Emission reductions through the Norwegian NOx Fund

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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

Government

NOx Agreement

NOx Fund

Company

2.2 EUR/kg NOx emitted

Company

0.5 EUR/kg NOx emitted

Financial support to emission reduction technology investments

Commitments

Status reporting
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 independant
- Installation must 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 CO2-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 "Midnattssol": 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
  - Platform 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%

Rolls-Royce Gas Engine C25:33L6PG
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

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Source: The NOx-fund, SSB and DNV 2013
Costs of distribution of LNG in Norway

Source: DNV 2013
A typical LNG contract in Norway 2015

- MGO price - X %
- €/MWh differented 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 or
www.nho.no/nox/english