

# CEDA Working Group on Energy Efficiency

**Paul Vercruijsse**

Chair CEDA WGEE



**DEME**

Dredging, Environmental  
& Marine Engineering



Central Dredging Association

# CEDA WGEE - Introduction

## Background

- Energy plays a role in the *entire lifecycle of dredging projects*, and decisions made early in the project initiation phase can have huge impacts on later energy consumption.
- Also, legislation, relating to emissions and sustainability, is becoming more strict. The International Maritime Organization (IMO) f.i. has adopted mandatory energy-efficiency measures, to reduce emissions of greenhouse gases from international shipping.

## Objectives (TOR)

- The information paper will highlight aspects related to *energy efficiency* during all stages of dredging projects (from initiation to design, and execution to completion).
- The paper will address *dredging equipment*, looking at everything from the choices made in dredger design to equipment selection.
- The paper will aim to facilitate knowledge exchange, and highlight current best practice, and will allow for structured optimisation which leads to increased efficiency.

# CEDA WGEE - Introduction

## The CEDA Working Group Energy Efficiency:

- Paul Vercruijse (chair)      DEME
- Leila Benali                      Atlantic Dredging
- Dirk Roukema                    Blue Pelican Associates
- Ewout van Duursen            Damen Dredging Equipment
- Alberto del Pino                Dravo S.A.
- Michel De Ruyck                Jan De Nul
- Peter de Looze                  Monitrax
- Ruben Brouwer                 Royal Boskalis
- Leonard den Boer                Royal IHC

*Some Port representative?*



From LtoR: Leila Benali, Paul Vercruijse, Dirk Roukema, Michel De Ruyck, Ewout van Duursen, Leonard den Boer

# CEDA WGEE – Definitions

## Energy Efficiency of Dredging Projects

*Each dredging project has its unique set of amongst others soil & rock conditions, volumes, transport distances and water depths.*

*Moreover projects are often located at completely different spots (sensitive ecosystems, busy port areas, remote working spots,...)*

*Given*

- *all these factors' impact on energy consumption*
- *recent and upcoming developments in legislation,*

***It is a challenge to define and evaluate the Energy Efficiency of a Project.***



# CEDA WGEE – Benchmarks

## CO<sub>2</sub> emissions in absolute numbers:

The **World Dredging Fleet** was estimated to have produced:

**6.3 Mton of CO<sub>2</sub> in 2008** (= IMO 'reference year').

The emissions of the **European Dredging Industry** (EuDA members) was:

**3.6 Mton of CO<sub>2</sub> in 2008.**

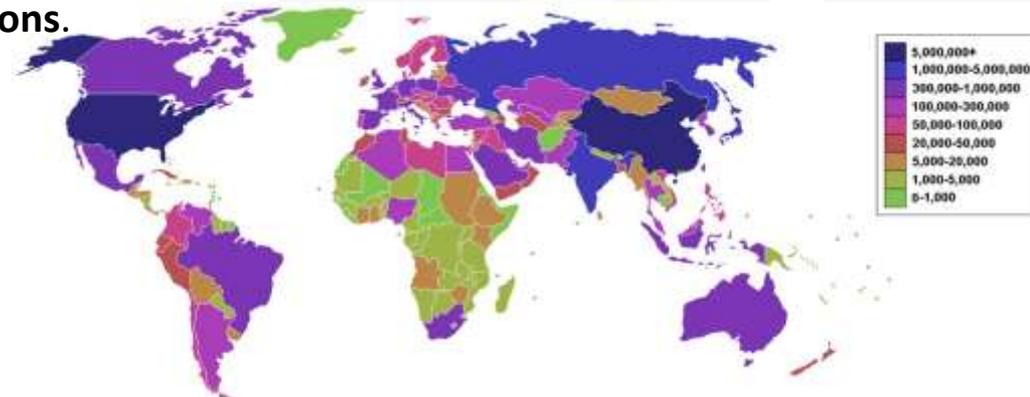
## CO<sub>2</sub> emissions in relative numbers:

The emissions of the **World Dredging Fleet** is:

**ca. 0.6%** of the total CO<sub>2</sub> emissions of **Global Shipping**.

The emissions of **Global Shipping** is:

**ca. 2%** of the **Global Total of CO<sub>2</sub> emissions.**



Co<sub>2</sub> emissions in kiloton per annum via the burning of fossil fuels

Source: Wikipedia

# CEDA WGEE – Benchmarks

## CO<sub>2</sub> emissions in absolute numbers *(continued)*:

The emissions of the **European Dredging Industry<sup>1</sup>** (EuDA members) was:

**3.6 Mton of CO<sub>2</sub> in 2008.**

**2.4 Mton of CO<sub>2</sub> in 2016 and 2017**

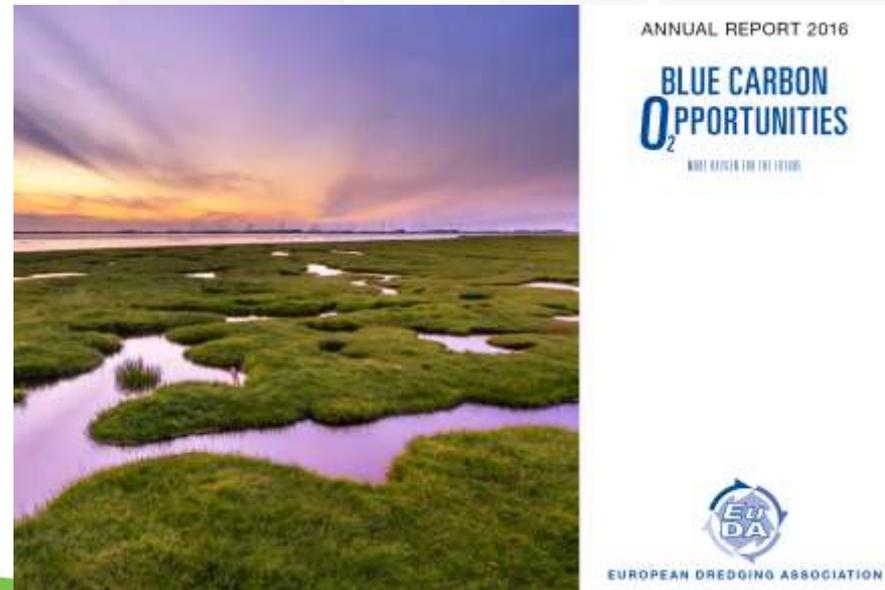
## The reduction in the CO<sub>2</sub> emissions can be attributed to:

### Primary

The effects of the financial and economic crises, reducing the level of occupancy after 2008.

### Secondary

Modernization of the EuDA fleet.



# CEDA WGEE – Legislation

The International Maritime Organization (IMO) under the UNFCCC reached agreement on a global set of initial short-, medium-, and long-term strategies to reduce **international shipping** GHG emissions.

However, there has been much less focus on the emissions related to **construction and maintenance of infrastructure that supports waterborne transport**.



## IMO – April 2018

Global shipping shall reduce its CO<sub>2</sub> emissions by a relative reduction of:

- **40 percent by 2030,**
- **50 percent by 2050**  
compared with **2008.**

# CEDA WGEE – Legislation

PARIS AGREEMENT



'Other'

International Shipping



Nation

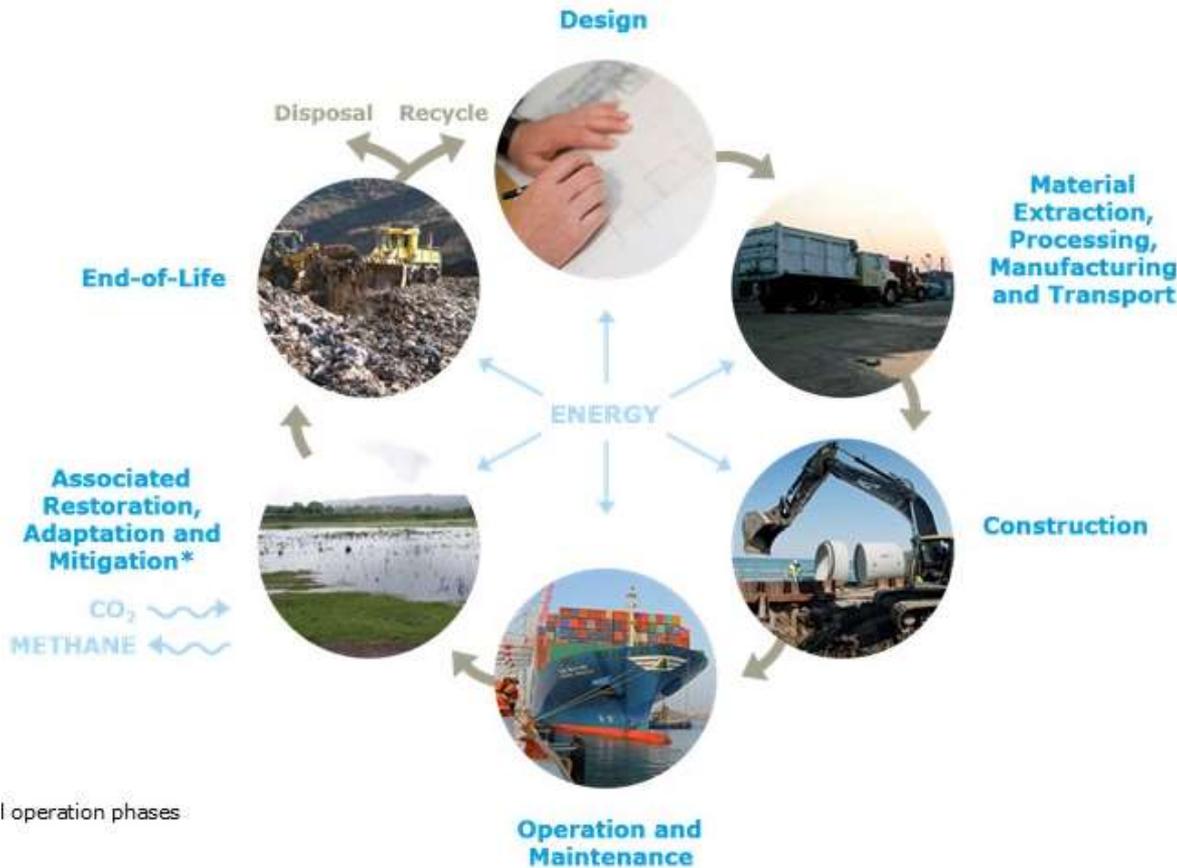
Flagstate

Capital & Maintenance  
Dredging Projects

Operation & Mobilization  
Dredging Vessels

# CEDA WGEE – Legislation

## PIANC WG188 Carbon Management for Port and Navigation Infrastructure



operation phases



PIANC  
The World Association for  
Waterborne Transport Infrastructure.

PIANC and its partners in the Think Climate coalition are working **to fill the gap** regarding strategies to reduce GHG emissions related to the development and maintenance of infrastructure that supports waterborne transport.



# CEDA WGEE - Equipment

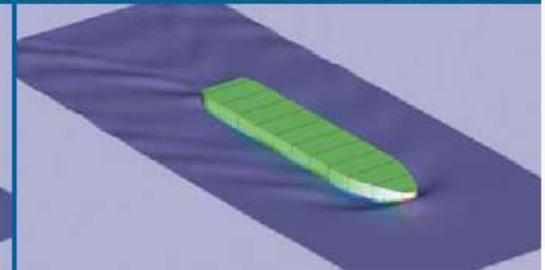
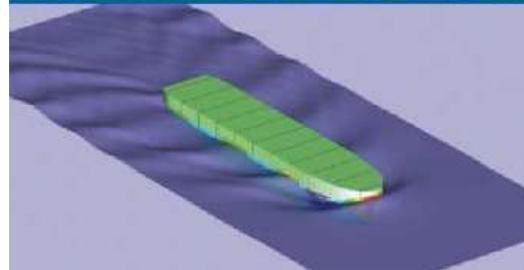
## Technology Development

- Hull Design & Propulsion  
*Hydrodynamic optimization*
- Pump Design  
*Efficiency, Suction Performance & Passage*
- Efficient Excavation Tools  
*Enabling high density mixtures*
- Efficient Drive Trains  
*Energy Management Systems*
- Automation & Control  
*Smart Use of Information*
- Alternative Fuel Sources

*TSHD Lange Wapper  
without bulb*

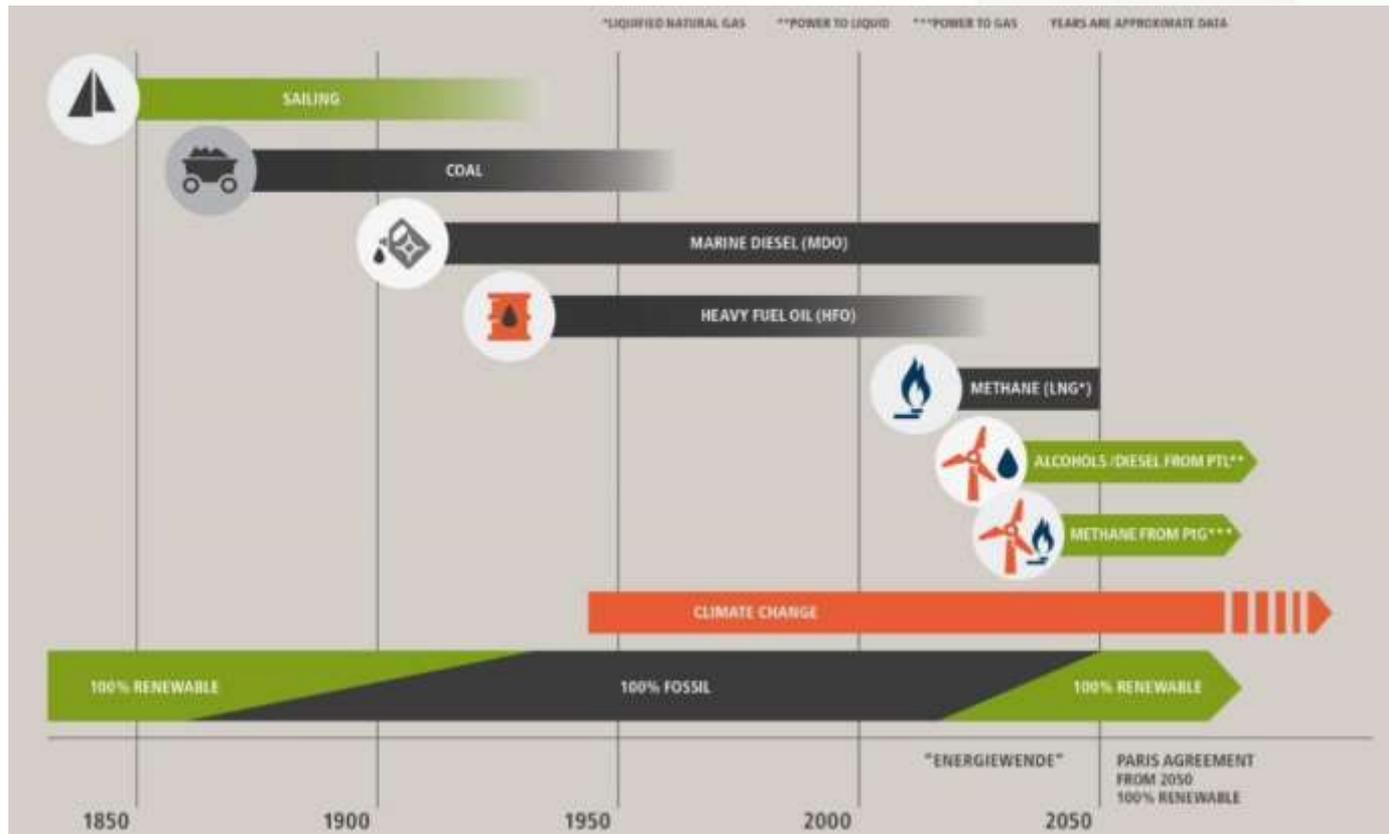


*TSHD Uilenspiegel  
with bulb*



# CEDA WGEE - Equipment

## Energy Transition – Fuels in Shipping



Source: Meyer Group

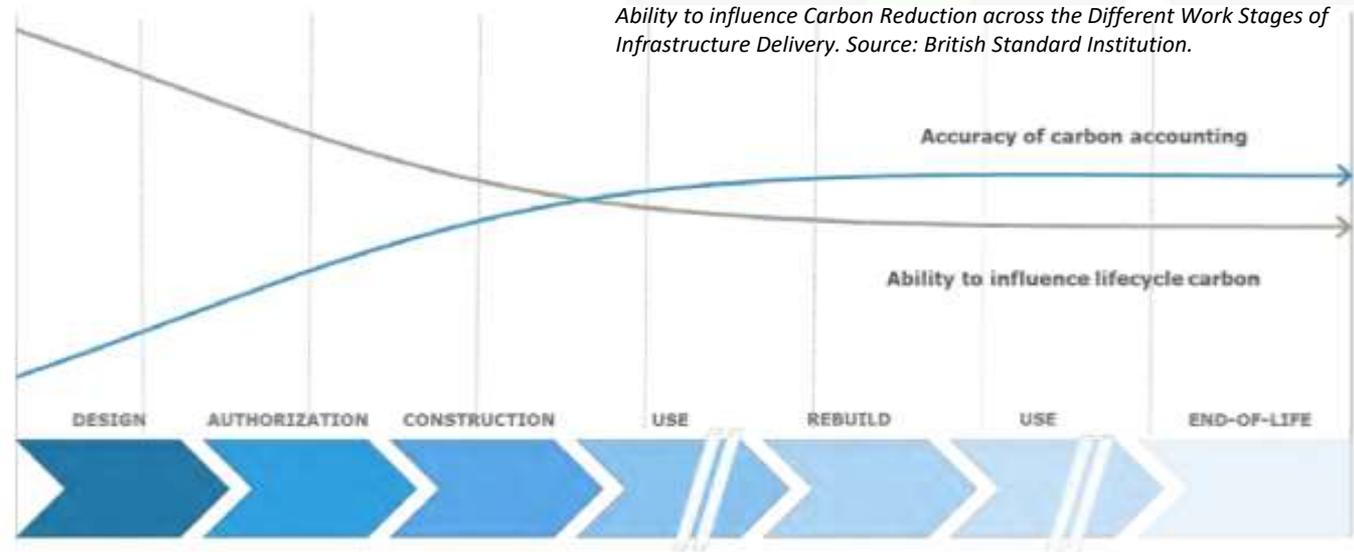
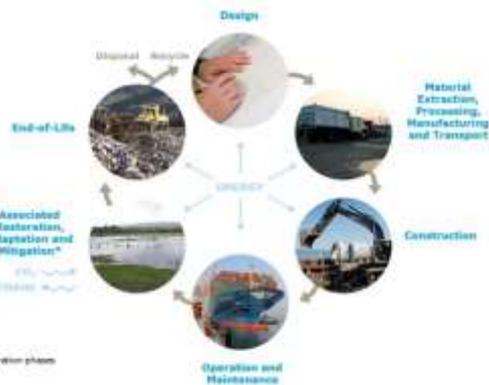
# CEDA WGEE – Projects

## Opportunities

- The greatest opportunities to control carbon emissions are in those decisions made in the early phases of the project life-cycle.
- Given early involvement: Contractors can play an important role in the management of carbon emissions.

## Challenges

- In the early phases of the project life-cycle the knowledge is likely to be lowest.
- How to compare (benchmark) Project A vs Project B?
- Legislation differs per nation, tender, ...



# CEDA WGEE – Way Forward

## Information Paper (working title):

‘Structured Information on Energy Use in Dredging’

## Envisaged timeline:

March 22<sup>nd</sup>, 2018 Kick Off meeting – definition of ToR

May 30<sup>th</sup>, 2018 – First working session

October 3<sup>rd</sup>, 2018 – Second working session

December, 2018 – Third working session

March, 2019 – Fourth working session

September 2019 – Draft ready for review

