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Siemens in the U.S.: Driving Economic Growth through Infrastructure Investment

Siemens has been in the U.S. for over 150 years and the U.S. is now the largest market for Siemens, with nearly 50,000 employees throughout all 50 states and Puerto Rico.

- It has invested more than \$35 billion in America over the past 15 years, with more than 70 manufacturing sites that export about \$5 billion worth of products each year.
- In the U.S., Siemens invests more than one billion dollars annually on R&D as well as \$50 million in job training each year.
- In addition to its own manufacturing sites, over the last 25 years, Siemens has developed a robust supply chain across the country, working with U.S. companies to provide components and parts for projects across the Siemens' portfolio. For transit and passenger rail projects alone, Siemens is working with suppliers that represent more than 20 states and over 50 cities.

Siemens & Intelligent Infrastructure: A Strong Legacy

Siemens has a long history of working in cities to make life better for their citizens and businesses; from installing the first electric street lighting in Berlin in 1882 to building continental Europe's first underground rail line in Budapest in 1896.

Today, it continues to build on Siemens' leading-edge infrastructure technologies and digitalization that helps cities move people and goods safely and efficiently, while improving the environmental footprint. Siemens' portfolio for intelligent infrastructure technologies includes complete traffic and rail transportation systems, efficient energy supply, and high-performing, building technologies. Siemens also provides ways to modernize how power is transmitted and distributed to enhance the smart consumption of electricity.

Siemens Technology, Software & Equipment: Moving Cities Forward

Transportation & Mobility:

Siemens is a worldwide leader in high-speed rail and the largest light rail provider in the U.S. In the U.S. it manufactures passenger rail locomotives and trainsets out of its solar-powered plant in Sacramento home to more than 800 employees.

- **Higher Speed Trains:** Siemens is building 32 high-performance diesel-electric locomotives for several Midwestern and West Coast states and 70 new Amtrak electric locomotives for the heavily traveled Northeast Corridor. Siemens was also selected to provide diesel electric locomotives and passenger coaches for All Aboard Florida, bringing high speed intercity passenger rail from Miami to Orlando.
- **Light Rail:** One-third of all light rail vehicles in the U.S. today are manufactured by Siemens. Recently, San Francisco's Municipal Transportation Agency selected Siemens to provide 215 light rail vehicles, its largest rail order ever.
- **E-Highway:** Siemens has been selected to install an eHighway system in the proximity of the Ports of Los Angeles and Long Beach, the two largest ports in the U.S. This system in California will electrify select routes via an overhead system that supplies trucks with electric power, similar to how modern day trolleys or streetcars as powered. This project will not only be the first of its kind in the U.S., but the only fully-developed eHighway demonstration in the world.
- **Smart automobile traffic management:** In Harris County, Texas—the third-most populous county in the U.S.—Siemens' Intelligent Traffic Solutions equipped 400 intersections with control systems that alter traffic light timing to ensure the optimal flow of cars, thus cutting down on travel times and idling vehicles.

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- **GPS-Based Bus System:** Siemens partnered with Trapeze Group to create a GPS-based bus rapid transit system that keeps San Antonio's new VIA Primo bus fleet on-schedule with minimal impact on individual traffic flow. This solution allows the VIA Primo fleet's on-board computer to automatically request a green light when the bus is behind schedule and approaching a busy intersection, improving travel times and getting riders to their destinations faster. Since being launched in December 2012, the VIA has seen a 20% reduction in travel time.
- **Communications-based train control (CBTC) system:** Currently installed on NY's Canarsie L subway line – the trains along the 10-mile underground Canarsie line are guided by high-performance onboard intelligence, substantially improving traffic and transport capacity. On the Canarsie line, ridership has increased to the point where 26 trains per hour will sometimes run—nearly double the old maximum of 15.
- **Regenerative Energy Storage:** Siemens installed the first regenerative energy storage unit on the new TriMet Portland-Milwaukie Light Rail Transit Line. This allows for energy created during braking to be stored and then re-used in one of two forms, energy savings or voltage stabilization, during peak demand times.

High-Performing, Effective & Energy Efficient Building & Water Technologies:

Energy efficiency is no longer just measured through “greenness” but now also through “intelligence.”

Technology and data-based services are helping cities – as well as major campuses, enterprises, hospitals and data centers -- monitor energy usage, and building automation solutions integrate systems to enhance energy efficiency, reliability, and safety.

- Since 1995, Siemens has helped to modernize nearly **7,000 buildings worldwide**, highlighted by the world's tallest green skyscraper, in Taipei and important American landmarks like the new World Trade Center Memorial, the Times Square building, Carnegie Hall, Walt Disney World and the Mount Vernon estate.
- **Distributing and pumping water** throughout a city is one of the most energy-intensive processes in cities today. By switching to smarter electrical pumps and motors, one station alone -- the Springfield Pumping Station in Chicago -- was able to save the city \$7.5 million in energy and operating costs and also lowers its carbon footprint.
- **The National Park Service (NPS)** has chosen Siemens to implement energy and water conservation measures at 13 of the nation's most important sites in the Washington, DC metropolitan area. The National Mall and Memorial Parks, Antietam and Manassas National Battlefields, Rock Creek Park and Wolf Trap National Park for the Performing Arts are among the regional landmarks to be upgraded by Siemens to help the NPS achieve significant energy and water reductions and their associated cost savings.

Sustainable Energy Management:

Technologies exist today that can give the power grid system the face lift – a “hybrid” of intelligent technologies within existing infrastructure – it needs to serve the American people with reliable, cost-effective, and market-leading energy resources.

- **Intelligent Substations:** Coal power plant retirement can result in a loss of dynamic reactive power, energy generated in addition to megawatts that is necessary to move and deliver electricity efficiently. With intelligent substations, utilities can deliver consistent, reliable power to its customers without any risks at the current growth in electrical demand.
- **Grid Stabilization Technology:** In Chicago, a local utility needed to maintain the performance of its electrical transmission and transmission systems while continuing optimal service for its customers. By installing Static Var Compensators, a high voltage system that dynamically controls the network voltage, the utility will maintain transmission stability in the future.
- **HVDC Transmission:** Siemens installed an HVDC back-to-back link to connect the power supply networks of New Jersey and New York. This provided a new source of electric power for the New York City customers of the New York Power Authority (NYPA) and also provided New York City with access to renewable resources and included significant upgrades and reinforcements to the transmission system in New Jersey. The cable is entirely underground and underwater, ensuring greater power reliability in light of storms or other extreme events.
- **Residential EV Charging Stations:** Siemens' new VersiCharge SG electric vehicle charging station is the first wi-fi enabled cloud-based technology that allows users to monitor and control a charger in real-time via a

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mobile or web-based app on the cloud. It can interact with utility programs like demand response directly through the cloud, allowing utilities to better understand electric vehicle usage and lowering costs for users. The technology has shown to result in 45 percent lower charging costs during off-peak hours compared to traditional electric vehicle chargers

Digital Industrial Infrastructure:

Improvements in networking, virtualization and collaboration are changing the way products are designed, manufactured and serviced. Siemens seamlessly connects the virtual and real worlds of product development and production with automation and drive technologies and innovative software that enable greater productivity, flexibility, resource efficiency and shorter time to market.

- **Siemens PLM Software** is a world-leading provider of product lifecycle management (PLM) software, systems and services with 77,000 customers worldwide. Headquartered in Plano, Texas, Siemens PLM Software helps thousands of companies make great products by optimizing their lifecycle processes, from planning and development through manufacturing and support. Many of the world's leading companies in automotive, aerospace, consumer products, medical devices, shipbuilding, apparel and machinery, rely on Siemens integrated family of PLM offerings to enhance quality, increase efficiency and reduce product costs.
- **Aerospace:** To keep up with growing demand, aerospace manufacturers are embracing "hyper-automation," or the moving production line. At Boeing's 777 assembly plant, lost workday cases and production time were substantially reduced.
- **Food & Beverage:** Schlafly Brewery teamed up with Siemens to increase efficiency, meet higher production demands and provide consistency in products – resulting in a 30% gain in efficiency (daily production).

Infrastructure to Harness America's Energy Revolution:

Siemens is an end-to-end supplier of equipment and technology from the moment oil and gas leaves the wellhead until the moment the light comes on in your home. And it continues to make significant investments in innovation across the energy value chain – from the oil and gas space, to wind power and renewables, to distributed power generation.

- **Oil & Gas:** Siemens aims to revolutionize the speed, efficiency and reliability with which it moves oil and gas from extraction to end user through automation and digitalization. By providing the necessary physical and digital infrastructure, the installed base of natural gas will be able to grow – boosting demand for wind power and renewables as governments pursue 'all of the above' solutions to reduce greenhouse gases.
- **FlexPlants:** As more renewables mix with carbon-based energy, the need for flexibility in power generation will grow, and Siemens is a global leader in efficient power plant technology – including FlexPlants, which enable gas-fired plants to ramp up quickly when there's a gap between renewable and traditional energy sources. In California, the LEC (the Lodi Energy Center) manages efficiencies above 57% with startup times that are as short as half those of earlier plants due to the integration of fast-start features.
- **Solar Photovoltaic Installations:** Siemens installed the largest solar photovoltaic system at the U.S. Army's White Sands Missile Range, supplying approximately 10 percent of the total power used at the installation.
- **Wind Farm Systems:** The National Nuclear Security Administration awarded Siemens Government Technologies a contract to construct the federal government's largest wind farm at the Pantex Plant in Amarillo, Texas. The cost of the project will be funded by the energy savings guaranteed by Siemens and will enable Pantex to meet President Obama's directive for agencies to meet federal energy mandates as well as supporting the Department of Energy's renewable energy goals.
- **Biogas-Powered Data Centers:** Microsoft tapped Siemens to help power the world's first waste-to-energy, biogas powered data center. Siemens' power monitoring equipment and software in this data center allows operators to ensure enough biogas is flowing and power created so the Microsoft can count on these resources to keep its data center operational at all times.

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