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# **How Well Can a Regulator Oversee Electricity Transmission Planning?**

*Limitations and Options for Improvement for the Case of Germany.*

Alexander Weber

Technische Universität Berlin, Workgroup for Infrastructure Policy (WIP)

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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

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## **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

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## 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**

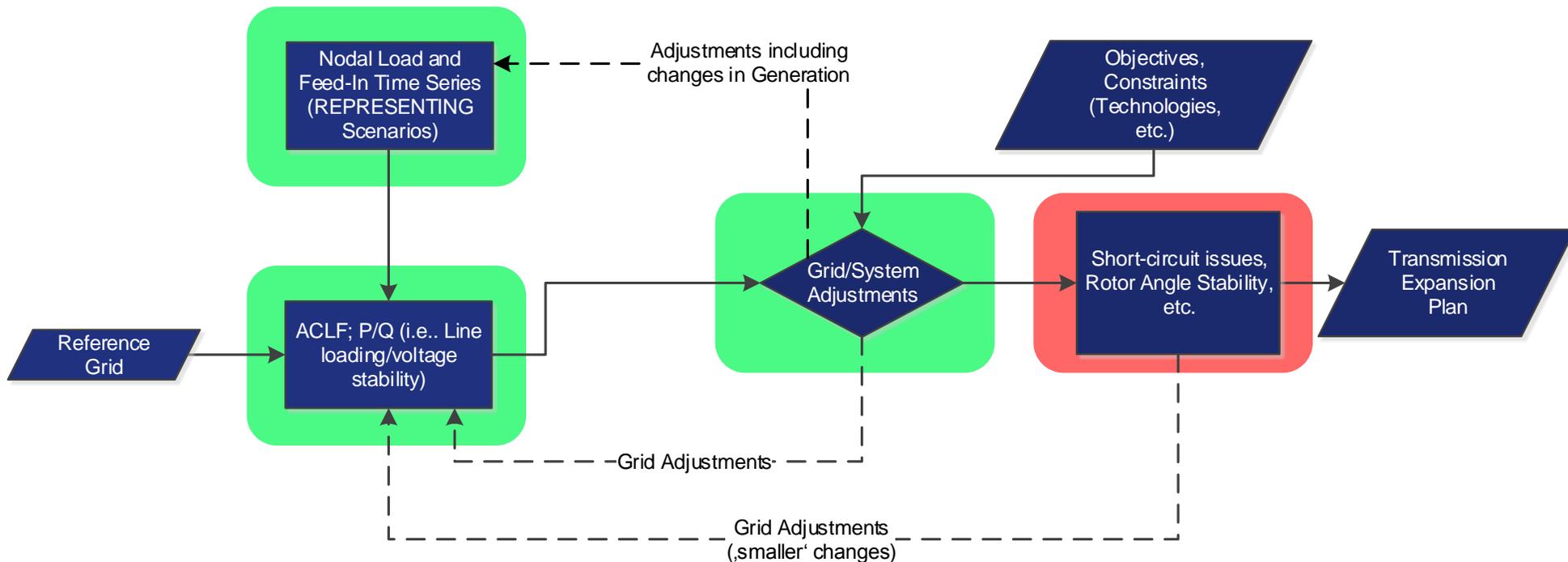
- What can transparency contribute, how should it be designed? (Taking into account costs of abuse)

## 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

**Simplified exposition!**



-  **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

## **Regulatory Principal Agent Problem**

- 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.

## **Political Commitments**

- 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**

- 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

## *private TSO with Monitoring ("SQ+")*

- 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.

## *public TSO*

- 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..**

## *public ISO*

- 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

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**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, shorter-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.

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