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EnergyCommittee05072014

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To:
Los Angeles Energy and Environment Committee, 05/07/2014, Item (4) 14-0331
Subject: Lake View Terrace Solar Project

1.0 Introduction, (3.0 Results)
Looks like property taxes and insurance on land and equipment will total 0.0829 $/kWh. 0.0829 $/kWh (82.9 $/MWh) is approximately the busbar cost of power from an airplane motor (simple-cycle gas turbine) burning 6.1 $/MMBtu natural gas. 6.1 $/MMBtu gas can be contracted out to December 2026. Twelve years into the future.
After solar tax credits expire, property taxes and insurance may make investment uneconomic. Junk man may salvage aluminum frames and copper cables. Possible residual hazardous waste may be left on land.

2.0 Background
Senate bill 32, passed 2009: requires LADWP to have 75 MWe solar FIT.
LADWP presently planning for 100 MWe FIT.

2.1 Solar Farm Configuration
2.5 acre, 1.5 MWe 3500 PV panels

4.0 Design Input (a = annual = one year)
4.1 Lake View Terrace land value from internet: 400,000 $/acre
4.2 Property Tax rate: 1.25% per year = 0.0125/a
4.3 1 acre = (5280 ft/mile * 0.3048 m/ft)^2/640 acre/mile^2 = 4047 m^2
4.4 quotes.ino.com, 05/07/2014, December 2026 natural gas: 6.1 USD/MMBtu.

5.0 Assumptions
Non-tracker solar PV utilization = 0.12 (expect shadowing at low sun)
Shadowing justification:
1,500,000 W/(2.5 land-acres * 4047 m^2/acre) = 126 W/land-m^2
Installed cost of solar PV: 3.5 $/W (Discount tool store PV kit price)

6.0 References

7.0 Calculations
7.1 Solar PV array cost based on land cost
2.5 acres * 400,000 $/acre/1,500,000 watts = 0.67 $-land value/W
7.2 Property Tax based on land value
0.67 $-land/W * 1000 W/kW * 0.0125/a land property tax
/ (8766 h/a * 0.12) = 0.008 $-land-property-tax/kWh
7.3 Property taxes based on Solar Equipment at 12% utilization
3.5 $-Solar-PV/W * 1000 W/kW * 0.0125/a equipment property tax
/ (8766 h/a * 0.12 utilzation) = 0.0416 $-PV-property-tax/kWh
7.4 Insurance cost based on Solar Equipment at 12% utilization
3.5 $-Solar-PV/W 1000 W/kW * 0.010/a insurance
/ (8766 h/a * 0.12 utilzation) = 0.0333 $-PV-insurance/kWh
7.5 Total ownership costs, no maintenance, no loan cost, no depreciation
0.008 $-land-property-tax/kWh + 0.0416 $-PV-property-tax/kWh
+ 0.0333 $-PV-insurance/kWh = 0.0829 $/kWh

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W. E. S. 05/07/14