REVISED

DATE July 31, 2009 **Item No. 4**

LOCAL AGENCY FORMATION COMMISSION

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Available for review at City Hall, Room 244

Completed by: Alisa Somera Date: July 30, 2009

* This list reflects the explanatory documents provided.

San Francisco
Local Agency
Formation Commission

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TO: LAFCo Commissioners

FROM: Nancy C. Miller, Interim Executive Officer

DATE: July 31, 2009

SUBJECT: Item 4: Report from GES on Status of the In City Renewable Resource Study. (Discussion Item)

In City Renewable Resource Study: SFPUC contracted with George E. Sansoucy, Inc., (GES) to study the potential to use in-city resources for renewable energy generation pursuant to the December 2008 Request for Bids to Perform CCA Tasks.

SFPUC staff will provide an oral and written update on the report, including the expected timeline for a final report to be publicly released.

The San Francisco Public Utilities Commission (SFPUC) retained George E. Sansoucy, P.E., LLC (GES) to prepare a series of reports on the theoretical, technical, and economic potential for renewable energy resource development in the City and County of San Francisco (CCSF) and compare these resources to out-of-city options.

The purpose of these reports is to assess the availability and economic potential of renewable energy resources within the CCSF that could be utilized as a component of the Community Choice Aggregation (CCA) program as compared with out-of-city options.

Theoretical and Technical Potential (Task 1)

The scope of this analysis involved an initial screening of all commercially available renewable energy technologies considered feasible to deploy within the CCSF jurisdiction. Once these technologies were identified, additional variables such as natural resource availability, technical limitations, land use restrictions, and siting constraints were considered to identify the theoretical and technical potential within the CCSF. The technologies and projects identified as feasible within the CCSF are diverse and provide a wide range of electric supply options capable of meeting the CCA program directives. The technical potential of the six categories is estimated at approximately 300 megawatts (MW) of generation capacity with the ability to produce 1.7 million megawatt-hours (MWh) per year prior to economic constraints.

Table ES-1
Existing and Technical Potential of Renewable Resources in the CCSF Prior to Economic Consideration

	Resources Currently Installed in CCSF (MW)[1]	Resources Identified in Report		
Category		Technical Potential (MW)	Estimated Annual Energy (MWh)[2]	Average Capacity Factor[3]
Solar PV	7	100	130,000	15%
Wind Power	0.5	15	30,000	23%
Tidal Power	0	3	2,400	10%
Biogas[4]	3	55	435,000	90%
Fuel Cells	0.255	10	43,800	50%
CHP	30	130	1,025,000	90%
Total	**40.8**	**313**	**1,666,200**	

[1] Megawatt (MW): The standard measure of electricity power plant generating capacity. One megawatt is equal to 1,000 kilowatts or 1 million watts.
[2] Megawatt-hour (MWh): A unit or energy or work equal to 1,000 kilowatt-hours or 1 million watt-hours.
[3] Capacity Factor (CF): A measure of the productivity of a power plant, calculated as the amount of energy that the power plant produces over a set time period, divided by the amount of energy that would have been produced if the plant had been running at full capacity during that same time interval.
[4] Biogas assumes transportation into the CCSF via interstate pipeline.

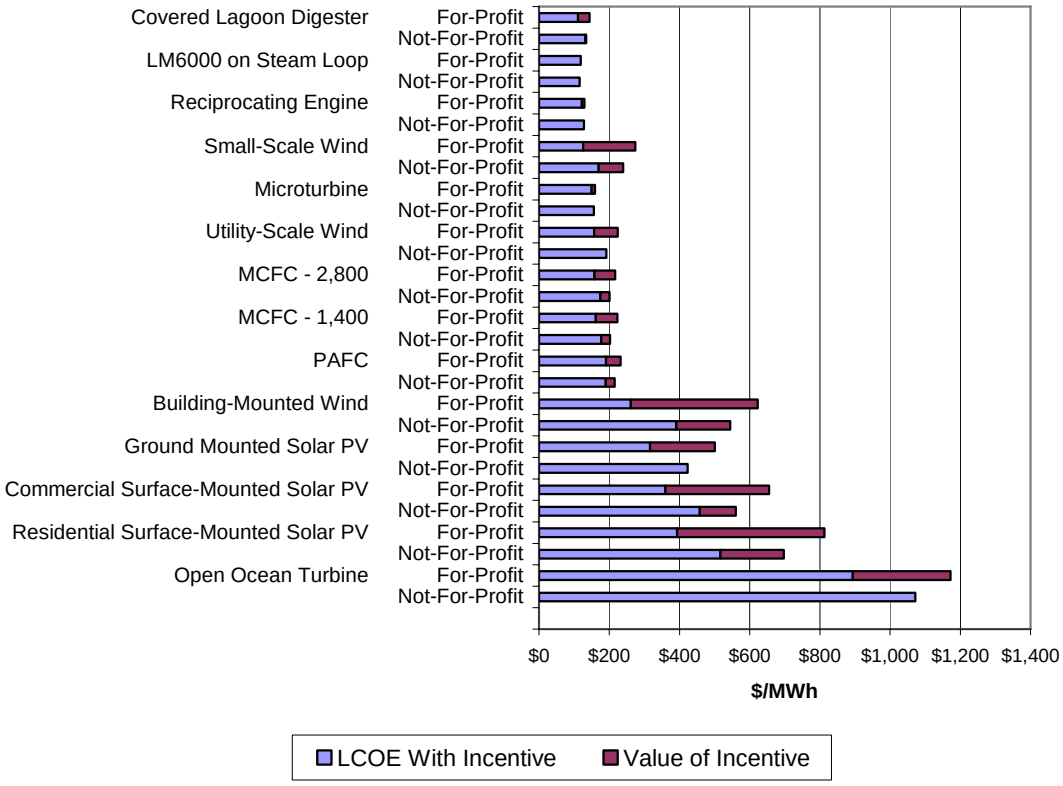
Economic Potential (Task 2)

The economic potential is based on the Levelized Cost of Electricity (LCOE) associated with each technology identified in the Theoretical and Technical Potential (Task 1) Report under two ownership scenarios. The first scenario assumes for-profit ownership with the electricity being delivered to the CCA program via a power purchase agreement (PPA). The second scenario assumes the renewable resource is owned by a not-for-profit entity such as the CCSF or quasi-governmental entity created to own the generation on behalf of the CCA program using H Bonds or other forms of tax exempt revenue bonds to finance these projects. The for-profit scenario allows the owner/developer to utilize all incentives available at the federal level through the U.S. Tax Code. The LCOE, for the purposes of this analysis, is defined as the cost per unit of electricity required to recover the invested capital, cover annual operating and maintenance (O&M) expenses, and provide debt and equity investors their respective rates of return.

The LCOE of the theoretically and technically possible renewable energy resources identified in the Task 1 report was developed using the spreadsheet models developed by GES. A separate model was developed for each ownership structure that addresses the capital structure and ability of each ownership type to take advantage of incentives available to renewable resources. The model calculates the LCOE of each renewable resource over a 20-year period, which is a typical period for this type of analysis, based on resource-specific cost and operating data and market-based assumptions about financing, federal and State tax liability or benefits, and other incentives available to each technology. The 20-year period is selected to reflect typical useful lives of projects, debt financing periods which typically do not exceed 20 years, and is a long enough period to reflect future costs associated with each unit relative to other market alternatives. The for-profit model minimizes the LCOE while maintaining debt financing requirements and equity returns necessary to satisfy investor requirements. The not-for-profit model develops the LCOE by calculating the revenue requirements associated with each project assuming 100% debt financing and no federal or State income tax benefits or liability.

The results of each analysis are set forth in Figure ES-1. A general discussion of these results is provided below along with a summary of the assumptions and results for each resource category.

Figure ES-1
Levelized Cost of Electricity (LCOE)
Including Incentives and LCOE Without Incentives
(in ascending order by For-Profit)



The LCOEs shown in Figure ES-1 illustrate the total cost of each resource with and without incentives utilizing an LCOE spreadsheet model designed to minimize the cost of electricity. The LCOE for each resource is presented based on for- and not-for-profit ownership structures and takes into account the value of the various federal, state, and local incentives. The LCOE with incentives represents the price at which these resources could provide power to the CCA program utilizing the existing incentives. The total LCOE is presented to measure the total cost of the resources absent any incentives.