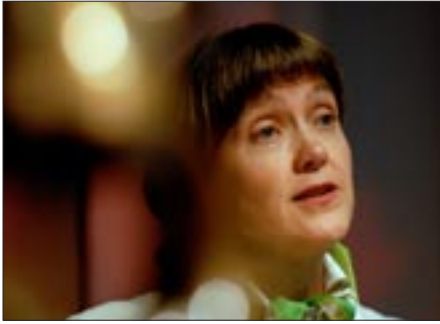


# Mind the Gap

Documentation of the seminar Mind the Gap at Svenska Mässan Conference Center, Gothenburg, 3 May 2006. Moderator was the excellent Jakob Lagerkrantz. Equest and documentalist Lennart Mossberg, LM Bild och Bokstav AB.





## *A Swedish Strategy to Protect the Marine Environment*

*Lena Sommestad, Swedish Minister of Environment*

– This conference, Mind the Gap, will deal with questions of great importance for the marine environment in the North Sea and the Baltic Sea. It's clear that the marine environment has deteriorated for a long period of time due to lack of implementation of the best available environmental solutions in the shipping and fishery industries.

Lena Sommestad was in Gothenburg also to attend the sixth North Sea Conference, held 4-5 May, at which representatives for governments for all countries around the North Sea were to discuss the marine environment.

– If nothing is done, the emissions from ships, for example NO<sub>x</sub> and SO<sub>x</sub>, will become one of our major environmental problems. While emissions from land based transport are on its way down, they are increasing from shipping. The North Sea Conference will address these problems and take measures. The marine environment is an international concern and therefore international regulations are needed.

– There are a lot of techniques and concepts available. “The Clean Ship” concept sets out a way to move forward and the Swedish government is committed to argue for this.

In the harbours many ships use diesel or oil to run their auxiliary engines which causes harmful emissions. Lena Sommestad made clear that the Swedish government will propose a tax exemption for shore-side electricity and hopefully the other countries around the North Sea will agree to implement this measure.



## *From Ideas to Results*

*Kristina Jonäng, Chairman of the Environmental Committee, Region Västra Götaland*

Kristina Jonäng greeted the seminar participants welcome to Region Västra Götaland.

– Region Västra Götaland is since 1999 responsible for issues concerning sustainable development in the region. As a part of this we finance projects like the Grön Kemi (Green Chemistry) and Mind the Gap which are important to address environmental problems.

– To reduce the gap between available solutions and the present ones, we need to improve the quality of the marine fuels, improve the cleaning measures, reduce air pollution in harbours and, in the long run, find alternative renewable fuels. All this calls for international agreements and regulations and we will be very active in advocating such measures and financing projects aimed to achieve this.

After her speech, moderator Jakob Lagercrantz asked: “When do you think we will have a non-fossil fuel available for ships?” “In five years and in this region”, was Kristina Jonängs optimistic answer.



## *Examples from the Port of Gothenburg*

*Ulf Duus, project Grön Kemi (Green Chemistry)*

There are already lots of environmentally adapted solutions for ships implemented in several ships regularly calling the port of Gothenburg. That's what toxicologist Ulf Duus found out when he, together with Jan Ahlbom in the Green Chemistry project, examined five good examples. The examples are presented in a printed matter available at the seminar, fresh from the press.

– In fact I was astonished that so many good things were implemented going far beyond the regulated standards. It was also encouraging to find out that the gap we're talking about here can be reduced very much simply by applying existing technologies, Ulf Duus stated.

Among the good examples, Ulf Duus mentioned:

- Two techniques for NO<sub>x</sub> emission abatement.
- Use of low sulphur fuels.
- Active bilge water treatment.
- Implementation of biodegradable, non-toxic stern tube oils.
- Environmentally adapted cleaning agents.
- New methods for boiler water treatment.
- Use of shore-side electricity to reduce air pollution and noise in the harbours.
- Energy saving measures.

Regarding anti-fouling coatings Ulf Duus concluded that there are some interesting ideas, but more research is needed.



## *Controlling emissions in a combustion engine*

*Thomas Sternhede, Wärtsilä*

As an introduction to his speech on controlling emissions in combustion engines, Thomas Sternhede from Wärtsilä, made clear what kind of emissions we are dealing with:

NO<sub>x</sub> – causing acidification, ozone/smog formation in the lower atmosphere and damage on vegetation and human health.

CO – detrimental to health.

CO<sub>2</sub> – contribution to the greenhouse effect.

Total hydrocarbons/VOC – contribution to the greenhouse effect and ozone/smog formation in the lower atmosphere.

SO<sub>x</sub> – acidification and causing erosion and corrosion.

Particulates – detrimental to lungs.

In general terms the NO<sub>x</sub> emissions are addressed with engine modifications, water treatment (WetPac) and after treatment with selective catalytic reduction system (SCR). CO emissions can be reduced with oxidation catalysts, VOC with improved combustion and also oxidation catalysts. The emissions of particulates, sulphur and CO<sub>2</sub> are related to the choice of fuel and the amount of fuel consumed in the combustion process.

As the NO<sub>x</sub> emissions are concerned, there are new tougher emissions limits proposed from 2007 by EPA and EU. If all three measures mentioned above to reduce NO<sub>x</sub> emissions are in effect, these new demands will easily be fulfilled. Wärtsilä is working with two different ways of controlling NO<sub>x</sub> emissions, the “dry technology” and the “wet technology”. The dry technology includes miller timing, retarded start of injection, common rail and exhaust gas recirculation. The wet technology consists of fuel/water emulsions, humidification of combustion air (WetPac) and direct water injection (DWI).

Low sulphur oil reduces the emissions of particulates (PM) and, of course, SO<sub>x</sub>. The PM emissions can be reduced furthermore if common rail injection is used instead of a conventional injection system.

As the CO<sub>2</sub> emissions are concerned, the choice of fuel is very important. Gas driven DF engines give the lowest CO<sub>2</sub> emissions of the engines in present use.

Thomas Sternhede was rather optimistic about the future, he meant that emissions can be reduced more and more when research makes progress and when best available solutions become implemented in the shipping industry.



















