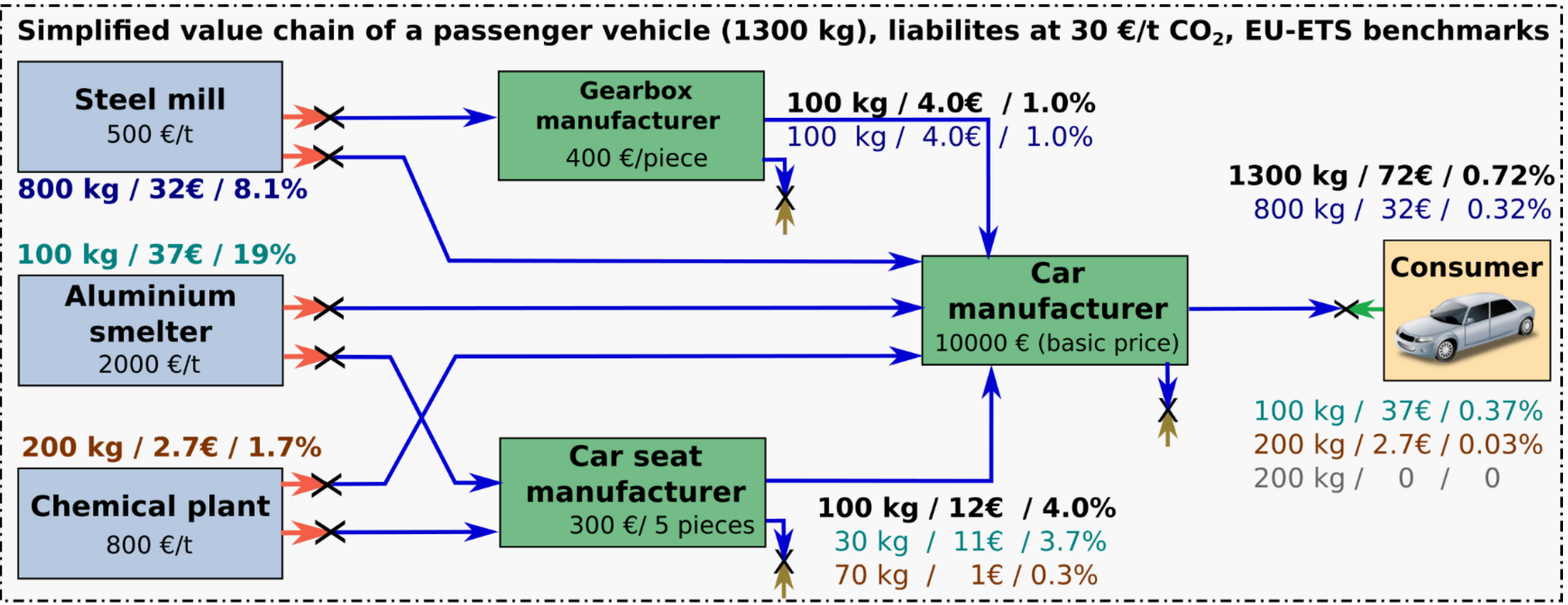
How does 'Inclusion of Consumption', (IoC) work?



* Based on weight of material times benchmark for material (e.g. steel, clinker)

Pauliuk et al. (2016), DIW discussion paper 1570

How does IoC affect the value chain?



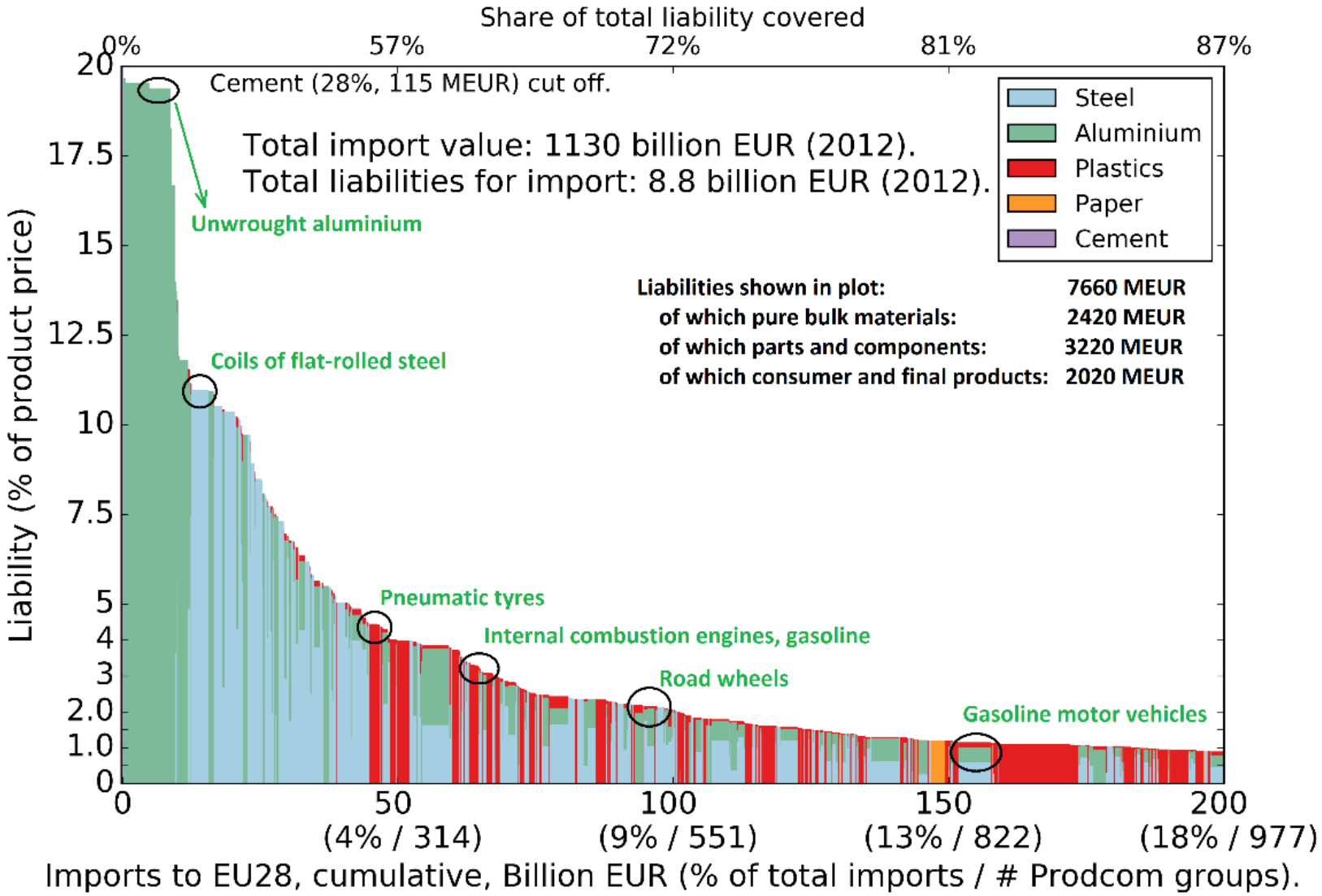
Pauliuk et al. (2016), DIW discussion paper 1570

How high are the charges related to IoC?

Material	Total production, EU28 2012, (Mt)	EU-ETS benchmark tons of CO_2-eq/ ton of material)	Liability per ton (EUR)	Liability in % of material price	Total liabilit created withi EU28 (MEUR
l	160	1.780	53	11	8500
ninum	3.6	12.82	385	20	1400
tics	57	1.5	45	6	2500
er/Pulp	100	0.4	12	2	1200
ent	170	0.69	21	28	3600
on price: EUR/ CO_2	**30**			**Sum:**	**17200**

Pauliuk et al. (2016), DIW discussion paper 1570

IoC: Monitoring of imports and exports to and from the EU28



Pauliuk et al. (2016), DIW discussion paper 1570

nsumption-based charge can re-establish carbon-related price signals along the value

Incentive for modernization/ emissions reductions	Role that carbon pricing can play:	Free allocation	+ Inclusion of consumption
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: emission coverage inclusion of consumption

Draft report IoC, Neuhoff et al. (2016)

Conclusion

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

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

Producers of materials covered by IoC receive free allocation at full benchmark

-> Shifts the focus of debate from carbon leakage protection to innovation

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 emission trading effective for the materials sector

DIW BERLIN

Thank you!

Clima Strate

Berlin 13.9.2016

Inclusion of Consumption in Emission Trading

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Additional slides

Findings 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 the 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

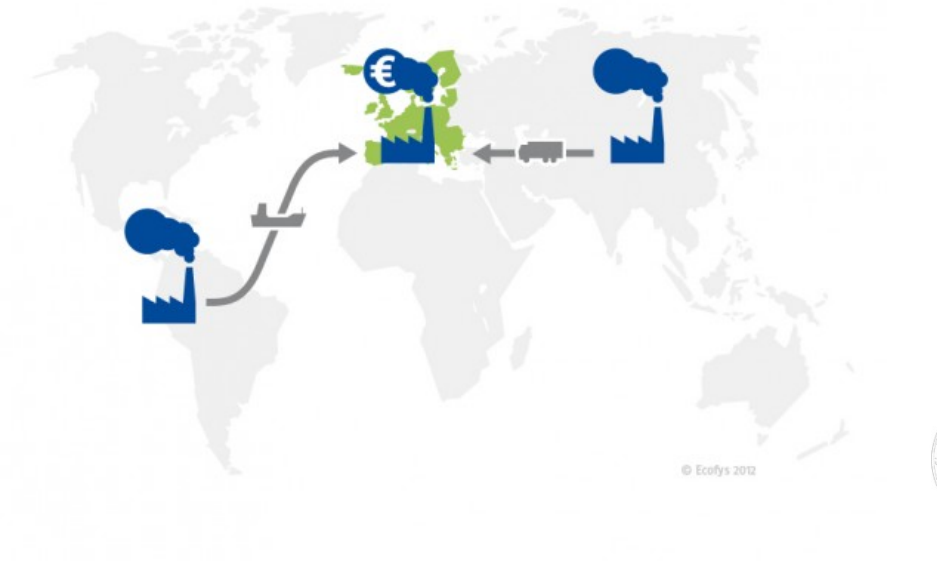
What can we learn from quantifying the impact across product categories?

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

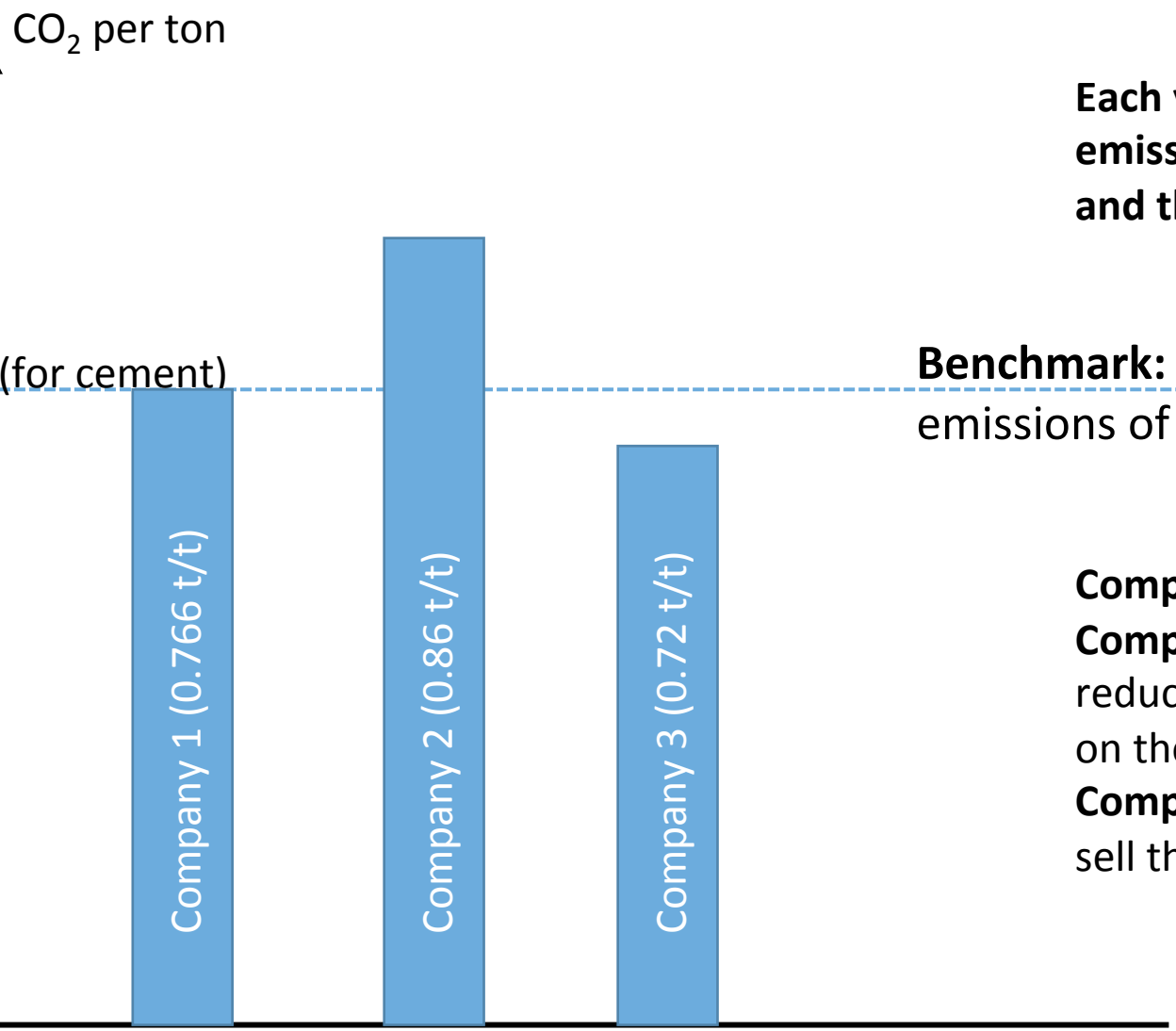
-> de-minimis rules possible, excluding e.g. 80% of imported products

What is carbon leakage and how to deal with it?

- Many emissions-intensive commodities (steel, cement, Al, pulp/paper) are traded on global markets.
- Unilateral taxation of GHG emissions on these materials for EU producers could reduce competitiveness of the domestic material production industries
- Relocation of these industries to countries with lower or no carbon taxation and subsequent imports of the pro to the EU might be the consequence. This phenomenon is called carbon leakage.
- Carbon leakage is an example of a spill-over effect (*Nebeneffekt*) of climate policy.
- To address the risk of carbon leakage, the EU-ETS includes free allowances for GHG emissions to producers with significant carbon costs and internationally traded products



How does free allocation work?



Each year, all companies under the scheme receive free emissions permits according to their production levels and the current benchmarks

Benchmark: product-specific, reflecting the average GHG emissions of the 10% best performing installations in the E

Company 1 receives all allowances needed for free.
Company 2 receives less allowances than needed, and ca reduce its emissions intensity or buy additional allowanc on the market.
Company 3 receives more allowances than needed and c sell those on the market to actors like company 2.

c.europa.eu/clima/policies/ets/cap/allocation/index_en.htm
c.europa.eu/clima/publications/docs/ets_handbook_en.pdf

The EU Emissions Trading System (EU-ETS)

Cornerstone of cost-effective reduction of industrial GHG in the EU

By far the largest cap-and trade system, covers more than 11,000 power stations and industrial plants in 31 countr

(EU28 + Iceland, Liechtenstein, and Norway) as well airlines

Covers about 45% of the EU's GHG emissions

By 2020, the total cap for the sectors covered will decrease by 21% compared to 2005 levels.

A reduction of 43% for 2005-2030 has been proposed by the European Commission

The 2013 cap for emissions from power stations and other fixed installations within the system

was set at 2,084,301,856 allowances, which corresponds to GHG emissions of 2.084 Gt/yr.

In its third phase, reaching from 2013 to 2020, 40% of all emissions allowances are auctioned,

the rest is allocated for free, share of freely allocated emissions declines each year.

c.europa.eu/clima/policies/ets/index_en.htm

Free allocation and windfall profits (‘Überraschungsgewinne’)

Free allocation can deliver windfall profits to sectors which pass through some or all of the cost of llowances to their consumers. These sectors pass on their opportunity costs on to their consumers f having to use freely allocated allowances for compliance instead of being able to sell it. “

Translating this statement into understandable language:

Some producers receive emissions allowances for free. (In the first phase of the EU-ETS, this included the power se
Some energy suppliers partly pass on the market value of freely obtained CO_2-emission rights to their customers, t
making ‘money for nothing’ (windfall profit).
The argument is that energy suppliers have to use these allowances instead of being able to sell them, which repre
a lost opportunity, and they charge their costumer for this opportunity cost.

ere is an academic debate about the extent to which windfall profits due to free allocation actually happen.

any actors argue to abandon free allocation in favour off full auctioning.

c.europa.eu/clima/publications/docs/ets_handbook_en.pdf
nk.springer.com/article/10.1007%2Fs10657-009-9098-6#page-2

A consumption-based charge for material-intensive commodities: 'Inclusion of Consumption', (IoC)

How to 'fix' the problems resulting from free allocation and carbon leakage?

- Border tax adjustments:
  Auction allowances at full carbon price, adjust prices at borders
  → Only works if no free allowances are given
  → Needs careful design to be compatible with WTO regulations.

  OR

- Consumption-based charge:
  Instead of charging producers, the consumers of material intensive goods directly pay the bill!
  → Consumers less mobile than producers
  → Consumers would eventually have to pay anyway
  → Material-intensive products contribute to high standards of living and wellbeing
  → Potentially easier to implement than border tax adjustments

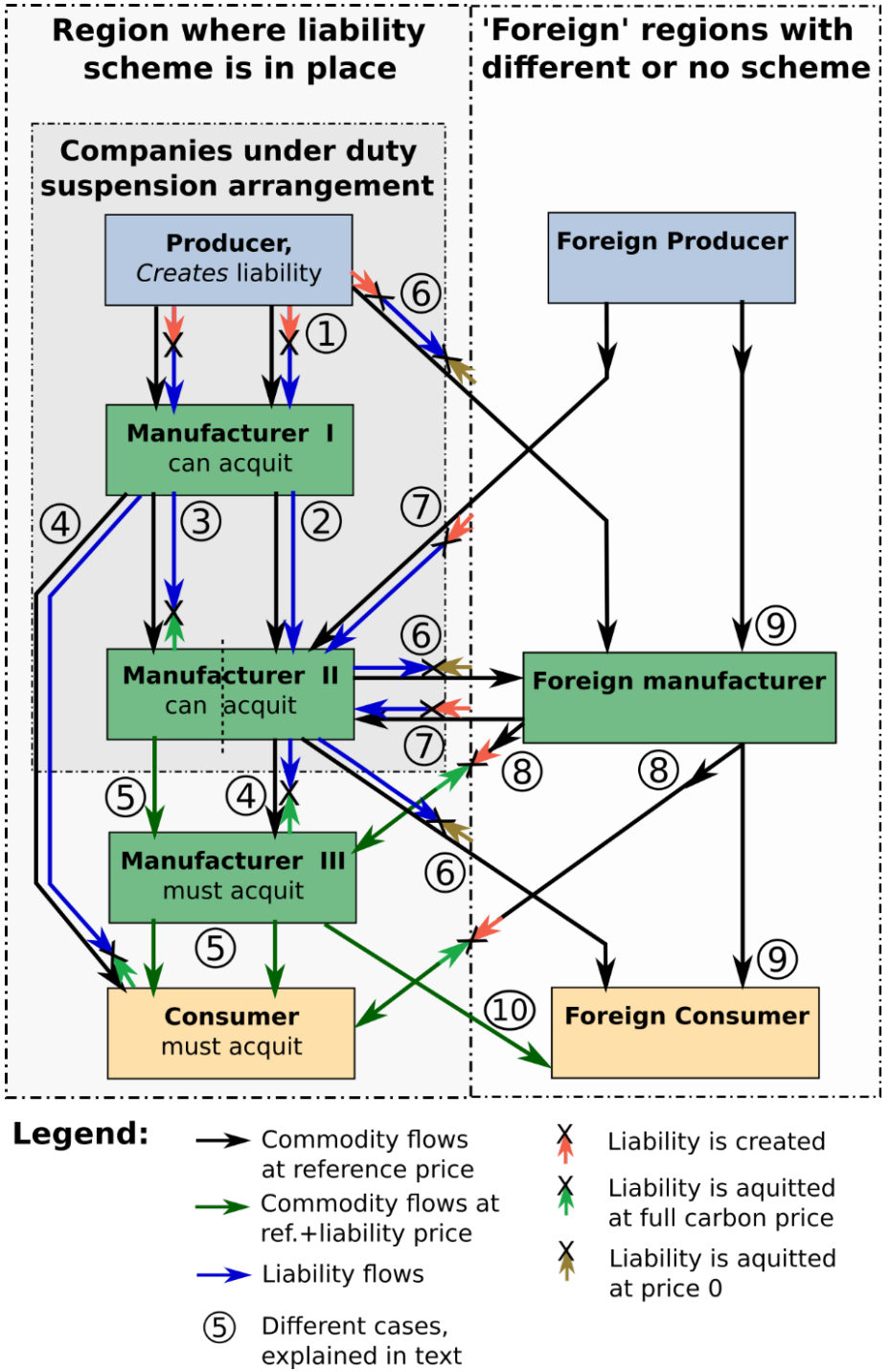
v does ‘Inclusion of Consumption’, (IoC) work?

abilities are created upon material production within the U28

ompanies within duty suspension arrangement (DSA, *euerausetzungsvereinbarung*) can pass on liabilities to eir customers

ompanies and customers outside the DSA but within the U28 have to acquit the liabilities.

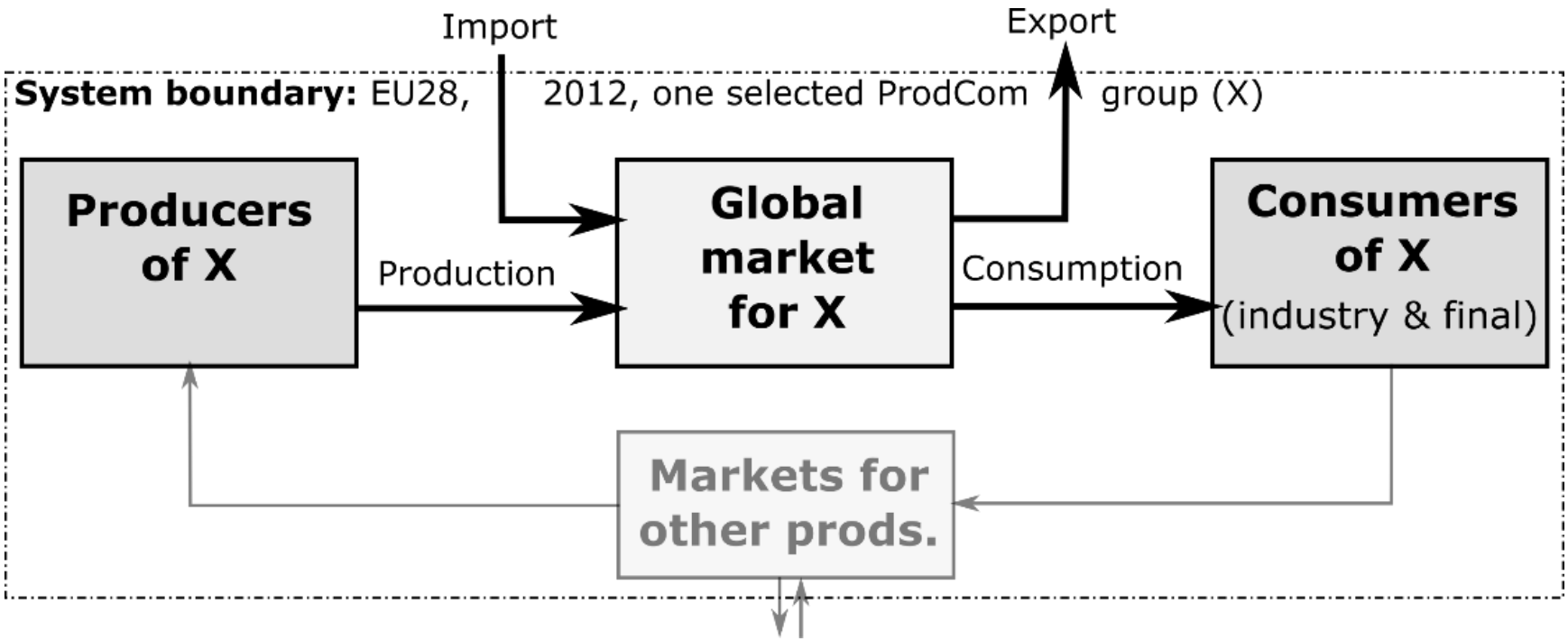
ade across the borders of the EU28 is monitored



right: Pauliuk et al. (2016), Technical report on IoC, provided on ILIAS

Assessment method: Material flow cost accounting (MFCA)

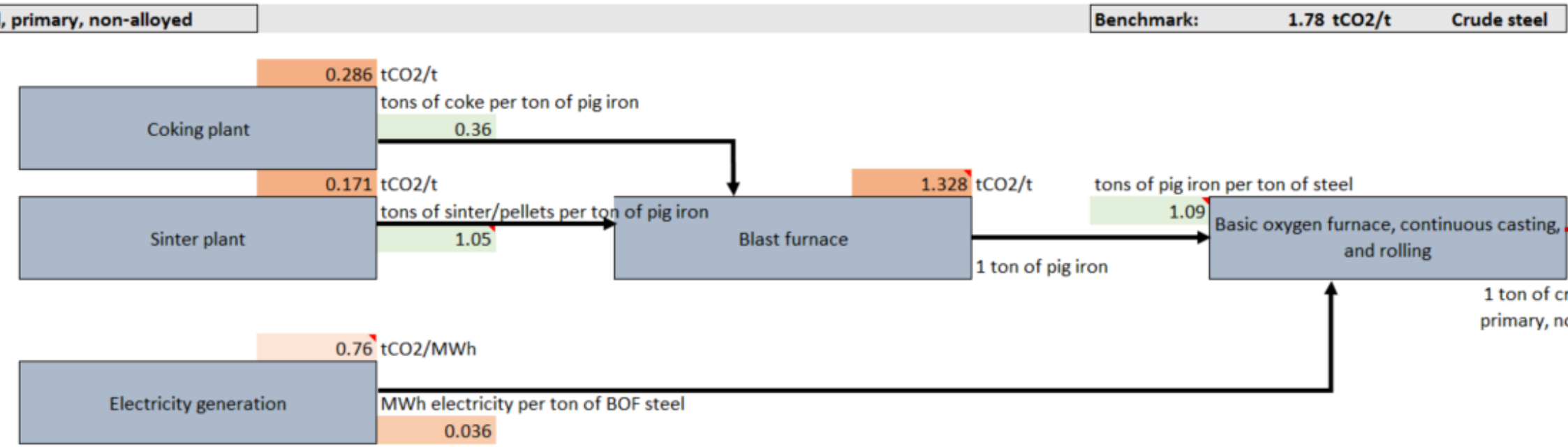
n datasource: EU ProdCom 2012 (4047 groups), own estimates of material content



Absolute charge (€) = Production volume (kt) * material content * CO_2-benchmark * CO_2-price

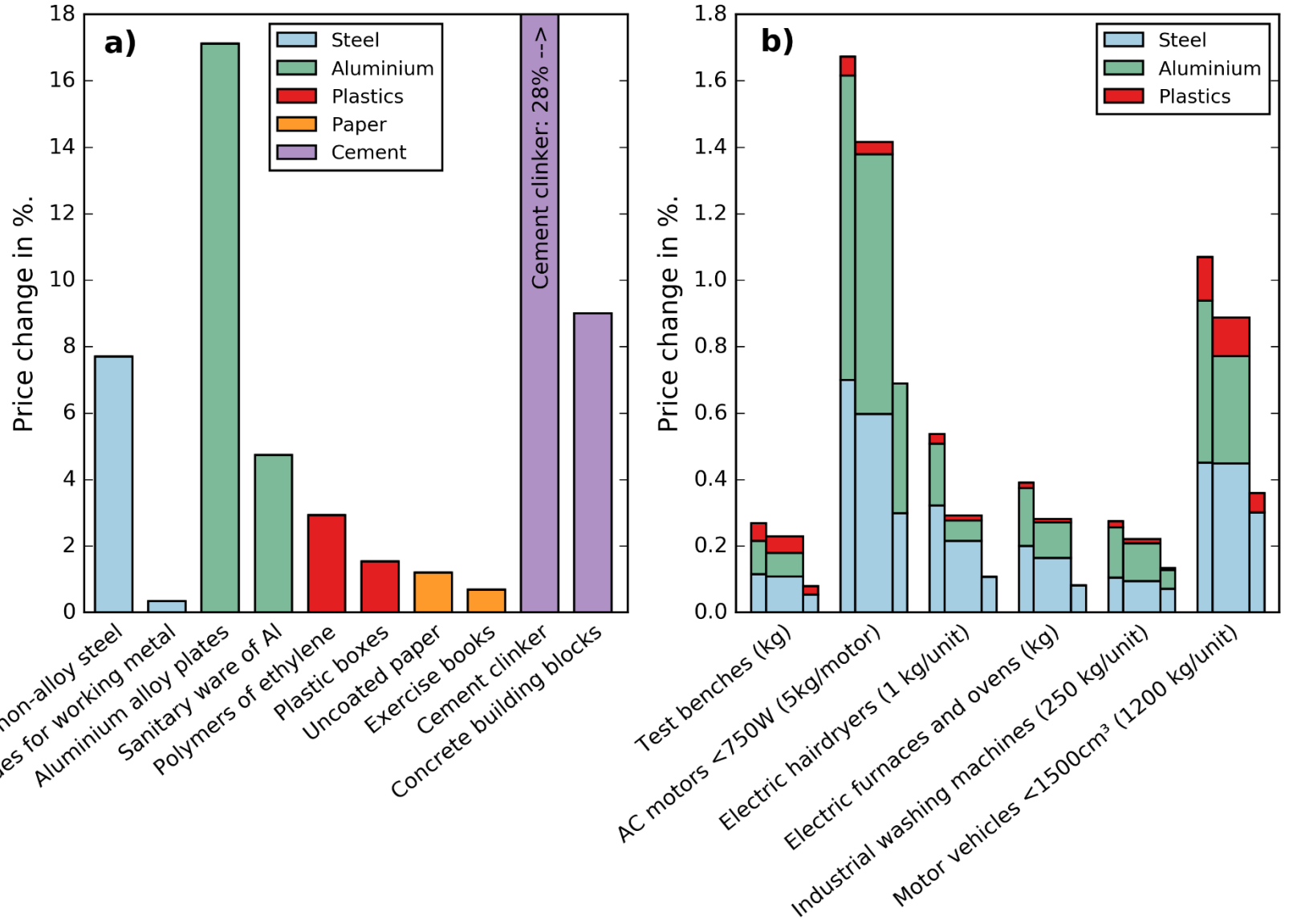
Relative charge (%) = Absolute charge / Production value (€)

How to determine product-specific benchmarks from EU-ETS process benchmarks



xxx	data from ecoinvent 3.2
xxx	stoichiometric data
xxx	EU-ETS (2011/278/EU) (Direct emissions benchmarks for industrial processes)
xxx	EU-ETS (2012/C 387/06) (Electricity intensity benchmarks)
xxx	EU-ETS (2012/C 158/04) (Emissions intensity benchmarks for electricity)

Relative charges (price changes) to be expected @ 30 €/ton CO_2



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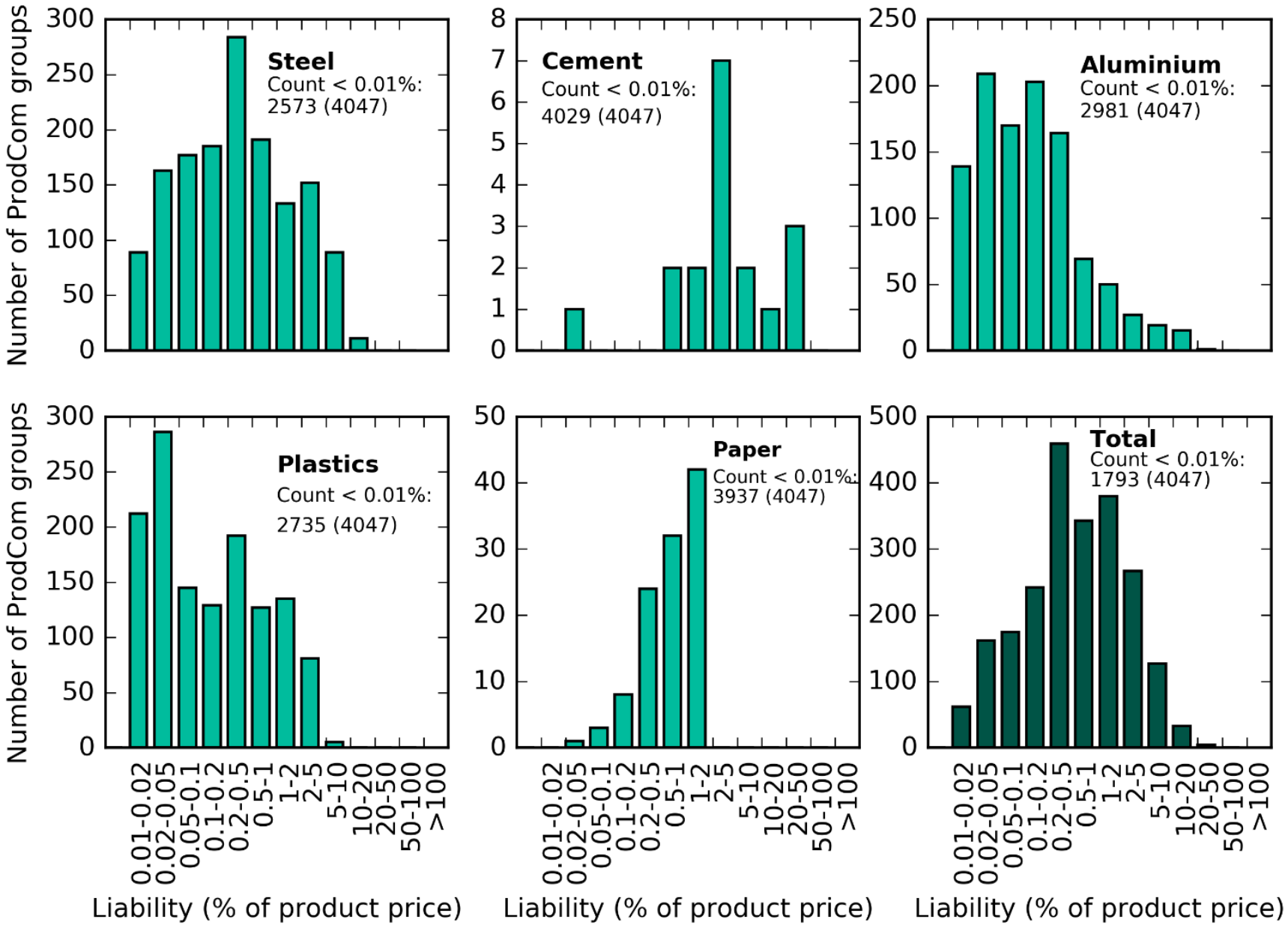

IoC: Monitoring of imports and exports to and from the EU28