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Research:

Weather Derivatives Give European Energy Utilities a Sunnier Outlook

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The development of the weather derivatives market could have a positive impact on European energy utilities, and it has the potential to grow significantly once it gains wide acceptance in the sector. The use of weather derivatives could provide more predictable cash flows and mitigate demand and price volatility risks facing a utility managing its operations. The benefits of reduced revenue volatility could be positive for a utility's business profile and therefore its credit quality, because the derivative would provide a hedge that is not available through vertical integration of generation and supply.

Weather derivatives can provide utilities with protection from many of the variables in the energy market, not least by hedging some of the risks of generation. The weather has considerable effect on all energy utilities' output. Where there is significant use of air conditioning, both cold and hot weather require the provision of more power than when temperatures are mild. Based on historical data, "normal" demand can be predicted accurately. Extremes of weather and rapid climatic changes, however, can create demand volatility, thereby producing price spikes. Energy production therefore involves the risk of both under and overproduction, whereby the "wrong" weather causes the energy market to be over or undersupplied and prices either to fall or rise.

Vertical Integration Provides Limited Comfort

Integrated utilities, which both generate and supply power, can hedge this risk to some extent by only producing power that is very likely to be sold, but the protection afforded by this precaution is very limited. Utilities are therefore reliant on their ability to increase output on demand. Independent generators operating as uncontracted merchant plants are at even greater risk because low demand for energy results in reduced generation, and therefore reduced income. Furthermore, weather effects can also affect fuel prices, which can also reduce available margins. Weather swaps, however, can bring a degree of certainty to cash flows.

The weather derivatives market will consequently become increasingly attractive to utilities and investors, who will derive more certainty from projects that are hedged by weather derivative products from good-quality counterparties. Concerns regarding the extent to which such sources can fulfill the energy needs of customers and the increased cost of producing energy from renewable sources remain, but they are declining.

Weather Derivatives in Operation

Weather derivatives are financial products that are used to hedge against climatic conditions. They often use heat degree days and cooling degree days as measures of weather conditions affecting aspects of the transaction.

One example of how a weather derivative can operate is the transaction between Enron Corp. and the London-based bar and restaurant operator Corney & Barrow (C&B) in 2000. C&B, aware that its takings increased when there was sunny weather on Thursdays and Fridays, paid Enron a sum similar to an insurance premium. Enron established a derivative under which, if the temperature in London fell below 24 degrees centigrade on a Thursday or a Friday (the heat degree days), it would make a payment to C&B, capped at £100,000 ($167,000) over the summer. This payment to some extent covered loss of trade resulting from clients being discouraged from going to C&B's outlets by poor weather. If the temperature was above the benchmark, C&B would benefit from increased revenue above the amount of the premium.

Reducing Volatility

In Standard & Poor's view, the European weather derivatives market is ideally placed to help reduce the problems for the energy sector arising from the volatility of the market. This volatility, which undermines

energy companies' business profiles, has contributed to the decline in credit quality across the sector.

Variations in weather conditions can create a natural hedge within a weather derivative portfolio that would protect a company holding such a portfolio from the impact of varying costs. A very dry season, for example, may limit the output of a hydroelectric plant, but a solar power plant would be likely to benefit because of the presumed consequent increase in sunlight. Within a portfolio, the income received from the solar plant would then be available to cover some of the costs of the underperforming hydroelectric plant. This structure provides protection for both utilities and portfolio managers. The utility's payment of a premium for hedging against price volatility enables it to maintain its income despite variations in weather conditions. At the same time, the portfolio manager receives premium income and can offset some of the risk incurred by matching opposite positions within a portfolio.

A Growing Appetite for Weather Products

The weather derivatives market is still establishing itself, but Standard & Poor's believes that it also has the potential for significant development, partly as a result of sociopolitical considerations. The market only began in 1997, and, as with all sectors, it has required some time to mature. The decline in the global energy sector, which is probably the largest beneficiary of the market, has considerably hindered growth. As the sector repositions itself, however, and as other sectors that are dependent upon the weather, such as agriculture, harness the security that it can provide, the weather derivatives market is expected to expand.

The market was affected by the demise of Enron Corp. in 2001 because Enron had been successful in generating interest, investment, and confidence in the new products. The impact of Enron's collapse was limited, however, because the market was still in its infancy at that stage, and other companies have continued to develop expertise in weather derivatives. The most significant European players at present include Entergy Koch Trading Ltd., Centrica PLC (A/Stable/A-1), Scottish Power PLC (A-/Negative/A-2), and Tractebel.

In light of evidence that indicates that climatic conditions are becoming increasingly unpredictable, many governments have begun to take measures, some of which are outlined in the Kyoto Protocol, to reduce their countries' dependence on fossil fuels. As a consequence, production from alternative sources of power has increased.

Developing Technology

In addition to these financial derivatives, asset construction can also create a hedge against the impact of weather conditions. The output of renewable energy assets, such as wind farms and hydroelectric power stations, reflects the weather and so generally correlates with variations in demand for power. Cold temperatures, for example, are often accompanied by windy weather, which increases the potential output of wind farms. The output of these plants would therefore rise in line with the expected increase in demand for heating.

The construction of renewable energy assets is not yet economic, however. At present, utilities' development of renewable generation plants such as wind farms and biomass facilities is largely due to growing political impetus towards establishing renewable energy production resulting from concerns about the effect of fossil fuel use on the environment.

Although the introduction of renewable energy production in Europe has encountered considerable problems in terms of cost and implementation, Standard & Poor's expects that many of the issues will be resolved in the short to medium term. Since its inception, the renewable generation market has expanded considerably, and technology risk has declined as equipment is improved and operators become more experienced.

Weather forecasting has also developed significantly in terms of the sophistication of modeling and pricing techniques. The reliability of historical climatic data has also improved. In addition, production costs are not dependent on such variables as commodity prices, although it is sometimes uneconomic to transport large volumes of biomass fuel to generation sites.

These factors, coupled with an increase in the volume of available energy from renewable sources, have reduced the costs of production. Wind power, for example, is now comparable in cost to traditional power generation from fossil fuels, albeit with one significant difference--there is considerably less control over its output.

In order to overcome this issue, the sector needs better climatic information from the specific geographical areas in which plants are based. This would enable companies to maximize the benefits of renewable energy. Climatic information would enable a company with a naturally hedging portfolio to cover plants affected by adverse weather conditions. It would be of no value attempting to cover the output of a wind farm if the nearest equipment able to assess whether it is windy enough is based hundreds of kilometers away.

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