

Department of Water and Power



the City of Los Angeles

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Chief Executive Officer and General Manager

October 21, 2008

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

Attention: Council President Eric Garcetti
Chairperson, Rules and Government Committee

Honorable Members:

Subject: Council File 08-2795 – Los Angeles Basin Solar Power, Green Energy and
Jobs Development Mandate

The enclosed report responds to the Motion (Garcetti - Greuel - Perry - Rosendahl - Hahn - Huizar - Parks) directing LADWP to: report on the elements of a Los Angeles Basin Solar Power, Green Energy and Jobs Development Mandate for Los Angeles Initiative and take steps necessary to place the measure before the voters on the March 2009 Ballot, and begin work on the implementation of a Los Angeles Basin Solar Power, Green Energy and Jobs Development Plan for the City of Los Angeles (City) to produce 400 megawatts of the City's power demand from in-basin solar energy by 2013.

If you have any questions or if further information is required, please call me at (213) 367-1338, or have your staff contact Ms. Winifred J. Yancy, Manager, Government and Neighborhood Relations at (213) 367-0025.

Sincerely,

H. David Nahai
Chief Executive Officer
and General Manager

RULES & GOVERNMENT

OCT 22 2008

WJY:ps
Enclosure
c/enc: Ms. Winifred J. Yancy

Water and Power Conservation ... a way of life

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**Report to the Los Angeles City Council
and the Rules and Government Committee
on the Green Energy and Good Jobs for Los Angeles Act**



October 22, 2008

The Green Energy and Good Jobs for Los Angeles Act

Summary:

On October 15, 2008, the Los Angeles City Council introduced a Motion that was referred to the Rules Committee calling for consideration relative to installation of solar energy systems sufficient to produce 400 megawatts (MW) of generation capacity on commercial, industrial and institutional buildings and property located in the City of Los Angeles by 2013. LADWP staff estimates that 400 MW of capacity would provide for the electricity needs of about 108,000 customers. These solar energy systems would be constructed, operated and maintained by the Los Angeles Department of Water and Power (LADWP) and, once installed, would be designed to produce up to 3 percent of the City's annual electricity needs.

The Council Motion called for LADWP, with the assistance of the Office of the Chief Legislative Analyst (CLA), City Administrative Officer (CAO) and City Attorney, to report back to the City Council's Rules and Government Committee on the elements of the Green Energy and Good Jobs for Los Angeles Initiative for possible inclusion on the March 3, 2009 ballot. The Motion further called for LADWP to begin work immediately to prepare a plan in support of a solar initiative that would include a cost analysis, financing strategy, a rooftop availability survey, a job training and job creation program, incentives for in-basin solar manufacturers as well as private property owners, and regular status updates to the Board of Water and Power Commissioners (Board) and City Council.

Background:

Mayor Antonio Villaraigosa, the City Council and Working Californians are sponsoring an initiative called the Green Energy and Good Jobs for Los Angeles Initiative (Green Energy and Good Jobs Initiative or Initiative). The Green Energy and Good Jobs Initiative will reduce the City of Los Angeles' reliance on carbon-based fossil fuel electricity resources, generate good, green collar jobs in Los Angeles and alleviate stress on LADWP's electricity distribution infrastructure. The Initiative is wholly consistent with Mayor Villaraigosa's transformative efforts to confront global climate change by making Los Angeles the greenest big city in the nation and by promoting a sustainable, local green economy.

The proposed Green Energy and Good Jobs Initiative is key component of a more comprehensive Solar Plan (SP) that LADWP is developing and will rollout in the coming weeks. The SP represents a road map for how LADWP will maximize solar generation resources within Los Angeles through development of a new feed in tariff as well as a solar investment vehicle designed to enable any customer regardless of income level to purchase a "virtual" share in a solar power facility. The SP will be designed to employ a variety of solar energy technologies including, but not limited to, solar photovoltaic (PV) energy systems, while also creating new "green" jobs and contributing to the City's overall economic vitality.

The Green Energy and Good Jobs Initiative will move Los Angeles closer to achieving the Mayor and Council's goal of producing 20 percent of the City's total energy requirements from renewable resources by 2010 and 35 percent by 2020. The Green Energy and Good Jobs Initiative will also help reduce greenhouse gas emissions as mandated by the State's Global Warming Solutions Act of 2006 (AB 32). The Green Energy and Good Jobs Initiative will also help to achieve the Mayor's climate action goal of reducing Los Angeles' CO₂ to 35 percent below 1990 levels by 2030.

As utilities including LADWP are reporting record peak loads, an expanded use of solar technologies is expected nationwide. Domestic solar manufacturing, distribution, and business models are in the early stages of development and will take some time to realize economies of scale. A welcome consequence of this phenomenon is development of new market entrants with various types of new and enhanced solar technologies including thin film and solar thermal generation. While solar use has grown dramatically in the last 10 years, the greatest growth has occurred recently in response to dramatic increases in residential peak power demand.

While challenges are a reality of pursuing a new and ambitious program, LADWP remains committed to working with the Mayor, Council and Working Californians to meet these challenges in the development and implementation of the Green Energy and Good Jobs Initiative. Accordingly, LADWP must be afforded the flexibility, particularly as to timing and technology, to modify the program as required to assure successful execution. This approach will enable LADWP to encourage competition among solar technology providers through a large scale, sustained commitment to solar development which, in turn, should reduce the relative cost of solar power in the future. LADWP considers the Green Energy and Good Jobs Initiative a unique and worthwhile opportunity to expand development of cost effective and reliable solar technologies for use by the City and throughout the world.

Program Goals:

Once the Green Energy and Good Jobs Initiative is approved, staff will immediately initiate a program focused on installing solar systems on LADWP, City-owned and commercial buildings located throughout the City of Los Angeles. The initial planning effort will include, but not be limited to, developing staffing, costing and load forecasting models to create a set of standardized protocols designed to support large scale roll out of this program. In order to lower the cost of the Initiative, LADWP will focus on large-scale projects sited on properties where the solar resources are the best.

The Green Energy and Good Jobs Initiative will be designed to accomplish the following goals:

- Employing innovative construction techniques and materials, financing and other program tools to minimize the relative cost of solar.
- Reducing the City's carbon footprint and greenhouse gas emissions.
- Mitigating the City's vulnerability to natural gas price volatility.
- Fostering creation of new green jobs and contributing to the City's economic vitality.
- Providing bid preferences and other incentives to encourage green technology, solar manufacturing and related economic development activity in the City.
- Working with the private sector to encourage green collar jobs including development of recruitment and training programs to residents particularly those living in economically disadvantaged and historically underserved communities throughout the City.

Issues:

Los Angeles possesses a plethora of natural gifts not the least of which is an abundance of sunshine. In order to optimize its natural, strategic and human resources, the City needs energy. While understandably proud of the City’s leadership role in promoting renewable energy particularly in the area of solar energy, Mayor Villaraigosa has recognized the need to do more in response to the enormous challenges and health risks posed by global warming. In response to these concerns, the Mayor in his climate change action plan – Green LA – directed the LADWP Board to adopt Renewable Portfolio Standard goals of 20 percent by 2010 and 35 percent by 2020. LADWP is intent on doing its part to meet the challenge of providing reliable and affordable energy service to the City’s 4 million residents by dramatically increasing its commitment to renewable energy through support of the Green Energy and Good Jobs Initiative.

Meeting the various existing and proposed State and National renewables and greenhouse gas emission reduction goals poses enormous opportunities and challenges for LADWP. LADWP is committed to meeting these opportunities and challenges in an effort to reduce the City’s reliance on fossil fuels and to create a cleaner, more sustainable future for its customers. While the Green Energy and Good Jobs Initiative will help in meeting the goals set forth in Green LA, solar power infrastructure remains relatively expensive with the health and cost benefits being realized in outlying years. (see chart below).

<i>Typical Energy Resources</i>				
Resource Type	Generation Type	Economic Life (Years)	Capacity Factor (%)	Energy Cost (cent/kwh)
Combined Cycle –Gas	Intermediate/Base	30	80 - 95	5.5 - 11.0
Simple Cycle – Gas	Peak	30	10 - 90	6.5 – 17.5
Coal	Base	30	85 - 95	2.0 - 4.0
Wind	Peak/Intermediate	30	27 - 36	6.0 - 10.5
Geothermal	Intermediate/Base	30	80 - 95	8.0 – 12.0
Landfill	Intermediate/Base	30	80 - 95	6.0 – 11.0
Biomass	Intermediate/Base	30	80 - 95	8.0 - 13.0
Solar/Thermal (gas-fired)	Intermediate/Base	30	18 - 25	8.5 - 21.0
Photovoltaic	Peak	30	18 - 25	20.0 – 40.0 *
Fuel Cell	Intermediate/Base	30	80 - 95	8.0 – 35.0

- These estimates assume availability of tax credits, volume discounts, enhanced performance and technological innovations, economies of scale etc. (the “Efficiency Measures”).

Financing Strategy – The Green Energy and Good Jobs Initiative represents a multi-year, multi-billion dollar investment to fund large scale projects that will significantly increase the City of Los Angeles’ solar generation resources, decrease LADWP’s carbon footprint and greenhouse gas emissions. The Initiative will include a blend of conventional bond financing and federal and state tax credits. To that end, LADWP staff will analyze various funding options to support the Green Energy and Good Jobs Initiative including, but not limited to the use of revenue bonds, private capital, power revenues and federal and state grants. While the issuance of revenue bonds may be used to fund some or all of the LADWP constructed solar projects, the actual cost will depend on the location, cost and performance of the technology employed by LADWP. In the process of crafting a financing strategy in support of the Green

Energy and Good Jobs Initiative, LADWP will remain committed to providing the lowest cost, most reliable electricity service possible to its 4 million residents.

According to the City Clerk's Office, in order to place a bond initiative on the March 3, 2009 ballot a proposal will need to be put forth by the City Council with instructions to the City Attorney by October 29, 2008. These instructions would include preparation of related resolutions and ordinances for placing measures on the ballot which then must be adopted by the City Council not later than November 7, 2008.

Cost Analysis – The Green Energy and Good Jobs Initiative will prove a valuable tool in response to the vagaries of natural gas markets which recently experienced record increases which are projected to continue rising for the foreseeable future. This coupled with the City's increased demand for power particularly during peak periods has hastened the need to redefine the role of solar power at LADWP as a sustainable, carbon-free peak power resource. LADWP will thoroughly analyze financing methods with the Council, the Board and other key stakeholders prior to implementation of the Green Energy and Good Jobs Initiative to take advantage of revenue bonds, private capital, power revenues and federal and state grants to ensure the lowest cost, most reliable electricity service possible.

Solar energy production is directly related to the amount of sun-light received which can vary depending on a variety of factors including, but not limited to, time of year, location, system orientation and panel temperature. Solar installation performance can be reliably estimated using various established design principals and methodologies the most common of which is the National Renewable Energy Laboratory PV Watts Model (PV Watts). PV Watts is used to determine the amount of kilowatt hour output produced by solar energy systems which includes a number of assumptions pertaining to Standard Test Conditions, expected alternating current output produced, expected panel life and projected O&M costs. LADWP has long supported solar power through its Solar Incentive Program which has been in place for nearly a decade and has been a frequent user of the PV Watts Model.

According to LADWP staff, recent bids for in-basin photovoltaic (PV) solar energy systems are averaging \$7,500 per Direct Current (DC) kilowatt. Using the PV Watts model, if a solar PV project were funded by LADWP at its current cost of funds with total installation costs assumed at \$7,500 per kilowatt, amortized over a 25-year asset life, and assuming no O&M costs, the price of solar power would be approximately 45 cents/kilowatt hour or 3 to 4 times LADWP's current retail electricity prices. The latter notwithstanding, LADWP will aggressively seek ways to lower the cost of the Green Energy and Good Jobs Initiative by taking advantage of economies of scale, design and installation, siting of projects to optimize the solar resource, and by taking advantage of emerging solar technologies wherever possible. The estimated total project cost of the 400 MW Green Energy and Good Jobs Initiative could range from as low as \$1.5 billion assuming availability of the aforementioned Efficiency Measures to in excess of \$3.0 billion based on an estimated cost of \$7,500 per kilowatt.

Rooftop Availability Survey – The areas in and around the City of Los Angeles with expanses of flat, underdeveloped land represent some of the nation's best solar resources in the world. LADWP intends to focus on large scale solar projects sited in areas like the northeast San Fernando Valley where solar power production is most advantageous in support of the Green Energy and Good Jobs Initiative. One of the core goals of LADWP's strategy is to take advantage of economies of scale in order to lower the cost

of the Initiative to the maximum possible extent. A private solar energy firm estimates that over 350 MW of potential rooftop capacity exists in LADWP territory. This estimate is especially noteworthy in that it focuses exclusively on rooftop space on existing buildings with roofs over 500,000 sq. ft.

While economics, real estate constraints and availability of solar panels will dictate the precise amount of solar power actually developed, it is believed the City's total solar potential is somewhere between 700 MW and 900 MW. To offer some sense of perspective, 700 MW of conventional photovoltaic (PV) solar modules would cover somewhere around 4000 acres or 6 square miles of surface area depending on type of installation and location. Based on a non-scientific review performed by LADWP staff, there is approximately 700 MW of potential solar energy development in Los Angeles assuming that only 25 percent of 2500 MW to 3000 MW total surface area is usable flat roof space. This estimate does not include LADWP or City-owned properties such as reservoirs, transmission corridors, parking lots and vacant land located in and around City-owned airports (e.g. Palmdale). In the absence of a detailed study, it would not be unreasonable to state that the solar potential in the City of Los Angeles is sufficient to support considerably more than the 400 MW contemplated by the Green Energy and Good Jobs Initiative. However, by providing for 400 MW in this program, the private sector will be allowed to contribute a meaningful share toward the City's total solar resource goals.

Greenhouse Gas Emissions – Introduction of the Green Energy and Good Jobs Initiative represents a new weapon in LADWP's fight to reach the ambitious goals set forth in the Mayor's Green LA Plan. The Mayor's plan calls for the City to reduce its carbon footprint by 35 percent below 1990 levels by 2030. These carbon reduction goals go far beyond those contained in the Kyoto Protocol and are the greatest carbon reduction targets of any large U.S. city. With roughly 13 MW of residential and commercial photovoltaic solar systems installed at 17 facilities throughout the City, including libraries, an animal shelter and the L.A. Convention Center, LADWP leads the nation in providing the most solar power among all public power utilities, according to a recent survey of the utility solar electricity market.¹ Building on that record, the Green Energy and Good Jobs Initiative represents a major paradigm shift in how LADWP intends to utilize solar power going forward insofar as this resource will now be treated as a genuine alternative to meet a portion of the City's peaking power needs. As a result of the implementation of the Green Energy and Good Jobs Initiative, solar power will constitute a sustainable carbon-free "peaking resource" that is projected to yield carbon emission (CO₂) reductions of about 400,000 metric tons per year or 2.5 percent of LADWP's current CO₂ emissions.

Job Training and Creation – The Green Energy and Good Jobs Initiative is expected to create hundreds of direct and indirect good paying jobs with benefits throughout Los Angeles. The Green Energy and Good Jobs Initiative will be crafted to take full advantage of the rich diversity of people living together in a place renowned for its world-class technology and educational institutions. The Initiative represents an enormous opportunity for LADWP to develop new green collar jobs targeting underserved and economically disadvantaged areas throughout Los Angeles. To the end, LADWP will work with IBEW and City Departments to develop training programs to ensure that the City's low and modest income residents will be afforded an opportunity to develop skills and find family wage paying, meaningful careers in the renewable energy field.

¹ Solar Electric Power Association, "First Annual Top Ten Solar Integration Rankings," Results of the 2007 U.S. Utility Solar Electricity Market Survey, July 24, 2008.

Developing 400 MW of solar projects on City-owned land requires a trained and capable workforce. In conjunction with IBEW, LADWP will establish a Training Academy that will emphasize youth recruitment efforts in underserved communities throughout Los Angeles. It is estimated that for every 10 MWs of solar installed annually, approximately 200-400 jobs can be generated from manufacturing to installation. Notwithstanding the benefits of establishing job training and an outreach academy, the actual number of jobs produced from the Green Energy and Good Jobs Initiative may be higher or lower depending on the actual installation type, size of location, and solar technology employed. Requests for Proposals issued in support of this Initiative shall include provisions requiring contractors to pay the general prevailing rate of per diem wages on all work performed pursuant to the Labor Code, as determined by the Director of the Department of Industrial Relations of the State of California.

The Green Energy and Good Jobs Initiative has and will continue to include close partnerships with training organizations (such as local community college programs and IBEW) to address the need for skilled, local talent. For example, the Los Angeles Unified School District (at the East Los Angeles Skills Center) is currently providing training and programs to develop both solar thermal and photovoltaic installers. This program is successfully providing training and re-training for low income residents and already includes a partnership with IBEW. LADWP contributed some of the seed funding for this program and, in support of the Green Energy and Good Jobs Initiative, will consider leveraging its previous investment by providing new funding to help expand this successful and much needed program. The Initiative will also include a comprehensive training, educational and outreach plan to develop solar energy employment opportunities particularly in underserved and economically disadvantaged communities.

Environmental Sustainability – Today approximately 76 percent of LADWP’s electricity is generated using fossil fuel resources. While this approach has historically enabled LADWP to offer its customers substantially lower rates and reliable service, this business model is not consistent with the Mayor’s stated directive to shift away from coal based generation resources and exposes Los Angeles ratepayers to volatile and uncertain international commodity energy market prices. Moreover, pollution created by burning fossil fuels for electricity is a well documented contributor to smog and greenhouse gas emissions. As such, the Green Energy and Good Jobs Initiative is being viewed by LADWP not only as a physical hedge against fossil fuel price volatility but also as a way to significantly reduce pollution attributed to fossil fuel based power generation that may be contributing to thousands of cases of lung disease, asthma and other respiratory ailments. Rather than waiting for the imposition of punitive legislative or regulatory measures on LADWP, the Initiative and the Department’s broader strategy of relying on renewable resources represents a proactive means to achieve clean, sustainable energy self sufficiency for generations of Angelenos in every community.

LADWP will work with the Housing Authority of the City of Los Angeles (HACLA) along with IBEW to identify ways to build and operate solar plants installed on multi-family government owned housing developments located within the City. Housing Authority representatives informed LADWP staff that as much as 4 million square feet of rooftop space is available on HACLA housing facilities. These HACLA solar developments will not only bring solar energy to government owned housing developments but will provide educational opportunities and new “green” jobs to historically underserved communities.

Recommendation:

The LADWP will provide, at a minimum, annual Green Energy and Good Jobs Initiative oversight reports to the Board, Mayor, City Council and other interested stakeholders (collectively the parties). The Oversight report will include findings from an annual audit, in cooperation with the Controller, of the Green Energy and Good Jobs Initiative. The Oversight report will be designed to provide periodic updates to the parties to ensure the Green Energy and Good Jobs Initiative is meeting its goals and objectives while affording LADWP the right to suspend, postpone, or modify the Green Energy and Good Jobs Initiative as needed to take advantage cost savings from emerging solar technologies or to protect its fiscal and/or operational integrity. The Oversight report should include the following:

- The viability and cost-effectiveness of the various solar technologies being employed on a cents/kilowatt hour basis
- Establishment of projected performance goals of the various solar technologies being employed for each of the following 5 years.
- Identification of the projects needed to support the defined goals and objectives over the next 5 years.
- Planned project costs and funding sources required to meet the goals set forth in the Green Energy and Good Jobs Initiative Plan.
- Projected per unit cost on a cents/kilowatt hour basis for each project financed by the Green Energy and Good Jobs Initiative.
- An ongoing comparison of per unit costs on a cents/kilowatt hour basis on all projects completed relative to the planned project cost.
- An estimate of the projected rate impacts to the Power System.