

June 21, 2017

The Honorable City Council  
c/o Office of the City Clerk  
Room 395, City Hall  
Mail Stop 160

Attention: Councilmember Nury Martinez  
Chair, Energy and Environment Committee

Honorable Members:

Subject: Council File No. 17-0115 – Clean Energy Storage Projects

This correspondence is in response to the January 31, 2017, Energy and Environment Committee Motion (Englander-Bonin-Martinez-Koretz) requesting the Los Angeles Department of Water and Power (LADWP) implement clean energy storage projects in the City of Los Angeles (City) and report on the feasibility of partnering with local investor-owned and municipally owned utilities (IOUs/POUs) to implement clean energy storage projects in the region.

### **Background**

LADWP is a vertically integrated utility, owning generation, transmission, and distribution assets that enable greater control and flexibility to balance generation and load. LADWP is planning the size and timing of energy storage procurement based on:

- Power System's 2016 Integrated Resource Plan recommendations,
- Transmission and distribution system grid support needs,
- Rate impacts, and
- Regulatory mandates.

LADWP is committed to an accelerated and cost-effective integration of renewable energy resources. To that end, energy storage technologies can ultimately play a significant role in sustaining a reliable power system based on system studies and technical analysis that address factors related to overall feasibility, economics, market maturity, environmental impact, battery life-cycle, disposal, and opportunities for recycling.

LADWP has supported energy storage since the early 1970's, and owns and operates the cost-effective, ~1200-megawatt (MW)(9,600 megawatt-hours) Castaic pumped-hydro energy storage plant, which can store and also produce enough energy to power over 435,000 households for one day.

This contrasts with lithium-ion battery, whose life is expected to be less than ten years, and will vary based on battery cycling, use cases, and chemistries. The largest lithium-ion installation currently in service is a four-hour, 30-MW (120 megawatt-hours) battery in Escondido, California built by AES Corporation for San Diego Gas & Electric (SDG&E).

LADWP is continuously monitoring the current state of the energy storage industry, and is ready to adapt, integrate, and deploy when and where feasible while being fiscally responsible to our customers.



*Front view of Castaic Pumped Storage Plant*

LADWP's current efforts regarding new energy storage are detailed below.

**Assembly Bill 2514 – Energy Storage**

In response to AB 2514, LADWP developed an analytical framework to set technologically viable and cost-effective energy storage procurement targets. In September 2014, the Board of Water and Power Commissioners (Board) approved the LADWP energy storage procurement targets of 178 MW by 2021 at the transmission, distribution, and customer levels of the power system. In 2016, pursuant to the AB 2514 targets, LADWP reported to the California Energy Commission (CEC) the commissioning of 22.57 MW of energy storage.

| PROJECT NAME  | TARGET CAPACITY | STATUS   | ACHIEVEMENT     |
|---|-----------------|----------|-----------------|
| Castaic Pumped Hydro Storage Power Plant Unit 1 Upgrade | 21 MW           | Complete | 21 MW           |
| LAX Thermal ES Incentive                                | 3 MW            | Complete | 1.25 MW         |
| LA Downtown (Pilot)                                     | 50 kW           | Complete | 60 kW           |
| Garage of the Future (Pilot)                            | 25 kW           | Complete | 9 kW            |
| Behind the Meter (Batteries)                            | -               | Complete | 158.4kW         |
| Behind the Meter (TES)                                  | -               | Complete | 97 kW           |
| <b>Total</b>  | <b>24.08 MW</b> |          | <b>22.57 MW</b> |

**Aliso Canyon Gas Leak Accelerates Utility-Scale Energy Storage Efforts at LADWP**

LADWP has accelerated the planning, development, and procurement of multiple battery energy storage projects, directly in response to the Aliso Canyon gas leak, including:

- 20 MW battery energy storage system to be installed and deployed at the Beacon substation renewable energy hub for large, solar photovoltaic (PV) plants. Proposals are being evaluated, with commercial operation anticipated in early 2018 and
- LADWP is also accelerating the procurement of an additional 30 MW battery energy storage system near the Beacon substation by 2019. The Beacon battery system will be a fast-responding energy storage facility for enhancing electric system reliability and integrating intermittent renewable energy into LADWP’s supply portfolio, with potential to reduce reliance on gas-powered generators.



*Beacon Solar Collector Station and Site 4 (January 31, 2017)*

By locating the battery energy storage system next to a large solar PV generating facility, LADWP anticipates using clean energy generated from the solar plants to charge and discharge the battery, rather than power from the grid that can come from other resources.

#### **Other Battery Storage Efforts at LADWP**

LADWP's other behind-the-meter, multi-technology battery energy storage efforts are also intended to mitigate the impacts from Aliso Canyon and include:

- LADWP, in collaboration with the Mayor's Office, the Los Angeles Fire Department, the Los Angeles Department of Building and Safety, and the Los Angeles Department of General Services, is championing energy storage pilot projects near the Aliso Canyon communities, including a 12-kilowatt (kW) system at Fire Station 28 in the Porter Ranch area. The systems will demonstrate demand response, integration with a solar PV system, electricity demand reduction during peak-hours, and emergency backup in the event of an outage;
- LADWP, in collaboration with the Electric Power Research Institute (EPRI) is developing an Energy Storage research project at the John Ferraro Building (JFB), that will focus on comparing energy storage technologies;
- LADWP has approved standards for behind-the-meter battery energy storage backup and peak shaving systems. Requirements were developed in collaboration with experienced inspectors and engineers for prudent interconnection of battery systems. LADWP is working with vendors to review designs, safety features, and operating characteristics for customers applying for battery systems.
- LADWP is exploring energy storage to: a) defer transmission and distribution system upgrades at generating stations and substations b) load shift during peak demand periods, c) increase demand response capability, d) implement load following, e) support grid operations, and f) store over generation from renewable energy resources.
- LADWP installed battery energy storage systems at the LADWP Truesdale Training Center. The Truesdale Training Center is building and testing advanced solar, battery, and inverter technologies to develop safety standards and processes when working around or with this equipment. The training center has tested and approved a solar and storage backup system for residential use. Additionally, LADWP is constructing a 60-kW lithium-ion battery system with a power management system at the same training facility.
- LADWP has also installed battery energy storage at the Smart Grid Garage of the Future and the La Kretz Innovation Campus that will demonstrate real-world designs built for residential and small commercial operations.

#### **Partnering with IOUs, POUs, and Others**

LADWP has long-standing partnerships with a number of organizations related to energy storage, including:

- LADWP has partnered with the EPRI to examine the environmental aspects of grid-scale battery deployment. The analysis evaluates lithium-ion batteries from cradle to grave, not only considering battery collection, recycling, and disposal, but also the energy and

resources required during material mining, distribution, and manufacturing. Unlike lead acid batteries, the industry is still determining how best to recycle lithium-ion batteries.

- LADWP is an active member and contributor to multiple EPRI research programs, including Energy Storage and Distributed Generation Program 94. EPRI has a long history of evaluating the state of technology with utilities, demonstrating and testing projects all around the world.
- LADWP and EPRI are currently evaluating preliminary results from the Distributed Energy Resources (DER) Integration Study and will evaluate the potential of DER impacts to the distribution system in a pilot study, including the use of energy storage to integrate with distributed PV generation. The study will evaluate current DER technologies, including the latest grid-interactive energy storage technologies, and provide a more comprehensive understanding of the current state of the art capabilities, reliability, resource planning, and costs to LADWP and ratepayers. The project will provide information on how energy storage will cohesively integrate with other types of DER, and where energy storage will bring value to the power system without duplicating efforts with other DERs.
- EPRI and LADWP are partnering in a research and development project to determine appropriate usages of battery storage and to better understand battery capabilities, design, integration, testing, operation, and maintenance of different types of energy storage systems. This project will take place at LADWP headquarters and will allow LADWP and EPRI to directly compare two energy storage technologies types connected in parallel.
- LADWP partners with eleven other POU's through the joint power agency Southern California Public Power Authority (SCPPA), including Anaheim, Azusa, Banning, Burbank, Cerritos, Colton, Glendale, Pasadena, Riverside, Vernon, and the Imperial Irrigation District. LADWP plays an active role in the Energy Storage Working Group, to promote research and development in this area. LADWP is promoting further development in energy storage with other municipal utilities by establishing energy storage targets in compliance with AB 2514 and reporting compliance and updates to targets with the CEC.
- LADWP collaborates regularly with other IOUs and POU's, like Southern California Edison, Pacific Gas and Electric, SDG&E, Sacramento Municipal Utility District, Tucson Electric Power, and Hawaiian Electric Company. LADWP is incorporating many of the lessons learned from other utilities into its own engineering and program development regarding distributed generation, energy storage, technology procurement, reliability, and rate structures.
- LADWP is collaborating with the California Public Utilities Commission (CPUC) Self-Generation Incentive Program (SGIP) and SoCalGas/Sempra to provide incentives for energy storage technologies in LADWP service territory. The energy storage incentives cover qualifying energy storage system for both residential and business customers.

- LADWP is exploring potential opportunities for new hydro pumped-storage power plant(s) to expand its energy storage capacity.

LADWP is committed to the reliable, cost-effective deployment of clean energy as responsible stewards to the City and the environment. This involves looking at all options to increase flexibility when balancing load to match generation. Unlike most other utilities, LADWP is a vertically integrated utility with diverse energy resources stretched over a vast high-voltage transmission network spanning five states. The Pacific High Voltage Direct Current Intertie, for example, is an 846-mile line to Oregon that delivers inexpensive hydro and wind power to Los Angeles which helps keep rates low.

Consistent with the LADWP's Strategic Plan, LADWP is committed to training and safety around battery systems to ensure the safe and reliable integration into, and operational control of, new technologies into the existing network. This current infrastructure allows LADWP to import low-cost energy, resulting in some of the most affordable rates in California, which lowers the cost-of-living and drives business development in Los Angeles. LADWP is leveraging all of its resources, including partnerships with utilities, research institutions, and industry partners to ensure clean generating resources and energy storage resources are integrated to provide the best solutions for the citizens of Los Angeles.

If you have any questions or if further information is required, please call me at (213) 367-1338, or you may have a member of your staff contact Ms. Winifred J. Yancy, Director of Legislative and Intergovernmental Affairs, at (213) 367-0025.

Sincerely,



David H. Wright  
General Manager

RAK/LCT:rq/ps

c: Councilmember Bob Blumenfield, Vice Chair, Energy and Environment Committee  
Councilmember Gilbert A. Cedillo, Member, Energy and Environment Committee  
Councilmember Paul Koretz, Member, Energy and Environment Committee  
Councilmember Mitch O'Farrell, Member, Energy and Environment Committee  
Councilmember Mitchell Englander, President Pro Tempore, Twelfth District  
Councilmember Mike Bonin, Eleventh District  
Ms. Zina Cheng, Legislative Assistant, Energy and Environment Committee  
Dr. Frederick H. Pickel, Office of Public Accountability  
Board of Water and Power Commissioners  
Ms. Winifred J. Yancy

MOTION

State Senator Henry Stern recently introduced a legislative proposal that seeks to accelerate clean energy storage projects throughout Southern California. Senator Stern's proposal would establish a framework for expediting 120 MW of clean energy storage projects in both investor-owned and municipal-owned utilities.

This plan follows efforts by Southern California Edison and San Diego Gas & Electric to implement 100 MW of clean energy storage projects in their territories. These efforts were in response to the Aliso Canyon gas leak and the impact the leak had on local communities and the region.

The health and welfare of the Porter Ranch community was significantly affected by the natural gas leak. In addition, it threatened the reliability of local power systems given their dependence, in part, on natural gas.

Battery installations are able store power generated by the grid during the day and can be used to offset higher demand at night. This is especially desirable in places like California with high generation from renewables like solar. These efforts were in response to the Aliso Canyon gas leak and the impact the leak had on local communities and the region.

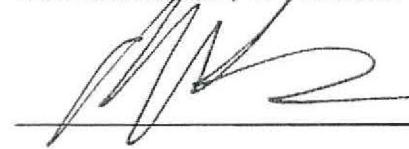
The implementation of clean energy storage projects in the region would serve to mitigate the dangers associated with natural gas use. These projects are cleaner, safer and more cost-effective for ratepayers. These projects also provide for greater power system reliability.



In order to ensure the City maximizes opportunities associated with the implementation of clean energy storage projects in the region, it is critical that the Department of Water and Power report to the Council. This way, the health and welfare of the City's residents and the environment can be ensured.

I THEREFORE MOVE that the Department of Water and Power immediately report to the Council on its efforts to implement clean energy storage projects in the City.

I FURTHER MOVE that the Department of Water and Power report on the feasibility of partnering with local investor-owned and municipal-owned utilities to implement clean energy storage projects in the region.

PRESENTED BY:   
MITCHELL ENGLANDER  
Councilmember, 12<sup>th</sup> District

SECONDED BY: 

ORIGINAL

  
JAN 31 2017