



**Competitiveness of the EU Chemical Industry, a
Key sector in the Refining Value Chain**
José Mosquera, Director Industrial Policy

***Second meeting of the EU Refining Forum
27 November 2013, Brussels***

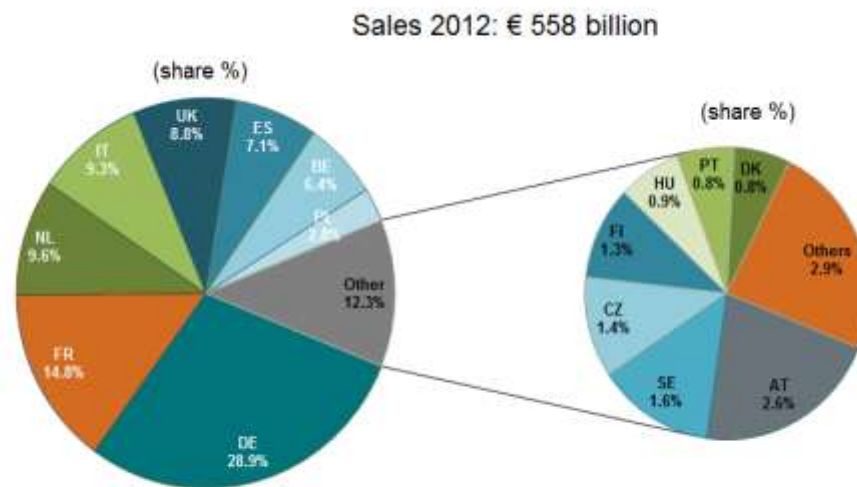


Profile of the European Chemical Industry

“Manufacturing Platform Europe”



- Generates € 558 billion of revenues (2012)
- Contributes to 18% of the world's chemical sales (2012)
- Employs 1.1 million people (2012)
- Creates a trade surplus of € 49.5 billion in (2012)

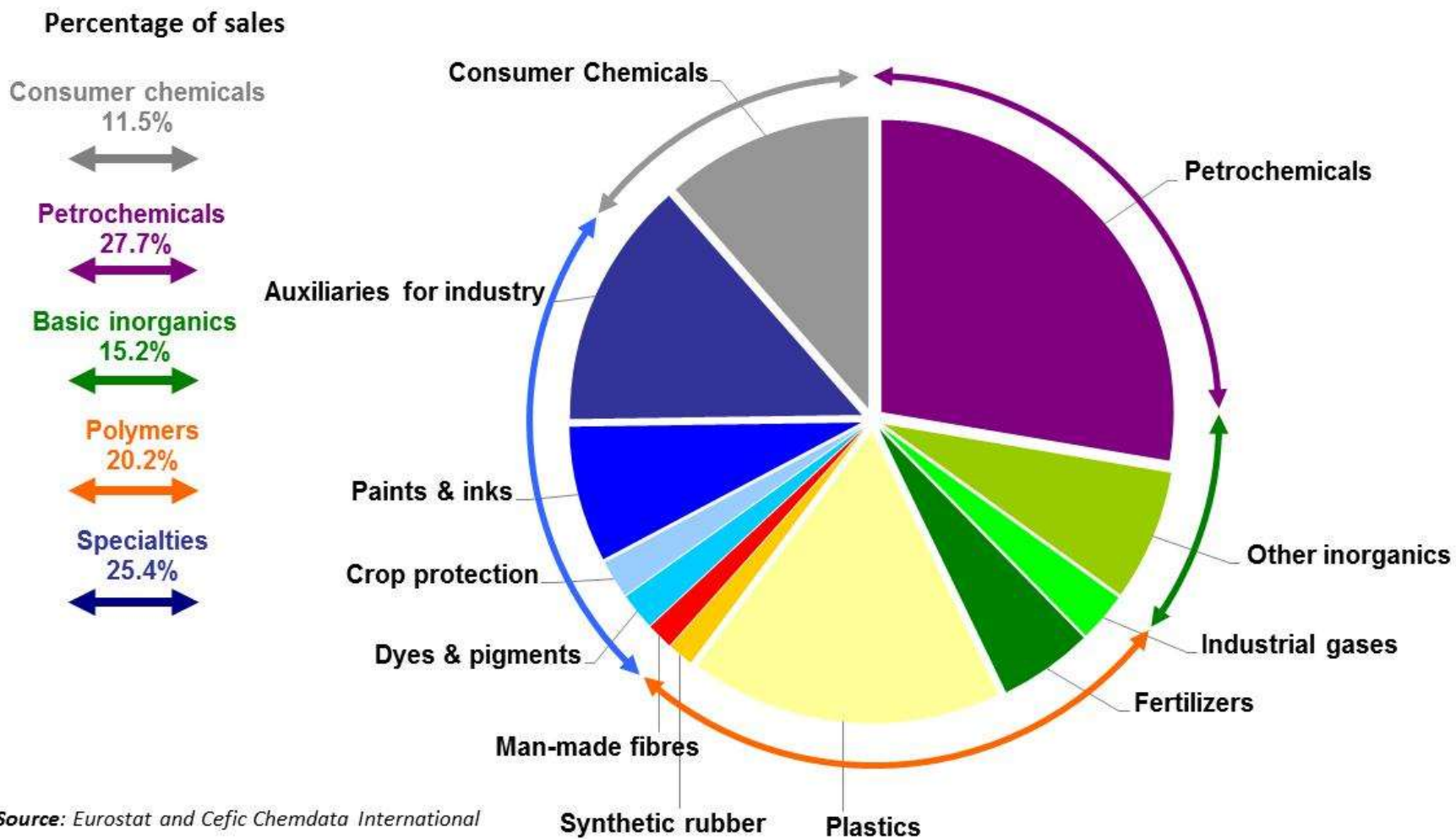


Source: Eurostat and Cefic Chemdata International

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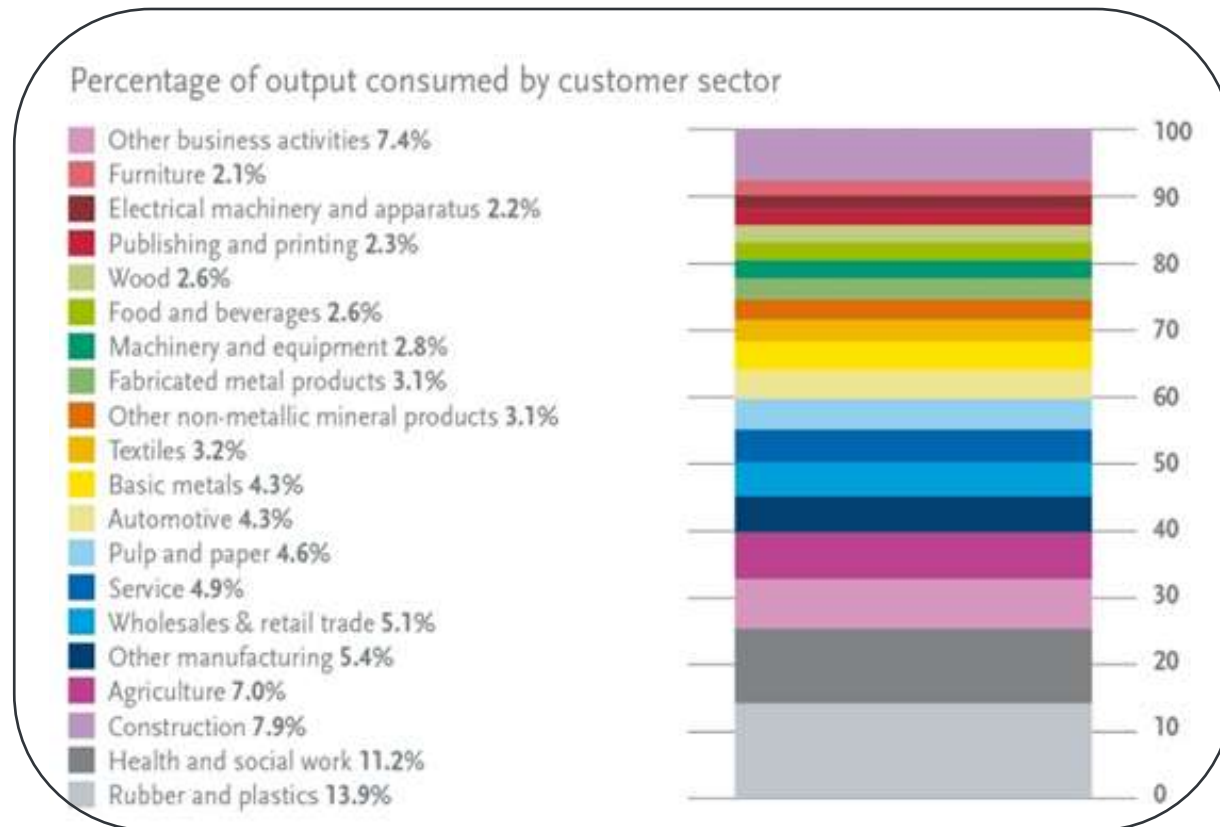


EU Chemical Industry Structure (2012)



Source: Eurostat and Cefic Chemdata International

The EU chemical industry supplies virtually all sectors of the economy

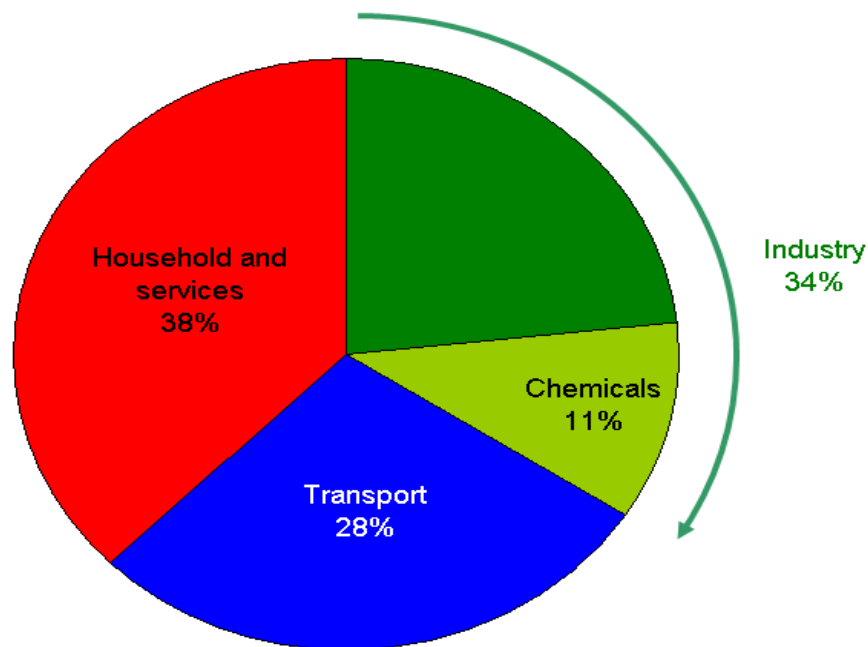


Sources: European Commission, Eurostat data (Input-Output 2000) and Cefic Analysis



EU Chemical Industry Energy Uptake

Energy consumption in the different economic sectors
(fuel and feedstock)



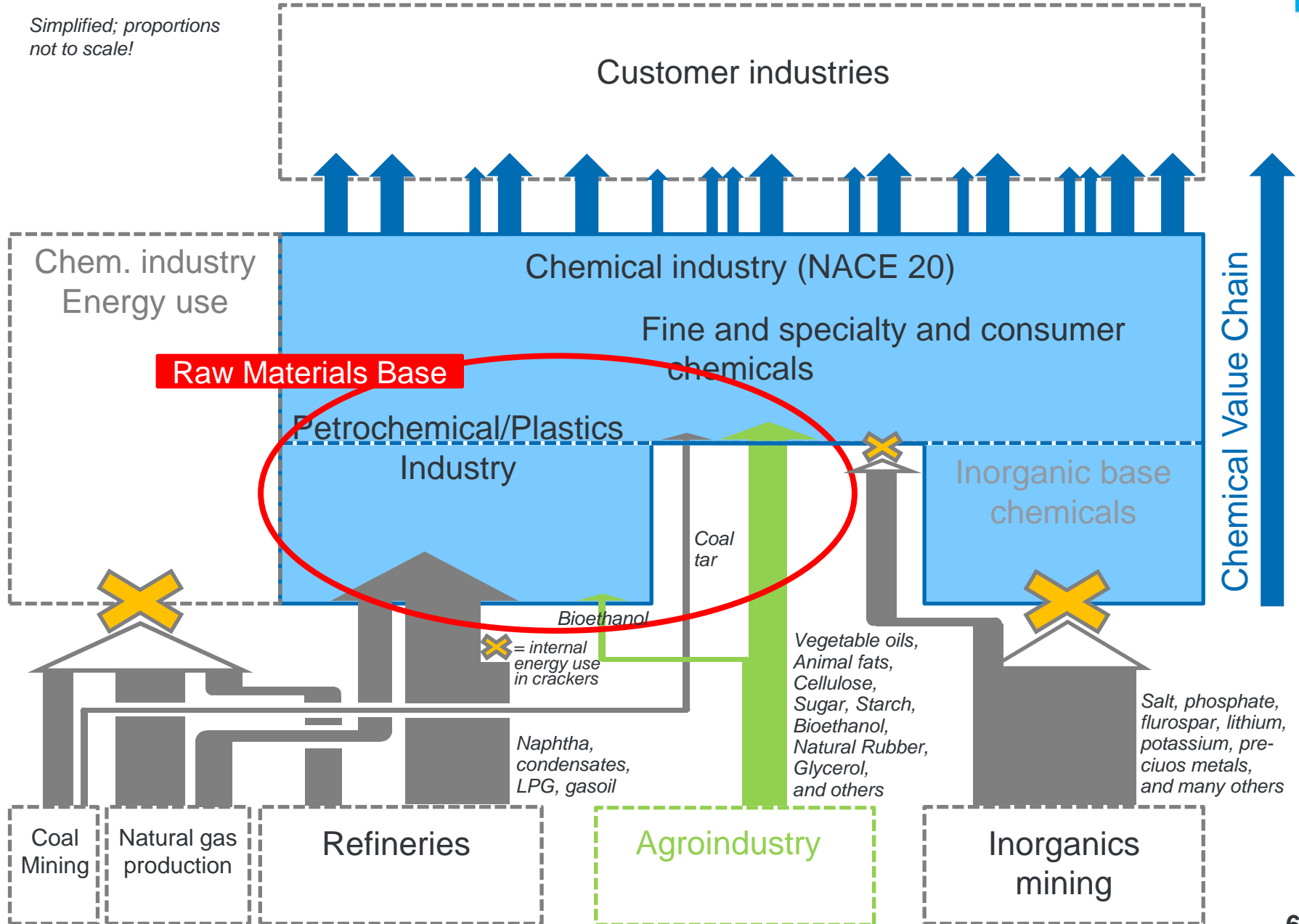
Source: Eurostat

- ✓ Chemical industry: 11% of the total EU energy demand and for one-third of industrial use (fuel and feedstock)

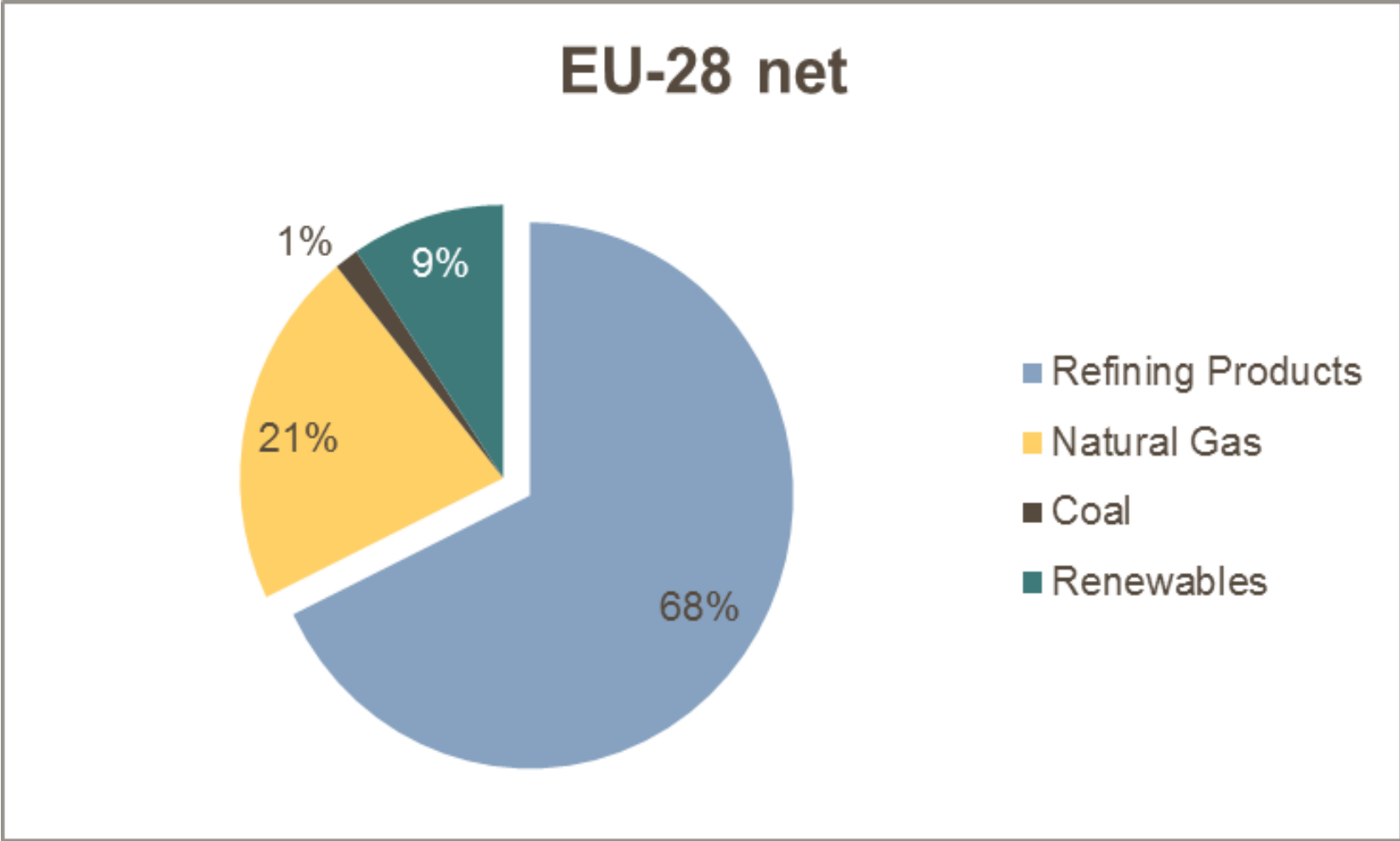
Raw material use by the EU chemical industry



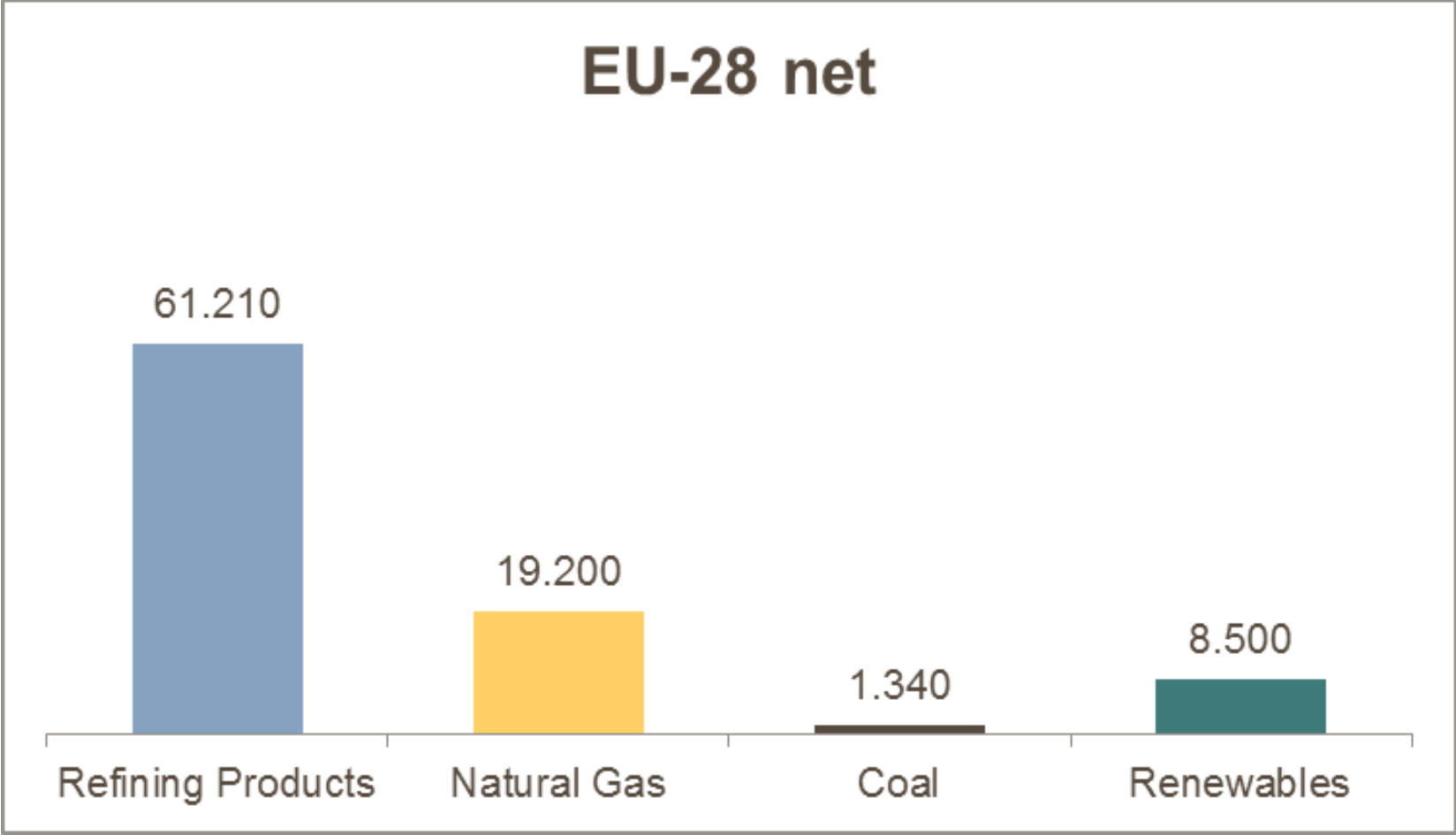
Simplified; proportions not to scale!



Raw material use by the EU chemical industry (2011, material use – draft)



Chemical Industry Raw Material Use (2011, material use, draft)





The European Petrochemical Sector

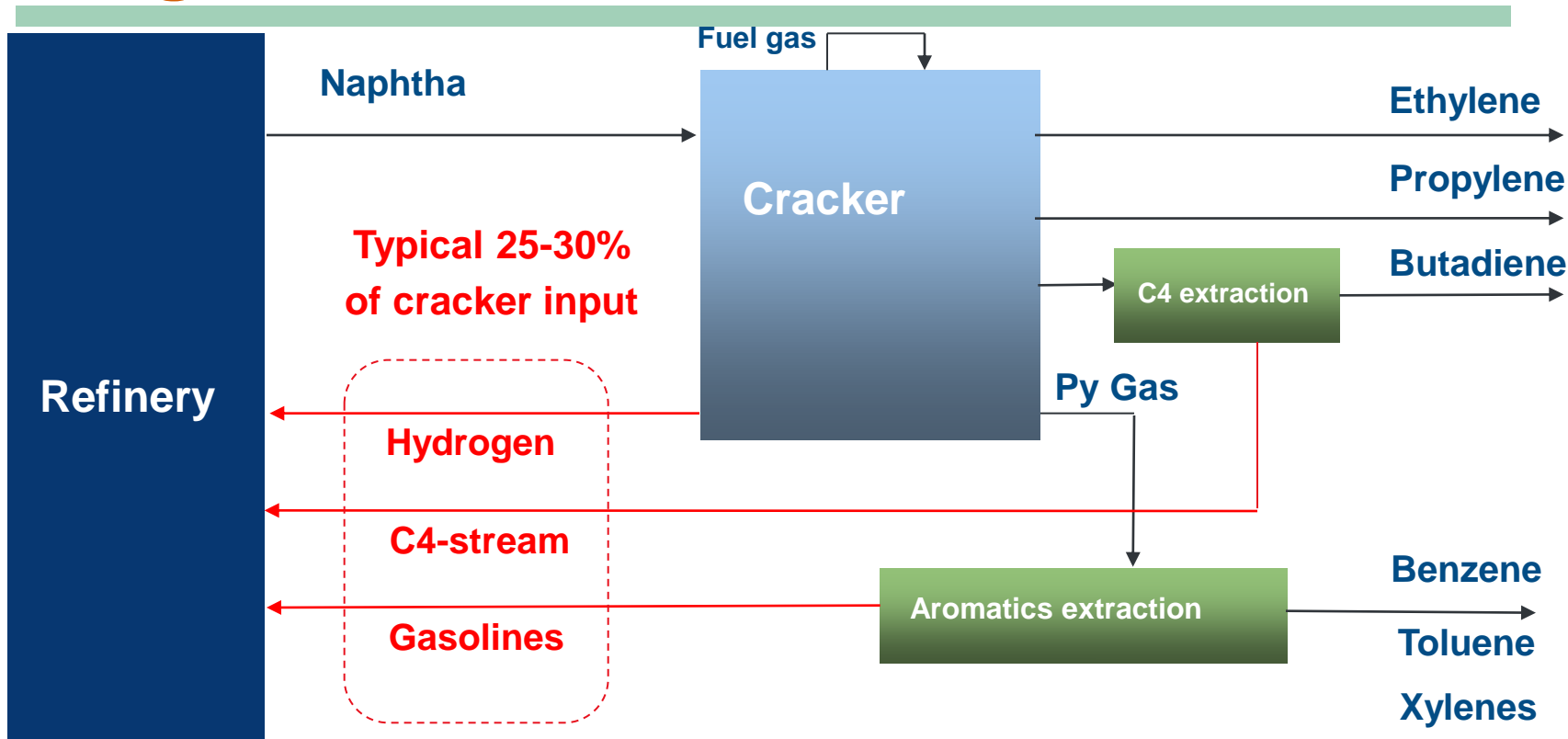
- 59 crackers in the EU
- 40 units integrated with refineries (approx. 70%)
- 26 million tons ethylene → in total 40 million tons of chemicals
- 20% of WW ethylene capacity (130 million tons)

Petrochemical Industry: Crackers' key dimensions

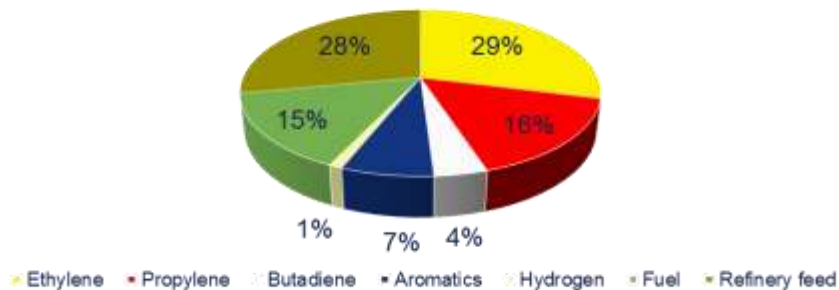


- Crackers convert raw materials into valuable compounds
- Cracking is energy intensive
- Units are capital intensive (2,5 to 4 billion euros)
- Units are difficult to upgrade (technology dependent)
- Capacity and utilisation rates are essential for viability
- 80% of manufacturing costs are related to feedstock and energy
- 85% of European crackers use naphtha as main feedstock
- Integration is highly important

Refining / Petrochemicals integration



Product integration : feeds and petrochemical products



Process integration

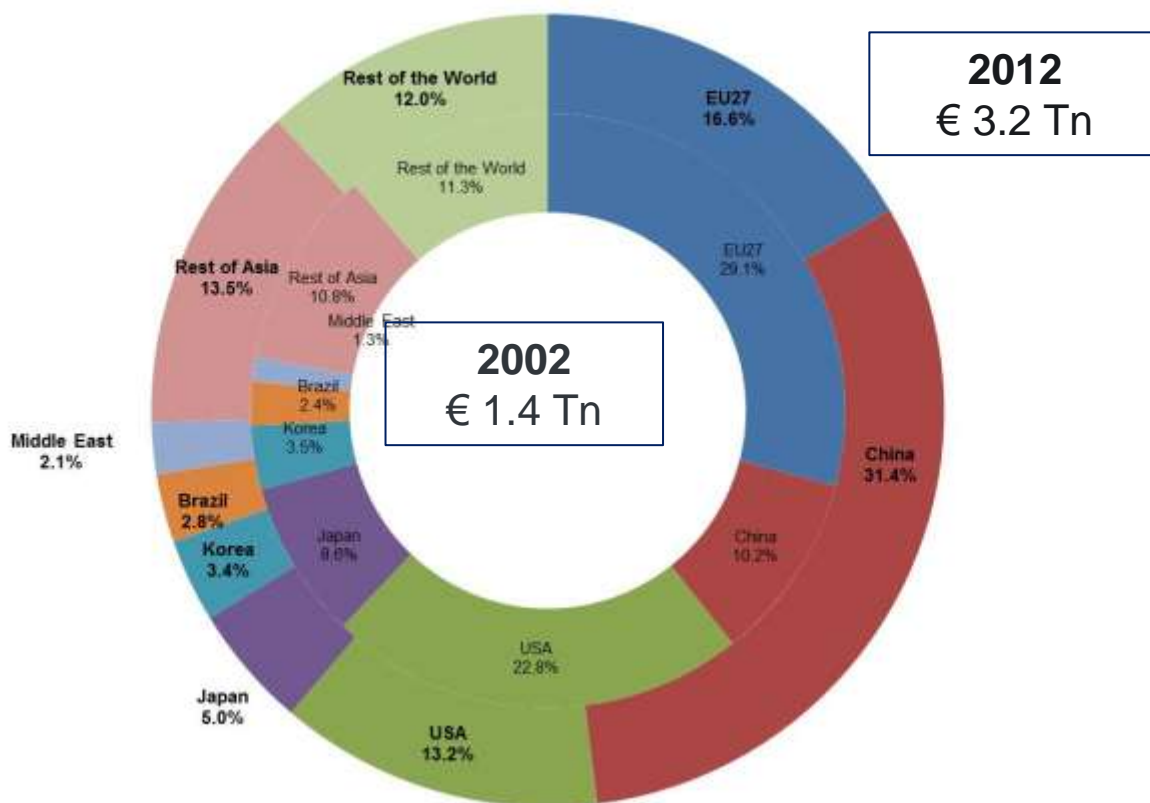
- Heat integration
- Utilities (air, water, ...)
- Maintenance
- Shared services



Global Chemical Market Profile and Evolution

- Chemicals Market Size : chemicals demand in value

Breakdown of the market of the chemical industry, in 2002 and 2012



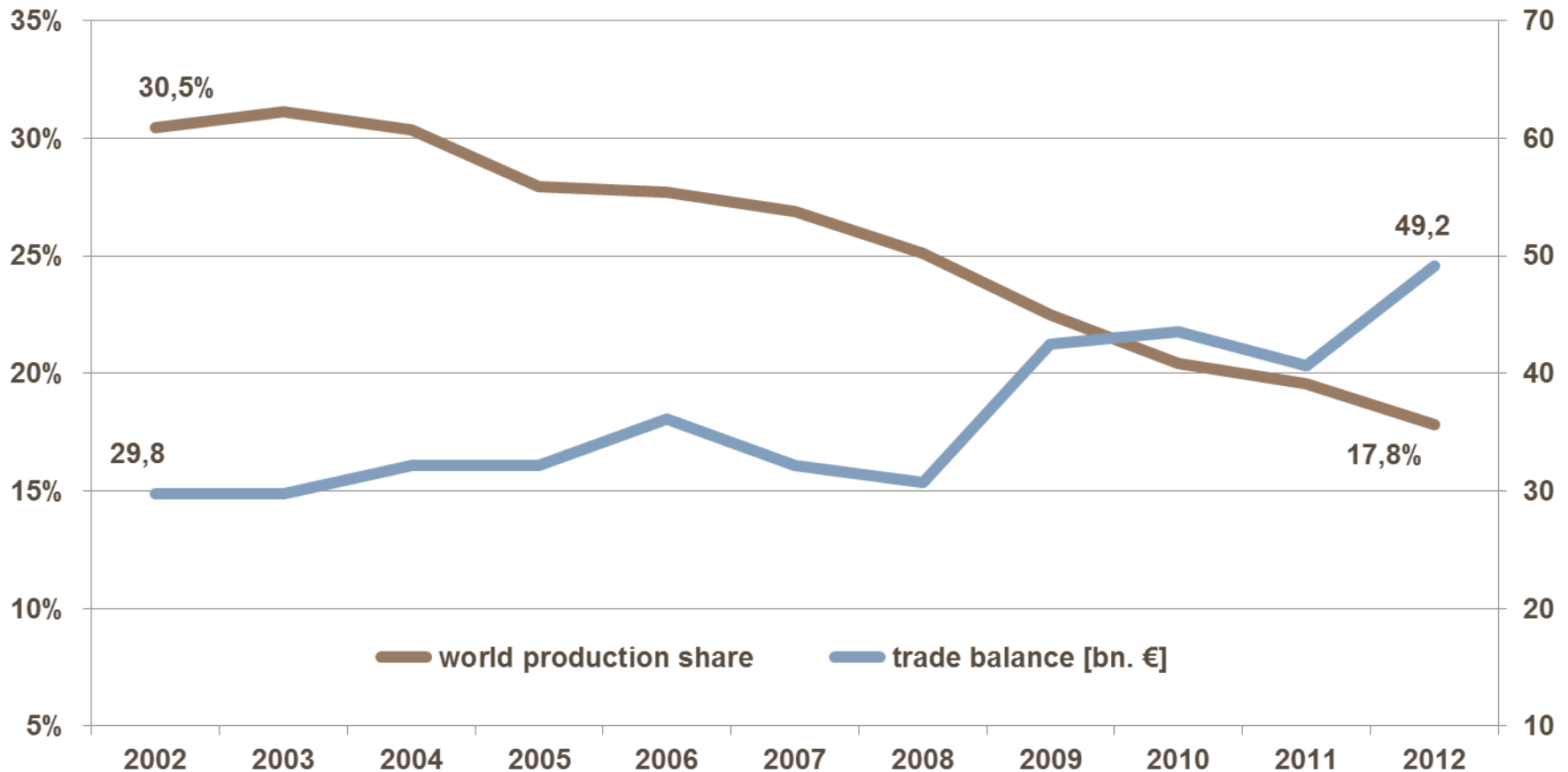
- The global chemicals market has doubled in ten years, and is expected to continue growing at approx. 3-4%/yr for the coming 20 years.
- Despite having grown in absolute terms, EU share of global demand has declined
- European demand grew more slowly than world average (due to mature markets, aging population)

Source : Cefic Chemdata, * proxy for M-E (Iran, Israël and Saudi-Arabia)

Has EU chemical industry lost (production share declined) or won competitiveness (trade surplus increased)?



Production platform Europe: global production share & trade balance evolution - 2002-2012

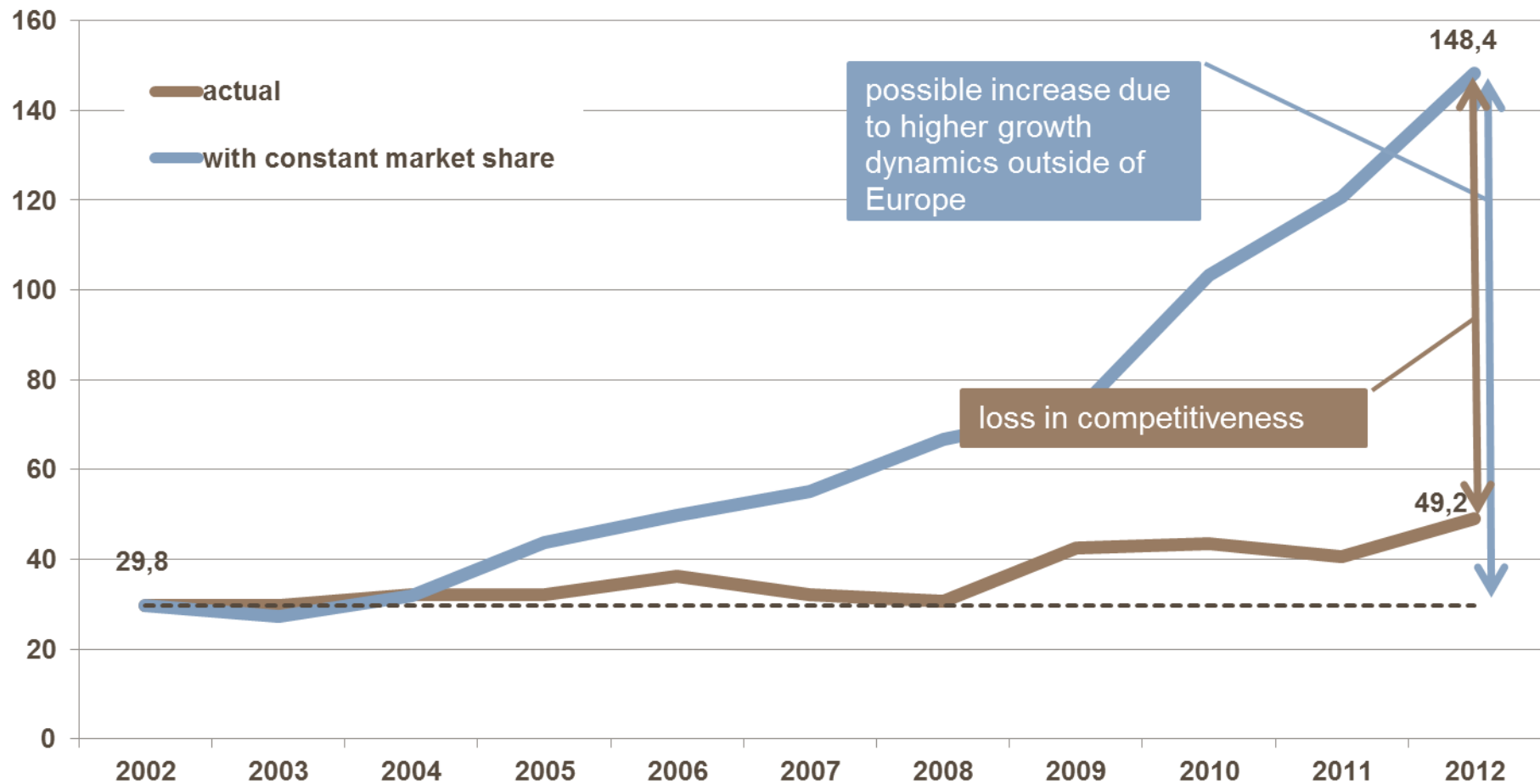


Source: Cefic Chemdata International 2013

EU chemical industry: trade surplus could be 3 times higher



EU trade surplus [in bn €]

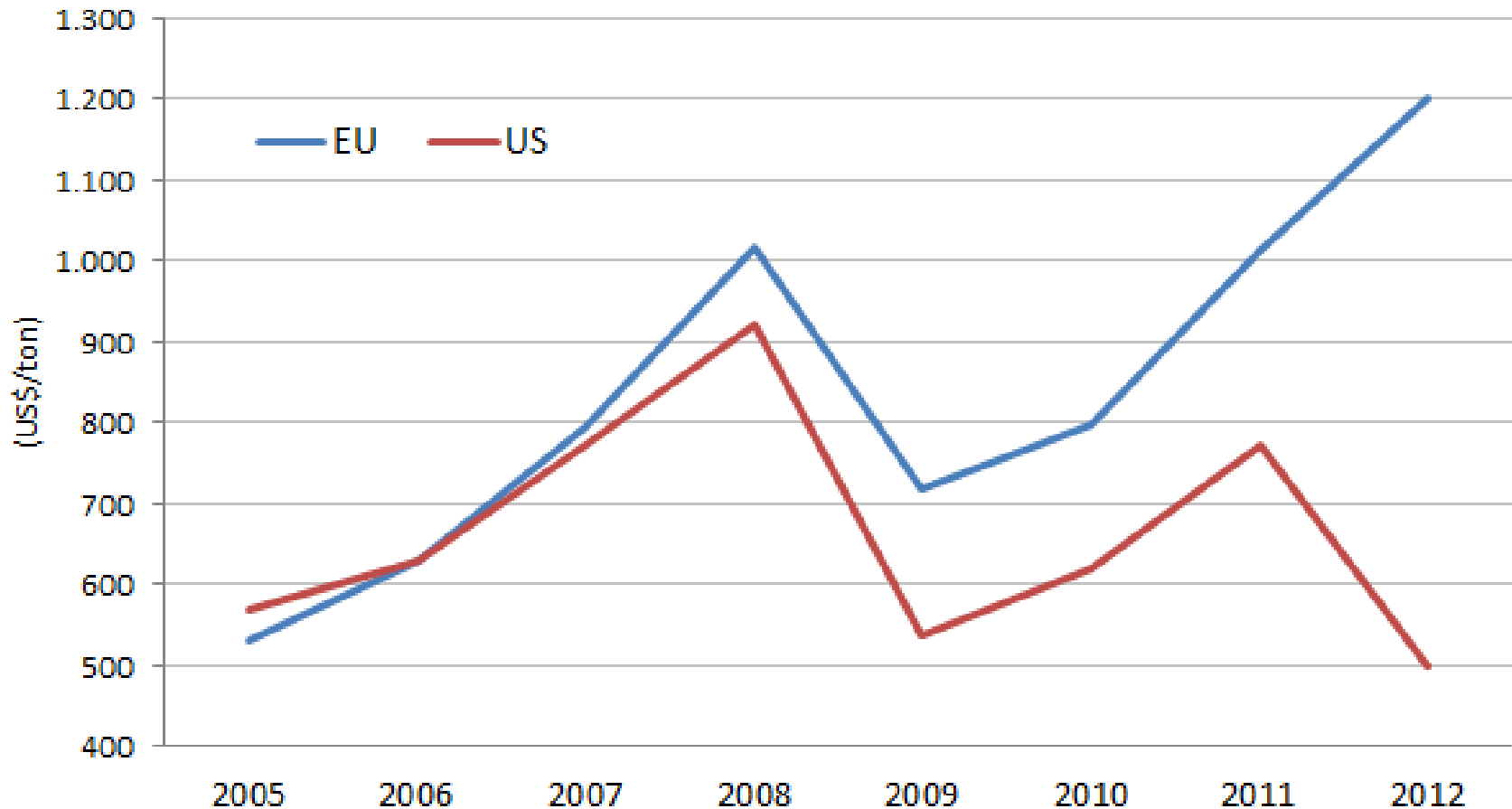




What are the key factors affecting competitiveness?

- **Energy and Raw Materials**
- **Regulatory Stability and Consistency**
- Access to Markets
- Innovation
- Skills and People
- Logistics and Infrastructure
- **Capital Investment**

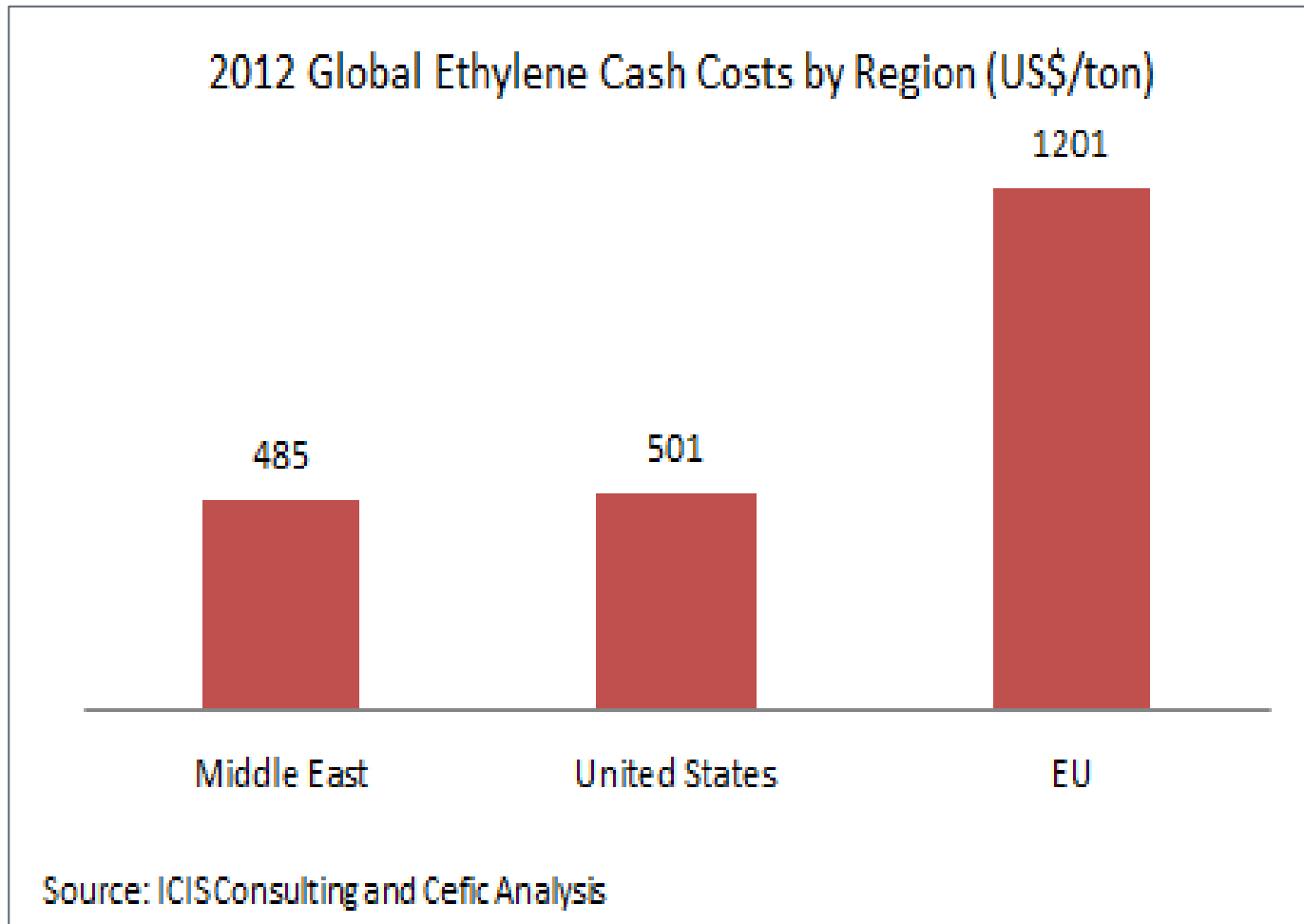
Impact of shale gas on Ethylene Costs: EU vs US



Source: ICIS

Critical regional differences: Over 85% of U.S. production gas based, about 85% of European petrochemical production naphtha based, Gulf region mainly use gas Crackers

Ethylene costs - Global Picture



Impact of shale gas on the Petrochemical Industry



➤ New Investments in the US

✓ Ethylene as key example:

- largest basic building block for the chemical industry and largest volume organic chemical produced (~130 million tons/yr).
- more than 38% increase in ethylene capacity in US in coming 3-5 years (existing capacity approx. 30 million tons).

✓ Boosting profitability of US-based petrochemical companies.

✓ 126 new chemical projects, totaling around 84 billion USD new capital investment, have been announced

➤ Key Consequences for Europe:

✓ Increased US volumes of ethylene derivatives to Asia, Latin America, and Europe. European export capacity affected.

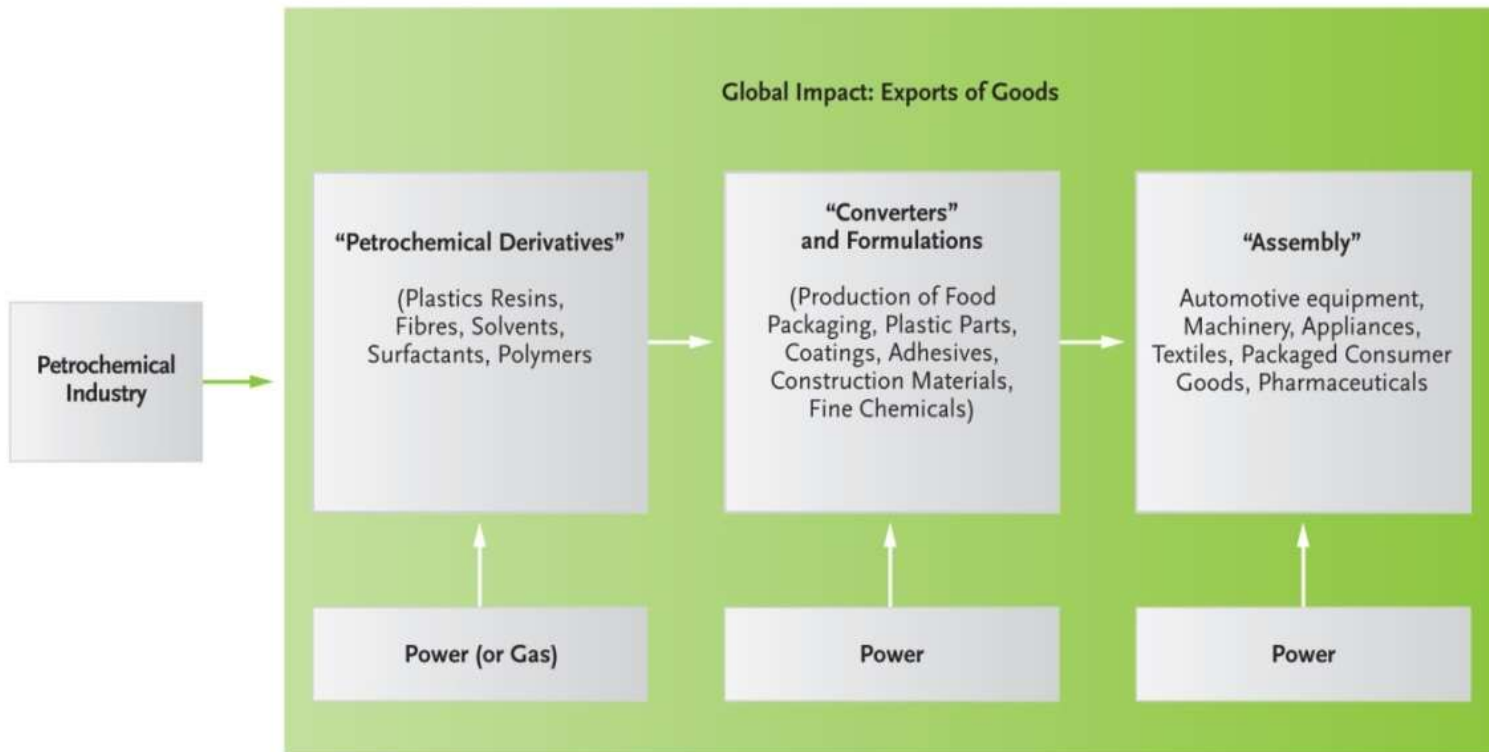
✓ Loss of competitiveness of EU naptha crackers vs US ethane crackers.

✓ US manufacturing renaissance may create pull for specialties.

Impact down the Value Chain



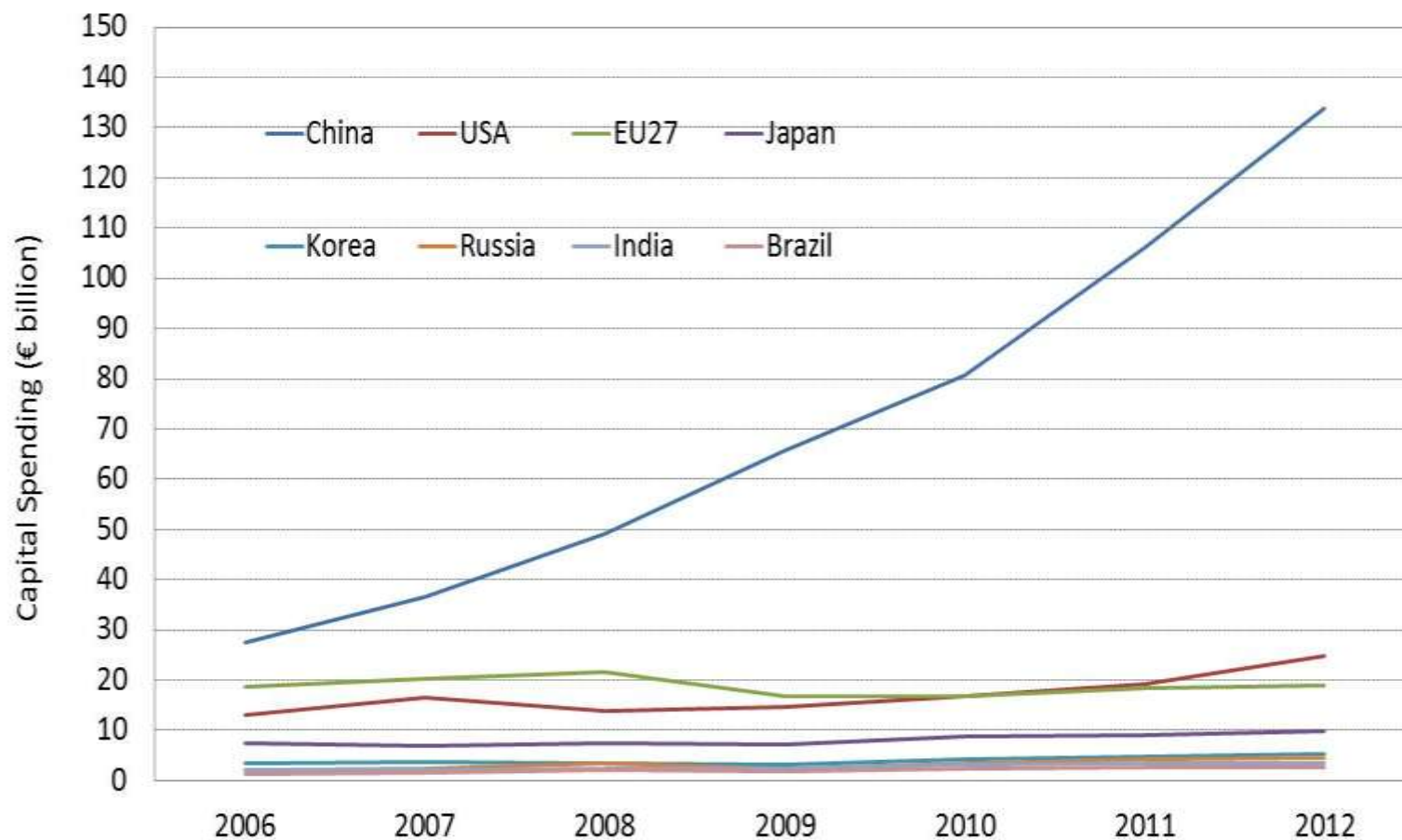
Impact of Shale Gas on the Chemical Value Chain





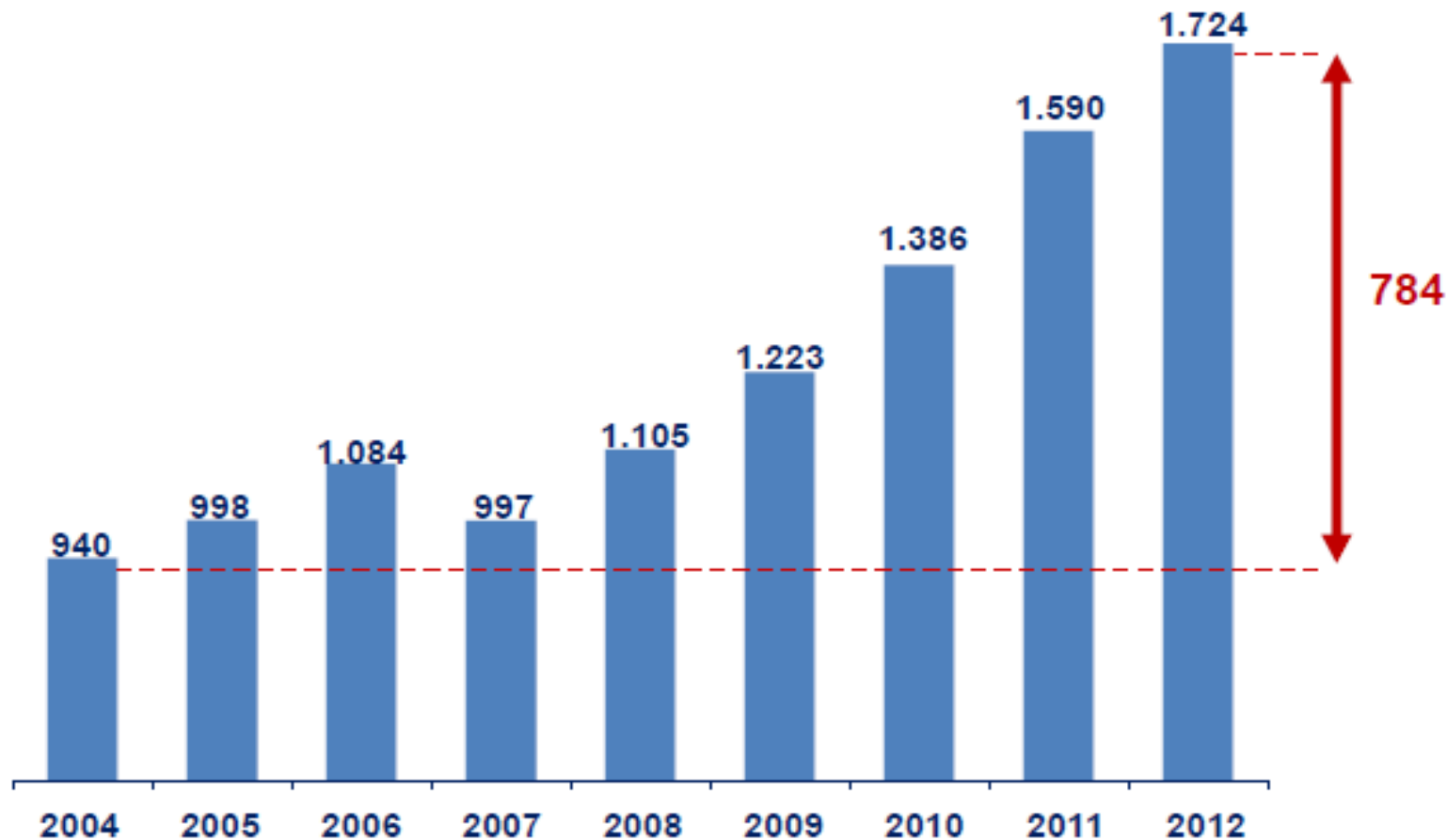
Capital Investment (Euro Billion)

- China, attracting the bulk of chemicals investment
- Increase in investments in the US due to improvement in feedstock end energy costs



Source: Cefic Chemdata International 2013 and and cefic analysis

Cumulated number of EU regulations on Health, Safety and Environment (net of abrogation)



Source: EU, Directory of EU legislation in force
(Chapter 15 – Environment, consumers and health protection)



Enterprise and Industry

- *Fitness Checks, Cumulative Cost Assessments and Evaluations planned:*
 - **Fitness Checks on the most relevant chemicals legislation not covered by REACH as well as related aspects of legislation applied to downstream industries;**
 - Evaluations of the machinery Directive and firearms legislation;
 - **Cumulative cost assessments in the areas of chemical industry** and forest-based industries (woodworking, furniture, pulp/paper and printing).
- *Fitness Checks and Evaluations ongoing/completed:*
 - Evaluation of regulations regarding internal market for industrial products;
 - **Fitness check** on the type-approval system for motor vehicles and **of the oil refining sector;**
 - Cumulative cost assessment of the aluminum sector;
 - A cumulative cost assessment on the steel sector has been delivered in 2013.



Competitiveness – Pros and Cons for Europe

- 😊 Large **integrated domestic market** with strong customer industry clusters
- 😊 High international **orientation and global network** to external customer industries
- 😊 Until now availability of **skilled and motivated workers** and scientists
- 😊 Continued strategic **restructuring** efforts (flexibility to globalised markets)
- 😊 **Strong innovation** efforts will generate new growth clusters: Efficient Energy use, health and new materials which could solve upcoming societal mega challenges
- 😞 Low “new consumers” population growth in the EU => low demand growth for chemicals in general - **elderly population, shrinking working age classes**, high saturation levels.
- 😞 **High energy and feedstock costs** vs Middle East and now the US => EU is facing an upcoming wave of petrochemical capacity additions, especially in Middle East and US
- 😞 High **Regulatory Compliance** Costs (eg REACH, Seveso, IED, 7th EAP...)
- 😞 **Non-energy raw material availability and cost** issues (eg. biobased feedstock, rare earths, minerals)
- 😞 Lack of a “Common Industrial Policy” or a “Common Energy Policy”