Invitation to EffShip seminar

21 March 2013

We are now ready to present the conclusions from the EffShip project, www.effship.com.
You are invited to be one of the participants at the final seminar.

Preliminary agenda:

8.30 **Registration**

9.00 **Welcome**
Björn Allenström, SSPA, EffShip coordinator

9.05 **Presentation of the agenda**
Bengt-Olof Petersen, Point High AB, moderator

9.10 **Key note speech**
Carl-Johan Hagman, VD Stena Rederi AB

9.30 **Background, structure and objectives of the EffShip project**
Per Fagerlund and Bengt Ramne, ScandiNAOS, EffShip Technical Manager

10.00 **Exhaust gas emissions and after treatment**
Love Hagström, DEC Marine

10.30 **Coffee break**

11.00 **Future fuels**
Lennart Haraldsson, Wärtsilä

11.30 **End users aspects**
Per Stefenson, Stena Rederi AB

12.00 **Lunch**

13.30 **Optimal use of energy**
Thomas Stenhede, Wärtsila

14.15 **Wind propulsion**
Björn Allenström, SSPA

14.55 **Reflections from the class**
Lloyds Register

15.15 **Project conclusions and visions for the future**
Bengt Ramne, ScandiNAOS

16.00 **Conclusions and discussion**
Bengt-Olof Petersen, Point High AB, moderator

16.30 **End of seminar**

Please confirm your attendance to: info@sspa.se by 1 March 2013

Note: Presentations will be given in Swedish, written material presented in English.
The number of participants will be limited.

Location: Sjösäkerhetens Hus, Långedrag (Svenska Sjöräddningssällskapet)
Talattagatan 24, Västra Frölunda
http://kartor.eniro.se/m/n0dDF

The EffShip Project

The Effship project (www.effship.com) began in December 2009 and is based on the vision of a sustainable and successful maritime industry that has a minimal environmental impact. The project has been co-financed by Vinnova (the Swedish Innovation Agency) and the project partners.

Challenges

The ongoing globalization and development of international trade, which is key to improving our standard of living, wealth and quality of life, is dependent on maritime transport. In 2011, the seaborne transport work was around 43,000 billion ton-miles. There is no alternative to this enormous contribution by the shipping industry. There are drawbacks, however, from all transport activities, in the form of negative environmental impacts.

Regulations and targets have been set to improve environmental performance of shipping including:

- Emission control areas (such as in the Baltic and North Sea), where SOx and NOx must be substantially reduced by 2015/2016
- EU targets for transport sector Green House Gas (GHG) emission reductions of 20% below the 2008 level by 2030 and by 70% below the 2008 levels by 2050
- Swedish targets for the transport sector to use 10% renewable fuel and have a 40% GHG reduction
- Mandatory energy efficiency measures for international shipping adopted by the International Maritime Organization, with the goal to reduce emissions of GHGs.

The second IMO GHG study, completed in 2009, identified and evaluated a number of possible future scenarios and concluded that reductions in emissions below the minimum scenarios would require radical changes such as:

- "abrupt decoupling between seaborne trade and global economic growth"
- rates of global economic growth significantly lower than the lowest impact scenario considered in the study
- extreme shortages of fossil energy compared to the Special Report on Emission Scenarios published by IPCC (Intergovernmental Panel on Climate Change)
- "introduction of unexpected technologies"

These conclusions signal the need for fundamental change in order to achieve such reductions.

Solutions

The EffShip project has investigated a range of solutions and concludes that the "unexpected technologies" that the IMO GHG study identified for future scenarios exist in other industries or as research prototypes. EffShip identified specific technologies and solutions that could achieve fundamental change if industrialized and implemented in the shipping industry. They would lead to sustainability for the shipping industry and also be commercially beneficial, and of benefit to the rest of the world.

Suggestions for the way forward are as follows:

Short term: Upcoming SOx/NOx regulations for 2015/2016 set the agenda. Available solutions such as end of pipe abatement technologies for heavy fuel oil (both SOx and NOx reduction) and low sulphur marine diesel (NOx reduction), and the use of alternative fuels including natural gas, LNG, methanol, and dimethyl ether (DME) were investigated and compared within the project.

EffShip concluded that from an overall perspective, methanol is the best alternative fuel when considering prompt availability within existing infrastructure, low price, and simple engine and ship technology (shore applications have existed for many years). Further development on the regulatory side and marine engine testing is being addressed in a spin-off project, SPIRETH, which began in 2011. Methanol also paves the way to fulfilling GHG reduction targets in 2030/2050, because it can be produced from renewable feedstocks.

Medium term: GHG targets for 2030 can be fulfilled by lower CO2 fuels such as methanol (conventional production combined with renewable production such as from forest industry residuals or by carbon capture and recycling). EffShip studies on wind propulsion showed that for some conditions savings in fuel use of up to 40% could be achieved. Wind propulsors can give a significant reduction in engine power, but this varies for different routes and wind conditions. Reduction in power must, however, also be considered from operational safety aspects. The EffSail concept was found to have a shorter payback time than kites and rotors, based on simplified economic estimates.

Efficient transport system design and heat recovery were also investigated within EffShip and found to have good potential for improving the energy efficiency of marine transport.

Long term: From the perspective of fuels, GHG targets can be fulfilled by gradually increasing the amount of GHG neutral methanol produced from captured CO2 and hydrogen produced with wind, water, sun and geothermal energy. This technology exists but the cost is currently high. Ongoing improvements in energy efficiency, heat recovery, and the use of wind propulsors will also play a role in meeting the targets.

The Effship project has further detailed the above road map for the three time perspectives and suggests some 18 future projects for advancing, refining and industrializing the findings.