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March 7, 2008

Another Renewable Energy Challenge: Getting It To Customers And At What Cost?

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Places where the wind blows hardest and the sun shines brightest aren't necessarily near any electricity transmission lines, so U.S. utilities are looking to build new power lines to reach these renewable energy sources. Spending to build power lines has been a relatively small component of electricity infrastructure costs, but now the need to connect new renewable electricity resources such as wind farms and solar arrays to aesthetically pleasing transmission lines will lead to billions of dollars in outlays for utilities and higher bills for ratepayers. With all the new customer demand, government mandates for renewable energy, and the needed expansion of the existing transmission grid, will regulators be willing to approve the necessary siting permits and rate increases to recover the costs?

Projects may have to deal with a not-in-my-backyard (NIMBY) response that may delay construction for the new lines and significantly increase costs. Ultimately, it will be up to regulators and government officials to approve the siting and rate hikes needed for these upgrades and expansions. They'll need to reach compromises that will keep the rate increases reasonable for ratepayers while not exposing investors and bondholders to unreasonable post-construction prudence reviews of costs. The preapproval process for utilities building new power plants taken up in states appears to balance concerns about higher rates with cost recovery by the utilities. Will this also work for renewable energy-related transmission investment?

Preserving Credit Quality Through Rate Recovery

Regulated utilities that are building lines for renewable projects can be fairly insulated from weakened credit quality if they use appropriate safeguards. These include access to regulatory preapproval (including siting) before building begins, and regulatory support and use of contracts to contain costs during construction.

Standard & Poor's Ratings Services assesses construction risks, regulatory risks such as siting, and other constraints on cash flow and liquidity that companies experience as they invest in infrastructure. Construction can be delayed due to siting or other issues. Construction costs and delays require companies to have strong balance sheets and adequate liquidity to withstand extended start-up periods. Various regulatory measures can strengthen a transmission company's credit quality. If a regulator allows for timely and efficient rate recovery, companies' credit quality could strengthen because greater internally generated cash flow during construction results in lower liquidity needs and reduced external financing. Cash flow could improve if a company's rates are updated annually for new costs, including those for plant additions, plant operations, and depreciation. In addition, allowing rate recovery of projected costs with subsequent updates for actual results reduces lags in cost recovery.

Some Renewable Transmission Projects Have Already Begun

Because renewable generation resources are usually built at remote locations, "greenfield" sites (places where nothing has been built before), or both, utilities will need to extend the existing transmission grid to bring the electricity to customers. The cost per megawatt (MW) for this new generation could be much higher if there's no existing transmission infrastructure or rights-of-way. Renewable projects tend to be smaller than traditional generation plants, so new line costs will need to be shared in various ways until new generation utilizes the capacity

of a new line.

Some states already have projects in the works.

California

An example of a large renewable integration project is the Tehachapi Renewable Transmission Project (250 miles of new lines and upgrades to existing lines) in California, which has a price tag of about $2 billion. For this line, the participating transmission owner will build the main (trunk) line out to the renewable resources and will initially recover costs through Federal Energy Regulatory Commission (FERC)-approved rates.

As companies build and connect individual renewable projects to the transmission grid, each generator would pay its proportionate share of the line's annual revenues. This approach would continue until the entire capacity of the line is contracted, at which time the generators would pay the revenue requirement for the completed transmission facility. This approach would help finance construction of new trunk lines, unlike other transmission projects that require generation plant owners to pay up front for the costs of new lines.

Texas

In Texas, wind generation development has been studied along with the necessary transmission improvements to bring the capacity to customers. As a result, they are considering creating competitive renewable energy zones. With the wind generation opportunities in West Texas, the existing transmission network can't handle any additional power coming out of the area, so new transmission lines need to be built. In 2007, the Public Utility Commission of Texas (PUCT) received a proposal to build an 800-mile, 345-kilovolt line throughout the Texas panhandle. The Panhandle Loop, as it's being called, would act as a pipeline to connect up to 8,000 MW of power, mostly wind but also natural gas and coal-fired generation, into the Electric Reliability Council of Texas (ERCOT) electric market. The Loop will be open for use by anyone, regardless of the power source, to access the ERCOT power market. Under Texas market rules, all ratepayers in ERCOT would bear the Loop's cost.

Electric Transmission Texas LLC, a joint venture of American Electric Power Co. Inc. and MidAmerican Energy Holdings Co., is seeking PUCT approval to build 1,000 miles of transmission lines to support competitive renewable energy zones. Electric Transmission Texas also proposed a 900-mile, high-voltage "backbone" transmission system to support long-range grid reliability in Texas. It would be built in phases and could end up costing about $7 billion if they construct all these phases. Phases one and two would serve as trunks for renewable power. The first phase would provide access for up to eight gigawatts (GW) of existing and planned renewable energy projects in northern and west-central Texas. The second phase would support an additional 2 GW of renewable projects. These phases would cost $3 billion and would be shared by ratepayers in the ERCOT market. After receiving PUCT approval, Electric Transmission Texas anticipates completing the first phase by 2012 and the second by 2015.

Minnesota

The Southwest Minnesota Wind Expansion Project (220 miles of new lines and 300 miles of upgrades) will connect 800 MW of wind power to the grid at a cost of $290 million. The project will be able to recover that sum through an existing state transmission rate rider.

Other initiatives

For a further breakdown of various initiatives related to building transmission lines to transport renewable generation, see the table.

Transmission-Related Initiatives

Transmission-Related Initiatives(cont.)

Initiative	Description	Cost recovery	Cost limits	Status
California Independent System Operator (CAISO) Location Constrained Resource Interconnection (LCRI)	Transmission rates for connecting remote resources to the grid.	Costs are rolled into the CAISO's transmission access charge until generators are on-line, after which generators pay a proportionate share of forward costs.	Limited to 15% of total net high-voltage transmission plant investment of participating transmission owners in CAISO.	The FERC approved it in late 2007.
California Public Utilities Commission (CPUC) Transmission	Cost recovery assurance to transmission owners that volunteer to finance generation connections or transmission facilities that help reach the state's Renewable Portfolio Standard.	If the FERC rejects cost recovery, CPUC will address cost-recovery on a project-specific basis, with an intent to allocate to customers of all Commission-jurisdictional utilities.	None, but subject to project-specific CPUC approvals and traditional regulatory oversight.	CPUC order in 2006.
Colorado Energy Resource Zones	Identifies zones with significant clean energy potential and transmission necessary to access it.	Subject to annual adjustment, utilities may recover construction costs for permitted transmission facilities through a rate rider. A return on construction work in progress is also authorized.	None, but subject to regulatory review.	Law enacted in 2007. Xcel Energy filed three proposed energy resource zones for eastern and southern Colorado, and an application for a 345-kilovolt line.
Texas Competitive Renewable Energy Zones (CREZ)	Designates zones with high, substantiated renewable energy development interest and authorizes a specific transmission plan necessary to deliver a specified MW level of renewable energy development.	Costs are spread across all load-serving entities in ERCOT. Annual proceeding available to incorporate capital costs of new transmission facilities.	None, but subject to regulatory review.	Public Utility Commission of Texas interim order designating five zones that may support 10,000 to 25,000 MW. ERCOT now performing CREZ transmission optimization study and wind integration study. Final order expected in Spring 2008 specifying transmission plan necessary to serve designated MW levels in each zone. Transmission providers to be selected in 2008 and PUCT permit approval in 2010.

Sources: California Independent System Operator, California Public Utilities Commission, Colorado Public Utilities Commission, Public Utility Commission of Texas, and Electric Reliability Council of Texas.

Siting Problems And Solutions

Siting difficulties, which contribute to construction delays and cost overruns, continue to be one of the thornier issues of building transmission lines, including those for renewable energy. These challenges stem from jurisdictional issues between states and the federal government. Unlike the relatively clear federal jurisdiction over natural gas pipelines, the electric transmission system straddles the federal/state divide and leads to turf battles. The 2005 Energy Policy Act, which gave the feds a wider role in transmission siting by granting the FERC authority in areas deemed "congested" and in federally designated transmission corridors, eliminated some preconstruction hurdles.

Merchant transmission is an alternative that adds capacity to the transmission network. In metropolitan areas that require additional power and face major hurdles in building new generation close to customers, construction of merchant transmission lines can bring power into the cities, including electricity coming from renewable sources.

In cities such as New York and San Francisco, transmission lines are being installed underwater to bypass the costs and delays caused by siting issues. One project is the 67-mile Neptune undersea high-voltage direct current cable between the PJM Interconnection and New York's Long Island, which lacks sufficient transmission capacity, and will provide access to lower cost generation. Another is the Trans Bay Cable 400 MW high-voltage direct-current

underwater cable that will connect the eastern side of San Francisco Bay to the City of San Francisco grid. The city expects the project to ease congestion on the grid. Building costs will be recovered through the California Independent System Operator, which spreads transmission costs over the system.

Easing Construction Risk

Utilities may seek to reduce construction risks associated with large transmission investments by consolidating their construction contracts into a single engineering, procurement, and construction (EPC) contract, and instituting strong contractual protections regarding performance guarantees, liquidated damages in case of underperformance, and contractor credit support. Such contracts could limit any construction delays, defective workmanship, or technology failures that can all contribute to meaningful regulatory disallowances, which can weaken credit metrics. Utilities can further reduce cost overruns with a fixed-price contract. They may forego the contractual protections embedded in standard EPC contracts and choose to build the project itself or go the multi-prime route, where the sponsor spreads the risks, which an EPC contractor normally assumes, among a few large contractors. Both approaches give utilities greater control over construction and may lower costs. These alternatives, however, can expose utilities to material cost overruns, scheduling delays, and performance issues. Exposure to these risks is the worst in the self-build case, where the utility can't transfer any of the construction risks to a third party. The danger associated with multi-prime contracting lies somewhere in between the EPC and self-build approach. Given the absence of guarantees against cost overruns, delays, and performance problems for the entire project, we may consider the multi-prime approach to be less favorable to credit quality than an EPC, but a better option than self-building.

The Advantage Of Regulatory Preapproval

Historically, utilities have generally had to wait until a transmission line is completed before knowing whether all related construction costs will be included in their "rate bases," or the asset base on which a regulator permits a utility to earn a specified rate of return. Regulators also determine whether utilities will be able to earn an adequate rate of return on their investment. Uncertainty about future cost recovery and the associated rates of return can make it difficult to assess the strength and stability of a company's future cash flows. Preapproval mechanisms can help support the credit quality of utilities that build new transmission infrastructure for renewable generation. By providing specific parameters for future regulatory support, preapproval mechanisms enhance the predictability of cash flows and reduce the likelihood of disallowances.

A utility's financial measures may weaken during construction unless regulatory support is available to help strengthen cash flows. Utilities that record allowance for funds used during construction on capital projects being built can experience a cash drain as they incur financing costs without current cost recovery from ratepayers. When regulators authorize utilities to receive a cash return on all or some portion of construction work in progress, they provide utilities with the opportunity for higher and more stable cash flows during construction. This should also reduce the size of rate increases for customers once a renewable-related transmission line is built.

Summing Up

As utilities continue their efforts to "go green," the need to connect new renewable electricity sources to the transmission grid will lead to a lot of capital spending on power lines by utilities and potentially higher bills for ratepayers. While regulators mull siting issues and just how much customers will have to pay out of their pocket, regulated utilities that are building lines for renewable projects can insulate themselves from weakened credit quality if they use appropriate safeguards in pursuing the wind and the sun.