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European gas without Ukraine?

The economics of South Stream

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E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

Main messages

1. Under most gas demand scenarios, South Stream is not a profitable investment

2. However, South Stream's value would be positive if:
   - Gas demand in Europe is expected to be very high, and/or
   - Ukraine raises its transit fee considerably

3. Assuming that Ukraine (that is, Naftogaz, the national energy company) has a very high discount rate then it may allow Russia to bypass Ukraine entirely

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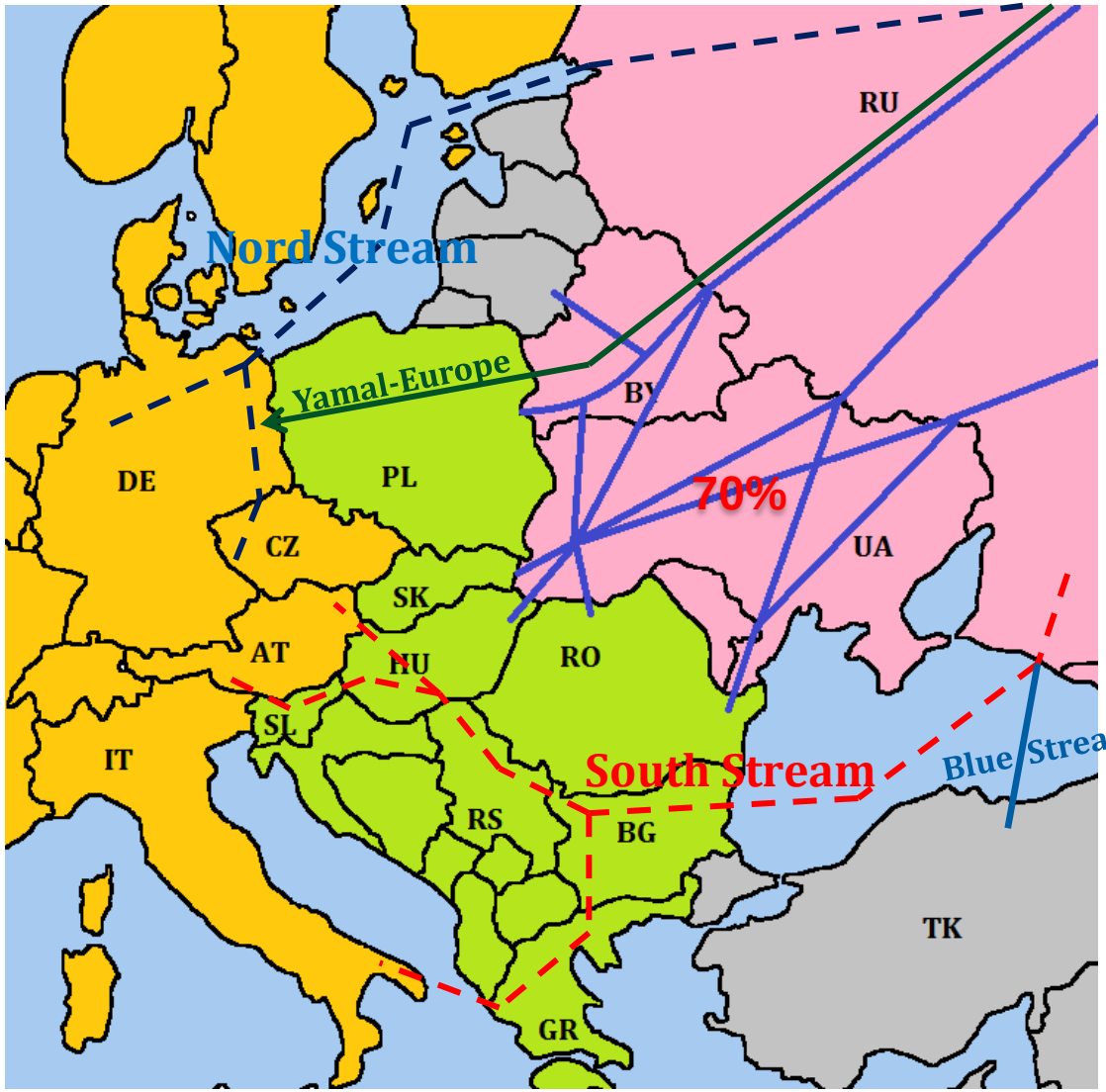
The context



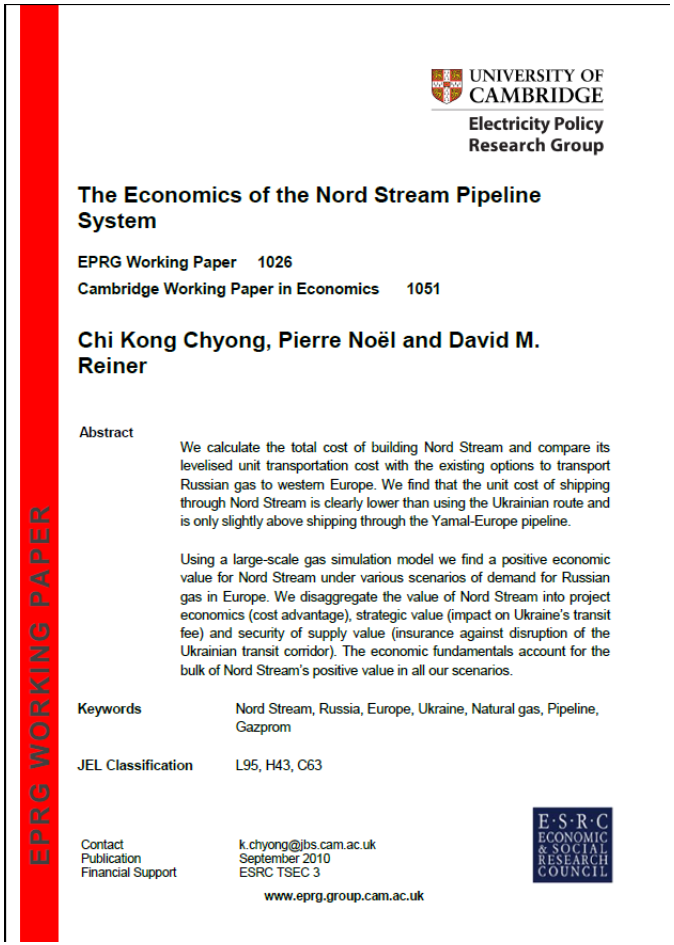
- Ukraine currently transports 70% of Russian gas to Europe
- Frequent gas disputes with Russia have raised concerns about the reliability of transit through Ukraine
- Gazprom's route diversification strategy:
  1. Yamal-Europe
  2. Blue Stream
  3. Nord Stream
  4. South Stream

Research question

- Given that Nord Stream is under contruction

Will South Stream be built?

The Economics of Nord Stream



EPRG WORKING PAPER

UNIVERSITY OF CAMBRIDGE
Electricity Policy Research Group

The Economics of the Nord Stream Pipeline System

EPRG Working Paper 1026
Cambridge Working Paper in Economics 1051

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Abstract

We calculate the total cost of building Nord Stream and compare its levelised unit transportation cost with the existing options to transport Russian gas to western Europe. We find that the unit cost of shipping through Nord Stream is clearly lower than using the Ukrainian route and is only slightly above shipping through the Yamal-Europe pipeline.

Using a large-scale gas simulation model we find a positive economic value for Nord Stream under various scenarios of demand for Russian gas in Europe. We disaggregate the value of Nord Stream into project economics (cost advantage), strategic value (impact on Ukraine's transit fee) and security of supply value (insurance against disruption of the Ukrainian transit corridor). The economic fundamentals account for the bulk of Nord Stream's positive value in all our scenarios.

Keywords Nord Stream, Russia, Europe, Ukraine, Natural gas, Pipeline, Gazprom

JEL Classification L95, H43, C63

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- Nord Stream investment is profitable :
  - The Nord Stream route is shorter than the Ukrainian one
  - If Ukraine lowers its transit fee, the Nord Stream value would increase significantly
  - The Nord Stream security of supply value is marginal

The paper can be downloaded from *www.eprg.group.cam.ac.uk*

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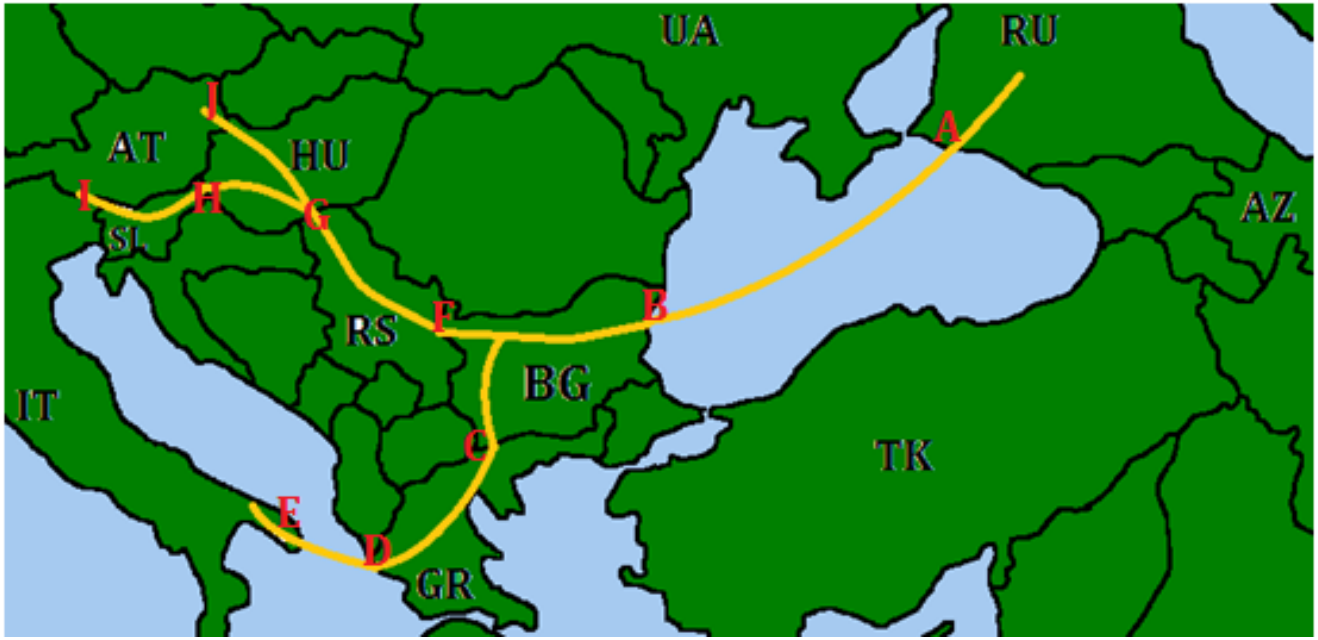
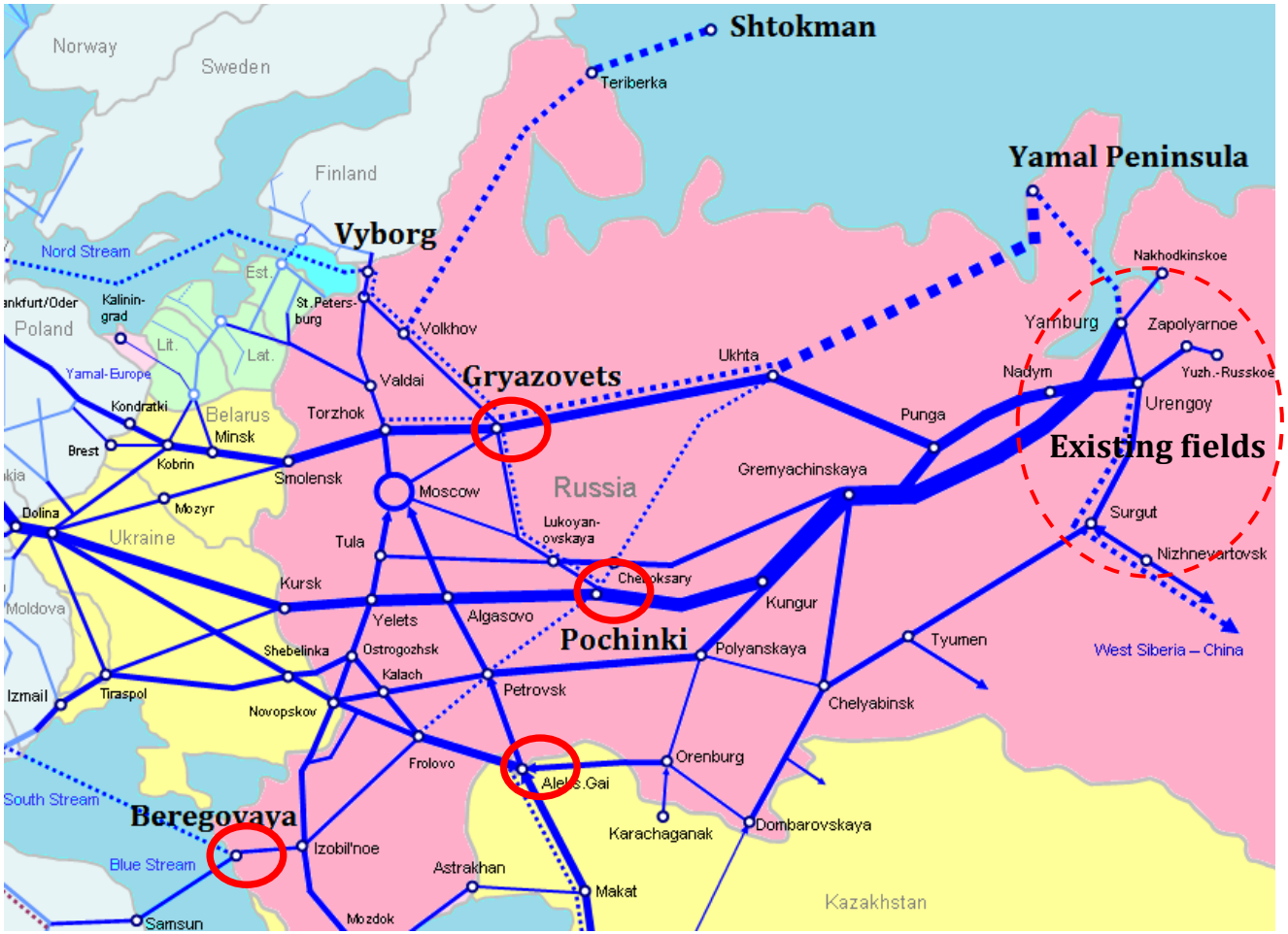
The South Stream system



Source: based on South-stream.info

- Off-shore pipeline under the Black Sea (A-B):
  Total Capacity: 63 bcm;
  Length:~900 km
- Northern route:
  1. Bulgaria-Serbia (B-F): ~960km;
  2. Serbia-Hungary (F-G): ~530km
  3. Hungary-Slovenia (G-H): ~610km
  4. Hungary-Austria (G-J): ~350km
  5. Slovenia-Austria (H-I): ~220km
- Southern route:
  1. Bulgaria-Greece (B-C): ~416km
  2. Greece (C-D): ~690km
  3. Greece-Italy (D-E): ~200 km
- Cost estimates:
  - Gazprom (2010): €15.5 Bn

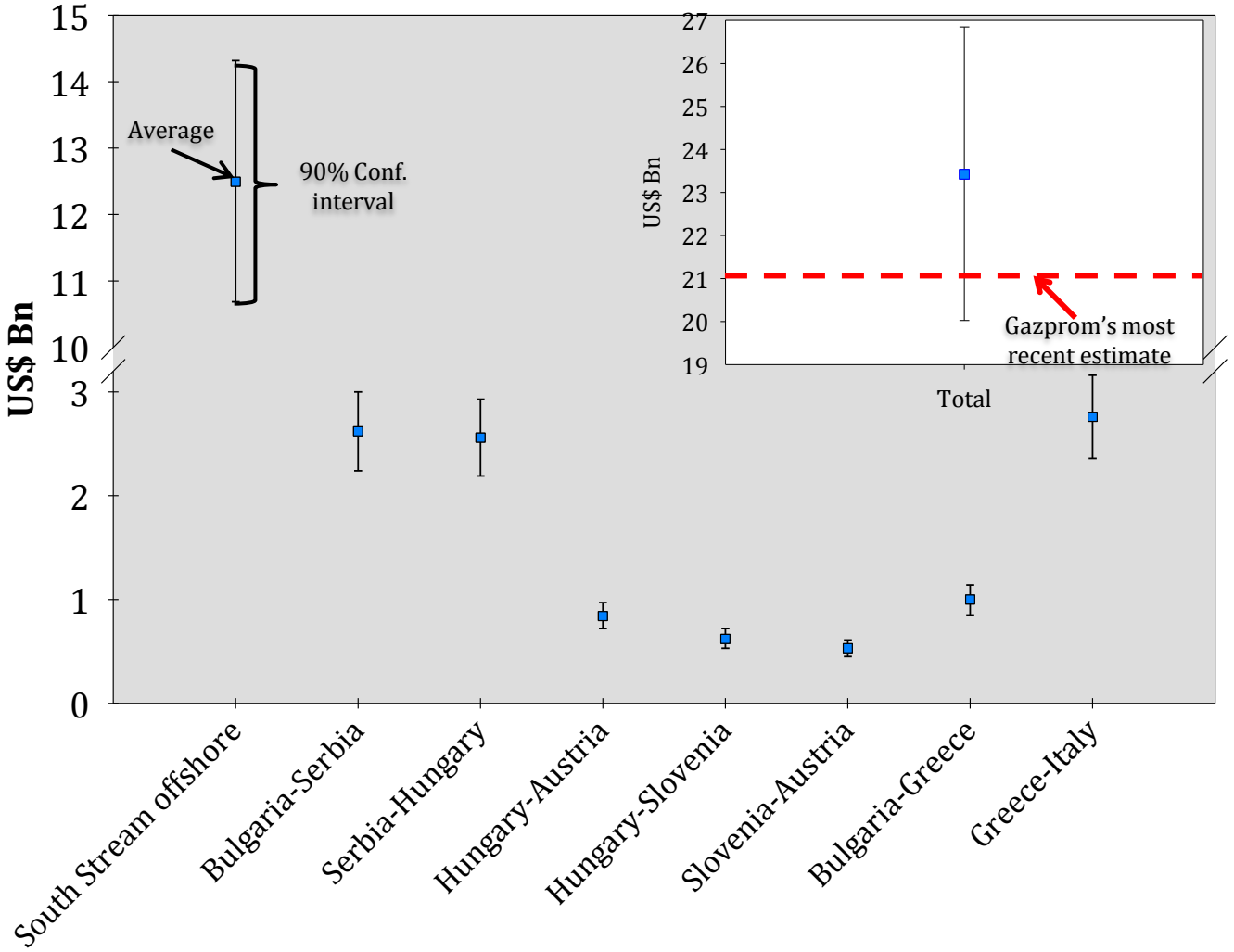
The South Stream System in Russia



Source: adapted from eegas.com

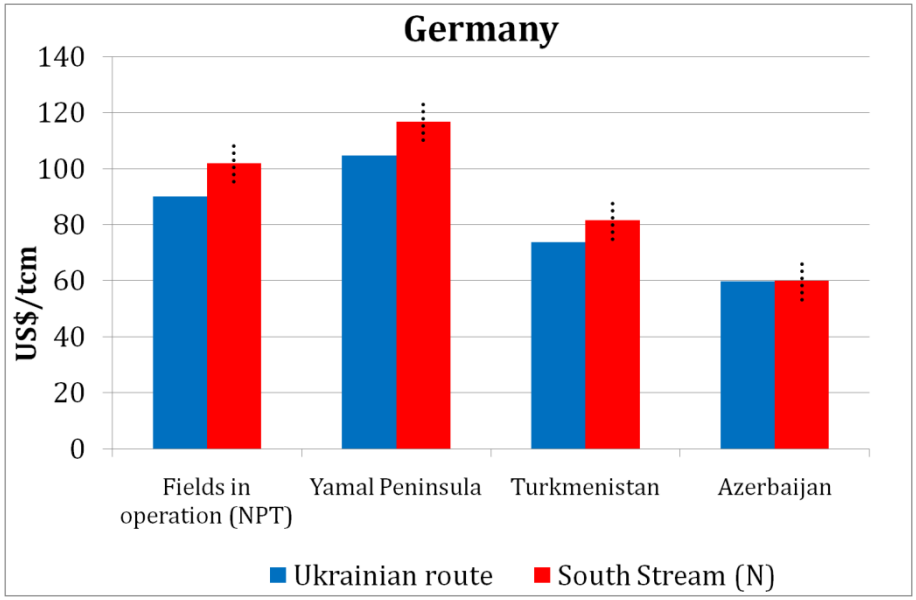
- South Stream would begin at Pochinki
- From Pochinki to Beregovaya (South Stream offshore):
  1. Existing lines ~ 32 bcm;
  2. A new pipeline from Pochinki to Beregovaya ~ 32 bcm
- Possible gas sources:
  1. Fields in operation: Nadym-Pur-Taz (NPT) region
  2. Yamal Peninsula (Gryazovets-Pochinki bi-directional pipeline ~ 36 bcm)
  3. Central Asia
- Total anticipated pipeline expansion in Russia ~2200 km

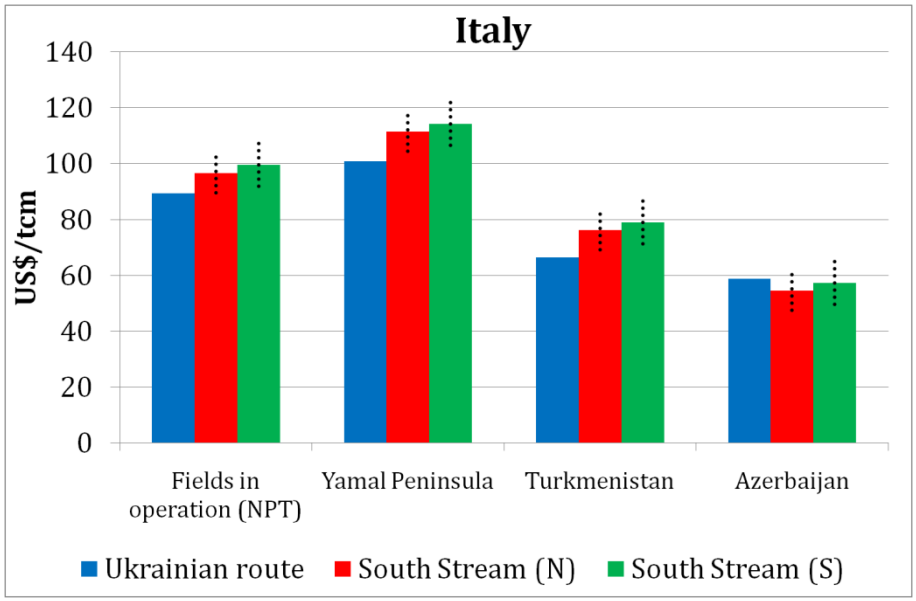
South Stream Construction Cost



- Cost of onshore pipelines:
  - Based on engineering model (WB, 2010)
- Cost of offshore pipelines:
  - Based on econometric estimation
- Project-related uncertainties:
  - Monte-Carlo simulation with key assumptions

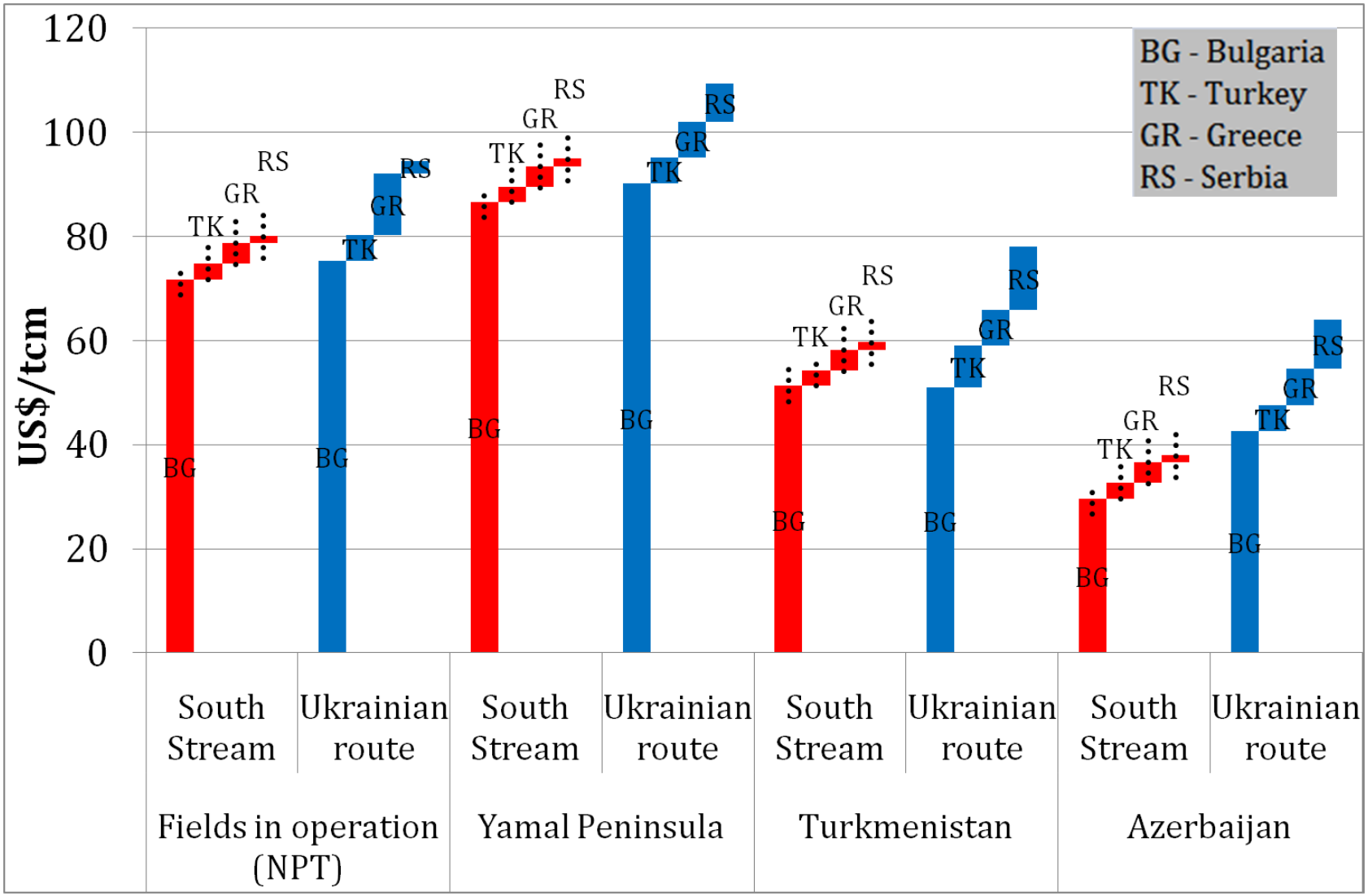
Transporting gas to Germany and Italy





- On average, it is cheaper to use the Ukrainian route to export gas to Germany and Italy
- Transporting gas from Azerbaijan is cheaper through South Stream

Transporting gas to Southern Europe



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Deriving South Stream value

- **South Stream value** = changes in Gazprom's profit when South Stream is built versus when it is not built.

- A computational (strategic) gas market model is used to calculate the South Stream value under:
  1. Different demand scenarios, and
  2. Different values of transit fees through Ukraine

- Major assumptions:
  1. Nord Stream is built by 2013 (55 bcm)
  2. Ukraine's transit fee is fixed exogenously
  3. Gazprom can re-export gas from Central Asia to Europe

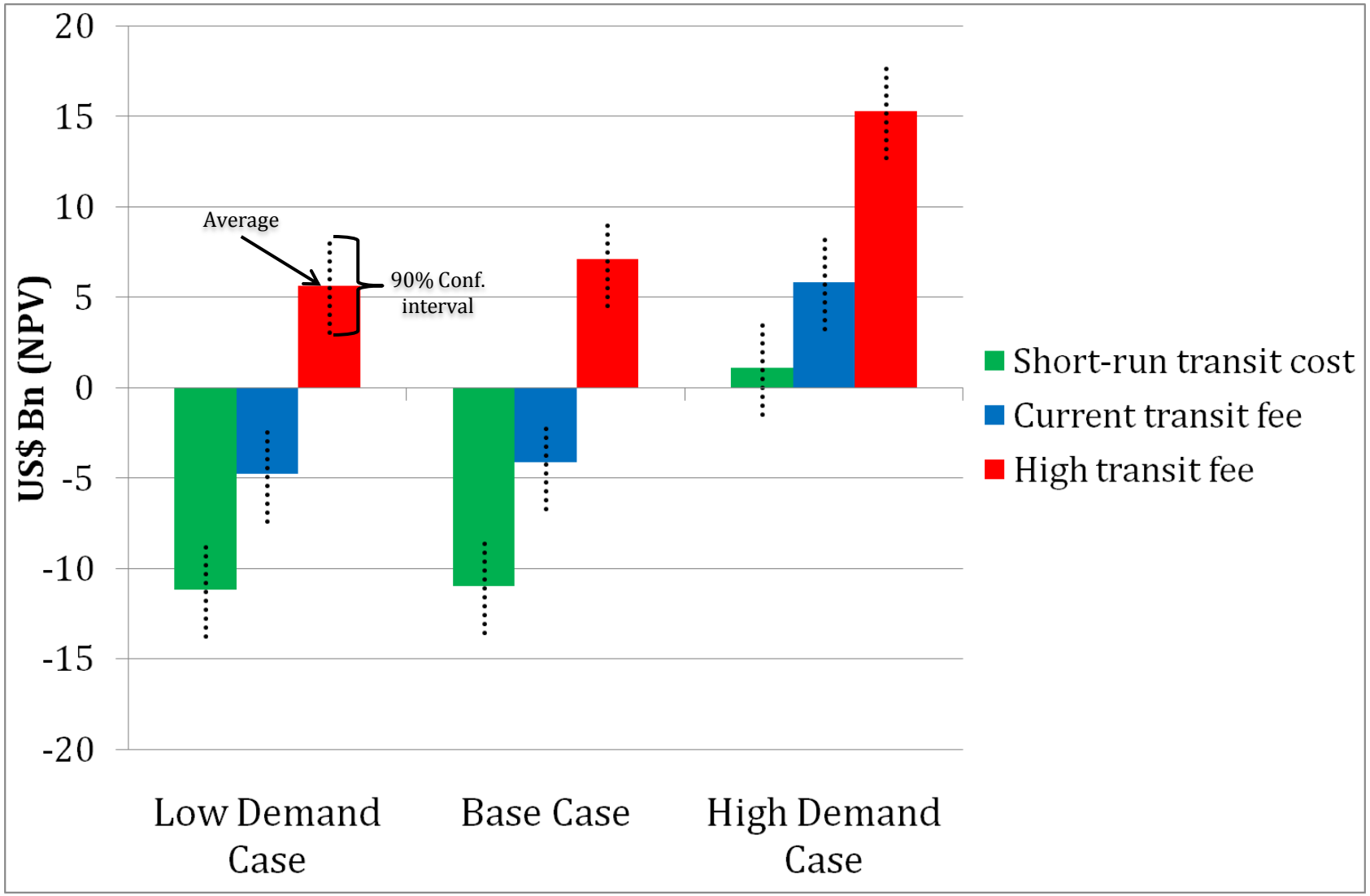
	Low Demand case	Base case	High Demand case
Western and Southern Europe	-0.2%	+0.7%	+1.9%
Central and Eastern Europe	-0.2%	+0.8%	+1.9%
Balkan Countries	-0.2%	+0.8%	+1.9%

Demand Scenarios: 2011-2025
Source: Base and Low Demand cases - IEA (2009)
High Demand case - IEA (2000-2007)

Short-run transit cost	Current transit fee	High transit fee
0.50	2.07	5.11

Transit fees through Ukraine ($/tcm/100km)

South Stream Value



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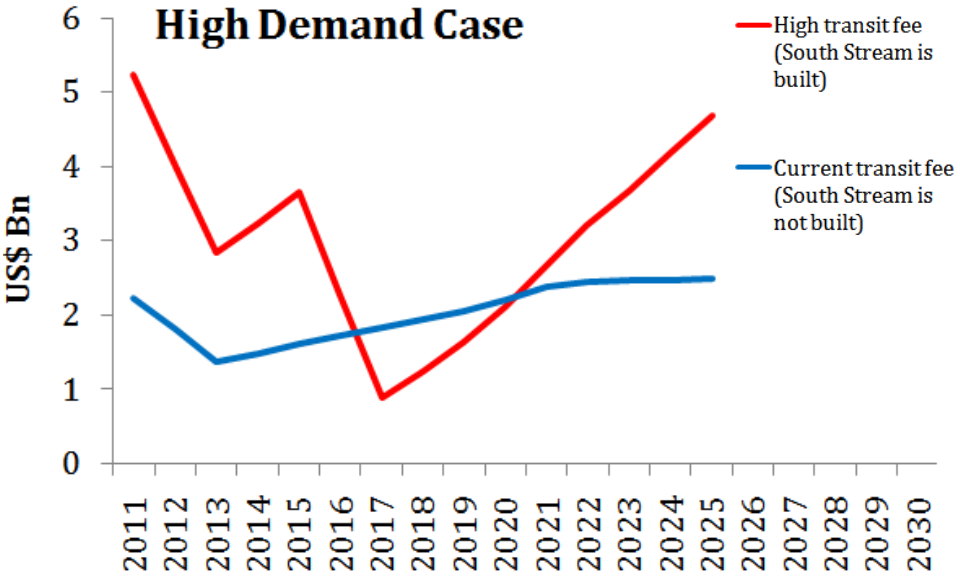
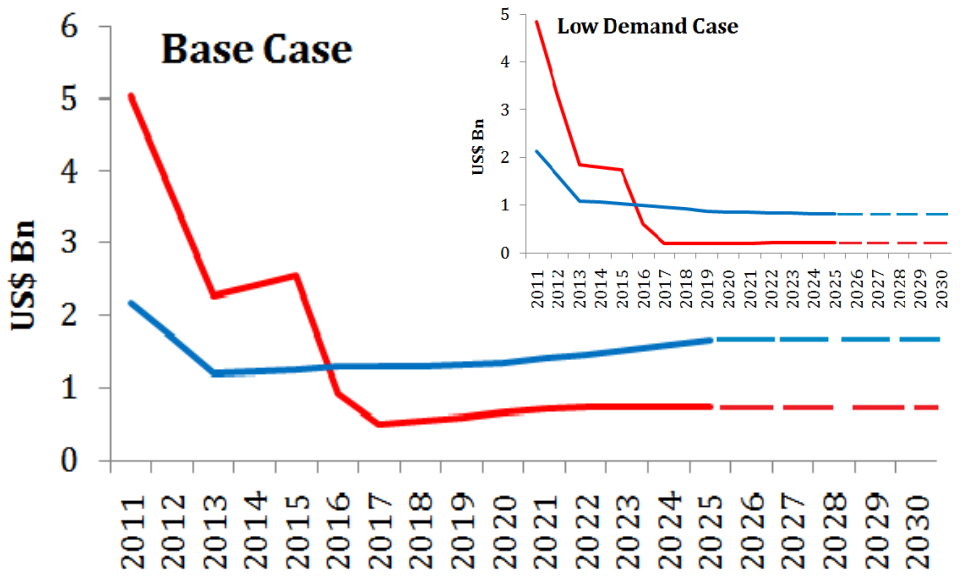
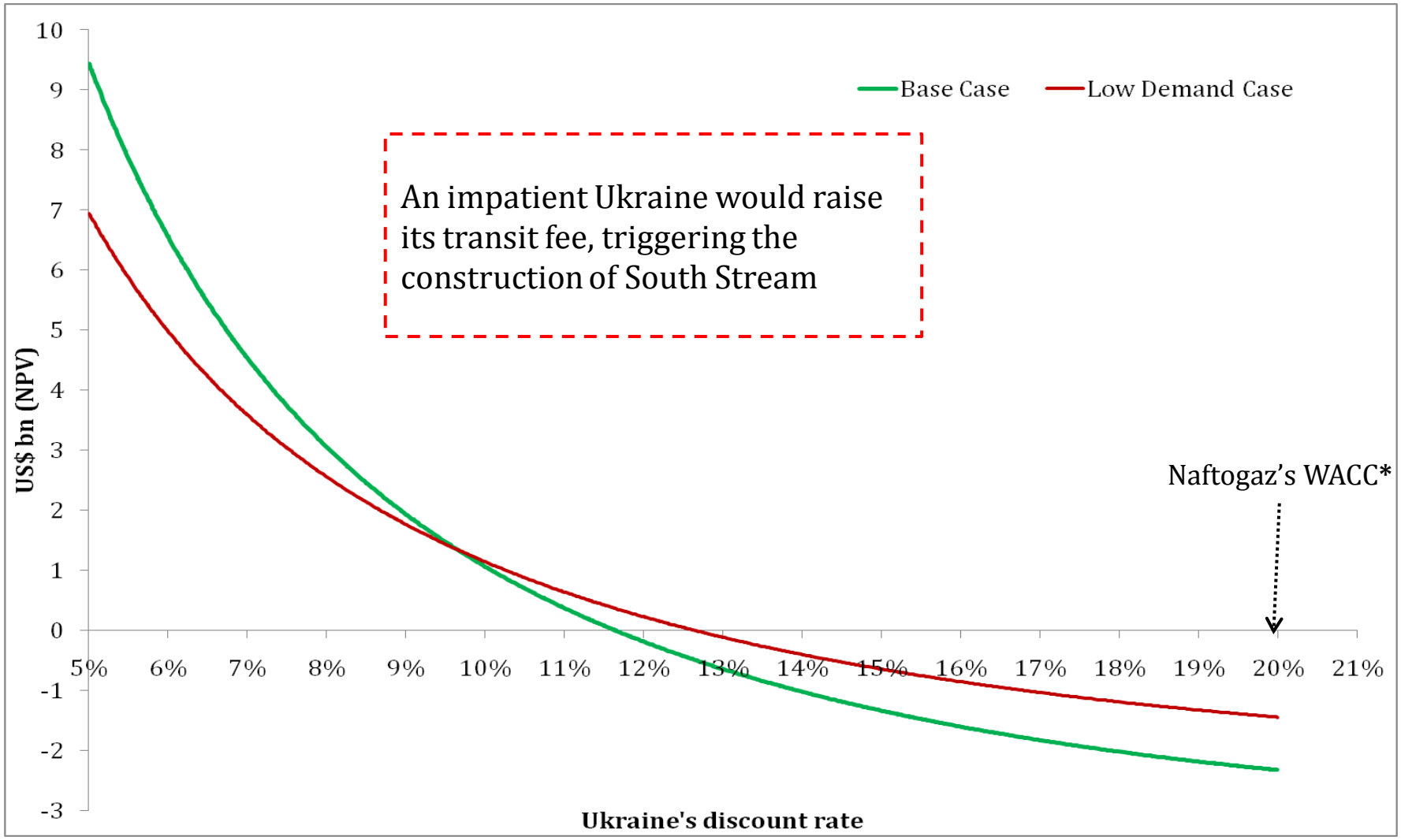
Ukraine's transit profits





Ukraine's net benefit of not raising the transit fee over 30 years



*Source: (Vitrenko, 2008; Kovalko&Vitrenko, 2009)

Conclusions

- The value of South Stream investment is only positive when:
  - Gas demand in Europe is expected to be very high (+1.9% p.a.), or
  - When Ukraine raises its transit fee considerably

- Naftogaz's corporate governance issues make its discount rate very high, which explains its willingness to bargain with Russia

- If Ukraine bargains to raise its transit fee sufficiently high, then South Stream would be built leading to the undesirable longer-term outcome of being completely bypassed by Gazprom

- To avoid this outcome, Ukraine would need to find ways to reduce the very high discount rate of Naftogaz, perhaps via restructuring and privatization

Russo-Ukrainian gas bargaining

Source: adapted from korrespondent.net

THANK YOU