“Electricity Infrastructure in the EU: An introduction to Policy, Regulation and Financing aspects”

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BUILDING PARTNERSHIPS FOR ENERGY SECURITY
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   c. Targets and prospects

2. Regulation for Energy Infrastructure
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   b. Electricity Interconnections: the key issues
   c. Regulatory risks & incentives

3. Financing of Energy Infrastructure
   a. Decision making process (Identification)
   b. How does it work at national level?
   c. Overview of EU financing sources
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Interconnection of Energy Networks: the roots

<table>
<thead>
<tr>
<th></th>
<th>First stage</th>
<th>Second stage</th>
<th>Third stage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time frame</strong></td>
<td>Mid-1950s to late 1980s</td>
<td>Late 1980s to mid-2000s</td>
<td>Since mid-2000s</td>
</tr>
<tr>
<td><strong>Legal framework</strong></td>
<td>• European Coal and Steel Community (1951)</td>
<td>• Single European Act (1987)</td>
<td>• Treaty of Lisbon (2007)</td>
</tr>
<tr>
<td></td>
<td>• Atomic Energy Community (1957)</td>
<td>• Treaty of Maastricht (1992)</td>
<td></td>
</tr>
<tr>
<td><strong>Focus of EU energy policy</strong></td>
<td>• Energy security</td>
<td>• Environmental policy integration (EPI) principle</td>
<td>• Functioning of energy markets</td>
</tr>
<tr>
<td></td>
<td>• Common market</td>
<td>• Energy as a priority matter</td>
<td>• Energy supply</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>• Energy efficiency</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Renewable energy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Interconnection of energy networks</td>
</tr>
</tbody>
</table>

Interconnection of Energy Networks: the overall policy framework

Security of Supply (Electricity)

*Directive*

2005/89/EC

(new in 2016!)

Projects of Common Interest (PCI) Regulation 347/2013

Internal Energy Market (Art. 114 TFEU)

3rd IEM Package 2009

Energy Union Package (Communication 2015(80)fin.)

CEF / EFSI (2014)

EEPR

ESIF (Funding)

ESIF: European Structural and Investment Fund

EEPR: European Energy Programme for Recovery

EFSI: European Fund for Strategic Investments

CEF: Connecting Europe Facility
Policy Framework: focus on some key elements

3rd Energy Package
- Regulation (EC) 713/2009 (Art. 8) ACER on Cross border infrastructure
- Regulation (EC) 714/2009 TSO cooperation, TPA exemption (Art. 17)

Energy Union Package
- Energy Security, Solidarity and Trust
- 10% (of installed generation capacity) interconnection by 2020 in each MS
- Enhanced regional cooperation

(PCI) Regulation 347/2013
- Faster permitting (3 ½ years, one-stop-shop)
- Improved regulatory treatment (Cross Border Cost Alloc., risk-related incentives)
10% Interconnection target (pre-PCI)
10% Interconnection target (post-PCI)
Projects of Common interest in Electricity

Energy Infrastructure - Electricity

Projects of Common Interest:
High-Voltage Lines
- Commissioning date < 2017
- Commissioning date 2017 to 2020
- Commissioning date > 2020

Electricity Storages
- Commissioning date < 2017
- Commissioning date 2017 to 2020
- Commissioning date > 2020

Offshore hubs
- Baltic Integration and Synchronisation

All potential routes should be considered and assessed both from an energy security point of view and from the point of view of their relative economic costs and benefits.
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In Conclusion: A Toolkit of Energy Infrastructure

Focus
- PCIs
- 12 Regional Groups
- 1 Union List every 2 years

Coordinate
- Regulations (EC) 713, 714, 715/2009
- TYNDPs (incl. PCIs and “universal” CBA)
- ACER: Implementation & Monitoring, guidance to NRAs

Accelerate
- European Coordinators, One-Stop Shops
- Deadlines on permits granting
- Deadlines for cost allocation procedures
- Guidelines for regulated investment procedures

Finance
- The European Energy Programme for Recovery (EEPR) – Regulation 663/2009
- The Connecting Europe Facility CCF (2014-2020)
- Innovative financing (Project Bonds, Risk Capital)
EU Regulatory Perspective: ACER’s Role

Opinion/Approval

Regional PCI List

CBA

Guidance

Cross-Regional Consistency

NRAs: on Cross Border Impact

NRAs: on Incentives (Best Practices)
Regulatory Decisions/Options for the interconnection

Regulatory Considerations

Access

Market based

Non-market based (exemption)

Recovery of Investment

Regulated (+ congestion rent)

Usage charges (exemption)
# 2 business models for interconnectors in the EU

<table>
<thead>
<tr>
<th>Regulated Investment Scheme</th>
<th>vs.</th>
<th>Merchant Investment Scheme</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Owner:</strong></td>
<td>TSO</td>
<td>Legally separate from TSO</td>
</tr>
<tr>
<td><strong>Regulatory Status:</strong></td>
<td>Conforms fully to Regulation 714/2009 &amp; Directive 2009/72</td>
<td>Exemption from regulated third party access and/or restrictions on use of capacity allocation revenues</td>
</tr>
<tr>
<td><strong>Benefits to Investors:</strong></td>
<td>Revenue losses recoverable from national transmission charges</td>
<td>Increased control over capacity allocation and use of revenues, which may shorten loan payback period</td>
</tr>
</tbody>
</table>
Regulated or Merchant?

Merchant interconnectors
Article 17(1) of EU Regulation 714/2009

• Should enhance competition
• Have an owner legally separated from the TSOs in the linked markets
• Have a level of risk so high that investment would not take place without an exemption
• Charges must be levied on users of the interconnector
  – No part of capital or operation costs are recovered from regulated transmission tariffs in the interconnected markets
• HVDC only (so not to interfere with TSOs..)

• Approval by National Regulators and European Commission is needed
Why merchant interconnectors?
Some reasons

- TSOs do not always face the right incentives to build new interconnectors
  - (congestion rent falls if more capacity is offered to the market!)
- TSO may not be able to finance and / or construct promptly
- TSO may not have full information about the commercial benefit of the project
- Flexibility needed to mitigate potentially high CapEx (thus needs protection against rigid regulatory intervention.)

<table>
<thead>
<tr>
<th>TSO</th>
<th>Congestion rent (mil €)</th>
<th>Interconnection investment (mil €)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>200 - 300</td>
<td>25-25</td>
</tr>
<tr>
<td>B</td>
<td>0-20</td>
<td>0-10</td>
</tr>
<tr>
<td>C</td>
<td>80-150</td>
<td>0-10</td>
</tr>
<tr>
<td>D</td>
<td>200-300</td>
<td>0-10</td>
</tr>
<tr>
<td>E</td>
<td>200-300</td>
<td>50-100</td>
</tr>
<tr>
<td>F</td>
<td>80-150</td>
<td>0-10</td>
</tr>
<tr>
<td>G</td>
<td>20-80</td>
<td>0-10</td>
</tr>
<tr>
<td>H</td>
<td>80-150</td>
<td>80-150</td>
</tr>
<tr>
<td>J</td>
<td>0-20</td>
<td>10-40</td>
</tr>
<tr>
<td>K</td>
<td>0-20</td>
<td>10-40</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DG COMP: Energy Sector Enquiry 2005-06
## Energy infrastructure concerns

<table>
<thead>
<tr>
<th>Frequency of concerns mentioned</th>
<th>Regulated investment</th>
<th>Concession-based invest.</th>
<th>Merchant investment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Desert power related concerns</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of national interest</td>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building trust between countries</td>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Interconnection specific concerns</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selected stakeholders oppose</td>
<td>High (MENA) / Medium (EU)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-ordination</td>
<td>Medium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permitting</td>
<td>Medium (MENA) / High (EU)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Business model related concerns</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TO not motivated</td>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to capital</td>
<td>Medium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost allocation between countries</td>
<td>High</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Define quality for T line</td>
<td>-</td>
<td>Medium</td>
<td>-</td>
</tr>
<tr>
<td>Operation and expansion flexibility</td>
<td>-</td>
<td>Medium (MENA) / Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Under-sizing</td>
<td>-</td>
<td>-</td>
<td>High</td>
</tr>
<tr>
<td>High cost of capital</td>
<td>-</td>
<td>-</td>
<td>High</td>
</tr>
</tbody>
</table>

Regulatory Risks

- Cost overrun
- Time overrun
- Stranded assets
- Efficiently incurred cost
- Liquidity risks

Regulatory Incentives (ECRB, April 2015)

Cost overrun
- Regulatory accounts
- Correction factors

Time overrun
- Regulatory accounts
- Correction factors

Stranded assets
- Including anticipatory investments in the RAB
- Alternative depreciation method
- Smoothing
- Deep connection charges
- Investment budgets

Efficiently incurred costs
- Regulatory accounts
- Correction factors
- The rules of anticipatory investment

Liquidity risk
- The rules of anticipatory investments
- Early recognition of efficiently incurred costs
- Regulatory accounts
- Rate of Return uplifts
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Energy infrastructure decision making process in the EU

Source: ACER
**How does it work at a national level?**

DECC (UK): Comparison of network planning of interconnection in selected EU countries (December 2013)

<table>
<thead>
<tr>
<th>Country</th>
<th>Interconnection planning?</th>
<th>Roles in respect of network planning of interconnection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great Britain</td>
<td>X</td>
<td>N/A</td>
</tr>
<tr>
<td>Belgium</td>
<td>✓</td>
<td>TSO planning; Regulator consultation; Government approval</td>
</tr>
<tr>
<td>Denmark</td>
<td>✓</td>
<td>TSO planning; Government approval</td>
</tr>
<tr>
<td>France</td>
<td>✓</td>
<td>TSO planning</td>
</tr>
<tr>
<td>Germany</td>
<td>✓</td>
<td>TSO planning; Regulator approval</td>
</tr>
<tr>
<td>Iceland</td>
<td>✓</td>
<td>TSO and Regulator planning</td>
</tr>
<tr>
<td>Ireland</td>
<td>✓</td>
<td>TSO planning; Government approval</td>
</tr>
<tr>
<td>Netherlands</td>
<td>✓</td>
<td>TSO planning</td>
</tr>
<tr>
<td>Norway</td>
<td>✓</td>
<td>TSO &amp; Government planning</td>
</tr>
<tr>
<td>Spain</td>
<td>✓</td>
<td>TSO planning; Government approval</td>
</tr>
<tr>
<td>Sweden</td>
<td>✓</td>
<td>TSO and Government planning</td>
</tr>
</tbody>
</table>

*Source: DECC analysis*

### How does it work at a national level?

**DECC (UK): Comparison of interconnection project assessment in selected EU countries (December 2013)**

<table>
<thead>
<tr>
<th>Country</th>
<th>Project assessment under current model?</th>
<th>Roles in respect of interconnection project assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great Britain</td>
<td>X&lt;sup&gt;28&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;29&lt;/sup&gt;</td>
</tr>
<tr>
<td>Belgium</td>
<td>✓</td>
<td>TSO assessment; Government approval; Regulator consultation</td>
</tr>
<tr>
<td>Denmark</td>
<td>✓</td>
<td>TSO assessment; Government approval</td>
</tr>
<tr>
<td>France</td>
<td>✓</td>
<td>TSO assessment; Government approval</td>
</tr>
<tr>
<td>Germany</td>
<td>✓</td>
<td>Regulator assessment with TSO input</td>
</tr>
<tr>
<td>Iceland</td>
<td>✓</td>
<td>Government assessment</td>
</tr>
<tr>
<td>Ireland</td>
<td>✓</td>
<td>Regulator &amp; Government assessment</td>
</tr>
<tr>
<td>Netherlands</td>
<td>✓</td>
<td>Regulator assessment</td>
</tr>
<tr>
<td>Norway</td>
<td>✓</td>
<td>TSO assessment; Government approval</td>
</tr>
<tr>
<td>Spain</td>
<td>✓</td>
<td>TSO assessment; Government approval</td>
</tr>
<tr>
<td>Sweden</td>
<td>✓</td>
<td>TSO assessment; Government approval</td>
</tr>
</tbody>
</table>

Source: DECC analysis

Priority Electricity Corridors

- Baltic Energy Market Interconnection Plan in electricity
- North South interconnections in Western Europe
- North South interconnections in Central and South Europe
- Northen Seas Off-shore grid

“Smart grids” and Electricity highways all MS concerned
A Single Pan-European Planning Document

The Ten Year Network Development Plan (TYNDP)...

...tells about:

...and identifies & analyses project - candidates with Pan-European relevance

- Drivers
- Market prices
- Targets
- Adequacy
- Projects
- Bottlenecks

- Transparency
- Standard Cost Benefit Analysis approach
- Stakeholders’ involvement
- TSO cooperation platform
Projects in the TYNDP 2014

TYNDP 2014 package

Regional reports: Projects of regional relevance

TYNDP report: Projects of pan-European relevance

PCIs: Projects of common interest

120 projects of pan-European relevance

Incorporating 22 third party projects

17 PCI projects assessed:
• 8 transmission projects
• 9 storage projects

Financing Energy Infrastructure in the EU

Some €200 billion on infrastructure are needed by 2020

Electricity PCIs ca. €105 billion

Connecting Europe Facility (€5.35 billion) for energy
90% grant & 10% FI debt/equity

European Fund for Strategic Investments (EFSI), managed by the European Investment Bank (EIB)
Expected to leverage €315 billion for energy

European Energy Programme for Recovery (€3.98 billion)
12 Electricity Projects
Спасибо!
Thank you!

Nick Tourlis
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INO Gates Technical Secretariat and Integrated Programme in support of the Baku Initiative and the Eastern Partnership energy objectives