

NÆRINGSGLIVETS  
**NOx-fond**

# **Economic measures for innovation – effects of the Norwegian NOx-fund**

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Gothenburg 5<sup>th</sup> of April 2011**

# **NOx tax in Norway in 2007**

## **Fiscal NOx tax**

- Fiscal NOx tax 1<sup>st</sup> of January 2007 of 1,9 € per kg NOx
- Engines exceeding 750 kW and boilers over 10 MW are subject for taxation

## **Environmental Agreements 2008-2010 and 2011-2017**

- On the 14<sup>th</sup> of May 2008, 14 business organizations and the Ministry of the Environment signed the Environmental Agreement on NOx. Approved by ESA 15. July 2008.
- The NOx-Agreement was prolonged to 2017 on 14. December 2010. Notification to ESA under way.
- The Business Sector's NOx Fund has to fulfill the obligations in the Agreement

# Affiliation

- Affiliation to NOx Agreement makes enterprises entitled to exemption from fiscal NOx tax
- All enterprises subject to NOx tax may be affiliated, both foreign and Norwegian
- 648 affiliated enterprises by December 2010.
- 430 have affiliated for the periode 2011-2017 by 28. of March
- Over 1700 registered ships

# The Business Sector's NOx Fund

- Affiliated enterprises pay to the NOx Fund per kg NOx emitted
  - Oil and gas producers pays 11 NOK per kg
  - All other sectors pays 4 NOK per kg (e.g. fishing, offshore supply vessels, ferries, airlines, cargo, railways, land based industry)
- The Fund has about 1 800 mill. NOK available for support of NOx reducing measures from 2008 to end of 2011.
- Further funds will be available as soon as the new Agreement has been approved by ESA
- 530 applications has been granted support or are verified, giving NOx reductions of about **23 000** tons from 2008 until 2011

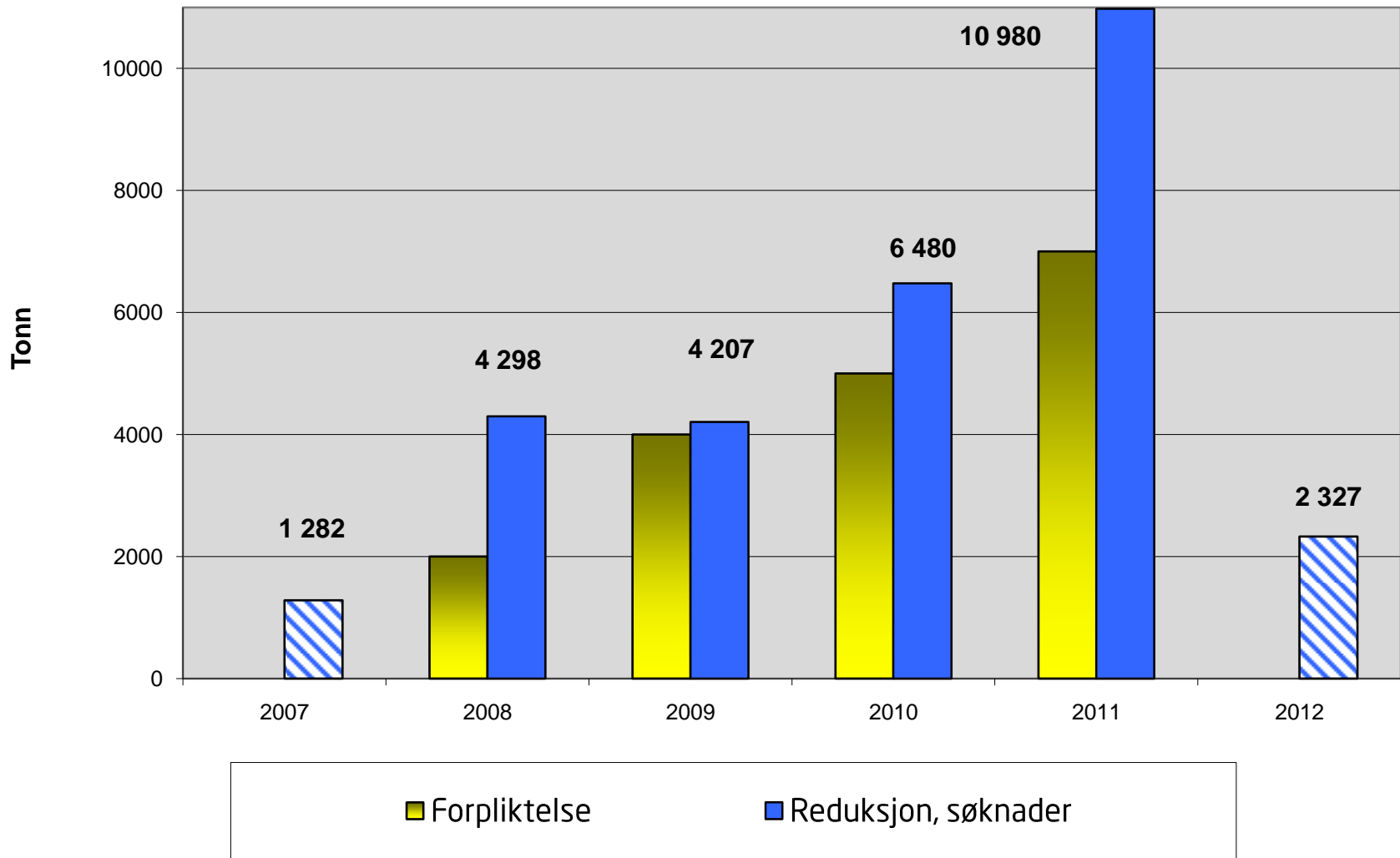
# NOx- commitments

- Emissions should come below **98 000** tons by the end of 2011. Implicated reductions of 31 000 tons when we started.
- **14 000** tons comes from improved data and updated forecasts
- About **19 000** tons in actual reduction,
  - 1000 tons in 2006/7
  - 2000 tons in 2008
  - 4000 tons in 2009
  - 5000 tons in 2010
  - 7000 tons in 2011

2011 - 2017 **16.000** tons



# NOx reductions compared with obligations



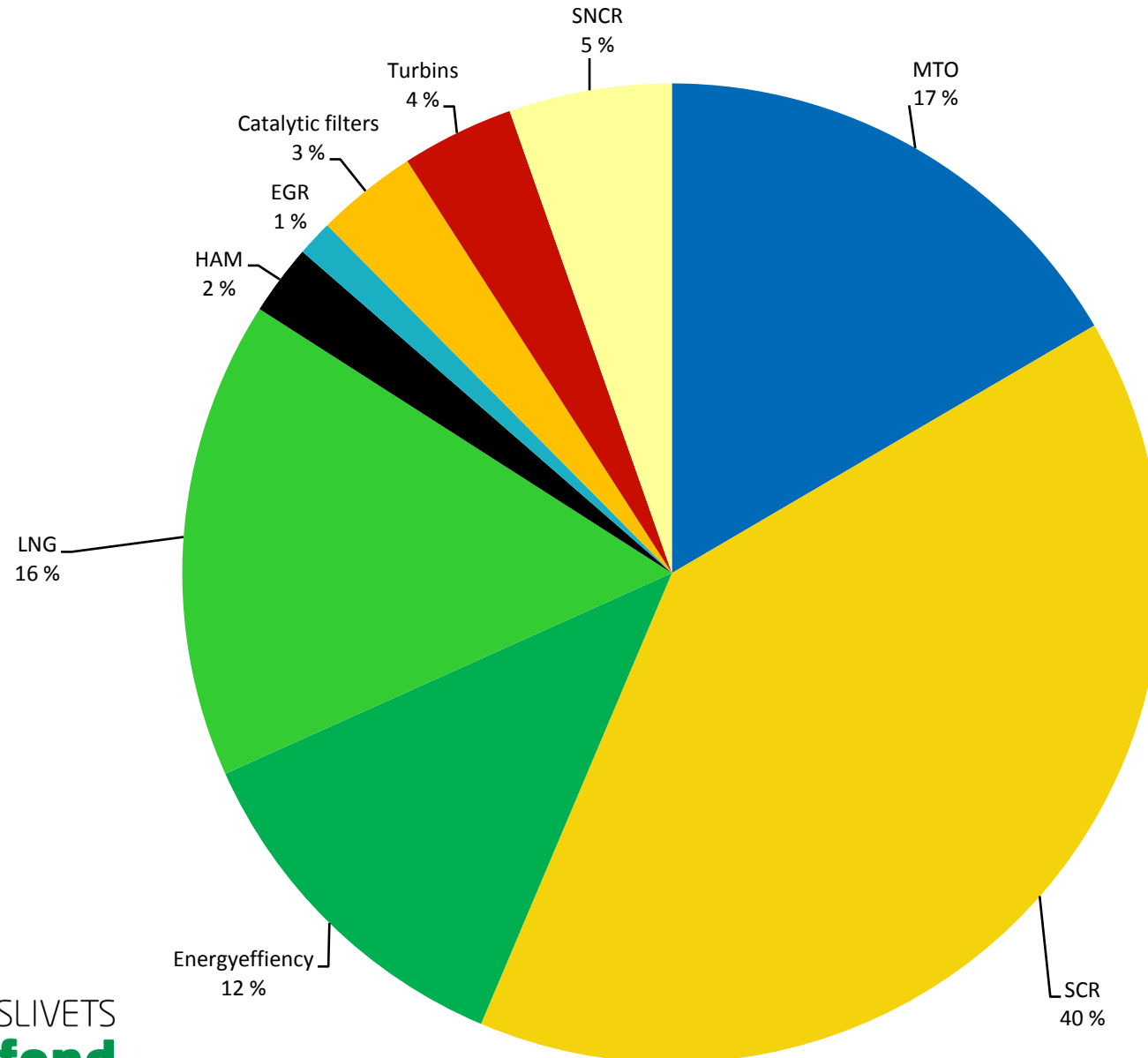
# How to get NOx effect:

Fuel consumption x emission factor

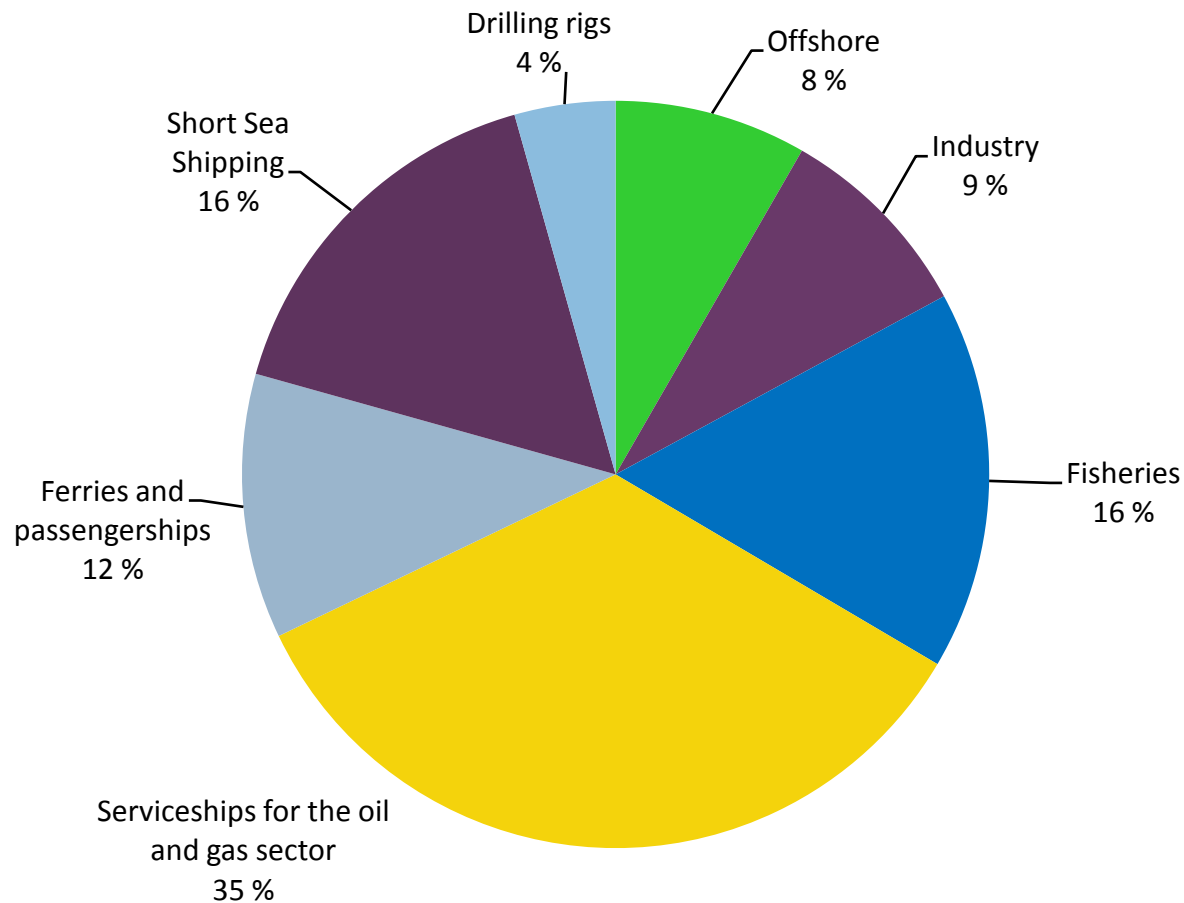
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NOx emission in kilos

# NOx reductions by measure

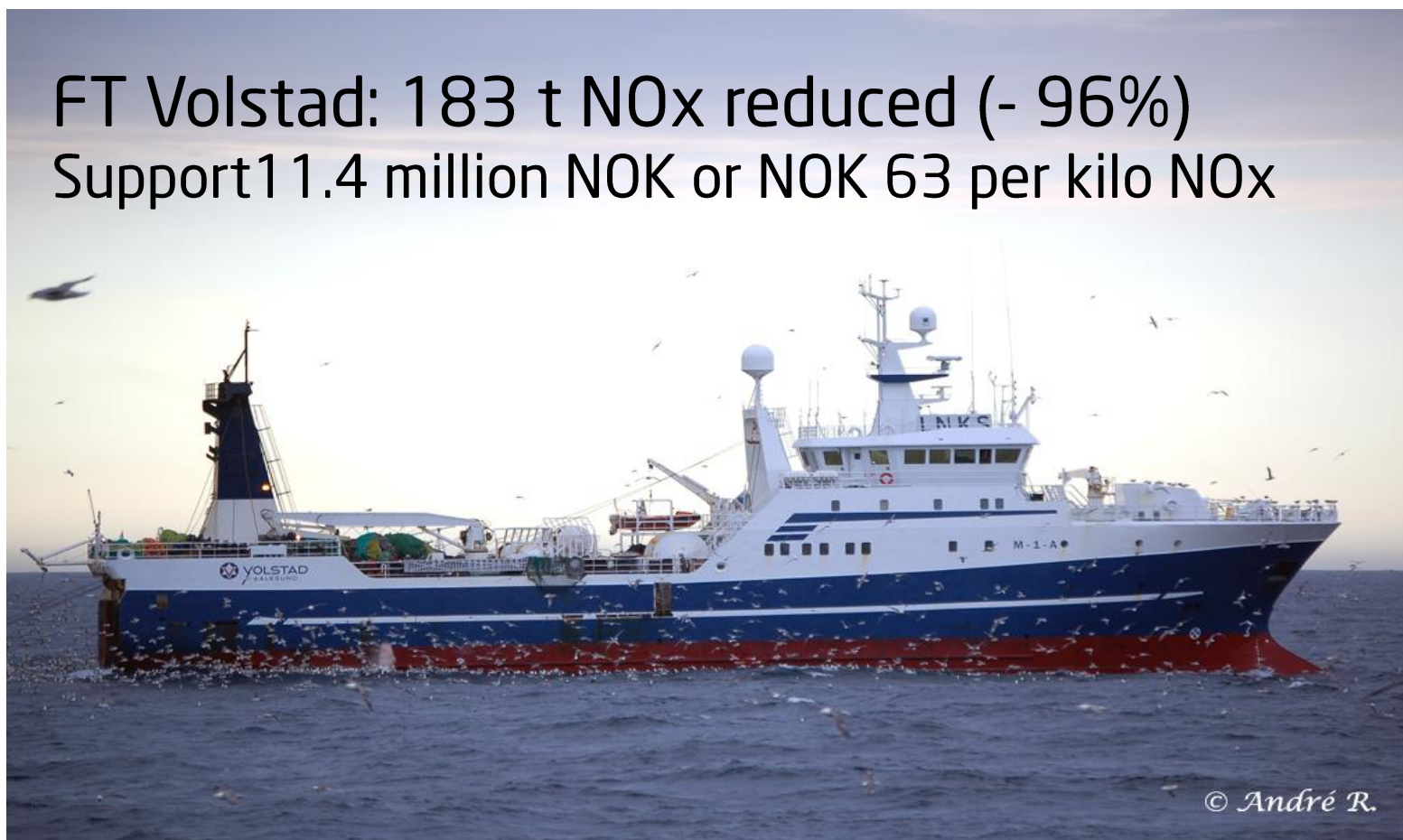


# NOx reduction by sectors



# Fishing boat owners active early

FT Volstad: 183 t NO<sub>x</sub> reduced (- 96%)  
Support 1 1.4 million NOK or NOK 63 per kilo NO<sub>x</sub>



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# Support rates projects

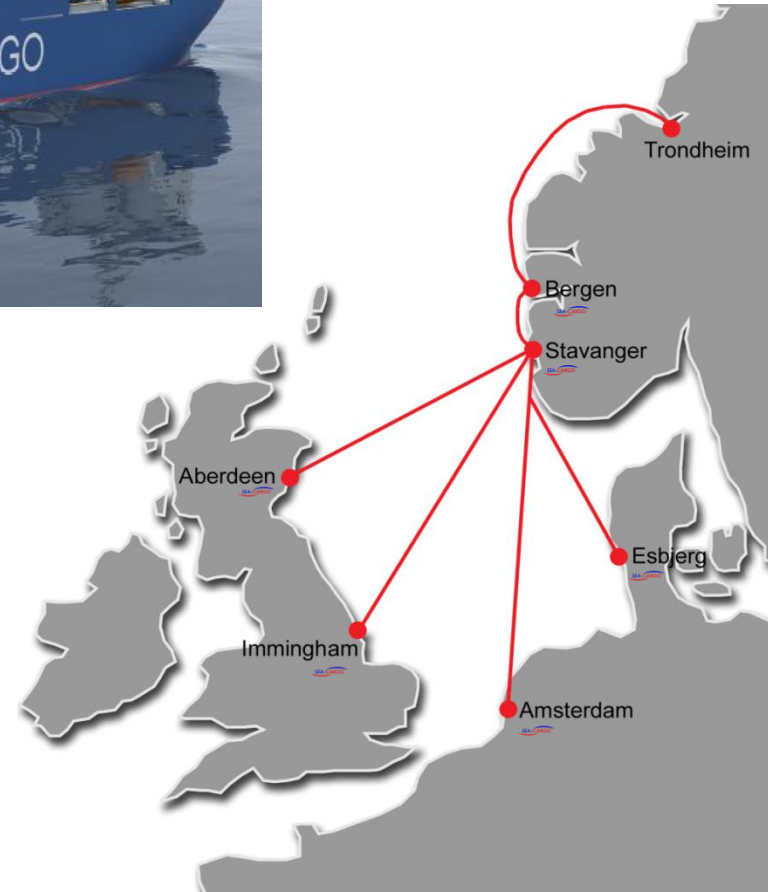
- Support to cover additional costs of investing in gas/LNG propulsion in shipping (up to 75 % of investment cost and up to 150 NOK per kilo NOx reduced) in 2008 - 2010
- Support to cover additional costs of investing in gas/LNG propulsion in shipping (up to 80 % of investment cost and up to 350 NOK per kilo NOx reduced) in 2011 - 2015
- Support possible also for infrastructure for LNG from 2011
- Other measures 225 NOK up to 80 % of costs
- Payments from the fund take place post implementation and documentation of the effects of measures
- Costs and effect of measures has to be documented by the companies and verified by DNV

# Gas propulsion

Sea-Cargo revised contract from diesel to gas in May 2008



- 2 ships granted support for the additional cost of gas propulsion
- Granted 52 million NOK for reductions of 200 and 146 tons NO<sub>x</sub>
- - 92 % NO<sub>x</sub>, -23 % CO<sub>2</sub>, zero emissions of SO<sub>x</sub> & Particulate



# LNG conversion (Dual Fuel)

## Tarbit Shipping AB - MT BIT Viking

- NOx reduction  
479 tons (- 85%)
- Support 45,8 mill. NOK  
(75% of cost)
- 100 NOK per kilo NOx  
reduced
- Supplier:  
Wärtsilä, Sweden



# 32 ships planned converted or built using LNG propulsion

- In 2008 only 3 ships except ferries were based on LNG
- The NOx Fund has granted support to 24 ships, converted to gas or new buildings. 14 will come on stream in 2011. 4 in 2012. 8 more have applied for support after 2012.
- In 2008 only 3 % of maritime fuel sold in Norway was LNG. In 2016 it can be 16 %
- By 2020 DNV and MARINTEK expect 1/3 of maritime fuel in Norway could be LNG if the NOx Fond and its support continues

# 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)

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# Background - the Baltic Sea is slowly dying

- Multiple pollution sources
  - Agricultural runoff
  - Untreated wastewater
  - Ship emissions
- Extremely vulnerable sea
  - Shallow waters
  - Low water exchange rate
  - Algal blooms caused by pollution
- More than 2,000 ships operating at any time, 10 000 ships yearly
- Annual ship emissions:
  - SO<sub>x</sub>: 135 000 tonnes
  - NO<sub>x</sub>: 400 000 tonnes
  - CO<sub>2</sub>: 19 million tonnes
- Ship emissions equals
  - all land-based NO<sub>x</sub> from Denmark & Sweden combined
  - twice the SO<sub>x</sub> emissions from Denmark and Sweden combined

