

Evolution Of The Methods To Guarantee Security Of Gas Supply And Demand On Different Stages Of Gas Market Development

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- During the last decade threats for the security of gas trade on supply and demand sides are one of the most discussed issues on the international agenda and in public debates about the future role of gas.
- Disruptions in gas supply, transit conflicts, severe price disputes and rigid pipeline competition are becoming commonplace in the modern gas markets. Eternal opposition between producers and consumers is currently aggravated by the economic crises and increased vulnerability of the markets.
- This “insecure” image is seriously hampering position of gas in the inter-fuel competition and might limit its share in the global energy mix.
- For many decades gas markets had been functioning in an extremely reliable way, but now with their integration and globalisation, concerns about security issues in gas trade are increasing.
- Are these increasing security threats for the gas trade incidental or politically driven, or maybe they reflect a consistent pattern?
- The aim of this research was to identify the main challenges for supply and demand security in the modern international gas trade, to find out the main methods and mechanisms that market participants are using to reduce risks on each stage of gas market development and to analyze the future development of these mechanisms.



The role of security considerations in shaping the institutional and contractual structure of gas industry



Security of supply and security of demand



Mechanisms used by the market participants to reduce “security costs” on each stage of gas market development



Instruments ensuring security in international gas trade

Specific nature of the gas industry

- **High specificity of assets** and high probability of opportunistic behavior
- **Long character of relationship** between counterparts with strong interdependence
- **High degree of uncertainty** due to long investment cycle and long period of the subsequent operation of specific assets
- **Strategic, social and infrastructural importance** of gas industry as well as its role in formation of the state budgets cause active intervention of the state in its institutional structure
- International gas trade is often linked with **geopolitical** relationship between countries, which increase state involvement. The need to secure energy supply from foreign sources became a national security issue, driving foreign policy priorities
- Gas industry with its unique pipeline, maritime and transit infrastructure (in terms of capital intensity and technical complexity) is often affected by the geopolitical relationships between the countries and itself became an important geopolitical factor. An increase in global energy trade together with some possibilities to manage prices turned the ability to dominate the energy sector into a powerful political and economic lever

Transaction costs are shaping the gas market design

- **Transaction costs (and the desire of the market players to reduce them) play an extremely important role in the gas market design: these are actually the “cost of security”**
- Market participants in the gas business face transactions with high degree of specificity, uncertainty, risk of opportunistic behavior and difficulties with the contractual regulation of long term relationships, aggravated by active states interventions in the institutional structure of the industry and different geopolitical considerations.
- Transaction cost economics suggests that these characteristics of transactions and difficulties of regulation of long relationships by contracts favor vertical integration, allowing to save on transaction costs.
- When vertical integration is impossible, its substitutes – bilateral long term contracts with rigid obligations of the parties or international consortiums including suppliers and consumer side or other their substitutes are used. In this case the parties remain formally independent.
- With maturing markets and decreasing asset specificity shorter-term contracts are becoming attractive. But strong contract fulfillment guarantees are still necessary – so the need for profound consistent institutional framework arises.



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Security includes both security of supply and security of demand

- Incorporating the whole gas supply chain, the concept of gas market security should include security of **all segments of gas delivery infrastructure**.
- **Security of natural gas demand** is crucial for the producers.
- Market security is inclusive of **supply security**, including concerns about the physical availability of gas – e.g. are absolute volumes delivered, or do users have the flexibility to switch to other fuels?
- Market security is dually concerned with the financial aspect, e.g. what price do customers pay for gas (or alternative) energy sources consumed? This broader conception of market security is particularly applicable to natural gas markets where demand (and price) is much more highly variable than actual gas supply.
- Both producers and consumers are exposed to the above mentioned risks and security threats in international gas trade, both sides have to develop mechanisms minimizing their “security costs”.



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Evolution of natural gas markets and instruments reducing “security costs”

Features	Local markets	National markets	International markets	Transcontinental markets/ Global market
Main product	Pipeline gas	Pipeline gas	Pipeline gas, LNG	Pipeline gas, LNG
Infrastructure	Few unlinked gas pipelines between producer and consumer	National gas supply systems	Development of large scale long-distance cross-border pipelines and bilateral LNG supply	LNG and pipeline gas supply from many countries, development of international pipeline systems
Market volume	A few BCM	10-102 BCM	A few hundred BCM	Several TCM
Institutional gas market structure	Local vertically integrated monopolies	National vertically integrated monopolies, independent gas production companies	Bilateral international contracts between two national companies	Multiple contracts between many companies, transnational vertically integrated energy companies
Competition	Absent	In certain conditions competition in gas production is possible	Competition between domestic production and imports	Competition between domestic production and multiple import sources
Aspects of energy security	Investment Physical	Investment Physical National energy security	Investment Physical National energy security Bilateral international (security of supply, security of demand)	Investment Physical National energy security Bilateral international (security of supply, security of demand) Security of transit
Instruments to reduce “security costs”	Local monopoly, super-long-term contracts	National monopoly	National monopoly, long-term inter-governmental agreements	Multilateral international agreements, asset swaps and joint ownership, consortiums

Current stage: new transitional period

- As the market develops, interdependence is increasing dramatically
- Growing number of parties involved in each transaction
- Growing number of market participants with different institutional frameworks
- Growing number of transit countries increase transit risks
- Fast regulatory reforms (incl. liberalization) in many countries create additional uncertainties and decrease trust to the state guarantees
- Need for higher than ever investments to produce and transport more gas from remote areas, while the emergence of natural gas as a commodity presents the challenges of attracting capital to meet future demand within a volatile market
- Mutual distrust of many market participants encourages energy nationalism and protectionism
- **Changing markets and growing uncertainties impose higher transaction costs**



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Several tools to mitigate security threats in the gas trade were developed

- Reducing import dependence
- Diversification of supply sources and markets
- Resilience (reserve capacities)
- Tools ensuring sufficient investments:
 - Energy dialogues at the international level
 - Vertical integration
 - Development of joint projects involving multiple participants from different countries
 - Bilateral long term contracts
- **These mechanisms of adaptation are justified from the transaction economy point of view and should be regarded not as a market failure**

Conclusions

- To deal with the new challenges and to lower high transaction costs (including “security costs”) new approaches are necessary. Due to high underinvestment threat, long term relationships, guarantying these investments and their return, are still extremely important in gas markets.
- International vertical integration is one of the possible approaches. Another form of market adaptation to these high “security costs” is development of joint projects including many participants from different countries which provides a sort of balance and mutual guarantees.
- Further gas market evolution will demand more unified institutional framework to decrease threats to energy security and transaction costs. New multilateral international agreements become critical for the further development of gas markets, especially with the growing number of transit countries and market participants involved in each transaction.