

CEDA Working Group on Energy Efficiency

Paul Verduyn

Chair CEDA WGEE

CEDA Dredging Days 2019

Conference and Exhibition

7-8 November 2019

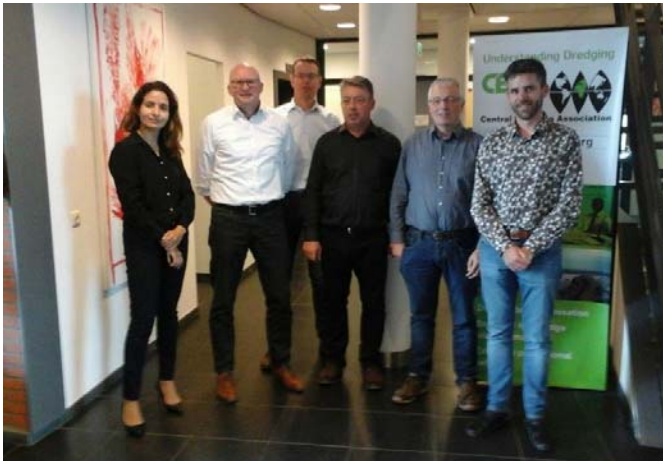
Rotterdam Ahoy, the Netherlands



CEDA WGEE - Introduction

The CEDA Working Group Energy Efficiency

| | | | |
|-------------------------|-------------------|-------------------|--------------------------|
| Paul Vercruijse (chair) | DEME | Ewout van Duursen | Damen Dredging Equipment |
| Leila Benali | Atlantic Dredging | Dirk Roukema | Blue Pelican Associates |
| Leonard den Boer | Royal IHC | Alberto del Pino | Dravo S.A. |
| Michel De Ruyck | Jan De Nul | Bert Visser | Rijkswaterstaat |



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

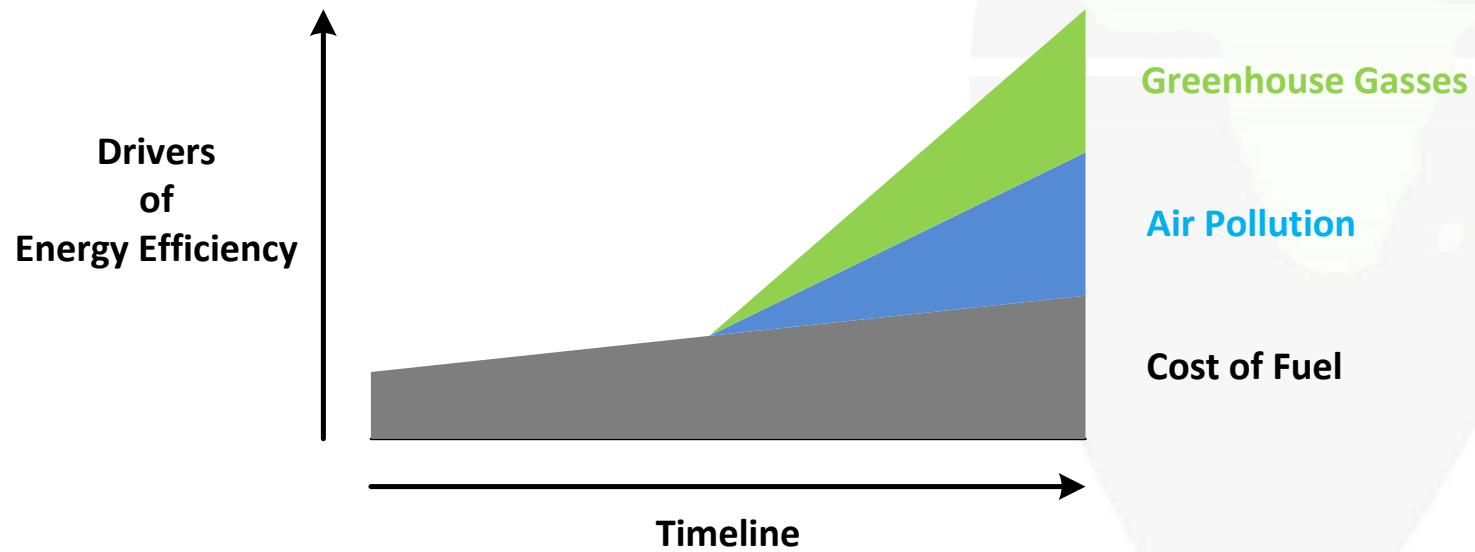


From LtoR: Paul Vercruijse, Ewout van Duursen, Michel De Ruyck, Alberto del Pino

CEDA WGEE – Introduction

Drivers of Energy Efficiency

- Cost of Fuel
- Fuel related Emissions

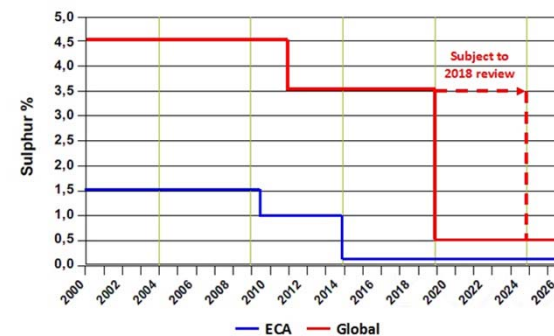
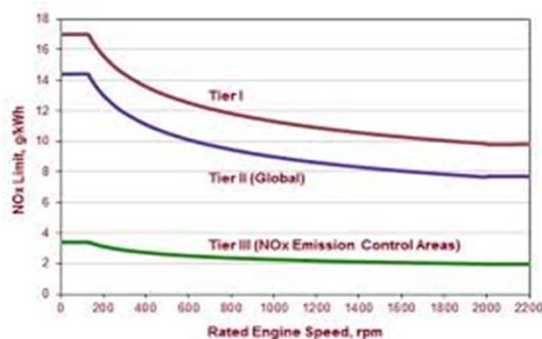


CEDA WGEE – Legislation

International Maritime Organization - International Shipping

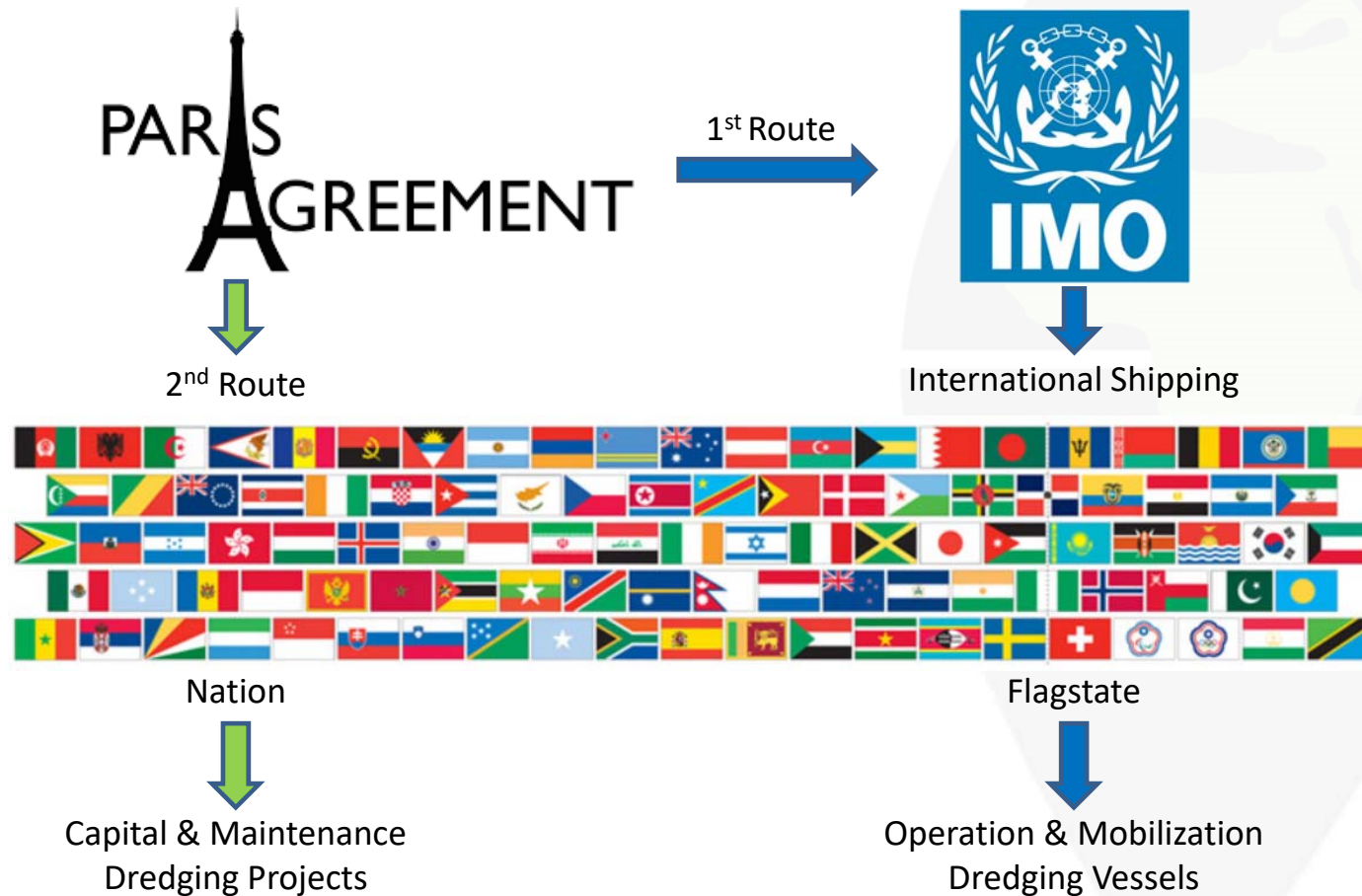


- **Fuel Efficiency**
Ship Energy Efficiency Management Plan (SEEMP),
Energy Efficiency Design Index (EEDI), Data Collection System (DCS)
- **Air Pollution**
NOx, SOx & Particle Matter (PM)

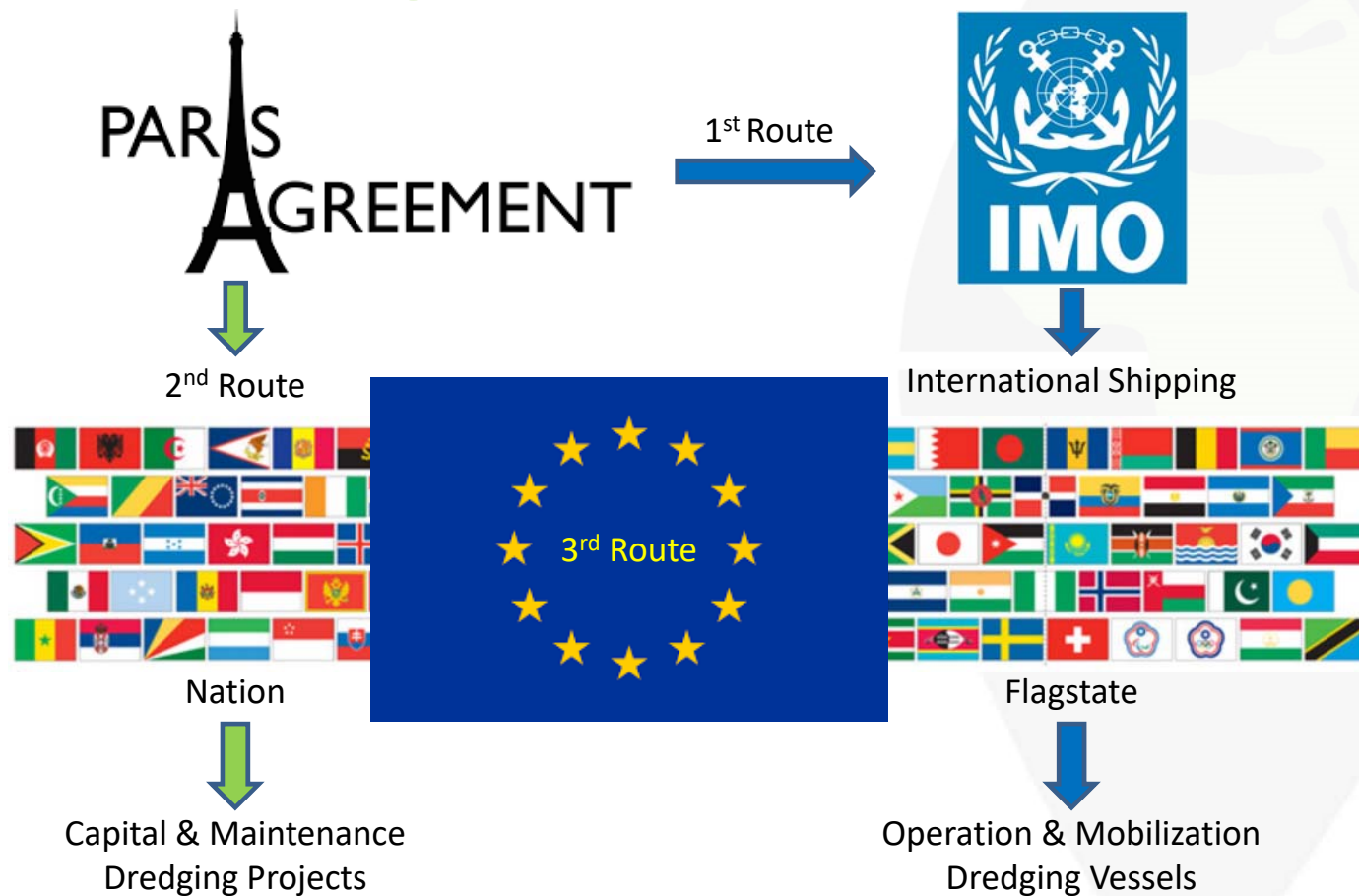


- **Greenhouse Gasses**
Global shipping shall reduce its GHG emissions:
at least **50 percent by 2050** compared with **2008**

CEDA WGEE – Legislation



CEDA WGEE – Legislation



CEDA WGEE – Benchmarks

Some Numbers from a Global Perspective

CO₂ Emissions in Absolute Numbers:

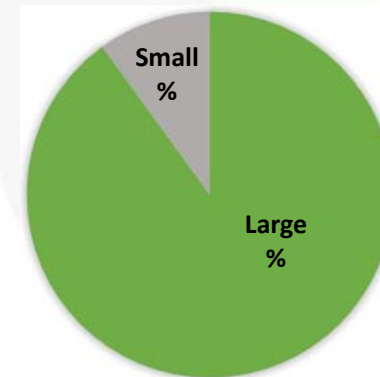
The **World Dredging Fleet** was estimated to have produced:
6.3 Mton of CO₂ in 2008 (= IMO 'reference year').

The emissions of the **European Dredging Industry** (EuDA members) was:
3.6 Mton of CO₂ in 2008.

CO₂ Emissions in Relative Numbers:

The emissions of the **World Dredging Fleet** is:
ca. 0.6% of the total CO₂ emissions of **Global Shipping**.

The emissions of **Global Shipping** is:
ca. 2% of the **Global Total of CO₂ emissions**.



CEDA WGEE – Benchmarks

Some Numbers from an Equipment Perspective

Environmental Impact of Dredging Equipment

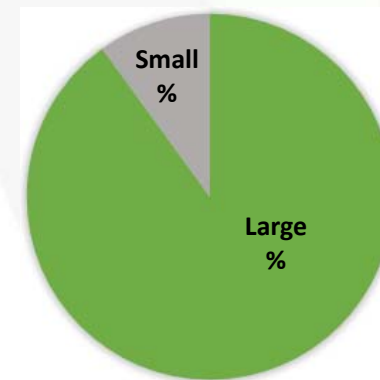
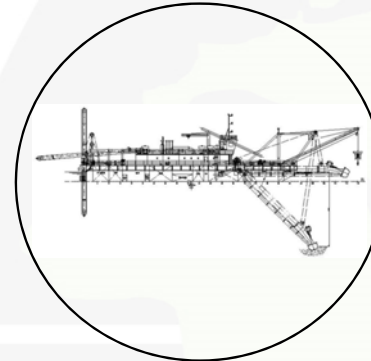
Life Cycle Analysis of Dredging Equipment shows:

The **Environmental Impact** of Dredging Equipment is **Dominated** by the use of **Fossil Fuels** and the **Fuel Related Emissions**.

CO₂ footprint Fleet Owners

The **CO₂ footprint** of a **Fleet Owner** in the **Transport Industry**:
is generally **Dominated** by **Fuel used by the Fleet**.

This holds for Transport by Ship, Truck and Airplane alike.



CEDA WGEE – Benchmarks

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 close to – or in the confined space of busy port areas. Giving all these factors' impact on energy consumption and given recent and upcoming developments in legislation, it is a challenge to define and evaluate the Energy Efficiency of a Project.



CEDA WGEE – Dredging Equipment

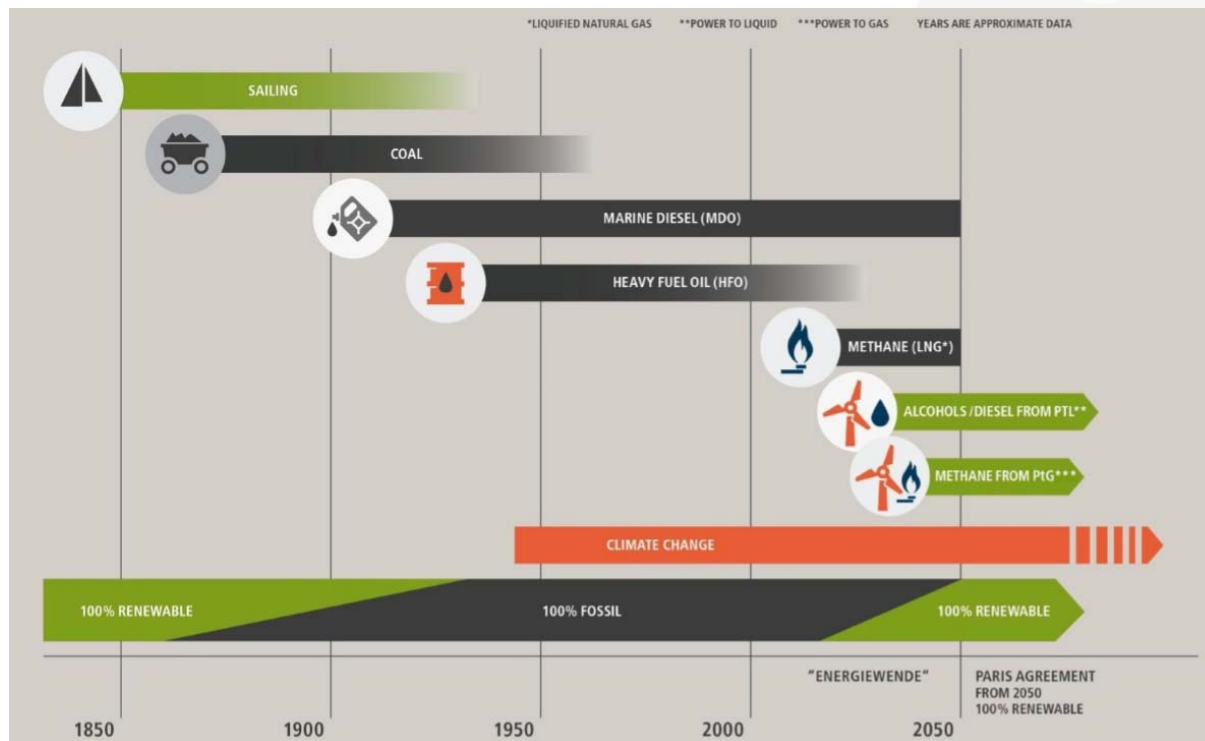
Technology Development

- 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
See next slide



CEDA WGEE – Dredging Equipment

Energy Transition – Fuels in Shipping



Source: Meyer Group

CEDA WGEE– Information Paper

‘Structured Information on Energy Efficiency in Dredging’

Introduction

- 1. Definitions & Terminology**
- 2. Dredging Projects**
Scope, Procurement & Execution
- 3. Dredging Equipment**
Development of Technology & Alternative Fuels
- 4. Policies & Legislation**

Annexes

List of References
Case Studies

