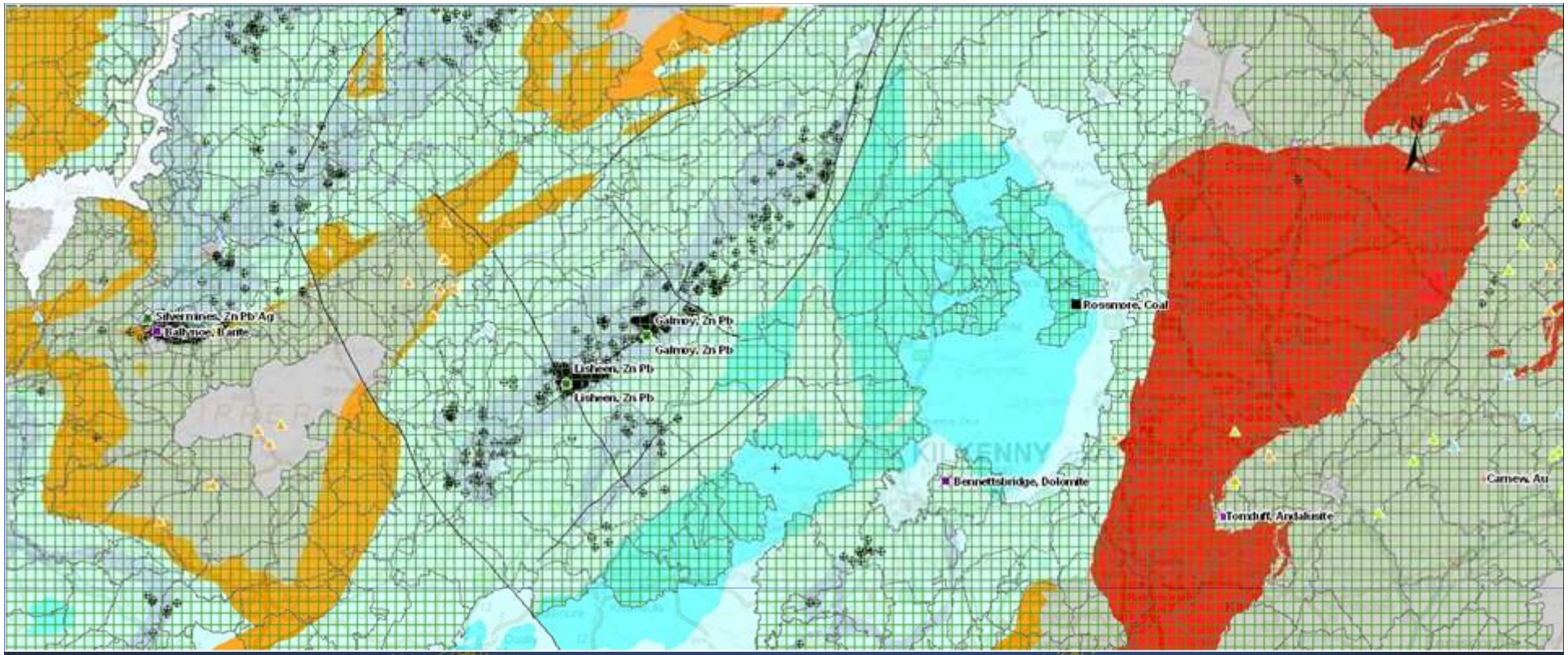

WHY EUROPE NEEDS A MINERAL RESOURCES POLICY

Natural Resources Reporting Workshop

Institute of Geologists of Ireland

Dublin, May 14th, 2009

Dr. Patrice Christmann
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EuroGeoSurveys

European Institutions

+ Provides science-based advice
+ Provides access to data, information and expertise
+ Participates to working groups
+ Formulates proposals

(PROACTIVITY)

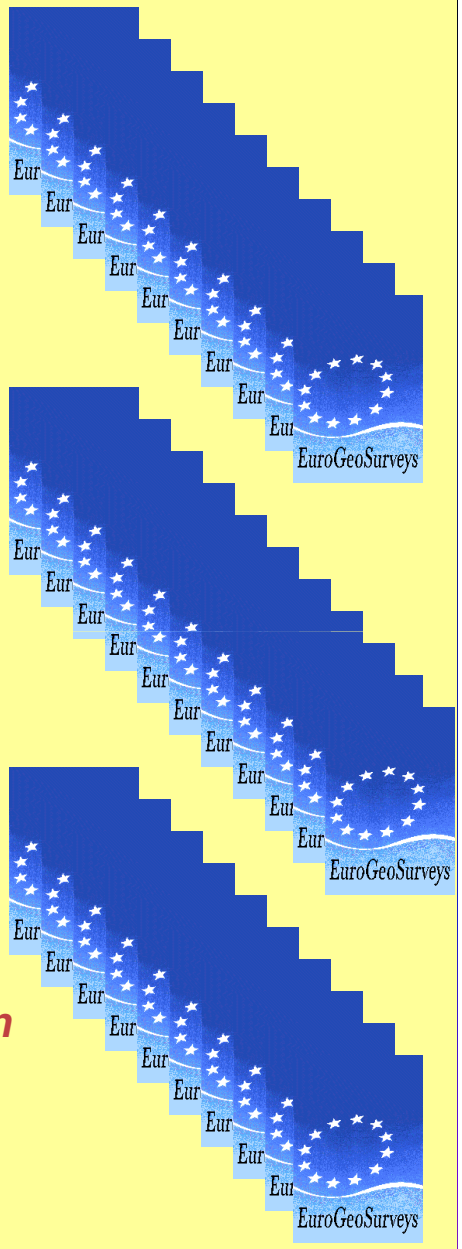
Brussels office

EuroGeoSurveys

(REACTIVITY)

+ Informs on policy development and implementation
+ Transmit requests and enquiries

33 National Geological Surveys



MINERAL RESOURCES
A RISING STAR ON POLITICAL AGENDAS

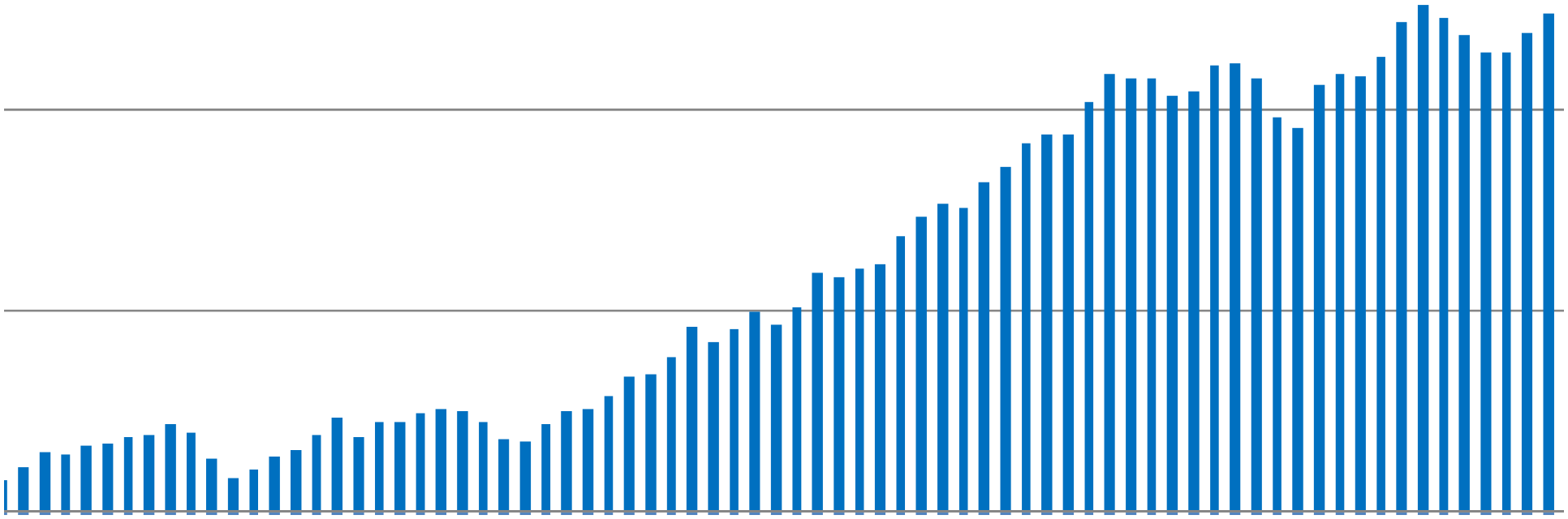
economy, from 1919 to 2007

(Al, Cu, Pb, Zn, Fe, Cr, Phosphate rock, K_20, Pt Group Metals, Co, Au, Mn, Ni, Baryte)

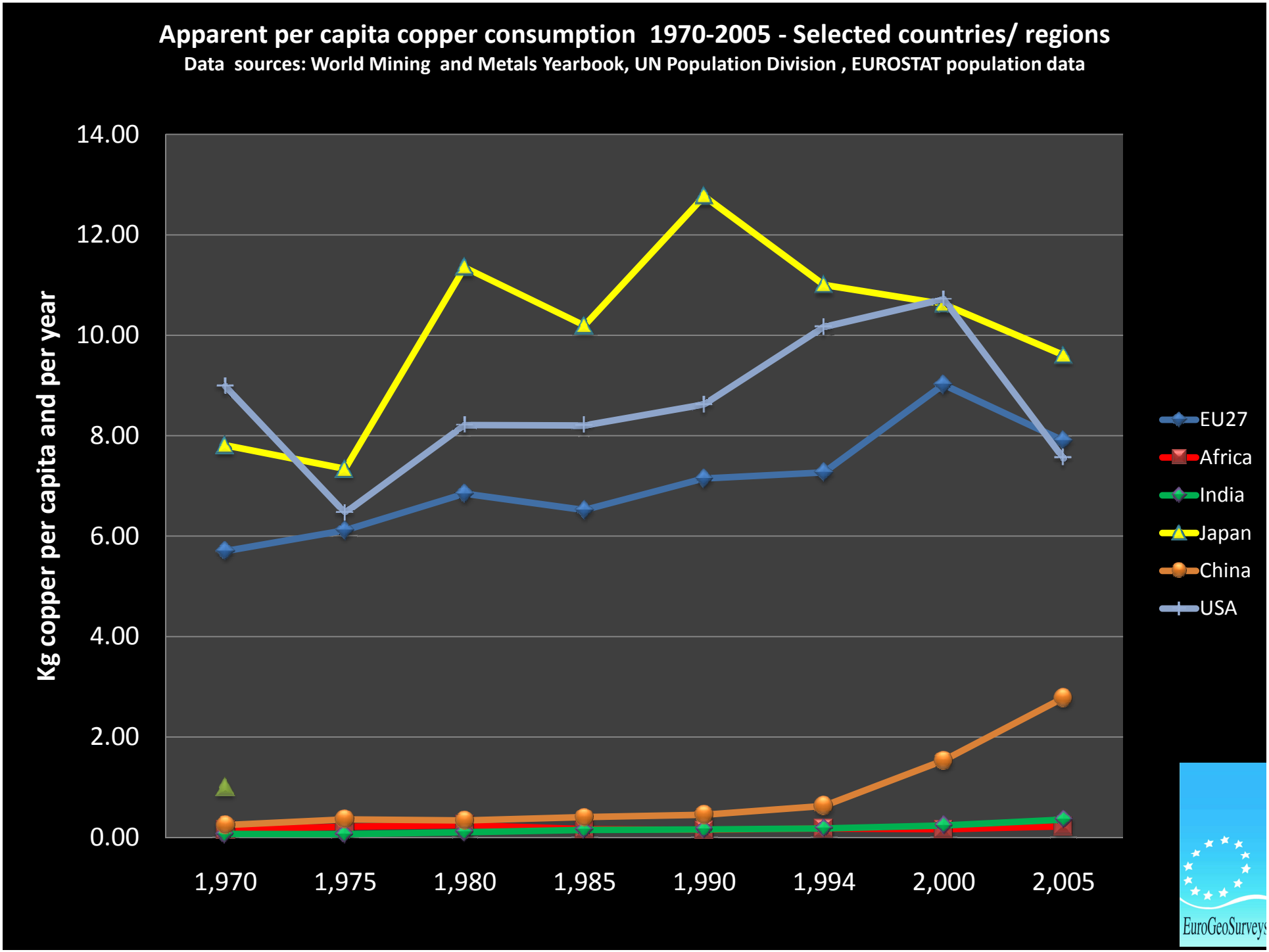
Data source: USGS Data series 140 - http://minerals.usgs.g

In about 90 years the world production of the listed commodities was multiplied by

420! with a strong acceleration since 2002.



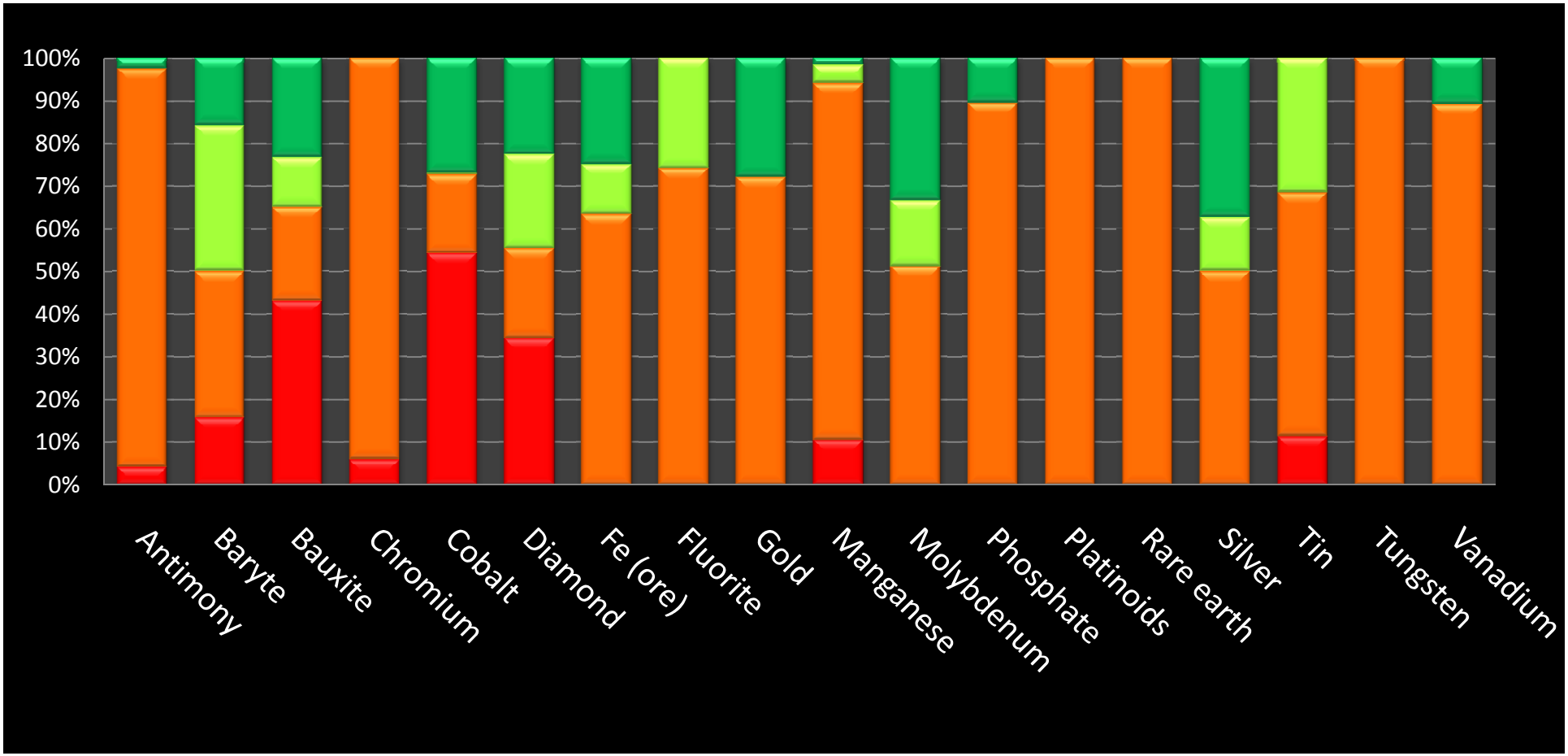
Competition for access to (mineral) resources is likely to grow over the coming decades …


Apparent per capita copper consumption 1970-2005 - Selected countries/ regions
Data sources: World Mining and Metals Yearbook, UN Population Division , EUROSTAT population data
Kg copper per capita and per year
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
1,970
1,975
1,980
1,985
1,990
1,994
2,000
2,005
EU27
Africa
India
Japan
China
USA
EuroGeoSurveys

… WHILE THE RESERVES OF MANY ESSENTIAL MINERALS ARE LOCATED IN POOR COUNTRIES WITH SEVERE LIMITATIONS TO THEIR GOVERNANCE CAPACITIES

Localisation of the RESERVES of some main mineral commodities, per gross national income per day and capita of the hosting countries

Data sources: USGS (2006 Reserves data) and World Bank (GNI)



… AND THE EU IS VERY DEPENDENT ON THE IMPORTS OF MANY MINERALS AND METALS

EU dependence on the import of metal ores (2003)

Antimony ore	100%	Rutile	100%
Beryllium ore	100%	Vanadium ore	100%
Boron	100%	Phosphate rock	92%
Cobalt	100%	Nickel	86%
Molybdenum	100%	Iron ore	83%
Niobium ore	100%	Bauxite	80%
PGM ores	100%	Zinc ore	80%
Rare Earth ores	100%	Tungsten ore	76%
Rhenium ore	100%	Lead Ore	76%
Tantalum ore	100%	Copper Ore	74%
Ilmenite	100%	Chromium ore	53%

Source: based on BGS Data (2005)

... AND HAS A VERY LIMITED MINERALS INTELLIGENCE CAPACITY

… BUT WHAT DOES THE EU DO ABOUT THE ISSUE ?

THE NEED FOR AN EU MINERALS POLICY

Impacts of the lack of an EU minerals Directive

- According to the EU Treaty (Nice) mineral resources are an exclusive competence of the Member States
- This impedes the Commission to look at the issues in a holistic way. Only some specific actions can be developped (competitiveness, environment, development, maritime affairs, research, regional development trade)
- This leads to contradictions and inconsistencies in EU policy making. Over 40 EU directives, policies, programmes impact on the development of the supply of minerals to the EU economy!
- The Commission lacks staff with mineral resources experience and its efficiency is furthermore affected by the rotation rule

Impacts of the lack of an EU minerals Directive

- No EU Member State has the political weight to negociate in the WTO or with China.

BASED
ON MINERALS INTELLIGENCE

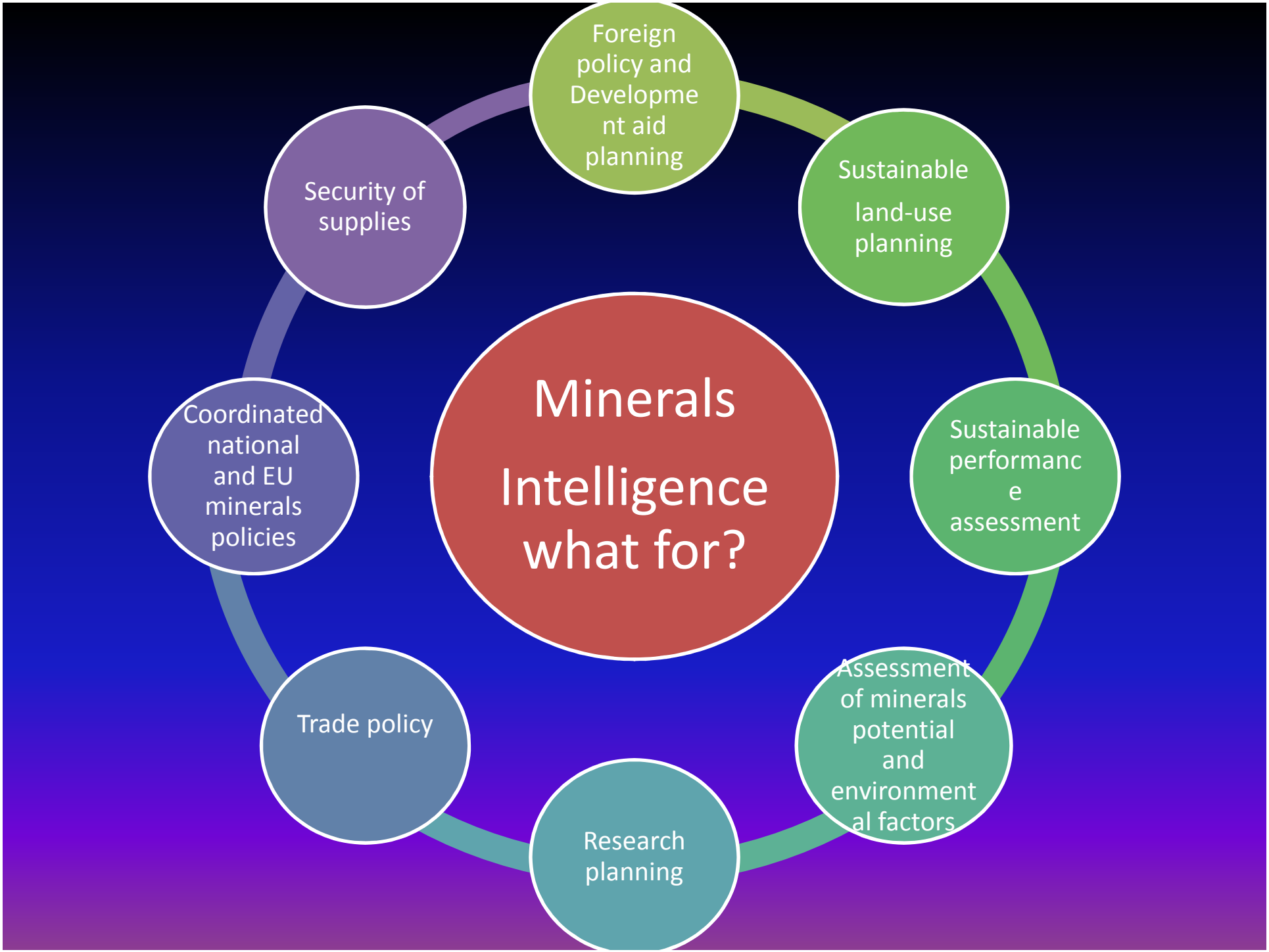
The need for an EU Minerals Intelligence capacity

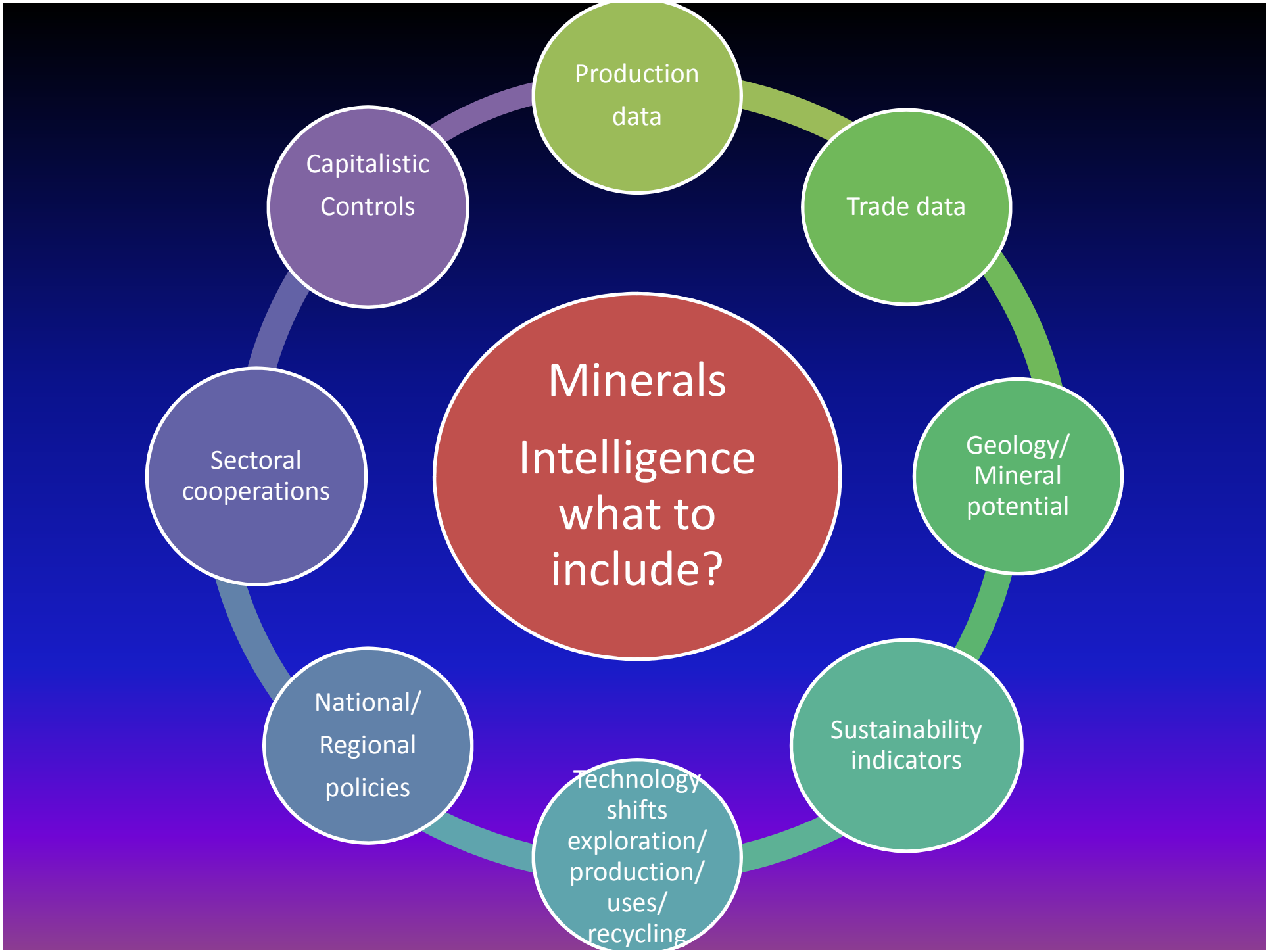
Minerals intelligence capacity:

Data + information systems + expertise = information for specific end-uses

EU versus the US: the mineral resources case

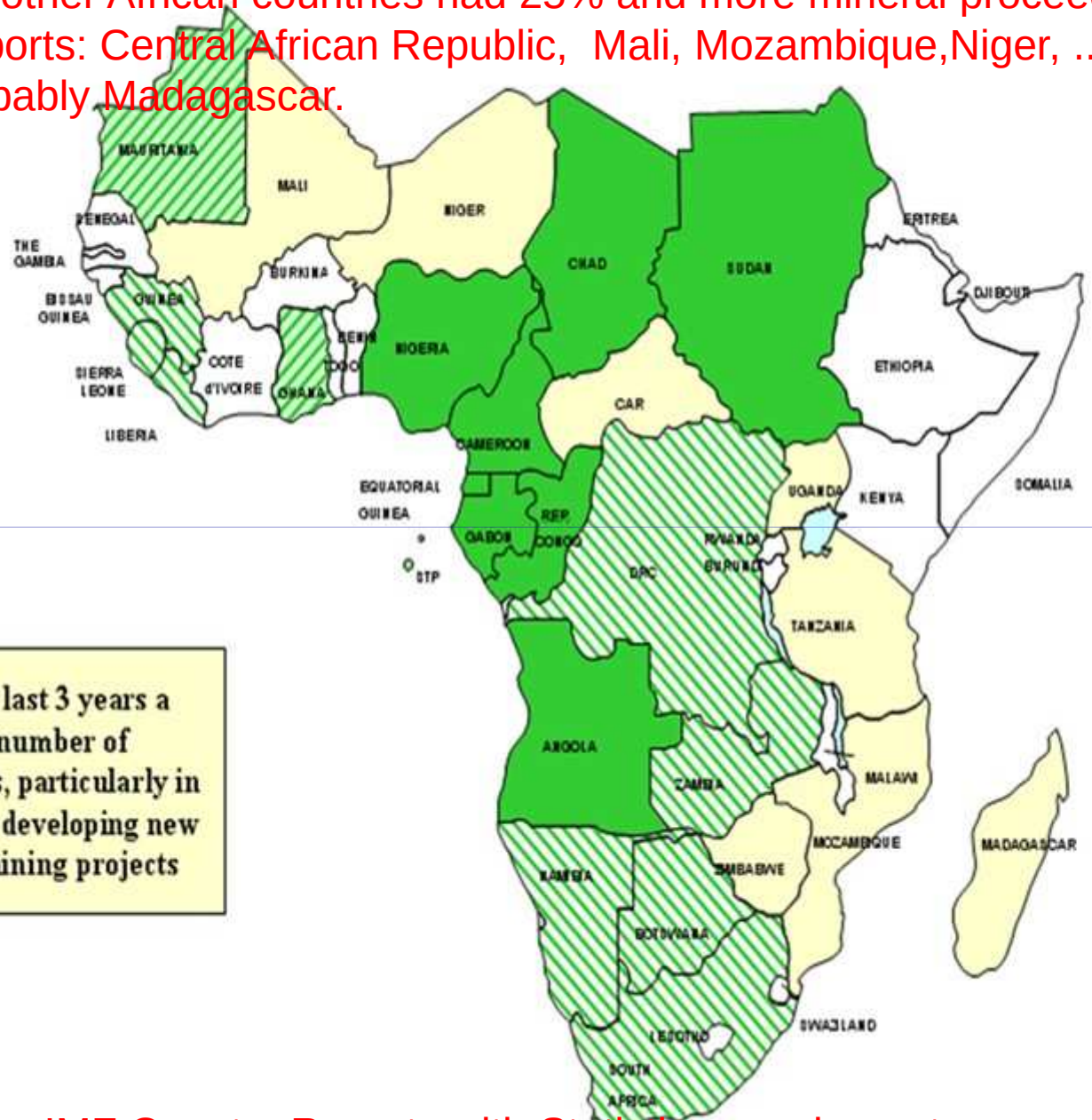
USA	EU
State geological surveys	National geological surveys
Federal geological survey (USGS) with 51 M$ 2007 budget for the assessment of mineral resources potential including 16 M$ (160 full-time positions) for the provision of minerals information to US government and economy	No EU capacity, no budget . Only oldening, loosely coordinated capacities in Member States. Last edition of EU minerals yearbook was in 1997, with data up to 1995
Decades of federal attention to mineral resources issues	No competence given to EU up to 21/05 Council conclusions calling for the development of a to develop a coherent political approach with regard to raw materials supplies for industry, including all relevant areas of policy


Minerals
Intelligence
what for?
Foreign policy and Development aid planning
Sustainable land-use planning
Sustainable performance assessment
Assessment of minerals potential and environmental factors
Research planning
Trade policy
Coordinated national and EU minerals policies
Security of supplies


Production data
Trade data
Geology/ Mineral potential
Sustainability indicators
Technology shifts exploration/ production/ uses/ recycling
National/ Regional policies
Sectoral cooperations
Capitalistic Controls
Minerals Intelligence what to include?

Annex 6 — Resource-rich countries in Sub-Saharan Africa (2000-2005).

Several other African countries had 25% and more mineral proceeds in their total exports: Central African Republic, Mali, Mozambique,Niger, ... and probably Madagascar.



Definition of "resource rich":

i) average share of hydrocarbon and/or mineral fiscal revenues in total fiscal revenues at least 25% over the period 2000-2005 or
(ii) average share of hydrocarbon and/or mineral export proceeds in total export process of at least 25%.

Source: IMF (2007) Guide on Resource Revenue Transparency, Appendix I

See http://www.sigafrique.net/ for detailed Geological maps

Over the last 3 years a growing number of countries, particularly in SSA, are developing new oil and mining projects

Hydrocarbon-rich

Potentially large medium to long-term hydrocarbon revenue

Potentially large medium to long-term hydrocarbon revenue and mineral-rich

Mineral-rich

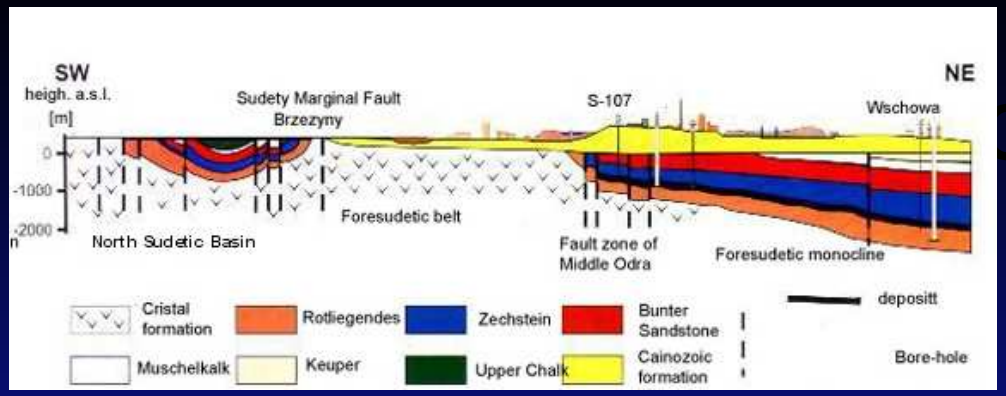
Source: IMF Country Reports with Statistics supplements

… TO INCLUDE GEOLOGICAL DATA AND KNOWLEDGE

DO WE KNOW THE EU GEOLOGICAL POTENTIAL?

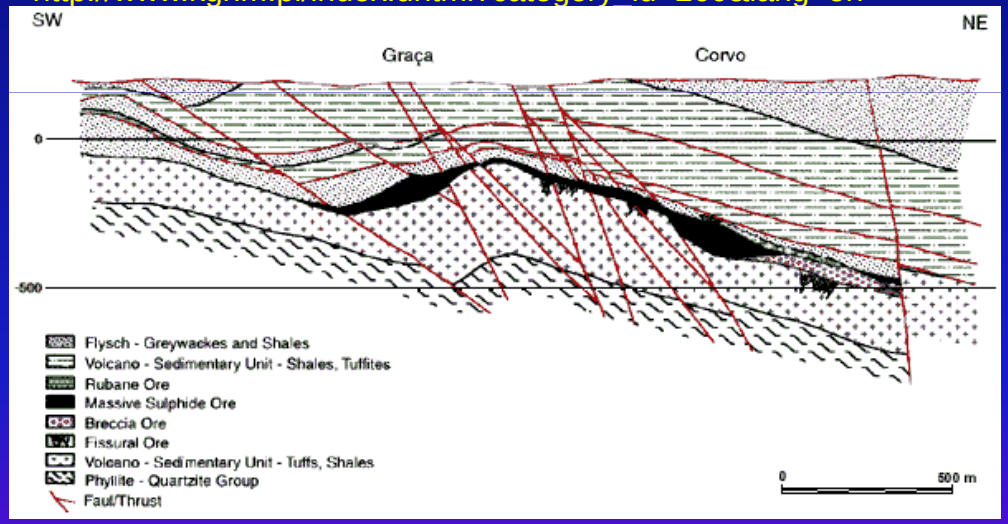
Do we know the geological potential of Europe?

- The potential for concentrations of specific minerals of possible economic interest (a very dynamic concept) is determined by the geological history of Europe,
- For the time being we only well know the near surface geology of Europe and the related mineral deposits
- The future of improved EU supply of metallic minerals lies in deep-seated concealed deposits
- There is no available public pan-EU Mineral Resources GIS, only heterogeneous information at national/ regional levels, some very difficult to identify and to access.



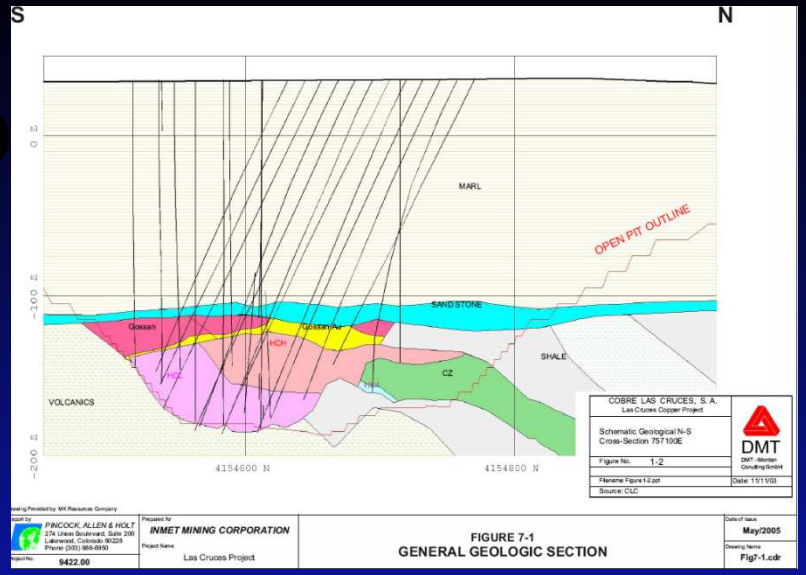
The foresudetic basin, Poland – 30.8 Mt resource (31/12/07 data)

http://www.kghm.pl/index.dhtml?category_id=260&lang=en



Neves Corvo, Portugal – 1.7 Mt Cu, 3 Mt Zn, 50 kt Sn in resources + ~ 1Mt Cu produced (12/1997 data)

http://e-geo.ineti.pt/edicoes_online/diversos/mining_develop/capitulo4.htm



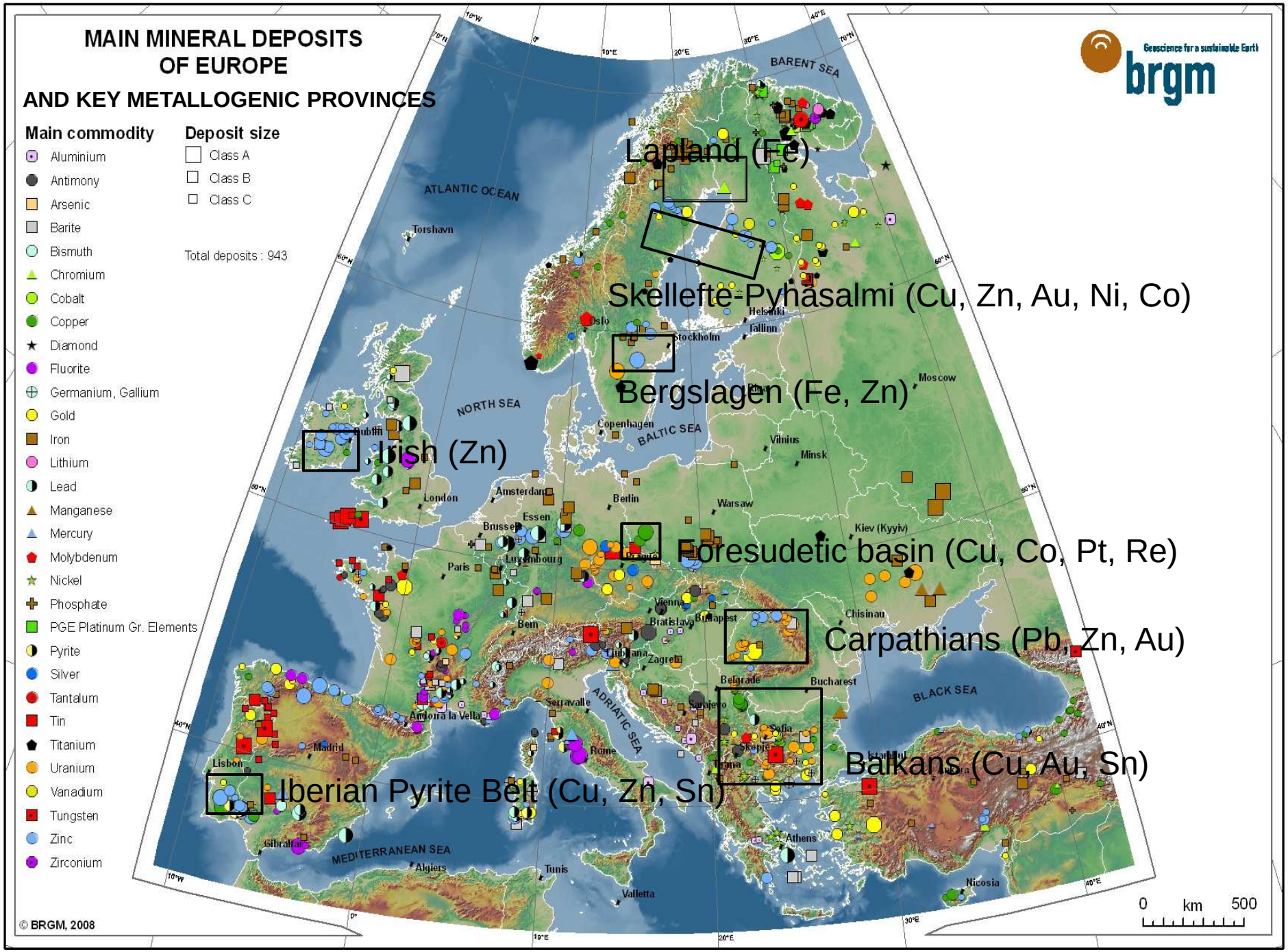
Las Cruces, Spain – ~1.1 Mt Cu In reserves (31/12/07 data)

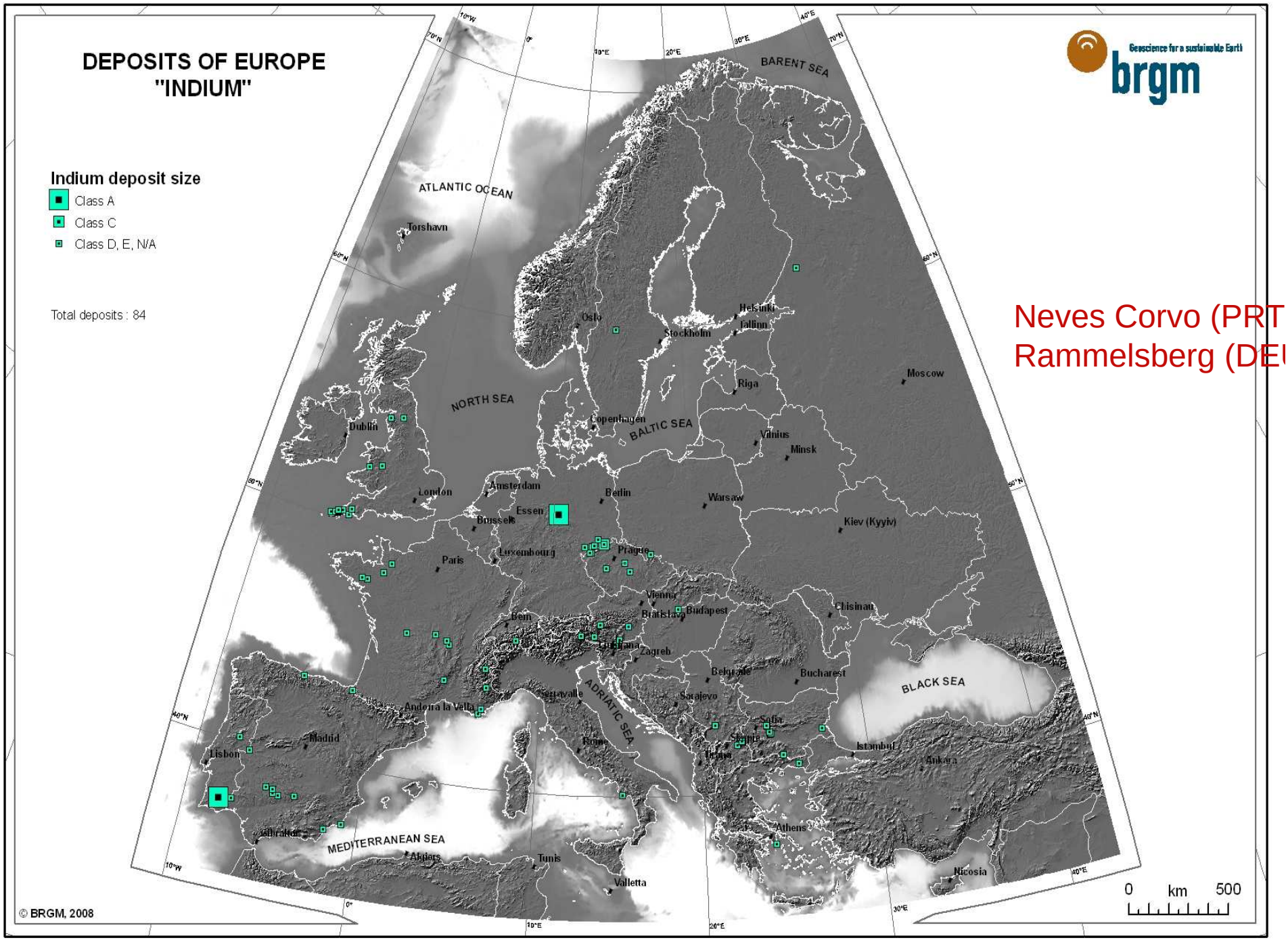
http://www.inmetmining.com/ouroperations/mineralreservesresources/default.aspx

ON THE WAY TO THE FUTURE:
THREE WORLD-CLASS EU CONCEALED DEPOSITS

Do we know the geological potential of Europe?

- OneGeology Europe (http://www.onegeology-europe.eu/) will bring together a web-accessible, interoperable geological spatial dataset for the whole of Europe at 1:1 million scale based on existing data.
- ProMine will deliver the first ever Pan-European GIS based database on EU known mineral occurrences, already in development within the framework of a BRGM research project and a 3-D model of four of its main metallogenic provinces (launch date: 01/05/09)
- The two projects are co-financed by the European Commission


MAIN MINERAL DEPOSITS
OF EUROPE
AND KEY METALLOGENIC PROVINCES
Main commodity
Aluminium
Antimony
Arsenic
Barite
Bismuth
Chromium
Cobalt
Copper
Diamond
Fluorite
Germanium, Gallium
Gold
Iron
Lithium
Lead
Manganese
Mercury
Molybdenum
Nickel
Phosphate
PGE Platinum Gr. Elements
Pyrite
Silver
Tantalum
Tin
Titanium
Uranium
Vanadium
Tungsten
Zinc
Zirconium
Deposit size
Class A
Class B
Class C
Total deposits : 943
Lapland (Fe)
Skellefte-Pyhäsalmi (Cu, Zn, Au, Ni, Co)
Bergslagen (Fe, Zn)
Irish (Zn)
Foresudetic basin (Cu, Co, Pt, Re)
Carpathians (Pb, Zn, Au)
Balkans (Cu, Au, Sn)
Iberian Pyrite Belt (Cu, Zn, Sn)
ATLANTIC OCEAN
NORTH SEA
BALTIC SEA
BARENT SEA
BLACK SEA
MEDITERRANEAN SEA
ADRIATIC SEA
Torshavn
Oslo
Stockholm
Helsinki
Tallinn
Moscow
Copenhagen
Dublin
London
Amsterdam
Berlin
Warsaw
Vilnius
Minsk
Kiev (Kyyiv)
Brussels
Essen
Luxembourg
Paris
Vienna
Bratislava
Budapest
Chisinau
Bern
Ljubljana
Zagreb
Belgrade
Bucharest
Sarajevo
Sofia
Skopje
Andorra la Vella
Serravalle
Rome
Madrid
Lisbon
Gibraltar
Algiers
Tunis
Valletta
Athens
Nicosia
0 km 500
© BRGM, 2008
brgm
Geoscience for a sustainable Earth


DEPOSITS OF EUROPE
"INDIUM"
Indium deposit size
Class A
Class C
Class D, E, N/A
Total deposits : 84
brgm
Geoscience for a sustainable Earth
ATLANTIC OCEAN
BARENT SEA
NORTH SEA
BALTIC SEA
BLACK SEA
ADRIATIC SEA
MEDITERRANEAN SEA
Torshavn
Oslo
Stockholm
Helsinki
Tallinn
Riga
Moscow
Copenhagen
Dublin
Vilnius
Minsk
London
Amsterdam
Berlin
Warsaw
Essen
Brussels
Kiev (Kyyiv)
Luxembourg
Prague
Paris
Vienna
Bratislava
Budapest
Chisinau
Bern
Ljubljana
Zagreb
Belgrade
Bucharest
Sarajevo
Andorra la Vella
Sofia
Madrid
Rome
Istanbul
Lisbon
Ankara
Athens
Algiers
Tunis
Valletta
Nicosia
0 km 500
© BRGM, 2008
Neves Corvo (PRT
Rammelsberg (DE

To turn potential into the material flows required by the EU economy (beyond recycling/ re-use) requires:

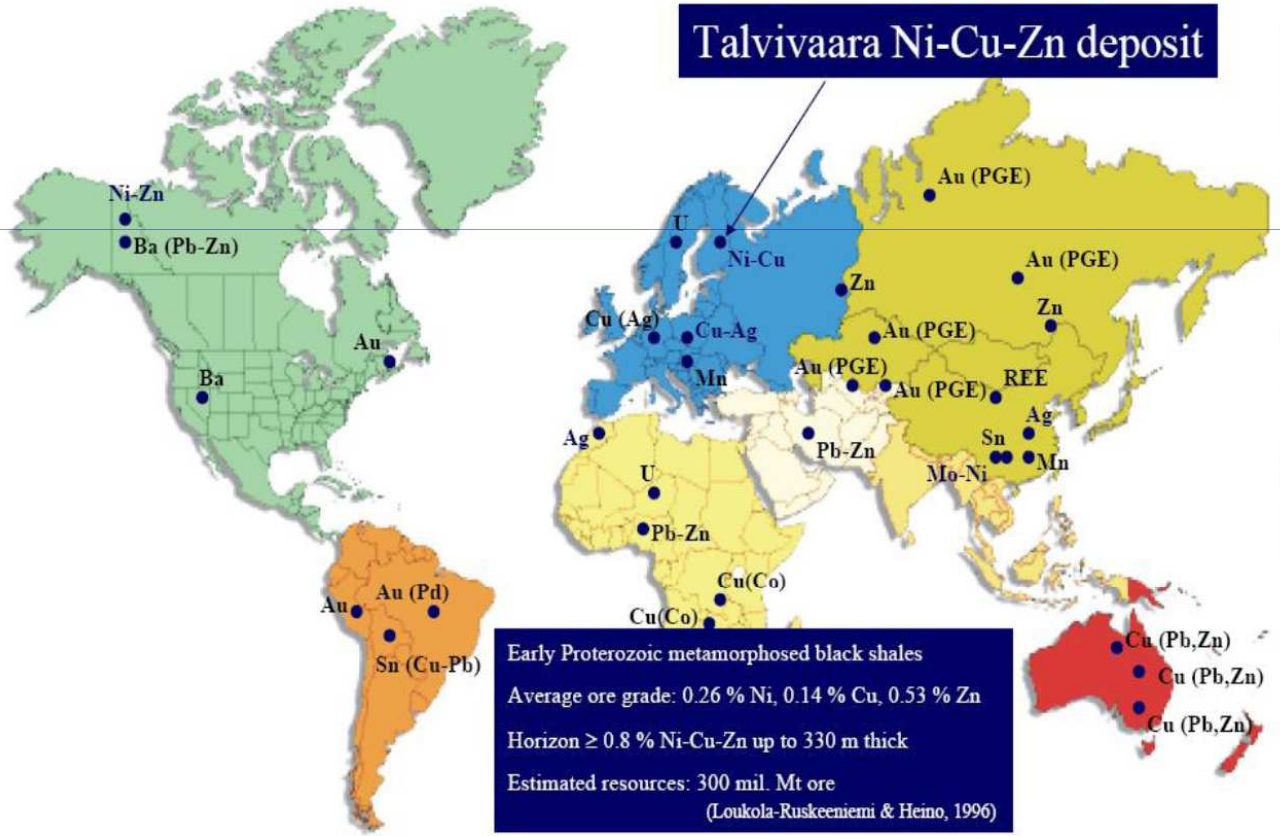
- Geological potential, well documented by accessible PUBLIC data/ information (language and semantics are issues !!!) including geology, airborne (magnetism, electro-magnetism, radiometry) and in-situ geophysics (gravimetry, electromagnetic and seismic methods), multi-element geochemistry.
- Enabling business framework conditions, to attract the needed private-sector investment.

... research in innovative ore processing technologies that unlock access to otherwise difficult to process ore, allow better recovery rates of valuable elements and/or reduce environmental impacts ...

BIOSHALE Project co-financed by the EU RTD FP6

Developing biotechnology for a sustainable exploitation of black shale ores

13 Partners in 8 European countries, 2004-2007, € 3.4 million, GTK € 0.8 million



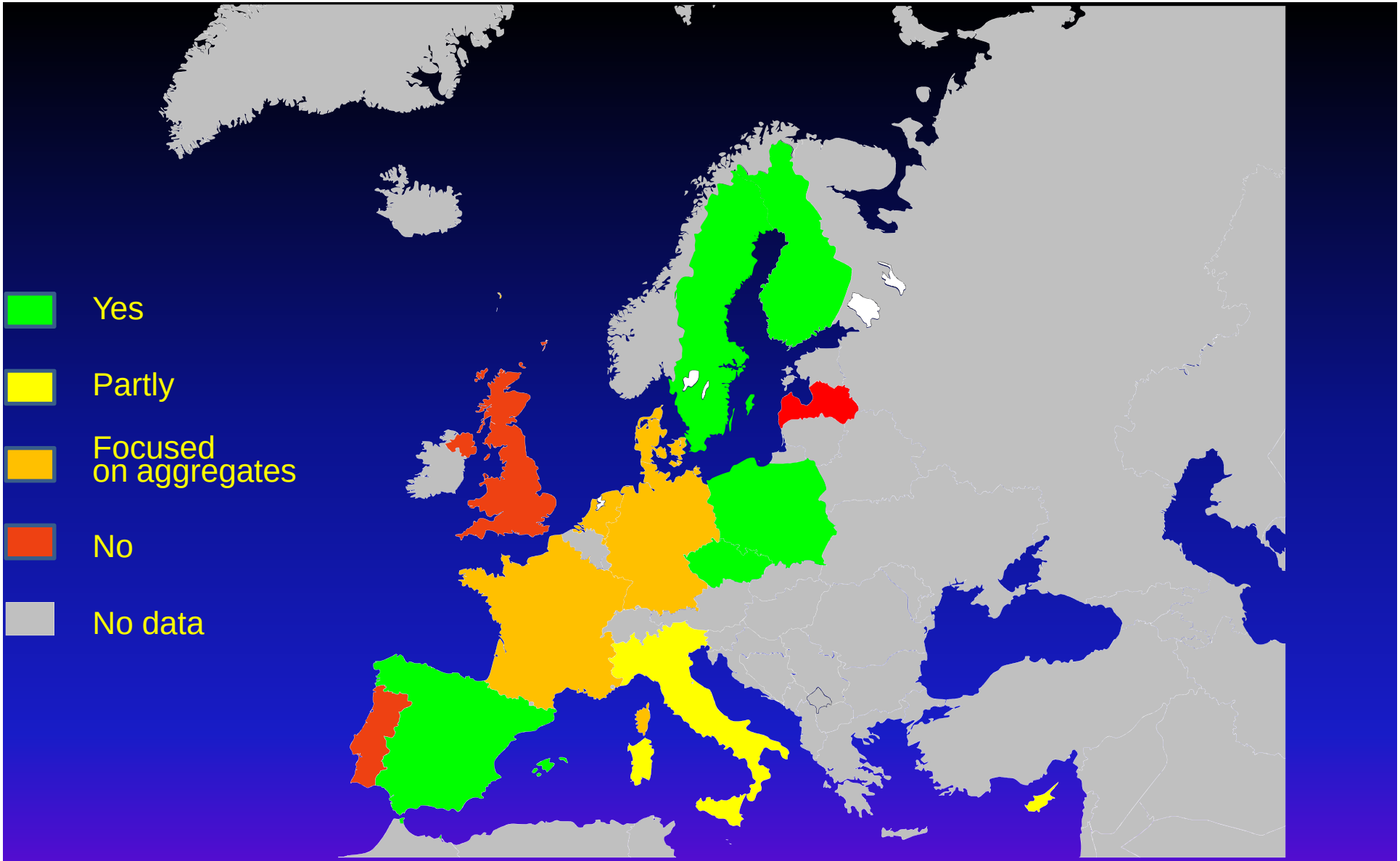
Revisiting apparently well-known metallogenic provinces with new geological concepts AND new exploration technologies, combining the use of several Earth observation techniques, especially modern geophysics, is a key to success.

The case of the Iberian Pyrite Belt, known since the Romans, is a good example showing that Europe's mineral potential is far from being exhausted and even known ...: two hidden world-class deposits have been discovered there over the last thirty years (Neves Corvo and Las Cruces)

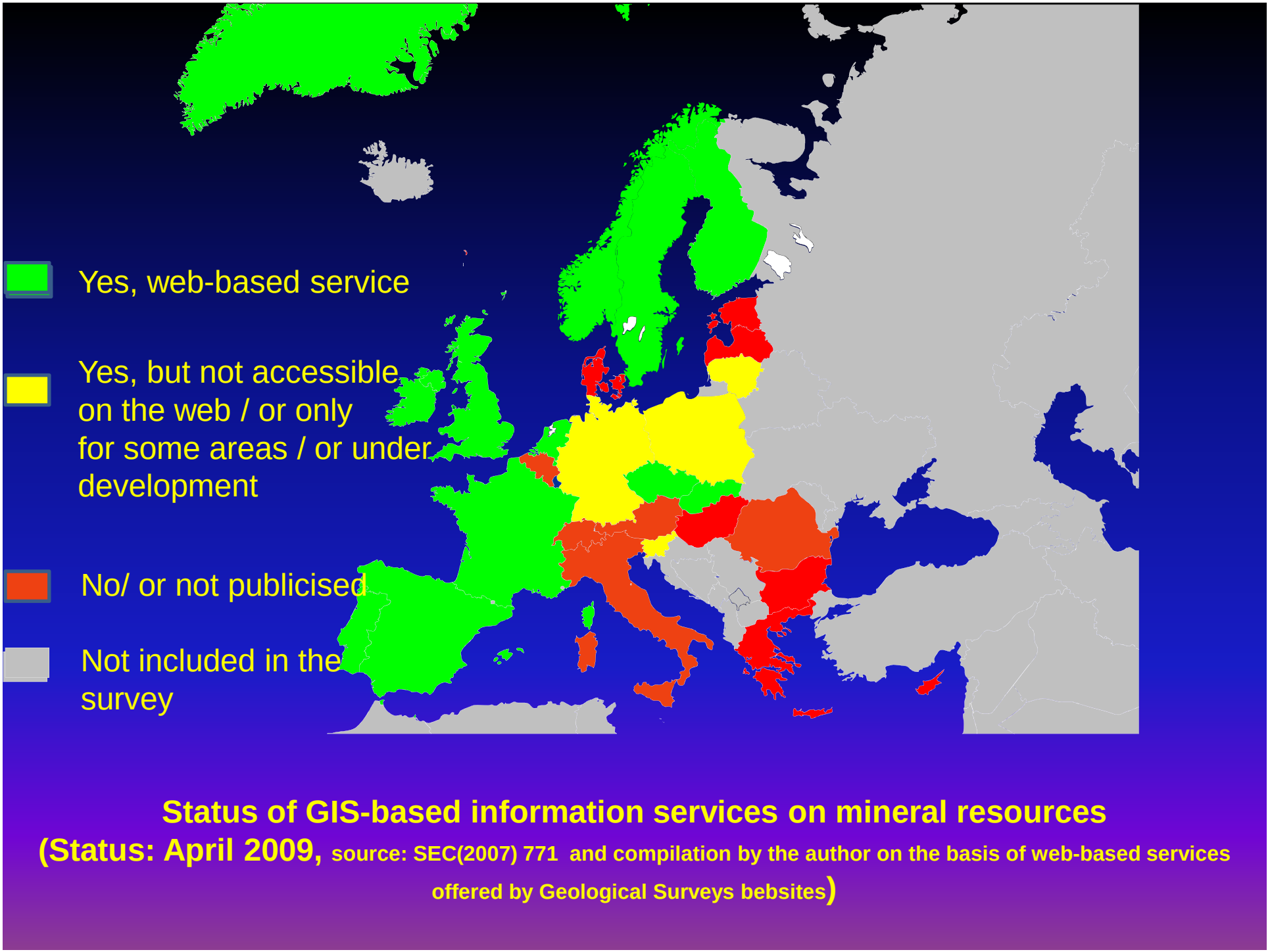
WHAT DO WE KNOW ABOUT THE EU GEOLOGICAL POTENTIAL?

The two following maps illustrate the diversity of policies and publicly accessible mineral resources related information across Europe.

Important note: the interpretation of the two following maps requires to take into consideration the geological potential of each country. Several EU countries such as the Baltic states, Denmark, or the Netherlands have no surface or near-surface metallic minerals potential. This geological reality impacts on their mineral resources policies and on the information services they provide.



Is regional/national acquisition of public geoscientific data in support of mineral exploration part of the current publicly financed activities of your Geological Survey? (Source: "Analysis of the competitiveness of the non-energy extractive industry in the EU, Annex II – Commission Staff Working Document SEC(2007) 771 - http://ec.europa.eu/enterprise/non_energy_extractive_industries/docs/sec_2007_771_en.pdf)

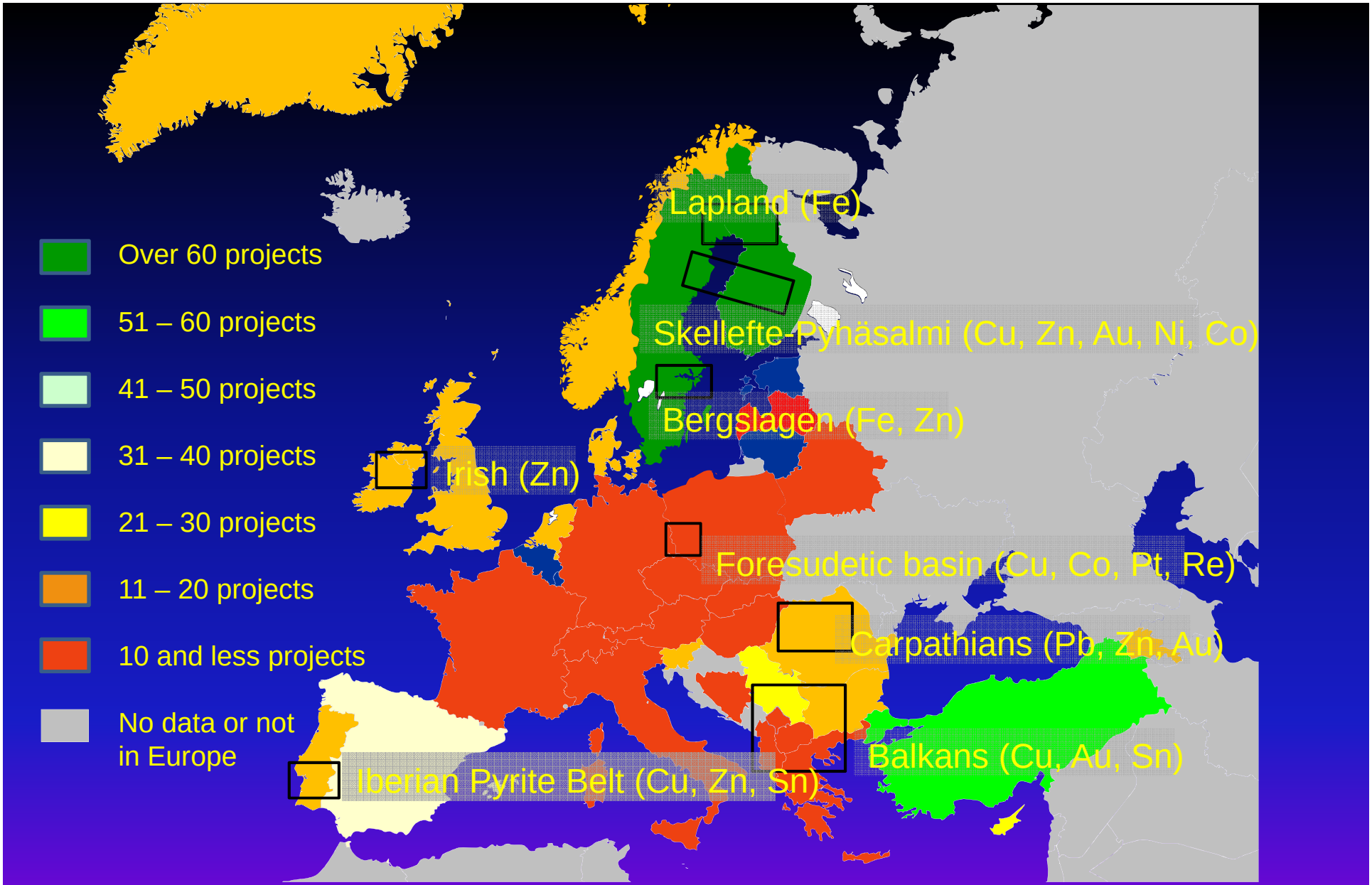


Status of GIS-based information services on mineral resources

(Status: April 2009, source: SEC(2007) 771 and compilation by the author on the basis of web-based services offered by Geological Surveys bebsites)

Mineral resources activities in Europe

- While as a whole Europe's mineral potential remains MUCH underexplored, there are sharp contrasts about mineral resources development activities across Europe …
- In 2008 Ireland, Portugal and Sweden, thanks to a very favourable geology, excellent public geology derived information services and an enabling business climate respectively received 206, 73 and149 €/ km2 in exploration investments, more than Canada or Australia!



Number of mineral resources projects, at all stages of development, listed in the MineSearch database developed by the Metals Economics Group (period: 1985-2009. Note: projects can be shelved or dormant

THE RAW MATERIALS INITIATIVE

The Raw Materials Initiative

- a European Commission policy proposal [COM(2008]699 – dated 11/2008- essentially focused on non-energy minerals
- a broad based policy framework based on three pillars: the external (non-EU), internal and recycling/ reuse pillars
- An implementation plan has now to be drafted by the Commission to be submitted to the Council (Competitiveness) in November 2010

The triggers

- Deep concerns from industry and business about the future availability (rather than the price) of the minerals and metals they need
- A Commission Staff Working Document on the competitiveness of the EU non-energy extractive industry of June 2007 analysed the availability of non-energy raw materials within the EU. It also examined the different issues and drivers of a competitive extractive industry in Europe. It is available here:
- http://ec.europa.eu/enterprise/steel/docs/sec_2007_771_en.pdf
- The rapid development of new players (the BRIC group of countries) on the global minerals and metals markets

Led the Competitiveness Council on May 21st 2007 to request the Commission

- "to develop a coherent political approach with regard to raw materials supplies for industry, including all relevant areas of policy (foreign affairs, trade, environmental, development and research and innovation policy) and
- to identify appropriate measures for cost-effective, reliable and environmentally friendly access to and exploitation of natural resources, secondary raw materials and recyclable waste, especially concerning third-country markets"

Public consultation:

- Online questionnaire
  - 240 replies: 68 individuals & 172 organisations
- Position papers
  - 36 (38) replies, including the detailed EuroGeoSurveys position paper titled: « Proposal for the implementation of a coherent EU non-energy raw materials policy »

    available here:
    http://ec.europa.eu/enterprise/non_energy_extractive_industries/docs/consultation_2008/ngo_egs_proposal.pdf
  - Good participation of downstream users (metals, pulp and paper, rubber, chemicals, etc.)

The three pillars of the Initiative

1. ensure access to raw materials from international markets under the same conditions as other industrial competitors. This would include a raw materials policy and international cooperation, strengthening states and promoting sound investment climates

- set the right framework conditions within the EU in order to foster sustainable supply of raw materials from European sources. This would involve improving the EU knowledge base and networking between geological surveys, skills development, research, raising public awareness

- boost overall resource efficiency and promote recycling to reduce the EU's consumption of primary raw materials and decrease the relative import dependence.

Ten actions to be detailed

- The Communication proposes 10 actions for further identification.
- Two of these will be defined by DG Enterprise and the two working groups to be soon launched, in view to deliver fully identified proposals for actions by April 2010, to serve as an input for the drafting by the Commission of the Implementation Plan it will present to the Council Competitiveness in November 2010.

Working Group 1: Minerals Criticality

- Using pre-existing assessments and studies it will define a methodology to define critical minerals
- It will establish a list of critical minerals
- Doing this it is likely to identify data availability / accessibility issues and to look to the need for an EU minerals intelligence capacity (the EuroGeoSurveys EMINENT proposal)

Working Group 2: Best practices and networking

- Shall help identifying the Member States land-use practices, and their practice to streamline procedures in order to speed-up permitting procedures
- Identify the possibilities to improve the EU geological knowledge base, to develop the interoperability and the dissemination of EU mineral resources data,

THANK YOU FOR YOUR INVITATION !