



**Metro**

Los Angeles County  
Metropolitan Transportation Authority

One Gateway Plaza  
Los Angeles, CA 90012-2952

213.922.2000 Tel  
metro.net

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**TO: BOARD OF DIRECTORS**

**THROUGH: PHILLIP A. WASHINGTON** *PAW*  
**CHIEF EXECUTIVE OFFICER**

**FROM: BRYAN PENNINGTON** *B.P.*  
**EXECUTIVE DIRECTOR, ENGINEERING & CONSTRUCTION**

**SUBJECT: 2015 METRO ENERGY MANAGEMENT PROGRAM UPDATE**

### **ISSUE**

In 2011, the Los Angeles County Metropolitan Transportation Authority (Metro) developed a comprehensive Energy Conservation and Management Plan (Energy Plan) that provides a blueprint to direct Metro's overall energy management and use. Staff is required to annually report on the status of Energy Plan implementation. Contained in this report is Metro staff's annual report on Metro's energy related accomplishments, milestones, and next steps. As of the end of calendar year 2014, Metro's renewable energy use is estimated to be at 25%, compared to Metro's goal of achieving 33% renewable energy use by 2020.

### **BACKGROUND**

Metro's Energy Plan provides a blueprint for directing Metro's overall energy management and use in a sustainable, secure, and cost-efficient manner. The Energy Plan is part of an overall Environmental and Sustainability Program overseen by Environmental Compliance and Sustainability (EC/S) staff working within the Engineering & Construction Division. Management of these initiatives through EC/S is strategic as their staff assists in:

- the planning and environmental clearance of all major capital and capital improvement projects;
- supports or oversees all types of engineering, design, construction, and infrastructure commissioning work; and
- under an agency-wide ISO 14001 certified Environmental Management System (EMS), works very closely with Metro Operations in ensuring environmental compliance, efficient resource use and waste reduction, and development of innovative processes and technologies

This integrated approach to operational sustainability promotes process efficiency, cost-savings, and cultivates a continual culture of innovation while enhancing frontline worker welfare. In the past four years of Energy Plan implementation, EC/S staff has coordinated with appropriate business units at all levels of our organization: frontline to executive management to ensure seamless energy operations.

The Energy Plan incorporates elements of the Board adopted Energy and Sustainability and Renewable and Energy Policies. Metro has a goal of 33% renewable energy use by 2020. This goal, along with the energy-related policies, provides clear direction for the full development of Metro's energy program. Our agency's Energy Program has been recognized by the Alliance to Save Energy [through an independent nomination by the American Public Transportation Association (APTA)] ***as a national model*** for public organizations wanting to develop a similar program; ensuring clearly defined targets, reduces carbon footprint, increases renewable energy use and energy efficiency, and most importantly reduces operational costs.

## **DISCUSSION**

The following summarizes FY15 Energy Program activities and accomplishments.

### **Energy Efficiency Project Update**

- Implemented energy saving projects and identified new opportunities, including:
  - Completion of lighting retrofits and advanced lighting controls at Divisions 11 and 22, which are now saving the organization over \$167,000/year;
  - Reprogrammed Division 9's compressor system, which is delivering cost savings of \$5,500/year (savings were verified using installed sub-meters);
  - Implemented cost saving opportunities at five of Metro's Compressed Natural Gas (CNG) Facilities and is projected to save \$130,000 over the next year with no capital expenditure; and
  - Identified \$2.5M of needed energy improvements at Metro's Central Maintenance Facility that would ultimately replace all HVAC systems in Buildings 1-5 and save more than \$145,000 annually.
  
- As part of the FY14 capital program, Metro staff has been developing a comprehensive energy efficiency and renewable energy project at multiple bus and rail divisions. Metro staff has completed the 30% design packages for these projects and is now ready for procurement. The procurement is scheduled to be completed and awarded at the end of 2015. The estimated costs and savings of the projects are summarized in Table 1 below:

**Table 1. Energy Efficiency Improvement Projects at Selected Divisions**

	<b>Net Capital Cost, Includes Incentives</b>	<b>Total Annual Cost Savings</b>	<b>Annual kWh Savings</b>	<b>Annual Therm Savings</b>
Division 3	\$580,880	\$54,091	470,215	5,431
Division 11	\$867,015	\$95,111	614,874	29,435
Division 22	\$208,712	\$52,550	451,235	290
Division 7	\$246,026	\$48,226	329,701	8,141
Division 15	\$368,480	\$73,101	623,765	9,888
Division 9	\$288,377	\$55,115	563,226	15,721
<b>TOTAL</b>	<b>\$2,559,490</b>	<b>\$378,194</b>	<b>3,053,016</b>	<b>68,906</b>

Note: All savings and cost estimates assume full implementation of recommended measures

- Staff has implemented a pilot fueling lockout strategy at select CNG Fuel Stations without impacts to bus fueling operations. This minor operational change to prevent fueling at peak energy cost timeframes is projected to save Metro nearly \$138,000 in annual energy costs with no additional capital expenditure.
- The Energy Project Dashboard was also expanded this year to permanently include a live Google map displaying the location of all Metro facilities as well as a roll up summary of all projects at those facilities. Links embedded in the display direct users to detailed facility and project information including utility account information, square footage, project costs and project status.

Leadership in Energy and Environmental Design (LEED) Program Update

- Continued the pursuit of Metro’s goal to achieve LEED-Existing Building (EBOM) certification at all existing maintenance facilities by 2020. LEED-EBOM progress in FY15 includes:
  - Completed the development of remaining sub-metering plans. EC/S has procured and is in the process of installing sub-metering equipment at all bus and rail divisions.
  - Installation of remaining electric and water sub-meters at four facilities will be completed by the end of the calendar year. *(Note: Because of the Drought Motion recently passed by the Metro Board on June 25, 2015, EC/S will accelerate the water sub-metering effort to be completed by December 2015.)*
  - Completed submission of LEED Certification documentation for Division 7, which is expected to receive LEED-Silver certification. This site represents Metro’s second LEED-EBOM certified facility (Gateway Headquarters is the other one) and one of only a few in the country.
- Extensive analysis and testing led to the identification of over \$2.5M in needed upgrades and energy efficiency opportunities. Many units are beyond their useful life to maintain a state of good repair and as compared to industry standards. These

equipment will now require replacement to be in compliance with appropriate statutes, regulations, and industry guidelines.

### Renewable Energy Update

- Metro continues its progress in meeting and striving to exceed the goal of 33% use of renewable energy by 2020. Current estimates for calendar year 2014 total at least 25% renewable energy use.
- EC/S is pursuing a transition to biomethane, which has the same fuel specifications as natural gas but is derived from landfills, dairy digesters, and waste water treatment plants. The use of biomethane, a renewable fuel, will significantly reduce the carbon footprint of Metro's bus operations with no infrastructure or operational changes and significantly accelerate Metro's progress towards achieving its renewable energy goal.
- Metro's existing photovoltaic (PV) systems at Division 8, 15, and 18 have underperformed over the past year. The minor regular maintenance schedule and implementation issues have been corrected at Division 15 but critical system failures at both Divisions 8 & 18 are keeping Metro from achieving optimum renewable energy production. Corrective action measures are currently being implemented to correct all known problems at the sites.
- A comprehensive preventative maintenance process was also developed and rolled out this year. EC/S and facility maintenance staff are working together to implement protocols that will ensure all systems receive regular maintenance; produce as optimum renewable energy and timely communication and correction of system failures. Detailed training sessions on the preventative maintenance procedures were held with facility maintenance staff. These types of courses are part of the Metro EMS' Environmental Training Institute and will be continually offered as a refresher course or as new training to new staff.
- Procurement has been initiated on a set of new photovoltaic (PV) systems. Once installed and operational in 2016, the new systems will expand Metro's PV portfolio by more than 50%. Summary of the approach and systems are as follows:
  - Shaded and PV wired parking structures are specified for Division 9 and rooftop installations are proposed at Division 11, 22 and Exposition Yard Maintenance facility.
  - The entire project will have 1.73MW in capacity and projected to avoid nearly 3,000,000 kWh of energy purchased from Southern California Edison.
  - The proposed financing structure will be a Power Purchase Agreement (PPA) and will be funded through a Public-Private Partnership (P3) with no up-front capital cost to Metro.
  - Metro will agree to a price per unit of energy and purchase all the energy produced by the system for the life of the system.

This approach will constitute the second renewable energy-related public private partnership at Metro following the system installed at Division 30 by Chevron Energy Services.

Roofing replacements will be included at Divisions 11 & 22 as part of the project; specifics of the cost and financing structure are currently being analyzed by Metro Legal, Treasury, P3 Program, and EC/S staff.

- Metro continues to pursue opportunities for introducing PV systems throughout the new and existing rail alignments. Efforts are underway to determine feasible locations along the Crenshaw Light Rail Line as required by the project's Sustainability Plan. EC/S staff has participated in the design, installation, and commissioning of PV systems at the Foothill Extension Maintenance Yard. Other PV opportunities are being pursued at the Purple Line Extension and forthcoming capital projects.
- Solar powered lighting systems are being installed at Metro Gold Line Highland Park Station as a safety enhancement. This is being piloted for possible deployment in similar locations across the Metro rail network that have safety concerns due to lack of lighting.

## **NEXT STEPS**

Metro staff will continue to implement the on-going programs as follows:

### **Energy Efficiency Projects**

- Issue procurement in late Summer/early Fall 2015 for the implementation of energy efficiency projects identified in Table 1;
- Issue procurement for large scale lighting and enhanced controls retrofit in late Summer 2015 at the Gateway Building expected to save over \$225,000 annually;
- Complete the following projects (combined annual cost savings - \$46,300):
  - Install heat recovery project at the Gateway building; and
  - Complete installation of LED lighting at Divisions 5, 7 & 9;
- Complete expansion of the Energy Data Platform as the remaining sub-metering systems are installed and commissioned;
- Continue and the monitoring and measurement of energy efficiency measures up to an additional 6 maintenance divisions;
- Continue managing utility incentives for any and all Metro projects. Outstanding incentives pre-approved by the utility companies total nearly \$200,000;
- Implement remaining cost saving strategies related to the operation of CNG Fuel Stations estimated to save nearly \$125,000 annually;

- Continue utilizing the Master Energy Project Dashboard as the central reporting tool while expanding to include all Sustainability related projects/assets.

### LEED Program

- Officially earn LEED Certification at Division 7;
- Initiate 2 new LEED Certification applications at eligible maintenance divisions;
- Recertify the Gateway Headquarters to LEED-Platinum level in 2016;
- Continue expanding the use of Disadvantaged Business Enterprises in the LEED Certification Process;
- Continue managing installed sub-metering systems and continually manage energy data to further identify cost-saving strategies;

### Renewable Energy Program

- Issue procurement for proposed PV systems using PPA structure;
- Determine the feasibility of bus parking lot shade structures as a potential configuration for a PV system superstructure;
- Continue measuring and verifying the generation performance of installed systems and implementing the new preventative maintenance program;
- Issue procurement to complete corrective action on PV systems at Division 8, 15 and 18;
- Continue biomethane procurement and implementation.

Staff will report back to the Board periodically on accomplishments and challenges related to this Energy Program.

### ATTACHMENTS

None.

Prepared by: Cris B. Liban, EO, Projects Engineering  
Environmental Compliance and Sustainability, 213/922-2471