

Facility-Wide Solar Panel Installation Study and Project Implementation Plan



**EMAC and Finance & Budget Committees
March 14-15, 2007**

Background

- **May 2005: Metro completes its first solar project at Divisions 8 (Chatsworth) and 15 (Sun Valley)**
- **October 2006: Board approves second solar project at Division 18 in Carson. Award of contract scheduled for March 23, 2007**
- **October 2006: Board requests that staff return with a three-year comprehensive plan to install solar panels at all facilities, with details on cost, staffing, schedule, etc.**



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Solar Panel Installation Study

- Staff formed a multi-disciplinary team to evaluate ALL Metro properties and facilities for installation of solar panels
- Evaluation criteria included analysis of available space, utility service, structural issues, cost recovery analyses, and the potential for future joint development
- Out of more than 200 facilities agency-wide, staff selected 38 facilities with feasible solar opportunities (Bus/Red/Blue/Green/Gold/Orange).
- The selected 38 facilities total 59 acres of usable space for solar panels and are spread across the bus and rail system.
- Infeasible facilities included subway stations, light rail canopies, and facilities with pending joint development.



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Rebates and Incentives

Rebates and Incentives

- CPUC operates incentive programs for self-generation of electricity
- Maximum rebate amounts are decreasing
- 2005: Division 8 & 15 Project, \$3.50/watt
- 2006: Division 18 and RRC Projects, \$2.50/watt
- 2007: New projects, \$1.50/ watt
- FY08 additional SCAQMD funding may be available but is highly competitive. Metro will submit proposal.

Result

- Previous cost recovery figures realized by Metro (such as 7-8 years for D8 & 15 project), are decreasing to an approximate 15-year average

Traditional Capital Purchase Approach

- Metro's past solar projects have employed this approach, by contracting and paying for the installation and receiving rebates at the end
- Using current material pricing and \$1.50/watt rebates, the end of project Metro cost (after rebates) for all 38 facilities would be \$226,625,000
- If Metro concentrated on only rooftop and parking structure installations at Divisions/USG (13 facilities), the end of project cost would be \$48,020,000
- Cost recovery analyses suggest an average payback of 15 years
- Due to the high upfront capital cost of such a program, the traditional capital approach is not feasible and is therefore not recommended



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Solar Panel Installation Study

Division/Facility	Location	Utility	Usable Square Footage	Estimated Cost	Potential Estimated Rebates	Total Net Cost to Metro	Total KW	Minimum Return on Investment (Years)	Maximum Return on Investment (Years)	Rank
Headquarters and Divisions										
USG Building	One Gateway Plaza, L.A.	LADWP	27,500	\$2,500,000	\$750,000	\$1,750,000	344	11	15	5
Division 1 (Central)	1130 E. 6th Street, L.A.	LADWP	20,130	\$2,400,000	\$720,000	\$1,680,000	251	14	19	8
Division 3 (Cypress Park)	630 W. Ave 28, L.A.	LADWP	45,840	\$5,800,000	\$1,740,000	\$4,060,000	573	15	20	13
Division 5 (Arthur Winston)	5425 S. Van Ness Ave, L.A.	LADWP	47,720	\$6,000,000	\$1,800,000	\$4,200,000	596	15	20	12
Division 7 (West Hollywood)	8800 Santa Monica Blvd., W. Hollywood	SCE	27,840	\$3,500,000	\$1,050,000	\$2,450,000	348	12	20	7
Division 9 (El Monte)	3449 Santa Anita Ave, El Monte	SCE	46,080	\$5,800,000	\$1,740,000	\$4,060,000	576	12	20	6
Division 10 (Gateway/Mission)	742 N. Mission Road, L.A.	LADWP	23,980	\$2,800,000	\$840,000	\$1,960,000	299	14	19	9
Division 11 (Blue Line Yard)	430 E. 208th Street, Long Beach	SCE	61,526	\$7,100,000	\$2,130,000	\$4,970,000	769	11	16	2
Division 20 (Red Line Yard)	320 S. Santa Fe Ave, L.A.	LADWP	75,510	\$8,800,000	\$2,640,000	\$6,160,000	944	14	19	10
Division 21 (Gold Line Yard)	1800 Baker Street, L.A.	LADWP	20,087	\$2,300,000	\$690,000	\$1,610,000	251	14	18	11
Division 22 (Green Line Yard)	14724 Aviation Blvd., Lawndale	SCE	27,698	\$3,200,000	\$960,000	\$2,240,000	346	11	16	4
Regional Rebuild Center (Loc. 30)	900 S. Lyon St., L.A.	LADWP	119,130	\$14,000,000	\$4,200,000	\$9,800,000	1498	14	19	1
Rail Operations Center (Loc. 60)	2000 Imperial Highway, Compton	SCE	38,250	\$4,400,000	\$1,320,000	\$3,080,000	478	11	16	3
SUBTOTAL FOR HEADQUARTERS AND DIVISIONS			581,291	\$68,600,000	\$20,580,000	\$48,020,000				
Blue Line										
Florence Station Park N Ride	7225 Graham Avenue, L.A.	SCE	7,500	\$950,000	\$285,000	\$665,000	94	12	17	15
Artesia Station Park N Ride	1920 1/2 Acacia Ave., Compton	SCE	82,743	\$10,500,000	\$3,150,000	\$7,350,000	1034	12	17	18
Del Amo Station Park N Ride	20220 Santa Fe Ave, L.A.	SCE	71,640	\$9,000,000	\$2,700,000	\$6,300,000	896	12	17	21
Wardlow Station Park N Ride	3420 N. Pacific Ave., Long Beach	LB Power	15,510	\$2,000,000	\$600,000	\$1,400,000	194	15	21	38
Willow Station Park N Ride	2750 W. American Ave., Long Beach	LB Power	43,800	\$5,500,000	\$1,650,000	\$3,850,000	548	15	20	29
Green Line										
Marine Station Parking Lots	5301 Marine Ave, Redondo Beach	SCE	79,800	\$10,000,000	\$3,000,000	\$7,000,000	998	12	17	17
El Segundo Station Park N Ride	22226 E. El Segundo Blvd., El Segundo	SCE	28,275	\$3,500,000	\$1,050,000	\$2,450,000	353	12	17	19
Aviation Station Park N Ride	11500 Aviation Blvd, L.A.	SCE	86,700	\$11,000,000	\$3,300,000	\$7,700,000	1084	12	17	20
Hawthorne Station Park N Ride	11230 S. Acacia, Inglewood	SCE	132,165	\$16,700,000	\$5,010,000	\$11,690,000	1652	12	17	22
Crenshaw Station Park N Ride	11901 S. Crenshaw Blvd, Hawthorne	LADWP	85,140	\$10,700,000	\$3,210,000	\$7,490,000	1064	15	20	28
Vermont Station Park N Ride	11603 S. Vermont Ave, L.A.	LADWP	38,430	\$4,800,000	\$1,440,000	\$3,360,000	480	15	20	33
Harbor Fwy/I-105 Park N Ride	1150 S. Figueroa St., L.A.	LADWP	70,620	\$8,900,000	\$2,670,000	\$6,230,000	883	15	20	30
Avalon Station Park N Ride	11667 S. Avalon Blvd., L.A.	LADWP	44,010	\$5,500,000	\$1,650,000	\$3,850,000	550	15	20	34
Rosa Parks Station Park N Ride	11651 Wilmington Ave, L.A.	LADWP	21,816	\$2,700,000	\$810,000	\$1,890,000	273	15	20	36
Long Beach Station Park N Ride	11508 Long Beach Blvd, Lynwood	LADWP	129,991	\$16,400,000	\$4,920,000	\$11,480,000	1652	15	20	27
Lakewood Station Park N Ride	12801 Lakewood Avenue, Downey	LADWP	63,805	\$8,000,000	\$2,400,000	\$5,600,000	798	15	20	31
Norwalk Station Park N Ride	12901 Hoxie Ave, Norwalk	LADWP	411,479	\$52,000,000	\$15,600,000	\$36,400,000	5143	15	20	25
Gold Line										
Lincoln Heights Station Park N Ride	370 West Avenue 26, L.A.	LADWP	31,680	\$4,000,000	\$1,200,000	\$2,800,000	396	15	20	35
French Avenue Station Park N Ride	3545 Pasadena Ave, L.A.	LADWP	30,240	\$3,800,000	\$1,140,000	\$2,660,000	378	15	20	37
Sierra Madre Villa Station Park N Ride	149 Halstead Ave, Pasadena	SCE	40,474	\$5,100,000	\$1,530,000	\$3,570,000	506	12	20	16
Orange Line										
Van Nuys Station Park N Ride	14620 Bessemer Street, Van Nuys	LADWP	119,385	\$15,100,000	\$4,530,000	\$10,570,000	1492	15	20	24
Canoga Station Park N Ride	Canoga	LADWP	206,910	\$30,500,000	\$9,150,000	\$21,350,000	3022	15	20	23
Reseda Station Park N Ride	8534 Topham Street, Reseda	LADWP	67,950	\$8,600,000	\$2,580,000	\$6,020,000	849	15	20	26
Pierce College Park N Ride	6355 Winnetka Ave, Woodland Hills	LADWP	36,765	\$4,600,000	\$1,380,000	\$3,220,000	460	15	20	32
Red Line										
MOW Buildings (Loc. 61)	284 S. Santa Fe Ave, L.A.	LADWP	45,678	\$5,300,000	\$1,590,000	\$3,710,000	571	14	19	14
SUBTOTAL FOR RAIL FACILITIES AND PARKING LOTS			1,992,506	\$255,150,000	\$76,545,000	\$178,605,000				
GRAND TOTALS			2,573,797	\$323,750,000	\$97,125,000	\$226,625,000				

Alternative Financing

- In an effort to meet the goals and intent of the Board motions, and to further our sustainability efforts in an era of low capital availability, staff researched several “low-capital” or “no capital” financing strategies
- After several meetings with solar installers and financing entities, staff has determined that there are two distinct financing strategies that can be employed.
- **Alternative#1: Performance Contracting**
- **Alternative #2: Power Purchase Agreements**

Alternative #1: Performance Contracting

- Essentially a public/private partnership between solar installer and owner
- Contractor responsible for all facets including financing, design, permits, construction, and operations and maintenance
- Contractor pays the finance costs from the energy savings generated, and Metro benefits from the remainder of the savings
- Contractor owns the system for the life of the contract, leasing the system back to Metro
- Down payment is optional; however, Metro realizes greater savings the higher the down payment is. Possible to re-invest Division 18 rebates

Alternative #1: Example of RRC Project

- Staff have evaluated the Regional Rebuild Center (across the street) as a perfect facility to test the Performance Contracting approach.
- 20-acre facility constructed in 1985 for all major rebuild of transit vehicles and components
- 75% of the \$1 million/year electrical bill is for lighting and HVAC.
- Staff plans to “green” the facility by retrofitting HVAC and lighting equipment, and installing 1 megawatt of solar panels on the roofs
- Rebates at \$2.50/watt are reserved for total of \$3.4 million in incentives
- Largest solar installation by a transit property to date, likely within the top 20 in the nation (non-utility).



Alternative #1: Aerial Photograph of RRC



- 20 acre site
- Adjacent to USG
- 22-year old heavy maintenance facility with \$1,000,000/year energy bills
- 119,000 usable square feet for solar panels
- Space for 1.5 megawatts of solar panels
- Opportunities for energy efficiency upgrades

Alternative #1: Performance Contracting

Financial Assumptions w/ Theoretical \$2 million down

- Project Cost: \$12,622,523
- Rebate at end of construction: (\$3,402,303)
- Net Project Cost: \$9,219,221
- Down Payment: (\$2,000,000)
- Capitalized Interest: \$340,173
- Net Financed Amount: \$7,559,393
- 20 year financing at 4.5%
- First Year Savings: \$544,134
- First Year Finance Cost (\$485,034)
- First Year Net Savings: \$59,100

Alternative# 2: Power Purchase Agreements

- Agreement in which the energy provider supplies the power source and the customer agrees to purchase the power at a fixed rate for a set amount of time
- Most PPAs are 20-25 years with an option to purchase after the 6th year
- Contractor responsible for all rebates, tax credits, design, construction, operations, and maintenance.
- Metro responsible for access and to pay for the power at a negotiated rate.
- No initial capital outlay, the customer only pays for what is produced, and it hedges against future rate increases.
- The customer does not experience savings, but the goal is to approximate as closely as possible the existing utility rates.
- Without competitive bidding, at present staff cannot determine whether a PPA can provide the economic and environmental benefits we desire



Problem: Power Purchase Agreements are not allowed by LADWP.

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Plan for Moving Forward

- Staff will prepare a performance contracting RFP for the RRC “Greening” project. The goal is to complete the RFP and issue for competitive bidding in May 2007.
- Staff will also prepare an RFP for entering into PPA contracts. The plan will be to select the top 10 most feasible non-LADWP sites, and the bidders would be free to bid on any combination of facilities. The goal would be to approximate as closely as possible the existing utility rates without initial capital outlay. Staff will prepare the RFP for competition by September 2007.
- If Metro is able to negotiate a satisfactory Performance Contract and PPAs that provide the economic and environmental benefits we desire, staff will seek approval of the contracts by the Board of Directors.



Financial Impact

In order for staff to complete the RFP's, conduct competitive bidding, and negotiate terms, Metro will incur administrative cost as follows:

- Energy Management Consultant (effective April 1, 2007): \$200,000
 - Support Depts. (Facilities, Procurement, EEO, Estimating, etc.): \$80,000
 - Non-labor support (advertising, supplies, etc): \$10,000
 - TOTAL for FY07/FY08: \$290,000**
- Funding of \$290,000 for FY07/FY08 would be transferred from the FY07 Bus Facilities Contingency Project (local funding)
- When/if staff returns to the board with satisfactory contracts to approve, staff will report on the cost impacts associated with completing the solar installations.

Questions or Comments?