



Beacon of Light: Solar Plant Shines in Mojave Desert

First Grid-Scale Battery Gets Connected at Solar Facility

By Carol Tucker
Communications, Media and Community Affairs

LADWP's first utility-scale solar-plus-battery system is shining brightly in the Mojave Desert. As the Beacon Solar Plant converts the sun's rays to 250 megawatts (MW) of solar power for Los Angeles, the Beacon Battery Energy Storage System (BESS) is working in tandem to ensure a reliable flow of this clean, sustainable energy resource to the city's residents and businesses.



Steve Taylor, Sr. Electrical Craft Helper, works on solar array. (Photo by Chris Corsmeier)

The Beacon Solar Plant, located just north of Cantil, Calif., is a state-of-the-art solar power facility featuring 903,434 panels on single-axis trackers that follow the sun in the early morning and late afternoon hours for maximum operational efficiency. When operating at full capacity, Beacon produces enough renewable solar energy to serve 102,667 Los Angeles homes, and offset emissions of about 313,311 metric tons of CO₂ annually from fossil fuel power plants. That amount of avoided greenhouse gas emissions is like removing 67,117 gas-fueled vehicles from highway every year. The plant was fully energized in December 2017.

Beacon Battery Fast-Tracked

The Beacon BESS, which was fast-tracked and commissioned in October 2018, is able to store over 20 MW of renewable energy, running at full power for 30 minutes. Its main function is to stabilize and regulate solar voltage levels, which fluctuate because of cloud cover, to smooth the interconnection with LADWP's nearby switching station and transmission highway. Essentially, this enhances the reliability of the solar power flowing to L.A. along the LADWP's Barren Ridge Renewable Transmission Project (BR RTP) from the Mojave Desert to the terminus in Sylmar. From there the energy is distributed throughout the city. The BESS can also store up solar power for use later in the day to help meet peak demand.

"The Mojave Desert averages 260 days a year of sunshine, but the sun doesn't shine all day. We need to provide reliable, affordable electricity to our customers 24/7/365," said Reiko Kerr, Senior Assistant General Manager of Power System Engineering, Planning and Technical Services. "The Beacon BESS helps keep the power on sustainably and cleanly, working in tandem with the Beacon Solar Power Plant

and our ever growing portfolio of grid-scale renewables projects to maintain capacity.”



The Beacon BESS now stabilizes and stores energy from Beacon Solar Plant in the Mojave Desert. (Photo by Chris Corsmeier)

In addition to Beacon, LADWP has power purchase agreements for solar generated by the 260 MW Springbok Solar Projects 1 and 2, and the 60 MW RE Cinco Solar Project, all completed in 2016. Construction is underway on a third phase of Springbok, which will generate 90 MW when completed in early 2019. Adding to the robust renewable resources, LADWP continues to own and operate its 135 MW Pine Tree Wind Farm and 8.5 MW Pine Tree Solar Plant in the nearby Tehachapi Mountains.

Andrew C. Kendall, Senior Assistant General Manager of Power System Construction, Maintenance and Operations, praised LADWP crews for designing and constructing all of the electrical infrastructure work on time and within budget. “We worked closely with the developers to get the interconnections done and successfully complete test phases with the Energy Control Center to bring this solar power smoothly into our system,” Kendall said.

Reliability Challenge

As LADWP seeks to bring more renewable energy onto the electrical grid, one of the hottest issues is how to continue providing reliable electric service to customers, especially during late afternoon and early evening when energy use rises and darkness falls.

Renewable Energy Rising:

LADWP is on track to meet the next state legislated renewable portfolio standard (RPS) targets of 33 percent by 2020 and 60 percent by 2030. Looking forward, LADWP is studying

raising that target further—to 70 percent by 2036—under the Department’s accelerated greenhouse gas reduction plan.

“We bring electricity to our customers 24/7. Solar obviously gathers energy during the daylight only. That means we have to put something in place that helps close the gap, especially during those peak hours,” said Tom Honles, Manager of Major Solar Transmission and Distribution Projects. “That’s why we’re looking at energy storage.”

Typically, the gap created when solar panels stop producing power as the sun sets, and energy demand peaks beginning in late afternoon, is mostly bridged by efficient use of natural gas fuel at LADWP’s in-basin generating stations. These natural gas generators are designed to provide “dispatchable” power that can ramp up quickly and maintain reliability.

However, as LADWP works to reduce fossil fuel power, the Department is developing new battery energy storage projects to offset the need for natural gas generation. Whenever a large amount of solar energy is placed on the grid, the natural fluctuations of solar can create issues with grid electrical stability.

Siting the BESS next to the Beacon Solar Plant helps address those issues in three ways, Honles said. “First, the BESS is a powerful means of keeping the electrical frequency steady, and complying with standards set by the federal government. Second, it will store energy, so we can put that solar onto our grid when the sun is not shining. Third, it will help us to control voltage levels on the transmission lines connecting the solar facilities to Los Angeles, increasing reliability,” Honles said.

The Beacon BESS will help LADWP meet its target of 178 MW of new energy storage by 2021, as set forth in AB 2514, which allows local governing bodies, such as the Los Angeles City Council and the Board of Water and Power Commissioners, to establish energy storage targets for their public power utility.



(Photo by Chris Corsmeier)



LADWP's La Kretz Innovation Campus: Meet the Cleantech Future of Water and Power

By Christina Holland
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When you think of Downtown Los Angeles, what comes to mind? Innovation? Clean technology? L.A.'s green economy? Probably not, but it should.

More than eight years ago, in what was once a neglected part of Los Angeles, a four-mile strip of industrial-zoned business development was emerging along the Los Angeles River, and it was nicknamed the Cleantech Corridor. While it may not have achieved the status of a second Silicon Valley, a cleantech vibe is most certainly developing in what is now considered the Downtown Arts District.



The La Kretz Innovation Campus, located in the downtown Los Angeles Arts District, is home to the one of the world's leading Cleantech incubators and LADWP's Customer Engagement Lab and Sustainable Living Lab.

At its hub, you'll find LADWP's La Kretz Innovation Campus (LKIC), named after Morton La Kretz, a local real estate developer whose philanthropic efforts helped launch the campus. La Kretz is home to LADWP's Sustainable Living and Customer Engagement Labs, and the LA Cleantech Incubator (LACI), a place where entrepreneurs, engineers, scientists and policymakers can collaborate, promote, and support the development of clean technologies and L.A.'s green economy.

Officially launched in October of 2016, LKIC is already making its mark locally and around the globe. For starters, it is the first facility of its kind in which an incubator is housed in the same building as the R&D labs of a major utility. Then, you have the building itself. Originally a furniture manufacturing warehouse, the building's refurbishment plan was carefully orchestrated so it could stand as an example of best practices for other builders who are committed clean technology and a green economy.

Sustainable Energy & Water Features

“The La Kretz Innovation Campus has some unique features that help it qualify for the LEED Silver distinction. But we wanted more than that, so our Efficiency Solutions Engineering Team stepped in to add a few additional emerging tech features, such as a greywater system and a microgrid to help the facility apply for the highest LEED status,” said Terry Brungard, LADWP Efficiency Solutions engineering supervisor and project team leader. LEED provides the world’s premier green building rating system and certifies buildings on based on resource efficiency. “Now, not only are we on track for LEED’s Platinum rating, we have a building for future innovators, a living demonstration lab where every part is a learning experience,” Brungard added.

Brungard isn’t exaggerating. Even the parking lot educates visitors with its low-profile bioswale collecting run-off water and solar panels generating up to 1,000 kilowatt-hours per day. Enter the building and it just keeps going.

The beautiful reception area is equipped with the obligatory comfy seats and charging outlets, but it has something most lobbies don’t: a living wall—a daily reminder that La Kretz is all about ensuring a sustainable future.

Microgrid



Continue through to the Sustainable Living Lab and you’ll run into LADWP’s microgrid, a small on-site energy control system that manages the Battery Energy Storage System (BESS), the use of grid supplied power and the use of the on-site solar power, which is a distributed energy resource. The microgrid at La Kretz is powered by the city’s electric grid and from its onsite 175 kilowatt solar photovoltaic system, which generates clean, renewable energy while also charging the energy storage system located within the facility.

Ultimately, this framework provides economic benefits by using stored energy and solar energy to reduce the campus’s demand on the L.A. power grid. The microgrid’s BESS project is also a test case to determine the reliability, safety and cost-effectiveness of energy storage systems, working together with solar, for future use in the larger citywide power grid. Recently, the La Kretz microgrid was recognized as a 2017 Project Excellence Award winner by the National Electrical Contractors Association.

Case Study Home

Next door to the microgrid is LADWP's Case Study Home, a hands-on experience featuring some of the latest appliances and technologies available to consumers. Visitors can use the refrigerator's touch screen for fun as well as for practical purposes. Need some mood music for a small dinner party or the score from today's game? This fridge has an app for that. Need help managing your food budget? Do you ever buy too much or toss spoiled food? Your fridge has an app for that too.

Without even opening the door, you can take advantage of your smart fridge's features to keep track of what food you have in stock and what is about to spoil, then sync it all to your phone. Not only does this save time and money, it saves energy by cutting down on the number of times you open the fridge's door.

Continue touring the Case Study Home and you'll start thinking about how to morph your own place into the home of the future. Among other things, you'll see a dimmable skylight and a smart thermostat you can control from anywhere on the planet. You'll see that in a smart home, everything is connected. In the age of the "internet of things," all kinds of smart devices are connected in cyberspace and you can easily control them all through an app on your phone.

"The Department is looking at all smart technologies, meaning Wi-Fi connected, that allow our customers to control their appliances remotely so they can save on their water and power usage even when they aren't home," said Dale Thompson, Efficiency Solutions engineering supervisor. "But smart devices can have a wider application and benefit. For example, with a customer's prior consent, the Department will one day be able to help manage a resident's energy load by simply sending a control signal to shut off certain large appliances during periods of high energy demand. He added, "One smart home can serve as a learning tool. Thousands of smart homes could be a real asset to our distribution system."



(From Left) Dale Thompson, Mark Fernandes, and James Kemper of Efficiency Solutions Engineering Group and La Kretz Labs worked closely on designing the Case Study Home, researching and installing its energy efficient, high-tech measures.

All of this is happening in just half of the cleantech campus. Walk across the hall to the LACI side of campus and you'll be among the 42 active portfolio companies who are hard at work developing, nurturing, and releasing to market their cleantech innovations. Residing under the same roof as the nation's largest municipal utility gives these startups an opportunity to demo their wares to LADWP staff who can evaluate their future applications and relevance for the Department and our customers.

Recognized as one of the most innovative business incubators in the world by UBI Global, a Swedish-based data and advisory firm specializing in mapping and highlighting the world of business incubation, LACI identifies local entrepreneurs across multiple cleantech business sectors and guides them to market, creating jobs that advance L.A.'s green economy. In just five years, LACI has helped 67 companies raise \$135 million in funding, created 1,500 jobs, and delivered more than \$335 million in long term economic value for the city of Los Angeles.

(Top photo by Art Mochizuki)

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