

Improving regulation of gas infrastructure expansion

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NEXT
GENERATION
INFRASTRUCTURES



Outline

- Introduction
- Research question
- Regulation & regulatory choices
- Evaluation & main results
 - Case: gas storage
 - Case: pipelines
- Concluding remarks

Introduction

- Investment required in EU gas infrastructure
 - Depletion of EU gas reserves
 - Changing gas flow patterns
 - Market integration
 - Diversification (LNG)
 - More storage for flexibility / security of supply
- Public goals
 - Affordability & Security of supply
 - (Sustainability)

Research question

- Which type of regulation should be preferred with respect to the expansion of a particular type of gas infrastructure in a particular context?
- Scope:
 - EU
 - LNG, gas storage, gas pipelines



Regulation and regulatory choices

Regulation

- Regulation: form of government intervention designed to influence the behavior of firms and individuals in the market
 - Structural regulation: impacts market structure and degree of competition
 - Conduct regulation: aims at influencing behavior of economic agents
- Optimal infrastructure regulation is unattainable
 - Uncertainty
 - Information asymmetry
 - Lack of regulatory commitment
 - Evolving market conditions and technologies

Regulation and regulatory choices

Regulatory choices

	Aspects	Regulatory design questions
Structural regulation	Ownership	Who is allowed to own?
	Organization	Who is allowed to operate?
	Governance	Who is allowed to invest?
		How is expansion decided?
Conduct regulation	Price structure	How are prices set?
	Capacity allocation	How is capacity allocated?
	Congestion management	How is congestion solved?
	Etc.	How ...?

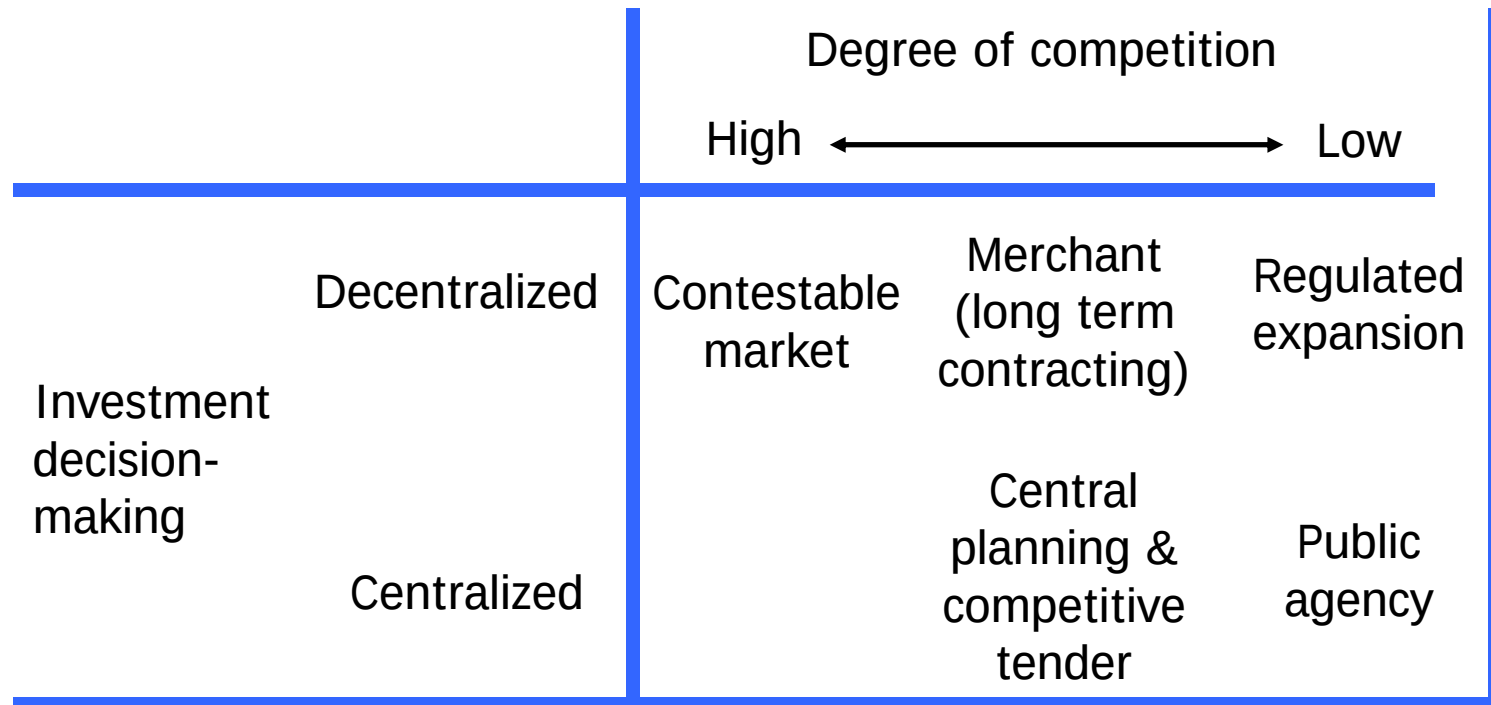
Regulation and regulatory choices

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Regulation and regulatory choices

Regulatory (governance) models for expansion



Regulation and regulatory choices

Regulatory models for expansion

1. Contestable market

- Economics' textbook model
- Market is contestable / no barriers for market entry
- full-cost recovery
- Decentralized investment decisions

2. 'Merchant' expansion

- Decentralized investment decision-making
- Negotiated access conditions
- Recovery of investment cost through market value of project
- Facilitated by long-term contracts
- Regulatory choices:
 - Mode of investment identification (bilateral, open season, auction)

Regulation and regulatory choices

Regulatory models for expansion

3. Regulated expansion

- Decentralized investment decision
- Regulated access conditions
- Recovery of investment costs through regulated tariffs
- Regulatory choices:
 - Mode of investment identification (bilateral, open season, auction)
 - Strength of investment incentives (WACC, performance metrics)

Regulation and regulatory choices

Regulatory models for expansion

4. Central planning & competitive tender
 - Centralized investment decision (i.e. 'social planner')
 - Centralized coordination & planning (long-term contracts), regulated access conditions, competitive tender for expansion
 - Tender for efficient expansion project allocation
5. Public agency
 - Centralized coordination & planning
 - Regulated access conditions
 - Socialization of costs

Evaluation of regulatory models

Evaluation framework

- Under which type of regulation would gas infrastructure expansion perform best from a social welfare perspective?
- Which criteria to use in evaluating regulatory options?
 - Affordability → Economic efficiency
 - Security of supply → Capacity adequacy

Evaluation of regulatory model

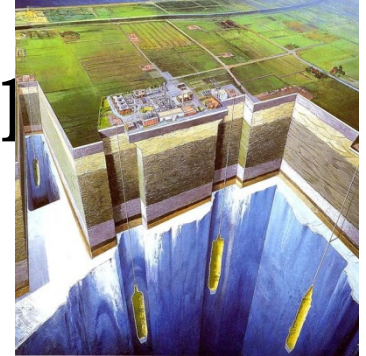
Main results for case of gas storage



- Small-scale, high deliverability gas storage facilities
 - Short-term flexibility
 - Considerations
 - Competing alternatives
 - Sufficient expansion opportunities (geologically)?
 - Capital cost investment relatively low
 - Other market barriers (permitting, siting)
- Contestable market if sufficient opportunities exist
- Regulated expansion if opportunities are limited

Evaluation of regulatory model

Main results for case of gas storage



- Seasonal gas storage / strategic storage facilities
 - Providing seasonal flexibility and insurance in case of low risk, high impact security of supply events
 - Considerations:
 - Competing alternatives (indigenous production, imports)?
 - Availability potential storage sites?
 - Much higher upfront cost and uncertainty
 - Missing markets: what is demand for peak capacity?
 - Certainty on cost recovery for investors needed
 - Asymmetric risk of under- / overinvestment
- Merchant investment (long-term contracts) if sufficient development opportunities exist, market is large, in combination with storage obligations
- Regulation (performance-based) if little development opportunities exist

Evaluation of regulatory models

Main results for case of gas pipelines



- Single pipeline connecting two gas pipeline networks
 - Contestable to some degree (parallel pipelines, LNG arbitrage)
 - Externalities: private vs public optimal investment level
 - Possible regulatory models:
 - Merchant (with additional X% for short-term market)
 - Regulated (performance-based with social welfare metrics)
 - Central planning (with market-based information) with competitive tender (long-term contracts)
- Single pipeline within dense gas pipeline network
 - Need for coordination with existing infrastructure
 - Regulated (performance-based)

Concluding remarks

- Which type of regulatory model (governance mode) for a particular type of gas infrastructure expansion?
 - Keeping in mind public goals of affordability and security of supply
- Range of regulatory models based on degree of competition and level of investment decision-making
- Analysis on storage, pipelines (and LNG) supports differential case-by-case approach
 - Reflected in current EU legislation on gas pipelines, but less so with respect to gas storage
 - Possibility of EU member state level recommendations

*Thank you for your attention
Questions?*

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