The socio-economic importance of chemistry in Europe

Simon Campbell
Former Head of WW Discovery Pfizer
President-elect of the Royal Society of Chemistry

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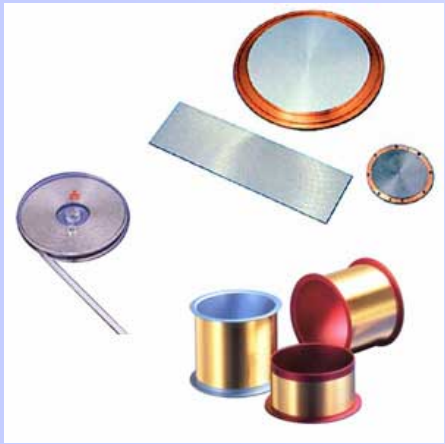
Chemistry and Society



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Looking to future success

- Chemistry is critical to the EU
  - It underpins successful industries
  - It has the ability to improve our health, wealth and environment
- Chemistry faces challenges
  - Economic, Legal, Social
- How can we work together to ensure our future success?

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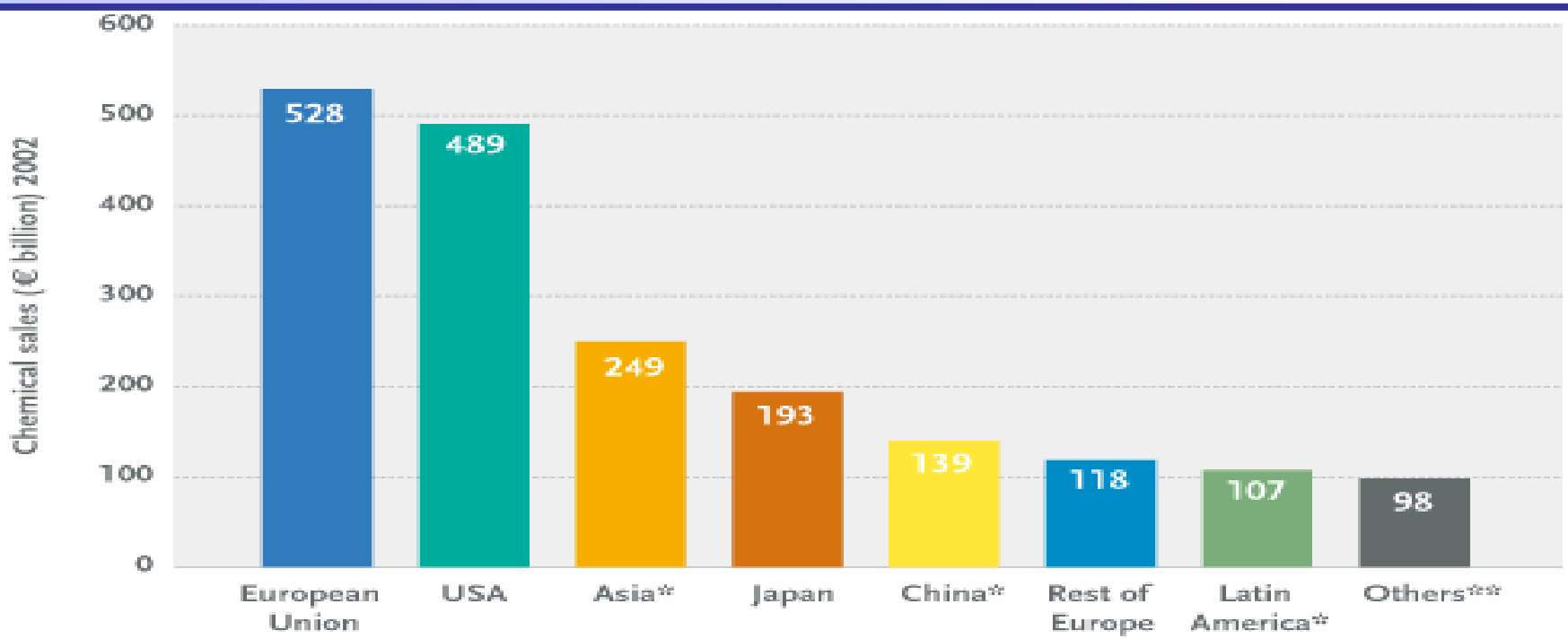
Geographic breakdown of world chemical sales



World chemicals production in 2002 is estimated at € 1921 billion.
The EU accounts for 27.5% of the total.

Sources: Cefic
Notes: * estimated
Definition: Rest of Europe= Switzerland, Norway, Central & Eastern Europe, and Turkey
Asia excluding Japan & China.
** Others including Canada, Mexico, Africa, & Oceania

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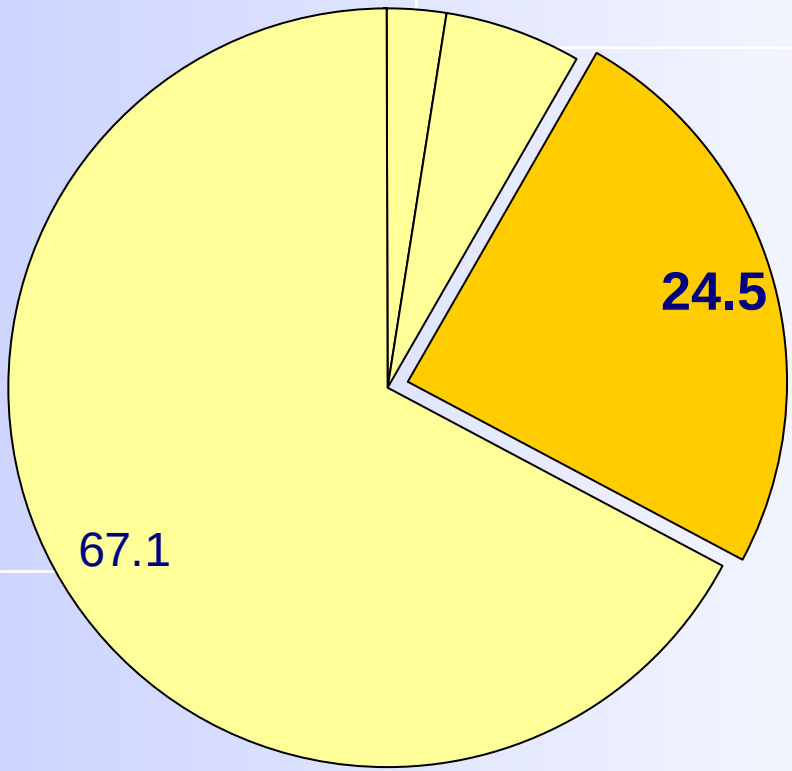
Contribution of the Chemical Industry to the EU Economy

Percentage of GDP



Agriculture 2.6%

Construction 5.8%

Industry 24.5

Chemical Industry 2.4%

Rest of Manufacturing 18.9%

Rest of industry 3.2%

Services and administration 67.1

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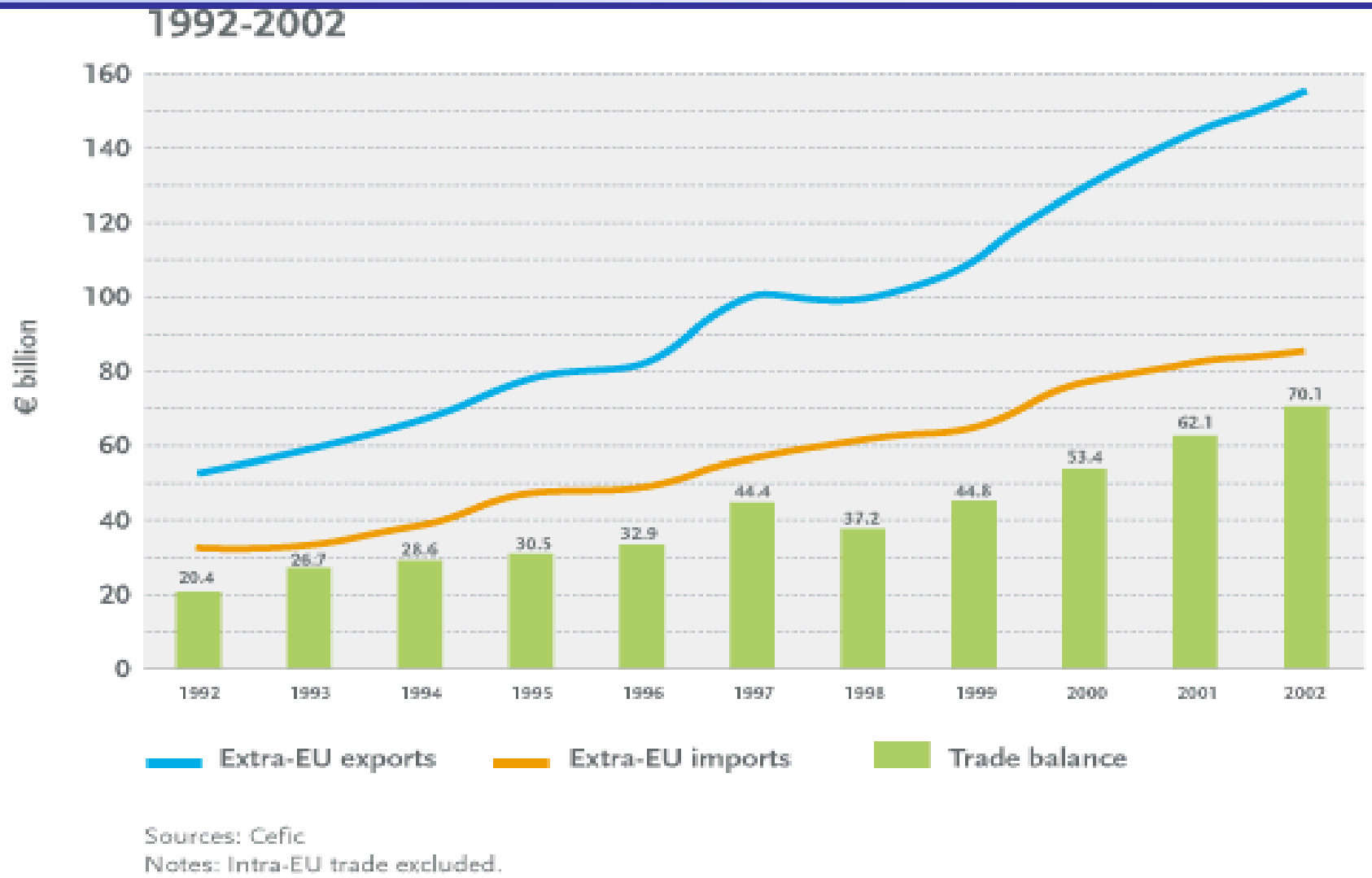
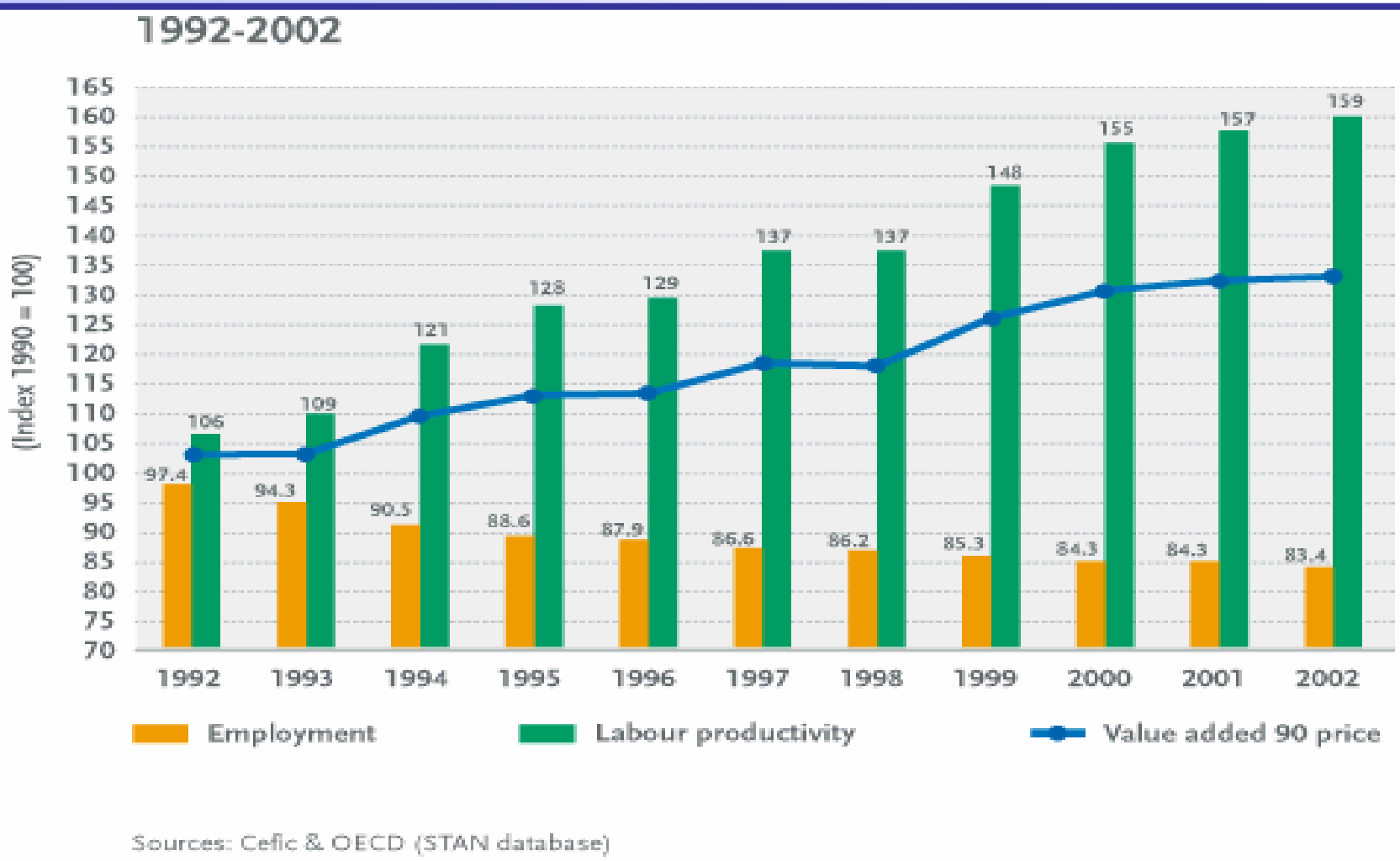
Source: Eurostat-Compet, SBS and Cefic-ITC Analysis

EU chemicals trade balance



Labour productivity in the EU chemicals industry



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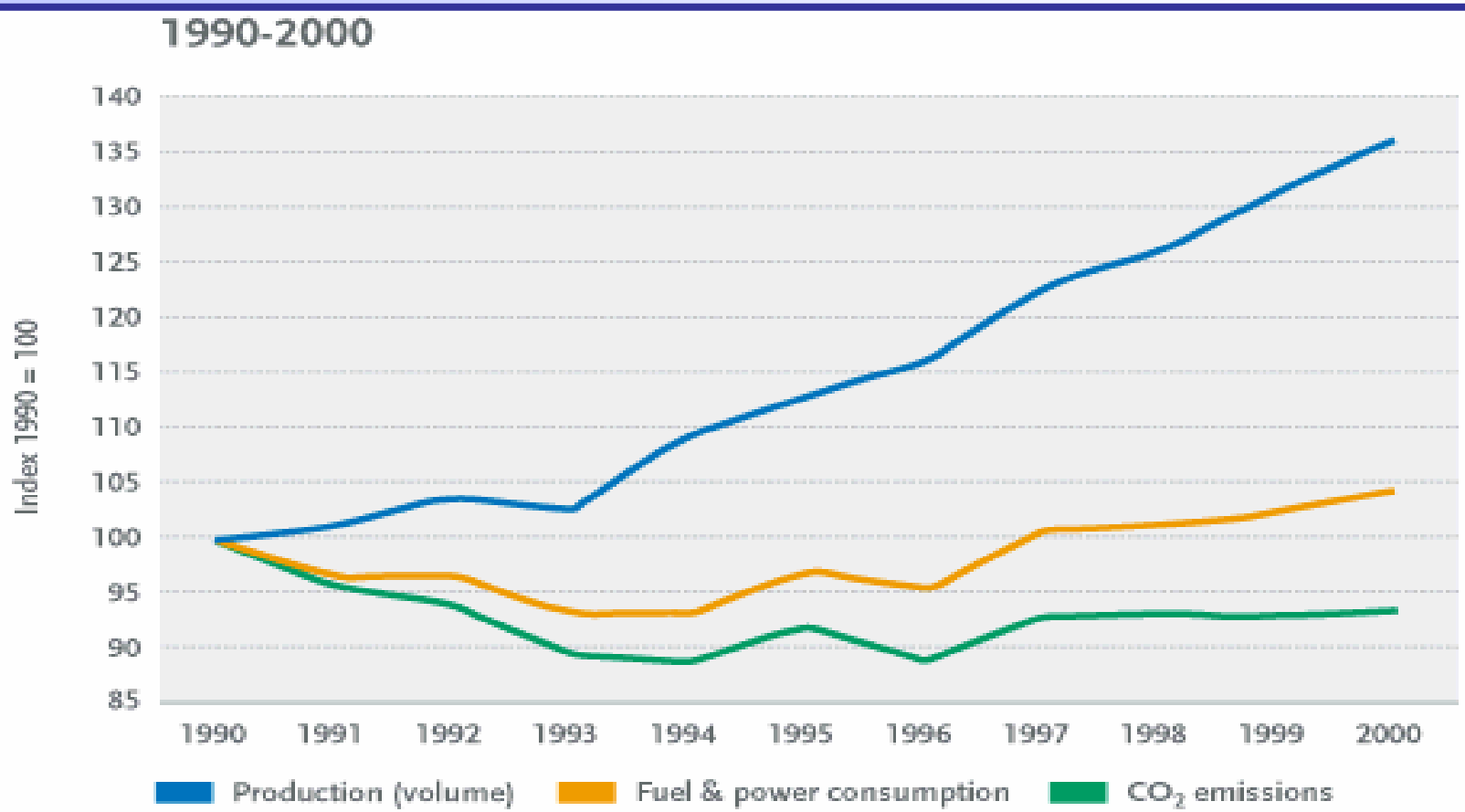
EU chemical industry CO_2 emissions, energy consumption and production



Top 10 Pharma exporters

Table 6.2.6 Top 10 exporters of R&D Intensive Pharmaceuticals

		World market share % (1999)	Av. annual growth in exports % (1995-1999)
1	EU-15	29	13.9
2	USA	14	12.8
3	Switzerland	13	27.0
4	Germany	8	10.3
5	Belgium	8	:
6	UK	7	8.7
7	France	7	12.4
8	Italy	6	9.5
9	Denmark	5	12.0
10	Ireland	4	31.0

Source: DG Research
Data: Eurostat (Comext) UN (Comtrade)
Note: EU-15 = EU exports to non-EU countries only. Other countries = total exports.
The World total includes intra-EU trade.

Third European Report on S&T Indicators, 2003

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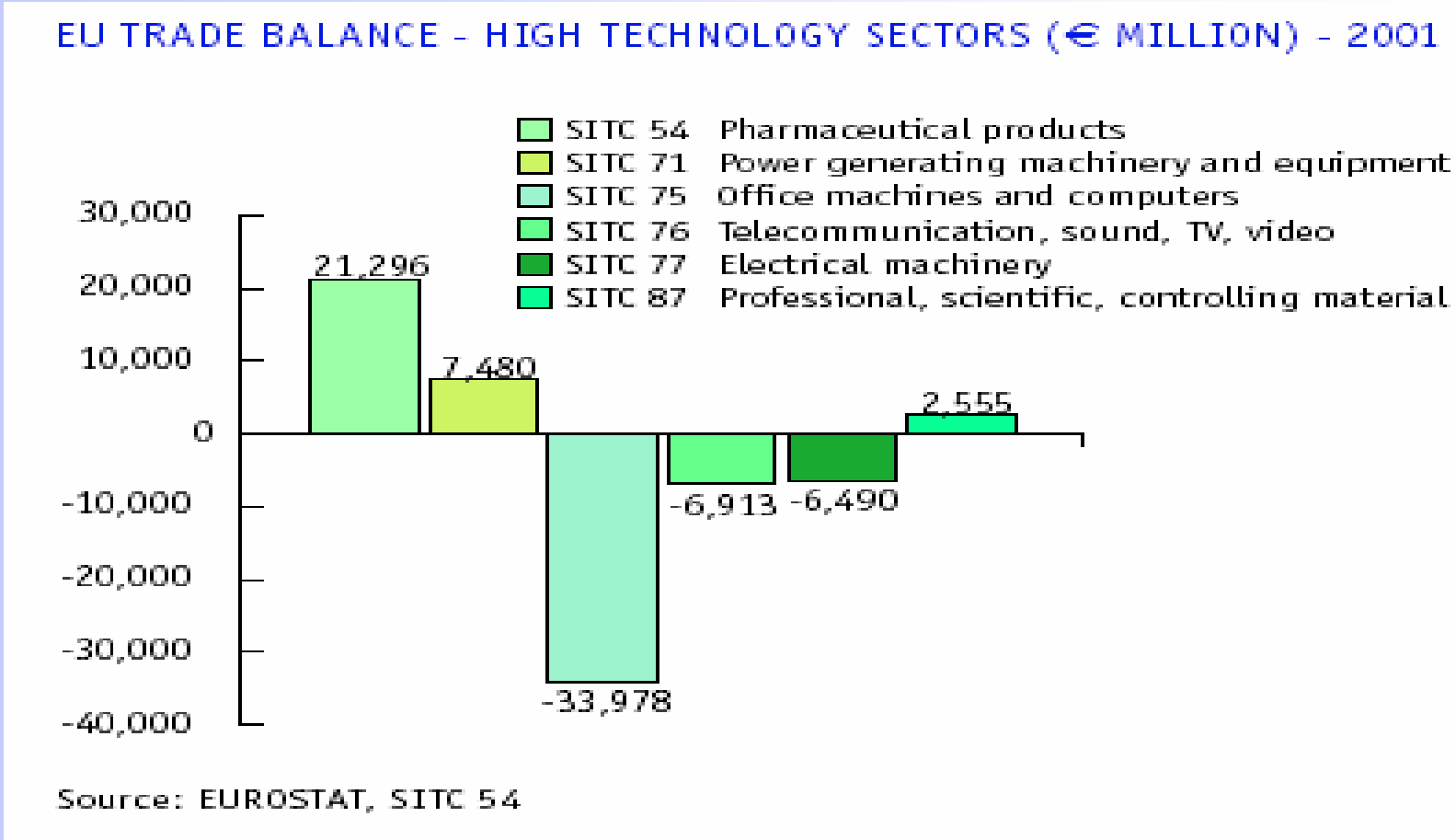
EU Trade balance - High technology sectors



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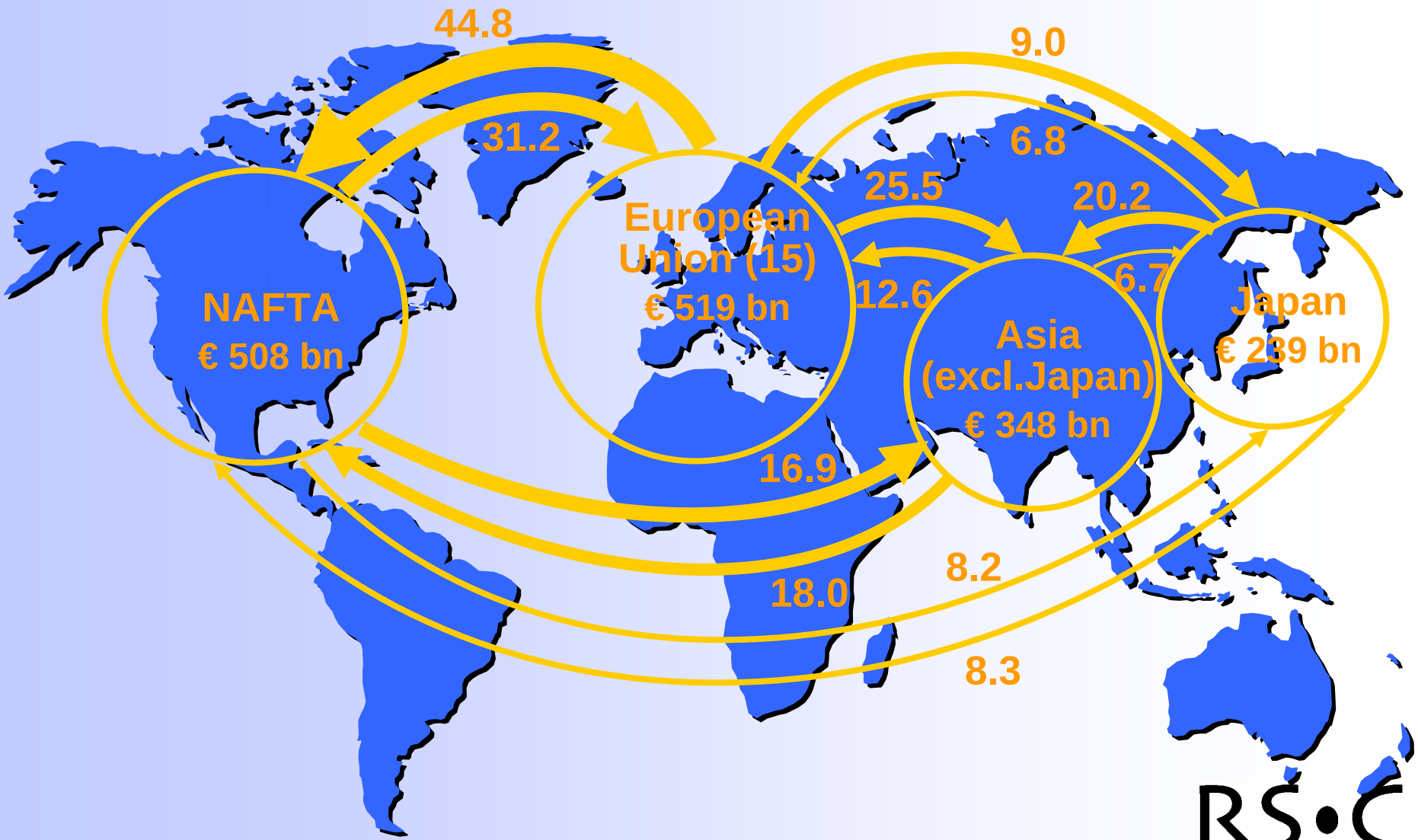
Trade flows of chemicals worldwide in 2001 (in billion €)



Source : CEFIC / WTO ; circles : Production value, arrows : trade flows

The EU pharmaceutical environment

- Government price controls in almost every Member State
- Delays in market access for new products
- Cost-containment policies focused at the beginning of the product life cycle (contrary to US)
- Wide price differentials which lead to artificial parallel trade flows (that will further be exacerbated with enlargement)

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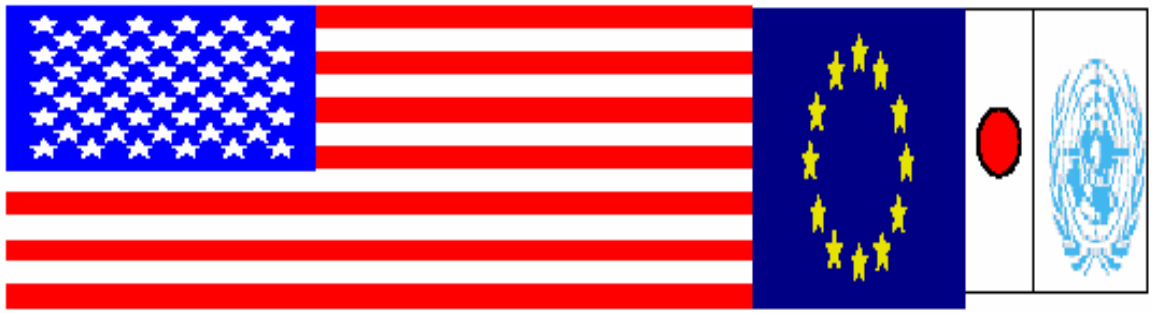
Innovation – Market penetration

Geographical breakdown (by main markets) of sales of new medicines launched during the period 1998 - 2002



70 %
USA

18 %
Europe

4 %
Japan

8 %
Rest of World

Source: IMS, 2003

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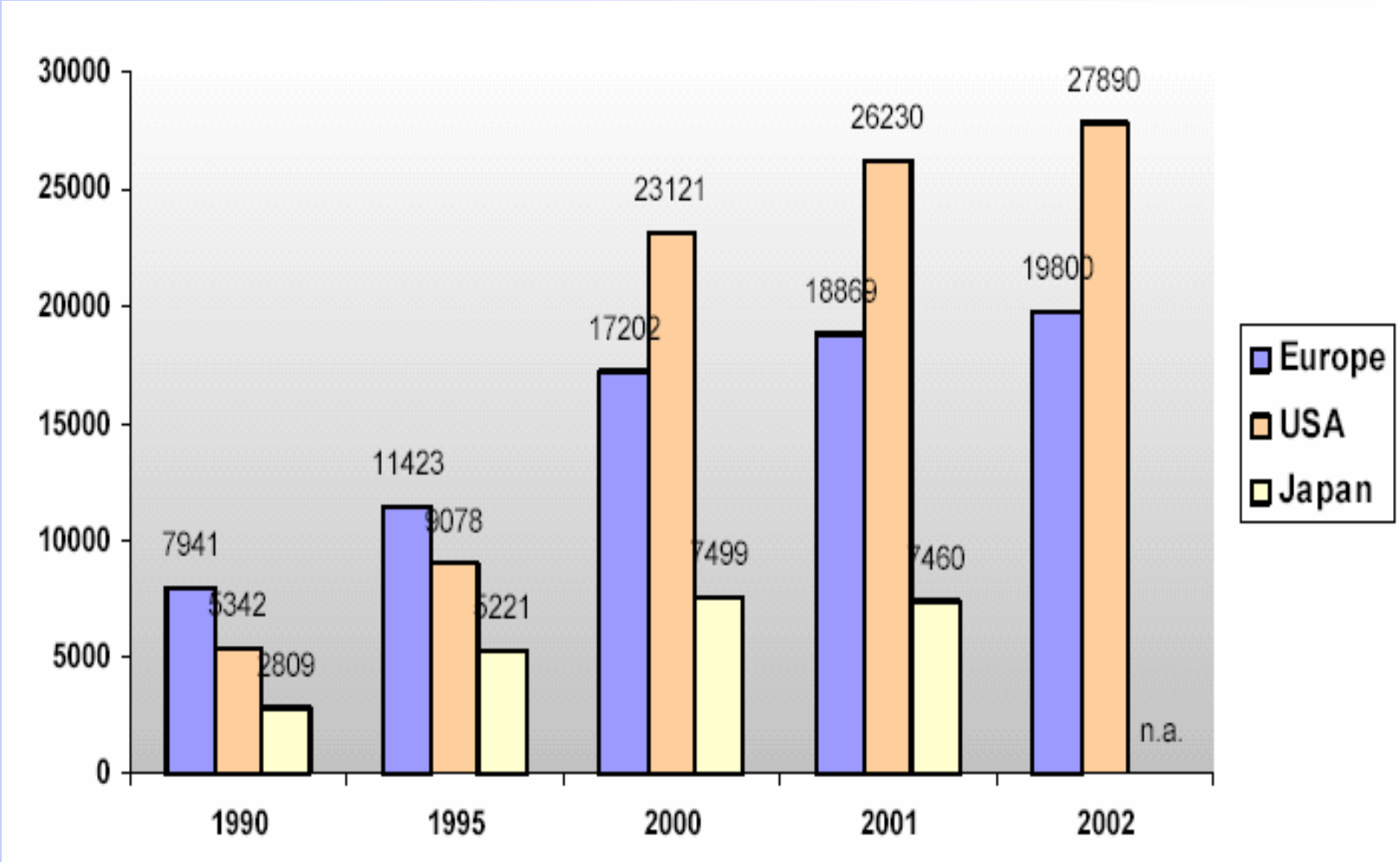
Pharmaceutical R&D spending



Data 2002: estimate EFPIA & PhRMA

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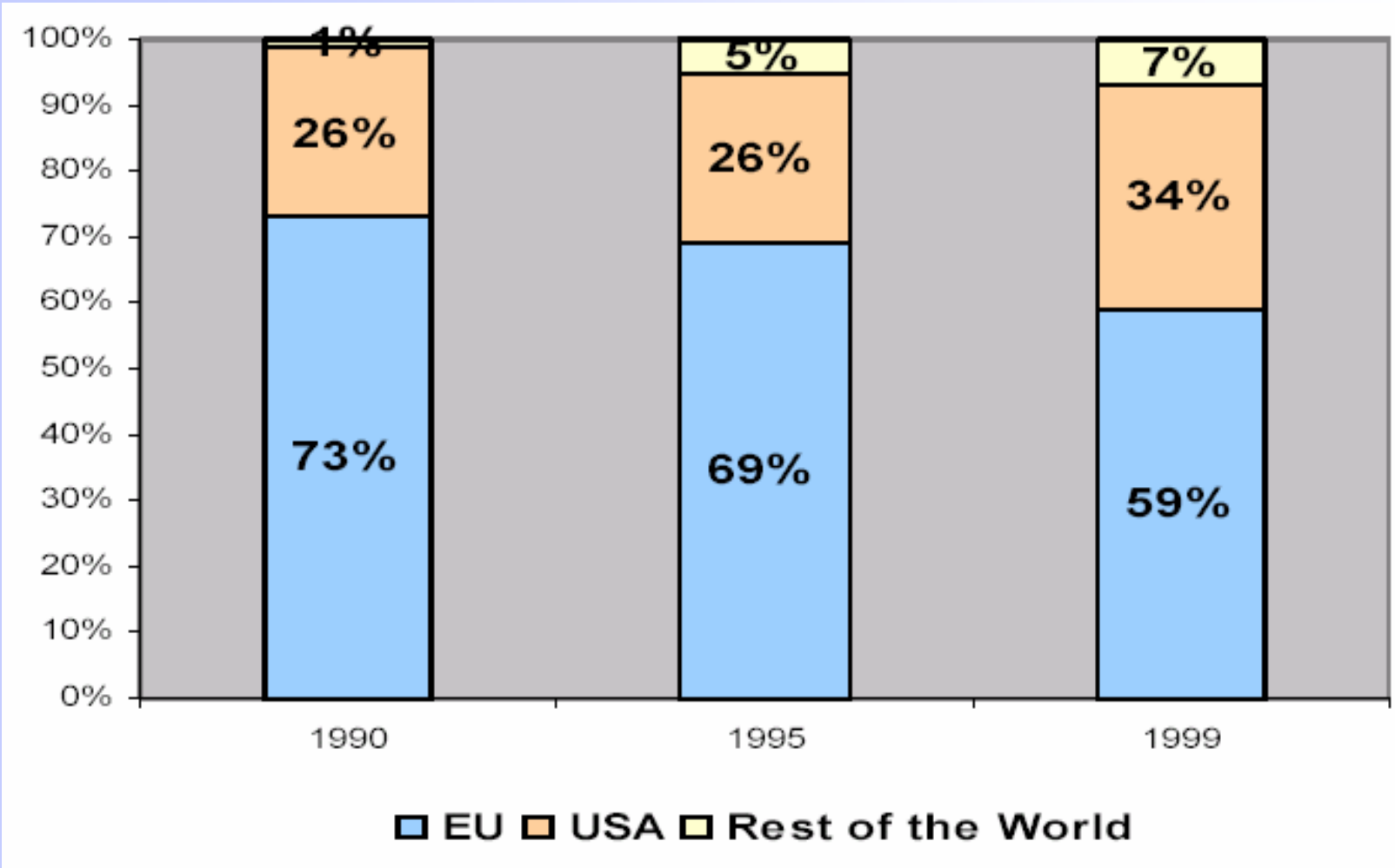
Location of R&D spending by EU companies



Source: EFPIA, 2000

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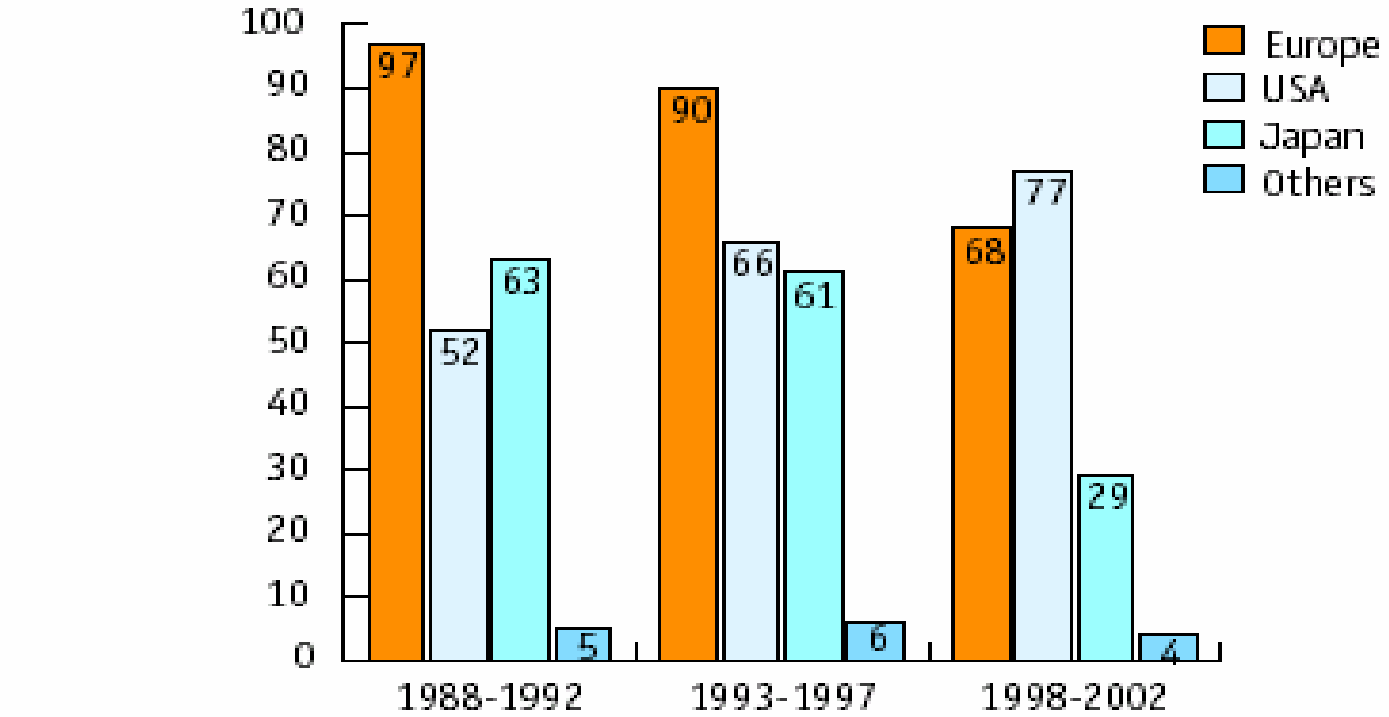
New chemical and biological entities



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‘Boehringer Ingelheim to expand in the US’

- Free competition in pharma markets essential for future medical progress
- Economic future of the pharmaceutical industry lies in the US
- Only matter of time before bulk of investment made overseas
- $500m expansion of US R&D facilities, 700 new posts

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What is REACH?

- REACH is a proposed single, integrated system for Registration, Evaluation and Authorisation (and Restriction) of Chemicals in Europe
  - most significant development on controlling chemicals in the EU for decades
  - proposes new arrangements for evaluating chemicals so that their use can be controlled more effectively and before there is an opportunity for harm
  - will require enterprises manufacturing or importing > 1 tonne/yr of a chemical to register
  - places the 'burden of proof' on industry to show that a chemical can be used safely

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REACH: potential positive impact

- Confidence that risk posed by chemicals in current use is minimal
- Reduction of bureaucracy by replacing over 40 existing Directives and Regulations
- Simplified registration procedures – for chemicals used in low volumes (1-10 tonne/year)

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REACH: potential positive impact

- Greater compatibility with existing/proposed international chemicals control initiatives
- Removal of the distinction between existing and new chemicals
- *In vitro* and other non-animal studies are positively encouraged

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REACH: potential negative impact

- High cost of testing
  - could result in withdrawal of useful chemicals of low economic value
  - could result in loss of competitiveness driving industry relocation outside the EU
- Increased level of tests on animals
- Since REACH is based on tonnage, effort would be misdirected from low-volume high-concern substances
- Control based on hazard not risk (the actual threat that a substance poses to health and safety)

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REACH: requirements

The RSC believes REACH should:

- not lead to withdrawal of useful chemicals due to the high cost of testing
- strike a balance between the need for transparency and commercial confidentiality
- not inhibit innovation – substitution alone will not to lead to innovation

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REACH: requirements

The RSC believes REACH should:

- be based on the risk that a substance poses rather than on intrinsic hazard alone
- be compatible with existing and proposed international chemicals control legislation
- address concerns about resources and expertise available to cope with the legislation
- require only data that has real value

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Competitiveness Council

- Original proposal was so expensive that there were no downstream benefits
- Not the beneficial effects expected from a proposal so profound
- Proposed program is greatly improved, but there is still more to do
- Chemicals industry is not the enemy, it has contributed so much
- We have an innovative industry that should not be hindered by excess bureaucracy

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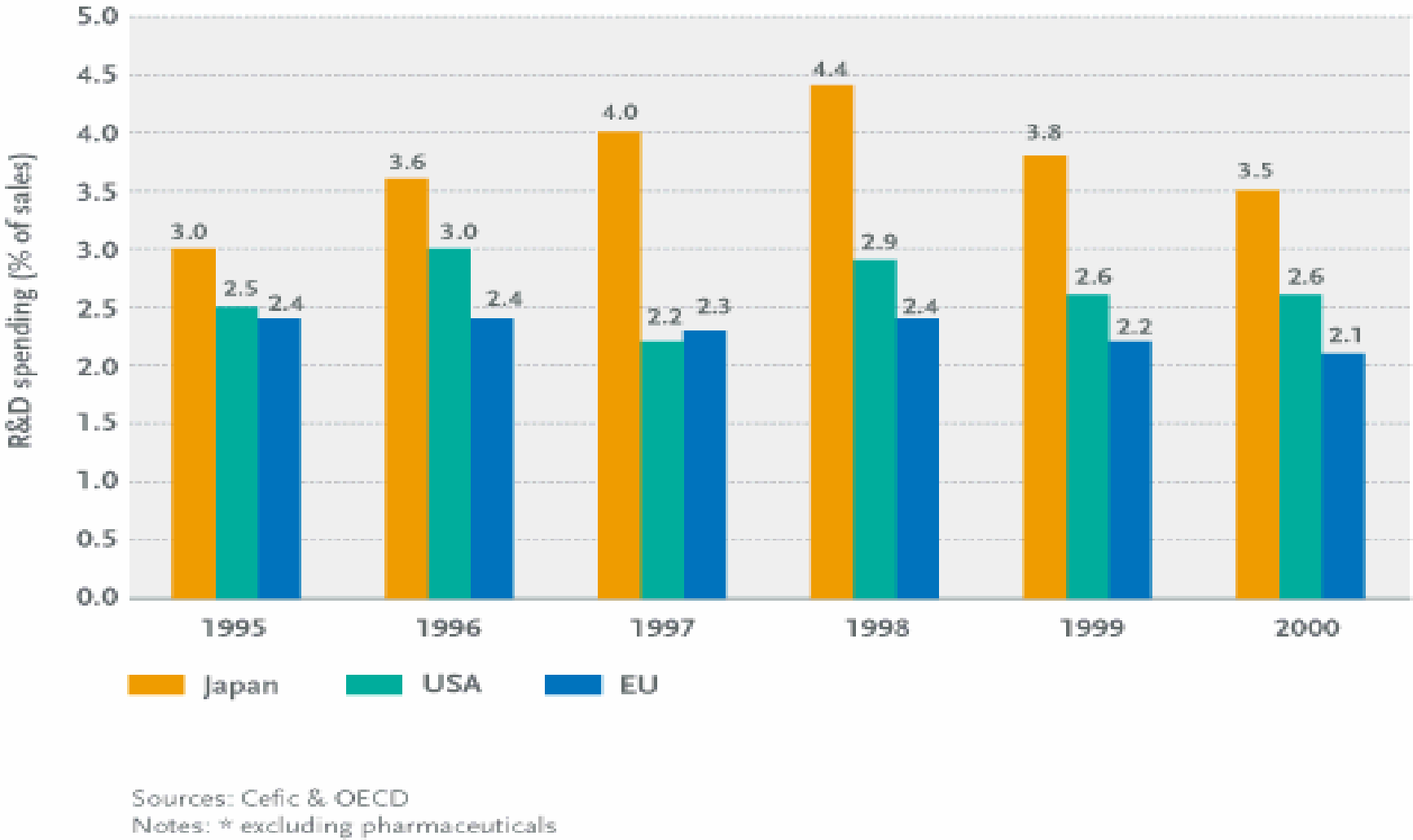
Chemical industry R&TD spending in the EU, the USA and Japan



Sources: Cefic & OECD
Notes: * excluding pharmaceuticals

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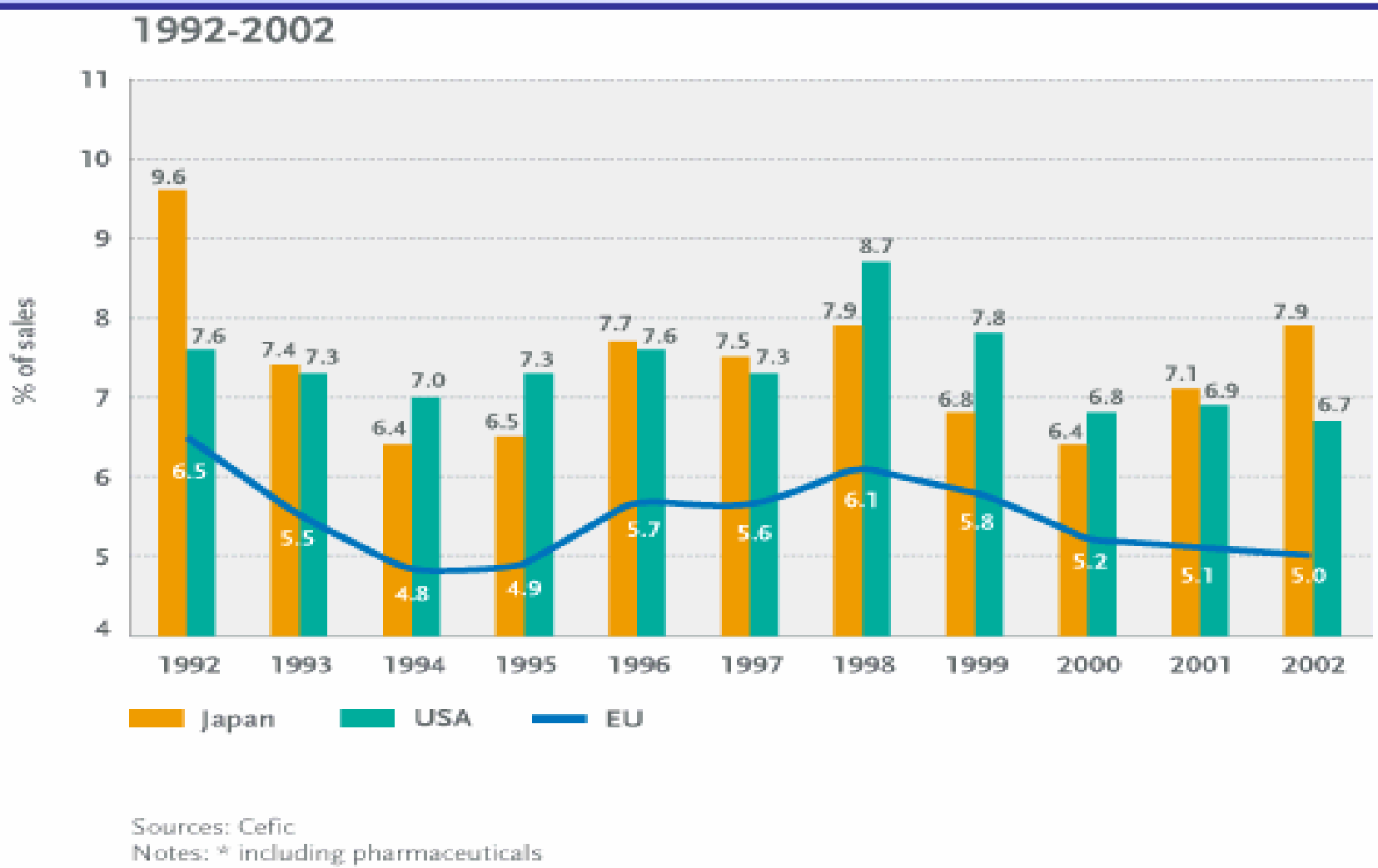
Chemical industry capital spending in the EU, the USA and Japan



Sources: Cefic
Notes: * including pharmaceuticals

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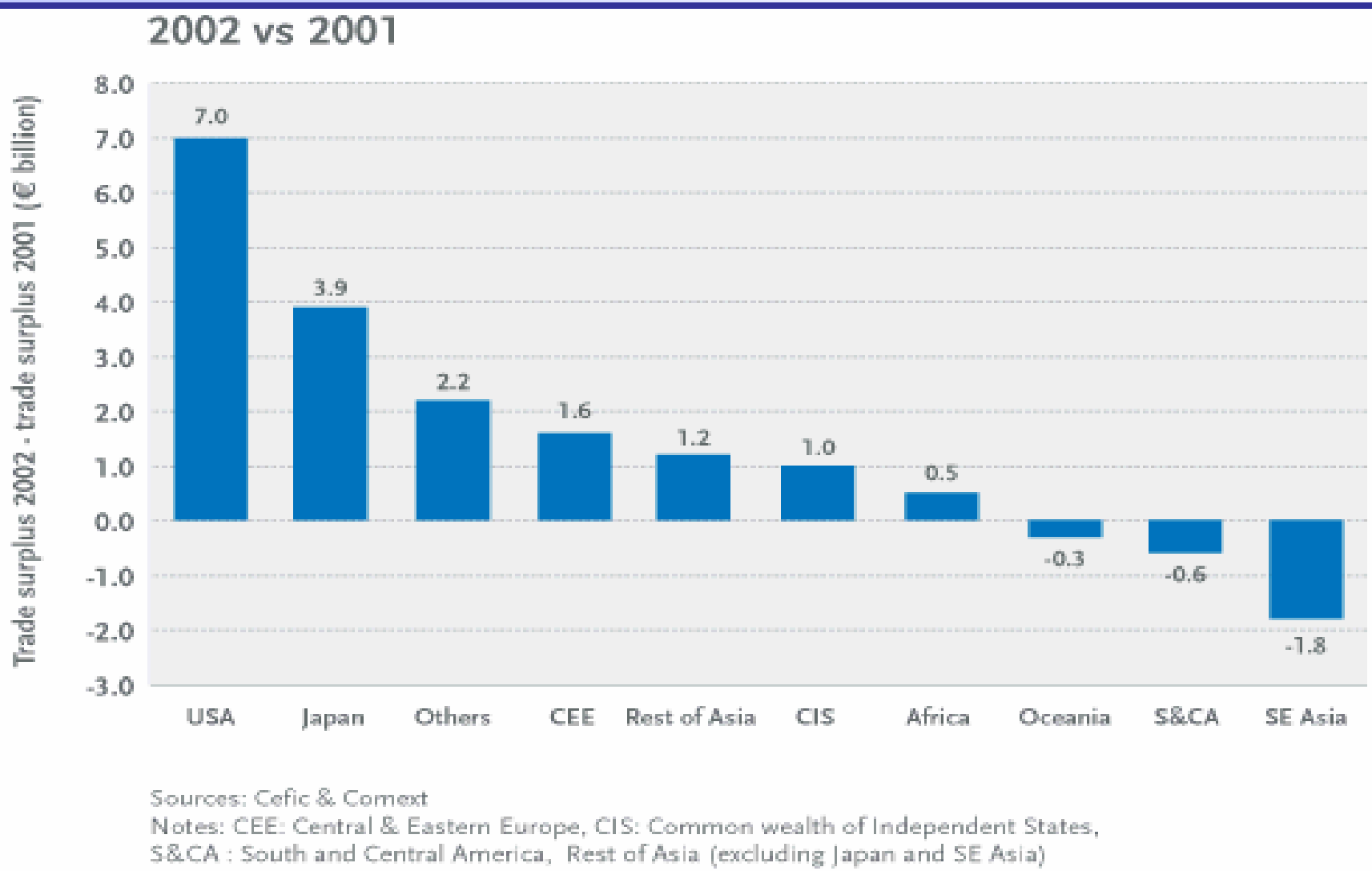
Changes in extra-EU trade balance



Sources: Cefic & Comext
Notes: CEE: Central & Eastern Europe, CIS: Common wealth of Independent States,
S&CA : South and Central America, Rest of Asia (excluding Japan and SE Asia)

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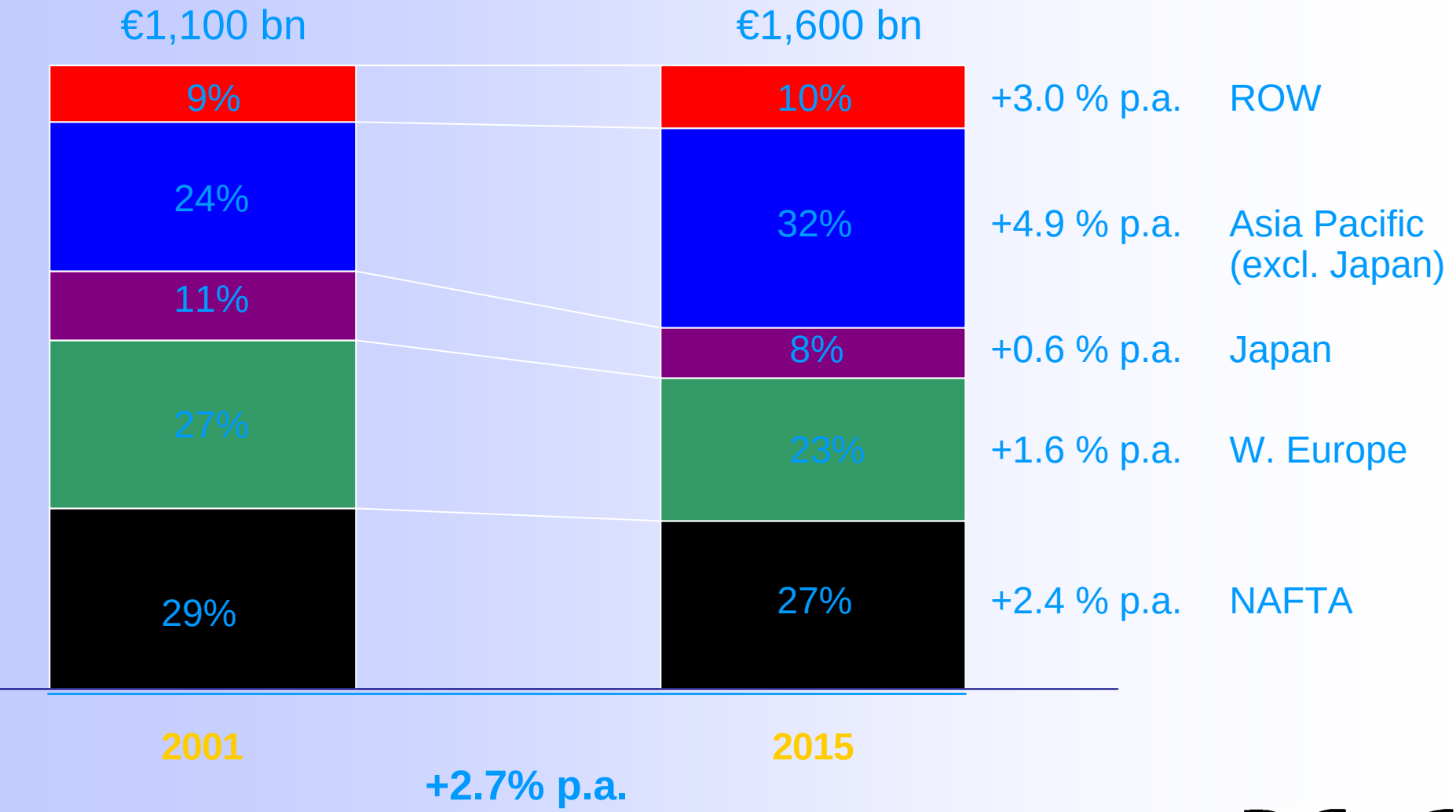
Regional Growth of World Chemical Market by Region 2001-2015



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Sources: ZZS/M, WEFA WIM

Supporting EU innovation

"Europe needs to invest more in research particularly if it is to attain its objective of becoming the most competitive and dynamic knowledge based economy in the world by 2010"

Phillipe Busquin

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Implications of 'Barcelona call for action'

- Average R&D investment to rise from 1.9% to 3.0%
- 6% growth for public investment, 9% for private
- Requires extra 1.2m research personnel, 0.7 m researchers
- Generates annual increase of 0.5% GDP, 400k new jobs

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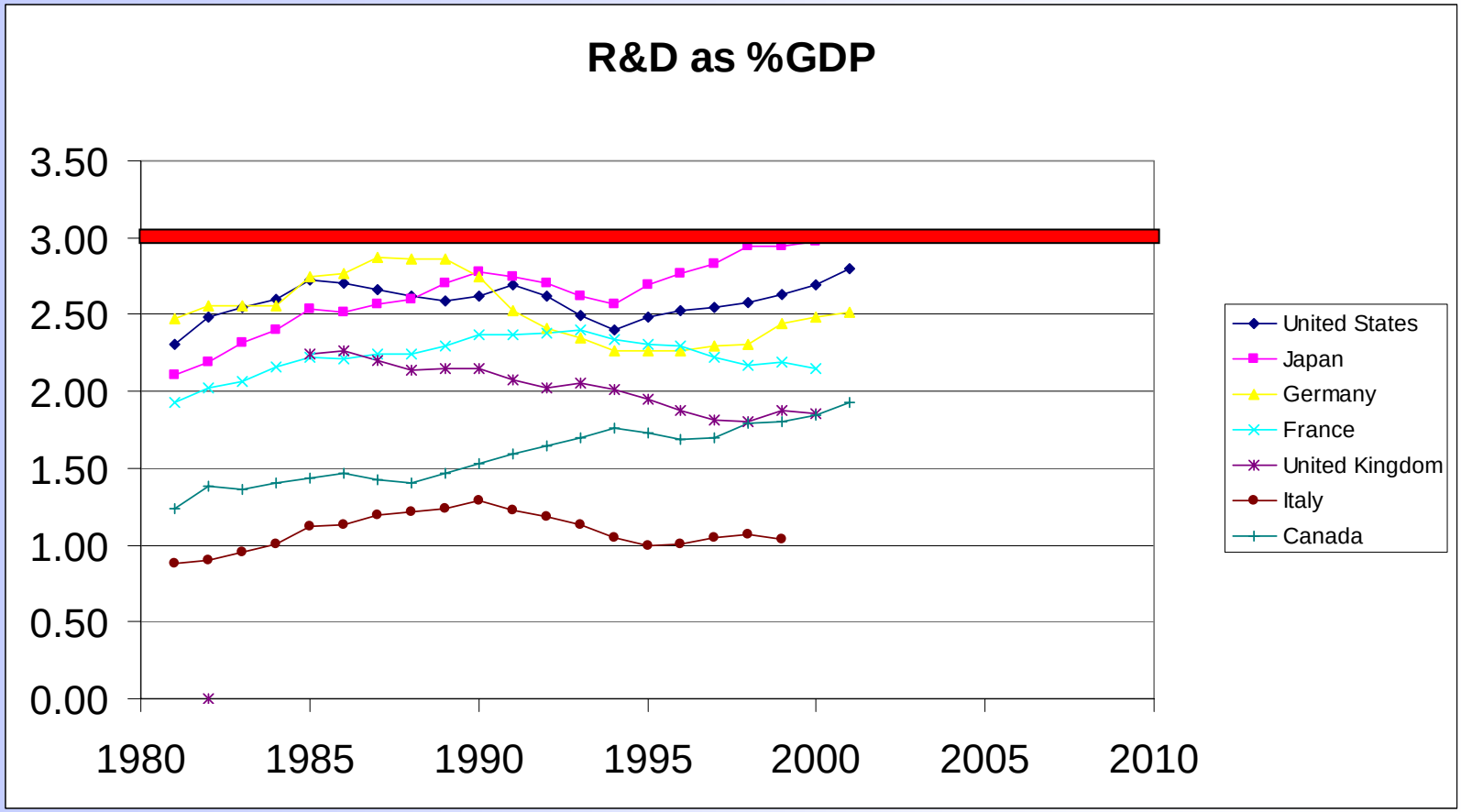
R&D and GDP


R&D as %GDP
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1980
1985
1990
1995
2000
2005
2010
United States
Japan
Germany
France
United Kingdom
Italy
Canada

R&D Investment Gap

- 80% of gap reflects differences in domestic business R&D spend
- 56% of R&D in EU financed by business compared to US (66%) and Japan (73%)
- Annual growth of R&D investment 5x higher in US [1.53%] that EU [0.32%]

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R&D Academic Gap

- EU proportionately produces more scientist than US or Japan
- But lower ratio of researchers in total workforce for EU [5.4] compared to US [8.1] and Japan [9.3]
- 70% of EU born US doctorates have no plans to return
- Predicted shortage of highly qualified researchers over next 10-15 years

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Competitiveness Deteriorating

- EU experienced significant slowdown in transition to a knowledge based economy over 2000/1
- Growth rate of overall investment and performance lower than late 1990s
- Inability to attract knowledge intensive and knowledge producing capita

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Today's research, tomorrow's cures

The legitimate concern to limit public expenditure must not be allowed to jeopardise the future of pharmaceutical research in Europe. **Public health and social security have nothing to gain from a weakening of the European pharmaceutical industry**, because a substantial share of pharmaceutical spending will continue to have to be reimbursed in any event, even if innovative activity is pursued in the US and Japan in the future.

European Commission Communication on the outlines of an industrial policy for the pharmaceutical sector in Europe (March 1994)

If most innovative activity is pursued outside Europe, we will lose on all fronts: employment, research (clinical and fundamental), education, economic vitality, public finances, etc.

European Commission Communication"A Stronger European-based Pharmaceutical Industry for the Benefit of the Patient - A Call for Action" (1 July 2003)

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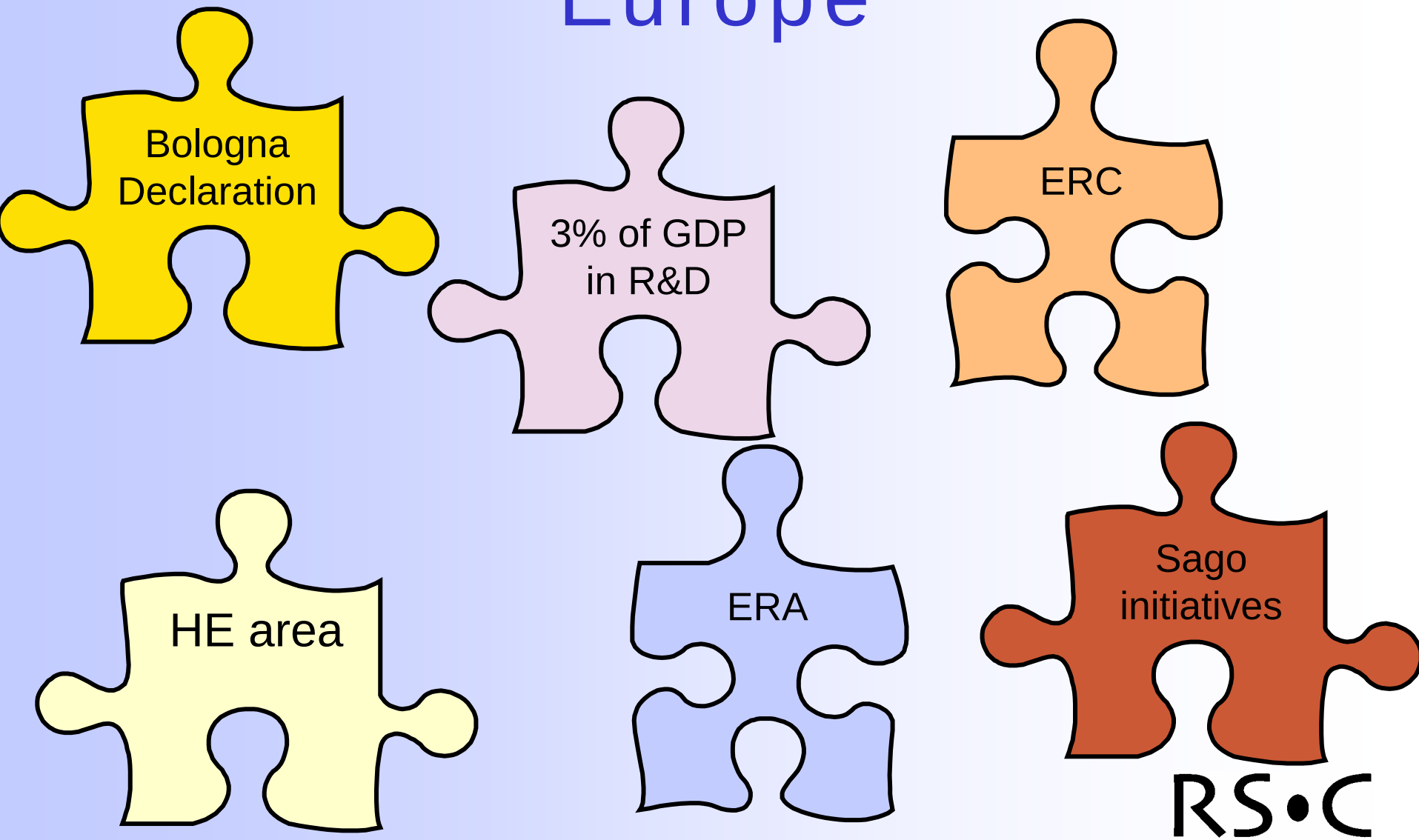
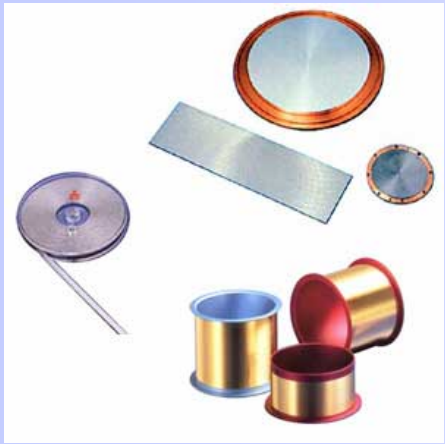
Supporting Innovation in Europe



Chemistry and Society



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