



FACTS

ISSUE 2 | 06 – 2007

FACTS ABOUT THE NATURAL GAS PIPELINE ACROSS THE BALTIC SEA

ENERGY INFRASTRUCTURE PROJECTS IN THE BALTIC SEA

ENVIRONMENTAL CHALLENGES CAN BE COPED WITH

Nord Stream is only one of several planned or already operating energy infrastructure projects in the Baltic Sea. In addition to the pipeline from Vyborg to Greifswald, further offshore natural gas pipelines across the Baltic Sea are under consideration: Poland is interested in a connection from Denmark across the Baltic Sea (Baltic Pipe), while Estonia and Finland are also planning a connecting pipeline across the sea (Balticconnector). Furthermore, subsea power cables and several offshore wind parks already exist or are planned in the Baltic Sea. All of these projects are striving to keep their impact on the environment as low as possible and to preserve the Baltic ecosystem as it is. “Nord Stream: Facts” talked to Per Jørgensen, a leading international expert in the field of infrastructure, energy and environment about these projects.

In what way are the existing or planned energy infrastructure projects endangering the Baltic Sea?
The Baltic Sea differs in its nature from e.g. the North Sea, as it is a brackish sea with a delicate balance of salt water from the oceans and freshwater from the

numerous rivers that flow into the sea. Historically, the main challenge for infrastructure projects has therefore been to maintain this balance.

Energy infrastructure projects like pipelines, wind farms and submarine power cables are in general smaller than infrastructure projects like bridges, tunnels and harbours. However, the energy projects stretch over longer distances and it may therefore be necessary to cross sensitive areas, like munitions dump sites.

All use of the sea has an impact; this includes energy infrastructure as well as ship traffic or traffic infrastructure. One of the reasons for choosing locations in the sea instead of onshore is the availability of space, which is becoming a scarce resource. In this context, the impact of large diameter pipelines like Nord Stream is almost the same as smaller pipeline projects.

Pipeline projects mainly impact the sea during the construction phase, while the impact during operation is limited and mainly associated with third party risk.

Interview continues next page

Examples of Energy Infrastructure Projects in the Baltic Sea

Project name	Developer	Length [km]	Distance	Total capacity [bcm p.a.]	Operation	Status
Nord Stream	Nord Stream AG	1,200	Vyborg, RU to Greifswald, DE	Initial 27.5 Final 55	2010	Environmental Impact Assessment
Baltic Gas Interconnector	E.ON Sweden, DONG Energy, et al.	200	Rostock, DE to Avedore, DK and Trelleborg, SE	Initial 3 Final 10	2012	Environmental Impact Assessment completed. Permits granted by Sweden and Denmark
Balticconnector	Gasum Oy	80–120	Helsinki, FI to Estonian coast, EE	n/a	n/a	Seabed survey
Baltic Pipe	PGNiG, Energinet.dk	250	Copenhagen, DK to Polish coast, PL	2	2010	Signed agreement
Danish Belts	DONG Energy	2 x 30 + 2 x 3	Funen to Zealand and Jutland, DK	6	1984	In operation
Oeresound	Swedegas	20	Dragor, DK to Limhamn, SE	2	1985	In operation
Estlink	AS Nordic Energy link	74	Harku, EE to Espoo, FI	350 [MW]	2006	In operation
Baltic Cable	Baltic Cable AB	250	Malmö, SE to Lübeck, DE	600 [MW]	1994	In operation

■ Gas pipeline projects ■ Submarine power cables



ENERGY INFRASTRUCTURE PROJECTS IN THE BALTIC SEA

Continues from page 1 – Interview with Per Jørgensen, international expert in the field of infrastructure, energy and environment

What are the differences between the environmental impacts of gas pipelines, subsea power cables and wind farms?

While pipelines and submarine cables are located on or below the seabed, wind turbines will by their very nature be visible and exposed to collisions with ship traffic. There may also be noise impact. The submarine cables will often include electrode stations with emissions into the sea and there may be an electro-magnetic impact in the vicinity of such stations.

Most impact from gas pipelines will be during the construction phase – which includes preparation of the seabed for the laying of the pipeline – due to seabed intervention. But seabed intervention, in terms of trenching something into the seabed, was also inevitable during the construction of the already existing subsea power cables and this has not caused any severe environmental damages, as far as we know.

How can these impacts be minimised?

First of all, it is important to conduct thorough investigations of the planned route to identify the sections where it is really necessary to trench the pipeline into the seabed. Where this is not necessary, the impacts are lower.

There are three main reasons for trenching the pipeline: to protect it against damage caused by anchors, to improve the stability of the pipeline and to secure it in the event of an uneven seabed. So trenching the pipeline in these cases contributes to the safety of the pipeline during operation.

How can one ensure that all possible environmental impacts of an infrastructure project are understood before construction begins?

The most important thing is to recognise the environmental impact in due time, which is the only way to mitigate it. This is the reason behind the strict

permission procedures in international and national legislation.

Regarding gas pipelines, there is a lot of experience that can be drawn on: five major Norwegian gas pipelines routed via Danish waters already exist in the North Sea, while others were installed in the early 1980s in the Danish Belts and Sound in the Baltic Sea.

Finding the most optimal route with the lowest environmental impact is vital before construction begins. This may be time-consuming and requires a lot of data collection.

Generally, all energy infrastructure projects face very similar challenges in the Baltic Sea. Such challenges can be handled if you plan a project very carefully and use the best available technology to meet the highest environmental standards, as Nord Stream does.



Per Jørgensen, Director for Market and Business Development, Ramboll Oil & Gas's pipeline, storage, LNG and wind activities.

Per Jørgensen has worked on gas projects in more than 30 countries, mostly in Europe, for international oil and gas companies, investment and development banks, and EU and national administrations. Back in the early 1980s, he designed the Great Belt gas pipelines and participated in the construction supervision. Later, he worked on the feasibility studies and design of various pipeline projects in the Baltic Sea.



SEABED SURVEY NEAR BORNHOLM



The seabed close to Bornholm has been studied with this survey vessel.

The Swedish company Marin Mätteknik has been commissioned by Nord Stream to conduct a survey of the seabed in the area around the island of Bornholm. Marin Mätteknik is carrying out detailed investigations into possible corridors for the pipeline in the area, in addition to the one south of Bornholm previously surveyed. The investigations are being conducted to optimise the pipeline route and to minimise effects on the marine environment.

Marin Mätteknik is a reputable marine survey company based in Gothenburg specialising in high-resolution marine surveys. The company provides qualified technical solutions for seabed and sub-bottom mapping. Marin Mätteknik has broad experience of conducting water surveys in the Baltic Sea and waters bordering the UK and Norway.

Marin Mätteknik was involved in the pre-planning of Nord Stream in 1998, when the company performed marine surveys of a number of landfall locations in Germany, Sweden, Denmark and Finland.

Since April 2007, Marin Mätteknik has been carrying out detailed investigations into possible corridors for the pipeline in the area bordering Bornholm. The corridors are approximately 1,000 m wide and 200

km long. The first stage of the investigations was completed in mid-May 2007. Results from the survey are currently being processed and will be completed by the end of June 2007.

The route options will be studied using state-of-the-art survey equipment: a multi-beam echo sounder, high-resolution side scanning equipment giving information on the seabed roughness, seabed profiling equipment to examine the soil strata and a magnetometer for scanning for any metallic objects such as cables and possible pieces of munitions.

In order to gain an in-depth understanding of the possible danger caused by munitions, Nord Stream will launch a further detailed investigation dedicated to screening the seabed in the selected pipeline installation corridors. The best available metallic detection equipment on the market today, modified for this particular purpose, as well as a number of sonar and remotely operated small submarines will be used in the survey. If munitions are found close to the track lines of the pipeline, these will be rerouted to pass such areas at a safe distance.

The information collected during the surveys will be included in the comprehensive environmental impact assessment report.

Nord Stream at Hanover Trade Fair

From 16-20 April 2007, Nord Stream AG presented itself at the Hanover Trade Fair, the world's biggest industrial trade fair attracting 6,400 exhibitors and 230,000 visitors. At its stand in the hall for pipeline technologies and systems, the company provided information on its mission to improve Europe's supply security, the technical implementation of the pipeline and how this will meet the highest environmental standards. Among the visitors to the stand were suppliers in the field of pipeline technology, politicians and the media. A delegation of government officials and representatives of energy companies from various African countries attended the stand to listen to a presentation on the important European infrastructure project. The Nord Stream stand was granted an international design award – the iF Award 2007 – as a convincing corporate communications project in terms of quality of design and value of information.



EU-RUSSIAN ENERGY COLLABORATION

At the annual meeting of the German-Finnish Chamber of Commerce in Helsinki on 7 May 2007, former German Chancellor Gerhard Schröder underlined the importance of a strategic energy partnership between Europe and Russia.

The pipeline across the Baltic Sea is an important step towards deepening cooperation in the Baltic Sea region. "Nord Stream is a significant contribution to meeting the requirement of integrating north-western Russia more closely into the Baltic Sea region," Gerhard Schröder said. "The Baltic Sea is increasingly becoming Russia's 'Window to Europe' and Europe's 'Window to Russia'. In addition, the Baltic Sea is becoming more important with regard to oil transports which leave a deeper impact on the environment. On the Finnish coast, for instance, this problem is extremely vivid. In contrast, a natural gas pipeline is an environmentally wise solution. Nord Stream will carry energy equivalent to 165 oil or 550 LNG tank ships," Schröder concluded.

Moreover, Schröder remarked that natural gas will remain an important and indispensable energy source for Europe. The European Union possesses only three per cent of the worldwide gas reserves

and will have to increase its imports by 50 per cent in the next decade alone. According to Schröder, debating security and reliability of energy supplies also means talking about the stability of the supply regions. Against the background of developments in the Middle East and Africa, one must come to the conclusion that with the exception of Norway, there is no other stable supplier of gas and oil apart from Russia.



Tarja Halonen, President of the Republic of Finland, asked if the current tensions between Russia and Estonia have influenced the Finnish stance on Nord Stream. (Quoted according to Handelsblatt, 4 May 2007)

"This is not a political question, but an environmental one. We are saying 'yes' to the pipeline and 'no' to environmental hazards. If these can be avoided, we will support the pipeline. And these hazards can be dealt with."



NORD STREAM'S AGENDA

June 8-10 St. Petersburg Economic Forum in St. Petersburg, Russia

June 11-13 Baltic Regional Energy Forum in Riga, Latvia

June 24-25 Presentation of Nord Stream at the Baltic Sea Convention in Visby, Gotland, Sweden

June 28 Information meeting with environmental NGOs in St. Petersburg, Russia

July 8-14 Nord Stream at "Almedalen", Politicians Week, in Visby, Gotland, Sweden

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