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Citizens' Rights and Constitutional Affairs



**THE NORD STREAM GAS PIPELINE PROJECT:  
ENVIRONMENTAL ISSUES**

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**Directorate-General Internal Policies  
Policy Department C  
Citizens Rights and Constitutional Affairs**

## **THE NORD STREAM GAS PIPELINE PROJECT: ENVIRONMENTAL ISSUES**

### **BRIEFING NOTE**

#### Résumé:

The briefing paper examines the environmental impacts of a proposed project compassing a 1200-kilometre offshore gas pipeline from Russia to Germany through the Baltic Sea. The paper also states the enforceable international and European legislation relevant to the project and reviews the alternatives presented for the proposed pipeline.

The expected environmental impacts are assembled from information provided in the statements of authorities and the public in the affected states and by the project developer. The reviewed environmental impacts comprise effects on biota, conservation areas, fishing and shipping activities as well as on the public. Legislation relevant to the project includes the UN Convention on the Law of the Sea, the UNECE Convention on Environmental Impact Assessment in a Transboundary Context, the EU Directive on environmental impact assessment (EIA) as well as national legislation in force associated to European and international agreements or regulations in each affected state.

The project is managed by Nord Stream AG, the ownership of which is shared between Russian, German and Dutch enterprises. The most significant impacts of the project are expected to be associated with the construction and installation of the pipeline. Investigations on the environmental impacts and thus the environmental impact assessment process are currently underway.

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# BRIEFING NOTE

## THE NORD STREAM GAS PIPELINE PROJECT: ENVIRONMENTAL ISSUES

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### 1. INTRODUCTION

The offshore natural gas pipeline is planned to run from Vyborg, Russia across the Gulf of Finland and the Baltic Sea to Lubmin in Greifswalder Bodden, Germany. The developer of the project is Nord Stream AG, which is owned by OAO Gazprom, BASF/Wintershall, E.ON Ruhrgas and N.V. Nederlandse Gasunie. The purpose of the project is to transport natural gas from Russia to accommodate the demand for natural gas in the European Union. The project is among the priority projects under the European Commission Trans-European Energy Networks (TEN-E).

The project comprises two parallel pipelines as well as an offshore service station northeast of Gotland. The submarine length of the pipeline is approximately 1200 km. The diameter of each pipeline is 1220 mm and the expected total annual capacity of the gas pipe 55 billion m<sup>3</sup>. The service platform requires a seabed area of 50 x 50 m.

The gas pipe project would extend to the Exclusive Economic Zone (EEZ) of five states: Denmark, Finland, Germany, Russia and Sweden. The service station is planned to be situated within the Swedish EEZ. The gas pipe is planned to pass through the territorial waters of the two landfall states, Germany and Russia. Territorial waters of Denmark are crossed northwest of Bornholm.

The environmental impact assessment (EIA) procedure of the project is performed according to the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) as well as to national legislation regarding environmental impact assessment in each state. The scoping document was submitted to environmental authorities of the Concerned Parties in November 2006. After being displayed for public inspection until 16 February 2007 129 statements or comments concerning the scoping document were given by the authorities and the public of the Concerned Parties. In October 2007 the scoping document was supplemented with a further report concerning the state of the project, which provides information on the alterations to the pipeline route as a response to the received comments. The final EIA report with appropriate translations is estimated to be submitted in April 2008.

The installation of the first pipeline is planned to be initiated within 2008 and to be completed by the end of 2009. The commissioning of the first pipeline together with the offshore service platform is planned to take place in 2010. The second pipeline is intended to be installed at a later time and the full capacity of the transmission system reached in 2013. The lifetime of the gas transmission system is estimated at 50 years.

The reference material used for assembling the briefing paper include the scoping document<sup>(1)</sup>, the statements and comments given by the environmental and other authorities and by the public of the Concerned Parties, the report on the current status of the project<sup>(2)</sup> as well as information supplied on the Nord Stream AG website<sup>(3)</sup>. It should be emphasised that the source information and thus

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<sup>1</sup> Nord Stream AG, The Project Information Document. Offshore Pipeline through the Baltic Sea

<sup>2</sup> Nord Stream AG, Status of the Nord Stream Pipeline Route in the Baltic Sea

<sup>3</sup> See <http://www.nord-stream.com/eia.html>

the impacts stated in this document do not present the definite effects of the project on the environment. For instance, information concerning the eventual technical solutions for the proposed pipeline is yet to be established. The revised environmental impacts will be presented in the final EIA report, which is expected to become available in April 2008.

## **2. ENFORCEABLE INTERNATIONAL LEGAL PROVISIONS**

### **2.1. United Nations Convention on the Law of the Sea**

#### 2.1.1. General Provisions

The States Parties to the United Nations Convention on the Law of the Sea (UNCLOS) have agreed on a comprehensive normative instrument to regulate the exploitation, preservation and management of the oceans. Germany, Russia, Denmark, Finland and Sweden have all ratified the Convention and implemented the provisions therein regarding the territorial sea, the EEZ and the continental shelf in their national legislation.

Part XII of the Convention sets out the general provisions relating to the protection and preservation of the marine environment. For instance, According to Article 192<sup>(4)</sup>, States have the general obligation to protect and preserve the marine environment. Under Article 194<sup>(5)</sup> States shall take all measures consistent with the Convention that are necessary to prevent, reduce and control pollution of the marine environment from any source.

The Convention contains specific provisions on the rights and duties of coastal States and other States with respect to the laying of submarine cables and pipelines on the continental shelf. Article 79<sup>(6)</sup> states:

- 1. All States are entitled to lay submarine cables and pipelines on the continental shelf, in accordance with the provisions of this article.*
- 2. Subject to its right to take reasonable measures for the exploration of the continental shelf, the exploitation of its natural resources and the prevention, reduction and control of pollution from pipelines, the coastal State may not impede the laying or maintenance of such cables or pipelines.*
- 3. The delineation of the course for the laying of such pipelines on the continental shelf is subject to the consent of the coastal State.*

#### 2.1.2. Exclusive Economic Zones

The Exclusive Economic Zones of coastal states are established according to Part V of UNCLOS. According to Article 57<sup>(7)</sup>, the maximum breadth of the EEZ is 200 nautical miles from the baselines from which the breadth of the territorial sea is measured. Due to the limited breadth of the Baltic Sea the whole water area consists of either territorial water or EEZs of the coastal states. The division of the EEZs in the Baltic Sea area has been jointly agreed on by the coastal states.

The rights, jurisdiction and duties of coastal states in the EEZ are stated in Article 56<sup>(8)</sup> while the rights and duties of other states in the EEZ are stated in Article 58<sup>(9)</sup>. Article 60<sup>(10)</sup> states the provisions regarding the establishment of installations and structures within the EEZ:

- 1. In the exclusive economic zone, the coastal State shall have the exclusive right to construct and to authorize and regulate the construction, operation and use of:*

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<sup>4</sup> UNCLOS Part XII, Article 192

<sup>5</sup> UNCLOS Part XII, Article 194

<sup>6</sup> UNCLOS Part VI, Article 79, 1-3

<sup>7</sup> UNCLOS Part V, Article 57

<sup>8</sup> UNCLOS Part V, Article 56

<sup>9</sup> UNCLOS Part V, Article 58

<sup>10</sup> UNCLOS Part V, Article 60, 1-2

(a) artificial islands; (b) installations and structures for the purposes provided for in article 56 and other economic purposes; (c) installations and structures which may interfere with the exercise of the rights of the coastal State in the zone.

2. The coastal State shall have exclusive jurisdiction over such artificial islands, installations and structures, including jurisdiction with regard to customs, fiscal, health, safety and immigration laws and regulations.

Article 60 also states that the decommissioning of offshore installations or structures that have been abandoned or no longer in use are to be removed to 'ensure the safety of navigation, [...] fishing, the protection of the marine environment and the rights and duties of other states' (<sup>11</sup>).

## **2.2. UNECE Convention on Environmental Impact Assessment in a Transboundary Context**

The UNECE(<sup>12</sup>) Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention; EIA Convention) lays down the obligations to both assess environmental impacts of certain projects and to notify and consult other parties of their probable significant adverse environmental impacts. Germany, Denmark, Sweden and Finland are Parties to the Espoo Convention whereas Russia remains a signatory of the Convention.

Due to the nature of the project the offshore pipeline involves transboundary environmental impacts to Concerned Parties as well as to third parties (only Affected Parties). According to Article 3(<sup>13</sup>), a notification of any activities likely to cause a significant adverse transboundary impact is to be given to the affected parties as early as possible and no later than its own public is informed. According to Appendix I(<sup>14</sup>), the construction of large-diameter pipelines for the transport of gas is among the list of activities to which the convention is to be applied. Article 3 was unanimously concluded to be applied in the Nord Stream offshore pipeline project by the EIA authorities of Denmark, Finland, Germany, Russia and Sweden in April 2006.

In the notification procedure the Parties of Origin (Germany, Denmark, Sweden and Finland) and Russia are to give notification to all Affected Parties (the Parties of Origin, Russia, Estonia, Latvia, Lithuania and Poland). In the case of the gas pipe project the Parties of Origin also are among the Affected Parties according to the Espoo Convention.

## **3. ENFORCEABLE EUROPEAN LEGAL PROVISIONS**

### **3.1. EIA Directive**

The gas pipeline project is subject to the Council Directive of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment (85/337/EEC, 97/11/EC, 2003/35/EC; EIA Directive) according to Annex I(<sup>15</sup>). The Espoo Convention was approved by the European Community on 24 June 1997 and has been ratified by the Member States. Most of the obligations under the Espoo Convention are complied with the EIA Directive.

Article 7(<sup>16</sup>) of the EIA Directive states the obligations of Member States regarding possible significant transboundary environmental impacts and the participation of other Member States in the environmental impact assessment procedure. According to Article 7, the Member States in whose territory the project is intended to be carried out are to, inter alia, make information available to the authorities and the public of the Member States concerned and provide them an opportunity

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<sup>11</sup> UNCLOS Part V, Article 60, 3

<sup>12</sup> United Nations Economic Commission for Europe

<sup>13</sup> Convention on Environmental Impact Assessment in a Transboundary Context, Article 3, 1

<sup>14</sup> Convention on Environmental Impact Assessment in a Transboundary Context, Appendix I, 8

<sup>15</sup> Council Directive 97/11/EC, Annex I, 16

<sup>16</sup> Council Directive 97/11/EC, Article 7



to express their opinion. Furthermore, the Member States concerned are to have the opportunity to enter consultations regarding the potential transboundary effects of the project. The EU countries have implemented the EIA Directive into their national legislation.

### **3.2. National Legislations**

Besides the provisions of UNCLOS, national legislation in force implementing the Convention is observed in the EEZ of the coastal states. Furthermore, any national legislation enacted by an individual coastal state regarding the permit procedure for pipeline construction and operation is observed within the EEZ of the state. The right of appeal against the decisions on permits is subject to relevant national regulations of each state.

The performance of obligations resulting from the Espoo Convention not currently covered by the European Community law and by the EIA Directive particularly is the responsibility of the EU Member States.

## **4. CONCEIVABLE ALTERNATIVES TO THE PROJECT PROPOSAL**

In the statements of national authorities as well as in the comments from the public the scoping document was criticized on the lack of presenting genuine alternatives to the pipeline routing except for the zero alternative. As an alternative to the offshore project some quarters have suggested the construction of onshore route options for the gas pipe. The developer has, however, not perceived these as feasible alternatives to the offshore route as the project explicitly is developed to produce a submarine gas supply as an offset to the present land-based gas supply options.

According to the project developer, the onshore options such as Yamal-Europe and Amber, which were presented as the alternatives to the offshore project in the Project Information Document, were rejected referring to the principle of providing natural gas to the European market with minimal risk of political or economic instability, which occasionally is associated with onshore pipelines routes. The Yamal-Europe route would run from Russia to central Europe and be parallel to the existing Belarus pipeline. The Amber route would run from Russia and across Latvia and Lithuania to Poland, where it would be connected with the Yamal-Europe pipeline.

Since the publication of the scoping document the developer has produced alternative route options designed to change the pipeline delineation presented in the scoping document. The possible alternatives are presented in the Status of the Nord Stream Pipeline Route in the Baltic Sea document, which was published in October 2007 and is currently being displayed for public inspection. The alternative options include changes to the pipeline delineation in the Gulf of Finland, the Baltic Sea (Baltic Proper) and the southern part of the route in Denmark and Germany. The aim of the revision is also to reduce the environmental impacts of the project by minimising the need for seabed modification.

## **5. ENVIRONMENTAL IMPACTS ON THE BALTIC SEA AND COASTAL AREA OF THE CURRENT PROPOSAL**

The Baltic Sea is a brackish sea and therefore a particularly sensitive ecosystem with distinctive natural characteristics. Furthermore, the sea is already suffering from excessive load of contaminants. In places the topography of the seabed is highly irregular. This poses limitations to the proposed pipeline routing and to some extent would complicate the installation activities. The greatest impacts to the environment are expected to occur during and immediately after the construction phase of the pipeline and service platform.

## **5.1. Biota**

### **5.1.1. Installation Phase**

Flora and fauna may be distressed by landfall construction due to the sediment diffused during dredging and filling activities. As a result of shading the seabed biomass may be reduced temporarily. Sediment diffusion may also occur at the service platform site due to potential dredging activities. This may have an effect on fish and benthic fauna as well as on marine mammals and birds near the platform site.

Suspended sediment load and sedimentation may affect the marine benthic fauna and flora in particular. The disturbance to benthic organisms is expected to be the greatest at sites with sediment contaminated with inorganic or organic particles and in areas of bedrock seabed. In areas of current sand erosion the filling in the construction phase may also have an effect on the local benthic organisms. The benthic flora and fauna are estimated to recolonise the planned dredging and trenching sites within approximately a few years.

Activities of the installation phase such as blasting and increased ship traffic may cause disturbance to the ringed seal. Furthermore, during winters with minimal ice coverage the breeding areas of the ringed seal would overlap with the eastern construction area. Additional fish species would probably be attracted by the legs of the service platform and by the dumped rocks on the seabed beneath it. This so-called artificial reef effect would also have an impact on other flora and fauna.

The flora and fauna of coastal areas may experience disturbance from noise exposure during the construction phase. The construction may also cause disturbance to migratory resting places as well as the wintering and breeding areas of birds. Furthermore, supply vessels operating to and from the onshore supply bases of pipelines would produce noise and airborne contaminants from vessel fuel thus affecting birds and marine fauna in the proximity of the supply bases.

### **5.1.2. Operational Phase and Decommissioning**

The activities prior to the commissioning of the pipeline would include discharge of filtered seawater used for hydrotesting at an offshore site. The anoxic test water would cause a temporary reduction in the oxygen level as well as an imbalance in the salinity of the seawater around the discharge site.

Local effects to benthic flora and fauna may arise as a result of alterations in the transport of sediments due to changes in topography and sea currents: increased accumulation of sand may occur along the pipe while sand is lost in other areas. Little or no effects are estimated to occur due to the solution of toxic elements from the anti-corrosive coating and anodes of the pipeline.

Rather little disturbance is estimated to occur to fish, birds and marine mammals during the operational phase of the pipeline.

Incidents such as ship sinking, anchoring and grounding or activation of explosives may damage the pipeline and result in the release of gas to the marine environment or to the air. The released gas would be likely to form a gas plume in seawater and eventually be dispersed in the atmosphere. To the marine environment the effects of a potential gas leakage are likely to be unsubstantial apart from the local impacts occurring to marine biota as a consequence of a decrease in oxygen level and a potential supersaturation of seawater with dissolved gas.

The demolition of the pipeline system is estimated to have environmental impacts of similar magnitude as the ones caused by the planned installation activities.

## **5.2. Protected Areas**

Protected or recreational areas as well as tourism may be adversely affected by the landfall construction or other instalment activities in coastal areas.

### **5.3. Fishing and Shipping**

The planned actions on the Baltic Sea seabed would probably also have impacts on the fishing industry. Traditional trawling areas would be threatened within the pipeline corridor zone. Trawling would suffer from the construction work during the pipeline installation as well as by the associated safety zone along the pipeline. Fishing would also be impacted by the construction phase of the service platform due to a potential safety zone of 500 metres prohibiting ship traffic surrounding the platform site. Along the pipeline a potential safety zone of 2 500 metres surrounding the laying vessel would prohibit ship traffic during the pipeline installation. Local alterations in oxygen level of seawater resulting from a barrier effect may also affect fishing. In addition to fishing changes in seabed would have an adverse impact to fish stocks in the Baltic Sea.

There is a potential risk of collision between the pipe-laying vessels and ship traffic during the pipeline installation. Shipping would also be affected during the construction and installation of the service platform. In the event of a potential gas leakage from the pipeline an ignition of a gas cloud formed above the sea level may occur producing a flash fire if the source of ignition is nearby. This poses a risk to shipping providing the source of ignition is on a passing ship or on a ship causing the leakage by anchoring, for instance. The occurrence of such an event is, however, estimated as extremely rare, i.e. once every thousand to ten thousand years.

### **5.4. Local Public and Tourism**

The landfall as well as the service platform construction would cause noise disturbance and emissions of airborne contaminants from fuel burning, which would affect the local public and visitors. Sheet piling is considered to be the activity causing the most noise to the environment in its immediate proximity. As a consequence of the sediment diffused from dredging at the landfall site the quality of water may be reduced along the beaches nearby.

The service platform could not be seen from the island of Gotland nor from the mainland Sweden.

### **5.5. Minefields and Chemical Ammunitions**

The most recent research concerning munitions in the Baltic Sea was completed by a Working Group on Dumped Chemical Munition (HELCOM CHEMU) on the grounds of national reports in 1994<sup>(17)</sup>. In 2006 information on technological risks involved in offshore munitions dumpsites in the area was provided by the National Scientific and Research Institute of Navigation and Hydrography (Ministry of Defence, Russian Federation).

The locations and the state of potential ammunitions within the proposed pipeline corridor are currently being investigated by the project developer. Initially a corridor of two kilometres was screened for large objects. For closer examination the screening area was gradually narrowed down to cover the two corridors of 15 metres along the planned pipelines. The possibility of activating mines or chemical munitions submerged in the seabed is minimised by planning the route delineation to steer clear of identified munitions sites and minefields or their transport routes and by avoiding any construction activities in their vicinity.

### **5.6. Criticism on the Project Proposal**

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<sup>17</sup> See Ad Hoc Working Group on Dumped Chemical Munition: Report on Chemical Munitions Dumped in the Baltic Sea

### 5.6.1. Biota

According to the statements and comments given by authorities and the public, particular attention should be given to the feeding areas of auks and bird species feeding on benthic fauna. To prevent or minimise the damage caused to bird life the installation phase would have to be arranged outside the nesting and migratory period of May to July. Follow-up would particularly be needed regarding the impacts on the indicator organisms, the most important fish and seal species as well on the bird species in the archipelago. The potential release of nutrients from the sediment and its impact on seaweed production and further to the marine ecosystem is to be evaluated.

### 5.6.2. Protected Areas

The extension of the Natura 2000 network to the EEZs is currently being examined in accordance with the requirement set out by the European Commission. Whether any reefs or underwater sandbanks referred to in Annex I or any species (grey sea, the ringed seal, birds native to open sea) referred to in Annex II of the Habitats Directive<sup>18</sup>) would occur within the affected area is to be detected and the impacts of the project on them evaluated.

### 5.6.3. Project Time Frame and Planning

The scoping document was criticized on the narrowness of the planned time frame, which poses limitations for accomplishing a comprehensive evaluation of the impacts and a sufficiently detailed scoping document. Further investigations such as mapping the seabed topography, an inventory of the biota and an examination of harmful substances, nutrients and their concentrations within the affected area are to be completed in order to obtain precise information on the actual impacts of the project. Information on the follow-up of the impacts during and after the installation phase should also to be established prior the construction of the proposed pipeline.

The concentration of nutrients and harmful substances such as heavy metals and organic pollutants in the sediments are to be assessed in more detail. The potential release of nutrients and harmful substances from the sediments as well as their transport, deposition and binding to organisms are also to be evaluated. The existing information on harmful substances mentioned in the scoping document should be released for public scrutiny.

### 5.6.4. Health and Safety Aspects

Besides the impacts on fish stocks and fishing, the effects on human health through fish used as food should be evaluated. A follow-up on the accumulation and the effects of heavy metals, contaminants and other harmful substances in the food chain must be carried out.

An investigation of areas with gas vents and potential rock faults connected to these within the gas pipe zone in order to secure the safety of the gas pipe has been demanded for. The construction phase would have significant effects on the marine environment and therefore technology incurring the least damage to the environment is to be applied in the construction process. The potential effects of a 100-year storm on the Baltic Sea on the proposed pipeline and service platform are also to be examined.

Potential ship wrecks within the project area are to be identified and the risk of oil leakage or a release of harmful substances from the ship wrecks is to be assessed. Potential remains of chemical weapons and munitions submerged in the seabed are to be located and appropriately treated. The discharge of anoxic flush water may also potentially harm the marine environment during the pre-commissioning phase.

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<sup>18</sup> Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora

### 5.6.5. General Aspects

In addition to the environmental impacts listed above the general width of two kilometres set for the pipeline corridor is criticised to ignore the local variation in sea currents and sediments. The area in which the expected impacts would occur varies according to the nature of the affecting activity as well as the specific nature of the impact in question.

## **6. CONCLUSIONS**

The most significant environmental impacts of the gas pipeline project are expected to appear during the construction phase of the two adjacent offshore gas pipelines and of the service platform. Due to the great variation in seabed topography in the Baltic Sea the project would require modification of the seabed. Changes in seabed would occur as a result of dredging, trenching, rock dumping, blasting, filling, levelling of the seabed and other activities in the construction phase. Levelling of the seabed and filling are assessed to cause the most considerable environmental impacts of the project both to the water column and to the seabed. Potential effects of the seabed modification include changes in sea currents, the dispersion of sediments, the movement of substances in interstitial water and changes in benthic fauna diversity. Relatively few adverse environmental effects are expected to occur during the operational phase.

It should be noted that the economic and political interests related to the gas pipeline project have greatly influenced the public discussion on the environmental impacts of the project. The scoping document was primarily criticised on the narrow time frame and consequent lack of sufficiently detailed studies on the potential impacts on the marine environment and the coastal areas as well as on the lack of presenting genuine alternatives to the pipeline and its delineation.

The relevance of the information displayed for public inspection and the progress of the environmental impact assessment procedure have proven difficult to be accurately comprehended by members of the public in particular. The scoping document does not yet present the results of the complete environmental impact assessment process but demonstrates the environmental impacts assessed for the project and the methods used in their assessment. The environmental impact assessment process is currently underway and the results will be presented by the project developer in the final EIA report, which is expected to be completed in April 2008. Hence it is premature to present any definite estimations on the potential environmental impacts of the gas pipeline project at this stage.