

Innovation in Liberalized Electricity Markets: A Comparison of Regulatory Incentives in California and Germany

A decorative graphic consisting of a small gold horizontal bar above a dark grey downward-pointing arrow shape.

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➤ Reciprocal and multifaceted relationship between innovation and regulation

- Majone 1976: Performance of policy instruments depends even more on the institutional framework in which they are used than on their technical characteristics
- Kemp 1998, 12:
 - „The topic of regulation, innovation and competitiveness is much discussed, yet little analysed.
It gave rise to diametrical views of regulation being a barrier and stimulus to ordinary and compliance innovation. The debate has been characterised by a high anecdotal level, little systematic empirical research has been done into the topic,
One reason for this is the lack of a theoretical framework about regulation and innovation which recognises the reciprocal and multifaceted nature of the relationship and the myriad of factors that are influencing innovation decision and output.“

Research on institutional design is based on personal interviews in California and Germany

Research methodology

- semi-structured interviews with government officials, managers of investor-owned utilities, and regulators
- carried out in Summer/Fall 2008
- part of on-going research on the institutional design of electricity markets

Theoretical background

- Institutional change, based on the New Institutional Economics literature (North 1990, Roe 1996, special application to electricity markets e.g. Glachant and Finon 2003, Finon 2004)
 - Diverging designs lead to different outcomes, institutions matter, path-dependence
- Political economy and transnational regulatory networks (Eising 2002, Eberlein and Grande 2005)
 - ‘incremental negotiation techniques’ in the EU and cross-national harmonisation of regulation via information networks
- Evolutionary economics (Campbell 1969)
 - trial and error learning and ‘convergent evolution’

California and Germany perceive themselves as leading by example towards a sustainable energy transformation




- AB 32: 2020 emissions reduced to 1990 levels, a 25% reduction compared to business as usual, mandatory caps from 2012 on
- “Load Order”: Efficiency first, then Renewables, then “other” generation
- Renewable Portfolio Standard: 33% in 2020, 20% by 10
- Lots of proposals...




- IEKP: 2020 40% less than 1990 levels, if EU reduces to 30% and “other states have comparable ambitious targets”
- From 13% to 25-30% Renewables in 2020
- IEKP: KWK, EEG, Biogas, Grid, Metering....

California was the first state in the USA to introduce competition, while Germany stuck to the old regulated system


California

- Before deregulation, California had a power system similar to most other US American states
- most electricity was served by vertically integrated companies that were completely responsible for generation, transmission, and distribution of power
- Following deregulation,
- the vertically integrated utilities were split into three parts
- independent firms bought and operated the large utilities' power plants
- the state of California operated both the state-wide power grid and the California Power Exchange (CPX)
- supply-side of the market was largely deregulated; demand side of the electricity market, however, became more regulated (in 1996, electricity rates were cut by 10% and locked in for four years)


Germany

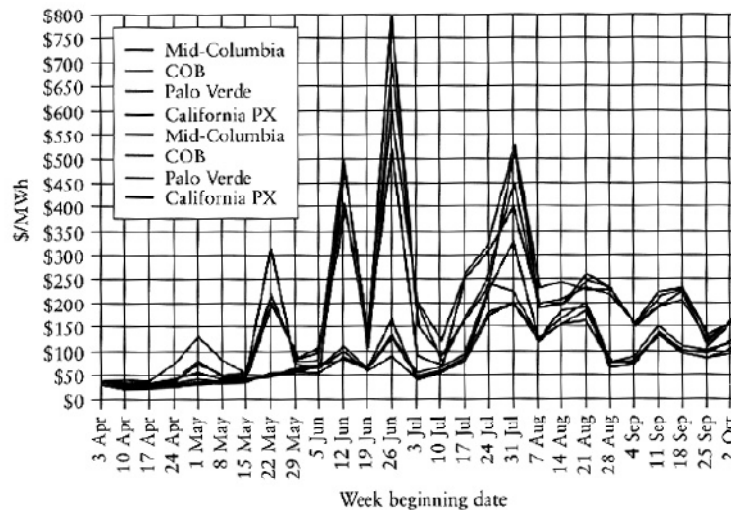
- Before deregulation, the German ESI consisted of two different types of firms
- a small number of so-called Verbundunternehmen owned and operated the High Voltage (HV) network and the generation plants in the associated control area
- about 900 mainly municipality-owned distribution companies held franchises for both the distribution network and the local retail or supply businesses

Two major events triggered fundamental changes in the regulation of the systems

Power Crisis

California

- 1996-1999 electricity demand grew by 5500 MW, while supply grew by only 672 MW
- System breakdown, bankrupt utilities and blackouts in



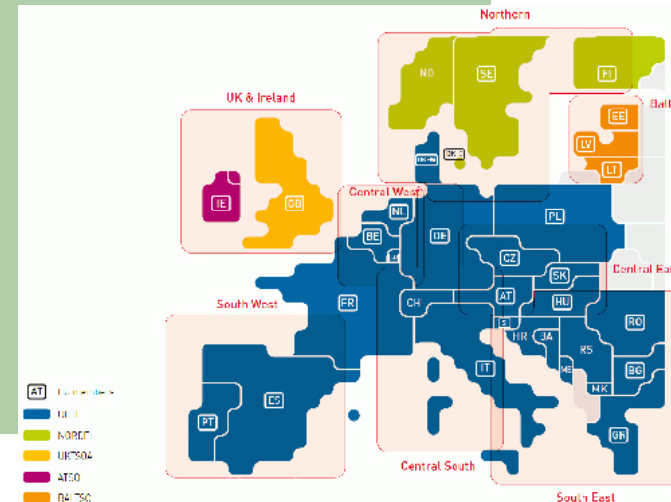
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Germany



- In 1998, the liberalisation of the German ESI started
- Energy Act implemented the EU Electricity Directive of 1996

European Energy Liberalisation



After the crisis, the momentum has reversed



California

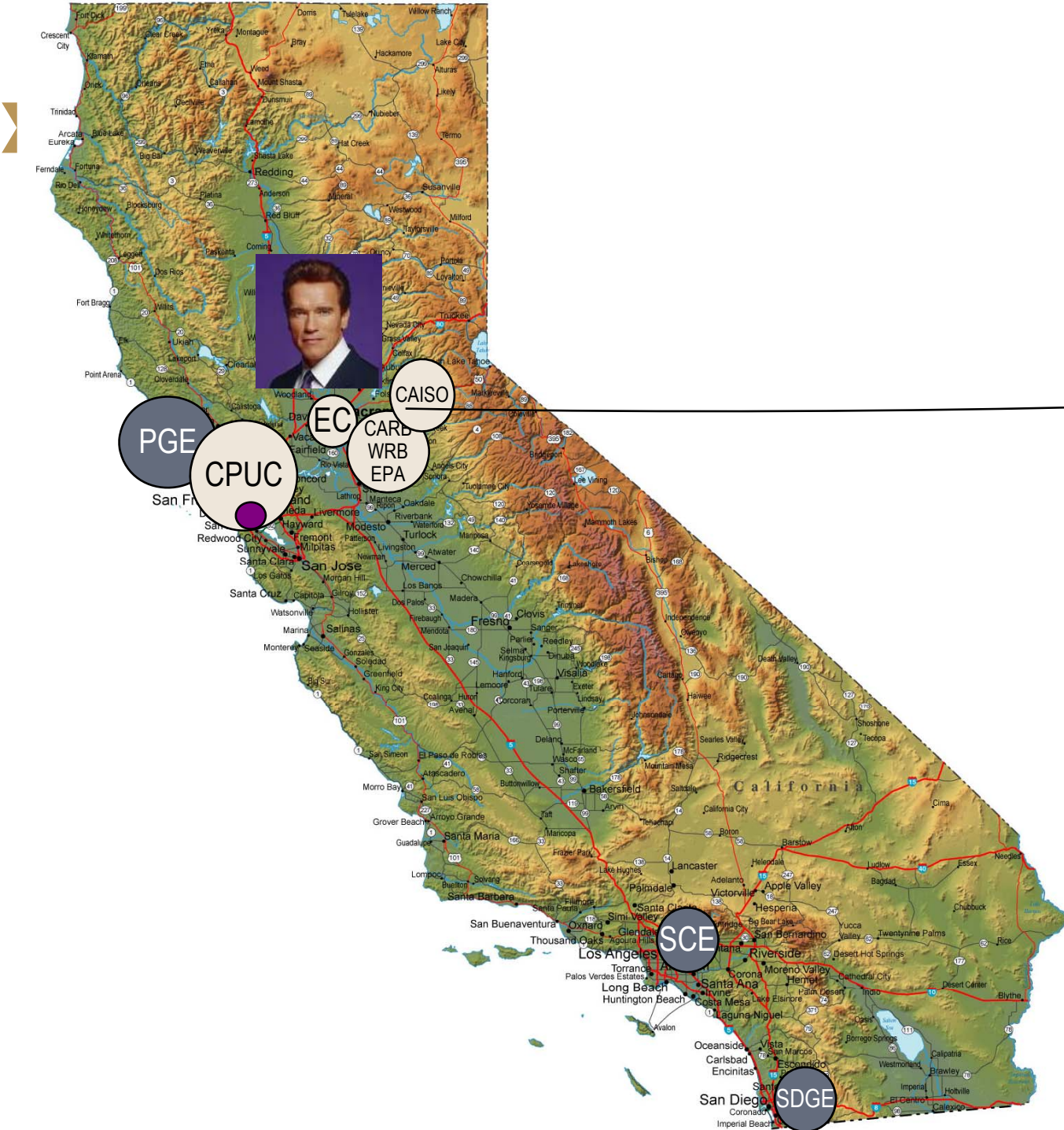
- Government signs 38 long-term contracts, totaling nearly \$43 billion, to hedge prices
- The California Public Utilities Commission, Gov. Gray Davis (D), and other officials petitioned the Federal Energy Regulatory Commission (FERC) to reimpose a cap on wholesale electricity prices
- FERC did so in mid-2001, and in 2003 it ordered refunds from the independent power generators
- In 2001, the California PUC issued an interim opinion that suspended retail choice in California
- In January 2009, CAISO filed its certification of readiness to implement a Market Redesign and Technology Upgrade, leading eventually to a new electricity spot market



Germany


- EU Electricity Directive of June 2003 imposed additional requirements
- First, Germany had to establish a regulator for the industry
- Second, negotiated Third Party Access (TPA) is no longer acceptable and had to be replaced by regulated TPA from July 2004
- Competitive pressure from abroad is increasing, but still restricted by the interconnector constraints
- Monopolkommission still criticises lack of competition with four dominant suppliers
- 18% of German electricity consumers have changed their supplier at least once within the last 3 years, while 43% of all German electricity customers consider a change of the supplier





FERC

What do stakeholders say?


California

The EC perspective:

- „we delivered basis for common understanding“

The CPUC perspective:

- IEPR „vehicle for integration“, „some degree of coordination, perhaps even collaboration“
- Consistent policy „dependant on individual relationships“ and informal personal network on a case by case basis
- „California is good at making goals, not implementation“

The Schwarzenegger perspective:

- Executive orders to speed up things

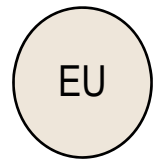

California

The IOUs perspective:

- “Fragmented outcome”
Would like overall goals (like fuel diversity, GHG reduction, reducing dependency on fossil fuels)
- Integrated energy policy report “does not help”, “agencies develop policies independently, not well coordinated”
- Deadlocks tend to be solved on “case by case” basis
- “Regulatory and legislative micromanagement”
- “New plants do not get permits even if they would replace older existing plants”

Wishlist of regulators and firms:

- Energy Department: less friction, more coordinated approach – central planning?



What do stakeholders say?


Germany

The BNetzA perspective:

- We make markets work and optimize the regulatory triangle
- We make sure that EU laws will be executed

The policy makers perspective

- Digital divide between proponents of “old” and “new” order


Germany

The IOUs perspective:

- There is no plan, but “moving targets”
- “Lack of coordinated energy policy”
- Pro-competition stance: “Let markets work and do not interfere”
- We do a lot for innovation in large scale projects (CCS, Offshore Wind,...)

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▶ Relevant factors for innovation and system transformation



California

1. Stressed system forces innovation ("Flex Alert")

Relevant factors for innovation and system transformation



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2. Framework “Load order”
(Efficiency/DR, then Ren, then “other”)

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2. Old paradigm – new paradigm
Transition path unclear

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1. reg. triangle 2. Competition 3. EU law

▶ The case for Advanced / Smart Metering



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- Advanced metering regarded as key instrument for efficiency, shifting demand and reducing peak load
- Ratepayer advocates and lots of groups very adverse
- All IOUs implemented plans to adopt AMI and integrate it into regulated asset base: CA – wide rollout 2009 – 2011
- “Just do it” approach not in line with standardization and processes

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- Durchführungsverordnung z. Gesetz zur Öffnung des Meßwesens bei Strom und Gas
- BNetzA sets standards, Industry has further homework
- New buildings must have SM from 01/10
- Tariffs must be available 2011, so that customers can choose if they wish so
- Number of pilots

Diagnosis: at least 2 years later

▶ The case for electric cars



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- Nov. 2008: Joint project:
Transforming the Bay Area into the US EV capital
- Joint Project:
Governor, Mayors, Politicians, Companies etc. etc.
- "We have the venture capital, we have the research universities, we have management talent, and, perhaps most importantly, we have the visionary elected leaders gathered here today to clear the field for green tech companies ... with progressive public policy."
Jim Wonderman, CEO Bay Area Council
- 1 Billion US\$ network inv., rollout from 2010 on
- Mass availability of cars and Bay Area System in 2012
- Still strong lobby for zero emission vehicle approach



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Germany

- Nov. 2008 „Nationale Strategiekonferenz“
- BMU BMBF BMWi BMVBS
- Defining a „Leitmarkt“ / key market
- 500 million for R&D, pilot projects and fleet rollouts
- Industry agrees on infrastructure standards
- Carmakers' role?
- Still strong lobby for 120g as late as possible

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- ▶ We will see whether speed or rock-solid setup is more successful for innovation in a large scale energy infrastructure transformation.

