Transmission & Distribution Infrastructure

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"By 2030, the electric utility industry will need to make a total infrastructure investment of $1.5 to $2.0 trillion."
-The Brattle Group, Transforming America's Power Industry

The U.S. transmission and distribution ("T&D") industry is expected to demonstrate significant growth in the future, driven by long-term, secular trends including (i) stable, growing demand for electricity; (ii) decades of under-investment in the transmission grid resulting in pent up demand for replacement of aging infrastructure; (iii) targeted government initiatives and stimulus to improve the existing T&D grid; and (iv) the proliferation of renewable power generation sources, such as wind and solar, which require greater T&D investment. These long-term trends augment substantial growth opportunities for providers of products, services, and technologies that support essential T&D infrastructure.

Our mission with this paper is to provide an overview of the U.S. T&D industry with a particular focus on the trends driving growth in infrastructure investment spending.

Overview

Industry Drivers

Originally constructed to serve local markets, the U.S. T&D grid transmits ever larger amounts of energy nationally across an aging and antiquated system. As a result, industry analysts project sustained growth in T&D infrastructure spending. Annual spending on rehabilitation and expansion of transmission systems by Edison Electric Institute ("EEI") members exceeded $9 billion in 2008 and an additional $34 billion of investments are planned for 2009 through 2011. Additionally, the annual maintenance cost to upgrade and replace aging distribution infrastructure is estimated to be $3 to $6 billion per year. The exhibit below outlines the key drivers of the U.S. T&D industry.

Industry Drivers

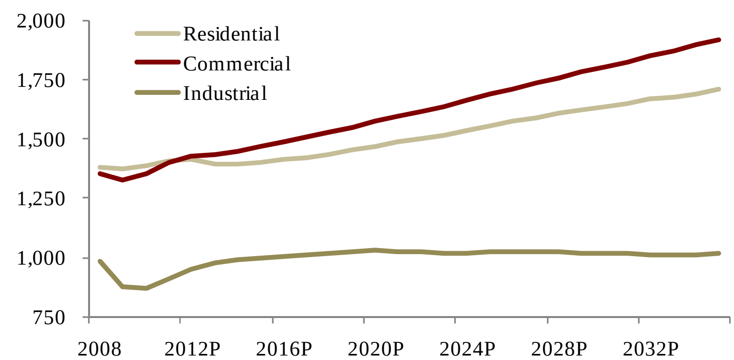
Increasing Demand for Reliable Power Delivery	• Growth of digital economy. • Large potential economic loss from power failures. • Proliferation of electronic equipment in the home. • Increased automation of industrial processes.
Inadequate Electric Power Infrastructure	• Aging equipment requires replacement and renewal. • T&D system additions are lagging power demand growth. • Declining capacity margins require generation and T&D additions.
Regulatory Drivers	• Adoption of *The American Reinvestment and Recovery Act of 2009*. • Further implementation of Energy Policy Act of 2005. • Incentives for T&D investment. • Deregulation led to deferred investment in regular grid maintenance.
Proliferation of Renewable Energy Assets	• Renewable portfolio standards ("RPS") mandates required percentages of total generation capacity from renewable sources. • Remotely located sources of renewable power, such as wind and solar, require greater T&D investment per equivalent GW of installed capacity.

Increasing Demand for Reliable Power Delivery

Growth in demand for electric power will drive increased investment in T&D infrastructure. Despite the recent drop in demand as a result of the economic recession, electricity use in North America is expected to continue its increase as a result of economic growth and the further digitalization of the global economy, particularly growing electronic data storage and transfer requirements. Since 1980, total electricity use has increased by 80%, and the U.S. Department of Energy's Energy Information Administration ("EIA") projects continued consistent growth in demand for electricity in each of the commercial, residential, and industrial sectors. In fact, total electricity use is forecast to increase across all sectors by approximately 28% from 2007 to 2035P, with the commercial sector accounting for the greatest amount of growth. This demand growth will require significant investment in T&D infrastructure to improve the performance of existing systems and expand the overall grid. The following chart illustrates historical and projected electricity demand growth.

U.S. Electricity Use by Sector

For the Years Ended and Ending December 31, 2007 – 2035P
(kilowatt hours in billions)



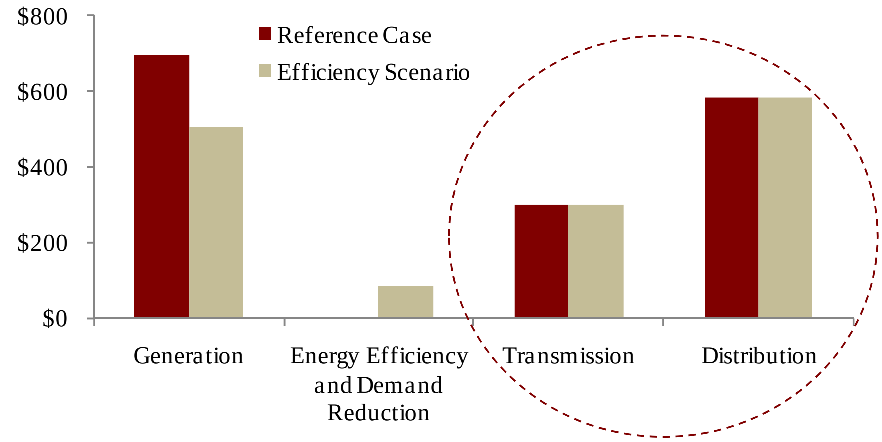
Source: EIA.

The EIA projects electricity demand growth in the commercial sector of 44% through 2035P driven by a growing digital economy and business environment that require electronic storage and transmission of data. Increasingly, service industries, which have large electronic data needs, are leading economic growth in the U.S. Residential electricity demand is projected to increase by 22% through 2035P driven by increased penetration of electric appliances in the home, the continued proliferation of the Internet, and a growing number of at-home workspaces. Electric power demand for industrial applications is forecast to increase by 3% during the same time period through greater automation of production processes and the electronic storage of manufacturing data.

Significant investment in the nation's infrastructure is required to support this incremental demand. According to the EEI, the U.S. electric utility industry will require a total infrastructure investment on the order of $1.5 to $2.0 trillion by 2030. As part of this investment, the EEI projects total investment in T&D infrastructure of approximately $880 billion. As part of its study, EEI projected a base case and an "efficiency" case (which reduced required generation investment). The chart below illustrates that required investment in T&D infrastructure was the same in both scenarios.

Cumulative Required Investment in U.S. Power Infrastructure

For the Years Ending December 31, 2010P – 2030P
($ in billions)



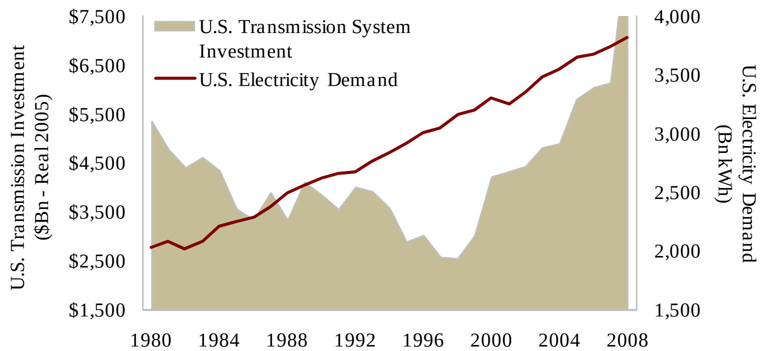
Source: EEI.

Inadequate Electric Power Infrastructure

The long-term growth of both the power quality and T&D equipment industries is supported by a power infrastructure that cannot sustain the bulk power movements or standards of quality required by today's digital economy. The power delivery system is characterized by an aging infrastructure and largely reflects technology developed in the 1950s or earlier. According to the DOE, 70% of transmission lines and transformers are 25 years or older and 60% of circuit breakers are more than 30 years old. Furthermore, investment in transmission infrastructure declined 44% from 1980 to 1999, during which time electricity use increased by 58%, resulting in increased grid congestion, as illustrated in the chart on the following page. In order to avoid power outages from component and equipment failures, analysts believe the industry will replace 0.5% to 1.0% of transmission mileage annually over the next two decades. With approximately 283,000 transmission miles in North America, the annual replacement of 1% of transmission mileage, at a cost of approximately $1 million per mile, represents nearly $3 billion per year in replacement investment.

U.S. Transmission Investment and Electricity Demand

For the Years Ended December 31, 1980 – 2008P

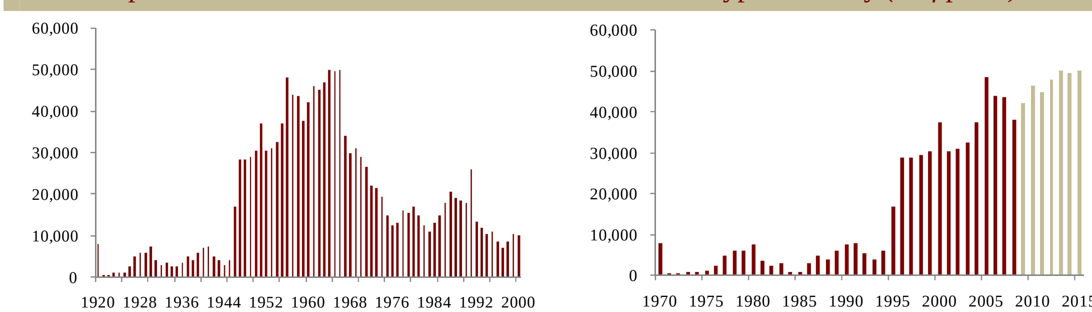


Source: EIA and EEI.

As a response to historical under-investment, recent transmission investment has reversed the declining trend and returned to historical spending levels. A survey by EEI shows that investor-owned utilities spent more than $9 billion on transmission infrastructure in 2008 and spent or planned to spend an additional $34 billion from 2009 to 2011P, representing an increase of 60% from the prior three years.

The story on the distribution side of the grid is much the same. Industry analysts estimate that approximately 50% of distribution poles are 30 to 50 years old, and near the end of their useful life. With 2.2 million distribution miles in North America, the annual replacement of 1% to 2% of distribution miles (22,000 to 44,000 miles), at a cost of $140,000 per mile, represents approximately $3 to $6 billion per year. It is important to note that these figures do not include upgrades or new mileage. The charts below illustrate the current age of a typical utility's distribution poles as well as the implied demand for replacement poles in coming years.

Representative Distribution Pole Infrastructure of a Typical Utility *(# of poles)*

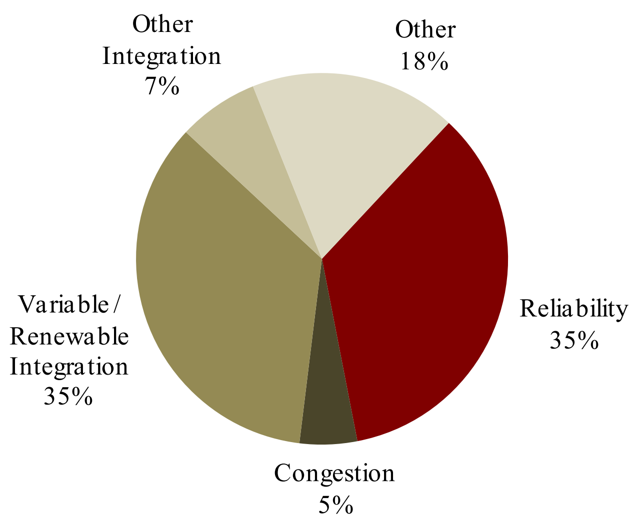


Note: Assumes 50-year life.
Source: Quanta Services.

Without expanded T&D transmission investment, grid congestion is forecast to increase making it more difficult for available supply to reach demand, resulting in supply shortages and power interruptions. The grid congestion is magnified by projected decreases in available capacity margin, which is defined as the difference between committed capacity and peak demand expressed as a percentage of capacity resources. As peak demand catches up to available capacity, electricity providers require an efficient transmission system to deliver power to end users. Additionally, declining capacity margins will require substantial increased investment in both generating assets and the T&D infrastructure to support the new supply. In its 2009 Long-Term Reliability Assessment, the North American Electric Reliability Corporation ("NERC") identified inadequate long-term capacity margins for a reliable national bulk electric system despite improvements from 2008. As a result, more than 11,000 miles of transmission lines (200kV and above), representing 35% of projected construction from 2009 to 2018P, must be developed and deployed to ensure reliability of the transmission grid over the next five years. The integration of renewable generation resources, discussed in greater detail on page 9, represents another major driver of planned transmission mile additions. The exhibit below illustrates the drivers of planned transmission investments.

Planned Transmission Mile Additions by Driver

(as of % of planned transmission mile additions >200kV)



Source: NERC 2009 Long-Term Reliability Assessment.

The strain on the existing transmission grid can be measured by T&D losses (or electric power lost due to grid inefficiency), which is related to how heavily the system is loaded. T&D losses increased from approximately 5% in 1970 to 9.5% in 2001 due to heavier utilization and congestion. The 4.5% increase in T&D losses equates to 184 million MWh, or enough electrical energy to power 13% of U.S. households. These losses result in real economic and environmental impact. The U.S. Department of Energy ("DOE") estimates the annual cost of power outages to the U.S. economy is approximately $80 billion per year. Power outages lasting less than five minutes account for two-thirds, or more than $50 billion, of the annual estimated cost. The 2006 rolling blackouts in Texas, coupled with the well-publicized Northeast blackout in August 2003 and the California energy crisis in 2000 and 2001 are symptoms of the underlying problem with the current electric power grid: demand is outpacing supply and the T&D infrastructure cannot support the necessary capacity additions or the demand for high quality, reliable bulk power.

Regulatory Drivers

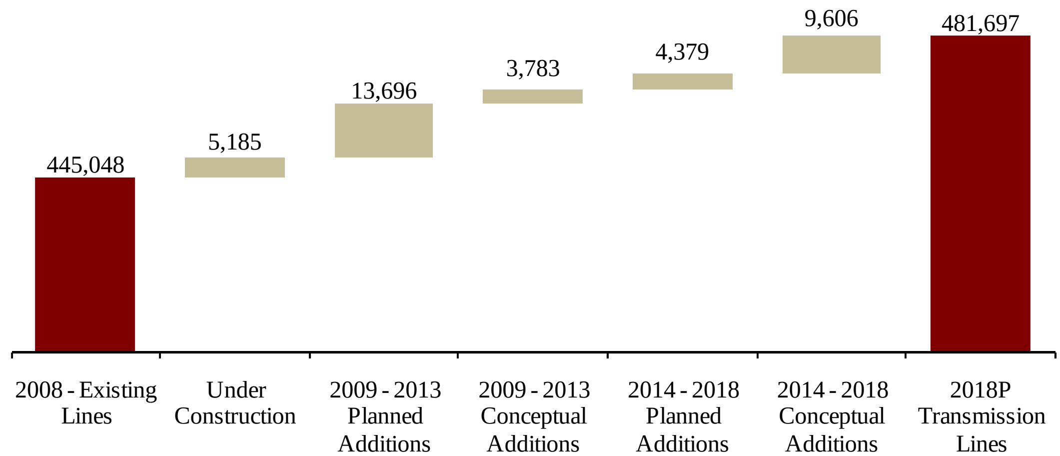
Through the interconnection of roughly 3,000 public, municipal, and federal electric utilities, the electric power grid in the U.S. represents an approximately $360 billion asset with nearly 283,000 high voltage transmission miles, 2.2 million low voltage distribution miles, and 70,000 substations that serve nearly 300 million customers. The reliable transmission of electricity to U.S. commercial, industrial, and residential end users is an essential element of the nation's economy and national security. Recognizing the deteriorating condition of this critical power infrastructure, the U.S. government has directed significant efforts towards the modernization and improvement of the nation's electric grid, including (i) the Energy Policy Act of 2005 and (ii) the American Recovery and Reinvestment Act of 2009.

<u>The Energy Policy Act of 2005</u>

The Energy Policy Act of 2005 (the "Act") outlined the establishment of mandatory electric grid reliability standards and created incentives to increase T&D investments directed towards grid improvement. The Act was established under Federal Energy Regulatory Commission ("FERC") jurisdiction, an electric reliability organization to enforce reliability standards for the bulk power system. The Act promoted new investment in transmission infrastructure through (i) tax credits and other financial incentives and (ii) the easing or elimination of state and local citing processes that can slow the construction of new transmission networks through the creation of National Interest Electric Transmission Corridors ("NIETC"). These initiatives have led to a substantial increase in planned transmission mileage, as illustrated in the exhibit on the following page.

Planned Transmission Circuit Mile Additions (>100kV)

For the Years Ended and Ending December 31, 2008 – 2018P
(in miles)

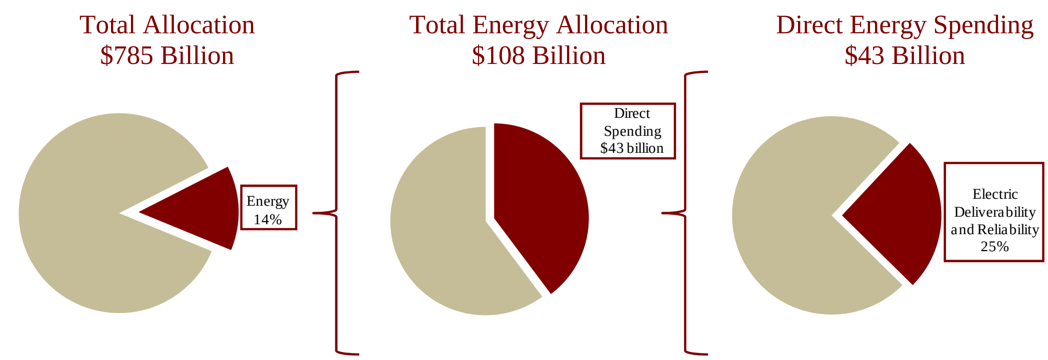


Source: NERC 2009 Long-Term Reliability Assessment.

American Recovery and Reinvestment Act

The American Recovery and Reinvestment Act of 2009 ("ARRA") increased focus on electric deliverability and reliability, dedicating $108 billion to energy-related spending and tax credits. Further, approximately $11 billion has been allocated specifically to improve electric delivery and reliability through T&D grid improvements and expansion. The majority of this funding is dedicated for investment in 2010 through 2013. The charts below detail the allocation of ARRA funds.

American Recovery and Reinvestment Act



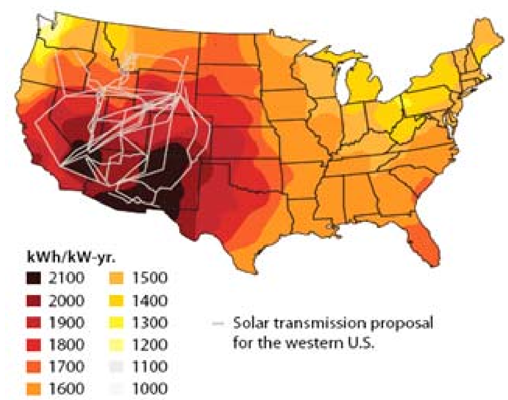
Source: Recovery Accountability and Transparency Board and The Wall Street Journal.

Focus on Renewable Energy

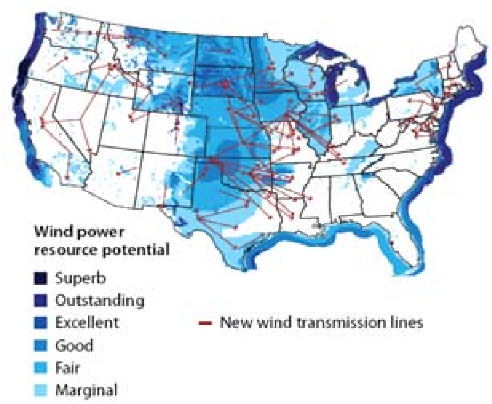
Increased focus on renewable energy also augments growth in T&D investment. Driven by state-level Renewable Portfolio Standards, which mandate future targets for the percentage of energy that must come from renewable sources, and federal government initiatives, utilities are actively diversifying fuel sources for power generation. Developing remote or semi-remote sources of power generation, such as wind or solar, will require new high voltage transmission systems to deliver the energy to the grid. Under a scenario in which wind power represents 20% of electric generation by 2030, the National Renewable Energy Laboratory ("NERL") estimates a required investment of approximately $60 billion in transmission, or approximately $3 billion per year. The maps below illustrate the existing lack of T&D assets connecting population centers to the regions where wind power, solar power, and geothermal power are most abundant.

Renewable Energy Infrastructure Dynamics

Required Solar Transmission Lines



Required Wind Power Transmission Lines



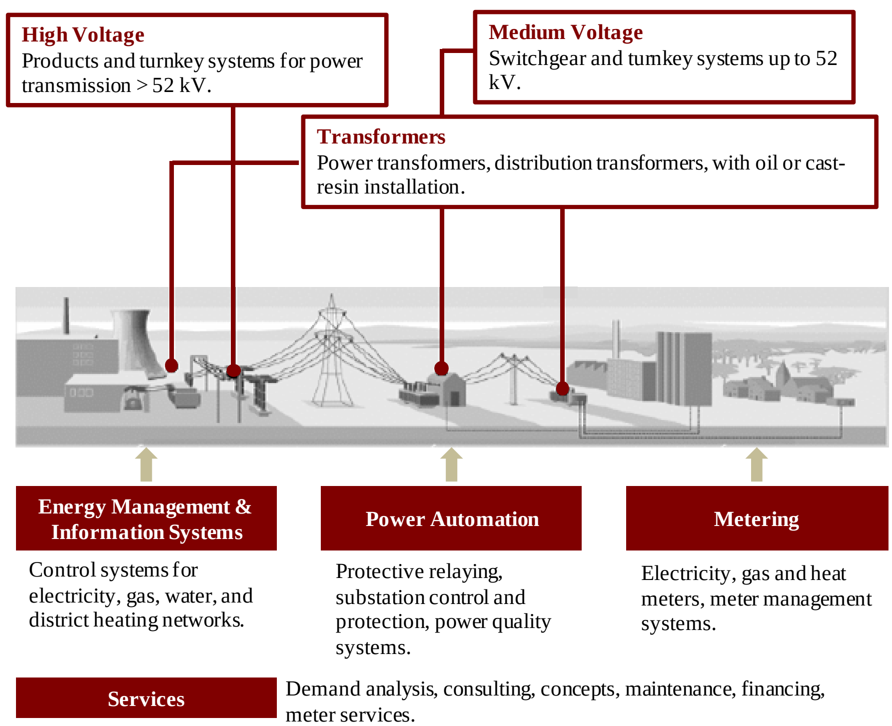
Source: EEI.

Market Basics

T&D market participants supply equipment, systems, and services to medium and high voltage energy markets. At or near the site of power generation, transformation, control, transmission, and switching and protection systems transforms the power generated at the facility to high voltage that can be transported efficiently over long distances via overhead transmission lines or underground cables. While high voltage power is the most efficient form of long-distance transportation, power must be decreased to a medium level in order to safely service and distribute power to high population density areas.

Power travels through one or more substations, which use switchgear to control the amounts delivered to circuit breakers and surge arresters to protect against power transmission safety hazards. At the substations, transforms decrease the voltage for delivery to more populated areas. Prior to end-user delivery, distribution transformers further decrease the voltage a suitable level for final distribution. Metering systems measure and record the locations and amounts of power transmitted. The exhibit below provides an overview of T&D products and services.

T&D Equipment and Services



Source: Siemens.

Market Participants

The overall T&D product market is dominated by large global players, such as ABB, Siemens, and Areva (Areva's T&D operations are being acquired by Schneider and Alstom). These companies possess the most sophisticated technologies and dominate the high voltage transmission market with greater than 75% global market share. The medium voltage and T&D systems markets are less consolidated with the top three players representing 37% and 60% of the market, respectively. A wide range of private competitors supply additional products, services, and technologies to support North American T&D infrastructure. A brief summary of leading public market participants is provided in the table below.

Select T&D Market Participants	
ABB Ltd.	ABB Ltd, headquartered in Zurich, Switzerland, provides power and automation technologies to utility and industry customers worldwide.
Siemens AG	Siemens, an electronics and electrical engineering conglomerate based in Munich, Germany, provides engineered and technological solutions for the generation, transmission, and distribution of power.
Areva T&D SA	Areva T&D designs, manufactures, and installs high- and medium-voltage products to transmit and distribute electricity from generation to the end user worldwide. Based in Paris, France, the company is being acquired by Alstom SA and Schneider Electric SA.
Schneider Electric SA	Schneider Electric S.A. designs and manufactures products for electricity and automation management.
Cooper Industries plc	Cooper Industries plc engages in the manufacture and sale of electrical products and tools in the United States and internationally.
Thomas & Betts	The company's Steel Structures segment designs, manufactures, and markets highly engineered steel transmission structures.
Valmont Industries	The company's Utility Support Structures segment offers tapered steel and pre-stressed concrete poles for high-voltage transmission lines, substations, and electrical distribution.
Quanta Services	Quanta's Electric Power Infrastructure Services segment specializes in the design, installation, upgrade, repair, and maintenance of electric power transmission and distribution networks, substation facilities, and wind turbine facilities and solar arrays.

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Mr. Armstrong co-leads the Energy & Power Group and was Harris Williams & Co.'s second employee, joining the firm in 1993. In 1999, Mr. Armstrong founded the San Francisco office and has over 19 years of middle market experience. Having directed over 125 mergers and acquisitions transactions during his career, Mr. Armstrong has worked across industries including energy and power, consumer products, building products, business services, distribution, retailing, specialty chemicals, and technology. Mr. Armstrong currently co-leads the Energy & Power Group and specializes on the Power segment. Prior to joining Harris Williams & Co., Mr. Armstrong was with Wheat First Butcher Singer (now Wells Fargo). He earned a B.S. with a concentration in Finance from the University of Virginia's McIntire School of Commerce and is also a Chartered Financial Analyst. Mr. Armstrong was past president and director of the San Francisco Chapter of ACG and is currently a director of the Greater Richmond YMCA.

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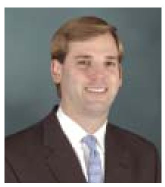

Mr. Spitzer founded and co-leads the Energy & Power Group at Harris Williams & Co. Over his investment banking career, Mr. Spitzer has advised clients on a variety of merger and acquisition and strategic advisory assignments, as well as corporate financings. Mr. Spitzer has advised a diverse range of manufacturing and service businesses in the energy and power industries. Key niche focus areas have included demand response solutions, power quality equipment, infrastructure and industrial services, and oilfield products and services. Prior to focusing on energy and power companies, Mr. Spitzer developed experience in numerous industries including industrial manufacturing, chemicals, automotive, aerospace and defense, business services, and consumer products. Prior to joining Harris Williams & Co., Mr. Spitzer worked in the General Industrial Group at Banc of America Securities, LLC and in the Investment Banking Group at Goldman Sachs & Co. Mr. Spitzer earned an M.B.A. with Honors from Columbia Business School, where he served as the Caplan Fellow. Mr. Spitzer earned a B.A. in Economics from the University of Virginia.

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Mr. Lucas re-joined Harris Williams & Co. following the completion of an M.B.A. from The Wharton School at the University of Pennsylvania. Prior to business school, Mr. Lucas served as an Associate with Harris Williams & Co., working on mergers and acquisitions transactions in a broad range of industries, including general industrial, consumer products, plastics, and waste equipment/services. Before re-joining Harris Williams & Co., Mr. Lucas worked as an Associate with Graham Partners, a private equity group in Philadelphia. Previous experience also includes work as an Investment Banking Analyst with JP Morgan. Mr. Lucas earned a B.S. in Commerce, with a concentration in Finance from The McIntire School of Commerce at the University of Virginia.

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Prior to joining Harris Williams & Co., Mr. White worked as an Associate in the Equity Capital Markets Group at SunTrust Robinson Humphrey. Previous experience also includes work in the Capital Finance Group at Wachovia Securities (now Wells Fargo) where he focused on acquisition financing, growth capital, and workout situations. Mr. White earned an M.B.A. from the Goizueta Business School at Emory University and a B.S. in Business Administration from the University of North Carolina at Chapel Hill.

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