

Identifying sectors deemed to be exposed to a significant risk of carbon leakage

Results for the Chemical Industry

J. Barreiro-Hurle - I. Juergens
J. Bemelmans – M. Przeor - A. Vasa

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What has been analysed? Sectors

Sectors are understood as NACE sectors.

NACE Rev. 1.1 is used due to reference period

Data has been obtained for all sectors at 4-digit level and therefore analysis has been undertaken at this level.

For some sectors where specific sub-sectors' trade intensity or CO2 cost would be masked by aggregation, analysis at a more disaggregated level has been undertaken (PRODCOM 6-digit or 8-digit level)

What has been analysed? Sectors

As far as the Chemical Industry is concerned the following 20 sectors have been analysed:

NACE 4-digit code	Sector description
23.20	Refined petroleum products
24.11	Industrial gases
24.12	Dyes and pigments
24.13	Other inorganic basic chemicals
24.14	Other organic basic chemicals
24.15	Fertilizers and nitrogen compounds
24.16	Plastics in primary forms
24.17	Synthetic rubber in primary forms
24.2	Pesticides and other agro -chemical products
24.3	Paints, varnishes and similar coatings, printing ink and mastics
24.41	Basic pharmaceutical products
24.42	Pharmaceutical preparations
24.51	Soap and detergents, cleaning and polishing preparations
24.52	Perfumes and toilet preparations
24.61	Explosives
24.62	Glues and gelatines
24.63	Essential oils
24.64	Photographic chemical material
24.65	Prepared unrecorded media
24.66	Other chemical products n.e.c.



What do we assess? Criteria

- Article 10a para. 15a and 15b of the ETS Directive
 - Non-EU Trade Intensity
 - Production cost increase due to direct and indirect additional costs induced by cost of allowances

How do we assess? Indicators

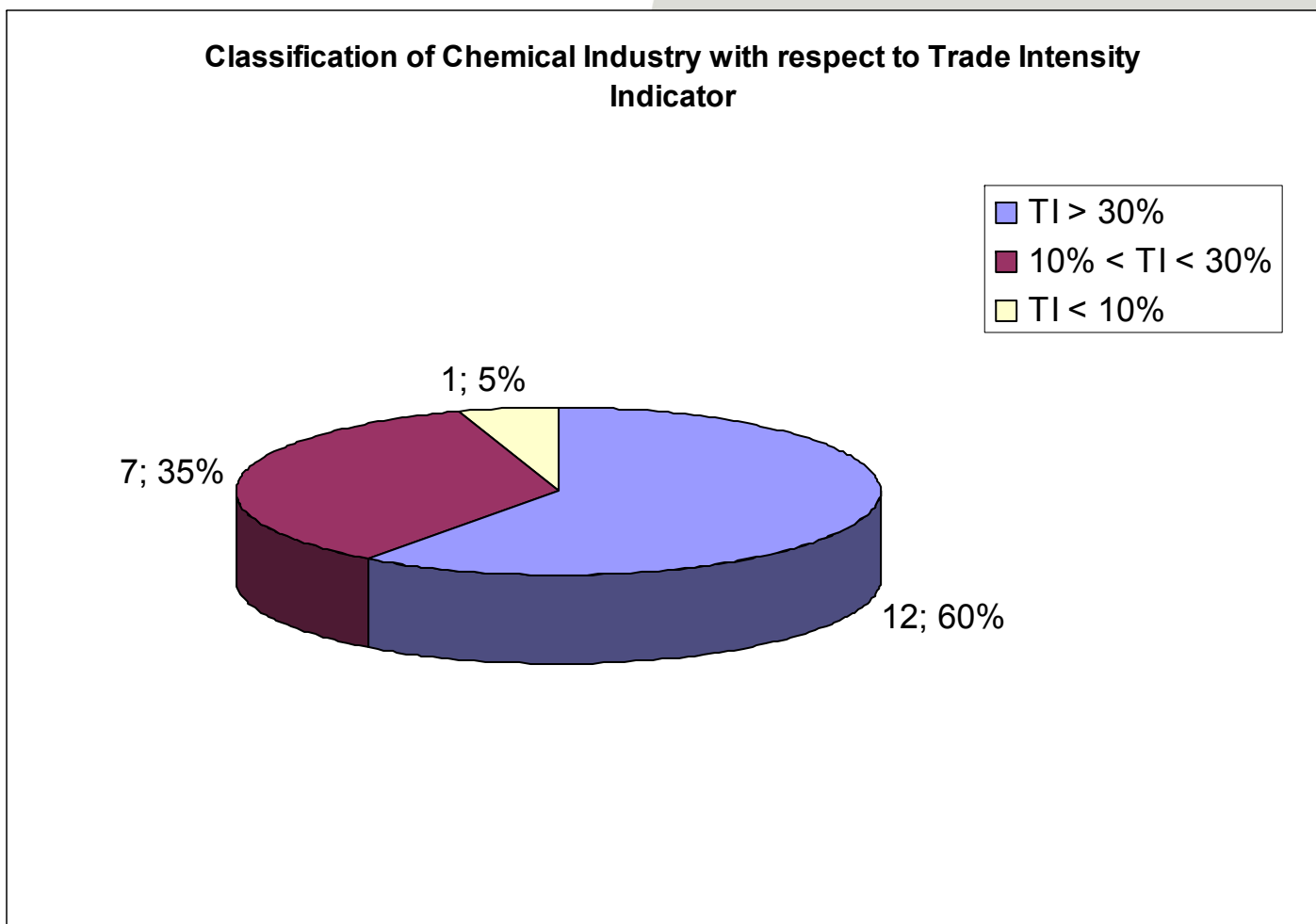
- Non-EU Trade Intensity

Ratio between total value of exports (M) to non-EU plus value of imports (X) from non-EU and the total market size for the Community (annual turnover plus total imports)

$$\frac{M_{extra-EU} + X_{extra-EU}}{Y_{EU} + M_{extra-EU}}$$

Trade Intensity (TI)

- Summary of obtained results:



How do we assess? Indicators

- Production cost increase due to direct and indirect additional costs induced by cost of allowances

Sum of direct and indirect costs over sectoral gross value added (GVA)

$$\frac{\left(\text{Direct } CO_2 \text{ emissions} \times P_{CO_2} \right) + \left(\text{Indirect } CO_2 \text{ emissions} \times P_{CO_2} \right)}{GVA}$$

Direct emissions = combustion related emissions + process emissions

Data Sources and availability

	2004	2005	2006	2007
GVA	SBS	SBS	SBS	
Direct CO2	MS	CITL MS	CITL MS	CITL MS
Indirect CO2	MS	MS	MS	MS

CO₂ cost increase: Direct Emissions in CITL

Matching of installations and their emissions with NACE
sectors

Emissions and GVA of an installation have been allocated to
the same NACE sector

The Rationale for Using Member State Data for Direct Emissions

- CITL data is not suitable for all sectors -

- Chemical Industry Sectors entering the scope of the EU-ETS (in terms of their non-combustion installation related emissions) only as of 2013 (5 sectors – 24.11; 24.13; 24.14; 24.15; 23.20)
- Chemical Industry Sectors which had no emissions identified in CITL but for which MS had reported emissions the MS data has been used to determine their direct emissions (2 sectors – 24.63; 24.63).

CO₂ cost increase: Direct Emissions reported by MS

- Direct CO₂ emissions, fuel consumption, (limited) process emissions data and electricity consumption reported by Member States
- Process emissions data from the European Community's greenhouse gas inventory.

CO₂ cost increase: Process emissions I

- Most MS did not report process emissions data
- European Community's greenhouse gas inventory (inventory 2005 and 2006, submission 2008 v1.1).
- The relevant greenhouse gases for the purpose of this directive are CO₂, N₂O and PFC

Process Emissions II: activities, sectors, gases

Process Emissions – average for years 2005 and 2006		CO ₂	N ₂ O	PFC
Activity specified in the Inventory	Nace-4 code	- CO ₂ equivalents (1000 t) -		
A. Mineral Products				
Soda Ash Production and Use	24.13	x		
B. Chemical Industry				
Ammonia Production	24.15	x	x	
Nitric Acid Production	24.15		x	
Adipic Acid Production	24.14	x	x	
Carbide Production	24.66	x		
C. Metal Production				
Aluminium Production	27.42	x		x

- **Data Source:** TABLE 2(I) SECTORAL REPORT FOR INDUSTRIAL PROCESSES, Inventory 2005 and 2005, Submission 2008 v1.1, http://www.eea.europa.eu/publications/technical_report_2008_6

Indirect emissions

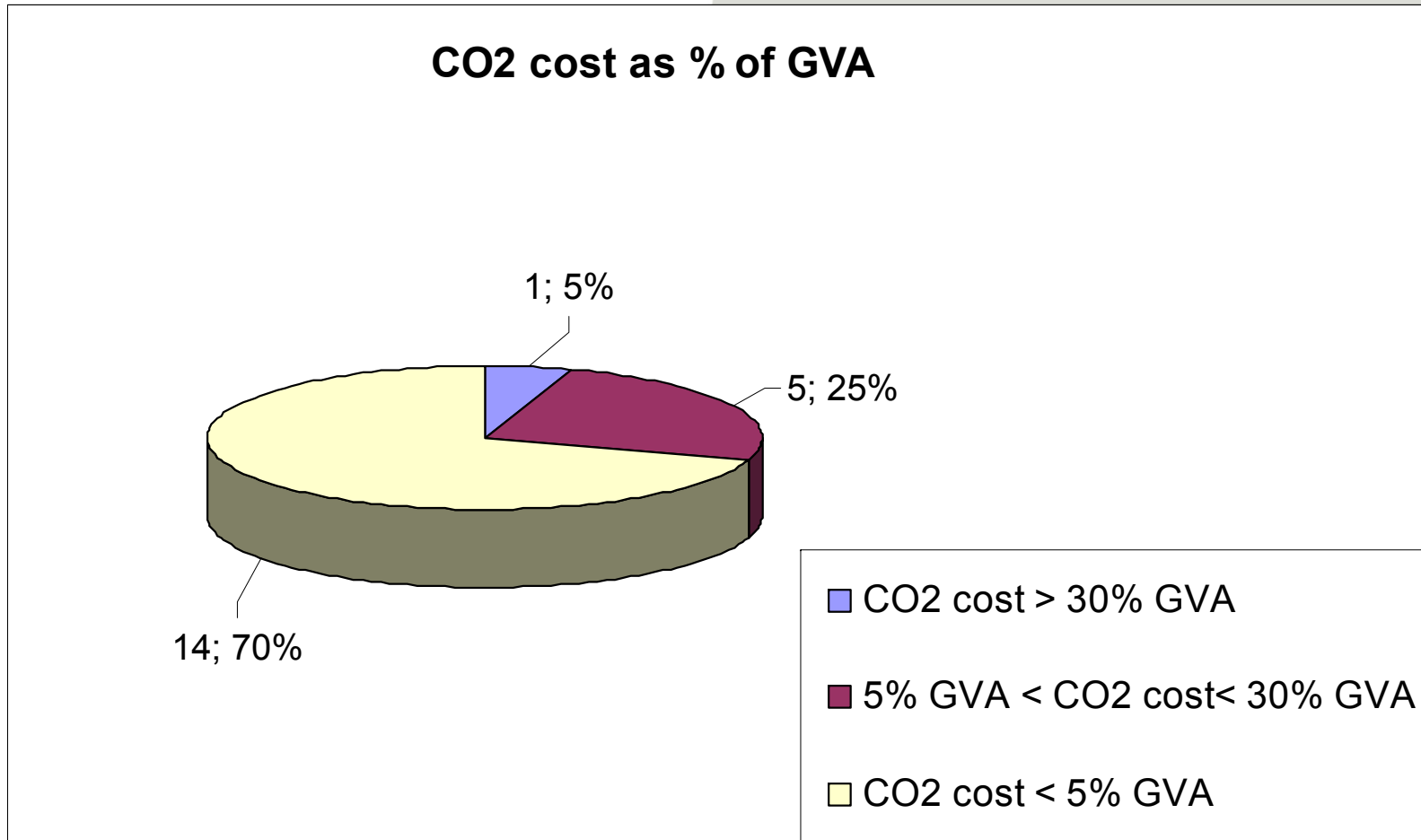
- **Data source:** not covered by CITL and not available at EUROSTAT → MS data.
- MS reported electricity consumption [MWh]
- Indirect cost was calculated based on electricity consumption * emission factor for electricity (0.465 t CO₂ MWh⁻¹) * CO₂ price (30 € t CO₂⁻¹)

Confidentiality

- **Addressed how?**
Response to confidentiality concern: EUROSTAT received encrypted, confidential data and processed it.
- **Applicable when?**
 - Data for a sector is treated as confidential in line with relevant regulation on processing of statistical data.
 - Confidential already if one of the parameters (direct cost, indirect cost or GVA) is confidential (otherwise estimate of other confidential parameters possible).
 - 2 cases for MS data on Direct Emissions (24.63 & 24.65) and 2 cases for electricity consumption (24.17 & 24.65)
- **Presented how?**
 - “Confidential data” indicated relative to the threshold, i.e. as <5%, >5% <30%, or >30%.

CO2 cost over GVA

- Summary of obtained results:



Results of the quantitative analysis

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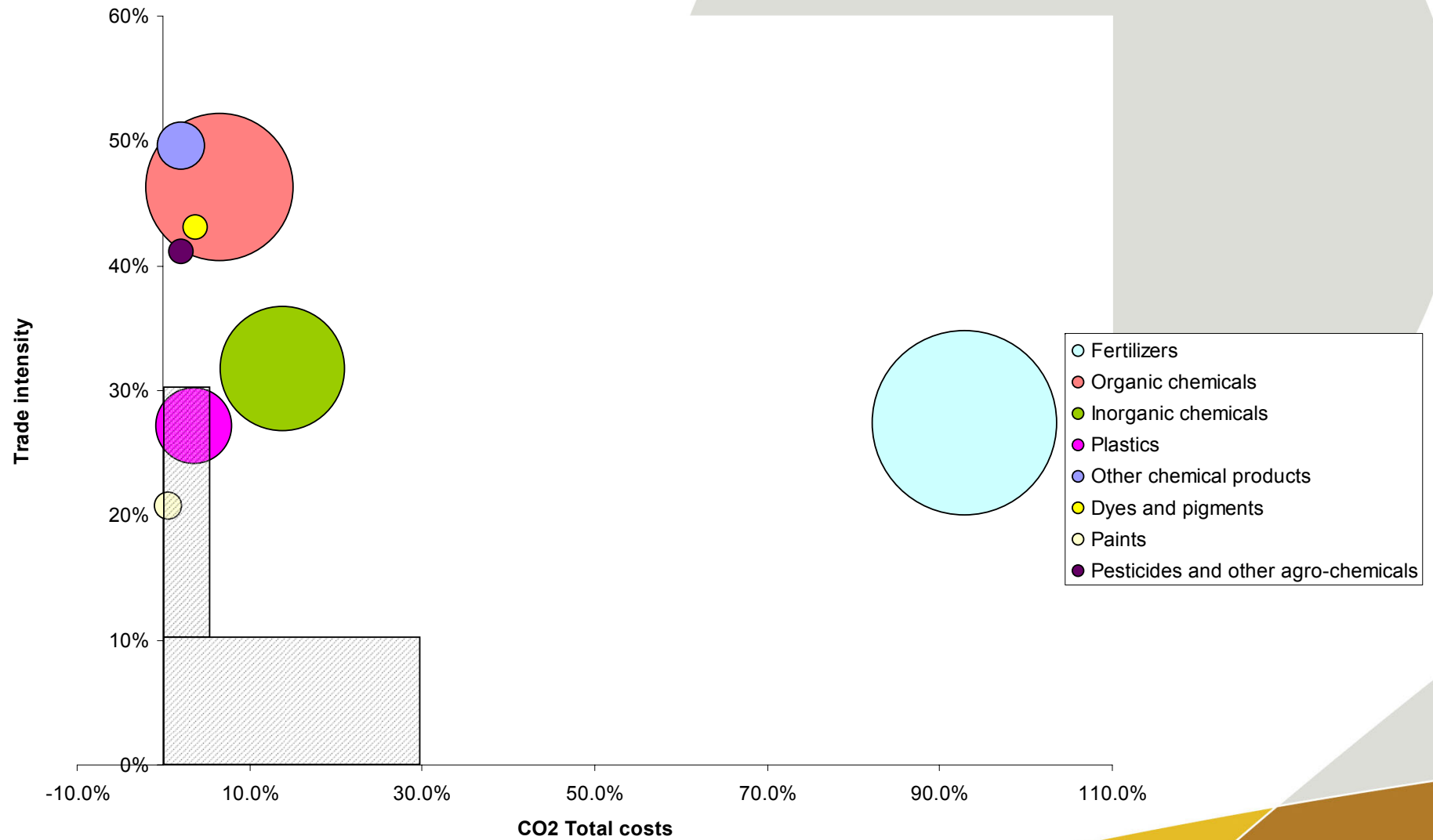
Sectors meeting the Trade Intensity threshold (10)

Sectors for which further disaggregation has been made (3)

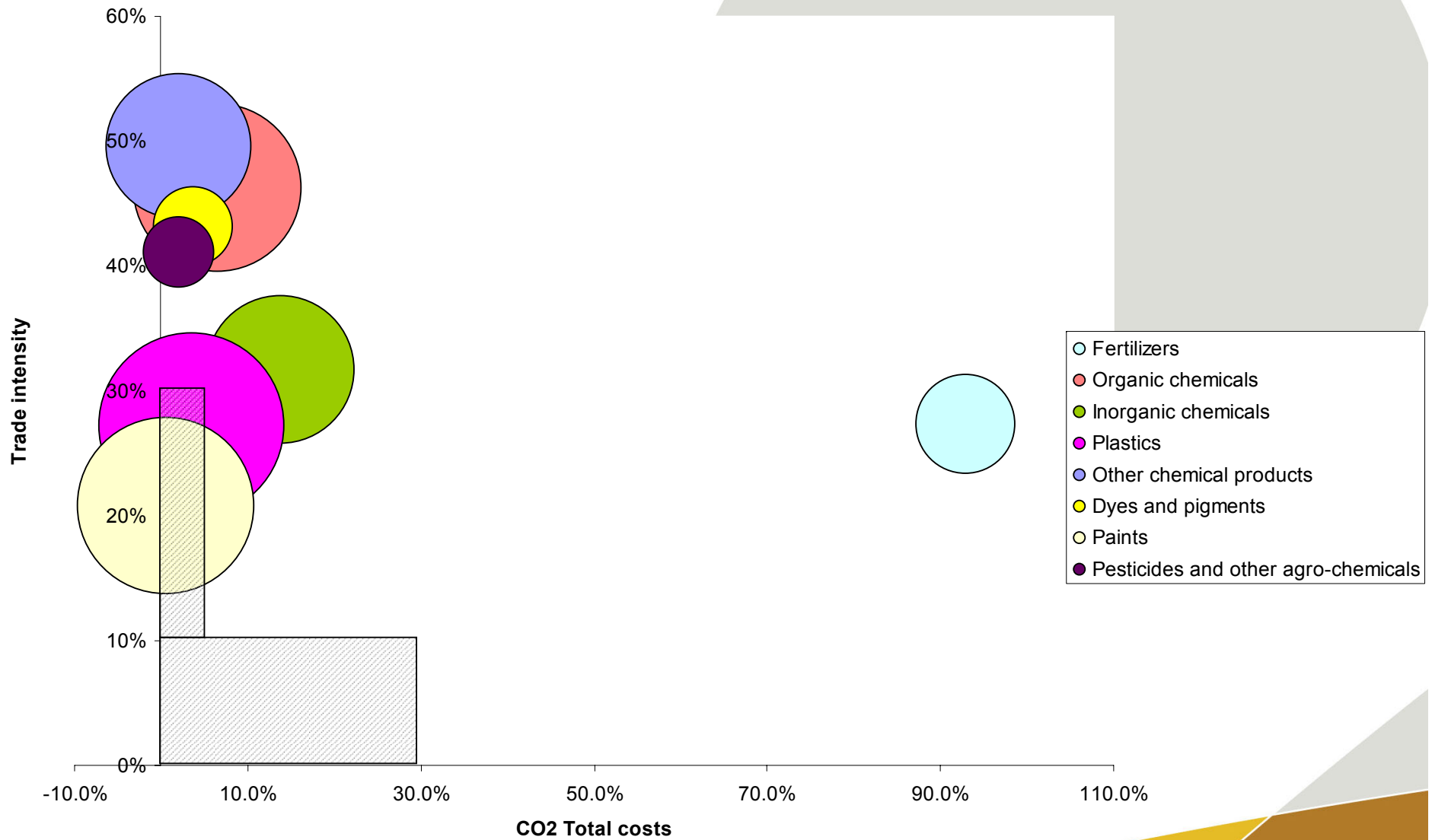
Sectors meeting the Trade Intensity and CO2 Cost thresholds (4)

Sector for which qualitative assessment has been made (1)

CO2 emissions for the chemical sector in the carbon leakage assessment
 (bubble size indicates size of sector's emissions)
 - Sectors in shaded areas do not meet carbon leakage criteria according to 2009/29/EC -



Employment for the chemical sector in the carbon leakage assessment
 (bubble size indicates size of employment)
 - Sectors in shaded areas do not meet carbon leakage criteria according to 2009/29/EC -



Obtaining the results of this assessment would have been impossible without the collaboration of:

DG ENTR colleagues (Directorates F & G)

EUROSTAT (Mr. E. Pongas; Ms. P. Sneijers and Mr. B. Williams)

Member States

Industry Associations and individual members

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