



**EDISON ELECTRIC  
INSTITUTE**

# **Transmission Projects: At A Glance**

**JANUARY 2007**

**Edison Electric Institute (EEI)** is the association of United States shareholder-owned electric companies, international affiliates, and industry associates worldwide. Our U.S. members serve 97 percent of the ultimate customers in the shareholder-owned segment of the industry, and 71 percent of all electric utility ultimate customers in the nation. They generate almost 60 percent of the electricity produced by U.S. electric generators.

Organized in 1933, EEI works closely with its members, representing their interests and advocating equitable policies in legislative and regulatory arenas. In its leadership role, the Institute provides authoritative analysis and critical industry data to its members, Congress, government agencies, the financial community and other influential audiences. EEI provides forums for member company representatives to discuss issues and strategies to advance the industry and to ensure a competitive position in a changing marketplace.

EEI's mission is to ensure members' success in a new competitive environment by:

- Advocating Public Policy
- Expanding Market Opportunities
- Providing Strategic Business Information

For more information on EEI programs and activities, products and services, or membership, visit our Web site at [www.eei.org](http://www.eei.org).



**EDISON ELECTRIC  
INSTITUTE**

# **Transmission Projects: At A Glance**

Prepared by: **Edison Electric Institute**

**JANUARY 2007**

© 2006 by the Edison Electric Institute (EEI).

All rights reserved. Published 2006.

Printed in the United States of America.

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or any information storage or retrieval system or method, now known or hereinafter invented or adopted, without the express prior written permission of the Edison Electric Institute.

#### **Attribution Notice and Disclaimer**

This work was prepared by the Edison Electric Institute (EEI). When used as a reference, attribution to EEI is requested. EEI, any member of EEI, and any person acting on its behalf (a) does not make any warranty, express or implied, with respect to the accuracy, completeness or usefulness of the information, advice or recommendations contained in this work, and (b) does not assume and expressly disclaims any liability with respect to the use of, or for damages resulting from the use of any information, advice or recommendations contained in this work.

The views and opinions expressed in this work do not necessarily reflect those of EEI or any member of EEI. This material and its production, reproduction and distribution by EEI does not imply endorsement of the material.

Published by:  
Edison Electric Institute  
701 Pennsylvania Avenue, N.W.  
Washington, D.C. 20004-2696  
Phone: 202-508-5000  
Web site: [www.eei.org](http://www.eei.org)

---

# TABLE OF CONTENTS

<b>INTRODUCTION</b>	<b>v</b>
<b>ALLEGHENY POWER</b>	<b>1</b>
• Trans-Allegheny Interstate Line (TrAIL) Project	1
• Black Oak Static VAR Compensator	2
<b>AMEREN</b>	<b>3</b>
• Callaway - Franks 345 kV Central Missouri Project	3
• LaSalle County 138 kV Lines in Northern Illinois Project	4
• Prairie State 1650 MW IPP Connection Transmission Project	4
<b>AMERICAN ELECTRIC POWER</b>	<b>5</b>
• AEP Interstate Project - 765 kV Transmission Line Project	5
• Wyoming - Jacksons Ferry 765 kV Transmission Line Project	6
<b>AMERICAN TRANSMISSION COMPANY</b>	<b>7</b>
• Arrowhead Weston 345 kV Project	7
• Rockdale-West Middleton Transmission Line 345 kV Project	8
• Gardner Park-Central Wisconsin and Morgan-Werner West 345 kV Projects	9
<b>ARIZONA PUBLIC SERVICE</b>	<b>10</b>
• Palo Verde Hub – TS5 Substation – TS9 Substation –Pinnacle Peak Substation 500 kV Projects	10
• Palo Verde Hub – North Gila 500 kV Project	11
• TransWest Express Project	11
<b>AVISTA CORP.</b>	<b>13</b>
• Palouse 230 kV Transmission Line Project	13
<b>CENTERPOINT ENERGY</b>	<b>14</b>
• Houston Import Constraint Mitigation Project	14
<b>CLECO</b>	<b>16</b>
• Wells 500/230 kV Substation	16
<b>DOMINION RESOURCES</b>	<b>17</b>
• Carson-Suffolk 500 kV and Thrasher 230 kV Line	17
• Meadow Brook - Loudoun 500 kV Transmission Line	18
<b>DUKE ENERGY</b>	<b>19</b>
• Santeetlah-Robbinsville Tie Line Upgrade Project	19
<b>EMPIRE DISTRICT</b>	<b>20</b>
• Ozark 161 kV Transmission Line Project	20
• Riverton Power Plant 161 kV Transmission Upgrades Project	21

<b>EXELON CORP. (COMMONWEALTH EDISON)</b> .....	<b>22</b>
• West Loop Project .....	22
<b>FIRSTENERGY</b> .....	<b>23</b>
• New Energy Management System Project.....	23
<b>FPL GROUP</b> .....	<b>24</b>
• Bunnell - St. Johns 230 kV Project .....	24
• Indiantown - Riviera 230 kV Project .....	25
• Overtown - Venetian 138 kV Project.....	25
<b>ITC HOLDINGS CORP.</b> .....	<b>26</b>
• Bismark-Troy 345 kV Project.....	26
• Goodision 345 kV Project.....	27
<b>MIDAMERICAN ENERGY HOLDINGS COMPANY (MIDAMERICAN ENERGY CO.)</b> .....	<b>28</b>
• Council Bluffs Energy Center to Grimes 345 kV Project.....	28
<b>MIDAMERICAN ENERGY HOLDINGS COMPANY (PACIFICORP)</b> .....	<b>29</b>
• Summit Vineyard Project .....	29
• Path C Upgrade Project .....	30
• Walla Walla to Mid C .....	30
• Mona to Oquirrh .....	31
• Camp Williams to Mona .....	31
<b>NORTHEAST UTILITIES (CONNECTICUT LIGHT &amp; POWER (CL&amp;P))</b> .....	<b>32</b>
• Bethel-Norwalk 345 kV Underground & Overhead Project .....	32
• Glenbrook Underground Cable Project .....	33
• Long Island 138 kV Cable Replacement Project .....	34
• Middletown-Norwalk 345 kV Underground and Overhead Project .....	35
<b>PACIFIC GAS &amp; ELECTRIC</b> .....	<b>36</b>
• Jefferson-Martin 230 kV Project.....	36
• Tri-Valley Project .....	37
• Midway – Gregg 500 kV Project.....	38
<b>PEPCO HOLDINGS INC.</b> .....	<b>39</b>
• Mid Atlantic Power Pathway Project .....	39
<b>PNM RESOURCES</b> .....	<b>41</b>
• Norton to Zia 115 kV Project (Project Power).....	41
<b>PROGRESS ENERGY</b> .....	<b>43</b>
• Central Florida – Bushnell 230 kV Line Project (Florida) .....	43
• Darlington County Plant - Florence 230 kV Line Project (South Carolina).....	44
• Hines – West Lake Wales 230 kV Line Project (Florida).....	44

<b>PUBLIC SERVICE ELECTRIC AND GAS COMPANY</b> .....	<b>45</b>
• Branchburg Switching Station Project.....	45
• Transformer Replacement Project.....	45
• Essex - Aldene 230 kV Project.....	46
• Flagtown - Somerville - Bridgewater Project.....	46
<b>SIERRA PACIFIC RESOURCES</b> .....	<b>47</b>
• Centennial Project.....	47
• Eastern Nevada Transmission Intertie Project .....	48
• East Valley Master Plan Project .....	48
• Emma Line and Substation Project .....	49
• Falcon to Gonder Project .....	49
• North Las Vegas Area Routing and Siting Project.....	50
<b>SOUTHERN CALIFORNIA EDISON</b> .....	<b>51</b>
• Devers - Palo Verde No. 1 .....	51
• Devers-Palo Verde No. 2.....	52
<b>SOUTHERN COMPANY</b> .....	<b>54</b>
• McGrau Ford-Mosteller Springs 500 kV Line Project .....	54
<b>TXU</b> .....	<b>55</b>
• Jacksboro Switching Station – West Denton 345 kV Circuit Project .....	55
• Paris Switching Station – Valley South Switching Station – Anna Switching Station 345 kV Circuit Project .....	56
• West Levee Switching Station – Norwood Switching Station 345 kV Circuit Project.....	56
<b>XCEL ENERGY</b> .....	<b>57</b>
• CapX 2020 Transmission Plan.....	57
• Comanche – Daniels Park 345 kV Transmission Project .....	58
• SW Minnesota Wind Expansion Project.....	59
• Buffalo Ridge Incremental Generation Outlet (BRIGO).....	60
• Chisago to Apple River Transmission Upgrade .....	61





---

# INTRODUCTION

Recently, a good deal of interest has been focused on the state of the Nation's transmission infrastructure. The sluggish transmission investment trend that prevailed from the 1970s through 1999 has seen a reversal in recent years. EEI member companies plan to increase transmission investment by nearly 60% over the 2006–2009 period as compared to the 2002–2005 period, to \$31.5 billion.<sup>1</sup>

Moreover, there have been several landmark developments in Federal Policy affecting transmission infrastructure. It is against this backdrop that EEI provides this report to give a broad, but not comprehensive, perspective on the panoply of transmission investment projects that are presently being planned and undertaken.

## Report Scope

The materials that follow are not intended to provide a comprehensive list of transmission investment activity. Rather, the report focuses on highlighting representative projects covering several key categories of transmission investment presently being undertaken by EEI's members. Although several of the projects in this report are in the proposal stages and subject to additional review of their costs and benefits as well as an assessment of alternative projects, they are representative of new transmission investments advancing in the electric industry. The objective of this report is to provide a broader perspective on the types of projects proposed and underway.

The Report includes member company projects that are representative of various project investment category types, such as: long line; reliability, economic, resource access (conventional and renewable), multi-state, multi-entity (e.g., projects involving IOU and Public Power as collaborative efforts), and non-transmission line projects. Although the report includes samples of all these project categories, it does not attempt to identify which projects fall under which category since many of the projects serve multiple purposes and can easily satisfy several of the representative categories.

A minimum project investment threshold of \$10 million was applied to prospective projects and only projects from 2005 going forward are included. A brief profile of each company is included along with the representative projects it submitted.

## Some General Observations

In many instances, projects intended to meet a particular need provide other ancillary benefits as well. For example, the proposed Trans-Allegheny Interstate Line, while its initial purpose is to improve system reliability, the project may also provide some economic benefits. Therefore, when reviewing the representative projects highlighted in this report, it is important to appreciate the multifaceted benefits a project can bring.

---

<sup>1</sup> Data represents both vertically integrated and stand-alone transmission companies. Planned total industry expenditures are preliminary and estimated from 90% response rate to EEI's Electric Transmission Capital Budget & Forecast Survey. Actual expenditures are from EEI's Annual Property & Plant Capital Investment Survey & Form 1s.

Many of the projects highlighted in this report span several states and involve numerous entities. These projects portend the future for transmission enhancements that may lead the way to the development of a nationwide transmission super highway. The proposed AEP 765 kilovolt (kV) Interstate line is one such project spanning three states from West Virginia to New Jersey. Another is the CAPX 2020 projects, the collaborative efforts of nine entities and crossing four states. Often these projects involve not only traditional electric utilities but also involve the cooperation of public power entities and governmental agencies. Two such projects are the Santeetlah to Robbinsville 161 kV line and Long Island Cable Replacement.

The representative projects presented in this report also include a number of non-transmission line projects. These projects span the range of phase angle regulators, stepdown transformers, Static VAR Compensators (SVC), static capacitors and control system improvements. While not adding to the overall line mileage, these projects provide tangible benefits to the transmission system through the creation of additional transfer capability, added controllability and strengthening the overall transmission system. Non-transmission line projects highlighted in this report include the addition of the Allegheny Black Oak SVC, Southern California Edison Devers-PaloVerde PAR and FirstEnergy EMS Project.

Finally, there are also a number of long transmission line projects that are intended to serve a multitude of purposes from maintaining or improving reliability and reducing congestion to enabling access to new markets and renewable resources. One such project is the Trans West Express Project constructing over, 1,300 miles of new transmission. Another is the Middleton to Norwalk project which creates a “loop” in southwest Connecticut, connecting that area to the nearly 400 miles of 345 kV transmission lines that already run through the rest of the state.

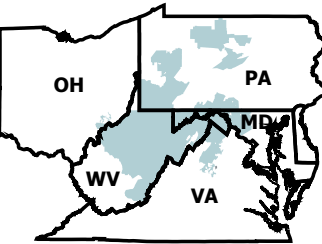
While it is not the objective of this report to draw any conclusions, it is apparent there is much activity taking place across the nation to add to the existing transmission infrastructure.

---

# ALLEGHENY POWER



- The three Allegheny Power operating companies that conduct business as “Allegheny Power” are Monongahela Power Company, The Potomac Edison Company and West Penn Power Company. All three are subsidiaries of Allegheny Energy, Inc.
- Allegheny Power provides retail electric service to a population of approximately three and one-half million people in Maryland, Pennsylvania, Virginia, and West Virginia.
- System wide there are approximately 4,600 circuit miles of transmission lines.
- Between 2000 and 2005 Allegheny Power has invested approximately \$64 million into the transmission system.

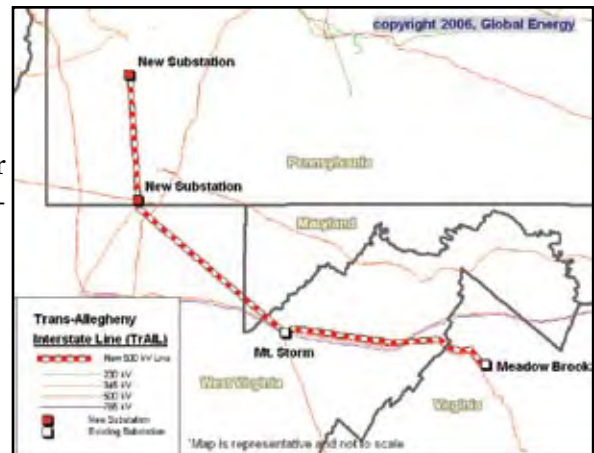


Electric service territory source:  
Global Energy Decisions, Inc. © 2006

---

## Trans-Allegheny Interstate Line (TrAIL) Project

**Project Description:** This project constructs a new 210-mile 500 kV line in Allegheny Power’s transmission zone extending from southwestern Pennsylvania to existing substations at Mt. Storm, West Virginia, and Middletown, Virginia. The line continues east for another 40 miles in Dominion Virginia Power’s transmission zone to Dominion Virginia Power’s Loudoun Substation. Allegheny and Dominion Virginia Power will each construct the line in their respective transmission zones. Trans-Allegheny Interstate Line Company, an Allegheny Energy Company, has been designated by Allegheny Power to build the line.



**Line mileages by state:** Maryland—10 miles, Pennsylvania— 40 miles, Virginia— 40 miles and West Virginia—120 miles. These line mileages are approximate since the line route has not been selected at this time.

Additional information on the TrAIL project may be found at [www.aptrailinfo.com](http://www.aptrailinfo.com)

**Project Cost:** Allegheny \$820 million +; Dominion Virginia Power \$150 million +.

**Project Status:** The PJM board has approved as part of its five-year Regional Transmission Expansion Plan (RTEP) the construction of a 250-mile, 500 kV transmission line that includes the 210-mile TrAIL project. Allegheny has commenced line siting and has received incentive rate authorization from the Federal Energy Regulatory Commission (FERC), and has requested

National Interest Electric Transmission Corridor (NIETC) designation from the Department of Energy (DOE). The project is anticipated to be in service by June 2011.

**Investment Partner(s):** None. Allegheny and Dominion Virginia Power will each construct the portion of the line in their respective transmission zones. Trans-Allegheny Interstate Line Company, an Allegheny Energy Company, has been designated by Allegheny Power to build the line.

**Project Benefits:** The Project has been designated for reliability purposes and will significantly strengthen the existing PJM Transmission System infrastructure relieving loading on several highly congested facilities and alleviating voltage and thermal limitations in the PJM region. The project will also increase west-to-east transfer capability, making cost-effective generation available to more consumers.

---

## Black Oak Static VAR Compensator

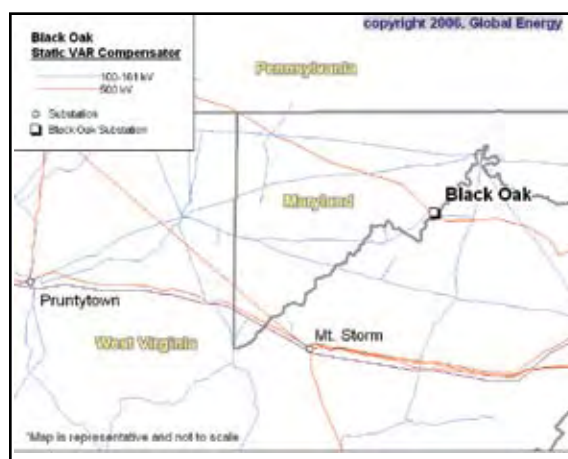
**Project Description:** The project installs a  $-100 / +575$  MVAR Static VAR Compensator (SVC) on the 500 kV bus at Black Oak Substation.

**Project Costs:** \$50 million +.

**Project Status:** The project is scheduled to be in-service in December 2007.

**Investment Partner(s):** None.

**Project Benefits:** The installation will provide a solution to a voltage constraint at Black Oak Substation for the loss of the Pruntytown–Mt. Storm 500 kV line. The SVC will restore the 500 kV Black Oak Bus voltage to an acceptable level for the loss of the line.

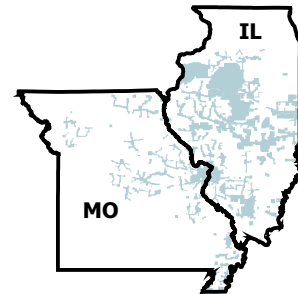


---

# AMEREN



- Ameren is the largest electric utility in Missouri and the second largest in Illinois. Ameren companies (AmerenCILCO, AmerenCIPS, AmerenUE and AmerenIP) serve 2.4 million electric customers in a 64,000 square-mile area in Missouri and Illinois.
- System wide there are 7,337 circuit miles of transmission lines.
- Between 2000 and 2005 Ameren has invested approximately \$260 million into the transmission system.
- In 2006, AmerenUE increased its transmission capital budget by more than 30 percent, focusing on specific projects to enhance reliability through infrastructure improvements and increased tree trimming. Many projects are driven by economic and population growth.



Electric service territory source:  
Global Energy Decisions, Inc. © 2006

---

## Callaway - Franks 345 kV Central Missouri Project

**Project Description:** The 345 kV transmission line, called the Callaway-Franks line, is approximately 54 miles long, beginning near Chamois in Osage County and ending near Franks in Pulaski County. The project also installs an additional 345/161 kV transformer at the Associated Electric Cooperative - Franks station.

**Project Cost:** \$29.4 million.

**Project Status:** The project was placed in service on December 15, 2006.

**Investment Partner(s):** Associated Electric Cooperative, Inc.

**Project Benefits:** The line relieves overload conditions on the current Bland-Franks line and provides additional capacity for future growth.



## LaSalle County 138 kV Lines in Northern Illinois Project

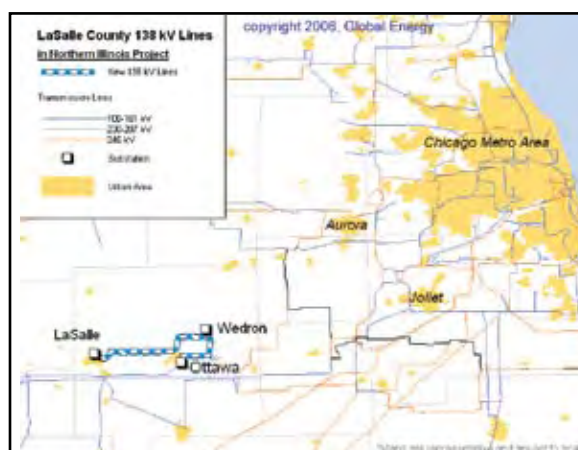
**Project Description:** This project will install a pair of 138 kV transmission lines linking LaSalle and Ottawa to a forthcoming substation in Wedron. The LaSalle and Ottawa lines are 24.5 miles and 10.5 miles in length, respectively.

**Project Cost:** Approximately \$21 million. Ameren Transco will fund and own 90% of the project during construction and AmerenIP will own the remaining 10%. Once the project is in service, AmerenIP will have the right to acquire Ameren Transco's 90% share.

**Project Status:** Public workshops were held in April 2006. A filing for a certificate of Convenience and Necessity was made with the Illinois Commerce Commission in November 2006. The anticipated in service date for the LaSalle line is June 1, 2008.

**Investment Partner(s):** None.

**Project Benefits:** This project will meet load growth in the Illinois Valley area and enhance the current transmission infrastructure in Illinois.



## Prairie State 1650 MW IPP Connection Transmission Project

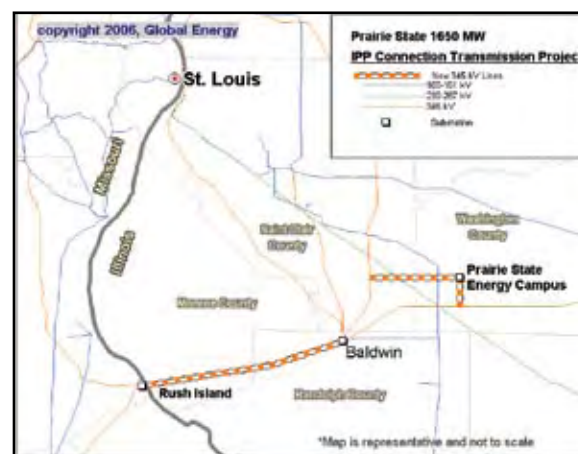
**Project Description:** This project will construct 44 circuit miles of 345 kV transmission in southwestern Illinois passing through four counties to interconnect a coal-fired plant being developed by Peabody Energy Corp. Two lines tap into existing circuits, and one new circuit ties Baldwin to Rush Island.

**Project Cost:** The estimated cost is \$87 million. Ameren Transco will fund and own 90% of the project during construction and AmerenIP will own the remaining 10%. Once the project is in service, AmerenIP will have the right to acquire Ameren Transco's 90% share.

**Project Status:** Public workshops have been held. Construction depends on whether Peabody Energy, builds the 1,650 MW, coal-fired power plant on the western edge of Washington County, Illinois. Both the authorization for public utility recognition for Ameren Transco and the request for a certificate of public convenience and necessity were filed with the Illinois Commerce Commission on March 3, 2006. The anticipated in service date for Prairie States line is May 2009.

**Investment Partner(s):** None.

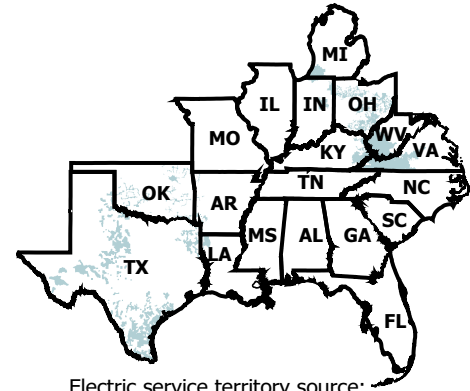
**Project Benefits:** The project will enable the interconnection of a coal-fired plant being developed by Peabody Energy Corp.





# AMERICAN ELECTRIC POWER

- American Electric Power (AEP) is one of the largest electric utilities in the United States, delivering electricity to more than 5 million customers in 11 states.
- AEP's service territory covers 197,500 square-miles in Arkansas, Indiana, Kentucky, Louisiana, Michigan, Ohio, Oklahoma, Tennessee, Texas, Virginia and West Virginia.
- System-wide there are more than 39,000 circuit miles of transmission lines.
- Customer service is provided through AEP's seven regional utilities: AEP Ohio; AEP Texas; Appalachian Power; Indiana Michigan Power; Kentucky Power; Public Service Company of Oklahoma; and Southwestern Electric Power Company.
- AEP is also developing an interstate system using a 765 kV transmission superhighway stretching from West Virginia to New Jersey, announced a joint venture with MidAmerican Energy to invest in transmission in Texas, announced a joint study effort with ITC Holdings for new 765 kV transmission into Michigan, and submitted 765 kV network plans for SPP and ERCOT.
- In addition to adding generation, between 2000 and 2005 AEP has invested approximately \$1.6 billion into the transmission system.

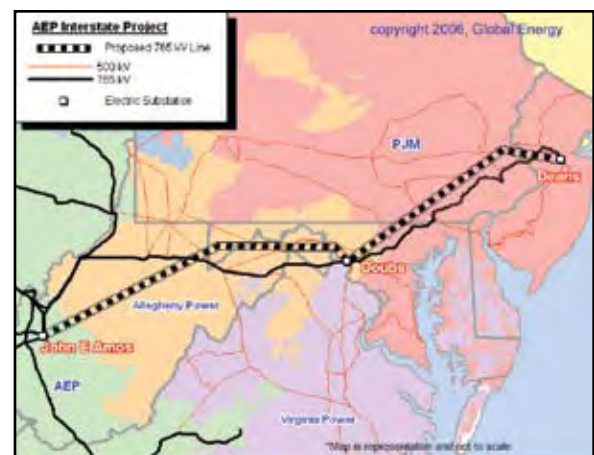


Electric service territory source:  
Global Energy Decisions, Inc. © 2006

## AEP Interstate Project - 765 kV Transmission Line Project

**Project Description:** AEP proposes to build a new 765 kV transmission line stretching 550 miles from West Virginia (on the AEP system) through Allegheny Power Company and terminating in New Jersey. The line will improve west to east transfer capability by approximately 5,000 MW. The 765 kV construction requires a smaller right-of-way, approximately 200 feet, as compared to equivalent capacity at lower voltage levels and has the capability of carrying more power over longer distances.

**Project Cost:** \$3 billion (nominal dollars). AEP has sought incentive rate treatment from the Federal Energy Regulatory Commission (FERC).



**Project Status:** AEP is seeking designation as a National Interest Electric Transmission Corridor (NIETC) for the I-765 line and is requesting PJM to include the I-765 line in its Regional Transmission Expansion Plan (RTEP). PJM will consider this project in its 2007 RTEP process, and the project has an estimated in service date of 2015.

**Investment Partner(s):** AEP has formed a separate transmission company that will build, own and operate the line. This new company, AEP Transmission Company, LLC, will be operated as an affiliated transmission company. It is possible that other utilities may participate in the project.

**Project Benefits:** The proposed transmission line is designed to reduce PJM congestion costs substantially by improving west to east transfer capability and reducing transmission line losses saving consumers more than \$30 million annually associated with losses, and enhance reliability over the long run by reducing the probability of future blackouts or mitigating the spread of a blackout should it occur. The project is also allow more help generators to compete over a broader area and the expanded 765 kV network will increase opportunities for green power, such as wind farms located in remote areas far removed from load centers.

## Wyoming - Jacksons Ferry 765 kV Transmission Line Project

**Project Description:** AEP's 90-mile Wyoming-Jacksons Ferry line connects stations in Wyoming County, West Virginia, and Jacksons Ferry, Virginia. A team of experts from Virginia Tech and West Virginia University developed routes for the 765 kV transmission line project by conducting intensive and detailed analysis of transmission line corridors. In December 2002 the U.S. Forest Service recommended that the power line be allowed to cross 11 miles of federal land.

**Project Cost:** \$305.8 million.



**Project Status:** AEP first proposed the line in March 1990 as the Wyoming - Cloverdale Project. The project was dedicated on May 8, 2006 and was energized in June 2006.

**Investment Partner(s):** None.

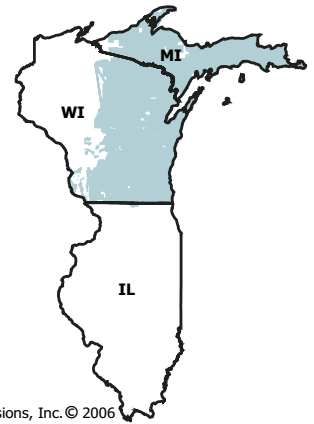
**Project Benefits:** The project will improve the reliability of service in the company's West Virginia and Virginia service area where customer demand far exceeds the local generation resources.



---

# AMERICAN TRANSMISSION COMPANY

- American Transmission Company (ATC) provides electric transmission service in an area from the Upper Peninsula of Michigan, throughout the eastern half of Wisconsin and into portions of Illinois and Minnesota. ATC has 8,900 circuit miles of high-voltage transmission lines and 480 substations which provide communities with access to local and regional energy sources.
- ATC operates its \$1.5 billion transmission system as a single entity, providing comparable service to all customers. Our customers include electricity producers and electric distribution companies who count on ATC to deliver power from where it's produced to where it's needed in the homes and businesses they serve.
- Since ATC was formed in 2001 as a utility solely focused on electric transmission, it has invested more than \$1 billion to upgrade more than 809 miles of transmission line, improve 90 electric substations and build 20 new transmission lines (78 miles).



Source:  
Global Energy Decisions, Inc. © 2006

---

## Arrowhead Weston 345 kV Project

**Project Description:** This project constructs a 345 kV line between Wausau, Wisconsin and Duluth, Minnesota (approximately 220 miles) to improve reliability, help increase electric import capability, reduce disturbances.

**Project Cost:** \$400 million +.

**Project Status:** The initial 2/3 (143 miles) of the project were placed in service in November 2006, ahead of schedule and on budget. The project continues to be on schedule for completion before June 2008. All regulatory permits have been received and easement negotiations are almost complete.



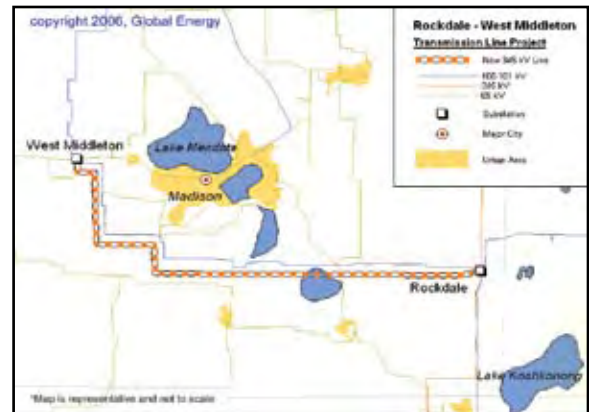
**Investment Partner(s):** Minnesota Power and Wisconsin Public Service.

**Project Benefits:** When construction is finished in 2008, this 345 kV line will significantly improve ATC's transmission infrastructure, boosting electric reliability in the region and giving ATC's customers another important interstate connection to neighboring electricity markets.

## Rockdale-West Middleton Transmission Line 345 kV Project

**Project Description:** The Rockdale-West Middleton line will serve multiple reliability functions. The project involves constructing approximately 35-55 miles (depending on route) of new 345 kV transmission line to connect the Rockdale Substation located near Christiana with the West Middleton Substation. Both substations will require some equipment upgrades to support this new line.

**Project Cost:** Depending on route, between \$131 million to \$163 million.



**Project Status:** Three possible route options were presented to the public in June 2006; these options will be narrowed down to two routes for regulatory review in early 2007. This project is anticipated to be in service in 2010.

**Investment Partner(s):** None.

**Project Benefits:** This project will improve reliability for Dane County. Dane County has experienced in recent years some of the highest growth rates in the state, both in population and electricity usage. The existing transmission system in and around Dane County brings power in from outside the county to meet the needs for electricity. However, the system is operating at its limits and additional transmission lines are needed to keep pace with the growing demand.

## Gardner Park-Central Wisconsin and Morgan-Werner West 345 kV Projects

**Project Description:** This project constructs a 345 kV transmission line from a new substation, Gardner Park, located just south of the existing Weston Power Plant, to a new substation, called Central Wisconsin, in central Shawano County. This approximately 50-mile line will interconnect with another new 50-mile 345 kV line to link the existing Morgan Substation, southwest of Oconto Falls, to a new substation called Werner West in the New London area.

**Project Cost:** \$264 million.



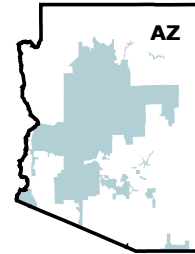
**Project Status:** The Public Service Commission of Wisconsin has approved ATC's application. Construction is set to begin in 2007 with an in-service date of December 2009.

**Investment Partner(s):** None.

**Project Benefits:** The projects are needed to bolster electric reliability in north central and north-eastern Wisconsin. The Gardner Park - Central Wisconsin line is needed because of the addition of a 500-megawatt generator at the Weston Power Plant near Wausau. The existing transmission system is inadequate to deliver the additional energy. The Morgan-Werner West line is needed to alleviate overloaded facilities in the Green Bay and Fox Valley areas. Together, the two lines will significantly improve reliability in the region and improve ATC's ability to move power in and around northeastern Wisconsin and Michigan's Upper Peninsula.

# ARIZONA PUBLIC SERVICE

- Arizona Public Service (APS) delivers electricity to more than 1 million customers in 11 of Arizona's 15 counties.
- System wide there are approximately 2,186 circuit miles of 230 kV and above high-voltage transmission lines that APS either wholly owns or has a partnership interest in.
- Between 2000 and 2005 APS has invested approximately \$455 million into the transmission system.



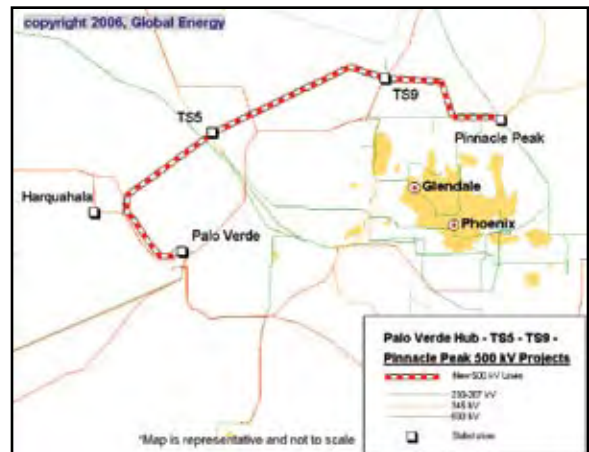
Electric service territory source:  
Global Energy Decisions, Inc. © 2006

## Palo Verde Hub – TS5 Substation – TS9 Substation – Pinnacle Peak Substation 500 kV Projects

**Project Description:** This project constructs approximately 110 miles of new 500 kV transmission connecting Southwest Phoenix to Northeast Phoenix. The project will consist of three segments: Palo Verde Hub to TS5; TS5 to TS9; and TS9 –Pinnacle Peak.

**Project Cost:** \$700 million.

**Project Status:** The Arizona Corporation Commission granted APS a Certificate of Environmental Compatibility (CEC) for the Palo Verde Hub to TS5 Substation 500 kV Transmission Project on August 9, 2005. The project is planned to be completed and operational by the summer of 2009. The TS9 to Pinnacle Peak 500/230 kV Transmission Project is anticipated to be in service by 2010 and the CEC application was filed on October 4, 2006. The TS5 to TS9 500 kV Transmission Line Project is anticipated to be in service by 2012. A CEC application has not yet been filed for the TS5 to TS9 Project.



**Investment Partner(s):** Salt River Project and Central Arizona Water Conservation District.

**Project Benefits:** This project will strengthen the entire Arizona and APS transmission system by providing an additional high-voltage transmission source to the Phoenix Metropolitan area, allowing the import of an additional 1,000 MW of power from generating sources at, or around, the Palo Verde Hub. The project will connect three major transmission systems – the Navajo South system, the Palo Verde system, and the Four Corners system. The project will also strengthen the transmission system throughout the metropolitan Phoenix area.

## Palo Verde Hub – North Gila 500 kV Project

**Project Description:** This project will build a new 500 kV transmission line between the Palo Verde Hub (the area around the Palo Verde Nuclear Generating Station) and the existing North Gila Substation (Northeast of Yuma). The 500 kV single-circuit transmission line will be approximately 115 miles in length built on tubular or lattice tower structures 130 – 150 feet high, spaced approximately 600 – 1,800 feet apart.

**Project Cost:** \$300 million.

**Project Status:** APS anticipates submitting an application to the Arizona Corporation Commission in early 2007 and the project has a projected in-service date of 2012.

**Investment Partner(s):** Salt River Project, Imperial Irrigation District, and Welton Mohawk Irrigation and Drainage District.

**Project Benefits:** The Palo Verde Hub to North Gila 500 kV Project will provide the electrical transmission infrastructure to import power into the high-growth Yuma area from additional generation resources around the Palo Verde Hub. The project will improve the reliability of the APS system in the Yuma area by providing an additional high-voltage transmission source to the region. The project will also provide Arizona load serving entities access to geothermal and solar renewable resources in the Imperial Valley area of California.



## TransWest Express Project

**Project Description:** This project will construct a 500 kV DC transmission line from Wyoming to Arizona. Depending on routing, the line will be from 1,000 to 1,350 miles in length, and will be integrated with other planned projects such as the Dine Navajo Transmission Project, the second Palo Verde – Devers 500 kV line and the second Palo Verde – North Gila 500 kV line.

**Project Cost:** \$2.5 billion.

**Project Status:** APS has substantially completed a feasibility study for the project, which demonstrated the economic benefit for a 500 kV DC transmission line from Wyoming to Arizona. APS is presently in negotiations with Salt River Project, Tucson Electric Power, Southern California Edison, National Grid (as potential Project Manager), and



the Wyoming Infrastructure Authority (as a potential financing partner) to develop a participation agreement for the project development phase, which would include project permitting. An in-service date of 2015 is anticipated.

**Investment Partner(s):** Negotiations are underway to determine participants as described above.

**Project Benefits:** The completion of the TransWest Express Project would provide Arizona and other western states increased capability to access electricity generated from coal, wind and other resources in Wyoming. The TransWest Express Project also will help strengthen the western interconnection.

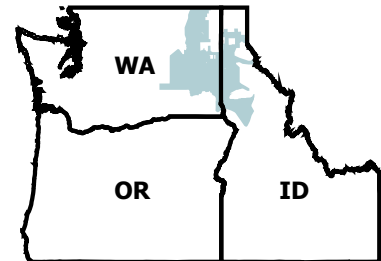


---

# AVISTA CORP.



- Avista Utilities' primary area covers more than 30,000 square-miles.
- Avista operates and manages transmission and distribution facilities in five western states and serves nearly 325,000 electric customers in eastern Washington and northern Idaho.
- System wide there are approximately 2,300 miles of transmission lines.
- Between 2000 and 2005 Avista has invested approximately \$100 million into the transmission system.



Electric service territory source:  
Global Energy Decisions, Inc. © 2006

---

## Palouse 230 kV Transmission Line Project

**Project Description:** The Palouse Upgrade Project will be constructed in two distinct phases and will create a 230 kV transmission corridor between Avista's existing Shawnee and Benewah substations:

**Phase One** - upgrades and increases the capacity of the existing 50-year-old, 35-mile 115 kV transmission line between Avista's Shawnee and Rosalia substations.

**Phase Two** - builds an east-west link between the Shawnee-Rosalia line and the parallel Benewah-Moscow line. Connecting these two lines will help ensure electric transmission reliability and the additional connection serves as a backup between the Benewah and Shawnee substations.



In order to connect the Shawnee-Rosalia and Benewah-Moscow transmission lines, Avista rebuilt 11 miles of existing 115 kV transmission line from the Benewah Substation west and south to the Spokane and Whitman counties' border; and constructed a new 14-mile transmission line along the county line to the intersection of the Shawnee-Rosalia line. In addition, Avista is rebuilding its Benewah 230 kV Substation and plans to add 200 MVAR or reactive resource in 2007.

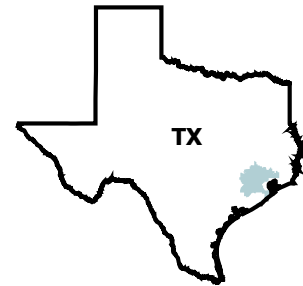
**Project Cost:** \$52 million.

**Project Status:** The project is anticipated to be energized in November 2007.

**Investment Partner(s):** None.

**Project Benefits:** The project will relieve current congestion in the area and improve reliability, which reduces the amount of time consumers wait for power restoration during an outage. It will also provide capacity to meet future growth needs in the region.

# CENTERPOINT ENERGY



Electric service territory source:  
Global Energy Decisions, Inc. © 2006

- CenterPoint Energy, Inc., headquartered in Houston, Texas, is a domestic energy delivery company that provides electric transmission and distribution service, natural gas distribution, competitive natural gas sales and services, and pipeline and field services operations.
- The company serves more than five million customers in Arkansas, Louisiana, Minnesota, Mississippi, Oklahoma, and Texas.
- CenterPoint Energy Houston Electric (CenterPoint Energy) is the regulated electric transmission and distribution utility focused strictly on energy delivery within a 5,000 square-miles service area in and around Houston.
- The transmission delivery system is made up of approximately 3,600 circuit miles of transmission lines, delivering service to approximately 1.9 million metered customers.
- Between 2000 and 2005 CenterPoint has invested over \$600 million into the transmission system.

## Houston Import Constraint Mitigation Project

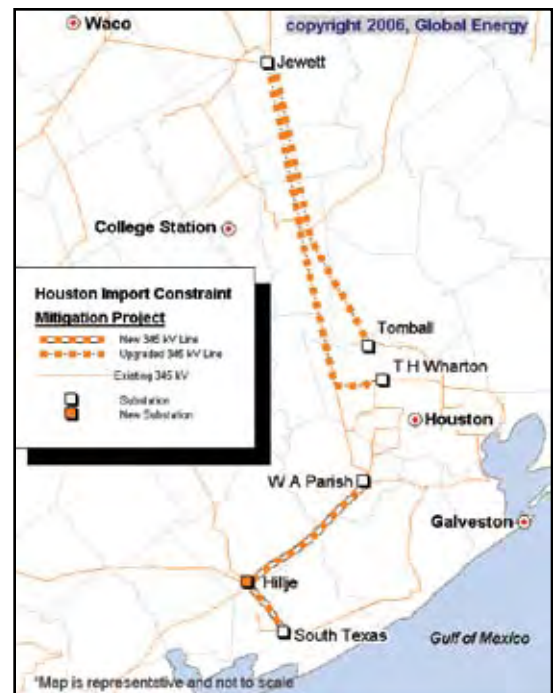
**Project Description:** The project includes construction of a new 345 kV Hillje switching station, the addition of approximately 68 miles of 345 kV transmission line from the South Texas Project (STP) to Hillje to W.A. Parish, the upgrade of two 345 kV tie lines into Houston from the north, the addition of four 345/138 kV 800 MVA autotransformers in the Houston area, and other miscellaneous transmission system upgrades.

The construction of 68 miles of new transmission line consists of 29.3 miles of new construction within an existing transmission line corridor, 19.6 miles of new construction within newly acquired right-of-way adjacent to an existing transmission line corridor, and 19.4 miles of new conductor on existing steel lattice towers.

**Project Cost:** \$120 million.

**Project Status:** Upgrades to the two 345 kV tie lines were completed in 2005, and anticipated completion of the overall Houston Area Constraint Mitigation Project is June 2007.

**Investment Partner(s):** None.





**Project Benefits:** This project will increase the power transfer capability into the Houston area, thereby significantly reducing transmission constraints and improving reliability. ERCOT designated the project critical to the reliability of the ERCOT transmission system. Under state commission rules, projects designated as critical to reliability by ERCOT are afforded an accelerated procedural schedule for transmission line certification. In addition, ERCOT estimated that the project will save ERCOT consumers an estimated \$63 million annually in generation production costs.

# CLECO

- Cleco Power LLC, a regulated electric utility business serves approximately 265,000 customers in Louisiana.
- System wide there are 1,200 circuit miles of transmission lines.
- Between 2000 and 2005 Cleco has invested approximately \$63 million into the transmission system.



Electric service territory source:  
Global Energy Decisions, Inc. © 2006

## Wells 500/230 kV Substation

**Project Description:** The Wells substation was built at the intersection of the Entergy 500 kV Webre to Richard line and the Cleco 230 kV Ville Platte to Pont des Mouton line. This location is just south of Opelousas, Louisiana. A 600 MVA auto-transformer was also installed.

**Project Cost:** \$20 million.

**Project Status:** Phase I was completed in 2005. Phase II is under study.

**Investment Partner(s):** Entergy Louisiana.

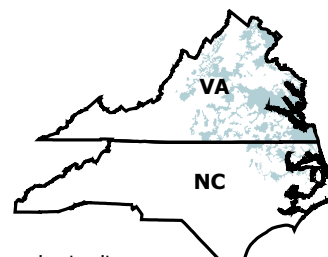
**Project Benefits:** Eliminated the almost daily implementation of Transmission Loading Relief (TLR) in the area by increasing the import capability of the Acadiana Load Pocket by 300 MW. This project has also provided some economic benefit allowing the few generating units in the area to back down more often when cheaper energy is available.



# DOMINION RESOURCES



- Dominion serves more than 2 million homes and businesses in Virginia and North Carolina.
- Dominion owns and maintains approximately 6,000 circuit miles of electric transmission lines in Virginia, North Carolina and West Virginia. These facilities are integrated into the PJM RTO.
- Between 2000 and 2005 Dominion has invested approximately \$440 million into the transmission system.



Electric service territory source:  
Global Energy Decisions, Inc. © 2006

## Carson-Suffolk 500 kV and Thrasher 230 kV Line

**Project Description:** This project installs a 50-mile long, 500 kV transmission line in southeastern Virginia. The transmission line will begin at the Carson Substation in Dinwiddie County and continue to the Suffolk Substation in the City of Suffolk. Also proposed is a 21.5-mile long, 230 kV line in the existing right-of-way from Suffolk Substation to Thrasher Substation in the City of Chesapeake. New 500-230 kV transformers will be added at the Suffolk Substation.

**Project Cost:** \$160 million.

**Project Status:** Dominion anticipates filing the application for these lines in early 2007. Both lines are anticipated to be in service by May 2011.

**Investment Partner(s):** None.

**Project Benefits:** The addition of the two transmission lines will ensure continued reliable electric service to the homes and businesses in the growing south Hampton Roads area of Virginia and the Outer Banks of North Carolina. The proposed 230 kV lines between Suffolk and Chesapeake will move the power further east into the center of the high electric demand.



## Meadow Brook - Loudoun 500 kV Transmission Line

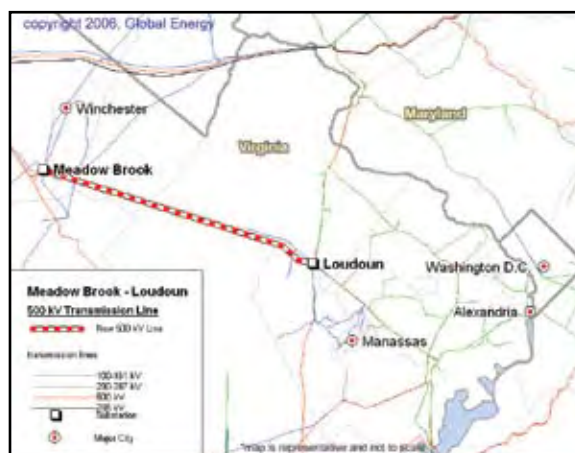
**Project Description:** Dominion has proposed a new 40-mile overhead transmission line through an area extending from the Meadow Brook substation in Frederick County to its Loudoun substation. This line is a continuation of the 210-mile, 500 kV TrAIL project constructed by Allegheny Power.

**Project Cost:** Dominion Virginia Power \$150 million +; Allegheny Power \$820 million +.

**Project Status:** The PJM Board has approved this project as part of its five-year Regional Transmission Expansion Plan (RTEP). Dominion plans to apply with the Virginia State Corporation Commission for approval of this project in the spring of 2007. The project is anticipated to be in service by June 2011.

**Investment Partner(s):** None. Dominion Virginia Power and Allegheny Power will each construct the portion of the line in their respective transmission zones.

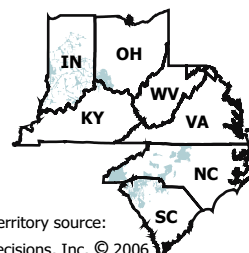
**Project Benefits:** The Meadow Brook transmission line is needed to avoid the growing risk of an electrical blackout in Northern Virginia by 2011. Northern Virginia has faced significant increases in electrical demand over the past 10 years, and is expected to face an additional 8 percent demand growth by 2011.



# DUKE ENERGY



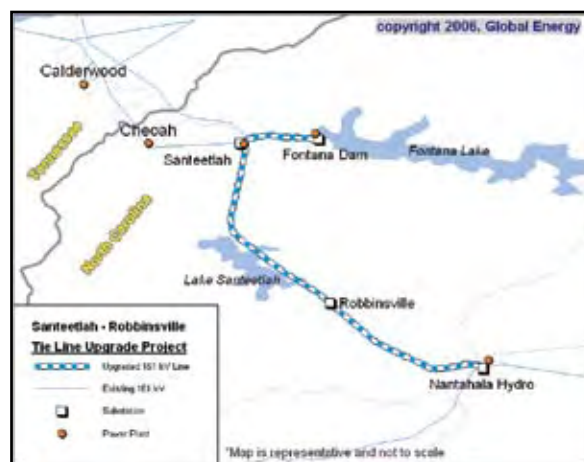
- Duke Energy serves 3.8 million retail electric customers in Ohio, Kentucky, Indiana, North Carolina and South Carolina.
- System wide there are approximately 20,000 circuit miles of transmission lines.
- Between 2000 and 2005 Duke Energy has invested approximately \$480 million into the transmission system before its merger with Cinergy.



Electric service territory source:  
Global Energy Decisions, Inc. © 2006

## Santeetlah-Robbinsville Tie Line Upgrade Project

**Project Description:** This project will upgrade the Duke-Tennessee Valley Authority (TVA) interface capacity from 216 MVA to at least 600 MVA. Duke Energy is rebuilding a 19.5-mile, 161 kV transmission line between Nantahala Hydro and Santeetlah Hydro to a double circuit, two conductor 795 ACSR bundle with a continuous capacity of 1,086 MVA. TVA is rebuilding their 3.6-mile, 161 kV transmission line between Fontana Hydro and Santeetlah Hydro to a double circuit, single conductor 636 ACSS with a continuous capacity of 600 MVA.



**Project Cost:** \$70 million.

**Project Status:** TVA and Duke Energy are in the design and permitting phase working towards a summer 2009 in-service date.

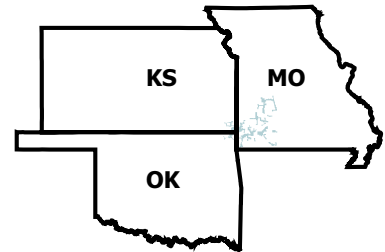
**Investment Partner(s):** TVA.

**Project Benefits:** This project will eliminate the need to invoke operating procedures on the Duke Energy Carolinas -TVA tie where opening the existing tie requires curtailment of any scheduled transactions on the Duke/TVA interface. The operating procedure has been in place for over ten years and is invoked over 100 times per year. The Santeetlah-Robbinsville line will also improve the overall ability to import to the Duke Energy Carolinas system, to export from the Duke Energy Carolinas system and to reliably move energy across the SERC region. The line will also address a potential reliability concern related to the outage of the 230 kV double circuit Shuler line between Jocassee and Tuckasegee supplying the Duke Energy Carolinas Nantahala region.

---

# EMPIRE DISTRICT

- The Empire District Electric Company is an investor-owned utility providing electric service to approximately 162,000 customers in southwest Missouri, southeast Kansas, northeast Oklahoma, and northwest Arkansas.
- System wide there are approximately 1,280 circuit miles of transmission lines.
- Between 2000 and 2005 Empire District Electric Company has invested approximately \$52 million into the transmission system.



Electric service territory source:  
Global Energy Decisions, Inc. © 2006

---

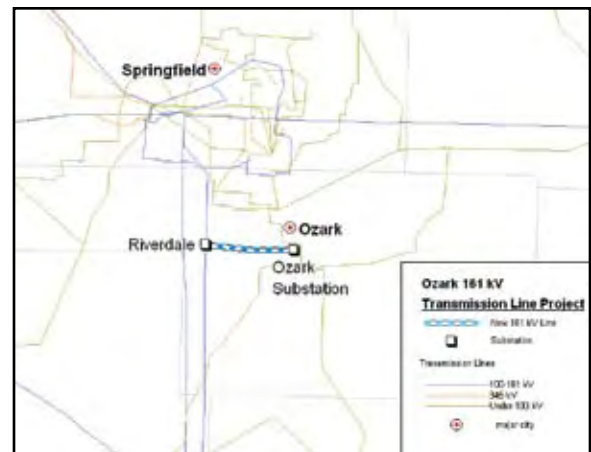
## Ozark 161 kV Transmission Line Project

**Project Description:** This project will build a new 161/69 kV substation in Ozark, Missouri and inter-connect with KAMO Power Corporation via nine miles of new 161 kV transmission.

**Project Cost:** Approximately \$13 million.

**Project Status:** This project is currently being engineered and needed land and right-of-ways are being obtained. Completion is anticipated in 2008.

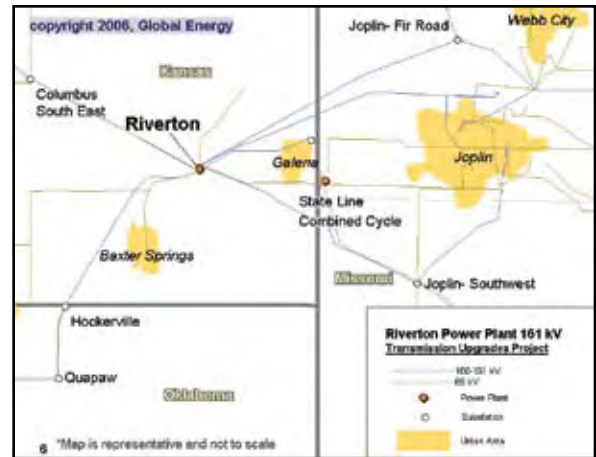
**Investment Partner(s):** None.



**Project Benefits:** This project will provide much needed support for the fast growing city of Ozark, Missouri (near Branson, Missouri) and will help relieve loading problems on two 161/69 kV transformers owned by KAMO Power Corporation.

## Riverton Power Plant 161 kV Transmission Upgrades Project

**Project Description:** Empire District is installing an additional 170 MW of gas-fired generation at its existing Riverton Power Plant (Riverton, Kansas). This facility first began providing electricity to the area in 1905 via a small hydro plant and has undergone many plant additions/improvements and modifications throughout its existence. In order to provide for the new turbine, extensive modifications are being made to existing substation facilities and a new 161 kV substation is being built. The additional generation also requires re-conductoring of 11 miles of 161 kV and the new construction of four miles of 161 kV transmission line.



**Project Cost:** Substation and transmission expense will be about \$14 million.

**Project Status:** Project is on schedule and is anticipated to be completed in early 2007.

**Investment Partner(s):** None.

**Project Benefits:** Will provide for the additional generation necessary due to the strong economy and resulting growth being enjoyed in Southwest Missouri.



---

# EXELON CORP.

## (COMMONWEALTH EDISON)



- Commonwealth Edison (ComEd) is a unit of Chicago-based Exelon Corporation providing service to approximately 3.7 million customers across Northern Illinois, or 70 percent of the state's population.
- There are more than 6,756 circuit miles of transmission comprising the Exelon (ComEd and PECO) systems.
- Between 2000 and 2005 Exelon has invested approximately \$930 million into the transmission system.



Electric service territory source:  
Global Energy Decisions, Inc. © 2006

---

### West Loop Project

**Project Description:** The West Loop Project consists of installing two new 345 kV lines, four new 138 kV lines, two new switchyards and two new autotransformers. One of the new 345 kV lines is approximately 10 miles in length and will connect the ComEd Crawford substation to the new 345 kV switchyard at West Loop. A second 345 kV line, approximately three miles in length, will connect the 345 kV switchyard at West Loop with ComEd's existing Taylor substation. Approximately eight miles of the new 345 kV lines will be installed as underground cables. In addition, four new 138 kV transmission lines will be constructed and three existing 138 kV transmission lines will be rerouted.



**Project Cost:** \$345 million.

**Project Status:** ComEd has filed a petition with the Illinois Commerce Commission in March of 2005. The project is targeted for completion in 2008.

**Investment Partner(s):** None.

**Project Benefits:** The transmission project will provide transmission redundancy and meet load growth in the Chicago area.

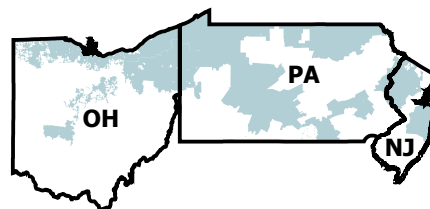


---

# FIRSTENERGY

- FirstEnergy is comprised of seven electric utility operating companies serving 4.5 million customers within 36,100 square-miles of Ohio, Pennsylvania and New Jersey.
- System wide there are approximately 12,000 circuit miles of transmission lines (69 kV and above) and 94 interconnections with 13 electric systems.
- Between 2000 and 2005 FirstEnergy has invested approximately \$450 million into the transmission system.

**FirstEnergy**®



Electric service territory source:  
Global Energy Decisions, Inc. © 2006

---

## New Energy Management System Project

**Project Description:** This project renovated FirstEnergy's Ohio Transmission System Control Center and installed a new Energy Management System (EMS) providing: easier to navigate screens that will provide faster service restoration to customers; a Dispatcher Training System that will prepare operators to respond to actual events; and, a Power Network Analysis "look ahead" feature inclusive of alarms that will alert operators to line flow and voltage problems. The system also included live standby backup control centers that can be ramped up to full operation within seconds in the event that some catastrophe strikes one of FirstEnergy's primary control centers.

**Project Cost:** \$22 million.

**Project Status:** Completed in 2004. The back up control centers were successfully tested in May of 2005.

**Investment Partner(s):** None.

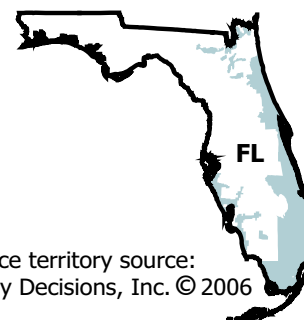
**Project Benefits:** Upgrades to the EMS will enable more rapid restoration and enable system operators to operate the system in a more secure and reliable manner. Live back up systems provide a high degree of reliability through redundancy should a catastrophe strike a primary control center.



---

# FPL GROUP

- FPL is among the largest and fastest-growing electric utilities in the United States. In 2005, the company's average number of customer accounts grew by more than 97,000, or 2.3 percent, to more than 4.3 million.
- FPL is the largest investor-owned Florida electricity/utility company serving a 2005 peak load of over 22,300 MW.
- FPL's transmission system consists of 6,470 circuit miles.
- In addition to adding generation, FPL plans to invest approximately \$650 million annually in the transmission and distribution infrastructure (poles, wire and related systems) needed to meet the growing demand for electricity in Florida.
- Between 2000 and 2005 FPL has invested approximately \$1.2 billion into the transmission system.



Electric service territory source:  
Global Energy Decisions, Inc. © 2006

---

## Bunnell - St. Johns 230 kV Project

**Project Description:** The project will install a new overhead 230 kV line, 38-miles long, in Flagler and St. Johns Counties, inland of St. Augustine, Florida. The project includes a new autotransformer site (230/115), 3-4 circuit miles of new overhead 115 kV lines to reinforce an existing, coastal 115 kV network, and other line upgrades or terminal equipment additions. The majority of the new lines will be sited on a new corridor alignment, requiring acquisition of new right-of-way.

**Project Cost:** \$31 million.

**Project Status:** FPL received corridor certification from the State Siting Board (Governor and Cabinet) in May 2006, under Florida's Transmission Line Siting Act (TLSA). Surveying and preliminary engineering are underway to support right-of-way acquisition activities. The project will be constructed in phases between 2007 and 2011.

**Investment Partner(s):** None.

**Project Benefits:** Inland areas along Interstate 95 between Flagler Beach and St. Augustine are growing rapidly. This new line will serve five new distribution substations planned along the route, some as early as 2007. The line also provides bulk transfer and reinforcement to existing networks assuring reliable uninterrupted service to this fast growing area.



## Indiantown - Riviera 230 kV Project

**Project Description:** This project will strengthen the electrical system with a new 230 kV transmission line that will move power from an existing substation located near Indiantown in Martin County, to an existing substation located at FPL's power plant in Riviera Beach in Palm Beach County. The proposed power line is of single, concrete pole construction and will be located within an existing right-of-way for about 38 miles.

**Project Cost:** \$40 million.

**Project Status:** Construction of the first phases of the power line started in the fall of 2005. The line is anticipated to be completed by fall 2007.

**Investment Partner(s):** None.

**Project Benefits:** The power line will meet an increasing demand for electricity from existing and new customers as well as strengthen the overall electric transmission system in Palm Beach and Martin counties. In the areas of southern Martin County and northern Palm Beach County the number of customers has increased by about three percent per year during the past three years; this trend is expected to continue.



## Overtown - Venetian 138 kV Project

**Project Description:** The project will install a new underground 138 kV line, four miles long, under Biscayne Bay from mainland Miami to southern Miami Beach, Florida. The project includes a new auto-transformer (138/69), and other terminal equipment additions. The line installation will consist of several directional bores between the terminals, with both land based and marine based (by barge) operations.

**Project Cost:** \$28 million.

**Project Status:** FPL has filed applications for County, State and Federal environmental permits. FPL is working with these agencies to finalize approvals. Cable design is complete and the project is anticipated to be completed by summer 2008.

**Investment Partner(s):** None.

**Project Benefits:** Miami Beach, Key Biscayne, and coastal areas of Miami are experiencing strong growth in new commercial buildings, condominiums, hotels and rebuilding of older structures. Load forecasts project average growth over 8% exceeding the current capacity to serve it. This project will relieve the potential for overloads and low voltages in the Miami Beach area.



---

# ITC HOLDINGS CORP.

- ITC Holdings Corp. owns and operates ITCTransmission and recently acquired Michigan Electric Transmission Company, which together serve approximately 6 million end use customers throughout the lower peninsula of Michigan. The two operating companies own approximately 8,100 circuit miles of transmission lines and over 230 stations.
- As an independently owned and operated transmission company, the company maintains and invests in transmission infrastructure in order to enhance system integrity and reliability and to relieve transmission constraints.
- Between 2003 and 2006, ITCTransmission invested over \$300 million to upgrade the transmission system of Southeast Michigan. In 2007, the combined company is expected to invest an additional \$215 million.



Electric service territory source:  
Global Energy Decisions, Inc. © 2006

---

## Bismarck-Troy 345 kV Project

**Project Description:** This project constructs a new 13.9-mile 345 kV circuit in the ITCTransmission area. This circuit will include over 11 miles of new 345 kV underground cable and a new 345/120 kV transformer at Troy. It will connect the 345 kV Bismarck Station to the heavily loaded 120 kV system at Troy Station. The circuit will travel through Macomb and Oakland counties of southeastern Michigan and will help bring power from generation in the northeast part of the ITC-Transmission system directly to central part of our system at Troy.



**Project Cost:** \$150 million.

**Project Status:** ITCTransmission is seeking a Certificate of Public Convenience and Necessity from the Michigan Public Service Commission. The certificate allows interested stakeholders to provide input during the preliminary phases of the project and will create a streamlined permitting process. The project is designated as Planned in the 2006 Midwest ISO Transmission Expansion Plan (MTEP) with an in-service date of December 2009. It is expected detailed design would begin in the second half of 2007, with construction commencing in 2008.

**Investment Partner(s):** None.



**Project Benefits:** The project will improve reliability on the central part of the ITC Transmission system by providing an additional high-voltage source into the region. It relieves numerous single contingency overloads in the area, reduces system losses at peak by 11–15 MW, and results in additional reactive power available to the system.

## Goodison 345 kV Project

**Project Description:** This project constructs a new 345/120 kV switching station in the ITC Transmission area and establishes four new 120 kV circuits. These new circuits include construction of 4.9 miles of new overhead and 8.1 miles of new underground circuit. The new station provides a strong source into the rapidly growing northern Oakland County area.

**Project Cost:** \$50 million, pending a more detailed engineering estimate.



**Project Status:** The project is designated as Planned in the 2006 Midwest ISO Transmission Expansion Plan (MTEP) with an in-service date of December 2009. It is expected detailed design would begin in the second half of 2007, with construction commencing in 2008.

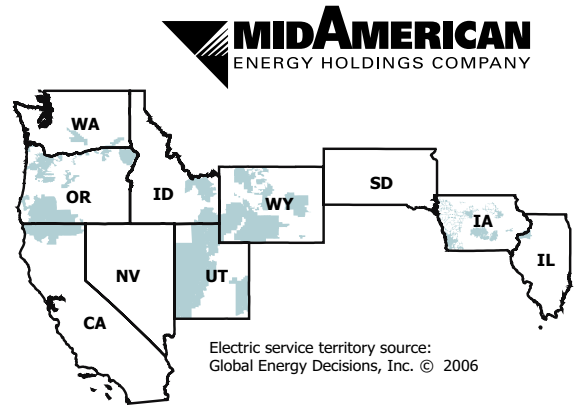
**Investment Partner(s):** None.

**Project Benefits:** The project will improve reliability in Oakland County, Michigan by providing an additional high-voltage source into the region. It relieves numerous overloads on transformers and circuits in the area and provides a new interconnection point for the local distribution company.

---

# MIDAMERICAN ENERGY HOLDINGS COMPANY (MIDAMERICAN ENERGY CO.)

- MidAmerican Energy Company is the largest utility in Iowa providing service to more than 706,000 electric customers in a 10,600 square-mile area from Sioux Falls, South Dakota to the Quad-Cities area of Iowa and Illinois.
- System wide, there are approximately 4,500 circuit miles of transmission lines.
- Between 2000 and 2005 MidAmerican Energy Company has invested approximately \$227 million into the transmission system.



---

## Council Bluffs Energy Center to Grimes 345 kV Project

**Project Description:** This project called for the construction of a jointly-owned 124-mile long 345 kV transmission line from Council Bluffs to the Des Moines area. An existing transmission line corridor was used, as was the existing 100-foot right-of-way. The original wood H-frame multi-pole structures in the transmission line corridor were replaced with single poles that support the existing transmission lines and the new 345 kV transmission line. The poles are made of self-weathering steel, to minimize maintenance, with a typical height of 120 to 150 feet.



**Project Cost:** \$134 million.

**Project Status:** Construction started in January 2005 and was completed in June 2006.

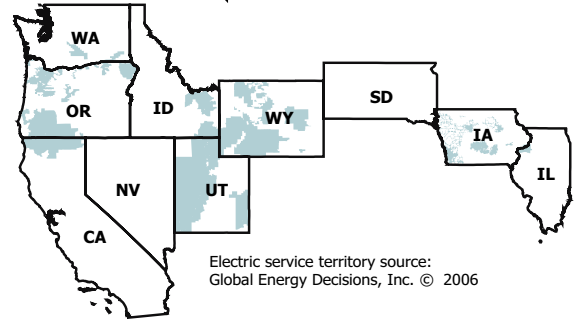
**Investment Partners:** MidAmerican is the developer and operator of the project. Several other power industry partners, including municipal utilities, generation and transmission cooperatives and a state energy agency, also are involved in ownership.

**Project Benefits:** The project provided a 345 kV transmission line needed to deliver the electricity from the planned Council Bluffs Energy Center Unit 4 to a substation near Des Moines to meet area load growth.

---

# MIDAMERICAN ENERGY HOLDINGS COMPANY(PACIFICORP)

- PacifiCorp provides service to more than 1.6 million customers in six western states covering a more than 106 thousand square-miles service territory in Oregon, Washington, California, Idaho, Wyoming and Utah states.
- Within the system there are over 15,000 circuit miles of transmission lines.
- Between 2000 and 2005 PacifiCorp has invested approximately \$465 million into the transmission system.
- Since 2005 PacifiCorp has invested approximately \$170 million into the transmission and distribution system adding more than 1,400 MW of capacity.



---

## Summit Vineyard Project

**Project Description:** This project rebuilds a 36-mile long 138 kV transmission line and modification of six substations across the Salt Lake valley. The new line will be a combination of a rebuilt 138 kV line and new double circuit 138 kV line. The existing structures in the transmission line corridors would be replaced with maintenance free single steel poles with a typical height of 80 to 100 feet.

**Project Cost:** Information pending estimated at \$41 million.

**Project Status:** Currently under construction with an anticipated in service date of September 2007.

**Investment Partner(s):** None.

**Project Benefits:** The project transmission line is needed to deliver the electricity from the Summit Vineyard Lakeside generation plant to meet load growth in Utah and Salt Lake Counties.



## Path C Upgrade Project

**Project Description:** This plan rebuilds approximately 80 miles of an existing 138 kV transmission line in southern Idaho and northern Utah. The existing structures in the transmission line corridor would be replaced as required with maintenance free single steel poles with a typical height of 80 to 100 feet. The existing H frame structures will be reused to the extent possible. The optional plan is to construct approximately 120 miles of new 345 kV line in the same area. This option would be on new ROW and consist of new structures.



**Project Cost:** Estimated at \$78 million.

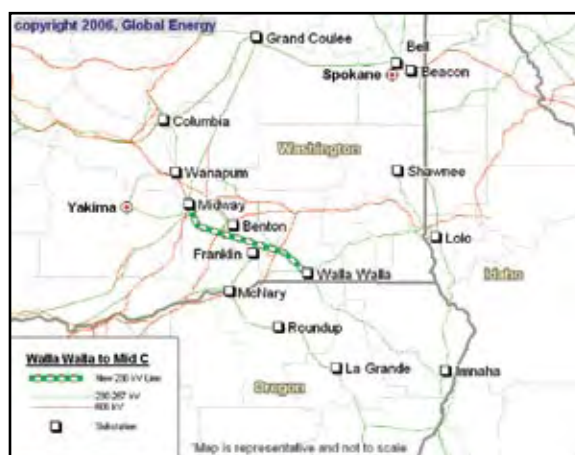
**Project Status:** Currently in Facilities Study stage developing the corridor analysis and scope of work. The estimated in service date is 2009.

**Investment Partner(s):** None.

**Project Benefits:** The project is needed to remove a current Path restraint and increase transfer capabilities into the Wasatch Front load pocket.

## Walla Walla to Mid C

**Project Description:** This plan is to construct a 100-mile long 230 kV transmission line in across eastern Washington State. The new line will be on new right-of-way and consist of new to be determined structures.



**Project Cost:** Estimated at \$100 million.

**Project Status:** Currently in Facilities Study stage developing the corridor analysis and scope of work. The estimated in service date is 2010.

**Investment Partner(s):** None.

**Project Benefits:** The project is needed to improve transfer capabilities between two separate load pockets and allow for increased renewable energy development in the area.



## Mona to Oquirrh

**Project Description:** This plan is to construct a new 60-mile long 345 kV transmission line from central Utah State into the Salt Lake Valley. The new line will be on new right-of-way and consist of new structures.

**Project Cost:** Estimated at \$76 million.

**Project Status:** This project is currently in the feasibility and siting process for the new transmission line and the siting and permitting process for the new substation associated with the transmission line. An estimated in service date is 2010.



**Investment Partner(s):** None.

**Project Benefits:** The project is needed to reliably deliver new resources located at or south of the Salt Lake valley to meet PacifiCorp load demands.

## Camp Williams to Mona

**Project Description:** This project is planned to add a second 42-mile, 345 kV circuit on the second position of an existing 345 kV transmission line, construct four miles of new 345 kV line, and modify 2 substations. The new line will be located in central Utah State starting near the town of Mona Utah and extending into the southern Salt Lake Valley.

**Project Cost:** Estimated at \$24 million.

**Project Status:** Currently in the engineering, procurement, and construction phases. An estimated in service date is the spring of 2007.



**Investment Partner(s):** None.

**Project Benefits:** The project is needed to deliver a new resource located in central Utah State into the Salt Lake valley to meet PacifiCorp load demands.

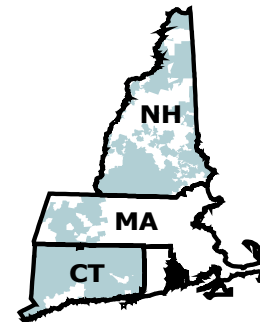
# NORTHEAST UTILITIES

## (CONNECTICUT LIGHT & POWER (CL&P))

- Northeast Utilities (NU) is a member of the New England ISO with operations in Connecticut, New Hampshire and Western Massachusetts covering 11,345 square-miles and serving over 1.8 million customers through over 3,000 transmission circuit miles.
- Member companies in NU's Transmission Group include Connecticut Light & Power; Public Service of New Hampshire; and Western Massachusetts Electric Co.
- Between 2000 and 2005 NU has invested approximately \$617 million into the transmission system.
- Transmission investments include the completion of a 345 kV "loop" in southwest Connecticut, connecting that area to the nearly 400 miles of 345 kV transmission lines that already run through the rest of the state. Additional projects will improve the reliability of service to customers and serve growing customer load.
- NU is also making substantial investments in new substations, transformers, and distribution facilities.



**Northeast  
Utilities System**

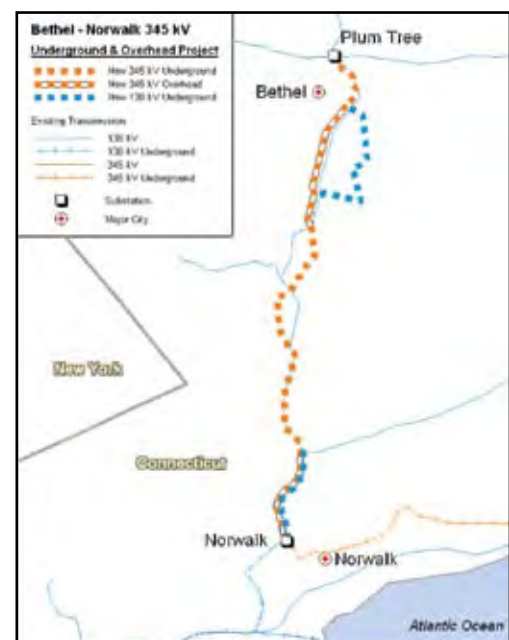


Electric service territory source:  
Global Energy Decisions, Inc. © 2006

## Bethel-Norwalk 345 kV Underground & Overhead Project

**Project Description:** The project will install new 345 kV electric transmission facilities with associated modifications to existing 115 kV lines through Bethel, Redding, Wilton, and Norwalk, Connecticut. The entire Bethel-Norwalk ("B/N") project consists of approximately 30.4 miles of new and reconstructed 345 kV and 115 kV lines. The project uses a combination of overhead and underground technologies in constructing the new 345 kV line and modifying portions of the existing 115 kV lines. The new 345 kV line will include 8.6 miles of new overhead construction and 11.8 miles of 345 kV underground cables. The majority of the lines will be sited within existing transmission corridors or public roadways.

**Project Cost:** Estimated at \$350 million.



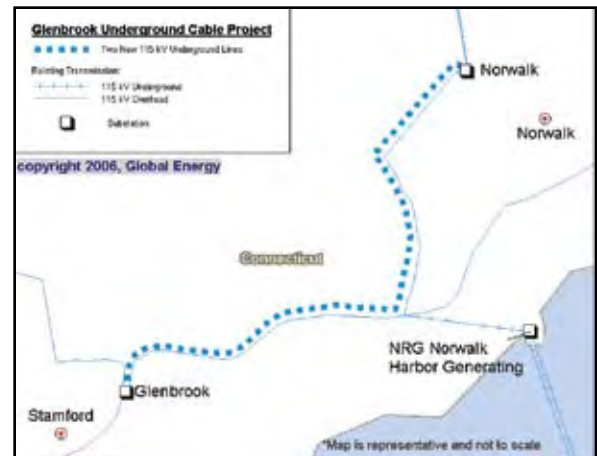
**Project Status:** Started construction in March of 2005, completed and energized October 12, 2006 at a total cost of approximately \$350 million.

**Investment Partner(s):** None.

**Project Benefits:** Southwest Connecticut is the only part of the state that is not served by the 345 kV power supply system. The line will extend the 345 kV system into the growing Stamford/Norwalk area of southwest Connecticut, thus providing additional transmission capacity needed to assure reliable uninterrupted service, particularly during peak use on hot and cold weather days. Completion of this 345 kV system will enhance electric service. This project is intended to lessen the area's dependence on local power generation that may be more expensive than other supplies support a competitive market for electric energy.

## Glenbrook Underground Cable Project

**Project Description:** This project constructs two new underground solid core 115 kV electric transmission lines. The 115 kV cables would be installed in two of the duct sets with a spare set of third ducts are for future potential uses. The project is being “pre-built” for possible future upgrade to 345 kV. The project will provide new direct transmission connections from CL&P's new transmission facilities in Norwalk to Stamford. The 8.7 miles of new underground 115 kV electric transmission cables will extend from CL&P's existing Norwalk Substation in the City of Norwalk through the Town of Darien, to CL&P's existing Glenbrook Substation in the City of Stamford.



**Project Cost:** \$183 million.

**Project Status:** The Connecticut Siting Council issued a certificate for construction on July 20, 2005 and construction is underway. The estimated in-service date is 2008.

**Investment Partner(s):** None.

**Project Benefits:** The project is will provide a reliable electric supply in southwest Fairfield County, and assure that the area's electric grid conforms to national and regional reliability criteria. This project will extend the benefits of a strong source in Norwalk created by the addition of the Bethel/Norwalk and Middletown/Norwalk projects to move power reliably to Stamford and the surrounding municipalities.

## Long Island 138 kV Cable Replacement Project

**Project Description:** This project calls for the replacement of seven fluid-filled transmission cables between Norwalk, Connecticut and Northport, New York with three new solid-core (non-fluid filled) cables. The existing cable system has been in service for more than 30 years and is vulnerable to damage from external sources. The cables will span 11 miles and are constructed of three state-of-the-art solid dielectric copper conductors that will carry the same power as the existing cables. The cables will be installed using a water jet technology that creates a trench approximately six feet deep in the ocean floor.



**Project Cost:** Project costs will be split between Northeast Utilities and the Long Island Power Authority. NU's share is \$72 million.

**Project Status:** Cable manufacturing is underway. Construction scheduled to begin in the Fall of 2007 with removal of some of the existing fluid-filled cables. Installation of the new cables is expected to take place over the winter 2007/2008 with removal of the remaining fluid-filled cables in the spring of 2008. The energization and in-service date is anticipated for spring 2008.

**Investment Partner(s):** Long Island Power Authority.

**Project Benefits:** The replacement cables will significantly improve reliability of service to both Connecticut and New York resulting from damage of the existing cables. By replacing the fluid-filled cables with a state-of-the-art solid core cable and burying it the entire length between Norwalk and Northport, the risk of leaks and potential environmental impacts is eliminated.

## Middletown-Norwalk 345 kV Underground and Overhead Project

**Project Description:** This project will extend Connecticut's existing 345 kV transmission system from Middletown to Norwalk. The overhead portion consists of 45 miles of overhead lines including the reinforcement of existing 345 and 115 kV lines between Haddam and Milford. Structures will include monopoles or H-frames, depending on the width of the right-of-way. The underground portion consists of 24 miles of underground lines beginning at a planned substation in Milford connecting to the planned switching station in Bridgeport and then into Norwalk using cross-linked polyethylene insulated cable (XLPE). Studies indicated that 24 miles



was the maximum underground portion without causing excessive transient overvoltages that could jeopardize electric grid reliability.

**Project Cost:** NU's share of the project is estimated at \$1.047 billion. CL&P will own approximately 80 percent of the project; United Illuminating Company will own the remaining portion.

**Project Status:** Connecticut Siting Council approval was given on April 7, 2005. Construction is underway and the estimated in-service date is December 2009.

**Investment Partner(s):** United Illuminating Company.

**Project Benefits:** Southwest Connecticut is the only part of the state that is not served by the 345 kV power supply system. The line will extend the 345 kV system into the growing Stamford/Norwalk area of southwest Connecticut providing additional transmission capacity needed to assure reliable uninterrupted service. Completion will create a "loop" in southwest Connecticut, connecting that area to the nearly 400 miles of 345 kV transmission lines that already run through the rest of the state.



---

# PACIFIC GAS & ELECTRIC

- The company provides electric service to approximately 15 million people throughout a 70,000-square-mile service area in northern and central California.
- Service area stretches from Eureka in the north to Bakersfield in the south, and from the Pacific Ocean in the west to the Sierra Nevada in the east.
- System wide there 18,610 circuit miles of interconnected transmission lines.
- Between 2000 and 2005 Pacific Gas & Electric (PG&E) has invested approximately \$2.16 billion into the transmission system.
- PG&E plans to invest approximately \$1.5 billion annually in the transmission and distribution infrastructure (poles, wire and related systems) needed to meet the growing demand for electricity in its territory.



Electric service territory source:  
Global Energy Decisions, Inc. © 2006

---

## Jefferson-Martin 230 kV Project

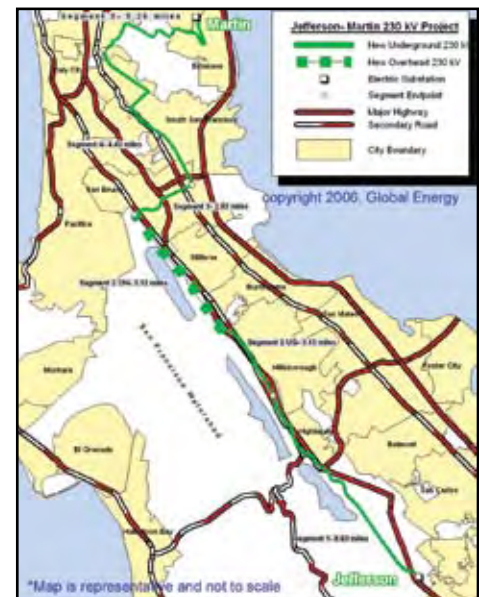
**Project Description:** This project constructed a new 27-mile 230 kV transmission circuit connecting the Jefferson and Martin substations on the San Francisco Peninsula. The line's route runs primarily beneath major roads. About 24 miles of the line is underground and the remainder is above ground along an existing transmission corridor. The Jefferson-Martin 230 kV transmission line allows for an additional 400 megawatts of electricity to flow into the northern portion of the San Francisco Peninsula.

**Project Cost:** \$220 million.

**Project Status:** The Project was operational on April 29, 2006.

**Investment Partner(s):** None.

**Project Benefits:** This line serves the growing demand for electricity in San Francisco and the northern portion of San Mateo County and has allowed the retirement of PG&E's Hunters Point Power Plant located in San Francisco. Building the line underground in major roads and streets and along the existing right-of-way eliminated visual impacts and avoided environmentally sensitive areas.





## Tri-Valley Project

**Project Description:** This project involved the construction of three 230/21 kV distribution substations in the eastern portion of the San Francisco Bay Area along with 14 miles of 230 kV overhead line and underground cable (2.5 miles of 230 kV overhead double-circuit transmission line and 11.8 miles of underground line) to interconnect these substations to the existing transmission system.

This project consisted of three phases.

**Phase 1:** Included an underground 230 kV transmission line from the Vineyard Substation to a newly constructed transition station connecting to the Contra Costa-Newark transmission line.

**Phase 2:** Included construction of an underground 230 kV transmission line from the newly constructed Cayetano Substation connecting to the Contra Costa-Newark transmission line.

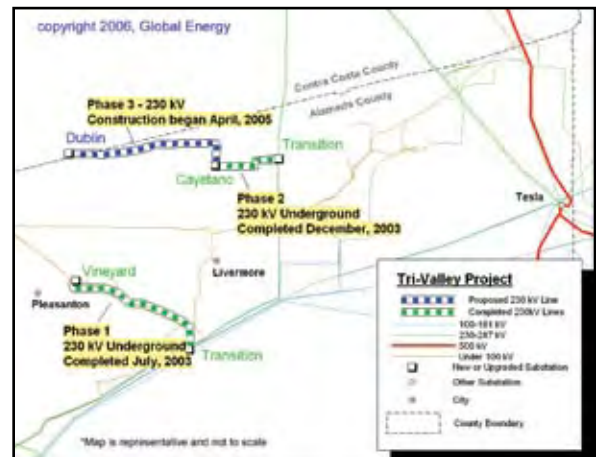
**Phase 3:** Includes construction of a new transmission line with overhead and underground segments from the Cayetano Substation terminating at a new North Dublin substation.

**Project Cost:** \$114 million.

**Project Status:** Phases 1 and 2 were operational in 2003 and Phase 3 was operational in September 2006.

**Investment Partner(s):** None.

**Project Benefits:** The Tri-Valley upgrade is designed to ensure continued reliability of the region's electric power system and serve the growing loads in the cities of Dublin, Livermore, Pleasanton, and San Ramon, as well as neighboring unincorporated parts of Alameda and Contra Costa counties.



## Midway – Gregg 500 kV Project

**Project Description:** This project will install a 150-mile 500 kV overhead transmission line from Midway to a new 500/230 kV substation (E2) between Gregg Substation and Helms PSP in Kern and Fresno counties in the southern portion of the PG&E service area. This project would build a new 500/230 kV substation (E2) at the intersection with the Helms – Gregg 230 kV lines (about 30 miles east of Gregg Substation).

**Project Cost:** \$800 million based on a conceptual cost estimate.

**Project Status:** This project is in the preliminary planning stage and is anticipated to be operational in 2010.

**Investment Partner(s):** None.

**Project Benefits:** This project will: 1) provide PG&E with access to renewable generating resources in southern California, 2) increase transmission capacity on Path 15, 3) increase reliability and load serving capability to the Yosemite/Fresno area, 4) increase utilization of existing pumping capability at the Helms Pump Storage Plant, and 5) provide generation dispatch flexibility by reducing reliance on Reliability Must-Run generation requirements in the Fresno area.



---

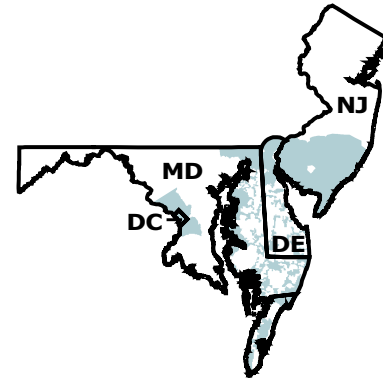
# PEPCO HOLDINGS INC.

- Pepco Holdings Inc. (PHI) delivers electricity to more than 1.8 million customers in Delaware, the District of Columbia, Maryland, New Jersey and Virginia.



- PHI's energy-related businesses include:

- Pepco - a regulated electric utility delivering electricity to more than 725,000 customers in Washington, D.C., and its Maryland suburbs.
- Delmarva Power - a regulated utility with more than 500,000 electric delivery customers in Delaware and the Delmarva Peninsula.
- Atlantic City Electric - a regulated electric utility serving more than 500,000 customers in southern New Jersey



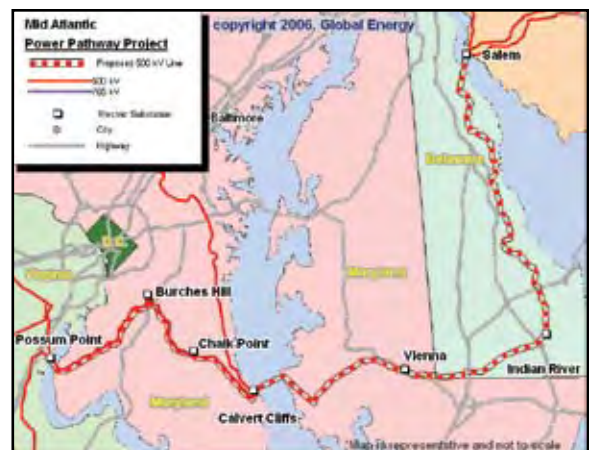
Electric service territory source:  
Global Energy Decisions, Inc. © 2006

- System wide there are approximately 4,000 circuit miles of transmission lines.
- Last year, PHI completed 50 miles of new transmission lines in New Jersey. PHI will place 90 miles of new transmission lines into service in Delaware during 2006.
- Between 2000 and 2005 PHI has invested approximately \$375 million into the transmission system.

---

## Mid Atlantic Power Pathway Project

**Project Description:** The project will construct a 500 kV, 230-mile line originating in northern Virginia, crossing Maryland, traveling up the Delmarva Peninsula and into Southern New Jersey. In addition, PHI would add significant 230 kV support lines in Maryland and New Jersey to connect with the new 500 kV line. Most of the line would be built either on or parallel to the existing right-of-way and 52 miles would use existing towers. The crossing of the Chesapeake Bay will utilize new state-of-the-art cable technology and installation practices to minimize environmental impacts.



**Project Cost:** \$1.2 billion.

**Project Status:** The anticipated project time line is: Possum Point to Calvert Cliffs by 2010; Calvert Cliffs to Indian River and Vienna to Steele by 2012; and Vienna to Loretto to Piney

Grove and Indian River to Salem and Dennis to Cardiff by 2014. The underwater crossing of the Chesapeake Bay and construction on the adjacent wetlands present the project's most significant environmental challenges.

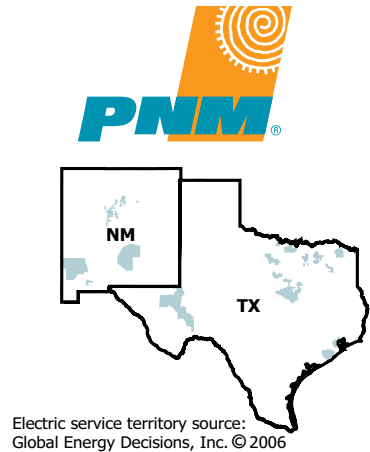
**Investment Partner(s):** None.

**Project Benefits:** The project will improve reliability for the Washington-Baltimore metropolitan area, Delmarva Peninsula and New Jersey. The project would become the only south-to-north line in the area. It is intended to allow affordable generation from the south and west to compete to supply congested areas. It will also establish a natural tie for Dominion in southern PJM and create multiple paths for importing power into the growing region and will complement the power pathways being developed through the PJM planning process.

---

# PNM RESOURCES

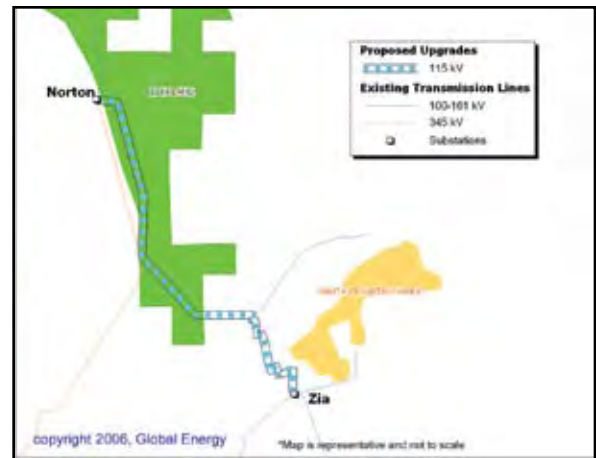
- PNM serves more than 420,000 electricity customers in New Mexico.
- System wide there is over 10,000 circuit miles of transmission lines.
- Between 2000 and 2005 PNM has invested approximately \$105 million into the transmission system.



---

## Norton to Zia 115 kV Project (Project Power)

**Project Description:** This project provided a much-needed new third transmission source to Santa Fe, New Mexico. The 13.1 mile route relied entirely on the use of existing right-of-way corridors and upgrading existing transmission lines rather than building new lines where none currently exist. The route began at PNM's Norton Station located north of Santa Fe and ended at the company's Zia Station in southern Santa Fe. The first 5.2 miles of the project were located on Bureau of Land Management (BLM) property. PNM rebuilt the existing H-frame transmission structures by installing trusses to raise the crossarms and increased the height of the structures by six to 12 feet. Existing conductors were replaced with new wire to increase capacity in the line. PNM replaced the existing H-frame structures along the remaining 7.9 miles, with single-pole steel double circuit structures and installed larger conductor. This portion of the line is adjacent to the Puesta Del Sol and Piñon Hills neighborhoods and runs through the Agua Fria Traditional Historic Community ending at PNM's Zia Station in southern Santa Fe. The project required the addition of equipment at the Norton station and the construction of a new 3-ring bus at the Zia Switching station.



**Project Cost:** \$16.4 million.

**Project Status:** Project was placed in-service in May 2006. The Bureau of Land Management (BLM), in an environmental assessment of the routes, identified the selected route as the route having the least environmental impact. Over 100 meetings with the public and agencies were held on this controversial project but it resulted in an acceptable line route and increased good working relationships with the involved communities.

**Investment Partner(s):** None.

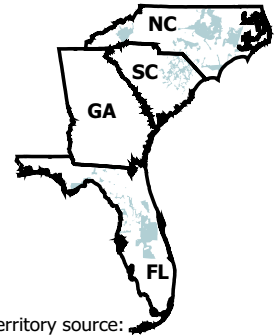
**Project Benefits:** This project meets the areas continuing load growth and strengthens the reliability of the Santa Fe and Northern New Mexico area. This third source of power additionally allows for regularly scheduled maintenance of other lines feeding Santa Fe. Additional benefits include the development of a new company public participation program which incorporates public stakeholders in the decision making process resulting in better public acceptance of a project.



# PROGRESS ENERGY



- Progress Energy's subsidiaries serve about 2.9 million electric customers in the Carolinas and Florida. The Carolinas service territory covers 33,600 square-miles, and the Florida service territory covers 20,000 square-miles in central Florida.
- Progress has an 11,000 circuit mile, interconnected, power-line network.
- Between 2000 and 2005 Progress has invested approximately \$650 million into the transmission system.



Electric service territory source:  
Global Energy Decisions, Inc. © 2006

## Central Florida – Bushnell 230 kV Line Project (Florida)

**Project Description:** This project will construct 19 miles of 1,622 ACSS, or equivalent conductor, from Central Florida Substation to Bushnell East Substation.

**Project Cost:** \$25.9 million.

**Project Status:** Approximately half of the line will be built by March 2008 (to serve a new industrial load adjacent to the route) and the other half will be built by June 2010.

**Investment Partner(s):** None.

**Project Benefits:** This 230 kV line will relieve loading on the 69 kV grid located in a quickly growing area in Central Florida assuring compliance with reliability standards. In addition, the line will provide service to a new customer owned industrial substation with a large motor starting load.



## Darlington County Plant - Florence 230 kV Line Project (South Carolina)

**Project Description:** This project constructs a new 36-mile 230 kV transmission line of 3-1590 MCM ACSR, or equivalent conductor, between the Darlington County Power Plant and an existing substation in Florence. The power line will be attached to single-pole transmission structures, spaced approximately every 500 to 700 feet and standing 85-105 feet tall. This project requires acquisition of 100 feet of right-of-way, 50 feet on both sides of the line.

**Project Cost:** \$18.5 million.



**Project Status:** On September 9, 2003, the South Carolina Public Service Commission approved the route. Construction began in early 2004 and the line was placed in-service on April 27, 2006.

**Investment Partner(s):** None.

**Project Benefits:** Progress Energy studies indicate that without these enhancements, the current transmission infrastructure would be overloaded by 2005. This project provides electricity for continued growth in the area and will enhance system reliability for consumers throughout the region, not just Progress Energy customers. The project will generate an estimated \$87,000 in additional annual property tax revenue for local governments.

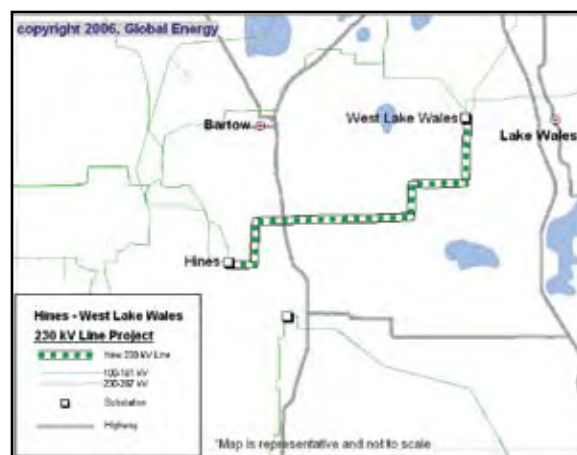
## Hines – West Lake Wales 230 kV Line Project (Florida)

**Project Description:** This project will construct an approximately 22-mile, 230 kV transmission line using 1622 ACSS/TW, or equivalent conductor, between Hines Substation and West Lake Wales Substation using double circuit structures capable of 1,622 ACSS/TW or equivalent per circuit.

**Project Cost:** \$ 56.7 million.

**Project Status:** Scheduled for June 2007.

**Investment Partner(s):** None.



**Project Benefits:** Support transmission and distribution of 500 MW of newly installed generation capacity from Hines Power Block 4.

---

# PUBLIC SERVICE ELECTRIC AND GAS COMPANY



- Public Service Electric and Gas Company (PSE&G) serves 2.1 million electric customers and 1.7 million gas customers in New Jersey. These residential and business customers reside in a 2,600-square-mile diagonal corridor across the state from Bergen to Gloucester Counties.
- System wide there are approximately 1,500 circuit miles of transmission lines.
- Between 2000 and 2005 PSEG has invested approximately \$223 million into the transmission system.



Electric service territory source:  
Global Energy Decisions, Inc. © 2006

---

## Branchburg Switching Station Project

**Project Description:** This project replaces one 500/230 kV transformer bank (three single phase transformers) with full rated transformers that can handle approximately 1,100 MW of electricity at Branchburg.

**Project Cost:** \$20 million.

**Project Status:** Targeted completion January 2007.

**Investment Partner(s):** None.

**Project Benefits:** The new transformers replace others whose ratings had been reduced in March 2004 to avoid overheating in the units and increased the total power handling capability of the Branchburg station.

---

## Transformer Replacement Project

**Project Description:** Replace thirteen transmission class transformers and associated equipment at several locations.

**Project Cost:** \$19 million.

**Project Status:** Completed June 2006.

**Investment Partner(s):** None.

**Project Benefits:** Increased system capability to address reliability and increased load needs.

## Essex - Aldene 230 kV Project

**Project Description:** Build new 19.1-mile Essex-Aldene 230 kV cable connected through a phase angle regulator at Essex.

**Project Cost:** \$60 million.

**Project Status:** Targeted completion is June 2007.

**Investment Partner(s):** None.

**Project Benefits:** Increased system capability to address reliability and increased load needs.



## Flagtown - Somerville - Bridgewater Project

**Project Description:** Reconductor the 8.25 mile Flagtown-Somerville-Bridgewater 230 kV circuit with 1590 ACSS and construct new line section between Branchburg and Flagtown.

**Project Cost:** \$22 million.

**Project Status:** Targeted completion is June 2008.

**Investment Partner(s):** None.

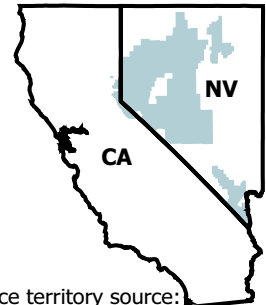
**Project Benefits:** Increased system capability to address reliability and increased load needs.



---

# SIERRA PACIFIC RESOURCES

- Sierra Pacific Resources has two wholly owned electric utility subsidiaries: Nevada Power Company (NPC) and Sierra Pacific Power Company (SPPC).
- Sierra Pacific Resources serves just over 1 million customers over a 54,500 square-miles area in southern and northern Nevada and northeastern California.
- System wide there are approximately 3,830 circuit miles of transmission lines.
- Between 2000 and 2005 Sierra Pacific Resources has invested approximately \$395 million into the transmission system. An additional \$1.3 billion in transmission projects has been proposed to Nevada Commission for approval. Of this \$1.3 billion in transmission projects, \$1.09 billion were approved through the resource plan.



Electric service territory source:  
Global Energy Decisions, Inc. © 2006

---

## Centennial Project

**Project Description:** This project calls for 100 miles of new and upgraded transmission lines; one new 500 kV switchyard; expansion of two 500 kV switchyards; and reconductoring of several 230 kV lines. The Harry Allen 500 kV switchyard, Crystal switchyard expansion, Harry Allen-Crystal 500 kV line; and Harry Allen-Mead 500 kV line have been completed. The Harry Allen-Mead 500 kV line is presently under construction and expected to be completed by early 2007. The 500/230 kV Mead transformer expected to be in-service by March 2007.

**Project Cost:** \$310 million.

**Project Status:** The final part of the project has a projected in-service date of early 2007.

**Investment Partner(s):** None.

**Project Benefits:** The Centennial Project increases the transfer capacity of the southwest grid and improves reliability in southern Nevada by increasing the deliverable energy supply by allowing up to 3,000 MW of new generation resources to be interconnected and delivered into the Las Vegas Valley and the southwest grid via the Mead substation.





## Eastern Nevada Transmission Intertie Project

**Project Description:** The project constructs a 250-mile 500 kV transmission line from southern Nevada to Ely tying Nevada's electrical grid together by creating a direct interconnect between the NPC and SPPC systems. The project also adds one 500/345 kV substation.

**Project Cost:** \$571 million (in 2011 dollars).

**Project Status:** Received tentative approval in the 2006 NPC Integrated Resource Plan. Projected in-service date of 2011.

**Investment Partner(s):** None.

**Project Benefits:** The proposed transmission line will improve reliability and increase transfer capability by creating an important tie between Sierra Pacific Power and Nevada Power. The project will also address the companies' and the state's growing emphasis on development of renewable energy resources facilitating the development of another 200 MW of renewable energy in Nevada. Finally, this project would connect SPR's proposed Ely Energy Center to Sierra Pacific and Nevada Power.



## East Valley Master Plan Project

**Project Description:** This project installs two new 500/230 kV, 1,500 MVA substations a new 1,500 MVA bank at an existing substation, one new 10-mile 500 kV line, and two new 230 kV lines on the east side of Las Vegas.

**Project Cost:** \$250 million.

**Project Status:** Received tentative approval in the 2006 NPC Integrated Resource Plan. Projected in-service dates between 2010 and 2014.

**Investment Partner(s):** None.

**Project Benefits:** The project will integrate more than 2,000 MW of future generation resources into the load serving transmission network on the east side of Las Vegas.





## Emma Line and Substation Project

**Project Description:** Constructs 20 miles of 345 kV and 32 miles of 120 kV transmission and a new 345 kV Substation.

**Project Cost:** \$80 million.

**Project Status:** The Emma additions have been broken into several sub-projects. The 345 kV line is on schedule for a 2008 in-service date. The substation site is still in the acquisition phase.

**Investment Partner(s):** None.

**Project Benefits:** This project allows resources to be delivered into the Company's load centers, provides transmission support in south and northwest Reno, and accommodates growth in Carson City and the Carson Valley.



## Falcon to Gonder Project

**Project Description:** This project constructs a 180-mile, 345 kV transmission line connecting the company's Falcon Substation, located between Battle Mountain and Carlin, to the Gonder Substation, north of Ely. The project also installs two 345/230 kV transformers at either end of the transmission line.

**Project Cost:** \$100 million.

**Project Status:** The project was completed in 2004.

**Investment Partner(s):** None.

**Project Benefits:** This project provides northwestern Nevada with additional access to resources located outside Sierra Pacific's system by increasing firm import capacity by 255 MW. The project also promotes generation development by increasing firm export capacity by 200 MW.



## North Las Vegas Area Routing and Siting Project

**Project Description:** This project will construct new 500/230/138/12 kV substation; install new quad circuit (two – 230 kV and two – 138 kV) and double circuit (two – 230 kV) transmission lines in the North Las Vegas area for a total of approximately 90 miles.

**Project Cost:** \$180 million.

**Project Status:** Received tentative approval in the 2006 NPC Integrated Resource Plan. Projected in-service dates are between 2007 and 2012.

**Investment Partner(s):** None.

**Project Benefits:** The project will accommodate growth in North Las Vegas and increase reliability in the northern Las Vegas Valley.



---

# SOUTHERN CALIFORNIA EDISON

- The Southern California Edison (SCE) service area covers 430 cities and communities in 50,000 square-miles encompassing 11 counties in central, coastal and Southern California serving 13 million people and nearly 300,000 businesses.
- The SCE-owned transmission grid is under the operational control of the California Independent System Operator and consists of approximately 12,000 circuit miles of transmission.
- SCE continues to make significant investments in its transmission grid to serve growing customer load, maintain reliability, access renewable energy resources, and support a competitive and robust electricity marketplace.
- Between 2000 and 2005 SCE has invested approximately \$1.3 billion into its transmission system.
- SCE has plans to invest approximately \$2.5 billion in additional transmission infrastructure through 2010.
- Transmission investments include projects that are expected to 1) increase the capability for transfers of power between California and other regions; 2) facilitate the development and delivery of remotely located renewable resources to customers; and 3) maintain reliability of the electric system and serve growing customer load.
- SCE is also making substantial investments in new substations, transformers, and distribution facilities.



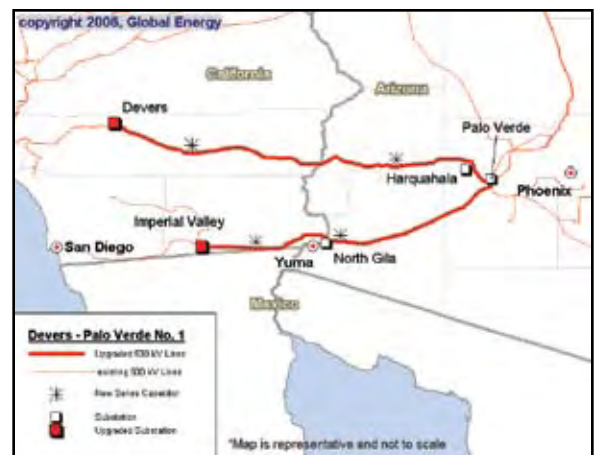
Electric service territory source:  
Global Energy Decisions, Inc. © 2006

---

## Devers - Palo Verde No. 1

**Project Description:** This project entailed increasing the power transfer capability of the existing 500 kV lines from Arizona to California by 505 MW through installation of several equipment upgrades:

- Palo Verde-Devers 500 kV Series Capacitor Upgrade
- Devers 500/230 kV Transformer and 230 kV series reactor
- Hassayampa-North Gila-Imperial Valley 500 kV Series Capacitor
- Imperial Valley phase shifting transformer



**Project Cost:** \$155 million.

**Project Status:** The CAISO Board of Governors in June of 2004 approved these upgrades. The project was placed into service on September 12, 2006.

**Investment Partners:** Sand Diego Gas & Electric (SDG&E).

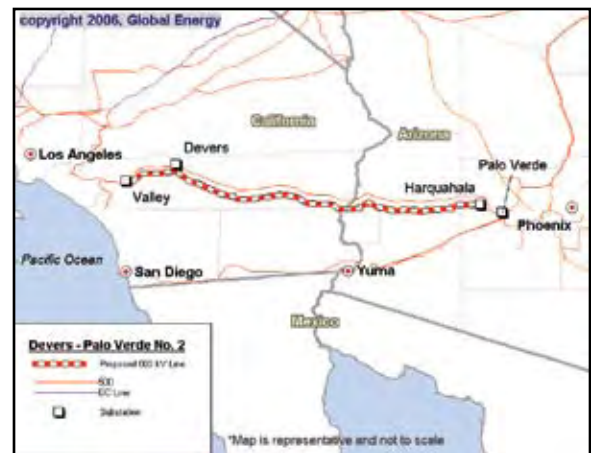
**Project Benefits:**

- Increased electricity transfer capability between Arizona and California;
- Intended to lower energy prices through the mitigation of market power and the potential reduction in RMR expenses;
- Increased reliability and operational flexibility; and,
- Reduced natural gas consumption, reduced air pollution.

---

## Devers-Palo Verde No. 2

**Project Description:** This project will involve construction of a new major regional transmission line that will further increase electricity transfer capability between Arizona and California by 1,200 MW. The project calls for the construction of a new 230-mile 500 kV transmission line from the Devers substation (near Palm Springs, California) to Harquahala (west of Phoenix, Arizona). The new line would also require upgrades to some of SCE's existing electrical transmission facilities in California, including construction of a new 41.6-mile 500 kV transmission line between SCE's Devers and Valley substations.



**Project Cost:** \$680 million.

**Project Status:** The CAISO Board of Governors approved the need for the project in February 2005, and in April SCE submitted the project licensing application to the CPUC for review. The project is expected to begin construction in 2007 and be online in 2009.

**Investment Partners:** None.

**Project Benefits:**

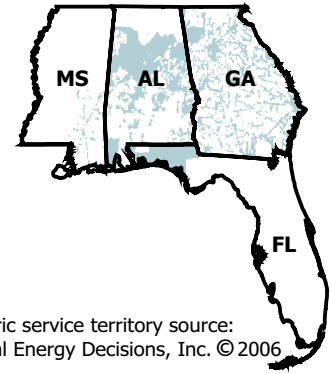
- Reduced cost of electricity purchased to serve California customers;
- Increased energy producers' access to the California energy market and would provide an incentive for new generation development;

- Intended to allow more generators to compete, which should lower California’s electricity costs; and,
- Increased operational flexibility helping to offset price increases that could result from extreme events such as droughts that reduce supplies of low-cost hydroelectricity and heat waves that create high peak demand for electricity.

# SOUTHERN COMPANY



- Southern Company utilities serve a 120,000 square-miles service territory spanning most of Georgia and Alabama, southeastern Mississippi, and the panhandle region of Florida.
- Southern Company is comprised of five regulated retail electric utilities: Alabama Power, Georgia Power, Gulf Power, Mississippi Power, and Savannah Electric.
- System wide there are approximately 28,000 circuit miles of transmission lines.
- Since 2000 Southern Company has invested approximately \$2.3 billion into the transmission system.



## McGrau Ford-Mosteller Springs 500 kV Line Project

**Project Description:** This project constructs:

- A 500/230 kV substation in the McGrau Ford 230 kV substation site, a 500 kV switching station at the Mosteller site;
- A 300 MVA, 230/115 kV substation at Cumming; and
- Installs a 300 MVA, 230/115 kV transformer in the Holly Springs substation.
- The McGrau Ford project consists of construction of 35 miles of 500 kV line and 10 miles of 230 kV line consisting of: A 500 kV transmission line from Mosteller to McGrau Ford; A 230 kV line McGrau Ford - Holly Springs, a 230 kV line from McGrau Ford to Cumming, and a 230 kV line from Cumming to Shoal Creek.



**Project Cost:** Approximately \$140 million.

**Project Status:** Construction activities are in progress and on schedule. All major material has been received and conductors are being pulled on the 500 kV line. The project is currently about 90% complete and anticipated to be in service in the summer of 2007.

**Investment Partner(s):** None.

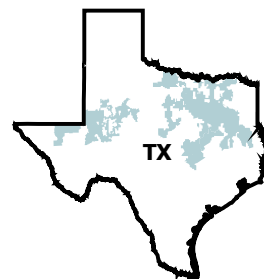
**Project Benefits:** This project will meet load growth in the North Atlanta / North Georgia area. This project will also alleviate the thermal overloads, reduce transmission losses and provide additional voltage support in the North Georgia area.



---

# TXU

- TXU Electric Delivery, a subsidiary of TXU, is responsible for maintaining and upgrading the transmission and distribution infrastructure.
- TXU Electric Delivery operates the largest distribution and transmission system in Texas, providing power to three million electric delivery points.
- System wide there are 14,354 circuit miles of transmission lines.
- Between 2000 and 2005 TXU Electric Delivery has invested approximately \$1.2 billion in the transmission system.



Electric service territory source:  
Global Energy Decisions, Inc. © 2006

---

## Jacksboro Switching Station – West Denton 345 kV Circuit Project

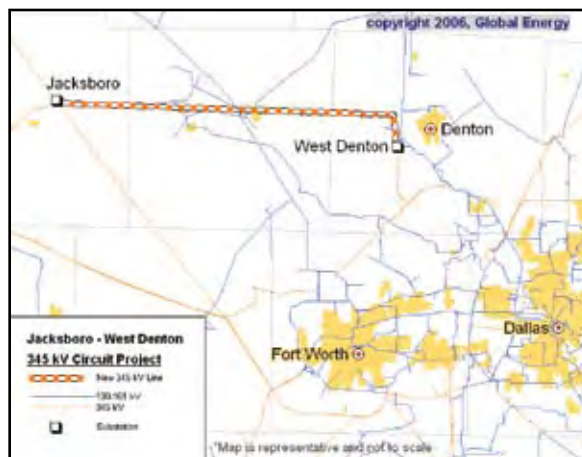
**Project Description:** This project constructed a new 72-mile, 345 kV double-circuit line from Jacksboro Switching Station to West Denton with one circuit in place.

**Project Cost:** \$57 million.

**Project Status:** The project was placed in service in December 2006.

**Investment Partner(s):** None.

**Project Benefits:** This project will increase the transfer capability into the Dallas/Fort Worth load center from the west and will relieve loading on the lower voltage system within that area.



## Paris Switching Station – Valley South Switching Station – Anna Switching Station 345 kV Circuit Project

**Project Description:** This project will add a second circuit to an existing 89-mile 345 kV line between Paris Switching Station and Anna Switching Station and construct the Valley South 345 kV Switching Station.

**Project Cost:** \$34 million.

**Project Status:** The project was placed in service in November 2006.

**Investment Partner(s):** None.



**Project Benefits:** This project increases the transfer capability from recent generation additions in Northeast Texas to the Dallas/Fort Worth load center and will enable the elimination of an existing Special Protection System.

## West Levee Switching Station – Norwood Switching Station 345 kV Circuit Project

**Project Description:** This project will install a new seven-mile 345 kV double-circuit line from West Levee Switching Station to a point north of the Norwood Switching Station with one circuit in place and add a second 345 kV circuit to existing structures from the point north of Norwood Switching Station into the station.

**Project Cost:** \$21 million.

**Project Status:** The project is anticipated to be in service by December 2007.

**Investment Partner(s):** None.

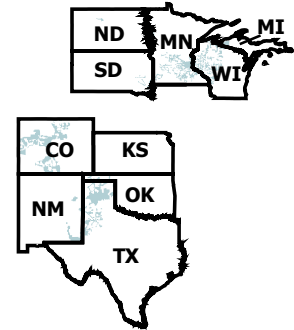


**Project Benefits:** This project will complete a major 345 kV transfer path and will prevent a single contingency loss of supply to three large autotransformers in Dallas.

# XCEL ENERGY



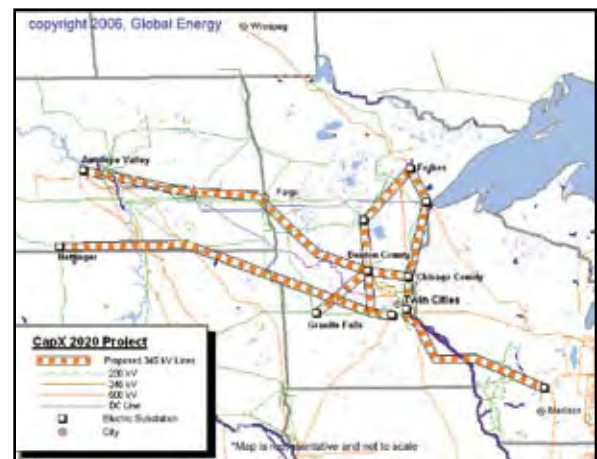
- Xcel Energy (Xcel) has operations in ten Western and Midwestern states serving 3.3 million electricity customers.
- System wide there are 78,875 circuit miles of transmission lines.
- Between 2000 and 2005 Xcel has invested approximately \$1 billion into the transmission system.



Electric service territory source:  
Global Energy Decisions, Inc. © 2006

## CapX 2020 Transmission Plan

**Project Description:** This undertaking is a collaborative high-voltage transmission grid expansion project to accommodate 8,000 MW of new generation to serve a forecasted 6,300 MW of new load in Minnesota and neighboring regions by the year 2020. It installs 1,620 miles of 345 kV transmission in Minnesota, North Dakota, South Dakota and Wisconsin resulting from studying three generation scenarios (Eastern, Minnesota and North/West bias). The project will commence in four groups:



Group 1 project cap ex total about \$1.3 billion, with major construction starting in 2009 or 2010 and ending three or four years later.

### Group I:

- A 200-mile, 345-Vk line between Brookings, South Dakota, and the southeast Twin Cities, plus a related 30-mile, 345 kV line between Marshall, Minnesota, and Granite Falls, Minnesota;
- A 200-mile, 345 kV line between Fargo, North Dakota and the St. Cloud/Monticello, Minnesota, area;
- A 150-mile, 345 kV line between the Twin Cities, Rochester, Minnesota, and La Crosse, Wisconsin
- A 70-mile, 230 kV line in the Bemidji area of north central Minnesota.

Group II (endpoints to be determined with further study work): Around the Twin Cities: Forbes – Arrowhead; Monticello – Chisago 345 kV; Monticello – Granite Fall 345 kV; Monticello – SW Twin Cities 345 kV; Arrowhead – Chisago 345 kV.

Group III: Remote Generation Outlet to be determined with further study work: Antelope Valley – Jamestown – Maple River 345 kV; Columbia – North LaCrosse 345 kV; Chisago – Prairie Island 345 kV.

Group IV: Remote Generation Outlet: Hettinger – Ellendale – Granite Falls 345 kV.

**Project Cost:** Cost will exceed \$2.3 billion by 2020. Total Group I cost is \$1.3 billion. Xcel Energy investment will be approximately \$700 million in Group I facilities.

**Project Status:** The certificate of need will be filed for the Group I projects in first quarter 2007.

**Investment Partner(s):** Great River Energy; Minnesota Power; Midwest Municipal Transmission Group; Missouri River Energy Services; Otter Tail Power Company; Rochester Public Utilities; Wisconsin Public Power Inc; SMMPA; and Xcel Energy.

**Project Benefits:** This project will accommodate the required new generation and increased customer demand in the region through 2020. The project will also assist in meeting the Minnesota Renewable Energy Objective.

## Comanche – Daniels Park 345 kV Transmission Project

**Project Description:** This project will establish approximately 125 miles of new double-circuit 345 kV transmission in the Front Range of Colorado. The project will link a new 750 MW, coal-fired generating unit at Comanche Station near Pueblo, Colorado, to the Daniels Park substation, south of Denver. The project involves the following:

- From Comanche Station to Daniels Park Substation, establish new double-circuit 345 kV transmission. Auto-transformers will be added at each end to allow 345 kV operation.
- From Midway Substation to Daniels Park Substation rebuild an existing 75-mile single-circuit 230 kV facility to a double-circuit facility. The circuits will have the capability of operating at 345 kV in the future.

**Project Cost:** Approximately \$150 million.

**Project Status:** The Colorado Public Utilities Commission granted a Certificate of Public Convenience and Necessity in September of 2006 for the proposed transmission facilities. The project is anticipated to be in-service by May 2009.



**Investment Partner(s):** None.

**Project Benefits:** The project will accommodate the new generation at the Comanche Station, and strengthen the bulk transmission system along the Front Range of Colorado. The project is also considered by transmission providers in the state to be the first stage of a long-range plan to develop a higher voltage backbone transmission system in the Front Range of Colorado.

## SW Minnesota Wind Expansion Project

**Project Description:** This project will install approximately 220 miles of new transmission line and upgrade 300 miles of existing transmission to provide deliverability for over 800 MW of wind resources. The new lines that will be installed include:

- Lakefield Junction to Fox Lake: A new 161 kV line in Jackson and Martin counties, connecting the Lakefield Junction Substation near Lakefield and Fox Lake Substation near Sherburn.
- Split Rock to Lakefield Junction (includes Chanarambie to Nobles County): A new 345 kV line connecting Lakefield Junction Substation in Minnesota with Split Rock Substation near Sioux Falls, South Dakota. This project also includes a new 115 kV line in Nobles and Murray counties that will be tied into the 345 kV line at a new substation and will connect to the existing Chanarambie Substation near Buffalo Ridge
- Buffalo Ridge to White: A new 115 kV line from the Buffalo Ridge Substation, southeast of Lake Benton in Lincoln County, to White Substation, south of Brookings in South Dakota.



**Project Cost:** \$290 million.

**Project Status:** Minnesota Certificates of Need and Route Permits have been received and other permits were filed in Fall of 2005. Construction of the 161 kV line is nearly complete. Construction has begun in Minnesota on the other lines and related substations. An in service date between 2007 and 2008 is anticipated.

**Investment Partner(s):** None.

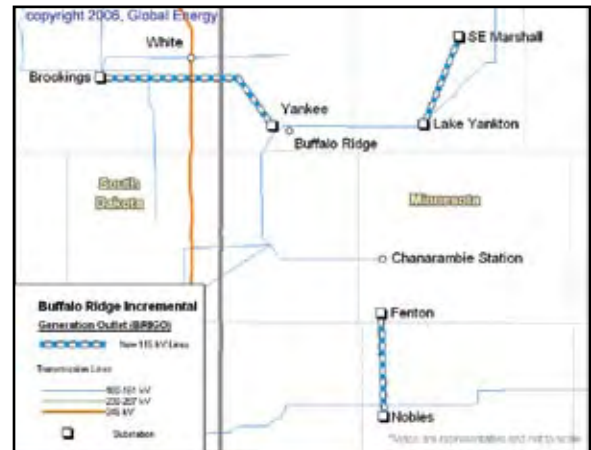
**Project Benefits:** In addition to helping the growth of wind generation in the area, the improvements will strengthen the transmission system, and provide more reliable electrical service to local communities and rural cooperative customers.



## Buffalo Ridge Incremental Generation Outlet (BRIGO)

**Project Description:** This project will install approximately 40 miles of new and upgraded transmission to provide deliverability for over 350 MW of wind resources. The lines that will be installed include:

- Fenton to Nobles: A new 115 kV line #2 in Nobles county, connecting the Fenton Substation and Nobles County Substation.
- Nobles County Transformer: A new 345/115 kV, 672 MVA transformer #2 will be added to the Nobles County Substation located east of Sioux Falls in Nobles County.
- Lake Yankton to SE Marshall: A new 115 kV line from the Lake Yankton Substation, south of Marshall in Lyon County, to the new SE Marshall Substation located south of Marshall, Minnesota.
- Yankee to Brookings County: A new 115 kV line #2 from the Yankee Substation, northwest of Buffalo Ridge in Lincoln County, to the Brookings County Substation located in Brookings County, South Dakota.
- Hazel Creek SVC: A new 115 kV SVC will be added to the new Hazel Creek substation located by the township of Hazel Run located in Yellow Medicine County.



**Project Cost:** \$17.5 million.

**Project Status:** Xcel Energy filed for the Minnesota Certificates of Need in December 2006 and the Route Permits are anticipated to be filed in 2007. An in service date between 2009 and 2010 is anticipated.

**Investment Partner(s):** None.

**Project Benefits:** In addition to helping the growth of wind generation in the area, the improvements will strengthen the transmission system, and provide more reliable electrical service to local communities and rural cooperative customers.



## Chisago to Apple River Transmission Upgrade

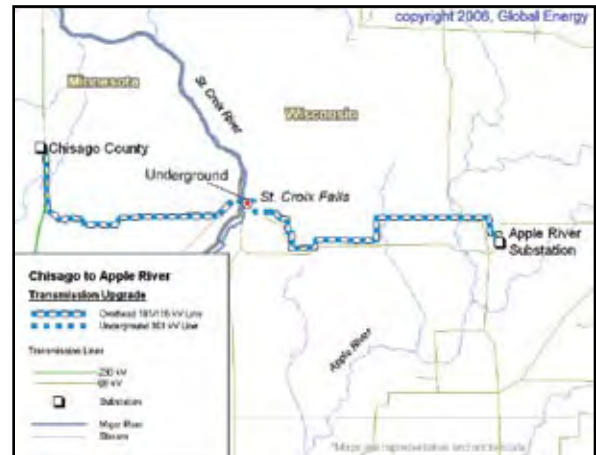
**Project Description:** This project will upgrade an existing 69 kV transmission line to a 37-mile 115 kV and 161 kV line. This is a joint project between Xcel Energy and Dairyland Power Cooperative to improve service reliability to customers in Chisago, Washington and Ramsey Counties in Minnesota and Polk County, Wisconsin. Because the line crosses the St. Croix River valley, a nationally designated Wild and Scenic Riverway, the project includes approximately three miles of underground 161 kV.

**Project Cost:** \$55 million (includes both Xcel Energy and Dairyland Power Cooperative segments).

**Project Status:** Xcel Energy submitted the application to the Minnesota PUC Certificate of Need on November 15, 2006; the Route Permit applications are anticipated to be filed by the end of 2006. The Wisconsin Public Service Commission has approved the project. Construction is planned to begin in 2008 with completion in 2009/2010.

**Investment Partner(s):** Dairyland Power Cooperative.

**Project Benefits:** The project provides service reliability improvements to a growing population center at the extreme northern and eastern fringes of the Minneapolis/St. Paul metropolitan area.





**EDISON ELECTRIC  
INSTITUTE**

701 Pennsylvania Avenue, N.W.  
Washington, D.C. 20004-2696  
202-508-5000  
[www.eei.org](http://www.eei.org)