THE EUROPEAN POWER SECTOR
ONLY THE NIMBLE WILL THRIVE

By Iván Martén and Andrew Mack

The European energy markets are undergoing structural changes that will permanently transform the power-generation and power-retail landscape. After more than 20 years of relative stability, the markets are being reshaped by three main forces:

- Large, long-lasting reductions in the demand for power
- Rising unit costs
- The emergence of economically viable alternatives to centralized power generation and distribution

In recent years, power demand has fallen significantly in many of the major European countries. For example, electricity demand fell by 7.5 percent in the U.K. from 2007 through 2012, according to National Grid. (See Exhibit 1.) Across the EU-27 countries, total electricity demand fell by 1.7 percent from 2007 through 2011 (the most recent year for which EU-27 data are available), according to Eurelectric.

The primary cause of the fall in demand was the global credit crisis and the ensuing European sovereign-debt crisis. Although the worst is now over for most countries, power demand may remain below precrisis levels for many years to come. For example, 2020 electricity consumption in the U.K. and Germany is expected to be below 2012 levels by 0.2 percent and 0.6 percent, respectively, according to Eurelectric. Economic growth, the main driver of demand, is weak; the European Commission forecasts growth of only 0.1 percent for the Eurozone in 2013.

The falloff in electric-power demand has coincided with an increase in renewable-energy capacity across Europe. Wind power capacity grew from 56 gigawatts (GW) at the end of 2007 to well over 100 GW by the end of 2012, according to the European Wind Energy Association (EWEA). Solar-photovoltaic (PV) capacity grew from 5 GW to approximately 70 GW over that time period, the European Photovoltaic Industry Association (EPIA) reported.
The decrease in demand coupled with the significant increase in installed capacity has resulted in excess capacity in several countries, affecting the traditional supply-demand balance and wholesale-power-market dynamics. At the same time, this new capacity does not fully contribute to an increase in the security of the supply given the intermittent nature of wind and solar power.

In parallel, unit energy costs have continued to rise, driven by multiple factors that vary by market. The following are the six major drivers:

- The share of higher-cost renewable-energy sources has grown as countries have continued to work to meet their 2020 EU renewable-energy targets. In Germany, the renewable-energy charge for domestic customers was increased from €3.6 cents to €5.3 cents per kilowatt-hour in January 2013. This tax now accounts for more than 20 percent of the typical customer’s energy bill.1
- The prices of basic energy commodities, such as oil and coal, have remained persistently high despite the global economic crisis. (See Exhibit 2.)
- Additional investments in grid infrastructure—for example, to accommodate new sources of supply or to increase levels of interconnection between markets—are also driving cost increases. For example, the EU’s renewable-energy directive, published in 2009, requires member states to provide either priority or guaranteed access to the grid for electricity produced from renewable sources and to develop grid infrastructure, intelligent networks, and storage facilities in order to secure the operation of the electricity system.
- Environmental regulations are ever more stringent. The EU’s Large Combustion Plant Directive requires coal power stations to retrofit emissions-reducing technology or cease operations, for instance.
- There is a general need to replace aging European infrastructure. For example, 24 GW of U.K. coal-fired generation—nearly 30 percent of the total U.K. generating capacity—was built between 40 and 50 years ago.

Rising Energy Costs: The New Normal?

Exhibit 1 | Over the Past Six Years, Power Demand Has Fallen in Many European Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Electricity consumption: change from 2007 through 2012 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.K.</td>
<td>-7.5</td>
</tr>
<tr>
<td>Italy</td>
<td>-4.3</td>
</tr>
<tr>
<td>Spain</td>
<td>-3.4</td>
</tr>
<tr>
<td>Germany</td>
<td>-3.2</td>
</tr>
<tr>
<td>France</td>
<td>1.9</td>
</tr>
</tbody>
</table>

Source: BCG analysis.

(See Exhibit 2.)
• New safety requirements for existing nuclear-power plants, the likely decommissioning of a significant share of Europe’s installed nuclear-power capacity, and enhanced safety for the next generation of nuclear-power plants may also contribute to rising costs. Both the Flamanville and Olkiluoto plants (located in France and Finland, respectively) are expected to cost well over twice what was forecasted at the start of construction, with a combined cost overrun of €9 billion.2

Emerging and relatively inexpensive shale gas has been suggested as the solution to Europe’s rising-energy-cost problem. However, shale gas has had no direct impact on European gas prices to date: Europe does not yet have a significant hydraulic fracturing, or “fracking,” industry, and there are significant doubts about the environmental feasibility of large-scale shale-gas production in Europe. Moreover, factor costs such as land rights are likely to make shale gas production in Europe much more expensive than it is in the U.S.

The biggest opportunity for less expensive energy may come if and when new gas contracts that delink gas prices from oil prices are negotiated. However, given the economic implications of lower export prices for gas-producing nations, European natural-gas importers would face many rounds of tough negotiations with their trading partners.

At the same time that demand is falling and costs are rising, new energy options are emerging that allow consumers to partially or completely disintermediate the traditional value-chain players. Cost reductions in solar PV mean that distributed generation and self-consumption are now more attractive economically for some consumers—for example, residential customers in parts of Italy have been able to save on energy costs as a result of this new source. New demand-response technologies such as Voltalis’s BluePod are winning tens of thousands of customers.3 Smarter control systems are enabling businesses to reshape their power demand, saving money on consumption and ancillary items such as grid fees.

The Energy Landscape: Permanently Transformed

The net result of these changes will be a permanent transformation of the energy landscape.
landscape. This new landscape will be more complex, more volatile, and more fragile. It will raise costs for consumers and increase risk levels for power companies.

- **Complexity will increase at all levels of the energy landscape.** At the grid level, the local, national, and regional power grids will be more interconnected and the distinction between generation and consumption nodes will begin to blur. At the generation level, enhanced safety requirements for new nuclear will require a new generation of advanced control systems. Operational procedures on power plants will be more complex, given the disruptive changes in wholesale markets.

- **Volatility in power prices will continue to increase, as power flows become less predictable and the share of low- or zero-marginal-cost power increases.** The rapid deployment of wind and solar PV is already having an impact on the operating patterns of conventional plants. As reported by the EPIA, Italy installed approximately 5 GW of wind and solar PV in 2012, and Germany installed approximately 10 GW of wind and solar PV (equivalent to half of the total nuclear generation capacity in Germany). With the concurrent increase in distributed generation, a growing share of power generation will bypass wholesale energy markets altogether, creating greater volatility in the residual wholesale market.

- **Fragility will increase, as policies used to guide investments are changed with greater frequency.** Political pressure on power prices—and scrutiny of power companies’ profit margins—is likely to increase. Subsidy regimes are already increasingly uncertain: the Netherlands cut targets for renewable energy and reduced subsidies for wind and solar PV in 2011, Spain introduced a moratorium on new-build renewables in 2012, and the U.K. will reduce subsidies for onshore wind in 2013, with the possibility of another reduction in 2014. At the same time, governments are considering further interventions in electricity markets in order to spur development of backup capacity and energy storage.

- **This new landscape will be more costly for consumers.** Most market participants expect a significant increase in electricity and gas prices by 2020. In Germany, the Deutsche Energie-Agentur expects residential electricity prices to rise by 20 percent over the 2012–2020 period. In 2013 alone, prices will increase by 7 percent, principally as a consequence of the need to fund solar PV subsidies.

- **The landscape will be more risky for power companies.** The creditworthiness of thermal generators is already being negatively impacted by low- or zero-marginal-cost renewables. According to Moody’s, “What were once considered stable companies have seen their business models severely disrupted and we expect steadily rising levels of renewable energy output to further affect European utilities’ creditworthiness.” Although start-ups may thrive in an environment that opens opportunities for attractive niches, the traditional utility shareholder promise—stable returns with limited risk—is in jeopardy.

While the rate of change has so far been gradual, we expect it to accelerate as other market participants react to these changes in the landscape.

Several national governments are accelerating energy-efficiency measures as a way to offset rising unit costs for power while also reducing carbon emissions. Germany plans to increase its efforts to provide free energy-saving advice to low-income households. U.K. politicians are introducing new energy-efficiency policies in an effort to reduce levels of “fuel poverty”—the condition in which people who spend more than 10 percent of their income on fuel live. The number of U.K. households in fuel poverty rose from 2 million in 2004 to nearly 5 million in 2010, according to the U.K. Department of Energy & Climate Change.
Consumers are also changing their behavior, in some cases producing their own energy and becoming “prosumers.” For example, Ikea is developing a portfolio of clean-energy generation to supply all its stores with low-carbon, fixed-price electricity, and GlaxoSmithKline is investing in technologies such as wind and tidal power to serve some of its manufacturing sites.

Public- and private-grid operators are not standing still. Those with regions that border on the North Sea have come together to investigate the merits of an offshore-grid network, and new interconnections are already planned between Germany, Denmark, the U.K., and Norway. Better land-based interconnections between Germany and its neighbors have already contributed to a significant drop in prices in Germany’s balancing market. Smart meters and smart grids are being rolled out in several countries, with the aim of managing supply-and-demand patterns at the local grid level.

Adaptability: The Imperative

Given the many challenges that European power companies will face in the coming years, how can they best prepare to compete and thrive in this changing landscape?

At the core of any plan of action is a sound strategic outlook, built on a range of possible scenarios rather than a single view of the future. Companies need to recognize that, given the nature of the changes in the European power landscape, awaiting a return to past patterns is not an option. Companies’ plans should also integrate potential “black swan” events that could further accelerate change, such as a major nuclear incident or a regional grid failure. Energy companies can also learn from other industries that have experienced similar levels of change, such as banking, telecommunications, and media.

With the uncertainties inherent in the future energy landscape and the growing importance of being nimble, companies must enhance their ability to adapt. There are three ways to do this:

- **Increase organizational flexibility.** For power retailers, this means becoming more nimble and adaptable to changes in customer needs and behaviors. This can be achieved by simplifying retail operations to increase the focus on the customer while reducing cost. For generators, this should include moving toward an asset-light business model for both new and existing generation, finding ways to increase efficiency in new large-capital projects, and identifying ways to increase flexibility in power-plant and grid operations. For example, E.ON launched its “2.0” program in 2011 with three objectives: reduce cost by €1.5 billion to increase investment flexibility, simplify the organization structure for faster decision-making, and put the operating business at the center by reducing administrative functions to the “absolute minimum.”

- **Build active hedges and create option value.** This can be achieved by creating a more balanced mix of generation technologies and retail markets, by selectively participating in the value chain, or by deepening understanding of consumer behavior and using this knowledge to design new products and services. Where larger investments are involved, companies should use partnerships or joint ventures to share risks with other market participants. One player that has achieved this is Dong Energy, Denmark’s largest electricity generator, which has led the offshore-wind market in bringing diverse partners and third-party investors into its projects. Investors have included Lego parent company Kirkbi (which made a €400 million investment) and Japanese trading house Marubeni (a €240 million investment).

- **Reconfigure existing portfolios.** Companies should reassess the scope of their operations, decapitalizing select assets,
exiting unattractive businesses, and carefully entering profitable new markets or value chain segments. Unsuccessful new ventures should be allowed to fail quickly and at low cost. Mitie, a major player in the U.K. energy-services market, takes a controlling stake in start-up businesses. The start-up’s management team invests the remainder and after five years has the option to sell the balance of the business to Mitie.

In addition to increasing their adaptability, companies may need to review their corporate structures in order to bridge the risk-return gap. Among the options that should be considered are mergers and acquisitions, joint ventures, and divestments. More radical options such as separating “good” businesses from “poor” businesses may even be necessary to renew investor confidence, as has been the case for some of the banks hardest hit by the global credit crisis.

The European power-generation and power-retail landscape is being fundamentally reshaped as demand falls, costs rise, and new energy options emerge. The result of these changes will be an energy landscape that is more complex, volatile, and fragile in the medium term, one where consumers will face higher costs and energy companies will face higher risks. Power companies that recognize this and reshape their business models to become more adaptable are likely to not only survive but thrive.

NOTES
3. Voltalis’s BluePods are installed in homes and allow Voltalis to turn off electric heating for 15-minute intervals at times of peak demand. The energy saved is then resold by Voltalis into the electricity market. Voltalis was launched in 2006 and reported 50,000 customers in France by the end of 2011, according to its website.