

# Market design for natural gas: the Target Model for the Internal Market

Dr Boaz Moselle

Bonn

22 February 2011

LECG

Copyright LECG Limited. All rights reserved.

Prepared for educational purposes only. Not to be distributed further without the prior consent of the author.

## Aim of LECG paper

- Input to ERGEG process
- Provide clearer conceptual foundations for the debate
- Provide guidance towards an evidence-based choice among different options

## Approach taken

- Identify goals of target model
- Develop into assessment criteria
- Lay out the main options
- Preliminary assessment of options against criteria
- Recommend further analyses to build evidence base for decision

## Assessment criteria for a target model

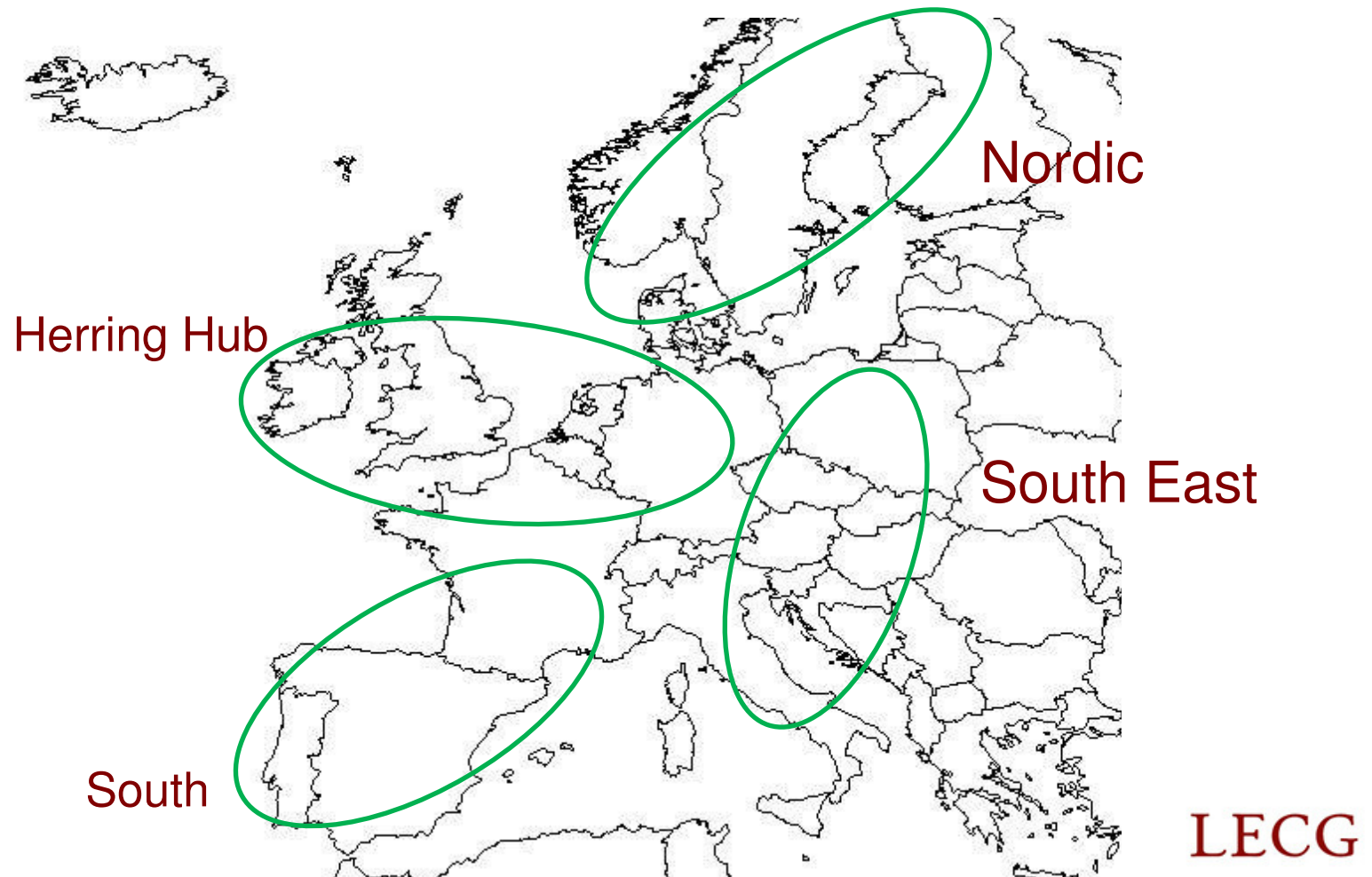
- 1) The promotion of efficient use of cross-border capacity
- 2) The impact on long-term contracts and on investment incentives upstream
- 3) The promotion of liquid trading and transparent spot prices
- 4) The impact on the role of TSOs
- 5) Ease of implementation

# Fundamental choices in market design: I

- Size of price zone — big vs small
  - “Price zone” essentially the same as an entry/exit zone
    - An area where one wholesale gas price prevails
    - Eg TTF in NL, NBP in GB
  - Under entry-exit, SO resolves internal transmission constraints via “re-despatch” (= “locational balancing”)
    - Simultaneously buys gas downstream of a constraint and sells upstream
  - Larger zones mean more reliance on re-despatch (and/or more capex) and a permanent merger of wholesale markets

# Fundamental choices in market design: I

- Examples of possible regional markets (purely illustrative!)

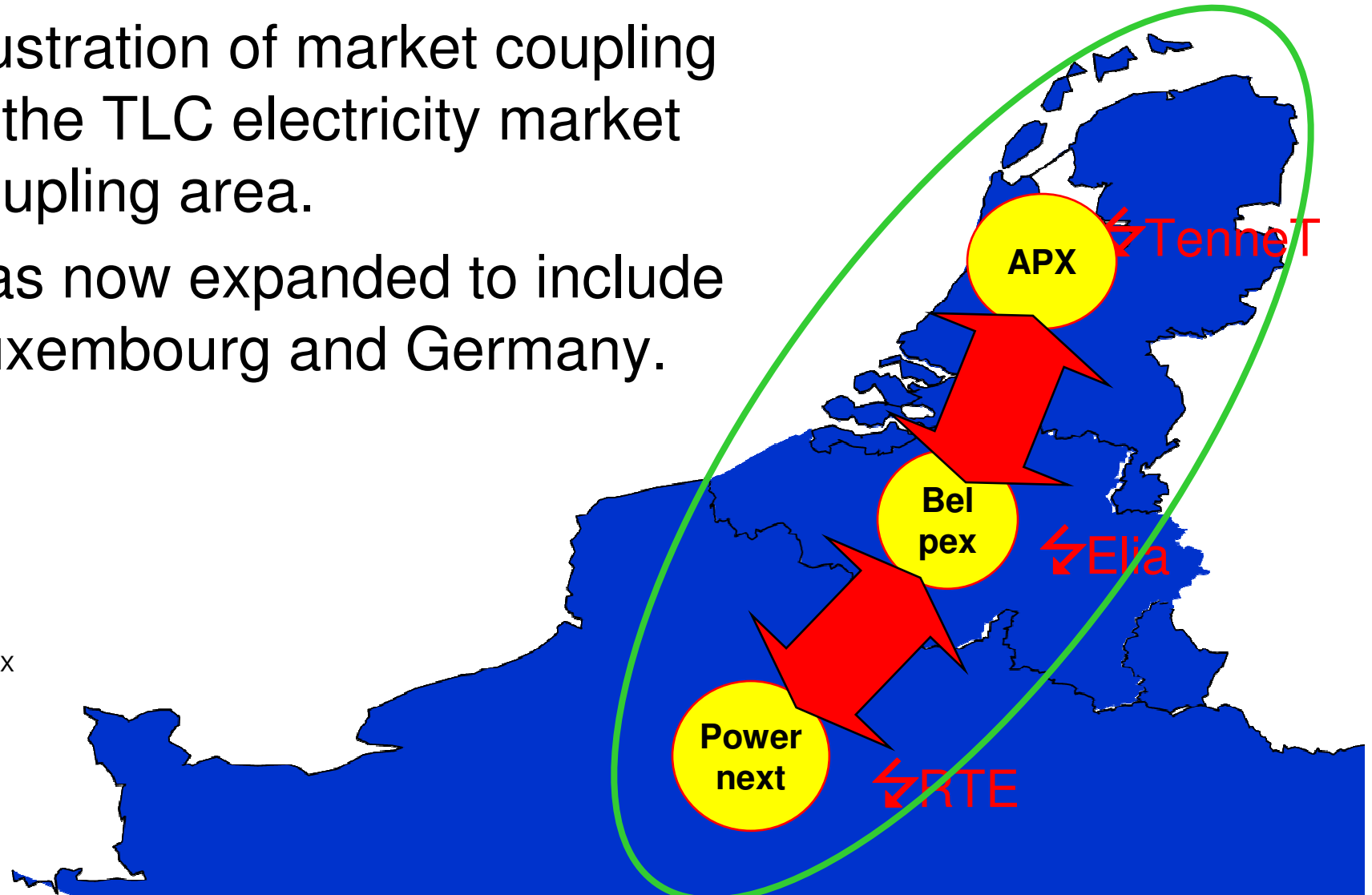


## Fundamental choices in market design: II

- Nature of capacity allocation: explicit vs implicit
  - Explicit allocation of transmission capacity to shippers is status quo in EU gas markets
    - Separate markets for energy, capacity
    - Issues of contractual congestion, UIOLI, etc
  - Implicit allocation via auctions and “gas despatch algorithm” would be like market coupling/splitting in EU power markets
    - Dynamic market integration when there is sufficient interconnector capacity
    - Important technical questions (gas  $\neq$  power!)
    - Can combine short-term implicit with longer-term explicit

## Fundamental choices in market design: II

- Illustration of market coupling in the TLC electricity market coupling area.
- Has now expanded to include Luxembourg and Germany.



Source: APX



# Possible options

		Size of price zone		
		Medium mostly national	Big often super- national	Sub-national (prices at points not zones)
<b>Cross-border capacity allocation</b>	Explicit trading of capacity	<p>Explicit trading of capacity.</p> <p>Business as usual in European gas market e.g. NBP, TTF</p> <p><b>Business As Usual</b></p>	<p>Merge current balancing zones.</p> <p>Explicit trading of capacity remains at borders.</p> <p><b>Merged Markets</b></p>	<p>Point to point capacity</p> <p>e.g. US gas market</p> <p>Not possible under 3<sup>rd</sup> Package</p> <p><b>Point To Point</b></p>
	Implicit trading of capacity	<p>Zones as now, or re-chosen on an objective basis.</p> <p>Implicit auctions for cross-border capacity, like CWE and Nordpool in the electricity market.</p> <p><b>Coupled Markets</b></p>	<p>Implicit trading but with larger pricing zones.</p> <p><b>Hybrid</b></p>	<p>Nodal pricing</p> <p>e.g. US electricity market</p> <p><b>Nodal Pricing</b></p>

## Three main options

1. Explicit transmission capacity combined with national/sub-national price zones (“**Business As Usual**”);
2. Explicit transmission capacity combined with larger, regional price zones (“**Merged Markets**”); and
3. Implicit transmission capacity combined with national/sub-national price zones (“**Coupled Markets**”) (but assume that market coupling would be used for short-term rights, TSOs would continue to provide long-term explicit rights).

We assess these options against the criteria identified above.

## Other options

1. Implicit transmission capacity with prices at each point on the network (“**Nodal Pricing**”). Not realistic in medium term, may be desirable in long term.
  - Flexible as system flows change, or new congestion appears (eg CH-IT border)
  - Could evolve from Market Coupling
2. Implicit transmission capacity combined with larger merged price zones (“**Hybrid**”).
  - Less flexible than just Market Coupling
  - Appears the hardest to implement
3. Explicit capacity on each specified transmission path (“**Point To Point**”).
  - Already rejected in EU policy debate.

# 1. Efficient use of cross-border capacity

- Business As Usual has big problems with **contractual congestion**
- Merged Markets, Coupled Markets help solve contractual congestion
- Coupled Markets may also increase the **use of available capacity**
- Business As Usual risks **pancaking**
- Merged Markets might undermine **investment incentives for TSOs**, or **require an ITC**

## 2. Impact on long-term contracts

- If Third Package implementation leads to **existing transit arrangements** being replaced with series of entry-exit contracts, then
  - Potentially significant burden under Business As Usual,
  - Merged Markets helps somewhat
  - Coupled Markets helps if includes LT rights, and introduce Financial Transmission Rights
  - Merged Markets might create problems re **delivery point in long term contracts**
  - If Coupled Markets means all trade through platform, might need to supplement existing contracts with side-contracts (“Contracts for Difference”)

### 3. Promoting liquid trading

- Business As Usual risks **fragmentation** (too many hubs)
- Merged Markets could help concentrate liquidity
- Coupled Markets might do even more (e.g., Nordpool)

## 4. Impact on the role of TSOs

- May be higher **tariffs** under Merged Markets, as TSOs' costs increase when dealing with internal constraints
- Under Coupled Markets, TSOs responsible for balancing after gate closure

## 5. Ease of implementation

- Merged Markets requires a great deal of **harmonisation** (GB BETTA experience)
- Coupled Markets may require less harmonisation, so could potentially be adopted quicker, provided political will exists.
- Merged Markets, Coupled Markets both imply big changes in **TSO roles and responsibilities**
- Relative merits of each approach in relation to costs and regulatory burden **remain to be investigated**



## Further analyses required (I)

From regulators:

- Updated analysis of the extent of contractual congestion in different parts of the EU
  - Assess potential to solve problem by UIOLI/UIOSI and/or “overselling” mechanisms;
- Analysis of extent of price convergence and liquidity at different hubs
- More detailed analysis of the regulatory requirements (in particular, degree of harmonisation required) for each model
- Analysis, in close consultation with market players, of the costs and regulatory burden associated with each model

## Further analyses required (II)

From ENTSOG:

- Extent of physical congestion, and likely re-dispatch costs, in potentially merged zones
- Potential to increase transmission capacity via Market Coupling
- Impact on revenues of merging various entry-exit zones
- Development of the technical requirements for applying market coupling to natural gas markets

From producers, importers and merchants:

- Analysis of how each of the models would impact existing long-term contracts, based on worked-up legal analysis

**Dr Boaz Moselle**  
BMoselle@lecg.com  
+44 (20) 7632 5160