



# **IHC Merwede**

## **Sustainability and Corporate Social Responsibility IHC Mining**

SOPAC Workshop

June 2013

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1. Overview IHC Merwede
2. Sustainability
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5. Conclusion
6. Q&A

*Innovative vessels*  
*Advanced equipment*  
*Life-cycle support*



Dredging



Mining



Offshore

**The technology innovator.**

# 1. Business divisions



## Comments

- Global market leader for efficient dredging vessels & equipment
- Strong position in alluvial mining market
- First mover in deep sea mining market
- Reliable supplier of custom-built ships and supplies for offshore construction
- > 3000 employees
- In-house design & engineering capabilities
- Technological innovation through continuous investment in research & development

**The technology innovator.**

## 2. Research & Development

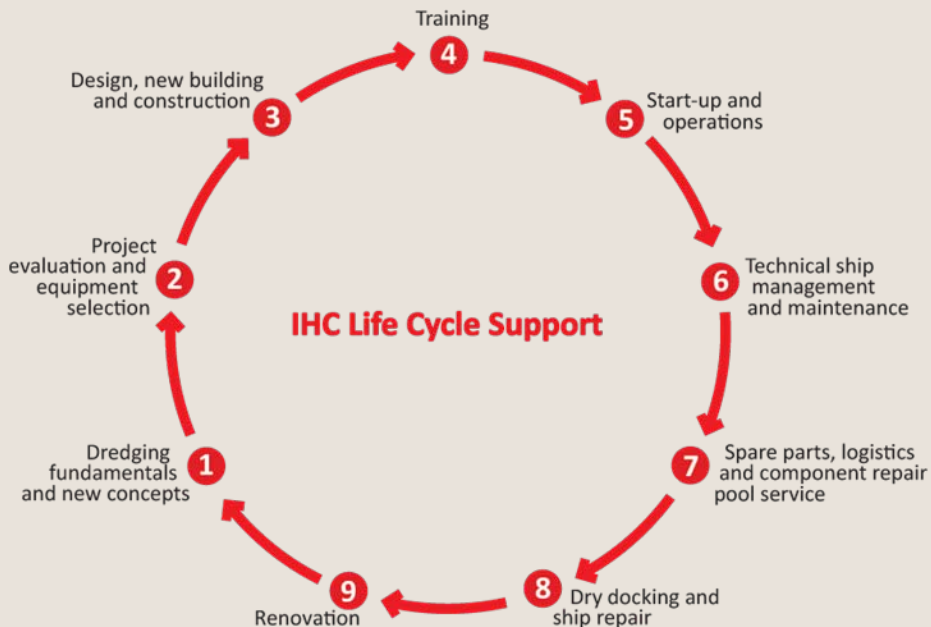
### Overview

- 3-4% of turnover for R&D
- 300-350 employees
- In-house research centres, MTI and OTI (60 employees)
- In top 20 on R&D list in The Netherlands
- Collaboration with several technical universities
- All IHC engineering designs have been copyrighted
- IP, subsidies, patents: IHC Merwede has a total portfolio of 230 patent applications
  - > 130 granted
  - > 50 published
  - > 40 pending
  - > 40 trade marks





# 3. Life Cycle Support



## Services portfolio

- Maintenance engineering
- Docking & ship repair
- Delivery of parts
- Renovation
- Component repair
- Field services
- Consultancy

## 4. IHC Merwede Mining Division

*Reliable partner for  
efficient mining life cycles*

Onshore mining

Nearshore mining

Deepsea mining



Innovative vessels



Advanced equipment



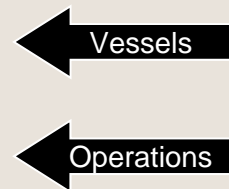
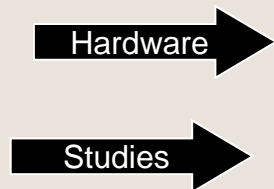
Life-cycle support

**The technology innovator.**

OceanfLORE makes offshore mining possible, profitable and sustainable

Hardware client

\$/ton client



**OceanfLORE: A vehicle to develop the deep sea mining market**



# Sustainability

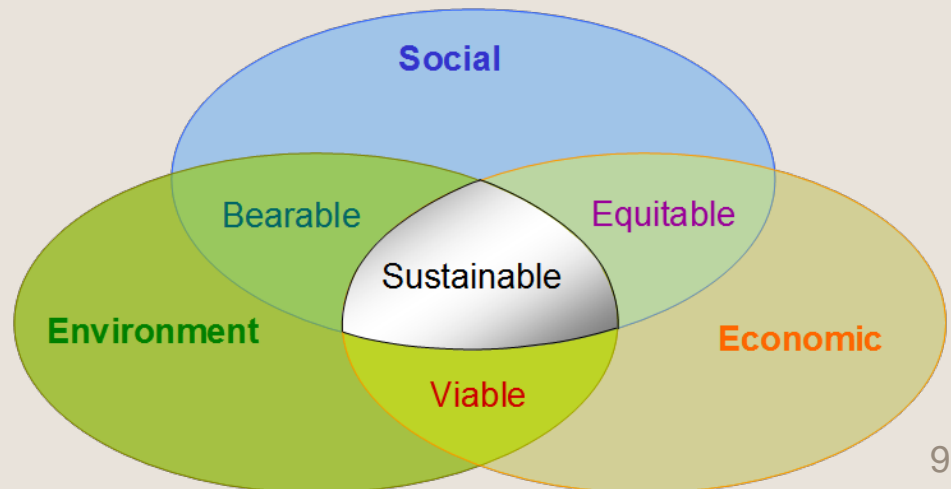
***Contributing to sustainable dredging and mining equipment with minimized environmental impacts***

## **Focus Topics:**

1. Emissions & Energy
2. Environmental Impact Assessment (EIA)
3. Life Cycle Assessment (LCA)
4. Underwater Sound
5. Turbidity

## **Focus Areas:**

- Dredging & Offshore
- Deep Sea Mining

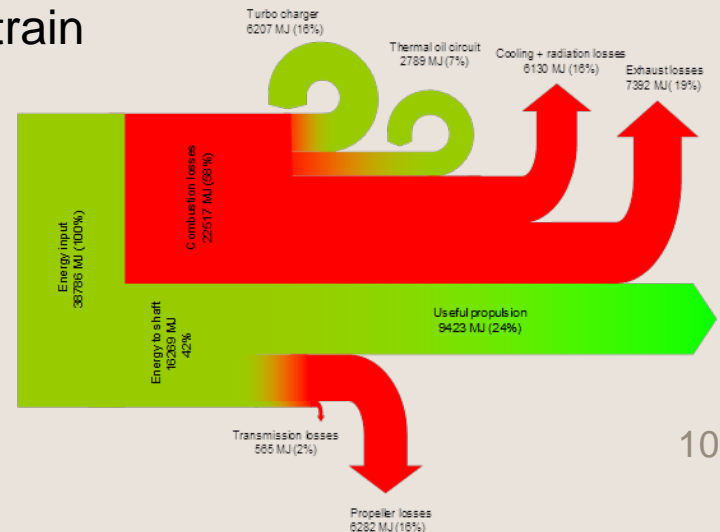


# Emissions & Energy

**Focus area:** dredging and mining equipment (e.g. TSHD, CSD)

## Activities:

1. Following trends and developments on legislation
2. Definition of CO<sub>2</sub> index for dredging vessels
3. Energy balance TSHD / CSD
4. Study alternatives for traditional diesel engines
5. Optimizing energy efficiency of power train

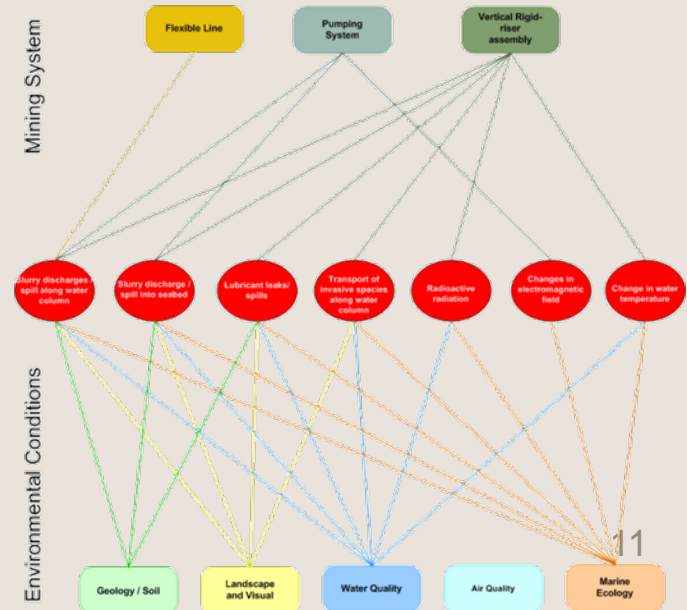


# Environmental Impact Assessment (EIA)

**Focus area:** dredging and mining equipment

## Objectives:

1. Environmental baseline assessment
2. Operational environmental risks
3. Risk assessment
4. Evaluation of Environmental Impact
5. Mitigation measures



# Life Cycle Assessment (LCA)

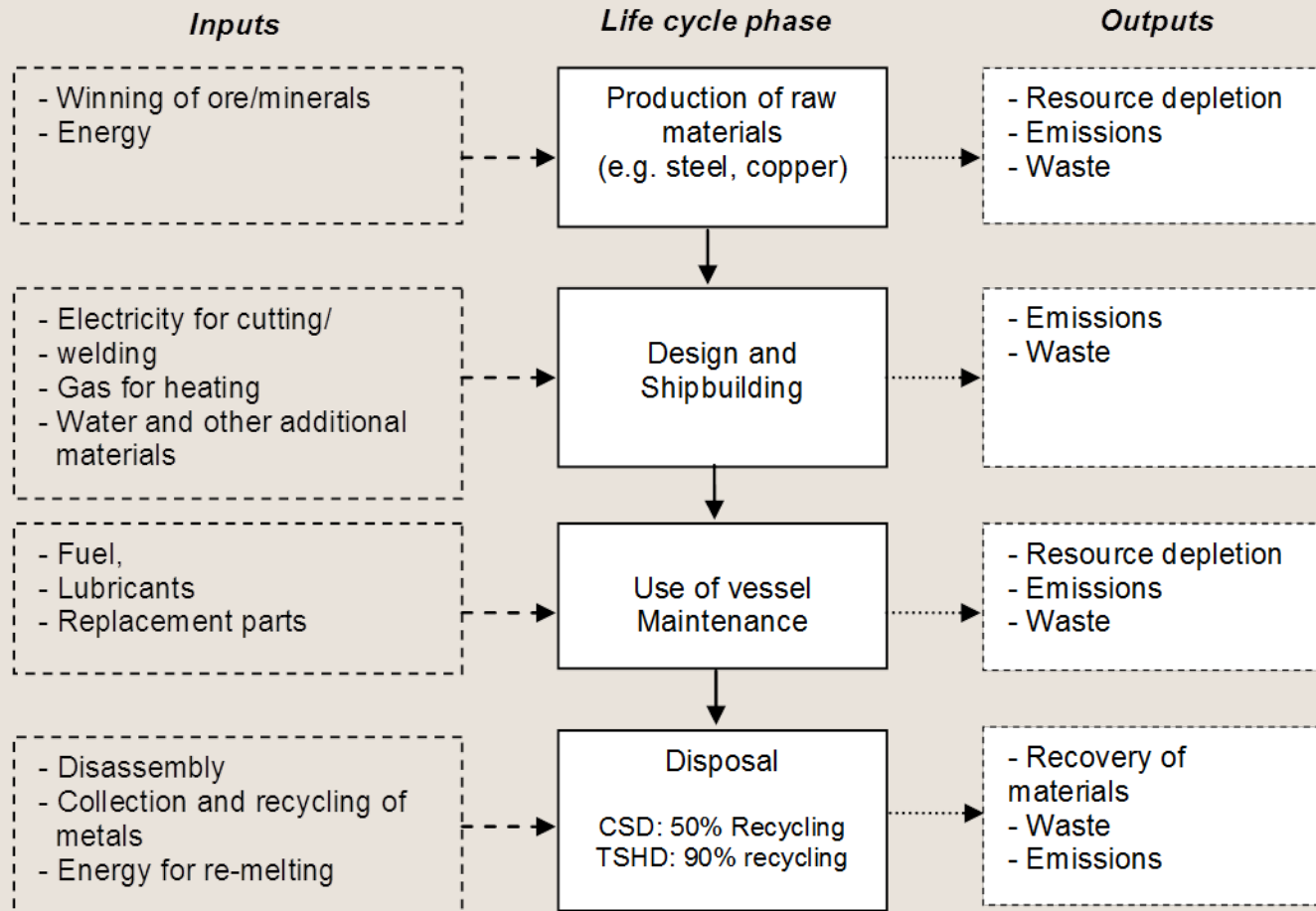
**Focus area:** dredging and mining equipment

## **Objectives:**

1. Determining environmental impact of each lifecycle stage
2. Determining contribution of components to environmental impact
3. Identifying critical materials regarding environmental impact
4. Comparison of alternative solutions



# Life Cycle Assessment (LCA)

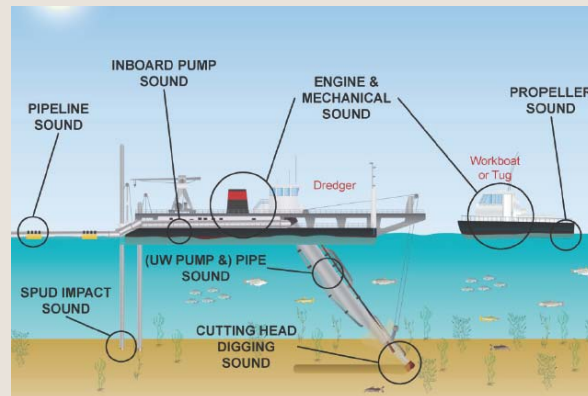
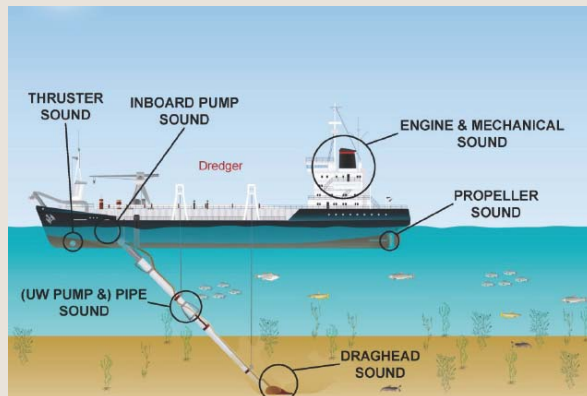


# Underwater Sound

**Focus area:** dredging and mining equipment-operation

## Activities:

1. Following trends and developments on legislation
2. Underwater sound measurements on Cutter Suction Dredger
3. Participation CEDA workgroup Underwater Sound
4. Participation WODA Expert Group Underwater Sound (WEGUS)

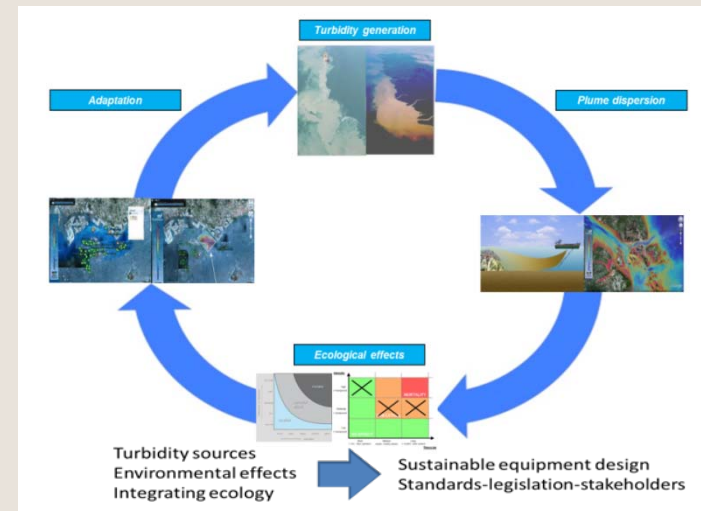


# Turbidity

**Focus area:** dredging and mining equipment-operation

## Objectives:

1. Understanding turbidity during dredging operation
2. Understanding impact of turbidity on local ecosystems
3. Plume modeling
4. Turbidity reduction and product development



# Sustainability Research topics

- **Towards Zero Impact**
- **European Commission collaborative programme**



# Sustainability Research topics

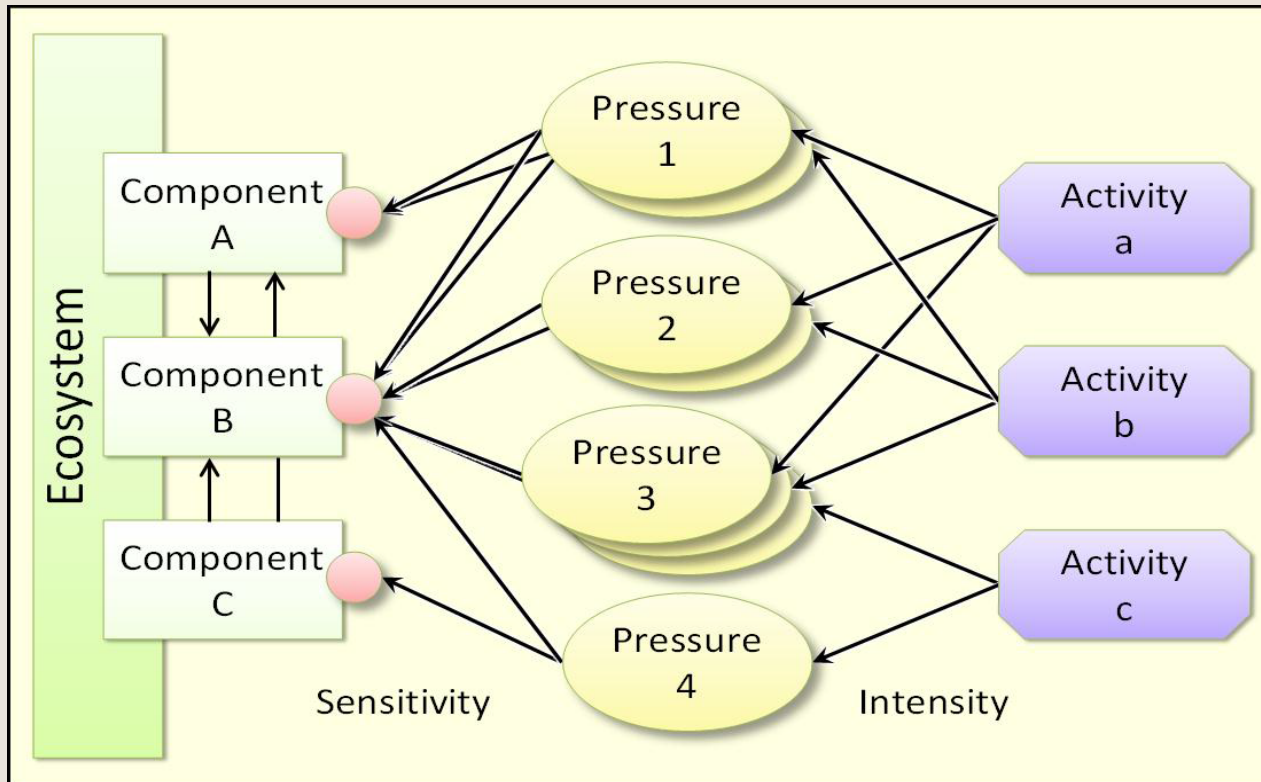
## Toward Zero Impact of deep sea mining projects

- Research framework of a mining scenario and mitigation alternatives
- **Objectives:**
  - To develop a framework to be used as a preliminary impact assessment of the mining activities in the deep sea
  - To determine the most important impacts of mining operations
  - To identify uncertainties in the assessment (gaps in knowledge)
- **Activities:**
  - Acquire knowledge on marine ecosystem components, by working with marine scientists
  - Develop equipment and mining methods to determine mining-induced pressures
  - Determining ecosystem vulnerability to control impacts

# Sustainability Research topics

## Toward Zero Impact of deep sea mining projects

- Determining ecosystem vulnerability to control impacts



# **Sustainability Research topics**

## **European Commission collaborative programme**

### **Managing impacts of deep-sea mining**

*Key scientific institutions in Europe, social scientists and industry partners*

### **Objectives**

- Study scale of possible impacts on deep sea ecosystems
- To develop best practice mining codes that care for the environment and society
- Develop cost-effective technologies for monitoring the impacts of mineral exploitation

# Next step

- **The ultimate solution** is to resolve the problem for future operations by engineering the correct equipment or operating approach

Resolve

Act

- Understanding the issues by doing work on the seafloor
- (to complement the simulation of possible outcomes)

- If we learn that there are adverse environmental impacts, we stop or mitigate the impact

Mitigate

Learn

- Learn the key outcomes of the act



# Projection of a dredger's environmental experience onto the deep sea mining world

## ENVIRONMENTAL FRAMEWORK

- Environmental Baseline Study
  - This study maps the current state of the environment at a given locality
- Environmental Impact Assessment
  - EIA studies the effects of both the execution method of the works and of the final design
  - It analyses the possible execution scenarios, and identifies which parameters will impact the environment and what factors will be negligible
- Environmental Monitoring and Management Plan
  - Defines the Site-specific monitoring programme required
  - Defines preventive measures to counter or limit the occurrence of the unfavourable factors
  - To complement them, protective measures are prepared to stop any remaining factors from affecting the environment, or to reduce their effect as much as possible

# Projection of a dredger's environmental experience onto the deep sea mining world

- Experience with deep-sea mining operations is lacking
- Deep-sea mining projects face similar environmental challenges as dredging and maritime engineering projects
- The shallow-water understanding and experience of the dredging industry could bridge the gap towards deep-sea excavation operations
  - The environmental framework for dredging and for deep sea mining operations has the same structure and mindset
  - Challenges for deep sea mining are
    - Depth
    - Remoteness
    - Waves

# Corporate Social Responsibility

## 3 Pillars:

1. Sustainable entrepreneurship
2. Social Responsibility
3. Attention and care for the environment

# Corporate Social Responsibility

## Sustainable entrepreneurship

- Financial results
- Internal and external stakeholder involvement
- Transparent financial and social reporting
- Partner of CSR Netherlands
- Corporate governance and anti-corruption (Code of Conduct and anti-corruption scheme)
- IHC Merwede Foundation
  - Support Social, Cultural activities and local communities
  - Intensive cooperation with local community and active involvement of our IHC employees
  - Goal is to support projects in countries where we do business and where IHC employees have a direct involvement





# Corporate Social Responsibility

## Social Responsibility

- Safety
  - Lean manufacturing and 5S principles to minimize incidents/accidents
  - Travel Security System
  - Optimize safety at foreign yards
- Health
  - Preventive Medical Examinations
  - Many sports activities and access to a gym
  - Health Services
- Quality
  - Cooperation with stakeholders
  - ISO 9001 certified



# Corporate Social Responsibility

## Social Responsibility

- Education and training
  - Technical Education Centre (TOC)
  - IHC Merwede Management School
  - Talent Program
  - Training Institute for Dredging
- Supply Chain Responsibility
  - Code of Conduct Procurement
  - Suppliers have to comply with social criteria: Human rights, work environment, environmental footprint



# Conclusion

## Sustainability

- Major focus within IHC Merwede on environment
  - Continuous improvements and R&D efforts to the equipment we design and manufacture to minimize environmental impacts
  - Also within the company: besides the design also the manufacturing processes are being optimised

## Next step

- We learn from operating customers how we can improve our equipment further and where impacts occur which we need to address

## Corporate Social Responsibility

- Internal culture to know and improve any issues
- Recognizing the effect we have on all stakeholders and addressing that in the best possible way for all stakeholders

The industry understands, delivering sustainable systems benefits all stakeholders, including IHC Merwede. We have to keep filling the gaps, be the best we can and keep improving our systems to avoid negative social impact and create positive social impacts.

# Questions and Answers



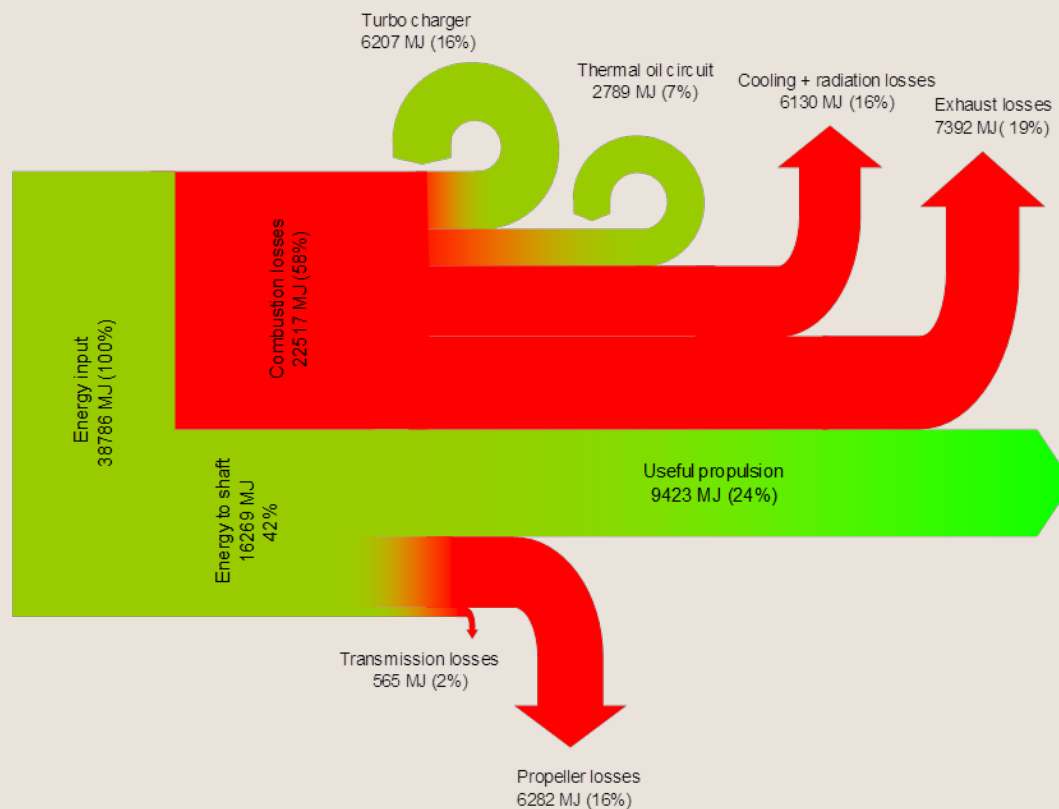
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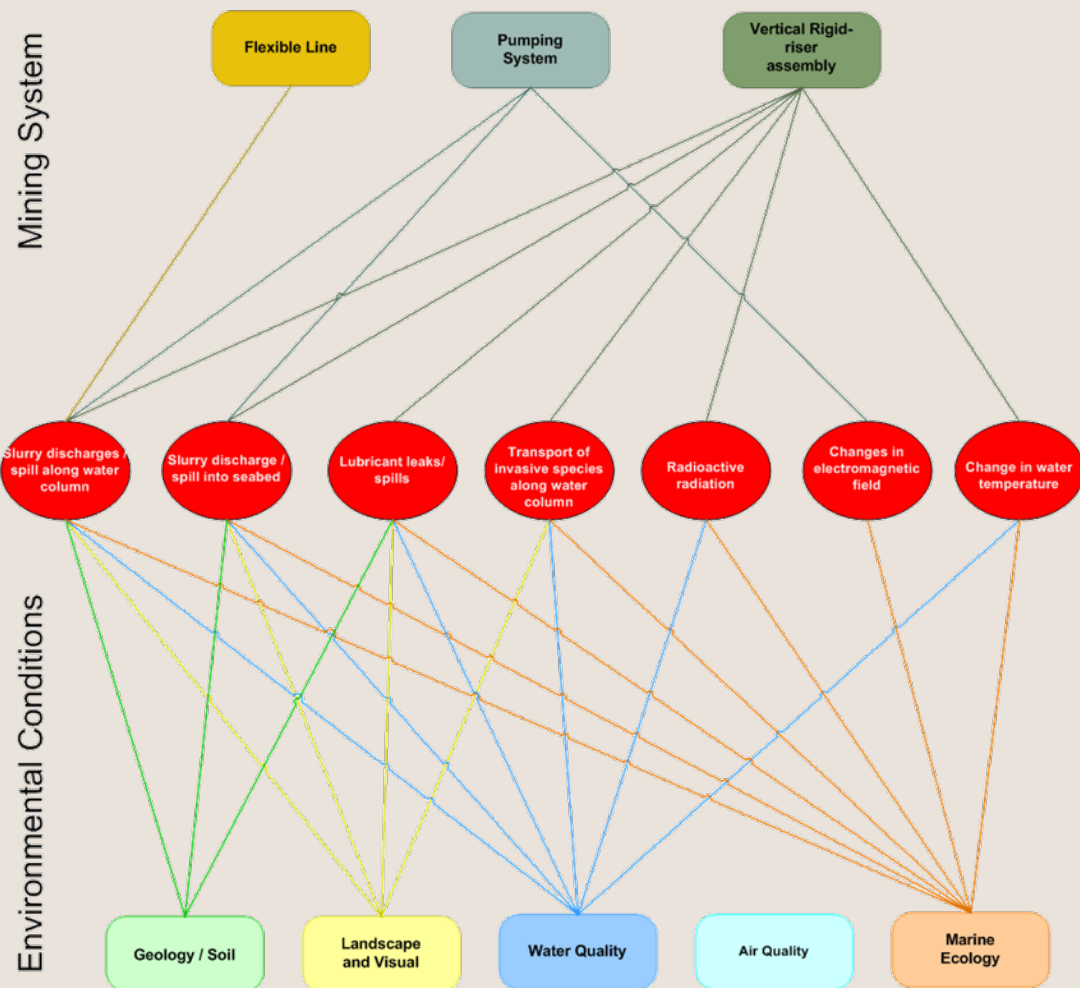
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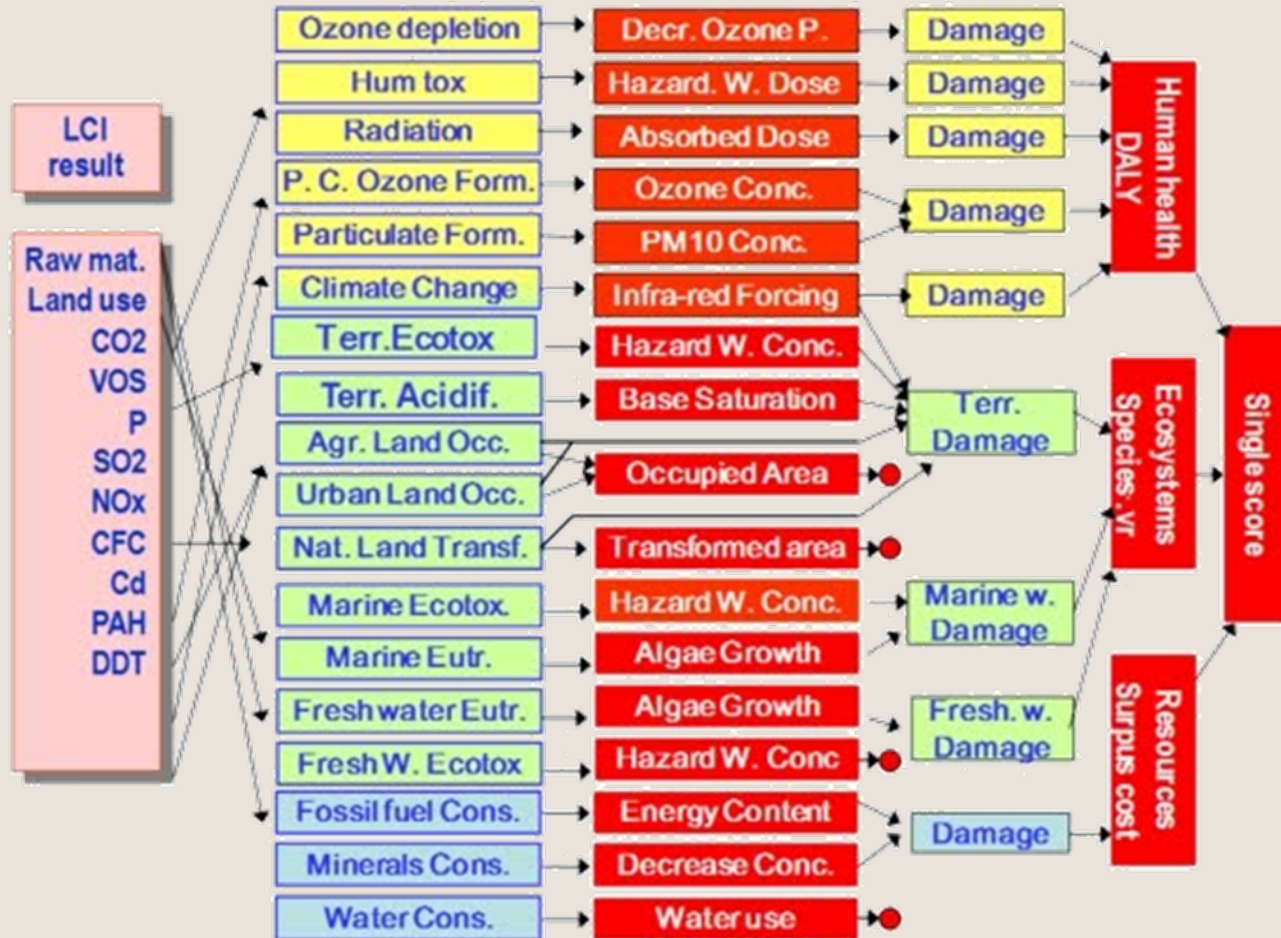




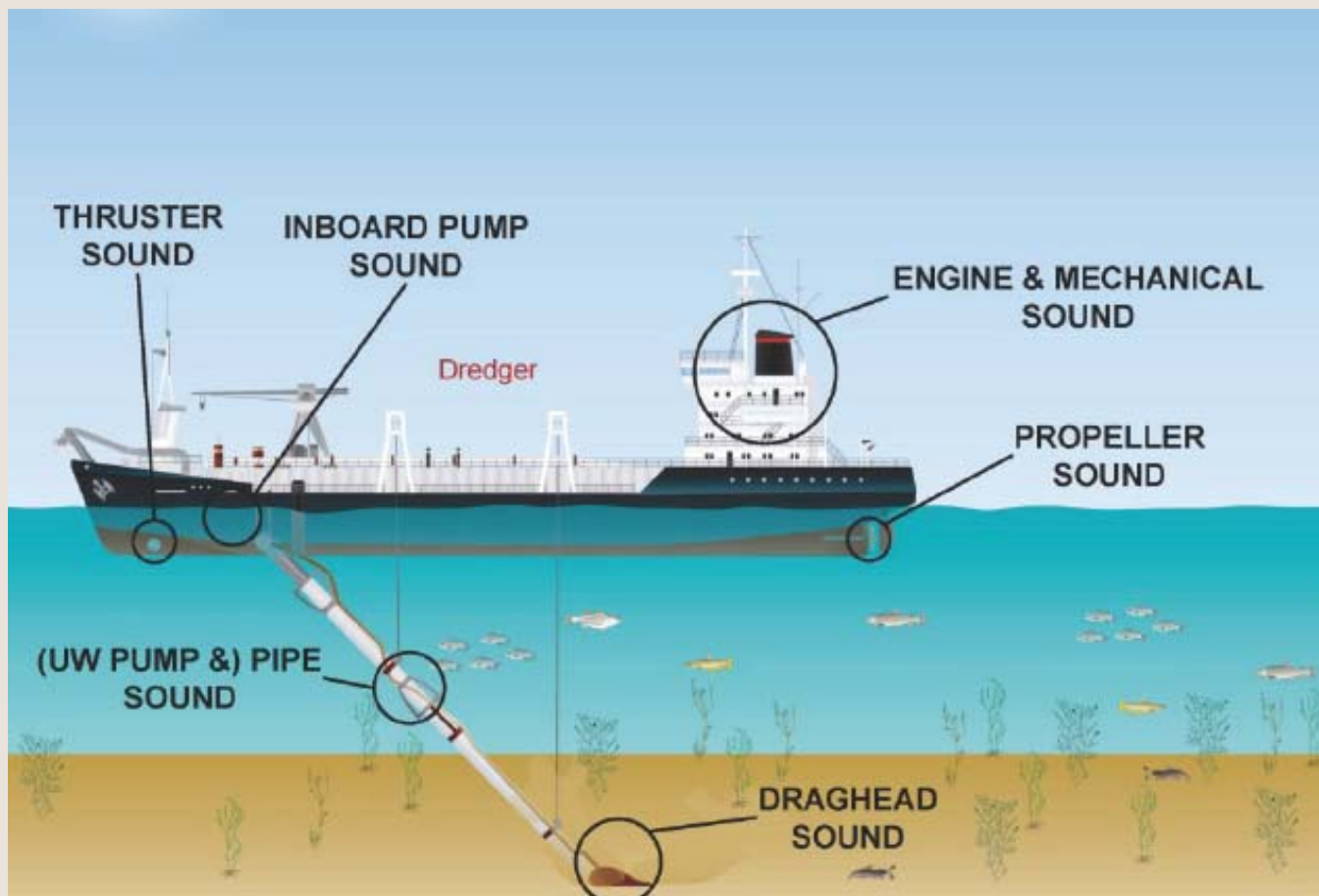
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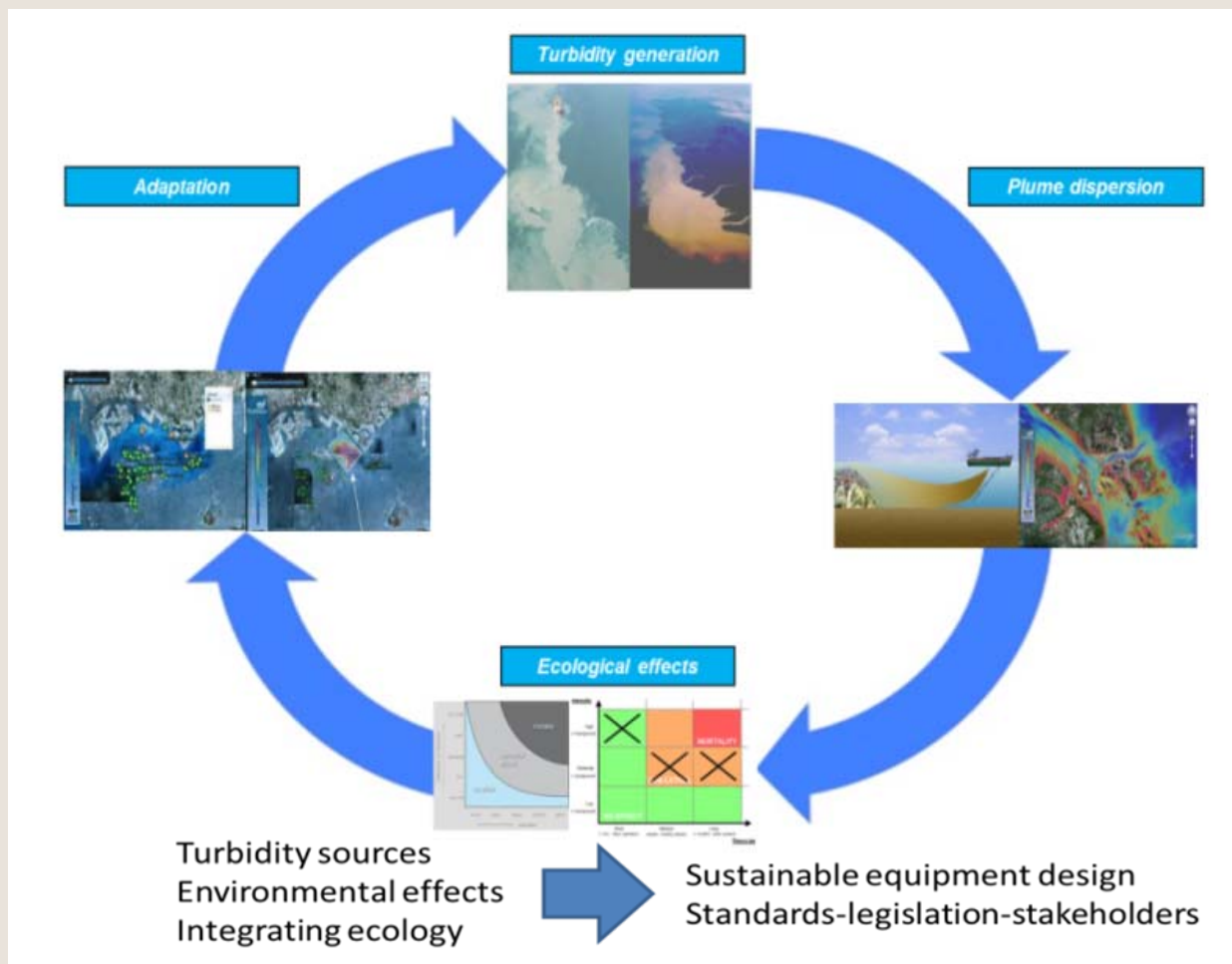
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# Appendix



# Appendix





# Mining Product Portfolio

## Product portfolio

- Mining dredger
- Slurry transport system
- Mineral separation plant
- Plant automation and control
- System integration

## From dry to dredge mining

- Potential cost reduction by avoiding de-watering

## Dredge Mining Project

- Richards Bay Mineral Sands
- Millenium Brazil

**The technology innovator.**

***Onshore mining***



# Mining Product Portfolio

## *Nearshore mining*



### Product portfolio

- Mining dredger
- Mining crawler
- Mineral separation plant
- Plant automation and control
- System integration

### Nearshore Mining Project

- PT Timah, Indonesia
- Offshore Tin mining
- Water depth up to 90m

**The technology innovator.**



# Mining Product Portfolio

## Product portfolio

- Mining support vessel
- Launch and recovery system
- Vertical transport system
- Seafloor mining tool
- System Integration

## Case study

- De Beers Marine, Namibia
- Diamond mining
- Water depth up to 200m

*Deep sea mining*

