



Norwegian Centres of Expertise

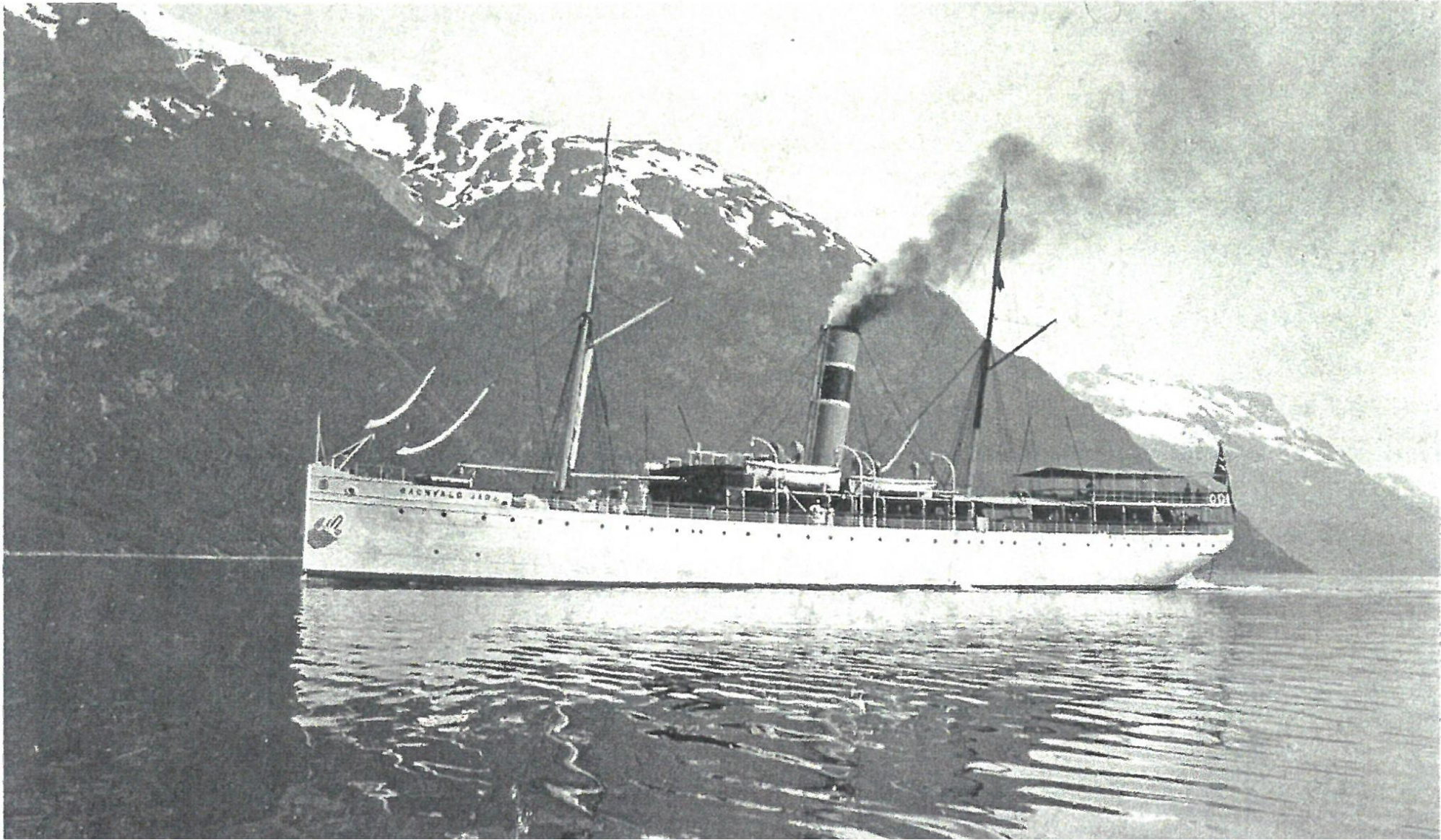
# NCE Maritime CleanTech

Norways's maritime industry at the forefront of green technology

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## EMISSIONS

- A key challenge that the maritime industry will have to tackle in coming years is the reduction of greenhouse gas emissions.
- Increasing worldwide trend towards lower emissions of CO<sub>2</sub>, NO<sub>x</sub> and particles



## STRICTER REGULATIONS

- National and international.
- IMO agree to reduce 50 % GHG emissions by 2050.
- 0.5 % Sulphur cap in ship fuel by 2020,



## SUBOPTIMAL UTILISATION

- Better use of capacity will reduce emissions.
- LNG, LPG, methanol, biofuel and hydrogen as alternative fuels for shipping.
- Battery, fuel cell and wind assisted propulsion.



## OUTLET TO SEA

- Grey water not regulated.
- Sewage regulations are weak.
- Wash water from exhaust scrubbers not regulated.



## STRICTER REGULATIONS

- New national rules suggested – within 2018.
- Outlet of sewage and grey water suggested banned in the Unesco Fjords.
- Exhaust scrubber wash water to be regulated.



## SUBOPTIMAL UTILISATION

- Avoid congestion / gap on number of passengers



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# NCE Maritime CleanTech

## EQUIPMENT AND SERVICE SUPPLIERS



## YARDS



## SHIP OWNERS



Through cluster cooperation we create new innovative and competitive solutions for the maritime sector that reduce harmful emissions to air and sea.

## POWER COMPANIES



## R&D AND EDUCATION



## PUBLIC SECTOR



## STAKEHOLDERS - REGULATORS



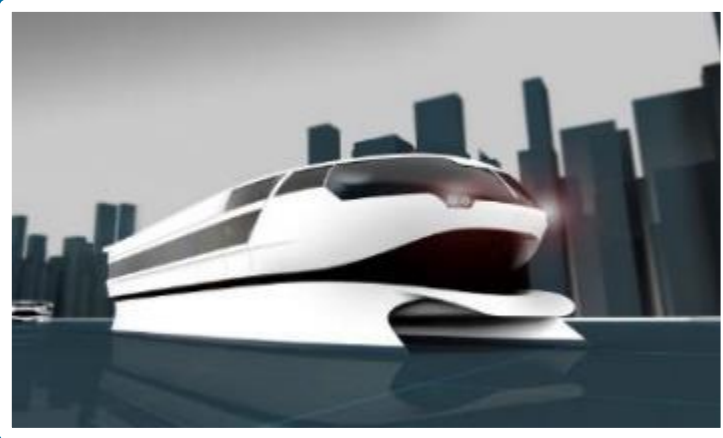
## FINANCE & LAW



# Cleaner maritime concepts



Cargo vessels



Passenger transport



Fishing / fish farm vessels



Offshore vessels



Car ferries



Inductive charging

# Cluster resource group for cruise



- Defines areas of priority for the cluster
- Provides political inputs to relevant strategies and regulations.
- Develops sustainable concepts for greener cruising.

