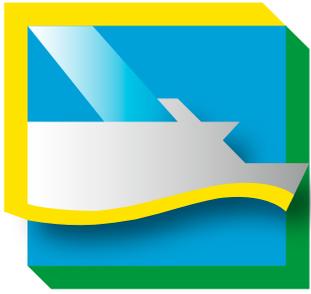


NEWSLETTER 2



MAGALOG
LNG a clean fuel for ships

Marine Fuel Gas Logistics
<http://www.eu-magalog.eu>

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Welcome to the 2nd issue of the MAGALOG newsletters



The introduction of liquefied natural gas (LNG) as ship's fuel



The new IMO MARPOL Annex VI

Will there be enough LNG available?

Candidates for use with LNG.

Small scale LNG terminal in Lübeck.

Will the new IMO MARPOL Annex VI be a driver for LNG fuel?

During the past months there have been discussed several options by the IMO Annex VI discussion panel regarding the future of Annex VI. The working group has suggested the following MARPOL Annex VI dates and new sulphur limits:

2010: SECA limit down to 1.00 % (from 1.50 %)

2012: Global limit down to 3.50 % (from 4.50 %)

2015: SECA limit down to 0.10 %

2020: Global limit down to 0.50 %
(subject to review - may be deferred to 2025)

If these recommendations become reality, maybe in October 2008, this will lead to a number of questions to the shipping world.

Can distillates be a substitute to heavy fuel? Will there be enough distillate in the world to supply also shipping? Isn't there already stiff competition by land based transports for diesel? Is there enough refinery capacity? Which effect has global increase of container transport by 100% by 2020 on fuel supply? How can SOxes and NOxes be reduced?

Several options do exist, but how far do they take the shipping industry? Skysails? - An option for the high seas only. Fuel saving? - Something for outside harbours and for goods without in-time pressure. Cold Ironing? - Only for hotelling operations.

What about travelling in SECA areas of the Baltic Sea and the North Sea and manoeuvring and hotelling in harbours?

Isn't there one solution which meets all challenges?

Yes there is: LNG or liquefied gas.

Shipping knows LNG as bulk commodity for decades. There are well established LNG trading routes around Europe and between the continents. Some LNG transporters have already skipped steam turbines in favour of diesel electric propulsion systems powered by boil-off gas from LNG.

Furthermore, under the light of a regime of heavy NOx taxes in Norway and high availability of gas and LNG there is an increasing number of coastal service ships in Norway running on LNG instead of marine diesel or even heavy fuel. In Norway and other countries around the North Sea more and more ship owners are considering building ships powered by LNG.

Also Ro-Ro and Ro-Pax ship owners in the Baltic Sea are increasingly aware of the opportunities of LNG as an alternative fuel either in one fuel only or in dual fuel operations. Also passenger lines and tug owners have expressed interest and are entering into research and development projects.

For the technological and environmental benefit of front runners LNG will be an intermediate step towards sustainability in the form of bio-gas or hydrogen.

Like some years or even decades ago gas as a fuel is coming more and more into the minds of ship owners sincerely thinking about fuel alternative price wise or for environmental concern.



Will there be enough LNG available?

In the light of the IMO WEP discussions it is questioned whether there will be enough distillates available for both land based transports and shipping.

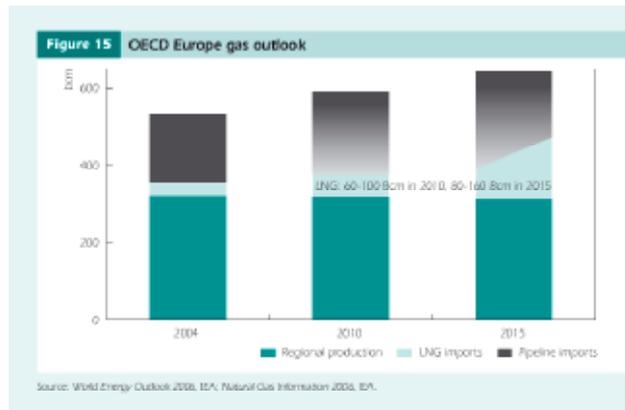
This question cannot easily be answered. But the international bunker industry association says:

- Europe is already unable to supply the demand for distillates
- An additional refinery capacity of 50 refinery units to be converted would be needed to satisfy demand
- The costs to the refining industry would be in the range of US \$ 38 billion
- Engineering and construction resources are not available
- Moreover additional cracking would increase CO2 output in the refineries

Here then comes LNG into the game. Not for each and every kind of shipping route and business but certainly in the present SECAs (Sulphur Control Areas) of the Baltic Sea and the North Sea and also in the future SECAs of the Mediterranean and the US West Coast.

Gas resources have much longer reach than oil resources. The BP statistical report says oil reserves have a reach of 40 years, whereas gas reserves have a reach of 60 years proven reserves and 130 years estimated reserves. From now on the shipping community does not only need observing developments in the oil market but also in the Gas and LNG markets.

In its OECD Europe Outlook the International Energy Agency in Paris says that there will be 60 to 100 billion cu metres LNG on the market by 2010 and between 80 and 160 million cu metres LNG by 2015. One tremendously large gas field, the Snøvhvit (Snow-white) has come on stream early 2008 and development of the Russian gas field Sthokman is under sincere development consideration together with an LNG liquefaction plant.



Source: International Energy Agency

What kind of ships would be candidates for use with LNG?

Until now, smaller vessels like fjord ferries, off-shore supply and coast guard vessels have been put in service or are on the drawing board.

The challenge will be to transfer the technology and fuel system to larger ships. Primarily, the project MAGALOG aims at LNG supply structures for ferries, Ro-Ro-ships and Ro-Pax-ships running on point-to-point routes in the Baltic Sea and adjacent sea areas.

The objectives of MAGALOG had been perfectly set. This is demonstrated by the fact, that meanwhile several ship owners and ship builders have become known to prepare for the post-mineral-oil age. A German consortium is preparing a research and demonstration project for passenger, Ro-Ro-ships and large scale luxury yachts. A Danish ferry owner said he would like to have LNG ferries running by 2012. A British-Norwegian shipping consortium is preparing the building of an LNG Ro-Ro vessel now.



Gothenburg to join MAGALOG as an associated partner.

MAGALOG has the possibility to open up to associated partners. A consortium from Gothenburg comprising the city, the port and the power utility has declared its willingness to join the project.

Lübeck to start construction of a small scale LNG terminal in 2009

The MAGALOG partner Public Utility of Lübeck declared at the most recent partner meeting in Swinoujście, Poland, that it will commence constructing a small scale LNG terminal in Europe's largest ferry port at Travemünde. This terminal will connect to the city's general gas grid in order to secure gas supply under non-conventional circumstances and to supply ferries calling at Travemünde likewise. The MAGALOG partner Stadtwerke Lübeck says that it will have the first LNG terminal operational by mid 2009

Swinoujście will have its new generation of city ferries powered by LNG

A tunnel connecting both parts of the municipality of Swinoujście, Poland, across the river Odra will not become reality due to excessive investment costs which may not be recovered by tunnel tolls. Therefore, the municipality is considering taking into service two newbuildings to be powered by LNG. LNG logistics may be secured via the new large scale LNG import terminal to become operational in 2011. A small scale LNG terminal dedicated for shipping maybe realized on the western bank of the river Odra.

Several MAGALOG studies finalized

The overall logistical study in the responsibility of MARINTEK is 95% ready. This study provides the basis for further logistical decisions. As an outcome of this study it is recommended to establish small scale LNG terminals in addition to those in Lübeck and Swinoujście in Stockholm, Helsinki and Klaipėda. Marintek has developed a logistic simulation programme for the distribution of LNG. Under leadership of MARINTEK a study regarding the potential ship and shipping line candidates

has been made. The largest potential is to be seen there were decisions for new ships will be made not or in the near future.

Several potential locations for small scale LNG have been investigated taking into account needs of the energy utility of Lübeck to feed gas into its grid and to supply shipping likewise. Such locations under consideration were Nordlandkai in-town Lübeck, Lehmannkai I halfway up-river to Lübeck and Scandinavia Quay downriver in Lübeck's daughter municipality Travemünde, Europe's largest ferry harbour. After due considerations it turns out that Travemünde will be the favoured location. Now it is up to Lübeck's energy utility to make an investment decision.

In Swinoujście several investigations as regard the best location for a small scale LNG terminal have been made likewise. Like in the case of Travemünde it turned out that the best location would be near the present bunker terminal.

MAGALOG presented at various Lloyds List conferences

The MAGALOG project had been presented at the Green Ship Technology conference in Rotterdam 11th-12th March 2008, at the Bunkering in the Baltic and Northsea Conference in Hamburg, on 15th-16th May 2008 and the RoRo Conference Gothenburg on 20-22nd May 2008

Next project meetings

The next partner meeting will be held in Stockholm in October and the second advisory group meeting on 8th October. The final partner meeting will be in Lübeck on 3rd December 2008 followed by the final conference in Lübeck's town hall on 4th December. Registrations can be made via the MAGALOG internet site.

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Energy Management Agency

Intelligent Energy  Europe

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GASNOR

GASNOR AS, Bergen, Norway

<http://www.gasnor.no>

GASNOR is the coordinator or lead partner in this project. This partner is setting paces in the field of Small Scale LNG. Gasnor has its own LNG-Resources on the island near the Norwegian town Haugesund in western Norway. The core business of Gasnor is sales and distribution of natural gas to local consumers like industrial enterprises and hotels and hospitals. Moreover Gasnor delivers natural gas in the form of CNG to cars and buses and in the form of LNG to shipping. Gasnor renders to its clients technical support, counselling, guidance and training.

baltic energy forum



Baltic Energy Forum e.V., Lübeck, Germany

<http://www.baltef.de>

Baltic Energy Forum is one of the initiators of MAGALOG and its assistant coordinator. Baltic Energy Forum e.V. is energy management agency within the European programme „Intelligent Energy Europe“ in the legal form of a non-governmental and charity organization since 2003. Together with its national and international partners, i.e. regional and local authorities, universities, enterprises and NGOs Baltic Energy Forum executes projects for reducing greenhouse gases and other emissions. A particular focus of Baltic Energy Forum lies on shipping, ports, maritime regions, offshore, fisheries and protection of the maritime environment. Baltic Energy Forum is one of the leading European organizations in the field of energy management and alternative energy solutions for shipping and harbours. Together with Stadtwerke Lübeck GmbH Baltic Energy Forum e.V. is signatory to the “Memorandum of Understanding on sustainable on Sustainable Port and Maritime Policy for the Baltic Sea Region.”

MARINTEK

MARINTEK AS, Trondheim, Norway

<http://www.marintek.sintef.no>

MARINTEK is one of the largest maritime scientific organizations in Europe. MARINTEK has special experience in the development of LNG system for maritime vessels. In MAGALOG MARINTEK provides the scientific view on maritime logistics in general and maritime small scale LNG propulsion systems in particular. MARINTEK is part of the SINTEF group, the largest independent scientific organization in Scandinavia. SINTEF supports about Norwegian and foreign enterprises in research and development.



Hordaland Oil & Gas, Bergen, Norway

<http://www.holga.no>

Hordaland Oil & Gas (HOG) is the leading representation of oil and gas interests in the County of Hordaland, the westernmost Region of Norway. Members of the organization are the County of Hordaland, communities and enterprises of the oil and gas sector. The members are committed to the development of oil and gas resources and to protection of the environment likewise.



The Municipality of Swinoujscie, Poland

<http://www.swinoujscie.pl>

The Municipality of Swinoujscie, Poland, is partner in the project and candidate for one of the shipping related pilot LNG terminals. It is of particular advantage of Swinoujscie that this town will be seat of a large scale LNG terminal in the future. Swinoujscie is well known seaside resort and the largest Polish ferry harbour likewise. Ship borne air emissions are threatening the touristic industry. Therefore it is a particular asset for Swinoujscie to be pacemaker in combating air pollution.



Stadtwerke Lübeck GmbH, Lübeck, Germany

<http://www.sw-luebeck.de>

Stadtwerke Lübeck GmbH (SWL) is the public utilities company of the Hanseatic City of Lübeck. It provides electricity, gas, district heat, water, telecommunication and public transport services to the city of Lübeck and its population. As transport provider Stadtwerke Lübeck operates river ferries in the part city of Travemünde, Germany's largest harbour at the Baltic Sea. Moreover Stadtwerke Lübeck represents the City of Lübeck in the Environmental Commission of the Union of the Baltic Cities, a pan-Baltic organization which represents more than 100 cities in the Baltic Sea Region. This partner has great interest in providing LNG supply to shipping, in utilizing LNG as a back-up for its natural gas grid and operating its own ferries and buses with LNG or CLNG as an environmentally friendly fuel. Stadtwerke Lübeck GmbH is one of the most important drivers in sustainable development. It had been lead partner in the predecessor project “New Hansa of sustainable ports and cities” which aimed i.a. at developing a shore side electricity system for commercial shipping as a means of reducing ship borne air pollution in port cities.