

SILICON VALLEY POWER

CEC Docket # 13-IEP-1C Electricity Demand Forecast

SILICON VALLEY POWER
1500 WARBURTON AVE
SANTA CLARA, CA 95050

California Energy Commission

DOCKETED

13-IEP-1C

TN 70572

APR 30 2013

Form 1.1 RETAIL SALES OF ELECTRICITY BY CLASS OR SECTOR – Enclosed is Silicon Valley Power’s (SVP) historical breakdown of retail sales by class. Data under street lighting includes all energy sold under SVP’s municipal and unmetered accounts. SVP does not forecast sales by customer class and does not use this data in its forecast. Rather, SVP forecasts sales in total, because SVP’s small size (relative, for example, to PG&E) and customer make-up (87% industrial) permits this forecast simplification without unduly affecting forecast accuracy or usefulness.

Form 1.2 DISTRIBUTION AREA NET ELECTRICITY GENERATION LOAD – Enclosed is SVP’s submission, which is derived from Form 1.1. Only total system load information, including losses is provided. All other requested information identified in the form is not available.

Form 1.3 LSE COINCIDENT PEAK DEMAND BY SECTOR - Data is not available by sectors as identified in the form. SVP does not break up coincident peak demand by sector and does not use this information in its forecast methodology. SVP produces and uses a forecast for total system peak loads. Historical and forecasted total system peak loads is provided.

Form 1.4 DISTRIBUTION AREA COINCIDENT PEAK DEMAND - Data is not available by distribution areas as identified in the form. Historical and forecasted total system peak loads is provided. SVP serves only the city of Santa Clara, which is one homogenous distribution area, and does not break up coincident peak demand into other distribution areas.

Form 1.5 PEAK DEMAND WEATHER SCENARIOS - SVP’s load forecasts are not weather-adjusted. By applying an average load factor to the forecasted monthly energy values, weather effects are inherently averaged.

Form 1.6a DISTRIBUTION AREA HOURLY LOAD – In reference to Form 1.4 above, data is not available by distribution area. Also, SVP does not forecast hourly loads. However, SVP employs a software program that produces future hourly resource energy dispatch based on our monthly energy load forecast. This energy resource dispatch model for our load forecasts was based on SVP’s hourly system load profile of calendar year 2011. As requested, we are attaching SVP’s recorded hourly system loads for calendar years 2011, 2012 and the forecasted hourly loads for calendar year 2013 load in a format produced by our software in the tab named **1.6a-Hourly Loads**. All other requested information identified in the original form is not available.

Form 1.6b HOURLY LOADS BY TRANSMISSION PLANNING SUBAREA – Data is not available as identified in the form.

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Form 1.7 LOCAL PRIVATE SUPPLY BY SECTOR OR CLASS – There is one significant private cogenerator in SVP territory, which sells any output in excess of the cogenerator’s native load requirement to PG&E. SVP provides wheeling and standby electric service to this cogenerator. SVP’s demand forecast reflects this cogenerator only to the extent that this cogenerator’s use of our standby electric service arrangement is reflected in historical data. There are also a limited number of photovoltaic installations in SVP territory. Their impact on historical results is minimal, and we do not explicitly reflect them on a forecast basis.

Form 2.1 PLANNING AREA ECONOMIC AND DEMOGRAPHIC ASSUMPTIONS - SVP has selected data available for submission. However, SVP does not use these planning area economic and demographic variables to develop its forecast. Rather, the most relevant economic input is historical system growth and specific “block load” service requests (see SVP’s response to Form 4).

Form 2.2 ELECTRICITY RATE FORECAST – SVP does not use electric rate or gas price forecasts to develop its demand forecast. Rather, the most relevant economic input is historical system growth and specific “block load” service requests (see SVP’s response to Form 4).

Form 2.3 CUSTOMER COUNT & OTHER FORECASTING INPUTS – SVP does not forecast future customer count, and does not use these variables to develop its forecast. However, SVP has selected information available for submission. Historical average number of customers per year has been provided to fulfill the request identified in the form. Category “Other Inputs” includes unmetered and municipal customers.

Form 3.1a EFFICIENCY PROGRAM FIRST YEAR GROSS IMPACTS – See attached form. Information is provided on a fiscal year basis.

Form 3.1b EFFICIENCY PROGRAM FIRST YEAR NET IMPACTS– See attached form. Information is provided on a fiscal year basis.

Form 3.2 EFFICIENCY PROGRAM CUMULATIVE NET IMPACTS – See attached form. Information is provided on a fiscal year basis.

Form 3.3 RENEWABLE AND DISTRIBUTED GENERATION PROGRAM COSTS AND IMPACTS – See attached form. Information is provided on a fiscal year basis.

Form 3.4 DEMAND RESPONSE PROGRAM COSTS & IMPACTS – Data is not available as identified in the form.

Form 4 REPORT ON DEMAND FORECAST METHODS AND MODELS – See attached report entitled –**SVP Energy and Demand Forecast Report 2013**. This report explains the conceptual basis of the adopted forecast used during our budget process, describes the electricity demand components and all necessary information and assumptions in the development of the forecast.

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Form 5 COMMITTED DEMAND-SIDE PROGRAM METHODOLOGY – See attached report entitled – **Status Report 2011**. Status Report 2012 is undergoing Council approval.

Form 6 UNCOMMITTED DEMAND-SIDE PROGRAM METHODOLOGY - See attached report entitled – **Status Report 2011**. Status Report 2012 is undergoing Council approval.

Form 7 ESP DEMAND FORECAST – N/A

Form 8 – N/A

13-IEP-1C
 Form 4: Demand Forecast Methods and Models
 City of Santa Clara/Silicon Valley Power
 Demand and Energy Forecast – 2013-2023
 April 2013

1. Introduction

This forecast represents Silicon Valley Power’s (SVP) assessment of future loads for the calendar years of 2013 to 2023. It is based on historical data and assessment of future load growth potential. This forecast underlies SVP’s 2013-14 budget and Five Year Revenue and Expenditure Projections, FY 2014-15 to FY 2019-20. Three energy forecast scenarios and three demand forecast scenarios were developed for management consideration. The forecast selected reflects a somewhat above average growth in the near-term due to prospective customer load requests, and average growth thereafter consistent with historical trends.

2. Forecast Methodology and Scenario Selections

The basic approach to SVP’s energy forecasts was to develop an expected case (Block Load), with optimistic and pessimistic (Low Case) variations from the expected case based on plausible alternate assumptions. Management makes a decision on which forecast to adopt based on their assessment of the information available. This methodology has remained unchanged from previous submissions. The results of these three cases are shown in Table 1.

Energy Forecast (Gwh) Alternatives						
	Low Case		Block Load Case		Optimistic Case	
Calendar Year	Gwh	Yrly % Growth	Gwh	Yrly % Growth	Gwh	Yrly % Growth
2012	3,079.8	0.3%	3,074.8	1.6%	3,079.8	2.6%
2013	3,110.6	1.0%	3,211.4	4.4%	3,227.2	4.8%
2014	3,141.8	1.0%	3,308.6	3.0%	3,421.2	6.0%
2015	3,173.2	1.0%	3,352.7	1.3%	3,513.3	2.7%
2016	3,204.9	1.0%	3,386.2	1.0%	3,548.4	1.0%
2017	3,236.9	1.0%	3,420.1	1.0%	3,583.9	1.0%
2018	3,269.3	1.0%	3,454.3	1.0%	3,619.7	1.0%
2019	3,302.0	1.0%	3,488.8	1.0%	3,655.9	1.0%
2020	3,335.0	1.0%	3,523.7	1.0%	3,692.5	1.0%
2021	3,368.4	1.0%	3,559.0	1.0%	3,729.4	1.0%
2022	3,402.1	1.0%	3,594.5	1.0%	3,766.7	1.0%
2023	3,436.1	1.0%	3,630.5	1.0%	3,804.4	1.0%

Table 1

3. Block Load (Base) Case Energy Forecast

The Base Case Energy Forecast reflects SVP's historical trends, an assessment of area economic outlooks and information received from major customers. The Base Case Energy Forecast is our benchmark if no additional adjustments are made for aggressive customer expansion, or a sudden economic collapse. This case reflects the potential addition of 56.3 MW of new block loads over a 36 month period. This potential load growth is based on customer service inquiries, primarily the addition of new data center service customers. After this 36 month period, we applied a 1.0% annual load growth which is consistent with SVP's historical long-term trends. This growth can be observed most recently in SVP's recorded energy consumption and the City of Santa Clara's annual population growth from 1990 to 2009 (See Attachment 1). Attachment 1 contains a table depicting the different trends and growth rates associated with SVP.

This forecast was selected for SVP's FY 2012-13 budget, and extendedly adopted for the FY 2013-14 budget and Five Year Revenue and Expenditure Projection. The utility is optimistic in the potential addition of 50 MW of new block loads during these two fiscal years; 25 MW each in FY 2012-13 and 2013-14, and has been relatively accurate in its assessment thus far.

4. High Case Energy Forecast

The High Case forecast was developed with the same methodology as the Base Case, but reflects a more robust potential addition of 62 MW of Block Loads over this same 36 month period. As mentioned earlier, this potential load growth is based on customer service inquiries, and differs by applying a higher probability level of occurrence.

5. Low Case Energy Forecast

Because economic recovery in Silicon Valley had been relatively slow during the last few years, and if the current economic situation continues, then SVP sales may respond more slowly than portrayed in the Base Case and High Case energy forecast scenarios. We developed a Low Case scenario to quantify this view. Considering the substantial investment SVP has in energy efficiency, and the increased interest and availability of the installation of solar power systems in the business and home, it is plausible that low growth rates could result even with modest economic recovery. In all likelihood, the growth rate for the low case would reflect SVP's historical annual system load growth of 1.0%.

As previously mentioned, SVP's recorded energy consumption and Santa Clara's population from 1990 to 2009 grew approximately 1.0% annually. This time period saw SVP experience an economic downturn from 2000 to 2003, and a slightly aggressive system recovery from 2003 to 2008. This time period takes into account the system's greatest gains, from 1995 to 2000, at almost 3.0% per year, and the slight recession that occurred from 1990 to 1995 at -1.0% per year.

6. Peak Demand Scenarios

For each energy forecast scenario, we developed the corresponding annual peak demand scenarios shown in Table 2. These annual peak demands were derived by applying the three year average

monthly system load factors from 2009 to 2011, to the forecasted monthly energy values. This approach was taken to eliminate and to normalize any affects that weather or any other factors may have on the overall system activity.

As was stated in our prior reports, this approach has the effect of dampening weather impacts and may not accurately portray the load shape impact of economic recovery, which we expect to occur, or higher-than-normal temperatures, which we also expect to occur. Moreover, we believe that the economic downturn may reduce air conditioning and computer use, and cumulative energy efficiency improvements financed through SVP’s Public Benefits Program are likely to have further reduced peak demands. Therefore, in an economic recovery, it is possible that prior peak usage patterns may re-emerge.

Peak Forecast (MW) Alternatives						
	Low Case		Block Load Case		Optimistic Case	
Calendar Year	MW	Yrly % Growth	MW	Yrly % Growth	MW	Yrly % Growth
2012	471.1	0.2%	486.1	1.8%	471.1	3.1%
2013	477.1	1.3%	506.3	4.2%	494.8	5.0%
2014	481.9	1.0%	519.5	2.6%	522.1	5.5%
2015	486.7	1.0%	524.3	0.9%	538.0	3.1%
2016	491.6	1.0%	529.5	1.0%	543.4	1.0%
2017	496.5	1.0%	534.8	1.0%	548.8	1.0%
2018	501.4	1.0%	540.2	1.0%	554.3	1.0%
2019	506.5	1.0%	545.6	1.0%	559.8	1.0%
2020	511.5	1.0%	551.0	1.0%	565.4	1.0%
2021	516.6	1.0%	556.5	1.0%	571.1	1.0%
2022	521.8	1.0%	562.1	1.0%	576.8	1.0%
2023	527.0	1.0%	567.7	1.0%	582.6	1.0%

Table 2

Attachment 1

Calendar Year	Recorded Peak Demand	Historical Consumption	City of Santa Clara Population
1990	400.00	2,437.29	93,754
1991	384.90	2,363.73	94,925
1992	373.50	2,362.21	94,673
1993	393.40	2,351.80	96,125
1994	381.60	2,309.97	96,918
1995	396.70	2,332.78	97,964
1996	411.60	2,481.89	97,982
1997	427.00	2,574.70	100,030
1998	443.80	2,621.71	101,877
1999	426.20	2,567.25	102,682
2000	456.90	2,701.62	102,895
2001	437.80	2,615.99	104,616
2002	419.00	2,538.72	104,306
2003	407.20	2,498.33	105,831
2004	399.70	2,538.28	105,831
2005	415.40	2,645.16	107,200
2006	486.50	2,878.75	109,106
2007	452.00	2,953.84	110,771
2008	489.90	3,004.75	115,503
2009	459.80	2,933.37	117,242
2010	469.80	2,915.96	118,830
YRLY GRWTH Rate:1990-2000	1.34%	1.03%	0.93%
YRLY GRWTH Rate:1990-2009	0.74%	0.98%	1.18%
YRLY GRWTH Rate:1990-1995	-0.17%	-0.87%	0.88%
YRLY GRWTH Rate:1995-2000	2.87%	2.98%	0.97%
YRLY GRWTH Rate:2000-2003	-3.77%	-2.56%	0.91%
YRLY GRWTH Rate:2003-2008	3.77%	3.76%	1.80%

City of Santa Clara Silicon Valley Power Public Benefit Program

Energy Efficiency and Renewable Results for Fiscal Year 2010-2011



*Giving You the Power
to Change the World*

February 2012

PUBLIC BENEFIT PROGRAMS

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City of Santa Clara
Silicon Valley Power
Public Benefit Program
Results for Fiscal Year 2010-2011

Purpose

This is an annual and historical reporting of energy savings from the efficiency programs, solar electric installations, and other Public Benefit (PBC) Programs implemented by the City of Santa Clara's municipal electric utility, Silicon Valley Power (SVP). This report has been developed every year since the inception of Assembly Bill 1890 (AB1890) and the Public Benefit Programs. In addition, the report summarizes achievements toward reaching energy efficiency goals, as required by AB 2021 and SB 1037, and solar electric installations, as required by SB 1. It includes the following items:

- Goals and Objectives
- Energy Savings Goals and Achievements from Energy Efficiency Programs
- Solar Installations
- PBC Revenues and Expenditures
- Demand Response Goals and Achievements
- Detailed Program Descriptions

Introduction to the Report

Energy Efficiency, Renewable Energy, and Other PBC Programs

California Assembly Bill 2021, signed into law in September 2006, expanded upon several of the energy efficiency policies adopted since 1996 and continuing with the passage of Senate Bill 1037 in 2005. This report complies with the requirements of AB 2021, SB 1 and SB 1037 to report to the Council and customers on the effectiveness of energy efficiency and solar electric programs toward meeting goals.

On behalf of its members, the Northern California Power Agency (NCPA) contracted with Summit Blue Consulting LLC to update appropriate energy efficiency goals. Summit Blue developed a process to identify all technically possible energy efficiency measures and results in the City for the next 10 years, all cost-effective measures, and all feasible measures. The City Council adopted these feasible measures and energy efficiency results as City goals on March 09, 2010

Goals of the Public Benefit Programs

As adopted by City Council, the goals of the PBC programs are as follows:

Qualitative Goals & Objectives of the Public Benefit Programs

1. Implement cost-effective energy efficiency programs to lower energy use. The cost to implement energy efficiency programs should be lower than the capital cost to build new generation and benefits of the total programs should exceed costs under the Total Resource Cost (TRC) test under the methodology reviewed and approved by the Northern California

Power Agency (NCPA) Public Benefits Committee, of which Silicon Valley Power's PBC program manager is a member.

2. Provide the PBC programs in a manner that creates value to the community and meets all applicable legal requirements.
3. Assist Divisions and City Departments in achieving optimal energy efficiency at City facilities by paying a portion of costs to reduce energy use through rebates and assist in implementing new energy related technologies for the benefit of the City and community.
4. Implement programs to support renewable power generation that increase resource diversity and minimize adverse environmental impacts from electric generation and operation of the electric system.
5. Support emerging technologies to speed up market acceptance, allowing energy efficiency services and products to compete in the open market.
6. Assist low-income residents in helping them to pay their electric bills and in installing energy efficient appliances and other measures.
7. Determine the best energy programs to offer Santa Clara customers by collecting input from community organizations, businesses and other City departments.

Quantitative Energy Efficiency Goals & Objectives of the Public Benefit Programs

First Year Megawatt Hour Reductions		By Class	
Year	Total Utility	Residential	Commercial & Industrial
Historical Net			
	24,509	1,237	23,272
2007-2008			
2008-2009	39,627	1,031	38,596
2009-2010	30,593	857	29,736
2010-2011	24,576	292	24,284
Budget Target			
2011-2012 Expected	25,415	1,197	24,218
2011-2012 Budgeted	25,415	1,197	24,218

Solar Electric Systems Installed in Santa Clara

Under SB1, Santa Clara is required to install 30 MW of solar electric systems by 2017. Total installations are shown below.

Systems	FY	# Net*	kW
Residential	99-00	1	1.73
	00-01	9	29.5
	01-02	2	8.94
	02-03	1	4.01
	05-06	7	21.15
	06-07	3	12.11
	07-08	6	19.5
	08-09	16	56.88
	09-10	56	205.11
	10-11	38	142
Commercial	00-01	1	1.61
	05-06	1	30
	06-07	2	100.4
	07-08	2	134.97
	08-09	2	58.42
	09-10	8	1089.49
	10-11	3	985
Habitat	03-04	3	6.9
	08-09	6	15
NSP	03-04	1	4.9
	06-07	1	7.9
	10-11	1	11.5
Totals		170	2947.02

* 3 residential systems have moved out of Santa Clara

SB1

Overall Spending by Category for SVP Public Benefit Programs

Santa Clara has expended about \$72.7 million for public benefit programs through June 2011 and has budgeted approximately \$8.1 million in fiscal year 2011 to 2012, for a total cumulative commitment of approximately \$81.7 million in the past fifteen years.

Low-income customers have received almost 1% of PBC funds since July 1, 1997. However, the Rate Assistance Program discount is paid for through a reduction in electric revenue from these customers. PBC funds cover the cost of marketing and administering the program. The most heavily pursued programs fund energy efficiency measures, and the measures used about 82% of expenditures. In the area of renewable energy, SVP has supported solar photovoltaic systems and geothermal incremental capital increases since July 1, 1997. These renewable programs were about 8% of the total program expenditures. Finally, new technology programs, primarily the hybrid bus program (*The Breathe Easy Express*), took about 9% of the total program expenditures.

*Note: @ \$1.5M of energy efficiency rebate dollars were attributed to projects completed in FY 09/10 but were paid out of the FY 10/11 budget. The dollars are reflected in the table on the following page, but the savings are not reflected in the table on page 9 or in the SB1037 report for FY 10/11, as they were previously reported. Approximately \$1.25 M was paid out in FY 11/12 for savings achieved in FY 10/11, which are included in the savings table on page 9 of this report, but are not reflected in the costs in the table on the following page. In addition, @ \$275k in solar rebate dollars were paid out of the FY 10/11 budget and are reflected in the table on the following page, but the systems were completed in FY 09/10 and are included in that year in the table on page 3 of this report.

Spending on programs for FY 10/11

Revenue	\$7,872,189.95
Expenditures	\$7,894,219.19
Residential	
Fans	\$10,309.24
Refrigerator & AC	\$138,186.64
Pool Pump	\$272.93
Attic Insulation	\$19,733.24
Electric Heat Pump Water Heater	\$5,000.00
General (salaries, energy audits, etc)	\$393,475.97
Commercial	
General (salaries, marketing, etc)	\$462,726.27
Small Business Program	\$128,066.92
Lighting	\$265,986.96
C&I Audits	\$146,286.90
HVAC & Motors	\$575,468.00
Washing Machine	\$3,500.00
Customer Directed Rebate	\$3,145,298.30
Renewable	
Residential PV	\$679,089.01
Commercial PV	\$1,707,019.20
Green Power Program	\$68,336.84
City PV Project	\$43,474.02
Low Income	
Rate Assistance Program	\$20,989.91
Measurement & Verification	
Third Party EM&V	\$37,758.30
Project M&V	\$43,240.54
Total Expenditures*:	\$7,894,219.19

Detailed Program Information

Santa Clara's municipal electric utility (dba Silicon Valley Power) is an enterprise of the City of Santa Clara, and was established in 1896. On a not-for-profit basis, Silicon Valley Power owns power generation facilities, has investments in joint ventures that produce electric power, and trades power on the open market. These efforts are directed toward ensuring its retail customers—the citizens, organizations and business of the City of Santa Clara—a highly reliable source of electric power at low, stable rates.

At the end of 2010, the utility had 52,464 meters with a peak demand of 469.8 megawatts. 44,048 of these customers were residential, but only 8.7% of power sales were to residents. Over 87.4% of sales went to 1,839 industrial customers (as defined by rate schedule).

Santa Clara customers enjoyed almost twice the amount of renewable energy in their mix during 2010 than those receiving the state's average power mixture during 2010. SVP's 2010 power mix consisted of 25.1% percent eligible renewable resources, compared to 13.7 % statewide and, when large hydroelectric resources are included, SVP's power mix consisted of 41.3% carbon free, as compared to 24.5% for the statewide mix.

SVP's Public Benefit Programs are separated into residential and business programs, with the majority of funding toward the business sector. This is due to the fact that the programs are required by City Council policy to be spent in the customer class from which the funding is received. This results in program funding less than 10% from the residential class. Total PBC funds are about \$7.5 million per year. Residential programs include rate assistance for low-income customers, energy efficiency rebates (refrigerators, whole house fans, attic insulation, pool pumps, window air conditioners, ceiling fans, solar attic fans, and lighting), solar electric installations, energy audits, and programs for schools and libraries. Business programs include energy audits, installation management for small companies, rebates for a wide variety of equipment (lighting, air conditioning systems, chillers, programmable thermostats, washing machines, motors, new construction, photovoltaic systems and customized installations), third party-implemented programs (retrocommissioning, refrigeration improvements, data center optimization audits and rebates, a laboratory energy management program, and an Enhanced Automation program for controls optimization) and design and construction assistance. Over 296.8 million kilowatt hours in first year savings (gross, not net) alone have been achieved since 1998.

Due to the fact that the vast majority of SVP's energy efficiency programs come from its large commercial and industrial customers, the greatest percentage of savings from programs that are calculated based on actual metered pre- and post-savings. These large, unique projects also result in "lumpy" savings levels, depending on the projects being completed at customer sites and their implementation budgets. PBC funds that were collected but not spent are collected in a special fund for spending on programs in future years.

In an analysis of programs for fiscal year 2010-2011, the total programs were found to be cost effective. The total resource cost test found that the program package had a benefit cost ratio of 2.2. Programs are developed in consultation with customer groups, especially the largest customers. The City Council annually approves the programs, as well as goals and objectives. An annual report is made to the City Council with data on the previous year's fiscal data. Once the City Council has approved the report, it is placed on the utility's website for any interested customers. The goals and objectives of the programs, as well as specific financial and energy saving data are listed in detail in the following pages.

Program Summaries

All Programs for FY 2010 to 2011

Current Commercial Customer Programs:

- **Business Audits**: Free energy efficiency audits to business customers.
- **Rebates**: A comprehensive portfolio of energy efficiency rebates (for purchase and installation of energy efficient lighting, motors, air conditioners, motion sensors, programmable thermostats, new construction, and customized energy-efficiency installations).
- **Retrocommissioning (RCx)**: Provides commissioning and retro commissioning services to data centers, commercial buildings, educational facilities, and hotels.
- **EnergySmart Program**: This program incorporates the measures that were previously funded under the “Keep Your Cool” and “Express Refrigeration” programs when those programs expired in late 2009 (mid-fiscal year). The new program will be managed by a single contractor to provide a more seamless interaction with the customer rather than dealing with separate programs managed by two contractors.
- **Laboratory Energy Management Program**: This program focuses on the unique needs of energy-intensive laboratory space. The program provides recommendations for energy savings, technical analysis and rebates for energy efficiency retrofit projects.
- **Enhanced Automation Initiative**: This program is focused on hardware and software upgrades to building controls systems to bring buildings up to optimum performance.
- **Data Center Optimization Program (DCOP)**: This program will target small data centers under 10,000 square feet within existing office or other buildings. The program will deliver an assessment of all electric end uses such as facility site infrastructure loads (cooling, fans, pumps, lighting, and uninterruptible power supplies), network equipment, storage, and servers. The program scope includes comprehensive facility assessments, reports, project management service during implementation, financial incentives for energy reductions, and savings verification services.
- **SVP Sustainable Preschools Program**: This program targets preschools and will provide technical assistance, contractor management and incentives for the installation of energy efficiency measures.
- **Business Energy Information**: Management information on energy usage through 15-minute interval meters, Itron's ‘EEM Suite’ software, training, and other sources.
- **Energy Innovation Program**: This program encourages businesses to demonstrate new products and product applications not yet commercially viable in today's marketplace, install energy efficient technologies not generally known or widely accepted, yet show potential for successful market growth, successfully apply energy efficiency solutions in new ways, or introduce energy efficiency into industries or businesses that are resistant to adopting new technologies or practices.
- **LEED Rebate for Energy Efficient Building Design**: If your building meets LEED criteria and exceeds Title 24 energy requirements by at least 10 percent, you can get a rebate of up to \$47,500.
- **Business Solar Photovoltaic Rebate**: Provides financial incentives for the installation of solar systems at business sites. Rebate structure is designed to decline over time as more PV is installed in SVP's service territory, similar to the California Solar Initiative program. Businesses can receive rebates that started at \$3.00 per output watt up to a total of \$300,000 per customer for systems up to 100 kW. (Current rebate level at the time of this report is \$1.50 per watt.) Businesses installing systems between 100kW and 1 MW are eligible for a Performance Based Incentive starting at \$0.40 per kWh. Current rebate level at the time of this report is \$0.20 per kWh.) Businesses are required to complete an energy audit in order to receive a rebate, as is the case with the statewide California Solar Initiative.

Current Residential Customer Programs:

- Residential In-Home Energy Audits and Education: Through this technical support program SVP staff provides on-site audit analysis, energy efficiency recommendations and distributes energy saving items (four compact fluorescent lights, "lime lites," and programmable thermostats). The Solar Explorer and the SVP information booth participate in major city events, providing education on energy efficiency and solar electric generation systems. In collaboration with the Santa Clara Police Department, compact fluorescent light bulbs (CFL's) and educational materials are distributed to residents participating in the National "Night Out" Program in August.
- Residential Appliance Rebates: Rebates encourage residents to purchase and install ENERGY STAR® labeled refrigerators or window AC units and recycle their old units.
- Energy Star Ceiling Fan Rebates: Provides a rebate of \$35 per fan (up to three fans per residence) for the installation of Energy Star ceiling fans.
- Energy Efficient Pool Pump Rebates: Provides a rebate to replace an existing pool pump and motor with a new high efficiency two-speed or a new high efficiency variable speed motor.
- Solar Attic Fan Rebates: This program encourages customers to cool the attic space with a solar attic fan. By reducing the attic temperature, the insulation is more effective at stopping heat from entering the home, thereby reducing the need to cool the living space.
- Residential Attic Insulation Rebates: These rebates encourage the installation of attic insulation by providing incentives for both single-family and multi-family units. All homes are inspected to ensure installation has been completed.
- Neighborhood Solar Program: SVP customers have the option to pay into a special fund to support the installation of solar electric systems at non-profit community buildings. The third installation is located at the Bill Wilson Center and was completed in the Fall of 2010.
- Rate Assistance Program: Qualified low-income customers receive a discount on their electric bill (low-income program).
- Refrigerator & Room Air Conditioner Recycling: Rebate for recycling old refrigerators and room air conditioners.
- Residential Solar Photovoltaic Rebate: Provides significant financial incentive to residential customers for installation of solar systems. Customers receiving the rebate are required to also complete an energy audit, as is the case with the statewide California Solar Initiative. The rebate started at \$4.50 per watt and under a declining scale similar to the California Solar Initiative program, and is currently at \$3.00 per watt, up to a maximum system size of 10 kW.

Current Community Programs:

- Public Facilities' Energy Efficiency Program: SVP provides technical assistance and financial incentives for the expansion, remodel, and new construction of City of Santa Clara buildings. Included in this program are higher levels of rebates for qualifying equipment, energy management assistance, and a small budget for retro commissioning.
- City Facilities Energy Efficiency Loan Program – this program provides loans for approved energy efficiency measures implemented at City of Santa Clara facilities. Loans are paid back via the utility bill through the reduction in energy consumption.

SVP Energy Saved: Actual

Actual Savings FY 10-11

Resource Savings Summary					Cost of Efficiency	
	Net Demand Savings (kW)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Utility (\$/kWh)	Total Resource (\$/kWh)
TOTAL EE PORTFOLIO	3,103	2,207	24,575,528	320,012,944	0.02	0.05
Res Clothes Washers	4	4	1,686	20,237	0.41	1.07
Res Cooling	1	1	2,649	30,312	0.86	1.48
Res Dishwashers						
Res Electronics						
Res Heating						
Res Lighting	88		21,359	117,618	0.23	0.23
Res Pool Pump			221	2,215	0.33	0.36
Res Refrigeration	51	51	245,993	1,454,517	0.22	0.25
Res Shell	7	7	7,818	156,366	0.59	0.76
Res Water Heating			11,836	118,363	0.22	0.26
Res Comprehensive						
Non-Res Cooking			3,756	15,025	0.07	0.18
Non-Res Cooling	959	769	20,863,745	275,740,713	0.02	0.03
Non-Res Heating						
Non-Res Lighting	1,773	1,179	1,424,977	18,660,459	0.03	0.05
Non-Res Motors	99	80	1,064,396	15,720,515	0.03	0.05
Non-Res Pumps	13	13	30,165	301,648	0.03	0.05
Non-Res Refrigeration	107	101	803,307	6,607,101	0.03	0.04
Non-Res Shell						
Non Res Process			42,344	84,687	0.08	0.46
Non Res Comprehensive			51,276	983,171	0.05	4.62
T&D						
Other						
Total	3,103	2,207	24,575,528	320,012,944	.02	.05

TRC is Total Resource Cost Test where a score greater than 1 equals benefits are greater than costs for the entire utility system.

TRC for FY 10-11 Programs is 2.2

SVP Program Specific Measurement & Verification Methodologies

Program	Planned or Actual	M&V Methodology	Explanation
RESIDENTIAL PROGRAMS at Silicon Valley Power			
ENERGY STAR® Refrigerator Rebate	Both	KEMA Report	Unit replacements are tracked by customer name, address, appliance, and date
Recycle Refrigerators	Both	PG&E Work Papers	Energy savings for replacing a working refrigerator are greater than for comparisons between a new appliance and an ENERGY STAR qualified one.
Low Income Refrigerator Giveaway	Planned (last actual was 3 years ago)	PG&E Work Papers	Energy savings for replacing a working refrigerator are greater than for comparisons between a new appliance and an ENERGY STAR qualified one.
Rate Assistance Program	Both	N/A	No direct savings calculated.
Attic insulation rebate	Both	KEMA Report	Unit replacements are tracked by customer name, address, and date. 100% of installations are verified.
Multi-family attic insulation rebate	Both	KEMA Report	Unit replacements are tracked by customer name, address, and date. 15% of installations are verified.
Recycle Home Window AC's	Both	NCPA Analysis	DEER report appears inaccurate. NCPA developed better methodologies to track home ac.
ENERGY STAR® Window AC Rebate	Both	SCE Workpapers with formula adjusted for Climate Zone 4	Unit replacements are tracked by customer name, address, appliance, and date
ENERGY STAR® Ceiling Fan Rebate	Both	KEMA Report	Unit installations are tracked by customer name, address, appliance, and date
Solar Attic Fan Rebate	Both	KEMA Report	Unit replacements are tracked by customer name, address, equipment , & date; 100% of installations are verified.
Pool Pump Rebate	Both	KEMA Report	Unit replacements are tracked by customer name, address, equipment , & date; 100% of installations are verified.
CFL Giveaway	Both	KEMA Report	Replacements tracked by event, number and date.
Whole House Fan Rebate	Both	KEMA Report	Unit replacements are tracked by customer name, address, equipment , & date; 100% of installations are verified.
Residential Home Energy Audit	Both	KEMA Report	Minor savings attributed to behavioral changes
Residential Hot-Line	Both	N/A	No direct savings calculated.
Residential EE Training	Both	N/A	No direct savings calculated.

BUSINESS PROGRAMS at Silicon Valley Power			
Small Business Efficiency Services Program	Both	Savings tracked by rebate	No direct savings calculated.
On-site Energy Audits	Both	Savings tracked by rebate	No direct savings calculated.
Custom Energy Audits	Both	Savings tracked by rebate	No direct savings calculated.
Prescriptive Rebates	Both	KEMA & Customized	Unit replacements are tracked by equipment type, customer name, address, and date. For methods not included in KEMA, M&V procedures have been developed.
Washing Machine Rebate	Both	PG&E Work Papers	Fund a rebate for commercial washing machine replacement through the Santa Clara Valley Water District.
Customer Directed Rebates	Both	Customized	Unit replacements are tracked by equipment type, customer name, address, and date. M&V procedures have been developed.
New Construction Rebates	Both	Customized	Unit replacements are tracked by equipment type, customer name, address, and date. For methods not included in KEMA, M&V procedures have been developed.
Energy Design Assistance	Both	N/A	No direct savings calculated.
Bright Start Initiative	Both	N/A	No direct savings calculated.
Meters and Information	Both	N/A	No direct savings calculated.
Training, Website, and Promotion	Both	N/A	No direct savings calculated.
Public Facility Energy Efficiency Assistance Program	Both	KEMA	Tracked based on actual rebate.
Energy Innovator Grant	Both	Customized	Unit replacements are tracked by equipment type, customer name, address, and date. M&V procedures have been developed.
Compressed Air Management Program	Both	Customized	Unit replacements are tracked by equipment type, customer name, address, and date. M&V procedures have been developed.
Energy Smart Program	Both	KEMA	Tracked based on actual rebate.
Data Center Optimization Program	Both	Customized	Unit replacements are tracked by equipment type, customer name, address, and date. M&V procedures have been developed.
Retrocommissioning	Both	Customized	Unit replacements are tracked by equipment type, customer name, address, and date. M&V procedures have been developed.

RENEWABLE PROGRAMS at Silicon Valley Power			
Solar PV Buydowns (residential & business)	Both	KEMA, adjusted for actual size and cost	All systems are checked and must pass inspection. Interconnection agreements are approved.
Neighborhood Solar Program	Both	KEMA, adjusted for actual size and cost	All systems are checked and must pass inspection. Interconnection agreements are approved.
Habitat for Humanity PV Systems	Both	KEMA, adjusted for actual size and cost	All systems are checked and must pass inspection. Interconnection agreements are approved.
City PV Project	Planned	KEMA, adjusted for actual size and cost	All systems are checked and must pass inspection. Interconnection agreements are approved.
NCPA Geothermal Recharge	Not included in PBC budget, but expenditures are allowed to be included in total percent spent	N/A	The majority of the costs for this project is not included in the PBC budget, but is included as renewable expenses in the normal utility operations budget.

Background of the Public Benefit Programs

The California electric restructuring legislation signed into law on September 23, 1996, AB 1890, requires that investor owned utilities (IOUs) and POU establish a non-bypassable usage-based charge to fund investments in energy-related PBC programs. AB 995, signed into law September 30, 2000, extended funding for PBC programs to January 1, 2012.

AB1890 and AB995 mandated that each POU must collect and spend a percentage of annual revenues on PBC programs. Specifically, "each local publicly owned electric utility shall establish a non-bypassable, usage based charge on local distribution service of not less than the lowest expenditure level of the three largest electrical corporations in California on a percent of revenue basis, calculated from each utility's total revenue requirement for the year ended December 31, 1994, and each utility's total annual public benefit programs expenditures." CMUA has determined this amount to be a floor of 2.85% of annual revenues. These funds are to support programs that provide:

- (1) Cost-effective demand-side management services to promote energy-efficiency and energy conservation;
- (2) New investment in renewable energy resources and technologies consistent with existing statutes and regulations, which promote those resources and technologies;
- (3) Research, development and demonstration programs for the public interest to advance science or technology which is not adequately provided by competitive and regulated markets;
- (4) Services provided for low-income electricity customers, including but not limited to, targeted energy efficiency service and rate discounts;

AB995 extended the mandate with for low-income programs. SB 1037 further required the POUs to report on their energy efficiency program effectiveness to the CEC and to customers. This report meets the requirements of that legislation.

On September 29, 2005, Governor Schwarzenegger signed Senate Bill 1037 into law, establishing several important policies on energy efficiency. Among the provisions of the law is a statewide commitment to cost-effective and feasible energy efficiency, with the expectation that all utilities consider energy efficiency before investing in any other resources to meet growing demand.

This report complies with Section 6 of Senate Bill 1037, which requires each publicly-owned utility to:

“Report annually to its customers and to the State Energy Resources Conservation and Development Commission, its investment in energy efficiency and demand reduction programs. A report shall contain a description of programs, expenditures, and expected and actual energy savings results.”

Also, the Governor signed AB 2021 on September 29, 2006, which requires local publicly owned electric utilities (POUs), on or before June 1, 2007, and every 3 years afterwards, to identify all potentially achievable cost-effective electricity efficiency savings and to set annual targets for energy efficiency savings and demand reduction over 10 years. The bill also requires POUs to report those targets to the California Energy Commission (CEC) within 60 days of adoption. POUs must make an annual report to customers and the CEC on energy efficiency investments, programs, expenditures, cost-effectiveness, and results, as well as an annual report to the CEC on efficiency investment funding, cost-effectiveness methodologies, and an independent evaluation of programs. The CEC is to include a summary of the utility-reported information and a comparison of each utility's energy efficiency targets and actual results in its integrated energy policy report (IEPR). The bill requires the CEC, if it finds that improvements can be made by a POU in setting or meeting targets, to provide recommendations to the local POU, the Legislature, and the Governor on those enhancements.

Thirty-nine POUs have submitted coordinated data in compliance with the legislation.

The California Municipal Utilities Association (CMUA), in partnership with the Northern California Power Agency (NCPA) and the Southern California Public Power Authority (SCPPA) began a collaborative effort in October 2005 and invested approximately \$150,000 to develop an Excel-based evaluation tool that can be used to measure energy efficiency program effectiveness and to report program savings in a consistent and comprehensive manner. The tool was completed August 2006 and is the key driver for the results in this report.

Public Benefit Program Administration

Designing and implementing PBC Programs is a major effort. SVP staff has applied significant resources—both staff and funding—to the creation and deployment of meaningful Programs.

SVP is required to, at a minimum, do the following in the Public Benefit Program:

- Identify potential Public Benefit Programs
- Assess the potential costs, benefits and resource ramifications of Program implementation
- Assess customers' willingness to participate in the program
- Verify that Public Benefit Programs qualify under AB 1890 guidelines
- Balance individual program expenditures against overall utility PBC Program goals
- Develop budgetary justifications for program expenditures
- Market the program to target customer segments
- Administer programs and track expenditures
- Monitor customer acceptance and satisfaction
- Modify programs as necessary for participation and funding

Energy Efficiency Conservation Block Grant (EECBG) Programs

The City of Santa Clara was awarded \$1,180,900 in stimulus funds under the EECBG funding opportunity. These programs are being administered under the municipal electric utility, Silicon Valley Power, and will be spent on the following programs:

- Retrocommissioning (RCx) of City Facilities
- LED Pedestrian Signal Retrofits
- A Photovoltaic System on a park facility at Henry Schmidt Park
- LED Lighting retrofits at various locations around the City of Santa Clara
- A Low Income & Multi-family Weatherization Program

During this fiscal year, SVP worked with its RCx contractor to complete RCx studies on the Santa Clara Convention Center and several other City facilities. Implementation of the recommended measures was completed in two facilities and the others are underway. The LED Pedestrian Signal Retrofit Project was completed in April 2011 and the Low Income & Multi-family Weatherization program was about 50% subscribed by the end of the fiscal year. By the end of the fiscal year, we entered into a contract for the LED Lighting retrofits and began work on the Public Works Bid documents for the PV System at Henry Schmidt Park. We expect to complete all projects with the exception of the PV system installation by the end of FY 2011-2012. The PV system is expected to be complete in the first quarter of FY 2012-2013.

Measurement and Verification of Public Benefits Programs

In 2005 legislation requiring the reporting of program involvement and effectiveness by publicly owned utilities (POU) to the California Energy Commission (CEC) was passed (SB 1037). SVP staff worked with other POU's, NCPA staff, and the Southern California Public Power Agency (SCPPA) to develop unified reporting methodologies and formats.

NCPA first contracted with KEMA Inc. to develop measure information for all POU energy efficiency projects. Using existing resources as much as possible, KEMA created summaries for all of the measures on a list of NCPA utility energy efficiency projects. To keep costs down, existing reports were leveraged and summarized in a simplified manner more usable for NCPA and SCPPA members than the complex reporting mechanisms used by the investor owned utilities (IOU's). The primary resources were the statewide Database for Energy Efficient Resources (DEER) and PG&E's work papers. In addition to these sources, KEMA used several other resources to assist with the project. NCPA utilities also worked to upgrade the residential air conditioning information from what was in DEER based on engineering analyses and actual installations at utilities in California.

DEER is a CEC and California Public Utilities Commission (CPUC) sponsored database with support and input from the IOUs and other interested stakeholders. The DEER database includes detailed information on many energy efficiency measures. The results include the gross impacts, incremental cost, and the equipment's useful life. The results include engineering calculations, building simulations, measurement studies and surveys, econometric regressions, or a combination of approaches. The objectives and focus of the DEER data is to serve as a centralized source of information for planning and forecasting issues for the energy efficiency programs that are provided to customers across the state. DEER has been designated by the CPUC as its source for deemed and impact costs for program planning.

The PG&E work papers are the documents that PG&E has prepared to document all of its measure savings calculations related to its energy efficiency programs. The work papers are a huge set of details that PG&E uses to defend energy savings assumptions. The papers are filed on a regular

basis with the CPUC. The KEMA report uses the 2005 version of the PG&E work papers. The work papers typically include measures not in the DEER database or new to their programs.

The KEMA report provides prescriptive savings for most of the measures. Some measures are considered custom, and savings are calculated individually for each unique project. When a particular utility has used a custom savings approach, its staff has carefully and thoroughly documented that savings analysis methodology.

Once the KEMA report was completed, NCPA contracted with Energy & Environment Economics (E3) to develop a cost-effectiveness model for the member utilities to use. This model is adapted and simplified from a similar one developed by E3 for the IOU's in their program cost-effectiveness analysis. This summary report was sent to CEC staff to meet the reporting requirements of SB1037.

AB 2021 requires each utility in California to utilize a third party for Evaluation, Measurement & Verification (EM&V) of its energy efficiency programs. NCPA issued an RFP for these services for its members and identified two qualified organizations. SVP elected to contract with Summit Blue Consulting for EM&V of its energy efficiency programs and a sampling of project implementations. The first evaluation report was complete in March 2009 for the FY 2007/2008 program year and the second in March 2010 for the FY 2008/2009 programs. The third evaluation report was completed in March 2011 for FY 2009/2010 programs and was prepared by Navigant Consulting, who acquired Summit Blue. Evaluation for the FY 2010/2011 programs is being conducted by The Cadmus Group, Inc. and is currently underway. Results will be available in Spring 2012.

The EM&V reports found that SVP was doing a good job of tracking all necessary information for energy efficiency reporting and verifying installation of equipment before rebates are processed. A few minor reclassifications of equipment were recommended to the existing database in the first year's report. According to Summit Blue, "overall, SVP is doing an outstanding job of promoting its energy efficiency programs to customers in a variety of ways. Moreover, the utility has established an excellent system of cross-checking and verification, which ensures that it is accurately reporting customer installations." (EVALUATION, VERIFICATION, AND MEASUREMENT STUDY, FY 2007/2008 Program for Silicon Valley Power, March 20, 2009) In addition, both reports have found that SVP's energy savings realization rates exceed 100% of the claimed energy savings. The evaluation of FY 2009/2010 programs also showed excellent results with a realization rate of 95%. Results for the FY 2010/2011 program evaluation are not yet available, but preliminary review shows that the programs have a high realization rate and may exceed 100% again. The reports are available for public viewing on NCPA's website at <http://www.ncpa.com/energy-efficiency-m-v-reports-2.html>.