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Lessons on funding practices from developing gas networks
Why study gas infrastructure?

- Gas reserves are frequently the booby prize
- Locations such as Shtokman, Yamal, Gorgon, Qatar North Field, etc.
- Remoteness of production from markets implies the need for infrastructure investments:
  - Pipelines (including compressor stations)
  - LNG supply chains: liquefaction, ships, regasification
- Many of the best renewable resources are similarly remote, e.g. North-Sea, North-Dakota, North Africa
Applying this to renewables

- How to get essential transmission in place for new renewable capacity?
  - At the right time, the right place, the right size?

- For renewables such regional integration is a key factor in
  - coping with intermittency
  - and improving economics:
    - negative pricing indicates a growing problem of sub-regional congestion in Europe
Characteristics of Gas Pipelines (1)

- Large Economies of Scale
- Long operating life, but lack of flexibility
- Strong government involvement
Characteristics of Gas Pipelines (2)

- Pipeline as a (vulnerable) part of a longer value chain
  - Strong interdependence with upstream and downstream

- Externalities and high threshold costs can lead in market failure
  - Potential implications for competition, environment

Many of these characteristics have analogies for long distance power transmission, especially cross-border
Some consequences

- Natural monopoly dimension: creates need for regulation to protect consumers
- Large upfront investment / low operating cost
- Agreements governing the pipeline have to operate over a long period
- Interruptions to operation can have far-reaching implications
Cross-border interactions

- Challenge of aligning jurisdiction interests along the gas value chain. Increasing complexity as number of transit countries increases.
- Challenge of operating in (multiple) legal and regulatory regimes
- Pipeline negotiations facilitated by increased choices
- Similar issues prevail between governments and private sector or between companies
A tale of three pipelines

- The Rockies Express Pipeline (USA)
  - Response to market signals within a single jurisdiction
- The Turkmenistan-China Pipeline
  - States and state-owned companies take the lead
- The Nabucco Pipeline
  - Aligning multiple state and private interest along the gas chain
Existing Hub – System (as of 2006)
Rockies Express
A 2,700 km pipeline, at total cost of USD 4.4 billion, went from concept to operation in 3 years,
Rockies Express – Key factors

- Transparent market signals (prices) that gave investors confidence in project fundamentals
- Strong links between producers and the pipeline owner operator
- Open season process which encapsulated these factors,
- Transparent, timely regulatory processes for a pipeline crossing several state boundaries,
- Implemented by a single Federal agency,
- Pipeline routes utilising existing utility corridors for 90% of the length
Turkmenistan – China pipeline

- Turkmenistan-China Agreement on Gas Cooperation 2006, followed by PSA and Gas Sale and Purchase Agreement
- Uzbekistan, Kazakhstan transit countries: Inter-Governmental Agreements in place
Turkmenistan – China: key-factors

- State-state negotiations and implementation by state-owned companies eases challenge of coordination
- Gas supply underpinned by 30-year gas sales and purchase agreement, linked in part to production from CNPC’s own PSA / production in Southeast Turkmenistan
- Transit risk mitigated by inter-governmental agreements and backed up by China’s bilateral political relationships
- Joint ventures by CNPC in Kazakhstan and Uzbekistan to build and own sections of the pipeline in the respective transit countries
Nabucco – Key factors

- Offers more diversified and secure European gas supply, plus access to European markets for gas exporters
- Multiple jurisdictions and regulatory regimes increase transaction costs.
- Need for more transparent European gas market operation
- Need to meet concerns about security of gas supply for transit countries
- Link to gas-rich region, but questions about specific supplier and short-term gas availability
What needs to be done to make markets work better? (1)

- Improving the interconnection between markets:
  - Better use of existing capacity
  - Cross-border investment
  - Balancing and quality issues

- Improving transparency (infrastructure data):
  - Publishing border flows
  - Publishing stock levels
  - Future capacity availability
What needs to be done to make markets work better? (2)

- Improved regulation:
  - Predictable, stable
  - Uniform across borders or at least harmonise
  - A Federal European Energy Regulator??

- Coordinated Investment planning:
  - TSOs produce medium to long term plans
  - Coordinated at European level
Thank you for your attention
United States: National Interest Electric Transmission Corridors (NIETC)
Australia: statement of opportunities

Gas pipelines  

Electricity network
Public-private interactions

- Pipelines can involve multiple public and private parties with different interests
  - The more parties involved, the greater the challenge of coordination..
  - Importance of a transparent, stable and harmonised regulatory framework,
  - Commercial drivers for projects work well
  - But energy is political.....

- Different companies involved may have different objectives
  - Vertically integrated companies vs. unbundled private entities

- In a well-conceived project, the interests of all stakeholders are balanced and aligned for the lifetime of the project.