

NÆRINGSLIVETS  
**NOx-fond**

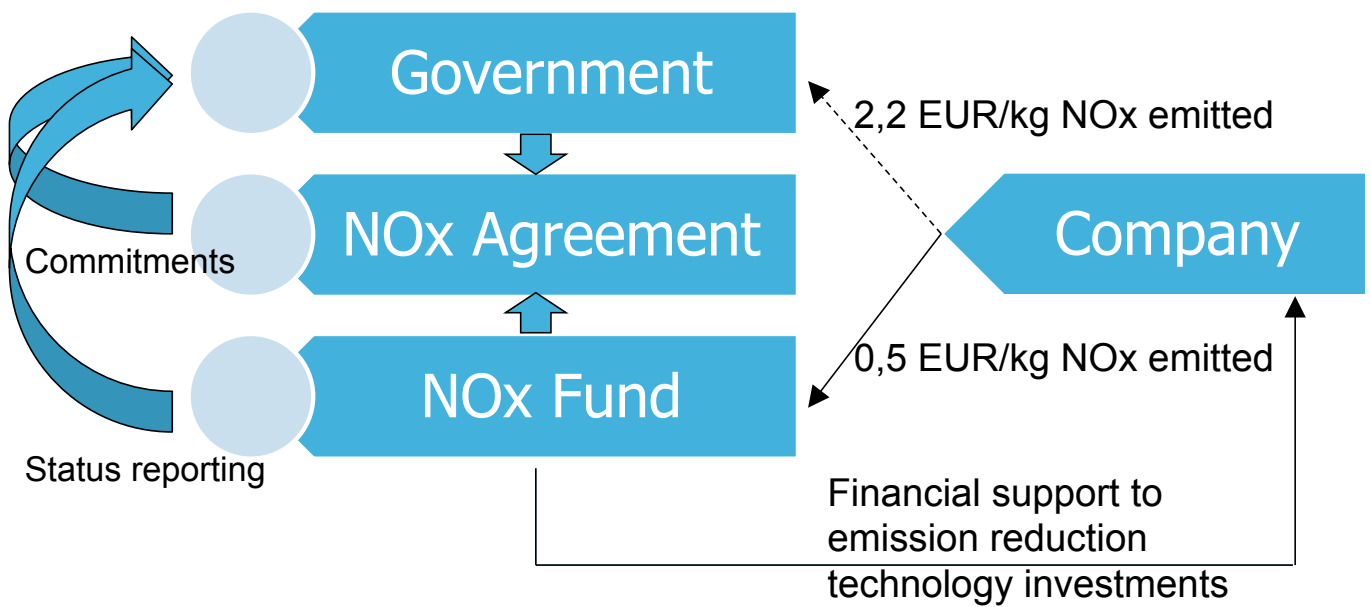
# **Emission reductions through the Norwegian NOx Fund**

**Tommy Johnsen  
Managing Director  
Business Sectors NOx Fund**

## **Environmental NOx-Agreement 2008 - 2017**

- Agreement between 15 Norwegian business organizations and the Ministry of the Environment
- Notified at EFTA Surveillance Authority
- Affiliated enterprises are entitled to exemption from the Norwegian fiscal NOx tax of 19 NOK (= EUR 2,2) per kg NOx
- Instead they pay lower rates into the fund:
  - Oil and gas production: 11 NOK (= EUR 1,3)
  - Shipping and others: 4 NOK (= EUR 0,5)
- 861 affiliated enterprises have joined, which gives the NOx Fund an annual income of approximately 650 mill. NOK (EUR 75 mill.)

# Principle illustration



## Who can get funding

- Objects subject to tax (Ships > 750 kW, power plants > 10 MW)
- Geographical operating area:
  - Between Norwegian ports
  - Between Norwegian offshore installations
  - Fishing in Norwegian economical zone (250 nm)
- Support is flag state independent
- Installation must be completed by end 2017

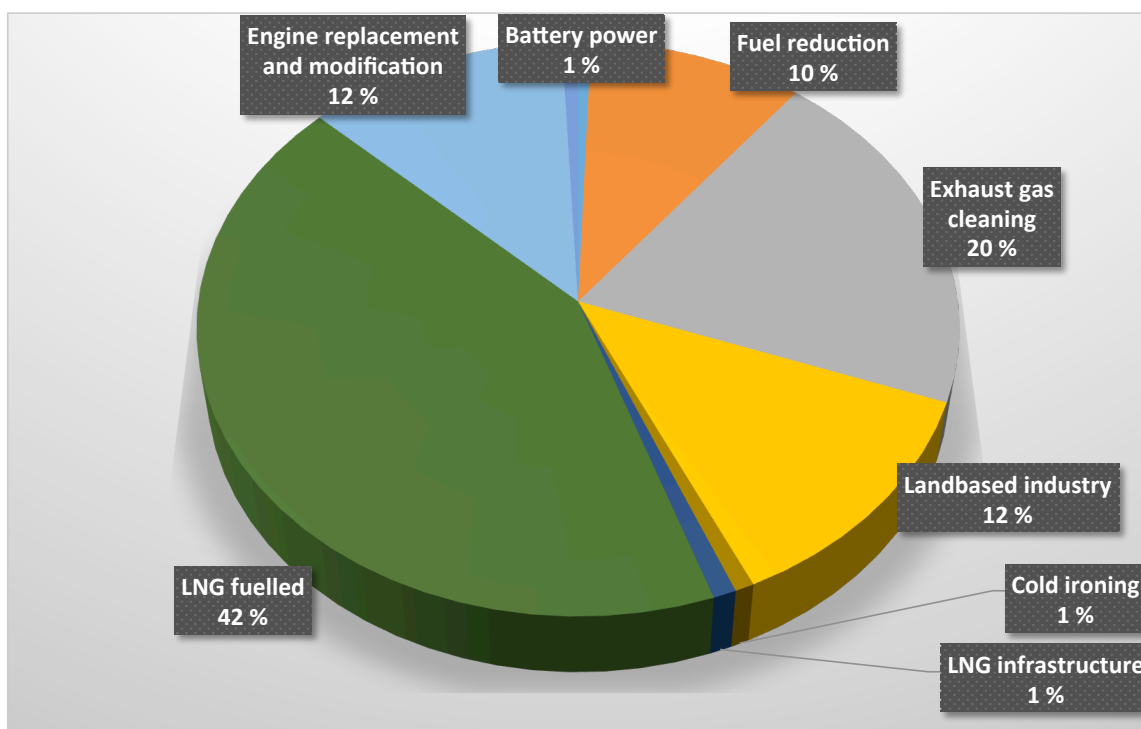
## Funded Technologies

- LNG/gas fuelled ships and power plants
- Shore power to ships et berth
- Battery power
- Exchange to new engines or modification of old
- Exhaust gas cleaning (SCR, SNCR, EGR...)
- Reduction of fuel consumption **–not for newbuilds** ( improvements of rudder, propeller, energy consuming equipment)

# Support

- Investment support
- Current support rates are 100–300 NOK (=EUR 12–36) per kg NOx
  - SCR = 100 kr/kg NOx reduced
  - All other technologies= 200 kr/kg NOx reduced
  - Batteri = 300 kr/kg NOx reduced
- Max. 80% av investment cost
- Funding is paid according to actual achieved NOx-reductions after technology is installed and verified

## Funding so far distributed on measure type (~ 5000 mill. NOK = EUR 550 mill)



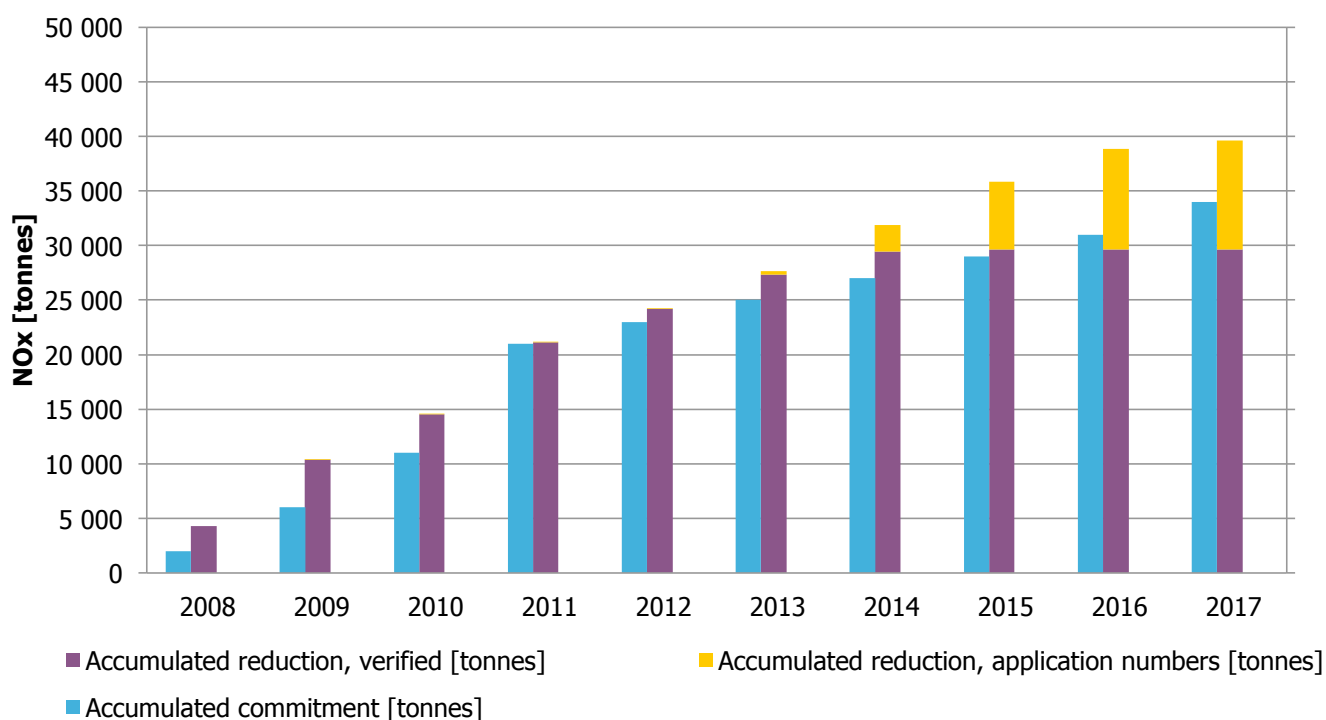
# The NOx-fund's project portfolio

- 910 projects, of which 650 is completed
- Support per project varies from 0,05 – 100 mill. NOK (up to 11 mill. EUR)
- 80% of project are on ships





# NOx reductions and commitments



In addition annual CO<sub>2</sub>-emissions are reduced with **500 000 tons!**

## The NOx Fund after 2017

- Norwegian government and business organisations agree to start negotiation to continue beyond 2017
- Prolonged 5-10 years
- Must be re-notified by ESA
- Expected to be in place during 2016

# Project examples and support rates (1)

- "Ampere": Fully battery powered ferry
- 10 mill. NOK (= EUR 1,1 mill.)



## Project examples and support rates (2)

- Hurtigruten "Midnattsol": More fuel efficient low NOx engines
- 12 mill. NOK (= EUR 1,4 mill.)



## Project examples and support rates (3)

- "Clipper Viking": Scrubber with EGR
- 10 mill. NOK (= EUR 1,1 mill.)



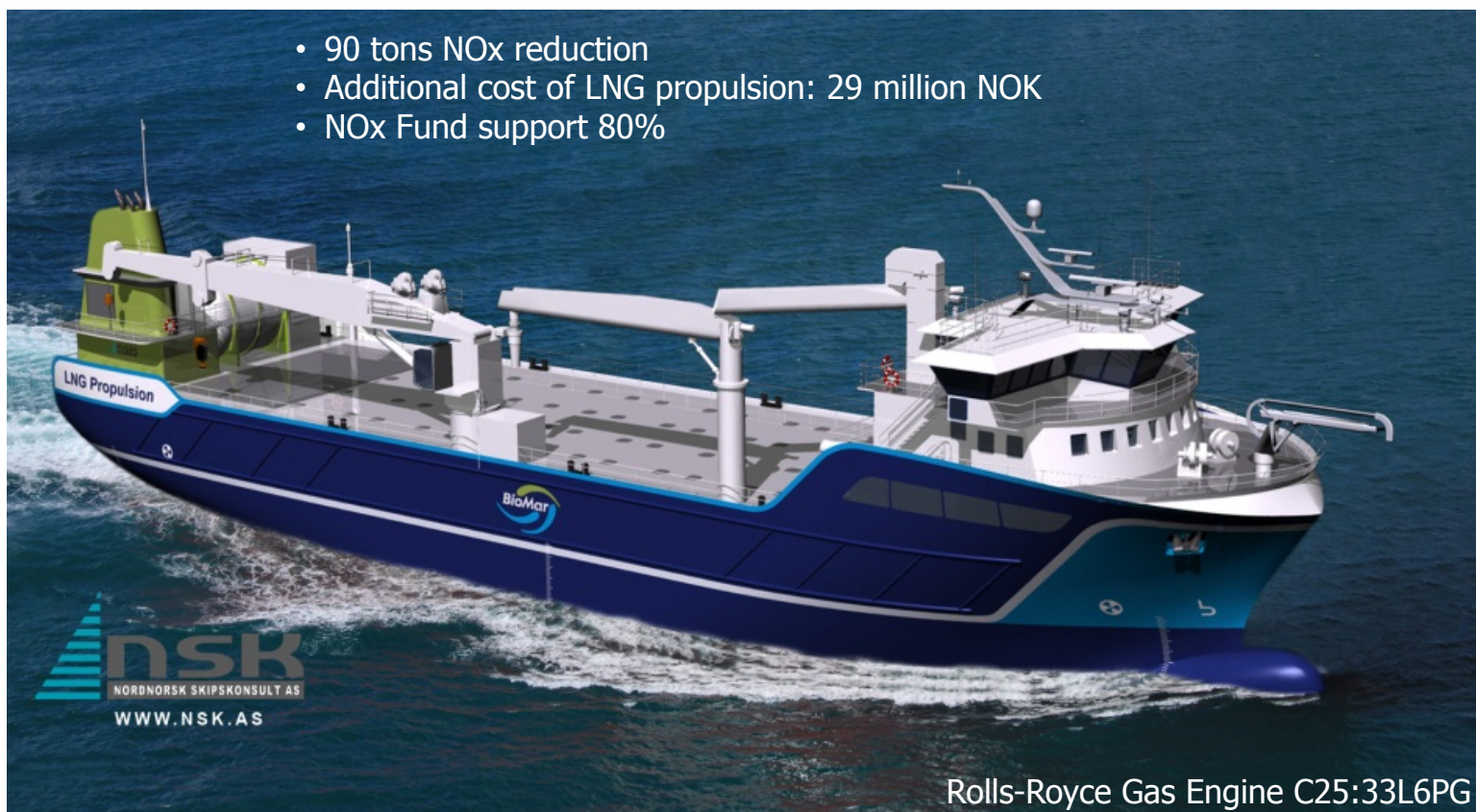
# LNG propulsion of ships

- In 2008 only 3 ships except ferries were running on LNG
- The NOx Fund has granted support to **70 ships**, converted to LNG or newbuilds. 42 have been delivered so far.
- In total Norway will have more than 80 LNG ships in a few years time (incl. Ferries on Government demand)
- LNG is used in various ship segments
  - Ferries
  - Cargo
  - Plattform Supply Vessels
  - Ro-pax
  - Tankers
  - Tugs



# NSK's cargo ship "Høydal"

- 90 tons NOx reduction
- Additional cost of LNG propulsion: 29 million NOK
- NOx Fund support 80%



# More ships on LNG

## Viking Prince (PSV)

- 161 tons of NOx reduction
- 80% support from the fund of LNG costs
- Sister ship Viking Princess



## Fjordline ferries x 2

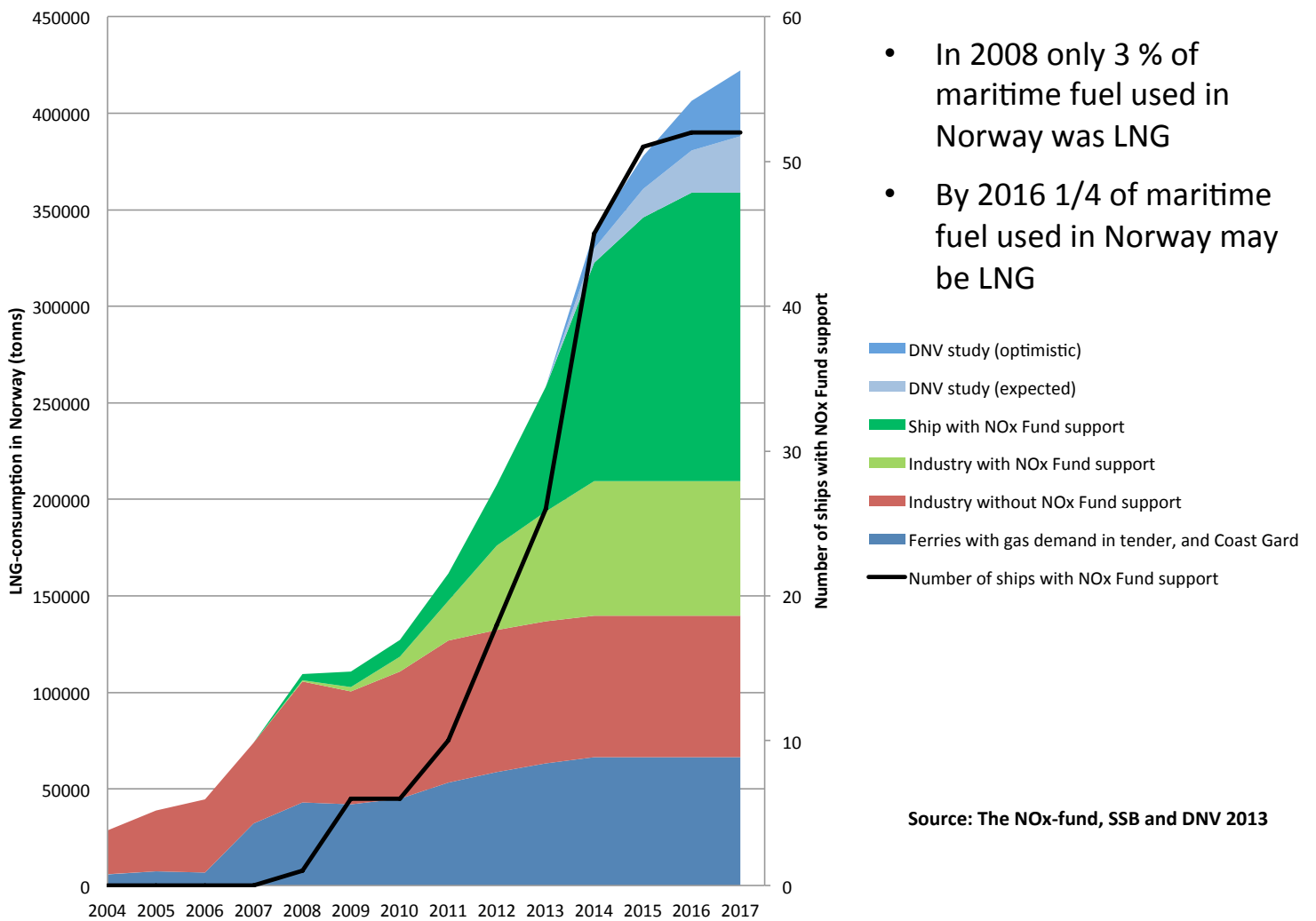
- 321,8 tons NOx-reduksjon x 2
- Granted 90 million NOK from the NOx-fund x 2 and from EU's TEN-program



# Development of LNG market in Norway

- In 2008 only 3 % of maritime fuel used in Norway was LNG
- By 2016 1/4 of maritime fuel used in Norway may be LNG
- The NOx Fund works to improve the functioning of the LNG market in Norway.

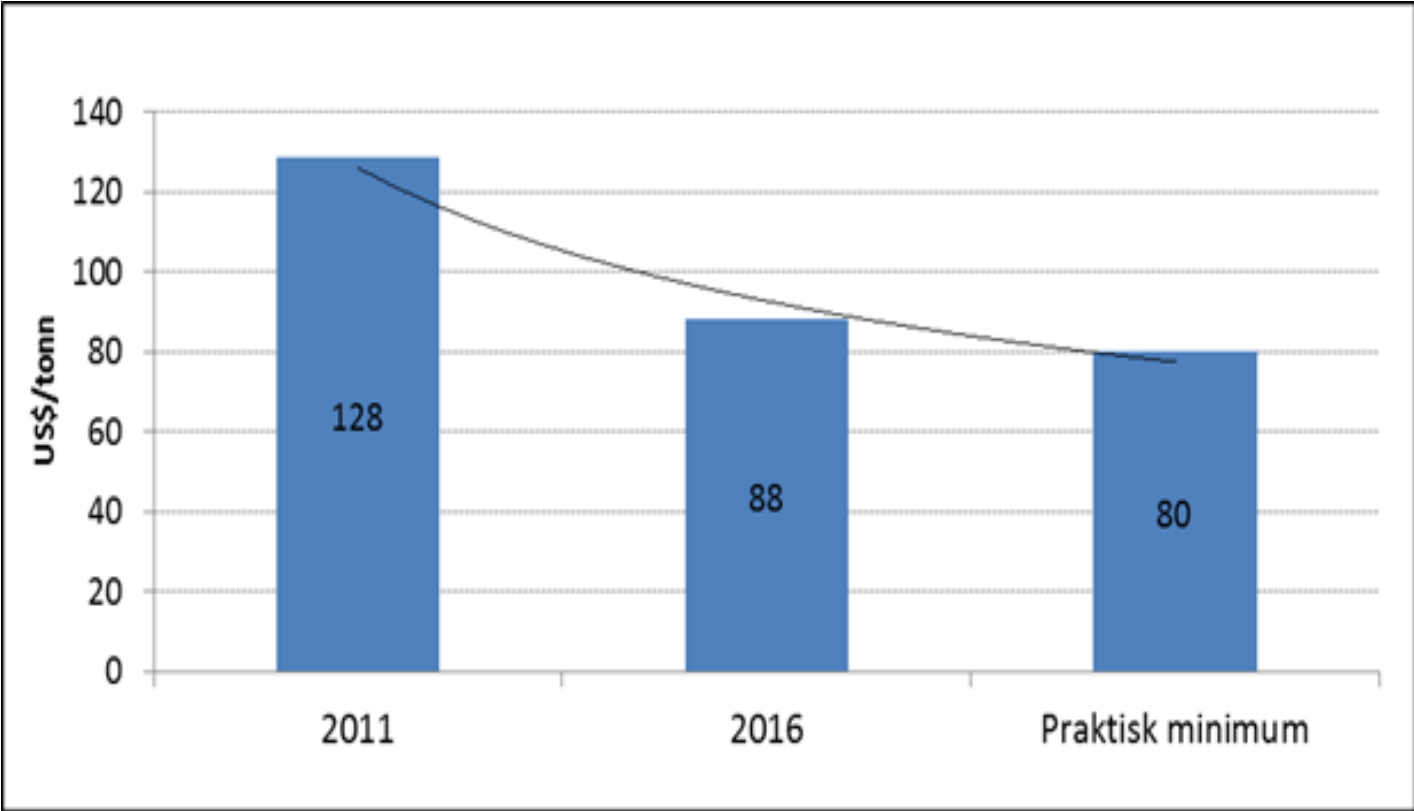
## LNG-consumption in Norway 2004-2017



- In 2008 only 3 % of maritime fuel used in Norway was LNG
- By 2016 1/4 of maritime fuel used in Norway may be LNG

Source: The NOx-fund, SSB and DNV 2013

# Costs of distribution of LNG in Norway



Sorce: DNV  
2013

## **A typical LNG contract in Norway 2015**

- MGO price - X %
- €/MWh differentiated by harbour
- Local fees for transportation by LNG lorry in Norway

With present price of MGO, X is small  
Challenging to make LNG economically attractive  
Large volumes and more competition on the  
supplier side is also needed

# Thank you!

For more information, please go to:

[www.nho.no/nox](http://www.nho.no/nox) or

[www.nho.no/nox/english](http://www.nho.no/nox/english)

