

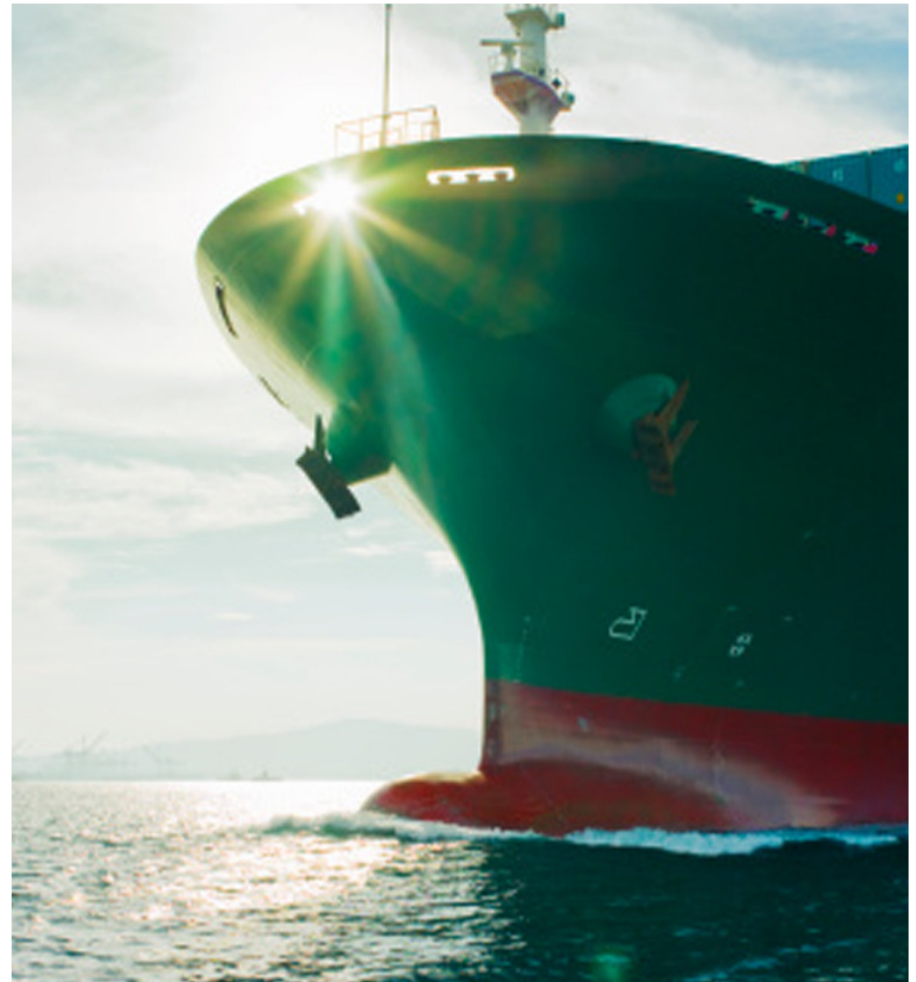
# An Outlook for the Maritime Industry Towards 2020

Future Development in Maritime Shipping

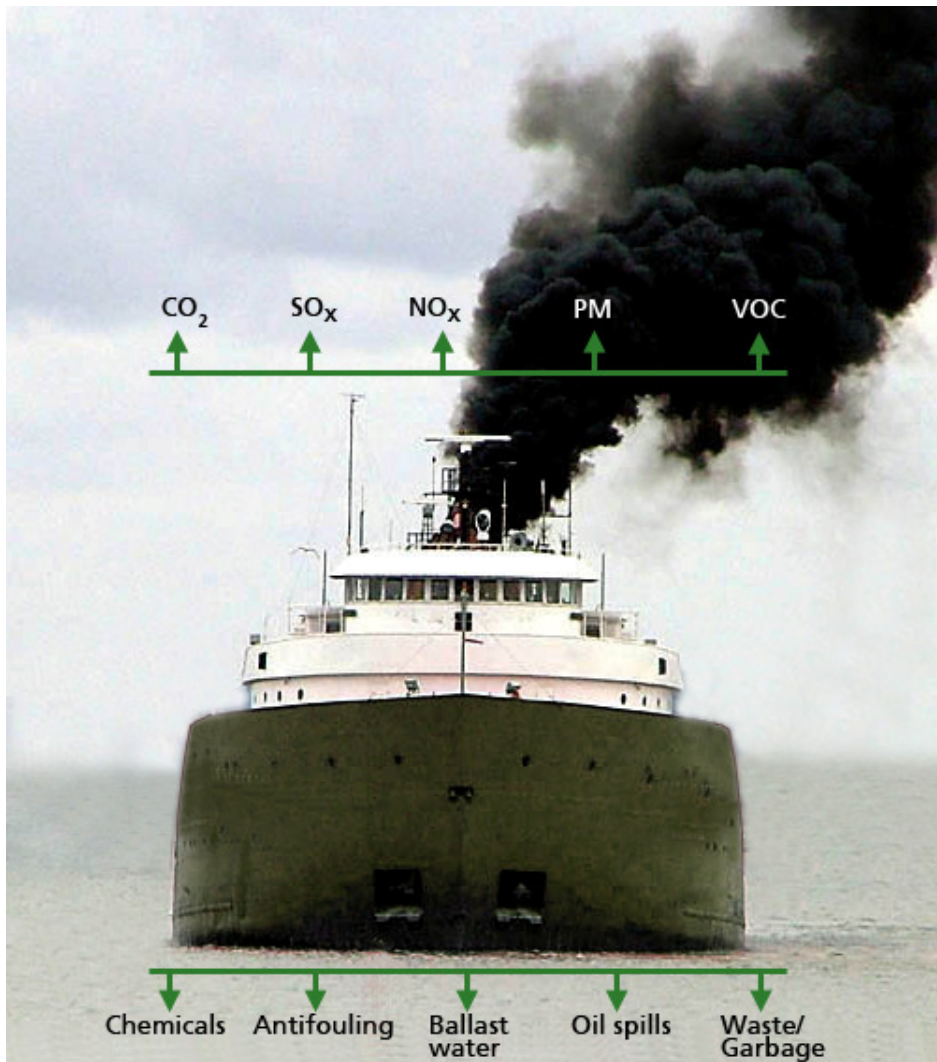
Kenneth Vareide  
2013-02-28

# Topics

- Background and Key Drivers for the Maritime Industry
- A Outlook Towards 2020
- Current Trends



# Background – Environment and Stakeholders

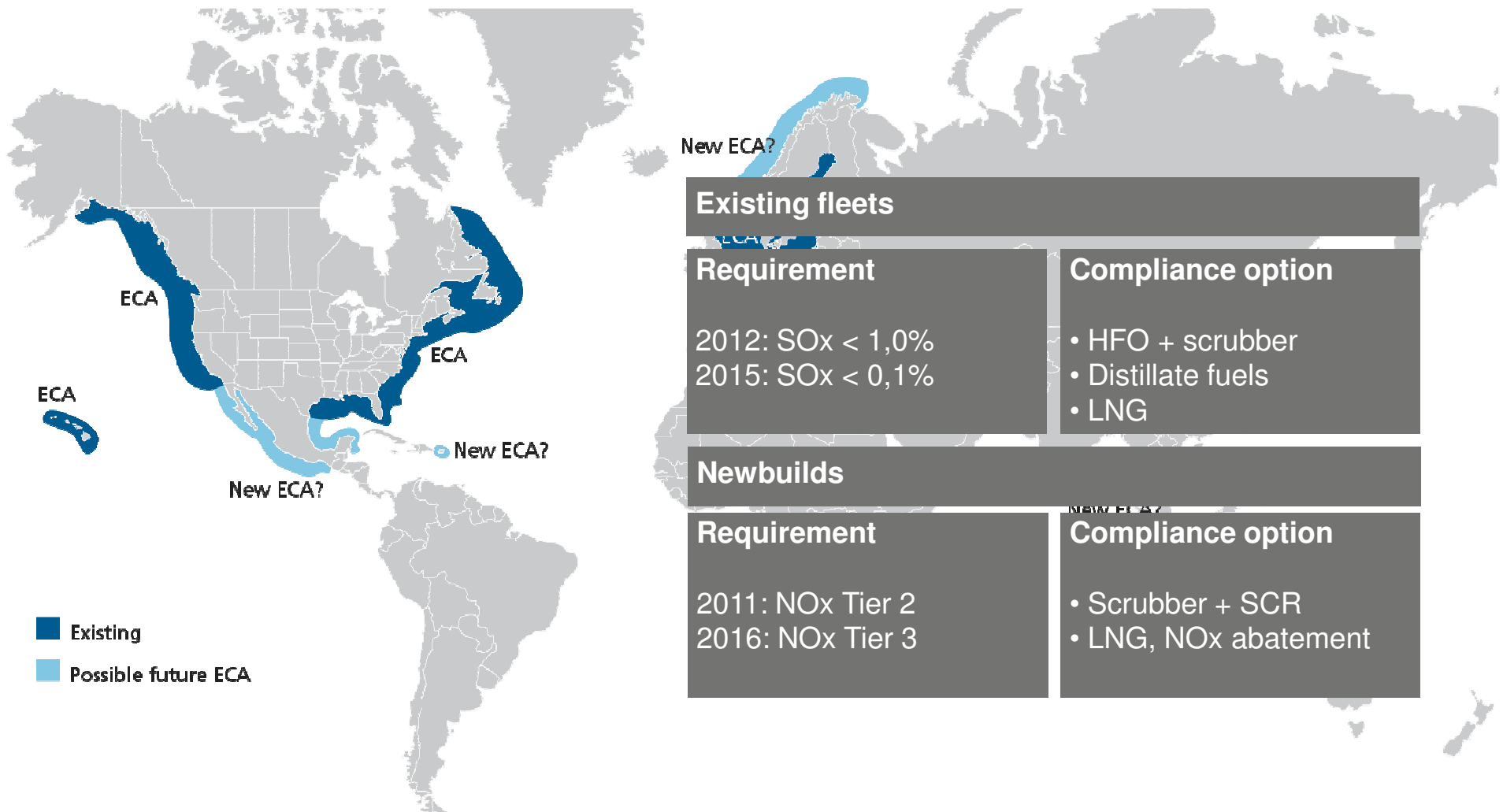


*Norwegian fjord  
Geiranger*

Tourists expect to see  
clean and unspoiled nature



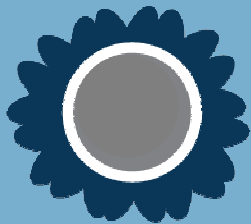
# Emissions to air is governed through IMO



# Megatrends and External Drivers for the Maritime Industry

## REGULATORY AND STAKEHOLDER PRESSURE

- Global or local regulations?
- Further requirements on GHG emissions?
- Rating schemes and requirements from charterer and public



## ECONOMIC GROWTH AND DEMAND FOR TRANSPORT

- Boom or bust?
- Growth level and level of contracting
- Overcapacity of vessels?



## FUEL TRENDS

- Sustained high fuel prices?
- LNG cheaper than HFO?
- Development of LNG infrastructure
- Impact of sulphur regulations



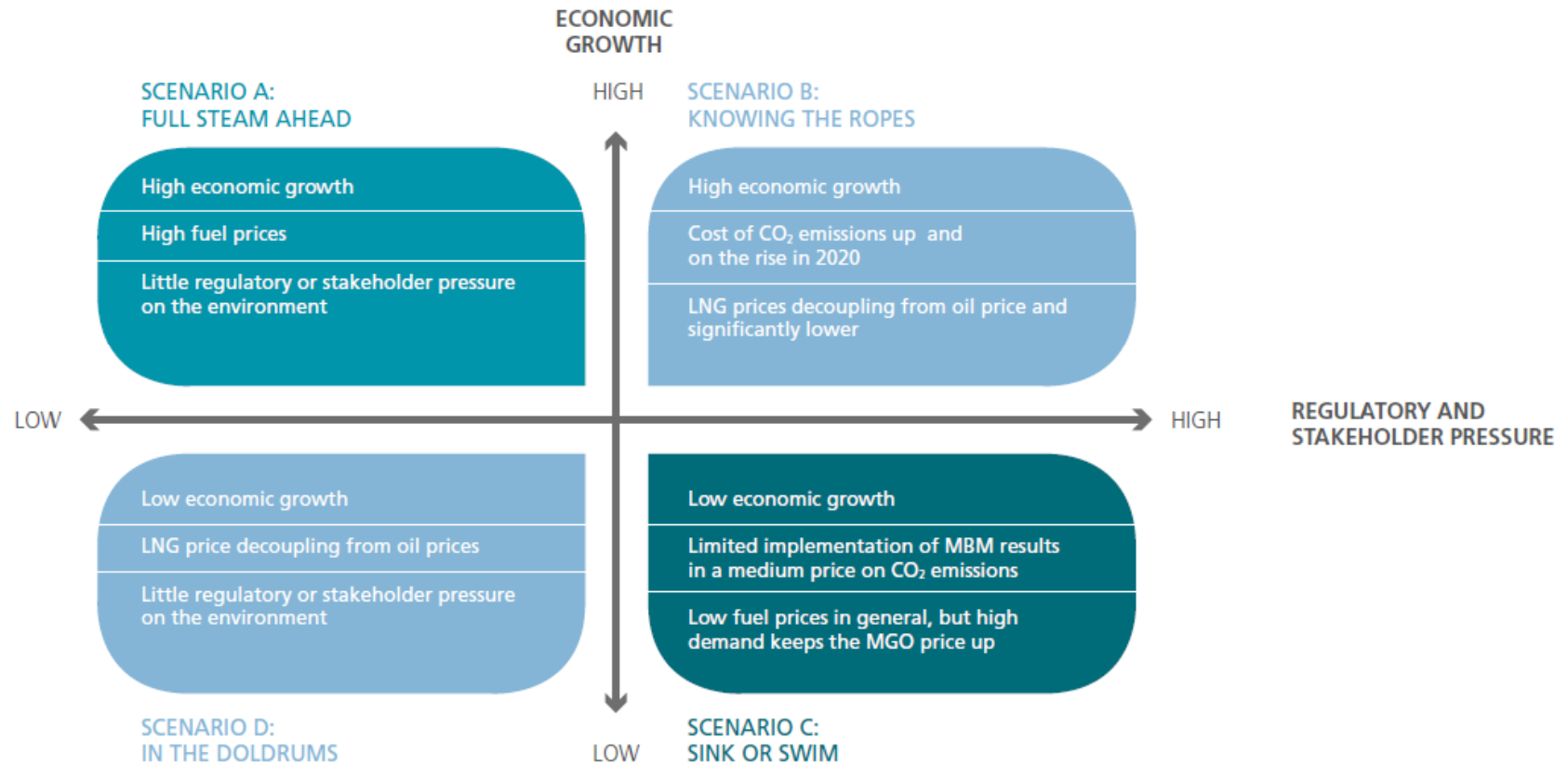
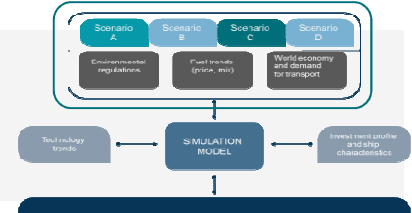




# “SHIPPING 2020”

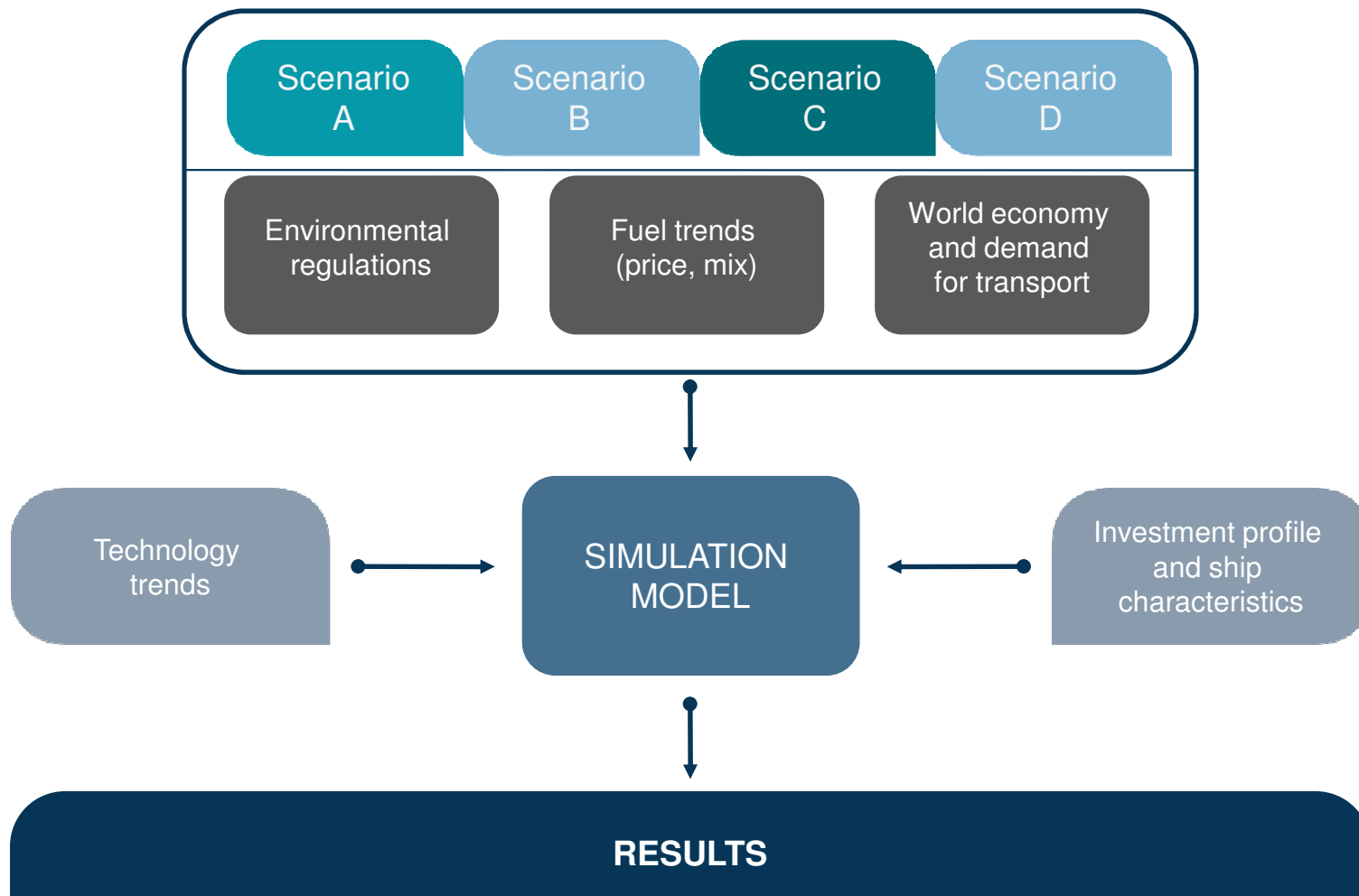
TECHNOLOGY INVESTMENTS IN THE NEW MARKET REALITY

# Scenarios have been created to capture uncertainties



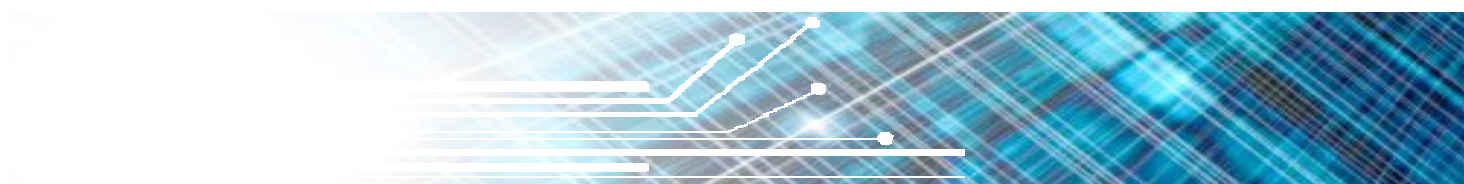


## ●●● The process – the big picture





## FINDINGS



## ●●● "Shipping 2020" – Summary

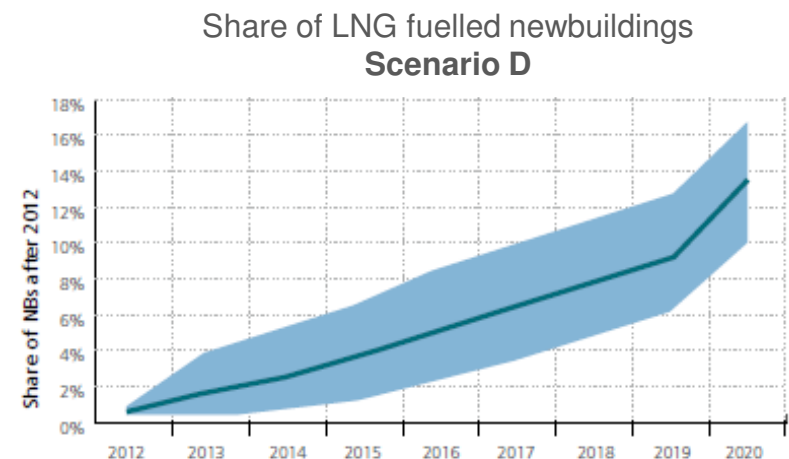
- More than 1 in 10 new buildings in the next 8 years will be delivered with **gas fuelled engines**
- In 2020, the demand for **marine distillates** could be as high as 200-250 million tonnes annually
- Newbuildings in 2020 will emit up to 10 to 35% less **CO2** than today's ships. The EEDI will be a driver for more than half of this reduction
- **Scrubbers** are a significant option after 2020
- **Ballast water treatment systems** will be installed on at least half of the world fleet
- At least 30-40% of newbuildings will be fitted with **EGR** or **SCR** by 2016



## ●●● Finding 1

### More than 1 in 10 new buildings in the next 8 years will be delivered with gas fuelled engines

- LNG price, sulphur limits and EEDI are the main drivers
- From 2012-2019 the LNG price is the main contributing factor
- When approaching 2020, EEDI and sulphur limits will create additional motivation for LNG as fuel
  - In Scenario D, 35% of newbuildings will be delivered with LNG engines
- In scenario D, we foresee about 1,000 newbuildings from 2012-2020 and some 6-700 retrofits





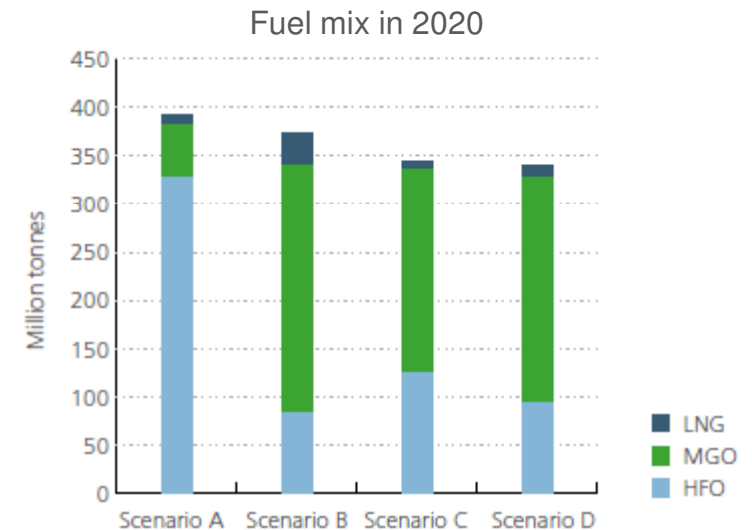
No ships on distillates

40,000 ships on distillates

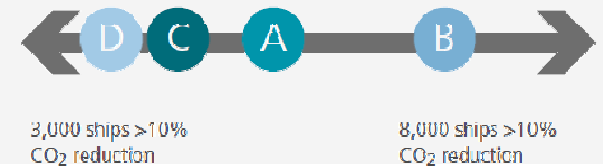
## ●●● Finding 2

In 2020, the demand for marine distillates could be as high as 200-250 million tonnes annually

- A 0.1% limit in ECAs (2015) is expected to increase the demand to 45 million tonnes
  - The current annual global demand for marine distillates is about 30 million tonnes
- With a global sulphur limit HFO demand may drop from 300-350 million tonnes to only 80-110 million tonnes in 2020
  - Depends on the number of scrubbers in use
  - The use of LNG will not significantly impact the demand of other fuels
  - Energy efficiency measure will only slow the fuel demand in the short term



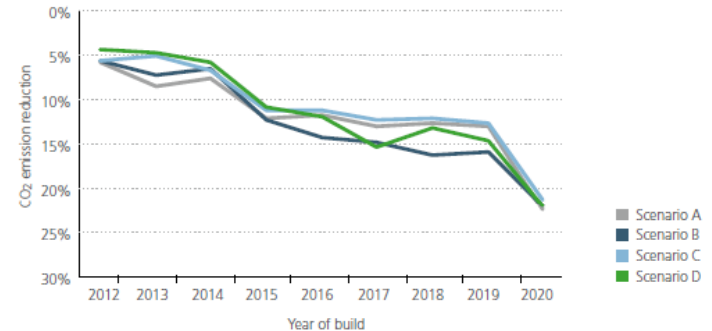
●●● Finding 3



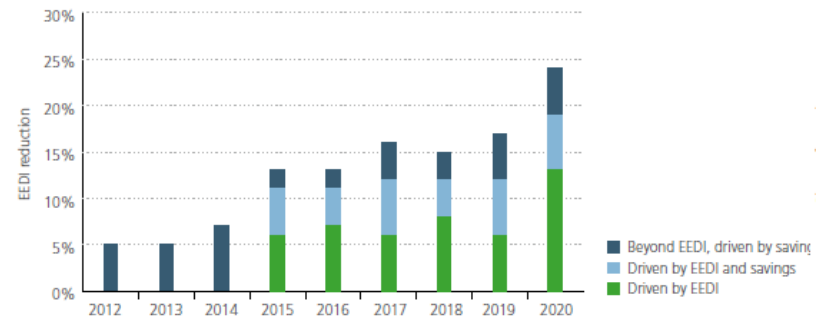
Newbuildings in 2020 will emit up to 10 to 35% less CO<sub>2</sub> than today's ships. The EEDI will be a driver for more than half of this reduction

- Phase 0 of EEDI (2013) will encourage cost-effective measures
- In Phase 1 (2015) and 2 (2020), up to half the reductions are motivated by EEDI alone
  - Due to short investment horizon and low fuel burden, these reductions are not cost effective for the ship owner
  - But in the long-term these are cost-effective
- Small differences between scenarios
  - Fuel prices are already so high that any variation does not affect uptake
- Operational measures not included

CO<sub>2</sub> emission reduction on newbuildings



EEDI reduction on newbuildings



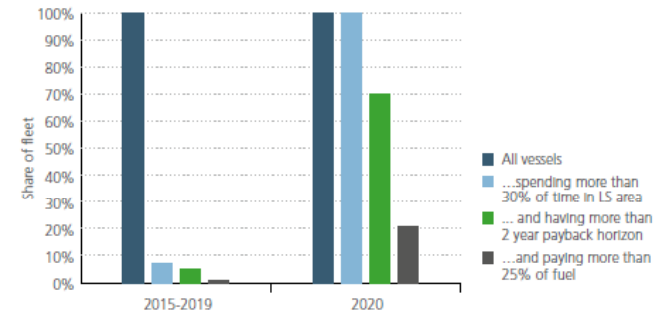
●●● Finding 4



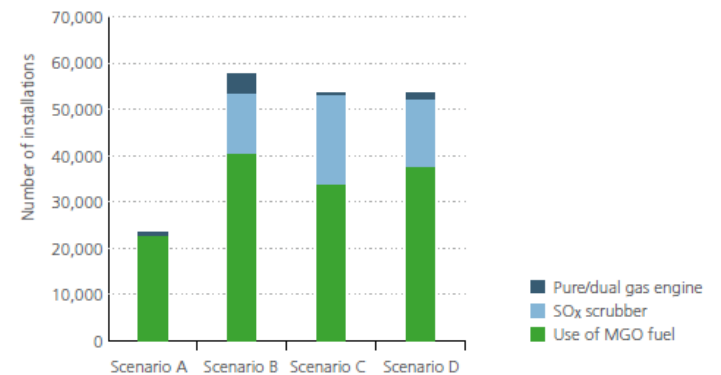
## Scrubbers are a significant option after 2020

- Few ships spend more than 30% of their time in and ECA justifying a scrubber before 2020
- In 2020, with the global sulphur requirements, scrubbers become a significant solution
  - Scrubbers can be retrofitted and can take 25% of the market, 15-20,000 ship
  - Still, 70% of ships will run on distillates
  - In the short term LNG can only take a small part of the market
- Uncertainty about the 2020 limit will slow technology development and uptake

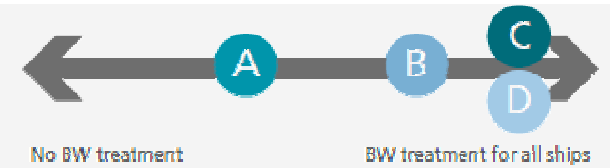
Ship owner investment profile



SOx reduction options in 2020



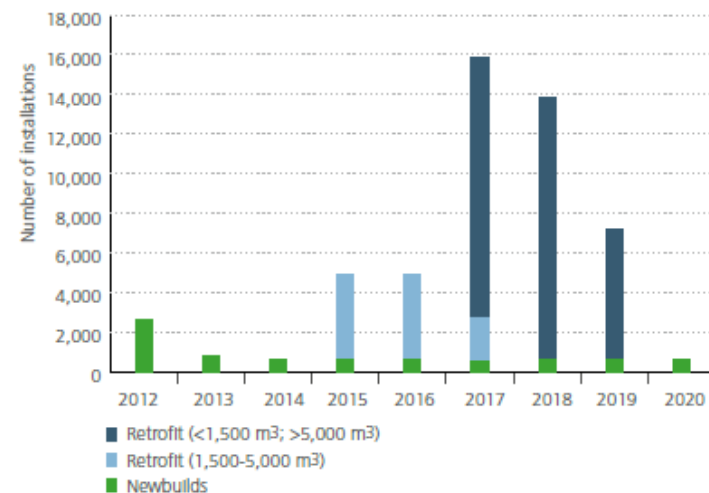
●●● Finding 5



## Ballast water treatment systems will be installed on at least half of the world fleet

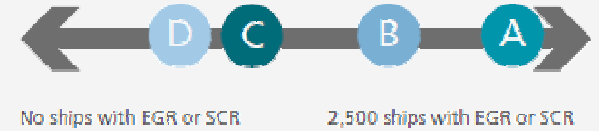
- The Ballast Water Management Convention has not yet entered into force, but
  - The schedule for mandatory treatment of BW is fixed (2019)
  - The US has decided to implement a similar scheme for all ships in US waters (2013)
  - Other countries have local requirements
- This will motivate a significant part of the world fleet to implement a treatment system irrespective of BWMC progress

Annual expected ballast water treatment installations



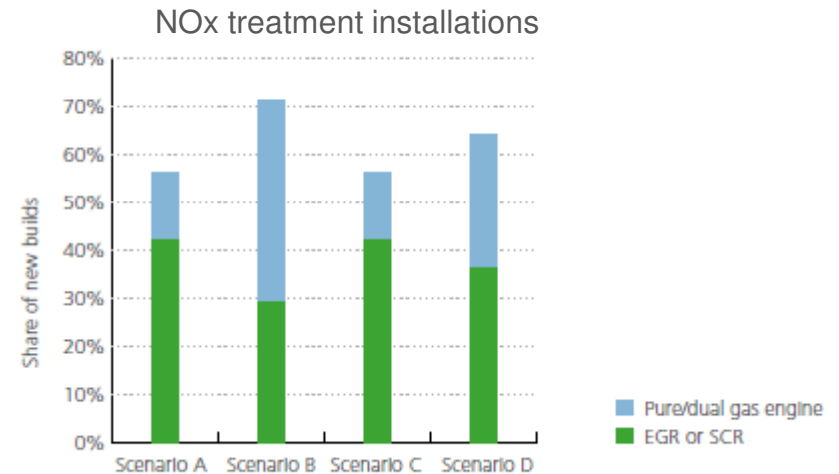


●●● Finding 6

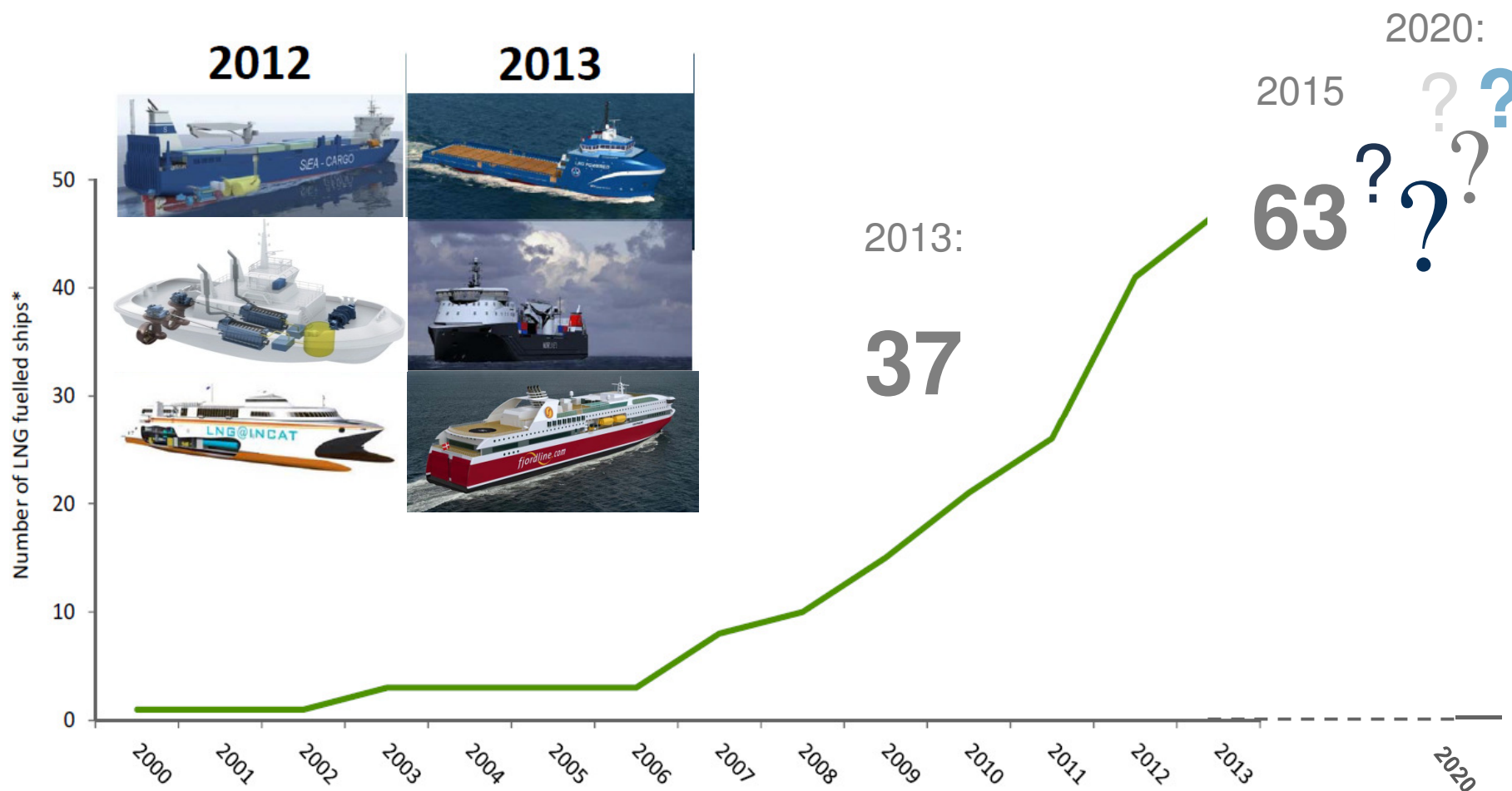


## At least 30-40% of newbuildings will be fitted with EGR or SCR by 2016

- Both EGR and SCR are currently under development and need more time to mature
- LNG is an alternative but does not seem to replace more than 25% of EGR or SCR installations
  - Dependent on LNG price
- Will a ship owner will opt for a Tier III engine even if the ship is initially not planned for sailing in an ECA?
  - Lower second-hand value due to the loss of geographic flexibility

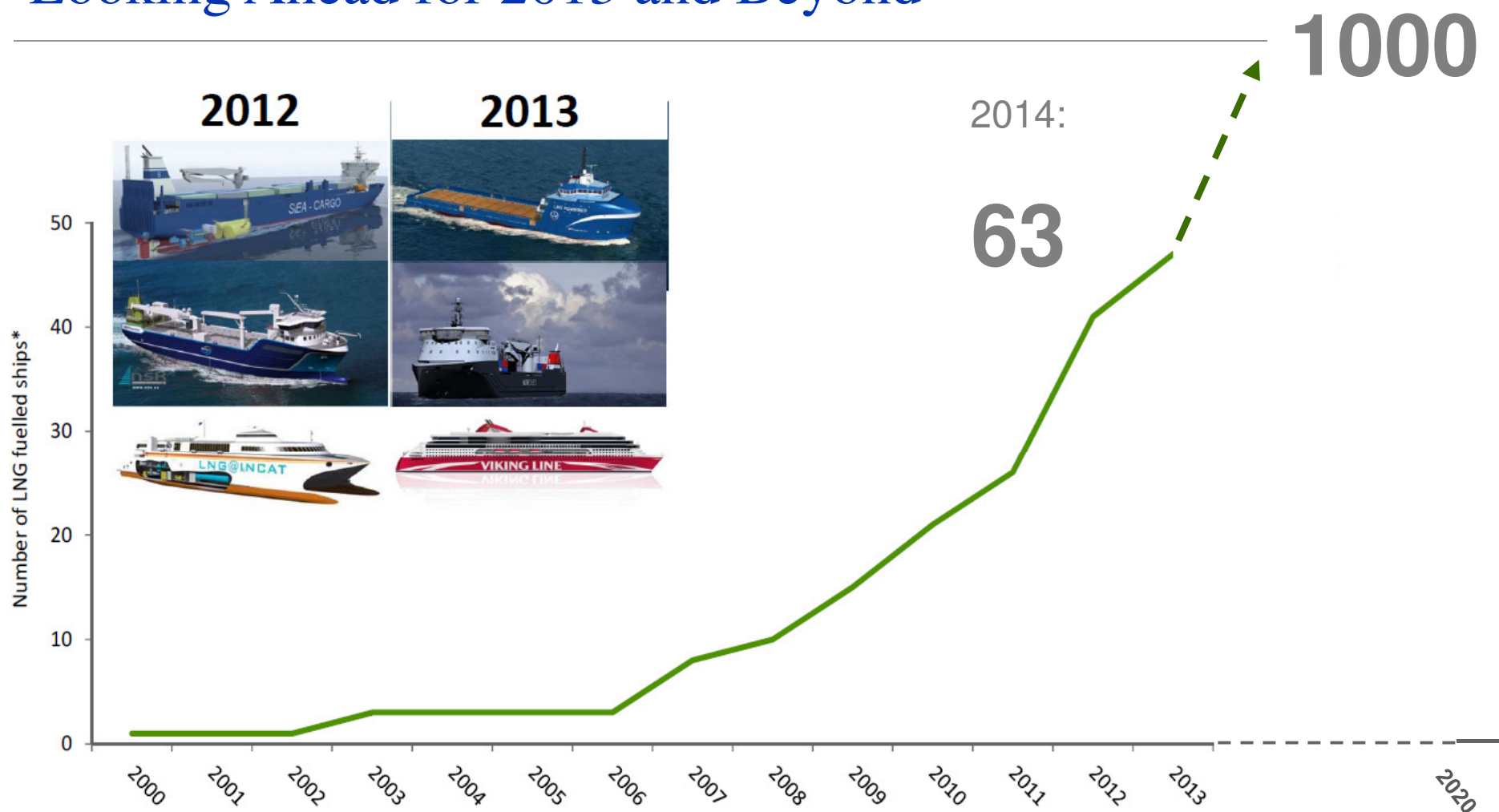


# LNG Vessels in Operation as of Today



# Looking Ahead for 2013 and Beyond

2020:



# Some vessels in Operation on LNG Fuel. Total 31



**MF Bergensfjord**

23,5 knop

Ferries (12)

- Capacity: 587 pax / 212 cars
- Engine: Rolls Royce, Bergen KV-GE



Ferries (3)

- Capacity: 600 pax
- Engine: Mitsubishi



Patrol Boats (3)

- Engine: Mitsubishi



Offshore Supply Vessels (7)

- Engine: Wartsila Dual Fuel

## Some Vessels on Order: Total 38



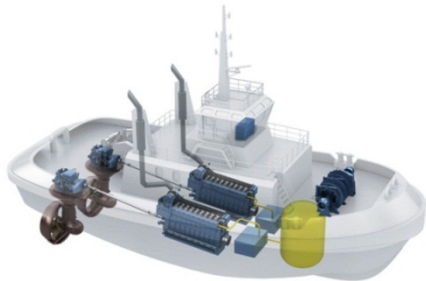
2 Cruise RoPax Ferries

- Main Engine: Rolls Royce
- Capacity: 3500 Pax / 306 cabins



1 Fish Farm Product Vessel

- Engine: Rolls Royce
- Dwt: 2650 tonnes



Tug (1)

Engine: Rolls Royce  
Bollard Pull: 65 tonnes



Ro Ro Containers (2)

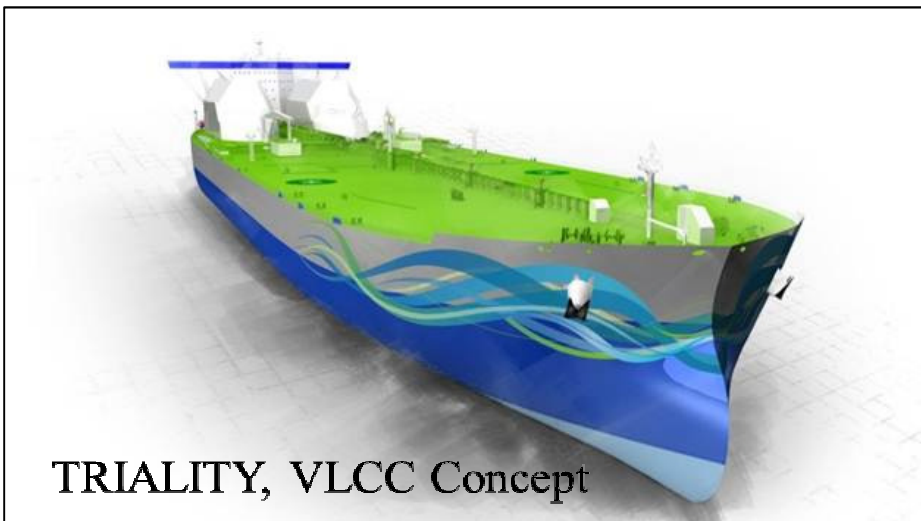
Capacity: 94 TEU  
Engine: Rolls Royce



High Speed Light Craft, 50 knots (1)

Capacity: 1000 Pax  
Engine: GE Gas Turbine

# ...with visions and technologies: DNV extraordinary innovation projects



# Further Considerations for LNG as a fuel

- Safety
- Security
- Local state and public awareness
- Supply
- Refueling methods
- Economy:
  - Ship
  - Port
  - Provider of LNG
- The LNG market



*Illustration by IM Skaugen*

# Developing LNG Bunkering Infrastructure

Small scale LNG infrastructure can be set up in a number of ways:

- 1) Coastal Shore Storage Permanent or Mobile ISO tanks
  - Replenishment by trucks, rail or feeder vessels
- 2) By trucking or small LNG carriers (up to 200m<sup>3</sup>)
  - Subject to weather and terrain. Limitations > 200 miles is questionable.
  - DOT driver regulation: 11 hrs / day & 70 hrs per week.
  - Issues concerning confidence on supply.
- 3) By small scale liquefaction plants with a natural gas pipeline grid in the vicinity
  - Permitting is needed





# Safeguarding life, property and the environment

[www.dnv.com](http://www.dnv.com)

