South Eastern Europe Natural Gas Twist

Aleksandar Kovacevic

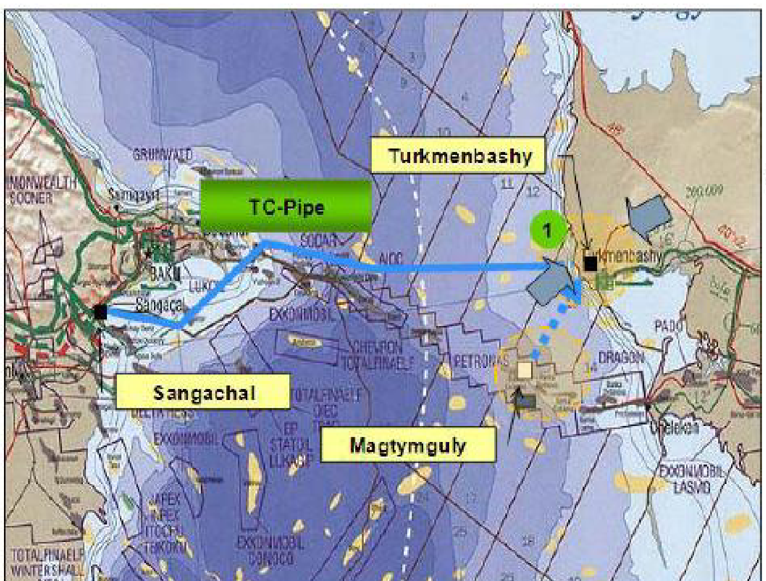
Ashgabat, November 2011

Natural Gas via South Eastern Europe

- Gas-to-gas competition
- Flexibility and security of supply
- Ubiquity and relevance to demand
- Supply infrastructure
- Money for energy and value for money: purchasing capacity of revenues

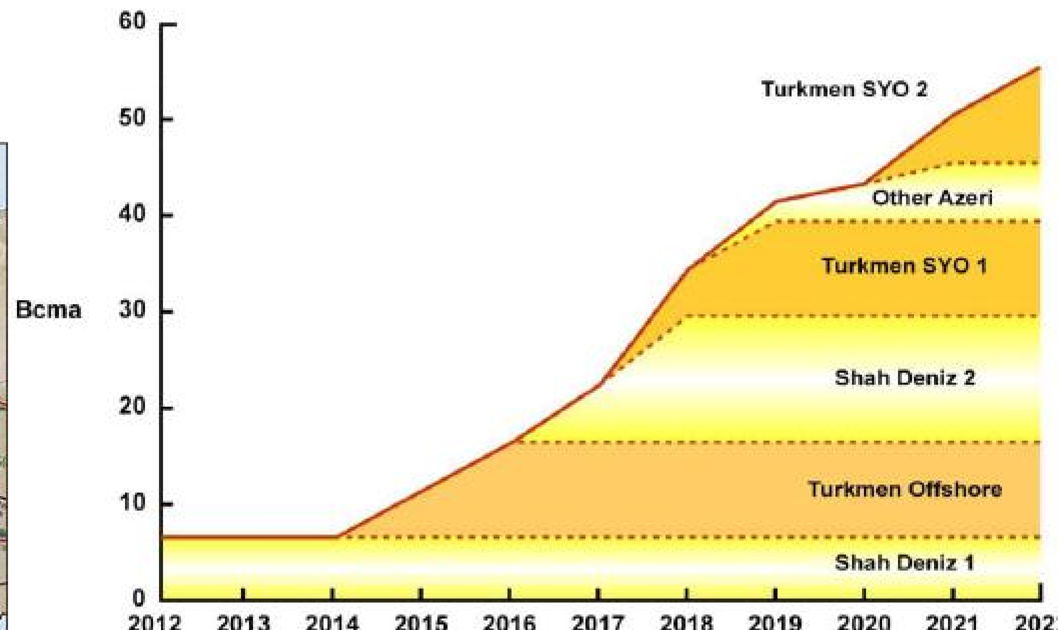
Gas to market: appropriate time, competitive price, right volume?

Possible Route to Trans-Caspian Gas Pipeline



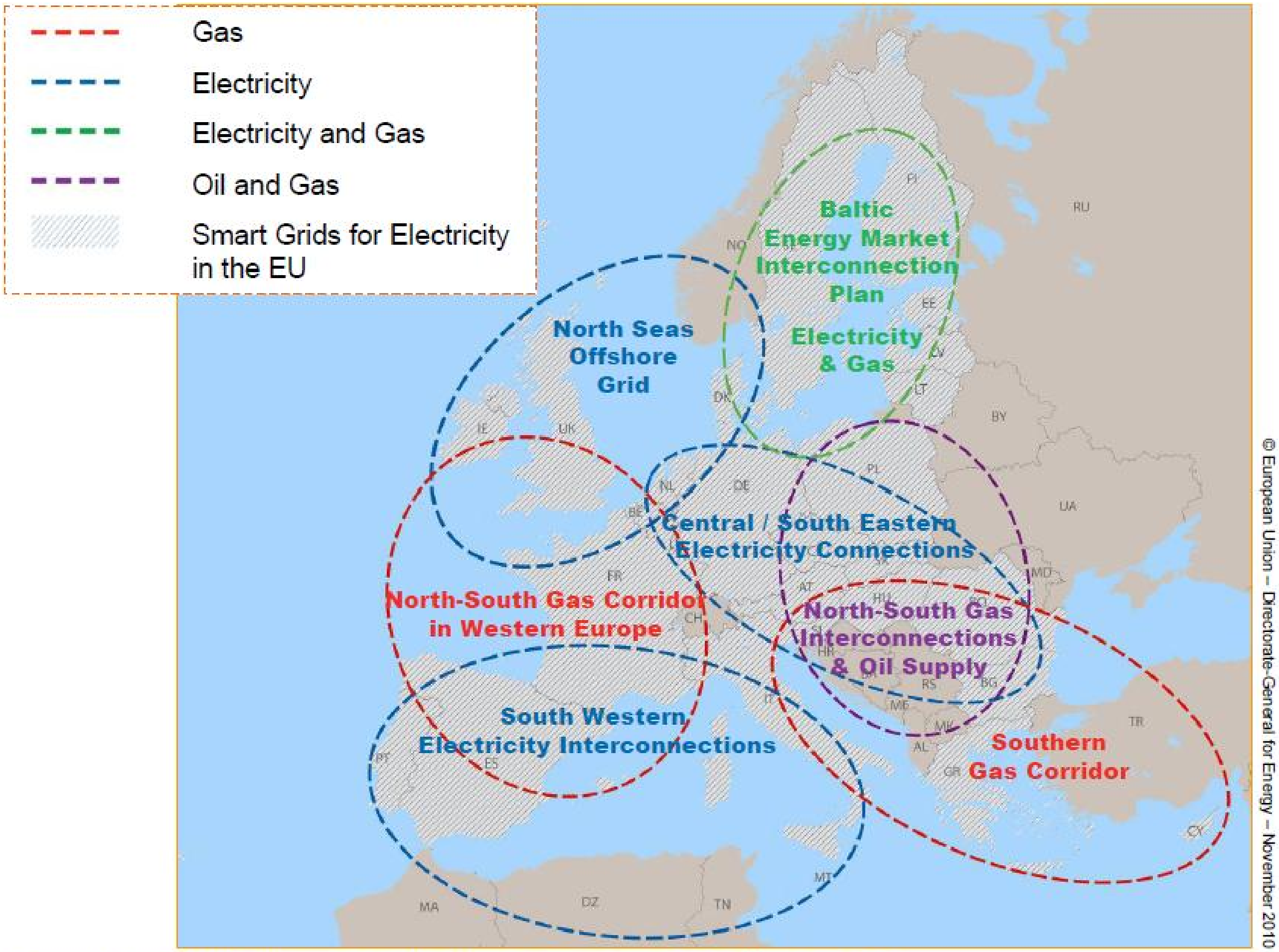
Source: OMV.

Build-up of Turkmen and Azerbaijan Gas Production
IHS CERA Reference Case
(Westbound Export Volumes Only)



Source: IHS CERA.
Notes: SYO = South Yolotan/Osman.
01214-19

European TEN E priority corridors



Presentation of J.M. Barroso to the European Council, 4 February 2011

SEE is the only area where three European priority corridors overlap.

Potential for close interrelation between pipeline gas and LNG

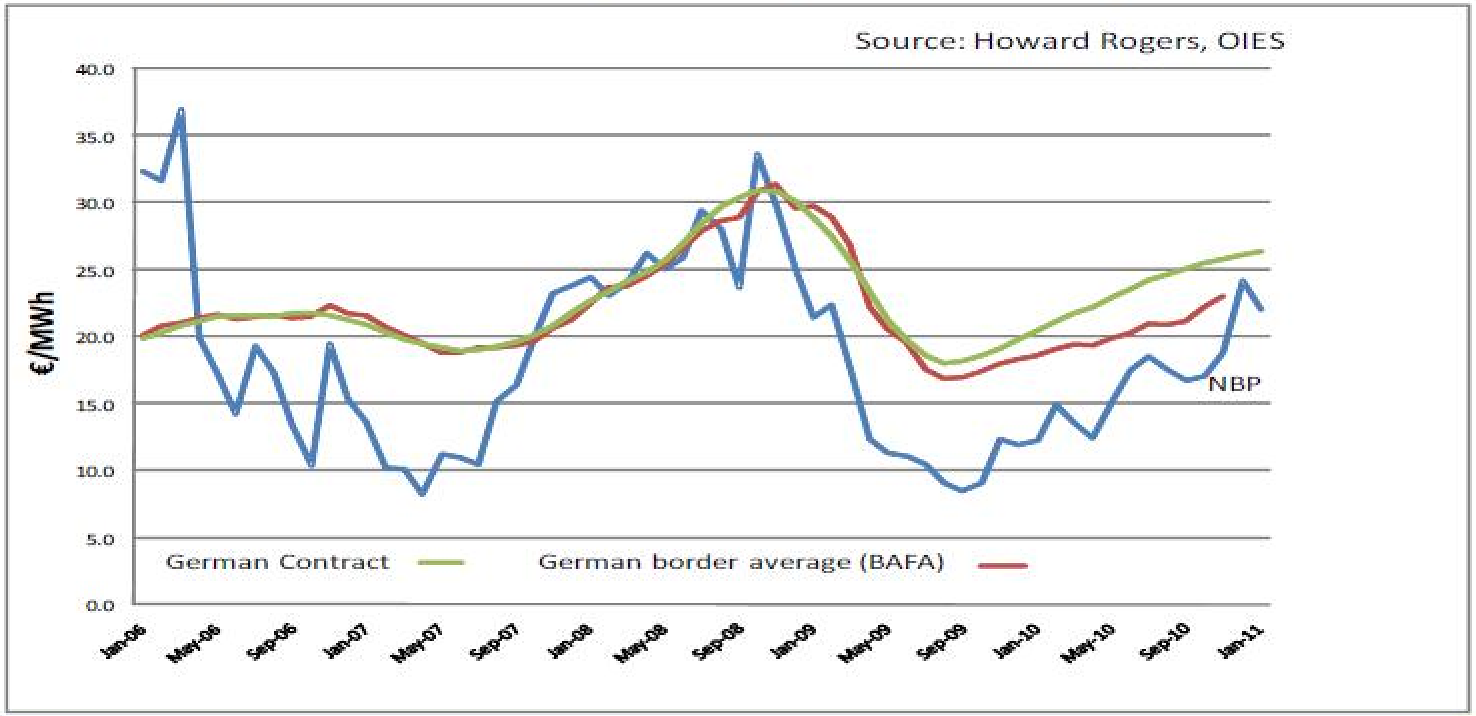
Hydro resources

SEE: Emerging Natural Gas Market

- Proposed Southern Gas corridor comprising many pipelines
- Supply via Ukraine with security of supply built in
- Under sea pipelines crossing Black Sea
- Energy Community Gas Ring
- More than 10 LNG / FSRU terminals proposed along Adriatic / Med coast
- Unconventional gas
- Off shore gas developments Black Sea and Mediterranean
- Spare transit capacity – security of supply
- Caspian gas delivered to SEE Trading Point to be competitive against LNG and Ukraine supplies

Performance of traded markets:

German Oil-Linked Contract Versus NBP Prices: January 2006-January 2011 (Euro/MWh)



End point of the transition could be where hub prices meet discounted long term contract prices (and eventually take over as the reference)

Evolution of LNG supply

- Tight shipping and volume markets due to post-Fukushima situation
- Already significant re-gas capacity in Europe and more to come on line
- Australian supply build up after 2015
- 15-20 curriers available for FSRU conversion in mid term
- Mediterranean production and off shore capacity
- Growth in shipping capacity and operability of ships
- Build up and timing profile tally with Caspian volumes build up

Black Sea gas markets

	Supply & demand drive	UGS	Electricity market	Access to LNG	Link to other markets	Seasonality
Russia	Supply	Over 80bcm	Large	No	Long term contracts	Winter demand
Ukraine	Demand	Up to 62bcm	Large	No	Transit	Winter demand
Caspian	Supply	Limited	Fragmented	No	Emerging	-
Turkey	Balanced	Limited	Large, insulated	Yes	Emerging	Managed
Balkans	demand	potential	Part of UCTE	limited	Emerging, EU rules	significant

Gas-to-market alternatives

- Gas-to-liquids
- Fertilizers
- LNG, CNG
- Appropriate time, competitive price, right volume
- Market characteristics: volatility due to relocation of energy intensive industry, decrease in residential and heating demand and increase in gas-to-power conversions
- Impact of renewable energy (wind, solar, heat pumps)
- Change in economic patterns
- Minimal infrastructure costs

SEE potential gas infrastructure and Black Sea flexible gas transit

Source: Aleksandar Kovacevic, "Potential Contribution of Natural Gas to Sustainable Development in South Eastern Europe", Oxford Institute for Energy Studies, 2007
http://www.oxfordenergy.org/pdfs/NG17.pdf

Seasonal flexibility competitive to UGS (OECD Europe monthly demand vary for 40bcm)

Security of supply flexibility

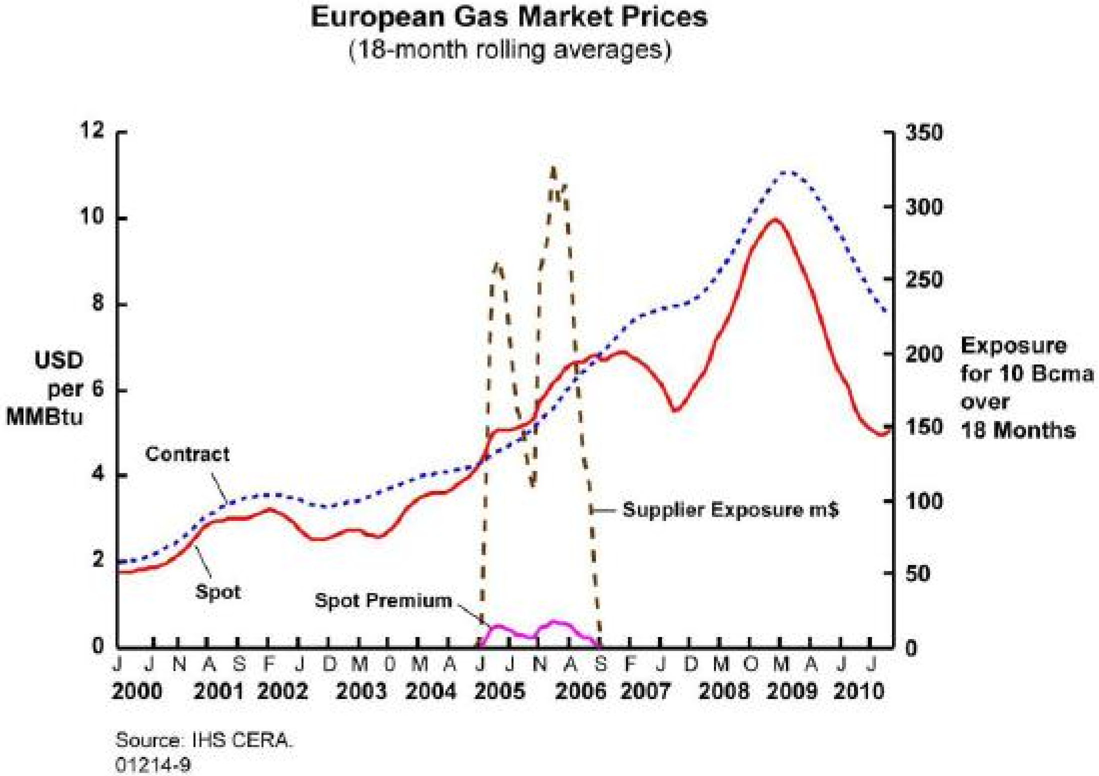
Short term weather related flexibility

Conclusions

- Time spans of investments and market evolution
- Market drivers: environmental concerns, economics, demography, technological change, renewable energy, EU integration
- Innovative market approach
- Flexibility
- Trade adds value

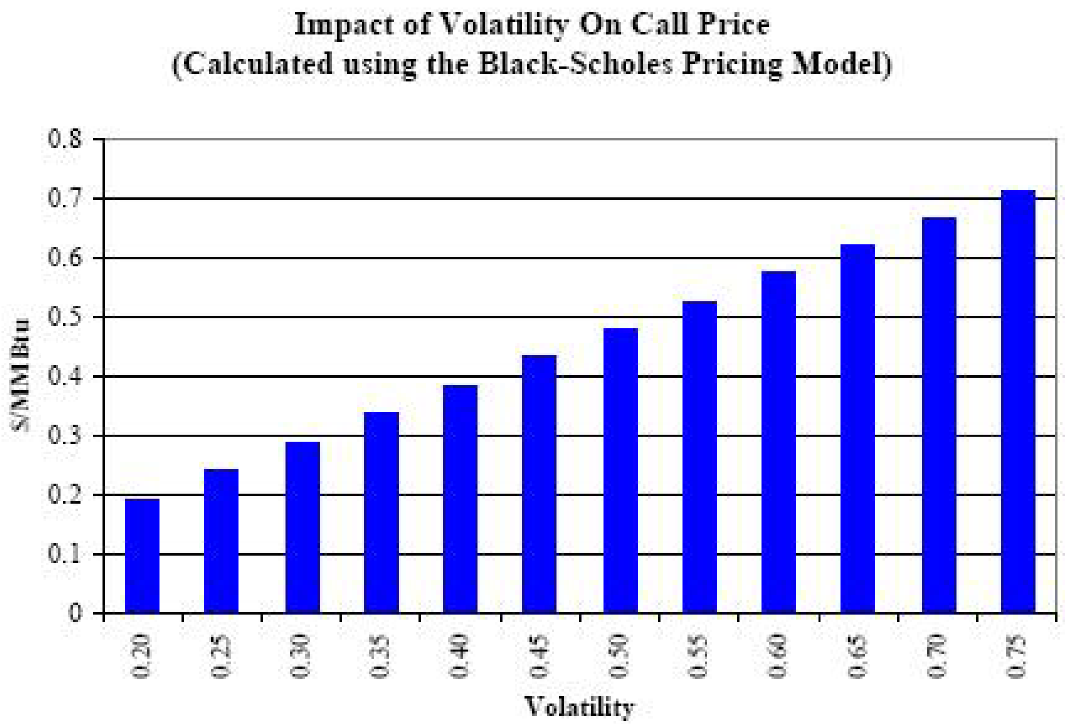
Add on slides

CDC risk exposure related with long term contracting



Gas market spread and arbitrage

Suppliers to Black Sea gas markets risk considerable part of their producer's rents to manage market risks, volatility and transit rents. Physical diversification of supply is not sufficient risk reduction tool in these circumstances.



Source: American Gas Foundation for the ORNL, 2003

AT&Bs Concept General Arrangement with general cargo / container barge