NorthernGrid

Economic Study Request

The economic study request window is posted on the NorthernGrid website at https://www.northerngrid.net

Please return the completed form to: NWPP_NorthernGrid_Staff@westernpowerpool.org with copy to Chelsea.Loomis@westernpowerpool.org

NorthernGrid will undertake up to one Regional Economic Study to be performed each year at no cost to the requestor. Stakeholders may pay NorthernGrid to perform additional studies. Any Economic Study Request that seeks to the performance of individual assets shall not be performed.

Requesting Stakeholder Information

Date:	3/31/2024
Requesting Stakeholder Company:	North Plains Connector LLC
Address:	712 Main St Suite 1000
City, State and Zip Code:	Houston, TX 70012
Contact Person:	Gimod Mathew
Title:	VP, Transmission Strategy
Phone Number:	(346) 450-5883
Email:	Gimod.mathew@gridunited.com

Describe the requested study of potential transmission solutions that could result in a net reduction in total production cost to supply system load, reduced congestion, or the integration of new resources and/or loads on an aggregate or regional basis.

Request Details:

North Plains Connector LLC (NPC) appreciates the opportunity to submit into the NorthernGrid 2024-2025 Regional Economic Study. NPC is a planned 3,000-megawatt ("MW") high voltage direct current voltage source converter ("HVDC VSC") transmission line between Montana and North Dakota designed to bridge the interregional gap between WECC and the Eastern Grid. The Project features a 3,000 MW interconnection with NorthWestern Energy's Colstrip substation in Western Electricity Coordinating Council ("WECC") territory and 1,500 MW interconnections into both the Southwest Power Pool ("SPP") and Midcontinent Independent System Operator ("MISO") systems in North Dakota (both part of the Eastern Interconnection), which will create a much needed, reliable large-scale connection between the two regions. As a multi-value project with reliability, economic, and policy benefits, NPC provides significant value to the NorthernGrid members in several key areas:

1. NPC addresses the ELCC problem by giving market access to new, geographically uncorrelated generation profiles from WECC, SPP, and MISO (and vice versa)

essentially making the grid bigger than the weather. The Project contracted Creative Renewable Solutions ("CRS") to run a comparison of utilities' integrated resource plan against resources that they could access through the project. For example, the CRS study compared the costs for a PNW utility to build Central Montana wind (non-Project options) vs North Dakota + Central Montana wind (option with the project) and found that the two resources are comparable on a levelized cost of electricity ("LCOE") bases, even after considering the cost of the Project. However, while these two resource options have a similar cost per MWh, the resource mix enabled by the Project is able to provide twice the ELCC. This is a key benefit as accessing a diverse set of resources allow utilities to reliably meet decarbonization goals cost effectively.

2. Economic optimization via deliverability of cheaper resources and reduced curtailment & congestion. Interregional transmission can help by exporting power during times of excess and importing power in times of need. A production cost modeling study of the Project done by PA Consulting found the total energy cost savings to be ~$10 billion of discounted NPV.
3. Supporting increased investment in renewable energy via integration of RE by providing deliverability to markets, reducing congestion, and via grid stability support.
4. Managing uncertainty in forecasting of weather, demand, and variable renewable generation.
5. Providing extreme weather resiliency. A study conducted by Astrape Consulting found that NPC had 1,650MW of capacity value to WECC and reduced the LOLE by 0.081 days/year.

In addition to the value interregional transmission brings to WECC, HVDC VSC technology offers many benefits to the grid, including:

- Enabling highly efficient instantaneous, bi-directional bulk energy exchange between asynchronous grids and thereby connecting previously disconnected markets;
- Provides key grid stability functions including:
    - Dynamic reactive power support;
    - Automatic sharing of frequency reserves;
    - Power oscillation damping;
    - Reinforcement of weak regions of the grid with low short circuit ratios;
    - Independent control of active and reactive power with high dynamic response;
    - Static synchronous compensator-like functionality with network equipment that provides dynamic voltage response to disturbances on the grid within milliseconds; and
    - A smaller footprint and less audible noise than traditional line commutated converter technology

- Connecting different resource profiles across large geographical distances and through features inherent to the HVDC VSC technology itself, materially enhancing grid reliability;
- Bridging regions with different pricing and resource dynamics. Through optimizing power system dispatch using HVDC VSC technology, the Project will lower the cost of power to consumers as compared to alternative investments;
- Creating a grid that is “bigger than the weather”, will improve grid resilience and lower the potential impact of extreme weather events on markets and customer;
- Providing the unique black start capabilities of HVDC VSC technology that enables a faster recovery of the grid in event of extreme outages like that nearly experienced by ERCOT in February of 2021.

North Plains Connector LLC would happily provide more details and model files upon request.

website - https://www.northerngrid.net contact- NWPP_NorthernGrid_Staff@westernpowerpool.org