EU Gas Supply After Nord Stream 2

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- Less supply options
- Lower security
- Lower flexibility
- Lower profits for Gazprom (non-commercial project)
- Additional costs for EU consumers

NS2 Reduces Gas Supply Options

Promises

- NS2 Booklet: “Nord Stream 2 will be a competitive additional option...”
- A. Merkel: “We believe Nord Stream poses no danger to diversification.”
- U.Lissek, Nord Stream 2 AG: “Nord Stream 2 is not a replacement for any other transport route.”
- CEOs of Uniper, Wintershall and OMV: “Nord Stream 2 provides another reliable route for transporting gas to Europe, nothing more, nothing less. Having an additional pipeline means more supply options.”

Reality

- NS2 is followed by “the decommissioning of almost 4,300 kilometers of single-string trunklines and 62 compressor shops with a total installed capacity of over 3 GW”.
  - Notably, Gazprom announced it well before the statements on the left were made.
  - Gazprom reports the progress of the plan.
- Gazprom CEO A.Miller says “some facilities in the central corridor are no longer needed”.
- Former deputy CEO A.Medvedev said “there won’t be any transit through Ukraine in future. Even if the Sun and the Moon switch places”.

Phasing Out Three Ukrainian Options

- There are four export corridors shipping Russian gas through Ukraine to Poland-1, Slovakia-2, Hungary-3 and Romania-4.
  - Option 4 replaced by TurkStream.
- Ukraine controls about 240 bcma at the Russian border and 146 bcma of export capacity to Europe.
- Gazprom plans to close over 95% of pipeline capacity at the Russian-Ukrainian border.
- There will be less options to deliver Russian gas to Europe after NS2.

“Optimization” Plan of Gazprom

NS2 Reduces Security of Gas Supply

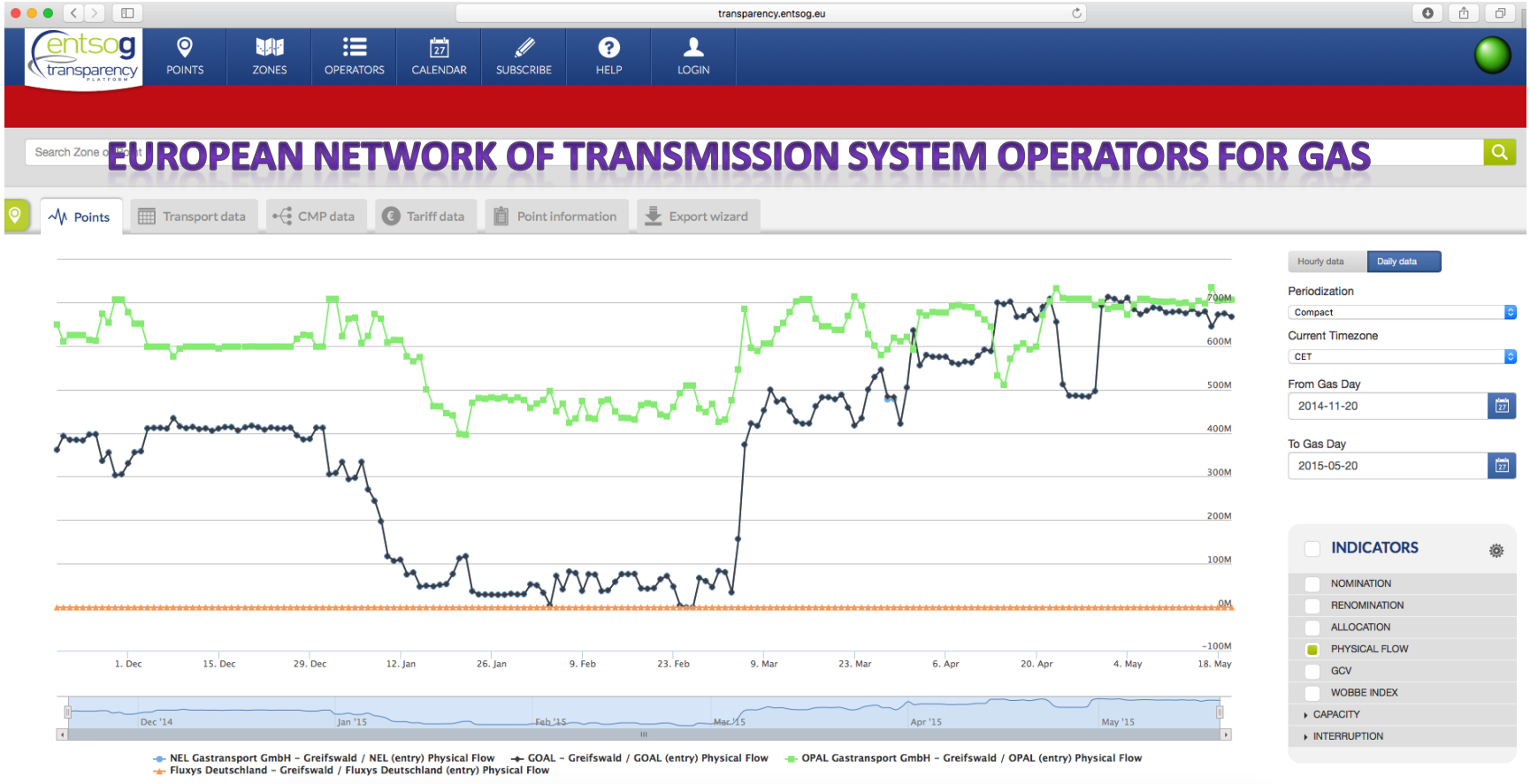
Promises

- V.Putin: “This project is designed to enhance energy security in Europe”.
- NS2 Booklet: “Nord Stream 2 will increase security of supply by offering an additional transport system...”
- Gazprom on NS2 and TurkStream: “Expansion of risk-free export routes to Europe”.

Reality

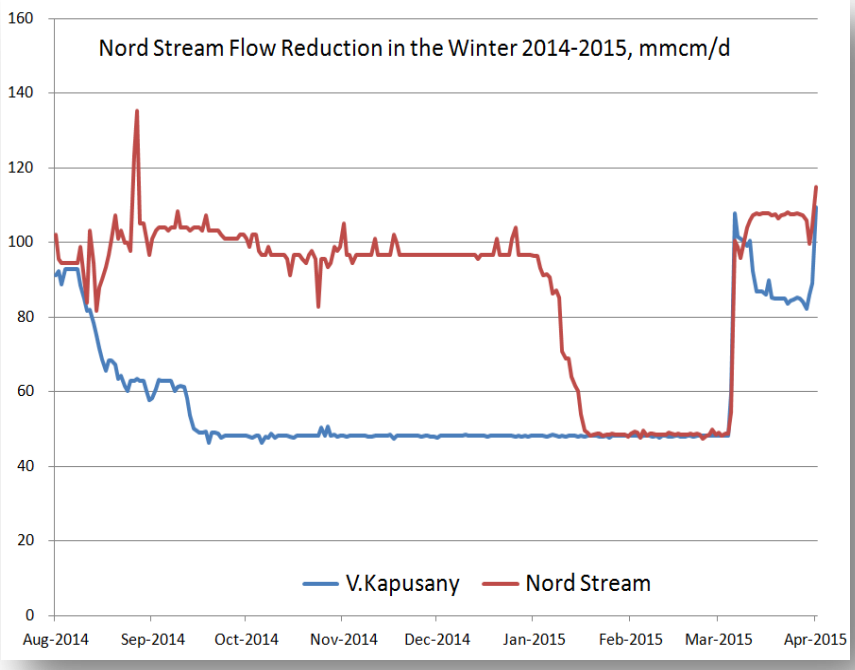
- Same promises were made about secure supplies through the first Nord Stream.
- However, when Putin got angry by reverse gas sales from the EU to Ukraine, he ordered Gazprom to reduce daily flow of NS1 by 50% (instead of arbitration).
- Stability of supplies by Nord Stream 1 and 2 depends on “good behavior” of Germany.

NS1 Flow in January-March 2015



Source: entsog.eu

“Risk-Free” Gas Flow in Jan-Mar-2015



Sources: NEL, OPAL, Eustream

- At that time Gazprom needed to demonstrate the reliability of the new route completed just 15 months ago.
- The failed attempt to stop the reverse flow to Ukraine resulted in a loss of $5.5 bn of Gazprom’s revenue and fines of $400 million.
- The temptation to use the gas tap to punish Europeans for “bad behavior” was irresistible.
  - For V.Putin it was more important than $6 billion and the reputation of Nord Stream.
- With NS2 in place, gas security of more than half of the EU would depend on the bilateral relations of Moscow and Berlin.

NS2 Reduces Flexibility of Supply

Promises

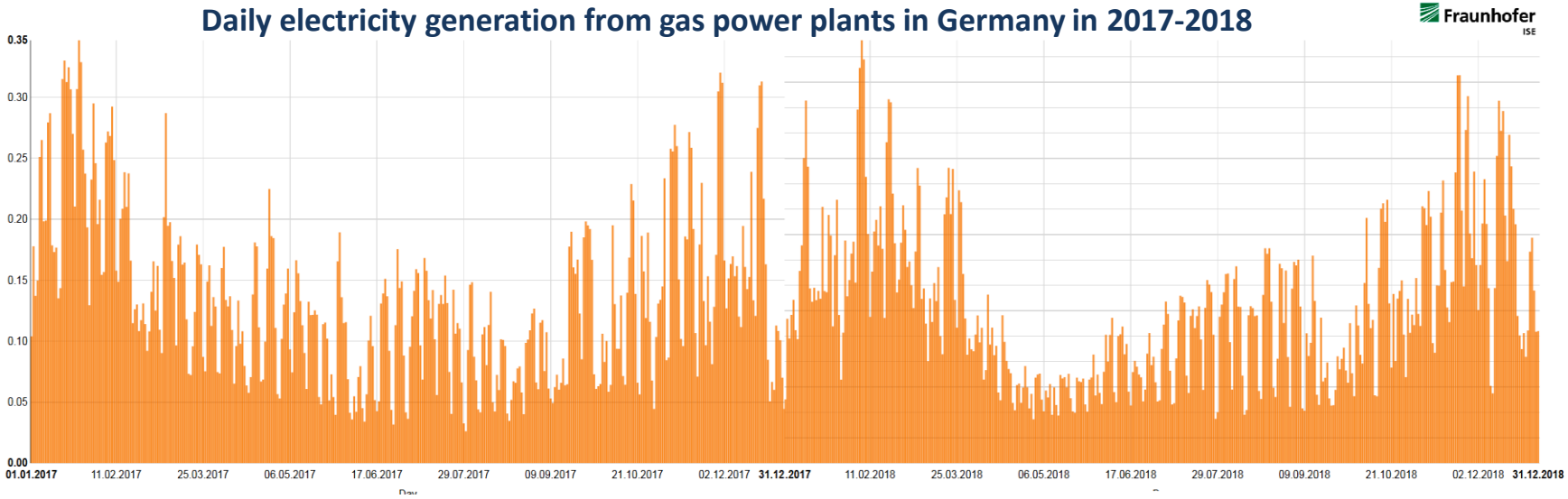
- NS2 Booklet: "In addition to its lower carbon profile, natural gas offers a second significant benefit: its flexibility."
- Pavel Zavalny, Chairman Energy Committee, Russian Duma, on NS2: "Only Russia can provide Europe with flexible supplies of big volumes of gas both in winter and in summer."
- Gazprom report: "Clean natural gas is the most efficient fuel to balance out renewable power generation".

Reality

- Same as NS1, NS2 is designed to ship equal daily volumes regardless of even the seasonal change of demand.
  - Responding to short terms swings in case of low wind condition or cold snap is out of question.
  - NS2 promotes coal as peak fuel.
- There is very limited gas storage capacity and no spare pipeline capacity along the route from Yamal to NS2.
- Gazprom would need to inject more gas to EU storage facilities with additional costs to be carried by European gas consumers.

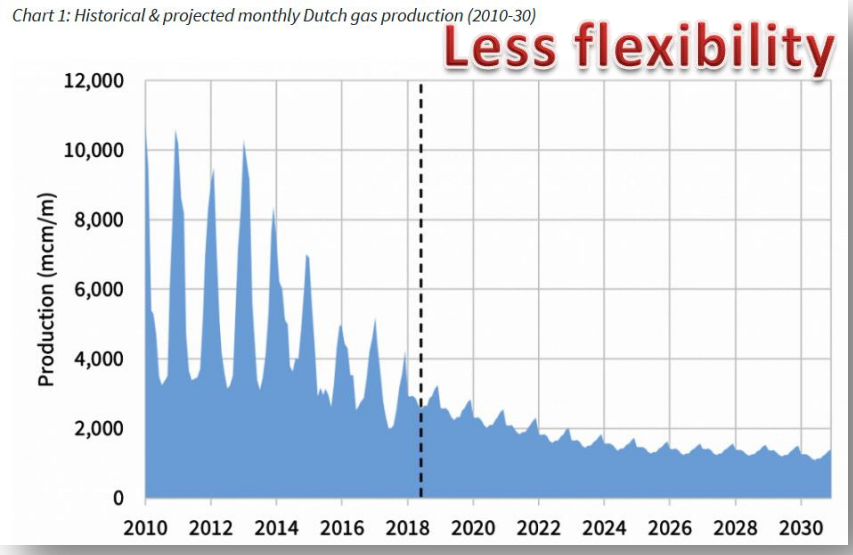
Balancing Role of Gas with Renewable Energy

- Consumers want to receive gas when they need it.
  - More on weekdays and less on weekends; more in the winter and less in the summer.
- Gas infrastructure should be able to respond to short term swings in supply/demand balance (e.g. low wind conditions, cold snap).

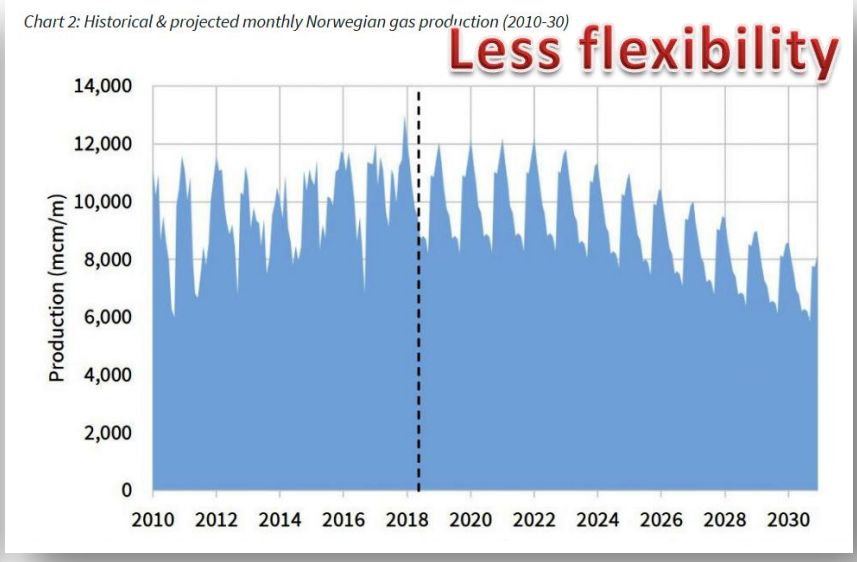


Replacement for Groningen Needed

Monthly Dutch gas production, mmcm

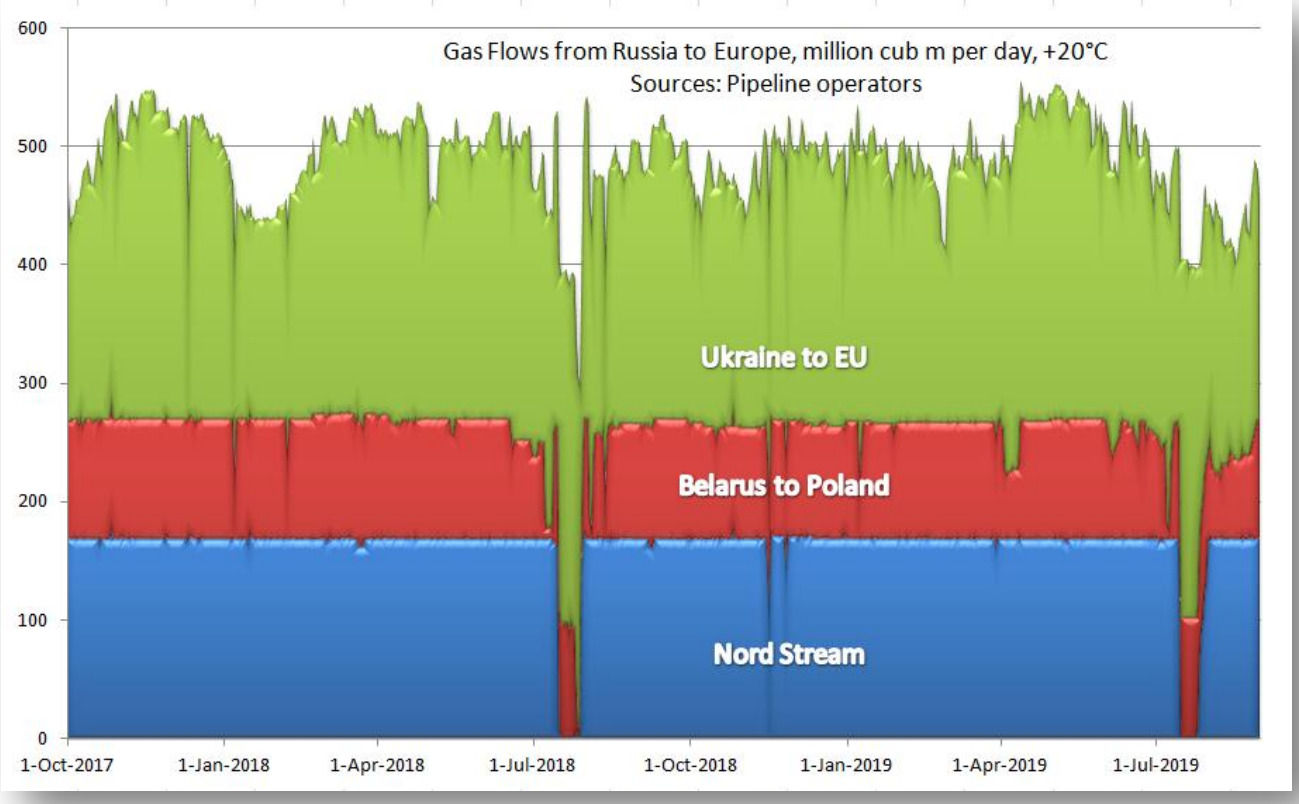


Monthly Norwegian gas production, mmcm



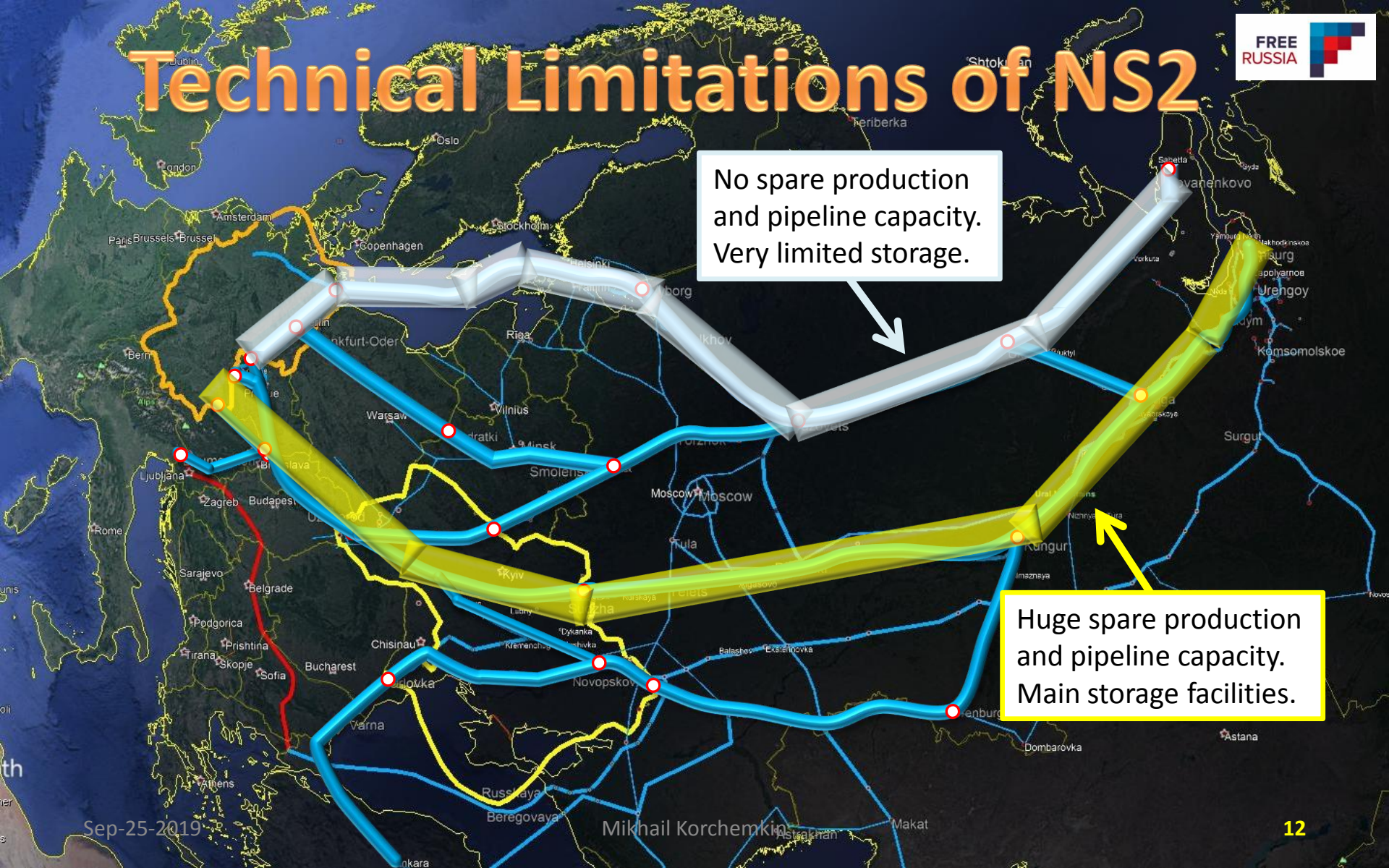
Norwegian seasonal flexibility has played a key role in 'backfilling' the loss of Rough storage in the UK. That has reduced seasonal profile of flows to the Continent. – Timera, "European production flex is declining fast".

Nord Stream Offers No Flexibility

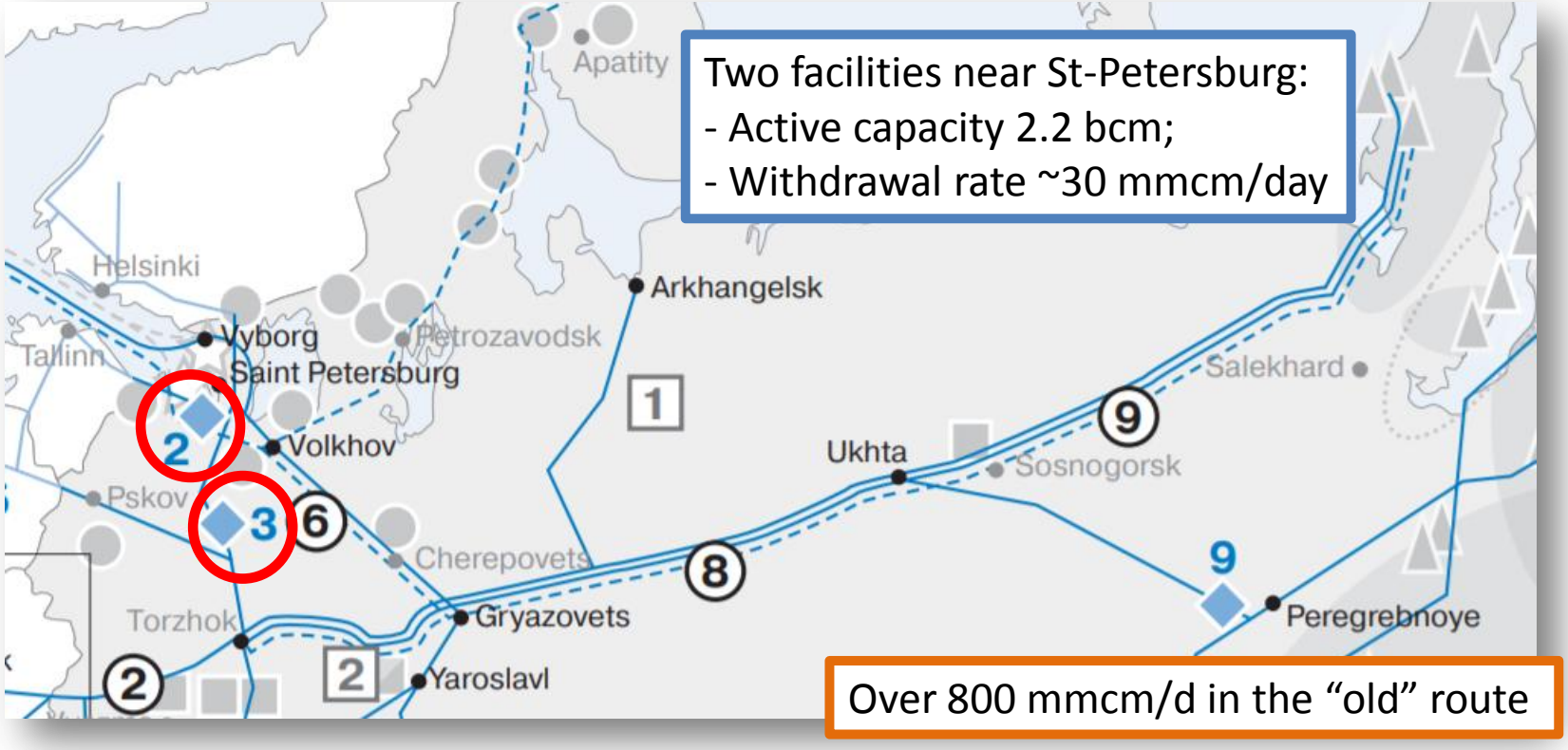


Gazprom plans to replace flexible exports by steady daily flows regardless of the demand.

Technical Limitations of NS2

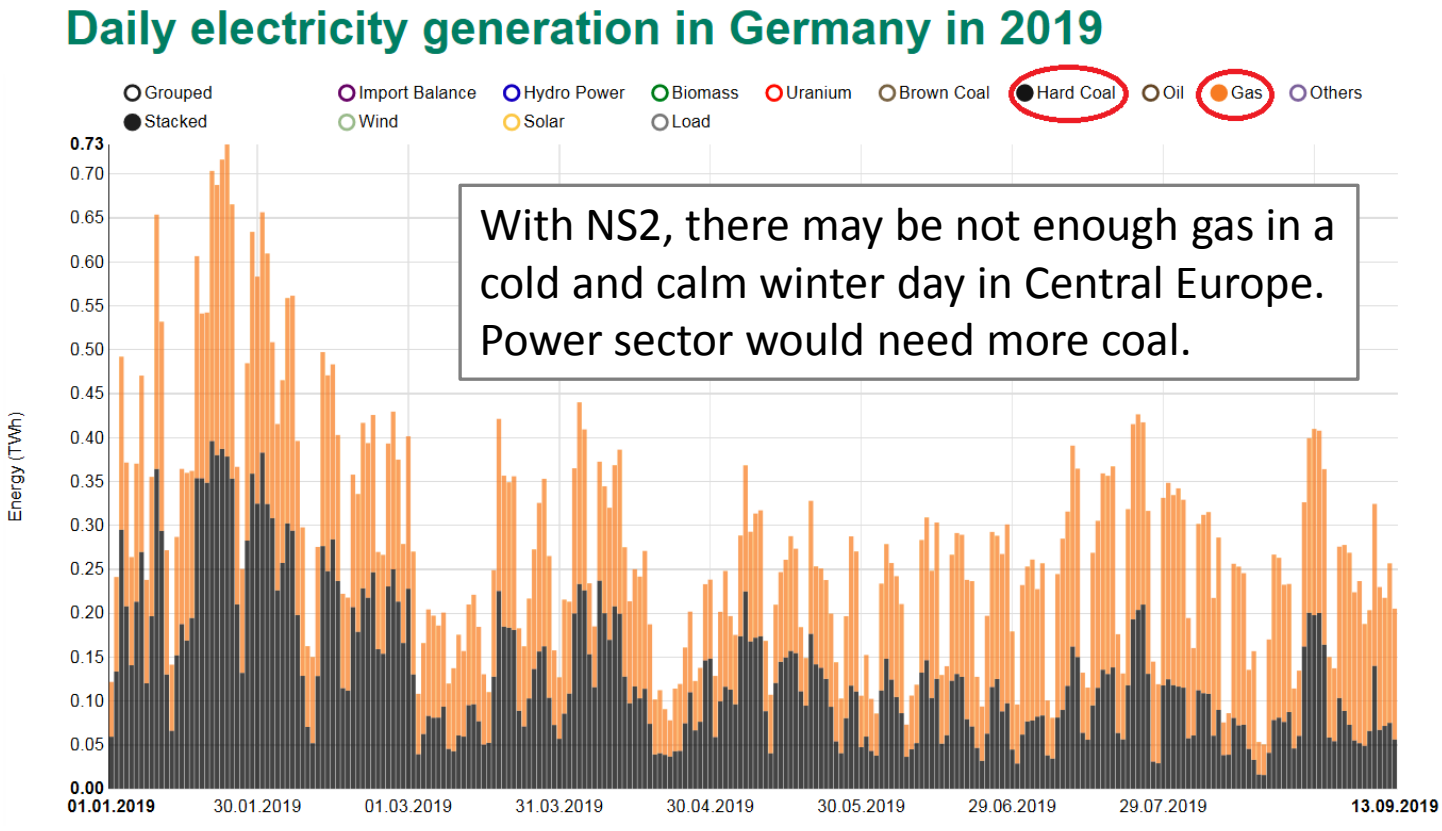


NS2 – Limited Access to Storage Facilities



Source: [Gazprom in Figures 2014-2018]

Fuel for Peak Power Generation



NS2 Brings Additional Costs

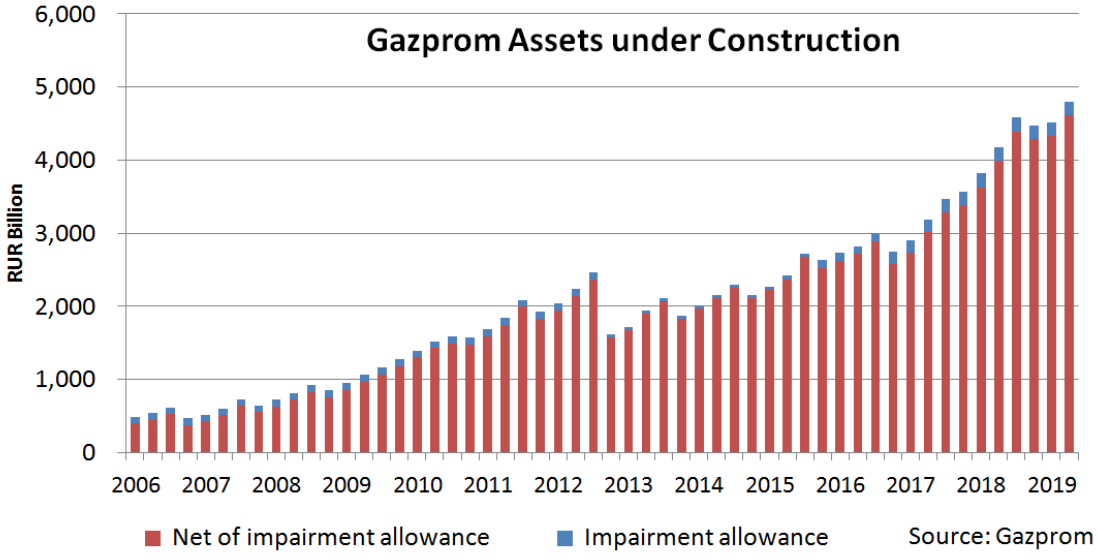
Promises

- Nord Stream 2 AG anticipates that with NS2 the EU wholesale gas prices would drop 13 percent.
- Putin on NS2 and TurkStream: “Pipeline gas from Russia, considering the distance and volume of deliveries, will always be cheaper, by definition, than liquefied gas from overseas. Always.”

Reality

- NS2 increases the level of gas price divergence in the EU.
- More storage injection is needed with the costs paid by end-users.
  - EU storage capacity lower than in 2016.
  - New facilities to be built with costs reflected in tariffs.
- Growing investment is not reflected in Gazprom costs yet.
- Different contracts have different price formulas.

No Depreciation for 1/3 of All Assets



- There was a twelvefold increase of assets under construction from 2006 to 2019 – the era of megaprojects of Gazprom.
- Technically, assets worth €75 Bn are not working (no depreciation costs).
  - Gazprom lowers gas transportation costs by delayed commissioning of assets.

Peak Gas from Storage or Spot Market

Product information

Storage location:	Haidach	
Product name:	astora-pack	
Gastype:	Natural gas	
1 Bundle comprises:	Injection capacity:	10.00 kWh/h
	Withdrawal capacity:	10.00 kWh/h
	Working gas volume:	22,000.00 kWh
Minimal Quantity:	500 Bundles	
Minimum runtime:	1 Year(s)	

Calculation data

Amounts of bundles:	500
Injection capacity:	5,000.00 kWh/h
Withdrawal capacity:	5,000.00 kWh/h
Working gas volume:	11,000,000.00 kWh
Starting date:	1 Apr 2020 6:00
End day:	1 Apr 2021 6:00

~ 1 million m3

Charge calculation

Storage fee		
Monthly storage fee	1 Apr 2020 - 1 Apr 2021	6,227.92 EUR
Accumulated amount over contract period	1 Apr 2020 - 1 Apr 2021	74,735.04 EUR

Source: Astora-Gazprom Germania

- Gas to be stored in summer time and withdrawn in winter.
  - Storage service costs money – Haidach about €76/mcm or €6.8/MWh.
  - Storage capacity is limited.
- Gazprom suggests selling LNG.
  - There are no pipelines to deliver gas from the sea shore to Southern Germany and Central Europe.
- NS2 creates bottlenecks.

NS2 Is Not a Commercial Project

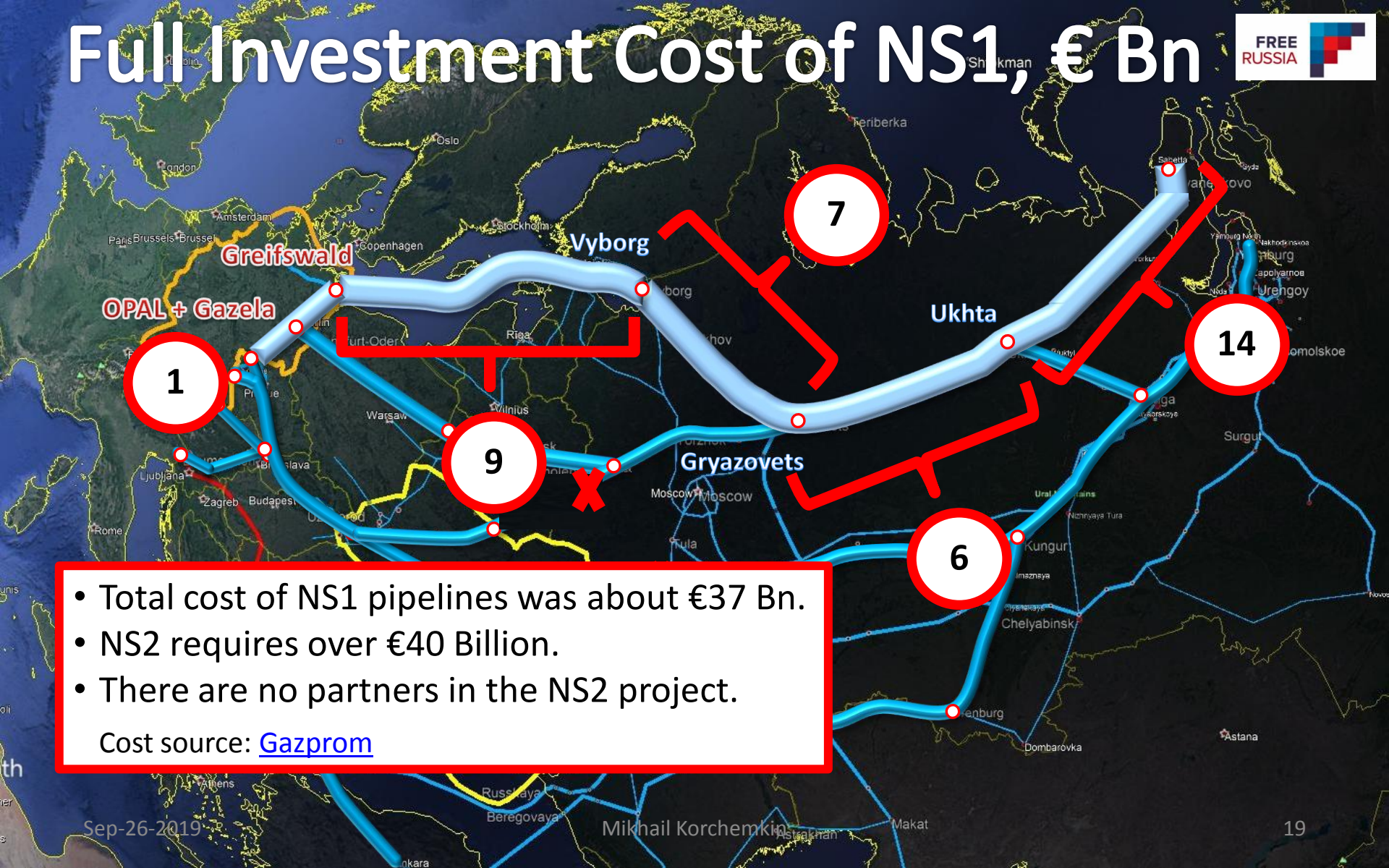
Promises

- Gazprom 2018 Investor Day on NS2: “$1.0 bn per year positive effect on EBITDA and FCF level”.
- NSP2AG Letter to EC: “It is anticipated that EU wholesale gas prices will be up to 13 percent lower by 2020 due to the additional gas which Nord Stream 2 will be able to make available to the European market”.

Reality

- Decommissioning of pipelines at the Russian-Ukrainian border means no additional gas.
- Gazprom alone has to invest €40+Bn to deliver gas from Yamal to Germany.
  - Gazprom invests billions to sell the same volume of gas at a lower price?
- OPAL court decision changes the transportation cost of Gazprom.

Full Investment Cost of NS1, € Bn



- Total cost of NS1 pipelines was about €37 Bn.
- NS2 requires over €40 Billion.
- There are no partners in the NS2 project.

Cost source: Gazprom

NS2 Not Needed from the Capacity Standpoint

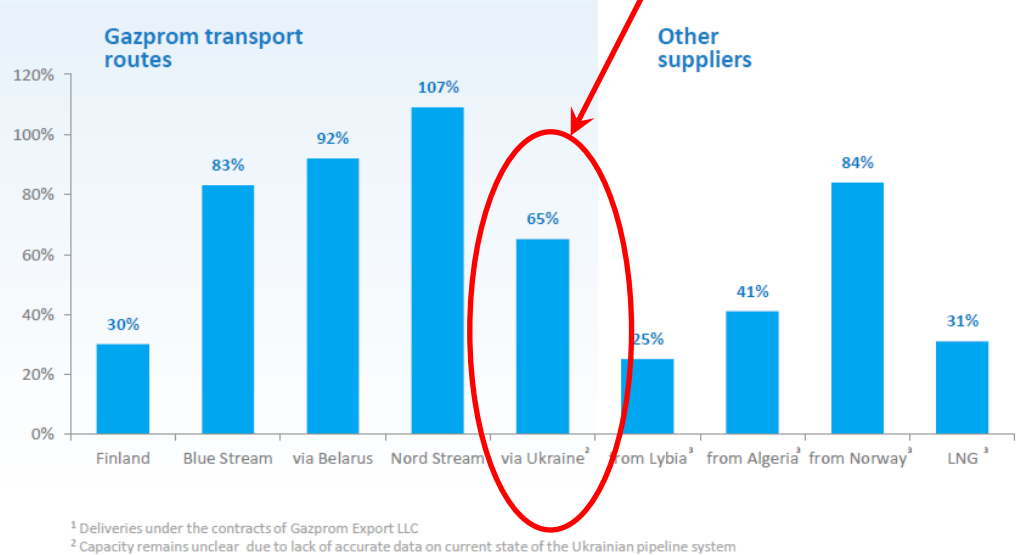
GAZPROM

2019 GAZPROM INVESTOR DAY

GAZPROM'S EXPORT ROUTES

Ukraine spare capacity ~50 bcma

CAPACITY UTILIZATION OF MAIN ROUTES FOR GAS SUPPLIES TO EUROPE IN 2018[1]



Gazprom transport routes demonstrated high level of capacity utilization in 2018

Utilization rate of the competing routes was at the same level or even declined

Utilization rate of LNG terminals in Europe increased from 29% in 2017 to 31% in 2018 as a result of increased LNG deliveries

Gazprom officially reports no violations of the transit contract by Naftogaz.

[1] Deliveries under the contracts of Gazprom Export LLC
[2] Capacity remains unclear due to lack of accurate data on current state of the Ukrainian pipeline system
[3] Pipeline exports
[4] Including LNG trading between European countries and capacity of FSRUs
Source: ENTSOG, Bloomberg, IHS Markit

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Commercial Project for Contractors

- Putin's friends are the obvious beneficiaries of NS1 and NS2.
- Sberbank Report May 2018.
  - We discover that Gazprom's decisions make perfect sense if the company is assumed to be run for the benefit of its contractors, not for commercial profit.
  - The Power of Siberia, Nord Stream2 and Turkish Stream are all deeply value-destructive projects.
- The report was withdrawn and the analyst fired.

"Yes, these people are my friends and I'm proud to have such friends. They are true patriots and their business is oriented towards Russia."
V. Putin on Messrs A.Rotenberg & G.Timchenko.