EurOCEAN 2010
Thermae Palace (Oostende, Belgium, 12-13 October 2010)

Marine Science contribution to Society and Industry

EurOCEAN 2010, Oostende, 12-13 October 2010

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The food challenge : Fisheries and Aquaculture

The global stakes at EU level :

EU fisheries (~ 4 Mt / y) + aquaculture (~ 1,3 Mt / y) production is not sufficient to satisfy consumer demand (~ 15 Mt / y, of which 5 are from the aquaculture)

=> seafood importation rate > 65%, still increasing

=> Aquaculture is a high potential sector in terms of employment and of sustainable development within the European market.

Marine sciences contribution to the Common Fisheries Policy :

- Stock assessment and fleet capacities
- Ecosystem approach, how to decrease the impact of fisheries ?
- From a stochastic to a deterministic approach

The vision for fisheries research :

- Need for more integration of ecosystem and economic models to anticipate crisis
- Need for more cooperation among fishermen and scientists at the local/regional level to reach the “maximum sustainable yield” of an eco-region
- Use the DCF (Data Collection Fisheries) for indication of biodiversity trends in the context of the MSFD (Marine Strategy Framework Directive).

The food challenge : Fisheries and Aquaculture

Marine science contributions to aquaculture :

Feeding substitutes

Healthy products

Conservation of the nutritional characteristics

Energy efficient and low discharges production systems

Resistance/resilience to environmental conditions

The vision for aquaculture research :

To overcome a paradox : European aquaculture is acknowledged for its research and its quality, but the sector growth is not there.

=> A new stimulus is needed at different levels :

Space competition (=> policy issue)

Research & Development (=> energy efficient production, closed circuit systems, off-shore aquaculture)

Production cost (=> in tune with the international market)






Marine Renewable Energy opportunities

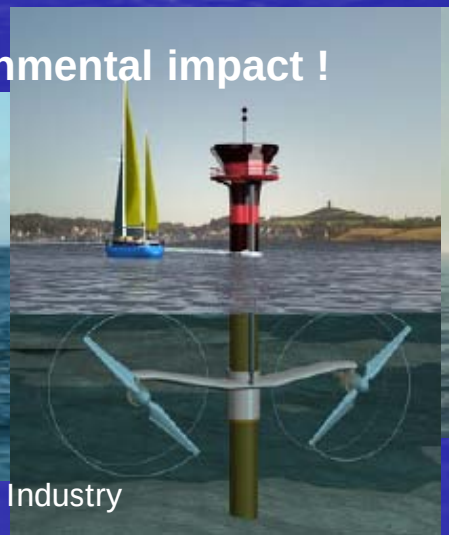
The global stakes :

A lot of potential resources and promising concepts

Marine Renewable Energy can be a significant contributor to EU energy objective of 20% renewables by 2020

Marine Science contributions :

- **Resources evaluation (wind and waves resources, spatial planning, …)**
- **Models and prototypes testing activities, demonstration sites, materials**
- **Monitoring of meteo/ocean environment and energy converters behaviour, and related modelling**
- **And of course … Environmental impact !**


Marine Renewable Energy opportunities

The vision :

- **Such quantitative objectives can only become reality through a joint mobilisation of all public and private actors on the right scale**
- **The key roles of the public stakeholders in the next decade**
  - **A ten years funding effort from the public research,**
  - **The development and consolidation of enabling policies,**
  - **A maritime spatial planning bringing into force,**
  - **A communication strategy to ensure public support,**

Official launch of the Marine Board Vision Document on Marine Renewable Energy, today at 17h40, don't miss it !!!

Marine biotechnology

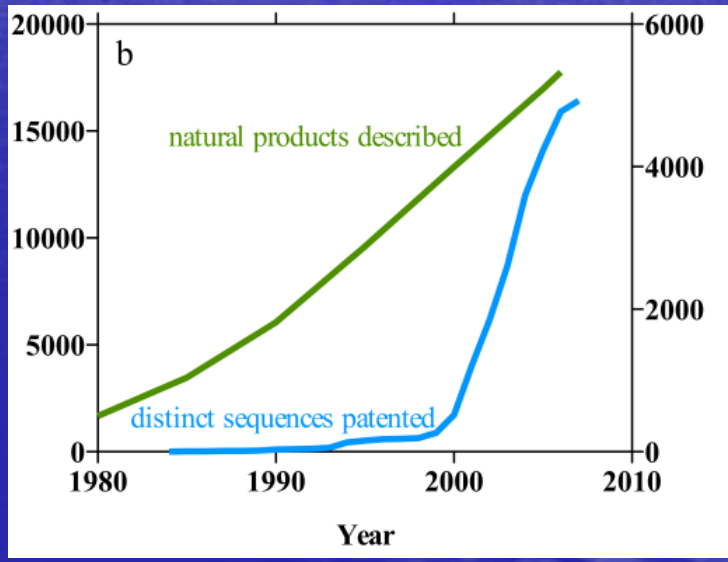
The global stakes :

Economic opportunities based on biodiscovery and innovation :

Food, Health (drugs and cosmetics), Energy, Innovative products (biopolymers, …) , Marine environment (Bioremediation)

More than 18000 natural products and 4900 patents associated with genes of marine organisms, a market estimation of more than 2 billions $ per year (1 billion $ for only enzymes) >>>>>>

(Ref : What lies underneath : conserving the oceans' genetic resiources Jesus M. Arrieta, Sophie Arnaud-haond, Carlos M. Duarte)



But extraction / conservation / exploitation of oceans' genetic resources and species is a challenge






Marine biotechnology

Marine science contributions :

- Discovery of the marine biodiversity
- Metagenomics
- Screening of genes roles and product
- Investigating in the metabolism of promising species
- Developping innovative processes to master the production of selected species

The vision :

A vast repertory of life and genomic diversity lies underneath, calling for increased research and protection efforts

Need a constant support and a critical masses of resources to discover the « blockbusters » => Huge potential for a public-private partnership, e.g. using the tax credit for research

Need a clear statement about the « patentability of the living resources »

This vision will be unveiled in tomorrow's presentation : « Blue Biotechnology - New opportunities for Europe », don't miss it !!!

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Exploration of deep-sea and challenging exploitation of fossil energy and mineral resources

The global stakes :

- **Fossil energy resources represent** about 30% of the world production

- **The potential mineral resources** of the oceans is really significant, it may contribute to supply critical raw materials (Ref : EC COM(2008) 699))

- **Europe need to define its own strategic approach at a time when the international context is quickly evolving**

Exploration of deep-sea and challenging exploitation of fossil energy and mineral resources

Marine Science contributions :

RIDGES

Massive polymetalic sulphides (thin metallic particles precipitate : Copper, Zinc, Silver, Gold, Cobalt, Lead, …**)**

Natural hydrogene(Serpentinisation)

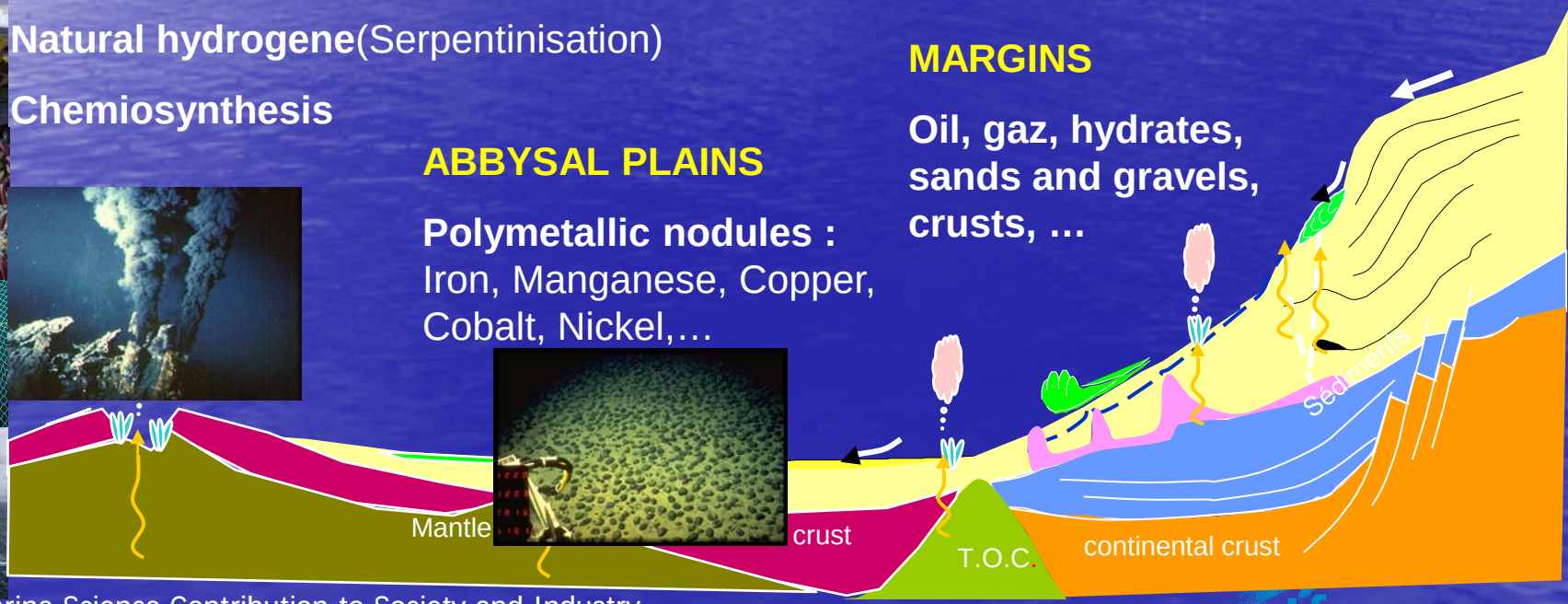
Chemiosynthesis

ABBYSAL PLAINS

Polymetallic nodules : Iron, Manganese, Copper, Cobalt, Nickel,…

MARGINS

Oil, gaz, hydrates, sands and gravels, crusts, …

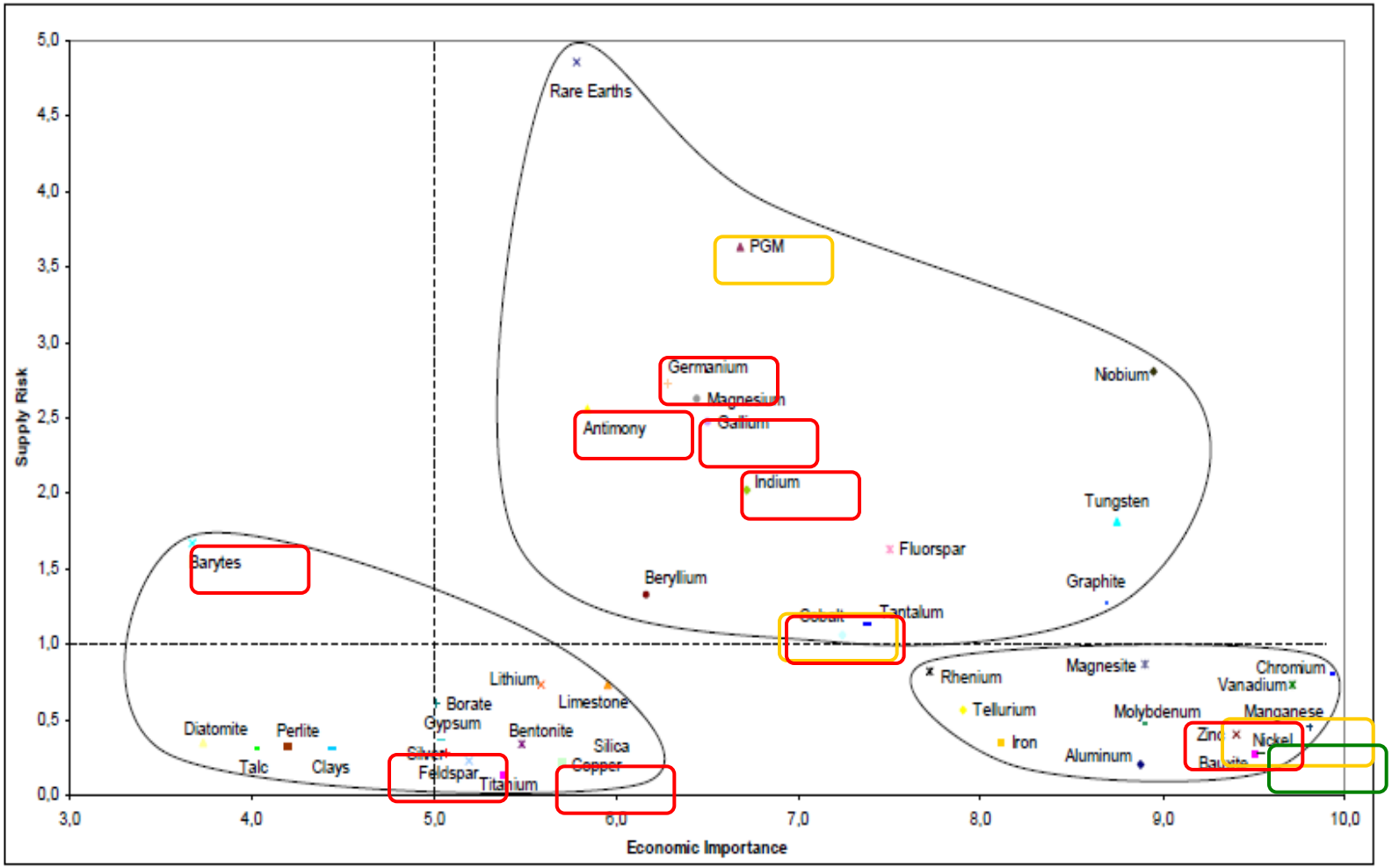


Critical raw materials issue - 2030 EC vision
Présence REMIMA significative

Sulfures

Encroutements

Nodules



Exploration of deep-sea and challenging exploitation of fossil energy and mineral resources

The vision :

- **Better organise the R/D capacities existing in EU**
- **Increase cooperation with a powerful private sector**
- **Develop a common approach at EU level to ISA to promote EU interest**

Sustainable monitoring of marine environment and ecosystems, marine data and information access

The global stakes :

The need for a consistent and sustainable data and scientific information service in support of :

- **policies (Integrated Maritime Policy, Marine Strategy Framework Directive),**
- **management (spatial planning),**
- **industry (transport & security, offshore facilities, aquaculture)**
- **research (inc. climate change impact)**

… and for the information of the public.

Marine science contributions to monitoring :

The capture of geo-referenced parameters : Physics, Chemistry, Geology, Biology, Living resources,

Through different acquisition methods : *In situ* sampling + land lab analysis (=> coastal stations, scientific cruises, *In situ* automated sensing (=> network of fixed and mobile observatories), Remote sensing (=> satellites)

Sustainable monitoring of marine environment and ecosystems, marine data and information access

Marine science contributions to data access :

- Marine Research institutes are deeply involved in marine « public » data service, originally in a scientific-to-scientific intention and now more in a scientific-to-any public one : data saving, validation, storage, accessibility, portal development.
- Marine Research institutes are also usually commited for a marine « legally obliged » data service by their state trustees : they report a set of specific data and indicators on a regular operational basis.

The vision : "Marine Knowledge 2020" COM(2010)461 => a timely vision which cover marine data collection, assembly and access issues (e.g. EMODNET)

Critical issues to solve within the next decade :

- Standards for data and meta data, to move towards a european network of distributed data centres
- Coordination of existing initiatives, to move towards a common marine data architecture
- Regular funding of the *in situ* data acquisition, the core condition for a permanent public service

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Conclusion :

Marine Sciences play a crucial role with the key involvment of industrial partnerships in addressing those societal challenges

This will require rethinking the networking of all concerned contributors :

- the implementation within the research community of an **European Joint Programming of the Member States for "Healthy and productive oceans and seas",**

- the development of a truly integrated and consistently funded **"European Ocean Observing System"** providing data and information under regulated access

- the promotion for the maritime and industrial sector of **innovation and development of new marine/maritime products, processes, services**

Thank you for your attention !

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