Article Title: ARCHIVE | Criteria | Corporates | Utilities: Are European Wind Power Projects on Their Way to Investment Grade? Data: (EDITOR'S NOTE: — We originally published this criteria article on Nov. 11, 2003. We're republishing this article following our periodic review completed on July 17, 2014. As a result of our review, we updated the author contact information. In the section headed "Standard & Poor's Approach to Wind Project Ratings," the referenced article titled "Debt Rating Criteria for Energy, Industrial, and Infrastructure Project Finance" has been superseded by the article titled "Updated Project Finance Summary Debt Rating Criteria," published on Sept. 18, 2007. This article is no longer current. It has been superseded by "Key Credit Factors For Power Project Financings," published Sept. 16, 2014.) Wind power projects in Europe can reach investment-grade debt ratings, but not without overcoming significant challenges. In the U.S., the FPL Energy American Wind LLC (senior secured debt 'BBB-/Stable') transaction was recently assigned an investment-grade rating. Western Europe overall is the world leader in wind power. The commitment to reduce emissions on greenhouse gases to levels agreed to under the Kyoto protocols, formalized in the form of the EU Renewables Directives, is forecast to continue providing a key growth driver for renewable power, mostly wind power. To date, sponsor capital and bank financing have been the dominant funding sources for wind projects. Standard & Poor's Ratings Services has been closely following developments in the sector for several years and has analyzed several wind power transactions. Standard & Poor's analyzes wind projects using established criteria that are employed in the analysis of a wide range of project finance transactions. The key challenges for wind projects in Europe include: Gaining sufficient political and regulatory financial support; and The likelihood that wind source forecasts are met. In Western Europe, the development of wind power differs greatly between individual countries. Germany, Denmark, and Spain have the highest levels of installed capacity. A supportive regulatory framework has supported investments in wind power in these countries. Chart: This commentary focuses on the credit elements of wind projects that would tend to support investment-grade credit quality. It also examines the credit concerns that these projects need to overcome to merit investment-grade ratings. The article focuses on onshore wind projects because Standard & Poor's considers that offshore wind projects are unlikely to be able to mitigate risk sufficiently to achieve an investment-grade credit profile at this stage of their development. Standard & Poor's Approach to Wind Project Ratings Standard & Poor's assesses the credit risk of wind power projects using the analytical framework provided by its project finance rating criteria, outlined in the article "Debt Rating Criteria for Energy, Industrial, and Infrastructure Project Finance", published on March 19, 2001, on RatingsDirect, Standard & Poor's Web-based credit analysis system. To ensure the consistency of its ratings, Standard & Poor's benchmarks each individual project against a large database of rated project finance transactions. The most logical benchmarks for wind projects are other power projects. These operate in similar markets and have other common features that are important in the examination of wind projects. These features include regulatory risk, fuel source risk, operational risk, and counterparty risk. Standard & Poor's uses a wider range of projects as benchmarks for the structural features of the transaction. Although each project has its own strengths and weaknesses, the wind projects assessed to date have had some general strengths that could support investment-grade ratings. They have also faced similar challenges that could prevent them reaching the investment-grade threshold. This article will discuss some of the factors affecting wind project credit quality: Regulation and government policy; Technology, construction, and operations; Wind resources; and Contractual and finance structures. Regulation and Government Policy The growth and viability of wind power has been and remains driven by government targets for clean power, international treaties, and diversification of fuel sources. Because wind power is relatively uneconomic, it requires governmental and regulatory financial support. The sector has become more cost competitive, owing to advances in technology, but it still requires government support to attract investment. The European power markets have changed considerably over the last couple of years. Liberalization has introduced different dynamics, and competition down to the smallest individual customer exists or will exist in the short term. Cost competitiveness and flexibility are therefore key issues for power generators that need to compete for supply companies to buy their power. Given these dynamics, wind power is at a disadvantage because it usually cannot compete well with coal and gas-fired plants in terms of economics or consistent output. A firm determination of competitiveness clearly depends on the price of fuel sources, plant efficiency, and the general market

situation in terms of available capacity. To overcome this lack of economic and operational competitiveness, government and regulatory financial support are required. Governments provide support in many forms, including favorable tariff regimes, tax incentives for investors or for the project in the form of depreciation policies, and regulation for grid connections. From a credit perspective, therefore, one of the key rating factors is the continuing support and robustness of the regulatory framework and the level of political support for wind power. As long as a wind power project is not able to compete well with other power generation technologies in terms of economics, its ability to achieve investment-grade credit quality would require, among other things, high confidence that the project will have a supportive regulatory framework for as long as it is servicing its debt. The tariff mechanisms will have to be clear and transparent, and lacking in uncertainties and/or volatility. In the European countries where wind power has grown significantly, supportive regulatory regimes and government policy have been the major drivers of this growth. Standard & Poor's analysis therefore concentrates on the historical performance of the regulation, the tariff-setting mechanism–-whether it is fixed, variable, or inflation adjusted--and the likelihood that the regulation might change. For its analysis, Standard & Poor's would expect to meet the regulators to assess the government's long-term commitment to this type of renewable energy. Key elements are the level of support and how long it will remain in place. In general, depending on the level of debt and the wind resources, onshore wind projects require at least 10 years to repay debt. Governmental commitment to grandfather regulatory regimes should changes that are likely to reduce support be introduced are crucial to the achievement of investment-grade ratings. The expected EU policy on support for renewable energy in the medium to long term could create a new framework that could alter regimes in the EU countries. Although this policy is expected to be favorable to renewable energy, projects would benefit from a clear government or EU statement to grandfather existing regimes. In addition, a clear commitment from governments to grandfather existing regimes when a specific renewable energy target has been reached is vital. Standard & Poor's will also undertake a legal review to understand the effect of changing laws and regulations. One example of a supportive regime is in Germany, which in essence guarantees a minimum fixed tariff for a period of 20 years depending on the level of wind. This provides a high degree of stability to project remuneration. The project would of course still have to produce energy to benefit from this tariff regime. By contrast, the U.K. regulatory regime only provides weak support to the wind sector. The Renewable Obligation scheme established in April 2002 provides an incentive for producers of CO2 to source clean power, but it will be reviewed in 2005-2006 and there is no clear commitment to renewable energy beyond the target of 2010. These factors are significant credit concerns for U.K. wind power projects. Regulatory and governmental support can also exist in other areas. Wind parks are often constructed in remote areas, which is likely to result in considerable costs to connect to the main grid. Support in the form of an obligation for distribution or grid companies to fund these investments, for example, reduces the overall level of debt required for the wind project. Standard & Poor's also analyzes the actual capacity of the transmission network where the project is located and the forecast expansion needed to absorb the increased output from wind farms. Technology, Construction, and Operations The construction and technology risk of a wind park can be less challenging than the construction of a traditional power plant. To have investment-grade credit quality, however, any construction program will need to comply with Standard & Poor's project construction criteria. As a matter of principle, Standard & Poor's rates through the whole life of the project debt. The fact that a plant still needs to be constructed, therefore, is not by itself a negative factor. The granting of all required permits and planning is a first step. This can be a challenging process because local residents and other groups often challenge the construction of wind parks for safety or environmental reasons, such as noise or "landscape pollution". Investors in wind energy, sector organizations, and turbine manufacturers have all stated, in discussions with Standard & Poor's, that construction is considered a fairly straightforward process as long as reasonable time is permitted and experienced contractors are hired. Nevertheless, for its analysis, Standard & Poor's requires an independent assessment from a technical consultant regarding the construction process and the planned wind technology. Standard & Poor's assesses the experience and financial position of the contractor in the design and construction of wind farms, and the experience and creditworthiness of the technology provider. The engineering, procurement, and construction contract and the turbine supply agreements should include adequate liquidated damages or

performance guarantees to compensate the project company if completion is delayed or performance does not meet pro forma forecasts. Contractors often have an estimated credit quality that is too low for company guarantees to provide credit support at an investment-grade level. Letters of Credit or other financial support for these guarantees can provide an acceptable alternative, as long as they comply with Standard & Poor's criteria. Technology in wind power has been evolutionary rather than revolutionary, but the longer a technology has been in operation, the more confidence is possible in its production capacity and availability. Standard & Poor's is able in some cases to give some credit to new technology that represents a small development from proven designs and has been independently certified. In its analysis, however, Standard & Poor's will ensure that the certification given covers all material matters and matches the wind resource characteristics at the site of operation. Standard & Poor's also considers certification by one of the main bodies that certify wind turbine design to be a positive factor. Such certifying bodies include Germanischer Lloyd in Germany and Det Norsk Veritas in Denmark. Technical problems for wind usually appear in the early years of operation. It is therefore important to have a warranty agreement with the suppliers or construction companies to mitigate this early operational risk. Operations and maintenance (O&M;) costs as a share of revenues are lower for wind projects than fossil fuel plants, and therefore are sometimes not often a main focus of attention. Plants only receive payments when they run, however, and Standard & Poor's considers that strong creditworthiness also requires a strong O&M; provider and program. In addition, if a defect that affects all turbines emerges, it is important to have an O&M; provider that has the skills to address these problems and still maintain high availability. Wind Resources Most of the above-mentioned risks are common to all projects and can be sufficiently mitigated. The risk most specific to wind projects-–namely the wind resource--is the most difficult to forecast and therefore the most difficult to mitigate. Traditional power projects can buy fuel in the market ad hoc or enter into contractual agreements to obtain relative fuel delivery and quality certainty. Wind is free, which is a major advantage, but the project company has no control over this fuel source, which is a major disadvantage. New wind projects often rely on limited (one year) onsite measurements at the height of the wind tower. The consequent lack of long-term site data is often overcome by using historical data from nearby sites or weather stations, provided that data at the two sites correlates well. A long-term average for the region or the specific location is often used to determine the forecasts. The long-term average may well apply for the next 20 years, but the day-to-day variability of the wind over this period remains a concern. A rating from Standard & Poor's reflects the obligor's ability and willingness to make timely payment of interest and principal in full. Wind variations in specific years may be compensated for in other years, but by then the damage may have been done and the project defaulted on its debt. The more reliable historical wind data available for the site, the more useful the forecasts will be. Weather patterns can change over time, however, and this creates further uncertainty. Assumptions may be wrong in any project financing, but for wind projects that only receive payments if there is wind, the wind forecast provides a principal uncertainty. In many cases there is insufficient historical wind data to support an extrapolation of wind production for the next 20 years. Unfortunately, there is no public database available that compares actual wind outturn with the initial forecasts for individual projects. Research conducted in the industry provided general statements that few, if any, wind projects have defaulted. This apparently reassuring conclusion may, however, not be based on Standard & Poor's definition of default, which includes any missed or deferred payment of interest and principal, restructuring, or restatement of the terms and conditions of the debt that would lead to an economic loss. Overall, the rating process requires an assessment of available historical data, discussions with the forecasters, and comparison with regional indices. Forecasts from more than one party are not unusual and help identify potential variations. Five years of historical data at a site is better than just one year, but all forecasts need to be assessed in terms of what probability (P) is attached to them. Various projects have seen forecasts based on an average for 10 years ranging between P50 and P90, while others have single-year probabilities. The latter are likely to be more accurate because they do not provide long-term averages. The higher a P estimate is, the greater the likelihood that the project will achieve the forecasts. Standard & Poor's not only focuses on the probability of wind projections, but also analyzes them in the context of the financial structure. A lower probability is likely to result in higher fluctuations from the base case, and the financial structure needs to be able to absorb these.

There is, therefore, no specific guideline about how many years' historical data need to be available for an investment-grade rating or at what probability level the forecasts need to be. The more historical data available, the existence of multiple independent forecasts, and a higher probability of the forecasts, however, all increase the likelihood of an investment-grade rating being assigned to the project. Owing to the level of uncertainty that the wind resource introduces to these projects, Standard & Poor's analyzes a wide range of different sensitivities, such as higher O&M; costs and various low wind scenarios. Contractual and Finance Structure Apart from the construction contracts and turbine supply agreements, any given project is likely to have other contractual agreements that need to be scrutinized to determine which risk lenders will bear. Wind projects generally have medium to long term contracts to provide energy to a distribution company, grid operator, or energy supply company. The exact contract may be shaped by regulatory obligations for the offtakers or a negotiated arrangement. In all cases, wind power purchase agreements (PPAs) differ from traditional ones in that wind power contracts provide energy but not capacity payments, while a traditional PPA provides both. Sometimes there are incentive payments for high availability, but it is uncommon to have fixed payments as under conventional PPAs. This is a major comparative disadvantage. The terms and conditions of all agreements are scrutinized in the same way as traditional PPAs. For regulatory agreements, the same analysis as described above under "Regulation and Government Policy" will apply to ensure the contract remains in place under the same terms and conditions for the life of the debt. Negotiated agreements will undergo a similar analysis. In addition, counterparty risk is an issue in the energy industry and needs to be carefully assessed alongside the other terms and conditions of the contract. Owing to wind resource risks, a highly leveraged wind project would find it difficult to attain investment-grade credit quality. Wind variability requires a cushion to mitigate bad wind years. Power projects with a PPA that have been assigned investment-grade ratings generally exhibit minimum debt-service cover ratios (DSCRs) of 1.3x-1.5x. Given the uncertainty of the fuel source and the lack of fixed capacity payments for wind projects, wind power projects ought to have similar, if not better, minimum DSCR levels. A project rating is not purely driven by its minimum DSCR, however, and ratios need to be analyzed in the overall context of the project's credit strengths and weaknesses. Dedicated reserves that are funded up front sufficient to cover stress scenarios (and are therefore likely to be higher than the traditional six-month debt-service reserve account) are vital for credit quality. Other elements that are required for investment-grade projects include adequate covenants, bankruptcy remoteness from sponsors, and historical and forward-looking distribution tests. Wind is often seasonal. This fact must be addressed in the cash flow payments of, for example, dividends or debt service. The financial structure should be supported by elements that mitigate the variability of the revenue sources. Some petrochemical project ratings have been supported by the pooling of cash in dedicated reserves in an upward cycle to create a buffer for a downward cycle. The use of wind derivatives could also mitigate elements of risk in a wind project. Analyst E-Mail Addresses
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