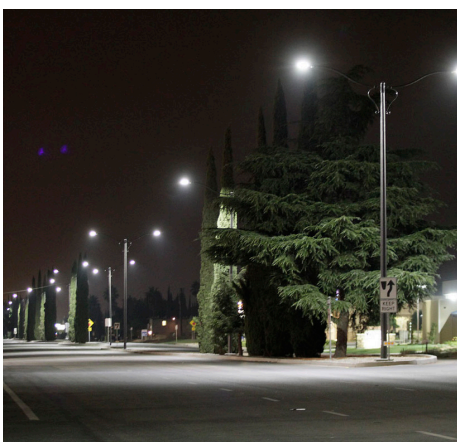
AECOM

Prepared for
The City of Beaumont
550 East Sixth Street
Beaumont, CA 92223

Climate Action Plan for the Building Energy Sector City of Beaumont, California



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Mayor's Letter

The potential effects of climate change could have significant impacts on the future of Beaumont. In response to these threats, and to do our part to mitigate climate change, Beaumont has prepared a Climate Action Plan (CAP). This CAP contains strategies to reduce greenhouse gas (GHG) emissions from the building energy sector throughout our community.

I want to thank City staff for all of their hard work throughout this process. I also want to acknowledge the public for their continued involvement and support.

Beaumont already has much to be proud of in the fight against climate change. These efforts include:

- Forming a partnership with Southern California Edison (SCE) and Southern California Gas Company (SCG) called the Energy Leader Partnership (ELP) to reduce its municipal and community-wide energy footprint
- Implementing of variety of retrofits in municipal lighting and heating, ventilation, and air-conditioning (HVAC) systems
- Conducting various forms of outreach in the Beaumont community to encourage adoption of energy efficiency and renewable energy programs offered by SCE and SCG.

We want to continue this momentum and I urge you to do your part to reduce Beaumont's GHG emissions community-wide. Successful implementation of this plan will take effort from everyone including City government, residents and businesses. I look forward to seeing what we can accomplish together.

Sincerely,

Brenda Knight

Mayor Brenda J. Knight

Contents

Common Acronyms

AB	Assembly Bill
CARB	California Air Resources Board
CAP	Climate Action Plan
CARB	California Air Resources Board
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CH_4	Methane
CNG	Compressed Natural Gas
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide equivalent
ELP	Energy Leader Partnership
EPA	U.S. Environmental Protection Agency
EO	Executive Order
GHG	Greenhouse Gas
GWP	Global Warming Potential
HVAC	Heating, ventilating, and air conditioning
IMT	Institute for Market Transformation
IPCC	Intergovernmental Panel on Climate Change
MPO	Metropolitan Planning Organization
MT	Metric Tons
NRDC	Natural Resources Defense Council
PACE	Property Assessed Clean Energy
RPS	Renewable Portfolio Standard
RTP	Regional Transportation Plan
SB	Senate Bill
SCAG	Southern California Association of Governments
SCE	Southern California Edison
SCG	Southern California Gas Company

Introduction

Introduction

Background

Climate change is one of California's most urgent environmental problems, and is considered a major global challenge for the 21st century. Driven primarily by greenhouse gas (GHG) emissions from human activities, the global climate is changing as evidenced by higher air and ocean temperatures, reduction in the extent of sea ice, and rising sea levels. These changes in the global climate also have local impacts, such as heat waves, drought, and wildfire. In fact, the City of Beaumont is already experiencing some of these impacts. In addition, the activities that generate greenhouse gas emissions, such as the consumption of natural gas and electricity generated from fossil fuel combustion, have local impacts, such as poorer air quality. Not only can reducing greenhouse gas emissions can help prevent the worst impacts of climate change from coming to bear in future decades, but these activities can also have many near-term local benefits, including better air quality, lower energy costs, and improved public health.

A Climate Action Plan (CAP) is a key tool that cities across the world, including many in Southern California, are developing to help decrease their dependence on fossil fuels, and to decrease their share of GHG emissions contributing to global climate change. Beaumont's CAP examines GHG emissions from the building energy sector (i.e., energy consumption in buildings). While there are other sources of GHG emissions, such as the waste and transportation sectors, this CAP focuses on energy consumption in buildings and sets out strategies requiring the commitment and involvement of local residents and businesses to help the City to move towards a lower carbon future. This CAP does much more, however, than just reduce greenhouse gas emissions. The strategies included within in this document will also help make Beaumont a more attractive place to live, through better air quality, lower energy bills, and more local jobs.

Action Against Climate Change – The Beaumont Context

In recent years, Beaumont has been a local leader in addressing climate change by putting in place, goals, policies and actions that are consistent with greenhouse gas mitigation.

Beaumont's 2007 General Plan[1] includes policies which promote the use of energy-efficient equipment and design in City facilities and infrastructure, and the incorporation of energy conservation features in new developments and renovation of existing development.

1 City of Beaumont General Plan, Chapter 4 – Resource Management, Page 50 <www.ci.beaumont.ca.us/DocumentCenter/Home/View/63>

In line with these policies, the City has participated, since 2008 the City has participated in the Energy Leader Partnership (ELP) program offered by Southern California Edison (SCE) and Southern California Gas Company (SCG). Through this partnership, the City has identified and implemented energy efficiency opportunities in its municipal facilities, thus leading by example in energy conservation efforts. In addition, the City has also leveraged the ELP to increase community awareness and participation in community-wide energy efficiency programs funded by the two utilities.

Beaumont's recent energy conservation achievements include:

- Lighting retrofits at City parking lots.
- Lighting retrofits via SCE's Municipal Direct Install Program at the Civic Center, Police Department, Community Recreation Center, and the City Pool completed in late 2013, which have yielded energy savings of 35,774 kWh to date.
- Replacement of the pool pump at the City Pool, which yielded energy savings of 5,994 kWh.
- Heating, Ventilation, and Air-Conditioning (HVAC) upgrades at the Civic Center.
- Energy retrofits at the wastewater treatment plant pump station.
- Streetlight retrofits.
- Lighting retrofits at the Old Summit Elementary School.
- The use of social media to promote energy conservation (e.g. the City of Beaumont, California Facebook page).
- Distribution of co-branded information on Energy Efficiency programs in utility bills and/or licensed information pieces.[2]
- Presentations on energy efficiency savings and sustainability to the Chamber of Commerce, Beaumont Rotary Club, and Pass Business Connection (a group of local business owners and representatives who share ideas and marketing funds to promote the goal of "Keeping Business Local" in the San Gorgonio Pass region).
- Participating in SCE's "Energy Walk," an outreach effort which is focused on very small businesses (a hard-to-reach sector of the economy).
- Promotion of ELP rebates through co-branded displays in City Hall.
- Platinum-level ELP membership, which demonstrates compliance with the most stringent participation criteria of the ELP program.

Beaumont Climate Protection Vision

The Beaumont CAP aims to build on the achievements of the City and the community in reducing their energy and GHG footprint. The future for Beaumont that is envisioned in the CAP includes:

- A reduction of GHG emissions that contributes to State-level GHG mitigation efforts.
- A business and residential community committed to a more sustainable way of working and living.
- An emphasis on reducing energy use in our homes and buildings.

2 Licensed information pieces are "co-branded" marketing materials that have been developed by the City of Beaumont, SCE, and SCG. They include informational articles about programs and projects that the City has worked on in cooperation with these utilities.

- An emphasis on solar thermal and solar photovoltaic installations on homes and businesses.
- A stronger local economy through reduced energy costs, increased property values, and green collar jobs.

Public Outreach

The development of the CAP involved a wide range of local stakeholders from the very beginning of the process. A project kick-off meeting was held with City staff in October 2013 to ensure a common and shared understanding of the City's vision and goals for the CAP. In February and March 2014, three meetings were hosted in Beaumont to engage the community at various stages of the climate action planning process. An online survey was also distributed to the community, and made available for several months as a means for gathering additional input. Nine survey responses were received and analyzed, and results from the survey informed the development and selection of the strategies.

The participation of the community was essential in the development of GHG reduction strategies. That participation – which needs to expand – will also be crucial in helping the City achieve its GHG emission reduction goals and realize the aforementioned co-benefits. In fact, most of the selected CAP strategies rely on a strong public outreach and education component, with an expectation that much of the outreach will be carried out by community members themselves – talking to their neighbors, friends, and fellow members of community organizations.

Scope of the Climate Action Plan

This CAP focuses on GHG emission reductions in the building energy sector. Specifically, the building energy sector includes consumption of electricity and natural gas in residential, commercial, and industrial buildings in the Beaumont community.

Climate Action Plan Content

The following outlines the content available in each of the following chapters.

Chapter 1: Outlines the CAP development process for Beaumont, and provides details on the community engagement process that informed the selection of GHG emission reduction strategies.

Chapter 2: Details the first two stages of the quantitative analysis that was performed in the CAP development process: calculating the baseline GHG inventory for the building energy sector, and projecting future emissions under two scenarios – a Business As Usual scenario (BAU), and an Adjusted BAU scenario.

Chapter 3: Describes the selected GHG reduction strategies for the Beaumont CAP, with estimates of the technical potential for GHG emissions reductions in individual buildings, estimates of participation rates, and then estimates of the community-wide reductions through 2020, which are based on the combination of technical potential and participation rate estimates.

Chapter 4: Gives an overview of recommended implementation and monitoring measures for each strategy, including mechanisms for funding each strategy, with order-of-magnitude estimates of costs to the city, homeowners, and building owners.

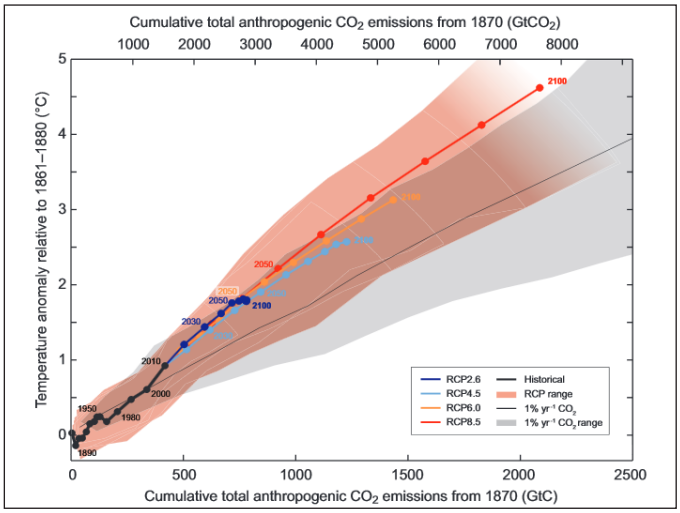
Chapter 5: Provides a high-level economic analysis of the co-benefits expected from the CAP's implementation, including job creation and property value increases

Appendices: Provides information on the GHG inventory, the rationale and background behind the GHG reduction quantification, and the energy modeling undertaken for the building energy measures.

Climate Change

The overwhelming consensus from scientists around the world is that climate change is a reality, and that it is primarily caused by human activities. Resulting largely from the combustion of fossil fuels, atmospheric concentrations of carbon dioxide (CO_2) – the principal anthropogenic greenhouse gas – are at a level unequaled for at least the last 800,000 years. Greenhouse gases from human activities, such as burning of fossil fuels for use in buildings and transportation and methane production from agricultural practices, are trapping more of the sun's heat in the earth's atmosphere and warming the earth. Over the last century, average global temperatures have risen by more than 1.5°F (0.85°C), with predictions for continued temperature increases in the coming years.

In its 5th assessment of climate change (2013),[3] the United Nations International Panel on Climate Change (IPCC) provides a comprehensive overview of various GHG emissions scenarios as well as their impacts on the climate over the course of this century, as agreed upon by the largest consensus of scientists ever assembled from around the world. These scenarios, known as Representative Concentration Pathways (RCPs) vary from a best-case scenario characterized by intensive GHG mitigation efforts, to a worst-case scenario characterized by unabated GHG emissions without mitigation efforts. The graph below shows the expected increase in average annual global temperature under various RCPs. The four RCPs – RCP2.6, RCP4.5, RCP6, and RCP8.5 – are named after a possible range of radiative forcing[4] values in the year 2100 (+2.6, +4.5, +6.0, and +8.5 watts per square meter [W/m2], respectively).



If these projections become reality, climate change will threaten our economic well-being, public health, and environment. While some degree of climate change is now deemed inevitable, most climate scientists agree that in order to avoid serious impacts from climate change, atmospheric GHG concentrations need to be stabilized as quickly as possible. Such stabilization can only occur if GHG emissions are dramatically reduced from current levels.

Effects of Climate Change in Riverside County

Models of the potential impact of climate change have primarily been developed at global and regional scales. Much uncertainty still exists about the extent of the changes that could be felt due to the incredibly complex interactions at play, particularly at the city level. However, potential impacts may include the following:

- Temperature rises of 3.7°F and 6.5°F by the end of the century.
- A significant increase in the number of heat-waves per year by the end of the century.
- Reduced water supply due to a decrease in annual rainfall.
- Slight increase in wildfires due to increased temperatures and drier conditions.

3 IPCC, 2013: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1535 pp.

4 Radiative forcing is defined as the imbalance between incoming solar radiation and outgoing infrared radiation that causes the Earth's radiative balance to stray away from its normal state, which, in turn, causes changes in global temperatures.

State Actions Regarding Climate Change – the California Context

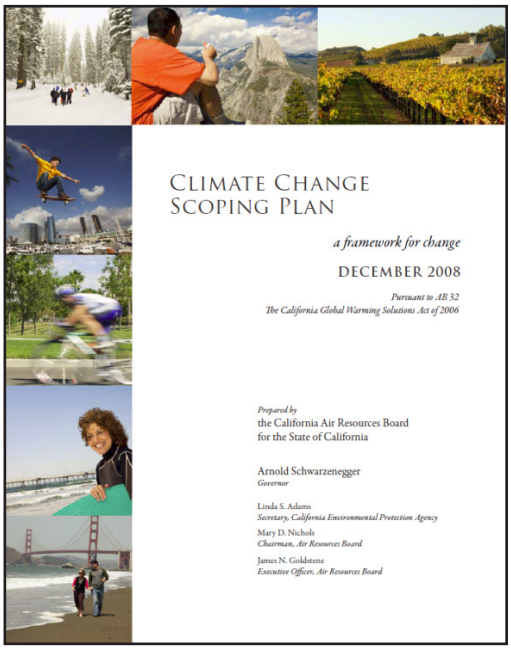
Beaumont's actions for GHG emission reductions in the building energy sector must be set within the context of the State of California's laws and initiatives, where much of the impetus for local action originates. California has long been a leader in GHG mitigation activities in the building energy sector, as illustrated by the following state-level actions.

Executive Order S-3-05

Recognizing California's vulnerability to reduced snowpack, exacerbation of air quality problems, and sea-level rise resulting from a changing climate, Governor Schwarzenegger signed Executive Order (EO) S-3-05 in 2005. This EO established targets to reduce GHG emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050.

Assembly Bill (AB) 32 - (California Global Warming Solutions Act)

In 2006, California became the first State to adopt a GHG reduction target through Assembly Bill (AB) 32, thereby making EO S-3-05 legally binding. This Bill requires California to reduce statewide emissions to 1990 levels by 2020. Reducing greenhouse gas emissions to 1990 levels means cutting approximately 30 percent from business-as-usual emissions levels projected for 2020, or about 15 percent from 2005 emission levels. AB 32 resulted in the production of a Scoping Plan, approved in 2008, which outlines the State's plan on how it will achieve the emissions reductions through a mixture of direct regulations, alternative compliance mechanisms, different types of incentives, voluntary actions, market based mechanisms, and an AB 32 program implementation regulatory scheme – the state's Carbon Cap and Trade Market – to fund the program. The Scoping Plan addresses sectors relevant to Beaumont's CAP, such as building energy efficiency.



Up to date progress and details on all legislation and actions supporting AB 32 implementation can be found on the California Air Resources Board (ARB) website (see: www.arb.ca.gov).

Senate Bill (SB) 97 - California Environmental Quality Act Guideline Amendments

SB 97 was adopted in 2007 and directed the Governor's Office of Planning and Research (OPR) to amend the California Environmental Quality Act (CEQA) Guidelines to address GHG emissions. The CEQA Guidelines prepared by OPR were adopted in December 2009 and went into effect March 18, 2010. Local governments may use adopted CAPs that are consistent with CEQA Guidelines to assess the cumulative impacts of development projects on climate change; consistency with CEQA means that the CAP accomplishes the following:

- Quantifies GHG emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area.
- Establishes an emissions level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable.
- Identifies and analyzes the GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area.
- Specifies measures or a group of measures, including performance standards that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level.

- Establishes a mechanism to monitor the plan's progress toward achieving the specified emissions level, and requires an amendment to the plan if it is not achieving the specified levels.
- Is adopted in a public process following environmental review.

Senate Bill (SB) 1368 – Emissions Performance Standards

SB 1368, enacted in 2006, sets performance standards for new long-term financial investments in electricity generation in California. This legislation will require electricity generators to comply with a GHG emission performance standard established jointly by the California Energy Commission (CEC) and the California Public Utilities Commission (CPUC).

Renewable Portfolio Standard (RPS)

The following actions have established increasingly stringent RPS requirements for California utilities. RPS requirements mandate that utilities incorporate renewable energy sources in their electricity generation so that by certain milestone years, a specified minimum percentage of energy generation comes from renewable, non-GHG-emitting sources. RPS- eligible energy sources include wind, solar, geothermal, biomass, and small-scale hydro-power.

- **State Bill (SB) 1078:** required investor- owned utilities to provide at least 20 percent of their electricity from renewable resources by 2020.
- **SB 107** accelerated the timeframe to take effect in 2010.
- **EO-S-14-08** increased the RPS further to 33% by 2020.
- **SBX1-2 of 2011** codified the 33% requirement in state law.

(SCE, Beaumont's electricity provider, delivered 21.6% of its electricity from renewable sources in 2013.)

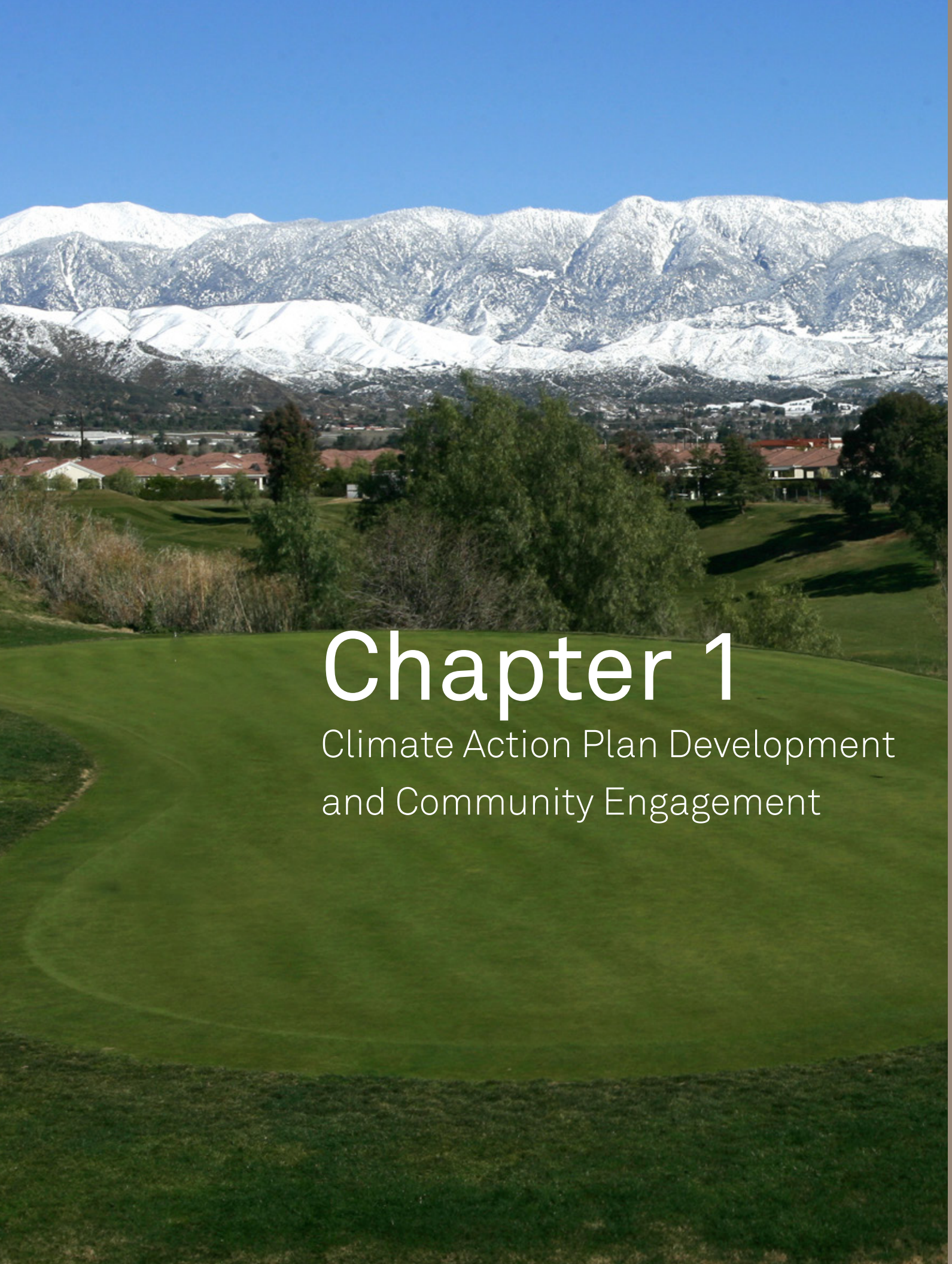
Title 24 – Building Energy Efficiency Standards Updates of 2013

The 2013 updates to California's Building Energy Standards improve upon the 2008 Standards for new construction of, and additions/alterations to, residential and nonresidential buildings.

Assembly Bill (AB) 811

AB 811 enables local governments in California to assist in financing the upfront costs of energy efficiency improvements or renewable energy installations that are permanent fixtures to a property. The bill authorizes cities and counties to establish assessment districts in order to provide property owners with loan financing for the installation of energy and water improvements within their home or business and pay back the loan over time through a line item on their property tax bill. This is achieved through the creation of a financing mechanism called a Property Assessed Clean Energy (PACE) finance program. More details can be found in Chapter 3.

These State-level actions will contribute in various ways to reducing GHG emissions at the local scale. In this CAP, the GHG emission reduction impacts of RPS and Title 24 updates are accounted for in the City's projected emissions in order to understand the extent to which State mandates will reduce community-wide GHG emissions, and to what degree the City of Beaumont needs to complement State efforts with its own initiatives to achieve its local emissions reduction goals (see Chapter 2 for GHG emission reductions associated with these legislations).



Chapter 1

Climate Action Plan Development and Community Engagement

Chapter 1: Climate Action Plan Development and Community Engagement

Typical Climate Action Planning Process and Content

Cities in California are among other national leaders in the development of local-level climate action plans (CAPs). A typical CAP includes the following elements:

- Completion of a baseline greenhouse gas (GHG) emissions inventory.
- Development of a GHG emissions forecast.
- Identification of a community-wide GHG reduction target for a certain year.
- Development of GHG reduction strategies to meet the reduction target.
- Evaluation of the environmental impacts of identified GHG reduction strategies consistent with the California Environmental Quality Act.
- A plan for CAP implementation.
- A plan for monitoring progress toward the reduction target and for modifying the CAP if progress is not sufficient.

A typical CAP addresses GHG emissions from community-wide sources, or sectors, including energy consumption (e.g., electricity and natural gas consumption in residential, commercial, and industrial buildings), transportation, water and wastewater, solid waste, and stationary sources (e.g., factories, public facilities such as wastewater treatment plants).

Beaumont Climate Action Planning: Content

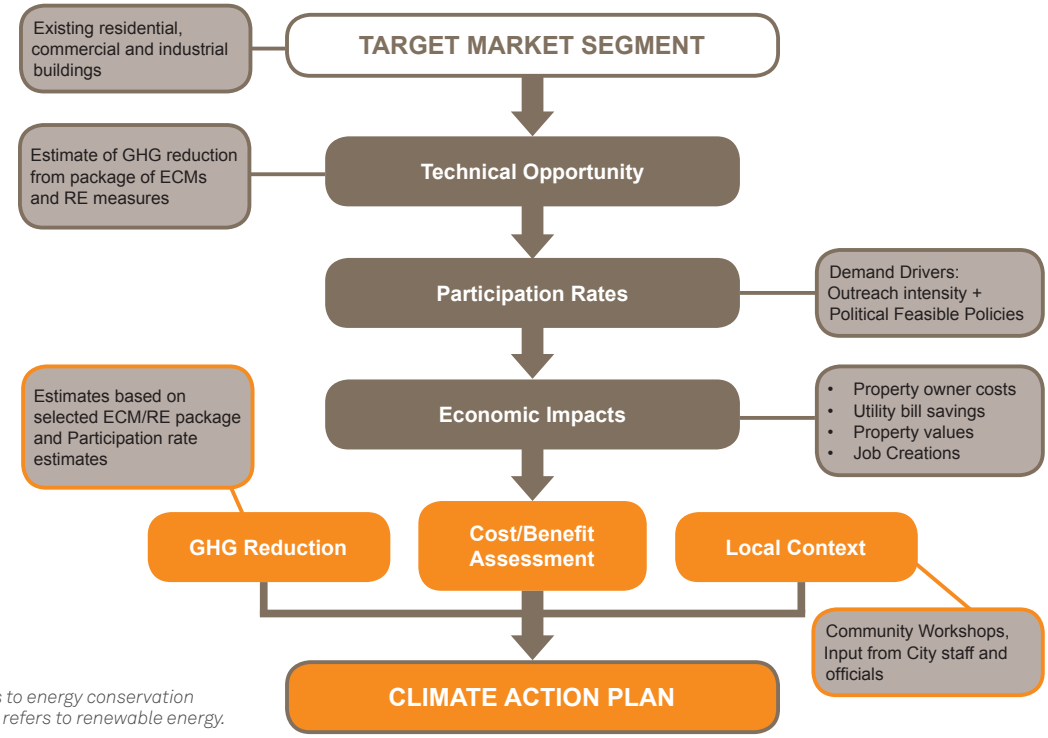
The City of Beaumont CAP is limited to an analysis of and strategies for reducing emissions in the energy sector – specifically in buildings.[5] The limited scope of this CAP is in large part a function of the source of grant funds that paid for its development. The grant funds came from the California Public Utilities Commission through the local electric utility, Southern California Edison, and from the local natural gas utility, Southern California Gas Company.

5 Southern California Edison and Southern California Gas Company provided the initial funding for this CAP to focus on the building energy sector. The City is expanding the scope of the CAP to include additional sectors, including transportation, wastewater, and solid waste. This additional work is being funded by a grant from the Southern California Association of Governments' Regional Transportation Plan/ Sustainable Communities Strategy program.

The City's CAP includes the following components:

- A baseline GHG emissions inventory of the building energy sector.
- GHG emissions forecasts based on projected growth in the Beaumont community through 2020.
- A suggested GHG emissions reduction target relative to the baseline year and the 2020 forecast year.
- A suite of GHG emission reduction strategies tailored to the Beaumont community.
- Estimates of GHG emission reductions that will occur through strategy implementation.
- Order-of-magnitude estimates of implementation costs and co-benefits.
- Suggested implementation routes for each strategy (summarized in Figure 1 below).

Figure 1. Implementation Routes for Strategies



Note: ECM refers to energy conservation measure and RE refers to renewable energy.

Beaumont Climate Action Planning: Community Engagement

City staff convened two workshops during the CAP development process. One workshop included two elected city officials, selected city staff, representatives of public entities (including the school district), as well as representatives from Southern California Edison (SCE) and Southern California Gas (SCG). The other workshop was open to the general public, and was broadly promoted by the City and held in the evening to encourage participation.

The workshops had a three-fold purpose. The first purpose was to provide workshop participants with a common understanding of climate change and the CAP development process. The second purpose was to introduce sample GHG reduction strategies to Beaumont's stakeholders. The third purpose was to solicit feedback from stakeholders on the sample strategies to identify which strategies were most likely to be embraced by residents, business owners, and civic leaders in Beaumont.

The sample strategies were selected because they a) address the GHG emitting activities that are the CAP's specific focus (i.e., energy use in existing buildings), b) are strategies that the City could implement on its own, without any changes in state or federal law, and c) represent a broad spectrum of approaches (e.g., education and outreach, mandated actions for residential, commercial, and industrial building tenants and owners).

To facilitate the understanding and selection of strategies to be incorporated into the CAP, the workshop presentations included a series of tables that informed workshop participants of the implementation impacts associated with each strategy.

The first of these tables (Table 1-1), shown below, provides a Low/Medium/High estimate for the GHG emissions reduction potential of each strategy.

Table 1-1: GHG Emissions Reduction Potential for Each Strategy Type

GHG Reduction Potential Of Various Strategies		
Strategies Targeting Existing Residential Buildings		
Type of Strategy	**Policy Description**	**GHG Reduction Potential**
Outreach	Promote third-party rebates, technical assistance, and on-bill financing	Low-Medium
Financial Incentives	Establish PACE financing program	Medium-High
Technical Assistance	Administer program offering free residential energy inspection/ energy performance assessment	Medium
Policy Mandate	Adopt and enforce benchmarking requirement[6]	Medium-High
Policy Mandate	Develop and enforce Residential Energy Conservation Ordinance (RECO)[7]	High
Strategies Targeting Existing Commercial and Industrial Buildings		
Outreach	Promote third-party rebates, technical assistance, and on-bill financing	Low-Medium
Technical Assistance	Administer program offering free commercial/industrial building/ operations energy inspection/energy performance assessment	Medium
Policy Mandate	Develop and enforce benchmarking requirement[8]	Medium-High
Policy Mandate	Develop and enforce Commercial Energy Conservation Ordinance (CECO)	High
Strategies Targeting Renewable Energy Deployment		
Outreach	Promote PPAs, rebates, on-bill financing, and informational resources on solar installation	Low
Technical Assistance	Administer program providing information on solar hot water and solar PV installation technologies, economics, financing options, and procurement pathways.	Medium

As shown in Table 1-1, the strategies with the lowest impact are those that focus on outreach and education. Those that provide incentives and technical assistance are more likely to lead to a medium level of GHG reductions (these often incorporate outreach and education as well). Mandates that require specific actions lead to the highest levels of reduction potential.

All of these strategies bring with them impacts that go well beyond GHG reductions. To ensure that workshop participants were aware of these other impacts, the workshop included a discussion of the most important additional impacts, which are summarized below in Table 1-2.

6 A residential benchmarking requirement mandates that homeowners assess and publicly disclose the energy performance of their homes. The requirement could be mandated when a home is sold or leased, or could be mandated annually or at some other frequency. The City of Austin, Texas has such a requirement. For more information, please see: http://www.austinenergy.com/wps/wcm/connect/deb31977-bc57-4025-ba84-237ae9588aae/ordinance.pdf?MOD=AJPERES.

7 A Residential or Commercial Energy Conservation Ordinance (RECO and CECO, respectively) requires property owners to implement specific energy conservation measures when the owner sells the home or building, similar to current laws that require the installation of earthquake and other safety measures. The law could also apply when residential property owners lease their homes. For more information, please see: http://ecoleader.org/assets/downloads/RECO/RECO_factsheet.pdf

8 The State of California already has a law in place mandating energy performance disclosure for commercial buildings. Disclosure is required at sale, lease, or refinance of a building. The City of San Francisco has taken the California law a step further, requiring energy performance assessments (i.e., energy audits) every five years and energy performance benchmarking annually. For more information, please see: http://www.sfenvironment.org/energy/energy-efficiency/commercial-and-multifamily-properties/existing-commercial-buildings-energy-performance-ordinance

Table 1-2: Additional Impacts of GHG Emissions Reduction Strategies

Impacts	Discussion
Costs to the City	The costs the city would incur for staff time, marketing expenses, and other costs
Costs to Individuals/ Businesses	The upfront costs to individuals and businesses to take advantage of an opportunity, or to comply with a mandate
Utility Bill Savings	Reduction in utility bills, influenced by the amount of and financing mechanisms of the upfront costs identified above
Job Creation	Jobs created by the installation of a mitigation measure, and the jobs from increased local spending resulting from reduced utility bills
Indoor Comfort and Health	Increase in comfort/livability of a home or business, often accompanied by improved indoor air quality
Property Values	Increase in property values from greater energy efficiency and comfort, or with renewable energy equipment installed[9]

With this understanding of the related impacts, workshop participants were provided a high-level assessment of the level of each impact that the community could expect from the previously discussed strategies. That assessment is presented in the Table 1-3.

Table 1-3: All Impacts of GHG Emissions Reduction Strategies

Type of Strategy	Policy Description	GHG Reduction Potential	Cost to City	Cost to Individual/ Business	Utility Bill Savings	Job Creation Potential	Indoor Comfort	Property Values
Strategies Targeting Existing Residential Buildings								
Outreach	Promote third-party rebates, technical assistance, and on-bill financing	L-M	L	L	L	L-M	M	L
Financial Incentives	Establish PACE financing program	M-H	M-H	L-M	M-H	H	H	M
Technical Assistance	Free energy performance assessment	M	M-H	L	M	L-M	L-M	L
Policy Mandate	Adopt benchmarking requirement	M	L	L-M	M-H	M-H	L	L
Policy Mandate	Develop and enforce RECO	H	M	M-H	H	H	H	M
Strategies Targeting Existing Commercial Buildings								
Outreach	Promote third-party rebates, technical assistance, and on-bill financing	L-M	L	L	L-M	L-M	M	L
Technical Assistance	Free energy performance assessment	M	M-H	L	M	L-M	L-M	L
Policy Mandate	Develop and enforce benchmarking requirement	M-H	L-M	L	L-H	M	M	L-M
Policy Mandate	Develop and enforce CECO	H	M	M-H	H	H	H	M
Strategies Targeting Renewable Energy Deployment								
Outreach	Promote PPAs, rebates, on-bill financing, and informational resources on solar installation	L	L	L	L-M	M-H	L	L
Technical Assistance	Administer program providing info on solar hot water and solar PV	M	M	L	L-M	L-M	L	M

After a break, workshop participants were given an opportunity to express their preferences for each of the strategies. Each participant was given ten votes, which they could allocate in any way to a list of strategies (slightly abbreviated from the full list in the tables above). For instance, a participant could place all ten of his or her votes

9 A December 2013 study by the Lawrence Berkeley National Laboratory on the impact on residential home values with solar PV systems concluded that each 1 kilowatt in size of a system yields a $5,911 increase in market value. For more information, please see: http://emp.lbl.gov/sites/all/files/lbnl-6484e.pdf.

in favor of one strategy, or four on one strategy and two each on three other strategies, and so on. The results of the voting are presented in the following Table 1-4, with the most preferred strategies are highlighted in yellow.

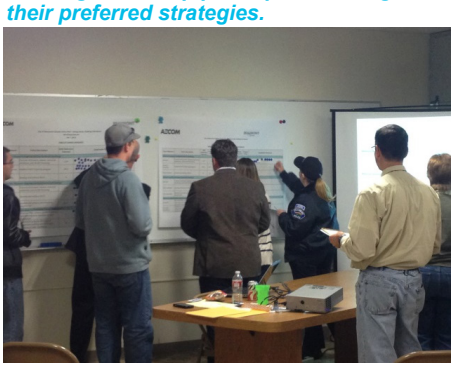
Table 1-4: Voting Results for GHG Emissions Reduction Strategies

Type of Strategy	Policy Description	Preferences:	Preferences:
Strategies Targeting Existing Residential Buildings			
Outreach	Promote third-party rebates, technical assistance, and on-bill financing	25	23%
Financial Incentives	Establish PACE financing program	32	29%
Policy Mandate	Develop and enforce RECO	3	3%
Strategies Targeting Existing Commercial Buildings			
Outreach	Promote third-party rebates, technical assistance, and on-bill financing	12	11%
Policy Mandate	Develop and enforce benchmarking requirement	7	6%
Policy Mandate	Develop and enforce CECO	6	5%
Strategies Targeting Renewable Energy Deployment			
Outreach	Promote PPAs, rebates, on-bill financing, and informational resources on	17	15%
Technical Assistance	Administer program providing information on solar hot water and solar PV	8	7%
# of Responses		**110**	**100%**

The results show a clear preference for voluntary strategies – outreach and education, and providing financial incentives. The results can also be interpreted to reveal a strong opposition to mandates, especially those with higher costs for residents, such as the RECO option.

This valuable feedback was subsequently presented to the Beaumont City Council during a public evening meeting at Beaumont City Hall. In addition to the City Council, at least 100 residents were present as well. After the presentation, City Council members expressed a particular interest in the PACE program.

Evening workshop participants voting for their preferred strategies.

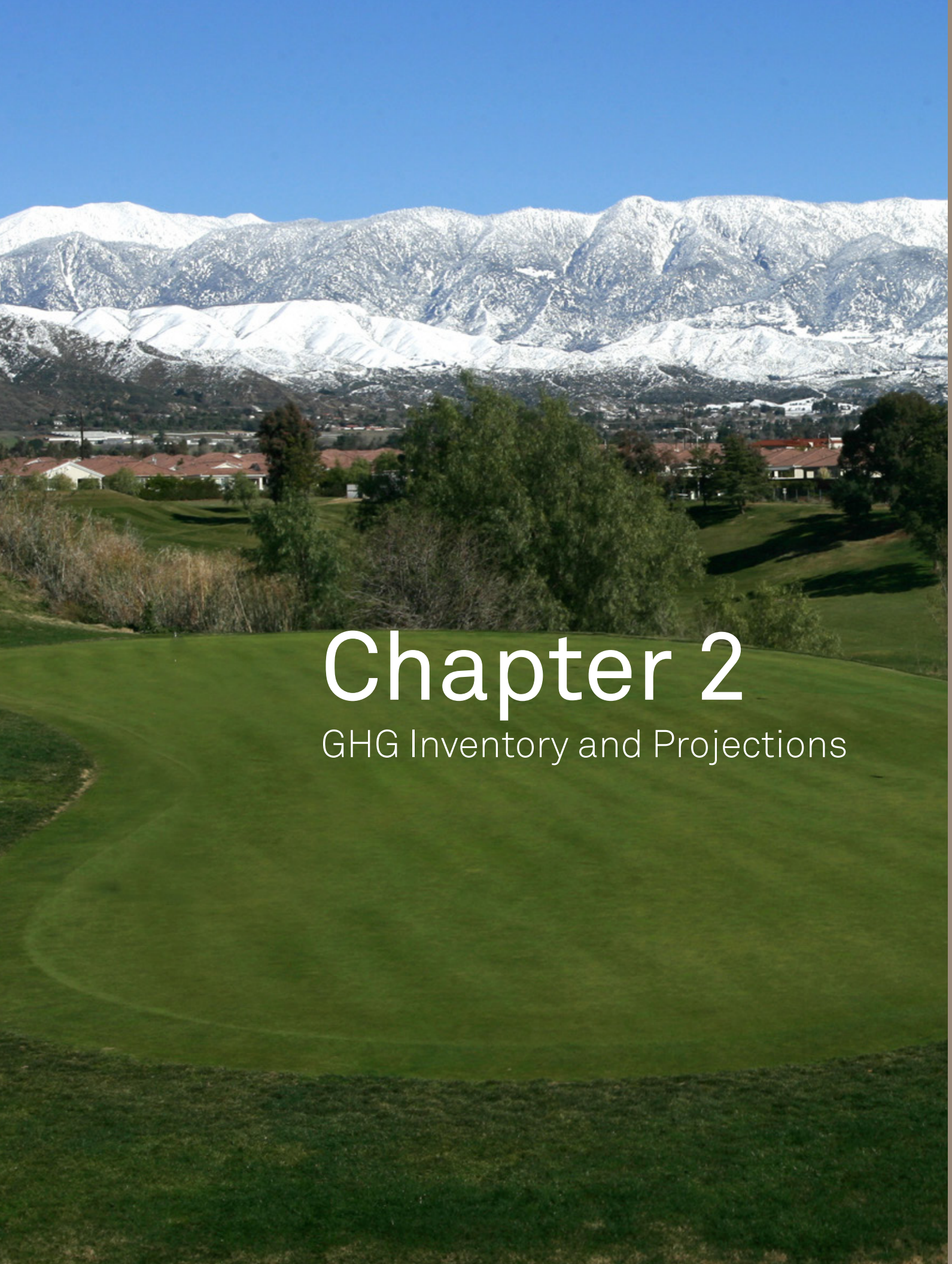


These voting results and the feedback from City Council members at the public meeting provided critical information to the quantitative modeling work that was conducted to estimate the GHG emissions reductions that would likely result from implementation of the CAP. These community engagement opportunities provided focus to the GHG emission reduction strategy selection process.

CAP Connection to City General Plan Update and CEQA Compliance

The City of Beaumont is scheduled to update its General Plan in 2017, and plans to add a climate change and sustainability element in this update.[10] Once this CAP is expanded to include GHG emissions analysis for other sectors (e.g., transportation, solid waste) it can directly inform the climate change and sustainability element in the General Plan update. Moreover, the expanded CAP presents an opportunity to ensure that future development projects will be in compliance with CEQA requirements specific to GHG emissions in a streamlined manner, as long as the CAP sets meaningful GHG reduction goals, and clearly delineates a roadmap to achieve those goals. Specifically, the CAP can be used to assess the cumulative impacts of future development projects on climate change in Beaumont, rather than conducting separate GHG impact assessments for each individual development project. For more guidance on the inter-connection between CAPs, General Plans, and CEQA compliance, refer to the California Governor's Office of Planning and Research website (see: http://www.opr.ca.gov/).

10 Beaumont Chamber of Commerce. (2014). Beaumont Begins New Revolution. Beaumont Now!, pp-8-9 https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&cad=rja&uact=8&ved=0CC8QFjAC&url=http%3A%2F%2Fwww.beaumontcachamber.com%2F_literature_205603%2FApril_2014_-_Beaumont_Now&ei=pk2mU-iBPIP8oASlnYDAAQ&usg=AFQjCNGdoTPt64wZxKqL5scavkyYntYH3w&sig2=APY1bmxXMmu6sKJAgOr7GQ&bvm=bv.69411363,d.cGU.



Chapter 2

GHG Inventory and Projections

Chapter 2: GHG Inventory and Projections

Greenhouse Gas Emissions Inventory

Purpose

The purpose of a GHG emissions inventory is to establish a baseline and to gather information about the sources of emissions in a community, and in the emissions sectors and subsectors within the community. Based on the maxim that "you can't manage what you haven't measured," the inventory data begins to assist policy-makers in identifying what kinds of strategies will be required to achieve GHG emission reductions. An accurate inventory provides the informational building blocks for knowing which emission sources comprise the largest portion of total emissions, have the highest GHG reduction potential, and can be effectively influenced by policies and actions implemented by the City.

Inventory Sector Focus

In this CAP, the baseline GHG inventory is limited to emission sources in the building energy sector. A "sector" is a distinct subset of a market, society, industry, or economy, whose components share similar characteristics. A sector may also contain subsectors, the analysis of which provides more specificity about the sources of emissions. For example, natural gas and electricity consumption in buildings are a subsector of the building energy sector. Alternatively, residential and commercial buildings are subsectors of the overall building energy sector. Commercial and industrial buildings can also be divided into those that are privately owned and those that are owned by the City and other public sector entities.

Inventory Development

The CAP developed a baseline GHG emissions inventory for the City's building energy sector, using consumption data for electricity and natural gas drawn from SCE and SCG. The most recent data available at the time of the analysis was from the year 2012. The inventory was compiled using an online tool called SEEC-ClearPath California, a product of the California Statewide Energy Efficiency Collaborative (SEEC), along with input data from a variety of information sources. The major emission sub-sectors included in this inventory are electricity and natural gas consumption from residential, commercial, and industrial buildings in the Beaumont community.

Table 2-1 shows a summary of the total quantity of electricity and natural gas consumed by the residential and commercial/industrial sub-sectors in Beaumont in 2012.

Table 2-1: Beaumont Electricity and Natural Gas Consumption, 2012.

Sub-sector and Energy Type	Quantity	Units	Data Source
Residential			
Electricity	98,608,434	kWh	SCE
Natural Gas	4,615,641	Therms	SCG
Commercial/Industrial			
Electricity	85,868,511	kWh	SCE
Natural Gas	891,905	Therms	SCG

Note: figures may not add exactly due to rounding.

Inventory Data

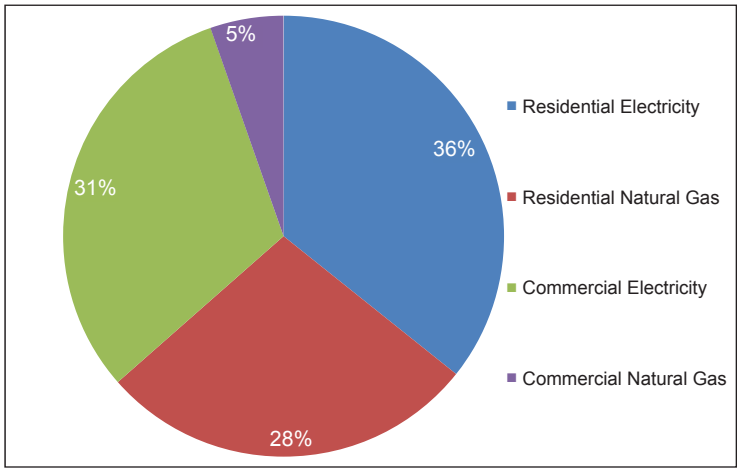
In 2012, Beaumont's building energy sector emitted approximately 88,310 metric tons of carbon dioxide-equivalent ($MTCO_{2e}$).[11] Approximately two-thirds (67%) of these emissions originated from electricity consumption, and the rest (33%) originated from natural gas consumption. The baseline GHG emissions, separated into each major emission source, are presented below in Table 2-2 and Figure 2-1. The breakdown of GHG emissions by sub-sector is reflective of the breakdown of the input activity data that was available to calculate the emissions. For example, the GHG emissions from energy consumed by commercial and industrial sub-sectors are presented in an aggregated form, as the input energy data for those two sub-sectors was provided in an aggregated form. This aggregated form of reporting emissions is recognized as a limitation. See Appendix A for more details on the development of the inventory.

Table 2-2: Beaumont Baseline GHG Inventory, 2012

Building Energy Sector		
Sub-sector and Source	**GHG Emissions ($MTCO_{2e}$)**	**% of Total Emissions**
Residential		
Electricity	31,555	36%
Natural Gas	24,535	28%
Commercial/Industrial		
Electricity	27,479	31%
Natural Gas	4,741	5%
Total	**88,310**	**100%**

Note: Figures may not add exactly due to rounding.

Figure 2-1: Beaumont Baseline GHG Emissions by Sub-sector and Source, 2012



GHG Emissions Forecast

The purpose of conducting a GHG emissions forecast is to understand how emissions are likely to increase in the future based on the extent of growth in population, housing, and employment expected in a community. In this CAP, the year 2020 was selected as the forecast year, because it aligns with the forecast year for California's Global Warming Solutions Act (AB 32), and because growth projections for Beaumont's population, employment, and housing are also readily available for the year 2020. The results of the baseline emissions inventory were used to project the building energy sector's GHG emissions in 2020 under two different scenarios – a business as usual (BAU) scenario and an adjusted BAU scenario.

11 CO_2e, or carbon dioxide equivalent, is a standard unit for measuring carbon footprints. CO_2e expresses the impact of each different greenhouse gas in terms of the amount of CO_2 that would create the same amount of warming. Other greenhouse gases analyzed in the inventory include methane and nitrous oxide. Methane has 25 times the global warming potential of carbon dioxide. Nitrous oxide has almost 300 times the global warming potential of carbon dioxide. See: http://www.c2es.org/facts-figures/basics/main-ghgs.

Projections under a Business-as-Usual Scenario

The BAU scenario assumes that historical and current GHG-generating practices and trends for energy consumption in buildings will continue until 2020. This scenario also assumes that the share of building types present in Beaumont today will remain the same as new construction occurs over the next six years. For example, it is assumed that most new homes will be single family construction of a similar size as the homes present in Beaumont today. In addition, this scenario assumes a similar energy consumption profile in Beaumont's homes; increases in electricity use from an increase in the use of electric vehicles, for instance, are not considered. Finally, the BAU scenario does not include GHG reductions associated with statewide legislation and programs or local GHG reduction measures.

The 2020 BAU emissions projections were performed using applicable and appropriate indicators for each emissions source. Refer to Appendix A for detailed descriptions of BAU projections. It should be noted these projections have been developed for planning purposes, and due to the complexity of the various subsectors comprising the building energy sector, the projections are subject to change. Upon the availability of more refined data, the City may reevaluate its BAU projections, and revise them as necessary. Under the BAU scenario, it is estimated that GHG emissions from Beaumont's building energy sector will increase by approximately 46%, to 129,137 $MTCO_2e$ by 2020. These increases are driven largely by population growth and a subsequent increase in the housing stock in the City. Beaumont's 2012 baseline emissions and 2020 BAU projected emissions are shown in Table 2-3.

Table 2-3: Baseline GHG Inventory and BAU Emissions Projections

Building Energy Sector						
Subsector	**2012**		**2020**		**Change**	
	$MTCO_2e$/year	**% of Total**	**$MTCO_2e$/year**	**% of Total**	**$MTCO_2e$/year**	**% Change**
Residential						
Electricity	31,555	36%	44,192	34%	12,637	40%
Natural Gas	24,535	28%	34,361	27%	9,826	40%
Commercial/Industrial						
Electricity	27,479	31%	43,141	33%	15,662	56%
Natural Gas	4,741	5%	7,443	6	2,702	56%
Total	**88,310**	**100%**	**129,137**	**100%**	**40,827**	**46%**

Note: Figures may not add exactly due to rounding.

Projections under an Adjusted Business-as-Usual Scenario

The GHG emissions from Beaumont's building energy sector were also projected under an adjusted BAU scenario. This scenario accounts for GHG emission reductions associated with statewide legislation or programs. In this CAP, adjusted BAU projections include the expected emission reductions resulting from the State's Renewable Portfolio Standard (RPS) and the Building Energy Efficiency Standards, commonly referred as Title 24 (i.e., Title 24, Part 6 of the California Code of Regulations). Under RPS, 33% of SCE's (Beaumont's electric utility) electricity production is required to come from renewable sources by 2020. As of 2013, SCE has delivered 21.6% of its electricity from renewable sources. As SCE moves closer to its target, the GHG intensity of its electricity production will continue to decrease, which, in turn, will reduce GHG emissions associated with electricity consumption in Beaumont's building energy sector. Similarly, Title 24 updates will raise the minimum energy efficiency standards for new buildings and for major modifications to existing buildings, thereby decreasing the expected energy consumption of new development in Beaumont. Under the adjusted BAU scenario, it is estimated that GHG emissions from Beaumont's building energy sector will increase by approximately 8%, to 95,418 $MTCO_2e$ by 2020. The difference in the magnitude of BAU and adjusted BAU emissions projections indicates that RPS and Title 24 updates will contribute significantly to GHG emission reductions at the City level. Beaumont's 2012 baseline emissions and 2020 adjusted BAU projected emissions are shown in Table 2-4.

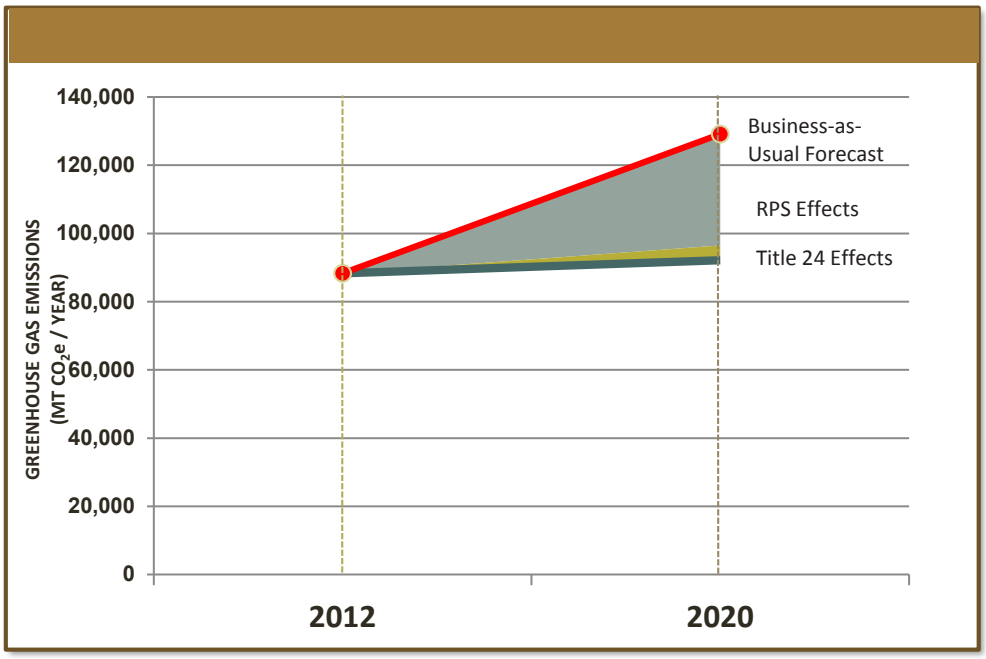
Table 2-4: Baseline GHG Inventory and Adjusted BAU Emissions Projections

Building Energy Sector						
Subsector	2012		2020		Change	
	$MTCO_2e$/year	% of Total	$MTCO_2e$/year	% of Total	$MTCO_2e$/year	% Change
Residential						
Electricity consumption	31,555	36%	28,935	30%	-2,620	-8%
Natural Gas consumption	24,535	28%	31,246	33%	6,711	27%
Commercial/Industrial						
Electricity consumption	27,479	31%	27,922	29%	443	2%
Natural Gas consumption	4,741	5%	7,315	8%	2,574	54%
Total	**88,310**	**100%**	**95,418**	**100%**	**7,108**	**8%**

Note: Figures may not add exactly due to rounding.

Figure 2-2 shows the relative magnitudes of GHG emissions from Beaumont's building energy sector under baseline, BAU, and adjusted BAU scenarios. The GHG reduction strategies developed for the City's CAP will be applied to the projected 2020 adjusted BAU emissions levels to determine the extent to which local measures will further reduce emissions relative to the projections.

Figure 2-2: Baseline GHG Inventory and Emissions Projections.

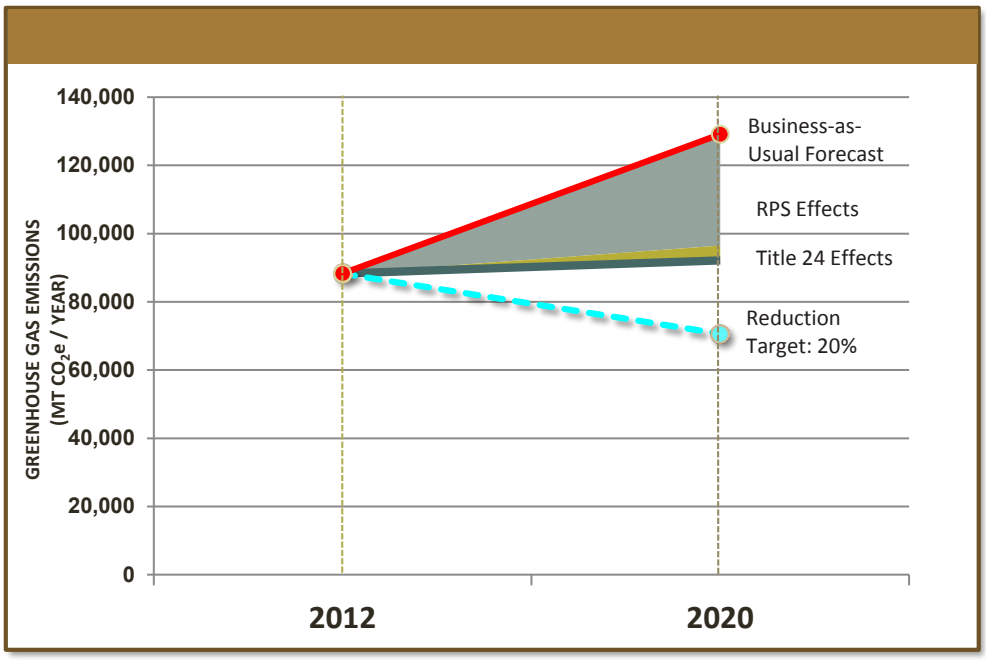


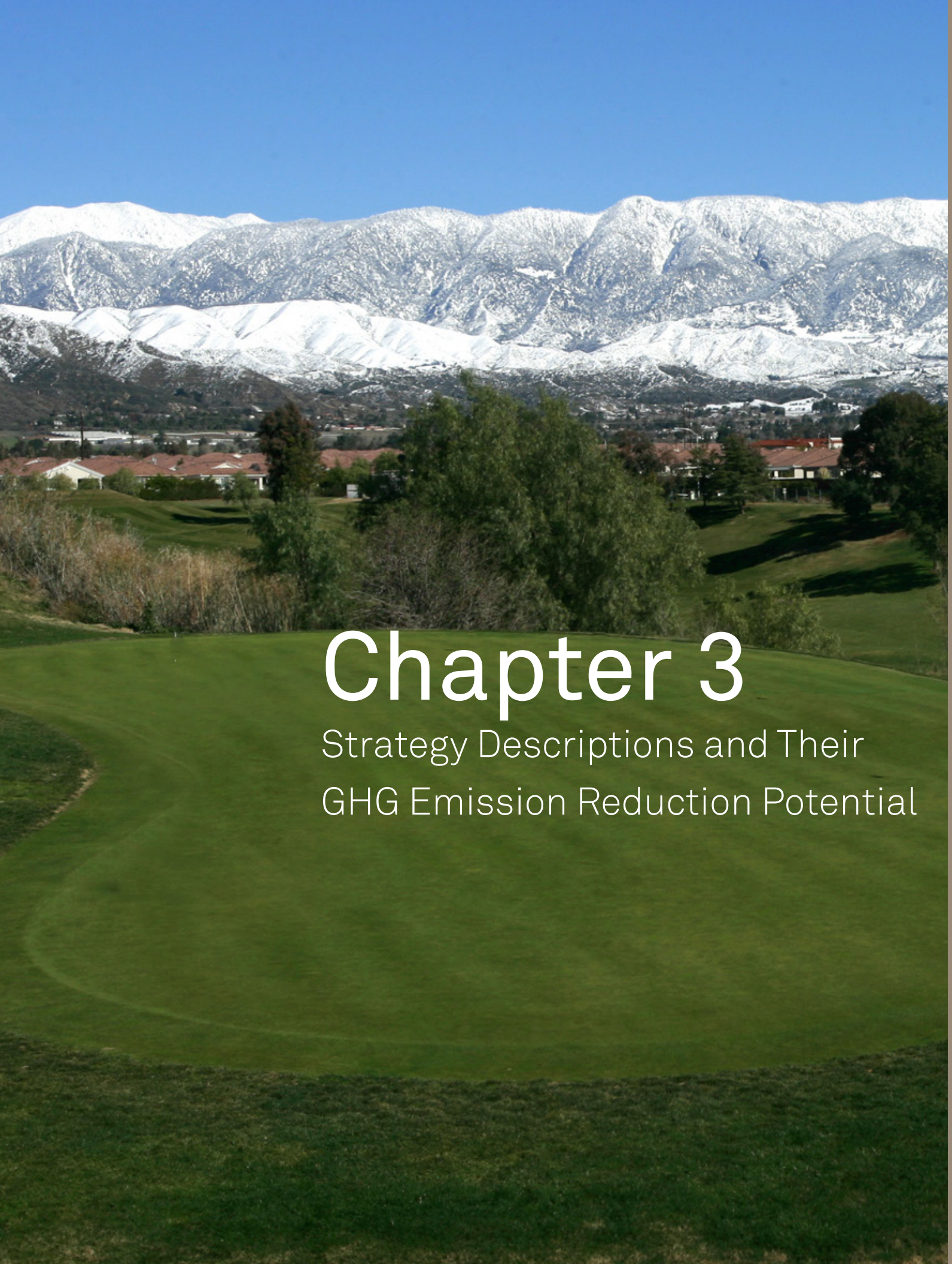
Suggested GHG Emissions Reduction Target

Adopting an emission reduction target is an important step in developing a CAP, since it is impossible to measure progress and successes without first identifying a desire future scenario.

While the City of Beaumont has not adopted a GHG emissions reduction target officially, this CAP includes a suggested target, which has been determined on the basis of Beaumont's baseline emissions, projected emissions, as well as state-level guidance on targets. It is recommended that the City consider adopting a GHG emissions reduction target of 28% below its 2012 baseline level by 2020. Reaching this target would achieve an emissions reduction of approximately 15% below Beaumont's estimated emissions in 2008 in the building energy sector, which is the target recommended for local governments in the AB 32 scoping plan. This target corresponds to a 2020 GHG emissions level of 63,583 $MTCO_2e$/year. Figure 2-3 demonstrates the magnitude of the suggested GHG reduction target relative to Beaumont's baseline and projected emissions levels. Refer to Appendix A for details on this suggested target.

Figure 2-3: GHG Emissions Reduction Target Relative to Baseline and Projected Emissions.

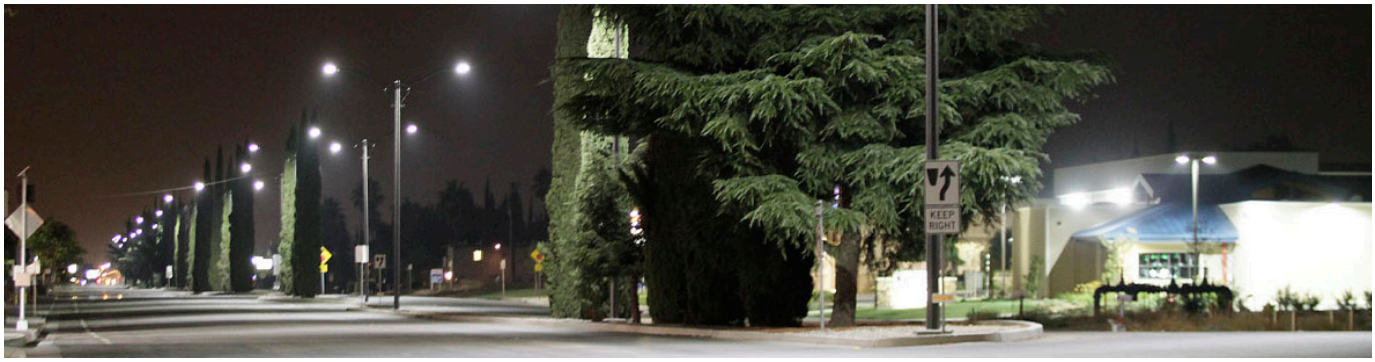




Chapter 3

Strategy Descriptions and Their GHG Emission Reduction Potential

Chapter 3: Strategy Descriptions and Their GHG Emission Reduction Potential



As revealed in the previous chapter, the consumption of electricity – which is primarily used to power appliances, lighting, and cooling – is responsible for approximately two-thirds of the total GHG emissions in Beaumont's building energy sector. The combustion of natural gas – which is primarily used for space and water heating and cooking – is responsible for the remaining one-third of total building energy sector GHG emissions. These emissions can be reduced through improving energy efficiency and increasing the use of renewable energy sources to provide the energy services that electricity and natural gas now provide.

Focusing the Strategies

Existing Homes and Buildings Only

As discussed in the previous chapter's section on projected emissions, there will be some growth in Beaumont's housing stock and commercial and industrial building stock. Construction of this new inventory will be built under some of the strictest energy codes in the country. By 2020, in fact, new housing stock will be required to be "net zero," meaning they must generate as much energy as they consume over the course of a year. These codes are enhancements to California's Building Standards Code (Title 24, Part 6). As 2020 approaches, new construction will be increasingly more energy efficient, and will incorporate more and more renewable energy on-site or through community-shared installations. The codes guiding the push to net-zero homes are implemented at the state-level, and therefore do not require any action on the part of Beaumont (other than to ensure local compliance). By 2030, commercial buildings will be held to the same net-zero energy performance standards.

As a result of the drive to net-zero homes and buildings through state-level regulations the Beaumont CAP does not consider any strategies relating to new construction. Instead the focus is on increasing the energy efficiency in existing homes and buildings, and the installation of additional renewable energy systems on buildings in Beaumont.

Privately-Owned Commercial and Industrial Buildings

In addition to limiting the focus of the GHG emission reduction strategies to existing homes and buildings, the CAP also limits the focus to privately-owned buildings. The City has already done much to improve the efficiency of its buildings, and is exploring opportunities to improve the efficiency of its facilities and to install renewable energy. The school district is also exploring opportunities to do the same.

Opportunities in Beaumont for Reducing GHG Emissions

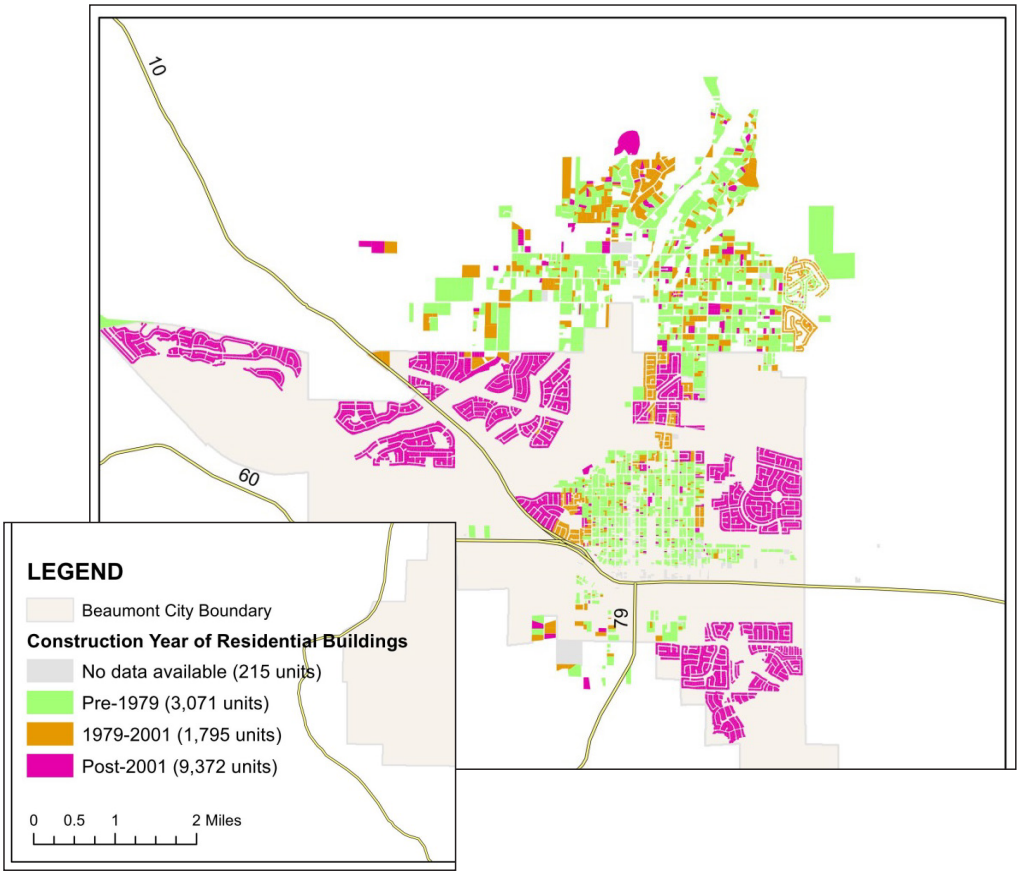
In Beaumont, approximately 20 percent of the housing stock was built before California's energy code, Title 24 Part 6, came into force in 1978 (see Figure 3-1 showing the city's housing inventory). Title 24 has required increasingly stronger energy efficiency standards in construction. Consequently, the older the building stock, the more considerable the opportunity for cost-effective energy efficiency retrofits to decrease the use of both electricity and natural gas – and subsequently greater opportunities for reducing GHG emissions.

Approximately 80% of the electric power mix provided to customers by SCE in 2012 was generated by fossil fuels, with the remainder from nuclear, hydroelectric, and renewable energy sources. Beaumont's location in Southern California is rich in solar resources with strong and frequent sunshine. As such, Beaumont is ideally located to take advantage of its solar resources through the installation of solar photovoltaic and solar thermal technologies, which can reduce consumption of electricity from the SCE grid and natural gas from SCG's distribution infrastructure.

Given these building energy-related opportunities, the City is looking to increase energy efficiency improvements and solar installations from its residents and commercial and industrial building owners.

This chapter provides detailed descriptions of the GHG reduction strategies Beaumont has considered for its building energy sector.

Figure 3-1: Beaumont Residential Properties by Age.



Source: Riverside County, AECOM

GHG Reduction Strategies for the Building Energy Sector

Based on the feedback from the community engagement sessions in February and March, the CAP recommends that the City of Beaumont explore the first two Building Energy (BE) sector strategies listed below. After discussions with City staff, the CAP includes a third BE strategy, also listed below.

This third strategy was added because a) even though it is a mandate, it is a relatively low-cost mandate that will provide important information to the marketplace to enhance decision-making by home buyers and sellers, and b) its implementation has the potential to help increase participation rates, which is a critical variable for Beaumont in striving to achieve significant community-wide GHG emission reductions in the BE sector.

BE-1	Enhance outreach efforts to increase participation rates in existing programs that provide third-party rebates, technical assistance, and financing options for Energy Measures (EMs)
BE-2	Establish or participate in a Property Assessed Clean Energy (PACE) financing program to assist property owners in accessing the upfront capital needed to implement higher cost EMs
BE-3	Adopt a mandatory energy performance labeling ordinance as a means of increasing demand for high performing homes/buildings

Strategy Descriptions

BE-1	Enhance outreach efforts to increase participation rates in existing programs that provide third-party rebates, technical assistance, and financing options for Energy Measures (EMs)

This strategy recommends that the City increase residents' and businesses' awareness of the benefits of the many programmatic, technical, informational, and financial resources on energy efficiency and renewable energy improvements provided by utilities and other parties.

The City can receive assistance on outreach through its Energy Leader Partnership (ELP) with SCE and SCG (refer to Introduction Chapter for more details). The ELP offers the City an opportunity to create a Marketing, Education, & Outreach (ME&O) plan,[12] which outlines strategic ways in which the City can encourage energy upgrades in the community. The plan includes guidance on how to conduct effective public events, educational workshops, and other forms of outreach for publicizing various types of assistance available to local residents and businesses. The partnership also offers resources to the City's communications department to create press releases that publicize upcoming ME&O events, and to identify additional opportunities for outreach through the City's many public communication channels, including the City's website, Facebook page, and utility billing. Examples of resources that the City can promote include the following:

Utilities' Resources for the Building Energy Sector

The following programs offer direct financial incentives (in the form of rebate checks or bill credits) for upgrades to high-efficiency equipment used in lighting, cooling, heating, and ventilation.

Commercial/Industrial Sub-sector

- SCE Express Solutions Program
- SCE Customized Solutions Program
- SCG Energy-Efficiency Calculated Incentive Program
- SCG Energy-Efficiency Rebates for Business (EERB) Program
- SCG On-bill Financing Program

Residential Sub-sector

- SCE rebates on appliances, such as refrigerators, pumps, motors, air conditioners, fans, coolers, electric water heaters, washers, and light-bulbs.

12 Details of the ME&O are listed in the following report on various SCE and SCG Partnership Programs: http://www.socalgas.com/regulatory/documents/A-12-07-003/Appendix%20B.2%20Section%20B%20Partnerships.pdf

- SCG rebates on home appliances, such as space heaters, water heaters, pool heaters, showerheads, washers, and insulation.

The following programs offer direct financial incentives (in the form of bill credits) to install equipment that automates electrical load reduction during demand response events.

Commercial/Industrial Sub-sector

- SCE Open Automated Demand Response (OpenADR)
- SCE Permanent Load Shifting
- SCE Time-of-Use Base Interruptible Program
- SCE Capacity Bidding Program
- SCE Demand Bidding Program
- SCE Aggregator Managed Portfolio (AMP) Program
- SCE Summer Advantage Incentive (also known as Critical Peak Pricing)
- SCE Optional Binding Mandatory Curtailment
- SCE Summer Discount Plan
- SCE Real-Time Pricing
- SCE Scheduled Load Reduction Program
- SCE Pumping and Agricultural Real-Time Pricing

Residential Sub-sector

- SCE Save Power Days Program
- SCE Summer Discount Plan

The following programs offer free technical, consulting, and financial incentives to make whole-building improvements in energy efficiency:

Commercial/Industrial Sub-sector

- SCE and SCG Retro-commissioning Program
- SCE HVAC Optimization Program
- SCE Direct Install Program
- SCE and SCG Continuous Energy Improvement Program
- SCG Energy-Efficiency Assessment Program
- Energy Upgrade California Home Upgrade Package

Residential Sub-sector

- SCG On-Demand Efficiency (Re-circulation Loops for Central Domestic Water Heaters) Program
- SCG Multifamily Direct Installation Programs
- SCG Home Energy Upgrade Financing Program

The following programs offer financial incentives to encourage the installation of renewable energy systems:

- SCE Net Energy Metering
- SCG Self-Generation Incentive Program (SGIP)
- California Solar Initiative
- California Solar Thermal Initiative

In addition to utility-guided opportunities for increasing awareness of these opportunities, we also recommend the use of trusted community organizations and leaders, and affiliation groups as messengers of the

opportunities represented by Energy Measures. Borrowing from a manual developed by Sonoma County and Energy Upgrade California for local governments on PACE financing (see next strategy),[13] we specifically recommend:

- **Property Owner Stories:** Testimonials from those who have previously taken advantage of Energy Measure programs, particularly other homeowners. Testimonials can be used widely in TV, radio, and print media ads.
- **Energy Champions:** Similar to above, property owners host presentations and tours of their properties to highlight the benefits of energy efficiency and/or renewable energy.
- **Trusted Leaders:** Enlist trusted local leaders from government, business and the community as Energy Champions, which can maximize the property owners' story tool and allow the program to reach specific constituencies.
- **Employee Outreach:** Employers invite CES program managers to present program benefits to their staff. Employees benefit from their knowledge and employers demonstrate their support for staff and their potential for home retrofit projects.

Peer-to-peer marketing through community affiliations should also be added to this list. By this we mean utilizing the trusted relationships that people have built within their personal networks (e.g., religious community, school groups, youth sports programs, business associations).

BE-2 Establish or participate in a Property Assessed Clean Energy (PACE) financing program to assist property owners in accessing the upfront capital needed to implement higher cost EMs

Property Assessed Clean Energy (PACE)[14] is a program that allows local governments to provide up-front financing to qualified property owners to finance the installation of renewable energy systems and energy efficiency improvements on their property. The program is 100% "opt in."

Property owners repay the local government's funding by agreeing to an assessment levied against their property, which is payable on their property tax bill. The assessment is paid off over a term often determined by either 1) the life of the bond or other financial mechanism used to finance improvements, or 2) the functional life (effective useful life) of the improvement. The typical maximum repayment duration is 20 years. The obligation to repay the assessment is attached to the improved property, not the property owner, and transfers with the sale of the property to the new owner.

In California, local governments have broad authority to determine the type of improvements that can be financed and the details of the financing arrangement. PACE improvements can include a wide variety of energy-saving upgrades, from solar systems to high efficiency HVAC systems to double-paned windows and doors.

The following is a list of options for PACE programs in which the City of Beaumont could participate:

- CaliforniaFIRST (see: https://californiafirst.org)
- Home Energy Renovation Opportunity Program (HERO) (see: https://www.heroprogram.com)
- Figtree Financing (see: http://www.figtreefinancing.com)
- Ygrene (see: https://ygrene.us)

13 Please see page 87, at http://pacenow.org/wp-content/uploads/2012/08/Sonoma-County-PACE-Manual.pdf

14 The following description is excerpted from a manual on PACE published by Sonoma County, "Property Assessed Clean Energy (PACE) Replication Guidance Package for Local Governments. See page 4 at http://pacenow.org/wp-content/uploads/2012/08/Sonoma-County-PACE-Manual.pdf.

BE-3 Adopt a mandatory energy performance labeling ordinance as a means of increasing demand for high performing homes/buildings

This strategy recommends that the City adopt an ordinance mandating that all residential buildings disclose their energy rating upon the sale or lease of the home.[15] With the energy rating in hand, prospective buyers or renters will be able to consider the building's energy performance in the same way that they now use location, square footage, number of bedrooms, and other factors in their decision-making process.

While rating and disclosure policies do not directly improve building energy performance, they create favorable market conditions for investments in energy efficiency improvements.[16] Such policies drive energy efficiency and renewable energy improvements in existing buildings, as it achieves the following goals:

- Making building owners aware of the energy performance of their building and how they compare to other buildings, thereby providing important baseline information from which they can act to increase the attractiveness of their asset to competing properties in the marketplace
- Creating market recognition of energy efficiency as well as inefficiency in buildings
- Improving building energy code compliance
- Providing feedback to and increasing accountability among building designers and owners
- Facilitating the collection of building performance data that can inform future local policies addressing energy consumption in the built environment.
- Increasing property values, by as much as 9%[17]

A typical ordinance mandating energy performance rating and disclosure can include the following elements:

- **Recommendations for a Rating System:** A user-friendly tool to collect data on energy and report energy performance. Examples of such tools include the Home Energy Rating System (HERS), ENERGY STAR Portfolio Manager, ENERGY STAR Target Finder, and the Commercial Energy Services Network's (COMNET) Energy Modeling Portal.
- **Scope of Ratings:** Guidance on the frequency, extent, and granularity of energy reporting.
- **Platforms for Public Disclosure:** Guidance on appropriate public platforms where this information can be disclosed.

In developing this ordinance, the City of Beaumont can draw from existing examples of similar ordinances that have been passed at the state and local levels (see discussion below).

The Voluntary Alternative to Mandatory Energy Performance Disclosure

Seeking passage of a mandatory ordinance may prove difficult. While the feedback received during the development of the CAP was decidedly against mandatory energy upgrades to buildings, feedback on this type of disclosure mandate was more mixed. An alternative approach would be for the City to work with the local realtor community to include an energy performance rating in the local Multiple Listing Service used by the real estate community. In July, 2013, the North Star MLS – whose territory includes Minneapolis and St. Paul – added two new fields to its residential listings.[18] One field includes notes on whether the home has received a green building certification. The other field discloses the home's energy efficiency rating.

15 As of July 1, 2014, all commercial buildings in California greater than 5,000 square feet must provide this same disclosure. For more information, please see http://www.energy.ca.gov/ab1103/.

16 Burr, A., Majersik, C., Goldstein, D., & Zigelbaum, N. (2010). Empowering the Market: How Building Energy Performance Rating and Disclosure Policies Encourage U.S. Energy Efficiency.

17 Please see the Executive Summary of The Value of Green Labels in the California Housing Market, June 2012. http://pacenow.org/wp-content/uploads/2012/08/KK_Green_Homes_0719121.pdf

18 Please see http://blog.mwalliance.org/2013/07/twin-cities-area-adopts-green-fields-in-the-mls.

The following are examples of regulations that have been passed on building energy performance disclosure, including within the residential sector.[19]

Austin Energy Conservation Audit and Disclosure Ordinance: This ordinance requires mandatory energy audits for single-family homes and multi-family residential buildings. According to this ordinance, owners must complete an energy audit prior to the sale of a property and provide the results of the audit to prospective buyers. The full text of the ordinance can be found in Title 6 of the Austin City Code (see: http://www.austinenergy.com/wps/wcm/connect/c8814cf7-e1a4-4d6f-8257-88445444f40c/ECADChap6-7EnergyConservation.pdf?MOD=AJPERES).

Seattle Energy Benchmarking and Disclosure Ordinance: This ordinance requires mandatory energy benchmarking and disclosure for multi-family residential buildings. According to this ordinance, owners of multi-family buildings must benchmark energy performance with ENERGY STAR Portfolio Manager and disclose their results to the Seattle Department of Planning and Development (DPD) and to transactional parties. The full text of the ordinance can be found in Title 22 of the Seattle Municipal Code (see http://clerk.ci.seattle.wa.us/~scripts/nph-brs.exe?s1=&s3+116731&s4=&s2=&s5=&Sect4=AND&l=20&Sect2+THESON&Sect3=PLURON&Sect5= CBORY&Sect6=HITOFF&d=ORDF&p=1&u=%2Fcbory.htm&r=1&f=G).

Other examples of cities that have passed similar regulation on energy performance rating and disclosure include Chicago, Boston, Washington DC, Minneapolis, Philadelphia, San Francisco, and New York City. It should be noted, however, that the ordinances in these cities primarily address buildings in the commercial sector. More details on the ordinances passed in each of these cities can be found on BuildingRating.Org, a web-based resource developed by the Institute for Market Transformation (IMT) and the Natural Resources Defense Council (NRDC) (see: http://www.buildingrating.org/content/us-policy-briefs).

GHG Reduction Potential of Strategies

The overall GHG savings associated with the strategies identified in this CAP will depend on two factors:

- The GHG reduction potential of Energy Measures (EMs) driven by the strategies
- The demand drivers responsible for increasing the uptake of the EMs

This section shows the results of an exercise conducted to understand how each of the two aforementioned factors will ultimately contribute to the success of the GHG reduction strategies. The first part of this section provides various options for EMs that can be encouraged by the City via its selected strategies. The second part of this section provides hypothetical scenarios for demand drivers with varying levels of uptake for the EMs, which will ultimately determine the overall GHG reduction potential of the strategies. The results of this exercise should be used to understand what kinds of EMs and levels of participation are needed to achieve meaningful reductions in GHG emissions from Beaumont's building energy sector.

Energy Measures

Within Beaumont's building energy sector, the residential sub-sector primarily consists of single-family homes, which makes up 83% of all residential units in 2012 (see Figure 3-2). Similarly, the plurality of GHG emissions generated by the commercial/industrial sub-sector comes from retail buildings. (In 2012, the square footage of retail-based buildings in Beaumont constituted 56% of the total square footage of non-warehouse-type commercial/industrial buildings in the City.[20]) EMs were selected for these two building types on the basis of the GHG reduction potential of the building types' various energy end-uses, and the relative contribution of the energy end-uses to overall GHG emissions from the building types. Other factors that were considered in the selection of the EM packages include historical data on the kinds of energy efficiency or renewable energy actions that are most popular for specific building types in a region like Beaumont's. For example, while there

19 Burr, A., Majersik, C., Goldstein, D., & Zigelbaum, N. (2010). Empowering the Market: How Building Energy Performance Rating and Disclosure Policies Encourage U.S. Energy Efficiency.

20 Warehouses are excluded from the total square footage of commercial/industrial buildings while determining this percentage, because even though warehouses have a high square footage, their energy consumption per square foot is relatively low. If warehouses are included in the total square footage of all commercial/industrial buildings in the City, retail-based buildings would constitute approximately 30% of the total commercial/industrial square footage in 2012.

is evidence to show that solar photovoltaic (PV) installation and solar hot water heater installation have been adopted in single-family homes in the residential sector, the uptake of solar technology in retail buildings has been fairly low, as retailers have limited control over the roofs of their leased retail building-space, and there are potential complications over how the building owners and tenants might share costs and benefits. The EMs were grouped into low, medium, and high packages on the basis of the GHG reduction potential of each package. Table 3-1 summarizes the EM packages for existing single family homes and Table 3-2 summarizes the EM packages for existing retail-based buildings.

Figure 3-2: Housing Units by Type in Beaumont, 2013

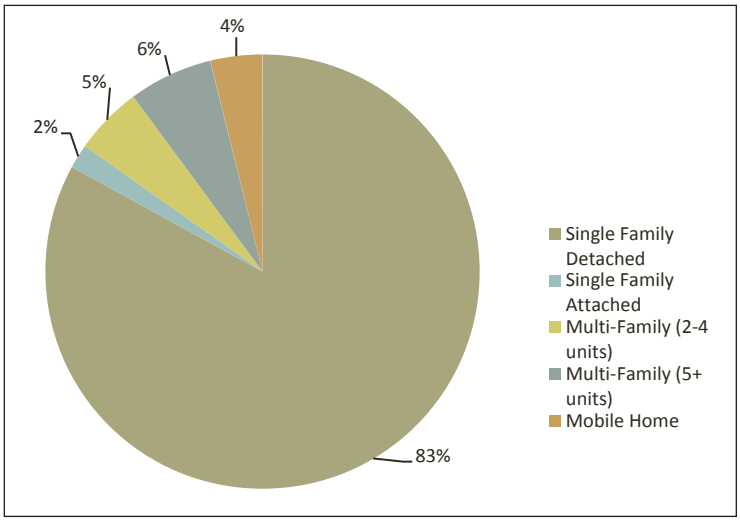


Table 3-1: EM Packages for Single Family Homes.

Energy Measures	Low EM Package	Medium EM Package	High EM Package
Interior Lighting Upgrades	■	■	■
Hot Water Management/Conservation	■	■	■
Duct Sealing and Loft Insulation		■	■
Solar Hot Water Heater			■
PV Installed Capacity			■

Table 3-2: EM Packages for Retail-based Buildings.

Energy Measures	Low EM Package	Medium EM Package	High EM Package
Ventilation Upgrades	■	■	■
Interior Lighting Upgrades (Code Efficiency)	■	■	
Interior Lighting Upgrades (High Efficiency)			■
Exterior Lighting Upgrades		■	■
Cooling System Upgrades			■

Demand Drivers

Two scenarios that both utilize different intensities of demand driving tactics were developed, showing varying levels of participation/uptake rates in single family homes and retail-based buildings for the aforementioned EM packages. The two scenarios are categorized as moderate and aggressive demand driver scenarios.

The participation rates in the Moderate Demand Driver scenarios presented in the following two tables are derived from studies that assessed participation rates in programs from various parts of the country.[21] The Aggressive Demand Driver scenarios are an estimate of improvements to participation rates that would occur as a result of more intensive outreach and marketing initiatives.[22]

21 See "The $20 Billion Bonanza: Best Practice Utility Energy Efficiency Programs and Their Benefits for the Southwest;" Southwest Energy Efficiency Project (SWEEP), 2012. See Appendix A: Detailed Program Methodologies, pages 180-208. Available at: swenergy.org/publications/20BBonanza/20B_Bonanza-COMPLETE_REPORT-Web.pdf

22 Chapter 4 includes a detailed discussion of Demand Driver tactics.

Table 3-3 shows the assumed cumulative participation rates from 2015-2020 under the moderate and aggressive demand driver scenarios for EMs targeting single family homes. Similarly, Table 3-4 shows the assumed cumulative participation rates over the same period under the moderate and aggressive demand driver scenarios for EMs targeting retail-based buildings.

Table 3-3: Demand Driver Scenarios for EMs Targeting Single Family Homes.

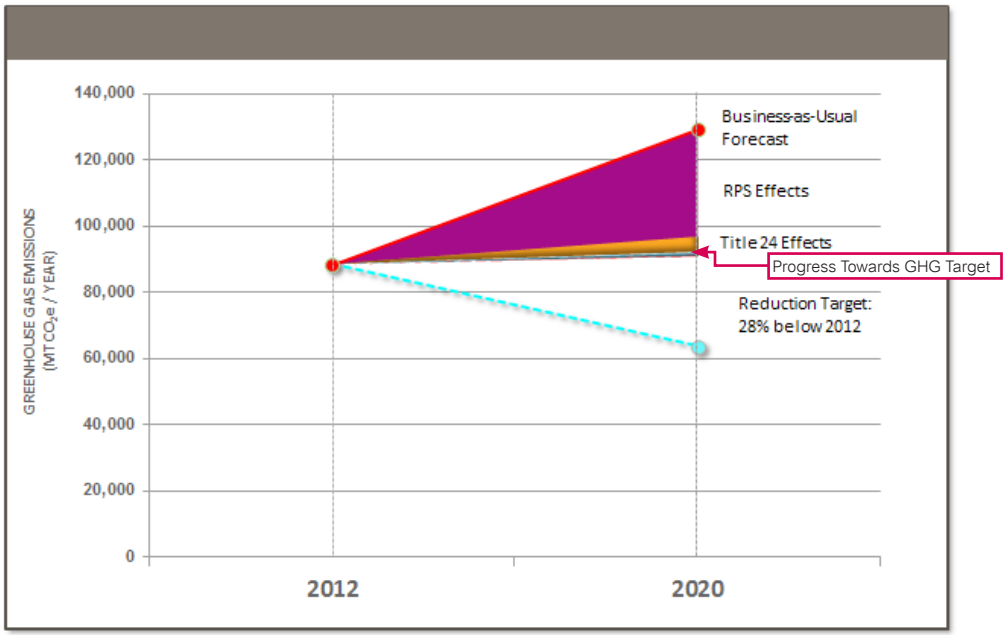
GHG Reduction Potential	Energy Measures (EMs)	Moderate Demand Driver Scenario	Aggressive Demand Driver Scenario
LOW	Interior Lighting Upgrades	15%	20%
	Hot Water Management/Conservation	15%	20%
MEDIUM	Interior Lighting Upgrades	15%	20%
	Hot Water Management/Conservation	15%	20%
	Duct Sealing and Loft Insulation	5%	8%
HIGH	Interior Lighting Upgrades	15%	20%
	Hot Water Management/Conservation	15%	20%
	Duct Sealing and Loft Insulation	5%	8%
	Solar Hot Water Heater	6%	12%
	PV Installed Capacity	6%	12%

Table 3-4: Demand Driver Scenarios for EMs Targeting Retail Buildings.

GHG Reduction Potential	Energy Measures (EMs)	Moderate Demand Driver Scenario	Aggressive Demand Driver Scenario
LOW	Ventilation Upgrades	15%	20%
	Interior Lighting Upgrades (Code Efficiency)	15%	20%
MEDIUM	Ventilation Upgrades	15%	20%
	Interior Lighting Upgrades (Code Efficiency)	15%	20%
	Exterior Lighting Upgrades	15%	20%
HIGH	Ventilation Upgrades	15%	20%
	Interior Lighting Upgrades (High Efficiency)	15%	20%
	Exterior Lighting Upgrades	15%	20%
	Cooling System Upgrades	15%	20%
	PV Installed Capacity	6%	12%

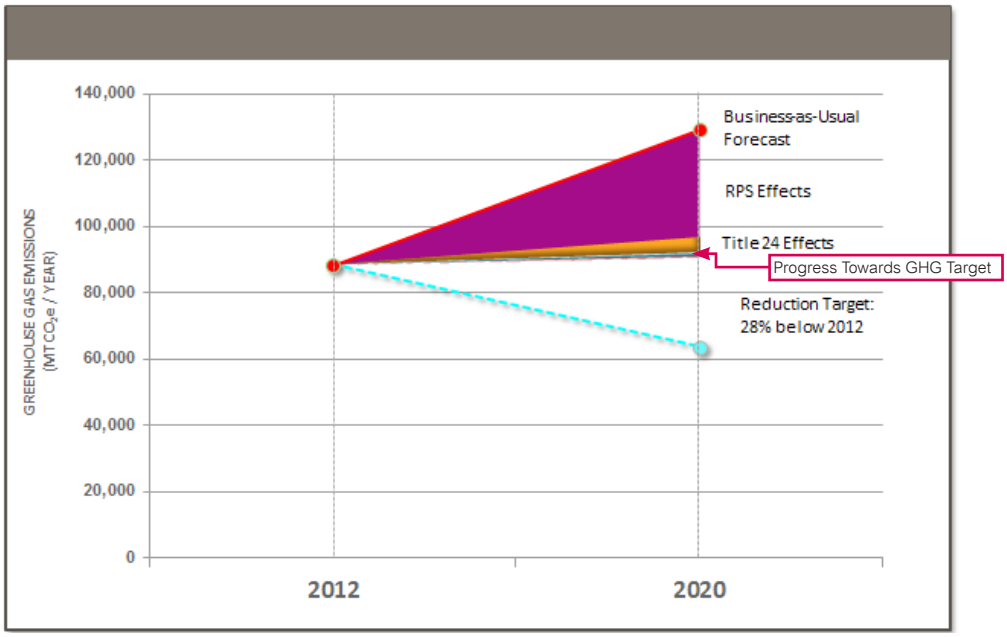
Using the three EM packages and two demand driver packages, a total of six citywide GHG savings scenarios were developed, focusing on single family homes and retail-based buildings. Figures 3-3 to 3-8 show the GHG savings under each of the six scenarios.

Figure 3-3: Progress Towards Suggested GHG Reduction Target (Low EM Package and Moderate Demand Drivers).



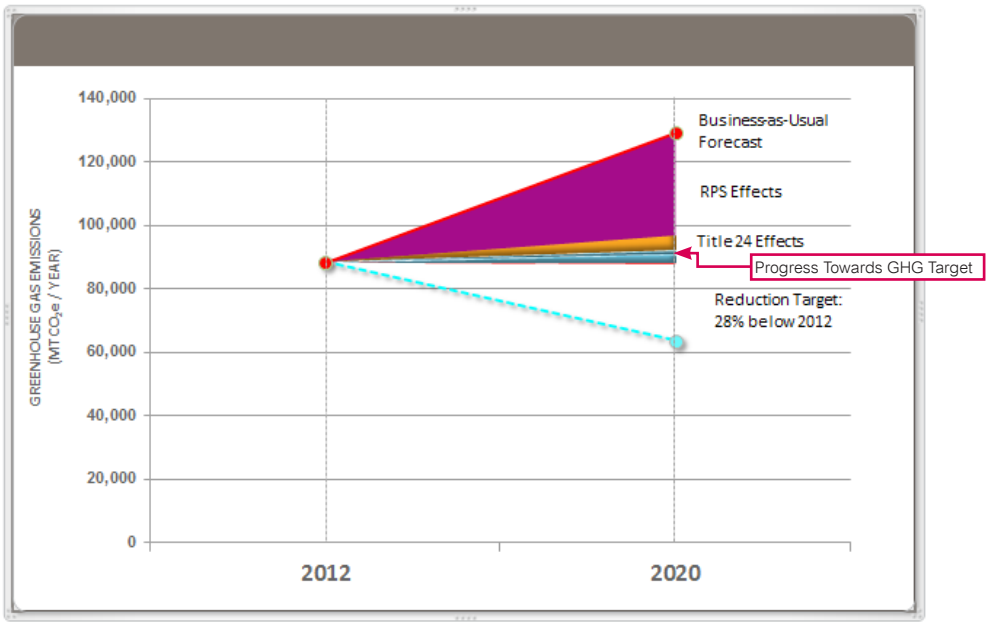
In the above scenario, the combined effect of state and local strategies will reduce GHG emissions by 38,059 $MTCO_2e$ relative to projected emissions under the BAU scenario. This magnitude of emission reductions will help the City achieve approximately 57% of the suggested target, which is to reduce emissions by 65,553 $MTCO_2e$ by the year 2020.

Figure 3-4: Progress Towards Suggested GHG Reduction Target (Moderate EM Package and Moderate Demand Drivers).



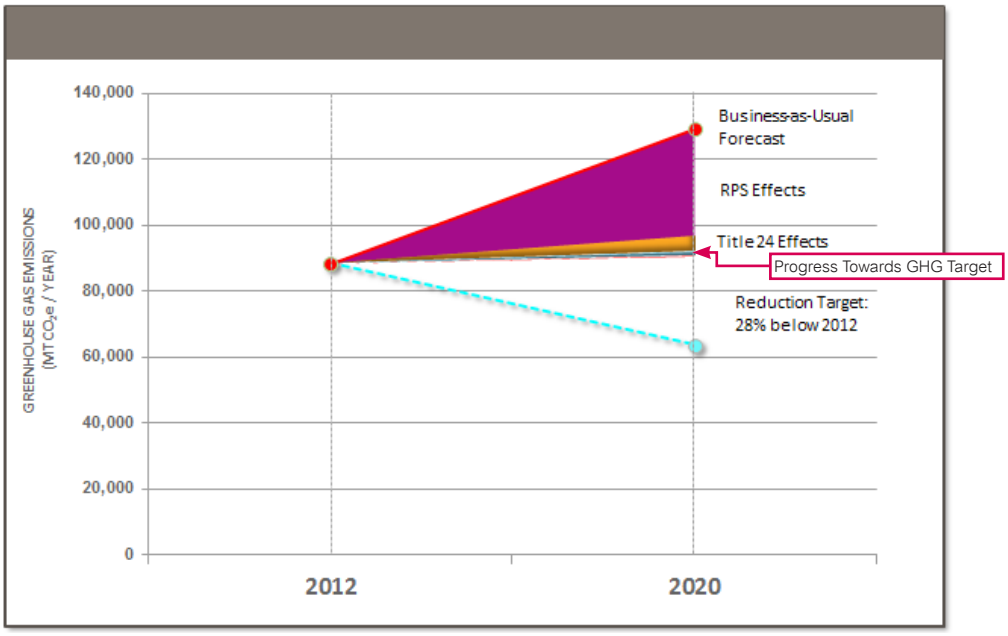
In this scenario, the combined effect of state and local strategies will reduce GHG emissions by 38,278 $MTCO_2e$ relative to projected emissions under the BAU scenario. This magnitude of emission reductions will help the City achieve approximately 58% of the suggested target, which is to reduce emissions by 65,553 $MTCO_2e$ by the year 2020.

Figure 3-5: Progress Towards Suggested GHG Reduction Target (High EM Package and Moderate Demand Drivers).



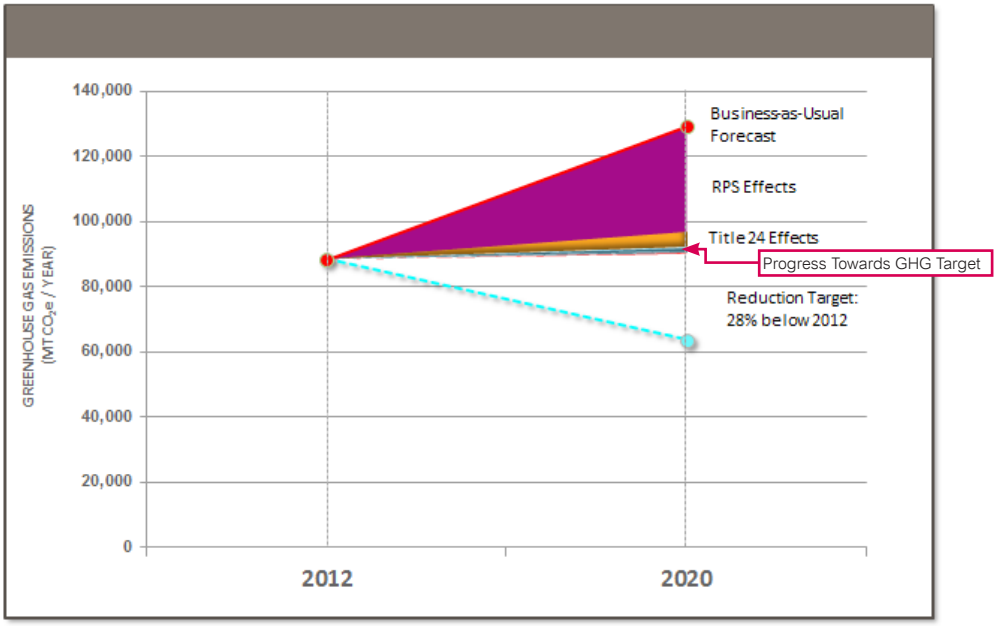
In this scenario, the combined effect of state and local strategies will reduce GHG emissions by 41,117 $MTCO_2e$ relative to projected emissions under the BAU scenario. This magnitude of emission reductions will help the City achieve approximately 63% of the suggested target, which is to reduce emissions by 65,553 $MTCO_2e$ by the year 2020.

Figure 3-6: Progress Towards Suggested GHG Reduction Target (Low EM Package and Aggressive Demand Drivers).



In this scenario, the combined effect of state and local strategies will reduce GHG emissions by 38,404 $MTCO_2e$ relative to projected emissions under the BAU scenario. This magnitude of emission reductions will help the City achieve approximately 58% of the suggested target, which is to reduce emissions by 65,553 $MTCO_2e$ by the year 2020.

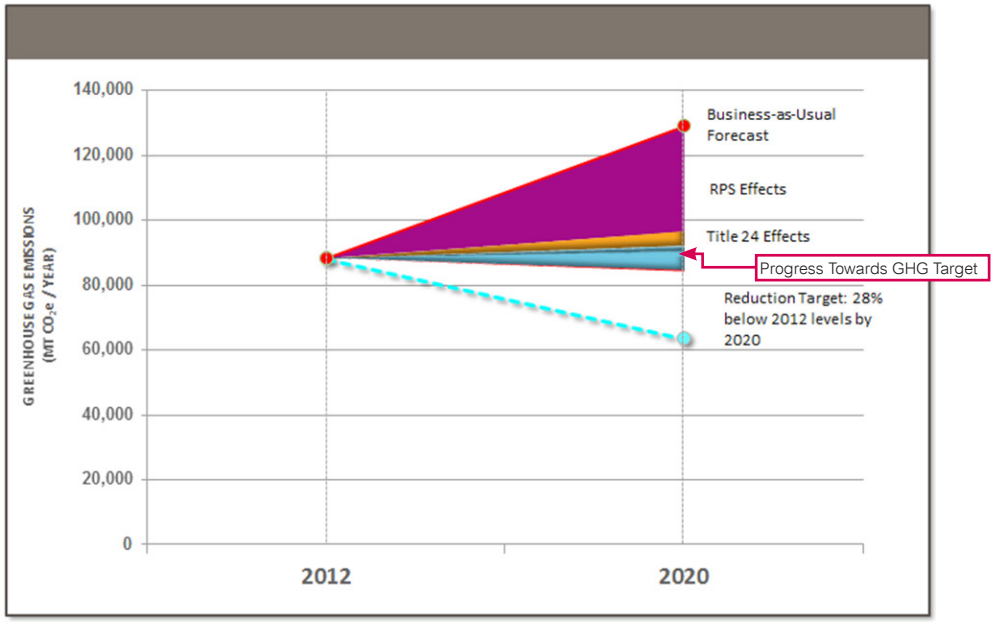
Figure 3-7: Progress Towards Suggested GHG Reduction Target (Medium EM Package and Aggressive Demand Drivers).



In this scenario, the combined effect of state and local strategies will reduce GHG emissions by 38,754 $MTCO_2e$ relative to projected emissions under the BAU scenario. This magnitude of emission reductions will help the City achieve approximately 59% of the suggested target, which is to reduce emissions by 65,553 $MTCO_2e$ by the year 2020.

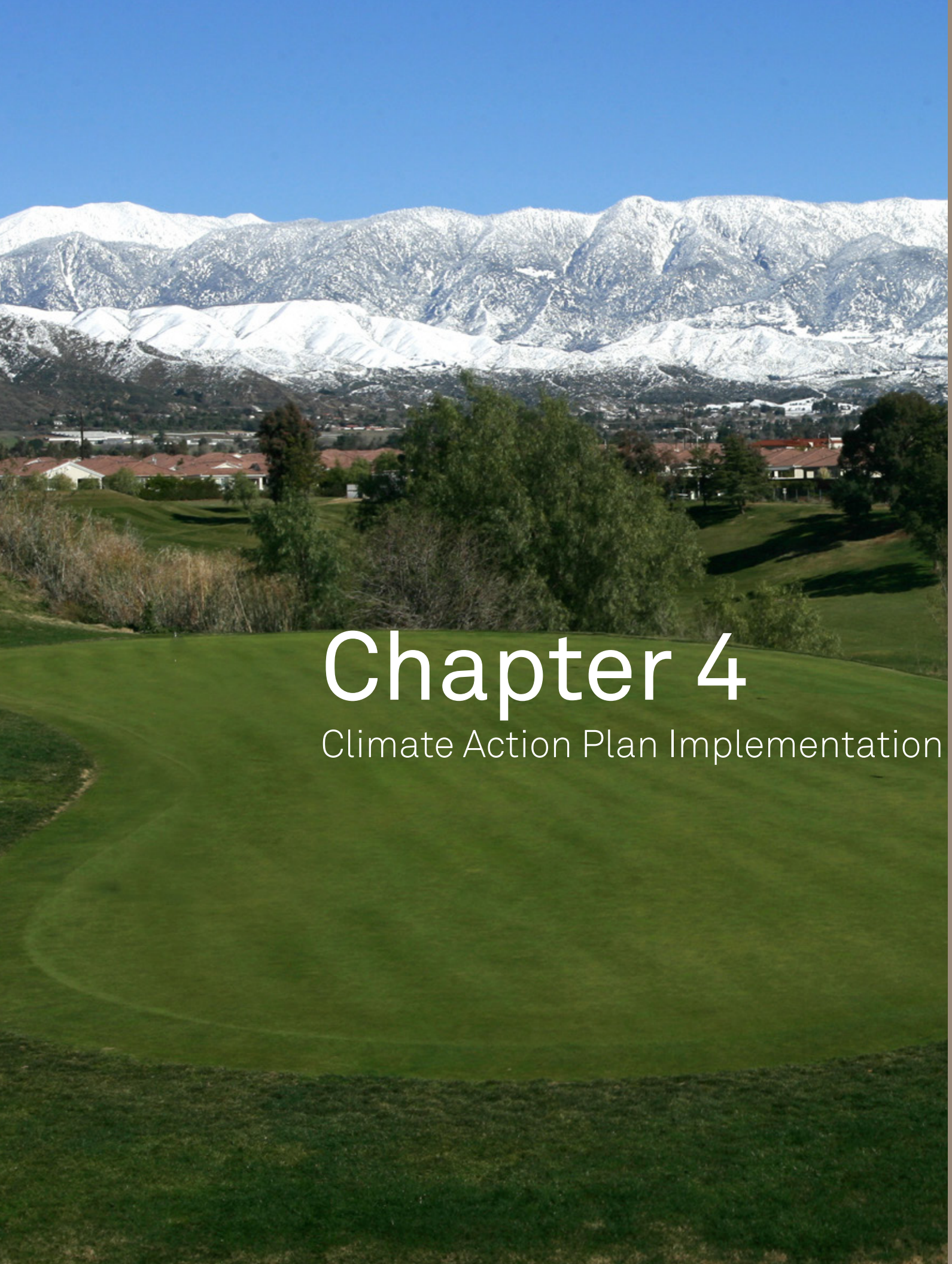
The minimal difference in emission reductions between this scenario and the previous scenario indicates that the incremental energy measures in the Medium EM package (i.e. insulation upgrades in the residential sub-sector, and exterior lighting upgrades in the commercial/industrial sub-sectors) do not provide significant GHG reduction benefits relative to the energy measures in the Low EM package.

Figure 3-8: Progress Towards Suggested GHG Reduction Target (High EM Package and Aggressive Demand Drivers).



In this scenario, the combined effect of state and local strategies will reduce GHG emissions by 44,432 $MTCO_2e$ relative to projected emissions under the BAU scenario. This magnitude of emission reductions will help the City achieve approximately 68% of the suggested target, which is to reduce emissions by 65,553 $MTCO_2e$ by the year 2020.

Based on the estimated emission reductions associated with each of the six scenarios, it is evident that none of the combinations of EM packages and demand driver scenarios meets the suggested GHG reduction target of 28% emissions reduction below 2012 emission levels by 2020. It is recommended that the City of Beaumont consider additional strategies applicable to the building energy sector, that are technically, politically, and financially feasible in the Beaumont community.



Chapter 4

Climate Action Plan Implementation

Chapter 4: Climate Action Plan Implementation

This CAP Implementation chapter covers three areas:

- Strategy Implementation
- Sources of Funds for Implementation
- CAP Progress Monitoring

BE-1	Enhance outreach efforts to increase participation rates in existing programs that provide third-party rebates, technical assistance, and financing options for Energy Measures (EMs)

Strategy Implementation

Ensuring that the strategies translate from policy language into on-the-ground results is essential for the success of the CAP. Each of the three strategies has its own implementation plan and opportunities to leverage the activities of the other strategies. The following sections recommend a high-level implementation plan for each strategy. BE-2 includes a discussion of opportunities for leveraging the efforts of BE-1 to benefit BE-2.

SCE and SCG's Local Government Partnership Programs for 2013-2014 included sections that describe the plan for SCE's "Beaumont Energy Partnership" (see Appendix C and Appendix D for Beaumont's "Program Implementation Plans" developed by SCE and SCG respectively). Both plans include components on outreach. For example, in the Program Implementation Plan developed by SCG, Core Program Element C.1 is titled, "Outreach & Education" and opens with the following commitment:

> *"The City of Beaumont Energy Partnership will establish a two year Marketing, Education, & Outreach (ME&O) plan that incorporates public events, educational workshops, and other venues for publicizing the partnership goals and providing various types of assistance to local business owners, private citizens, and other public entities within the City's jurisdiction."*

The purpose of outreach is to drive demand for Energy Measures. The CAP strongly recommends that Beaumont explore and implement innovative demand driving measures.

Tactics for Driving Demand

Given that the community's preferred strategies lean so strongly toward outreach and incentives – and away from mandates – the City will need to be thoughtful in how it will execute its outreach activities, and how it will make sure that Beaumont residents are aware of and know how to take the best advantage of the PACE program.

To that end, the presentation to the City Council also included a discussion on outreach and education, and offered a way to think about different outreach and education tactics. The selection of these tactics is critically important, especially if there will be no City policies that fall within the mandates category. Mandates, by their very nature, drive demand for Energy Measures. Non-mandatory strategies need to focus their implementation on driving demand, so that participation rates result in meaningful reductions in GHG emissions – in addition to the other benefits that were previously discussed (e.g., job creation, lower utility bills, increased property values). Another way of looking at the strategies is through the lens of their impact on driving demand. Table 4-1 provides a summary of this perspective on GHG emission reduction strategies.

Table 4-1: Demand Drivers for GHG Emissions Reduction Strategies.

Type of Driver	Sample Application of Demand Driver	Relative Impact on Driving Demand
Outreach	Increase awareness of and knowledge about utility rebates, technical assistance, financing options	L
Technical Assistance	Administer program offering free/low-cost energy saving and renewable energy opportunity assessments	L-M
Financial Incentives	Establish PACE financing program	M-H
Mandated Information Disclosure	Adopt and enforce energy performance disclosure requirement of for-sale, for-lease residential properties	M-H
Mandated Action	Adopt and enforce RECO	H

With the community's strong preference for outreach-focused strategies, the City Council presentation also included Table 4-2 below, showing a breakdown of different outreach tactics, and the implications of each along a few key factors.

Table 4-2: Outreach Tactics and their Implications.

Implications of Various Outreach Tactics					
Type of Outreach	City Financial Cost	City Staff Time Cost	Demand Driving (aka Participation Rate) Outcomes		
			Individually	Combined	
Newspaper ads, radio ads, utility bill inserts	M	L	L	M	H
Mass mailings	M	L	L		
Calls	L	M	L		
Door-to-door canvassing	L	H	L		
Affiliation marketing	L	H	M-H		

The table shows that the most effective way to drive demand is through a combination of outreach efforts that take advantage of affiliation marketing. For purposes of this discussion, affiliation marketing is defined as leveraging the personal relationships that are developed in formal or informal membership groups to communicate, explain, and take the unknown out of a consumer product or service, investment, or behavioral change opportunity. As an example of affiliation marketing, a member of a Parent Teacher Association (PTA) could take a few minutes at a PTA meeting to talk about her experience with a home energy audit and a subsequent home energy performance upgrade, and encourage her fellow PTA members to do the same.

Additional examples of membership groups include:

- Homeowner associations
- Faith-based organizations
- Kids' school, teams, and clubs
- Service xlubs (Rotary, Kiwanis, Lions, Soroptomists, etc.)
- Grassroots community organizations
- Clubs and organizations within senior communities (Solera, Four Seasons)

Note that affiliation marketing can be the lowest cost option to the City in terms of financial resources, yet it can be one of the higher cost options in terms of the investment of City staff time. This time would be used to help Energy Measure "evangelizers" coordinate and create materials for the PTA or Girl Scout Troop meetings.

Affiliation marketing also creates an interesting community development opportunity that the City could tap into. Because a member of a group (e.g. PTA) is leveraging the group's membership to drive demand – meaning to drive sales of Energy Measure products and services – the group could make an economic arrangement with the providers of those products and services. For instance, the group could receive a commission for each transaction that comes from its outreach/demand driving activities. The group could also forgo all or a portion of a commission and have it passed along in the form of a discount to the Energy Measure buyer. In some cases, a particularly effective evangelist may become part of the sales team for a CES provider, or with some training, move into a provider's technical staff role.

The choice of which combination of tactics to use depends on:

- The availability of City funding and staff resources.
- The strength of individual community groups in the City and the interest of their respective leadership in participating in CES demand driving activities.
- The means and practices by which information of this type tends to get effectively disseminated, (e.g., word of mouth, advertisements, peer-to-peer, and leaders to residents, school teachers and staff to families via their students).

BE-2 Establish or participate in a Property Assessed Clean Energy (PACE) financing program to assist property owners in accessing the upfront capital needed to implement higher cost EMs

There are two stages of implementation for this strategy. The first stage focuses on the establishment of the legal authority and mechanics for enabling PACE financing in Beaumont. The second stage focuses on driving demand for PACE transactions.

Establishing the PACE Program Mechanics

There are many detailed steps that go into establishing a PACE program in a community. Fortunately, the manual mentioned in Chapter 3 (Property Assessed Clean Energy (PACE) Replication Guidance Package for Local Governments) provides ample guidance on this process. The manual provides a visual summary of the steps on the path to PACE program development, provided below in Figure 4-1:

There are two statutory pathways that Beaumont can follow in establishing its PACE program. One is enabled through a law known as AB 811, the other through SB 555. The former authorizes local governments to enter into a contractual assessment agreement with an individual property owner to finance Energy Measures on the owner's property. The local government borrows capital, which is then provided to the property owner to make qualified Energy Measure investments. Under the agreement, the property owner repays the local government's funding through an assessment levied against the owner's improved property. In the latter approach – using SB 555 – a local government may create a community facilities district (CFD) into which property owners may voluntarily annex their properties. Money flows from capital markets to city to property owner and back to

the capital markets in largely the same fashion as in the AB 811 approach. SB 555 expanded the eligibility of local governments in California that may use CFDs to include any local agency, not just chartered cities. Legal counsel should be consulted in choosing which approach is best for Beaumont.

Driving Demand for PACE Transactions

Building a PACE program does not mean that homeowners will flock to take advantage of it. It is essential to drive demand for the program. Many PACE programs around the state – including the HERO program that is administered for the Western Riverside County Association of Governments – rely primarily on private sector contractors and solar installers to drive demand for PACE program utilization. The participation rates that Beaumont needs to reach in order to make real headway on reducing its building energy sector GHG emissions are higher than the participation rates seen in the HERO program, which are near 3% of owner-occupied homes per year.

Figure 4-1: PACE Program Development Steps.

To achieve higher rates – specifically those identified in the Aggressive Demand Driving scenario, which are from 33% to 50% higher than in the Moderate scenario – Beaumont will need to leverage the affiliation marketing opportunities discussed above. The power of personal relationships and shared community are powerful demand drivers. In the case of Energy Measures – which involve a significant amount of funds, and which involve one's biggest and very personal asset – leveraging relationships may likely be essential to achieving aggressive participation rate targets.

BE-3 Adopt a mandatory energy performance labeling ordinance as a means of increasing demand for high performing homes/buildings

As discussed in Chapter 3, a mandate or realtor-led voluntary program to disclose the energy performance of a home does not reduce energy use (and thus GHG emissions) in and of itself. Rather, the information will inform prospective homebuyers of the true operating and holding costs of a home.

To achieve adoption of a labeling law, it is advised that Beaumont meet with the stakeholders who would be affected by such a law. Some of the main stakeholders include realtors, home performance contractors, energy performance auditors, home loan officers, and of course homeowners (which are sometimes represented through their homeowner associations, where applicable).

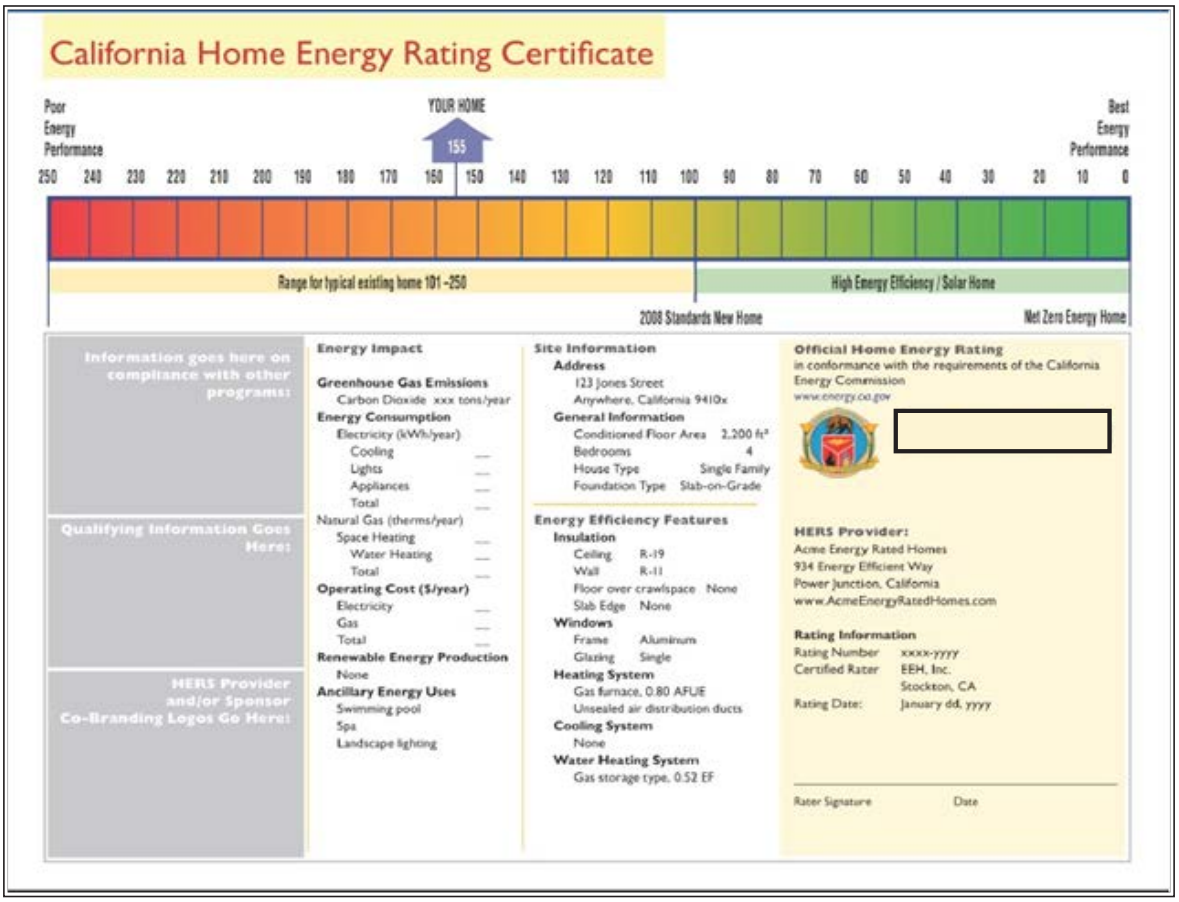
The following are some important variables to consider in designing an energy performance labeling ordinance for the residential sub-sector:

- What labeling system to use (see below)
- Should some homes be exempt from a mandate, such as homes less than two years old, or historically protected buildings
- Should the label identify specific deficiencies, and/or recommend specific Energy Measures to improve performance
- What certifications or other requirements should the individual or company have that is performing the energy assessment

- At what stage in the home selling/buying process should the home's energy performance be disclosed
- Who pays for the energy performance assessment
- How long is the assessment valid

Regarding the labels themselves, there are now a handful of home (and commercial) energy labeling schemes in place around the country and around the world. The Institute for Market Transformation has collected most of these labels and posted them on its partner web site (see: www.buildingrating.org/content/energy-label-gallery). One example of an energy performance disclosure label for California is provided below in Figure 4-2:

Figure 4-2: Sample energy Performance Disclosure Label.



Sources of Funds for Implementation

This section describes potential funding sources and financing mechanisms that Beaumont could pursue to offset the financial burden of implementing the CAP's recommendations. The costs to be borne by the City are administrative in nature – staff time to design and implement each of the three strategies. More significant costs burdens fall to homeowners and building owners, if they choose to implement one or more Energy Measures.

City Costs

To offset the costs to the City, the City may use existing staff resources, and it may supplement those resources with grants from the US Department of Energy and Environmental Protection Agency, from the State of California's Energy Commission (CEC), Public Utilities Commissions (CPUC), and cap-and-trade program revenues from the California Air Resources Board (CARB), the South Coast Air Quality Management District (SCAQMD), the Southern California Association of Governments (SCAG), and from SCE, SCG, and corporate partners with a local presence.

In addition to using existing resources and seeking out new resources, the City can explore options for creating programs that are self-financing. For instance, the City could administer its own PACE program and take a small fee from each PACE financing transaction, which would be used to fund the staff that would be running the program.

Private Home and Commercial Building Owner Costs

For private home and commercial building owners, one of the primary and most promising sources of financing is already called out and described in Strategy BE-2: PACE financing. While PACE may be an important and useful tool for many homeowners, innovative financing mechanisms are being developed all the time; as such, City staff should assess the PACE program over time to learn if there are some property owners or properties for which PACE is not the ideal solution, and identify alternative financing mechanisms.

Power Purchase Agreement

One such alternative for installing a solar PV system on one's property is already available – a Power Purchase Agreement, or PPA. In a PPA, the building owner allows a provider to install a solar PV system on the building's roof, lets it remain there – usually for 20 years, and buys from the PPA provider the electricity generated from the system at an agreed upon price (typically less than the price paid to the local electric utility for electricity). The building owner has the option of buying the system at the end of the lease term. The web site Energy Sage provides a simple comparison of solar PV acquired through a PPA and through a direct ownership model (as PACE financing would provide) (see: https://www.energysage.com/solar-lease/should-buy-or-lease).

Energy Upgrade California

(See: www.energyupgradecalifornia.com)

Energy Upgrade California is a program under the State Energy Program (SEP), which is administered by the CEC. The purpose of the Program is to create jobs and stimulate the economy through a comprehensive program to implement energy retrofits in existing residential buildings. The Program focuses on deploying construction workers and contractors, and youth entering the job market to improve the energy efficiency and comfort of California's existing housing, creating a sustainable energy workforce in the process.

The program is designed to:

- Establish sets of verifiable retrofit standards for energy efficiency and other green improvements that are easy for building owners and contractors to understand.
- Train contractors to implement these standards in their retrofit projects.
- Create quality assurance procedures to help ensure that retrofit work meets program requirements and performance expectations.
- Offer financing for eligible improvements through CaliforniaFIRST.
- Bundle potential rebates and other incentives to make them more accessible to property owners, which can total up to $4,500.
- Conduct a state-wide marketing and public outreach campaign to get the word out to property owners and building industry contractors about best practices for energy efficiency and green retrofits, as well as financing and incentive opportunities.

California Solar Initiative

(See: www.gosolarcalifornia.org/csi/index.php)

The California Solar Initiative (CSI) is the solar rebate program for California consumers who are customers of investor-owned utilities, such as SCE. The CSI Program pays solar consumers an incentive-based on expected or measured system performance. For existing homes, existing or new commercial, agricultural, government, and non-profit buildings, this program funds both solar photovoltaics (PV), as well as other solar thermal generating technologies. Additionally, for homes and businesses, this program funds solar hot water systems.

An additional rebate is available for single-family homes owned by low-income residents or multi-family affordable housing.

The CSI solar incentives differ by customer segment and size, and are intended to encourage high performing systems. There are two types of incentives available through the CSI program: Expected Performance-Based Buydown (EPBB) and Performance-based Incentives (PBI). EPBB is a one time, up-front payment based on an estimate of the system's future performance. For solar projects with a system larger than 30 kW, PBI are monthly payments for 5 years based on actual performance (output) of the system. The incentive rate is based on the incentive type—EPBB or PBI, and the relevant customer segment—residential, commercial or government/non-profit and current incentive step.

The CSI solar thermal hot water program will run for eight years, ending on December 31, 2017. The CSI-Thermal rebate amounts differ by customers' system size, class (e.g., residential or commercial) and water heating fuel source (e.g., gas or electric).

California Feed-In Tariff

(See: www.cpuc.ca.gov/PUC/energy/Renewables/hot/feedintariffs.htm)

The California feed-in tariff allows eligible customer-generators to enter into 10-, 15- or 20-year standard contracts with their utilities to sell the electricity produced by small renewable energy systems – up to 3 megawatts (MW) – at time-differentiated market-based prices. Time-of-use adjustments will be applied by each utility and will reflect the increased value of the electricity to the utility during periods of peak demand and its lesser value during off-peak periods. These tariffs are not available for facilities that have participated in the California Solar Initiative (CSI), Self-Generation Incentive Program (SGIP), Renewables Portfolio Standard, or other ratepayer funded generation incentive programs, including net-metering tariffs.

For customers generating renewable energy not covered by the CSI or SGIP (e.g., biomass or geothermal) the feed-in tariff is applicable. If customers prefer a long-term contract at a fixed price over a financial incentive paid in the short term, feed-in tariffs may be a beneficial financing tool.

CAP Progress Monitoring and Evolution

This CAP represents the City's best attempt to create an organized, community-wide response to the threat of climate change at the time of preparation. Staff will need to monitor the plan's performance over time and be ready to alter or amend the plan if it is not achieving the reduction target.

Plan Evaluation

Two types of performance evaluations are important: evaluation of the CAP as a whole and evaluation of the individual component measures. Building Energy sector-wide inventories of electricity use, natural gas use, and their associated GHG emissions (using the same methodologies as described in this document to ensure consistency) will provide the best indication of CAP effectiveness. Note that it will be important to reconcile actual growth in the City versus the growth projected when the CAP was developed. Conducting these inventories periodically will allow direct comparison to the 2012 baseline inventory and will demonstrate the CAP's ability to achieve the adopted reduction target. It is recommended that the inventories be updated every 12 months.

While Building Energy sector-wide inventories will provide information about overall GHG reductions, it will also be important to understand the effectiveness of the individual strategies.

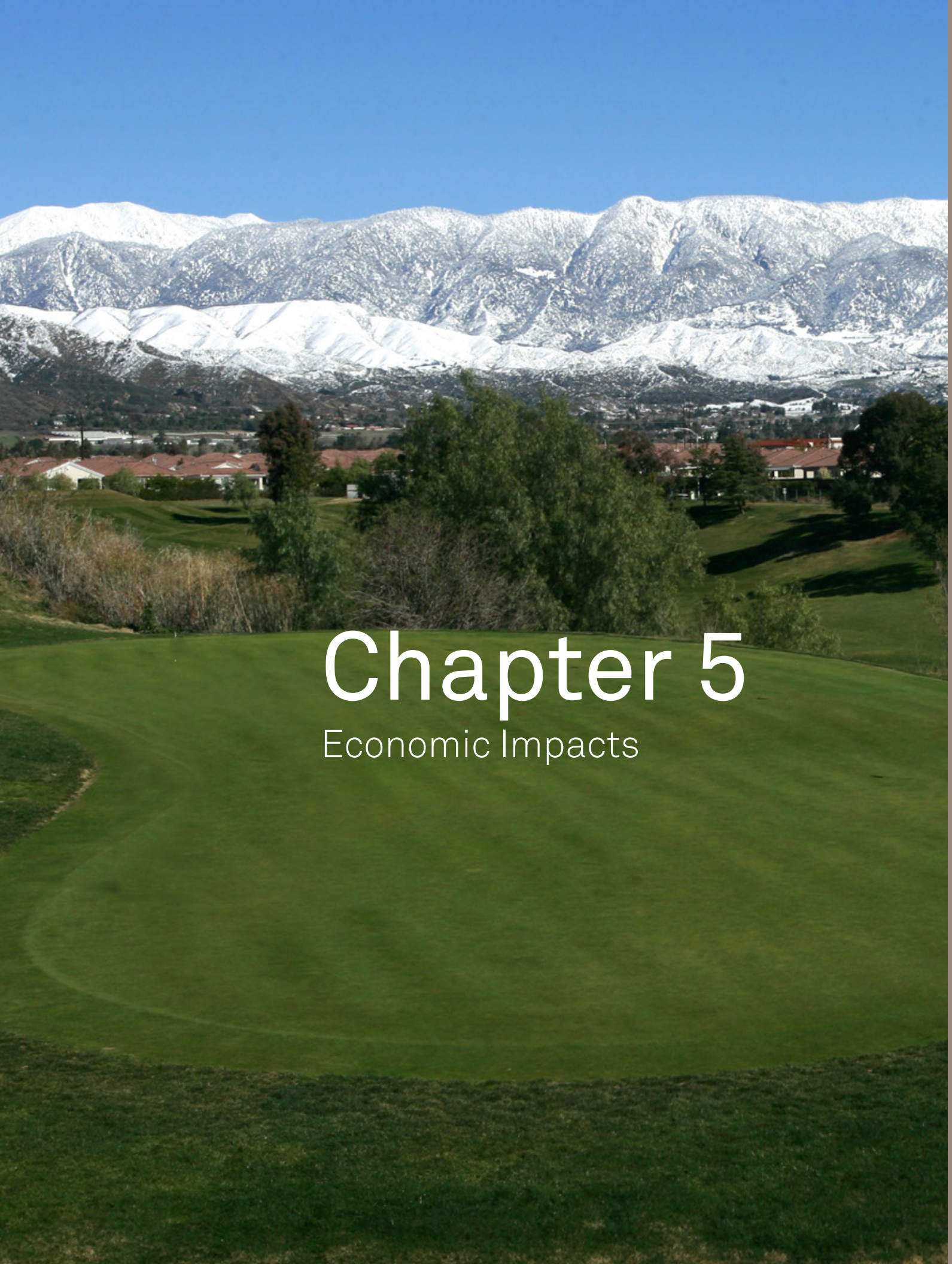
Evaluation of the emissions reduction capacity, costs, and benefits of individual strategies will improve staff and decision makers' ability to manage and implement the CAP. The City can promote successful strategies and reevaluate or replace those that are under-performing. Evaluating strategy performance will require data, such as community participation rates and measurement of GHG reductions that were achieved in a representative sample of buildings.

The CAP recommends that the City's Manager's Office coordinate measure evaluation, do so on the same schedule as the community-wide inventories, and summarize the progress towards meeting the GHG reduction target in a report that describes:

- A projection of estimated annual GHG reductions in 2020, compared to the Adjusted BAU GHG emissions scenario
- Participation rates (where applicable)
- Evidence of implementation costs
- Evidence of cost savings and payback (when feasible)
- Community co-benefits realized
- Remaining barriers to implementation

Plan Evolution

To remain relevant, the City must be prepared to adapt and evolve the CAP over time. It is likely that new information about climate change science and risk will emerge, new GHG reduction technologies and innovative municipal strategies will be developed, new financing options will materialize, and State and federal legislation will advance. It is also possible that community-wide inventories will indicate that the community is not achieving its adopted target. As part of the evaluations identified above, the City will assess the implications of new findings in the field of climate change, explore new opportunities for GHG reduction and climate adaptation, respond to changes in climate policy, and incorporate relevant changes to ensure an effective and efficient CAP.



Chapter 5

Economic Impacts

Chapter 5: Economic Impacts

This CAP Economic Impacts chapter covers three areas:

- Economic Impacts to Individual Home and Building Owners
- Property Value Impacts
- Jobs Generated in the Area

Introduction

Economic impacts were an important consideration in the selection of the CAP's strategies. These impacts were discussed in the Community Engagement section of Chapter 1. Table 5-1 summarizing the types of impacts is provided here again:

Table 5-1: Additional Impacts of GHG Emissions Reduction Strategies.

Impacts	Discussion
Costs to the City	The costs the city would incur for staff time, marketing expenses, and other costs
Costs to Individuals/Businesses	The upfront costs to individuals and businesses to take advantage of an opportunity, or to comply with a mandate
Utility Bill Savings	Reduction in utility bills, influenced by the amount of and financing mechanisms of the upfront costs identified above
Job Creation	Jobs created by the installation of a mitigation measure, and the jobs from increased local spending resulting from reduced utility bills
Property Values	Increase in property values from greater energy efficiency and comfort, or with renewable energy equipment installed
Indoor Comfort and Health	Increase in comfort/livability of a home or business, often accompanied by improved indoor air quality

This chapter will ignore the first and last of these impacts. The first of these – costs to the City – will involve minimal costs; the nature of the chosen strategies will lead only to administrative expenses for the City to absorb (i.e. expenses that are much smaller than the capital investments that home and building owners will be encouraged to make on a voluntary basis). The relatively small level of City costs will not have a material impact on job generation or property values. The other impact – indoor comfort and health – is quite difficult

to quantify (though experts and individual homeowners can attest to improvements in health, as well as improvements in comfort – both of which can lead to economic benefits). At best, one can state that individuals in Beaumont and the Beaumont community will experience a qualitative (rather than a quantitative) benefit from improvements in indoor comfort and health.

Economic Impacts to Individual Home and Building Owners

This category of impacts takes into consideration the upfront costs needed to implement low, medium, or high energy saving packages, and the possible negative impact of paying for those upfront costs on the yearly cash flows of a home or commercial building owner.

Each home and building is different in terms of its current energy performance, the potential for different kinds of Energy Measures to improve performance, and the cost to install each Energy Measure or package of Energy Measures. That being said, the CAP economic impacts analysis concludes that in most cases, owners will not experience a material negative impact on their yearly cash flows. The analysis relies on two important and reasonable presumptions in arriving at this conclusion.

1. If an owner installs Low or Medium Energy Measure packages, the net installation costs to the homeowner will be relatively low after various federal, state, and utility-based incentives are factored in (<$2,000) and the annual energy savings proportionally high (relative to the costs). As a result, the impact on the building owner from making the investment will not result in a materially negative economic impact on the finances of the home or building owner.

1. If an owner installs a High Energy Measure package, then the debt service over the course of a year to pay for the money borrowed to implement the package will be roughly equal to or less than the annual utility bill savings. As above, the impact on the building owner from making the investment will not result in a materially negative economic impact on the finances of the owner. (If an owner can afford to pay cash – as opposed to borrow – to install the High EM package, the analysis draws the same conclusion.)

To be sure, there are circumstances where utility bills may rise from one year to the next, despite the implementation of an Energy Measure package. In one circumstance, the rates that utilities charge for their services may rise. In another, the winter may be colder than usual and/or the summer may be hotter than usual. In both cases, the utility bill may go up. Yet the bill would have gone up even further if the Energy Measure package had not been installed.

Over the long-term – i.e. as upfront investments are recovered through lower utility bills or as debt taken on to implement the measures are paid off – the home or building owner will have extra cash in the bank because of ongoing utility bill savings.

Property Value Impacts

The assessment above only assesses the economic impact on property owners' annual cash flows. There are also impacts on the value of the home or building itself, as most investments increase the value of the underlying asset. This section first looks separately at the impacts on property values that result from energy efficiency investments, and that result from solar PV investments. The section concludes with an estimate of cumulative property value impacts in Beaumont that would result from the achievement of the projected participation rates.

The analysis only considers the existing housing stock in Beaumont, and not the additions to the housing stock expected by 2020.

Energy Efficiency Impacts on Home Values

There does not seem to be evidence that energy efficiency investments in a home have an impact on property values – at least not on their own. To have an effect on a home's value, the home needs to have a certified rating given to it by one of the recognized energy labeling schemes. This market dynamic makes intuitive sense: a prospective buyer will typically not be able to see the well-insulated attic and walls; many buyers may not

recognize or understand the benefits of super-insulated windows; similarly, buyers may not appreciate the efficiency rating of an air-conditioner or hot water heater. And in today's market, realtors are often not equipped (or motivated) to explain the comfort and economic advantages of these features. Therefore, a certified rating is needed as a means of communicating to buyers that a home is more comfortable and less expensive to operate.

A 2012 study by professors from the Universities of California at Berkeley and Los Angeles concluded that homes with a strong energy efficiency rating will have an increase in market value relative to comparable homes of 9%.[23]

The median value of homes in Beaumont is $248,400.[24] Using the 9% premium in home values that high energy performance rated homes appear to command in the marketplace, the average retrofitted home would command a premium over the median home value of $22,400.

Solar PV Impacts on Home Values

In contrast to energy efficiency, renewable energy installations – which on homes and buildings typically means solar PV installations – are visible, identifiable, and at this stage in the market, still come with a "wow" factor. As a result, no energy performance labeling or rating system is needed for the market to attach a value to the solar PV system.

A December 2013 study by the Lawrence Berkeley National Laboratory (LBNL) on the impact on residential home values in California of solar PV systems concluded that for every one kilowatt of an installed PV system, homes experience a $5,911 increase in market value over comparable homes.[25] It is important to note that the same study observed an erosion of this premium as the age of the solar system grew over time. Quoting from the study:

> *"For a system that is average across all block groups in terms of age (2.9 years) and size (3.7 kW), the estimated Premium is $24,851. In comparison, similarly aged systems of 1, 3, and 8 kW are estimated to have Premiums of $8,892, $20,714, and $47,312, respectively. Similarly sized systems (as the average) that are 1, 5, and 9 years old are estimated to have Premiums of $29,432, $19,789, and $10,146, respectively." (page 15)*

The California Solar Initiative (CSI) tracks every solar installation that has utilized the CSI inventive program. In Beaumont, 198 solar PV systems were installed using CSI funds between May, 2008 and early June, 2014. With just over 1 Megawatt of solar PV installed, the average installation size in Beaumont is 5.22 KWs. This system size would lead to a gross increase (i.e. before accounting for value erosion from solar system age) in a property's value of just under $31,000.

23 The study gives a margin of error of 4%+/-. Please see the Executive Summary of The Value of Green Labels in the California Housing Market, June 2012. http://pacenow.org/wp-content/uploads/2012/08/KK_Green_Homes_0719121.pdf

24 Median home value estimate generated daily by Zillow.com. Median home price for Beaumont accessed on June 21, 2014. See: http://www.zillow.com/beaumont-ca/home-values/,

25 The LBNL study included a sample size of 1,598 homes with solar PV systems. Home sale prices were taken from the period 1999-2009. All systems are owned by the homeowner, as opposed to owned by a third party. Premium amounts are all presented in 2009 dollars. Report available at http://emp.lbl.gov/sites/all/files/lbnl-6484e.pdf.

Table 5-2 below is taken from the LBNL study. It shows the net increase on home values of solar PV systems, using system size and system age as the variables. A five KW system that is five years old would command a sale price premium of about $27,500.

TABLE 5-2. Premium estimates using system size and age variables.

Average PV System Age in Block Group	1	2	3	3.7	5	8	10
0	$ 15,883	$ 21,794	$ 27,705	$ 31,842	$ 39,526	$ 54,303	$ 69,080
1	$ 13,473	$ 19,383	$ 25,294	$ 29,432	$ 37,116	$ 51,982	$ 66,669
2	$ 11,062	$ 16,973	$ 22,883	$ 27,021	$ 34,705	$ 49,482	$ 64,258
2.9	$ 8,892	$ 14,803	$ 20,714	$ 24,851	$ 32,535	$ 47,312	$ 62,089
4	$ 6,214	$ 12,151	$ 18,062	$ 22,199	$ 29,883	$ 44,660	$ 59,437
5	$ 3,830	$ 9,740	$ 15,651	$ 19,789	$ 24,473	$ 42,249	$ 57,024
6	$ 1,419	$ 7,330	$ 13,240	$ 17,378	$ 25,062	$ 39,839	$ 54,615
7	$ (992)	$ 4,919	$ 10,830	$ 14,967	$ 22,651	$ 37,428	$ 52,205
8	$ (3,402)	$ 2,508	$ 8,419	$ 12,556	$ 20,240	$ 35,017	$ 49,794
9	$ (5,813)	$ 98	$ 6,008	$ 10,146	$ 17,830	$ 32,606	$ 47,383
10	$ (8,224	$ (2,313)	$ 3,597	$ 7,735	$ 15,419	$ 30,196	$ 44,972

Cumulative Property Value Impacts

Solar PV Property Value Impacts

In 2012, there were 13,445 housing units in Beaumont. Under the CAP's Moderate participation rate scenario, 6% of homes in the City will have solar systems installed by 2020, or slightly over 800 homes (from Table 2.7 in Chapter Two. Under the Aggressive participation rate scenario, 12%, or slightly over 1600 homes, will have solar systems.

Using the 5 KW and 5 year old premium (~$27,500) from the LBNL data (see Table 5-2), cumulative property value increases resulting from solar installations are $16.5 million and $33.0 million, respectively for the Moderate and Aggressive participation rate scenarios.

Energy Efficiency Property Value Impacts

Under the CAP's Moderate participation rate scenario, 5% of homes in the City will have installed the Medium package of energy efficiency measures by 2020, or close to 700 homes. Under the Aggressive participation rate scenario, 8%, or close to 1100 homes, will have installed the same measures.[26]

Using the $22,400 per home price premium for every retrofitted home, cumulative property value increases resulting from energy efficiency retrofits are $15.7 million and $24.6 million, respectively for the Moderate and Aggressive participation rate scenarios.

26 The CAP analysis presumes that a home will receive a high energy performance rating if all three of the Medium package measures listed in Table 2.7 are installed: 1) interior lighting upgrades, 2) hot water management/ conservation, and 3) duct sealing and loft insulation. While the Moderate and Aggressive participation rate scenarios predict that 15% and20% of homes will have utilized the first two measures, they predict that only 5% and 8% of homes in the two scenarios will have utilized the third measure.

Solar PV + Efficiency Property Value Impacts

Under the Moderate participation rate scenarios, total increases in property values by 2020 amount to $32.2 million. Under the Aggressive participation rate scenarios, total increases in property values by 2020 amount to $57.6 million. Table 5-3 below summarizes these calculations.

Table 5-3: Solar PV and Efficiency Property Value Impacts.

Property Value Impacts Summary	Solar		Efficiency	
Participation Rate Scenario	Moderate	Aggressive	Moderate	Aggressive
Number of homes with solar installs / efficiency improvements by 2020	800	1600	700	1100
Net Solar Premium (5KW/% yrs. Old) // % Premium Over Comparable Home Median Price	$27,500		9% of $248,400 = ~$22,400	
Cumulative Property Value Impact ($ million)	$16.5	$33.0	$15.7	$24.6
	Solar + Efficiency			
Moderate	**$32.2 million**			
Aggressive	**$57.6 million**			

Jobs Generated in the Area

Investments in solar PV installations and energy efficiency will create jobs for persons in Beaumont and in the surrounding communities. This job creation analysis looks at the total jobs created through these investments, meaning the direct jobs, the indirect jobs, and induced jobs. Direct jobs are those created for the purpose of selling, financing, installing, and maintaining solar PV systems and energy efficiency measures. Indirect jobs are those created in the supply chain and supporting industries of the installer companies. Induced jobs are those created through the spending of the wages earned by those employed in both the new direct and new indirect jobs.

Jobs from Energy Efficiency Installations

The American Council for an Energy Efficient Economy (ACEEE) created a fact sheet titled, "How Does Energy Efficiency Create Jobs?"[27] ACEEE calculates that for every $1 million spent on energy efficiency, 20 direct, indirect, and induced jobs are created.

If the average gross cost of a Medium package energy efficiency investment is $2,600,[28] then, using the number of homes retrofitted from the property values discussion above, there will be $1.8 million spent on home retrofits in the Moderate participation rate scenario, and $2.9 million spent in the Aggressive scenario.

Using ACEEE's job creation numbers, the Moderate scenario would generate 36 total jobs from installation activities, and the Aggressive scenario would create 58 total jobs.

27 The fact sheet is available at: http://aceee.org/files/pdf/fact-sheet/ee-job-creation.pdf. ACEEE's job multiplier calculations – i.e. the number of indirect jobs coming from direct jobs, and the number of induced jobs coming from direct and indirect jobs – are derived using the IMPLAN. IMPLAN is an economic input-output model developed to understand the impacts on an economy of different public and private investment flows.

28 The amount used for the cost of the Medium package of energy efficiency measures - $2,600 – is taken from the State of California's 2014 estimate of the per-home cost to weatherize homes in the Weatherization Assistance Program. This estimate comes from the state's 2014 application to the US Department of Energy for Weatherization Assistance Program funds. See page 32 at http://www.csd.ca.gov/Portals/0/Documents/State%20Plans/2013-2014%20DOE%20State%20Plan%20FINAL%20Draft%205-1-14.pdf

Jobs from Solar PV Installations

In California in 2013, there were 47,233 jobs in the solar industry, with persons employed in various types of jobs.[29] In that year, over 2,000 megawatts of rooftop solar were installed.[30]

Using the same participation rate outcomes as in the property values discussion above, and assuming a 5 KW per home system size, the Moderate participation rate scenario would generate 60.4 jobs through 2020. The Aggressive participation rate scenario would generate 120.8 jobs in the same period. Table 5-4 below summarizes these calculations.

Table 5-4: Jobs from Solar PV Installation.

Job Types - Direct Employment	Number of Jobs in CA to Install 2,000 MWs	Jobs per Installed MW
Installation*	26,052	13.0
Manufacturing***	10,504	5.3
Sales and Distribution**	**5,877**	**1.5**
Project Development**	**2,369**	**0.6**
Other (workers in non-profits, government, and academia)***	**2,421**	**1.2**
TOTAL Direct Jobs	**47,233**	**21.6**
Multiplier for Indirect Job Creation // Indirect	1.801[31]	38.9
Jobs in and near Beaumont per MW – Direct and Indirect		60.5
Total Jobs in and near Beaumont: Direct + Indirect	**Moderate Participation Rate: 4 MWs**	**Aggressive Participation Rate: 8 MWs**
	242	**484**

* 100% of Installation jobs are presumed to be in and near Beaumont
** 50% of Sales and Distribution, and 50% of Project Development Jobs are presumed to be in and near Beaumont

Total Job Creation Projections: Efficiency + Solar

The total number of jobs that achievement of the CAP's two participation rate scenarios would generate is 96 for the Moderate scenario and 178 for the Aggressive scenario. These conclusions are summarized in Table 5-5 below:

Table 5-5: Summary of Job Creation Estimates.

Participation Rate Scenario	Moderate	Aggressive
Energy Efficiency Installations	36	58
Solar PV Installations	242	484
TOTALS	**278**	**532**

29 Solar industry employment statistics here and in the table below are taken from the California Solar Jobs Census, page 11. Published by the Solar Foundation, February 2014. Report available at: http://www.thesolarfoundation.org/sites/thesolarfoundation.org/files/California%20Solar%20Jobs%20Census%202013_Web.pdf

30 This figure is an estimate made by Solar Industry Magazine, article accessed on June 21, 2014, at: http://solarindustrymag.com/e107_plugins/content/content.php?content.13637.

31 The multiplier used is taken from the paper, "Job Creation Studies in California for VoteSolar," Fall 2004. Authors: G. Ban-Weiss, D. Larsen, S. X. Li, and D Wilusz. The authors utilized the California Commerce and Economic Development Program's multiplier set generated by the Regional Input-Output Modeling System (RIMS II). Paper available at: http://www.votesolar.org/linked-docs/MSR_Job_Creation.pdf

Appendices

Appendix A: GHG Emissions Inventory and Projections

Appendix B: Energy Modeling

Appendix C: SCE Local Government Partnership: Program Implementation Plan for City of Beaumont Energy Partnership

Appendix D: SCG Local Government Partnership: Program Implementation Plan for City of Beaumont Energy Partnership

Appendix A:

GHG Emissions Inventory and Projections

Appendix A
GHG Emissions Inventory and Projections

BASELINE GHG EMISSIONS INVENTORY AND EMISSIONS FORECAST

This section provides a detailed description of the methodology used to develop the baseline GHG emissions inventory, GHG emissions projections under business-as-usual (BAU) and adjusted BAU scenarios, and the suggested GHG emissions reduction target.

This baseline emissions inventory serves as the foundation for the projected emissions for the year 2020 under the BAU and adjusted BAU scenarios, as well as the suggested GHG emissions reduction target. In turn, the projected emissions under the BAU and adjusted BAU scenarios serve as the basis on which the GHG reduction strategies are applied.

Baseline Emissions Inventory

Beaumont's baseline emissions inventory was developed for calendar year 2012. This inventory focuses on estimating the three GHGs most relevant to energy consumption in the building energy sector: carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). These three GHGs have varying abilities to trap heat in the atmosphere, which are indicated by their Global Warming Potentials (GWPs). GWPs were developed by the Intergovernmental Panel on Climate Change (IPCC), and they represent the heat-trapping ability of each GHG relative to that of CO_2. For example, the GWP of CH_4 is 25 because one metric ton of CH_4 has 25 times more capacity to trap heat in the atmosphere than one metric ton of CO_2. The GWP of the three GHGs is listed below in Table A-1.

Table A-1: Global Warming Potentials of GHGs applicable to Beaumont Inventory.

Greenhouse Gas	Global Warming Potential
Carbon Dioxide (CO_2)	1
Methane (CH_4)	25
Nitrous Oxide (N_2O)	298

Source: 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantially Revised Data Elements.

Given the varying heat trapping abilities of these three GHGs, it is necessary to report the magnitude of their emissions in a standardized form. The GWPs of GHGs allows for the emissions of a specific GHG to be converted to their carbon dioxide-equivalent (CO_2e) emissions. This way, the emissions of different GHGs can be represented on a common basis, in the form of CO_2e emissions. For reporting consistency, all GHG emissions in this CAP are reported in units of Metric Tons CO_2e ($MTCO_2e$)/year.

As discussed in Chapter 1, the baseline emissions inventory estimates GHG emissions from the building energy sector. Specifically, the building energy sector includes consumption of electricity and natural gas in residential, commercial, and industrial buildings in the Beaumont community. A detailed description of the top-down GHG quantification methodology for the building energy sector is provided below. A top-down approach to the inventory development was decided to be acceptable, as a bottom-up calculation would have exposed the GHG analysis to an unacceptable amount of data inconsistencies and inaccuracies.

The electricity and natural gas consumption data for Beaumont's building energy sector for the year 2012 was provided by Southern California Edison (SCE) and Southern California Gas Company (SCG) respectively. SCE and SCG provided electricity and natural gas consumption respectively for the 2012 calendar year, split into two sub-sectors: residential and commercial/industrial. Electricity consumption was provided in units of kilowatt-hours (KWH) and natural gas consumption was provided in units of therms.

The level of granularity in the data provided by the utilities is limited because the utilities are required to comply with a confidentiality requirement known as the 15/15 Rule. According to this rule, any information on energy consumption provided

by the utilities must consist of at least 15 customers, and a single customer's energy consumption must be less than 15 percent of an assigned category. If the number of customers in the complied data is below 15, or if a single customer's load is more than 15% of the total, categories must be combined before the information is released (e.g., commercial and industrial energy consumption). For Beaumont's GHG emissions inventory, the 15/15 Rule was triggered for both commercial and industrial electricity and natural gas consumption data. As a result, the GHG emissions from these two sub-sectors are combined.

The GHG emissions associated with electricity and natural gas consumption were calculated using each utility's specific GHG emission factor. The electricity emission factor, presented in pounds of carbon dioxide equivalent per megawatt-hour (lb. CO_2e/MWH) of energy generation, was based on SCE's 2012 electricity production portfolio, which accounts for the types and amounts of energy sources (e.g., natural gas, hydroelectric, coal) used to generate electricity, and has been documented in SCE's 2012 Corporate Responsibilities and Sustainability Report. The natural gas emission factor was taken from the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas emissions (Community Protocol), and is presented in kilograms of CO_2e per million British thermal units (kg CO_2e/MMBtu). Electricity and natural gas consumption data for residential, commercial, and industrial uses were multiplied by the appropriate emission factor and then converted to MT CO_2e/yr. for the baseline emissions inventory. Table A-2 lists GHG emission factors for electricity and natural gas. A summary of the baseline GHG emissions can be found in Tables A-3 as well as A-4.

Table A-2: GHG Emission Factors for Electricity and Natural Gas, 2012.

Electricity				
Carbon Dioxide (CO_2) (lb./MWH)	Methane (CH_4) (lb./GWH)	Nitrous Oxide (N_2O) (lb./GWH)	Carbon Dioxide-equivalent (lb./MWH)	Source
705.48	Not Applicable	Not Applicable	705.48	SCE 2012 Corporate Responsibilities and Sustainability Report
Natural Gas				
Carbon Dioxide (CO_2) (kg./MMBtu)	Methane (CH_4) (kg./MMBtu)	Nitrous Oxide (N_2O) (kg./MMBtu)	Carbon Dioxide-equivalent (kg./MMBtu)	Source
53.02	0.005	0.0001	53.17	Community Protocol

GHG EMISSIONS FORECAST

The baseline inventory was used to project the City's 2020 GHG emissions under business-as-usual (BAU) and adjusted BAU scenarios.

Projected Emissions under a Business-as-Usual (BAU) Scenario

The BAU scenario assumes that historical and current GHG-generating practices and trends for energy consumption in buildings will continue until 2020. This scenario does not include GHG reductions associated with the statewide legislation or programs, or local GHG reduction measures.

Emissions from the building energy sector were projected under a BAU scenario in consultation with City staff, and via the use of appropriate indicators, such as growth projections in population, housing, and employment for the City of Beaumont, as estimated in the Southern California Association of Government's (SCAG) Regional Transportation Plan.[1] Bottom-up projections were not developed using exact planned development from the City's General Plan. Rather, the projected GHG emissions are based on applicable indicators for each sub-sector (i.e. residential and commercial/industrial). This section describes the methodology used to project emissions from each sub-sector.

Projected GHG emissions from Beaumont's building energy sector for the year 2020 were calculated in two stages. In the first stage, the energy consumption in Beaumont's building energy sector was projected by applying growth factors to the baseline energy consumption in the residential and commercial/industrial sub-sectors. Specifically, it was assumed that energy consumption in the residential sub-sector would increase at the same rate as the expected growth in Beaumont's housing sub-sector between 2012 and 2020. Similarly, it was assumed that energy consumption in the commercial/industrial sub-sectors would increase at the same rate as the expected growth in Beaumont's employment.

1 Growth Forecast Appendix, Regional Transportation Plan, 2012 – 2035, Southern California Association of Governments, <http://rtpscs.scag.ca.gov/Documents/2012/final/SR/2012fRTP_GrowthForecast.pdf?

In the second stage, appropriate GHG emission factors were applied to the projected energy consumption in the residential and commercial/industrial sub-sectors. For both electricity and natural gas, the same emission factors were used as those in the baseline inventory (see Table A-2).

See Figures A-1 and A-2, and Table A-3 for a summary of growth factors applied to the residential and commercial/industrial sub-sectors in Beaumont's Building Energy Sector. See Table A-4 for a summary of projected GHG emissions from each sub-sector under a BAU scenario.

Figure A-1: Observed and Projected Growth in Beaumont's Housing Units.

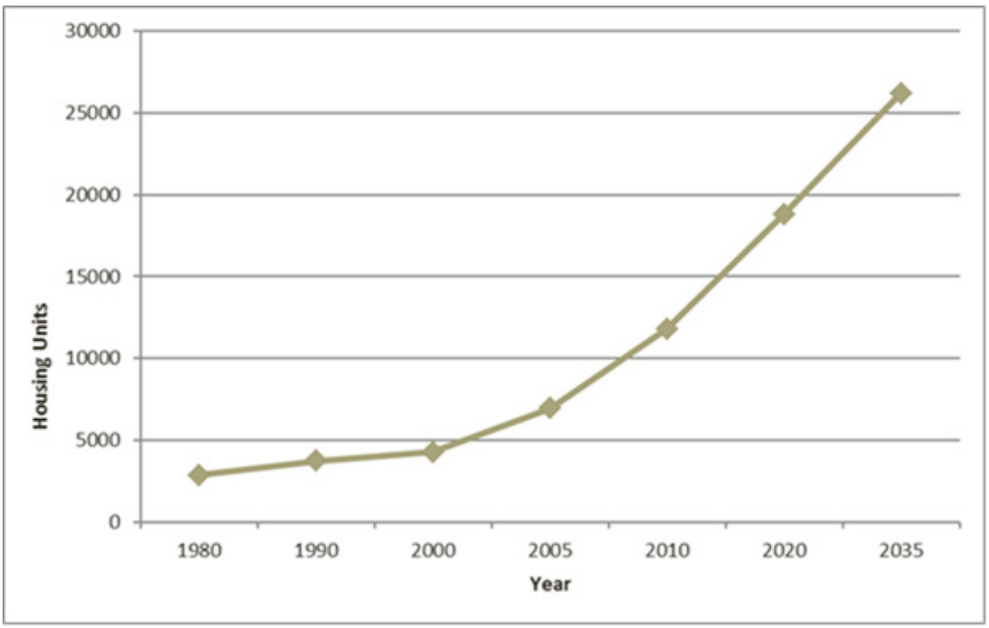


Figure A-2: Observed and Projected Growth in Beaumont's Employment.

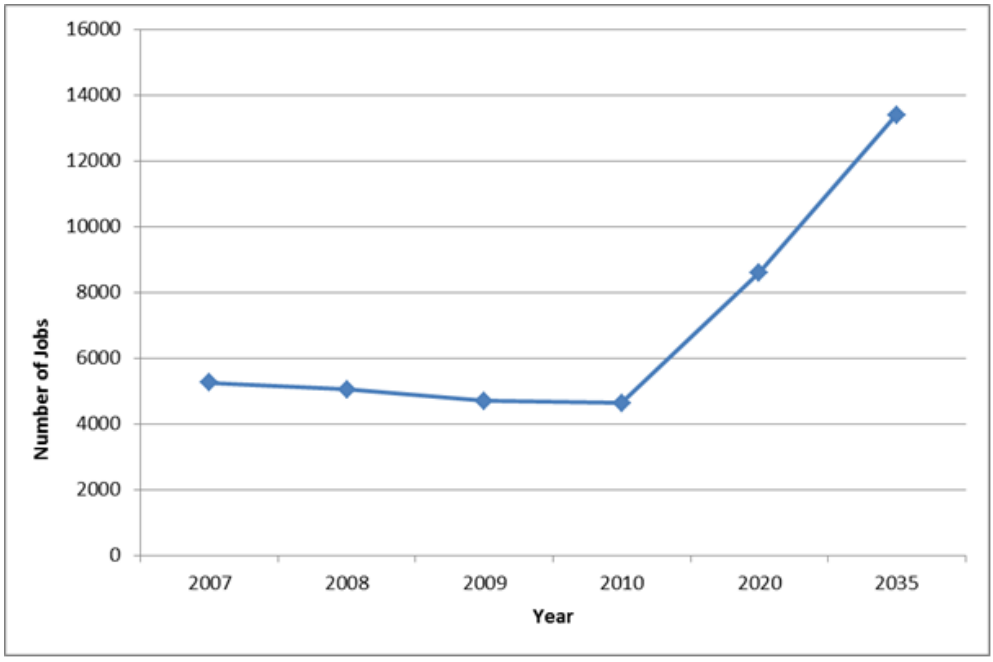


Table A-3: Growth Factors for Energy Consumption.

	2012	2020	Compound Annual Growth Rate	Source
Households	13,445	18,800	0.043 (used as a proxy growth factor for projecting residential energy consumption)	California Department of Finance http://www.dof.ca.gov/research/demographic/reports/estimates/e-5/2011-20/documents/E-5_2013_Internet_Version.xls SCAG <http://rtpscs.scag.ca.gov/Documents/2012/final/SR/2012fRTP_GrowthForecast.pdf>
Employment	5,495	8,600	0.058 (used as a proxy growth factor for projecting commercial energy consumption)	City of Beaumont SCAG <http://rtpscs.scag.ca.gov/Documents/2012/final/SR/2012fRTP_GrowthForecast.pdf>

Table A-4: Baseline GHG Inventory and BAU Emissions Projections.

Building Energy Sector						
Subsector	2012		2020		Change	
	$MTCO_2e$/year	% of Total	$MTCO_2e$/year	% of Total	$MTCO_2e$/year	% Change
Residential						
Electricity consumption	31,555	36%	44,192	34%	12,637	40%
Natural Gas consumption	24,535	28%	34,361	27%	9,826	40%
Commercial/Industrial						
Electricity consumption	27,479	31%	43,141	33%	15,662	56%
Natural Gas consumption	4,741	5%	7,443	6	2,702	56%
Total	**88,310**	**100%**	**129,137**	**100%**	**40,827**	**46%**

PROJECTED EMISSIONS UNDER AN ADJUSTED BUSINESS-AS-USUAL (BAU) SCENARIO

The GHG emissions from Beaumont's building energy sector were also projected under an adjusted BAU scenario. This scenario accounts for GHG emission reductions associated with statewide legislation, namely, the 2013 updates to the California Building Energy Efficiency Standards (Title 24 updates) and the Renewable Portfolio Standard.

Title 24 updates will raise the minimum energy efficiency standards for new buildings and for major modifications to existing buildings, thereby decreasing the expected energy consumption of future development in Beaumont. Under the adjusted BAU scenario, it was assumed that Title 24 updates will make new residential buildings 15% more efficient than they would be under the current 2008 Title 24 standards for new residential buildings by the year 2020. This assumption is based on conservative energy savings estimates provided by the California Energy Commission.[2] Similarly, it was assumed that the new commercial buildings will be 25% more efficient than they would be under the current standards by the year 2020. This percentage efficiency gain is based on the requirement put in place in the year 2008 for commercial buildings to achieve zero net-energy (ZNE) status by the year 2030, and assumes that new commercial buildings will have made incremental progress towards ZNE goals at the rate of approximately 4.5% per year, amounting to an efficiency gain of 25% between mid-2014 and 2030.[3]

2 Source: Background Information, 2013 Building Energy Efficiency Standards < http://www.energy.ca.gov/title24/2013standards/prerulemaking/background.html>

3 Frequently asked Questions, Building Energy Efficiency Standards, California Energy Commission < www.energy.ca.gov/title24/2013standards/rulemaking/documents/2013_Building_Energy_Efficiency_Standards_FAQ.pdf>

Under the RPS, 33% of SCE's (Beaumont's electric utility) electricity production is required to be derived from renewable sources by 2020. This requirement will reduce the GHG intensity of SCE's future electricity production, which will be reflected in a lower GHG emission factor for the electricity supplied to Beaumont by SCE. It was assumed that SCE's GHG emission factor for electricity in the year 2020 will be approximately 471 lb. CO_2e/MWH. This emission factor was derived from SCE's estimates of future emission factors under the assumption that the utility is on track to meet the requirements of the RPS.[4]
See Table A-5 for a summary of projected GHG emissions from each sub-sector under an adjusted BAU scenario.

Table A-5: Baseline GHG Inventory and BAU Emissions Projections.

Building Energy Sector						
Subsector	2012		2020		Change	
	$MTCO_2e$/year	% of Total	$MTCO_2e$/year	% of Total	$MTCO_2e$/year	% Change
Residential						
Electricity consumption	31,555	36%	28,935	30%	-2,620	-8%
Natural Gas consumption	24,535	28%	31,246	33%	6,711	27%
Commercial/Industrial						
Electricity consumption	27,479	31%	27,922	29%	443	2%
Natural Gas consumption	4,741	5%	7,315	8%	2,574	54%
Total	**88,310**	**100%**	**95,418**	**100%**	**7,108**	**8%**

SUGGESTED GHG EMISSIONS REDUCTION TARGET

The suggested GHG emissions reduction target for the City of Beaumont's building energy sector is 28% below 2012 levels by the year 2020. This target is equivalent in magnitude to the target recommended for local governments under the California Global Warming Solutions Act (AB 32). AB 32 recommends that local governments should aim to reduce GHG emissions by approximately 15% below 2008 levels by the year 2020. Many local governments in California have set GHG reduction targets based on this recommendation (see Table A-6).

Table A-6: Growth Factors for Energy Consumption.

Local Government	Time Frame	Target(s)
Millbrae	Short-term Long-term	15% below 2005 levels by 2020 80% below 2005 levels by 2050
Benicia	Short-term	2005 levels by 2010 10% below 2000 levels by 2020
Novato	Short-term	15% below 2005 levels by 2020
San Luis Obispo	Short-term	15% below 2005 levels by 2020
Alameda	Short-term	25% below 2005 levels by 2020
Santa Monica	Short-term	15% below 1990 levels by 2015
San Diego	Short-term	15% below 1990 levels by 2010
Chula Vista	Short-term	20% below 1990 levels by 2010

4 Greenhouse Gas Calculator for the California Energy Sector < www.ethree.com/documents/GHG%20update/GHG%20Calculator%20version%203c_Oct2010.zip>

Local Government	Time Frame	Target(s)
Los Angeles	Medium-term	35% below 1990 levels by 2030
Berkeley	Short-term Long-term	33% below 2000 levels by 2020 80% below 2000 levels by 2050
Hayward	Short-term Medium-term Long-term	6% below 2005 levels by 2013 12.5% below 2005 levels by 2020 82.5% below 2005 levels by 2050

Given that Beaumont's baseline inventory year was 2012, an equivalent target of 28% below 2012 was derived on the basis of the following factors:

- The extent to which Beaumont's housing and employment sectors experienced growth between 2008 and 2012
- The extent to which the 2008 Title 24 updates reduced the energy consumption from new development (residential and commercial/industrial) between 2008 and 2012
- The changes in the GHG emission factors of electricity supplied to Beaumont's building energy sector between 2008 and 2012
- The relative contribution of electricity and natural gas to overall residential sub-sector emissions
- The relative contribution of electricity and natural gas to overall commercial/industrial sub-sector emissions
- The relative contribution of the residential and commercial/industrial sub-sectors to overall emissions in the Beaumont building energy sector in the years 2008 and 2012

The Beaumont building energy sector experienced significant growth between 2008 and 2012. The GHG emissions from this growth were slightly compounded by an increase in SCE's GHG emission factors for electricity. On the other hand, improvements in energy efficiency as a result of the 2008 Title 24 updates lowered the GHG emissions from new development between 2009 and 2012, relative to what the magnitude of emissions may have been in the absence of the Title 24 updates. After taking into account all of these factors, it was determined that a target of 28% below 2012 levels is equivalent to AB 32's recommended target for local governments (15% below 2008 levels). Table A-7 contains the data-points that were used in deriving the suggested GHG emissions reduction target.

Table A-3: Growth Factors for Energy Consumption.

	2008	2012	% Change	Data Sources
Housing (number of units)	11,000	13,445	22%	SCAG
Employment (number of units)	5,100	5,495	8%	SCAG
GHG Emission factors for Electricity (MT/MWH)	0.31	0.32	3.23%	SCE
Estimated energy savings from 2008 Title 24 updates relative to 2008	0%	15%	NA	CEC
% Contribution of electricity to residential emissions	56%	44%	NA	2012 Baseline Inventory
% Contribution of natural gas to residential emissions	56%	44%	NA	2012 Baseline Inventory
% Contribution of electricity to commercial emissions	86%	86%	NA	2012 Baseline Inventory
% Contribution of natural gas to commercial/industrial emissions	14%	14%	NA	2012 Baseline Inventory
% Contribution of residential sub-sector to total building energy sector emissions	67%	69%	NA	2012 Baseline Inventory
% Contribution of commercial/industrial sub-sector to total building energy sector emissions	33%	31%	NA	2012 Baseline Inventory

Appendix B:

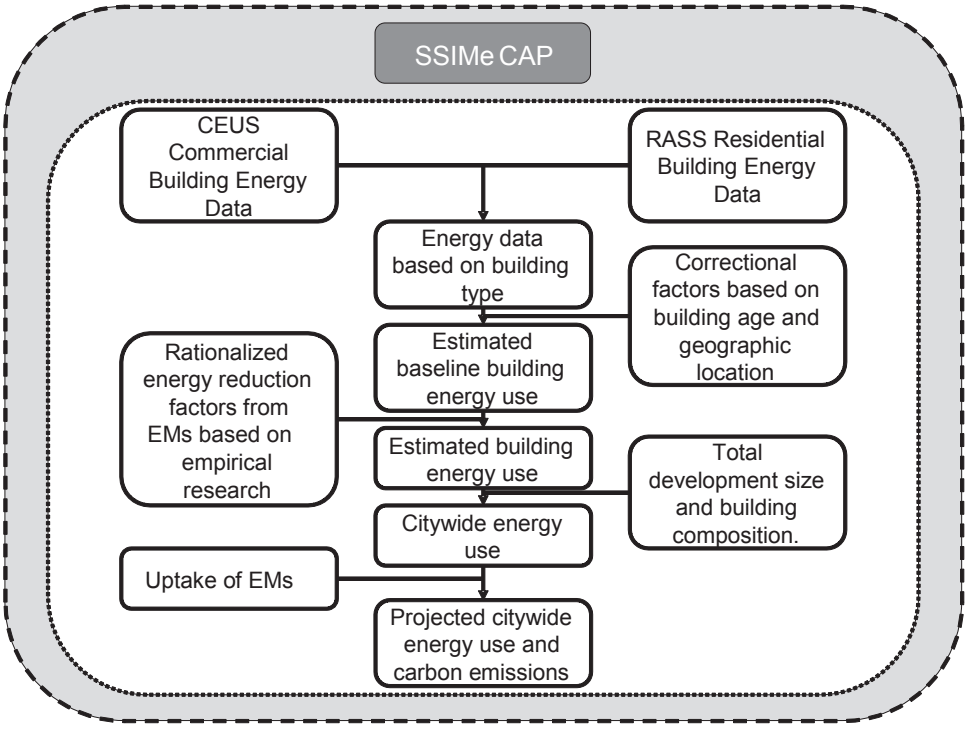
Energy Modeling

Appendix B
Energy Modeling

SUSTAINABLE SYSTEMS INTEGRATION METHOD - ENERGY (SSIME) CAP BUILDING ENERGY ANALYSIS

In order to identify the energy and GHG reduction potential of Beaumont's building stock, analysis was undertaken to identify the most cost-effective Energy Measures that could be applied to the range of buildings (in terms of use, operation and age) that are predominant across the city. At this high level of study, and without having conducted on-site energy audits of buildings, general strategies were developed that could be implemented through City policy or incentive schemes using AECOM's SSIMe CAP process. Figure B-1 shows a flow diagram of the SSIMe CAP process, the methodology for which is outlined below:

Figure B-1: Diagram of SSIMe CAP process.



SSIME CAP PROCESS

Without having access to building sub-metered energy data or energy audits for a range of buildings across the city, it is not possible to exactly determine end energy uses (i.e., the energy use associated with uses such as cooling, heating or lighting) for different buildings. Therefore, AECOM used data from two energy databases to identify and estimate the end use of energy in the building types that predominantly make up the city's total building stock. The California Energy Commission's (CECs) Commercial End Use Survey (CEUS) database was used to estimate the energy use associated with commercial/industrial buildings, and the California Residential Appliance Saturation Survey (RASS) database was used for the residential building analysis.

CEUS

The California Commercial End-Use Study (CEUS) is a comprehensive study of commercial sector energy end use in California. The database was developed based on a stratified random sample of 2,790 commercial facilities from the service areas of Pacific Gas and Electric (PG&E), San Diego Gas & Electric (SDG&E), Southern California Edison (SCE), Southern California Gas Company (SCGC), and the Sacramento Municipal Utility District (SMUD).

The survey assessed the energy use data for 12 common commercial building type categories (colleges, grocery stores; healthcare facilities, large offices, lodgings, refrigerated warehouses, restaurants, retail buildings, schools, small offices, warehouses and miscellaneous buildings).

The results of the study are freely available via the CEC website, and include data of floor stocks, fuel shares, electric and natural gas consumption, energy-use indices (EUIs) and energy intensities for each of the commercial building type categories. The data is separated by each of the 11 different climate zones in California served by the utility providers outlined above. For the Beaumont CAP, CEUS SCE climate zone 10 data was used for applicable building types, corresponding to the climate zone for Beaumont. Specifically, the energy end-use data for retail-based buildings in SCE's climate zone 10 was used to inform the Beaumont CAP, as retail businesses are the primary energy consumers in Beaumont's commercial/industrial sub-sector.

RASS

The California Residential Appliance Saturation Study (RASS) is a comprehensive study of residential energy end-use in California. A database of residential energy end-uses was developed under this study through surveys of over 25,000 households in the service territories of Pacific Gas and Electric Company (PG&E), Southern California Edison (SCE), San Diego Gas & Electric Company (SDG&E), Southern California Gas Company (SoCal Gas), and Los Angeles Department of Water and Power (LADWP).

The survey results are freely available via the CEC website, and include data categorized by climate zone, utility service territory, and housing type. For the Beaumont CAP, RASS SCE climate zone 10 data was used for applicable building types, corresponding to the climate zone for Beaumont. Specifically, the energy end-use data for single-family homes in SCE's climate zone 10 was used to inform the Beaumont CAP, as single family homes form the majority of the residential building stock in Beaumont's residential sub-sector.

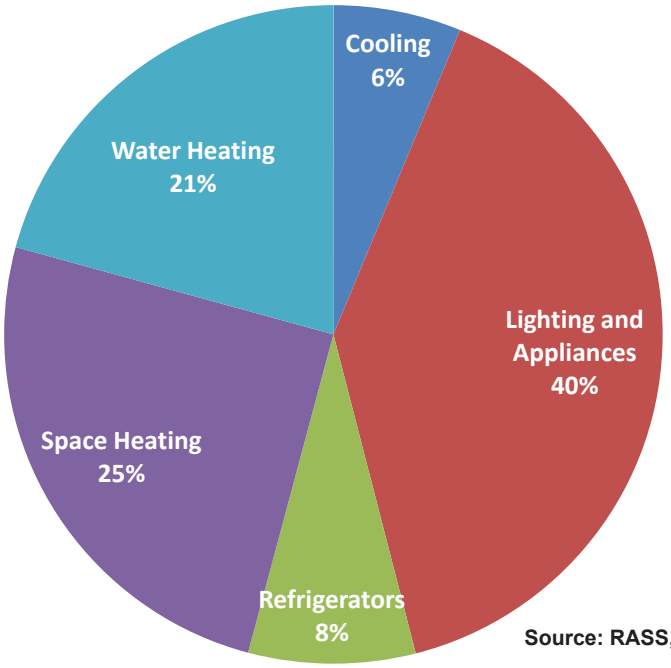
ENERGY MEASURE EM ANALYSIS

Using the energy end-use data, an Energy Measures (EM) analysis was undertaken to assess possible strategies that could be applied to the two identified building types across the city (through policy, incentives or other means) in order to help reduce the city's total GHG emissions. A range of EMs were tested on the two building types in order to examine their effectiveness at reducing building energy consumption, including the following:

- Upgrading appliances (e.g. dishwashers, washing machines, etc.)
- Upgrading heating systems
- Upgrading cooling systems
- Upgrading interior lighting
- Upgrading exterior lighting
- Making improvements to ventilation systems
- Making improvements to insulation
- Replacing doors/windows
- Hot water conservation/management (via low-flow fixtures)
- Installing solar water heating systems
- Photovoltaic energy generation

The EMs were evaluated on the basis of their GHG reduction potential per target end-use, and the extent to which their target energy end-use contributes to overall GHG emissions for the given building type. Figure B-2 shows the breakdown of GHG emissions by end-use in single family homes. Table B-1 shows the GHG reduction potential of various EMs as a percentage of the total GHG emissions from typical single family homes. Similarly, Figure B-3 shows the breakdown of GHG emissions by end-use in retail-based buildings, and Table B-2 shows the GHG reduction potential of various EMs as a percentage of the total GHG emissions from typical retail-based buildings.

Figure B-2: GHG Emissions by End-Use in Typical Single Family Homes.



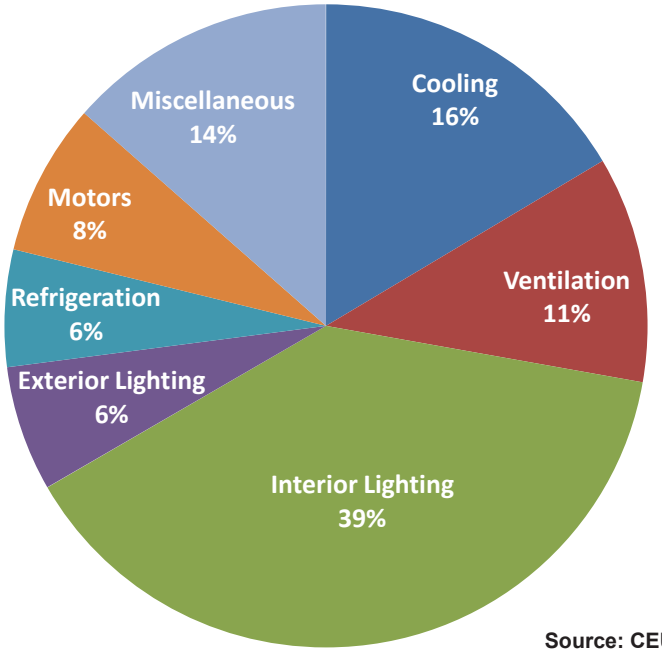
Source: RASS, 2009

Table B-1: GHG Reduction Potential of EMs as a Percentage of Total GHG Emissions from Single Family Homes.

Energy Measures (EMs)	GHG Reduction Potential (% of Total GHG Emissions)	Rank	Incentives Available
Appliances: Washing Machine Upgrade	<1%	Low	✓
Appliances: Clothes Dryer Upgrade	<1%		
Appliances: Dishwasher Upgrade	<1%		
Cooling System Upgrade (switch to high-efficiency centralized A/C)	1%		✓
Appliances: Refrigerator Upgrade	2%		✓
Heating System Upgrade (switch to high-efficiency furnace)	4%	Medium	✓
Duct Sealing and Loft Insulation Upgrade (will impact heating and cooling)	6%		✓
Windows Replacement (will impact heating and cooling)	6%		✓
Lighting Fixture Upgrade	6%		✓
Hot Water Management/Conservation	6%		✓
Hot Water Heater Upgrade (switch to high-efficiency heater)	7%	High	✓
PV Installed Capacity	8%		✓
Solar Hot Water Heating	15%		✓

Source: AECOM

Figure B-3: GHG Emissions by End-Use in Typical Retail-based Buildings.



Source: CEUS

Table B-2: GHG Reduction Potential of EMs as a Percentage of Total GHG Emissions from Retail-based Buildings.

Energy Measures (EMs)	GHG Reduction Potential (% of Total GHG Emissions)	Rank	Incentives Available
Appliances: Refrigerator Upgrade	2%	Low	✓
Ventilation Upgrades	2%		
Exterior Lighting Upgrades	3%		
Cooling	6%	Medium	✓
Interior Lighting (Code Efficiency)	7%	High	✓
Interior Lighting (High Efficiency)	21%		✓

Source: AECOM

Based on the GHG reduction potential of EMs per target end-use, and the contribution of the end-use to overall GHG emissions, three levels of EMs were identified for the building type within each sub-sector (i.e. single family homes in the residential sub-sector and retail-based buildings in the commercial/industrial sub-sector). The EM upgrade levels were categorized as low, medium, and high packages on the basis of the GHG reduction potential of each package. The creation of the packages took into account existing incentives that the City could leverage to encourage energy upgrades in buildings. Table B-3 summarizes the EM packages for existing single family homes and Table B-4 summarizes the EM packages for existing retail-based buildings.

Table B-3: EM Packages for Single Family Homes.

Energy Measures (EMs)	Low EM Package	Medium EM Package	High EM Package
Interior Lighting Upgrades	✓	✓	✓
Hot Water Management/Conservation	✓	✓	✓
Duct Sealing and Loft Insulation		✓	✓
Solar Hot Water Heater			✓
PV Installed Capacity			✓

Table B-4: EM Packages for Retail-Based Buildings.

Energy Measures (EMs)	Low EM Package	Medium EM Package	High EM Package
Ventilation Upgrades	✓	✓	✓
Interior Lighting Upgrades (Code Efficiency)	✓	✓	
Interior Lighting Upgrades (High Efficiency)			✓
Exterior Lighting Upgrades		✓	✓
Cooling System Upgrades			✓

Treatment of New Construction

It is important to note that EM packages were not created for new development in the residential and commercial/industrial sub-sectors, as it is assumed that the 2013 Title 24 updates will contribute significantly to lowering the energy footprint of new development, and additional improvements beyond those prescribed by the Title 24 updates will be technically, financially, and politically unfeasible in Beaumont.

DEMAND DRIVER ANALYSIS

Following the EM analysis, research was conducted on various demand drivers for energy upgrades as well as the extent of uptake for energy upgrades resulting from those demand drivers. Data was sought from the City of Beaumont, utilities serving Beaumont (SCE and SCG), PACE program administrators, as well as regional agencies such as WRCOG. However, it was concluded that there is a severe lack of data available on historic participation rates among residential and commercial/industrial customers in energy efficiency and renewable energy upgrades. In light of these data challenges, two hypothetical scenarios were developed, showing varying levels of participation/uptake rates for the aforementioned EM packages. These scenarios shed light on the order of magnitude of participation necessary to achieve meaningful reductions in GHG emission from the building energy sector. The two scenarios are categorized as moderate and aggressive demand driver scenarios. Table B-5 shows the assumed cumulative participation rates from 2015-2020 under the moderate and aggressive demand driver scenarios for EMs targeting single family homes. Similarly, Table B-6 shows the assumed cumulative participation rates from 2015-2020 under the moderate and aggressive demand driver scenarios for EMs targeting retail-based buildings.

Table B-5: Demand Driver Scenarios for EMs Targeting Single Family Homes.

GHG Reduction Potential	Energy Measures (EMs)	Moderate Demand Driver Scenario	Aggressive Demand Driver Scenario
Low	Interior Lighting Upgrades	15%	20%
	Hot Water Management/Conservation	15%	20%
Medium	Interior Lighting Upgrades	15%	20%
	Hot Water Management/Conservation	15%	20%
	Duct Sealing and Loft Insulation	5%	8%
High	Interior Lighting Upgrades	15%	20%
	Hot Water Management/Conservation	15%	20%
	Duct Sealing and Loft Insulation	5%	8%
	Solar Hot Water Heater	6%	12%
	PV Installed Capacity	6%	12%

Table B-6: Demand Driver Scenarios for EMs Retail-Based Buildings.

GHG Reduction Potential	Energy Measures (EMs)	Moderate Demand Driver Scenario	Aggressive Demand Driver Scenario
Low	Ventilation Upgrades	5%	20%
	Interior Lighting Upgrades (Code Efficiency)	5%	20%
Medium	Ventilation Upgrades	5%	20%
	Interior Lighting Upgrades (Code Efficiency)	5%	20%
	Exterior Lighting Upgrades	5%	20%
High	Ventilation Upgrades	5%	20%
	Interior Lighting Upgrades (High Efficiency)	5%	20%
	Exterior Lighting Upgrades	5%	20%
	Cooling System Upgrades	5%	20%

CITYWIDE GHG SAVINGS EXTRAPOLATION

Using the three EM packages and two demand driver packages, a total of six citywide GHG savings scenarios were developed, focusing on single family homes and retail-based buildings. Figures B-4 to B-9 show the GHG savings under each of the six scenarios.

Figure B-4: Progress Towards Suggested GHG Reduction Target (Low EM Package and Moderate Demand Drivers)

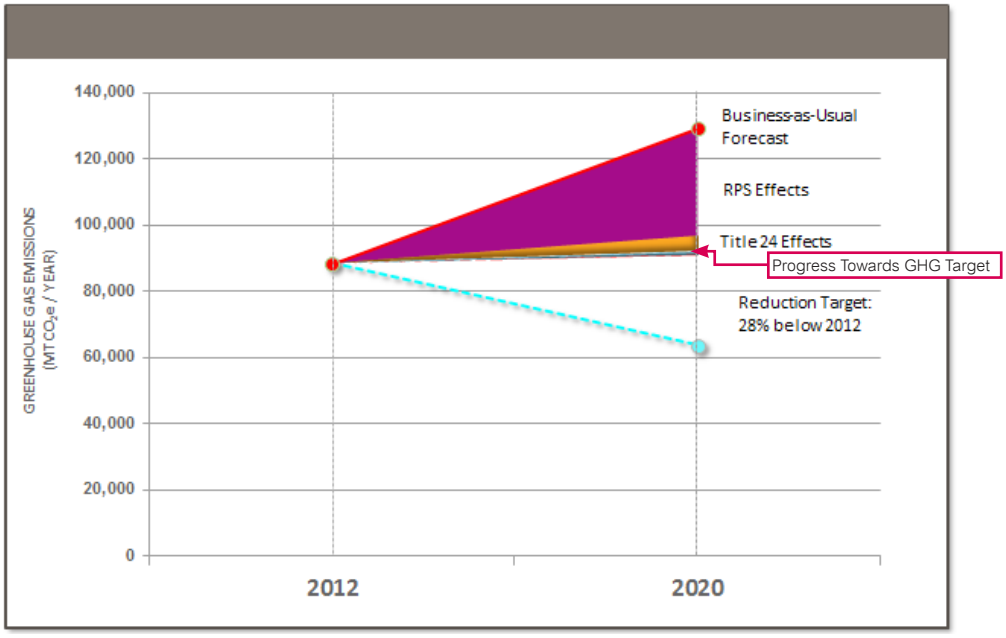


Figure B-5: Progress Towards Suggested GHG Reduction Target (Moderate EM Package and Moderate Demand Drivers)

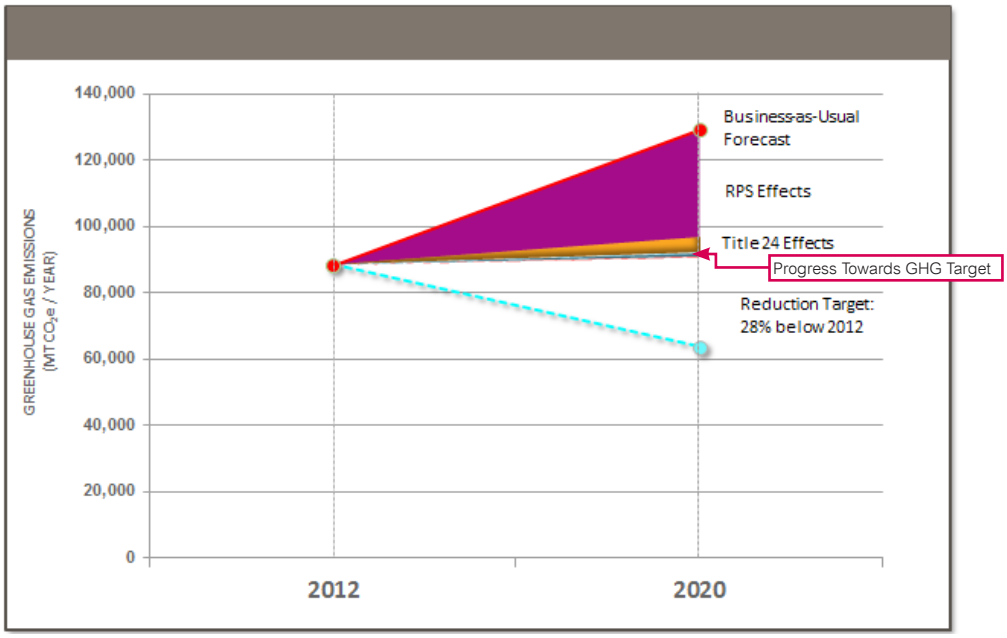


Figure B-6: Progress Towards Suggested GHG Reduction Target (High EM Package and Moderate Demand Drivers)

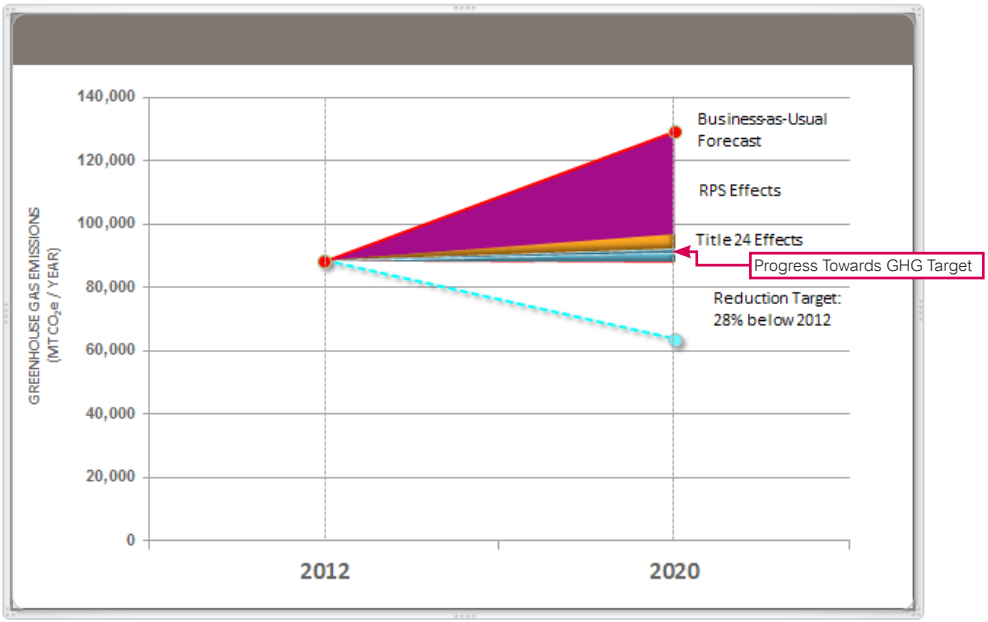


Figure B-7: Progress Towards Suggested GHG Reduction Target (Low EM Package and Aggressive Demand Drivers)

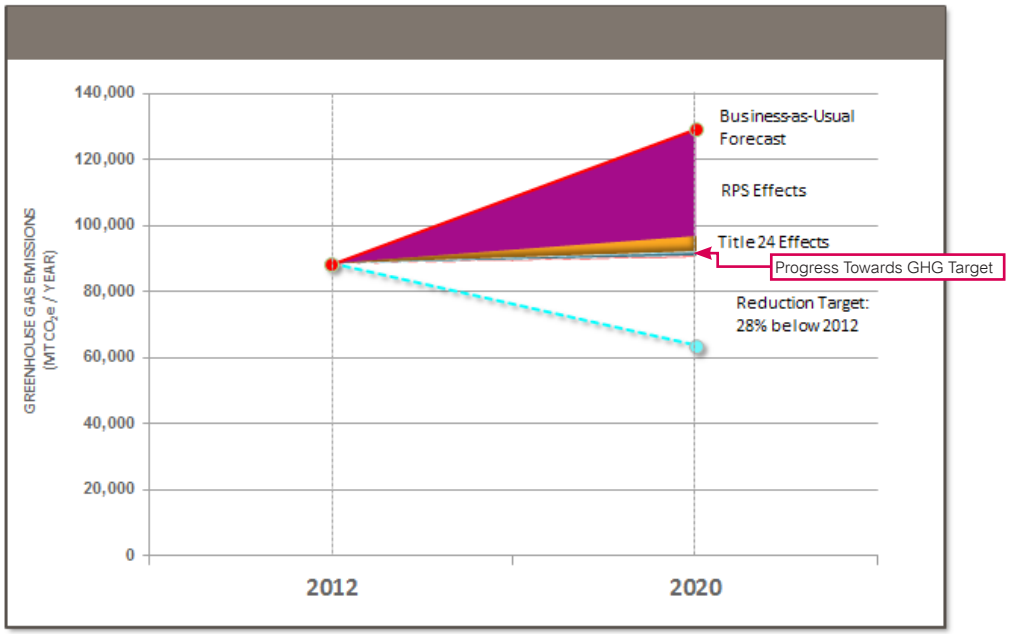


Figure B-8: Progress Towards Suggested GHG Reduction Target (Medium EM Package and Aggressive Demand Drivers)

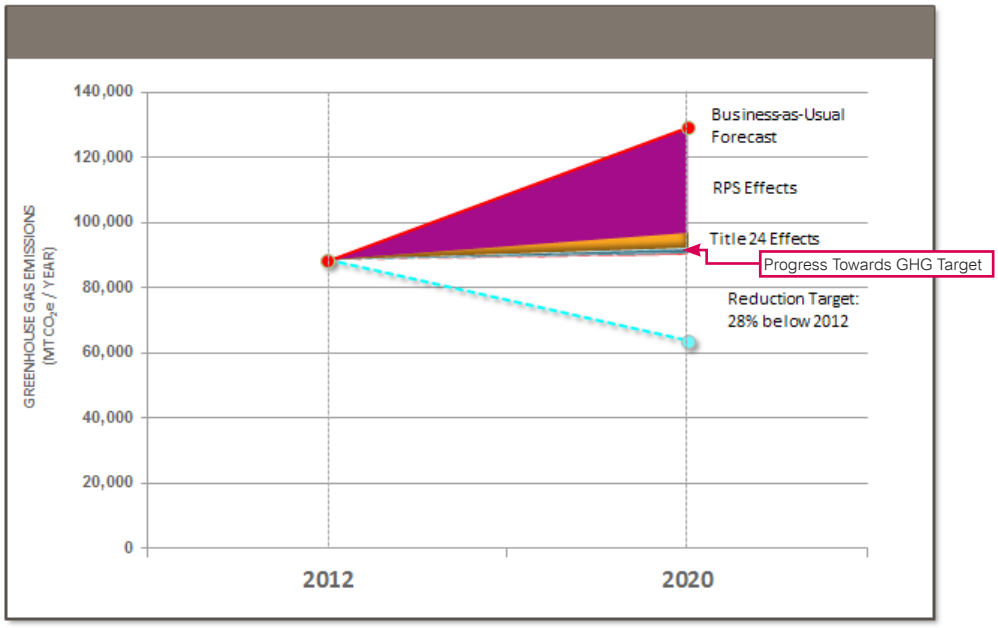
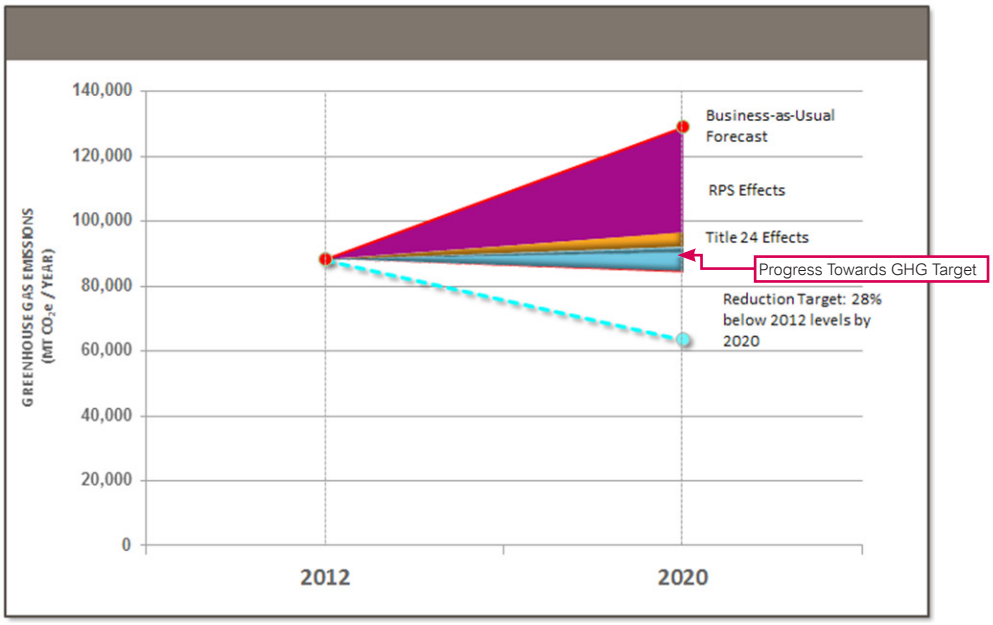


Figure B-9: Progress Towards Suggested GHG Reduction Target (High EM Package and Aggressive Demand Drivers)



Appendix C:

SCE Local Government Partnership:
Program Implementation Plan
for City of Beaumont Energy
Partnership

Local Government Partnership Strategic Plan Pilot
Program Implementation Plan

1) **Proposer:** City of Beaumont
   City Name(s): City of Beaumont

2) **Projected Program Budget Table**

Table 1: Budget by Task

City of Beaumont				
Tasks	**Total Administrative**	**Total Marketing & Outreach**	**Total Direct Implementation**	**Total Task Budget**
Task 3.2.1	$0	$2,523	$52,800	$55,323
Task 4.1.4	$0	$1,304	$27,473	$28,777
Total	**$0**	**$3,827**	**$80,273**	**$84,100**

3) **Program Element Description and Implementation Plan – Task 3.2.1**

3.a. Menu Number & Task Name:	**Task 3.2.1: Prepare an Updated Energy Chapter of a Municipal Climate Action Plan (CAP)**
3.b. Description of each pilot task, including how tasks will be implemented.	Through this task the City will update the energy chapter of its existing municipal Climate Action Plan (CAP). In 2009 the City adopted an Energy Action Plan (EAP). However, this plan expired in 2012 and was not well integrated into the City's major channels for projects (e.g., the Capital Improvement Plan and the General Plan). The updated energy chapter will be better integrated into the City's capital improvement process and will incorporate data from the utility manager system the City installed during the 2010-2012 LGP Strategic Plan Pilot, which provides reliable data for all city facilities. The energy chapter will also be augmented by the Municipal Action Plan (MAP), that will contain information on financial metrics for each project such as cost savings, possible funding sources, available rebates/ incentives, grants, and low-interest loans. The MAP will provide the City with the financial metrics needed to move forward through the City's budgeting process. The City will: • Conduct an in-depth evaluation of data provided by the utility manager software program; • Develop a "Top Priority Projects" list of EE projects that meet requirements established by City Council

	and/or City Management in order to initiate long-term, sustainable EE investments; and • Integrate the "Top Priority Projects" into a municipal CAP/MAP that will be integrated into the City's annual Capital Improvement Plan (CIP) process.
3.c. Which strategic plan goal(s) the task will address, and how it will advance progress towards the goal(s).	*Goal 3: Local governments lead by example with their own facilities and energy usage practices.* *Menu Option: 3.2.1 – Develop/adopt an energy chapter for City/ County climate or energy action plan.* Through this task the City will lead by example in their own facilities and energy usage by developing an energy chapter for the city's municipal Climate Action Plan and a Municipal Action Plan that provides a financial plan for the measures in the CAP.
3.d. How the benefits of the task will be sustained beyond the current program cycle	The benefits of developing the energy chapter of the city's municipal Climate Action Plan and the Municipal Action Plan will be sustained beyond the current program cycle by developing a long term EE plan for the City, which will be implemented beyond this program cycle. The Municipal Action Plan provides a detailed financial plan for the recommended EE measures in the CAP.

4) Program Element Rationale and Expected Outcome - Task 3.2.1

Menu Number & Task Name	**Task 3.2.1: Prepare an Updated EE Chapter of a Municipal Climate Action Plan (CAP)**
4.a. Baseline Information: Information on relevant baseline metrics or a plan to develop baseline information against which the project outcomes can be measured.	The baseline is not applicable because this is a yes/no metric. The city does not currently have a municipal Climate Action Plan.
4.b. Market Transformation Information: Whether and how the Work will address market transformation.	The Local Government Partnership Strategic Plan Program's primary purpose is to support the California Energy Efficiency Strategic Plan (CEESP). As such, fulfillment of program objectives will provide further progress toward the CEESP's objectives and goals. Because each of SCE's local governments do not represent a market by themselves, any market indicators would need to be collected on a larger geographic scale. Therefore, there are no market transformation indicators for these pilots.
4.c. Program Design to Overcome Barriers or Address Gaps: Describe the concern, gap	The primary barrier this task will address is: • Lack of a clear plan to implement EE. The City has not had a clear path to implement EE projects,

or problem that the pilot seeks to address and how the pilot is designed to overcome these barriers or address these problems. Identify the likelihood these issues can be addressed cost-effectively through utility programs and methodologies to test the cost-effectiveness of the project.	and as such, potential projects have not successfully navigated the city's budgetary process. By developing a CAP that identifies EE projects and using the MAP to integrate the projects in the City's Capital Improvement Plan, the City expects to implement more EE projects. *Note:* Strategic initiatives cannot be evaluated for cost effectiveness using the same quantitative methodologies used for energy efficiency measures. In addition, each of the local government pilot tasks is highly customized, due to a number of variables including: the region where they are located, political support/resources available, existing systems, the number and size of participating municipalities, and other factors. Furthermore, many of these tasks are not common practice and there is little or no existing cost data to use as a reasonable benchmark. As such, SCE proposes to examine both the costs and benefits of the LGP pilot activities during this program cycle to develop a framework of standards for costs and benefits for future cycle activities.
4.d. Program Objectives: Provide specific goals, objectives, and end points for each proposed task for the 2013-2014 timeframe (e.g., number of trainings, reach code adoption, etc.). Describe the data metrics that will be tracked to determine if the goals, objectives, and end points are being achieved.	The goal of this task is to develop the energy chapter of a CAP and augmenting the projects in the CAP with more detailed financial information found in the Municipal Action Plan that the city can integrate into its Capital Improvement Plan. This would facilitate the approval of funding of the EE measures in the CAP by City Council and City management on a normal fiscal year basis.

#	Objective	Metrics	Other Information
1	City adopts EE chapter of the Climate Action Plan & Municipal Action Plan	• Yes/No Metric	• Estimated completion 8-months after program launch
2	Adopt Capital Improvement Plan (CIP) with one (1) or more EE Top Priority projects included	• Yes/No Metric	• Estimated completion 13-months after program launch

5) Other Program Element Attributes - Task 3.2.1

Menu Number & Task Name	Task 3.2.1: Prepare an Updated EE Chapter of a Municipal Climate Action Plan (CAP)
5.a. Best Practices: A concrete strategy to identify and	Best practices and lessons learned from the Local Government Partnership Strategic Plan Program will be

disseminate best practices and lessons learned from the pilot to all California utilities and to transfer those practices to resource programs, as well as a schedule and plan to expand the pilot to utility and hopefully statewide usage.	made available for California IOU program and product design personnel for consideration of existing or future programs. Written reports on the findings from the Local Government Partnership Strategic Plan Pilot Program will be disseminated in the following ways: • CALMAC: the pilot's final assessment report will be posted on CALMAC and thus will be widely available to the public. This report will contain findings from utility-led assessments of how successful the pilot was against its planned objectives. This report will also include any best practices or lessons learned. • The Local Government Partnership Strategic Plan Pilot will also seek an opportunity to present findings in a public forum, to be determined. • Pilot initiative assessment reports will be provided to the Statewide Best Practices Coordinator, to be disseminated if they see fit. SCE will continue to find opportunities to present findings at events where local governments gather such as the Statewide Energy Efficiency Collaborative (SEEC) regional or annual meetings, and at conferences where program findings and best practices are normally shared, such as at the Association of Energy Service Professionals (AESP) annual conference, the International Energy Program Evaluation Conference (IEPEC), the American Council for an Energy-Efficient Economy (ACEEE) meetings, and at the Consortium for Energy Efficiency (CEE) forums. These are the key channels through which all energy efficiency programs share information. *Note:* The strategic initiatives implemented through the Local Government Partnership Strategic Plan Pilots are non-resource strategic planning activities. These pilots are not intended to transfer best practices to resource programs.
5.b. Innovation: New and innovative design, partnerships, concepts, or measure mixes that have not yet been tested or employed.	This task is part of the larger Local Government Strategic Plan Pilot the Commission directed SCE to undertake in D.09-09-047. The pilot as a whole is innovative in that it is designed to increasingly focus efforts and resources on achieving the goals laid out in the CEESP with an unprecedented level of focus and support. These activities represent significant steps towards integrating energy efficiency into the local government policy setting process and ongoing operations at a level that has not been undertaken previously through IOU LGP partnerships.
5.c. Interagency Coordination: Describe any interagency coordination with the ARB, CEC on PIER or Codes and Standards;	N/A

non-utility market initiatives; energy efficiency market forces, opportunities and trends; and timeline by which market segment will be "transformed'' or other aspects of the program.	
5.d. Integrated/Coordinated DSM: Describe how program will achieve integrated or coordinated delivery of all DSM options, as well as LIEE and WET. (If this is an integral part of the program element and fully covered previously note that here.)	N/A, this task will be focused solely on EE.
5.e. EM&V: Provide a proposed EM&V Plan. Describe any process evaluation or other evaluation efforts that will be undertaken by the utility to determine if the program is meeting its goals and objectives. Include the evaluation timeframe and brief description of scope, as well as a summary of specific methodologies, if already developed. If not developed, indicate the process for developing them. Include reference to tracking databases that will be used for evaluation purposes.	An EM&V Plan was filed at the overall Local Government Partnership Strategic Plan Program level and is included in this filing. The evaluation of the Strategic Plan Pilots will conform to the process that has been established by ED and the IOUs: Evaluation plans will be proposed by SCE and ED will make final determination of whether the evaluation is warranted or not. SCE will propose to ED the following evaluations: A 2013-2014 Process Evaluation in Q4 of 2013. This process evaluation will allow SCE to determine whether local governments are experiencing any difficulty achieving their Scope of Work. Process evaluations will be conducted through in-depth interviews of the local government project managers, SCE project managers, and with participating customers whenever appropriate. The interview methodology is a well-established methodology for program evaluation. Data from the Strategic Plan Pilots program tracking databases will be used in the process evaluation.

3) Program Element Description and Implementation Plan - Task 4.1.4

3.a. Menu Number & Task Name:	**Task 4.1.4: EE Savings Analysis of a Community Greenhouse Gas (GHG) Inventory**
3.b. Description of each pilot task, including how tasks will be implemented.	The City will conduct an analysis of its GHG inventory to identify community-focused EE measures that will be incorporated into the EE Chapter of the city's General Plan. The City will: • Update the GHG baseline energy consumption data in The Climate Registry's CRIS data system; • Conduct an analysis of EE savings based on data

	from CRIS; • Conduct community engagement activities, including the Community Climate Action Planning Summit; • Engage numerous community stakeholders to collaborate and participate in the planning process, to develop a set of community-defined EE strategies that will be integrated into the City's General Plan as an "Energy Efficiency Chapter" of the General Plan. Stakeholders may include schools, water districts, the Chamber of Commerce, and interested local residents. Additionally, the City will outreach to several rural, agriculturally focused non-profit organizations to collaborate on continuing support for a sustainable agricultural/ rural lifestyle that the region (San Gorgonio Pass) is known for; and • Integrate community-defined EE strategies as an "Energy Efficiency Chapter" into the City's General Plan. The result of this collaboration will be a well-rounded, community-defined, fully integrated Climate Action Plan. The CAP will focus on conserving natural resources through EE, and promoting responsible growth and development in the community within the greater framework of the City's General Plan.
3.c. Which strategic plan goal(s) the task will address, and how it will advance progress towards the goal(s).	*Goal 4: Local governments lead their communities with innovative programs for energy efficiency, sustainability and climate change.* *Menu Option: 4.1.4 – Conduct the energy efficiency savings analysis for an annual Greenhouse Gas inventory for the City/ County.* Through this task the City will conduct an analysis of GHG inventory data to identify EE measures that will be integrated into the city's General Plan.
3.d. How the benefits of the task will be sustained beyond the current program cycle	The benefits of performing this task will be sustained beyond the current program cycle by integrating the EE measures identified through this task into the city's General Plan, which governs the long term policies for development in the City.

4) Program Element Rationale and Expected Outcome - Task 4.1.4

Menu Number & Task Name	Task 4.1.4: EE Savings Analysis of a Community Greenhouse Gas (GHG) Inventory
4.a. Baseline Information: Information on relevant baseline metrics or a plan to develop baseline information against which the project outcomes can be measured.	The baseline is not applicable because this is a yes/no metric.
4.b. Market Transformation Information: Whether and how the Work will address market transformation.	The Local Government Partnership Strategic Plan Program's primary purpose is to support the California Energy Efficiency Strategic Plan (CEESP). As such, fulfillment of program objectives will provide further progress toward the CEESP's objectives and goals. Because each of SCE's local governments do not represent a market by themselves, any market indicators would need to be collected on a larger geographic scale. Therefore, there are no market transformation indicators for these pilots.
4.c. Program Design to Overcome Barriers or Address Gaps: Describe the concern, gap or problem that the pilot seeks to address and how the pilot is designed to overcome these barriers or address these problems. Identify the likelihood these issues can be addressed cost-effectively through utility programs and methodologies to test the cost-effectiveness of the project.	The primary barrier this task will address is: • Lack of long-term EE policies. The City has had recent success in implementing EE activities as part of the 2010-2012 Energy Leader Partnership program, however there is concern that support for these efforts may be short-term in nature. In order to foster long-term change that would result in permanent, sustainable energy savings, it is the intent of this task to embed and institutionalize EE in the City's policies, programs, and processes and to establish a culture of sustainability among the community. *Note:* Strategic initiatives cannot be evaluated for cost effectiveness using the same quantitative methodologies used for energy efficiency measures. In addition, each of the local government pilot tasks is highly customized, due to a number of variables including: the region where they are located, political support/resources available, existing systems, the number and size of participating municipalities, and other factors. Furthermore, many of these tasks are not common practice and there is little or no existing cost data to use as a reasonable benchmark. As such, SCE proposes to examine both the costs and benefits of the LGP pilot activities during this program cycle to develop a framework of standards for costs and benefits for future cycle activities.

4.d. Program Objectives: Provide specific goals, objectives, and end points for each proposed task for the 2013-2014 timeframe (e.g., number of trainings, reach code adoption, etc.). Describe the data metrics that will be tracked to determine if the goals, objectives, and end points are being achieved.	The goal of this task is to integrate the results of the EE savings analysis of the GHG inventory into the EE Chapter of the city's General Plan.

#	Objective	Metrics	Other Information
1	Update baseline energy consumption GHG emissions data into CRIS	• Yes/No Metric	• Estimated completion 6-months after program launch
2	Complete EE savings analysis	• Yes/No Metric	• Estimated completion 11-months after program launch
3	Conduct stakeholder collaboration activities	• Yes/No Metric	• Estimated completion 13-months after program launch
4	Adopt final EE chapter for the City's Climate Action Plan	• Yes/No Metric	• Estimated completion 14-months after program launch

5) Other Program Element Attributes - Task 4.1.4

Menu Number & Task Name	Task 4.1.4: EE Savings Analysis of a Community Greenhouse Gas (GHG) Inventory
5.a. Best Practices: A concrete strategy to identify and disseminate best practices and lessons learned from the pilot to all California utilities and to transfer those practices to resource programs, as well as a schedule and plan to expand the pilot to utility and hopefully statewide usage.	Best practices and lessons learned from the Local Government Partnership Strategic Plan Program will be made available for California IOU program and product design personnel for consideration of existing or future programs. Written reports on the findings from the Local Government Partnership Strategic Plan Pilot Program will be disseminated in the following ways: • CALMAC: the pilot's final assessment report will be posted on CALMAC and thus will be widely available to the public. This report will contain findings from utility-led assessments of how successful the pilot was against its planned objectives. This report will also include any best practices or lessons learned. • The Local Government Partnership Strategic Plan Pilot

	will also seek an opportunity to present findings in a public forum, to be determined. • Pilot initiative assessment reports will be provided to the Statewide Best Practices Coordinator, to be disseminated if they see fit. SCE will continue to find opportunities to present findings at events where local governments gather such as the Statewide Energy Efficiency Collaborative (SEEC) regional or annual meetings, and at conferences where program findings and best practices are normally shared, such as at the Association of Energy Service Professionals (AESP) annual conference, the International Energy Program Evaluation Conference (IEPEC), the American Council for an Energy-Efficient Economy (ACEEE) meetings, and at the Consortium for Energy Efficiency (CEE) forums. These are the key channels through which all energy efficiency programs share information. *Note:* The strategic initiatives implemented through the Local Government Partnership Strategic Plan Pilots are non-resource strategic planning activities. These pilots are not intended to transfer best practices to resource programs.
5.b. Innovation: New and innovative design, partnerships, concepts, or measure mixes that have not yet been tested or employed.	This task is part of the larger Local Government Strategic Plan Pilot the Commission directed SCE to undertake in D.09-09-047. The pilot as a whole is innovative in that it is designed to increasingly focus efforts and resources on achieving the goals laid out in the CEESP with an unprecedented level of focus and support. These activities represent significant steps towards integrating energy efficiency into the local government policy setting process and ongoing operations at a level that has not been undertaken previously through IOU LGP partnerships.
5.c. Interagency Coordination: Describe any interagency coordination with the ARB, CEC on PIER or Codes and Standards; non-utility market initiatives; energy efficiency market forces, opportunities and trends; and timeline by which market segment will be "transformed'' or other aspects of the program.	N/A
5.d. Integrated/Coordinated DSM: Describe how program will achieve integrated or coordinated delivery of all DSM options, as well as LIEE and WET. (If this is an integral part	N/A, this task will be focused solely on EE.

of the program element and fully covered previously note that here.)	
5.e. EM&V: Provide a proposed EM&V Plan. Describe any process evaluation or other evaluation efforts that will be undertaken by the utility to determine if the program is meeting its goals and objectives. Include the evaluation timeframe and brief description of scope, as well as a summary of specific methodologies, if already developed. If not developed, indicate the process for developing them. Include reference to tracking databases that will be used for evaluation purposes.	An EM&V Plan was filed at the overall Local Government Partnership Strategic Plan Program level and is included in this filing. The evaluation of the Strategic Plan Pilots will conform to the process that has been established by ED and the IOUs: Evaluation plans will be proposed by SCE and ED will make final determination of whether the evaluation is warranted or not. SCE will propose to ED the following evaluations: A 2013-2014 Process Evaluation in Q4 of 2013. This process evaluation will allow SCE to determine whether local governments are experiencing any difficulty achieving their Scope of Work. Process evaluations will be conducted through in-depth interviews of the local government project managers, SCE project managers, and with participating customers whenever appropriate. The interview methodology is a well-established methodology for program evaluation. Data from the Strategic Plan Pilots program tracking databases will be used in the process evaluation.

Appendix D:

SCG Local Government Partnership:
Program Implementation Plan
for City of Beaumont Energy
Partnership

2013-2014 Energy Efficiency Programs
Local Government Partnership Program
Program Implementation Plan

1. **Program Name:** City of Beaumont Energy Partnership
   Program ID: **SCG3782**
   Program Type: Local Government Partnership

2. Program Element Description and Implementation Plan

a) List of program elements:

The core program elements are similar to those identified in the Master Program Implementation Plan: Government Facilities, Strategic Plan Activities and Core Program Coordination.

b) Overview

The Beaumont Energy Partnership is an existing partnership between Southern California Edison (SCE), the City of Redlands and is a newly added Partnership for SoCalGas in 2013-2014. Beaumont has expressed interest for SoCalGas to join their partnership with SCE to provide support implementing energy efficiency at their municipal facilities as well as their rural community. The City is comprised of small businesses, and some hard to reach low income customers. By joining the Partnership SoCalGas will be able to leverage existing SCE efforts to promote EE to the city as well as their businesses and as well as Energy Upgrade California (EUC) and Energy Savings Assistance (ESA) programs to their residents.

The City of Beaumont has identified major facilities in need of Energy Efficiency (EE) retrofits. The City owns two large operational facilities (City Hall and the Police Department) in addition to several sewer-lift stations, a waste water treatment facility, a transit office and bus yard, the City pool, and several large municipal parks.

In 2010, the City purchased several buildings from the Beaumont Unified School District which were adjacent to the Beaumont Civic Center (City Hall) and the Police Station. The goal was to purchase these additional properties to expand the City's police department facility to include an administration building as well as a facility for the City's Animal Care Services. Currently, two of these buildings have been retrofitted using State grant funding (Energy Efficiency and Conservation Block Grant). The City is also currently working through SCE's "Savings by Design" program on upcoming upgrades to the City's waste water treatment facility. SoCalGas will evaluate natural gas energy efficiency retrofit opportunities at their waste water treatment facility. The sites that could qualify for Technical Assistance & Technical Incentives through the partnership have already been identified and preliminarily audited by a contractor. During the last few years, the City had retrofitted City Hall's and Police Department's lighting system and also installed the Variable Frequency Drives (VFDs) at Waste Water Treatment Plant. The City's Energy Champion and Partnership Project Managers will oversee the implementation of retrofit projects including demand response where applicable. The City Manager, with the direction of City Council, will determine the next potential project. Any projects totaling over $5,000 will need

approval from City Council to move forward. In addition, the work done on these retrofits must follow the public bid process if it does not qualify under the maintenance contract that the City currently holds. The City Manager will have the discretion regarding retrofit projects less than $5,000 and will have the authority to determine the priority list for those specific projects. Funding for all municipal retrofits will be in house- it has already been determined by the City Manager that the City will not seek funding from outside sources. Beaumont has its own financing authority.

All future facilities procured or constructed by the City will follow energy efficiency measures at Title 24 standards or better. All funding for municipal retrofit projects will be performed in house as a budgeted item to be renewed on a yearly basis and adjusted as need is determined. In addition, the City is actively seeking grant funding to implement additional EE and renewable energy projects.

Core Program Element A - Government Facilities

A.1 Retrofit of county and municipal facilities

The City of Beaumont plans to complete a comprehensive retrofit of all existing municipal facilities over the next two years. All municipal facilities have already been audited for energy efficiency and cost estimates for retrofits have been provided to the City Council and City Manager. The Partnership has established a savings target of 1,700 therms from municipal facilities which will be funneled to core rebate and incentive programs. Potential opportunities for energy savings through deep retrofits include but are not limited to projects which combine two of the following: HVAC, Controls, Retro Commissioning, hot water heating, lighting, vending machines, and computer networks.

A.2 Retro-Commissioning (of buildings or clusters of buildings)

The Beaumont Energy Partnership will focus on retro-commissioning municipal buildings through energy management systems for City Hall and the Police Department. In addition, this partnership will examine other creative ways to improve building efficiency and reduce its overall carbon footprint through examining hours of operation, evaluating possible lighting and HVAC procedural changes, and creating an atmosphere that encourages conservation and wise-stewardship of all natural resources. The City is implementing a utility manager software system to track and manage the City's energy consumption.

A.3 Integrating Demand Response into the audits

All retrofit projects will be assessed for opportunities to reduce peak demand. Where feasible and where financing opportunities exist, solar and other alternative energy projects will be considered for project inclusion.

A.4 Technical assistance for project management, training, audits, etc.

The City employees continue to attend various workshops provided by the SoCalGas and SCE. A specific budget for each of these elements will be included in the City's comprehensive "Office of Sustainability" which has preliminarily been approved by City

Council. In addition, Beaumont Partnership will provide Technical Support and Assistance to complete the investment grade audits at municipal facilities and develop the pipeline of potential energy efficiency program. Through the City's Local Government Strategic Plan Solicitation funding, the City is working through SCE and SoCalGas' Codes and Standards Division to host several trainings for local building officials from Beaumont as well as surrounding cities, in order to assist them in implementing and enforcing the new Title 24 energy efficiency requirements. The City of Beaumont hosted C&S training in March and will host another this upcoming August. The Partnership will also coordinate with the SoCalREN programs.

A.5 Financing Options/On-bill financing

Although the City of Beaumont plans to finance any retrofit projects in house, it is a possibility that on-bill financing may be utilized for certain HVAC retrofits that may include the use of alternative forms of energy such as hybrid AC units (solar) and "load shifting" technologies.

Core Program Element B - Strategic Plan Support

B.1 Code Compliance Support

Beaumont will examine current compliance with Title 24 standards and explore the potential of creating an energy efficiency code compliance improvement program. The partnership will support this activity.

The City had implemented a Green Building Program for municipal facility which will encourage developers as well as homeowners who plan on undertaking any improvements, to follow more sustainable guidelines and will provide technical assistance to do so. The City's Green Building Program was preliminarily approved by City Council as part of the City's Office of Sustainability. The City is also looking into augmenting this program into community voluntary program in the near future.

B.2 Reach Code Support

The partnership will seek to establish meaningful CEC-approved Reach codes as part of its effort to add value to energy efficiency in alignment with the strategies stated in the Master PIP. This activity will follow the proposed path described in the Codes & Standards PIP.

B.3 Guiding Document(s) Support

The City of Beaumont plans to use the resources provided through the Energy Leaders Partnership model to create a comprehensive Climate Action Plan as well as a short-term implementation plan to head towards achieving the goals of AB 32. The City of Beaumont has already identified its baseline energy usage as a point to progress forward from and plans to monitor its energy usage in relation to that baseline to track reductions.

B.4 Financing for the community

The City of Beaumont plans to augment its own resources with the technical knowledge and resources provided through the partnership to reach the community through various levels of involvement, including workshops and other public information tools as well as identifying other local entities, both public and private, to aid in the administering of the partnership resources to the public.

B.5 Peer to Peer Support

The City of Beaumont Partnership has been extremely proactive in working with other partnerships as well as SCE and SoCalGas to share ideas and strategies that have proved successful as well as to point out areas of improvement. Beaumont volunteered to assist SCE project coordinators in the creation of a template for community outreach to be utilized by all ELP's. The Beaumont Energy Partnership will continue to actively participate in the various Peer-to-Peer strategies outlined in the Master Program Implementation Plan while also forging their place as a leader and innovator among other partnerships.

Core Program Element C - Core Program Coordination

C.1 Outreach & Education

The City of Beaumont Energy Partnership will establish a two year Marketing, Education, &Outreach (ME&O) plan that incorporates public events, educational workshops, and other venues for publicizing the partnership goals and providing various types of assistance to local business owners, private citizens, and other public entities within the City's jurisdiction. In addition, the City of Beaumont plans to actively participate in regional initiatives focused on sustainable development including the "Green Valley Initiative," which the City Council has already passed a resolution in support of. The Beaumont Partnership will continue to work with the City's public information officer to create press releases outlining the progress of the partnership and publicizing upcoming ME&O events and to identify any potential opportunities for outreach through the City's many public communication channels, including the City's website, Facebook page, and utility billing.

C.2 Residential and Small Business Direct Install

No Direct Install initiatives are planned at this time through SoCalGas. The partnership will incorporate training programs with the goal of supporting SoCalGas and SCE's core programs for businesses, particularly small offices and convenience stores. In addition, through the partnership, the City will work in conjunction with the Chamber of Commerce and SoCalGas and SCE to provide workshops dedicated to specific businesses (restaurants, offices, etc.) to publicize the core programs. The City's Code Enforcement division has been instrumental in the continued success of programs such as Direct Install for small business.

C.3 Small Business Coordination

The Partnership will emphasize outreach to and support for small businesses. Our efforts will include coordination with Business Improvement Districts and other business groups (e.g. chambers of commerce, real estate groups, service clubs) to engage small businesses and

promote energy efficiency. We will explore potential for cost-effective rebate/incentive programs to encourage energy efficiency actions for small businesses.

C.4 Third-party program coordination

The City of Beaumont Energy Partnership will work to include third-party programs as well as encourage local businesses and residents to explore the options provided by these types of programs.

C.5 Retrofits for just-above ESA-qualified customers

The partnership will support retrofits for those who qualify for this program through active outreach and marketing. Direct marketing will be used where ever possible.

C.6 Technical assistance for program management, training, audits, etc.

The partnership plans to utilize a portion of its resources to this particular activity. The Core Programs will be utilized to reach their appropriate audience and the City will work continuously to identify other programs that may serve the City of Beaumont more effectively. These programs may include, but are not limited to: Savings by Design, Direct Install, VFD Pool Pump Rebate Program (residential and commercial), Multi-family Energy Efficiency Rebate Program, Home Energy Efficiency Programs, Commercial Rebates as well as Solar Thermal Incentive Program.

3. Program Element Rationale and Expected Outcome

a) Quantitative Baseline and Market Transformation Information

	Baseline Metric		
	Metric A	Metric B	Metric C
Program/Element	N/A	N/A	N/A

Refer to the overarching PIP section

b) Market Transformation Information

	Market Transformation Planning Estimates	
Program/Element	2013	2014
Metric A	N/A	N/A
Metric B	N/A	N/A
Metric C	N/A	N/A
Etc.	N/A	N/A

Refer to the overarching PIP section

c) Program Design to Overcome Barriers:
The Beaumont Energy Partnership will have barriers consistent with, and will overcome them using, strategies expressed in the Master PIP.

4. Other Program Element Attributes

a) Best Practices:
Described in the Master PIP

b) Innovation :
Develop municipal sustainability dashboard to simplify sustainability reporting including energy efficiency and renewable energy. Partner with Cherry Valley Water district to integrate recycled water for irrigation. Partner with the Green Valley Initiative.

c) Interagency Coordination:
See Master PIP for coordination activities with supporting organizations and agencies. This partnership will benefit from those coordination activities.

d) Integrated/coordinated Demand Side Management:
The IOU's have identified integrated Demand Side Management (IDSM) as an important priority. As a result they have proposed the establishment of a Statewide Integration Task Force (Task Force). Local government partnerships will monitor the progress of the statewide IDSM efforts and work closely with the Task Force to identify comprehensive integration approaches and to implement best practices. See Master PIP.

e) Integration across resource types : (energy, water air quality, etc.)
The Beaumont Energy Partnership will support interagency coordination as stated in Master PIP.

f) Pilots :
No pilots are planned through this partnership.

g) EM&V:
Not applicable to this program.

5. Partnership Program Advancement of Strategic Plan Goals and Objectives

1-1: Develop, adopt and implement model building energy codes (and/or other green codes) more stringent than Title 24's requirements, on both a mandatory and voluntary basis; adopt one or two additional tiers of increasing stringency.	As a result of the partnership, the city continued research on the implementation possibilities of other building energy codes for commercial, residential, and industrial developments in Beaumont.
1-2: Establish expedited permitting and entitlement approval processes, fee structures and other incentives for green buildings and other above-code developments.	Through the partnership, the Green Building Program adopted by the City's Building and Safety Department to encourage sustainable building practices.

2013-2014 Energy Efficiency Programs
Local Government Partnership Program
Program Implementation Plan

1-3: Develop, adopt and implement model point-of-sale and other point-of transactions relying on building ratings.	
1-4: Create assessment districts or other mechanisms so property owners can fund EE through city bonds and pay off on property taxes; develop other EE financing tools.	The partnership will continue exploration on the implementation possibilities for AB 811 legislation.
1-5: Develop broad education program and peer-to-peer support to local governments to adopt and implement model reach codes	Through the partnership, the city of Beaumont will partner with other community agencies, public and private, to increase knowledge and energy efficiency education.
1-6: Link emission reductions from "reach" codes and programs to ARB's AB 32 program	
2-2: Dramatically improve compliance with and enforcement of Title 24 building code, and of HVAC permitting and inspection requirements (including focus on peak load reductions in inland areas).	The partnership will support enhanced code compliance in general through education.
2-3: Local inspectors and contractors hired by local governments shall meet the requirements of the energy component of their professional licensing (as such energy components are adopted).	Specifications for contract services, public works projects, or other municipal facilities improvements that require a public bidding process will have these components included in the bid documents and specifications.
3-1: Adopt specific goals for efficiency of local government buildings, including:	The city goal is to retrofit all existing facilities and implement better than Title 24 standards for all new City construction.
3-2: Require commissioning for new buildings, and re-commissioning and retro-commissioning of existing buildings.	Through the partnership all municipal facilities have been audited for energy efficiency and costs for retrofits have been identified.
3-4: Explore creation of line item in LG budgets or other options that allow EE cost savings to be returned to the department and/or projects that provided the savings to fund additional efficiency.	It has been proposed that the City create a separate budget for the partnership to track spending as well as benefits of different programs.
3-5: Develop innovation Incubator that competitively selects initiatives for inclusion in LG pilot projects.	
4-1: LGs commit to clean energy/climate change leadership.	The City of Beaumont has identified several goals relating to sustainability. The City plans to create and implement a Climate Action Plan as a guideline for the City to follow.

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4-2: Use local governments' general plan energy and other elements to promote energy efficiency, sustainability and climate change.	The City Council approved a Sustainable City Plan as part of the 2009-2010 Capital Improvements Plan.
4-4: Develop local projects that integrate EE/DSM/water/wastewater end use and promote water/energy nexus.	The City of Beaumont and the Cherry Valley Water District collaborated to integrate recycled water program for irrigation. Infrastructure currently in place.
4-5: Develop EE-related "carrots'' and "sticks'' using local zoning and development authority	The partnership will identify new ways to use zoning authority to promote efficiency

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