

# Environmentally friendly energy creates new values

A forward-looking energy solution





# Market of opportunities

“On the site of the “ruins” of the old Shell Refinery, which has literally been turned upside down, rises one of Norway’s most exciting industrial projects,” wrote Gassmagasinet in January 2008.

Following the shutting down in 2000 of the Shell Refinery in Risavika, Norway, the area was rezoned as a port facility. The ground was cleaned and the planning of Risavika Port could begin.

In 2006 part of the port area was rezoned for industrial use and the plans to erect an LNG plant received approval from the Directorate for Civil

Protection and Emergency Planning in December the following year. In January 2008 the building of the LNG plant could start.

Skangass AS was founded in 2007. The company is owned by Lyse and is responsible for the operation of the LNG plant. At its Risavika plant Skangass will produce 300,000 tonnes of LNG annually, corresponding to the energy needs of two towns the size of Stavanger. Skangass is ready to supply LNG (liquefied natural gas) to industry and shipping throughout Northern Europe.



# The road to LNG



The LNG plant is among the most energy-efficient and environmentally friendly of its kind in the world. Environmental considerations are ensured through a combination of effective refrigeration technology, re-use of volatized gas and use of electrical power from the grid. The plant is an integrated part of the national Risavika Port and important for the port's development.

Natural gas is transported to the LNG plant in Risavika through Lyse's pipeline from Kårstø to Brunnavika/ Risavika. From here a high-pressure pipeline has been laid to the LNG plant.

At the LNG plant the gas first undergoes a cleaning process where CO<sub>2</sub> and water are removed. From there the gas is fed into the processing facility itself, which in principle acts in the same way as a freezer. Here the gas is refrigerated to approx. -160 degrees Celsius and becomes liquefied.

LNG is stored in a large tank from where it is loaded onto purpose-built secure tank lorries or ships for transportation to customers. Skangass puts major emphasis on safety at every stage of the process. There is constant focus on comprehensive training and safety.



*First loading of LNG bound for Øra.*



1. Start of plant construction.



2. Foundation work for the storage tank is in progress.



3. Managing director Bjørn Torkildsen of Skangass and site supervisor John-Arild Breimo on site.



5. The quay facilities are under construction.

6. The German engineering company, Linde, is responsible for the building of the processing facility.



4. Open Day in the tank for the inhabitants of the local community of Tananger. Project manager Terje Bjørndal briefs the visitors.

7. The roof of the tank is put in place.



8. Lyse's board of directors enjoys the view from the roof of the tank.



9. The plant is ready for commissioning.



10. Øra LNG terminal was completed in the summer of 2011.

## In brief:

### May 2006:

Risavika Port applies for a rezoning of the former Shell Refinery property for port/industrial use.

### January 2007:

Skangass is established.

### July 2007:

Final investment commitment for the LNG plant made by Lyse's Corporate Assembly.

### November 2007:

Framework permission for the development granted by Sola Municipality.

### December 2007:

The Directorate for Civil Protection and Emergency Planning approves the building application.

### January 2008:

The construction of the LNG plant starts.

### June 2009:

Commissioning of the LNG plant and delivery of LNG to customers.

### July 2011:

Øra LNG terminal in Fredrikstad, Norway, ready for operation.

### October 2011:

Official inauguration of the LNG plant in Risavika.

# Contracts

Skangass has to date entered into contracts totalling NOK 1 billion for the delivery of LNG to different industrial enterprises. This is in addition to contracts signed in 2009 and 2010.

Many contracts have been signed as a result of Skangass putting on stream a receiving and distribution terminal for LNG at Øra near Fredrikstad. The terminal is the biggest of its kind in Norway. The purpose of the LNG terminal is to provide less expensive and more environmentally friendly energy to energy-intensive industrial enterprises in Eastern Norway and in Sweden.

The biggest contract signed in 2011 is a long-term agreement with Uddeholm AB in Hagfors, a leading

steel producer in Sweden. Uddeholm has decided to convert from oil and LPG to natural gas. This makes Uddeholm the first company in the Scandinavian steel industry to use LNG. "For Uddeholm this is a conscious choice. The company has for many years focused on reducing its emissions," says managing director Per Hasselstrøm. The LNG investment is furthermore profitable and improves Uddeholm's position in the market. This means a lot for the company in the longer term.

Several new customer terminals will be set up in Eastern Norway and Sweden. Three terminals are now under construction.



*From the production process at Uddeholm AB.*

# Strategic location

Skangass provides customised deliveries of natural gas directly to major companies and industrial clusters. It is expected that companies will largely replace the use of fuel oil by LNG. This will provide a major environmental improvement. The plant is favourably situated to supply ships and ferries with LNG. This is also a good eco-friendly solution.



## Positive for the customers:

- Lower operating costs
- Better efficiency
- Lower maintenance costs
- Better availability
- Better working environment
- Reduced environmental taxes

## Positive for the environment:

- The most eco-friendly fossil fuel
- Reduced emissions of CO<sub>2</sub>, NO<sub>x</sub> and sulphur
- No release of particles



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