The NOx Fund - an incentive scheme to reduce emissions of NOx in Norway

Saltsjøbaden VI, March 20 2018 – Tommy Johnsen
The NOx Fund in brief

The NOx Fund is owned by 15 business organizations to reduce NOx in Norway.

1. Enterprises pay a (lower) fee, to the NOx Fund instead of a (higher) fiscal tax to the State.
2. In return collective emission reduction obligations must be met. State sanctions if not.
3. Payments to the Fund is returned to the industry as investment support. Those that invest pay less after the measure is implemented.
Sources of emissions covered by the agreement

• NOx-taxed sources of emissions
  ❑ Propulsion machinery > 750 kW (ship relevant)
  ❑ Boilers > 10 MW
  ❑ Turbines
  ❑ Flaring

• Non-NOx-taxed companies with NACE codes covered by the agreement
  ❑ Landbased process industry
Emissions levels covered by the agreement

- Taxable NOx emissions
  - 85,000 tonnes (in 2017)

- Non-taxable NOx emissions from land-based industry
  - 14,000 tonnes (in 2016)
    - The 10 largest sources (factories) of emissions account for 80% of emissions

- The total of approx. 100,000 ton is about 60% of national emissions
Emission levels and emission ceilings

Historische og estimerte fremtidige NOx-utslipp og utslippstak i NOx-avtalen 2018-2025

- Historisk utslipp, inkl. prosessindustri
- Estimert utslippsutvikling
- Utslippstak

Tonn NOx

# Technologies and support rates

<table>
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<tr>
<th>Measure Type and Support Rate</th>
<th>250 NOK/kg NOx reduced</th>
<th>500 NOK/kg NOx reduced</th>
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| **SCR and EGR or other purification technologies** (mobile sources) | • Energy conversion: LNG, electrification and hydrogen  
• Battery  
• Variable RPM / DC grid on motors  
• SNCR / SCR on fixed installations  
• Reduction of NOx factor from offshore gas turbines  
• Reduction of NOx emissions from flares  
• Optimization of processes in land-based industry  
• EE measures combined with Tier III compliant measures (SCR, EGR or LNG)  
• Engine exchange combined with Tier III measures |  |
| **Cold ironing (onboard mobile sources)** |  |  |
| **Energy Efficiency Measures (EE measures)** |  |  |
| **Engine Conversions** |  |  |

**Support** = Support Rate x Annual NOx Reduction (max. 80% of cost)
What have we supported?

• 1000 members
• 1000 projects completed, 4 billion NOK granted
• Additional 200 projects to come, 3 billion NOK granted
• 60 ships with energy storage systems (electrification with batteries)
• 100 ships with LNG conversion
• 300 ships with energy efficiency measures
• 500 ships with exhaust gas cleaning
LNG and SCR in combination on product tankers

- Terntank Ltd. with 3 ships
- 878 MNOK
- Will reduce 300 tonnes of NOx
Plug-in-hybrid electric ferry

- Torghatten Trafikkselskap
- Has been granted support with 26 million
- Expected NOx reduction of approx. 73 tonnes per year
Cold ironing on ships and home bases

- Solstad shipping
- Has been granted support with NOK 11 million
- 162 tonnes annual NOx reduction
Goal achievement so far

*Tiltak for 2006/2007 er ikke inkludert i akkumulert reduksjon

Overholdelse av utslippforpliktelsen i Miljøavtalen per virksomhetstype, akkumulert*

![Diagram showing goal achievement over years](image-url)
Why does it work?

- Strong incentive (big whip, large carrot)
- Tax level and fund income is balanced with needed support
- Predictable, long term scheme, but with a defined end
- Large volumes
- Common commitment and engagement across industry sectors
- Private fund, less limited by state aid regulations than direct public funding schemes
Thank you for your attention!

nho.no/nox