Nord Stream
The new gas supply route for Europe

BACKGROUND INFORMATION

August 2016

Nord Stream's Twin Pipelines: Part of the Long-Term Solution for Europe's Energy Security

- **Nord Stream's state-of-the art pipelines provide a fixed link between Russia and the EU for at least 50 years and can transport up to 55 bcm of natural gas a year**
- **Nord Stream's twin-pipeline system came on stream on schedule and on budget – the first line in November 2011 and the second in October 2012**
- **Ongoing monitoring confirms the environmental impact of the pipeline to be within pre-construction impact assessments.**

Nord Stream's underwater pipelines through the Baltic Sea now supply natural gas directly into the European gas transmission system from Russia's vast gas reserves. This state-of-the-art privately-financed energy infrastructure has an operating life of at least 50 years.

The safe and efficient operation of the Nord Stream pipelines enables our major shareholder Gazprom to fulfil its commitments to its European partners, customers, governments and other stakeholders – and thereby contribute to Europe's energy security for decades to come.

Key Facts and Figures about Nord Stream

The pipeline consortium Nord Stream AG, based in Zug, Switzerland, is an international joint venture established for the planning, construction and operation of the new offshore gas pipelines. Russian OAO Gazprom holds a 51 per cent stake in the joint venture; the German companies BASF SE/Wintershall Holding GmbH and PEG Infrastruktur AG (PEGI/E.ON subsidiary) hold 15.5 per cent each, and the Dutch gas infrastructure company N.V. Nederlandse Gasunie and the French energy company ENGIE each hold a 9 per cent stake.

The five shareholders in the Nord Stream consortium provided 30 per cent of the 7.4 billion euros investment, with the remaining 70 per cent coming in the form of commercial loans on the international financial markets at a time of severe global financial and economic difficulties.

Nord Stream's natural gas pipelines stretch across the Baltic Sea from Portovaya Bay near the town of Vyborg, Russia, to Germany's Baltic coast at Lubmin, near Greifswald. The Main Control Centre is in Zug, Switzerland. Each pipeline is 1,224 kilometres long and has a design capacity of 27.5 billion cubic metres

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(bcm) a year. The first of the twin pipelines became operational in November 2011 and has been transporting natural gas since then to Gazprom's partners and customers in Europe. The second line came on stream as part of the fully-integrated system on October 8, 2012.

Each line consists of approximately 100,000 24-tonne concrete weight coated steel pipes laid on the seabed. Nord Stream was able to design the pipeline to operate without an intermediate compressor station. Gas travels the full 1,224 kilometre distance to Germany's Baltic coast thanks to input pressures of up to 220 bar generated by Gazprom's state-of-the-art Portovaya compressor station.

The pipelines have a constant internal diameter of 1,153 millimetres. However, Nord Stream designed the pipeline with three different design pressure sections (220, 200 and 177.5 bar) and pipe wall thicknesses (34.4, 30.9 and 26.8 mm respectively) corresponding to the gas pressure drop over the long journey from Russia to Germany. By designing each section according to the changing pressures, Nord Stream was able to save on the amount of steel used, and thus the costs of the pipes. Each pipeline was laid in three sections, which were subsequently connected underwater off the coasts of Finland and Sweden by two hyperbaric tie-ins at sea depths of approximately 80 metres and 110 metres.

Construction completed in 30 months

Following completion of environmental studies, detailed planning and Environmental Impact Assessments along the entire pipeline route, construction of the Nord Stream pipelines started in April 2010 and was completed on budget and on schedule within 30 months.

At any one time at least 30 ships were working on the project in different parts of the Baltic Sea, and everything fitted into place according to plan. The construction plans even proved to be resilient enough to cope with periods of enforced down-time due to adverse weather conditions in the Baltic Sea.

Furthermore Nord Stream's logistics concept enabled the most efficient and environmentally-sound way of producing and supplying to the pipe-laying vessels the 202,000 24-tonne concrete weight coated pipes needed for the twin pipelines. This ensured that the supply vessels did not need to travel more than 100 nautical miles (approximately 185 kilometres) to take the pipes to the lay-barges anywhere along the 1,224 kilometre route.

Infrastructure for Europe's future needs

Nord Stream's twin pipelines will provide the transport capacity for around 12 per cent of the EU's total natural gas imports by 2035, and the pipelines will also make an important contribution to the EU's future security of energy supply by diversifying the routes through which the EU gains direct access to some of the world's largest natural gas reserves.

Recognised by the EU as a European priority project under the Trans-European Network Guidelines (TEN-E), Nord Stream's twin pipeline system has the

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capacity to transport up to 55 billion cubic metres (bcm) of natural gas per year to the European gas network for consumers in Germany, Denmark, the UK, the Netherlands, Belgium, France, the Czech Republic and other countries.

Despite the current short-term gas glut in Europe, natural gas will continue to play an increasingly important role in Europe's energy mix. On December 15, 2011, the European Commission adopted the communication "Energy Roadmap 2050", which is the basis for developing a long-term European energy framework together with all stakeholders. According to this communication, "gas will be critical for the transformation of the energy system."

The European Commission acknowledges that the "substitution of coal (and oil) with gas in the short to medium term could help to reduce emissions with existing technologies until at least 2030 or 2035. Although gas demand in the residential sector might drop by a quarter by 2030 due to several energy efficiency measures in the housing sector, it will stay high in other sectors, such as the power sector, over a longer period."[1]

The European Commission further notes that "with evolving technologies, gas might play an increasing role in the future" and "long-term gas supply contracts may continue to be necessary to underwrite investments in gas production and transmission infrastructures." The European Commission emphasises that in order "to support decarbonisation in power generation and to integrate renewable energies, flexible gas capacities […] are needed."[2]

Nord Stream will be part of the solution. Gas production in the EU is declining, as reserves in the North Sea are being depleted and EU environment and climate change policies are expected to have the effect of boosting gas: not only does gas produce much lower CO_2 emissions than other fossil fuels but it will also play a key role in complementing the much-favoured but intermittent renewable energy sources.

Strategic Value to Europe and Russia

Nord Stream's pipelines have been transporting gas to Gazprom's partners and customers in Europe since November 2011. Nord Stream becoming fully operational was a historic milestone in the energy partnership between Russia and Europe: the new pipelines now provide a fixed link between the European and Russian gas pipeline networks, giving Europe direct access for at least 50 years to some of the world's largest gas reserves.

Nord Stream is a strategically important commercial project for both the EU and Russia. All five consortium members are committed to its success: the four European energy groups need a safe, efficient and reliable way to receive their contracted gas from Russia's Gazprom, which in turn needs safe, efficient and reliable routes to market.

[1] European Commission Communication, Energy Roadmap 2050. 15 December 2011, p. 11.
[2] ibid, p. 15.

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Nord Stream's privately financed 7.4 billion euros investment also provided a major economic stimulus for many sectors of the European and Russian economies. The Nord Stream consortium awarded major steel, engineering, construction, pipe-laying and logistics contracts to companies from eleven European countries and Russia.

Diversification of Gas Supply Routes for Enhanced Security

The new pipelines provide a competitive additional option through which gas from Russia's reserves can be supplied to European customers. It is a state-of-the-art, high-quality pipeline system with no intermediate compressor stations and subject to fewer taxes and transit fees than onshore pipelines, as most of its route is in the high seas beyond territorial waters.

Nord Stream's efficient, modern pipeline system provides Gazprom with an additional northern route with the capacity to supply up to 55 bcm of natural gas a year to the EU, helping the EU to improve its energy security by diversifying its gas supply routes. Before Nord Stream's first pipeline came on stream, 80 per cent of Russia's gas exports to Europe had to be delivered through the Ukrainian pipeline system dating back to the 1970s. In any industry, it is generally considered risky for both the supplier and the customer to be so dependent on just one route to market, let alone one in serious need of repair and renovation.

Added to the existing transit routes through Ukraine and Belarus, Nord Stream provides Gazprom and its European partners with greater technical flexibility to meet changing EU demand. It also reduces the risk of bottlenecks at times of seasonal peaks and when there are temporary shutdowns of other lines for maintenance or other reasons.

Gazprom determines the most efficient use of these various options: gas dispatching through Nord Stream is based on market demand. The added technical flexibility provided by Nord Stream also enables Gazprom to respond efficiently to changing demand in its growing spot market business.

Safe and Environmentally Sound Route to Market

Nord Stream has been absolutely committed to safety and environment-friendly solutions from the very start of the project - through both the construction and now the operational phases.

The carefully-chosen pipeline route through the Baltic Sea was agreed with the authorities of the five countries through whose waters the pipelines now pass. The precise route is the result of many years of thorough analysis of many factors: technical, environmental, and economic aspects as well as the question of security of supply were taken into account.

In the planning phase the consortium invested 100 million euros and engaged in extensive dialogue and consultations with governments, authorities, experts and stakeholders in all Baltic Sea states to ensure that the design, routing,

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construction and operation of the pipeline would be safe and environmentally sound.

In planning the pipeline, Nord Stream conducted the most comprehensive research of the Baltic Sea ever and will share the findings with scientists and other interested parties. The pipelines were routed to keep clear of munitions dump sites after the seabed along the route had been thoroughly researched and cleared in preparation for pipe laying. Nord Stream now uses state-of-the-art technology to meet the highest international safety standards in operating the pipelines.

Also, by 2016 a total of 40 million euros will have been invested in the monitoring activities. Approximately 1,000 survey locations measure 16 parameters (including surveys of the physical and chemical environment, such as water quality and seabed sediment; the biological environment, such as bird, fish and marine mammal populations; the socio-economic environment, such as commercial fisheries and potential effects on cultural heritage) during construction and the first three years of operation to ensure that environmental impact is minimized. Some of the impacts are turning out to be even less than assessed in the pre-construction Environmental Impact Assessments (EIAs).

More information at www.nord-stream.com

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