USAID
FROM THE AMERICAN PEOPLE

National Association of Regulatory Utility Commissioners

Access to gas transportation

Sergio Ascari
Gas Advisor, Florence School of Regulation

WAGPA Natural Gas Workshop
Cotonou, February 14-16, 2012

Contents

- The gas market model
- Transportation Tariffs
- Network and market rules
- Capacity allocation and congestion management
- Balancing

The market model: beginnings

- The natural gas industry was generally developed by integrated transportation and supply companies
  - under direct government control (e.g. France, UK, Italy, Belgium, USSR...)
  - private, but strictly regulated (US, Canada...)
  - private, subject to interfuel competition (Germany, Netherlands...)
- Integrated companies dominated wholesale markets
- Production, local distribution & retailing often separated
- Industry afraid of public service status, as it would trigger public service obligations and regulation

The market model: growth

- As industry grows economies of scale reduce costs, hamper competitiveness of other fuels (1980s-1990s in advanced West)
- Strengthening of environmental protection, combined cycle and nuclear crisis foster natural gas hegemony on energy growth
- Public powers start to worry about gas market power risks
- As pro-market politics prevails in the 1980s, Anglo-Saxon world starts to promote gas-to-gas competition
- Government control or collective negotiations check market power in continental Europe

The market model: towards liberalization

- Pro-market wave: after 1985 US, UK governments hit at market power of integrated transmission & wholesale companies
- Common features: strong unbundling, spot market development, upstream competition, regulation of natural monopolies
- Different features:
  - regulated monopoly of transmission in UK, entry exit tariffs, virtual hub
  - regulated but competing pipelines in US, distance based tariffs, physical hubs
  - “widening Atlantic” in gas regulation

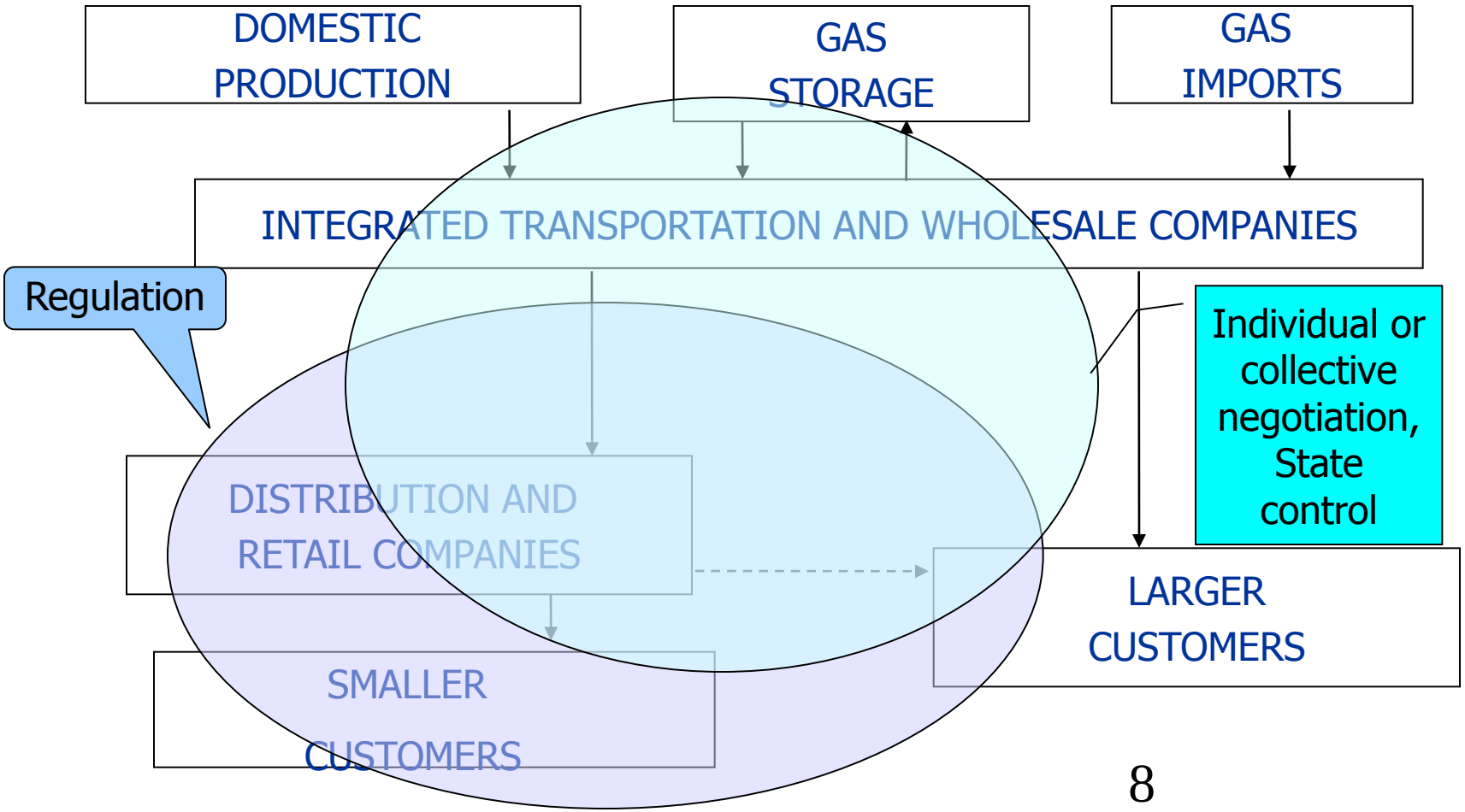
The North American liberalization model

- Strong unbundling of transport and supply
- Long term contracts burden dismissed in return of pipelines' bailout
- Tight transmission tariff regulation but:
  - distance based tariffs remain
  - limited productivity incentives, relatively high returns allowed
- Limited or no retail competition
- Pipe to pipe as well as gas to gas competition
- Market development led by private industry
  - based on physical hubs

The UK / EU liberalization model

- Transport unbundling strong in UK, weaker (but improving) in Continental Europe
- Mandatory incumbent's gas release in a few cases
- Tariff regulation:
  - entry-exit model is born
  - liquidity promoted in the “virtual hub”
  - productivity incentives through “price caps”
  - regulators strive to cut tariffs and prices
- No transmission competition but detailed market rules
- Mandatory retail competition, weak for small customers
  - widespread end user price controls, slowly fading

THE TRADITIONAL MARKET MODEL



USAID
FROM THE AMERICAN PEOPLE

National
Association of
Regulatory
Utility
Commissioners

Transportation tariffs - 1

- Rate of Return & Price Cap regulation: please refer to Presentation by Prof. J. M. Mwenechanya, “Rate of return regulation” and “Incentive Regulation”, Accra Seminar, April 26-28, 2011
- Fully consistent with EU experience as regards determination of a regulated company's allowed revenue
- Please see Annex on US-UK regulatory glossary
- More on the Regulatory Asset Base in the Presentation on Accounting issues

Transportation tariffs - 2

- Two-step approach
  - Set Allowed Revenue AR = RAB x RoR + DEPR + OPEX
    - In the EU, the RoR is normally set as Weighted Average Cost of Capital by the Capital Asset Pricing Model
  - Determine or approve tariff structure
- Will focus on gas transportation tariff design

Transportation tariff design: economic principles

- Transportation tariffs should be related to costs, hence to cost drivers:
  - capacity
  - distance
  - shipped volume
  - # of connection points
  - # of customers
- Different criteria may be used for primary ("national" or "interstate") and secondary grid

Transportation tariff design for primary grid - 1

- Point to point (P2P) (or: distance related)
  - tariff is proportional to capacity, distance
  - traditional, preferred by integrated companies
- Zonal tariff
  - American simplified version of P2P
- National postage stamp
  - Politically supported in some EU countries, but hardly cost reflective

Transportation tariff design for primary grid - 2

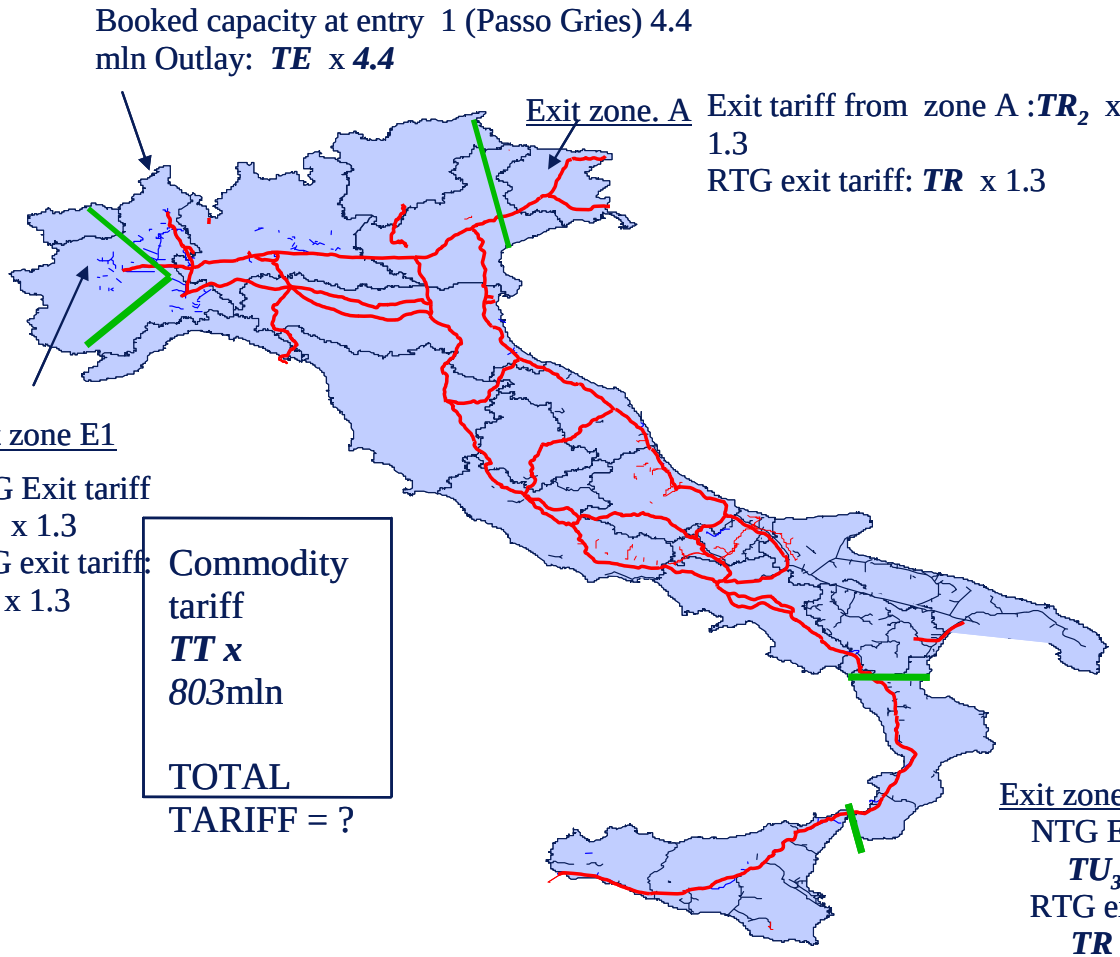
- Capacity auctions
  - OK but risky if market power
  - may lead to cost under-recovery unless reservation price is defined
- Entry – exit
  - Recommended and (shortly) mandatory in the EU
  - a capacity tariff is determined for each entry and each exit point of the main pipelines
  - separate (postage stamp) capacity tariffs often applied to lower pressure/rank pipelines (e.g. spurs)

Entry exit tariff example

Input data: 1 import contract, 800 Mcm/y;

1 entry point with a (booked or purchased) daily capacity of 4.4 Mcm/d;

eligible customers in 3 exit zones with daily capacity of 1.3, 1.3 e 1.8 Mcm/d.



Transportation tariff for primary grid - Comments

- Distance related tariffs are cost reflective with linear pipeline and constant flows
- If networks are meshed and gas sources unpredictable an possibly within the system (like in a power grid) even a postage stamp may be reasonable
- Key is treatment of backhaul flows – virtual flows against the physical stream
- In competitive system with several gas sources these are common
- Entry-exit account better for backhaul flows, but are actually similar to distance based for long distance transportation

Transportation tariffs: main issues

- Choice/size of entry and exit points (zones)
- Capacity / commodity split
- Accounting for backhaul costs
- Error correction mechanism
- Guaranteed income? paid by whom?
- Fuel gas and losses: tariff vs. in-kind
- Short-haul tariffs for “close” customers
- Investment incentives

Capacity-commodity split

- Pure cost responsiveness would require almost all costs to be related to capacity or fixed components (*straight fixed variable approach*)
- However, competition would lead to “commoditisation”
- May attribute company’s OPEX to commodity but theoretical foundation is weak
- Regulatory decision: commodity component may be higher than variable cost, to share demand risk between transport companies and shippers (Britain, Italy, Poland…)

Error correction mechanisms

- Given the allowed revenue, with almost any tariff design, actual tariff calculation is related to some estimation of transportation demand (e.g. last available data)
- As such estimates are normally "wrong", regulator should choose:
  - Whether to leave any resulting risk on the TSO
  - Or to compensate it, once actual transportation data are known – could be two years later, with interests
  - Compensation may be limited, to avoid too large tariff changes (risk split between TSO and users)

Backhaul services

- Not entirely logical, but common in case of LT contracts
- Relevant in large systems with gas of multiple origin (e.g. Britain, France, Germany, Italy, Spain)
- Swaps a likely alternative
- In principle cost may be negative, but this would require guaranteed flows
- Large variability of accounting criteria
  - Zero cost
  - 50%
  - Administrative costs only

Network and market rules: regulatory framework

- Network codes vis-à-vis standard contracts
- Standard contracts drafted by TSOs, amended by parties
- Network Codes are developed by TSOs, normally after Framework Guidelines issued by regulators
- Approved by Regulators or Ministries
- Allows for a degree of self-regulation and monitoring
- Updates and reviews are common, require special procedure
  - Committees of TSO and users chaired by regulators
- EU Network Code due by 2014

Network Code contents: Transparency of service

- Normative framework
- Network topology
- Services description (basic, ancillary and other special services)
- Quality of service
  - technical quality
  - commercial quality
- Capacity calculation criteria and flow models

Network Code: Transparency of information system

- Management of data and information relevant to transmission service
- Co-ordination with interconnected networks and systems
- Procedures and practices for training and updating of users
- Methods for securing commercial data and information privacy
- Emergency procedures

Network Code: Interconnected networks

- Applicable to downstream TSOs, LDCs, storage sites
- Criteria for identification of common shippers
- Traceability of transactions between shippers
- Operational co-ordination
- Measurement and allocation of gas at the interconnection points
  - problems with non daily/hourly metered end users
- These items are normally included in the IA (interconnection agreements) and OBA (operational balancing agreements)

Rules for transmission system utilization

- Gas day and its deadlines
- Bookings, nominations, confirmations, re-nominations
- Responsibilities stemming from the utilization of transmission
- Guarantees
- Planning of network extensions and enhancements
- Scheduling and management of maintenance
- Capacity management – Notice Board

Capacity booking (allocation): products

- Contract path vs. separate entry & exit
  - Flexible exit fosters for trading on the network
- Durations - from 1 day to 30 years
- Firm vs. interruptible
- Reverse flows, backhaul services
- Co-ordination among TSOs (long distance capacity auctions, one stop shop services)
- Bundled (exit & entry) services
- Virtual interconnections

Capacity Allocation: non-market criteria

- First come first served
  - acceptable if no congestion
  - if congested incumbent or “lucky” wins
- Pro-rata of requested capacities
  - may lead to capacity fragmentation, speculation, secondary market
- Merit orders
  - usually combined with pro-rata
  - PSO (e.g. priority to residential market)
  - Priority to long term contracts, new market entrants

Capacity Allocation: market criteria

- Recommended by EC Regulation 2009/715, preferred by regulators
- Capacity with end customers (rucksack principle)
- Auctions:
  - Most effective for short term (<= 1 year) CA
  - settled at clearing price (SMP) or discriminatory (pay as bid)
  - risk of cost under-recovery (need reserve prices?)
  - implicit auctions (market coupling)?
  - auction revenues beyond regulated tariffs used for system reinforcement or returned to users

Congestion Management (1)

- Physical vs. commercial congestion
  - Physical: technical capacity < peak demand
  - Commercial: capacity available but reserved on LT basis and not used (hoarded)
- Limited physical but high commercial congestion in Europe
- Use it or lose it (UIOLI) clauses in force, but hardly effective
- May turn to “Use it or sell it”: mandatory release to spot markets
- Capacity transfer to spot markets may lead to “market coupling”, but untested in gas (pilot project in France)

Congestion Management (2)

- Limitation of re-nomination rights proposed as anti-hoarding measure, but widely rejected
  - ST re-nominations needed for balancing
  - Unpredictable usage increases with renewables
- Capacity overbooking with buy-back by TSO in case of congestion
  - Agreed, it may be costly in some cases
- Commercial congestion problem may dwindle as:
  - Unbundling improvement leads to more access friendly by TSO behaviour
  - Secondary capacity market & LNG develop

Long Term auctions

- LT auctions used for sale of multiple ST product for entry points in UK, with limited success
- For large meshed systems like Europe, difficult to select paths to put up for auction
- If auction single interconnection points, users may not be interested and prefer to wait for ST capacity
- Other approach: subscription periods
- Regulated tariff used as reserve price

Open Seasons - 1

- Established American procedure for market based decisions on new pipelines & reinforcement of infrastructure
- Imported into Europe with good success
- Promoters required to advertise new project, allow other parties to join at fair conditions
- A decision criteria must be set in advance, e.g. minimum booked capacity or min. internal rate of return
- Usually used to book capacity, but it may be also about equity (on a voluntary basis)

Open Seasons - 2

- ERGEG Guidelines of Good Practice for Open Seasons require two stages:
  1. informative, no commitment
  2. binding commitment
- Regulatory approval of OS rules
- Allocated LT capacity usually subject to UIOLI
- In EU, some governments may be unhappy with OS results only, may intervene to require new facilities
- Security of supply a common reason
- Risk of unfair competition due to state aid, OS distortions

Balancing: tools and markets

- Linepack changes help for limited (mostly daily) swings
- Storage sites are the most common resource for larger swings
- Production may help, the closer the cheaper
- Interruptible customers
- In advanced systems, balancing resources mostly traded in short term (on the day) gas market
- Balancing market may trigger larger spot market
- Dedicated platforms vs. spot market
- Balancing services offered mainly by market centers (US), TSOs (EU)

Balancing: regulatory issues

- TSO responsibility vs. shipper duties
- Shippers' duties must be related to available information about their positions – cannot rebalance if don't know
- Period (month, day, hour) – Smaller systems normally require shorter balancing periods
- Ceilings and other constraints – may choose between:
  - longer balancing period with ceilings, referred to shorter periods
  - shorter balancing periods with tolerances
- Penalties for imbalances should be cost-reflective
- Risk of regulatory loopholes

Annex: US – UK Gas English Glossary

US	UK/EU
Distributor	(Retail) Supplier
Marketer	Trader
Rate	Tariff
Pipeline (company), Transporter	Transmission System Operator (TSO)
Transportation	Transmission (official)

Thank you for your attention!