

THE DEATH OF EUROPE'S LIBERALIZED POWER MARKET?

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THE LIBERALIZATION OF EUROPE'S wholesale electricity market—conceived with the objectives of increased industry efficiency, greater price stability, heightened competition, and enhanced security of supply—is a bold ambition and one that remains very much a work in progress.

Yet there are growing signs that the vision could be rendered moot before it is fully actualized. Indeed, Europe's power market appears to be on a course in which *more* government intervention, not less, is the next *trend du jour*.

Such a development is by no means guaranteed—the market's near- to intermediate-term evolution could take a number of different paths. Yet there are sufficient grounds on which to consider a turn away from liberalization possible, and stakeholders would be wise to consider the potential implications. For many of these stakeholders, the implications stand to be profound.

Understanding Europe's Power Market Today

Similar to other commodities markets, Europe's wholesale power market is structured as a merchant market—one that is guided by market forces. Competition among different means of production is based on the marginal costs of generating power. Investment decisions are market based, often leading to boom-and-bust cycles.

Power is unique in several key respects from other commodities, however. First and foremost, it cannot be stored in large volumes at competitive prices. Demand for electricity is also highly variable—by day, time of day, and season—and not all power plants are equipped to produce commensurately varying supply. The supply curve for electricity is also very steep, meaning that the marginal costs of producing electricity vary considerably among power plants. (The marginal cost of producing power from an open-cycle gas-turbine plant is more than six times greater than that of baseload nuclear

power, for example.) New conventional generation capacity also typically enters the market at “the right half” (that is, the more expensive side) of the supply curve, meaning that it is not dispatched as often as established power plants, thus making it a less attractive investment. Finally, given the fact that electricity is an essential commodity, it is highly politicized, and investors face the risk of political intervention and changing rules of the game.

Notwithstanding these characteristics, Europe’s wholesale power market has functioned relatively well thus far as a commodity market. The timing of the market’s launch—in the late 1990s, a period of overcapacity—has undoubtedly helped. Having a head start of surplus generation capacity has allowed the market to meet growth in electricity demand with relatively limited need for new investment. It has also helped the power market absorb the retirement of uneconomical aging and polluting power plants and generally muted the impact of electricity’s peculiarities on the market’s ability to function as a merchant market.

Growing Signs of Change

Since the end of the past decade, however, there have been increasing signs that the electricity market’s relative stasis might be nearing an end. The market is being gradually reshaped by Europe’s rapidly expanding emphasis on renewable energy sources—especially intermittent ones, such as wind and solar photovoltaic energy. While this new capacity has allowed the power market to continue functioning and postponed the need for the development of additional conventional capacity, the growing prevalence of renewable energy sources in the power system fundamentally changes the role and underlying economics of conventional plants.

Intermittent renewable energy sources, which generate unreliable supply, enjoy “must-run” status in Europe’s power scheme, with the power they produce often supplanting power provided by conventional power plants. As a result, many conven-

tional plants are no longer the primary providers of baseload power. Rather, they increasingly serve as flexible providers of backup power to ensure that demand is met during periods when generation from sun and wind is insufficient.

For conventional power plants, then, the increasing presence of intermittent renewables means both reduced hours of operation and higher operating and maintenance costs due to the demands of greater operating flexibility. It also means lower power prices, on average, for the market as a whole—because wind and solar power, which make up an increasing percentage of overall electricity supply, push the cheapest conventional power plants further to the periphery of Europe’s merit-order system (which determines the order in which available sources of energy are brought online based on their marginal costs of production). This downward pressure on conventional plants’ finances is exacerbated by the growth of decentralized power generation and the resulting rise in cogeneration of heat and power. Hence Europe’s conventional power producers are being buffeted from all sides. The combination of factors working against them has even led to instances of so-called negative energy prices—meaning that these companies, which are unable to easily shut down and restart their operations in the face of surging wind and/or solar supply, have chosen to temporarily pay buyers to take the electricity they produce so that they could continue running.

And the plot thickens. Demand for conventional generation capacity has been relatively stable, or even fallen, during Europe’s aggressive buildup of renewable energy sources (which began in the middle of the past decade and continues today), owing to surplus generation capacity heading into the period and the effects of the economic downturn, which began in 2008. But, as Europe’s economy recovers, an expected uptick in electricity demand is likely to quickly push the market to the point at which an increase in conventional capacity will be needed in order to main-

tain security of supply. Many conventional power plants, however, have been (or are being) decommissioned, owing either to the plants' unattractive economics or to an uncertain regulatory backdrop. And private investors will likely be reluctant to invest in new conventional capacity in this climate—the power market is far from offering the combination of low risk and stable return that the sector's investors have typically sought.

In short, Europe's power market has the ingredients for a perfect storm. The need for new conventional generation capacity is increasing and will continue to increase. We calculate that, due to the combination of growth in demand and the retirement of existing plants, Europe will need at least an additional 25 gigawatts of new conventional capacity by 2020 and as much as 250 gigawatts or even 300 gigawatts in additional new conventional capacity by 2030. But the appetite of investors to fund the development of that new capacity is falling. Over the coming years, this dynamic will pose a genuine threat to the security of Europe's electricity supply—and it suggests that remedial government intervention is all but guaranteed.

Turning Back the Clock on Liberalization?

Government authorities have already, in fact, begun to reinsert themselves into the power market, taking several steps to ensure that there is sufficient conventional capacity. In Germany, for example, authorities have passed regulations prohibiting, or making it more difficult for, owners of conventional nonnuclear plants to retire them. Effective in 2013, operators of conventional power plants must notify authorities a year in advance if they plan to shut down installations; if regulators declare a plant "system relevant," they can force the operator to keep the plant open for another five years. During this five-year period, the plant would remain under the control of the regulator, who would reimburse the plant operator for the cost of keeping the plant in operating condition and for operating the plant.

And government efforts to support conventional power generation are likely to increase. The European Commission, for example, is studying the launch of a so-called capacity market, in which the *capacity to produce electricity*, rather than electricity itself, is traded. Other government-driven or government-backed mechanisms that support conventional generation could emerge or become more prevalent as well. One example is power purchase agreements (PPAs), in which governments commit to buying all of the power generated by a new conventional plant at a predetermined price for a fixed period of time (typically 5 to 20 years); such agreements are under consideration in the U.K. and are currently in place in parts of the U.S. (See the sidebar "Europe Is Not Alone.") Other possibilities include the transfer of ownership and management of some conventional generation capacity to transmission system operators and an *ex-post* guarantee mechanism, in which investors in conventional generation capacity are guaranteed specific returns for a given amount of time and compensated at the end of the period if the actual returns fall short. (The latter idea is currently being considered by the Belgian government.)

In theory, a more activist policy from authorities would not necessarily mean the end of the liberalized electricity market, assuming investors are treated fairly and the intervention is conducted in a predictable manner over the long term. In practice, however, such a shift in governments' stance would likely spell the potentially rapid collapse of the liberalized market by hastening the day in which only state-guaranteed investments remain.

Planning for the Probable

How heavy a hand authorities choose to take (the current negative sentiment among consumers and media toward conventional power producers raises the odds of a relatively aggressive stance) and the ultimate fate of the merchant power market remain to be seen. But given the apparently increasing odds of a retreat

EUROPE IS NOT ALONE

The U.S., too, faces challenges in ensuring sufficient conventional generation capacity. The country has a range of market structures—from energy-only markets, such as the Electric Reliability Council of Texas (ERCOT), to capacity markets, such as the East Coast regional transmission organization PJM. None of these, however, is sending sufficient price signals to encourage needed new development.

Moreover, state governments are already intervening in the power markets. Both Maryland and New Jersey have circumvented PJM's rules and issued and awarded long-term PPAs for new plants at prices well above current market prices. These actions make an already complicated market structure even more complex, and PJM is sorting through the implications. The situation also sends an obvious signal to prospective developers that PJM's capacity-market prices are not the "real" new-build-price signal. What should the system operator do? Issue its own requests for proposals for PPAs? Modify the capacity markets?

Many in the U.S. are also beginning to ask questions about the long-term viability of deregulated power markets as currently configured. The inherent

challenge is that in capital-intensive, high-fixed-cost commodity businesses such as power, the vast majority of profit is made during the few peak hours. ERCOT, for one, is attempting to compensate by increasing its price caps, but even this effort might be inadequate. And other markets have demonstrated that authorities are not willing to let prices rise quickly or to the levels needed to induce new development. Hence a developer is faced with a "heads I win, tails you lose" dilemma. In periods of oversupply, prices will approach marginal cash costs, leaving the developer barely able to service debt. When prices climb sharply, however, the developer faces the prospect of government intervention or government-backed PPAs that ensure chronic oversupply.

This is a real dilemma for power producers. Some downstream utilities are even using the situation as an opportunity to look for chances to reenter the generation arena, and they are justifying such investments on the basis of supply risk as well as a clear cost-of-capital advantage.

The U.S. market, like Europe's, is thus in a period of transition—one whose outcome is uncertain.

from liberalization, stakeholders would do well to think through its potential consequences for their interests. Conventional power producers, especially, should ask themselves the following questions:

- How might the market's design and function change? How abruptly might the rules of the game be rewritten? Which of the possible outcomes seems most likely? What are the chances that a PPA-like market (an approach that was abandoned in Eastern Europe after those countries gained admission into the European Union) will re-emerge?
- How vulnerable is our business to changes in the market? What preparatory and/or defensive actions (for example, a refocusing of investments or an intensification of efforts to make our conventional plants more flexible) should we take today?
- How should we engage with authorities as they ponder how to reshape the market? How should we align incentives among our various stakeholders?
- Which activities and market segments should we focus on in order to be successful in the new environment?

Should we prepare for a fundamental transformation of the utility industry's structure (one in which, for example, self-generation of power is increasingly prevalent among consumers)?

- Based on the answers to these questions, what should our shareholder structure and capital markets focus look like?

Authorities, for their part, should develop a clear view of how they see their role in the market. They should also define their targeted end-state and the steps they propose taking to reach it. Questions that authorities should ask themselves include the following:

- Are we confident that a liberalized market structure can ensure a secure supply of electricity?
- If so, what can we do to reshape the market and foster confidence among private investors?

- If not, what degree of state intervention is optimal? How is intervention likely to work in practice? What is the potential for unintended consequences, and how can we mitigate the risk?
- How heavily should the potential impact of our actions on other European power markets weigh on our decision making? Should we request that neighboring governments consult with us before intervening in their own markets? Would intervention risk turning back the clock on market integration?
- To what degree should we consider broader industrial and environmental policy in our decisions? How can we ensure the competitiveness of our industry (especially in light of the shale gas revolution taking place in the U.S. and that country's resulting glut of cheap gas and cheap coal)? What impact might our actions, if implemented, have on costs, environmental objectives, and security of supply?

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