

**Measuring “a significant risk of carbon leakage”
according to the proposed Art. 10a of Directive
2003/87/EC**

The European Commission’s approach

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Presentation ECCP meeting 26 September 2008

Why do we care about carbon leakage?

- Negative environmental consequences at the global scale
 - *No emission reductions in the EU*
 - *Higher emissions in the rest of the world*
- Negative economic consequences within the EU
 - *Lower growth*
 - *Job losses*
 - *Potential negative consequences on security of supply*

When could carbon leakage occur?

- Supply-side driven:
 - Transaction costs of delocalising existing production $<$ CO₂ costs
 - Transaction costs of capacity expansion abroad (non-EEA) $<$ CO₂ costs
- Demand-side driven:
 - Transaction costs of sourcing supplies from abroad (non-EEA) $<$ CO₂ costs

... Art. 10a (9), 3

...taking into account the following:

- (a) the extent to which auctioning would lead to a *substantial increase in production cost*,
- (b) ... (benchmarking) ...
- (c) *market structure*, relevant *geographic* and *product* market, the *exposure* of the sectors *to international competition*;
- (d) The effects of climate change and energy policies implemented, or expected to be implemented outside the EU in the sectors considered

Stage 1: quantitative analysis

- Defining / identifying the (sub)sectors where problems may occur
- Measuring the impact in terms of potential product price increases
- Measuring the exposure to international trade

Stage 2: qualitative analysis of other market factors

- Relevant product market
- Relevant geographic market
- Concentration, competition, profit margins
- Tightness of market
- Transportation costs
- Value-chain characteristics
- ...

Subsectors analysed

- Energy-intensive business, i.e. all business outside the energy sector and where the purchases of energy products and electricity amounts to at least 3.0% of its production value
- Data gathering exercise (tentative list)

Sectors currently being analysed	Sectors that have provided information	Sectors that will provide information
Aluminium	Ceramics	Man-made fibers
Steel and Iron	Chemicals	Starch
Cement and Lime	Pulp and paper	Boards
	Magnesite & graphite	Nickel
	Potassium	Lead
	Aviation	Textiles
	Steel tube production	Sugar
	Casting of Iron	
	Ferro-Alloys	
	Refineries	
	Zinc	
	Technical gases	
	Expanded clay	
	Tyres	
	Copper	
	Glass	7

The relevant product market: The degree of disaggregation

- NACE 4-digit causes some problems
 - Manufacture of aluminium (DJ2742), but
 - Primary versus secondary aluminium
 - Manufacture of basic iron and steel and of ferroalloys (DJ2710), but
 - BOF process
 - EAF process
 - Manufacture of cement (DJ 2651), but
 - Clinker?
- ProdCom 8-digit provides some solutions

Art. 10a (9), 3 (a)

- “(substantial) increase in production cost”



- Increase in production cost (triggered by direct and indirect emissions)

(€/ton)



- Increase in price needed to recover higher production cost

$\Delta\text{€ cost} / \text{€ price}$

Profit-neutral price increase needed – the case of Aluminium

CO2 price	Δ cost (Δ price)		Al price	Δ price (%)	
€20/t	EEA	7.8 t CO2/t Al	156 €/t	2000 €/t	7.8%
€30/t	EU	10.0 t CO2/t Al	300 €/t	1847 €/t	16.2%
€40/t	EU coal	18.4 t CO2/t Al	738 €/t	1000 €/t	73.8%

Art. 10a (9), 3 (c)

“exposure to international competition”



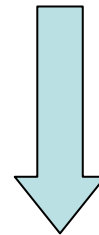
exposure to trade



Exports



Imports



Exports + Imports

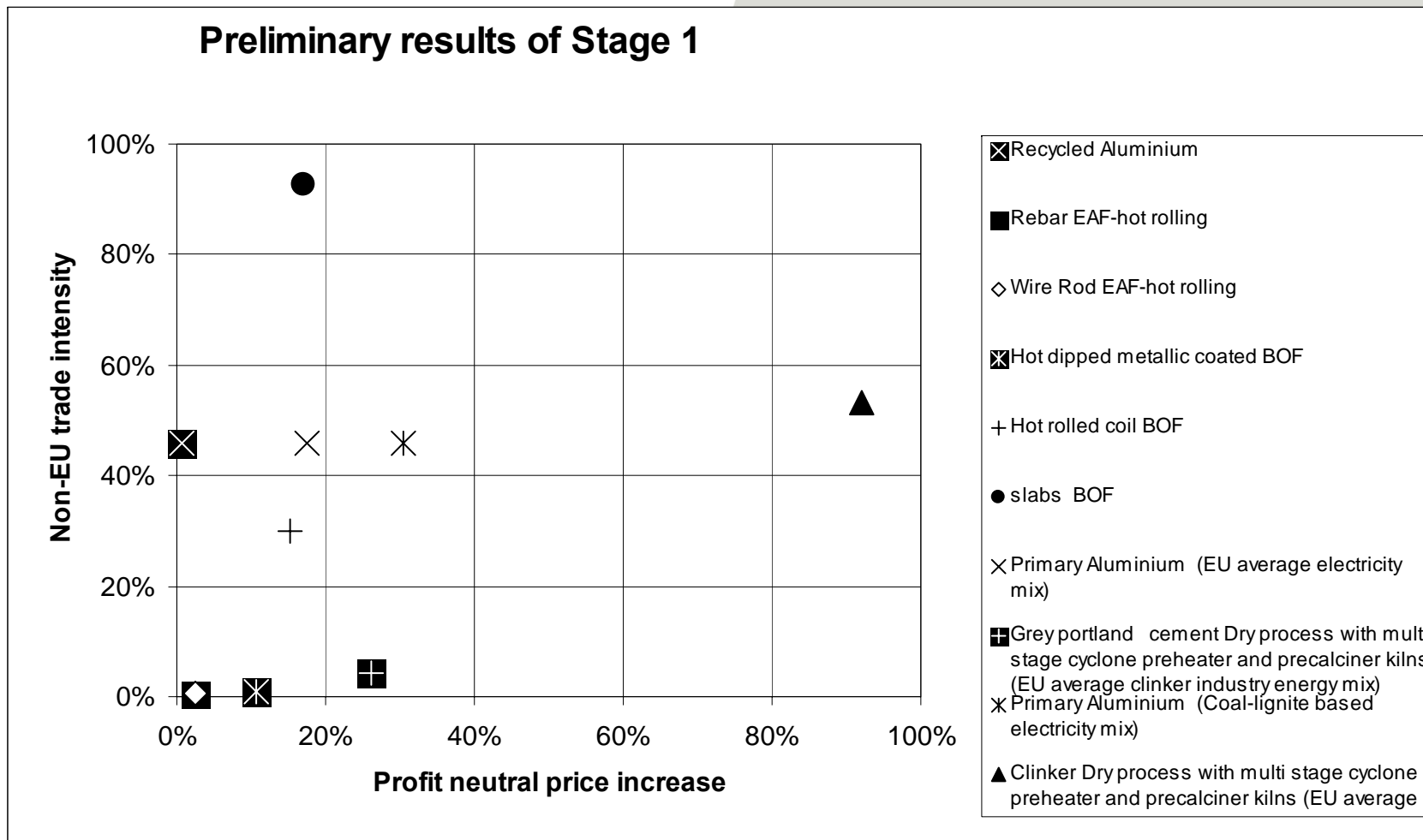
Domestic production for EU market + Exports + Imports

Trade intensity for selected products

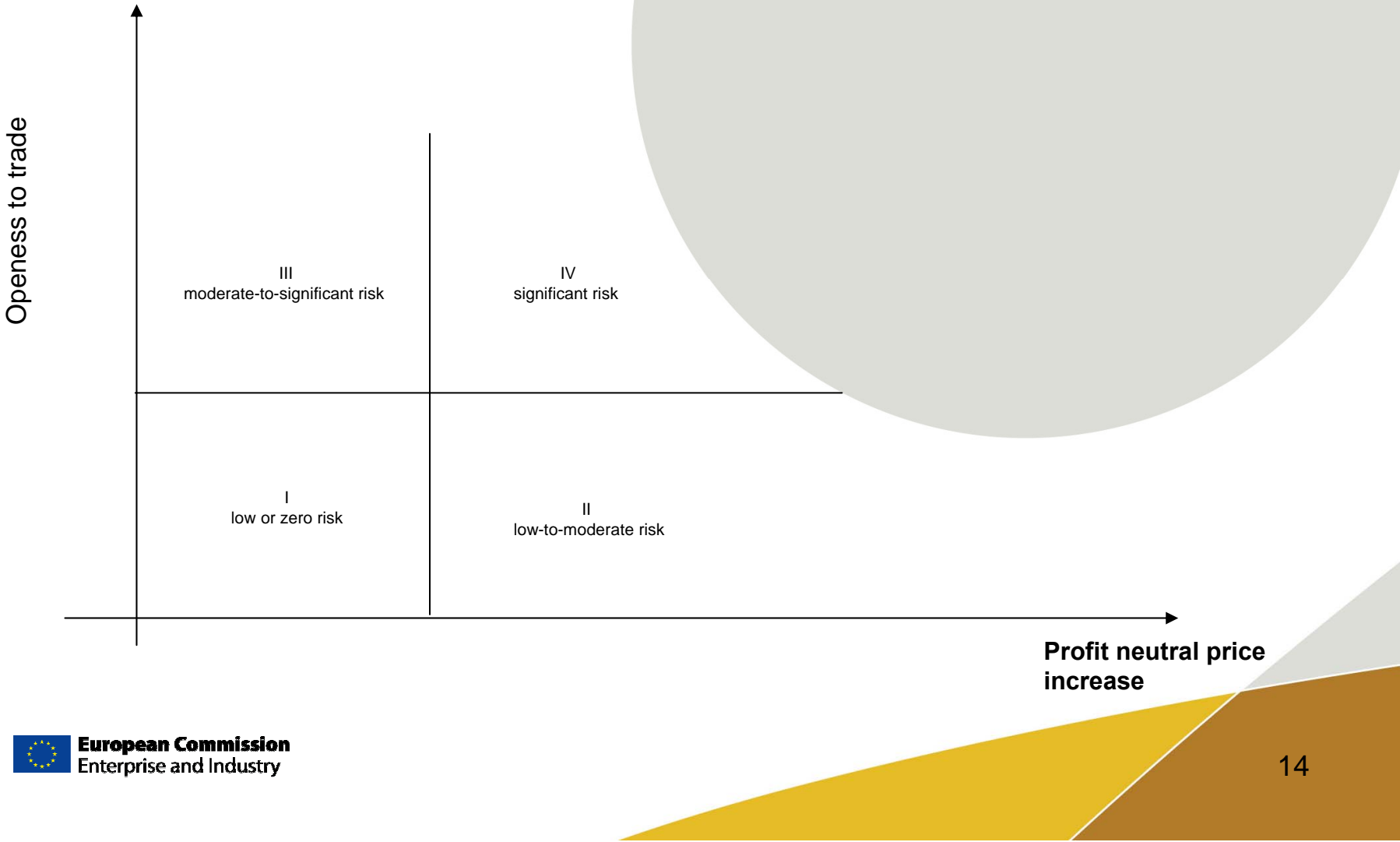
	Production	Exports	Imports	Exposure to trade
Primary Aluminium	5344	85	4635	47.3%
Recycled Aluminium	3939	101	231	8.0%
Extrusion Aluminium	4699	318	341	13.1%
Rolling Aluminium	5146	731	613	23.3%
Hot rolled coil (total)	32760	4190	7967	29.8%
slabs	7629	1636	5439	54.1%
Wire Rod EAF	18674	52	63	0.6%
Rebar EAF	20281	39	16	0.3%
Stainless Cold Rolled	3671	684	500	28.4%
Hot dipped metallic coated	20648	144	62	1.0%
Clinker	13042	1198	12198	53.1%
Cement	214840	5903	3631	4.4%

Source: Prodcom total, Prodcom Sold, 2006. Production, Imports and exports are presented in 1000 t.

Results of stage 1: A tentative illustration



Stage 1 classification of sectors exposed to different risks of carbon leakage



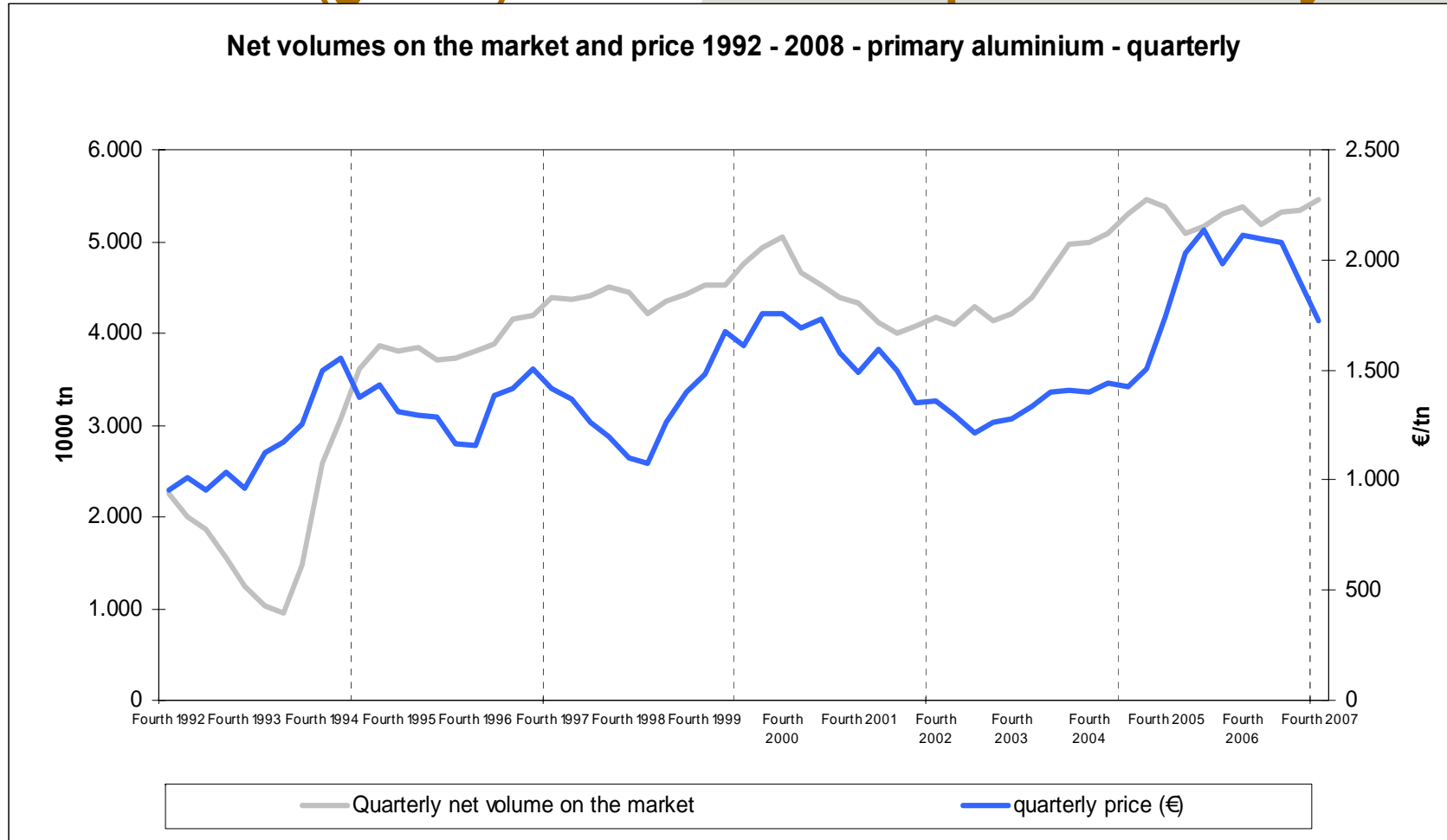
Stage 2: qualitative analysis of other market factors

- Relevant product market
- Relevant geographic market
- Concentration, competition, profit margins
- Tightness of market
- Transportation costs
- Value-chain characteristics
- ...

Art. 10a (9), 4

“For the purposes of evaluating whether the cost increase resulting from the Community scheme can be passed on, *estimates of lost sales* resulting from the increased carbon price or the *impact on the profitability* of the installations concerned may inter alia be used”

Prices and (global) demand – what price elasticity?



Art. 10a (9), 3 (c)

“relevant geographic and product market”



Global market
(yes/no)



Global Stock
Exchange?



Transport cost
tbd



What degree of
disaggregation?



NACE
4-digit

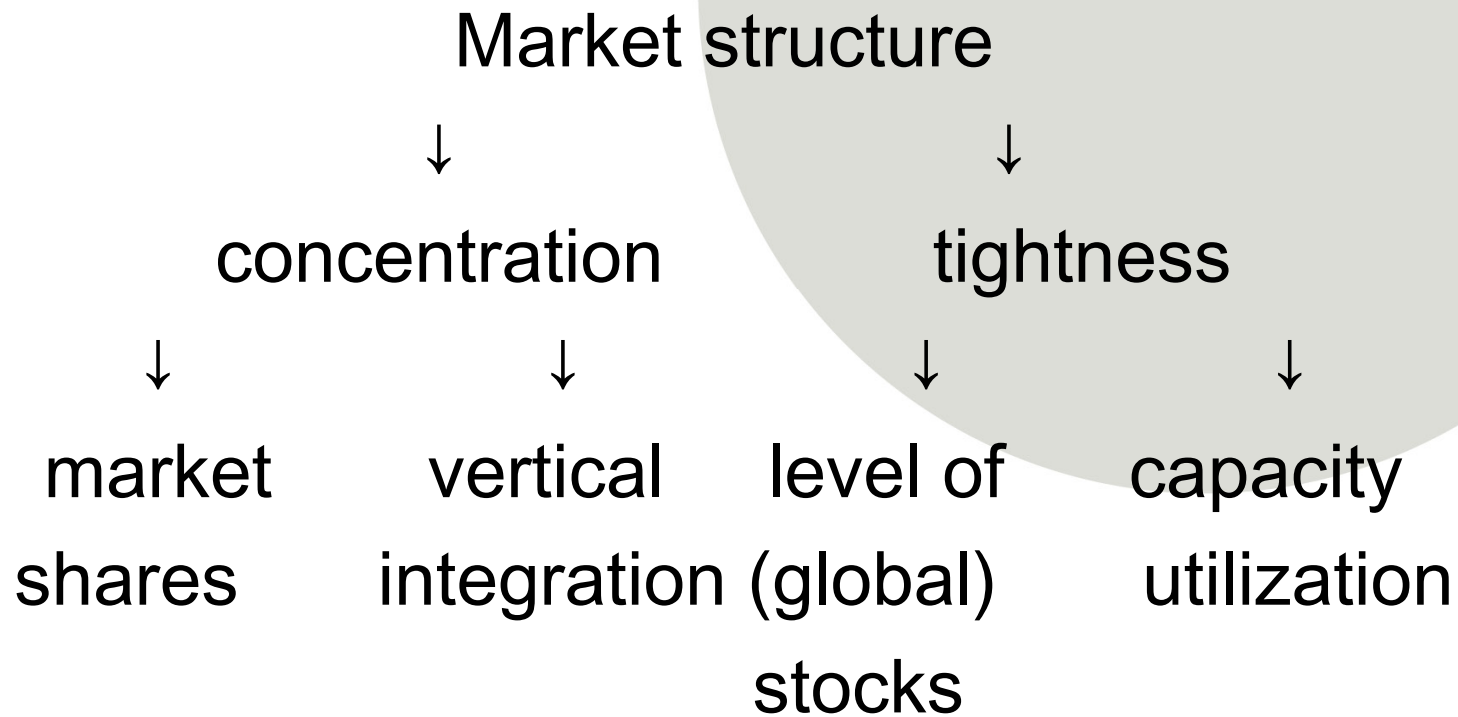


ProdCom
8-digit

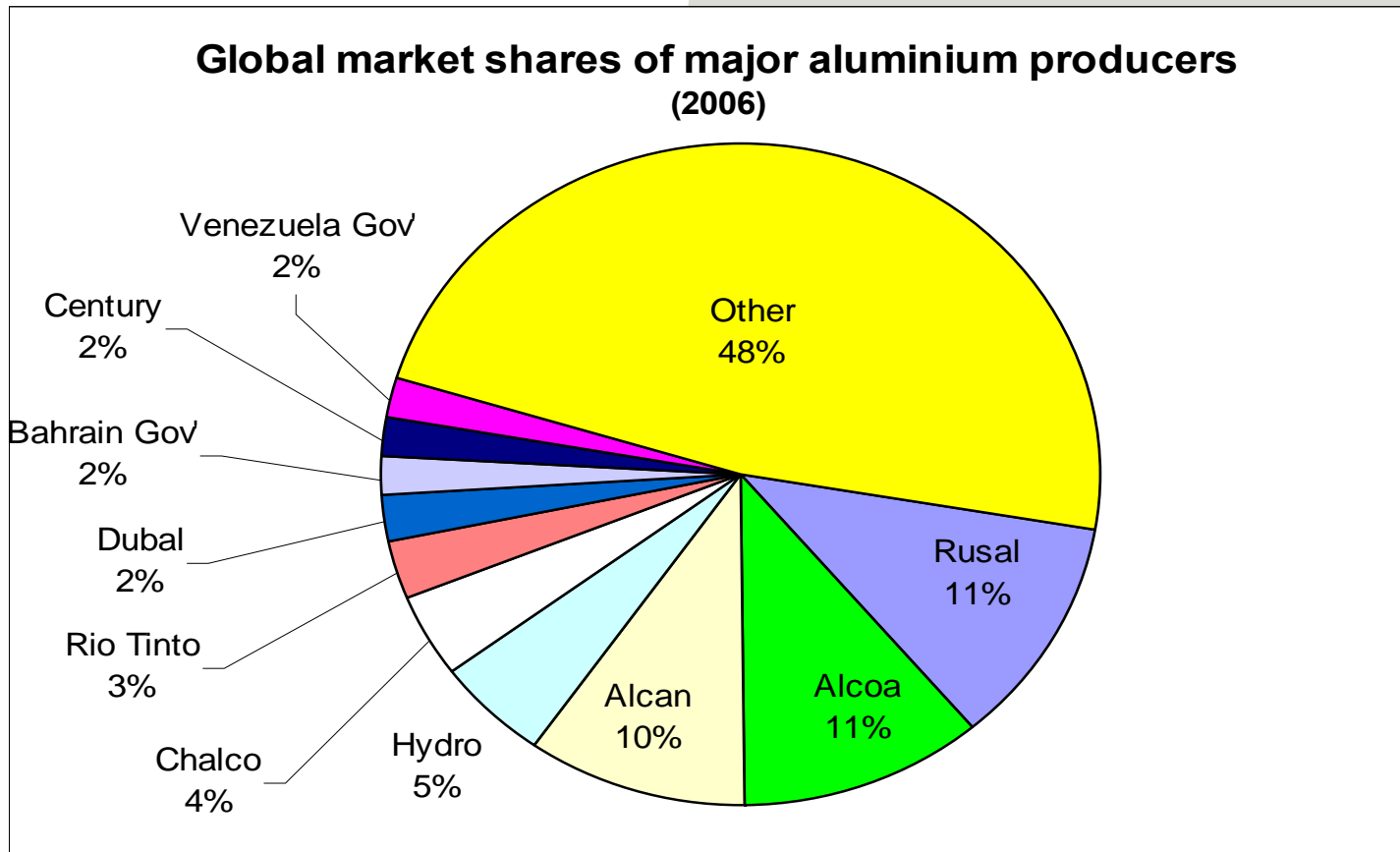
Is the relevant geographic market a global one?

- Global stock exchange
 - Aluminium: yes (e.g. LME)
 - Steel: yes
 - Cement / lime: no (Regional within 200 km)
- Transportation cost
 - Aluminium: no figures provided
 - Steel:
 - data provided for intra-EU (€/km)
 - Data provided for extra-EU (\$/day)
 - Cement / lime: Data provided for different locations in €/tn

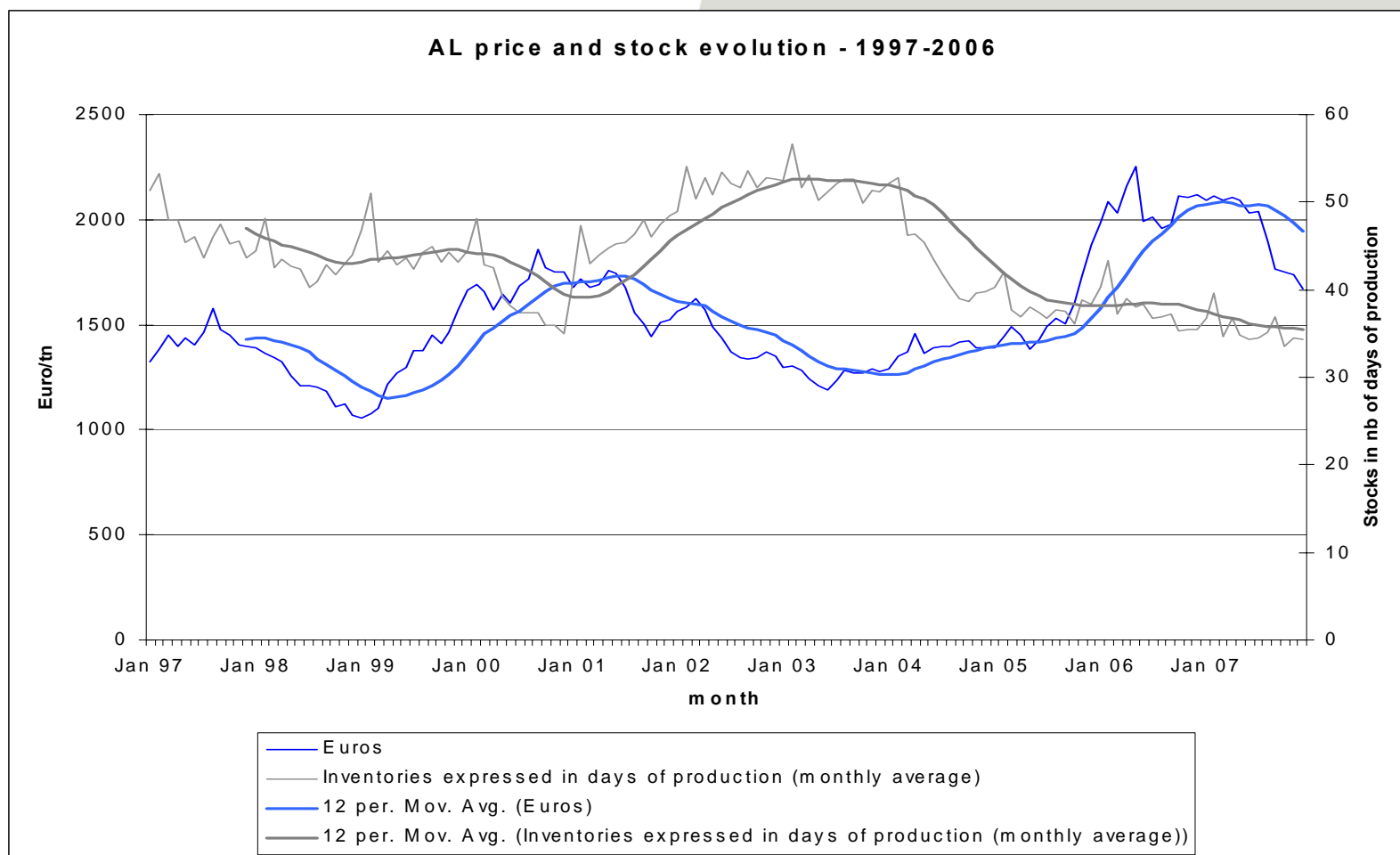
Art. 10a (9), 3 (c)



Global market shares



AL price and stock evolution 1997 - 2007



Stage 2: Tentative illustration of results for aluminium

- Positive impact on ability to pass through cost increases:
 - market is tight,
 - little spare capacity at the global level,
 - a high degree of concentration,
 - geographically clustered value chain
 - ...
 - ...
- Negative impact on ability to pass through cost increases:
 - market is global,
 - homogeneous product easy to substitute (in case of primary aluminium),
 - eventually installations will compete with each other
 - ...
 - ...
- **bottom line:**

Stage 2: Tentative illustration of results for cement

- Positive impact on ability to pass through cost increases:
 - high transportation cost, especially with respect to inland transport,
 - market is rather regional (except for clinker, where producers close to overseas ports are in competition with non-EU producers)
 - ...
 - ...
- Negative impact on ability to pass through cost increases:
 - potential cyclical downturn of construction sector in most OECD countries,
 - potential slowdown of boom in China,
 - potentially excess capacities at the regional, global level
 - ...
 - ...
- **bottom line:**

Operational conclusions

1. At the end of “Stage 1”, and after the thresholds will have been decided upon (in a policy process), each (sub)sector will belong to either category I, II, III or IV!
2. The (qualitative) analysis undertaken in “Stage 2” could lead to a reclassification (up or down by at most one category)!
3. The assessment of the results of international negotiations to be undertaken in “Stage 3” could lead to a further reclassification!
4. [Finally, the directive could specify how many free allowances the (sub)sectors should receive, depending on whether they are at the end of “Stage 3” belonging to either category I, II, III or IV]