Grupo de Economia da Energia

Séminaire de recherches en économie de l'énergie
Mines-Paristech, Paris-Dauphine et Paris-Sciences-Lettres

Designing the European Gas Market: More Liquid but Less Natural by Entry-Exit Zonal Tariff

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Outline

The problems we were trying to solve (in the EU)
One rarely finds the one-size-fits-all solution

The EU regulatory path

The logic for that path
NIE: Trade-off efficiency vs liquidity

Capacity allocation in the cross-border
Contractual congestions and some remedies

Tariffs with reduced efficiency
Different cost allocation creates advantages to certain paths

Investment in the cross-border
Not obvious how to combine two zones as the simplification hides information

Options
Central planning, auctions and open seasons

Liberalization paths

GB

- 1965 – Discovery of large reserves in the North Sea
- 1986 – Gas Act. It opened competition in the industry through common carriers
- 1988 – Significant problems with access to transmission system
- 1996 – Network Code. Introduces entry/exit capacity charges

US

- 1935 – Public Utility Act. Unbundling of gas distribution
- 1938 – Natural Gas Act. It establishes private carriers
- 1992 – Commodities Clause. Unbundling of transmission

We were primarily concerned with access to pipelines…

The EU regulatory path

First Directive:
Principle of the single European gas market and timetable for market opening
nTPA or rTPA on the national transmission network

Second Directive:
rTPA for national transmission network and LNG terminals
nTPA or rTPA for storage
Legal unbundling

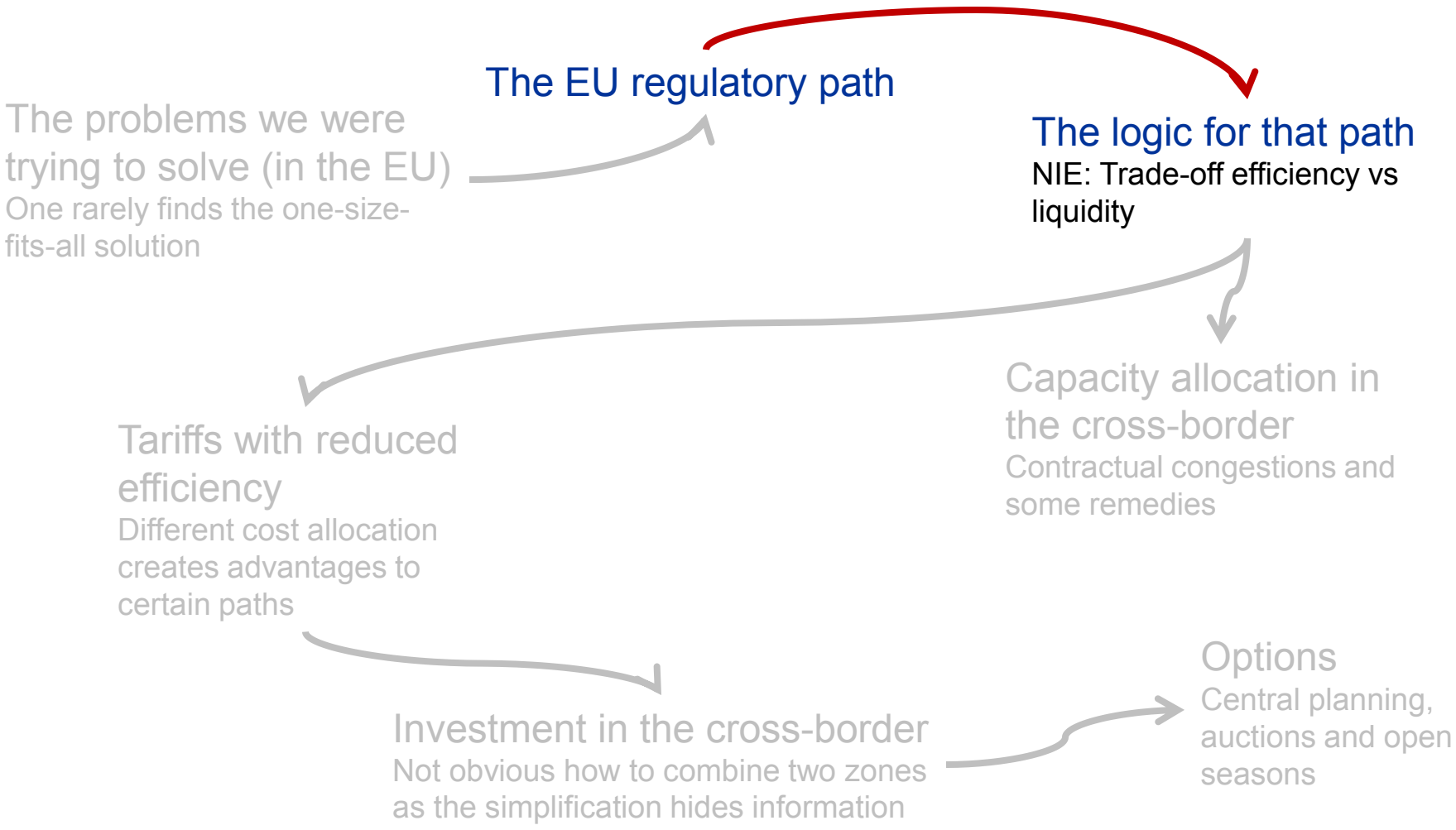
Framework Guidelines
Capacity Allocation,
Gas Balancing,
Interoperability and Tariffs
Released by ACER

Implementation of the Network
Code by ENTSOG

Completion of the sector inquiry led by DG COMP

EU Third Package:
Third Directive and Gas Regulation
- Ownership unbundling or Independent System Operator
- Creation of ACER

Outline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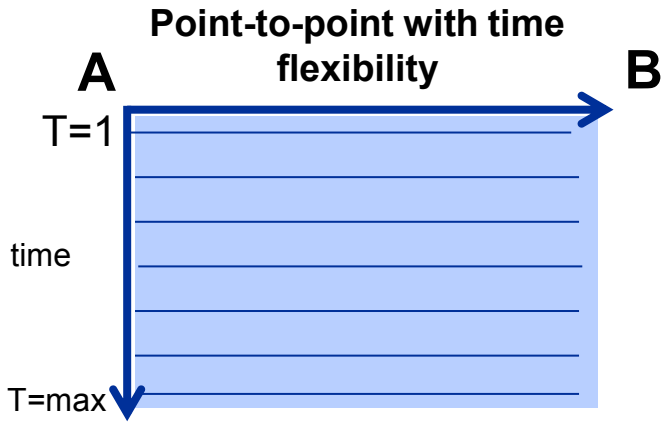
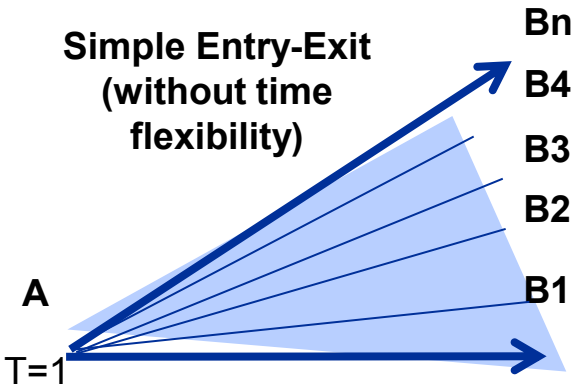
The logic for the model

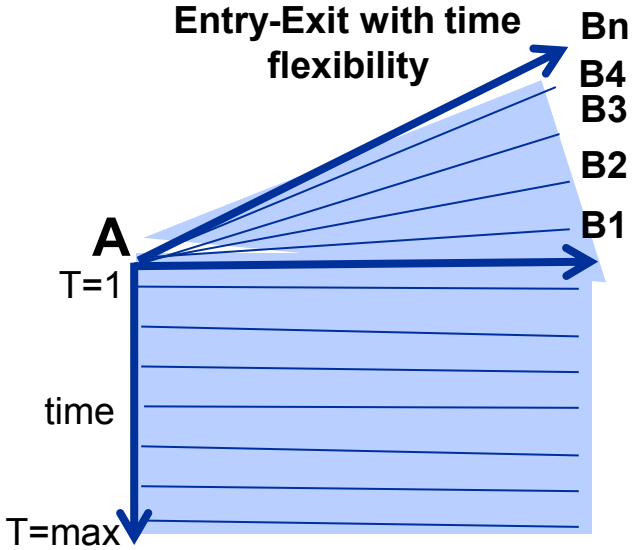
- Gas systems are subject to significant asset specificity
  - The model is based on creating commercial networks
  - Which in turn creates an homogeneous commodity and hence lowers transaction costs
- This is a general strategy that is discussed in New Institutional Economics (Riordan and Williamson)
  - Specificity as a design variable
  - When you separate activities you reduce the specificity of trading gas
  - But you also reduce efficiency
- How much should I reduce?
  - In theory, only what one needs to avoid the need for vertical integration…
- …But that depends on the estimation of the designer

The model in the short run

- Promoting liquidity sacrificing efficiency

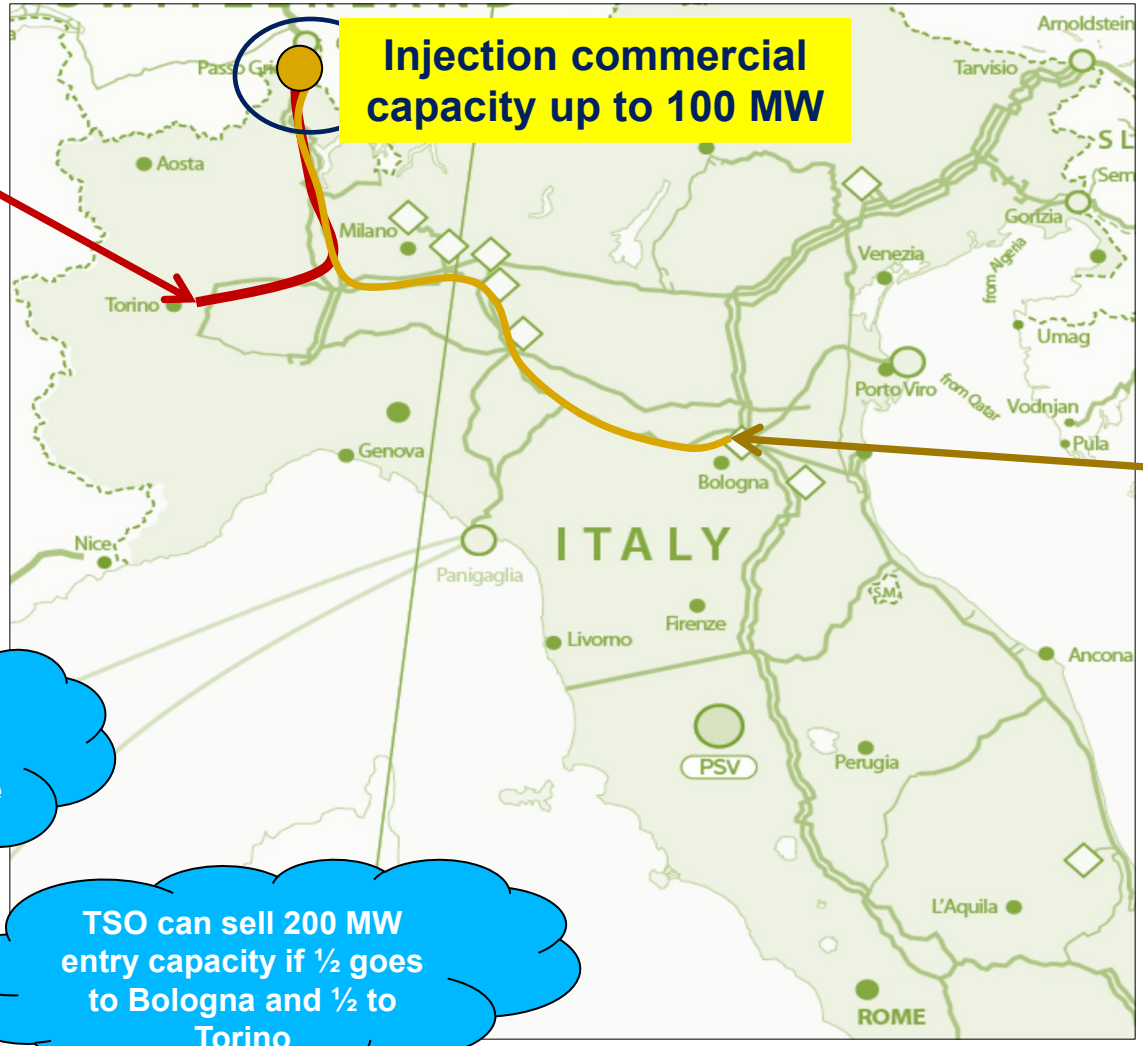






Challenges of entry/exit systems

Capacity allocation



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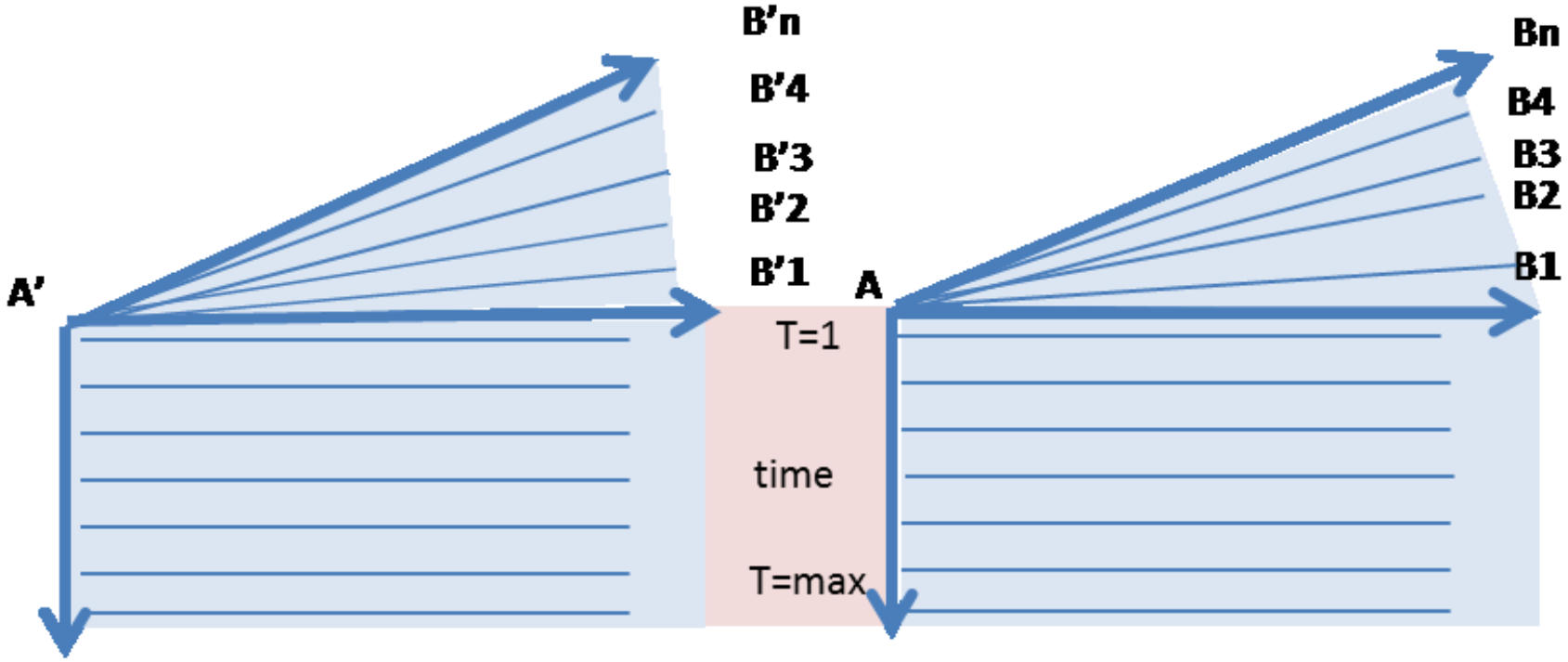
Cross-border trading



Possible remedies for cross-border trading

- Under entry-exit, system constraints are concentrated in definition of available capacity in the border
- Contractual congestion between the zones, as once within the zone the shipper has the right to use the system

Proposals	Drawbacks
Market Merger	Higher socialization costs
Market Coupling	Separation of the capacity right and the right to use the network

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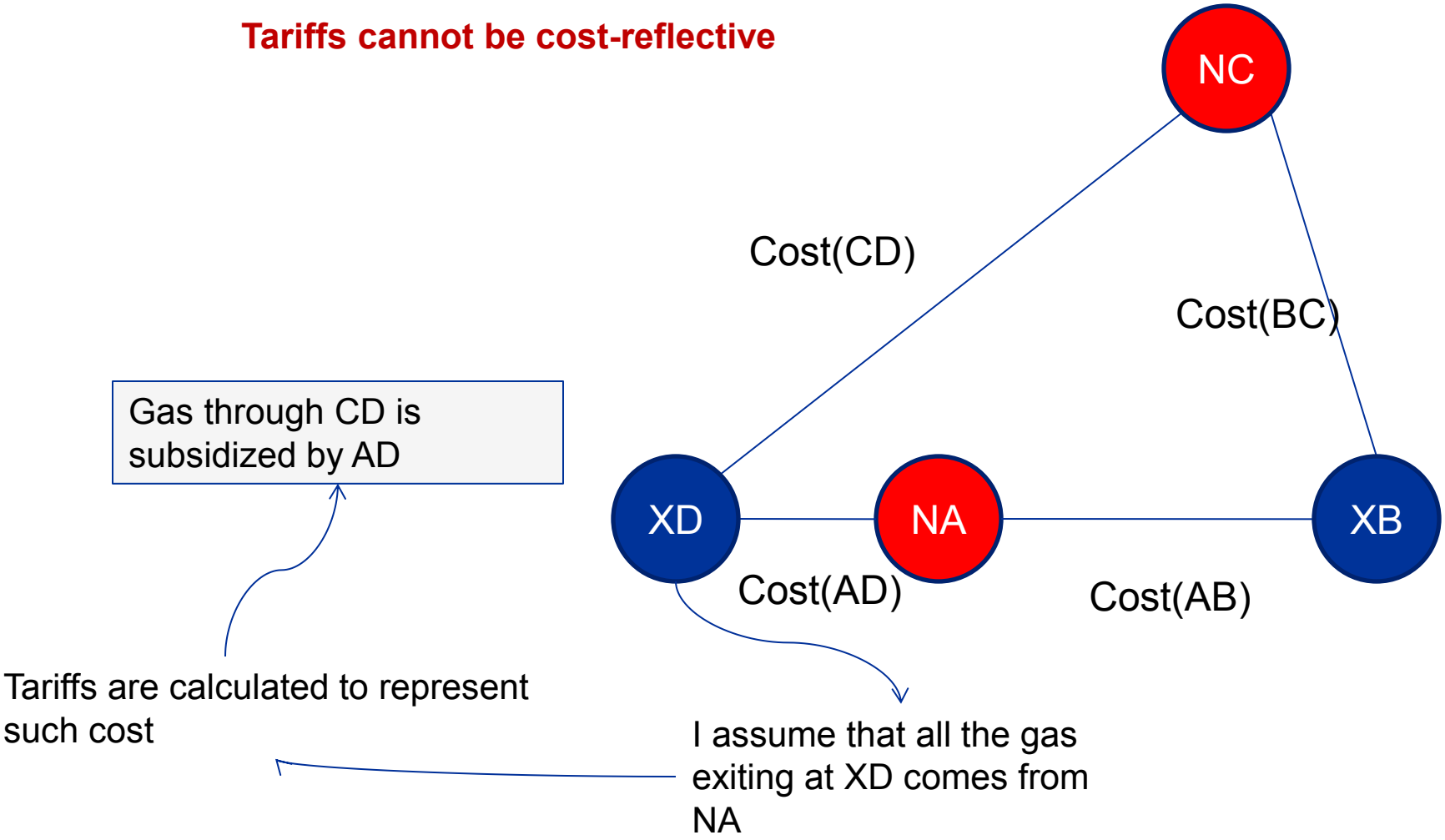
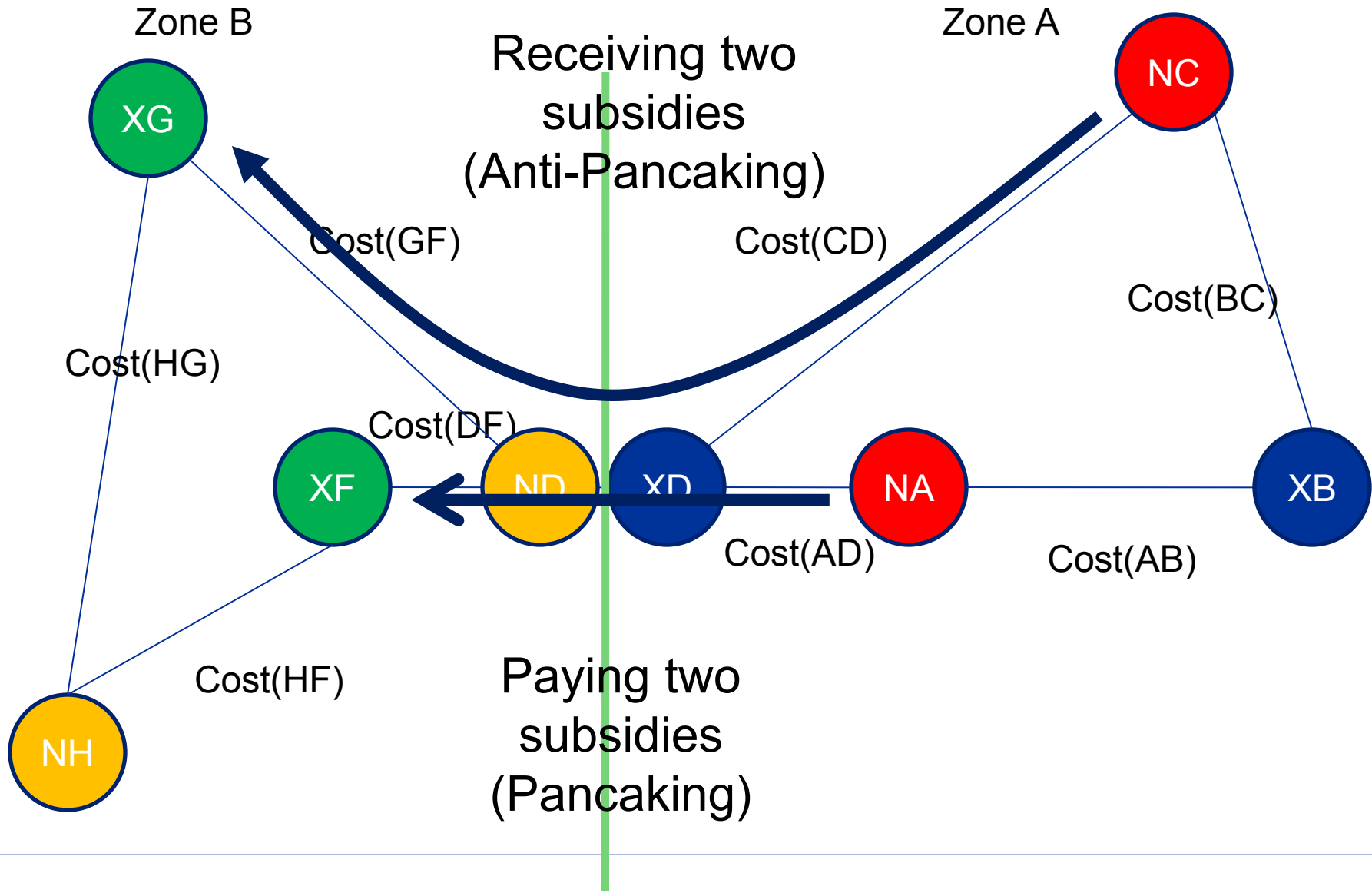
Spatial flexibility in tariffs

Tariffs cannot be cost-reflective



Challenges of entry/exit systems
Spatial flexibility in tariffs in the cross-border



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Investment in the cross border

- We have purposely created an untraceable commodity
  - So we have put gas networks very close to power networks
  - We know that cross-border trading of electricity is a serious challenge
- Distortions coming from tariffs are not easily solved in the short run
  - We do not have strong property rights
  - We need specific solutions for the long run
- Cost reflectivity
  - Difficulties to investment when costs are not efficiently allocated
- Capacity allocation
  - Lack of strong property rights makes difficult to implement non-centralized solutions

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Central planning

- At some extent, central planning is going to have a role in the interconnection of the EU gas systems
- Since October, the EU has a list of Projects of Common Interest
  - Projects are subject to a selection process which can be viewed as centrally planned through member states, NRAs and the European Commission
  - That selection of capacity expansion projects will be subject to a cost-benefit analysis to be undertaken by ENTSOG
- In addition, TSOs are supposed to coordinate through the Regional Initiatives of the Ten Years Network Development Plan

Auctions

- Integrated auctions (GB domestic transmission), bundling entry and exit points
- This approach needs an underlying costing model (for instance, LRMC) and a clear cost allocation policy between entry and exit points
- It generally features ascending auction rounds by price block
- There are no practical super-national examples of such auctions in the EU

Open seasons (i)

- In this case, the TSO does not run an auction for new or incremental capacity by price blocks
- Instead, it sets the terms and conditions of capacity expansion based on its own proposed models and put the plans forward to the industry
- The industry chooses
  - If it needs the capacity, they will contract in advance
  - If they do not need it, they will not contract
- Requirements
  - An investment and costing model must be prepared by the TSO(s)
  - Prospective transportation tariffs must be known

Open seasons (ii)

- Ideally, they represent a halfway between central planning and auction-based approaches
  - Complex expansions will be not easy to handle through auctions
  - Open seasons might be a solution
- In any case, market testing without regulatory certainty (or with different approaches on either side of interconnection points) will probably become problematic

Conclusions

- The need to interact with other entry/exit zones was never part of the plan
  - Congestion was summarized in the borders
  - Never meant to be computed in accordance to other zones
- Many of the additional problems in the cross-border comes from the fact that aggregating simplifications is difficult
- Implementing “American” solutions alone will not be enough
- A possible way forward is to coordinate that simplification as a part of the existing cooperation between European TSOs

Grupo de Economia da Energia

Thank you

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Tariffs

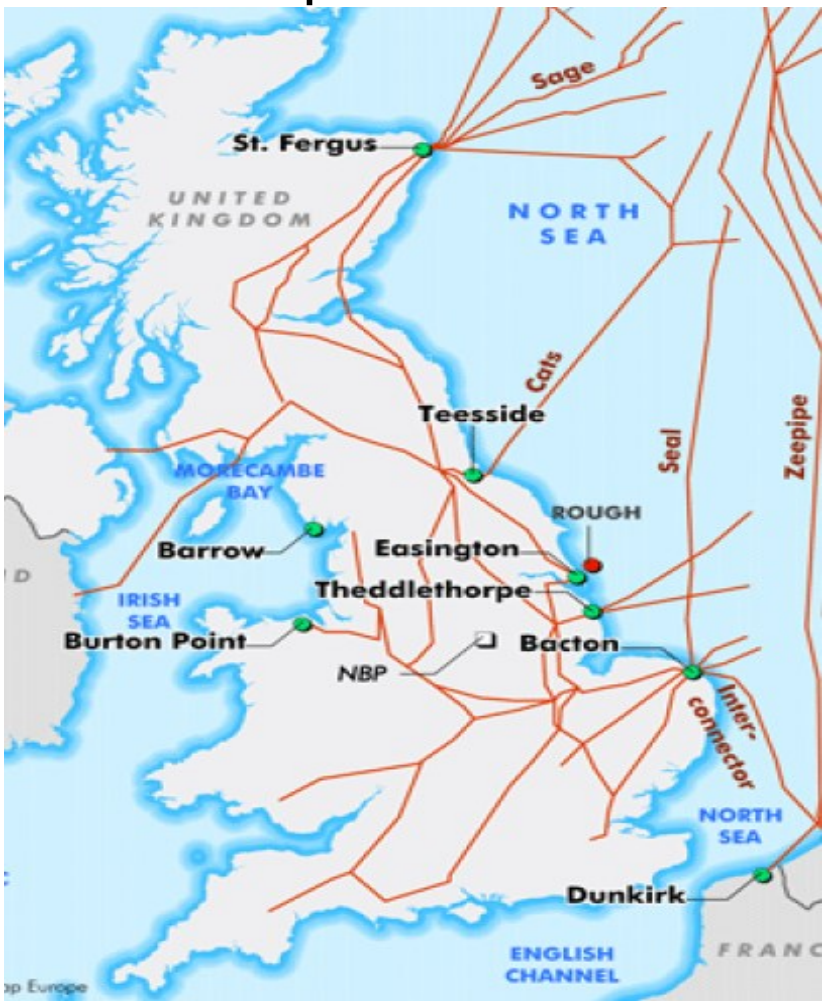
- We first review the LRMC methodology
  - One finds significant difficulties
  - Most of them already found in power systems
- We then analyze possibilities for cross-border trades

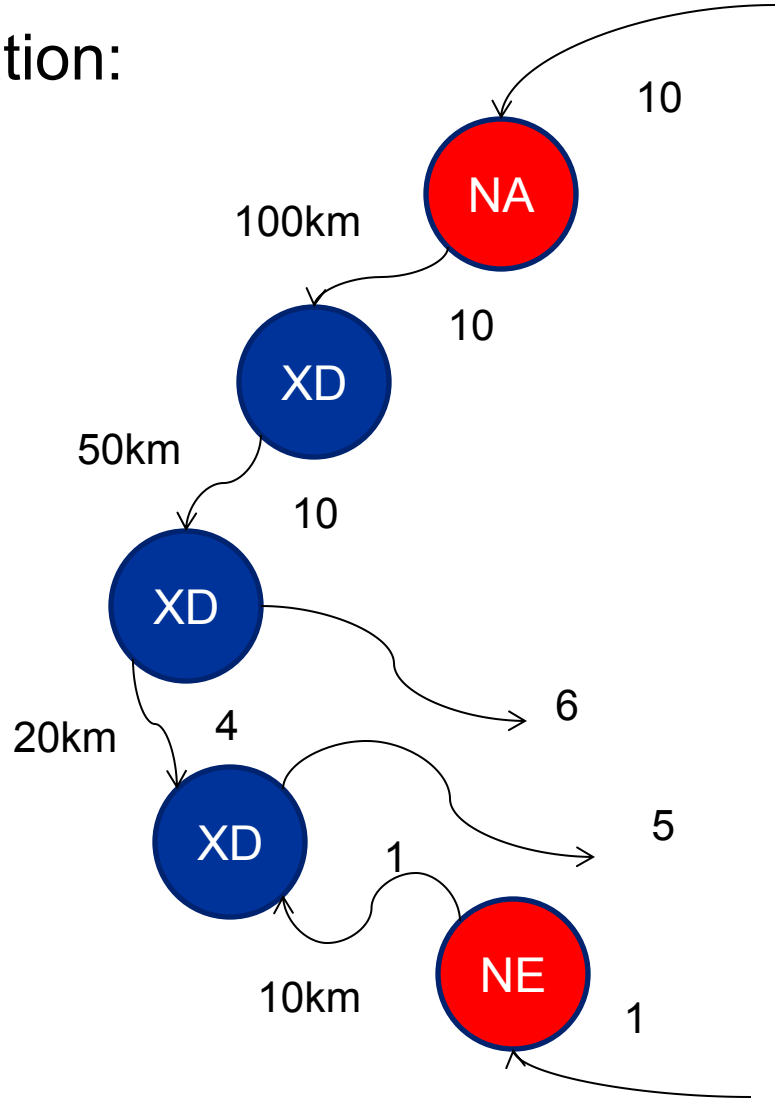
LRMC entry tariff methodology – Introduction

- The basic idea is to measure the incremental capital cost of an additional flow at either an entry point or an exit point.
- Start with a ‘baseline’ level of supply and demand at all the exit points.
- Measure the total distance that gas flows.
- Increase flow at e.g. one entry point, and measure the change in total flow distances .
- Convert this change in flow distance to a cost, using a £/GWh/km factor.

LRMC entry tariff methodology – how is it set? (1)

An example of LRMC determination:

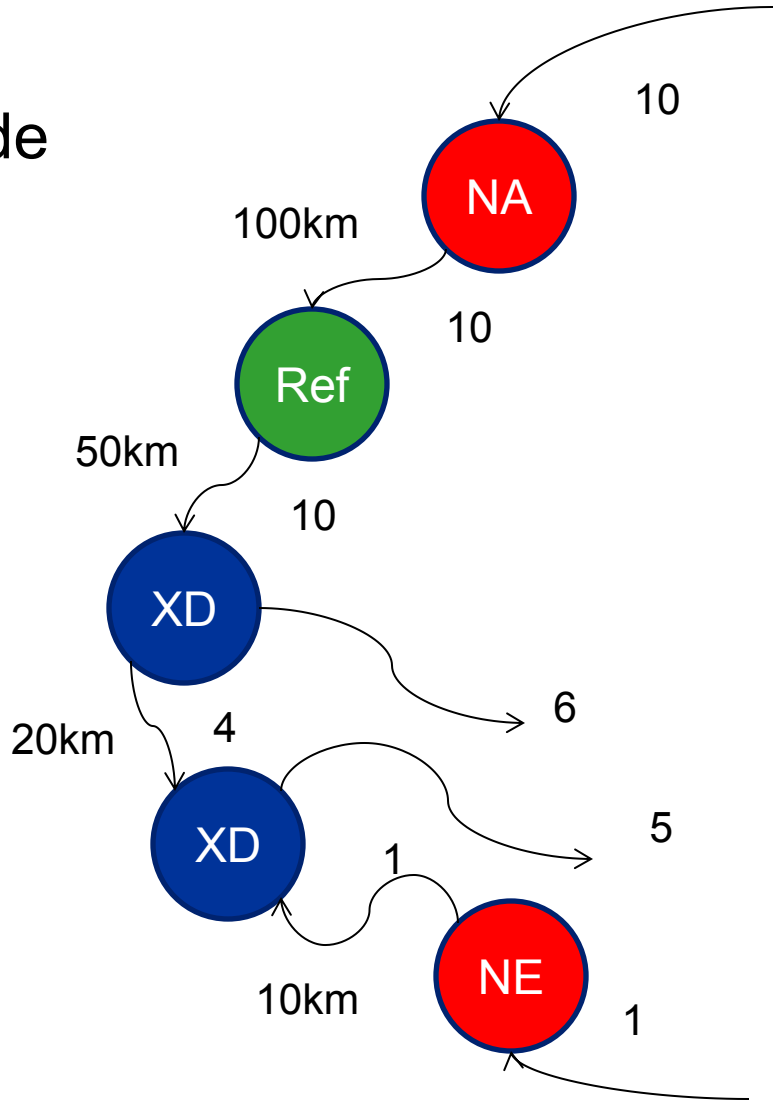




LRMC entry tariff methodology – how is it set? (1)

+1 Supply at NA
+1 Demand at the reference node

It travels 100km to reach Ref

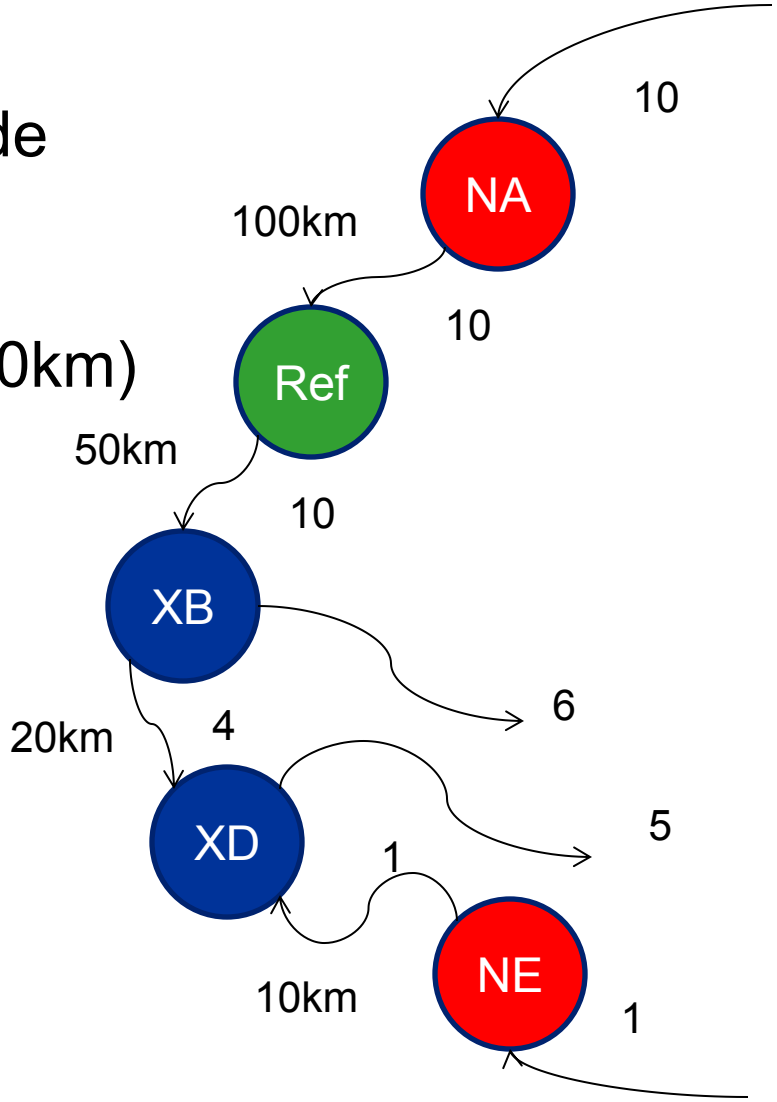


LRMC entry tariff methodology – how is it set? (1)

+1 Supply at NE
+1 Demand at the reference node

It travels 10km to reach XD
-1 will NOT travel from B to D (20km)
-1 from Ref to XB (50km)

10 – 20 – 50 = -60



LRMC entry tariff methodology – how is it set? (5)

LRMCs (km to) summary table:

Entry points	Raw LRMC	No negative LRMC
A	8	8
E	-8	0
Average		**4**

Exit points	Raw LRMC	No negative LRMC
C	6	6
D	10	10
E	8	8
Average		**8**