Measuring Supply Security in Electricity Markets

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Plant margins are often used as high-level indicators of the level of generation supply security. However, in dynamic markets, where the generation mix is evolving and there are changes in the operation of the underlying input fuel markets, this simplistic indicator may become less relevant as an indicator of electricity supply security. We present recent research undertaken by Oxera to construct a probabilistic security of supply metric that captures the impact of these changes on the average and marginal reliability of the system and illustrates how security levels differ when the same plant margin is provided by alternative generation mixes.

The physical security metric can be used to assess the incremental impact on reliability of new investment in alternative generation technologies, demand reduction policies or resilience in the fuel delivery system. Several examples of this are shown and an economic assessment of the efficiency of new investment is undertaken through the application of the value of lost load to the physical security improvement. This technique can provide insights into the optimal investment choices and the efficient level of supply security relative to that provided by the market.