

Natural Gas Pipeline through the Baltic Sea

Environmental Impact Assessment in the Exclusive Economic Zone of Finland

Summary

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Opinions and statements regarding this EIA report should be sent in written form to Uusimaa Environment Centre by 5th May 2009

Summary of Nord Stream Pipeline environmental impacts in the Finnish Exclusive Economic Zone (EEZ)

The results of the environmental impact assessment indicate that the impacts caused by the pipeline will be mostly no or minor impacts within the Finnish EEZ. Most of the potential impacts will be local and short-termed, occurring solely during the construction period. The transboundary impacts are addressed in the Espoo Report, which is an appendix to the Finnish Environmental Impact Assessment (EIA) documentation.

Impact Assessment Criteria

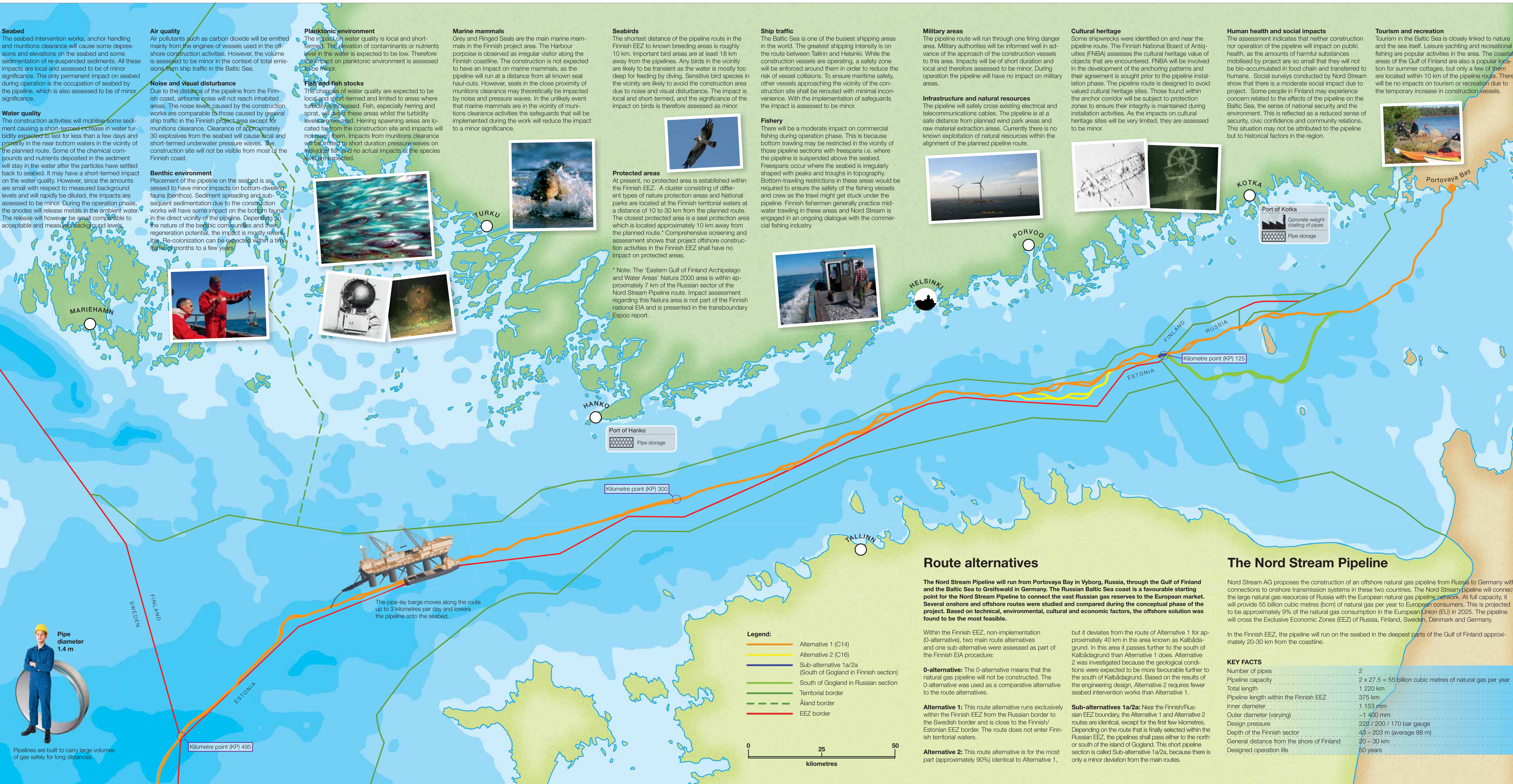
The EIA identifies and assesses potential impacts from pipeline construction and operation. The significance of impacts is classified into one of the following four levels.

No impact: the impact target is not affected or changed by the project.

Minor: impact with low importance, magnitude, and/or short duration. The impact is typically reversible.

Moderate: impact with medium importance. The impact is local/regional and/or the duration is medium- or long-term. The impact is typically partly reversible or irreversible.

Significant: Impact with high importance and significance for the impact target. The extent is typically regional/national and/or the duration is long-term or permanent. The impact is irreversible.



Why is the pipeline needed?

Natural gas demand in the European Union is projected to increase by 16% between 2005 and 2025. At the same time, domestic resources and production are decreasing, leaving a substantial natural gas supply gap to be filled by imports.

The share of renewable energy is expected to grow from 7 to 11%, but this increase will not be enough to meet the growing demand for energy consumption, nor is it enough to replace coal in order to meet the required reduction in carbon dioxide emissions. New natural gas import capacities will be needed to offset the emerging shortfall in EU natural gas supply.

Projected natural gas supply and demand in the EU

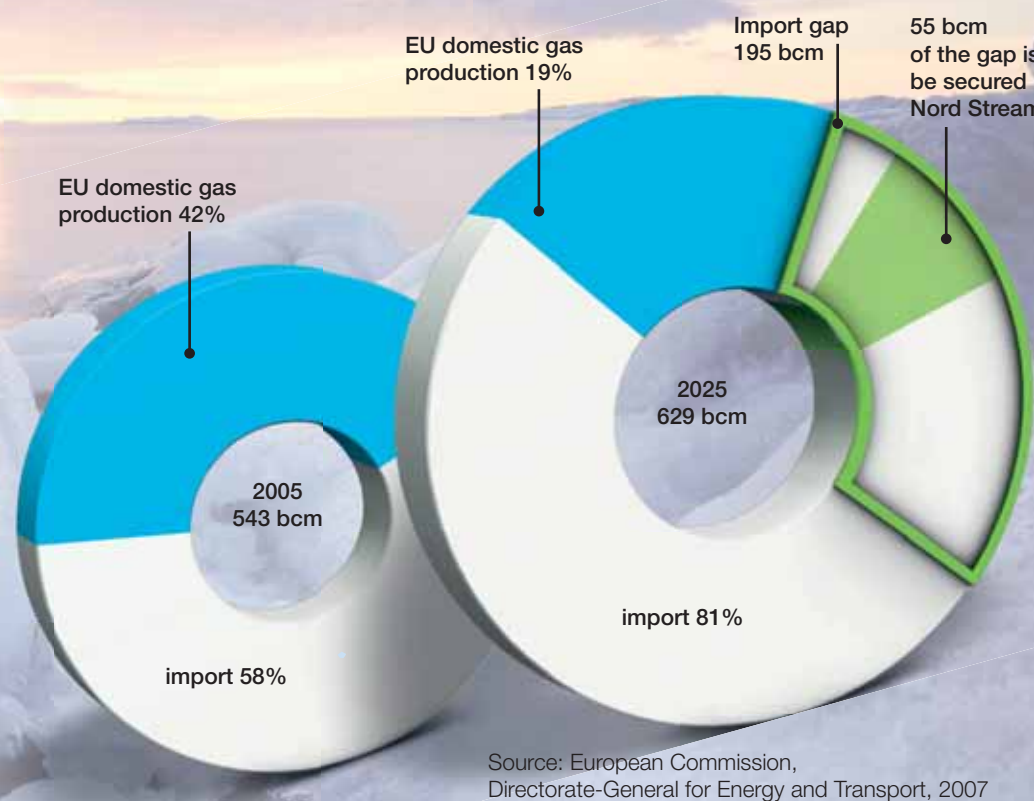
Europe will need almost 200 billion cubic meters (bcm) more imported gas annually in 2025. Nord Stream will provide about 55 bcm, a quarter of the gap, and enough for 26.5 million households for one year.

Europe currently obtains natural gas primarily from four sources: EU's domestic production plus supplies from Norway, Russia and Algeria. The potential increase in gas exports from Norway, Algeria and Qatar are insufficient to cover medium- and long-term growth in EU import requirements. Russia has been a reliable supplier of natural gas

to the EU for more than 35 years, it has the largest confirmed natural gas reserves in the world, especially in the Barents Sea, and is geographically close to the EU.

The Nord Stream project is part of the EU's Trans-European Energy Networks (TEN-E) programme and is recognized by the EU as a priority project of European interest. Under the TEN-E programme, the European Commission proposes expanding its natural gas supply relationship with Russia and has emphasised the mutual dependency of the EU and Russia's energy partnership. The EU Energy Commissioner recently stated that the Nord Stream project should be seen as supplementary – and not as an alternative – to other TEN-E projects that must also be completed in order to meet the projected demand.

Offshore pipelines represent a proven technology and have safely supplied natural gas to Europe for over 30 years. The European Union receives 45% of its natural gas imports via offshore pipelines.



Source: European Commission, Directorate-General for Energy and Transport, 2007

Project activities

The main project activities in the Finnish EEZ include surveys, placing of gravel supports on the seabed prior to the installation of the pipeline, munitions clearance, laying the pipes on the seabed and across the supports, logistics, post-lay activities, pre-commissioning and commissioning, operation and decommissioning.

Surveys

An extensive survey programme was carried out to determine the optimal route for the pipeline and to minimise the environmental impacts and overall costs of the project. The key issue in the surveys was to find a route where the seabed conditions allow pipe installation with minimal seabed intervention works.

The route surveys gathered specific information on seabed conditions, such as topography and identified artefacts such as shipwrecks, boulders and munitions along the route. Based on this information, the route optimisation has been fine-tuned so that the obstructions en route – especially munitions – will not pose a risk to the pipeline or the environment.

Construction

Nord Stream Pipeline consists of individual 12-metre-long steel line pipes that have been pre-treated against corrosion at an onshore facility. The line pipes are also weight-coated with concrete to ensure on-bottom stability and protection against external impacts.

The line pipes will be welded together on board the pipe-laying barges, from which the pipelines will be laid down on the seabed in a continuous process. The barge will move along the route, laying approximately 2.5 - 3 km of pipeline per day.

For both pipelines it is planned that a dynamically positioned pipelay barge (no anchors) will start from the Russian border and proceeds westward.

The second pipe-lay barge, an anchored vessel, will proceed eastward from the Swedish border. The two pipe sections will be welded together under water approximately at kilometre point (KP) 300, which is about 40 km southeast of Hanko.

Various vessels will be involved in the construction works including pipe haul, survey and anchor handling vessels.

Seabed intervention works

Nord Stream will conduct seabed intervention works both before and after pipe installation. These works include placing gravel on the seabed to support the pipelines where it has not been possible to avoid the so-called freespans i.e. sections of the pipe where it does not lay flat on the seabed. Gravel will be transported by dedicated vessels to the specific locations where the support is required. The gravel will be loaded into a fall pipe through which the material will be placed at the required location, thus minimising the contact of gravel with sea water. The structure of each rock support has been designed to minimise the amount of gravel to be used.

Munitions clearance

To ensure the safe installation and operation of the Nord Stream Pipeline conventional munitions will be cleared. All munitions will be cleared that are within 25 m of the pipeline route and selected munitions within the anchor corridor. Procedures for the clearance of munitions will be developed in conjunction with relevant national authorities and

fully risk assessed. The procedures will address the technical performance of the work, mitigation measures and monitoring requirements.

Post-lay activities

Progressively as the pipeline is laid, Nord Stream AG will conduct surveys to determine whether the pipeline needs further support.

Pre-commissioning activities will be carried out before the pipelines are filled with natural gas. During pre-commissioning, the pipelines will be flooded with seawater, cleaned and gauged internally and pressure-tested. The sections of pipeline will then be connected to each other, dewatered and dried.

After the pre-commissioning is completed, the pipeline will be commissioned, which refers to the process of the safe introduction of natural gas into the pipeline.

Operation

The operation of the Nord Stream Pipeline will be monitored and controlled from the main control room at the Nord Stream AG head office in Zug, Switzerland. The main control room will be manned 24 hours per day, 365 days per year.

Each of the Nord Stream landfill facilities will have a local operations room, but these rooms will normally be unmanned and in monitoring mode only. Some maintenance operations can be controlled from local facilities.

The Nord Stream Pipeline control system consists of

- pressure regulation
- pressure safeguarding
- leak detection
- parameter monitoring (including temperature, gas composition and inlet/outlet flow and pressure)
- telemetry and telecommunications
- fire and gas detection and protection and
- emergency shutdown systems.

Decommissioning

The Nord Stream Pipeline is designed to operate for 50 years, although its operational life may be extended. It is likely that the technological options and preferred methods for decommissioning of offshore pipelines will be different – and better – in 50 years time. Under all circumstances, decommissioning activities will be carried out according to prevailing international and national legislation and regulations and best practices regarding environmental and other potential impacts. The current practices for decommissioning pipeline are either removal of the pipeline or leaving the pipeline on the seabed after cleaning and filling with water. The prevailing opinion is that leaving the pipeline in place results in the least environmental impact.

Key environmental issues

The following key environmental issues relating to construction and operation of the pipelines were identified during the EIA process

Munitions and cultural heritage

The Baltic Sea, particularly the Gulf of Finland, was heavily mined during World War I and World War II. After the wars, the Gulf of Finland was swept for mines, but many remain to this day. Nord Stream AG is locating and determining the type of munitions and cultural heritage sites within the construction corridor. Once located, construction procedures will be modified, and, where necessary, munitions will be cleared. Munitions clearance will cause temporary sediment spreading and acoustic/pressure waves. Clearance also has a positive socioeconomic impact by removing potential future dangers.

Underwater cultural remains, such as shipwrecks, are very well-preserved in the Baltic Sea due to its unique physical and chemical conditions. These include low salt content, low species diversity, relatively low temperatures and low oxygen content. Any shipwrecks that are encountered are surveyed. The cultural heritage value of the wrecks is assessed in cooperation with the Finnish National Board of Antiquities (FNBA).

Long-term impacts

Most of the impacts caused by the Nord Stream project are temporary and occur during construction. There will be a few permanent impacts, which are:

- Both the rock berms created by the rock placement and the pipeline will permanently occupy the seabed. The footprint of this 'artificial reef' is comparatively small (1.1 km²), and therefore the impact on the seabed is assessed to be local, small and insignificant.
- The habitat of the benthos will be permanently lost on the footprint of the pipeline. The impact is local and insignificant, because the area is small compared to total area of suitable habitat for benthos.
- The flowing gas will create a permanent noise source on the seabed. The noise is assessed to be comparable to background noise and its significance low.
- The freespans of the pipeline will create a permanent impact on commercial trawling. For safety reasons, trawling along certain sections of the pipeline will be restricted. The impact is considered to be of medium importance because trawling vessels can either avoid crossing the pipelines or decide to raise the trawl gear to cross the pipelines.



Environmental advantages of the project

Public concern about climate change is one factor contributing to the rising demand for natural gas in the EU. This is reflected in the March 2007 decision of the European Council to reduce greenhouse gas emissions by 20% by the year 2020, compared with 1990 levels.

Natural gas has a distinct advantage over other fossil fuels as a primary energy source. Due to its higher hydrogen-to-carbon ratio and a cleaner combustion process, natural gas causes 30% to 50% less pollution and greenhouse gases than coal or oil.

An offshore pipeline is an efficient way of transporting natural gas. This is because a higher operating pressure can be used more safely in an offshore environment than in an onshore one. Nord Stream will transport gas without interm compression, whereas an onshore pipeline of similar length would need over 6 compressor stations – one every 100 to 200 km. Consequently, an offshore pipeline uses less fuel to transport the same quantity of natural gas, resulting in up to 40% lower greenhouse gas emissions than a comparable onshore pipeline.

Constructing an onshore pipeline would require a corridor to be cleared of vegetation and other obstructions in order to permit the welding of field joints, trenching and lowering of the pipelines. Such construction takes much longer than pipe-laying offshore. Construction and operation of an onshore pipeline is further affected by property issues, crossing of populated areas, nature conservation areas, roads, railways, rivers, forests, lakes – all resulting in potentially greater environmental impacts than an offshore pipeline.

Liquefied natural gas (LNG) imports into Germany would result in higher emissions than those associated with Nord Stream. Own use and losses along the LNG chain are three to four times the level of emissions from gas transported by pipeline. LNG uses 14% of the throughput gas in the liquefaction process, a further 2% in re-gasification and 0.15% per day during shipment.

Commercial fishing

There may be a permanent impact on bottom trawling along certain sections of the pipeline route. At some locations, the pipelines will form freespans. Freespans occur where pipelines do not rest directly on the seabed but are suspended between two local high points in the seabed. Because trawling gear can get caught under free-spanning pipelines, bottom-trawling should be restricted in these areas to ensure the safety of the fishing vessels and crew. However, it should be noted that Finnish commercial fishermen generally practice mid-water trawling in these areas.

Nord Stream AG is actively consulting with the commercial fishing community to resolve these matters.

Maritime safety

During the construction period, the pipe-lay barge and other vessels engaged in construction work will occupy an area with a radius of approximately 3 km, centered on the pipe-lay barge. This includes a safety zone maintained in the operating area of the anchor-handling vessels. To ensure maritime safety, other vessels approaching the vicinity of the construction site will be rerouted with minimal inconvenience. Nord Stream AG will communicate with the appropriate authorities to keep other maritime traffic informed of possible sailing restrictions.

Public concern about environmental and military security

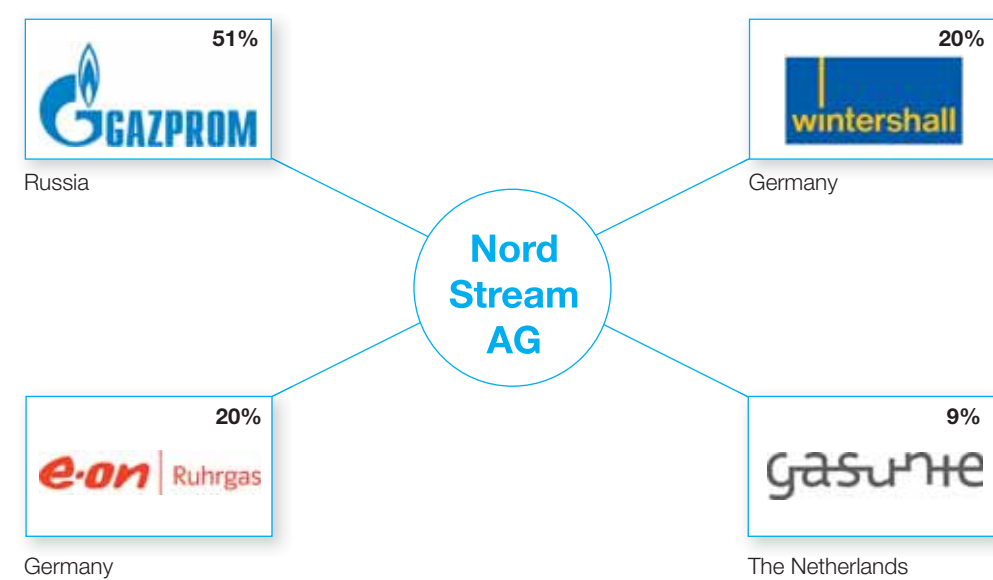
The most significant social impact is the negative impact on the public's sense of security. The actual changes to the physical environment due to the project are assessed to be low. However, the Finnish community is experiencing concern and uncertainty regarding the state of the Baltic Sea, national security and environmental risks arising from the project as a whole. Some of the reasons for the concerns about their sense of security are historic and would exist regardless of the project, but some are related directly to the project and to concern about its environmental impacts. The social impacts vary considerably depending on the individual's perception of the project and are not limited only to people living in coastal communities.

Sediment spreading

Seabed intervention works, anchor-handling and munitions clearance during construction of the pipeline will cause seabed sediments to be suspended in the water column and be spread by currents. This sediment spreading also includes dispersion of chemical compounds contained in the sediments. However, due to water depth and to the fact that the activities are located mostly in deep water in the middle of the Gulf of Finland, the impacts are considered to be minor.

Nord Stream Shareholders

The Nord Stream project is a pan-European joint venture by four companies.



EIA procedure in Finland

As the pipeline will cross the Finnish EEZ, the national Environmental Impact Assessment (EIA) procedure is applied to the project within the Finnish sector.

The EIA process aims to evaluate the environmental impacts of a project, to ensure that consistent information on the impacts is available during planning and decision-making and to provide the public with information and the opportunity to participate in the process. The EIA report and the statement of the coordinating authority (Uusimaa Environment Centre) will be taken into account in the decision on permits for the project within the Finnish sector. The required permits are the Council of State consent according to the EEZ Act and a permit for construction according to the Water Act.

The national Finnish EIA report describes the main characteristics and technical solutions of the project. These include:

- the activities during construction, operation and decommissioning of the pipeline
- the assessment methods used
- the environmental impacts of the studied alternatives
- the main information used in the assessment
- a comparison of the alternative pipeline routes within the national project area and the viability of these alternatives
- a proposal for a monitoring programme

In addition, the assessment report describes the main uncertainties related to the assessment and the measures to prevent and mitigate adverse environmental impacts. Transboundary impacts from other countries to the Finnish sector and from the Finnish EEZ to other countries are presented in the Nord Stream Espoo Report.

The Finnish national EIA procedure is two-phased

In the first phase, Nord Stream developed a scoping document, or an EIA programme, which described the strategy for the assessment of environmental impacts. This EIA programme was made available for the public in November 2006. During public hearings, the Uusimaa Environment Centre requested statements from various authorities, citizens and non-governmental organizations. Based on these opinions and statements, the Uusimaa Environment Centre issued its statement on the EIA programme to Nord Stream AG in February 2007.

In the second phase, based on the coordinating authority's statement and the EIA programme, Nord Stream carried out the actual environmental impact assessment and compiled the results in the EIA report. After the report is submitted to the Uusimaa Environment Centre, it will be available to the public and put for public display in the coastal municipalities between 9 March 2009–5 May 2009. During this period, Finnish authorities, citizens and other interest groups will have the opportunity to state their opinions on the EIA report. Opinions and statements should be sent directly to the Uusimaa Environment Centre (see contact information). Uusimaa Environment Centre will compile the public statements and issue their own statement on the EIA before 3rd July 2009. The EIA procedure will conclude with this statement. The EIA report and Uusimaa Environment Centre's statement will then be considered in the permitting procedures.

Public participation

The EIA has been carried out in an interactive manner. During the public hearing period of the EIA programme, meetings for the public and the media were held in Helsinki, Hanko, Turku and Kotka.

Throughout the EIA procedure, numerous meetings with governmental authorities have also been organized. These meetings were held to discuss the project status, technical information, assessment issues and other concerns.

The results of this EIA report will be presented at public meetings during the public hearing period between 9 March 2009–5 May 2009. Public meetings chaired by the Uusimaa Environment Centre will take place in March 2009 in Helsinki, Hanko, Kotka, Turku and Mariehamn.



Nord Stream has also organised media events and informal visits to survey vessels. The Nord Stream Pipeline Information Tour has visited events and festivals in Mariehamn, Kotka and Turku. The Nord Stream website provides updates on the project status and further information. www.nord-stream.com

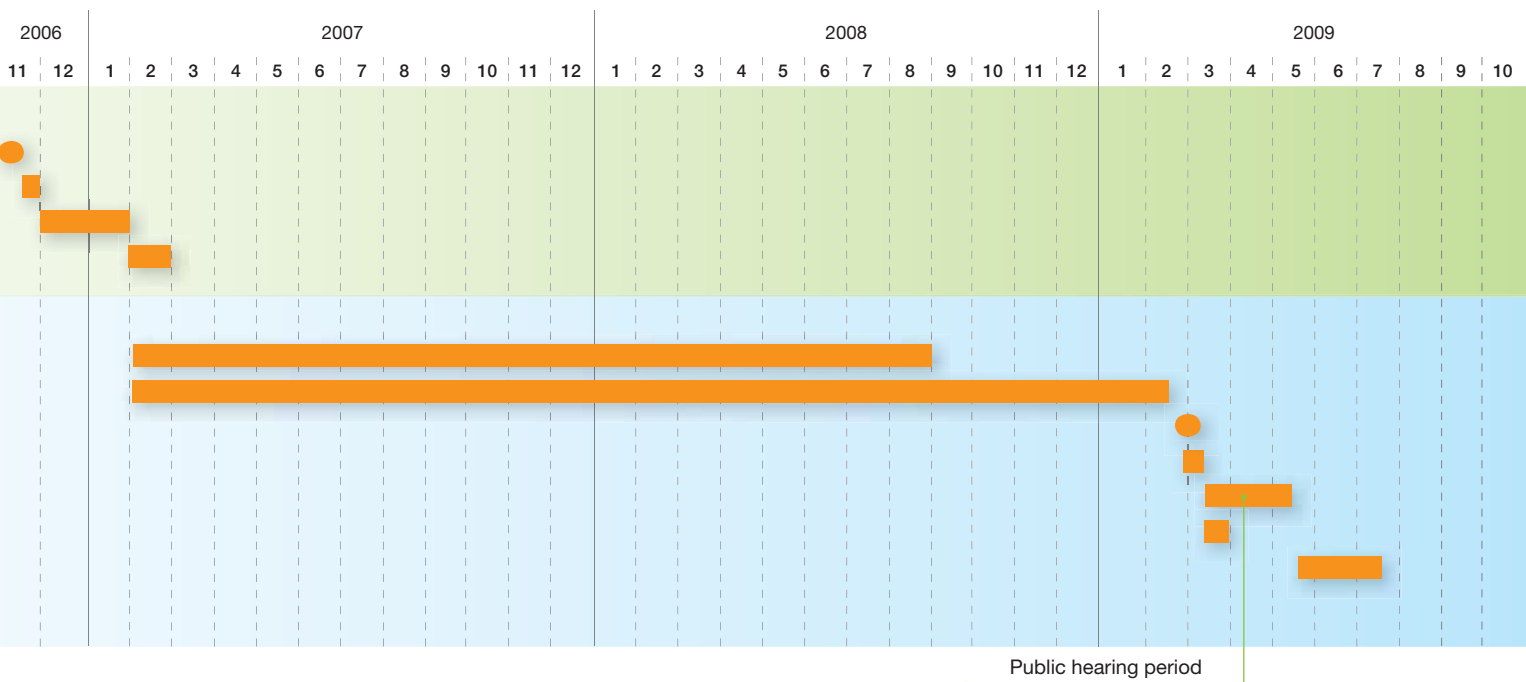
National EIA-procedure in Finland

EIA Program Phase

- Submission of FIN national EIA program
- Public announcement
- Notification and public hearings
- Coordinating authority statement

EIA and reporting

- Detailed technical design (basis of the EIA)
- Investigations, impact assessment, reporting
- Submission of National EIA-report
- Public announcement
- Notification and public hearings
- Public presentations (5 meetings)
- Coordinating authority statement



When will the Pipeline be built?

The chart below is a preliminary construction schedule of the Nord Stream Pipeline system comprising two pipelines. Pipeline construction is planned to start in 2010 in the Finnish EEZ, with the second pipeline being completed in 2012. The north-west pipeline will be operational before construction of the south-east pipeline is completed.

