Nord Stream 2 and its effects on European wholesale power prices

Executive Summary

ewi Energy Research & Scenarios | Dr. Harald Hecking | 10/10/2018
Reference: Analysis by ewi ER&S (2017) showed lower EU gas prices and consumer costs with Nord Stream 2

Weighted average gas wholesale price in the EU-28 and consumer savings

Scenario “Low”: Relaxed LNG market

Scenario “High”: Tight LNG market

EU annual gas bill is 8 to 13 bn EUR lower with NSP2

EU annual gas bill is 24 to 35 bn EUR lower with NSP2

Source: ewi ER&S (2017) - Impacts of Nord Stream 2 on the EU natural gas market
What will be the effect of Nord Stream 2 on the electricity expenses of EU energy consumers?

- The number of hours where gas-fired power plants are price-setting in the wholesale electricity market will increase in the next years.

- Since the gas price affects the marginal costs of those price-setting gas-fired units, gas prices becomes more and more crucial to explain the power price.

- The quicker EU member states phase out coal-fired generation the stronger will gas prices drive electricity prices.

- The aforementioned aspects are the consequence of the developments in the power market. This is independent from the question whether or not Nord Stream 2 is available.

- Hence, lower gas prices through Nord Stream 2 (meaning lower marginal generation costs for gas-fired stations) will cause lower electricity prices.
The effect of different gas prices on electricity prices is simulated with ewi‘s EU power market model DIMENSION*

- Gas price assumptions are taken from ewi ER&S (2017) „Impacts of Nord Stream 2 on the EU natural gas market“. These 4 different gas price scenarios (see below) are applied in ewi‘s DIMENSION model, resulting in electricity prices.

- Current forward prices (as of Sept 2018) from TTF are within the range of „low“ and „high“ scenario w/o NSP 2, indicating that scenarios „low“ and „high“ span a reasonable range of gas prices.

*For more information on the DIMENSION model see: www.ewi.research-scenarios.de/en/models/dimension/
Scenario low: Electricity prices are 2.2 to 4.3 EUR/MWh lower with NSP2, leading to significant savings for EU consumers

- The gas price reduction of 1.6 to 2.6 EUR/MWh from NSP2 causes an electricity price reduction of 2.2 to 4.3 EUR/MWh
- EU-28 power demand is roughly 3200 TWh implying electricity consumer savings of 7 to 14 bn EUR per year
- Lower power prices are achieved in each EU member state

[Diagram showing weighted average electricity wholesale price in the EU-28 and consumer savings]
Scenario high: Electricity prices are 6.5 to 10.7 EUR/MWh lower with NSP2, leading to significant savings for EU consumers.

- The gas price reduction of 4.9 to 6.9 EUR/MWh from NSP2 causes an electricity price reduction of 6.5 to 10.7 EUR/MWh.
- EU-28 power demand is roughly 3200 TWh implying electricity consumer savings of 21 to 35 bn EUR per year.
- Lower power prices are achieved in each EU member state.
Lower gas and electricity prices due to NSP2 imply double digit billion EUR cost savings for EU-28 energy consumers

- In scenario „Low“ the end consumer savings amount to 13 to 23 bn EUR/a
- In scenario „High“ the end consumer savings amount to 39 to 60 bn EUR/a
- Note: End consumer savings in the gas market shown here are lower than in Slide 2 to avoid double-counting of cost savings from gas use in power generation: Cost savings for gas use by gas-fired plants lead to lower electricity prices. Hence, the cost advantage is only accounted for once, i.e. in the electricity market, however not in the gas market.
Chemical industry is the industry branch, which benefits most from energy cost savings in a scenario with NSP2.

Annual EU-28 electricity and gas cost savings for exemplary industry sectors due to NSP2.

**Scenario “Low”: Relaxed LNG market**

<table>
<thead>
<tr>
<th>Year</th>
<th>Iron and Steel</th>
<th>Chemical</th>
<th>Non ferrous metals</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>257 EUR/Year</td>
<td>576 EUR/Year</td>
<td>143 EUR/Year</td>
</tr>
<tr>
<td>2025</td>
<td>499 EUR/Year</td>
<td>785 EUR/Year</td>
<td>278 EUR/Year</td>
</tr>
<tr>
<td>2030</td>
<td>408 EUR/Year</td>
<td>642 EUR/Year</td>
<td>227 EUR/Year</td>
</tr>
</tbody>
</table>

**Scenario “High”: Tight LNG market**

<table>
<thead>
<tr>
<th>Year</th>
<th>Iron and Steel</th>
<th>Chemical</th>
<th>Non ferrous metals</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>456 EUR/Year</td>
<td>1764 EUR/Year</td>
<td>419 EUR/Year</td>
</tr>
<tr>
<td>2025</td>
<td>753 EUR/Year</td>
<td>1185 EUR/Year</td>
<td>196 EUR/Year</td>
</tr>
<tr>
<td>2030</td>
<td>1040 EUR/Year</td>
<td>1637 EUR/Year</td>
<td>224 EUR/Year</td>
</tr>
</tbody>
</table>
German electricity consumers save 1.0 to 2.4 bn EUR/a (Low) and 2.6 to 5.3 bn EUR/a (High) in a scenario with NSP2.

Weighted average electricity wholesale price in the EU-28 and consumer savings

**Scenario “Low”: Relaxed LNG market**
- 2020: 1.0 bn EUR/a
- 2025: 2.4 bn EUR/a
- 2030: 1.6 bn EUR/a

**Scenario “High”: Tight LNG market**
- 2020: 2.6 bn EUR/a
- 2025: 5.3 bn EUR/a
- 2030: 3.8 bn EUR/a
British electricity consumers save 1.0 to 1.6 bn EUR/a (Low) and 3.3 to 4.4 bn EUR/a (High) in a scenario with NSP2

Weighted average electricity wholesale price in the EU-28 and consumer savings

Scenario “Low”: Relaxed LNG market

Scenario “High”: Tight LNG market
Italian electricity consumers save 1.0 to 1.4 bn EUR/a (Low) and 3.0 to 4.1 bn EUR/a (High) in a scenario with NSP2

Weighted average electricity wholesale price in the EU-28 and consumer savings

Scenario “Low”: Relaxed LNG market

- 2020: IT average electricity prices (left axis)
- 2025: IT consumer savings (right axis)
- 2030: IT average electricity prices (left axis)

Scenario “High”: Tight LNG market

- 2020: IT average electricity prices (left axis)
- 2025: IT consumer savings (right axis)
- 2030: IT average electricity prices (left axis)
Contact:

Dr. Harald Hecking, Managing Director

ewi Energy Research & Scenarios gGmbH | 10/10/2018

harald.hecking@ewi.research-scenarios.de, Phone: +49 (0) 221/ 277 29-108