



# Options for Emission Reduction and their Economies

N. Dalpis

# Exhaust Gas After Treatment

## **Advantage**

High Efficiency

## **Disadvantages**

Investment (equipment + labour)

Operational cost

Occasionally difficult to retro-fit

## **Remark**

SCR and/or DPF?

# Exhaust Gas After Treatment

Installation of the equipment often accounts half the cost

Rationalisation of installation work is at least as important as reducing the price of the equipment.

# DPF Equipment



# SCR Equipment



# SCR Equipment



# LNG

## **Advantages**

Low emission levels

Fuel economy

## **Disadvantages**

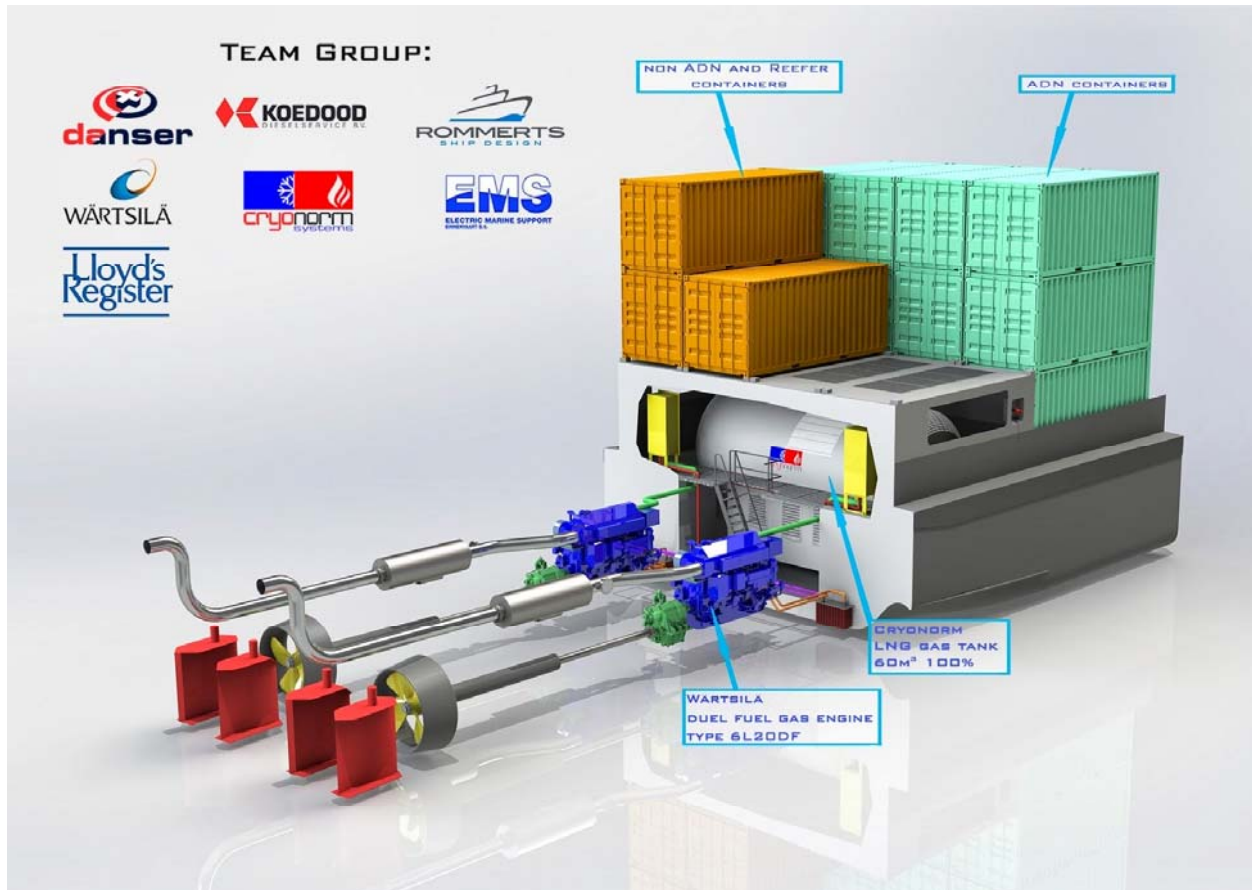
Investment

Space requirement

Difficult to retro-fit



# LNG





# Power train Optimisation

Multiple engine configuration

## **Advantages**

Fuel economy

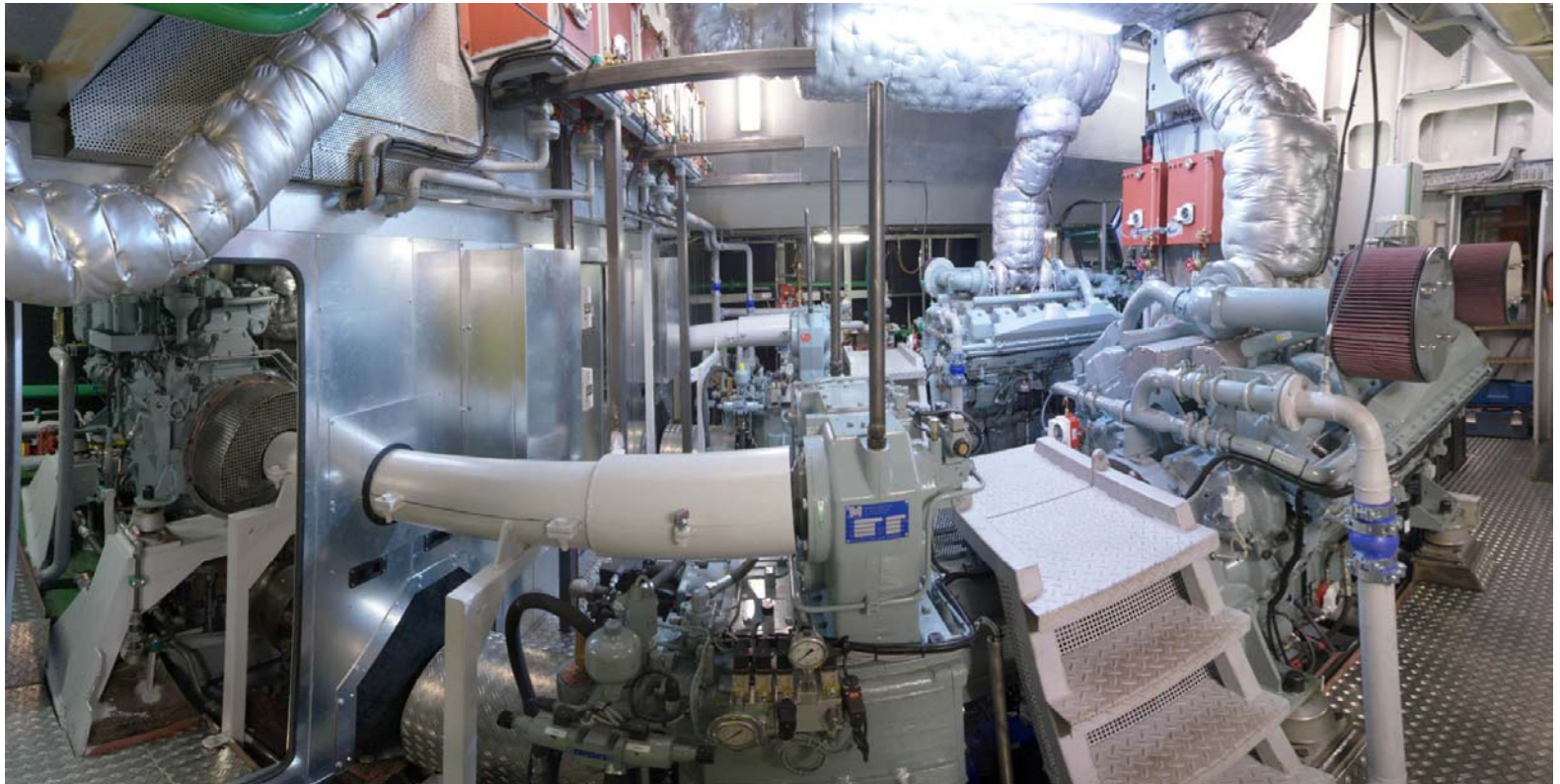
Reduced emissions

## **Disadvantages**

Space requirement

Moderate investment

# Multiple Engine Configuration



# Power train optimisation and Exhaust After Treatment

Multiple Engine, Diesel - Electric configuration

## **Advantages**

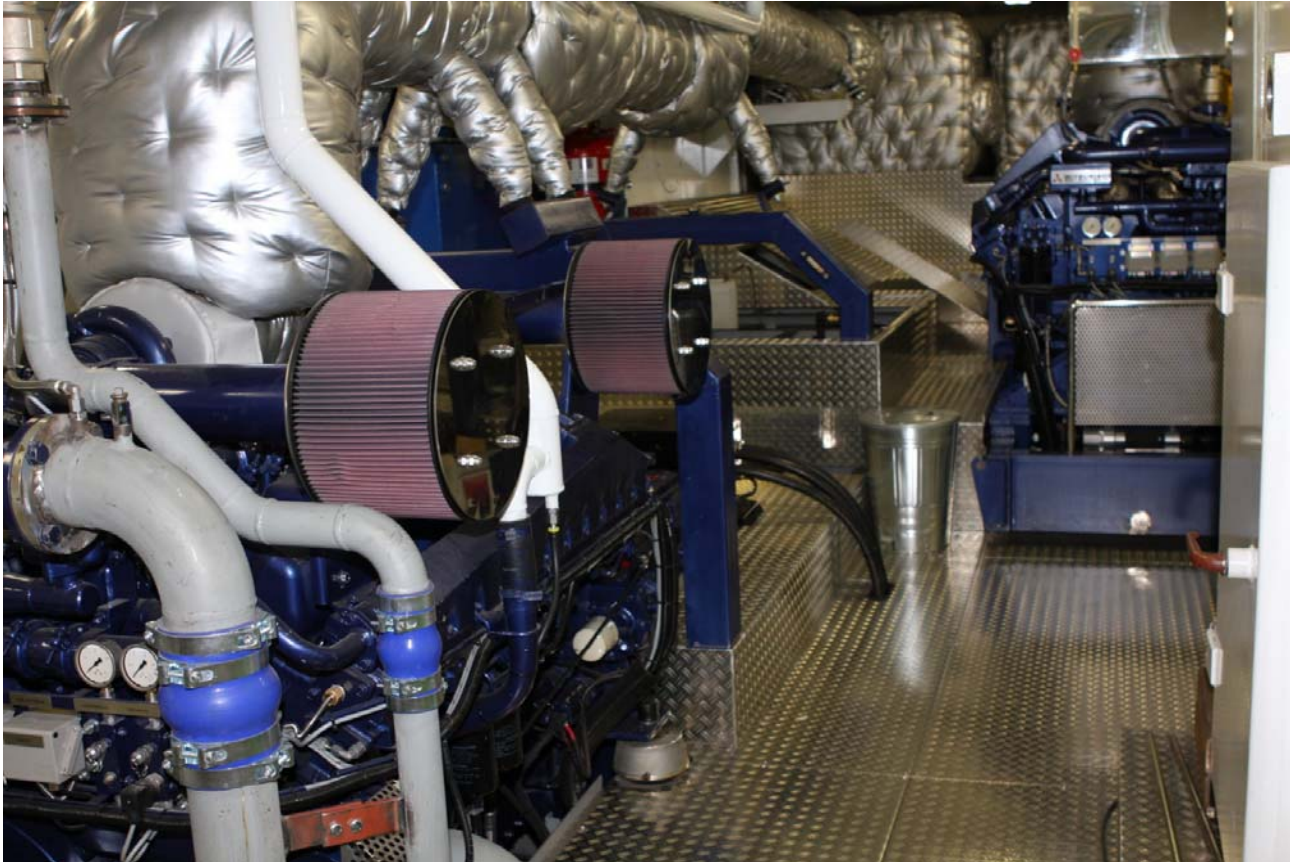
Fuel economy

Low emissions

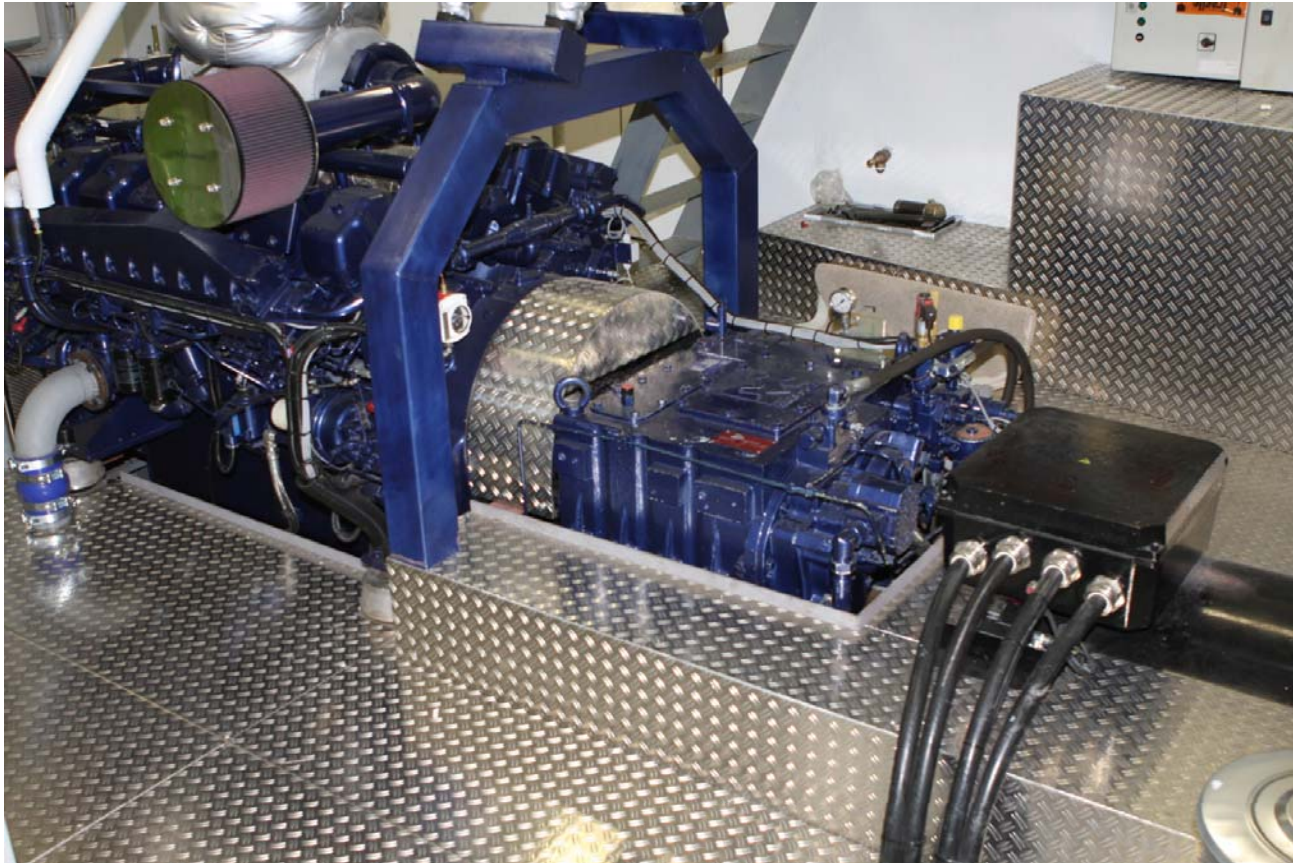
## **Disadvantages**

Space requirement

Initial investment







# Summarising

- Exhaust gas After Treatment (DPF, SCR, DPF+SCR)
- LNG
- Multiple Engine Configuration (mechanical, load dependent)
- Multiple Engine Configuration (diesel, diesel/electric, +SCR)

Thank you for your attention