Between planned and market economy: How much government intervention does the “Energiewende” need?

Session 1 „Coordinating the Energiewende: Regulatory challenges, trade-offs and responses“

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Often confused: goals and measures

1) Setting **GOALS**

- **Fictional extreme Position No. 1:**
  „100 % RES until 2020: No matter what, because macro-economic costs will otherwise increase even further...“

- **Fictional extreme Position No. 2:**
  „Renewables? 100%? Never! It’s technically and economically irrational....and the German industry will be under thread...“

2) Reaching Goals: **INSTRUMENTS** (system coordination/incentive mechanisms)

- Market forces (via competition)
- Hierarchies (via command & control)
- Networks (via cooperation)

**remaining questions:**
How much,...
of which,...
and (until) when...

⇒ Governance-Continuum
Sustainable evaluation: For efficient and effective achievements of goals the following criteria need to be addressed simultaneously:

### Classical criteria:
- Economic efficiency (static & dynamic)
- Security of supply
- Environmental protection

### Additional criteria:
- Transaction cost efficiency
- Adaptive efficiency
- Distributional impacts
- Social acceptability
- Political feasibility
- System Complexity (reduction?)
- …

### Research Goals and Approach:
1. **Interdisciplinary** (economic, sociologic, engineering, policy perspectives...)
2. No prioritization of sub-goals: equality of economic, ecologic and social aspects.
## More market or more state? The case of ensuring security of supply (SoS) in Germany

<table>
<thead>
<tr>
<th>Capacity Mechanisms (CMs)</th>
<th>State-based elements (centrally organized)</th>
<th>Market-based elements (decentral organized)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Adaption of existing markets (e.g. control/balancing)</td>
<td>demand defined by TSOs</td>
<td>competitive reserve bidding</td>
</tr>
<tr>
<td>• Introduction of new markets (e.g. capacity markets)</td>
<td>central capacity markets: demand defined by regulator</td>
<td>decent. capacity markets: via market participants</td>
</tr>
<tr>
<td>• Conditional capacity payments (selective markets)</td>
<td>definition of technical requirements</td>
<td>competitive reserve bidding</td>
</tr>
<tr>
<td>• Strategic reserve</td>
<td>definition of demand and technical requirements</td>
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CMs stimulate operation of (fossil) back-up power plants but .... ...

... are hard to design, revise or abolish, ...

... fail to address the diverse other options for SoS, ...

... are unlikely to be cost-effective in context of the 'Energiewende'
Better: a policy mix to provide the security of supply

Renewable power plants:
- Fixed premiums and quotas only partly helpful

Power market:
- No power price caps
- Market liberalization
- Market splitting
- Europeanization of security of supply

Grids and storage:
- Regulation of grid extension
- Design of grid charges
- R&D support

Non-renewable power plants:
- Acceleration of permitting
- Strengthening of emissions trading

Demand-side management:
- Load reduction
- Load shedding
- Load transfer

Promising avenues for further research:
- Designing a sustainable policy mix to secure the supply
- Designing deliberative policy processes to cope with uncertainties
More market or more state? The case of direct-marketing (DM) of RES-E in Germany

<table>
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<th>Market Integration Regime</th>
<th>State-based elements (centrally organized)</th>
<th>Market-based elements (decentral organized)</th>
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<tr>
<td>Integration via Power Exchange</td>
<td>definition of pricing mechanisms/premiums</td>
<td>competitive bidding</td>
</tr>
<tr>
<td>Integration via load serving entities (LSE)</td>
<td>definition of min. VRE-share in portfolio</td>
<td>tradable RECS</td>
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<tr>
<td>Support via floating premiums</td>
<td>definition of premium parameters</td>
<td>market-driven curtailment via (weak) price signals</td>
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<tr>
<td>Support via fixed premiums</td>
<td>definition of premium parameters</td>
<td>market-driven curtailment via (strong) price signals</td>
</tr>
<tr>
<td>Pricing mechanism for monopsons</td>
<td>state sets central demand for RES-E &amp; price</td>
<td>auctions for collection of decent. knowledge/information</td>
</tr>
</tbody>
</table>

Decentral DM makes sense for dispatchable technologies, but...

... not for variable renewable energies (VRE),
... not via the central power exchange,
... b/c VRE threatened by high risk premium for cost of capital
Better: RES & DM-support policy mix fitting the socio-technological requirements

Promising avenues for further research:

- Which market risks (price & volume) should (really) be transferred to actors
- Designing adequate policy instruments to cope with high uncertainties

Approx. 80 % of RES-capacity is owned by pps., farmers, pds. & SME

These actor-types ARE USUALLY NOT ABLE to apply adequate risk diversification measures for DM:

- No power market background/experience
- Single technology investments
- No portfolio of mixed technologies

→ leads to high risk premiums for costs of capital for VRE
→ will increase support costs
→ although RoE expectations are relatively low for these actor-types
How much government intervention does the “Energiewende” need? – Some conclusions

• Governance system should be designed with respect to the socio-technical system and actors characteristics

• Markets are instruments to organize systems, but no goal itself

• Power „markets“ have always been subject to strong government intervention (and probably always will be)

• In the context of the “Energiewende” neither markets nor government regulation are the most efficient governance approach per se, i.e. no simple solutions à la market-only vs. state-only

• Policy mix needed to address diverse sources of market and policy failure

• Incentive schemes should dynamically adopt to changing framework conditions
Thank you very much in the name of the whole team for your attention...

...Questions?