Foundation for Regulating Pipelines

United States and Europe: Two Different Regulatory Worlds

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(with thanks to Jeff Makholm, NERA Economic Consulting, Boston)

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There is now a handy source for the following ideas on regulating pipelines

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Jeff D. Makholm

The Political Economy of Pipelines

- University of Chicago Press: www.press.uchicago.edu
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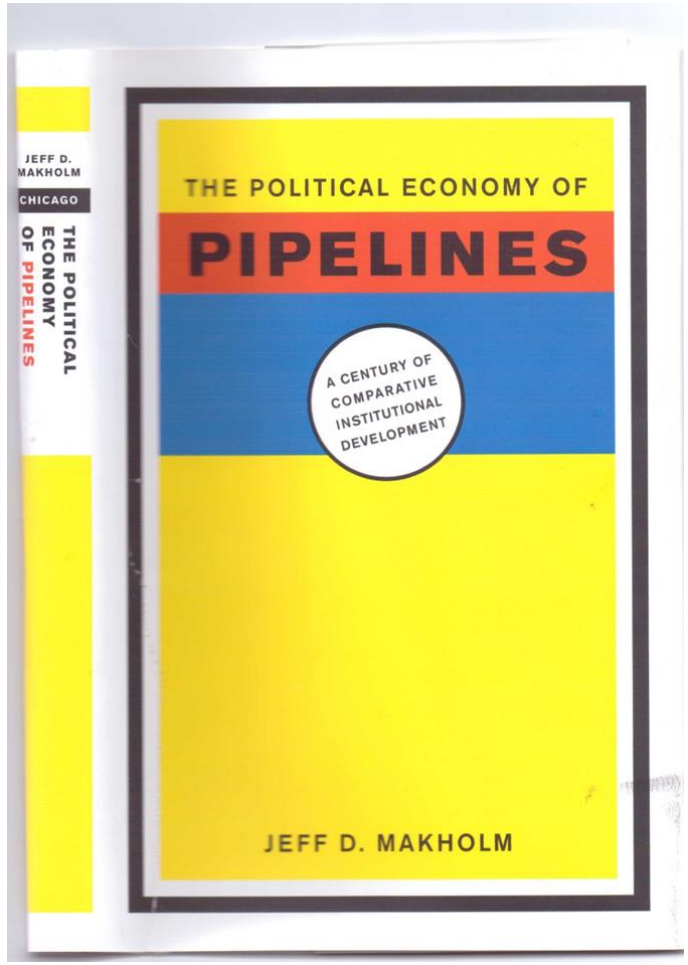

Outline: Three Topics

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1. **How Europe differs from the United States**
   - The gulf between European and US gas pipelines
   - What this means for European and US gas markets
2. **The institutional foundation for effective pipeline regulation**
   - Economic governance as a general concept
   - Specific regulatory institutions for pipelines
3. **Consequences of ineffective pipeline regulation in Europe**
   - Social costs and political consequences

Part 1: The (Similarities and) Differences

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- **How Europe is like, and unlike, the United States**
  - Inland gas transport industry
  - Gas markets
  - What regulators do

Gas pipelines differ in important ways from electricity transmission

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- **Similarities**
  - Both are inland energy transport systems
  - Both are highly capital intensive, irreversible and linked to particular suppliers and energy users
    - They are "relationship-specific investments" in the language of transaction cost economics.
- **Differences**
  - Electricity: sub-atomic particles moving at the speed of light
    - Flow paths are unpredictable.
      - Transmission "externalities" (loop flows) are endemic in electricity, but there are none in gas that can't be handled with operational transparency and commercial/accounting conventions.
  - Gas: molecules moving at 50km/h
    - Defining physical-path transport contracts is easy.

Electricity transmission is a “grid”; Gas pipelines are “point-to-point”

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- **Electricity transmission is a “Grid”**
  - The grid is “pooled” energy transport system where users necessarily share costs and regulators oversee planning and tariffs.
  - Physical path contracts are impossible to define with any accuracy or stability
- **Gas transmission is an orderly system of inland transport from place to place—not a “Grid”**
  - The system need not be a pooled, shared-cost system.
  - Pipeline capacity is bounded and its usage is exclusive
  - By separating out contracts for physical paths, its use and expansion can be made competitive.

Pipelines are pipelines, the whole world over….(1) The US

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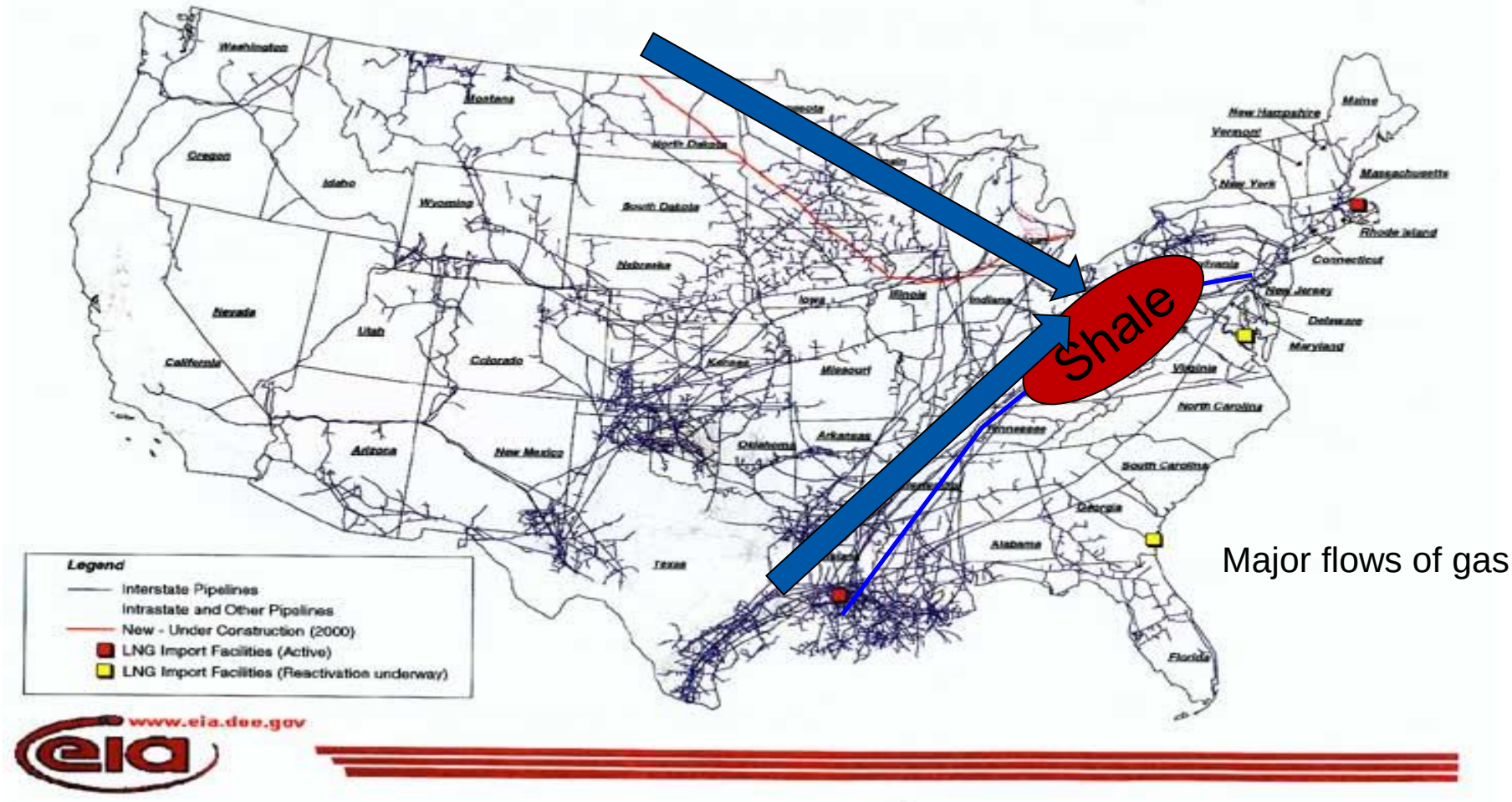
Natural Gas Pipeline Network 2000



Pipelines are pipelines, the whole world over…..(2) Europe

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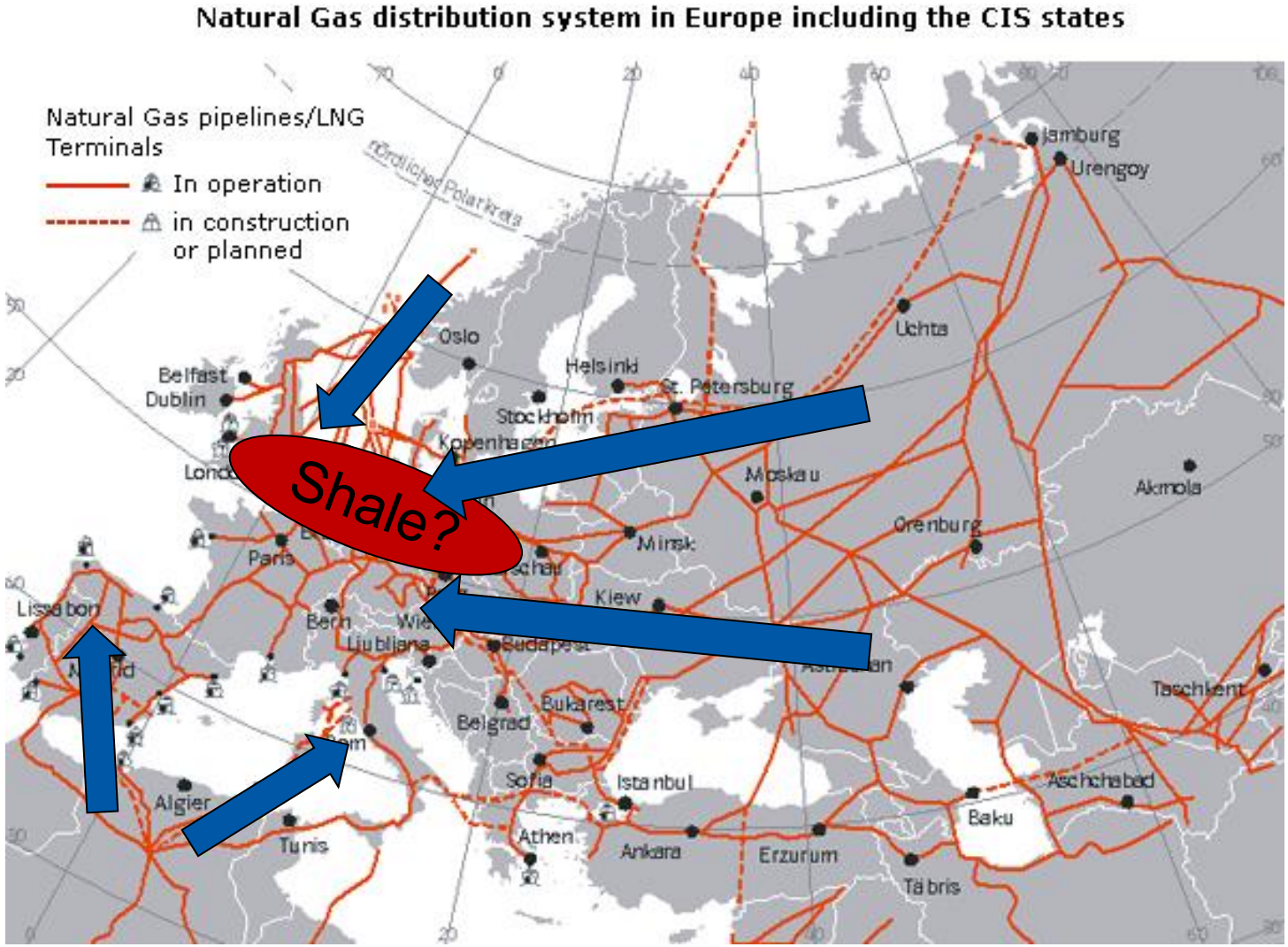

Major flows of gas → North Sea / Dutch gas fields ●

Company Structure: EU and US gas pipelines have different histories

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EUROPE

- Integrated with gas distribution
- Transporters of their own gas (until recently)
- Operating and financial data private (closed)
- Capacity kept secret from shippers
- Protected from rivalry
- Monopoly transport

UNITED STATES

- Separate from gas distribution
- May not transport their own gas (since the 1990s)
- Operating and financial data public (open)
- Capacity licensed by regulator and well-known
- Exposed to entry
- Competitive transport

Gas Transport: EU and US regulatory agencies perform different roles

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EUROPE

- National authorities coordinate their activities through ERGEG
- National authorities:
  - regulate gas distribution
  - regulate gas transport
- Member States:
  - cede no regulatory powers to the European Commission
  - defend "national champions"
- Regulators are not independent of the National Executive Authority

UNITED STATES

- State authorities coordinate their activities through NARUC
- State authorities:
  - regulate gas distribution
  - do not regulate gas transport
- The Federal Energy Regulatory Commission:
  - deals with all gas transport
  - promotes rivalry in pipeline transport
- Regulators are independent of State Executive authority

US Gas Transport Market

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- **Pipelines:** Operate and maintain regulated pipeline capacity—no role in the gas commodity market
- **Contract Shippers:** Control licensed pipeline capacity, to use or sell in unregulated markets
- **FERC:** Prime (new) job is protecting the value of shippers' capacity rights and overseeing frictionless pipeline-maintained, on-line trading mechanisms. Secondary (traditional) FERC job is overseeing cost-based pipeline prices.
- **State Regulators:** No direct involvement in interstate pipeline transport.
- **Incumbents and Entrants:** Seek out buyers for additional capacity—to be built and charged at cost-based "incremental" regulated prices.
- **Non-contract shippers:** Buy firm capacity from contract shippers or interruptible capacity from regulated pipeline companies.

US systems permit competition to build new pipelines

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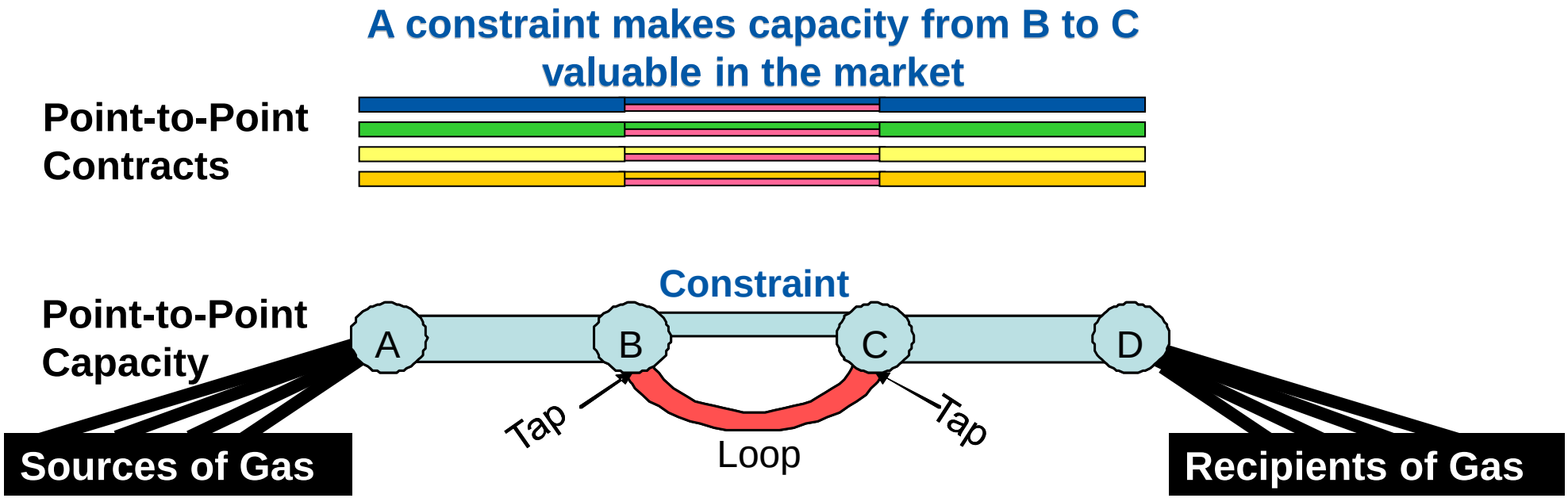
- Contract Capacity offers tradeable, “Coasian” property rights, so a market price emerges for pipeline capacity
- Contract Capacity matches pipeline capacity, physically and in cost structure, so the market price shows the value of real investments between specific places
- Anyone can build a new pipeline and connect it to existing pipelines via “taps” = “Open Access to Economies of Scale”



Competing investor adds capacity (“loop”) at least cost

What makes competitive pipeline transport work?

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For Efficient Investment

Open seasons	Enables cooperation by private investors to exploit economies of scale
Obligation to provide taps	Avoids inefficient duplication of capacity Preserves competition in expanding pipelines

For Efficient Use

Point-to-point charging in long-term contracts	Aligns the service offering with the physical capacity and with incremental costs
"Straight fixed-variable" charging structure	Promotes efficient utilisation by capacity holders: Variable usage charges = Variable costs

For Efficient Access

Unbundling	Allows a market price for capacity to emerge Unbundling from distribution prevents foreclosure
Capacity Trading: Standard terms and trading platforms	Traders are familiar with capacity products on all long-distance gas pipelines Market access to capacity is cheap and quick

Entry-exit tariffs reduce gas trading and hide the location of pipeline congestion

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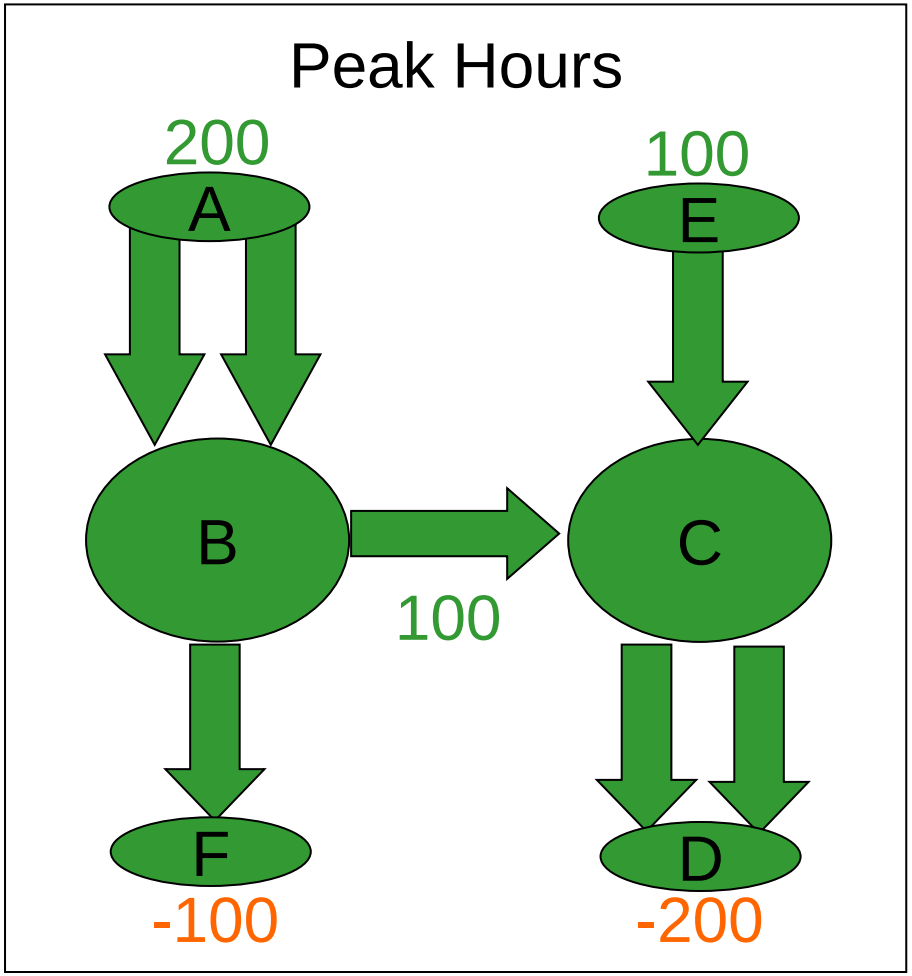

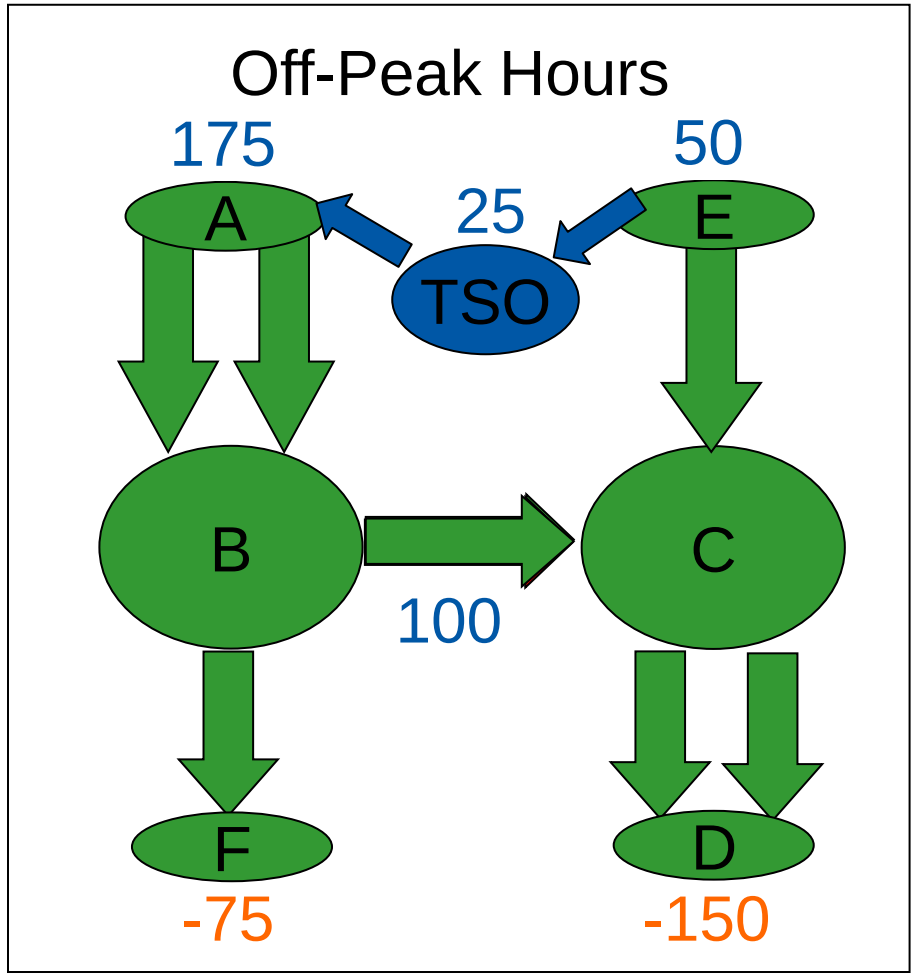

Uncongested Capacity
Congested Capacity

Each arrow represents 100 units of capacity, e.g. 100 mcm/hour

Part 2: Why the Differences? The institutional foundations for effective pipeline regulation

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Pipelines are pipelines, the whole world over….

DIFFERENT INSTITUTIONS EXPLAIN DIFFERING OUTCOMES!

- Role of private capital
- Political boundaries
- Constitutional protections of property
- Regulatory institutions

Pipeline Institutions Specific To The US

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- **Source of Capital**
  - Private in the US since the 19th century
- **Vertical Integration with Distribution**
  - Prohibited in the US since 1935
- **Accounting**
  - No "commercial secrets" since 1912—total transparency
- **Strong Federal Jurisdiction**
  - Commerce Clause of US Constitution of 1787
- **Pipelines Pushed Out of Gas Commodity Business**
  - "Divorcement" begun in 1992, finalized in 2000

Canada and the US both have robust regulatory institutions

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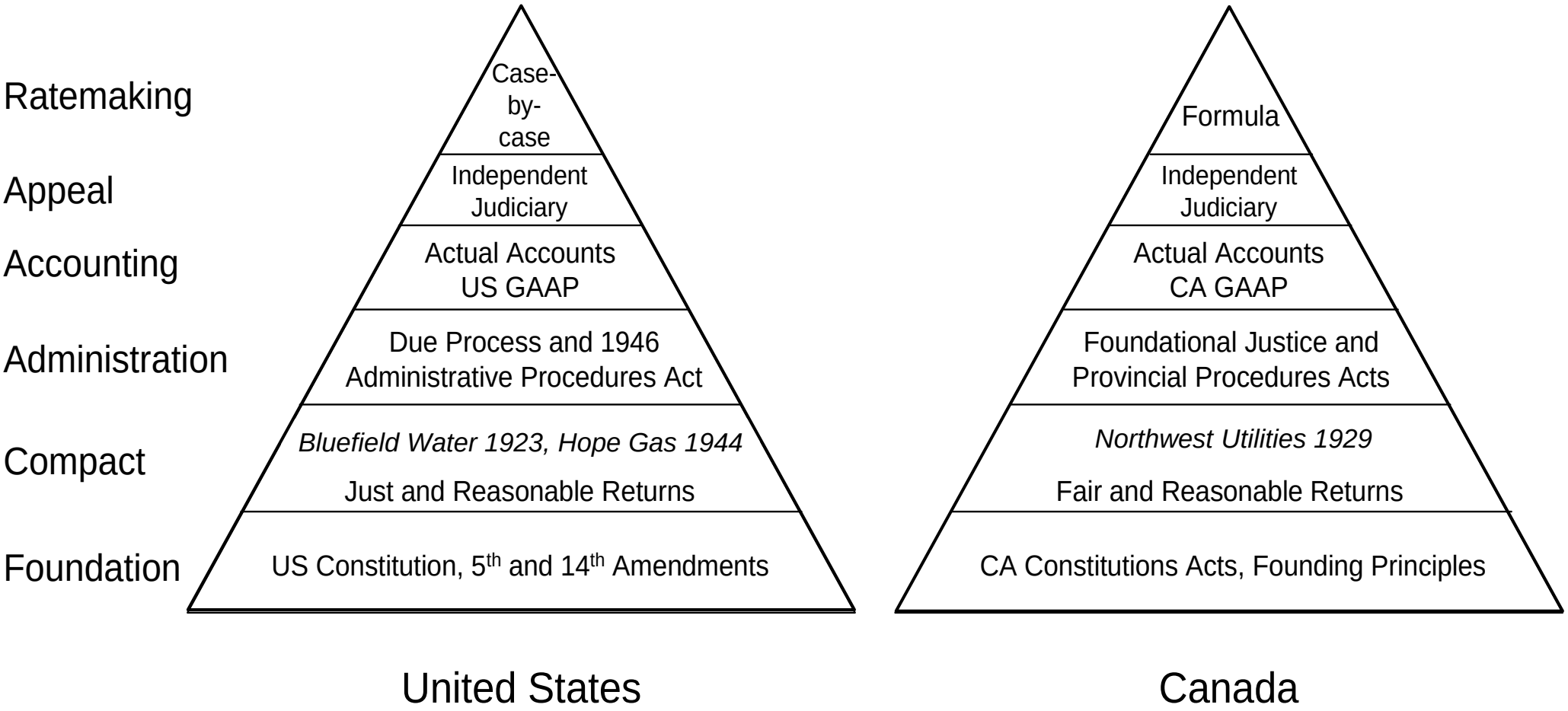
- **Regulatory institutions in Canada and U.S. have evolved into similar, stable structures:**



US regulatory institutions have evolved to a position of stability

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- Total transparency in capacity and finances for regulated pipeline capacity
- Operational limits, balancing, penalties all based on empirical engineering and cost studies
- Highly competitive trade in access to regulated capacity at unregulated prices
- No outstanding economic controversy

The US system is in market and regulatory equilibrium, with no pressure to change the rules (not so for the EU)

In Europe, gas pipeline regulation lacks long-term stability

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- Split jurisdiction:
  - strong national regulatory authorities;
  - weak EU regulator
- Lack of transparency on accounting and operational information
- No constitutional definition of regulated property
- Widespread and weakly-regulated vertical integration controlled by national regulators
- Entry-Exit tariff rules promote integration of pipelines (i.e. monopoly central planning), not competition between pipelines.

European gas pipeline regulation is unstable as it lacks the institutions underpinning success in North America

How would US or Canadian regulatory staffs view Europe's national regulators?

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- They would never understand why European regulators have not imposed strict accounting legislation.
- The would search in vain for solid regulatory book capital values.
- They would not tolerate secrecy by the regulated company.
- They would be unused to any sort of direct pressure from government Executive/Legislative authorities.
- With such a powerful FERC, they would wonder why DG Tren is so lacking in authority.
- The would look around and see too many economists, and not enough lawyers, accountants and engineers to operate transparent processes.
- They would look at wide area "entry/exit" pricing and wonder at such an overly-complex way of making pipeline prices, which complicates the role of system operators (compared with simple distance-based, point-to-point tariffs).

Part 3: Consequences Of Ineffective Pipeline Regulation in Europe

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- **Market power in gas**
  - Cost of oil-linked gas contracts
  - Take or pay provisions
  - Prohibition on re-sale in contracts
  - Lack of forward markets
- **Market power in pipeline transport**
  - Redundant pipelines (especially to the east)
  - Lack of competitive pressure facing existing pipelines
  - Difficulties over access to existing pipelines

European consumers are paying double what consumers are paying in the US

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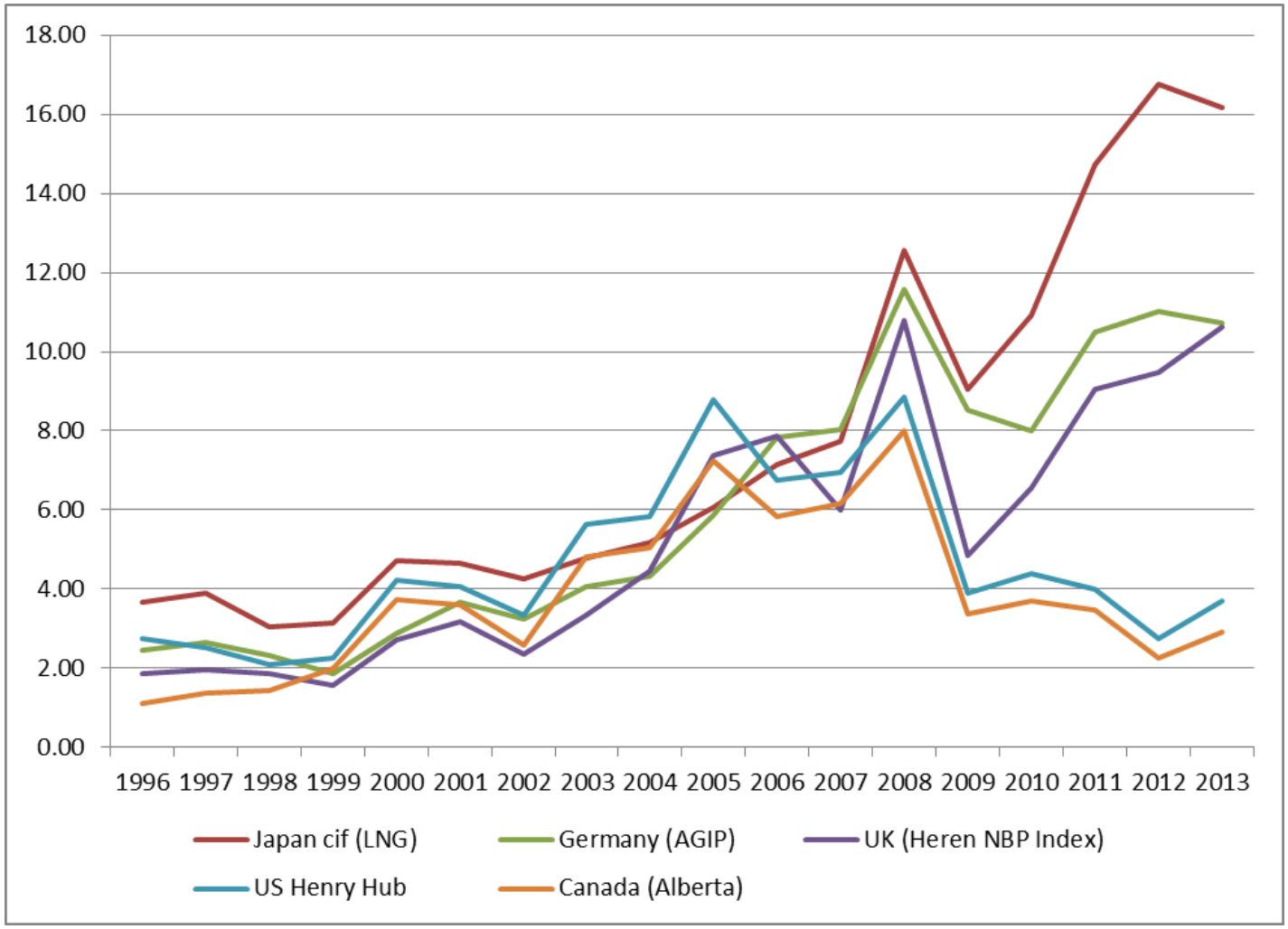
International Gas Prices By Market Area



Source: BP Statistical Review of World Energy, 2014.

Gas prices in the US reflect production costs around 4 US Dollars per MMBTU....

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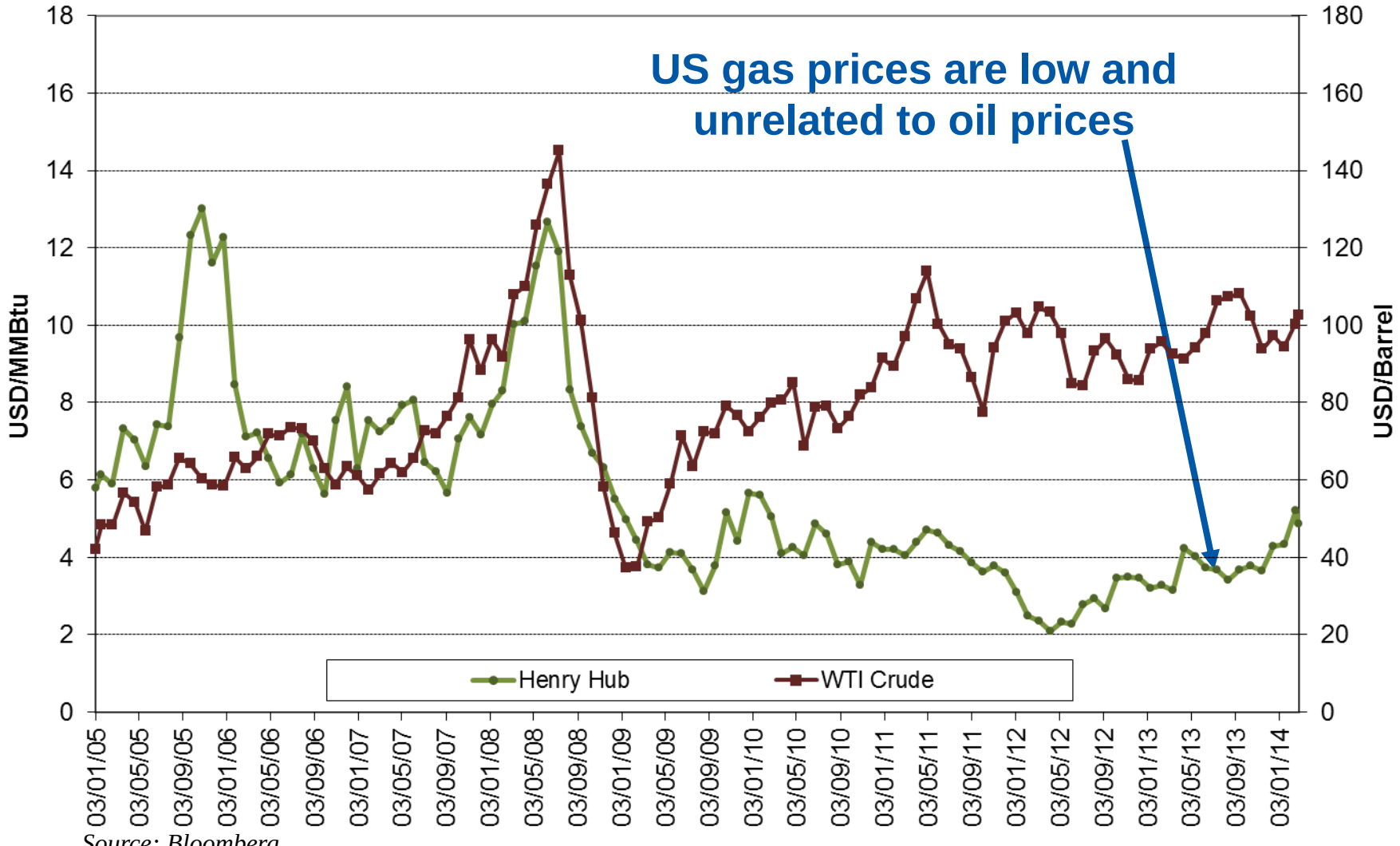
Henry Hub Natural Gas and WTI Crude
January 2005 to February 2014



Source: Bloomberg

...whilst European gas prices remain oil-based at around 10 US Dollars per MMBTU

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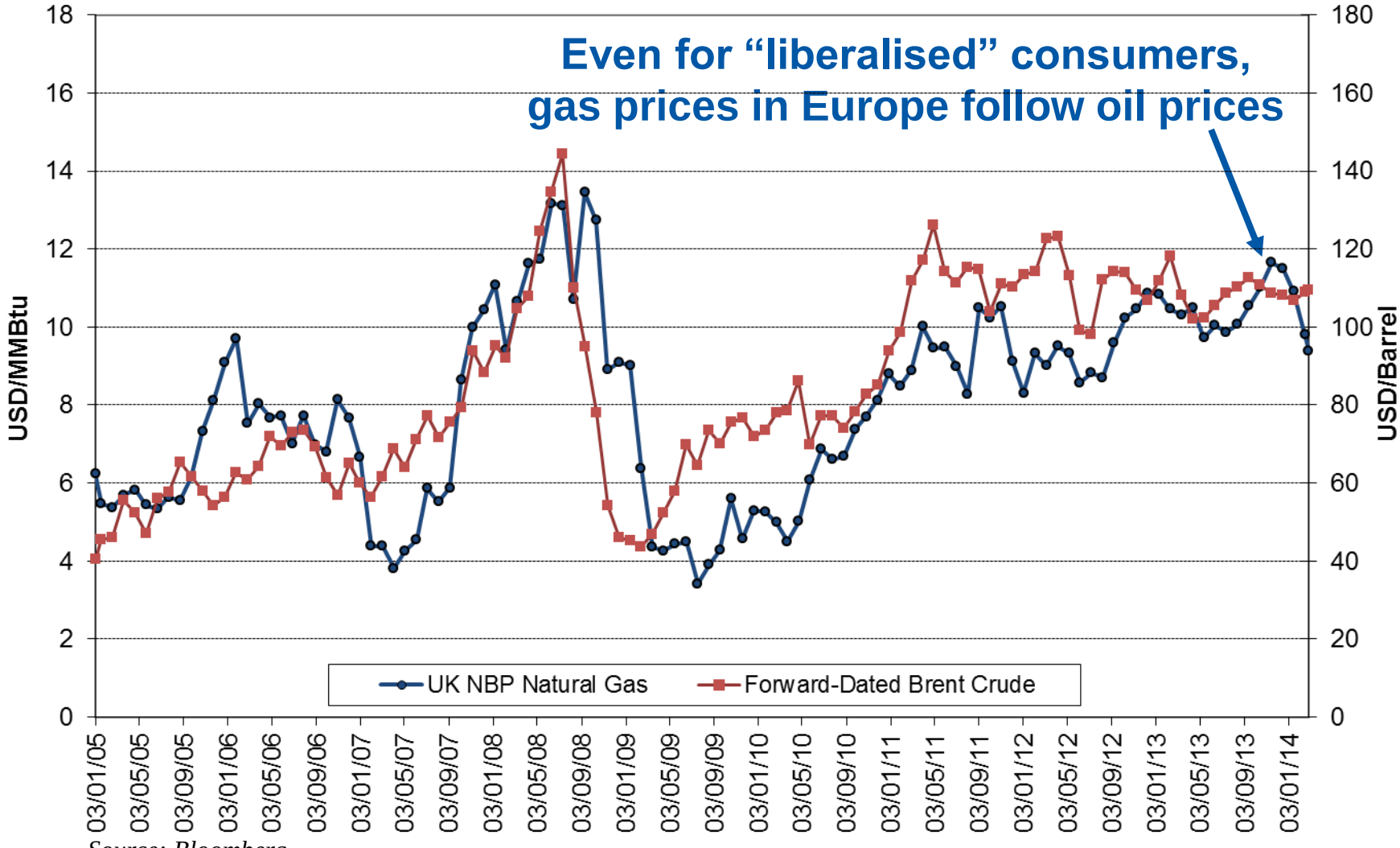
UK NBP Natural Gas and Forward-Dated Brent Crude
January 2005 to February 2014



Source: Bloomberg

The institutional differences have many real consequences

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EUROPE

- **No gas market** independent of oil markets (except intermittently)
  - **Some spot gas trading**
  - **No forward market of substance to shift risk of gas price changes**
- **No liquid market for inland gas transport capacity**
  - **Access is provided on tariffs**
  - **Permits collusion and politicisation of gas supply**
- **Worried about Russia**

UNITED STATES

- Gas market has long been **independent of oil prices and competitive**
  - **Universal spot trading**
  - **Large forward market (many times the size of Europe's)**
- **Competitive market for inland gas transport capacity**
  - **Low market prices for access**
  - **Politics not a part of gas supply**
- **Not worried about Canada!**

Gas Transport Markets In Europe: Prospects?

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- **In the "Third Package" of EU gas pipeline regulations, gas transport is still treated like electricity transmission**
  - Physical attributes of power grids and gas transport systems are not alike
  - Grids cannot sell physical point-to-point capacity rights;
  - Pipelines can easily sell point-to-point capacity, but the Third Package (Regulation 715.09 art. 13) prohibits point-to-point tariffs.
- **Current prospects for competition are dim:**
  - No effective pressure groups acting for consumers to pursue rivalry in transport (especially no powerful lobby of strictly regulated distribution companies)
  - Legislative packages bend to narrow interests of incumbents
  - ERGEG moving toward more virtual hubs, not more realistic/transparent inland transport
- **Political influence lies with incumbent pipelines and energy traders**

Gas Commodity Markets In Europe: Prospects?

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- **Except for small and isolated markets (like the UK), gas commodity competition depends on competitive inland transport.**
  - NYMEX Henry Hub in the US arose with real unbundling and competition in transport
  - Competitive transport destroyed long-term price and take-or-pay contracts
- **Prospect for rivalry in pipeline transport in EU is getting smaller**
  - Incumbents bend legislation in their favor
  - Incumbents resist unbundling and transparency
  - National regulators defend interests

Experience shows markets for both gas and transport can be competitive

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- **Pipelines can be limited to competitive, but cost-based transport service if:**
  - gas transport is unbundled from commodity sales; and
  - furthermore, distribution networks are unbundled from trunk pipelines
- **Capacity rights can form a new market if:**
  - Transport is made fully transparent
  - Regulatory accounts dictate the foundation for regulated tariffs
  - EU regulators defend property rights and frictionless markets for trade
  - Entry/exit is disaggregated into physical point-to-point service
  - Pipeline capacity additions are subject to incremental pricing

Experience shows that gas and transport markets are separable and that both can be competitive

End

Social costs and political consequences of European inaction

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- **Lack of Competition in Gas**
  - No effective gas-on-gas competition from different regions
  - Consumer surplus appropriated by gas producers
  - Gas not re-sellable, creating security of supply problems
- **Lack of Competition in Transport**
  - Redundant pipelines
  - Shippers unable to compare pipeline capacity to storage and other options
  - No low cost access to spare pipeline capacity
- **Political Consequences**
  - Europe exposed to Russian foreign policy

European affection for central planning is a major obstacle to the creation of institutions promoting competitive, low cost gas

Curing pipeline problems in Europe will face obstacles....

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- **Widespread Command and Control (Central Planning)**
  - The monopoly central planning role of TSOs reinforces the problems:
    - Complex tariff structures
    - High-level political alliances and protections from rivalry
  - More regulation will not promote greater competition in inland transport or in gas markets.
  - Exemptions for new infrastructure will gradually replace existing systems?
- **Lack of Institutions to Promote Competition**
  - Accounting for regulatory purposes
  - Transparency of capacity
  - Resolution of cross-border regulation and transnational sovereignty

The United States took 100 years to overcome obstacles…
…we should start now and learn from US experience!

End

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