



Nord Stream 2
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Nord Stream 2 and Climate Protection

Nord Stream 2 AG | Dec-17





Nord Stream 2 provides a cost-effective contribution to the EU's climate protection target

Natural gas offers versatile applications, from chemical feedstock, to heating, cooling, transportation on land and sea – to power generation. Gas-fired power plants are more flexible (start-up times) and less capital-intensive in their construction. In power generation, gas emits 50 percent less CO₂ compared to coal, even less when transport and mining are factored in, and gas is used in more efficient combined heat and power plants (CHP).

1. In the EU, gas is expanding its share in the power generation mix, projected to overtake coal in by 2025

IEA WEO 2017 NPS (p. 674)	2000	2015	2025	2035	2040
Gas share in power gen.	16%	15.5%	19.8%	22.2%	21%
Coal share in power gen.	32.2%	25.8%	16.1%	7.6%	5.9%

Current CO₂ emissions in the EU stand at around 4,452 million tonnes of CO₂ equivalents (for 2015¹) – which is about 22 percent below 1990 levels. This is putting the EU on track to surpass its 2020 target of a 20-percent reduction over 1990. However, as for the 2030 targets of a 40-percent reduction, the European Environment Agency expects a slowing down of the pace of emissions reductions, meaning that the **EU will likely fall short of the ambitious reduction target without stepping up its efforts**². According to a PWC study, the EU will need to decarbonise at 3.1 percent per year (measured in tCO₂/GDP) to reach its 40-percent reduction target by 2030. This is faster than the UK's "dash for gas" in the 1990s or Germany's restructuring after reunification. Despite the EU's existing policies to tackle climate change, it will still need to "find another gear."³

2. Without more gas for fuel switching, the emissions reduction targets will not be met

- > Coal use in the EU28 power sector accounted for 843 million tonnes of CO₂ in 2015, generating a total of 826 TWh of electricity. Producing the same amount of power with gas, the EU could save over 460 million tonnes of CO₂, already a long way towards the reduction goal.⁴

1 Eurostat: Greenhouse Gas Emission Statistics (as of December 2015) http://ec.europa.eu/eurostat/statistics-explained/index.php/Greenhouse_gas_emission_statistics (accessed 7.12.2017)

2 European Environment Agency, Greenhouse gas emissions across EU drop slightly in 2016, 7 November 2017 (accessed 7.12.2017)

3 PWC: EU Emissions targets and implications for business (2015) p. 3

4 IEA, WEO 2017, p. 674 (CO₂ Intensity per TWh based on New Policy Scenario)



- > The UK for example, increased power consumption between 1990 and 2013 by 11 percent. Still, emissions from power generation decreased by 29 percent over the same period, which the UK department of Energy and Climate Change attributes to the fuel switch from coal to gas.⁵
- > The ambitious goals to reduce emissions in Germany, despite the Energiewende, will not be achieved without additional efforts.⁶ In Germany, gas is under pressure from cheap coal – despite an ever-growing share of renewables, emissions have decreased only slightly due to increased coal burning in the middle of the last decade. Energy-related CO₂ emissions decreased from 784⁷ million tonnes in 2010 (when gas covered 14 percent of power generation, coal 42 percent⁸) to 744 million in 2015, reflecting that the share of gas in power generation dropped to 9.6 percent while coal remained steady at 42 percent. As emissions are linked to weather conditions, however, colder winters will see a new increase of emissions if coal continues to be a cheap and convenient fall back option.
- > Germany needs to reach a reduction down to 750 million tonnes of CO₂ emissions by 2020 (from currently 906 million) to stay on track with its own emission reduction targets (40 percent below 1990 levels by 2020). Currently, this goal is not in sight and experts project that without added drastic efforts, Germany will only be able to reduce by 30 percent.⁹ This is due to an understatement of the assumptions about economic growth on which the government's projections were based.
- > Using 55 billion cubic metres of gas (bcm; nameplate capacity of Nord Stream 2) to replace coal in power generation would by itself save about 160 million tonnes, or 14 percent of the CO₂ from power generation overall.¹⁰

3. Energy experts confirm gas demand will remain at least stable

The **EU and renowned research institutions like the IEA predict that demand for gas will remain at least stable.** The IEA sees gas demand, even under new policies, as largely stable (+2 bcm over current levels, EU28 New Policies Scenario for 2035¹¹) – if only current policies are accounted for, demand will grow by 98 bcm (EU28 Current Policies Scenario for 2040¹²). Based on the EU's own Reference Scenario (2016), gas demand is projected to remain mostly stable over the coming 20 years, while domestic production, which has already decreased significantly in the last years, is projected to

5 United Kingdom DECC: 2013 UK Greenhouse Gas Emissions, Provisional Figures and 2012 UK Greenhouse Gas Emissions, Final Figures by Fuel Type and End-User; https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/295968/20140327_2013_UK_Greenhouse_Gas_Emissions_Provisional_Figures.pdf (accessed 13.3.2016)

6 European Environment Agency, Greenhouse gas emissions across EU drop slightly in 2016, 7 November 2017 (accessed 7.12.2017)

7 UBA, Treibhausgas-Emissionen in Deutschland, 2017 (accessed 7.12.2017)

8 AGEBA, 2017

9 Agora Energiewende, 2017 (accessed 7.12.2017)

10 IEA, WEO 2015, p. 606 based on 10.34 kWh per cubic metre of gas, with a 49% efficiency factor applied for power

11 IEA World Energy Outlook 2015, p. 604

12 ibid. p. 605



drop by another 50 percent in the next 20 years (Norway -25 bcm, UK -25bcm, Netherlands -40 bcm).¹³

Fuel switching from coal to gas, even within the existing power generation capacities in the EU, can move gas demand by as much as 30 bcm in one year.¹⁴

A functioning gas market requires sufficient gas deliveries in a cost-competitive and secure way, since domestic production is projected to rapidly decrease. If this demand for more gas is not met or gas supplies become less competitive, coal may once again increasingly replace gas (as it happened in Germany, see above).

4. “Pipeline gas has the edge over LNG – both economically and ecologically”¹⁵

Nord Stream 2 will offer a secure, reliable connection to the world’s biggest gas reserves in Siberia, where investments from Russian and international energy companies over the last decades have ensured that the gas fields are **amongst the most cost-effective** sources from which to supply Europe. At the same time, Russian gas supplies are available and deliverable at short notice, making **Russian piped gas the best option for Europe’s gas supply** – economically and ecologically.

LNG, as often suggested, will certainly play a role in supplying the EU, yet its role in realising a secure, affordable and sustainable gas supply are limited.

- > The Nord Stream 2 route from the Bovanenkovo field in Northern Russia to Greifswald, Germany would produce 2.4 to 4.6 times less greenhouse gas emissions than LNG shipments, depending on the source of the liquefied gas. The emissions savings between 17.1 and 44.6 million tonnes of CO₂ equivalent per year would roughly equal the total annual emissions of Lithuania (lower end) or Slovakia (higher end).¹⁶
- > Lack in capacity: 55 bcm of gas would require around 600-700 LNG tanker shipments in the Baltic Sea.¹⁷ The number of tankers available for spot trading is limited at currently 46, the rest being tied up in long-term shipping contracts, mostly in Asia.¹⁸
- > LNG follows the markets: Global demand growth leads to increased need for LNG because production and consumption locations further diverge from each other. Demand in the Asia Pacific region is projected to double by 2040¹⁹ and the market to tighten. The number of LNG importing countries has risen from 15 in 2005 to 40 in 2016. Due to the prevailing market dynamics, LNG Imports in the EU dropped from around 80 bcm in 2011 to about 44 bcm in 2015, as suppliers directed their shipments

13 EU Reference Scenario 2016 - Energy, transport and GHG emissions - Trends to 2050, p. 4; adapted with various production outlooks

14 IHS Energy: The Four Floors of Global Gas Prices, March 2016

15 Mario Mehren, Chairman of the Board of Executive Directors at Wintershall, as quoted by Caspian Energy Newspaper, 5 May 2016

16 ThinkStep, Greenhouse Intensity of Natural Gas Transport - Comparing the Nord Stream 2 Pipeline to LNG Import Alternatives, April 2017

17 Assuming tanker sizes able to operate in the Baltic, around 150,000 m³ of LNG

18 <https://www.lngworldnews.com/poten-vessel-supply-growth-expectations-weigh-on-lng-spot-charter-rates/> (accessed 7.12.2017)

19 IEA, WEO 2017



to Asia because of the higher market prices in that region. Despite sufficient upstream facilities and many LNG regasification sites in Europe, which on average are only used at 23 percent of their 190 bcm capacity²⁰, LNG cannot competitively replace piped gas in the European markets.

Nord Stream 2 also compares favourably to onshore pipelines, which require significant land usage, longer construction times and burn more gas for interim compression.

Extensive Environmental and Social Monitoring Programmes have demonstrated that construction of the existing Nord Stream lines **did not cause any significant environmental impact in the Baltic Sea**, confirming the positive environmental recovery trend after construction. So far, all monitoring results have confirmed that construction-related impacts were minor, locally limited and predominantly short-term.

Nord Stream 2 will add a new and highly reliable supply route from Russia to the EU internal market, ensuring that gas remains affordable. By making more gas available to replace coal in power generation Nord Stream 2 will provide a cost-effective contribution to emissions reduction.

²⁰ CIEP, Outlook for LNG Imports into the EU to 2025, 2016.



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About Nord Stream 2 AG

Nord Stream 2 is a planned pipeline through the Baltic Sea, which will transport natural gas over 1,200km from the world's largest gas reserves in Russia via the most efficient route to consumers in Europe. Nord Stream 2 will largely follow the route and design of the successful Nord Stream pipeline. With Europe's domestic gas production projected to halve in the next 20 years, Nord Stream 2's twin pipeline system will help Europe to meet its future gas import needs, with the capacity to transport 55 billion cubic metres of gas per year, enough to supply 26 million European households. This secure supply of natural gas with its low CO₂ emissions will also contribute to Europe's objective to have a more climate-friendly energy mix with gas substituting for coal in power generation and providing back-up for intermittent renewable sources of energy such as wind and solar power.

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