



Winnen op Zee: competitieve positie van de Nederlandse industrie versterken

- Jan Willem van Bloois BSc, general manager IHC Deep Sea Dredging & Mining
- Bas Bolman BSc MSc, Wageningen UR - IMARES
- ir. Frank Lange, Heerema Marine Contractors bv





KIVI NIRIA



IMARES

WAGENINGEN UR



Jan Willem van Bloois

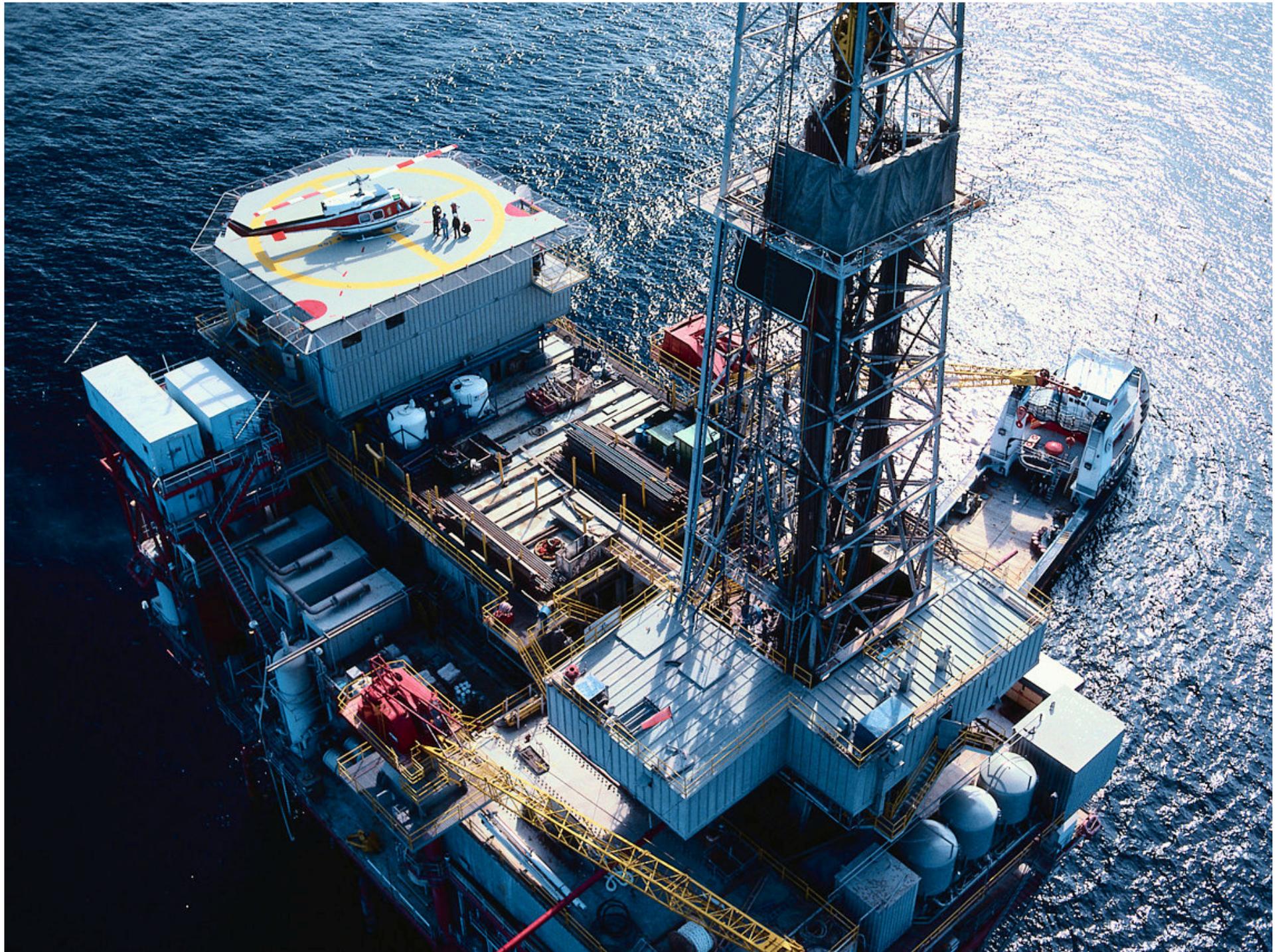
Bas Bolman

Frank Lange



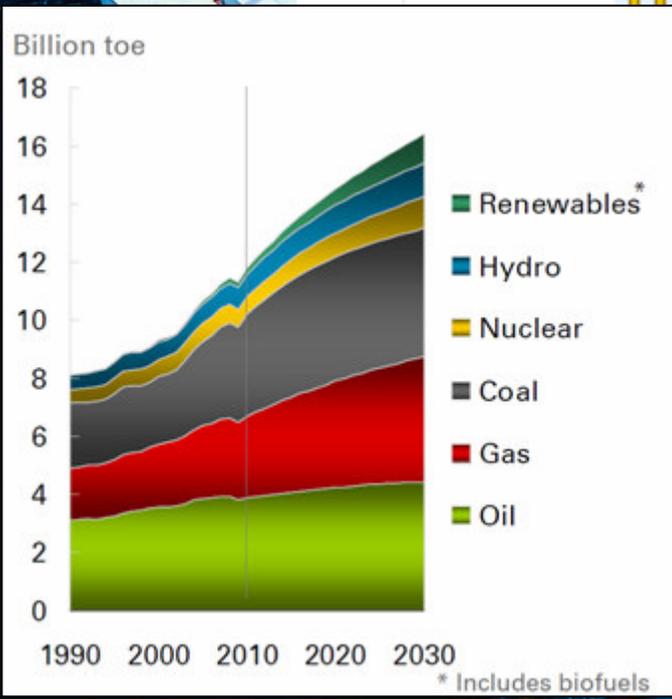
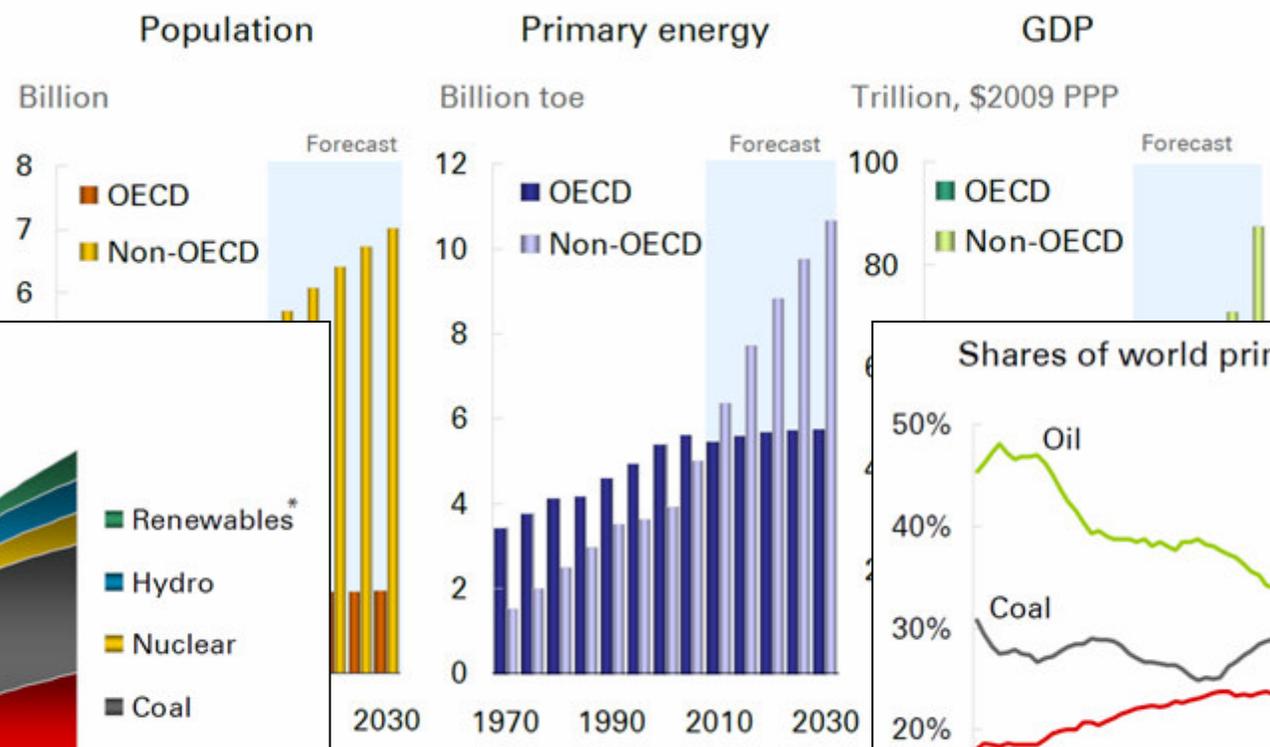
Agenda

- Oil scarcity
- Grondstoffen schaarste
- Imares activities
- HMC Arctic activities
- IHCM Deep sea mining
- Topsectoren



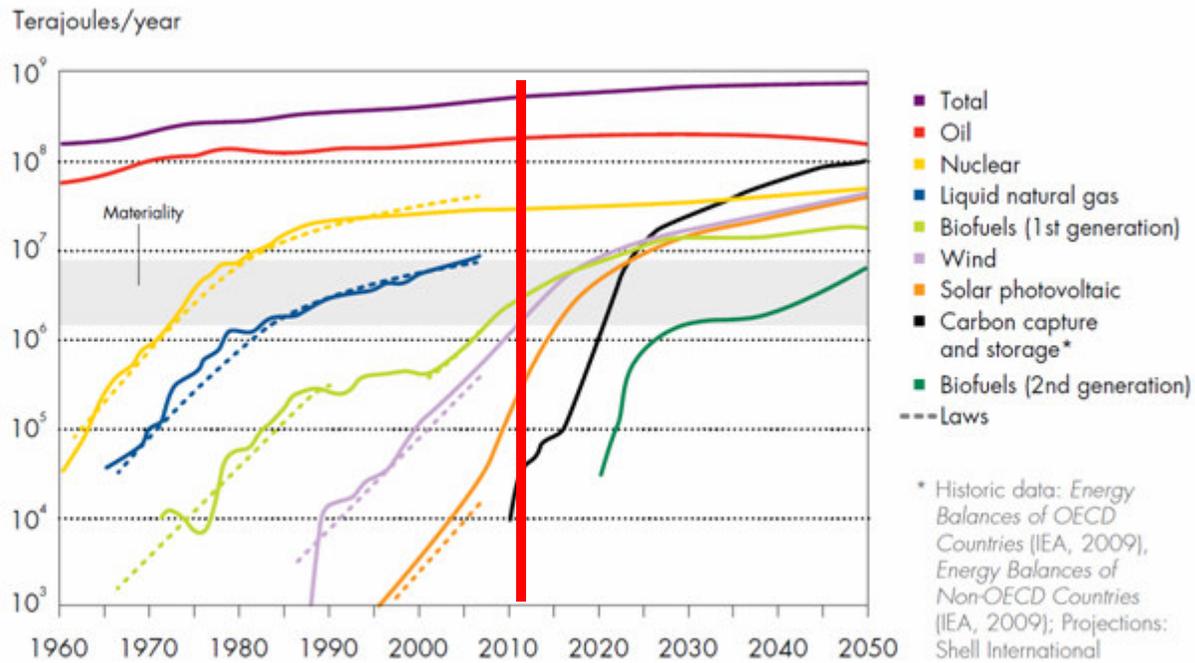


The world we live in...



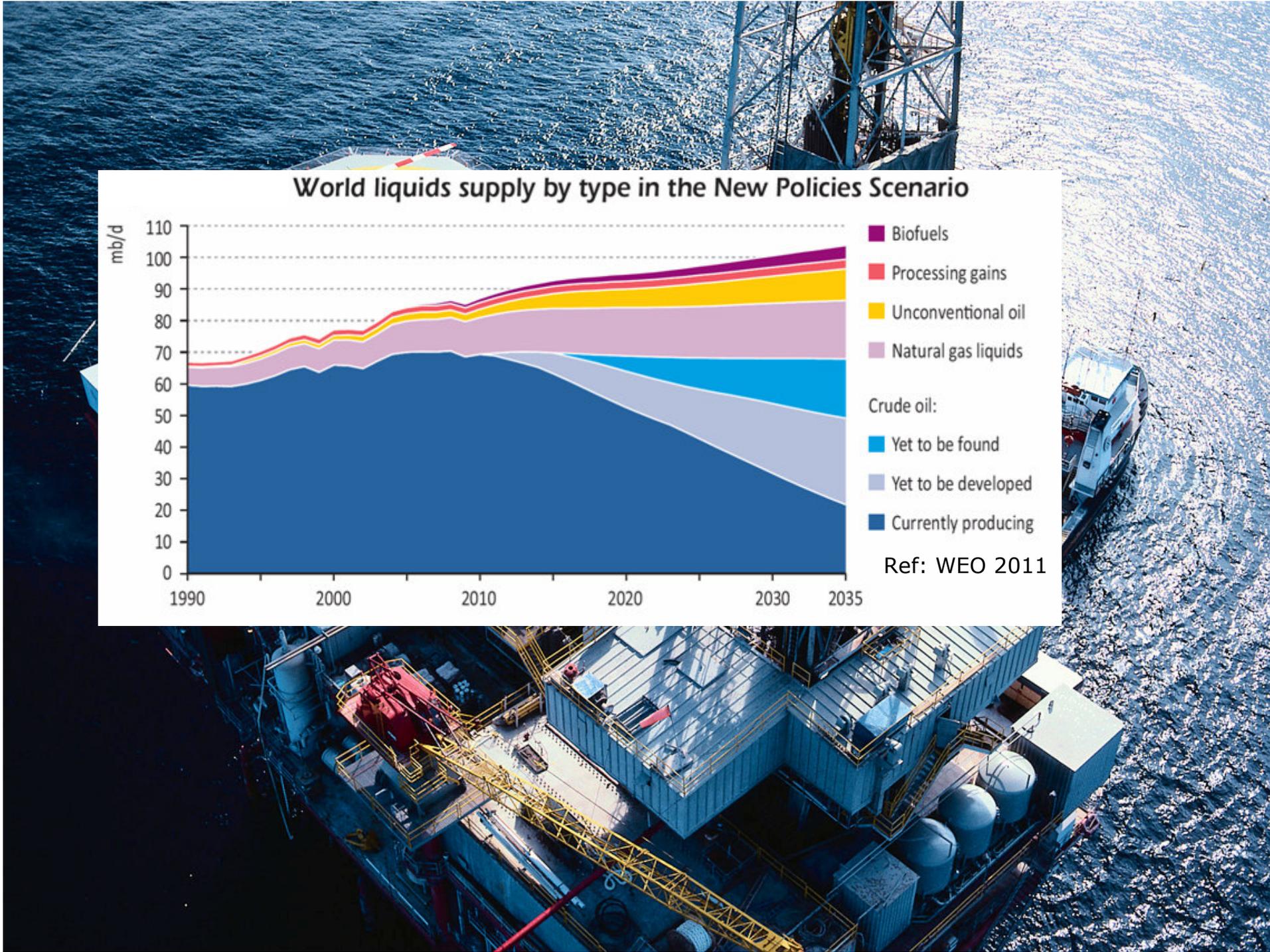
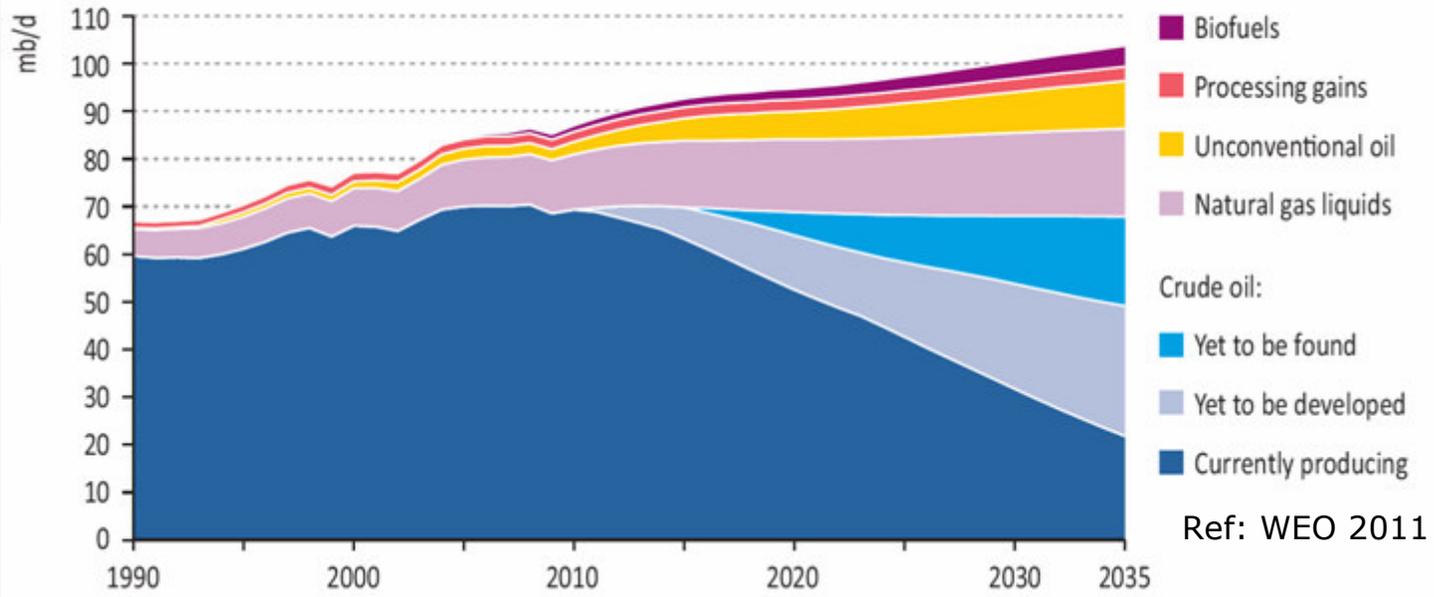
Ref: 2030 Energy Outlook - BP 8

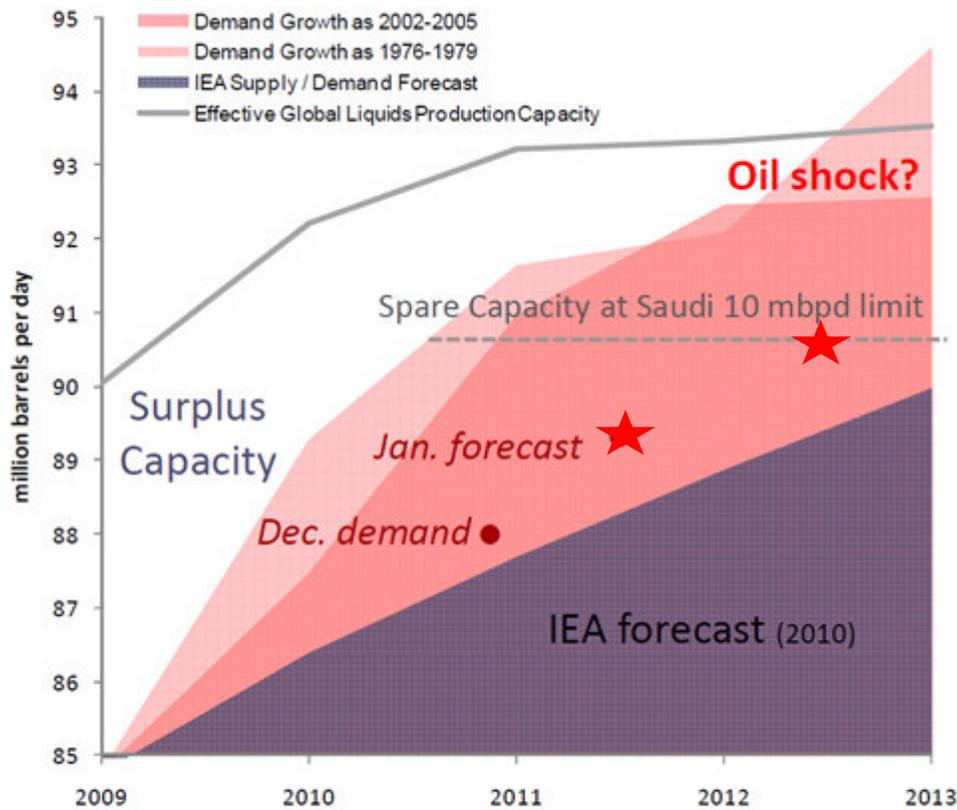
Chart 8. Energy-Technology Deployment



Ref: Signals & Signposts - Shell Energy Scenarios to 2050

World liquids supply by type in the New Policies Scenario



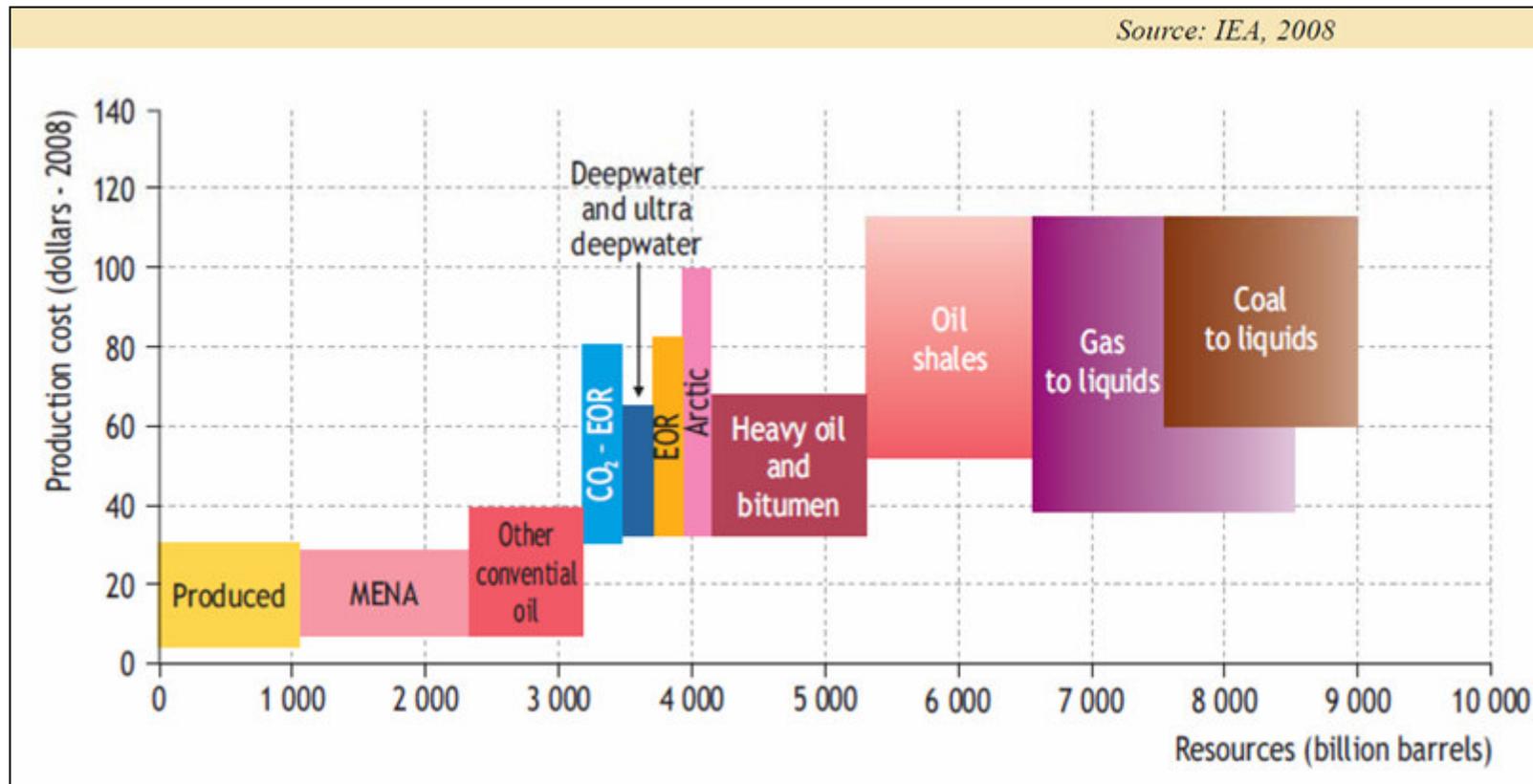


Oil Demand under Three Scenarios and Global Liquids Production Capacity

Source: IEA, Douglas-Westwood analysis



Yet to be found oil?





Influence oil scarcity



Consequences of metals scarcity

- Less affordable mass-produced electronic products
mobile phones, flatscreen TVs, PC's, ...
- Forget large-scale conversion towards alternative energy sources
- Forget large-scale electrification of land-based transport
- Chemical compounds will become more expensive
- Construction and machining will become more expensive
- Metals scarcity will aggravate energy scarcity !!



19 Metal minerals scarcity and the Elements of Hope

Dr. A.M. Diakova MEngSci, June 27, 2009



Return

KIVI NIRIA

INC
MERWEDE

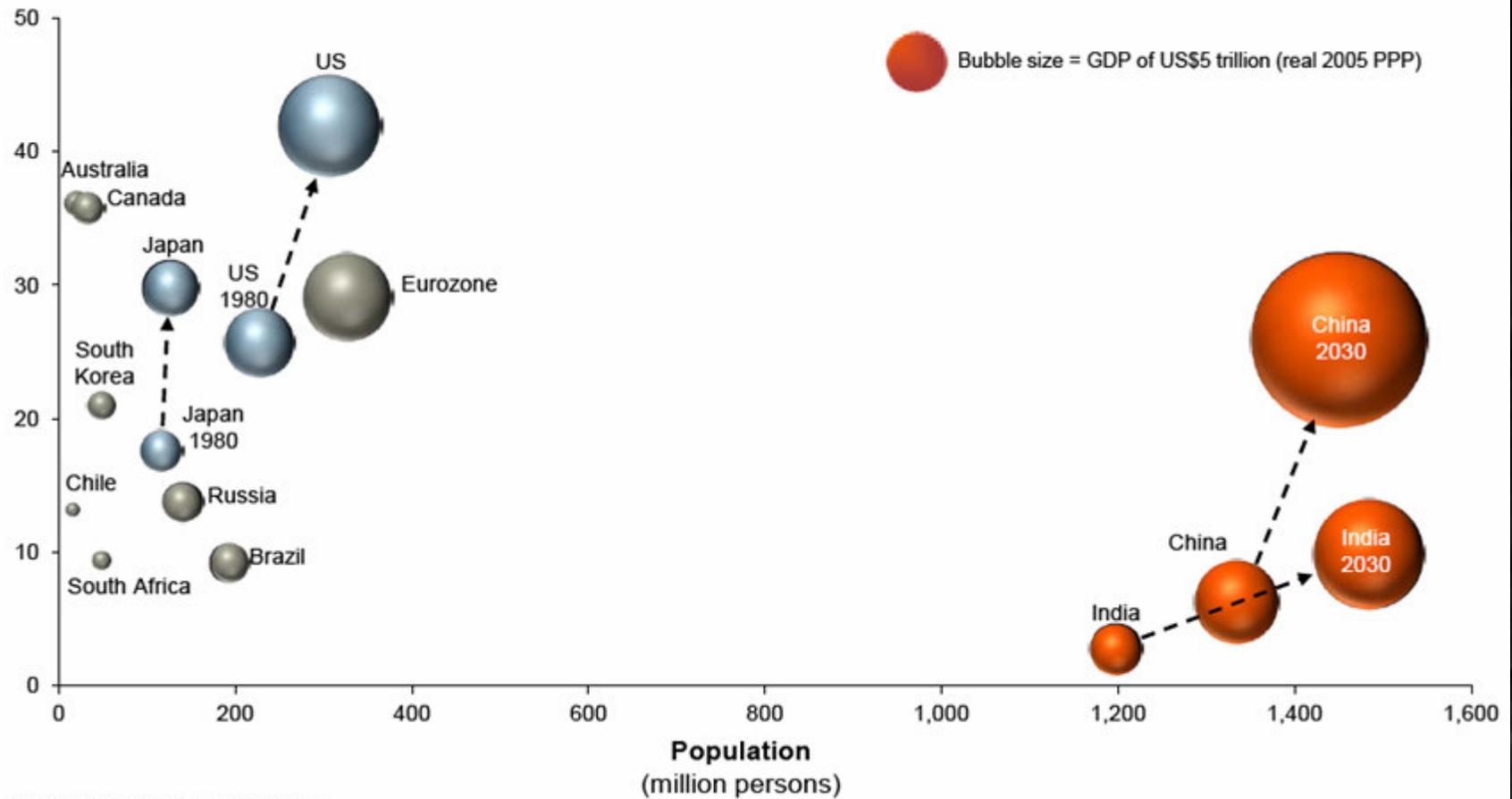
IMARES
WAGENINGEN UR

H
MARINE
CONTRACTORS



Congratulations!!

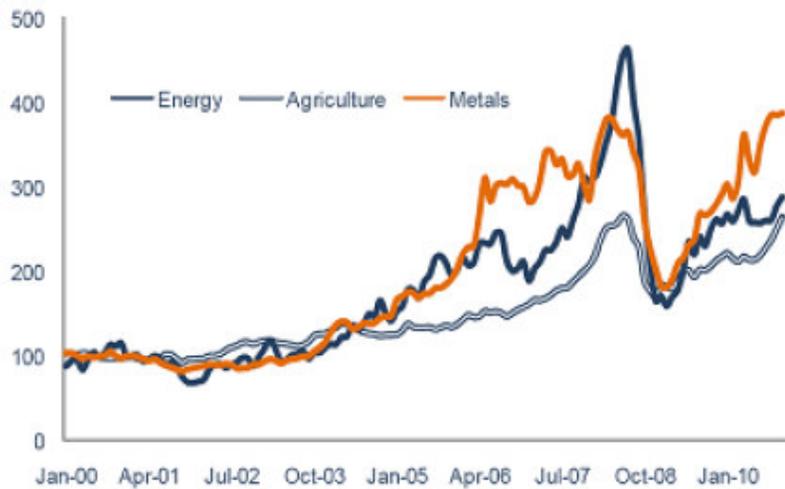
World GDP per capita¹ (US\$'000, real 2005 PPP)



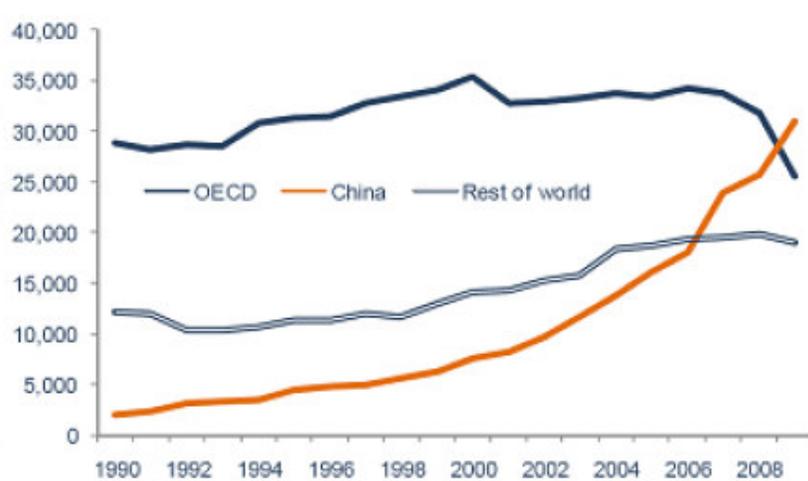
Source: Global Insight; BHP Billiton analysis.
1. All figures for 2009 unless mentioned otherwise.

If It Isn't Grown, It Is Mined

USD prices, index Jan 2000=100



Metal demand, thousand of tons

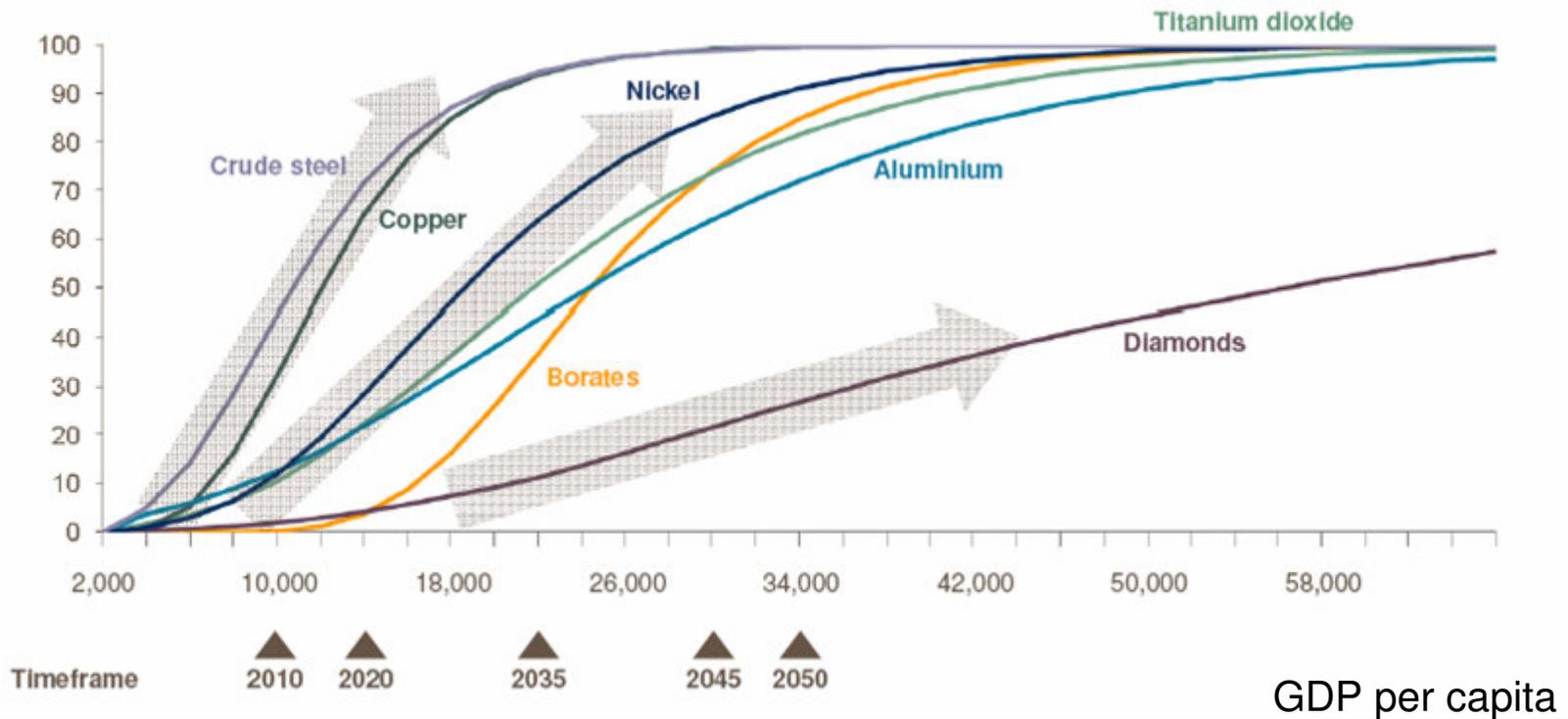


Source: World Bank

If It Isn't Grown, It Is Mined

The inflection point is yet to be reached for many of our products

Percentage of saturation level*



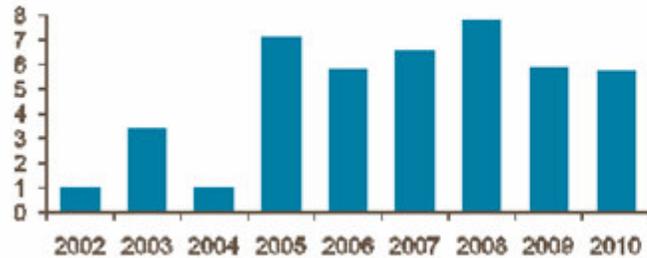
*Saturation level – point at which consumption per capita does not increase with income levels

Source: Rio Tinto

If It Isn't Grown, It Is Mined

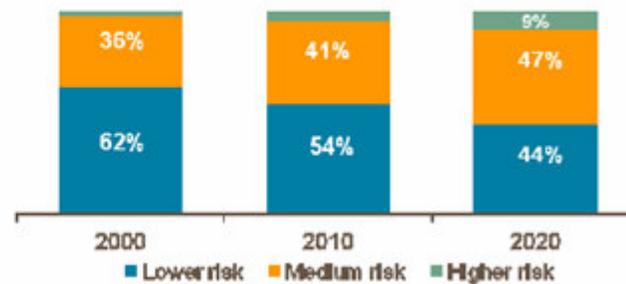
Disruption rates will continue

(% of planned production)



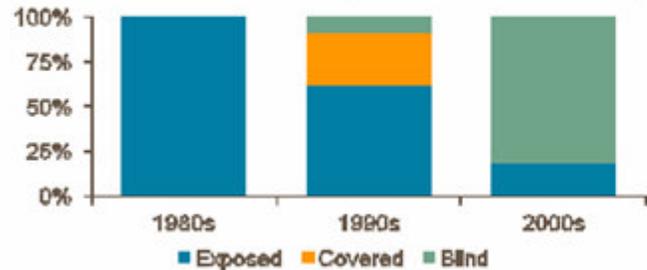
Sovereign risk

Copper supply location (%)



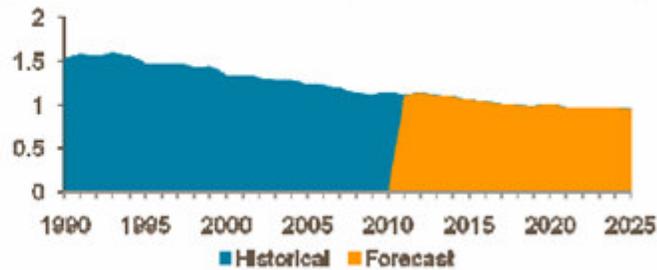
Increasing depths

Indicative depth of discoveries



Declining grades

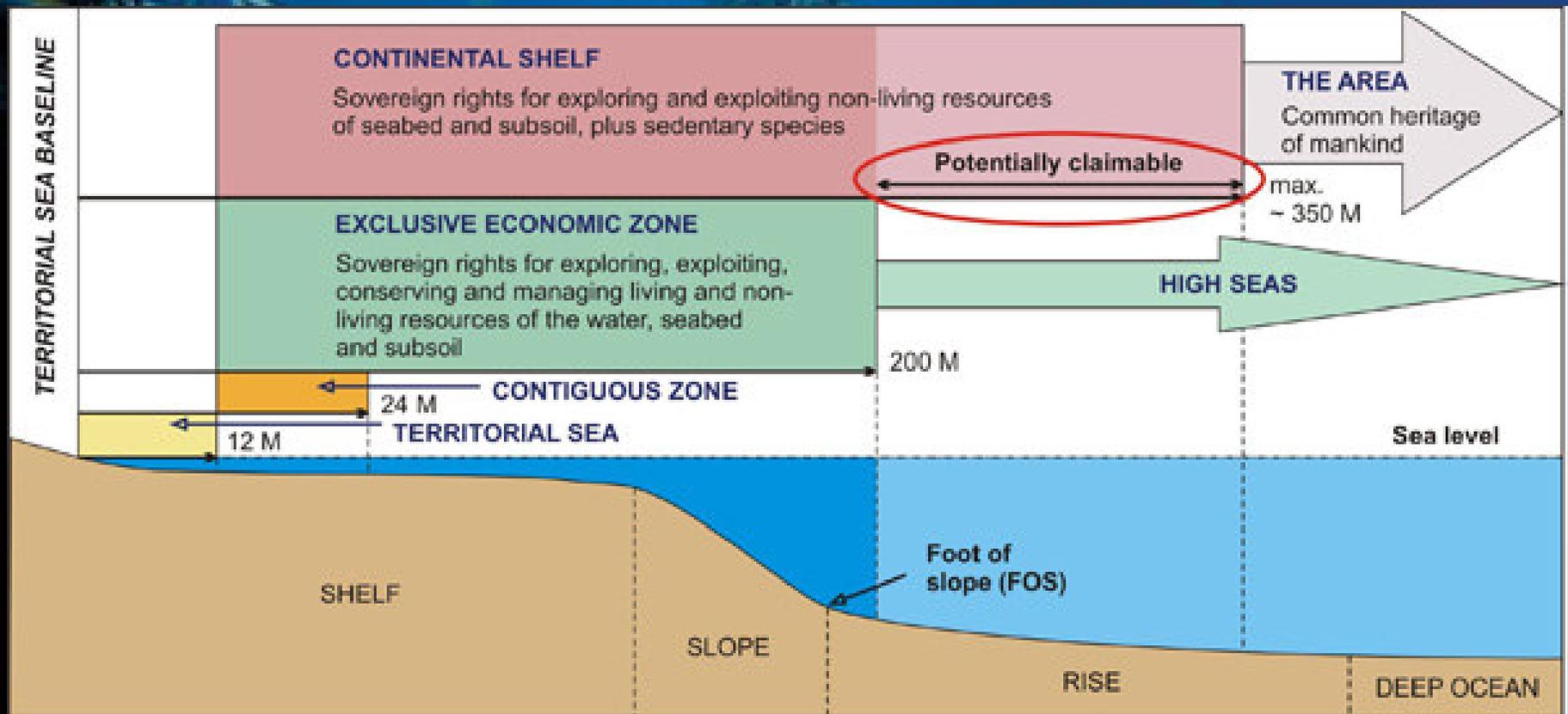
Average head grade treated (% Copper)



Sources: Brook Hunt – A Wood Mackenzie company

If It Isn't Grown, It Is Mined

Innovative ways of finding and efficiently developing the world's minerals are required.





1. IMARES

Scientific institute for strategic and applied marine ecological research in support of maritime policies and innovations.

Sustainable maritime economy and seafood production in harmony with the protection of the seas.



2. Responsible entrepreneurship in sensitive areas

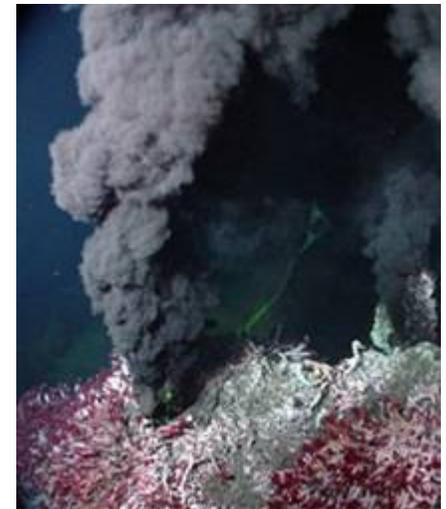
■ Arctic

- New economic potentials
- Technological challenges
- Sensitive ecosystem, short seasons

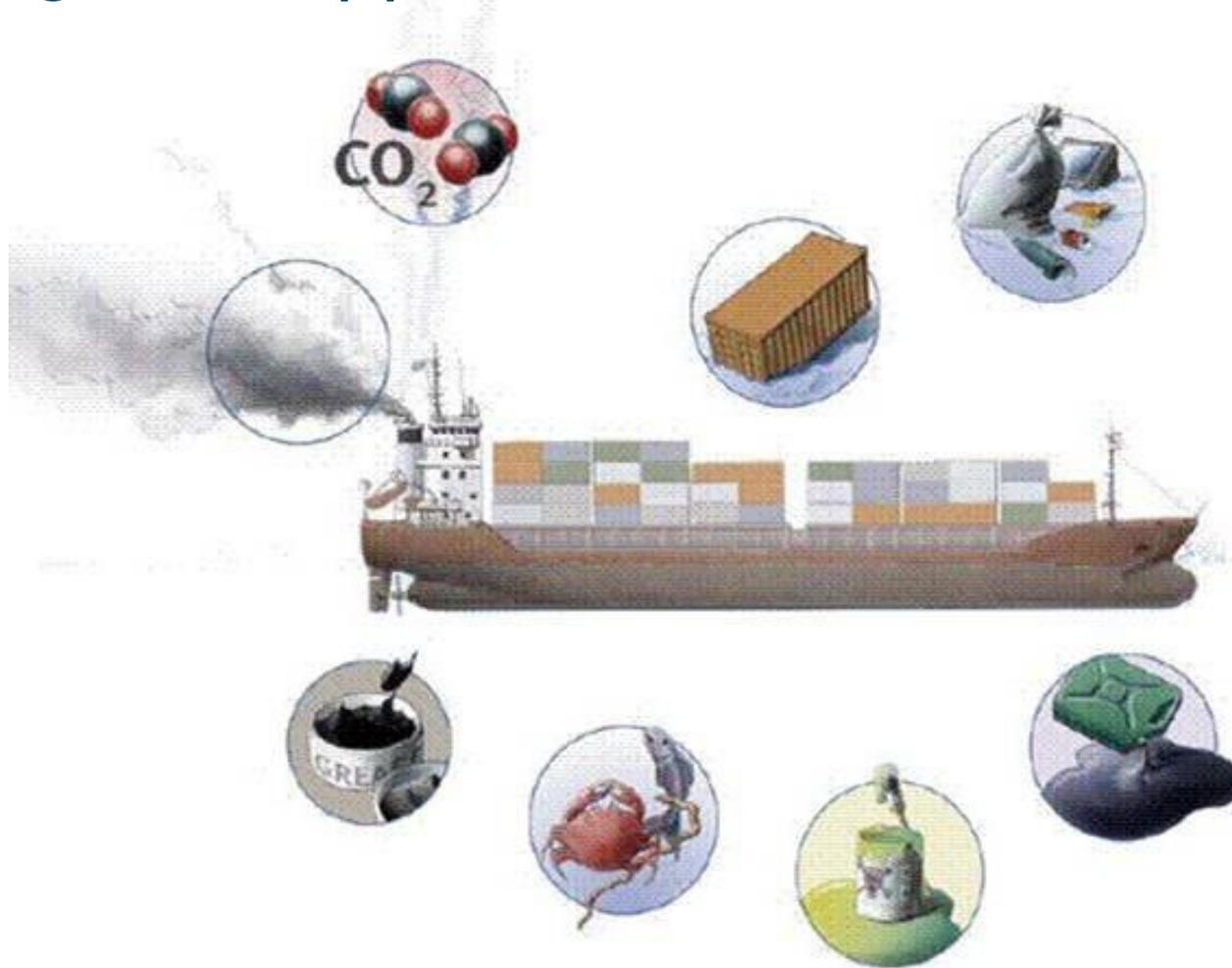


■ Deep Sea

- From shallow coastal seas to deep sea
- Technological challenges
- Pristine ecosystems
- Knowledge gaps



3. Integrated approach



Source: Maas/van Rootselaar & The North Sea Foundation



4. CUMULEO



- Objective
 - Sustainable operations

- How
 - Innovative solutions
 - Setting priorities

- Priorities
 - Overall emissions?
 - Impact?

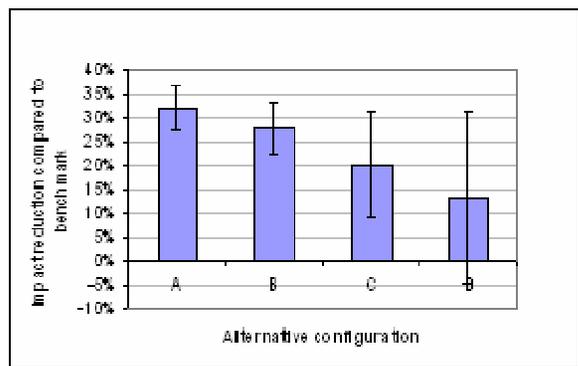




5. E3-tug, first application of new approach



3 - TUG



SMIT'S E3 TUG PROJECT REWARDED WITH KVNR SHIPPING AWARD

On 28 October 2009, SMIT was granted 'The Royal Association of Netherlands Ship Owner's (KVNR) prestigious "Shipping Award 2009" for its achievements in the development of the sustainable E3 tug at the 4th Maritime Awards Gala, in Rotterdam.

The KVNR jury rewarded SMIT's leading role within its industry of harbour and coastal towage service providers with regard to the areas of environmental awareness and vessel design.

The E3 tug (Environmentally friendly, Efficient In operation, and Economically viable) is being developed by a consortium consisting of SMIT

Engineering, Damen Shipyards and Alewijnse Marine Systems. The emphasis of this innovative tug design project is on "green performance" combined with operational flexibility. The E3 Group intends to develop a new generation of tugs with optimised performance regarding environment and operational efficiency.

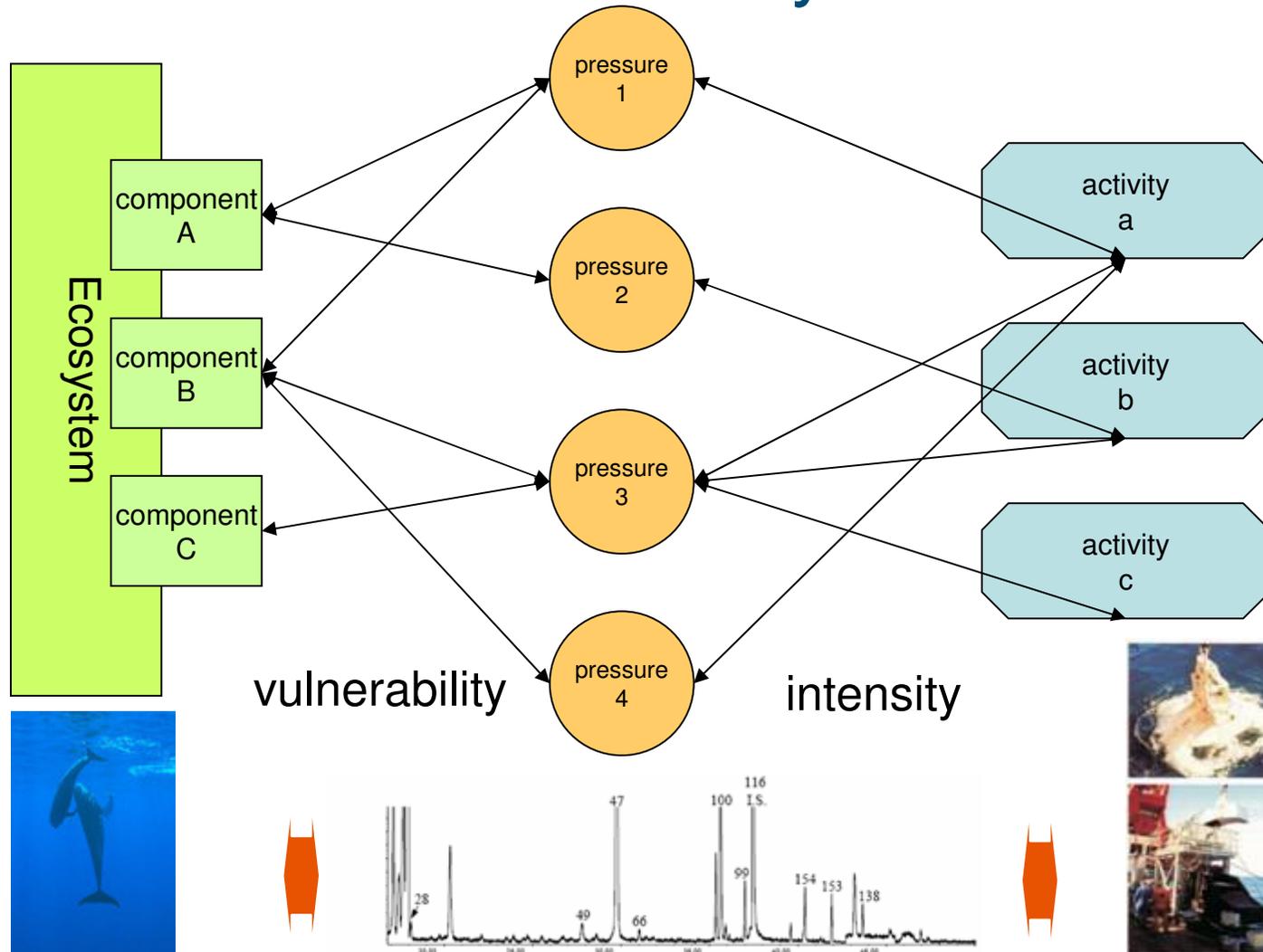
Peter Kortekaas, General Manager of SMIT Engineering and Chairman of the E3 Group, accepted the award presented by Tineke Netelenbos, Chairwoman of the KVNR, and Charlie Aprot, Member of the Lower House.

Peter Kortekaas accepts the KVNR Shipping Award as Chairman of the E3 Group.

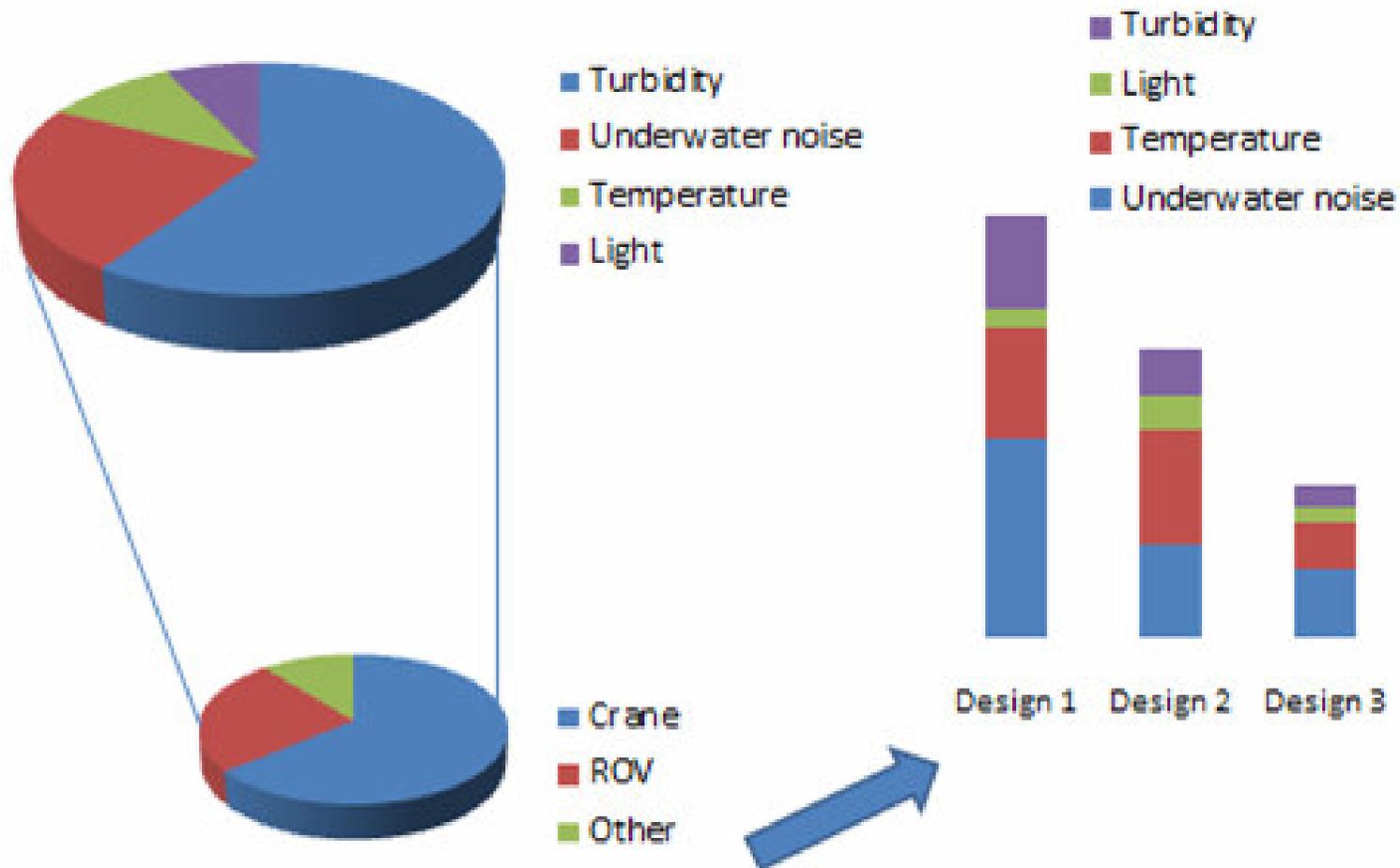




6. Effect chains: from activity to effect

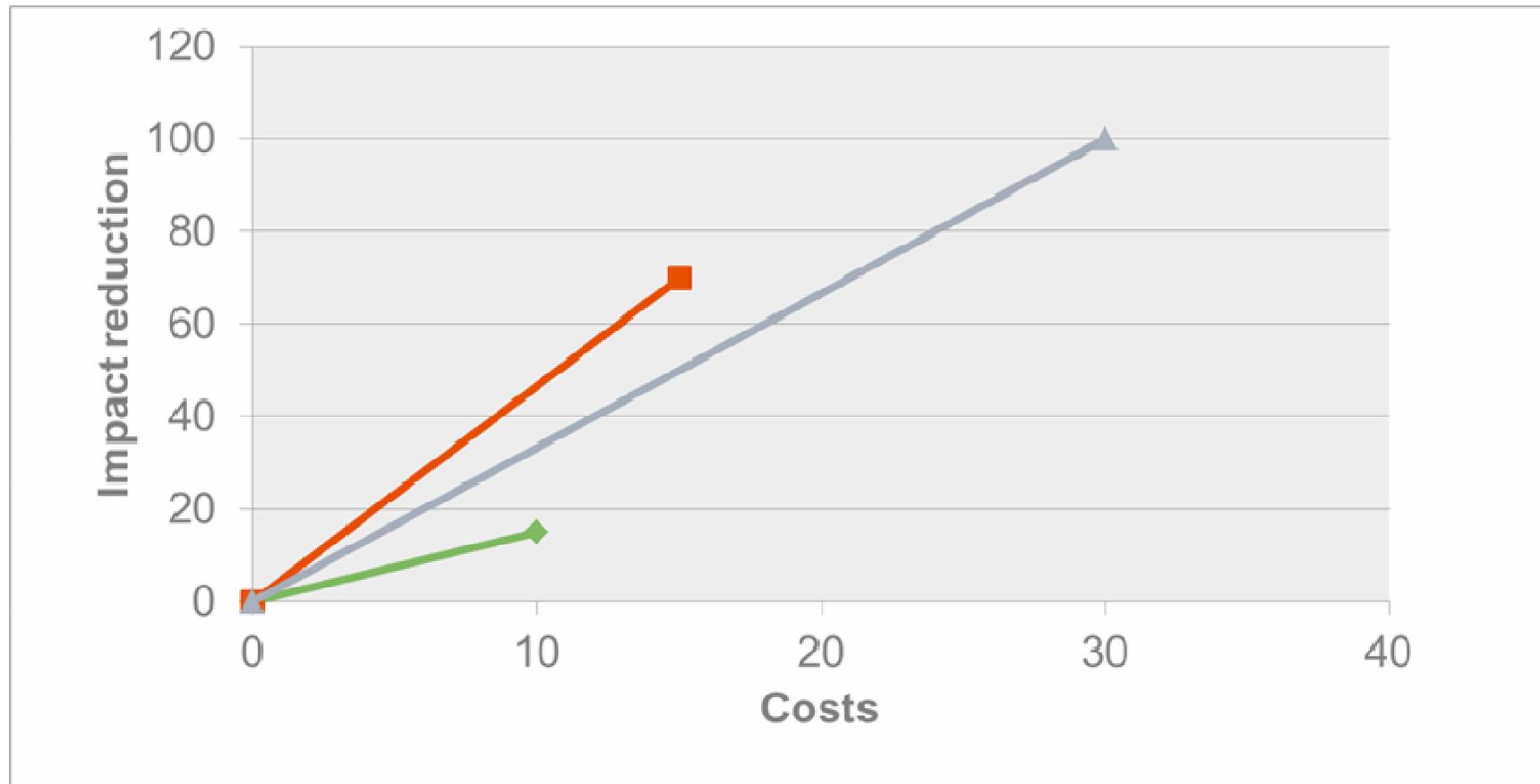


7. Outcome





8. Costs vs. benefits





9. Advantages

- Based on key ecological data
 - Can also include elements of concern (species, habitats)
 - May include audit trail (to identify uncertainties)
- Objective evaluation
- Focus on mitigation measures
 - Highest environmental benefit of investments
- Guidance for development of legislation
 - Focus on issues that are actually relevant
 - Goal based regulation > industry takes responsibility



Heerema Marine Contractors

DCV Aegir
In 2013



DCV Balder



SSCV Hermod



SSCV Thialf

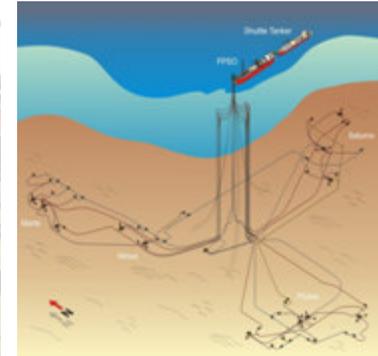




Heerema Marine Contractors

Key current products – Niche areas

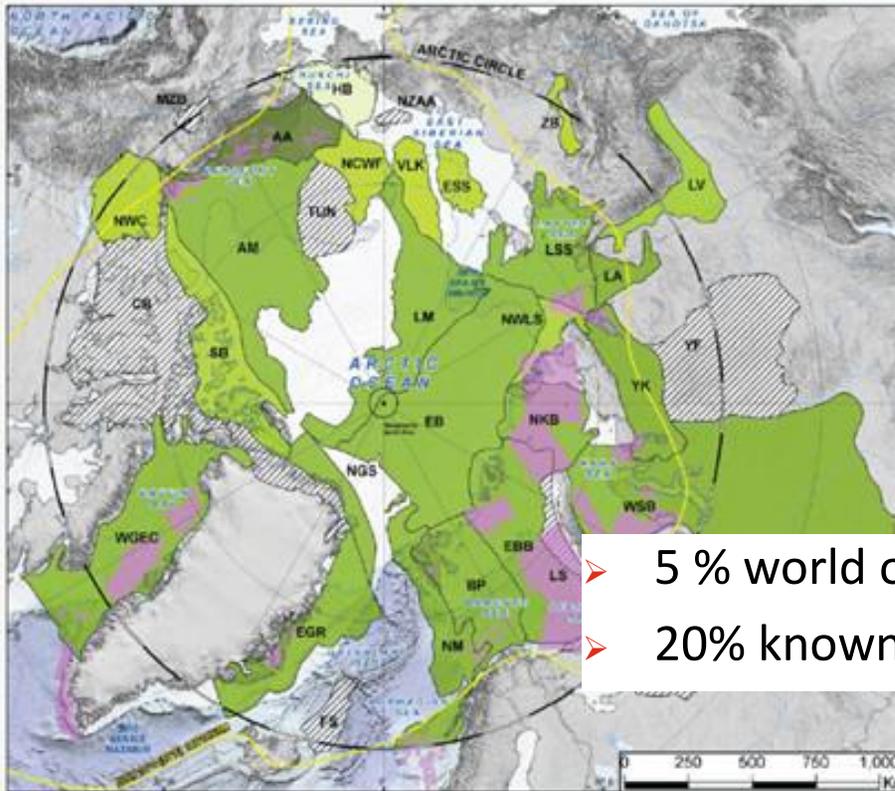
- Fixed platform installation (Topsides, Jackets & Float-over)
- Floating platform installation (TLP's, Semi's & SPAR's)
- Decommissioning and Removal
- Subsea and Pipeline installation



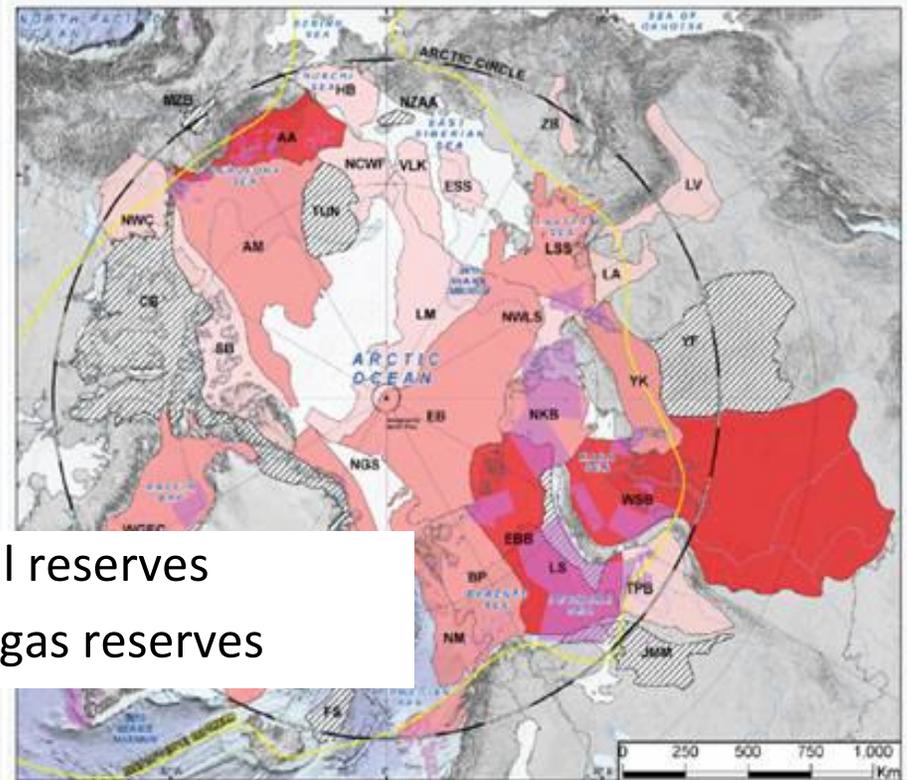


Arctic reserves

MAP 2 – ESTIMATED OIL IN-PLACE IN THE ARCTIC



MAP 3 – ESTIMATED GAS IN-PLACE IN THE ARCTIC



➤ 5 % world oil reserves
 ➤ 20% known gas reserves

LEGEND

MEAN UNDISCOVERED OIL (MMBO)	MEAN UNDISCOVERED GAS (BCFG)	OFFSHORE LEASE AREAS
10,001 - 29,961	100,001 - 1,000,000	2010 SEA ICE MINIMUM
1,001 - 10,000	10,001 - 100,000	2010 SEA ICE MAXIMUM
101 - 1,000	2 - 10,000	JULY 10 DEGREE C ISOTHERM
11 - 100	NOT QUANTITATIVELY ASSESSED	ARCTIC CIRCLE
2 - 10		
NOT QUANTITATIVELY ASSESSED		

SOURCE: USGS Note: See Table 1 for Geologic Province Codes.
http://www.offshore-mag.com/etc/medialib/platform-7/offshore/maps-and_posters.Par.97001.File.dat/0211ArcticPoster-012711ADS.pdf

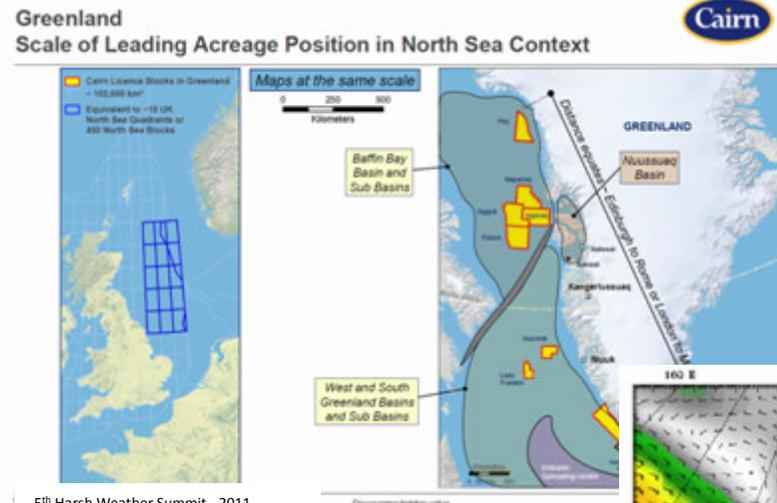
SOURCE: USGS Note: See Table 1 for Geologic Province Codes.



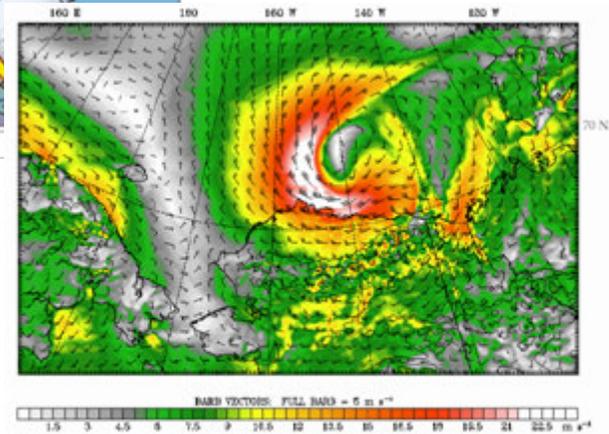


Arctic issues

- Open water period
- Air temperatures
- Metocean (Polar lows)
- Mobilizations
- Logistics
- Eco-system



5th Harsh Weather Summit - 2011



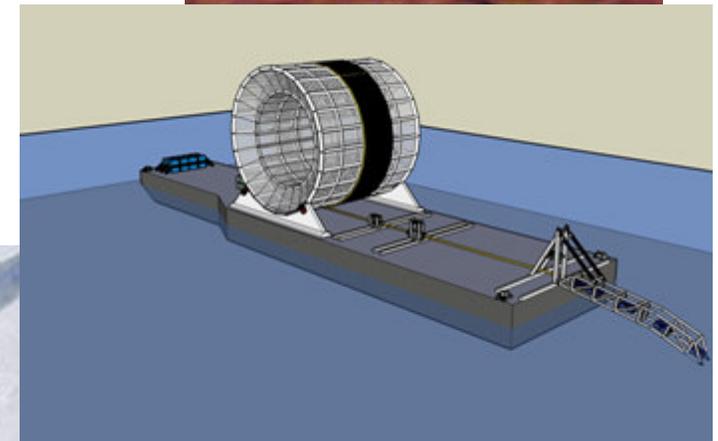
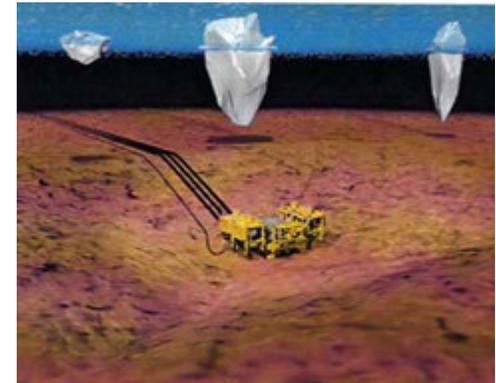
An Evaluation of the Science Needs to Inform Decisions on Outer Continental Shelf Energy Development in the Chukchi and Beaufort Seas, Alaska – USGS - 2011





Arctic approach

- Balanced approach – environment, economic & social
- High Health Safety Environmental standard
- New technologies / materials
- Limited effect on environment
- Cooperation with indigenous community
- Guideline development



Aker Arctic





Heerema Marine Contractors

DCV Aegir
In 2013





Subsea crawler technology

De Beers Marine
Offshore diamond mining





Innovative vessels
Advanced equipment
Life-cycle support



Dredging & Mining



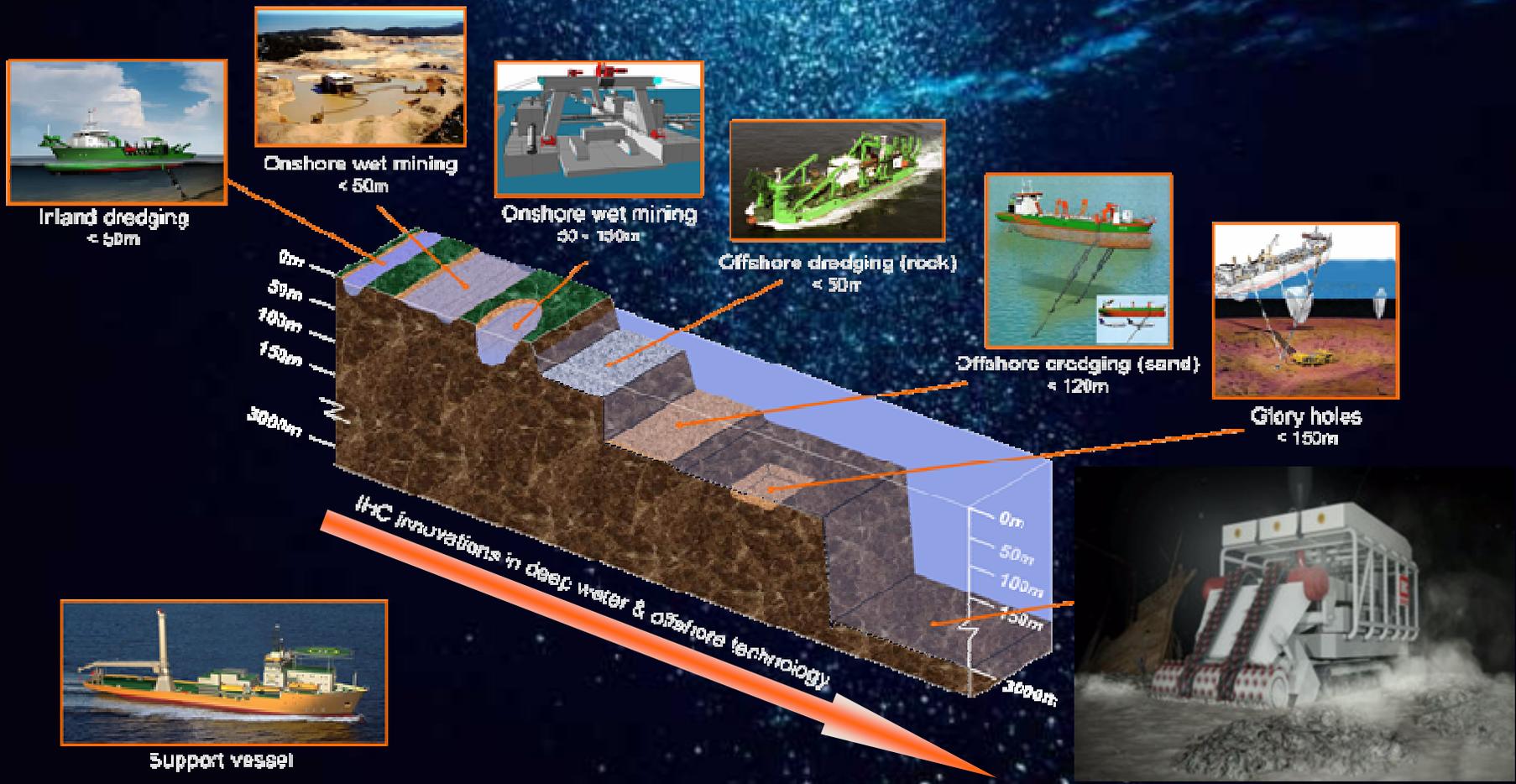
Technology & Services



Offshore & Marine

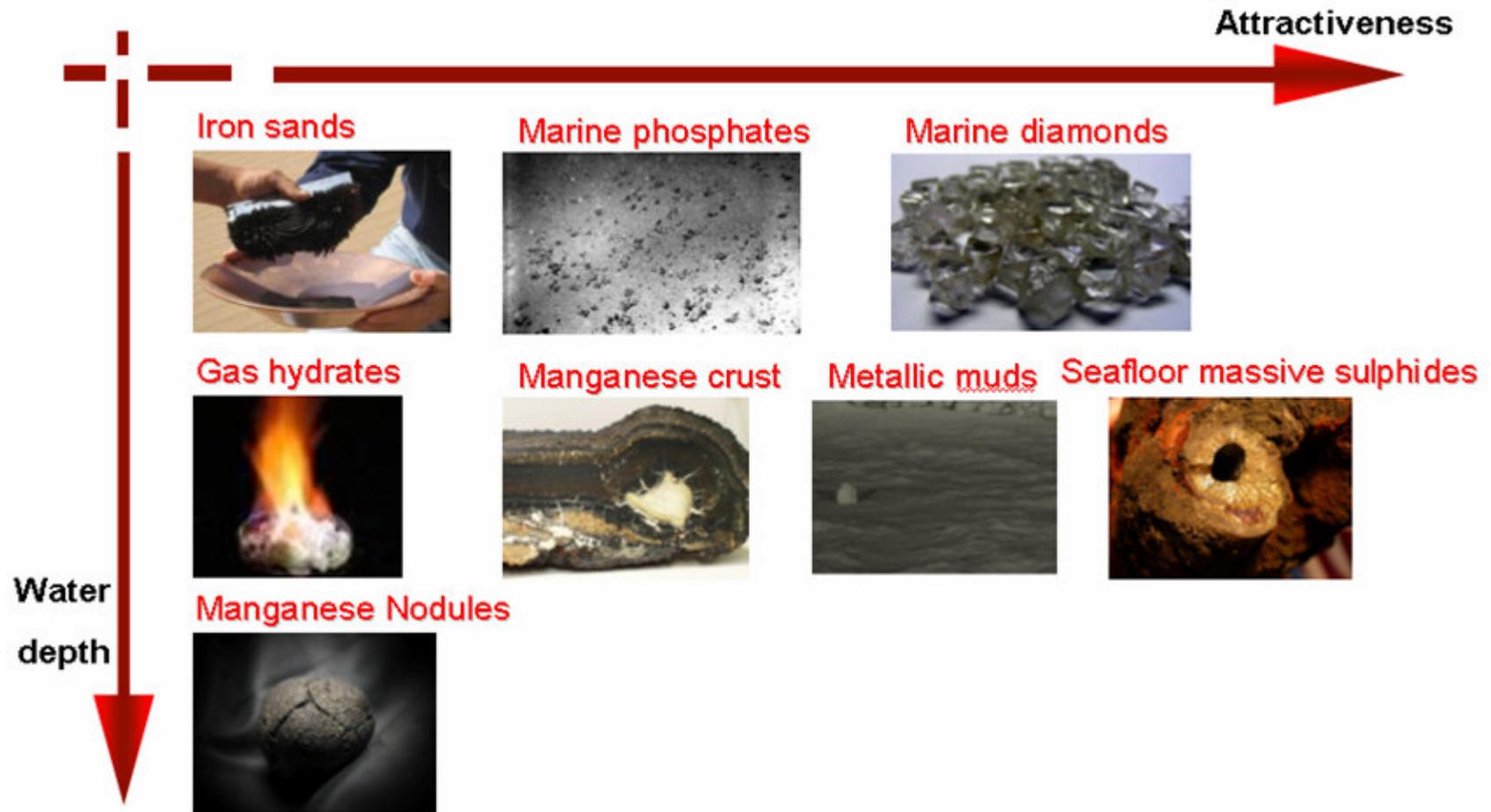
The technology innovator.

IHC DSDM: Expanding IHC Merwede knowledge to greater depths





Deep Sea Mining Business drivers





Technical challenges

Product development

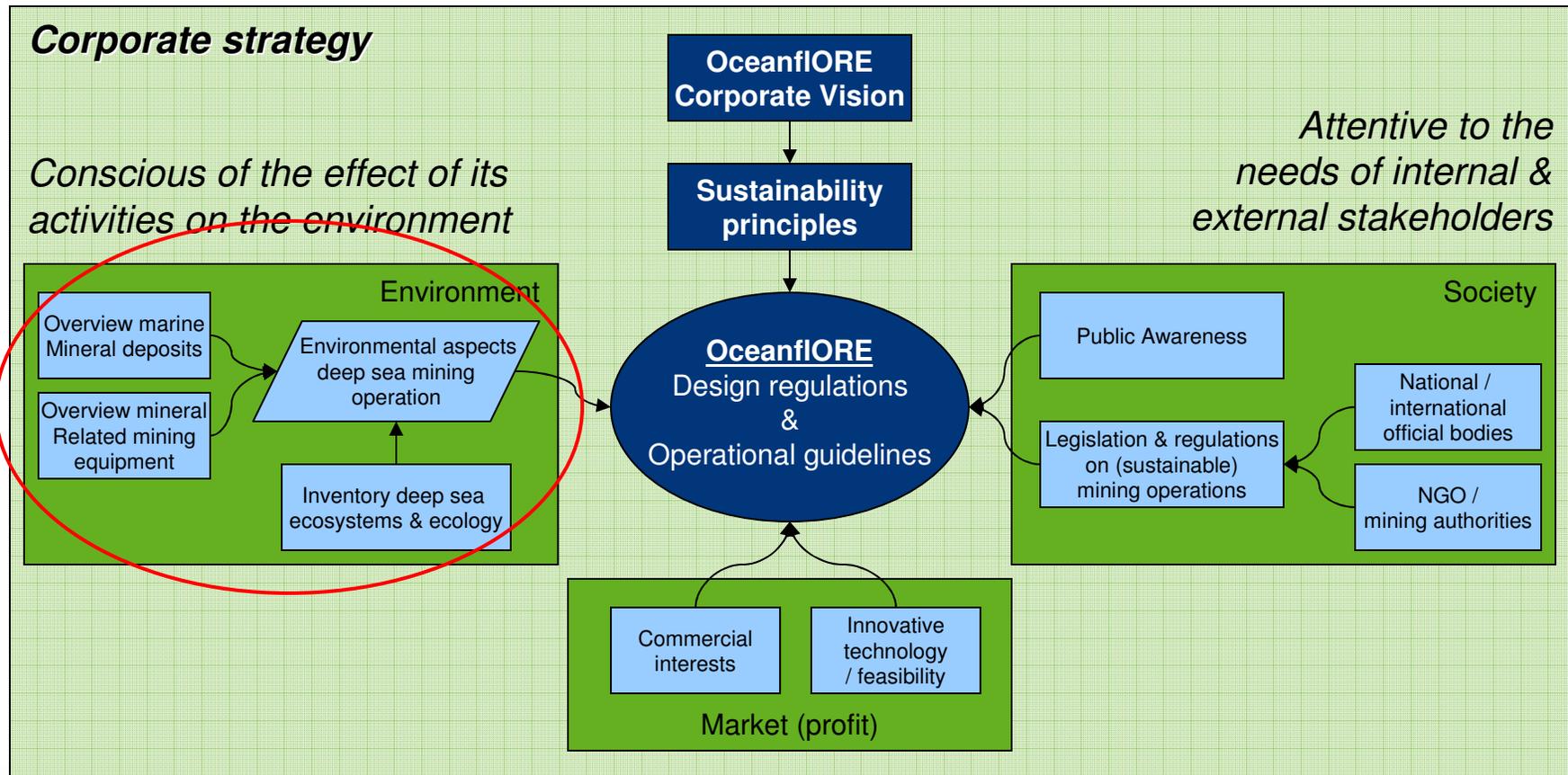


Extensive research & development program:

- Deep sea excavation
- Vertical slurry transport systems
- Power supply & drives



Deep Sea Mining: Perfectly balanced



High quality and efficient products & operations





IHC Merwede and Sustainability

True sustainability is not obtained by short-sighted savings in one specific area, but only by total life cycle design of products and processes, including the afterlife, and possible second life, of products.

IHC Dredgers

- Improved Hull allows to use less fuel
- Reduced Environmental Footprint
- Lower Operating Costs

IHC test sustainable dredging IHC Beaver® 40

- IHC ran a pilot test in which energy derived from hydrogen was the sole source used to power the electrical equipment on board of a dredger.





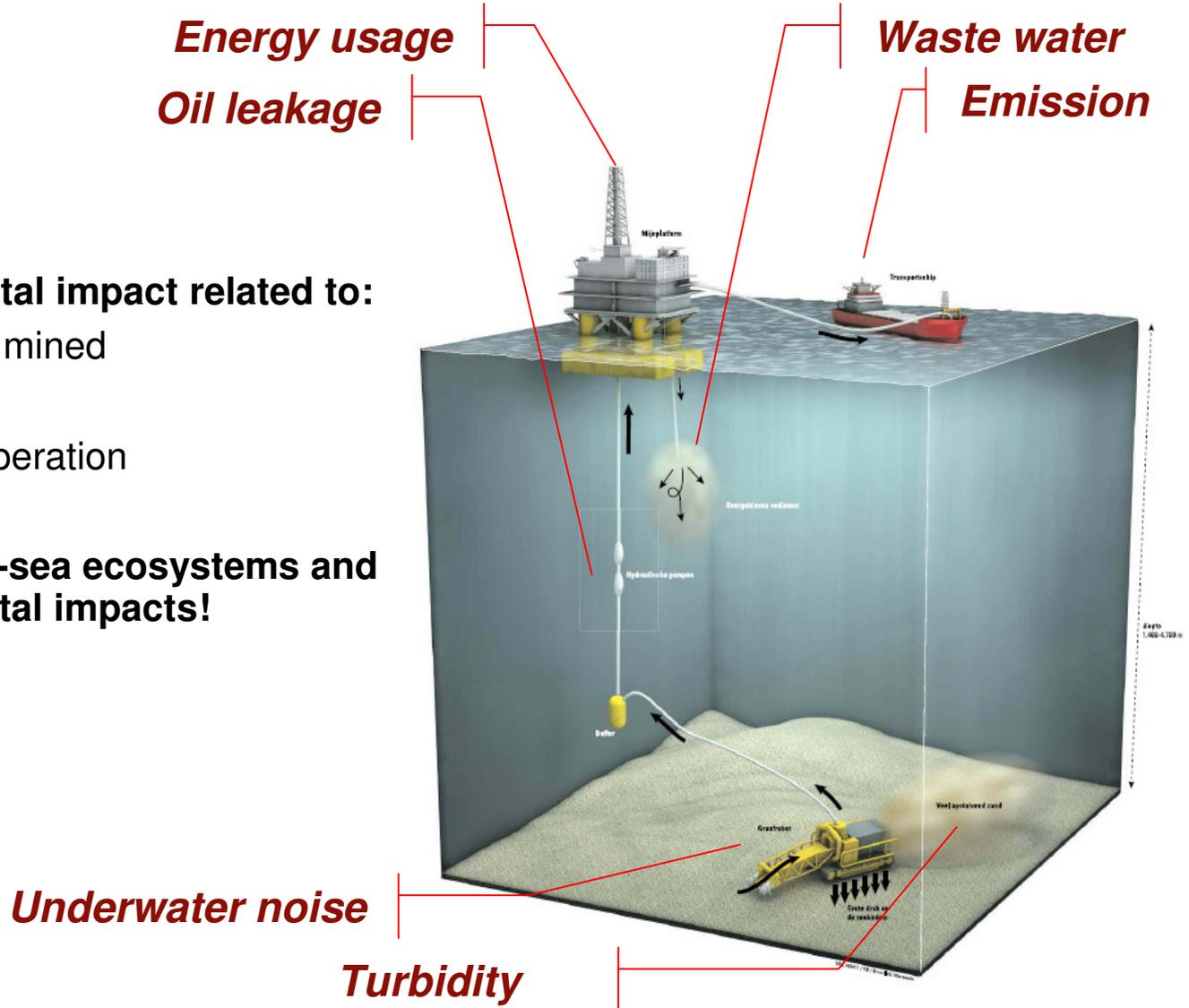
Understanding (Sustainable) Deep Sea Mining

Environment

Potential environmental impact related to:

- Type of deposit to be mined
- Local ecosystems
- Mining equipment / operation

Knowledge-gap deep-sea ecosystems and potential environmental impacts!

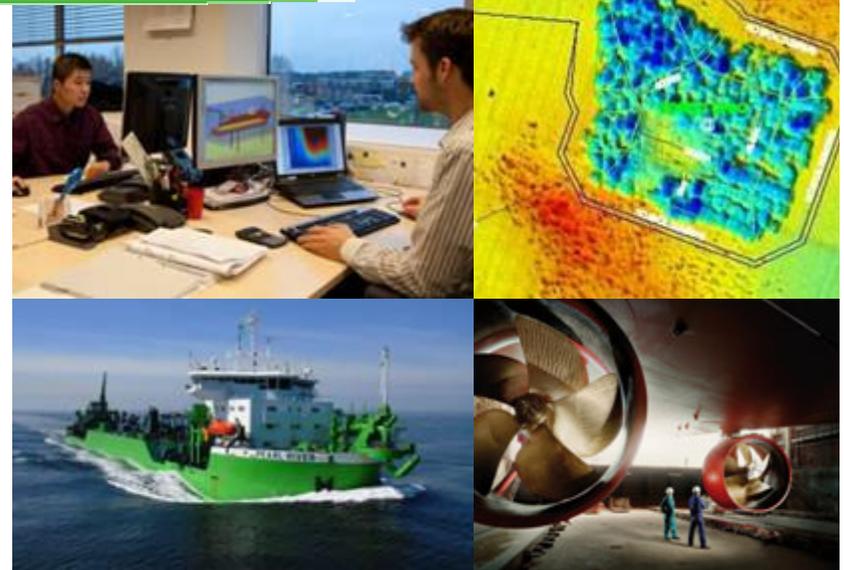




OceanfLORE makes offshore mining possible, profitable and sustainable

Capabilities

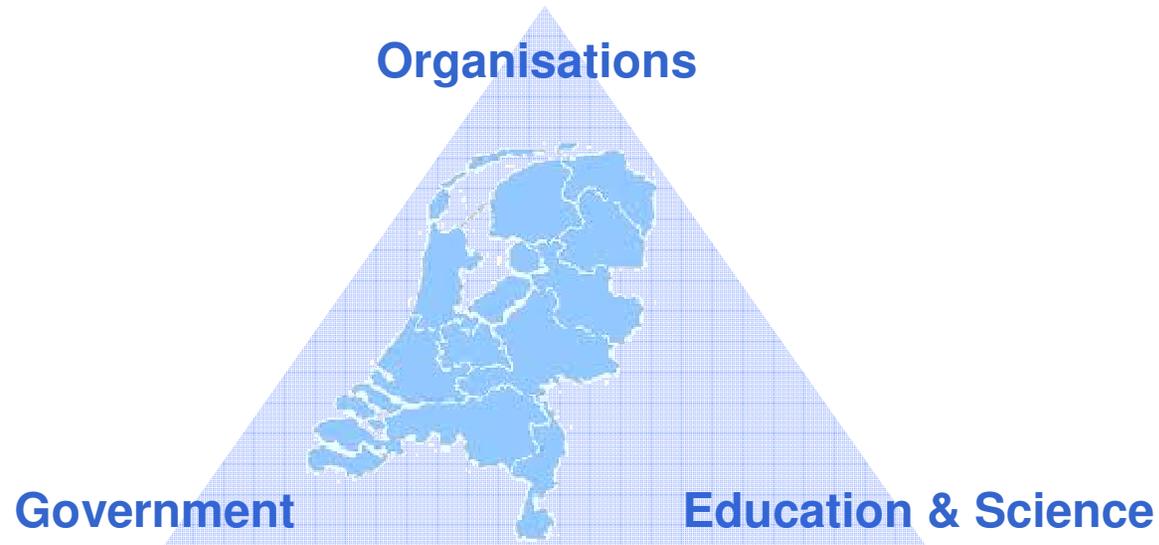
- A. Project Feasibility
- B. Survey Capabilities
- C. Design Capabilities
- D. Operational Capabilities
- E. Project Financing



Return



Dutch heritage / competitive position



Dredging



Maritime



Offshore





Actions moving forward



Water

De watersector richt zich op bescherming van de Nederlandse kust, maar ook op waterbesparende systemen en technologieën voor waterhergebruik.

- Dutch Topsector Water – Winnen op Zee
- Ongoing Joint Industry Projects
- Cooperation for development
- Strengthening of knowledge base
(knowledge & technology institutes and universities)

