How Well Can a Regulator Oversee Electricity Transmission Planning?

Limitations and Options for Improvement for the Case of Germany.

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Background & Focus of the Study

Background

• Large investment needs, to a large extent driven by decarbonization goals, are identified on both a national (50Hertz et al, 2014, p.74: ~23 BN € to 2024), and European (ENTSO-E, 2014, p.80: 110-150 BN € to 2030) level.
• Leads to question of how transmission planning should be governed ("regulated") in the presence of regulatory problems (most notably of “over-investment”)
  – NB.: Still, some 15 years ago, the very reverse was of concern: Strict regulation was perceived to lead to under-investment (cf. eg. Hirst/Kirby, 2002)

Focus of the Study

• We analyze the case of Germany:
  – In Germany, transmission planning governance was reformed in 2011: The regulator was now supposed to check expansion of transmission companies (cf. e.g. Steinbach, 2013).

• How well can this kind of regulation function? What are the alternatives?

• To identify alternative governance options, we analyze three problems, focusing on the first:
  – (1) How serious is the regulatory principal agent problem and how can it be tackled?
  – (2) In how far need decisions to be politically backed? (Political Commitments)
  – (3) Are there deficiencies in the current transparency regime and if so, what would reduce them?
Theoretical Background

Regulatory principal agent problem (e.g. Alchian/Woodward, 1988)

• Properties of the task are decisive; not only information but knowledge asymmetry:
  – Knowledge bound spatially (Hayek, 1945), personally (Polanyi, 1962, 1966), organizationally (Nelson/Winter 1982, Teece 1982) and thus not easily transferrable (often called ‘tacit’).
• “Monitoring” or Hierarchy?
  – Hierarchy (i.e. integration) can be an option; “Public ISO” as a blueprint.

Political Commitments (e.g. Moe 1990, Horn 1995, Dixit 1996)

• Important when social costs of reversal are high: Political costs of reversal should be similarly high! (Coordination, “seams” issues often reflect irreversible decisions of a “second order”).
• Relevant if distributive effect is substantial (otherwise chances of politically-driven reversal would be lower).

Transparency (in governance arrangements, e.g. Fenster 2006, Prat 2006):

• Transparency has real (production) costs!
• Some data can be abused (national security, “business secrets”)
• Transparency can undermine arrangements to provide political commitments by giving way to short-termism and self-serving interests of particular groups.
Approach of the Analysis

1/ Detailed analysis, mainly of a generic (technical) planning process, for each of three thematic blocks:

• Regulatory principal agent problem
  – What knowledge is required to assess planning decisions, can it be built up by a regulator and at what cost? Does it depend on system control experience? How severe is the impact of the respective planning decisions?

• Political Commitments
  – How large are distributional effects of transmission expansion, irreversibilities, and „seams issues“?

• Transparency
  – What can transparency contribute, how should it be designed? (Taking into account costs of abuse)

2/ Derivation of integrated Governance Options & Analysis
• First we discuss “country neutral” governance options and then apply them to Germany
Analysis of a generic planning process, focusing on knowledge requirements

Impact on investments high, but external knowledge build-up possible

Specialized knowledge, related to system control routine, required, but impact on investments limited!
Results of the Analysis

- Transmission planning requires a significant amount of tacit knowledge, which can be built up for the case of (long-term) transmission expansion planning (at reasonable cost).

- This, however, is not so much the case for smaller, shorter-term measures, e.g. related to protection schemes: Links to system control are significant.
  - Therefore, “Monitoring” Solutions cannot capture the regulatory problems associated with such measures

- Interdependencies with other functions of the transmission company (maintenance strategy, asset ownership etc.) are negligible.
  - Therefore “asset-light” options are possible (as can be observed), but they alone cannot be expected to solve the principal agent problem.

- Stable political commitments on preconditions of the planning (e.g. generation plans) are important, but may be limited; this should be appropriately taken into account (-> robust planning methodologies, cf. e.g. Agora/BET, 2013)
- Still, the distributive and irreversible impact of new lines makes a case for political ratification of the plans (e.g. by transposing them into national law).

- Transparency can sensibly be applied to make use of various actors’ knowledge; security concerns do not seem to apply to the data available for LT-transmission planning.
## Governance Options: Application to Germany

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<th>Private TSO with Monitoring (“SQ+”)</th>
<th>Public TSO</th>
<th>Public ISO</th>
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| • Close to status quo (SQ), but with some changes  
  • An effective monitoring requires that regulator is able to benchmark plans by creating alternatives!  
  • Currently, BNetzA only conducts “sensitivity” checks on a line-per-line basis. This replicates the well-known problems of a “cost-plus” regulation! (If you know that the wish list will be shortened, you expand it...)  
  • Robust planning in light of limited ability to give commitments!  
  • “Short-term measures” and coordination with them cannot be captured (well) by third parties not involved in transmission control.  
  • Transparency issues could be (slightly) improved by clarifying legal problems. | • Would enable the use of synergies between long-term and short-term measures, yet, additional benefits seem to be limited as compared to SQ+ and legal justification thus **needs to be judged as problematic**. | • May be easier to implement than public TSO and would bring comparable benefits from a planning perspective, but still, legal feasibility seems to be problematic. |
Discussion & Outlook

2011 reforms in Germany seem to be sensible in general, but there is some room for improvement:

• Increased knowledge build-up,
  – so that TSOs’ plans can be challenged with alternative plans,
  – and to allow for the improvement planning methods.

Outlook

• We find that for the case of integrated planning, “monitoring” can work similarly well, yet, short-term decisions (“winter planning”) still benefit from operational system control knowledge.

• Our observations make a case for a serious engagement of the regulator in to electricity system planning and related knowledge build-up, a dedicated office could be an option, to concentrate and the relevant expertise.
References


Backup: Planning Process in Germany

Governance-Sicht auf den Planungsprozess

Technischer Planungsprozess

Szenarienentwurf (ÜNB)
Marktsimulation (ÜNB)
Technische Netzplanung (ÜNB), Konsultation durch ÜNB
Technische Netzmodellierung

Konsultation durch BNetzA, ggf. Anpassung, abschließend Genehmigung

Bestätigung der Netzplanung (BNetzA)
Rechtlich bindende Netzplanung

Situation DE 2015