

On Regulation and Benchmarking of Energy Networks – the example of Germany

GARS, London, 10 & 11 Nov. 2006

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***Jacobs University Bremen as from Spring 2007**

Overview

- **Incentive Regulation for Power and Gas Networks in Germany**
- **Details of the benchmarking principles**
 - **TOTEX v. OPEX/CAPEX-split**
 - **Methods**
 - **Electricity**
 - **E-TSOs**
 - **E-DNOs**
 - **Gas**
 - **G-DNOs**
 - **Long distance g-NOs**
- **Yardstick competition**

Incentive Regulation for Energy Networks in Germany

- **1998-2005: negotiated Third Party Access**
 - Effectively no ex ante regulation of network charges
- **July 2005: new Energy Act**
 - Installation of regulator: Bundesnetzagentur (BNetzA)
 - Ex ante regulation of network charges
 - §21 cost-based ex-ante approval
 - §21a option to switch to price-based incentive regulation
- **Current process: cost-based regulation of**
 - Electricity: 4 TSO and 900 DNOs
 - Gas: 500 gas DNOs and 17 (regional) long distance Gas NOs

Cost based Regulation: First results

Date	Company	Cut
06.06.06	Vattenfall Europe Transmission	18%
31.07.06	RWE Transmission	9%
31.07.06	EnBW Transmission	8%
31.07.06	E.ON Distribution in Thuringia	14%
30.08.06	E.ON Transmission	16%
30.08.06	RWE Distribution in North Rhine-Westphalia	10%
01.09.06	EnBW Distribution	14%
15.09.06	Vattenfall Europe Distribution Berlin	15%
15.09.06	Vattenfall Europe Distribution Hamburg	15%

High reduction of network charges!

Incentive Regulation for Energy Networks in Germany

- **June, 30, 2006:**
 - **BNetzA published the Concept for Incentive Regulation**
- **To be implemented by 01.01.2008**
- **Everything still uncertain**
- **At the moment: *Bundesrat* decides on ordinance**

- **Key issues:**
 - **Too many details not cleared**
 - **Eg. benchmarking**
 - **Uncertainty about outcome and what to write in ordinance**
 - **Fear of detrimental effects on investment**

Key features

- **Hybrid revenue cap**
 - Includes an expansion factor
 - Includes regulatory account
 - Electricity regulation includes quality regulation (Q-factor)
 - Quality benchmarking postponed
- **X-factor comprises 2 elements**
 - X_{gen} – general sectoral productivity increase
 - TFP analysis
 - X_i – catch up of individual inefficiency
 - benchmarking
- **CAPEX is included in controllable costs**
- **Two periods of 3 to 5 years and then yardstick competition**

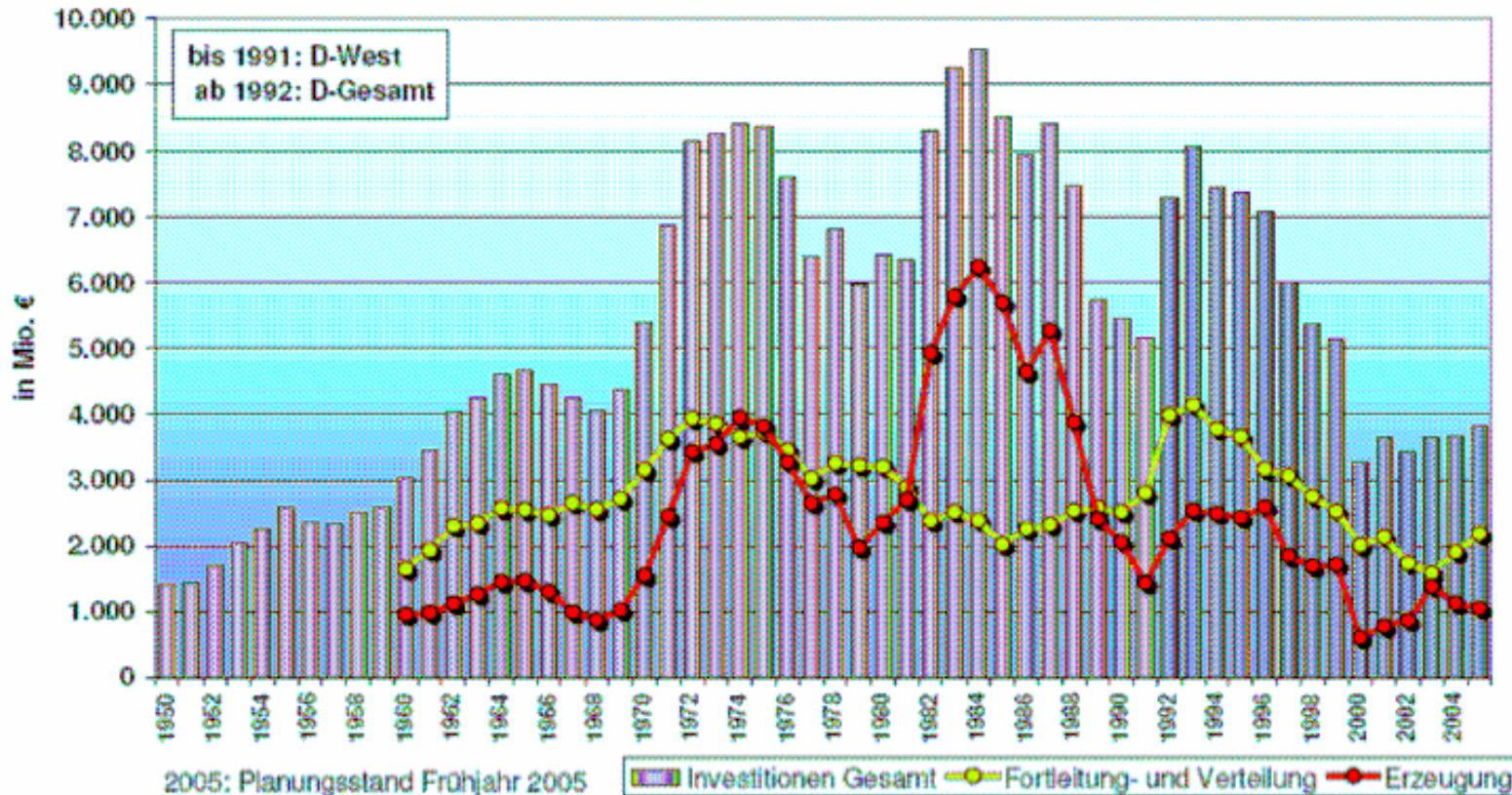
- **Methods**
 - **Stochastic Frontier Analysis**
 - **Data Envelopment Analysis**
 - **Either constant or non-decreasing Returns to Scale**
 - **The latter protects the tail of small (inefficient) DNOs, while not giving advantage to big firms**
- **Both methods will be used:**
 - **Either weighted average,**
 - **Or „best of two worlds,,**
 - **safety first**
- **Methods backed up by analytical cost models**

TOTEX-Benchmarking

- **In Germany: 900 e-DNO and 500 g-DNO make separate CAPEX treatment nearly impossible**
 - **Therefore: choice of BNetzA for TOTEX**
- **Practise and theory divided over TOTEX benchmarking or OPEX benchmarking plus separate CAPEX treatment**
 - **TOTEX includes more (incl. capital)**
 - **Less possibility to game with TOTEX**
 - **TOTEX takes account of substitution effect**
 - **TOTEX more difficult (?)**
 - **Potential drawback for investment**
 - **No opex-capex split**
 - **Requires standardisation of CAPEX**

TOTEX and Investment cycle

Investitionen der deutschen Stromversorger 1950 bis 2005 (real)
-in Preisen von 2000 auf Basis des Index der Erzeugerpreise gewerblicher Produkte-



**German networks:
Relatively old.
Currently in
investment valley.**

**New investment
required.**

- **Book values of German energy networks**
 - Relatively old and depreciated
 - Different ways of accounting
 - sometimes CAPEX was listed as OPEX for tax reasons
- **TOTEX benchmarking on book values**
 - Unfair results
 - Investment impediment
- **Solution: Annuities (for benchmarking only)**
 - Can it be done reliably?
 - And what about increasing OPEX as assets get older?
 - Especially for gas
- **However, BNetzA did not find significant age–effect !**

- **Four groups**

	Electricity	Gas
DNO	900 ****	500 ***
TSO/long distance	4 *	17 (13 + 4) **

- (# means number of NOs)
- many details not specified yet.
- **Number of stars (my subjective interpretation) denotes level of specification.**

Benchmarking - e-TSO

- **4 is not sufficient for reliable benchmarking**
- **Alternative approaches**
 - **Analytical cost modelling**
 - Can be done but can give strange and unreasonable results
 - **International benchmarking**
 - Appears to be unsatisfactory und unreliable
 - **ECOM / ECOM+**
 - Downsized benchmarking which does not question the roll-out of the network
 - It doesn't benchmark all that much
 - Not robust?
- **Alternatives? Building block, Cost-based incentive regulation?**

Benchmarking – e-DNO

- **Current state of test runs and data cleaning:**
 - **Correlation DEA and SFA (translog): 73.3%**
 - **Correlation DEA CRS and DEA NDRS nearly 100%**
 - **Av. Inefficiency roughly: 10 %**
- **Significant parameters (output):**
 - **Number of Connection points at different voltage levels**
 - **Peakload at different voltage levels**
 - **Geographic area (HV and MV)**
 - **Note: „energy“ is not included due to corr. with peakload**
- **Non-significant parameters**
 - **Decentralised generation**
 - **A variety of structural parameter (with 1 exception: „sealing“)**

Benchmarking – g-DNO

- **Current state of test runs and data cleaning:**
 - Correlation DEA and SFA (translog): 92.2%
 - Correlation DEA CRS and DEA NDRS nearly 100%
 - Av. Inefficiency roughly: 43 % !!
- **Significant parameters (output):**
 - Number of Connection points
 - Peakload
 - Transported gas
 - Geographic area
- **Structural parameters**
 - „sealing“ (but reverse sign from e-DNO !)
 - temperature

Benchmarking – long distance gas NO

- **Test runs so far thin**
 - Correlation between different models low
 - Can it be done with 17?
 - Data is poor
- **Methodological difficulties**
 - LD-gNO are quite different from each other
 - 13 regional, 4 transregional
 - The 4 transregional NO affect the network of the 13 regional
 - Path-dependent development
 - Quality
 - Option value to connect later
- **Next steps: CEER study?**

Yardstick competition

- **The BNetzA plans to introduce yardstick competition**
 - To start after the 2nd period
 - I.e. After 8 – 10 years all firms should be equally efficient
- **Yardstick competition**
 - Completely delinking revenue from own cost
- **What will yardstick competition look like? Two variations:**
 - 1) One X for all?
 - 2) Individual adjustment based on sector costs
 - Based on benchmarking
 - Adjustment of allowed revenue to sector efficiency?
 - Role of calibration?
 - Adjust sector average revenue to sector average cost

Four questions for debate

- **Is TOTEX benchmarking good or bad?**
 - **Is standardisation necessary and feasible?**
- **Where are we heading with regulation and benchmarking of electricity TSOs?**
- **How far are we with benchmarking of long distance gas NOs?**
- **Is yardstick competition good or bad?**

Thank You !

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