



Security of Supply

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- Framework for Investment Planning and Security of Supply in the European Union
- Ten Year Network Development Plan
- European Energy Regulators approach towards investment planning
- Regulatory treatment of cross-border investments

Investments in gas infrastructures

- NRAs are usually in charge of
 - Setting or approving a clear and stable TPA

Investments in gas infrastructure results from private initiatives, in response and anticipation of the needs of the market

potentially receive a specific rate of return, or by deciding a special treatment for new large investments, on a case by case basis

- 3rd package (Gas Directive 2009/73/EC and Gas Regulation (EC) No 715/2009)
 - Obligations for individual Transmission System Operators (TSOs) based on the chosen unbundling model
 - Non-binding community-wide 10 year network development plan (10 YNDP)
 - No obligations for LNG System Operators and Storage System Operators
 - Possibility for exemption from parts of the regulated framework

- Further legal developments with respect to infrastructure development and Security of Supply (SoS) in the pipeline
 - New gas SoS Regulation (adopted 11 October 2010)
 - Investment Notification Regulation (coming soon)
 - Energy Infrastructure Package (to be tabled in 2010)

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10 YNDP in the 3rd package - 1

**1st European Ten Year Gas Network
Development Plan published in December 2009
by European Network of Transmission System Operators for Gas
(www.entsog.eu)**

- Non-binding 10YNDP to be published every year (community-wide 10YNDP every two years)
- 10YNDP shall contain efficient measures to guarantee the adequacy of the system and SoS

The 10 YNDP shall, in particular:

- Indicate to market participants the main transmission infrastructure that needs to be built or upgraded over the next 10 years;
- Contain all investments already decided and identify new investments which have to be executed in the next 3 years; and
- Provide for a time frame for all projects.

- **Contents of the 10 YNDP are (should be!)**
 - Modelling of the integrated network,
 - Scenario development,
 - European supply adequacy report, and
 - Assessment of the resilience of the system
- **TSOs as well as ENTSOG will conduct extensive consultation processes.**
- **Consistency between EU-wide, regional and national plans.**

- **Role of the Agency**

- Provide a reasoned opinion and recommendations on the Plans.
- Monitor implementation of 10 YNDPs.
- Review national plans to assess their consistency with the EU 10 YNDP.

- **Role of NRAs**

- Monitor TSO plans and assess their consistency with the EU 10 YNDP.
- Differentiated powers depending on the unbundling model chosen (ITO, ISO, OU).

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ERGEG's approach towards 10 YNDP

- A **key transparency tool** to provide European Commission, NRAs and network users with medium and long term visibility of the network development.

The quality of the results will be proportional to the degree of commitment of all parties involved.

and simulating supply disruption situations.

- A **collective task** where the highest involvement of all actors – MS, NRAs, operators and stakeholders – will be needed.

ERGEG's recommendation for the gas 10 YNDP - 1

- **Scope of the 10 YNDP**
 - All investments of European dimension,
 - Requiring a high-level of coordination between TSOs,

**Need for a flexible approach.
“Learning-by-doing” process.**

- **Methodology**
 - A combination of top-down and bottom-up approaches,
 - based on a permanent constructive dialogue between ENTSOG/TSOs and stakeholders.

ERGEG's recommendation for the gas 10 YNDP - 2

- **Contents of the plan**

- Selection of scenarios is of greatest importance.
- Map of gas flows and identification of bottlenecks and capacity gaps.
- Technical and economic features of projects, with indication of their degree of maturity.
- Monitoring report to track modifications.

→ High involvement of stakeholders in data collection and consultation processes.

→ Coherence with regional and national network plans.

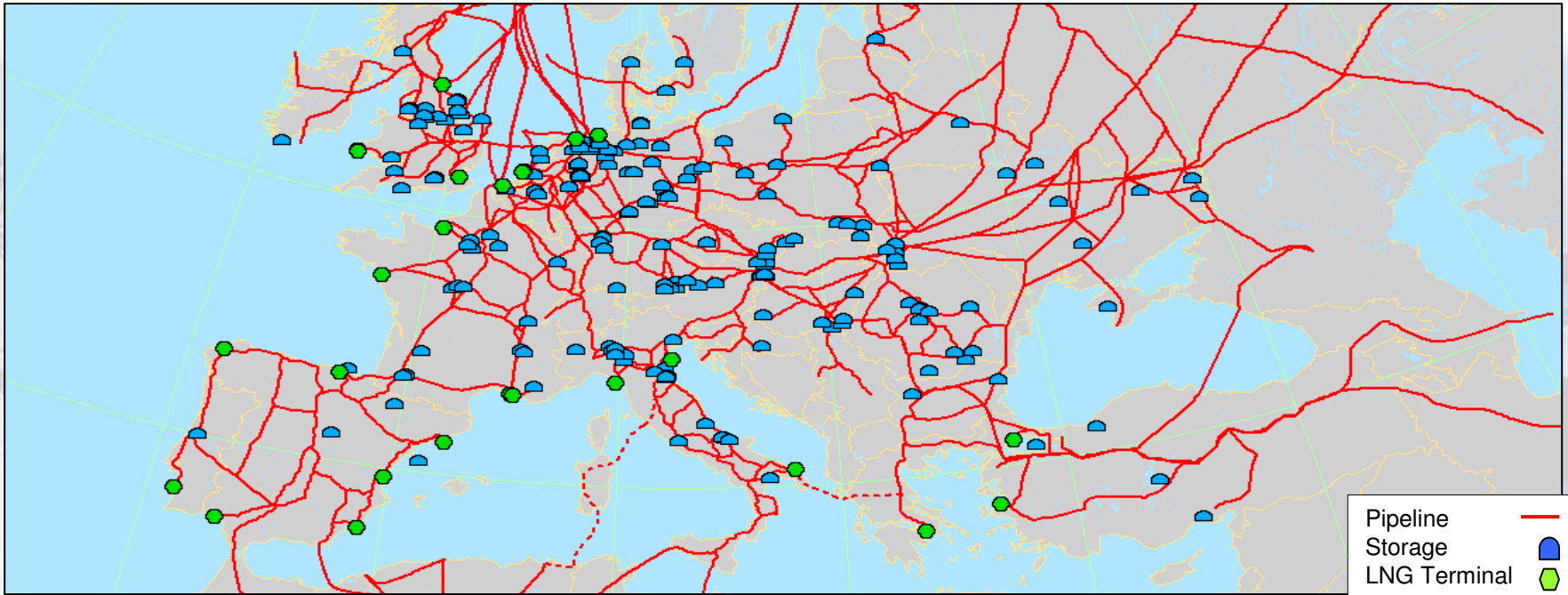


ER GEG's recommendation for the gas 10 YNDP - 2

- **Regulators assessment of gas ENTSO-G's first attempt at planning**
 - Pure bottom up approach
 - No scenarios
 - No harmonization of national planning assumptions
 - Some infrastructure projects missing
 - In summary: only a VERY first attempt on infrastructure planning
 - Huge need for improvement

NRAs wanted to give an example of how to do it better!

NRAs own study – using the TIGER – Model



- Production
 - costs and capacities
- Gas demand
 - by sector, regionalised
- Infrastructure
 - Capacities (exist. + exp.)

Linear Optimization

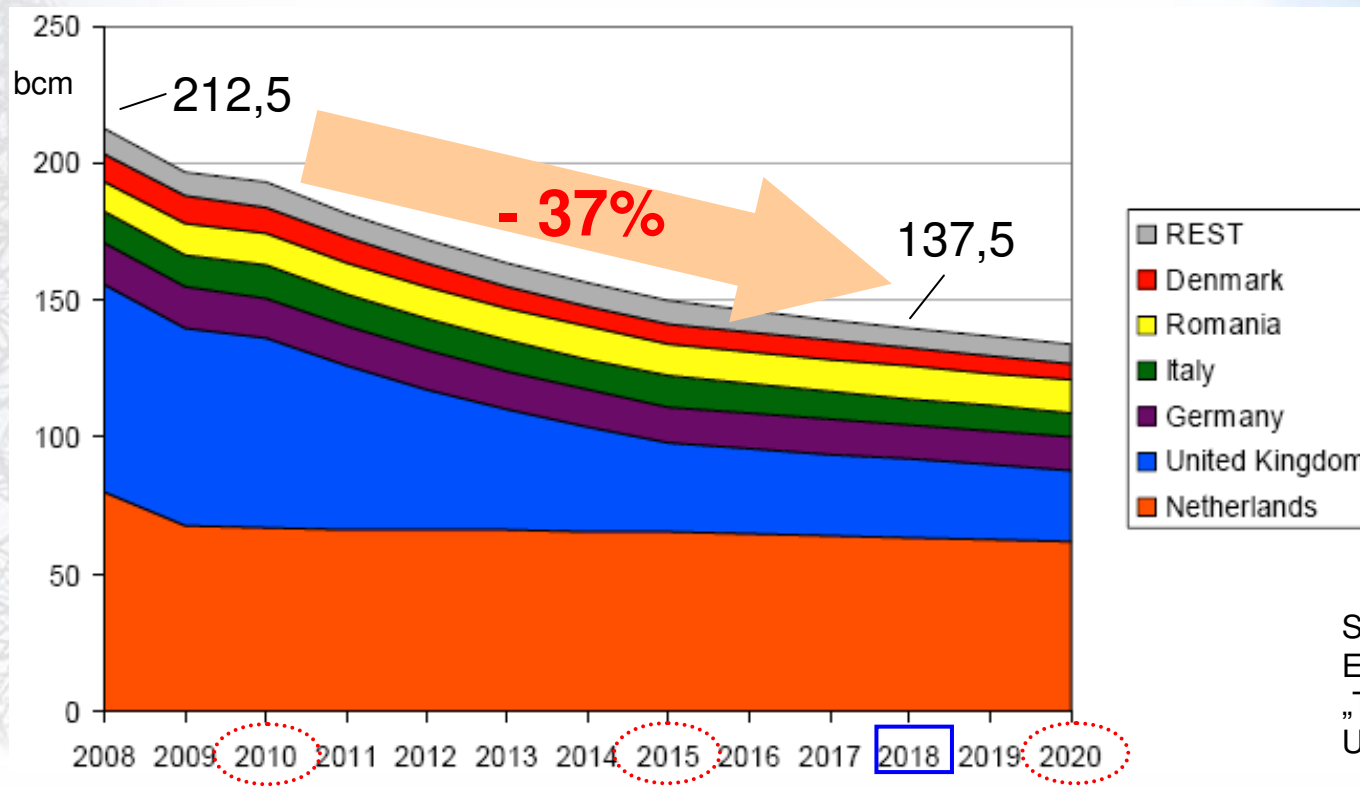
Objective:
Cost-minimal demand satisfaction,
restricted by available capacities

monthly (daily) granularity

- Infrastructure assets
*(Pipelines, Gas Storages,
LNG Terminals)*
 - Volumes, utilization,
flows etc.
- Locational Marginal Cost
Price Estimator

Supply assumptions: EU Production

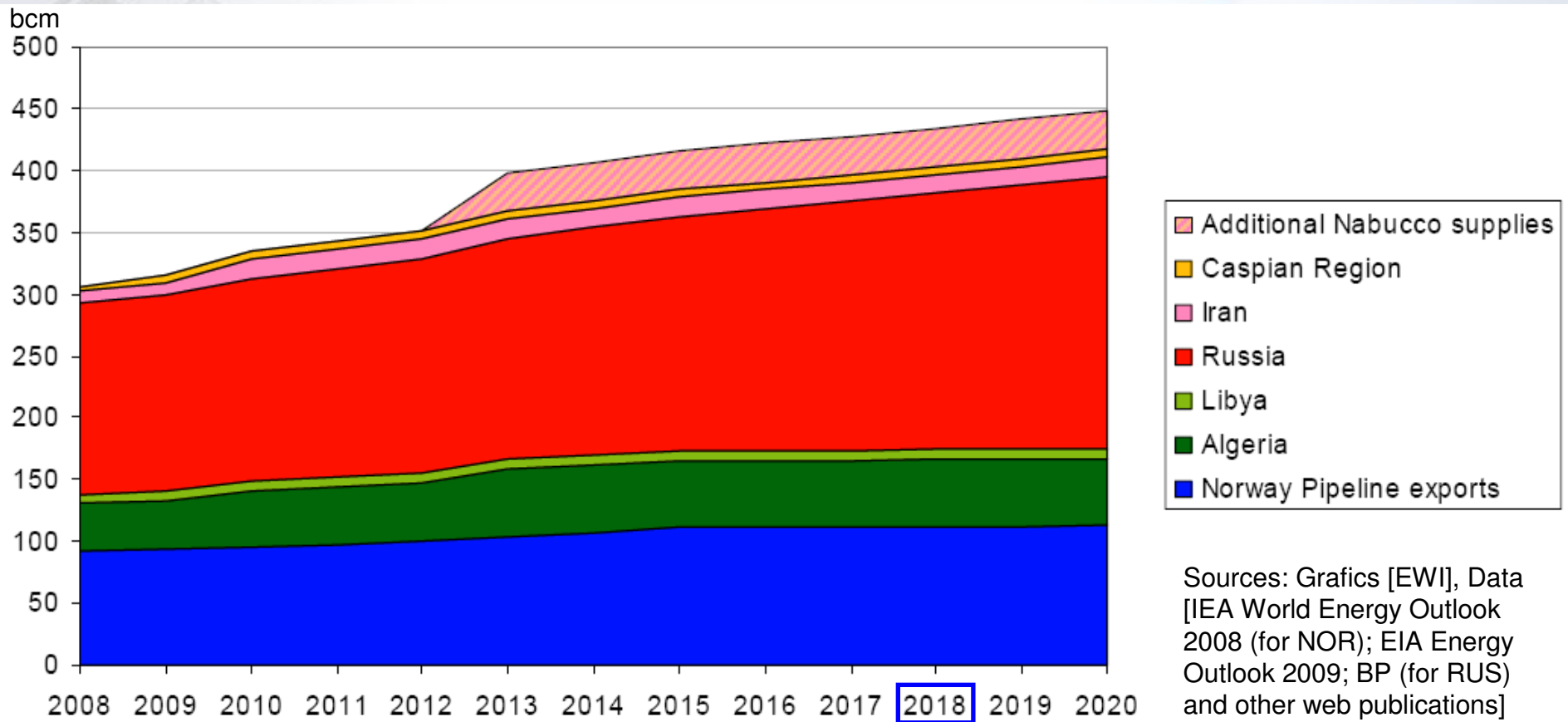
- 3 scenario dimensions: **Supply** – Demand – Infrastructure
- **Indigenous gas production EU-27**
 → Baseline Scenario of DGTREN's "Trends to 2030" (2008)



Source:
 EWI / EC DG TREN
 „Trends to 2030 –
 Update 2007“

Supply assumptions: Imports

- **Potential Pipeline imports from existing and potential gas suppliers outside the EU** (Algeria, Azerbaijan, Iran, Iraq, Libya, Norway, Russia)



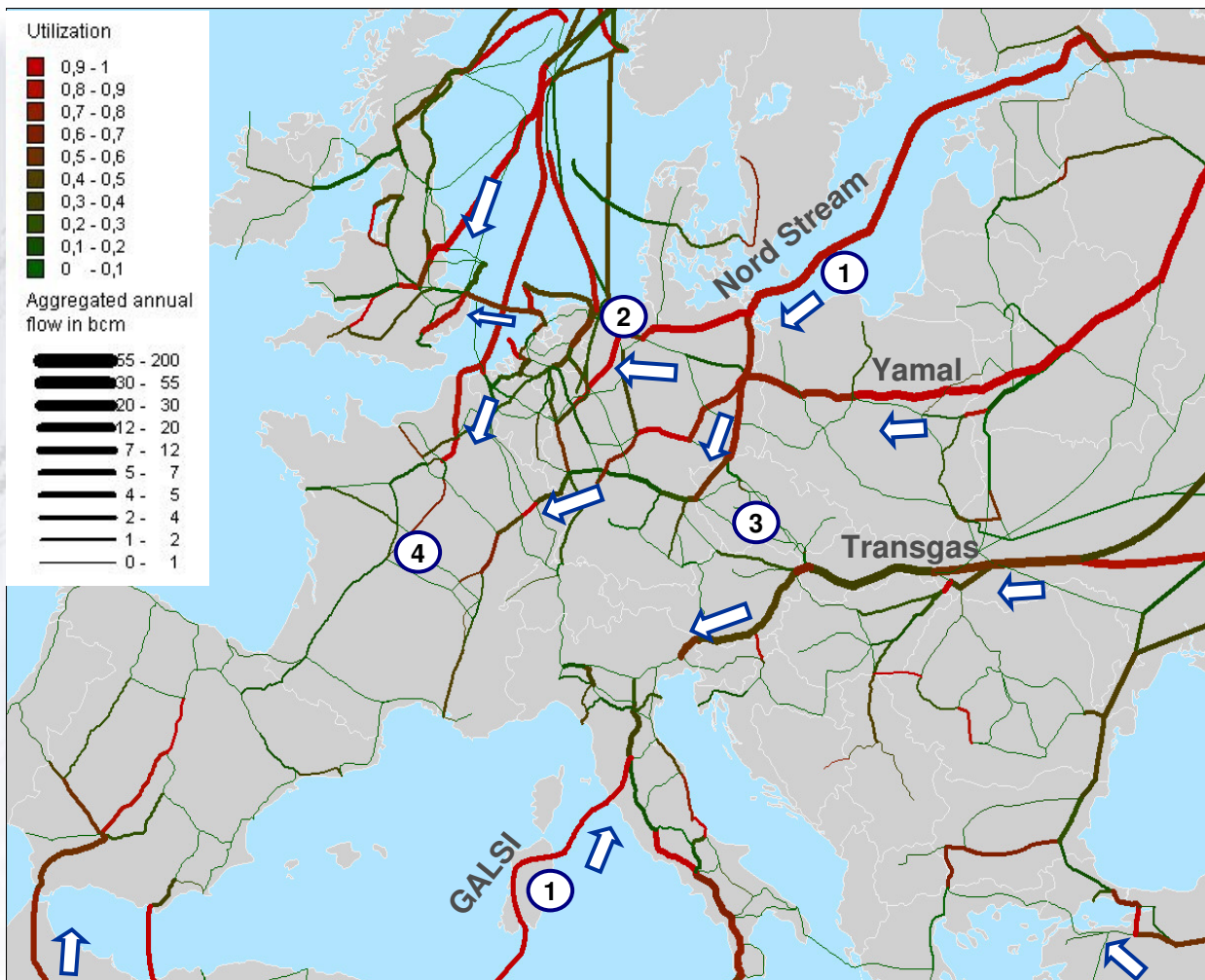
- **Reference demand case: (growth rate 2009-18: 0,9% p.a.)**
 - EC (2008) / PRIMES Baseline demand
 - detailed per country and sector data
 - due to the economic crisis, scenario will be **adjusted downwards** to reflect decrease in gas demand in 2009 (and the expected low growth rate for 2010), afterwards original growth rates will be used
 - **High demand case (growth rate 2009-18: 1,8% p.a.)**
 - correlates with ENTSOG aggregate growth path
 - Both ENTSOG and Eurogas assume higher growth; need for ensuring comparability of ERGEG study and ENTSOG statement
 - “worst case” for infrastructure
- Difference to adjusted reference case: **95 bcm** in 2018
= **sufficient bandwidth of possible demand evolution**

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- **Basis for all scenarios:** Intra-EU pipelines, LNG & storage projects according to ENTSOE (GTE+) Report (07/09) and databases
- **Major Import Pipeline Projects allow for several scenarios** (to be modelled and analysed for 2018):
 1. **Reference:** Nord Stream I only (but no other major projects)
 2. **Nord Stream II:** Reference + 2nd line of Nord Stream
 3. **Nabucco:** Reference + Nabucco pipeline
 4. **South Stream:** Reference + South Stream pipeline
 5. **DG-TREN:** Reference + 2nd line of Nord Stream + Nabucco
 6. **Low LNG-Price:** DG-TREN + lower LNG prices
- leads to 6 different infrastructure scenarios to be combined with the 2 demand scenarios = 12 „simulations“

- **Sensitivities** to be calculated for some scenarios
- **Peak Demand Day** sensitivities:
 - will include not just monthly, but **daily** granularity
 - analyses will focus on utilisation of assets on the peak day
- **Security of Supply** sensitivities:
 - simulate system in a stress scenario
 - use **Russia-Ukraine** gas crisis to simulate effects for Jan. 2018
 - disruption of **13 days** (and 4 weeks)
 - potentially: disruptions of supplies via **Belarus** (Yamal-PL)

Examples of Results of EWI study Annual Gas Flows 2018 – Nord Stream II (EWI/ER GEG Demand)

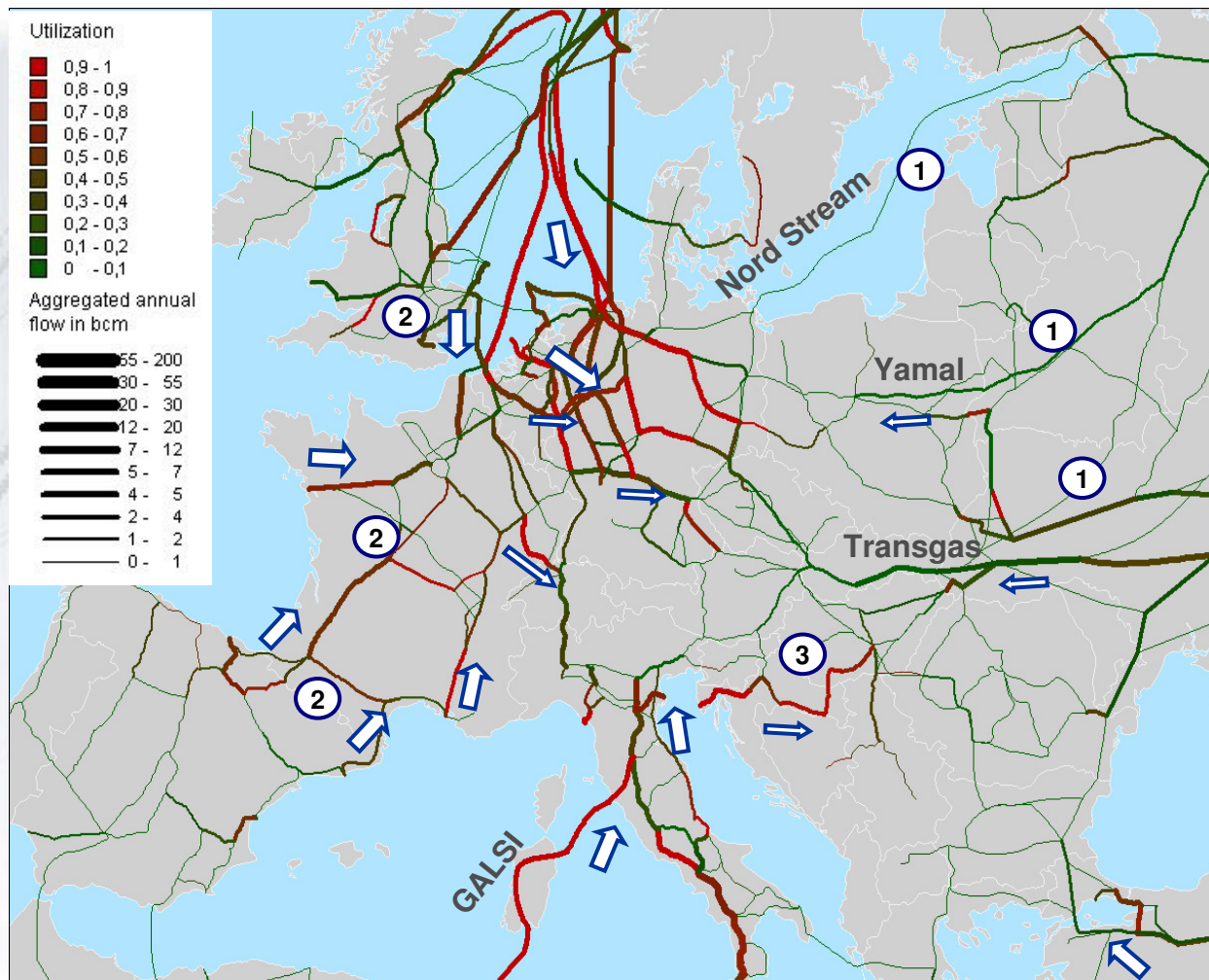


- (1) Additional import routes change gas flows in Europe
- (2) In Germany: increased East-to-West transit (Nord Stream replaces some imports from North and West)

With 2nd Nord Stream line:

- (3) Physical gas flows from Transgas to Germany and Western Europe (via Czech Republic) largely cease
- (4) Only small impact on gas flows in Western Europe

Examples of Results of EWI study Annual Gas Flows 2018 – LNG Glut (EWI/ER GEG Demand)



Assumption of temporally low LNG prices and option to reduce contract minimum take obligations to zero (maximum LNG import scenario):

- (1) Significant reduction in pipeline imports, especially from Russia
- (2) LNG imports in Spain, France, UK increase and LNG volumes transported to Central Europe where possible
- (3) Also high utilization of Krk LNG terminals, supplying HR, HU, CS

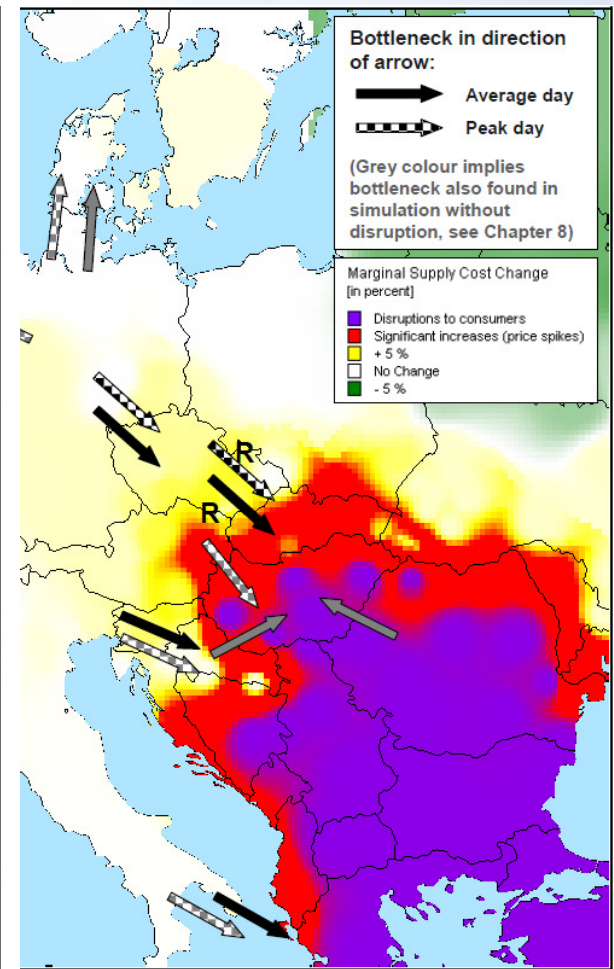
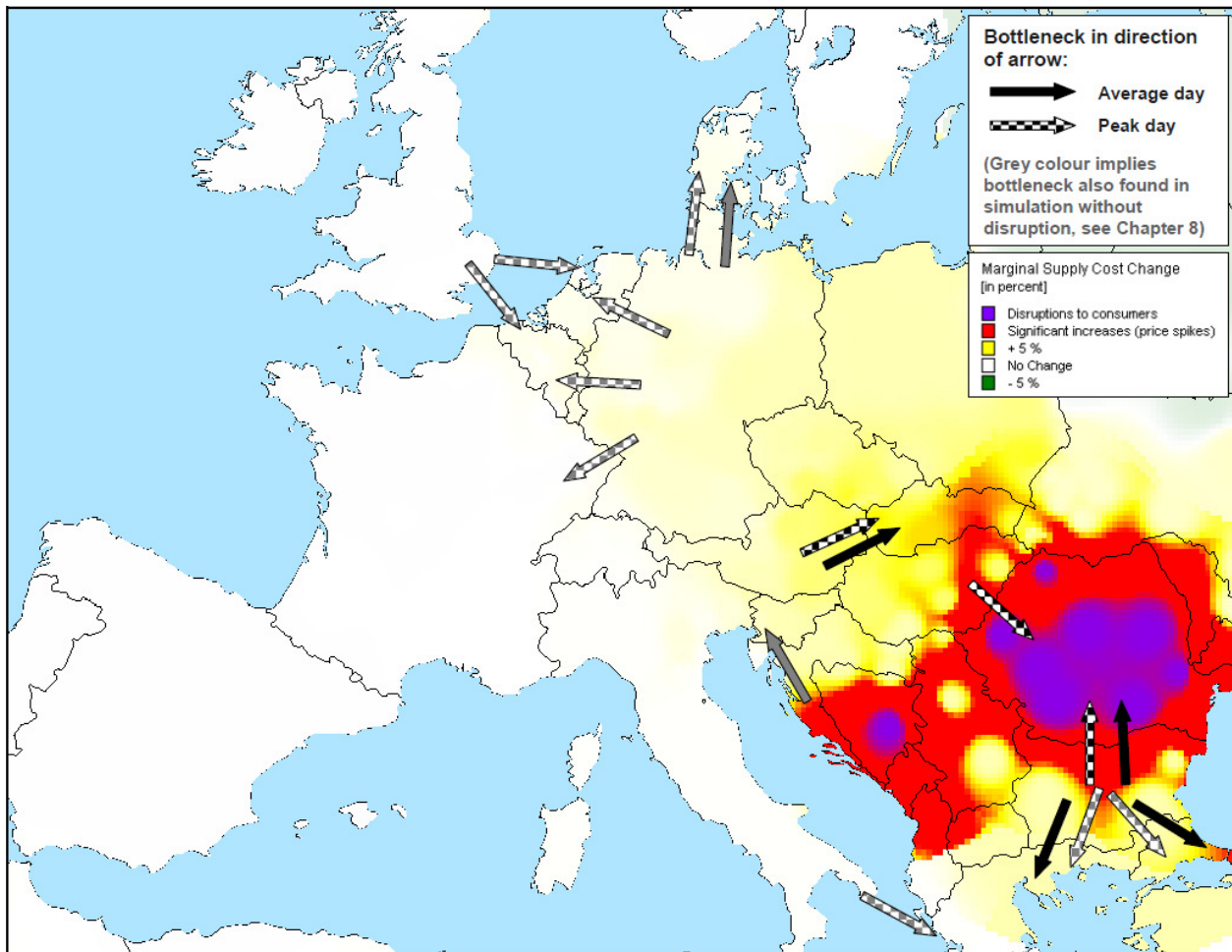


Is the EU gas network sufficiently integrated in case of a crisis?

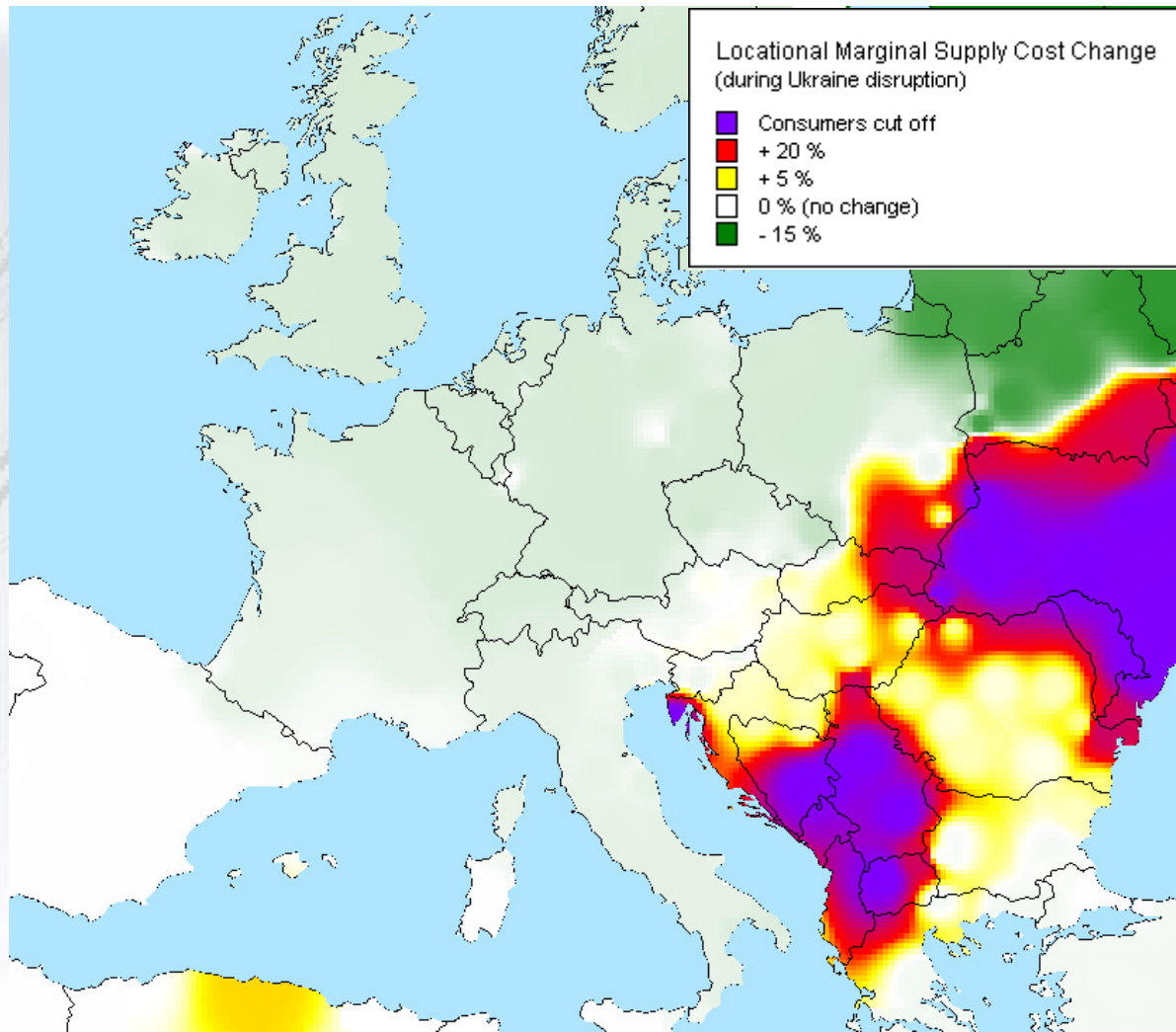
ER GEG/EWI study: Detected bottlenecks in "Ukraine crisis" scenario

Scenario „South Stream" (Reference + South Stream)

„Reference" (only Nord Stream I)



Exemplary Results of study Nabucco Scenario (ENTSOG Demand)



- Still small disruptions to consumers in Serbia & Montenegro, Bosnia & Herzegovina and Macedonia
- Compared to 2009 crisis, significantly improved situations in Bulgaria, Romania, Hungary, Slovakia, Western Balkan

Main reasons:

- Nord Stream and Nabucco increase diversify gas sources and routes.
- Reverse Flow Projects improve interconnection.

- EC Proposal on the notification of investment projects
 - Notification by Member States to the EC of data and information on investment projects - **reporting every 2 years.**
 - **No duplication of requests** – exemption in cases where a “specific body is entrusted with the preparation of a multi-annual investment plan in energy infrastructure at Community level” specific body shall notify all relevant data to the EC.
 - Concerning gas, the 10 YNDP will largely cover the regulation’s scope.

- New Gas SoS Regulation
 - **Obligatory emergency plans and risk assessments** based on scenarios on national and regional level
 - **Monitoring tasks of SOS**
 - **Supply standards:** supply for protected consumers guaranteed for 60 days according to the 1 out of 20 rule; supply for 30 days following a disruption of the single largest gas infrastructure under average winter conditions
 - **Infrastructure standards:** N-1 rule, reverse flows at all Interconnection Points.
 - Infrastructure & supply standards will feed the 10 YNDP; synergies concerning risk assessment.
 - **Regional cooperation** to draft Preventive Action and Emergency Plans



GRI SSE position on cost allocation of reverse flow investments

Allocation of costs for reverse flow investments in gas infrastructure:



- Two options have been consulted within GRI SSE





Market-based investments benefiting SOS

- ▶ Investing TSO should tender the reverse flow capacity
 - in a transparent procedure (Open Season procedure)
 - to all interested parties (including up- and downstream system operators and suppliers/shippers or even the Member States themselves)

- ▶ In case of sufficient demand, the reverse flow capacity is allocated by the TSO to interested shippers
 - capacity booked by the market allows for cost recovery through the applicable tariffs



Non market-based investments benefiting SOS

- ▶ Principle applies if costs incurred in one MS contribute to enhancement of SOS in another/several MS
- ▶ Where no market demand exists (bookings by shippers), the **national regulatory authorities of the MS concerned shall jointly decide on the allocation of the costs incurred based on the request of the investing TSO** (eg. multi-lateral mechanism) - Article 8(1) of Regulation (EC) No.713/2009 shall apply
 - Proportion to which each MS benefits from the infrastructure investments with regard to security of supply shall be taken into consideration



Example: Who could benefit from TAG reverse flow investment



- Framework for Investment Planning and Security of Supply in the European Union
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Regulatory treatment of cross-border investments - 1

- Key issues to promote the development of new gas infrastructure from the NRA perspective are:
 - Promoting close contact and communication between all market participants.
 - Guaranteeing a high transparency of investment process.
 - Ensuring appropriate incentives to invest efficiently in infrastructure and to respond to market needs and signals.
 - Ensuring a clear and stable regulatory framework to give guidance to stakeholders.



Regulatory treatment of cross-border investments - 2

- Harmonization / co-ordination of regulatory practices to facilitate the development of the internal energy market.
- Consultation with other NRAs, sharing experiences and identifying best practices at European level in order to:
 - Promote and facilitate inter-regional projects,
 - Carefully consider available instruments to balance the need, for new investments and the development of competition,
 - Ensure that there is a level playing field for investors.



Regulatory treatment of cross-border investments - 3

- Promoting the development of 10 YNDPs.
- Facilitating the identification of physical congestion.
- Ensuring
 - Effective unbundling to avoid conflicts of interest when making investment decisions,
 - Sufficient transparency of e.g. flows and available capacities,
 - Transparent, non-discriminators and market oriented capacity allocation mechanisms,
 - Effective congestion management procedures.
- Promoting the development of wholesale markets to provide price transparency.

Concluding Remarks

- 3rd package provides for a new instrument which allows the assessment of investments in infrastructure.
- We need a flexible approach.
- It is a learning-by-doing process.
- Involvement of all stakeholders needed.
- Regulators need to assure a suitable framework for infrastructure investments.



Thank you for your attention!

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