

December 1, 2016

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

Attention: Councilmember Nury Martinez
Chair, Energy and Environment Committee

Honorable Members:

Subject: Council File No. 16-0243 – Research Partnership | 100 Percent Energy
Portfolio, Los Angeles Department of Water and Power

This correspondence is in response to the March 2, 2016 Los Angeles City Council (City Council) motion (Krekorian, Bonin, Wesson, Koretz) requesting the Los Angeles Department of Water and Power (LADWP) develop and implement research partnerships with appropriate entities to determine what investments are required to achieve a 100 percent renewable energy portfolio. An amending motion, dated September 16, 2016, requested LADWP examine how a 100 percent renewable energy portfolio will impact the local economy and hiring programs based on the work required to modernize the electric system infrastructure.

During its consideration the City Council requested LADWP report back in 60 days on the areas of research to be considered and how LADWP will initiate a stakeholder engagement process.

Background

Over the years, LADWP has been leading efforts to address the threat of climate change by taking steps to curb pollution and other greenhouse gases through initiatives that eliminate the use of coal as a generation resource and promote programs for greater reliance on renewable energy.

In 2000, LADWP set out to reduce load growth by 50 percent through the use of behind the meter renewables, energy efficiency, and local solar. In 2010, LADWP achieved a

milestone of delivering 20 percent renewable energy to its customers. Following that, in 2013, LADWP's renewable portfolio grew to 23 percent of the total power supply and is currently on track to meet 25 percent by the end of 2016 and reach 50 percent on or before 2030. A key element of LADWP's renewable energy program is the development of local and utility-scale solar energy projects. Such projects have assisted LADWP to meet its renewable energy targets and reduce its carbon footprint created by fossil fuel burning power plants while serving as vital catalysts for creating jobs and stimulating the green economy within the greater Los Angeles area.

Similarly, in a landmark achievement, LADWP significantly reduced its greenhouse gas emissions to 19 percent below its 1990 level in 2015 and is expected to achieve 40 percent reduction in greenhouse gas emissions below 1990 levels by 2017, which is 13 years earlier than the State of California's requirement of 40 percent greenhouse gas reduction below 1990 levels by 2030.

The Process

In support of the City Council motion, LADWP will develop a plan to manage long-term research partnerships with the region's universities, members of the Southern California Public Power Authority, the California Independent System Operator, neighboring utilities and other stakeholders with the objective of determining what research institutions are currently conducting research and development activities related to 100 percent renewable energy and to provide a framework for partnering with the United States Department of Energy's Mission Innovation initiative.

In addition to research and development efforts, the 100 percent renewable energy initiative will include a robust outreach and stakeholder engagement process. Effective engagement will assist LADWP to anticipate and manage emerging issues, promote productive collaboration, and improve the overall decision making process. Therefore, a wide range of stakeholder interests will be represented as part of the process.

As a preliminary step, LADWP will set up a "Clean Energy Committee" to provide the necessary leadership and strategic guidance to working teams comprised of local government representatives, non-profit organizations, technical experts, research partners, commercial and institutional/industrial customers, office of the rate payer's advocate, neighborhood councils, environmental advocacy groups, businesses, policy makers, and members of civil society.

To ensure a comprehensive and multi-pronged stakeholder engagement process, a "Policy Working Team" and a "Technical Working Team" will be formed within the Clean Energy Committee and each team will have regularly scheduled workshops and public meetings to share information, deliberate on issues, and provide recommendations. LADWP plans to work with an independent consultant to develop a standard

stakeholder engagement strategy for identifying, selecting, mapping, and interacting with critical stakeholders. Based on best practice, the following factors can be considered as part of the stakeholder engagement process:

- **Responsibility:** Stakeholders to whom LADWP has, or in the future may have, legal, financial, and operational responsibilities in the form of services, contracts, or policies.
- **Influence:** Stakeholders with influence or decision-making power.
- **Proximity:** Local stakeholders that LADWP interacts with most, including those with long-standing relationships, and those stakeholders that LADWP depends on in its day-to-day operations.
- **Dependency:** Stakeholders directly dependent on LADWP's operations and activities in economic or financial terms, or in terms of local or regional infrastructure.
- **Representation:** Stakeholders who represent a critical constituency such as the environment, innovation, community, and the welfare of future generations.
- **Policy and Strategic Intent:** Stakeholders that LADWP addresses in policy and value statements, including customers and those who can give early warning about emerging issues and risks.
- **Technical Oversight:** Stakeholders that provide technical, scientific, and analytical perspective on the various options and scenarios to help develop practical system-wide engineering recommendations.

The Plan

Continuing on its upward trajectory, LADWP is committed to explore and investigate eligible energy resources and system upgrades to move towards a 100 percent clean energy future. In doing so, LADWP is planning to develop and pursue research partnerships with local universities, power utilities, research institutions, independent consultants, Department of Energy, and other stakeholders to determine what investments should be made to achieve a 100 percent clean energy portfolio.

To that end, targeted research will be conducted in the following areas to assess potential scenarios and evaluate key technological, system-wide, economic, and feasibility factors.

- **100 Percent Fossil-free Scenario:** This scenario refers to utilization of energy resources other than those derived from fossil fuels such as coal, natural gas,

and oil. Under this scenario, considerations will be made to retire all LADWP in-basin and external natural gas and coal fired generating stations. A fossil-free scenario includes a combination of solar, wind, hydro, geothermal, nuclear, hydrogen turbine, fuel cell, ocean wave energy, and other emerging clean technologies that will provide sufficient capacity to deliver 100 percent of LADWP's customer peak demand.

As an intrinsic part of the fossil-free scenario, a 100 percent renewable energy portfolio option or sub-scenario will be considered for analysis, evaluation, and review.

- **100 Percent Greenhouse Gas Neutral Scenario:** This scenario refers to achieving "net zero" greenhouse gas emissions by balancing or offsetting the amount of greenhouse gas released into the atmosphere through an equivalent renewable over-generation of non-greenhouse gas emitting energy resources or through purchase of enough greenhouse gas credits to compensate for the difference. A greenhouse gas neutral scenario can be achieved either through the retirement of all existing fossil fuel burning facilities, without the retirement of all existing fossil fuel burning facilities for back-up generation purposes, or through purchased offsets.
- **Impact on System Reliability:** Refers to research aimed at understanding and quantifying the impact that increased integration of renewable energy will have on the reliability of the power system. The objective of a reliability study is to address real and perceived challenges and analyze the barriers to integrating higher levels of intermittent renewable generation at the bulk power transmission and distribution levels. Further, such a study will determine level of required operating reserves and dependable energy needed to ensure system stability in order to balance interconnected systems, meet peak demand, and provide voltage support.
- **Location of Renewable Generation Resources:** Refers to required studies on locations and capacities of renewable energy resources that can provide sufficient utility-scale electrical power to the City of Los Angeles. As site-specific resources, renewables are highly dependent on the availability of infrastructure. In addition, capacity factors or availability of the various types of renewable resources need to be considered to determine the total capacity that needs to be installed in order to provide adequate and reliable power.
- **Transmission Constraints and Upgrades:** Refers to studies associated with building of new intra-state and/or interstate high voltage transmission lines and upgrading of existing transmission assets in order to transport and integrate utility-scale renewable energy resources. Additional studies of the transmission

infrastructure including interconnections and associated substations are required to support higher levels of renewable energy penetration. It is important to note that the development of transmission infrastructure typically take a much longer period than the development of renewable generation resources. As a result, the planning of these interdependent components needs to be closely examined and coordinated.

- **Study of Energy Storage Capabilities:** Refers to studies on the capability, cost, types, capacity, and space requirement of viable utility-scale transmission and distribution level energy storage technologies that can be used to support and integrate variable renewable energy resources. Transmission level energy storage options include pumped hydroelectric, compressed air electric storage, and flywheels while distribution level options include conventional batteries, electrochemical flow batteries, and superconducting magnetic energy storage. Analysis should be performed to determine an optimized mix between renewable energy resources and energy storage to maximize greenhouse gas reductions and minimize cost.
- **System Integration Studies:** Large-scale integration studies will be necessary to understand how to economically integrate variable renewable resources. The integration challenge is mitigated by balancing the properties of variable renewable energy with the flexibility of the electrical grid which may include increased need for regulation, system ramping requirements, management of over-generation events, and dispatch of less efficient resources.
- **Distribution System Upgrades:** Refers to studies associated with the augmentation of the distribution system due to high penetration of renewable sources at the bulk power level. Similarly, the impact of increased distributed generation and demand side customer participation on system voltage swings, fault levels, and power quality should be taken into consideration as part of the distribution system study.
- **Analysis of Estimated Investments:** Refers to studies to determine what capital investments should be made to achieve 100 percent clean energy under various scenarios taking financial risks, feasibility, cost of operations, reliability, integration, and cost-benefit into consideration.

In line with the objectives of the Motion, the 100 percent renewable portfolio study will provide a factual basis for determining the overall impact of the initiative with a focus on maintaining reliable electric service while quantifying costs and identifying cost-optimal pathways. The proposed research partnerships along with LADWP's in-house analysis, use of independent consultants, active stakeholder engagement, and consideration of

innovative solutions/technologies will offer LADWP valuable strategic and technical information that will be used to develop a clean energy roadmap for the City of Los Angeles.

LADWP plans to use its research and development partnerships to leverage the selection and implementation of clean energy solutions. In addition, LADWP will closely examine the regulatory landscape to monitor considerations such as the regionalization of the western grid, to ensure that local investments, commitment, and promotion of clean energy and clean climate initiatives will not be adversely impacted or curtailed.

Conclusion

As part of the 100 percent renewable portfolio study, LADWP plans to methodically incorporate all feasible, validated, and approved recommendations into its future Power Integrated Resource Plan documents to meet the City of Los Angeles' future energy needs at the lowest cost and risk consistent with the prevailing environmental priorities and reliability standards. LADWP will continue to make unprecedented investments to transform its power supply with new and innovative clean energy resources while significantly reducing its greenhouse gas emissions.

If you have any questions or if additional information is required, please contact me at (213) 367-1338, or 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

MSW/SZ:ps

- c: Honorable Bob Blumenfield, Vice Chair, Energy and Environment Committee
- Honorable Paul Koretz, Member, Energy and Environment Committee
- Honorable Gilbert A. Cedillo, Member, Energy and Environment Committee
- Honorable Mitch O'Farrell, Member, Energy and Environment Committee
- Honorable Herb J. Wesson, Jr., President, Los Angeles City Council, Tenth District
- Honorable Paul Krekorian, Councilmember, Second District
- Honorable Mike Bonin, Councilmember, Eleventh District
- Dr. Frederick H. Pickel, Office of Public Accountability
- Board of Water and Power Commissioners
- Ms. Winifred J. Yancy

MOTION

Climate change is the most significant issue facing the global environment today.

There is a broad, overwhelming consensus among scientists that the climate is changing as a direct result of human activity that produces greenhouse gases. The city has already acted decisively and deliberately to reduce its emissions of greenhouse gases and thereby reduce its contribution to the changing climate. Among these steps are investing in LED street lights, developing electrical hookups for ships at the Port of Los Angeles, expanding the use of electric vehicles at the city and major investments in energy efficiency among all types of electrical customers.

The most significant reduction in greenhouse gas emissions that the city will achieve will be the elimination of coal-fired power plants from the Department of Water and Power's electricity portfolio by 2025. In the period between 2005 and 2025, the utility will have reduced its greenhouse gas emissions by over 9 million metric tons each year. However, even after those investments in eliminating coal, the utility will still produce over 7 million metric tons of greenhouse gases, the equivalent of nearly 1.5 million cars on the road in Los Angeles each year. The remaining energy portfolio of the LADWP will be extremely reliant on natural gas, another source of greenhouse gases, and that portfolio will be susceptible to price and supply constraints of the gas market.

Clean energy and renewable technologies have developed significantly since the state began implementing renewable energy mandates in 2002 with the original Renewable Portfolio Standard legislation. Renewable projects, once viewed as a significant risk and potentially destabilizing for the electricity sector, are now readily available and adapted to the needs of utilities throughout the world. With advances in energy storage technology and distribution grid resilience, adopting greater quantities of renewables has become ever more possible and, in some cases, significantly more desirable than new fossil fuel generating stations.

On March 30, 1916, the Los Angeles Bureau of Power and Light constructed the first power poles to bring electricity from Pasadena and distribute it to customers in Los Angeles. Nearly a year later, its first hydroelectric generating station came on line to provide fossil-free electricity to even more customers. Today, with the LADWP on the verge of making significant investments in its infrastructure, and with that 100-year-old power system in need of significant upgrades, the city has an opportunity to re-create its utility in a way that recognizes the potential for a fossil-free future, demonstrates global leadership in its commitment to clean energy, and protects ratepayers from the increasing costs of carbon-based fuels.



I THEREFORE MOVE that the Council REQUEST that the Los Angeles Department of Water and Power report with a program to develop and implement a research partnership, utilizing relationships with the region's universities, members of the Southern California Public Power Authority, the California Independent System Operator, neighboring utilities and other stakeholders, with the objective of determining what investments should be made to achieve a 100% renewable energy portfolio for the LADWP.

I FURTHER MOVE that the aforementioned research partnership should utilize the resources and develop in partnership with the efforts of the U.S. Department of Energy and its support of Mission Innovation and the Breakthrough Energy Coalition.

Presented by: Paul Kerkorian
PAUL KREKORIAN
Councilmember, 2nd District

Co-Presented by: Mike Bonin
MIKE BONIN
Councilmember, 11th District

Seconded by: Meryl Kemp

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MOTION

I MOVE that the Council AMEND the Energy and Environment Committee report relative to a research partnership with appropriate entities to determine what investments should be made to achieve 100 percent renewable energy portfolio for the Los Angeles Department of Water and Power, CF Number 16-0243 and Item Number 6 on today's agenda, to add additional recommendations to read as follows:

3. REQUEST that the LADWP work with local academic institutions to examine, over the course of the research into a 100% renewable portfolio, the potential for high quality careers and equitable local economic development, including local hiring programs for work that must be performed to modernize the electric system infrastructure within the City to increase efficiency, install energy storage, add distribution-connected renewable generation and otherwise enhance the electrical grid within Los Angeles.

4. REQUEST that the LADWP report to Council in 60 days on the specific areas of research to be considered and how it will initiate a stakeholder engagement process.

Presented by: Paul Krekorian
PAUL KREKORIAN
Councilmember, 2nd District

Mike Bonin
MIKE BONIN
Councilmember, 11th District

Seconded by: Paul Kretz

Paul Kretz
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