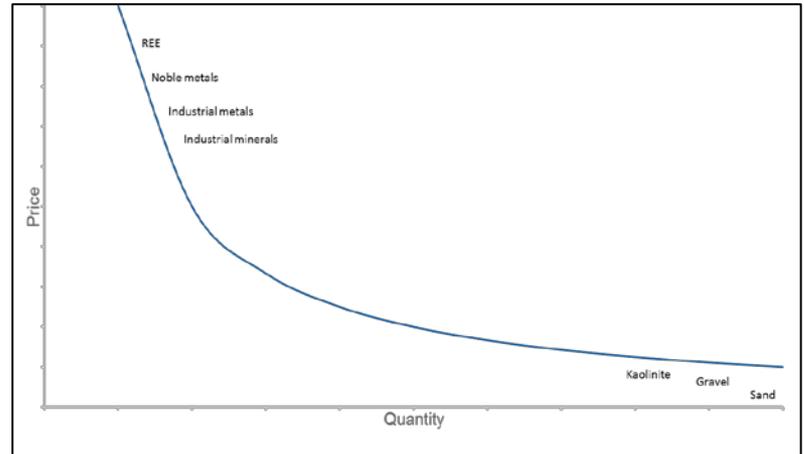
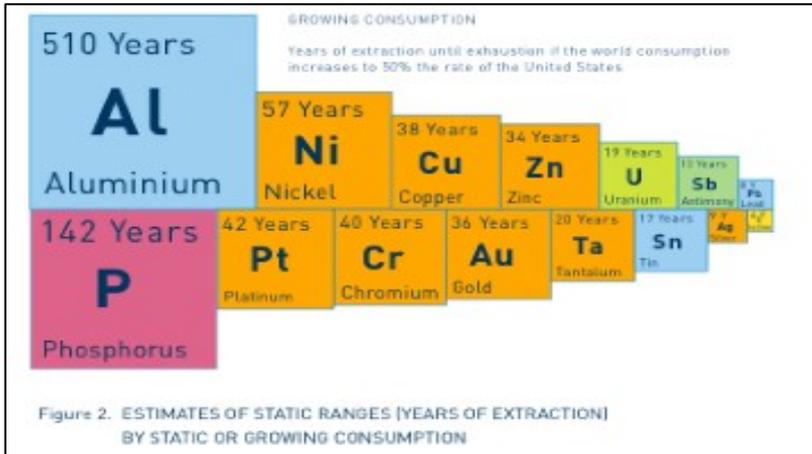


# FROM HIGH TO LOW-END MINERAL MINING

*Tuesday 26 June 2018, Norfolk, USA*

# HIGH/ LOW END MINERALS



HIGH END  
MINERALS



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**DAMEN**



# HORIZON 2020

HIGHLY VALUABLE MINERALS



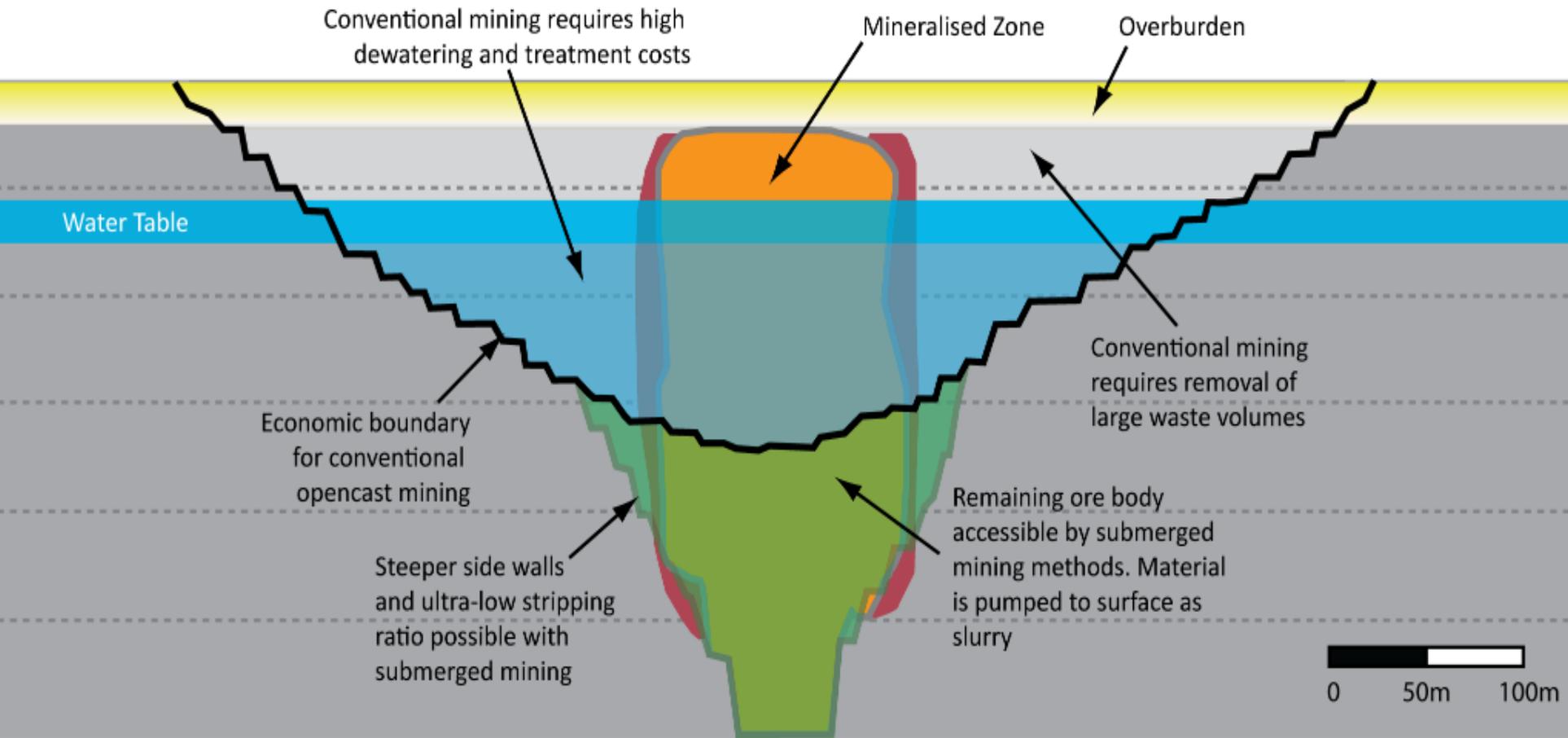
# VIABLE ALTERNATIVE MINE OPERATING SYSTEM

## DEPARTMENT OF THE INTERIOR:

- FINDING NEW SOURCES OF CRITICAL MATERIALS DOMESTICALLY
- INCREASE ACTIVITY ON ALL LEVELS OF THE SUPPLY CHAIN
- KNOW WHERE EACH OF THE CRITICAL MATERIALS CAN BE FOUND
- EASING THE ADMINISTRATIVE PROCESS ON EXPLOITING THESE RESERVES

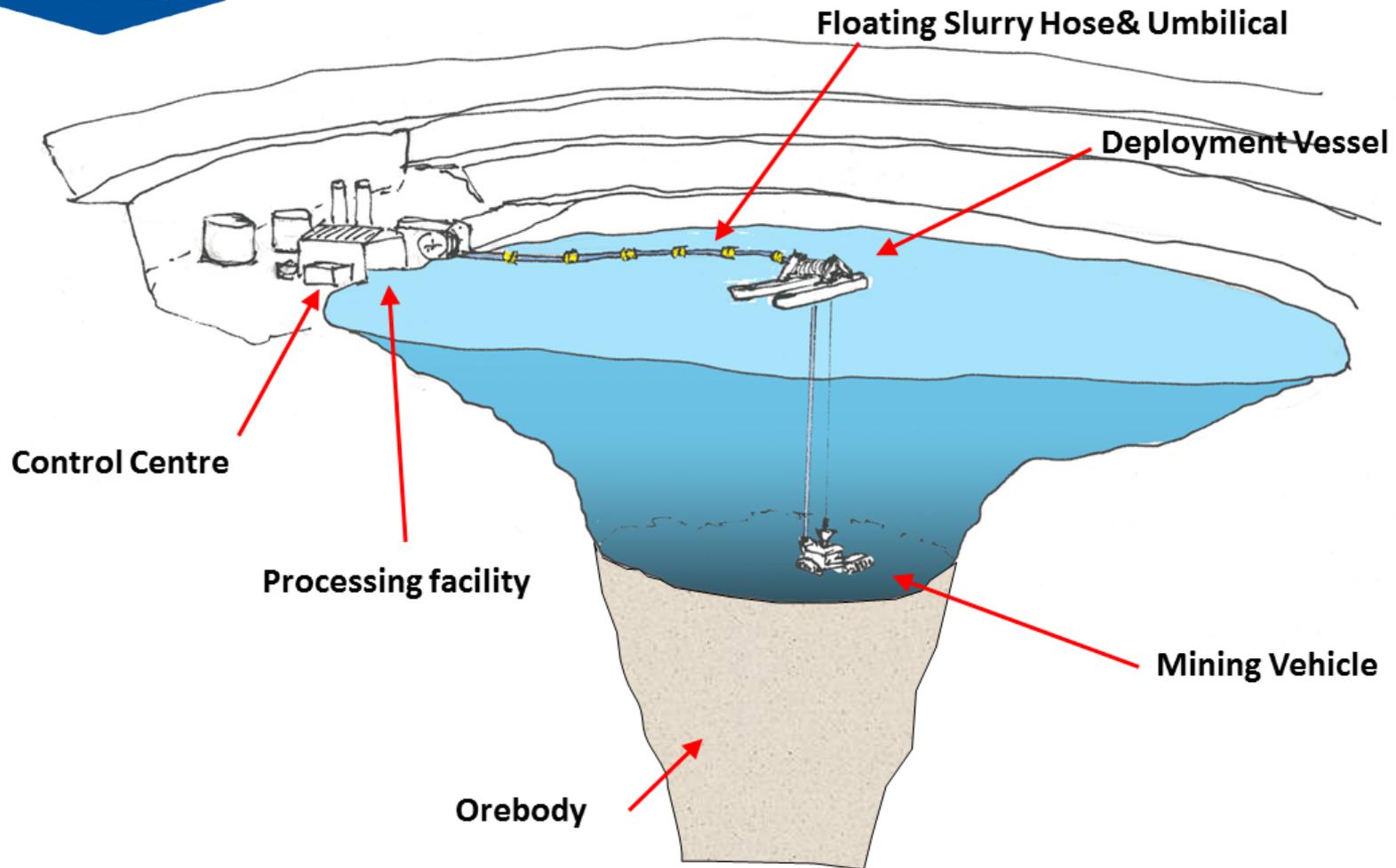
DOING SIMILAR MEASURES FOR MATERIAL INDEPENDENCE

HIGH END  
MINERALS



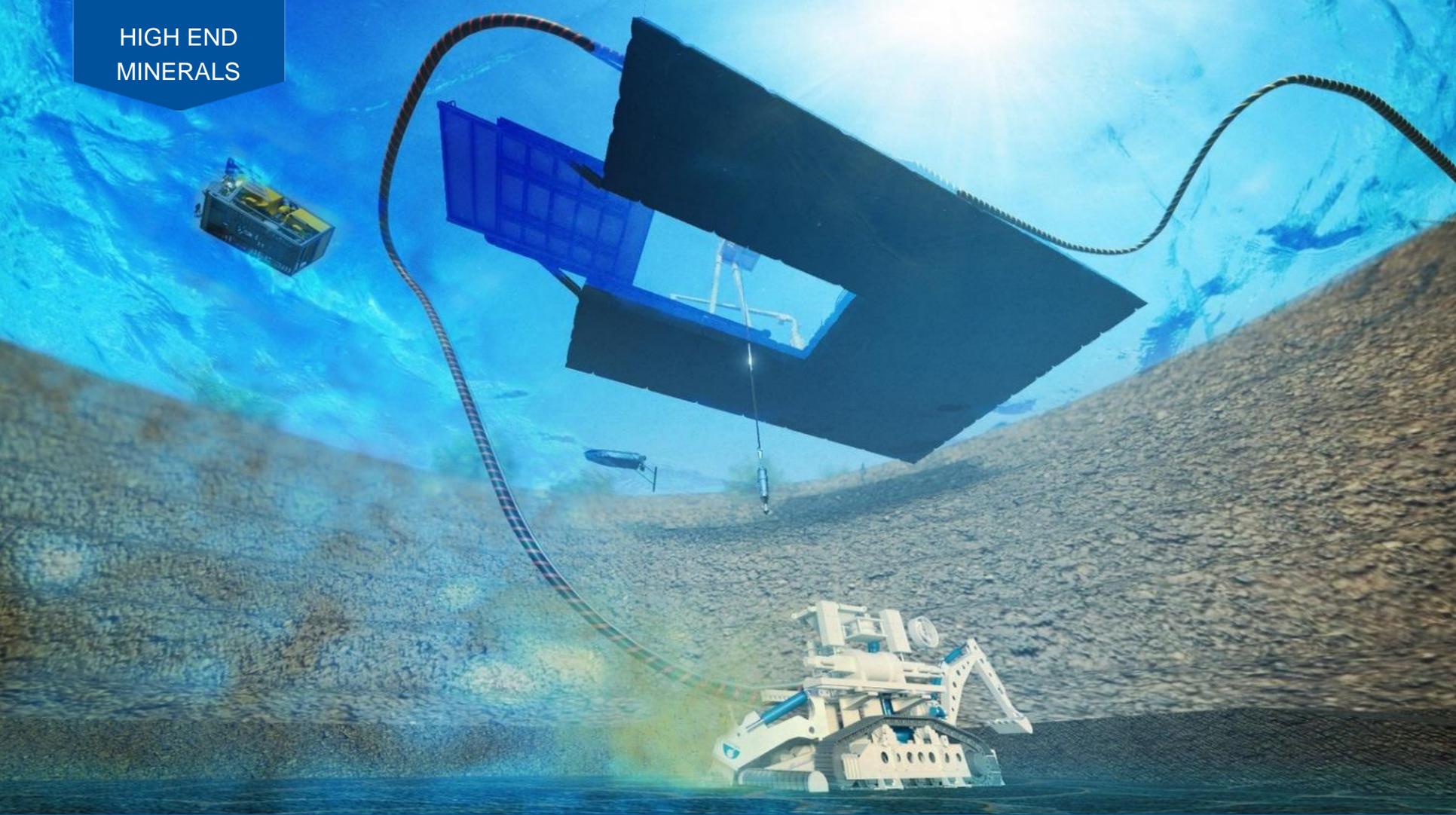
# ORE BODY RESERVES

HIGH END  
MINERALS



# VAMOS CONCEPT

HIGH END  
MINERALS



# THE MINING VEHICLE

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**DAMEN**

HIGH END  
MINERALS

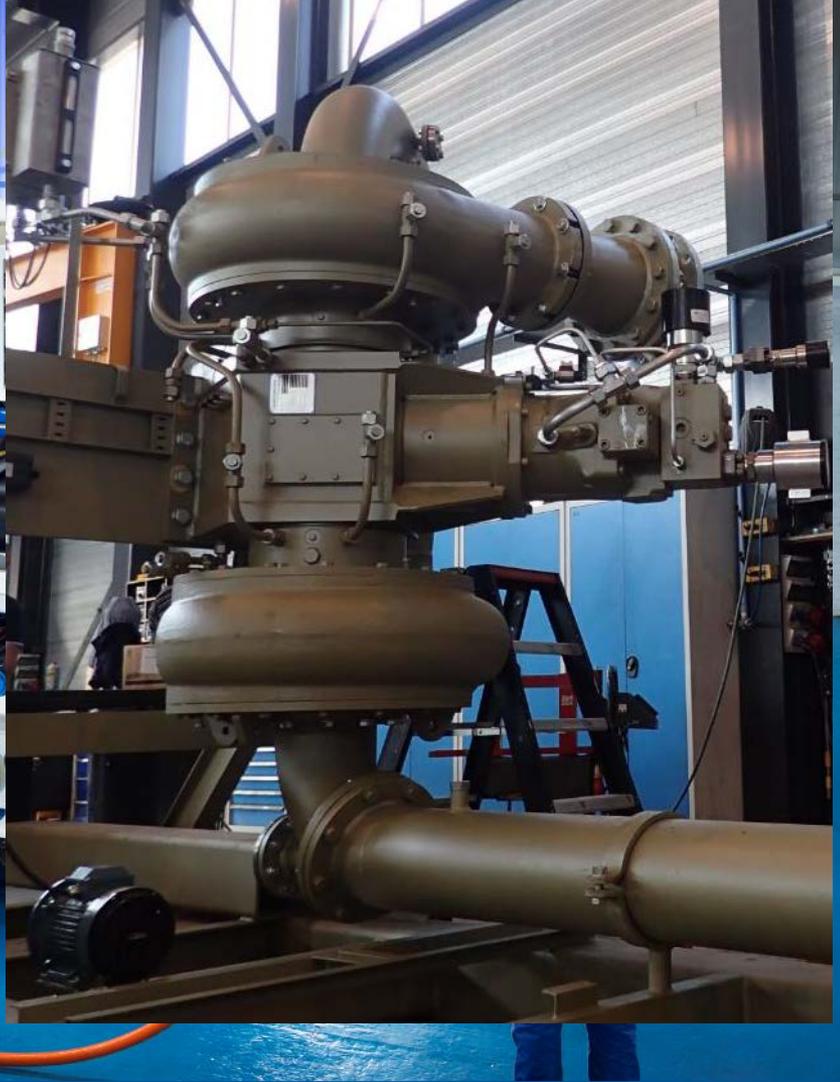
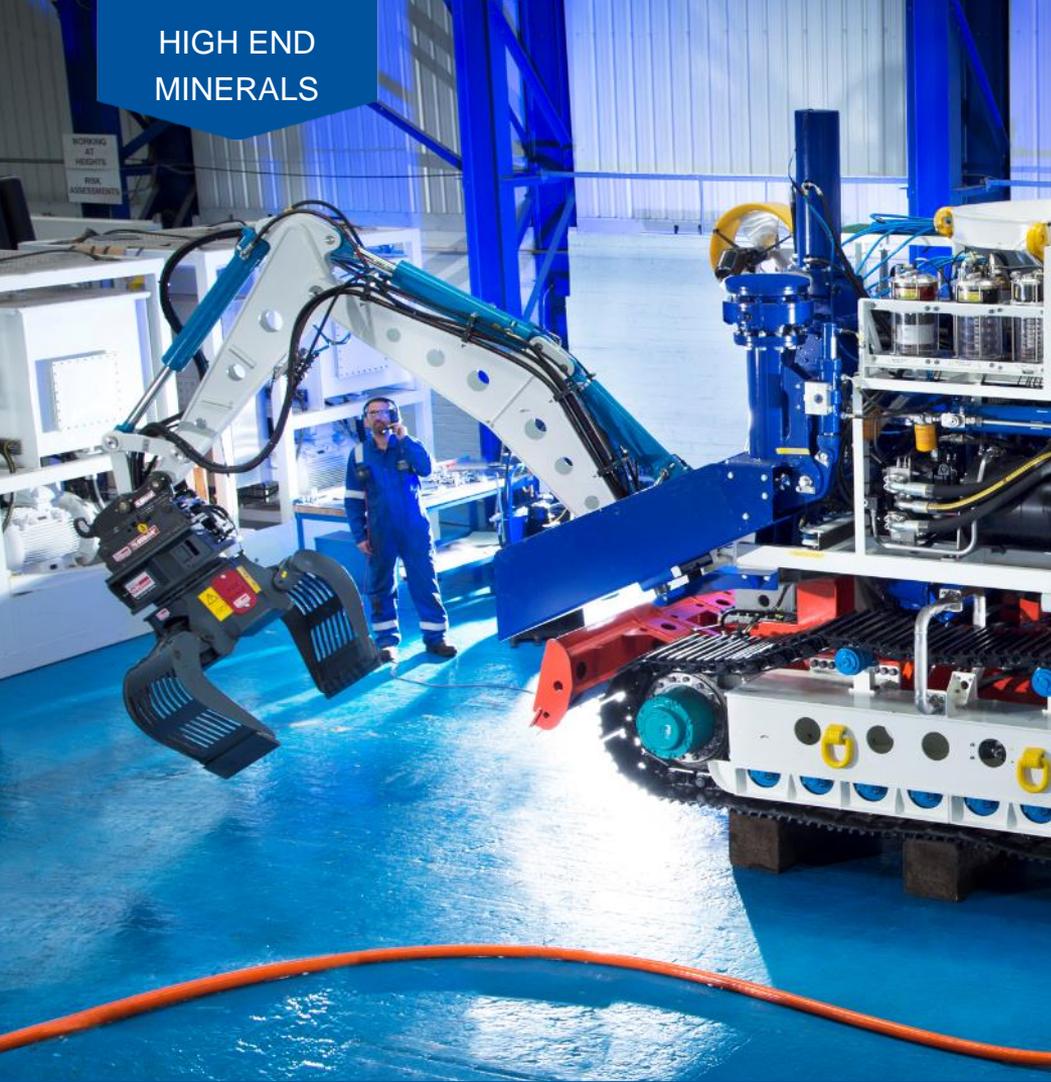


DEEP SEA MINING TOOLS WITH DAMEN TECHNOLOGY

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**DAMEN**

HIGH END  
MINERALS



USED FOR VAMOS

**DAMEN**

HIGH END  
MINERALS



## LAUNCH AND RECOVERY VESSEL

**DAMEN**

HIGH END  
MINERALS



CONTROL ROOM

**DAMEN**

HIGH END  
MINERALS



FIRST TEST SITE

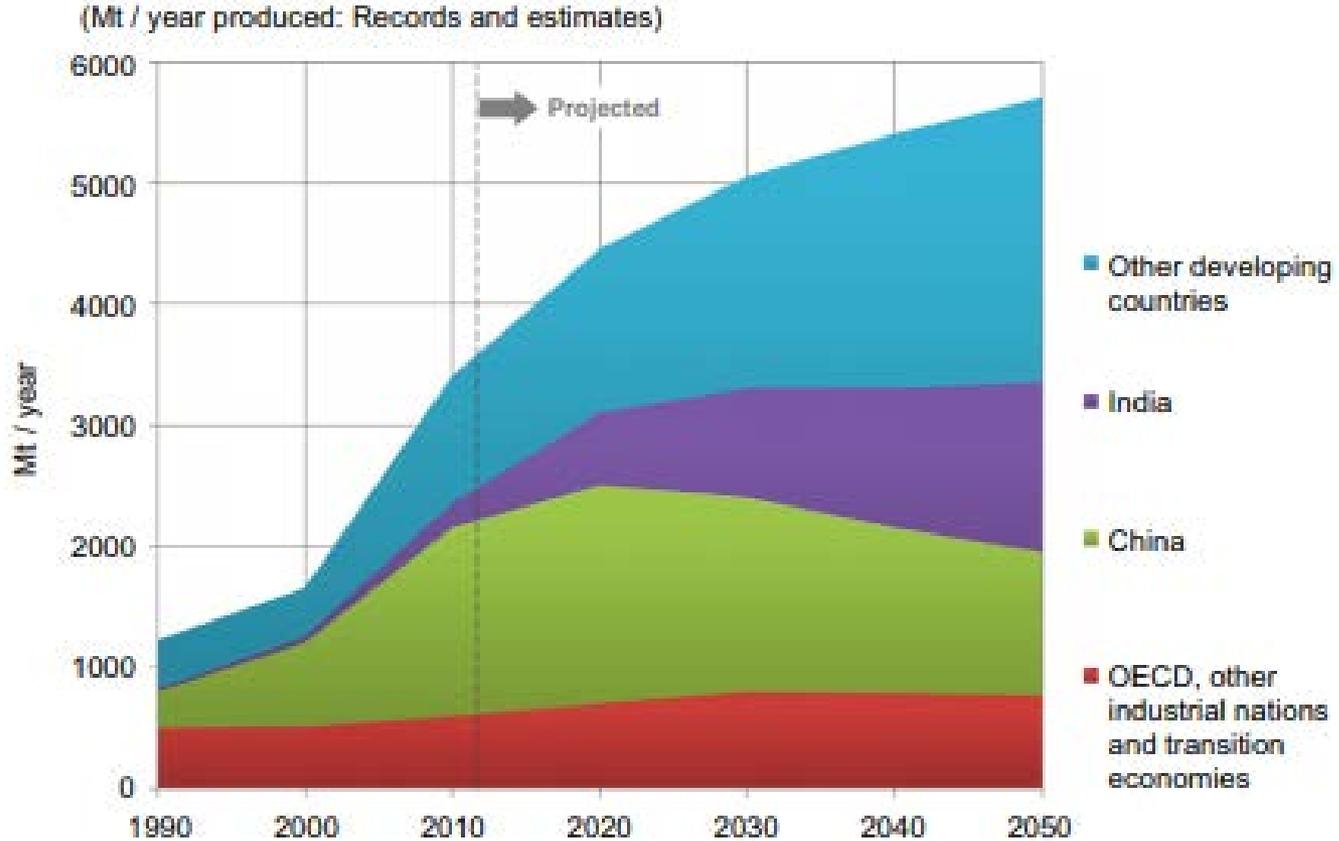
**DAMEN**

LOW END  
MINERALS



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**DAMEN**



# WORLDWIDE CEMENT PRODUCTION

LOW END  
MINERALS



# BURJ KHALIFA IN DUBAI

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**DAMEN**

LOW END  
MINERALS

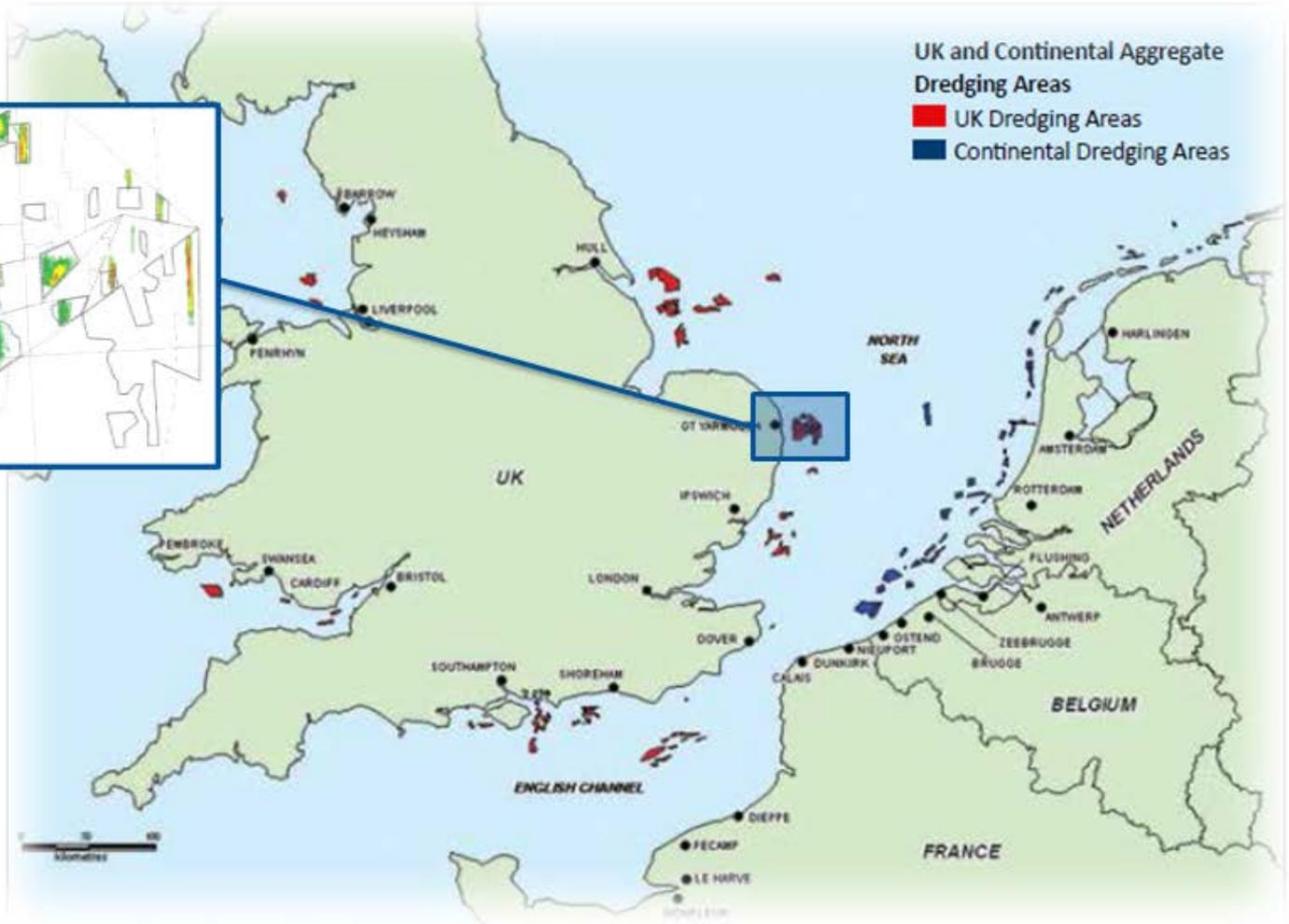
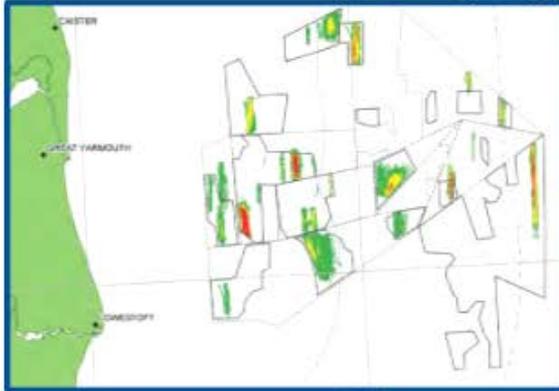


# INLAND MINERAL MINING

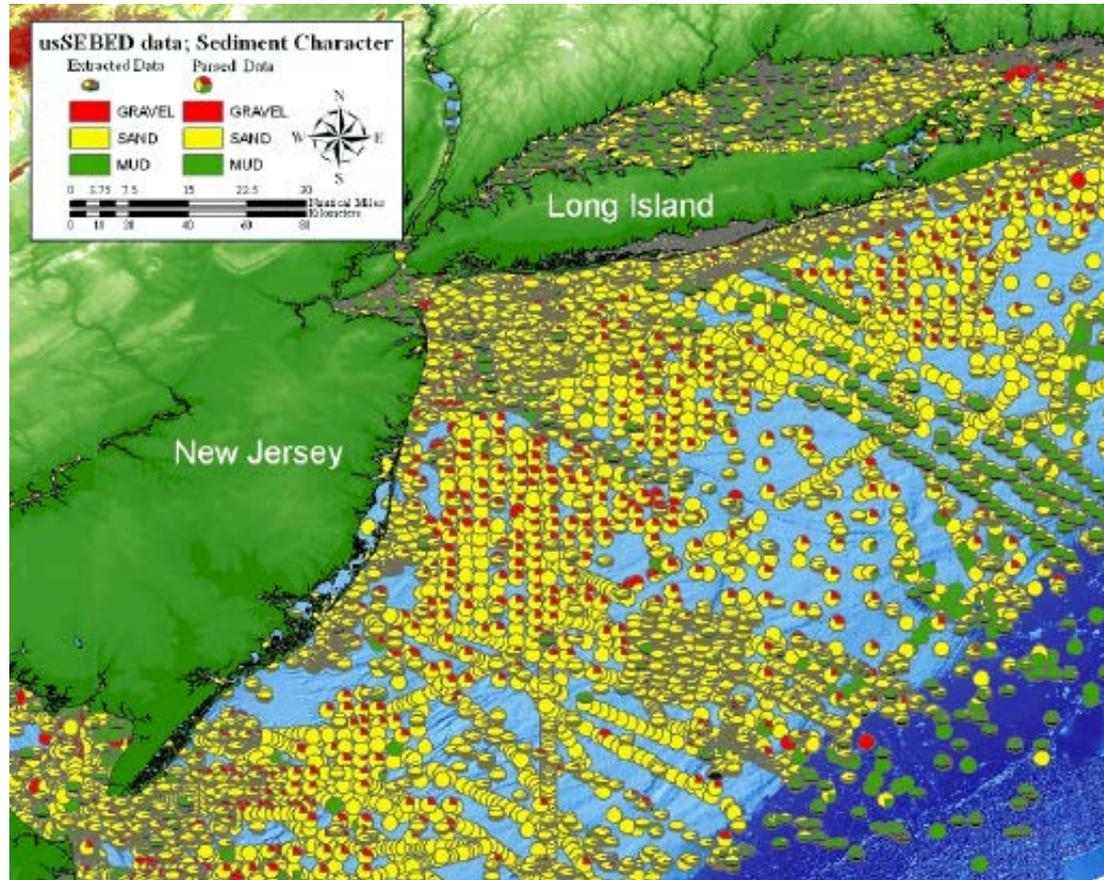
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**DAMEN**

# LOW END MINERALS



## EXISTING FLEET



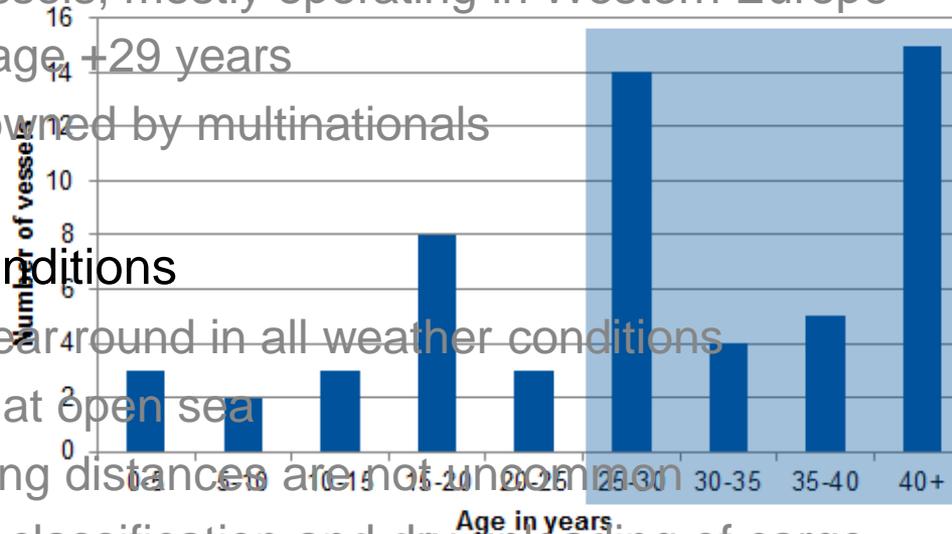
# SEDIMENT CHARACTER MAP OF THE NY-NJ OFFSHORE REGION

- At the beginning of 2015 it was decided to develop a dedicated design for the Marine Aggregate market

■ Fleet

**Historical distribution: number of vessels**

- 55-60 Vessels, mostly operating in Western Europe
- Average age +29 years
- Majority owned by multinationals



■ Operating conditions

- 24/7 All year round in all weather conditions
- Dredging at open sea
- Long sailing distances are not uncommon
- On board classification and dry unloading of cargo

MAD DESIGN

Weight optimization

Efficient power train

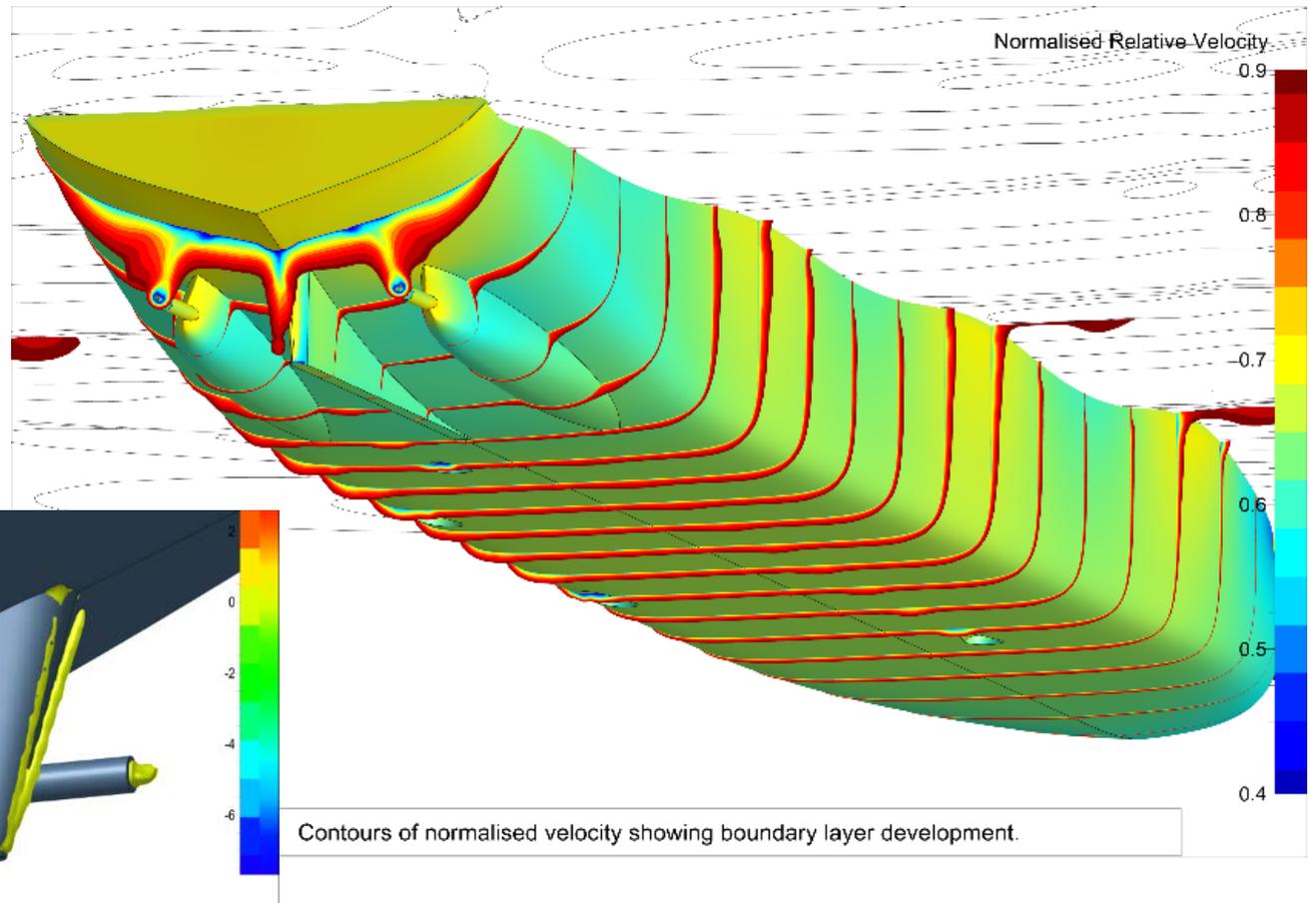
Dredging installation

Hull design

Screening towers

Dry unloading system





OPTIMAL EFFICIENCY AND FUEL CONSUMPTION



# HULL DESIGN

MAD DESIGN

Weight optimization

Efficient power train

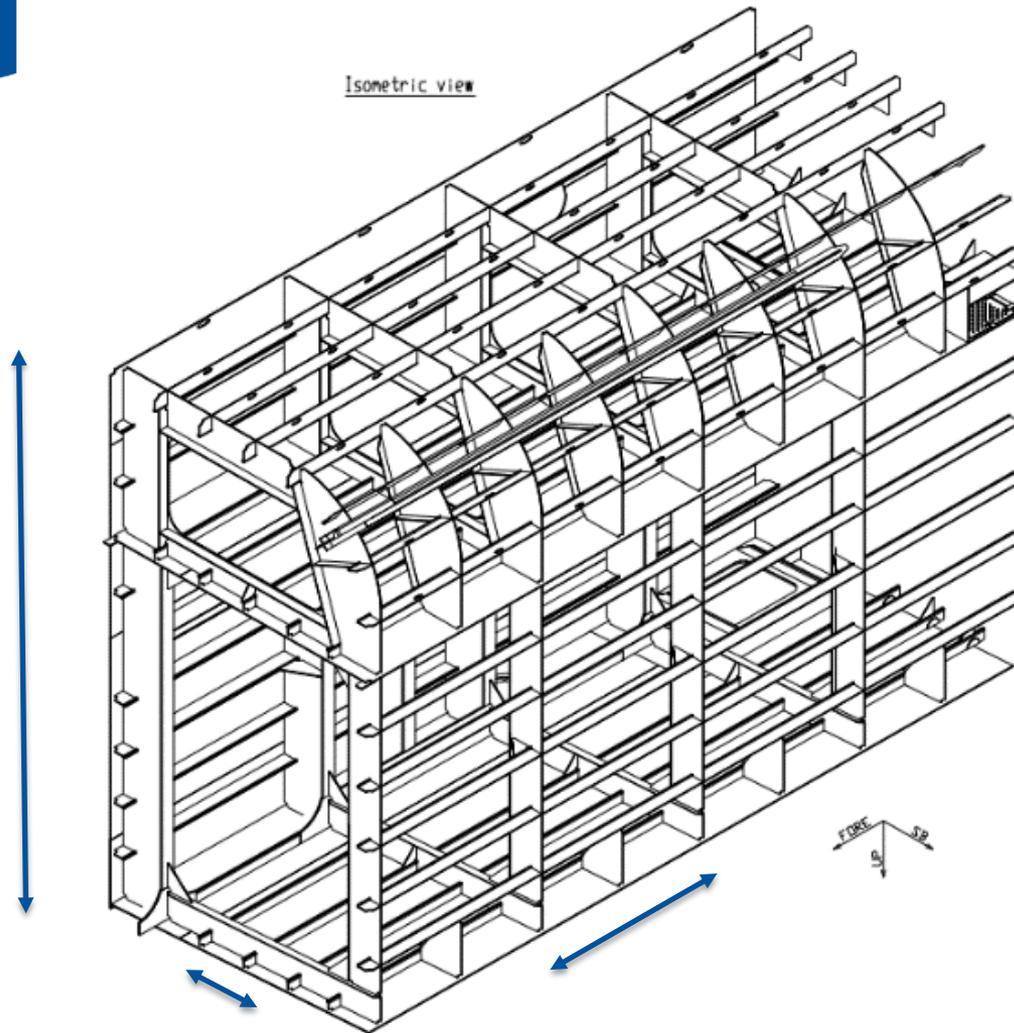
Dredging installation

Hull design

Screening towers

Dry unloading system





WEIGHT OPTIMIZATION: MAXIMUM PAYLOAD CAPACITY

MAD DESIGN

Weight optimization

Efficient power train

Dredging installation

Hull design

Screening towers

Dry unloading system



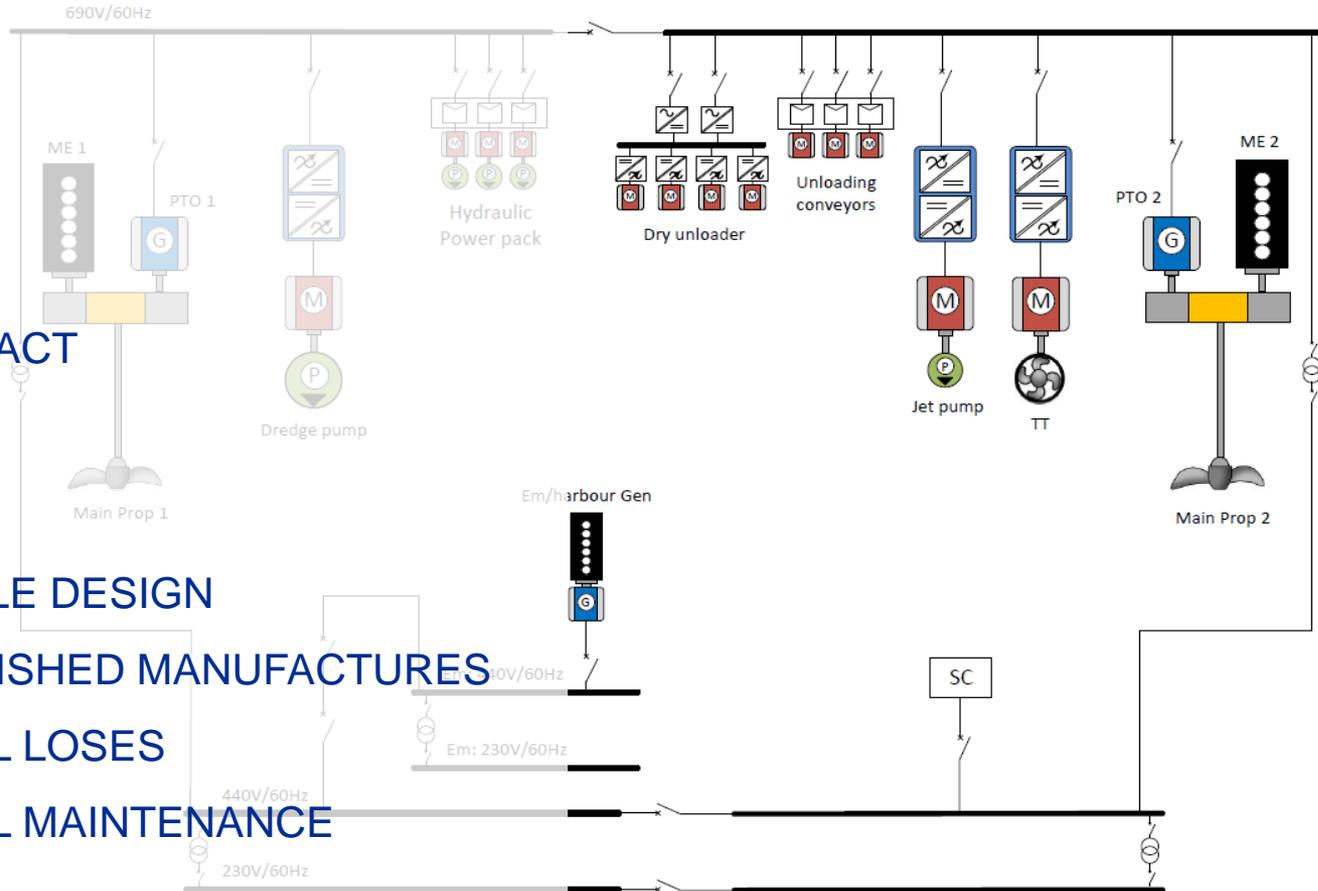
**DAMEN**

WHY?

- 24/7
- BIG IMPACT

HOW?

- RELIABLE DESIGN
- ESTABLISHED MANUFACTURES
- MINIMAL LOSSES
- MINIMAL MAINTENANCE



# EFFICIENT POWER TRAIN

MAD DESIGN

Weight optimization

Efficient power train

Dredging installation

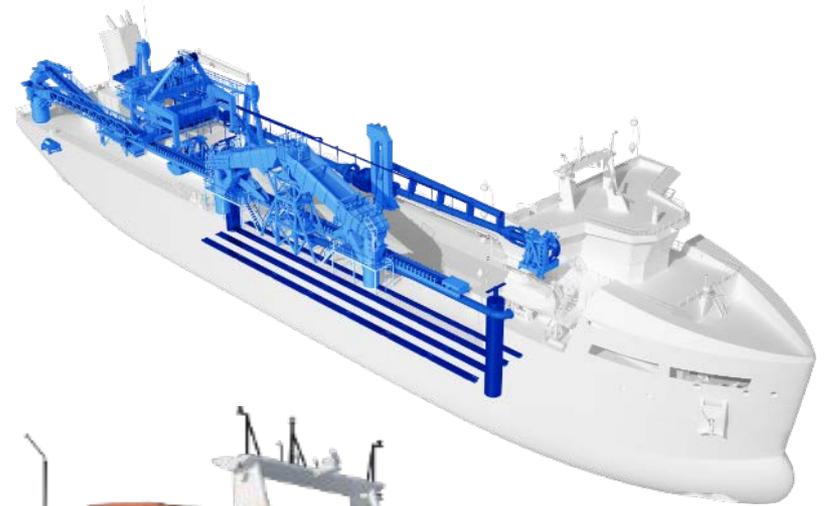
Hull design

Screening towers

Dry unloading system



**DAMEN**



- STANDARD DAMEN COMPONENTS
- PERMANENT MAGNET MOTOR
- PIPING ABOVE DECK
- WINCHES BELOW DECK
- NO DREDGE VALVES



FULLY INTEGRATED SOLUTION

MAD DESIGN

Weight optimization

Efficient power train

Dredging installation

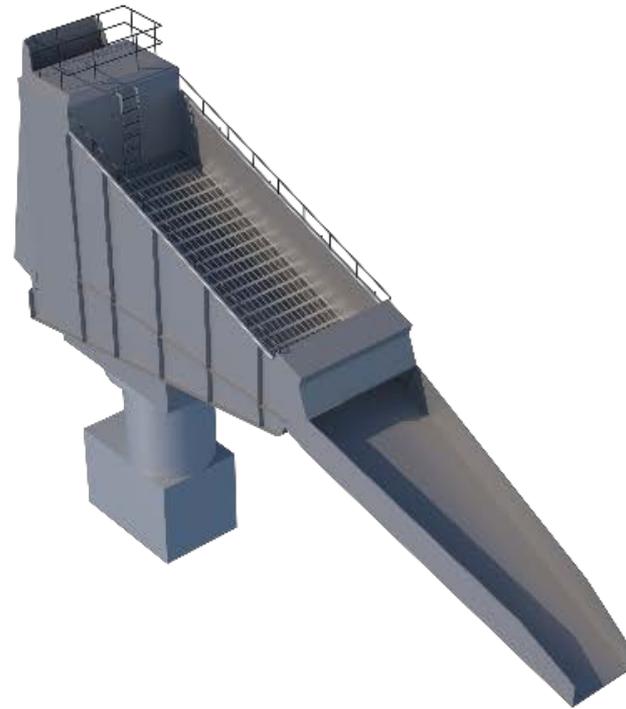
Hull design

Screening towers

Dry unloading system



- LARGE AREA
- EASY CHANGEABLE
- DUMPING THROUGH BOTTOM



SCREENING ONBOARD + DISTRIBUTION

MAD DESIGN

Weight optimization

Efficient power train

Dredging installation

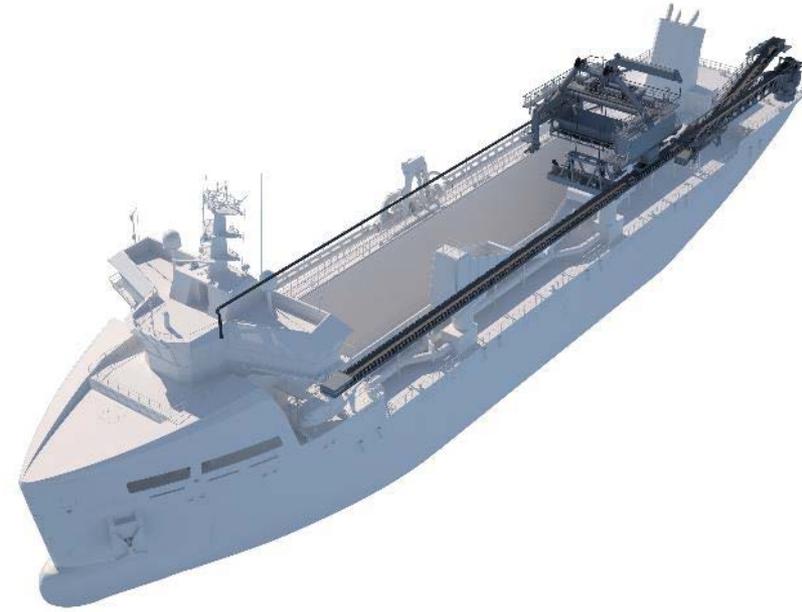
Hull design

Screening towers

Dry unloading system



- UPTO 27M REACH
- FULLY AUTOMATIC
- FULLY ELECTRIC



DIRECTLY TO THE PROCESSING PLANT

MAD DESIGN

Weight optimization

Efficient power train

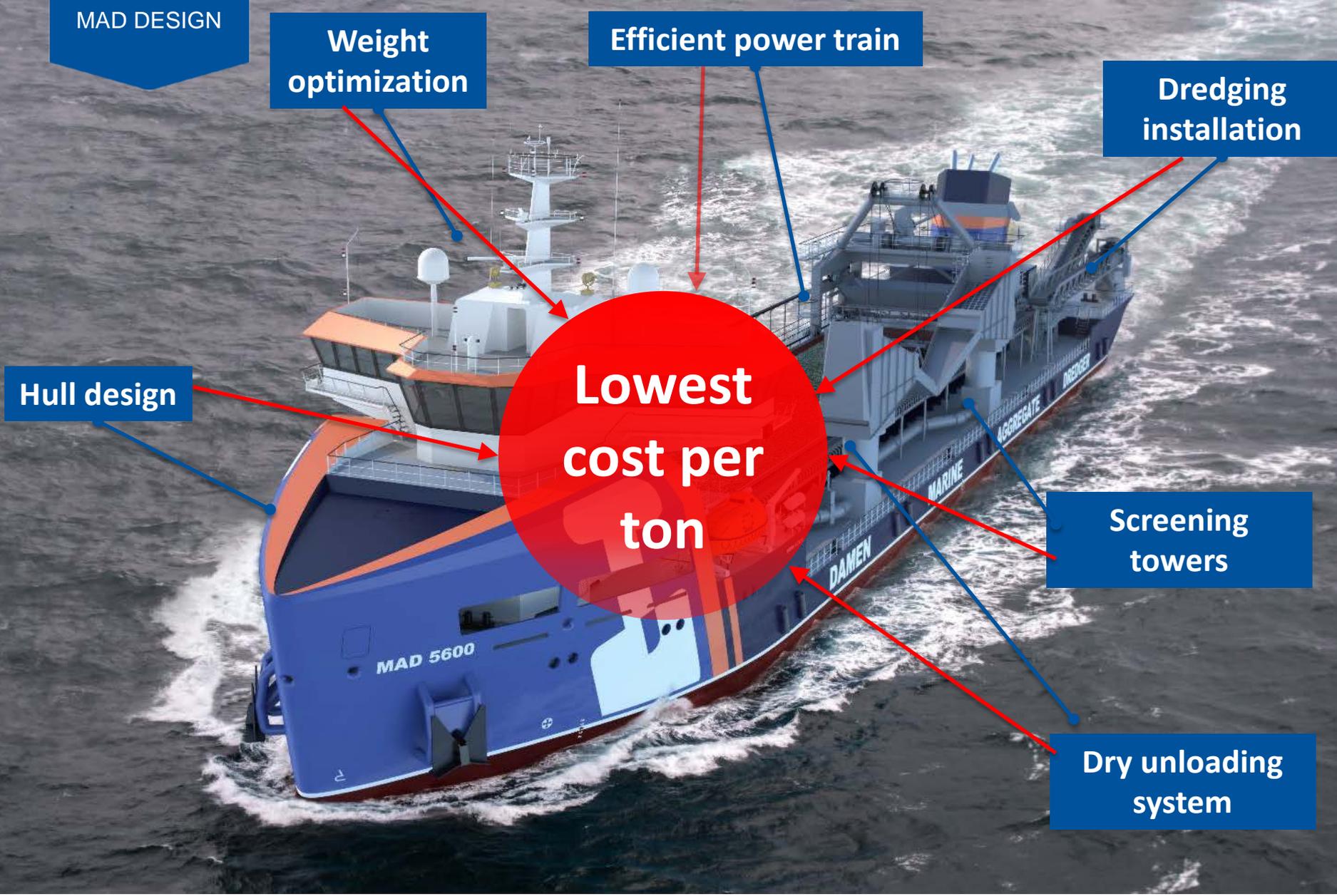
Dredging installation

Hull design

Lowest cost per ton

Screening towers

Dry unloading system



MAD  
DESIGN



IN A SAFE MANNER



**DAMEN**



MAD



THE FIRST...

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**DAMEN**

- YES, NEW DREDGING TECHNOLOGIES CAN MAKE THE DIFFERENCE
- YES, THERE ARE SIMILARITIES BETWEEN MINING IN US - EUROPE
- YES, DAMEN IS READY FOR IT WITH STATE OF THE ART EQUIPMENT

## CONCLUSIONS



THANK YOU FOR LISTENING