

Designation of a Heartland Transmission Corridor

Background

Wind Potential - Across North and South Dakota, Minnesota, Iowa and Wisconsin there is over 300 GW of potential wind generation capacity and some of the best wind resources in the Nation. Markets for wind power in the Midwest are strong and are driven by voluntary commitments by utilities as well as legislative and regulatory activity. The enormous wind potential in the Upper Midwest to deliver to markets east and south could provide consumers with economical clean energy, benefit the Great Plains economy, diversify our fuel mix and enhance the Nation's energy security. However, to tap the wind to serve markets several states away (Great Lakes region population centers) and along the way (Minnesota, Iowa, Wisconsin), major transmission infrastructure will be required.

Current Transmission Activity in the Midwest –

- **Midwest Independent System Operator (MISO)** - Within the 2006 MISO Transmission Expansion Planning (MTEP) process, MISO is studying transmission to move a 10% level of wind power across the MISO footprint (20,000 MW). Superior and economical wind resources are located on the western edge of the MISO footprint and loads and higher priced energy markets are in the eastern part of MISO.
- **CapX 2020 Project** - Utilities in Minnesota initiated the CapX 2020 project to construct transmission to serve growing load in Minnesota. The CapX utilities are seeking approval for 3 new 345 kV transmission lines across Minnesota that will provide “backbone” infrastructure that stretches from the Dakotas, through Minnesota and into Wisconsin. The new CapX transmission will largely be used to serve Minnesota load, however it will have significant positive impacts on reliability of the grid in the Midwest and allow for delivery of more wind power.

Federal Transmission Activity – In August 2006, the U.S. Department of Energy released the National Electric Transmission Congestion Study in response to Section 1221 (a) of the Energy Policy Act of 2005. The study identified the Dakotas to Minnesota geographic area as a “Conditional Congestion Area,” meaning that there is some transmission congestion presently, but significant congestion would result if large amount of new [wind] generation were developed with additional transmission capacity. DOE concluded that “affirmative government and industry decisions will be needed in the next few years to begin development of some of these generation resources and the associated transmission facilities.”

Summary

Designation of a Heartland Transmission Corridor would allow the Nation to tap into one of the best wind resources, deliver economical and clean energy to electric consumers, positively benefit the region's economy, diversify our fuel mix, help address national energy security issues, and bring transmission reliability benefits to the Midwest. Designation of a Heartland Transmission Corridor is consistent with transmission planning efforts currently underway in the MISO footprint.

Kansas- Panhandle X-Plan Transmission Corridor

Background

Wind Potential - Across Kansas, Oklahoma, Texas panhandle, and Nebraska there is over 150 GW of potential wind generation capacity in a region that has relied on natural gas and coal for electric power generation. Markets today for wind power in the Southwest Power Pool (SPP) are driven by cost-effective commitments by utilities, as well as the Renewable Portfolio Standard (RPS) in Texas. Tapping the enormous wind potential in the SPP region to deliver to markets east and south would provide consumers with an economical source of clean energy, meet state RPS requirements, diversify our fuel mix and enhance the Nation's energy security. To relieve congestion present in SPP, and deliver significant quantities of wind for markets in the east, major transmission infrastructure will be required.

Current Transmission Activity in the Southwest Power Pool –

- **Southwest Power Pool Regional Transmission Organization (SPP)** - Current transmission planning by SPP for new power plants and congestion relief uses a stylized X-Plan for the X shape across western Kansas, reaching from Nebraska, across Oklahoma and serving the Texas Panhandle.
- **American Electric Power (AEP)** – Company announcement of joint venture in Texas with MidAmerican Energy to invest in transmission. AEP subsidiaries include regions served by X-Plan in Oklahoma and Texas.
- **Texas PUC and Competitive Renewable Energy Zones.** Texas law SB 20 requires the Texas PUC to designate a number of “Zones” for transmission expansion where renewable energy is very economic to meet the higher RPS. Superior and economical wind resources are located in the Texas Panhandle, and the RPS is driving transmission planning.
- The higher electric loads and higher priced energy markets south of SPP in ERCOT are leading SPP planners and wind developers to look at transmission options that serve ERCOT from windfarms located in SPP.

Federal Transmission Activity – In August 2006, the U.S. Department of Energy released the National Electric Transmission Congestion Study in response to Section 1221 (a) of the Energy Policy Act of 2005. The study identified the Kansas – Oklahoma geographic area as a “Conditional Congestion/ Conditional Constraint Area,” meaning that there is some transmission congestion presently, but significant congestion would result if large amount of new [wind] generation were developed. DOE stated that “the Secretary, now or in the future, may designate one or more National Corridors in relation to a Conditional Constraint Area.”

Summary

Designation of an X-Plan Transmission Corridor is consistent with transmission planning efforts currently underway in the region by the Southwest Power Pool. This region, long reliant on natural gas, has energy cost volatility and congestion that can be reduced with transmission. As a significant wind region close to eastern markets, a transmission corridor to export wind to neighboring states offers a renewable supply not otherwise available.

Designation of a Southern California - Arizona Power Link

Transmission Corridor

Background

Potential – California is a driver of energy and transmission planning in the West. The large and growing loads combined with RPS (and now climate change) requirements puts pressure on all to develop a variety of renewable generation for California. The urban areas of Los Angeles and San Diego have critical needs for more renewable energy sources. The Tehachapi area promises 4500 MW of wind in the near term. The Imperial Valley area holds solar, geothermal, wind and access to more to farther east. However, to tap these resources, major transmission infrastructure will be required.

Current Transmission Activity in Southern California - Arizona

California Independent System Operator is involved in 3 significant transmission plans.

- 1) For Tehachapi, the development of 500 kV transmission designed to connect wind generation to SCE and PG&E transmission systems. This will allow 4500+ MW of renewable resources (almost all wind) to reach energy customers, and allow utilities to reach their RPS goals, as well as address reliability needs caused by congestion on Path 26.
- 2) Lake Elsinore Advanced Pump Storage requires associated transmission infrastructure associated for benefits to the SCE and SDG&E transmission systems.
- 3) Imperial Valley to San Diego Sunrise Powerlink / Green Path Projects, proposed by SDG&E, Imperial Irrigation District, and Citizens Energy involve development of a 500 kV transmission link between the existing Imperial Valley (IV) substation and a proposed substation in Central San Diego County supplemented by 230 kV transmission upgrades from Central to substations in the San Diego metropolitan area. Partial permit application has been filed with the California PUC by SDG&E. Development will meet near-term SDG&E reliability need, and allow 1500 MW of renewable resources to reach energy customers.

Los Angeles DWP & Southern California Edison resolved in October to build the long-delayed Devers- Palo Verde 500 kV connection from Arizona to California.

These are the same major projects the California Energy Commission identifies as needed for Southern California in the near term: Palo Verde (Arizona) – Devers No. 2 Project, Sunrise Powerlink Project, Tehachapi– Antelope Transmission Project, and Imperial Valley Transmission Upgrade.”

Federal Transmission Activity – In August 2006, the U.S. Department of Energy National Electric Transmission Congestion Study identified the So Cal AZ, Riverside, Los Angeles geographic area as a” Critical Congestion Area.” The study stated “Southern California needs new transmission capacity for reliability, economics, and compliance with the state’s renewable portfolio standard.”

Designation of a TransWest & Zia Transmission Corridor

Background

Wind Potential - Across Wyoming, Eastern Colorado and New Mexico, there is over 150 GW of potential wind generation capacity, much of it the best wind resources in the Nation. Markets for wind power in the Desert Southwest are strong and are driven by both load growth and RPS laws in Arizona, Nevada, and Colorado. Utilities and transmission development companies are working in Arizona and Colorado on transmission ties to Wyoming, aided by the Wyoming Infrastructure Authority. These efforts include the TransWest Express, an upgrade to the TOT 3 path, and a Bridger West expansion. These efforts all have the potential to move high-quality wind from Wyoming and Eastern Colorado to loads. A likely path through New Mexico allows New Mexico wind exports as well

Current Transmission Activity in the Interior West –

- **Arizona Public Service:** Lead on TransWest Express and other models to bring significant new resources to Arizona from East and North using two 500-KV lines. **National Grid** providing technical role. Commitments sought now.
- **Wyoming Infrastructure Authority:** Co-sponsor for early development of wind and coal exports from Wyoming to loads in Colorado, Utah, Nevada, Arizona and, ultimately California. Specific interest in 1000 MW wind transfer to Utah.
- **Trans-Elect:** Development lead on TOT3 expansion from Wyoming to Colorado. Initial stage of 500 MW wind possible. Commercial commitments sought now.
- **PNM:** Project Zia and wind export efforts are in conceptual stages of design and routing parallel to Interstate 10 from Las Cruces west to Phoenix for 1000 MW wind.

Federal Transmission Activity – In August 2006, the DOE National Electric Transmission Congestion Study identified relevant areas among those most likely to be the most heavily congested in 2008: Arizona to Southern Nevada and Southern California, North and Eastern Arizona, the Bridger West line from Wyoming to Utah, Colorado to Utah, Colorado to New Mexico, Utah to Northern and Central Nevada.

Summary

Designation of a TransWest/ Zia Corridor would allow the Nation to tap into some of the best regions for exporting wind resources, deliver economical and clean energy to electric consumers, support a growing region's economy, diversify our fuel mix, help address national energy security issues, and bring needed energy reliability to the Southwest. Designation of a TransWest/ Zia Transmission Corridor is consistent with transmission planning efforts currently underway in Southwest.