



City of San Bernardino Energy Efficiency Conservation Strategy Summary

Funded by Energy Efficiency and Conservation Block Grant

February 8, 2010



1. Introduction

The American Recovery and Reinvestment Act of 2009 appropriated \$3.2 billion for the Energy Efficiency and Conservation Block Grant (EECBG) Program. The Program provides federal grants to units of local government, Indian tribes, states, and territories for implementing strategies to reduce fossil fuel emissions and total energy use, and to improve energy efficiency in all sectors. The EECBG Program is administered by the Office of Weatherization and Intergovernmental Programs in the Office of Energy Efficiency and Renewable Energy of the U.S. Department of Energy (DOE).

On March 26, 2009, DOE released the Funding Opportunity Announcement for approximately \$2.7 billion in estimated formula grants under the EECBG program. Based on calculations under a series of complex formulas set out in the Energy Independence and Security Act, allocation amounts for states, cities, counties, and Indian tribes eligible for direct formula grants were made. The allocation for the City of San Bernardino was \$1,954,600.

In June 2009, the City responded to this allocation requesting an initial \$250,000 to develop an Energy Efficiency and Conservation Strategy (EECS). In October 2009, the City hired AECOM as consultants to help them develop the EECS and a Climate Action Plan. Per DOE requirements, the EECS was to be completed within a 120-day time period. However, due to the time consuming City procurement process and multiple holidays occurring during this period, the City requested a 30-day extension and received approval for submittal of their completed EECS on February 8, 2010.

What specific activities are eligible for use of the funds?

Grant funds can be used community-wide as well as for government-owned facilities and infrastructure projects. The following activities are eligible under the EECBG Program:

- Development of an energy efficiency and conservation strategy (EECS), and technical consultant services to assist in the development of such a strategy.
- Residential and commercial building energy audits.
- Financial incentive programs and mechanisms for energy efficiency improvements, such as energy savings performance contracting, on-bill financing, and revolving loan funds.
- Grants to nonprofit organizations and government agencies for the purpose of performing energy efficiency retrofits.
- Energy efficiency and conservation programs for buildings and facilities.
- Development and implementation of transportation programs to conserve energy.
- Building codes and inspections to promote building energy efficiency.
- Energy distribution technologies that significantly increase energy efficiency, including distributed resources, combined heat and power, and district heating and cooling systems.
- Material conservation programs including source reduction, recycling, and recycled content procurement programs that lead to increases in energy efficiency.
- Reduction and capture of methane and greenhouse gases generated by landfills or similar waste-related sources.
- Energy efficient traffic signals and street lighting.
- Renewable energy technologies on government buildings.

In addition, the DOE had the following requirements for funded projects to:

- Leverage other public and private resources;
- Enhance workforce development;
- Persist beyond the funding period;
- Promote energy market transformation such as revolving loans, low-cost loans, energy savings performance contracting, advanced building codes, building and home retrofit incentives and policies, and transportation programs and policies.

This document summarizes the Energy Efficiency Conservation Strategy that was submitted to the DOE on February 8, 2010.

2. Process

Initial List of Measures

The City presented AECOM with an initial list of measures with budget allocations to analyze, distributing the funding allocation between municipal projects and community projects as shown in the table below.

Initial List of EECS Measures and Suggested Budget	
Project	Cost
<u>Municipal Projects</u>	
EECS Development	\$250,000
Energy Management System (City Hall and Library)	\$90,000
Daylight Harvest and Lamp Upgrade Project (City Hall)	\$100,000
Window Film Project (City Hall)	\$25,000
Energy Management System Upgrade (Police Building)	\$100,000
LED Parking Lot Conversion (City Hall Parking Lot)	\$30,000
Fluorescent Light Wall-Park Conversion (All Buildings)	\$30,000
Agenda Management Software	\$50,000
AB 32 Compliance	\$52,000
Solar Feasibility Study	\$25,000
Geothermal Feasibility Study	\$50,000
TOD Overlay District	\$250,000
Building Code Update	\$150,000
Total Cost Municipal Projects	\$1,202,000
<u>Community Projects</u>	
AB 811 District Establishment and Start-Up	\$400,000
Residential and Commercial Energy and Water Efficiency Audit	\$500,000
Total Cost Community Projects	\$900,000

AECOM investigated each of these initial suggestions, alongside a gap analysis exercise that included assessment of existing programs and policies in place in San Bernardino relating to energy efficiency.

The following Measure Performance Criteria were used to help select the most appropriate strategies:

- Greenhouse Gas reduction – *Quantified GHG reduction potential (MT CO₂)*
- Energy saved - *kWh/year*
- Renewable energy – *additional capacity installed (kW)*
- Jobs created and/or retained – *job creation and retention potential*
- Funds leveraged – *Potential for other funding sources to be leveraged to help fund the measure/policy in addition to EECSBG funding or long after the EECSBG funding had been spent*
- Timeframe for spending - *Ability of the funding allocated to be programmed in 18 months and spent within 36 months, on or before September 12, 2012*
- Coordination with regional agencies - *does the program / policy/ measure include some co-ordination / linking with other regional programs?*
- Political feasibility - *City and community acceptance of the policy/program. Are there any insurmountable obstacles in implementing policy or program?*
- Administrative feasibility - *The feasibility of utilizing City resources and staff to effectively implement a proposed policy/program.*

- *Cost Savings - Does the policy/ program lead to commensurate cost savings for the City or the community based on their initial investment?*

Ancillary benefits were also considered, including the project's contribution to improving air quality and improving the public realm.

Stakeholder Involvement

Two stakeholder meetings, attended by representative staff from City Departments, agencies, and AECOM consultants, were held to discuss ideas and priorities for the EECS on November 9, 2009 and December 3, 2009. Representatives were present from:

- Mayor's Office
- City Manager's Office
- City Clerk's office
- Planning
- Facilities Management
- Building Department
- Development Services

In addition, AECOM interviewed stakeholders from the following agencies:

- Southern California Gas Company
- Southern California Edison
- Community Energy Partnership
- San Bernardino Municipal Water Department
- San Bernardino Economic Development Agency

3. EECS Goals, Measures and Actions

1. Goal: Improve the energy efficiency of existing buildings within the City of San Bernardino Supporting General Plan Goals 9.6.5; 13.1.1; 13.1.3; 13.1.4; 13.1.5; 13.1.6; 13.1.8

- 1.1. Measure: Improve energy efficiency performance of municipal-owned & operated facilities**
 - 1.1.1 Action: Implement lighting retrofit measures in prioritized buildings
 - 1.1.2 Action: Implement agenda management software
- 1.2. Measure: Promote community-wide building energy efficiency for residential buildings**
 - 1.2.1 Action: Develop an energy efficiency rebate and auditing program to supplement local utility programs
- 1.3. Measure: Promote community-wide building energy efficiency for commercial buildings**
 - 1.3.1 Action: Develop an energy efficiency rebate and auditing program to supplement local utility programs
- 1.4. Measure: Participate in a regional energy efficiency and renewable energy financing district**
 - 1.4.1 Action: Establish AB811 program in partnership with surrounding municipalities and San Bernardino County

2. Goal: Increase renewable energy capacity within the City of San Bernardino Supporting General Plan Goals 9.9; 13.1.9

- 2.1 Measure: Explore opportunities for increasing renewable energy capacity for municipal operated and owned facilities and properties**
 - 2.1.1 Action: Through an RFP process, commission a PPA for PV installation on municipal-owned buildings with roof area >10,000 square ft

3. Goal: Improve energy performance of new development within the City of San Bernardino Supporting General Plan Goals 13.1.2; 13.1.7-10

- 3.1 Measure: Develop training and education for City staff on correct implementation of current green building and energy codes**
 - 3.1.1 Action: Train existing staff in LEED and green building design

4. Goal: Achieve AB 32 compliance by reducing GHG emission levels to 1990 levels by 2020

- 4.1 Measure: Develop a comprehensive strategy to achieve AB 32 compliance**
 - 4.1.1 Action: Participate in SANBAG (County of San Bernardino) regional greenhouse inventory and climate action plan project
 - 4.1.2 Action: Develop a San Bernardino specific city-wide Climate Action Plan and supporting municipal GHG inventory

4. Description of Project Activities

The table below summarizes the twelve (12) projects the City of San Bernardino is pursuing with their EECBG funding by cost, job created or retained, and energy saved.

Summary of Activities			
Project Title	Cost	Jobs Created/ Retained	Energy Saved (kWh/annum)
City Hall Lighting Upgrade Project	\$300,657	3.3	198,192
Parking Structure Lighting Upgrade Project	\$174,157	1.9	216,047
Library Lighting Upgrade Project	\$185,157	2.0	160,537
Police Department Lighting Upgrade Project	\$152,157	1.7	236,314
Agenda Management Software	\$58,657	0.6	264
Residential Energy Efficiency Retrofit Program	\$113,657	1.2	55,800
Commercial Energy Efficiency Retrofit Program	\$113,657	1.2	To Be Determined
AB 811 District Establishment and Start-Up	\$433,669	4.7	2,084,000
Solar PPA RFP Preparation	\$86,465	0.9	3,722,589
Staff Training in Energy Efficiency and Green Building through LEED	\$21,257	0.2	To Be Determined
San Bernardino County Regional Greenhouse Gas Inventory Reduction Plan and EIR Participation	\$60,857	0.7	To Be Determined
Energy Efficiency & Conservation Strategy and Climate Action Plan	\$253,657	2.8	To Be Determined
Total	\$1,954,000	21	6,673,743

The pages that follow provide further information on each project, organized by EECS goal, measure, and action.

1. Goal: Improve the energy efficiency of existing buildings within the City of San Bernardino

1.1 Measure: Improve energy efficiency performance of municipal-owned and operated facilities

1.1.1 Action: Implement lighting retrofit measures in prioritized buildings

Project Title: City Hall Lighting Upgrade

Cost	\$300,657
Project Category	Energy Efficiency Retrofits – Public
Estimated Energy Savings	198,192 kWh/annum
Jobs Created/Retained	3.3

EECBG Program funds will be used to undertake a lighting retrofit of the existing lighting installation at the City of San Bernardino City Hall building. The scope of work includes retrofitting existing T12 lamps and magnetic ballasts with new T8 fluorescent lamps and electronic ballasts, replacement of incandescent lamps / fixtures with new compact fluorescent lamps / fixtures, replacement of existing signs, and installing occupancy sensors in selected areas.

The selected contractor will provide, install and render fully operational all-control system components, lighting fixtures, lamps, ballasts and fixture conversions. Additionally, they will also clean all of the reflective surfaces and inside of the lenses of the fixtures.

The project will leverage the ongoing Southern California Edison (SCE) rebate program for energy upgrades. Due to the City of San Bernardino being a "Silver" level of rebate user, they would receive an enhanced additional rebate of \$0.06/kWhr in addition to the base rebate of \$0.05/kWhr, which results in an incentive payment of approximately \$21,000 towards this process.

Project Title: Parking Structure Lighting Upgrade

Cost	\$174,157
Project Category	Energy Efficiency Retrofits – Public
Estimated Energy Savings	216,047 kWh/annum
Jobs Created/Retained	1.9

EECBG Program funds will be used to undertake a lighting retrofit of the existing lighting installation at the 300 N "D" Street Parking Structure, owned by the City of San Bernardino. The scope of work includes retrofitting existing T12 lamps and magnetic ballasts with new T5HO or T8 fluorescent lamps and electronic ballasts, replacement of incandescent lamps / fixtures with new compact fluorescent lamps / fixtures. A daylighting control module will also be installed at the roof deck to control the roof deck lighting on light levels, maintaining a minimum of 5fc (foot candles) at all times.

The selected contractor will provide, install and render fully operational all-control system components, lighting fixtures, lamps, ballasts and fixture conversions. Additionally, they will also clean all of the reflective surfaces and inside of the lenses of the fixtures.

The project will leverage the ongoing Southern California Edison (SCE) rebate program for energy upgrades. Due to the City of San Bernardino being a "Silver" level of rebate user, the City will receive an enhanced additional rebate of \$0.06/kWhr in addition to the base rebate of \$0.05/kWhr, which results in an incentive payment of approximately \$24,000 towards this process.

Project Title: Library Lighting Upgrade	
Cost	\$185,157
Project Category	Energy Efficiency Retrofits – Public
Estimated Energy Savings	160,537 kWh/annum
Jobs Created/Retained	2.0
<p>EECBG Program funds will be used to undertake a lighting retrofit of the existing lighting installation at the City of San Bernardino Library building. The scope of work includes retrofitting existing T12 lamps and magnetic ballasts with new T8 fluorescent lamps and electronic ballasts, replacement of incandescent lamps / fixtures with new compact fluorescent lamps / fixtures, replacement of existing signs, and installing occupancy sensors in selected areas.</p> <p>The selected contractor will provide, install and render fully operational all-control system components, lighting fixtures, lamps, ballasts and fixture conversions. Additionally, they will also clean all of the reflective surfaces and inside of the lenses of the fixtures. The project will leverage the ongoing Southern California Edison (SCE) rebate program for energy upgrades. Due to the City of San Bernardino being a "Silver" level of rebate user, the City will receive an enhanced additional rebate of \$0.06/kWhr in addition to the base rebate of \$0.05/kWhr, which results in an incentive payment of approximately \$17,000 towards this process.</p>	
Project Title: Police Department Lighting Upgrade	
Cost	\$152,157
Project Category	Energy Efficiency Retrofits – Public
Estimated Energy Savings	236,314 kWh/annum
Jobs Created/Retained	1.7
<p>EECBG Program funds will be used to undertake a lighting retrofit of the existing lighting installation at the City of San Bernardino Police Department building. The scope of work includes retrofitting existing T12 lamps and magnetic ballasts with new T8 fluorescent lamps and electronic ballasts, replacement of incandescent lamps / fixtures with new compact fluorescent lamps / fixtures, replacement of existing signs, and installing occupancy sensors in selected areas.</p> <p>The selected contractor will provide, install and render fully operational all-control system components, lighting fixtures, lamps, ballasts and fixture conversions. Additionally, they will also clean all of the reflective surfaces and inside of the lenses of the fixtures.</p> <p>The project will leverage the ongoing Southern California Edison (SCE) rebate program for energy upgrades. Due to the City of San Bernardino being a "Silver" level of rebate user, the City will receive an enhanced additional rebate of \$0.06/kWhr in addition to the base rebate of \$0.05/kWhr, which results in an incentive payment of approximately \$26,000 towards this process.</p> <p>The project will undergo the rebate verification process as required by SCE, which involves submittal of the proposed equipment cut sheets and post-installation inspections to verify completion of the project and release of the rebate funds.</p>	

1. Goal: Improve the energy efficiency of existing buildings within the City of San Bernardino
1.1 Measure: Improve energy efficiency performance of municipal-owned and operated facilities
1.1.2 Action item: Implement agenda management software

Project Title: Agenda Management Software

Cost	\$58,657
Project Category	Material Conservation Program – Public
Estimated Energy Savings	264.6 kWh/Energy Saved Annually
Jobs Created/Retained	0.6

The City of San Bernardino has determined that if they replace their current City Council agenda printing practices with an agenda management software package, which enables them to send and receive agenda packet materials digitally to staff and City Council members for review, they will contribute significant reductions to the City's energy and paper consumption.

Currently, the City Clerk's office uses a large work group printer/copier to produce the draft and final agenda packet materials for the City Council meetings. This printer/copier uses 28KWh on an annual basis and prints/copies 19,255 sheets of paper resulting in .21 MT of CO2 emitted. All supporting documentation for the City Council agendas is printed/copied by another large work group printer at the City's print shop. This printer/copier uses 264.6 KWh annually to produce 221,816 pages for the City Council agendas. With the implementation of the agenda management software, the City Clerk's office proposes that they will no longer need to print at the City's print shop therefore reducing both their paper and energy consumption thus eliminating a significant portion of the energy consumed and paper used for the City Council agenda production.

While the energy consumption reductions and GHG savings resulting from reduced printing efforts by the City Clerk's office for the agenda packet materials are not largely significant, the digital agenda system will massively reduce the consumption of paper for the City as a whole. More importantly, this effort will save the City energy in both the procurement of paper and electricity usage from the printing process on an annual basis. Savings will be earned both from the reduced procurement of paper and energy consumed in preparing the agenda packets. The City currently spends \$295,104 annually on the labor, production, paper, and energy costs associated with the production of draft, final and supporting documentation for the City Council agenda packet material. Purchasing this software will save the City approximately \$109,027 annually, with a five year payback of \$545,135.

1. Goal: Improve the energy efficiency of existing buildings within the City of San Bernardino

1.2 Measure: Promote community-wide building energy efficiency for residential buildings

1.2.1 Action item: Develop a energy efficiency rebate and auditing program to supplement local utility programs

Project Title: Residential Energy Efficiency Retrofit Program

Cost	\$113,657
Project Category	Financial Incentive Program – Residential
Estimated Energy Savings	55,800 kWh/year
Jobs Created/Retained	1.2

The City will work with the utility companies (Southern California Edison and Southern California Gas Company) and the Community Energy Partnership (CEP) to offer a comprehensive energy efficiency retrofit program that includes home auditing services and rebates for energy efficiency improvements. This program will also tie closely with the proposed AB 811 District program to be established with a portion of the City's EECBG funds. In looking more closely at the relationship between the AB811 program and the residential energy efficiency retrofit program, it is anticipated that an audit would be performed before AB 811-financed improvements are installed. Also, the rebate could be applied to the improvement financed through AB 811, reducing the total cost for the homeowner. The final details of the Energy Efficiency Retrofit program will be determined over the next year.

The City's auditing and rebate program will be established in conjunction with the utility companies to ensure the program is complementary with existing programs. In combination with the rebates and incentives already offered by the utility companies, the City's rebates will further incentive the installation of costly energy efficient improvements, such as new windows, insulation, air conditioners, furnaces, heat pumps and boilers. The maximum rebate amount offered by the City will be up to \$2,500 per household.

In order to increase San Bernardino resident participation, a portion of the grant funding will be spent on advertising the City's rebate program and the auditing program. The City may work with the utility companies to determine the best means to advertise. Possibilities include notices with residents' utility bills, citywide post card mailings, advertisements on Omnitrans, newspaper advertisements, press releases, and web postings.

1. Goal: Improve the energy efficiency of existing buildings within the City of San Bernardino

1.3 Measure: Promote community-wide building energy efficiency for commercial buildings

1.3.1 Action: Develop a energy efficiency rebate and auditing program to supplement local utility programs

Project Title: Commercial Building Energy Efficiency Retrofit Program

Cost	\$113,657
Project Category	Financial Incentive Program – Commercial
Estimated Energy Savings	To Be Determined
Jobs Created/Retained	1.2

The City will work with the utility companies (Southern California Edison and Southern California Gas Company) to offer a comprehensive energy efficiency retrofit program that includes business auditing services and rebates for energy efficiency improvements. This program will also tie closely with AB 811 District program in that an audit would be performed before AB 811-financed improvements are installed. Also, the rebate could be applied to the improvement financed through AB 811, reducing the total cost for the business owner. The final details of the Energy Efficiency Retrofit program will be determined over the next year.

The City's auditing and rebate program will be established in conjunction with the utility companies to ensure the program is complementary with existing programs. In combination with the rebates and incentives already offered by the utility companies, the City's rebates will further incentivize the installation of costly energy efficient improvements. The maximum rebate amount offered by the City will be up to \$5,000 per business. Therefore, a minimum of seventeen (17) businesses will receive rebates.

The City of San Bernardino was recently awarded a Compass BluePrint award from Southern California Association of Governments (SCAG) to create a profile of all the properties in the region based upon location, size, and age. The City will use these property profiles to target businesses for auditing and improvements based upon the likelihood of making transformational changes in their energy consumption. The rebates will be available to these businesses, as well as other interested and eligible parties, to encourage them to make improvements.

1. Goal: Improve the energy efficiency of existing buildings within the City of San Bernardino

1.4 Measure: Participate in a regional energy efficiency/renewable energy financing district

1.4.1 Action: Establish AB811 program in partnership with surrounding municipalities and San Bernardino County

Project Title: AB 811 District Establishment and Start-Up

Cost	\$433,669
Project Category	Financial Incentive Program – All Sectors
Estimated Energy Savings	2,084,000 kWh
Jobs Created/Retained	4.7

EECBG Program funds will be used to establish an Energy Efficiency and Renewable Energy Financing District (authorized by AB 811) within the San Bernardino Valley. This district will authorize the City and participating jurisdictions to enter into contractual assessment agreements with property owners to finance the installation of energy efficiency improvements and renewable energy technology that are permanently fixed to real property. The up-front cost of the improvements is typically paid through the issuance of bonds, and the property owner repays the government through an assessment on their property tax bill.

The development of an Energy Efficiency and Renewable Energy Financing District program is a complex undertaking that includes the following activities:

- *Define Partners and Establish Contractual Assessment Authority:* The City will partner with numerous communities within the San Bernardino Valley. Those cities (or county) that agree to participate will need to adopt a resolution to authorize the placement of a tax lien for the purpose of this program.
- *Establish a Separate Legal Entity:* The participating jurisdictions (with legal council) will establish a separate legal entity, such as a Joint Powers Authority, to operate this program collectively and to function as a pooling vehicle for debt issuance.
- *Define Program and Prepare Documentation:* The City, participating jurisdictions, and financial advisors will define the projects to be funded through the program, as well as document the processes, procedures, baseline guidelines, standards, and loan agreements to be met by all current and future program participants. Financing partners and loan procedures will also be established.
- *Legal Validation of Documentation, Procedures, and Lien Placement:* Legal council will be retained to establish the validity of the documentation, contracts, and procedures for lien establishment, priority of lien, and use of debt type.
- *Create Marketing and Educational Materials for Program Outreach:* The City will hire a marketing consultant to plan/run program outreach, including meetings and webinars to educate staff, interested vendors, and residents. When the program is ready to launch, the consultant will create a website, and the City will open an office to accept applications. The City and consultant will also partner with utility companies to include a program advertisement with applicable residents' utility bills.

The City anticipates that the development of the program will take 8 or 9 months and plans to begin accepting applications in late fall of 2010. The City also expects to use a pooled financing model where applications are taken before bonds are issued. The City aims to finance (through the issuance of bonds) over \$7.5 million in energy efficiency and renewable energy projects during the first round of applications. The City is also pursuing a SEP grant to fund ongoing costs, interim financing, interest rate buy-down, or property owner rebates.

2. Goal: Increase renewable energy capacity (kW installed) within the City of San Bernardino

2.1 Measure: Explore opportunities for increasing renewable energy capacity for municipal operated and owned facilities and properties

2.1.1 Action: Through an RFP process, commission a PPA for PV installation on municipal-owned buildings with roof area >10,000 square ft

Project Title: Solar PPA RFP Preparation

Cost	\$86,465
Project Category	Onsite Renewable Technology – Public
Estimated Energy Savings	3,722,589 kWh/annum
Jobs Created/Retained	0.9

ECEBG Program funds will be used to procure power purchase agreements (PPA) with specialist PPA providers. Through PPA's the City will be able to install photovoltaic (PV) panels on the roofs of municipal buildings throughout the City. Outline assessment of the available roof area on municipal buildings throughout the City indicates that a total of around 400,000 sq ft of roof area is available on which to locate PV. Based on established spacing criteria, it is estimated that this would be sufficient for around 2.5MW of PV, which it is calculated would generate around 3,700 MWh of renewable electricity per year and offset around 840 MT CO₂e annually.

A PPA is a long term contract to buy power between a renewable energy producer (in this case a solar provider) and an energy consumer (the City of San Bernardino). The energy producer would finance and install the PV system and then sell the energy produced back to the City over a fixed period of time at a lower price than the City currently pays for grid sourced electricity. By implementing this process the City is able to take advantage of both the federal tax credits and the rebates available through the California Solar Initiative (CSI).

The development of a PPA can be a complex activity. For the size of project envisaged for the City of San Bernardino, it would be typical to hire an external consultant to draft the PPA request for proposals (RFP). This would typically include the following activities:

- *Site Surveying.* A survey of proposed sites would be undertaken to determine the suitability of each for the installation of photovoltaics and to make more detailed assessment of the total capacity that could be installed at each installation.
- *Design Review.* Following receipt of PPA proposals the consultant would undertake a design review of each proposal and make appropriate recommendations to the City as to the preferred provider.
- *Contract Development.* Following selection of the PPA provider, the consultant would be retained to develop the necessary contractual and legal documentation on behalf of the City.

In addition to the costs associated with hiring an external consultant to negotiate and set up the PPA agreement, City staff would also be required to establish the validity of the documentation, contracts and procedures, as well as to negotiate and agreeing the terms of the PPA contract.

3. Goal: Improve energy performance of new development within the City of San Bernardino

3.1 Measure: Develop training and education for City staff and the local building community on correct implementation of current green building and energy codes

3.1.1 Action: Train existing staff in LEED and green building design

Project Title: Staff Training in Energy Efficiency and Green Building through LEED

Cost	\$21,257
Project Category	Workshops, Training, and Education
Estimated Energy Savings	To Be Determined
Jobs Created/Retained	0.2

Through multiple personnel interviews and rigorous review of the current staff capabilities and resources, it has been determined that the Development Services City staff, who work directly with the building and development community, need to be trained in measuring the performance of buildings and increasing energy efficiency throughout the community. The U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED®) credential is the most notable training and certification that the Staff members could achieve at this time. The LEED® accreditation program provides assurances of an individual's current level of competence and is the mark of qualified, educated, and influential green building professionals in the marketplace.

Funding spent towards training would consist of exam preparation, such as the purchase of a study guide, additional practice questions for the exam and attendance at a one-day exam preparation workshop, payment for the exam, as well as ongoing credit management and accreditation through Green Building Certification Institute.

4. Goal: Achieve AB 32 compliance by reducing GHG emission levels to 1990 levels by 2020

4.1 Measure: Develop a comprehensive strategy to achieve AB 32 compliance

4.1.1 Action: Participate in SANBAG (County of San Bernardino) regional greenhouse inventory and climate action plan project

Project Title: San Bernardino County Regional Greenhouse Gas Inventory Reduction Plan and EIR Participation

Cost	\$60,857
Project Category	Technical Consultant Services – All Sectors
Estimated Energy Savings	To Be Determined
Jobs Created/Retained	0.7

The jurisdictions in San Bernardino County face a demanding challenge to meet the targets established by the State of California to address global warming, through the requirements of AB 32 and SB 375. In response to these initiatives, an informal partnership, including San Bernardino Association of Governments (SANBAG), many of the cities in San Bernardino County, and San Bernardino County, is in the process of contracting with consultant ICF to develop a regional greenhouse gas (GHG) inventory and reduction plan to achieve a GHG reduction target of 1990 levels by 2020. Consultant PBS&J has been contracted to prepare an Environmental Impact Report (EIR) for the regional GHG reduction plan once complete.

The City of San Bernardino wishes to participate in this project and benefit from the economies of scale and efficiency that will come about through a regional approach to GHG inventory calculation and GHG reduction plan development and associated EIR. The contribution required for the City to participate is \$52,000. The contract will be managed through SANBAG.

The overall objectives of the project are:

- Provide a climate action plan tool to each city government to develop its internal inventory and reduction plan; provide technical and decision-making support for this tool as needed.
- Develop regional and local climate action measures for the following sectors: building energy water, transportation, goods movement, waste, and stationary fuel combustion.
- Develop external climate action plans for each jurisdiction participating as individual components of a regional (County-wide) climate action plan
- Prepare an EIR for the Regional GHG reduction plan.

4. Goal: Achieve AB 32 compliance by reducing GHG emission levels to 1990 levels by 2020

4.1 Measure: Develop a comprehensive strategy to achieve AB 32 compliance

4.1.2 Action: Develop a San Bernardino specific city-wide Climate Action Plan and supporting municipal GHG inventory

Project Title: Energy Efficiency & Conservation Strategy and Climate Action Plan

Cost	\$253,657
Project Category	Energy Efficiency and Conservation Strategy
Estimated Energy Savings	To Be Determined
Jobs Created/Retained	2.8

A portion of the EECBG funding is being used to develop this Energy Efficiency & Conservation Strategy (EECS). The EECS includes the development of the programs and projects discussed in this document. These programs are intended to assist the City in achieving long term energy efficiency and conservation. The City will use the EECS to create realistic goals and objectives for an overall reduction in energy and greenhouse gas emission levels.

A portion of the EECS funding will also be used to develop a Climate Action Plan for San Bernardino. This will build on the short term strategies developed for the EECS to develop route map to achieve a GHG reduction target of at least 1990 levels by 2020, in line with AB 32.

Tasks are to include:

- Additional stakeholder meetings
- Public workshops/forums
- GHG inventory peer review
- Development of recommended GHG reduction measures, with GHG quantification and economic analysis, action steps and performance indicators
- Development of administrative and public review drafts of CAP
- Attendance at public hearings / council meetings.

5. Next Steps

a. EECS submittal

The EECS was submitted on February 8, 2010 to the Department of Energy for review. It is anticipated that this review period will be approximately 60-90 days. Once the City's EECS is approved, the City may commence with spending the remainder of their grant money on EECS projects. Meanwhile, the City anticipates spending the remainder of their initial \$250,000 to develop a Climate Action Plan.

The Climate Action Plan (CAP) for San Bernardino will build on the short term goals and measures within the EECS and will set out a course of action over the next 10 years for the City to reduce greenhouse gas (GHG) emissions to 1990 levels by 2020 (in line with the requirements of California Assembly Bill 32).

The CAP will contain objectives, measures and actions to reduce greenhouse gas emissions from activities within the community such as:

- Transportation choices (e.g. improving bicycle infrastructure and bus links)
- Water conservation (e.g. efficient appliances and use of rainwater)
- Waste diversion (e.g. improving recycling and composting services)
- Building and public realm energy use (e.g. energy efficiency retrofits)
- Green infrastructure (e.g. expanding the urban forest)

Many of these measures may have positive benefits for the local community such as improved air quality, reduced energy bills and traffic congestion, as well as global environmental benefits.

Work will start on the CAP in 2010, and the City will be looking for community input and ideas (through a variety of outreach sources including on-line surveys and public meetings) regarding what measures and actions will work best to reduce the carbon footprint for San Bernardino and ultimately their GHG emissions.

6. Acknowledgements

We would like to thank the following individuals for their assistance with this EECS:

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Appendix A: Results of Gap Analysis

As well as examining each of the options put forward by the City, AECOM recommended a number of others including hiring a commissioning manager to improve the operating performance of the municipal buildings. The following paragraphs describe why initial projects suggested by the City were rejected.

Solar Feasibility Study

It was recommended that rather than spend further EECBG dollars on a solar feasibility study, either a focused study on one building should be carried out or a Power Purchase Agreement (PPA) RFP should be developed. The Carousel Mall Parking Structure was identified as the most appropriate facility for one detailed study as it had the highest power generation potential, the simplest structure/design and would provide additional beneficial shading of vehicles. A detailed feasibility study for this building would include the structural and electrical system implications and evaluate financing solutions. The alternative was to facilitate the installation of many more panels on municipal buildings through entering into a PPA agreement. This was the preferred alternative.

Geothermal Feasibility Study

Examination of existing data relating to the current geothermal system and discussions with the Water Department indicated that the current system was in significant need of investment to keep it operating even at existing levels. Temperature levels of the ground source water appear to be dropping. A significant investment in a comprehensive study would be required to establish whether the system is worth either upgrading or extending and would not result in energy savings. It was therefore decided not to pursue this as an option.

Building Code Update

Development projections for the City were discussed with the Development and Planning departments. It was decided that levels of new construction were likely to be low for the near term future (at least, within the required timeframe of spending the EECBG grant funds) and so investment in a more efficient building code would not impact a huge number of projects. It was decided that a lower cost and more effective strategy would be to train City staff in the LEED scheme so that staff would be in a position to advise the development community and contractors regarding sustainable design and construction techniques, and be in a better position to ensure that Title 24 and the California Green Building Code are properly implemented in the future.

Retro-commissioning program

AECOM suggested that a retro-commissioning program for the City could result in a 5% energy reduction merely by ensuring that existing equipment is operating in line with the original design intent (could be up to 1,140,000 kWhr/yr saving through retro-commissioning program). Three strategies were proposed:

- Invest in the training of existing O&M staff in retro-commissioning and then allow for retro-commissioning tasks within current job description.
- Recruit experienced commissioning (Cx) specialist to drive the process
- A hybrid approach whereby a Cx consultant was employed temporarily to start the program and train existing staff.

This strategy was rejected due to issues recruiting new staff, and prioritization of the lighting retrofit programs.

Replacement of "series circuit" Streetlights with LED lamps

AECOM proposed replacing existing heads of 232 "series circuit" streetlights with new, high efficiency LED heads. The advantages of this project were that it would replace heads of street lights that were soon to be unsupported by SCE and it would provide direct energy and cost savings. It was however relatively expensive for the carbon reductions achieved and therefore rejected.

Appendix B: San Bernardino EECS – General Plan Energy Policies

The General Plan was reviewed for existing policies that support energy efficiency activities in the building, transportation and water sectors. The list below summarizes the relevant sections:

Chapter 9. UTILITIES

- Goal 9.6 Ensure an adequate, safe, and orderly supply of electrical energy is available to support existing and future land uses within the City on a project level
 - 9.6.5 Encourage and promote the use of energy-efficient (U.S. Department of Energy “Energy Star” or equivalent) lighting fixtures, light bulbs, and compact fluorescent bulbs in residences, commercial, and public buildings, as well as in traffic signals and signs where feasible. (LU-1)
- Goal 9.9 Use the City’s available geothermal resources as an alternative to natural gas and electricity.
 - 9.9.1 Provide for the continued development and expansion of geothermal energy distribution lines. (U-3). Provide public funding to expand the existing geothermal production and distribution system. (U-3)
 - 9.9.2 Promote the use of geothermal resources particularly in the South San Bernardino Area.

Chapter 13: ENERGY AND WATER CONSERVATION ELEMENT

- Goal 13.1 Conserve scarce energy resources.
 - 13.1.1 Reduce the City’s ongoing electricity use by 10 percent and set an example for residents and businesses to follow.
 - 13.1.2 Ensure the incorporation of energy conservation features in the design of all new construction and site development in accordance with State Law. (LU-1)
 - 13.1.3 Consider enrollment in the Community Energy Efficiency Program (CEEP), which provides incentives for builders who attain energy savings 30 percent above the National Model Energy Code, the Energy Star Program, which is sponsored by the United States Department of Energy and the Environmental Protection Agency and encourages superior energy efficiency by residents and businesses, or the State’s Energy Efficiency and Demand Reduction Program, which offer rebates and incentives to agencies and developers who reduce energy consumption and use energy efficient fixtures and energy-saving design elements. (EWC-1)
 - 13.1.4 Require energy audits of existing public structures and encourage audits of private structures, identifying levels of existing energy use and potential conservation measures. (EWC-3)
 - 13.1.5 Encourage energy-efficient retrofitting of existing buildings throughout the City. (EWC-1)
 - 13.1.6 Consider program that awards incentives to projects that install energy conservation measures, including technical assistance and possible low-interest loans. (EWC-1)
 - 13.1.7 Ensure that new development consider the ability of adjacent properties to utilize energy conservation design. (LU-1 and EWC-1)
 - 13.1.8 Educate the public regarding the need for energy conservation, environmental stewardship, and sustainability techniques and about systems and standards that are currently available for achieving greater energy and resource efficiency, such as the U.S. Green Building Council’s “Leadership in Energy and Environmental Design” (LEED) standards for buildings.
 - 13.1.9 Encourage increased use of passive and active solar and wind design in existing and new development (e.g., orienting buildings to maximize exposure to cooling effects of prevailing winds, daylighting design, natural ventilation, space planning, thermal massing and locating landscaping and landscape structures to shade buildings). (LU-1)
 - 13.1.10 Consider adopting an ordinance relating to energy conservation, environmental stewardship, and sustainability for new development that incorporates the LEED standards. (A-1)

- **Implementation Measures**

- EWC-1 Evaluate the means and establish an appropriate program by which water and energy efficient fixtures and water/energy-saving design elements can be installed in existing structures.
- EWC-2 Develop environmental and water/energy-efficient design guidelines for new construction.
- EWC-3 Perform energy audits on all existing City buildings identifying levels of existing energy use and potential conservation measures.

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