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Data Centers and Silicon Valley Power: A Match Made in Santa Clara

Have you ever thought about how major Bay Area companies are able to transmit large amounts of information? Or maybe you've wondered how social media clouds are supported on the back-end. Data transport and cloud-based services are possible because of dark fiber, the infrastructure of fiber networks that delivers data and internet services. In Santa Clara, Silicon Valley Power (SVP) provides an extensive and reliable dark fiber service program that supports commercial customers.

The SVP Fiber Enterprise program is a dark fiber leasing service designed to improve access to high-speed communication and data services within Santa Clara. SVP leases dark fiber to fiber carriers, commercial businesses and nonprofits. Currently 90 percent of the data centers and colocation facilities in Santa Clara utilize the system.

The current network is made up of 151 cable miles of 144-, 288-, and 432-fiber cables running throughout

Santa Clara in places other carriers do not reach. SVP's extensive infrastructure makes it a prime market for companies that need fiber to support their business needs. The newest 432-fiber cable is an especially appealing feature for data centers that look to support their cloud-based services.

SVP Fiber Enterprise is designed specifically to meet the needs of SVP's commercial customers and has grown significantly since its inception in 2000. The program will continue to expand as more businesses, especially data centers, move to Santa Clara. The combination of Santa Clara's location, low cost and reliable power, and easy access to a fiber rich network creates a perfect ecology for businesses to thrive and grow.

Learn more about SVP Fiber Enterprise and how it can support your business by visiting svpfiber.com. ■

Solving Common Power Quality Issues

Many facilities experience power quality problems. Transients and voltage sags are two of the most common. They can disrupt or damage critical electronic equipment. A number of solutions are available to help protect your facility.

A short take on power transients

Transients are brief voltage spikes originating outside your facility. Causes include lightning, utility capacitor switching, neighboring plants or work areas that start or stop large equipment, such as motors or presses.

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SANTA CLARA GREEN POWER 2017 HISTORIC PRODUCT CONTENT LABEL¹

Santa Clara Green Power matches 100% of your electricity usage. In 2017, **Santa Clara Green Power** was made up of the following new renewable resources averaged annually. In 2018, **Santa Clara Green Power** began offering 100% Western Solar. See our Prospective Product Content Label online to learn more.

Green-e Energy Certified New ² Renewables in Santa Clara Green Power 2017		Generation Location
Solar	81%	CA
Wind	19%	ID
Total	100%	

1. These figures reflect the power delivered to **Santa Clara Green Power**'s customers in 2017.

2. New Renewables come from generation facilities that first began commercial operation within the past 15 years. This product may include generation from facilities that were approved for extended use under a strict set of criteria by Green-e Energy and/or qualify as repowered.

For comparison, in 2017 the average mix of resources supplying Silicon Valley Power Santa Clara included: Eligible Renewable (38%), Coal (9%), Large Hydroelectric (34%), Natural Gas (16%), Unspecified sources of power (3%). Source: <http://www.siliconvalleypower.com/svp-and-community/about-svp/power-content-label>.

The average home in Santa Clara uses 420 kWh per month (Silicon Valley Power Utility Fact Sheet Jan-Dec 2017). For specific information about this product, please contact Silicon Valley Power at 408-244-SAVE (7283), email green@siliconvalleypower.com, or visit www.siliconvalleypower.com/green.



Santa Clara Green Power is Green-e Energy certified, and meets the environmental and consumer-protection standards set forth by the nonprofit Center for Resource Solutions. Learn more at www.green-e.org.

Solving Common Power Quality Issues
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Spikes can also originate from inside your facility. When large motors, relays and other inductive devices are shut down, the voltage that was flowing must be absorbed into surrounding wires and other devices.

Capacitor switching before the meter can cause voltage transients, too. When power factor correction capacitors are switched on, line voltage falls, followed by a sudden rise. This process repeats until the system settles down within one half-cycle. After the initial voltage drop, there is an oscillation caused by interaction between the capacitor bank and system inductance. Disruptive transients can travel through the grid and create problems for motors, process controls and other electronic devices.

A number of devices are available to protect your facility and its critical equipment:

- Surge protection devices (SPDs) can be used for lower-voltage transient attenuation. It clamps the line voltage to a specific value and conducts any excess impulse energy to ground.
- Zero threshold surge suppressors (ZTSS) shunts transient energy away from sensitive equipment.
- Surge suppressor panels, receptacles and power strips use solid-state metal oxide varistors (MOVs) as the suppression element.

The lowdown on voltage sags

A sag is a reduction in voltage (typically at least 10 percent) that doesn’t hang around for long. They usually last for less than a second, although they can go on for up to a minute or two.

Sags can originate on either side of your electric meter, and their exact source is often difficult to pin down. Frequently, they’re caused by equipment within your facility; a bunch of motors starting at the same time, for example. Outside, wind or trees falling on power lines can also produce sags. The source doesn’t have to be close by. A voltage sag on a power grid can impact facilities within a 100-mile radius.

A power quality monitor is the most commonly used tool for detecting voltage sags. Simple monitors measure and record power as it enters your facility. More sophisticated models use software to track voltage sags and other power quality disturbances.

How do you protect your facility from voltage sags? First, fix the problem causing the sag and then focus on upgrading your equipment to ensure that it’s more capable of riding out voltage issues. Specify and purchase electrical equipment that’s more tolerant of voltage variations.



Next, take steps to compensate for sags when they do occur. Install uninterruptible power supply (UPS) devices on critical electronic equipment. A UPS constantly conditions power, including correcting voltage sags. Dynamic sag correctors are another option. They regulate voltage as the incoming primary voltage changes, riding through sags down to 50 percent.

By taking the time to understand how power quality issues can affect your critical equipment, you can take steps to protect your facility, which will save money and reduce downtime. ■

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Two Percent Rate Increase to Advance Reliable Power System

A two percent rate increase will take effect in January 2019 for Silicon Valley Power (SVP) customers. SVP’s stable, low rates mean SVP customers save more than an estimated \$150 million in annual electric costs compared to businesses in neighboring cities, whose rates are expected to increase by ten percent.

Funds from the rate increase will help ensure a sustainable, reliable and affordable power system for Santa Clara in the future. These funds will be used to make improvements to the electric system so that SVP can continue to provide high quality service to customers. The upgrades include replacing old power poles, crossarms and transformers, all of which will help prevent outages. Additionally, the funds will help cover the rising costs of power transmission on the grid, which, in recent years, has almost doubled in cost.

As a not-for-profit entity, SVP bases its rates on operating expenses and regulatory policies. SVP and other municipal utilities are working to educate legislators about the benefits of maintaining low rates for customers. ■

Meeting Your Power Needs: Updates to SVP’s Infrastructure

As businesses continue to expand into Santa Clara, Silicon Valley Power (SVP) strives to remain a dependable utility. SVP also aims to attract new businesses to the community to help the city grow. New data centers are especially drawn to Santa Clara due to SVP’s low electric rates, which are consistently 25-40 percent below those of nearby cities. However, SVP’s current infrastructure will not be able to carry the high power demands of these new data centers. According to research conducted by SVP’s engineering team, the current system could overload by 2021 without any upgrades or investments to meet this higher demand for electricity.

SVP has always been an innovative utility that supports a high-tech ecosystem with proactive measures. To prepare for this new data center growth, SVP is currently working on the South Loop Reconfiguration Project. The project will allow SVP to continue providing reliable power to all commercial customers as energy intensive businesses move to Santa Clara. When complete, the project will double SVP’s power servicing capability where the data center development is occurring.

The South Loop Reconfiguration Project will shift power demand from the South Loop circuit to the East Loop circuit, preventing system overload. The shift will involve building 3.5 miles of 60 kilovolt overhead transmission lines. The lines will be located in northeastern Santa Clara, stretching from the Kifer Substation to the De La Cruz Junction. The new lines will also connect to other existing substations. They will primarily run along Lafayette Street, Mathew Street, Martin Avenue and De La Cruz Boulevard.

This project is designed to meet growing energy demand while keeping costs down: It is almost \$15 million dollars cheaper than other expansion options. Customers adding new electric load to the distribution system pay their share of the costs associated with the upgrades required to power their facilities. This avoids shifting costs to existing customers.

Currently, 65 percent of the engineering design is complete, and the project is estimated to take six months. The target date for completion is 2020. ■



Employee
Profile



Shreya Kodnadu
Electric Utility Engineer

Name and Position: Shreya Kodnadu
Silicon Valley Power (SVP) Electric
Utility Engineer

Background: Working in the utility sector runs in Shreya’s family. Growing up, Shreya visited substations and generation facilities in Bangalore, India, where her father worked. She took this passion with her to her undergraduate studies in Bangalore and then to Washington State University, where she received her master’s degree. In 2016, Shreya joined SVP as a protection electrical engineer. She works on programming and testing protective relays and analyzing power outage data. She loves that her job focuses on safety, reliability, and helping the community.

Comment: “My favorite part of the job is working for the community. I can make a difference and see how my work directly affects Santa Clara residents and businesses.”

Favorite Pastime: “I love taking advantage of the outdoors, both locally and abroad. In 2015, my husband and I went on a six-day backpacking trip to Machu Picchu, and I loved every moment. We look forward to our next backpacking adventure in Patagonia.”

Working at SVP: “Not only is SVP serving Santa Clara residents and businesses, but I really enjoy the close community at work. I continue to learn from and enjoy the company of my amazing colleagues. Collectively we work toward the same mission. That is why I love coming to work every day.”