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Economic Analysis of Capacity Remuneration Mechanism Design in Consideration of International Experiences

Dipl.-Volksw. Albert Hoffrichter
Technische Universität Berlin, Fachgebiet Wirtschafts- und Infrastrukturpolitik (WIP)

This presentation is based on joint research acivities
with Prof. Dr. Thorsten Beckers and Prof. Dr. Christian von Hirschhausen

Agenda

1. **Study setup and ambition**
2. **System of objectives**
3. **Theory-based analysis**
4. **Case studies**
5. **Conclusions**

Study setup (simplified)

Analysis subject

* …or substitutes for generation infrastructure

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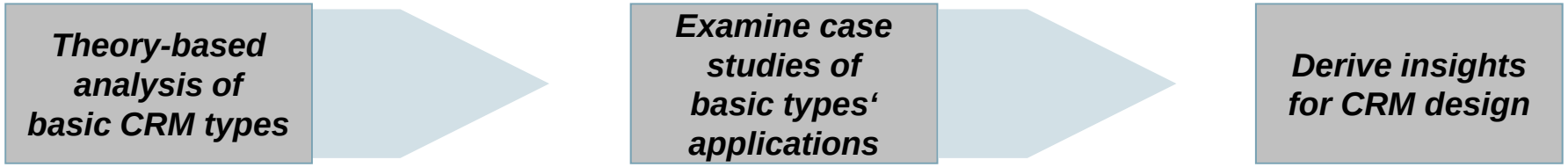
Analysis subject

Analysis procedure



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Study setup (simplified)

Analysis subject

Institutional electricity sector design	*Provision and financing of generation infrastructure**	*Capacity remuneration mechanisms (CRM)*

Analysis procedure

Theory-based analysis of basic CRM types	*Examine case studies of basic types' applications*	*Derive insights for CRM design*

Methodological approach

Industrial Economics and (New) Institutional Economics	*Transaction Cost Theory, Positive Agency Theory, Contract Theory, …*	*Application in theory-based analysis as well as case studies*

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Study ambition

- **What is NOT the aim of the study?**
  - Finding some **blueprint CRM design** for Germany or other countries from the international case studies
  - **Directly conclude** from case study observations to policy making / institutional design in other jurisdictions
  - Give an **exhaustive overview** of all CRM applications

- **What IS the aim of the study?**
  - Explore observations from **selected** international **case studies** in their **specific context** (technical system, policy objectivs, environmental influences…)
  - Gaining insights regarding **seperate** CRM **design elements** and aspects
  - Critically assess findings for their transferability and identify those, which can give insights for CRM design in other countries‘ situation

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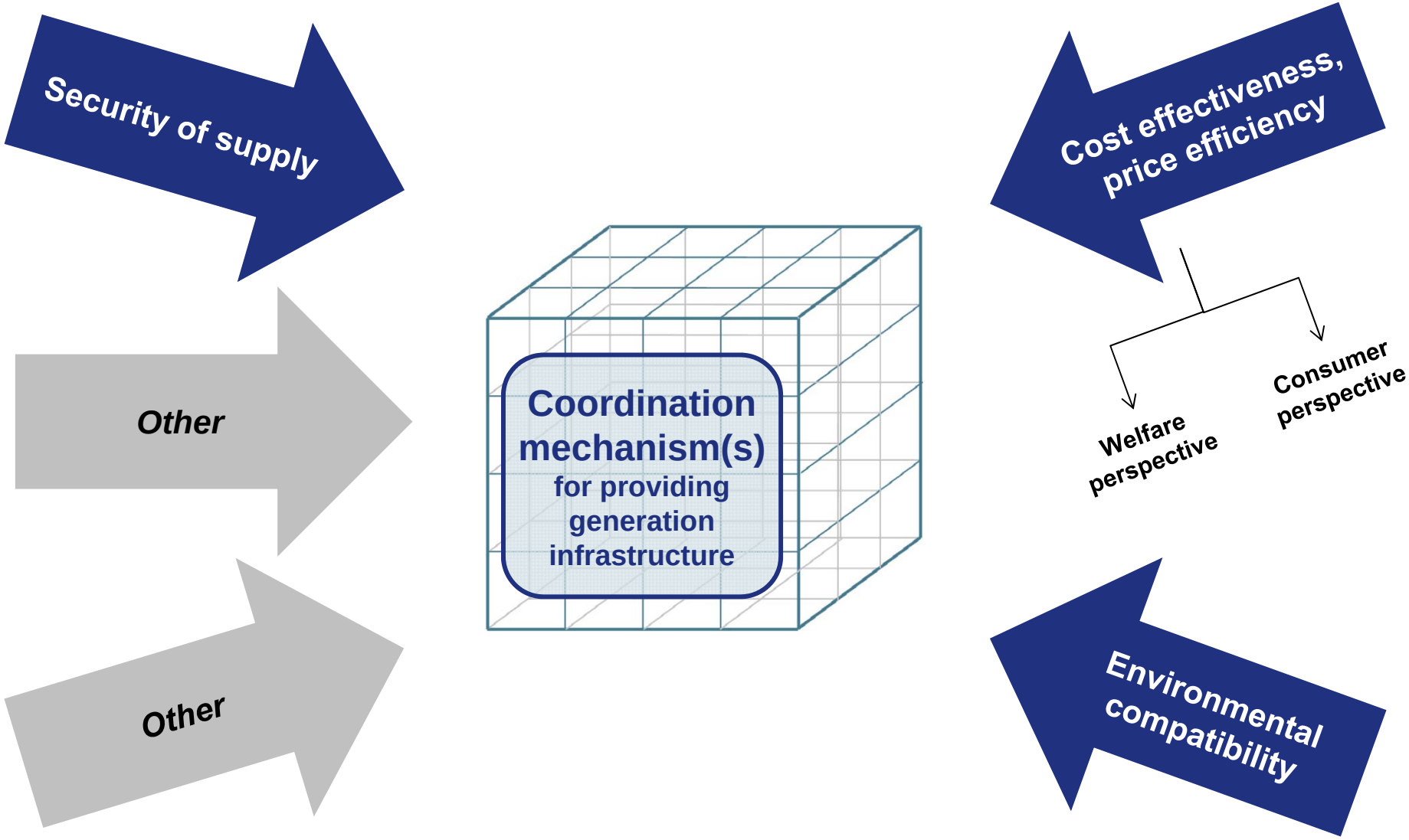
System of objectives: possible energy policy objectives



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Theory-based analysis: selected findings

- **Starting point**
  - **Problems** in the ‚**energy-only market**‘ approach (EOM) regarding security of supply (SoS) and cost efficiency objectives
  - Classification of different approaches to capacity provision in **7 CRM basic types** → investigation of ability / **potential to achieve underlying objectives**
- **Results**
  - Application of **most CRM basic types** can lead to **achievement of SoS** and **environment objectives**, if designed properly
  - CRM basic types **diverge considerably** in potential to achieve **cost objective**

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- **…hence focus on two (and a half) CRM basic types**

Strategic Reserve

- Reserves held by regulator to be only used in system scarcity situations, no regular market dispatch
- Here: broad definition → NOT necessarily used to create scarcity prices
- Short- or mid-term use: moderate costs to achieve SoS objective; long-term: deficits re. costs

Capacity certificates / Capa. options

- Regulator tenders capacity, successful bidders receive capacity premium and subsequently sell their energy in the regular wholesale markets
- Option elements: can be added to further reduce cost risk; comes with additional requirements to CRM design and regulator know-how

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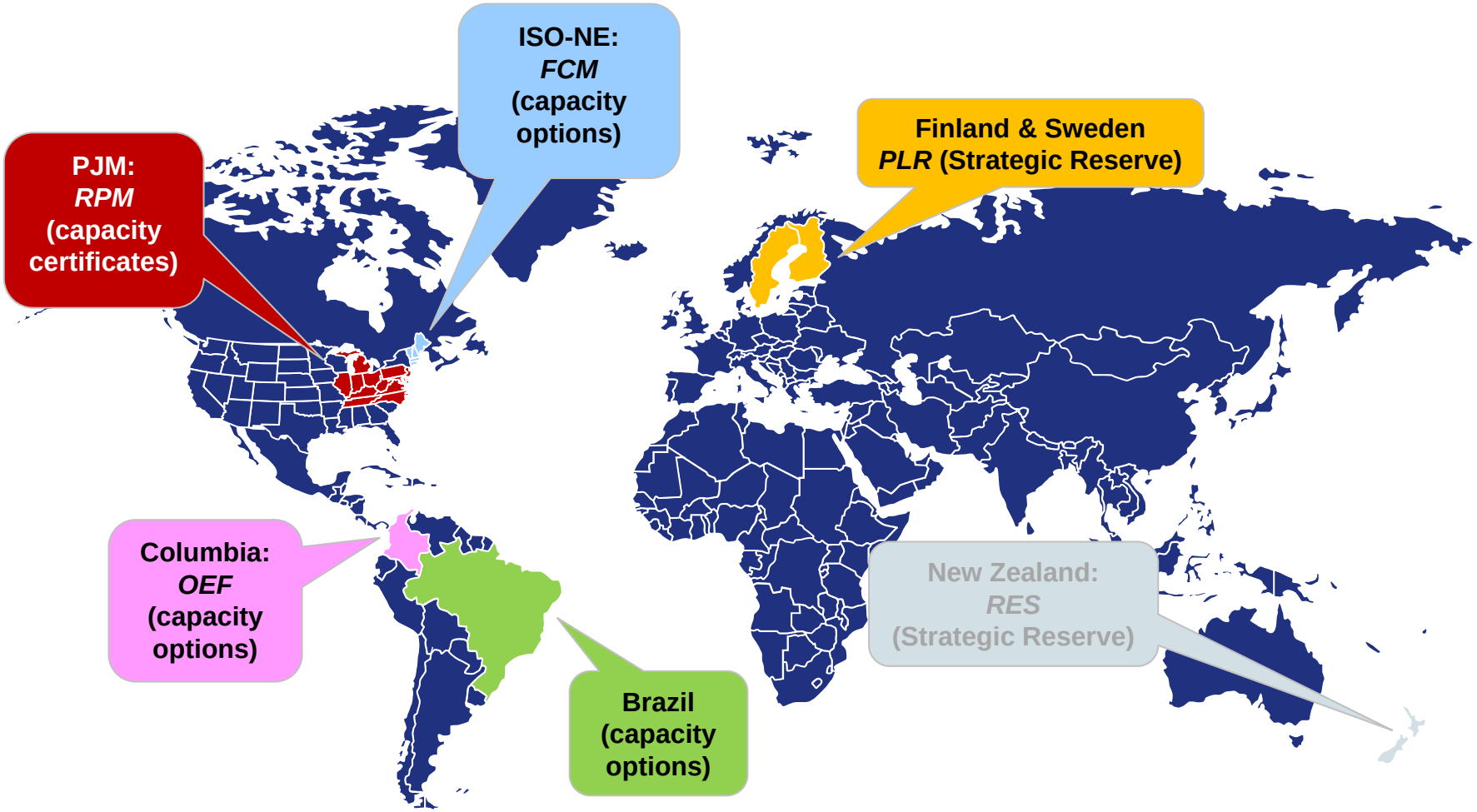
Case studies: overview



Case studies: selected findings

- **Strategic Reserve**
  -  FIN / SWE: formerly prevaling **SoS problems eliminated**, PLR mechanism proved effective to **maintain capacity in the system**
  -  FIN / SWE: PLR contract conditions prohibit ‚fled' into Strategic Reserve
  -  SWE: Considerable share of **demand side flexibility** (DSM) activated

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- **Capacity certificates / capacity options**
  - COL: first simple capacity **certificate approach developed to** a more complex and more effective **option mechanism**
  - COL: current approach still faces some trouble due to parametrization problems
  - NE-ISO & PJM: the 1990s' comprehensive, **undifferentiated CRM** were **ineffective** to procure intended capacity, immense windfall-profit for incumbents
  - PJM: former lack **of spatial differentiation** caused major grid and hence SoS issues
  - PJM: immense wind-fall profits also in new, ‚comprehensive' *RPM* approach
  - BRA: complex, deeply planned instrument; still: **backstop mechanism**, if regular mechanim fails to procure intended capacity

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- Choice of the 'correct' CRM basic type does not yet guarantee a well performance of the institutional setup; quite the contrary, **all** analysed **systems require** an **in-depth planning** to account for the specific circumstances of their environment; CRM's **adaptability** is important

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- Especially schemes which aim at creating a **comprehensive competition** by including a large variety of different technical options display a **need of detailed planning** to orchestrate this competition
  → Aiming at a **design where 'market forces' do** the **greatest** possible **share** of the work by themselves, seems to be an **unrewarding** strategy

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- Building up **central know-how** is likely to be a **no-regret option** when it comes to introducing a CRM, as the construction, parameterization, monitoring and adjustment poses a challenging task to the regulator

- To exploit a system's efficiency potential, **technical substitutes** to generation capacity (like DSM) should be explored and **kept in mind**, when designing a CRM

Outlook

BACK-UP

- **Recent developments**
  (since case study input information deadline, spring 2012)

- **Subsequent research steps**

Thank you for listening!

Contact

Albert Hoffrichter: ah@wip.tu-berlin.de, Tel.no. +49-30-314-78773

www.wip.tu-berlin.de

CRM design

BACK-UP

Conceptualising a capacity remuneration mechanism (CRM)