Defining a post-2020 implementation framework for energy infrastructure

ECF: From Roadmaps To Reality

Theme 1: Infrastructure

26 September 2012

ECF (2010)

Source: ECF (2010)
Chapter 2: Lessons from roadmaps

High variance (p. 4-6):
- From different cost assumptions, e.g. storage costs, CCTS, etc.
- OR: From different scenarios (e.g. „high grid“ vs. „low grid“)

Need for integrated, system-wide approach towards a flexible, renewables-base sector (p. 5)
- Dispatchable power plants
- Demand side management (DSM) and response
- Storage
- Interconnection with adjacent markets

Need for consistency:
- Between levels and jurisdiction
- Between operations and approaches
- Time consistency

Overall cost of upgrades remain minor relative to generation investment requirements (p. 8)
Transmission investment is important for the Energy Roadmap 2050, but investment in generation (including storage, demand-side management, etc.) is by far more important.

European Commission (2011), and Adapted from ECF (2011, summary presentation, pp. 9, 10).
<table>
<thead>
<tr>
<th>Scope</th>
<th>Geographic</th>
<th>European coordinating institutions</th>
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<tr>
<td>Regional</td>
<td>Europe-wide</td>
<td>… in place</td>
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<tr>
<td>Regional +</td>
<td>Europe centralized</td>
<td>… not in place</td>
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<tr>
<td>National</td>
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<td>Three Stylized Scenarios for the Green Investment Challenge</td>
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Theme 1: Infrastructure

Brussels, 26 September 2012

“Europe centralized” (energy highways all over the place ~ European infrastructure priorities)

“Regional +” (less infrastructure needs and cooperation on regional scale)

“National” (infrastructure is developed nationally and cooperation on regional scale)

Electricity
Natural Gas
CO₂ Pipelines

Additional lesson: Green investment in generation and transmission expansion can take three different forms: pan-European, regional, and national.
Chapter 3.2: Options: Deciding what to build

3.2.1 Role for targets? Not much to say

3.2.2 Institutionalizing the roadmaps: o.k., but develop the existing framework, e.g.
- Establish competitors to the Commission’s “Energy Roadmap”
- Broaden the scope of planning beyond TSOs and ENTSO-E/ENTSO-G

3.2.3 Regional planning and operation? Weaknesses identified are valid, but the solutions need to be formulated, i.e.
- What kind of regional coordination do we want?
- Regional coordination split up regional groups

3.2.4 Proactive market creation?
- Unclear at this point
Natural gas: the main issue is Central/Eastern Europe (Lochner, 2011)
Storage

b) Reactive power

a) Backup (reserve) capacity

South Germany, Austria, Switzerland, Eastern France

Zooming in on „Germanpina“
Regional + (Trade scenario):

- Combined wind integration and trade capacity
- Meshed offshore system

European integration (Meshed scenario):

- Combined wind integration and trade capacity
- Meshed offshore system

Point-to-point connectors between two countries

Regional + (Trade scenario):
Assessing the value of investments: the complex task of comparing projects need to be compared carefully. Perhaps method in the PCI is not well described; perhaps not feasible. Criticism: method in the PCI is not well described; perhaps not feasible. This was not important when everything that was needed could be built, but is crucial when everything that was needed is irreversible and long-term.

Irreversible and long-term investments need to be assessed and compared carefully through CBA.

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Background and methodology

ITC electricity

Availabile to host cross-border electricity flows

Differentiation between (i) costs of losses and (ii) costs of making infrastructure available to recover the cost incurred as a result of hosting cross-border electricity flows of

Methodology:

Zero-sum game with all TSOs paying into a fund according to a first methodology

Differentiation between (i) costs of losses and (ii) costs of making infrastructure available to host cross-border electricity flows

The costs [...] shall be established on the basis of the forward-looking long-run average incremental costs, taking into account losses, investment in new infrastructure and an appropriate proportion of the cost of existing infrastructure, and an appropriate proportion of the cost of existing infrastructure, and an appropriate proportion of the cost of existing infrastructure.

Regulatory binding EU instrument [Regulations 714/2009 and 838/2010]
Revisions to the EU instrument for allocating costs should be related to the EU instrument for infrastructure planning, using detailed cost-benefit analysis that takes into account all externalities. The ceiling of €100m for the compensation fund is too low for the stated objectives. Investments and competition are probably not satisfactory, and the current ITF mechanism will be designed to support adequate competition and investment.

Thus, we recommend:

- Methodologically debatable
- No link to the TYNDP
- Multi-lateral agreements more difficult
- Identification of beneficaries becomes more and more complex, which makes also bi-lateral agreements more difficult
- Current methodology does not take into account new infrastructures
- No ceiling of €100m for the compensation fund is too low for the stated objectives (i.e.

Inter-TSO compensation mechanism
Lack of information exchange main cause for black-outs

TSO not informed about state of the European power system

- TSO not allocated within market – TSO have to buy back capacity
  
  Congested lines are within and between EU

Countries

Congested lines are within and between EU
Zones for zonal pricing do not match national borders.

Suitsable zones in congested network can change hour by hour. Max wind output and zones with similar price change with wind output.