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From the Editor

On 30 May 2006, Germany's energy regulatory authority, the Federal Network Agency or Bundesnetzagentur (BNA), submitted to the German government a report on the introduction of incentive regulation. If the proposed regulatory scheme were transposed into a government ordinance by the end of 2006, the regulator could commission the data surveys and assessments in 2007 and incentive regulation could begin on 1 January 2008. The proposed regulation will have major repercussions for the business of Germany's 900 electricity and 700 gas network operators. The concepts underlying it should interest all regulated utilities.

—Graham Shuttleworth, Editor

Incentive Regulation For German Energy Network Operators

By Michael Kraus, *Special Consultant*

According to the Bundesnetzagentur or BNA, its latest proposal for regulating electricity and gas transmission and distribution network operators will provide incentives to improve their efficiency, and ensure that productivity increases achieved by companies will be passed through to network customers. This issue of the ERI examines the basis for these claims.

Proposed Method of Regulation

Under the proposed regime, BNA will cap the total revenues of the regulated network operator, rather than average prices or actual tariff components. The incentive scheme seeks to mimic a feature of competition—companies increasing their efficiency in any regulatory period can keep the efficiency gains. Customers benefit from such presumed efficiency gains under this methodology because the cap on revenues is adjusted (reduced) to reflect expected efficiency gains (or the efficiency gain observed for the comparable companies) resulting in lower costs in the form of lower network charges. This much will be familiar to regulated utilities in Europe and elsewhere.

The regulation of revenues starts with determining the level of initial costs, which are established on the basis of Germany's existing accounting rules. The BNA will set rates of return on equity for the electricity and gas industries for the whole regulatory period. In order to counter any strategic gaming by the network operators, data and accounting rules will be scrutinised in a specific regulatory review.



For the moment, at least, the BNA does not envisage applying price caps or revenue caps to all costs. Costs of system operation associated with the provision of balancing energy will be considered “non-controllable” and will be passed through to network users, as long as the networks incur these costs through competitive instruments in accordance with German legal requirements.

Efficiency Targets

The BNA will set revenues equal to actual (or at least approved actual) costs in the first year. Then the revenue cap will decline each year by a factor X_{gen} , representing a measure of the extent to which the energy industry in general exceeds the productivity of the whole economy, and a “stretch” factor X_{ind} , representing a measure of the extent to which an individual operator lags behind the maximum efficiency of the energy industry. The BNA has not set out in full how it will calculate X_{ind} .

The BNA suggests employing past trends in the Törnquist index of Total Factor Productivity (TFP) to set X_{gen} in the first regulatory period of incentive regulation. If implemented correctly, this is a method that has been accepted and is widely practised in the United States. Applying the Törnquist index, the BNA initially calculated an X_{gen} efficiency target of 2.54% p.a.

The BNA acknowledges that the data series used to calculate the highly disputed X_{gen} figure gives rise to criticism. Notably, the BNA admits that there are uncertainties about data resulting from German unification and because no separate data series exist for electricity and gas sectors. The BNA also acknowledges that these series cover more than merely network operations and include generation, wholesale and retail sales, storage, and other activities. The BNA's choice of data series used to represent input factors has also been heavily criticised. Because of these criticisms, but also

for “legal reasons”, the BNA concedes that X should take a value consistent with accepted international experience, in the range 1.5%-2.0% including both X_{gen} and a stretch factor (X_{ind}) of 0.56%.

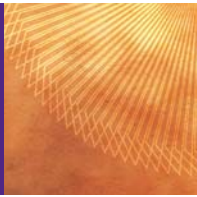
Different Methods for Future Regulatory Periods

The first regulatory period will be three years and the second period will last between three and five years. For the second period the BNA intends to use the Malmquist index of TFP for the determination of the X_{gen} , as data series from 2004 onwards will exist by then. The only purpose of switching from the Törnquist index to a Malmquist index is to take advantage of the ability to break down movements in a Malmquist index into (1) the rate of technical progress and (2) changes in a company's relative efficiency. However, it is not clear what the BNA will do with such information (which says nothing about the absolute or relative level of a company's efficiency).

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In the third regulatory period and thereafter, the BNA intends to use “yardstick regulation” along the lines proposed in the Netherlands for its next regulatory period. The BNA views this technique as the one that comes closest to full replication of competition, since it requires only one single X factor. In order to benefit fully from that technique, the BNA wishes to update cost and revenue figures more frequently, and so from that time on the yardstick regulatory periods will only last two years.

Selection of X Factors

When regulatory systems rely on benchmarking, one highly variable and controversial aspect is the period over which the company is expected to achieve the efficiency target. The German Energy Law stipulates that network operator efficiency targets need to be designed so that meeting the targets is “objectively feasible”, implying a gradual reduction in revenues. (In contrast, Germany’s Federal High Court has ruled in competition cases that unnecessary mark-ups must be transferred to

customers by cutting prices without any delay.) This requirement for objectivity is the reason why the BNA will apply a limited X factor in order to “stay on the safe side of the [Energy] Law”. It is interesting that the BNA regards an “objectively feasible” X factor as limited to the range 1.5%—2.0%, since it implies that higher values, as suggested at various times in other jurisdictions, would presumably fail this test.

In the first year of the first regulatory period, the BNA will adjust revenues so that each operator can recover only the costs applicable to its conditions and consistent with the *average* level of efficiency of all operators. (It is not clear how the BNA will know what costs are consistent with the average level of efficiency, taking into account every other possible difference between networks to ensure an objectively feasible outcome.)

Networks “must” then remove inefficiency (relative to the “efficient frontier”) in operational expenditure over the three years of the first regu-

latory period, whilst inefficiency in capital expenditure “must” be removed by the end of the second regulatory period, i.e. over a period of six to eight years.

It is not clear how the BNA will know where the efficient frontier lies (since the Malmquist index does not say) or what will happen if companies fail to reach this supposed frontier or surpass it. The BNA seems to anticipate using some statistical method to establish efficient frontiers and benchmarks, but acknowledges that the small number (four) of German electricity transmission network operators does not allow for a full and broad benchmarking of these networks. BNA wishes therefore to extend the benchmark pool internationally and refers to current studies by the CEER.

The BNA does intend to apply parametric and non-parametric benchmarking to gas transport companies, since there is a sufficiently large number of comparators (24). However, under the current

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German legislation those gas transmission network operators that qualify as supra-regional (i.e. those transmitting gas from a German border point or a German gas production field for delivery to domestic customers or to another German border point) can opt out of the cost-benchmarking regime, if they can prove that existing and potential pipelines provide sufficient competition in their market. Thirteen gas transport network companies have filed for this option.

Reviewing Investment

The BNA intends to use cost models, i.e. reference networks, that attempt to mimic investment on expanding and refurbishing networks. The network operators will have to submit investment budgets and will eventually be able to pick from menus of

possible investment budgets reviewed by the BNA. In order to create an incentive for efficient investment, which is a German legal requirement, these menus will offer each company a trade-off between variables, like Ofgem's Sliding Scale, so that each company will receive a larger share of any cost savings in return for submitting a lower initial forecast of capex.¹ The BNA has said that operators will receive higher returns on capital if they keep investment below their initial investment forecasts.

In order to overcome the disadvantages under revenue capping of not providing incentives to maximise the quality of service, the BNA proposes a "hybrid" regulation, i.e. regulating revenues and service quality. The BNA distinguishes among the services: security of supply, product quality,

service quality, and reliability of supply. The regulation scheme will reward operators who provide specific service quality levels for their customers.

Appraisal

Based on experience of attempts to regulate networks with benchmarking, I do not share the optimism of the BNA regarding statistical analysis as an alternative to individual cost reviews. The BNA describes benchmarking methodologies as "scientific", which overlooks the high degree of subjectivity inherent in the design and interpretation of a benchmarking methodology. By any objective standard, benchmarking will always fail to prove a company is inefficient or to measure its degree of inefficiency, because the specification of cost models is always

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Our work includes designing and conducting energy auctions and providing strategy and valuation advice on mergers and acquisitions, the financing of energy companies, and the financial restructuring of distressed companies.



incomplete and based on subjective choices. It is therefore incorrect to identify residual costs as inefficiency, as many commentators do, since the unexplained costs may just as easily be attributable to deficiencies in the model. It should be of concern to the BNA that benchmarking results do not in most cases prove to be robust.

Other European regulators have used “Data Envelopment Analysis” (DEA, which is based on the Malmquist index) to estimate the current level of productivity of specific firms (instead of providing more stable estimates of long-term productivity growth). However, the Malmquist index was not intended for this purpose and experience in those regulatory regimes shows that the DEA/Malmquist procedure is not objective. It relies on the subjective or arbitrary choice of method (between different DEA models and different forms of analysis) and interpretation of results (assuming residual costs are due to inefficiency). Therefore, experience contradicts the impression given by the BNA report; the DEA/Malmquist procedure is by no means a conventional, necessary, reliable, or proven method of regulation.

This misunderstanding lies behind the BNA’s belief that the use of multiple methods will improve the quality of

the benchmark. BNA refers to Austria where the regulator used two different DEA models and an alternative known as Modified Ordinary Least Squares (MOLS).² This reference does not recognise the subjective choices made by the Austrian regulator when calculating a single, integrated result. Because of the arbitrary weighting of the different results, the regulator was heavily criticised and forced to make significant concessions.

The BNA acknowledges that on the electric side a pool of four TSOs is inadequate for parametric or non-parametric benchmarking methods. However, the supra-regional gas transport operators will be regulated under a different regime of revenue-benchmarking, leaving only about a dozen or so operators to form a homogeneous pool for the incentive scheme. This small number would present the regulator with a problem of critical pool size in the gas industry as well.

Finally, as discussed in Shuttleworth (2005), Ofgem’s implementation of the Sliding Scale did not avoid the need to review individual companies’ investment plans. The BNA’s proposal of negotiating, approving, and guaranteeing individual TSO investment plans and budgets

contrasts with the regulator’s stated philosophy of “regulation by methods” rather than by micro-management. However, such individual scrutiny is probably inevitable.

Conclusion

In the past, Germany’s regulation of the electricity and gas industry placed heavy reliance on scrutiny by the courts, rather than on *ex ante* sector-specific rules.³ In most instances, traders and retailers had to take the utilities to court over issues of network access and charges.

The newly instituted energy regulator therefore created high hopes that new rules would not only improve network efficiency but also provide a level playing field in energy markets. The regulatory methods now proposed by the BNA are unlikely to meet these objectives without provoking economic and legal challenges. The fierce reactions to the new regulations by Germany’s powerful municipalities (which own many utilities) point to court disputes continuing in the future—only this time it will be the utilities taking the regulator to court.



Notes

- 1 For a brief explanation of the Ofgem's Sliding Scale, see G. Shuttleworth (2005), Using Incentives to Inform regulatory Decisions, *NERA Energy Regulation Insight* No. 24, July 2005.
- 2 Faced with the accusation that their benchmarking results are not robust, several regulators have sought to defend their decisions by carrying out a variety of benchmarking analyses using different model specifications and methods. In some cases, different methods give different results, but even if the results are similar, they do not overcome the accusation that all the analyses omit at least one important factor that might explain the residual cost differences.
- 3 Until recently Germany was the only EU member state without an energy regulatory authority.

Contributors

Michael Kraus, Special Consultant Berlin: +49 69 710 447 500

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