
Project Financing in the World's Largest Wholesale Electricity Market

By Michael T. Reese and Joseph Galvin

Stable and predictable cash flows are one of the most essential aspects for bankability of a project financing. Traditionally, this could be assured by the project entering into a long-term offtake agreement with a creditworthy counterparty. This type of agreement provides revenue certainty in the form of energy payments (for the amount of electricity produced by the generating facility) and capacity payments (for being ready and able to produce electricity). Ideally, energy payments would cover the variable costs of operating and maintaining the project, and capacity payments would be sized to cover debt service for construction, plus a return on equity.

For gas-fired generation projects, however, long-term offtake agreements have become significantly less common, with project participants embracing other financing structures mechanisms. PJM Interconnection, a regional transmission organization that operates in 13 states and the District of Columbia ("PJM" standing for Pennsylvania, New Jersey and Maryland), has been particularly active in shaping the development of these alternate forms of financing structures for gas-fired generating projects.

Below, we review how these alternative financing structures play out in the PJM market, first by providing an overview of PJM and the capacity market. We then identify some of the risks of the capacity market and the principal structures a gas-fired generation project and its financing parties might use to address those risks.

PJM—Overview

PJM operates the largest wholesale electricity market in the world and the largest power grid in North America, serving over 60 million customers. It is the most active market for new gas-fired generation in the United States and has served as a model for wholesale electricity market in other countries. PJM facilitates the purchase and sale of power and related transactions through three primary mechanisms: an energy market, a capacity market and an ancillary services market.

- The **energy market** procures electricity to meet consumer demand, both in real time and in the near term.
- The **capacity market**, discussed in more detail below, aims to ensure long-term grid reliability by procuring the appropriate amount of power supply resources needed to meet predicted energy demand in the future.
- The **ancillary services market** helps balance the transmission system as it moves electricity from generating sources to consumers.

PJM—Capacity Market and Auctions

PJM's capacity market structure is called the "Reliability Pricing Model." Capacity represents a commitment of resources to be delivered when needed, particularly when there is a grid emergency, such as in extremely inclement weather. Capacity markets encourage investment in power generation plants by providing payments to the project in exchange for its ability to supply power when needed, even if the power is not ultimately dispatched. The cornerstone of the Reliability Pricing Model is the "Base Residual Auction," an annual auction designed to ensure resource adequacy in advance and at a reasonable cost.

PJM conducts the Base Residual Auction each May for the delivery year commencing three years later. For each auction, PJM determines the total capacity needed across the entire service territory and each zone for the delivery year. Different resources then bid for the amount of megawatts they can provide and at what price. The clearing price for the auction is set at the point where supply and demand meet, and every megawatt bid below that clearing price is set at the clearing price, regardless of the bid. As an example, in the 2019/20 delivery year the clearing price was \$100/MW-day for most of the region, down from \$164.77/MW-day in the prior delivery year.

In June 2015, the Federal Energy Regulatory Commission (FERC) approved changes—proposed by PJM—to the Reliability Pricing Model, including to the Base Residual Auction. This proposal was PJM's response both to widespread electricity outages faced by customers during the January 2014 polar vortex and to long-term reliability concerns.

PJM also made changes to its incremental auctions, which procure additional resource commitments in response to known market dynamics and occur 20 months, ten months and three months prior to the delivery year; and the bilateral market, which enables resource providers to cover any auction commitment shortages. The updated Reliability Pricing Model also provides for steep penalties payable by the project company when a project fails to be available as a capacity resource as needed.

Risk Management

Financing power plants in the PJM market raises a number of issues. The reduced likelihood of a long-term offtake agreement reduces stable, contracted revenues, creating merchant risk. This risk is heightened by varying capacity auction results each year and the possibility of large penalty payments for non-performance.

These risks may be addressed by requiring more sponsor equity relative to debt, excess cash flow sweeps and reserves for penalties. Hedging agreements are also used to increase the stability of cash flows of a project. These hedging arrangements are typically in the form of either a revenue put option or a heat rate call option.

In a revenue put option, if the revenues of the project from the sale of electricity are less than a predetermined amount, the hedge provider pays the difference. If project revenues are greater than that amount, the project is entitled to keep the excess amount. In exchange, the hedge provider receives a premium, generally paid upfront at financial close. The hedge agreement will typically provide for a five-year term, annually-calculated payments and quarterly hedge settlements.

A heat rate call option, on the other hand, is a swap of variable cash flows for a fixed payment stream that may be paid either to the hedge provider or the project. The hedge provider is more active than in a revenue put option, deciding on a day-ahead basis whether to consider the plant in operation for purposes of the hedge. If the hedge is called, revenue of the project may be positive or negative, depending on actual market prices and assumptions about the plant's heat rate and operating costs. If the hedge is not called, there is no revenue for purposes of calculating the cash settlement amount. No upfront payment to the hedge provider is required, but there is the possibility that the hedge provider will be entitled to a payment when the hedge is settled, which typically happens on a monthly basis.

Conclusion

As with all project financings, success will depend on all parties' understanding and analysis of the particular cash flow risks involved and their effective mitigation of those risks. Although the lack of a long-term offtake agreement may be one of the biggest risks when financing a gas-fired power plant in the PJM market, it is not insurmountable with an experienced and creative legal team capable of guiding a project and its financing parties through the options that are available to achieve project bankability.

If you have any questions about the content of this white paper, please contact the Pillsbury attorney with whom you regularly work, or the authors below.

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