The United Nations' 21st Conference of the Parties, held in December 2015 in Paris, has been heralded as a watershed moment in the campaign against global warming.
Nearly 200 countries agreed to seek to hold the global temperature increase to less than 2°C above pre-industrial temperatures by 2100, and they committed their best efforts to limiting the rise to 1.5°C. Buy-in to the agreement from China, the US, the European Union, India, and Russia, which collectively account for about two-thirds of global greenhouse gas emissions, has generated much optimism.
While it remains to be seen to what extent COP21 ultimately delivers on its objectives, the deal could be a net positive for many of Europe's power producers over the long term. After 2020, emissions reductions will have an increasingly tangible impact, if COP21's participating countries honor their commitments, and the EU's Emissions Trading System will have entered a new phase with a lower emissions threshold. As a result, European carbon prices (the fee that emitters of carbon dioxide pay per metric ton through ETS or national tax regimes) will likely rise. Higher carbon prices, in turn, would lead to higher average electricity prices, boosting many power producers' cash flows. And higher carbon and electricity prices would increase the economic attractiveness of renewable energy sources, potentially creating lucrative business opportunities for many producers.
For many of Europe's power producers, COP21 could thus be a favorable development. But they must make the right strategic moves to fully capture the upside.
Higher Carbon Prices
Power and heat generation accounts for more than a third of the world's greenhouse gas emissions. According to 2013 data from the International Energy Agency, emissions from the EU's power sector represent 6% to 10% of that amount
Europe has long been at the forefront of efforts to tackle climate change. The EU's ETS, launched in 2005, was the first large greenhouse-gas-emissions trading scheme and remains the largest. Its deployment has contributed to measurable reductions in emissions. But those have come at the expense of some segments of European industry, especially energy- and emissions-intensive ones that are subject to the EU ETS and compete internationally. These companies have been saddled with the direct costs of their emissions and with relatively high electricity prices—Europe's industrial electricity prices are twice those in the US and China—resulting in a significant competitive disadvantage.
The cost burden is particularly great for companies in the steel, aluminum, cement, paper, and chemical industries, in which energy can account for as much as 40% of operating costs. European policymakers' concerns about further damaging Europe's industrial

competitiveness have made them reluctant to take aggressive measures to support higher carbon prices despite their desire to continue to reduce emissions.

COP21 greatly levels the playing field for Europe. Given that the governments of all large economies have committed to tackling carbon emissions, the relative toll on European industry will decrease considerably. This will give European policymakers more latitude to boost carbon prices further.

Higher CO_2 prices—or even just their increased likelihood—would fundamentally change the economics of power production in Europe.

A Changed Power Market

Steeper CO_2 prices would have a significant, multifaceted impact on Europe's power market. In particular, the rise in generation costs for fossil-fuel-fired plants would translate into higher electricity prices. On the basis of BCG's Power Generation Model, which uses bottom-up data to provide a holistic view of the market's development, we estimate that an increase of €10 in CO_2 prices would result in an increase of €5 to €10 per megawatt-hours in average electricity prices. And that increase would be accompanied by greater price volatility: in times of abundant renewable generation, Europe's electricity prices would be low, when fossil-fuel-based generation sets prices, they would be high.

Simultaneously, some plants with particularly high carbon emissions would likely be shut down because of their ballooning costs, and the resulting reduction in supply would put additional upward pressure on power prices. Five of the UK's remaining ten coal plants, for example, are scheduled to be shut down in 2016 and 2017, and the government plans to close the rest by 2025. Ultimately, we expect that if carbon prices increase, average electricity prices in Europe could rise to €50 to €60 per MWh after 2020—50% to 100% higher than their current level.

Higher carbon and electricity prices, in turn, would accelerate the adoption of renewable energy sources, such as wind and solar. They would also likely boost the business case for distributed rather than centralized generation. As a result of higher revenues from renewable generation and the lower investment costs it involves as technology advances, renewables would require less government subsidization. According to a 2014 EU report, the EU spent approximately €40 billion in support of renewables in 2012; Germany, Spain, and France accounted for about 35%, 20%, and 10% of that amount, respectively.

Higher electricity prices could, however, work to the disadvantage of several green technologies that rely on electricity—in particular, electric cars and small-scale electricity-based heating solutions, such as heat pumps. If broadly adopted, these technologies could substantially reduce emissions and help manage load fluctuations. To shield them from the

effects of higher power prices, policymakers could move toward broader or more aggressive taxation of competing fossil-fuel-based technologies. Policymakers are already discussing extending carbon taxation to small-scale, gas-based heating and tightening emissions standards for new gasoline-fueled cars. Such actions would not only encourage the adoption of green technologies but also increase demand for electricity and boost the fortunes of low-carbon-emitting power producers.

Finally, higher carbon prices would be a boon for the gas turbine plants that survive the next few years. Those plants' utilization rates would increase as their economics improve relative to those of carbon-heavy coal plants: our analysis shows that gas power plants have lower marginal costs than coal plants and thus replace coal plants in Europe's power generation merit order starting at a carbon price of about €15. The precise value will be determined by the relative prices of gas and coal and plants' power-producing efficiencies. Gas plants would also benefit from the greater need to balance the electricity system that results from the rising percentage of intermittent renewable sources in the system's generation mix.

These factors would improve the fortunes of many European power producers. In particular, higher electricity prices and potentially higher electricity demand would increase their cash flow. BCG's Power Generation Model indicates that German power plants, for example, would double their cash flows, to more than €7 billion, if CO2 prices reached €20.

Strategic Decisions for European Power Producers

Power producers' windfall would not be shared equally, however. Much hinges on the types of generation that producers employ. Utilities with a large proportion of coal-based production, for example, would struggle; nuclear plants and renewable generation, in contrast, would shine. Natural gas plants, if they survive, would be in a better position than they are.

Business opportunities would also emerge. Players that embrace new technologies, such as distributed generation, better or faster than their competitors stand to do particularly well. Ultimately, we see three high-level strategic courses that could be profitable for power producers in this environment:

Move toward renewable distributed generation. This requires new capabilities, such as the ability to build and operate many small generation units instead of a few large ones and to install, maintain, and operate such units. It also calls on enhanced risk- and portfolio-management capabilities to compensate for the more volatile production profile that this strategy entails, as well as an increased focus on new technologies that steer demand and store electricity.

Invest in low-carbon-emitting centralized generation units. Examples include nuclear plants and hydroelectric plants. This route requires deep pockets for investment, top-notch capabilities in the management of large capital expenditures, and the skills to manage relevant authorities and public opinion.
Extract maximal value from disadvantaged assets. It’s possible to wring value from assets such as coal plants and older gas-fueled units through cost cutting, greater production flexibility, and increased commercial acumen. This strategy works well for players that are ready to take on more risk and believe that there is a sufficiently attractive market or regulatory environment for peak production or ancillary services.
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