

International Benchmarking of Electricity Transmission by Regulators: Theory and Practice

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This paper discusses the use of international benchmarking, including the use of frontier efficiency techniques (such as data envelopment analysis and stochastic frontier analysis), of electricity transmission by regulators. We attempt to draw attention to the methodological issues around benchmarking transmission and to suggest what we can learn from previous studies. We also make use of a survey of 48 national electricity regulators to contrast the lessons from the literature with the actual experience and practice of energy regulators with benchmarking. A key aim of the paper is to suggest where transmission benchmarking within regulation should be heading in the future.

On benchmarking electricity transmission we draw the following conclusions.

We need to think about the purpose of regulation in order to consider what best practice in regulatory benchmarking looks like. Benchmarking has a key role in sharing the benefits of efficiency improvements with consumers.

Relative to electricity distribution, electricity transmission systems are much more difficult to benchmark consistently and in a way that regulators can defend to their stakeholders in the industry and in government. Our survey of regulators indicates that they are aware that electricity transmission benchmarking is significantly more challenging than benchmarking distribution. A significant number of regulators also

think that transmission benchmarking is not getting any easier. Fundamentally, this is because transmission companies are much more idiosyncratic entities than distribution companies, particularly when transmission must be compared internationally.

As a result, there have been few academic studies of transmission benchmarking and regulators are reluctant to use frontier efficiency techniques - such as data envelopment analysis (DEA) and stochastic frontier analysis (SFA) - to benchmark their transmission utilities. The data requirements to sensibly benchmark transmission are significant and sophisticated benchmarking methods are required. New panel data techniques aimed at dealing with unobserved heterogeneity and the validity of the comparator group look intellectually promising but are in their infancy for regulatory purposes.

The choice of variables used in benchmarking affects the results of any benchmarking exercise. In electricity transmission choosing variables is particularly difficult, because of the large number of potential variables to choose from. Variables are often arbitrarily chosen and combined, while the degree of control the company has over them may be limited. Efficiency scores arising from transmission benchmarking need to be carefully translated back into regulated revenue allowances in order to avoid appropriation of normal returns to investments which have been previously approved by the regulator. Failure to apply benchmarking appropriately may negatively affect investors' willingness to invest in the future.

Our survey suggests that regulators make relatively little use of frontier efficiency techniques for benchmarking electricity transmission and are interested in new approaches to regulation (though many see these approaches as some way from being implemented). It also suggests that regulators need to pay attention to the potential for regulatory risk implicit in the use of transmission benchmarking. While few acknowledge that regulatory risk is currently an issue in transmission benchmarking, many more concede it might be. If benchmarking induces uncertainty

as to whether large transmission investment programmes will be adequately remunerated this will significantly raise the capital cost of financing new investments and could be counterproductive.

Overall, we think that the reliance of regulators on benchmarking seems set to decline. Future networks will be even more bespoke and idiosyncratic than now, making the high level comparisons used by regulators today even less meaningful. New regulatory approaches – such as those based on tendering, negotiated settlements, a wider range of outputs or longer term grid planning - are emerging and will necessarily involve a reduced role for benchmarking. New approaches will be necessary if the ambitious European plans for transmission network expansion over the next ten years are to be, even partially, realised.

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