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Trans Sahara Gas Pipeline

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Trans Sahara Gas Pipeline - Content

- Trans Sahara Gas Pipeline – Historical background and Objective
- Background and overview
- European gas market
- Gas supply and sourcing of gas from Nigeria
- Pipeline route and integration with existing systems
- Political risk and safety along pipeline route
- Conclusions and next steps

TSGP – Historical Background and Objective

- Pipeline to be developed by the governments of Nigeria, Algeria and Niger
- To export gas to Europe
- To develop the sub-regional economics

Overview: TSGP – from Nigeria to Europe



TSGP – Competing with other supplies outside EU

- Shortest route to Spain
- Short offshore pipeline crossings
- Shortcut from West Africa compared to LNG transport
- First long-distance pipeline from West Africa to Europe



TSGP – Competing with LNG transport

	TSGP	LNG
Strengths	<ul style="list-style-type: none"> • Known and relatively simple and robust technology. • Only three countries involved. • Cheaper transportation to southern Europe if volumes are high 	<ul style="list-style-type: none"> • Diversification of market for Nigerian gas. • Some LNG plants have been established making this a known technology.
Weaknesses	<ul style="list-style-type: none"> • Uncertainty about whether reserves will be sufficient to fill the pipeline. • Can only supply the North African and EU gas markets. • Very large project, requiring strong political and commercial support. 	<ul style="list-style-type: none"> • High cost of the entire LNG chain • Longer transportation route to Japan and Korea than for other LNG suppliers • Complex technology making implementation depending on large international companies. • Less local jobs than pipeline construction.
Opportunities	<ul style="list-style-type: none"> • EU support to pipeline • Use of existing gas infrastructure in Algeria 	<ul style="list-style-type: none"> • Market possibilities globally • Support from existing LNG plant owners. • Use of existing gas receiving terminals in Europe presently underutilised.
Threats	<ul style="list-style-type: none"> • Security along pipeline during construction and operation. • Lack of support of gas producing companies who may prefer LNG 	<ul style="list-style-type: none"> • Security of plants and ship transport • Competition from other LNG producers globally (the US, Australia, East Africa, Qatar).

Europe increasingly dependent on import of gas

- **Demand:** 10 % decline during economic crisis
- **Indigenous production:** decline from 235 bcm to below 150 bcm
- **Import:** increase in dependency of pipeline gas from e.g. Norway, Russia and Algeria
- **Market trends:**
 - Shale gas in USA has changed global gas market
 - LNG supply is competing with the global market
 - Ukraine crisis increases importance of security of supply

European gas market during the crises – demand

Increase in investment cost

High oil prices

Decoupling of gas and oil prices

Financial and economic crises

High economic growth in Nigeria and other African countries

Terror attacks on gas infrastructure

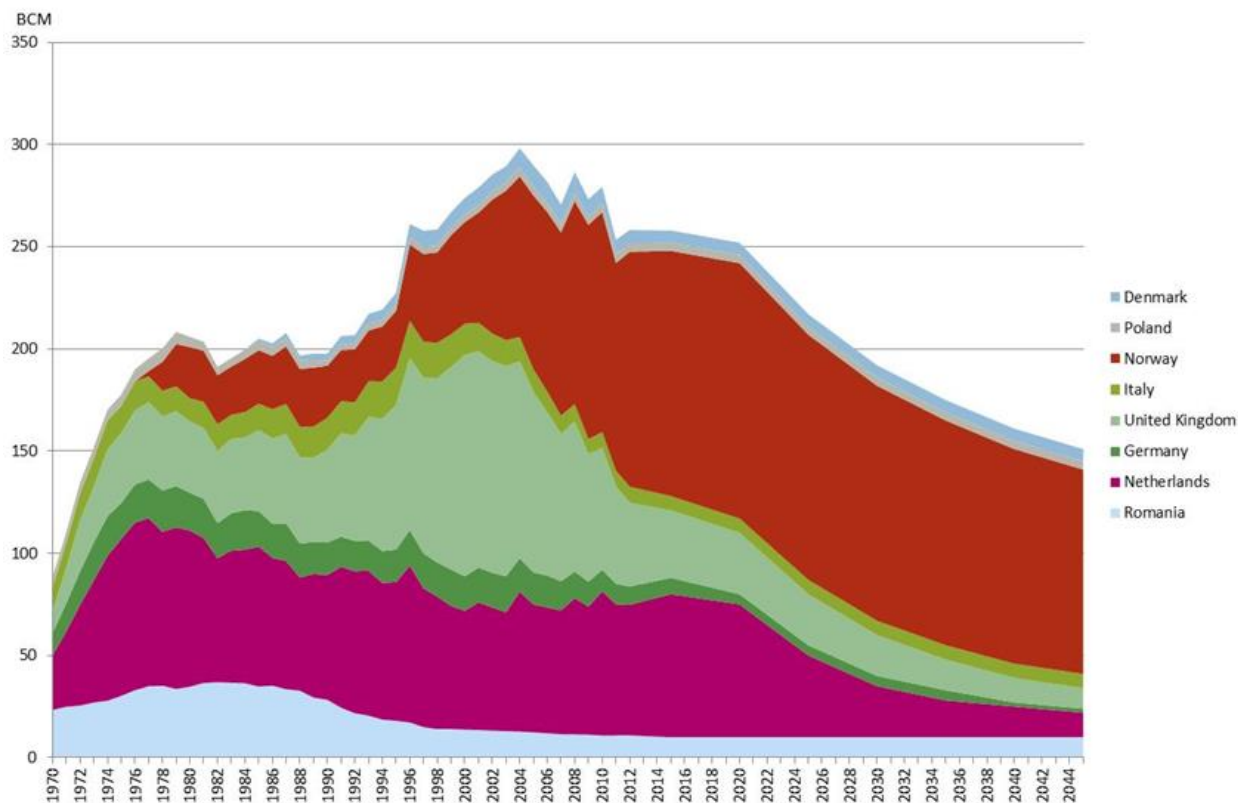
Fukushima accident in Japan

New gas infrastructure in place like Medgaz and Nord Stream

Arabic spring

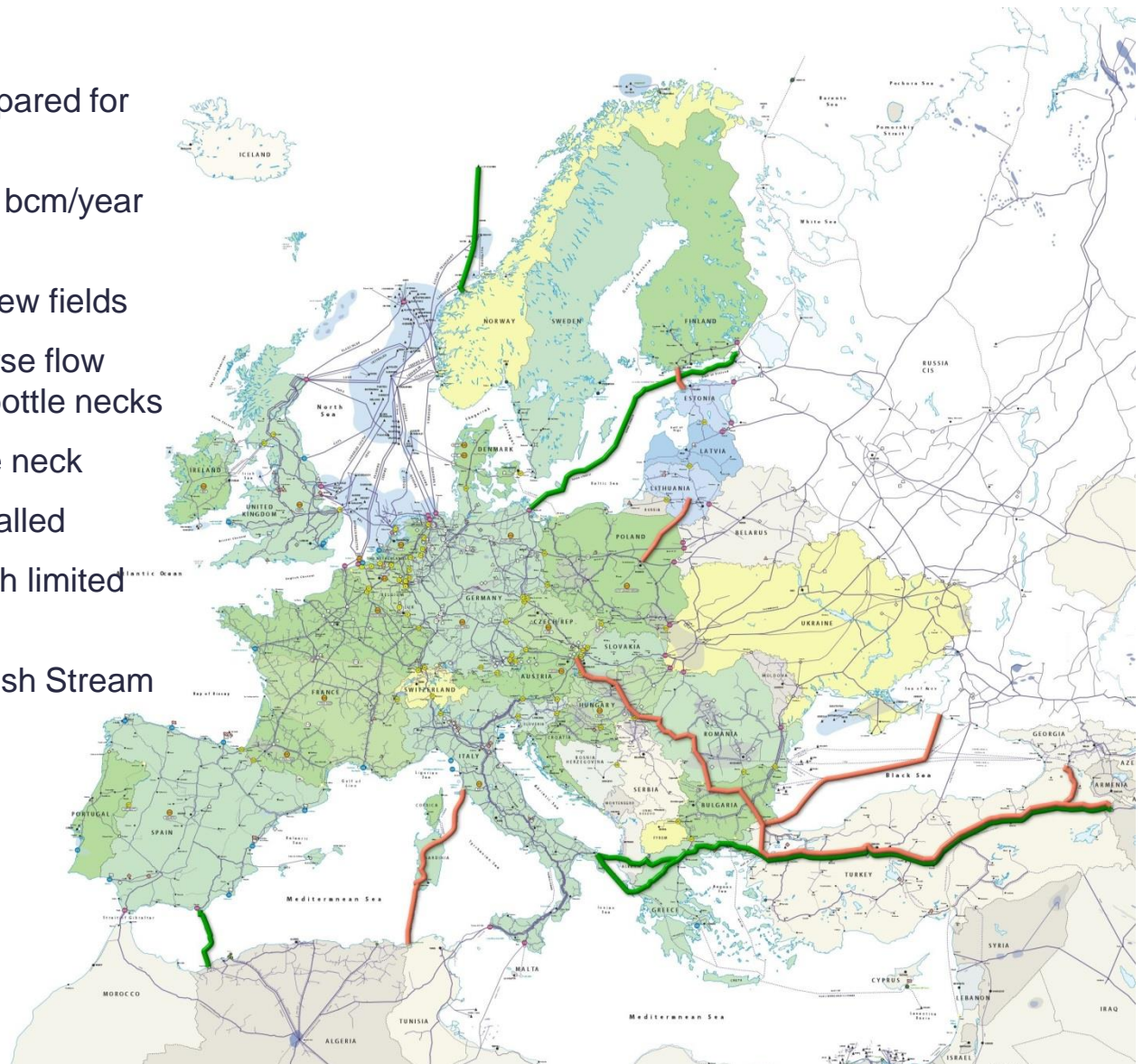
European indigenous gas supply declining

- Large decline in production from the UK and the Netherlands
- Groningen field will accelerate decline from 2020
- Norway will continue its role as the dominant producer
- Overall decline from 250 bcm today to 150 bcm in 2045



Europe – new gas infrastructure last decade

- **Medgaz:** Algeria to Spain – prepared for second line
- **Nord Stream:** Double line – 55 bcm/year capacity
- **Polarled:** Norway – connects new fields
- **Intra EU connectors** and reverse flow create unified market with few bottle necks
- Spain-France is one such bottle neck
- **Nabucco, Galsi, Poseidon:** Stalled
- **TAP/TANAP:** Moving ahead with limited capacity
- **South Stream:** Becoming Turkish Stream



4 scenarios of TSGP economics

- **Reasonable – Europe:** Global financial imbalances continue. Stagnation.
- **Two child – growth:** Financial balance achieved by larger consumption in China and Germany.
- **Heat – climate:** Climate changes rapidly. Heat waves experienced. Coordinated international response.
- **99%:** Social unrest. The Arab spring will spread to other parts of the world.

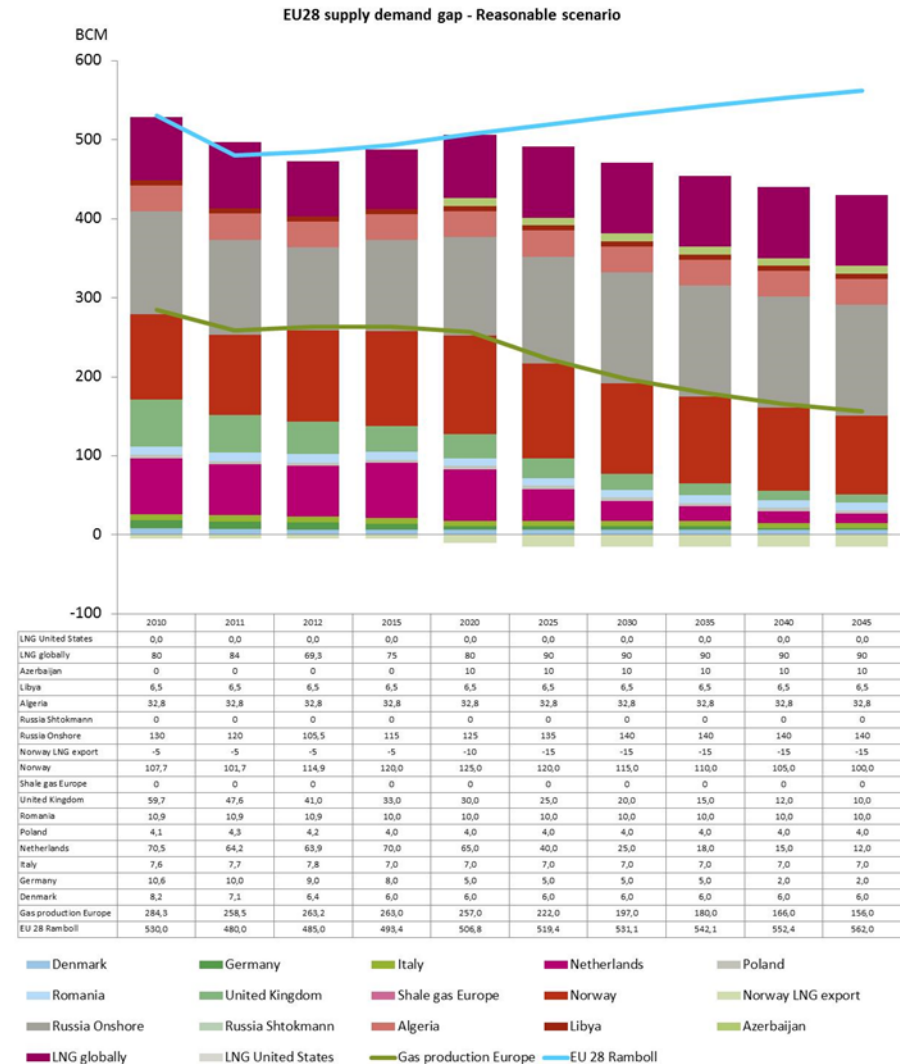
- Main drivers for analysis are GDP, population, energy prices, renewables, social stability.

Scenario approach – selected main drivers

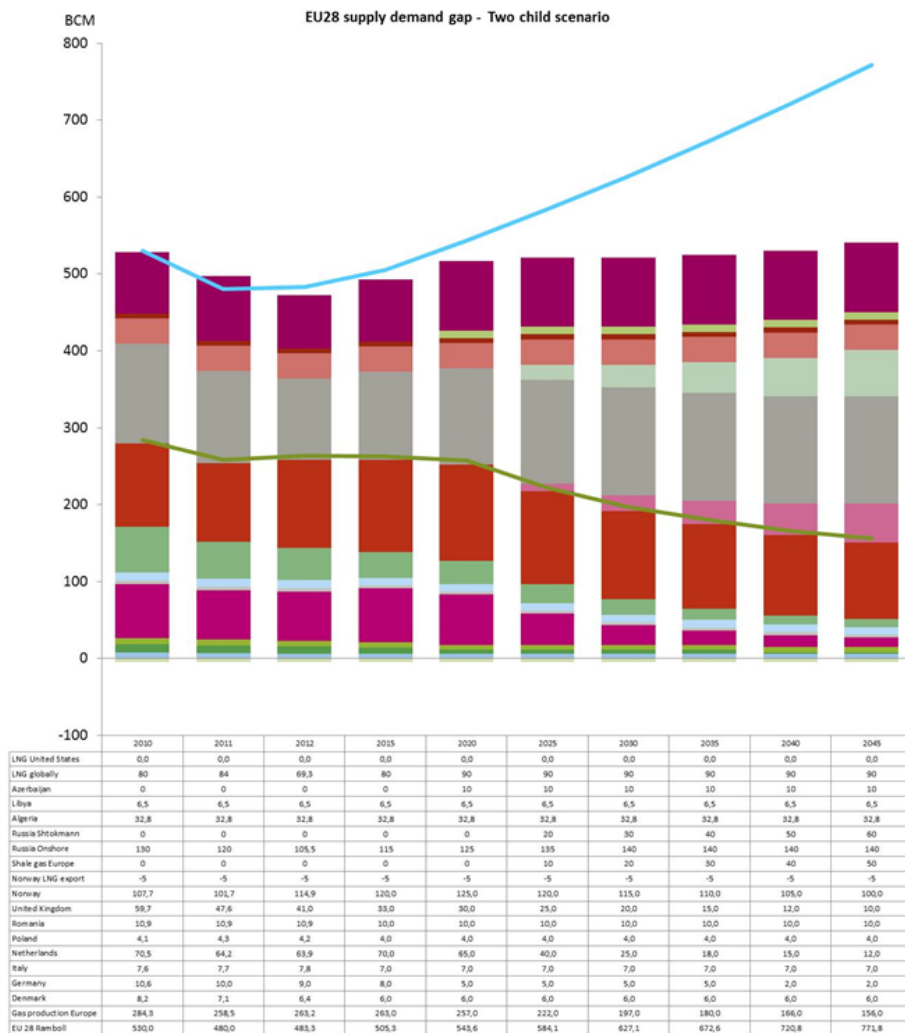
2011-2035	Reasonable Stagnation	Two child growth	Heat climate	99% Social unrest
EU GDP Growth	1.6%	3.0%	1.0%	1.0%
EU pop Growth	0.1%	0.5%	0.3%	0.0%
Oil price 2035 (USD/bbl 2012)	130	150	100	80
EU gas price (USD/MMBtu)	13	14	10	8
Energy efficiency p.a.	-0.5%	-0.5%	-1.0%	-0.2%
EU Renewable	30%	25%	40%	20%

European gas supply/demand: Reasonable – Europe

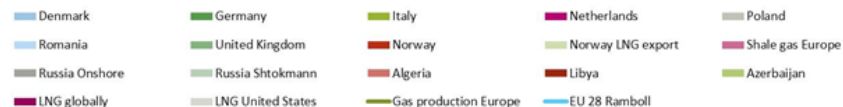
- Gas demand increases slowly
- European gas supply decreases after 2020
- Russian gas supply increases
- TAP pipeline comes on stream
- No shale gas in Europe
- Space for TSGP



European gas supply/demand: Two child – growth

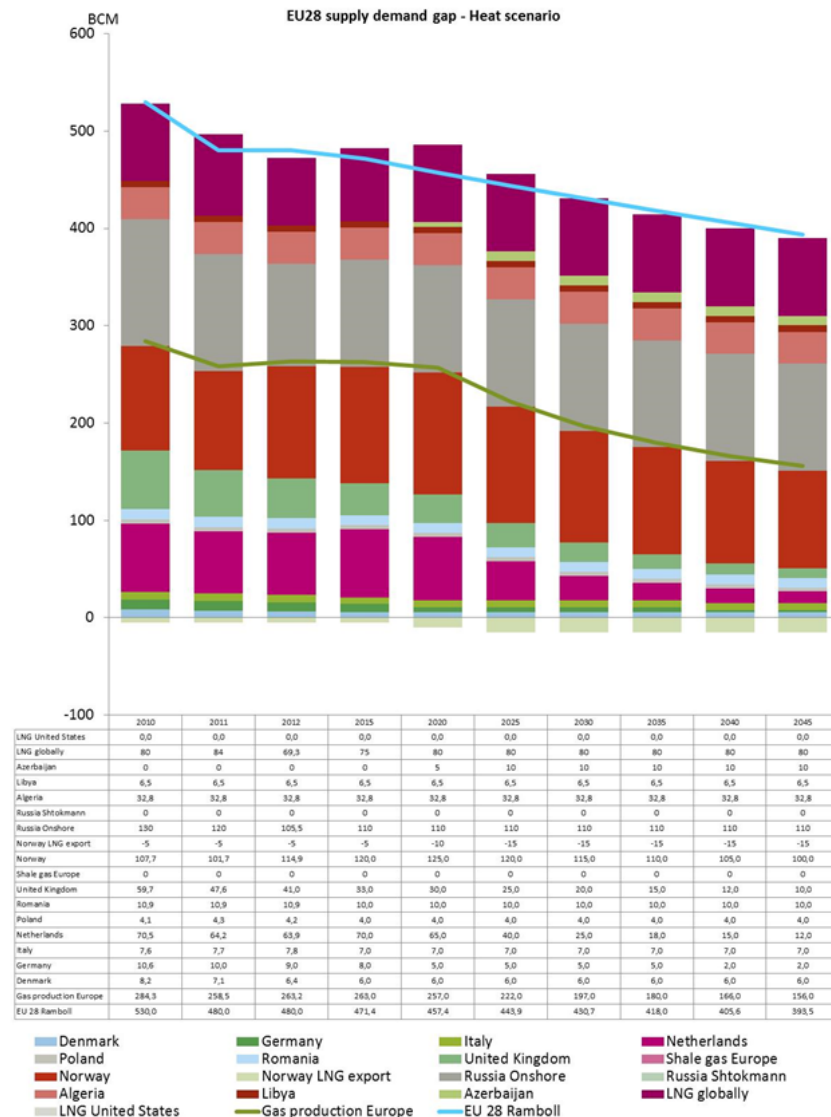


- Rapid increase in gas demand due to high growth
- Shale gas in Europe
- Shtokman gas field
- Barent Sea pipeline

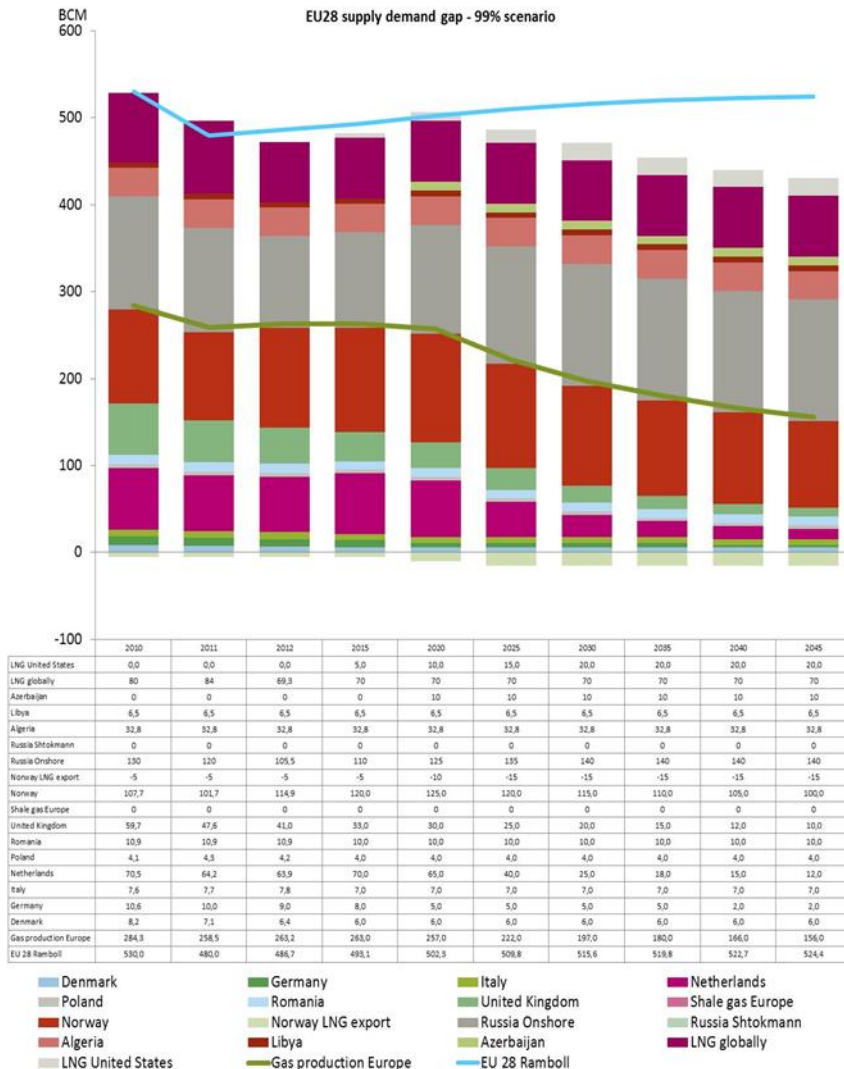


European gas supply/demand: Heat – climate

- Declining gas demand due to energy efficiency and renewables
- LNG stays at present level
- TAP pipeline
- TSGP will need to push other suppliers out

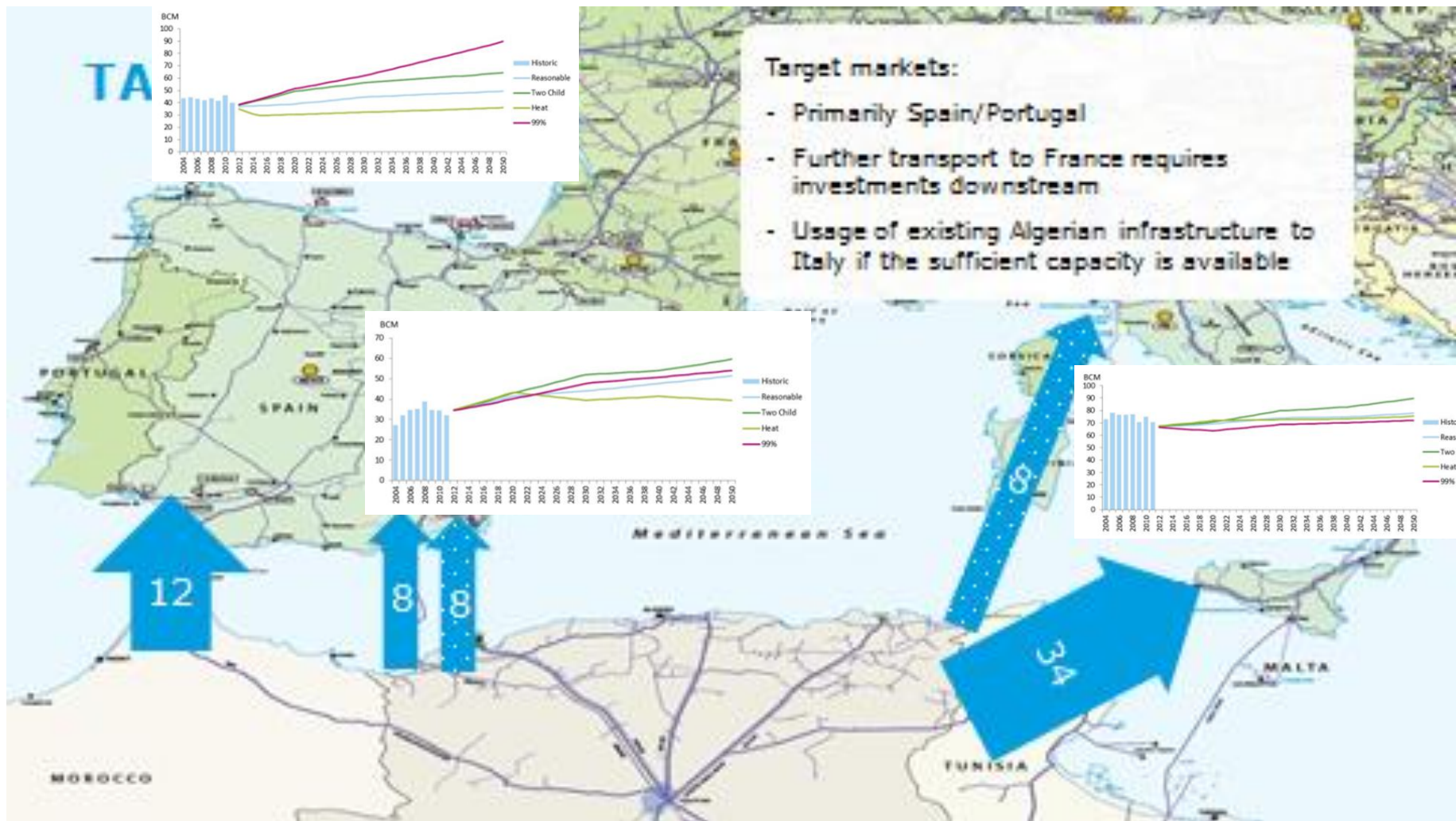


European gas supply/demand: 99%



- Slow increase in demand due to slow growth
- LNG from USA
- Russian increase to win market share
- TAP pipeline
- Room for TSGP

EU target markets: Spain, Portugal, Italy, France

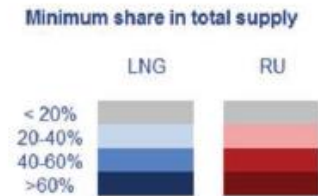


European gas market – security of gas supply

- **South-West Europe:** Depends on LNG supply
- **Eastern Europe:** Depends on Russia
- **Iberian peninsula:** Weakly connected to rest of EU
- **Ukraine:** Situation highlights the need for new supply from new sources
- **Japan:** LNG supply may be diverted to other markets such as Japan if needed
- **South-West Europe:** Vulnerable to LNG supply crises
- **Conclusion:** Need for more pipeline gas supply



Figure 5.13. Supply Source Dependence on annual basis

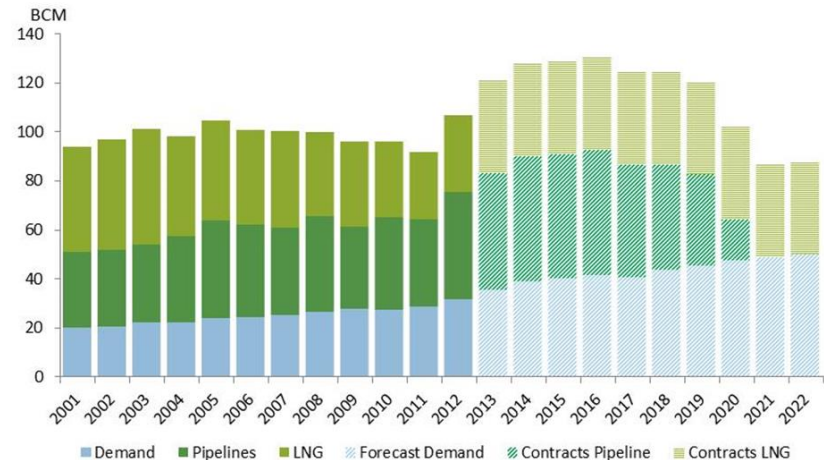
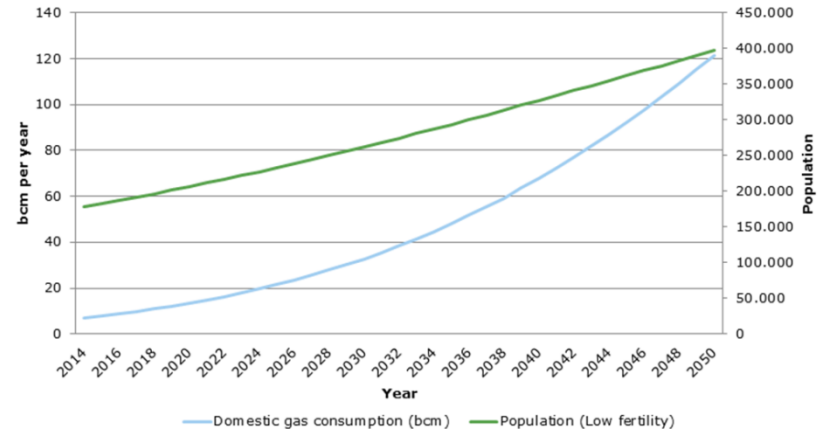


Zone connected to a LNG terminal



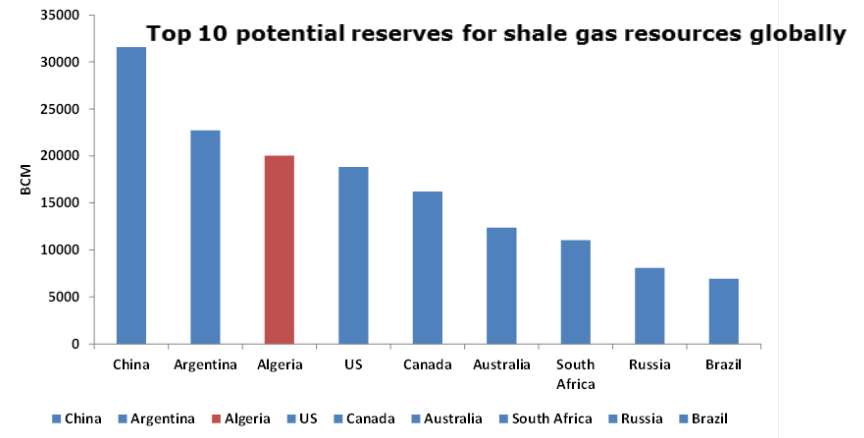
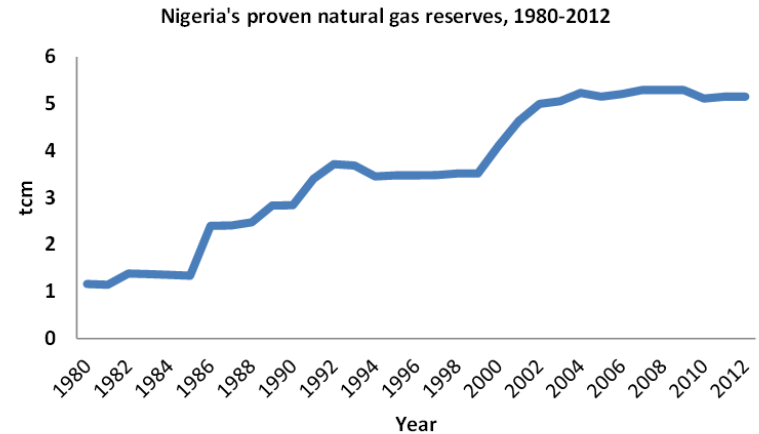
North and West African gas demand

- **Algeria:** Most mature gas market. Demand could increase to 40 bcm/year.
- **Nigeria:** New gas market. Power and fertilizer are main sectors. Potential for +100 bcm/year
- **Niger:** Small market. Gas transit could create development. Supply to mines and power sectors
- TSGP may develop to internal connection over time



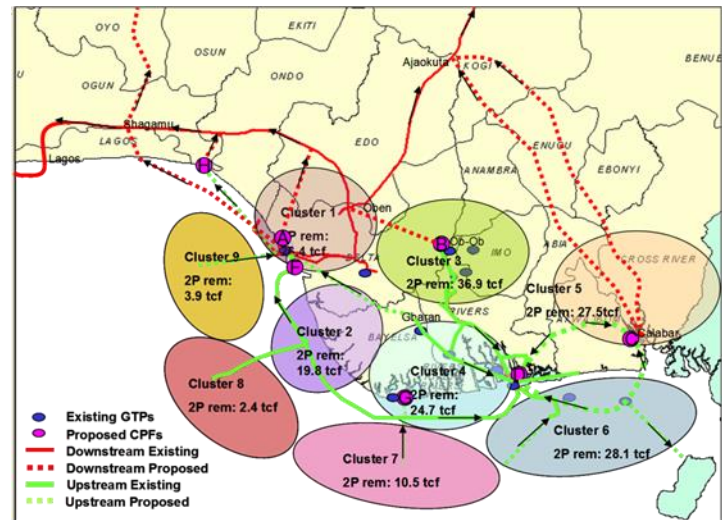
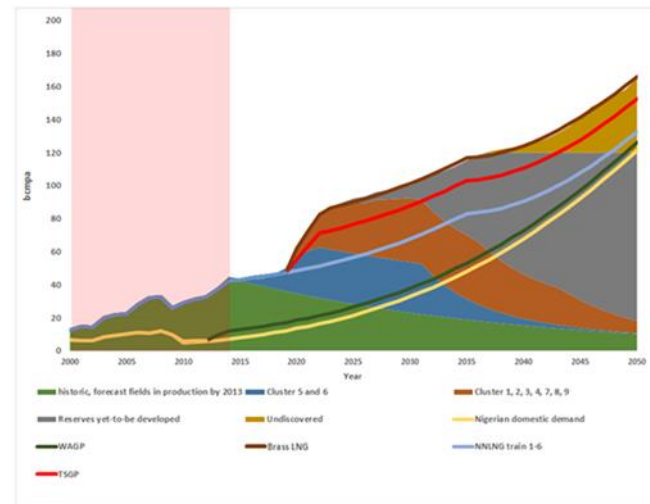
Gas reserves

- **Nigeria:** 2.8% of global gas reserves – 5200 bcm
- **Algeria:** 4500 bcm gas reserves – plus large shale gas potential
- TSGP needs 20bcm over 30 years: 600 bcm
- Reserves are available in Nigeria – mostly a question of cost and timing of production and competition with LNG



Gas supply to TSGP – Nigeria

- **Gas source:** Cluster 5 and 6 onshore; cluster 7 offshore
- **IOC:** Reluctant to engage with TSGP as it prefers LNG export
- **LNG:** Assumed to go ahead in parallel with TSGP
- **Indigenous demand:** Assumed to grow rapidly and to have first priority together with existing LNG

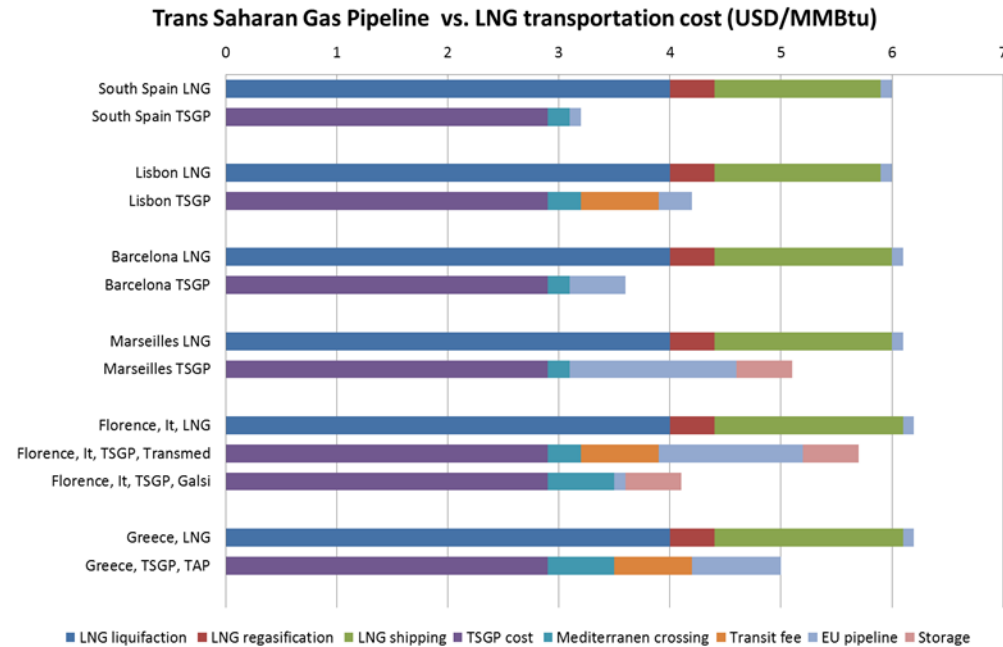


Nigeria: Gas export or indigenous consumption

- Traditional dilemma for gas exporting country with high demand and population growth
- Export creates connection to world market and encourages sustainable use of gas reserves
- Export can drag on supply system in Nigeria, in particular combination between TSGP and national grid
- Long term potential for supply of shale gas from Algeria

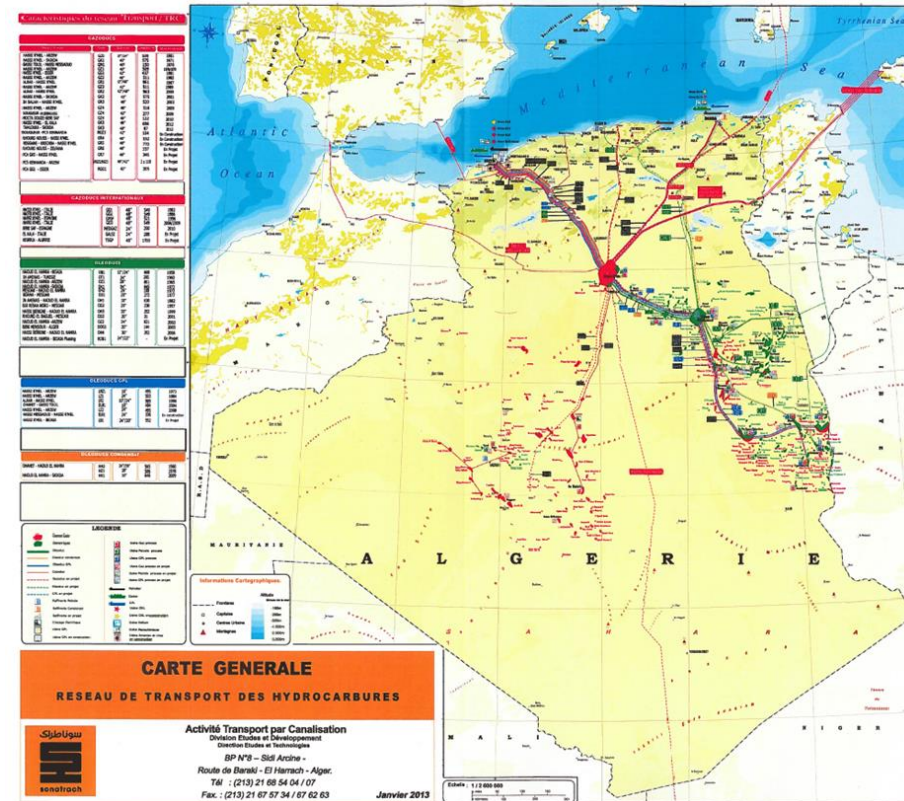
Algeria: Gas supply to Europe, LNG and TSGP

- TSGP supply cost to South Europe lower than LNG transport cost from Nigeria
- Transit in European systems will favour LNG in France and Northern Italy
- TSGP target will be South West Europe
- Storage need in Europe to ensure high load factor for TSGP



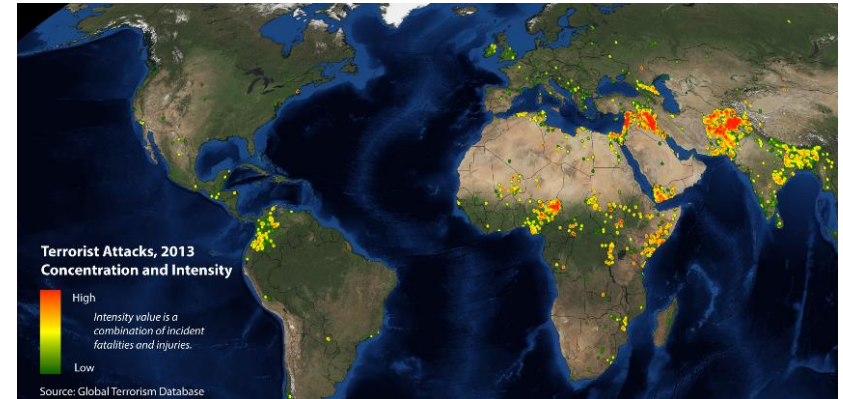
Integration with existing systems

- “Missing link“: Kano to Hassi R'Mel (approx. 2600 km)
- Use of spare capacity in Algerian gas export system possible
- Combine with flexibility in Algerian gas production can ensure high load factor



Political risk and safety along pipeline route

- Safety along TSGP
- National systems in Nigeria and Algeria contribute to increase safety
- Technical design modification
- Underground gas storage



Conclusions and next steps

- Gas market of more than 20 bcm/year exists in Europe in 3 out of four scenarios
- Sufficient gas supply for the pipeline is available from 2020 and onwards
- Next steps
 - EU priority of project
 - Security along pipeline
 - Gas suppliers to be engaged in Nigeria
 - Integration with existing and planned network in Nigeria and Algeria