



Nord Stream 2

Committed. Reliable. Safe.

Nord Stream 2

Enhancing European Energy Security

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The Pipeline Will Run Through the Baltic Sea – Along the Proven Nord Stream Route

> With an overall length of approx. 1,230 km, the **Nord Stream 2 Pipeline** will connect Europe to the largest gas reserves in the world, in Russia



> Route optimised for **maximum efficiency** and **minimum impact** on the environment



> Design & implementation verified by **independent certification**




> Extensive international **consultation and permitting** process



> Construction and design will largely follow the **Nord Stream model**



Nord Stream 2 Delivers Sustainability Benefits



Lower CO₂ Emissions in Power Generation

- > Use of 55 bcm natural gas instead of coal could save 14% CO₂ emissions of EU power generation
- > Electricity generated in gas-fired power plants emits **around 50% less CO₂** than power produced in **coal-fired plants**
- > **Complements renewable energy** forms, crucial for the EU to achieve its overall climate target



Low-emission Gas Transport

- > **Better carbon footprint than LNG** liquefaction chain
- > **Lower emissions from fuel gas use than onshore systems** due to efficient compression to 220 bar



Environmentally Friendly Pipeline

- > Can be constructed in a fraction of the time compared to onshore systems
- > **Monitoring of Nord Stream shows environmental impact is minor, local and short term only**



Low-emission, High-efficiency Gas Transport

55 bcm of gas shipped via Nord Stream 2 compared to...



Central Russian corridor onshore pipeline:

Nord Stream 2 saves 8.2 mn tonnes

of CO₂ per year.

This roughly equals the total annual CO₂ emissions of **Cyprus**

Source: based on Gazprom Investors Day Presentation 2017



Up to 600-700 LNG tanker loads from the global market:

Nord Stream 2 saves 17.1-44.6 mn tonnes

of CO₂ eq. per year, depending on distance travelled.

This roughly equals the total annual CO₂-emissions of **Lithuania** (lower end) or **Slovakia** (higher end)

Source: based on ThinkStep GHG Intensity of Natural Gas Transport Report 2017



Coal burned in an average power plant to generate the same electricity:

Nord Stream 2 saves ~160 mn tonnes

of CO₂ per year.

This roughly equals the total annual CO₂ emissions of **Sweden, Finland, Estonia and Lithuania combined!**

Source: own calculation, based on IEA 2015, 10.34 kWh/m³, 49% efficiency for gas

Country comparisons based on Eurostat, Total greenhouse gas emissions by countries (including international aviation and indirect CO₂, excluding LULUCF) for 2014



Compatible with European Energy Policy

- > **Nord Stream 2 supports the three main objectives of EU energy policy:**
 - **Supply security:** strengthens the EU's import infrastructure
 - **Affordability:** the most efficient access to abundant gas supplies
 - **Sustainability:** more gas supply to replace coal in power generation
- > **The EU cannot pursue all three objectives simultaneously without sufficient gas supply**
- > Nord Stream 2 is complementary to other routes and sources
- > The relationship between Russia and the EU is balanced and interdependent – the EU is Russia's largest customer for gas exports
- > Nord Stream 2 will be developed in full compliance with all applicable requirements from EU law, international conventions and national legislation





Five Vessels Guarantee a Timely Construction



Solitaire

- > Allseas Group S.A.
- > Dynamically positioned
- > Lay rate: approx. 3 km/day
- > Transit speed: 13 knots

Pioneering Spirit

- > Allseas Group S.A.
- > Largest pipelay vessel in the world
- > Dynamically positioned
- > Lay rate: approx. 3 km/day

Audacia

- > Allseas Group S.A.
- > Anchored vessel
- > Lay rate approx. 1,2 km/day
- > Offshore construction in German waters

Castoro Dieci (C10)

- > Saipem S.p.A.
- > Flat bottom, shallow draught
- > Anchored vessel
- > Nearshore preparatory works in Germany

Fortuna

- > MRTS
- > Flat bottom, multipurpose vessel
- > Anchor positioned
- > Installation of Russian landfall and shore approach



Nord Stream 2 – a European Project

Already, **more than half of the CAPEX of EUR 8 billion have been contractually committed in investments** in European industry and services involving over 670 companies from 25 countries. A selection:

Logistics

- 1 Port of Mukran
- 2 Port of HaminaKotka
- 3 Port of Karlshamn
- 4 Port of Hanko Koverhar
- 5 Company Headquarter in Zug

Pipes & Materials

- 1 EUROPIPE
- 2 OMK
- 3 Chelpipe
- 4 PetrolValves
- 5 Voestalpine
- 6 MMK
- 7 Dillinger Hütte
- 8 Impalloy
- 9 Wasco Coatings

Engineering & Surveys

- 1 Saipem Fano
- 2 Fugro Survey
- 3 Geo
- 4 Next
- 5 MMT
- 6 N-Sea

Offshore Pipelay

- 1 Allseas
- 2 Saipem
- 3 Boskalis / van Oord

Environmental Studies, Quality Management, Safety & inspection

- 1 Rambøll
- 2 IfaÖ
- 3 DNV GL
- 4 Svarog
- 5 Business Trend
- 6 Delta Energy Services
- 7 Intertek

