CA Review HS

CITY COUNCIL

Staff Report

Meeting Date:	Sept. 26, 2017
To:	Mayor and City Council
From:	Kevin Crawford, City Manager
Staff Contact:	Michael Grim, Senior Program Manager/CAP Administrator mike.grim@carlsbadca.gov or 760-602-4623
Subject:	Receive the Climate Action Plan Annual Report for Reporting Year 1, fiscal year 2016-17.

Recommended Action

Receive the Climate Action Plan Annual Report for Reporting Year 1, fiscal year 2016-17.

Executive Summary

The Climate Action Plan (CAP) calls for annual monitoring and reporting. Staff is using the fiscal year as the reporting year for CAP implementation activities. The attached report (Exhibit 1) contains a summary of the activities performed in fiscal year 2016-17. During that period, staff has implemented the CAP Measures and Actions in accordance with their respective timeframes established in the CAP. All development projects subject to CEQA have undergone a CAP consistency review.

Discussion

The CAP was approved on Sept. 22, 2015, along with the General Plan Update and associated environmental impact report. The purpose of the CAP is to describe how greenhouse gas (GHG) emissions within Carlsbad will be reduced in accordance with statewide targets. The statewide targets used for the CAP are derived from the Governor's Executive Order S-3-05 (EO S-3-05) and the Global Warming Solutions Act of 2006 (AB 32).

Implementation of the CAP is required by the General Plan Sustainability Element Policy 9-P.1, which states: "Enforce the Climate Action Plan as the city's strategy to reduce greenhouse gas emissions." Also, Sustainability Element Policy 9-P.13 states: "Use the city's Climate Action Plan as the platform for delineating and implementing measures to improve energy conservation, and increase renewable energy use (such as solar) in existing and new development." Implementation of the CAP strategies are also consistent with the city's Sustainability Guiding Principles, and the city's Community Value of Sustainability, which states: "Build on the city's sustainability initiatives to emerge as a leader in green development and sustainability. Pursue public/private partnerships, particularly on sustainable water, energy, recycling and foods."

Staff made considerable progress in CAP implementation during the first reporting period. The attached annual report (Exhibit 1) contains a detailed description of those activities. In summary, the first year's accomplishments within the city's CAP included:

- Filling CAP administrator position
- Establishing interdepartmental implementation team
- Beginning preparation of CAP Implementation Plan
- Beginning implementation of CAP Measures and Actions including: developing CAP ordinances; developing Transportation Demand Management (TDM) plan and implementing TDM strategies; energy efficiency retrofits and renewable energy at city facilities; and public outreach and education
- Coordinating with regional partners, such as SANDAG, other local jurisdictions, San Diego Regional Climate Collaborative and SDG&E
- Coordinating with the business community, including Carlsbad Chamber of Commerce and Cleantech San Diego

During the first reporting period, the Planning Division developed the *Climate Action Plan Consistency Checklist* and an accompanying *Guidance for Demonstrating Consistency with the Climate Action Plan – For Discretionary Projects Subject to CEQA*. The Planning Division staff used this checklist to review discretionary project permits for consistency with the CAP. If projects are deemed consistent with the CAP, they need not provide an independent project-specific GHG emissions analysis.

Staff began the process to complete GHG inventories and forecasts for 2012, 2014 and 2016 as part of this annual report cycle. Not all of the data needed for these inventories and forecasts were available by the end of the reporting period, therefore this annual report does not contain an inventory or forecast. Staff will continue to work with University of San Diego's Energy Policy Initiatives Center to gather the data, complete the inventory and run the forecasting models. The inventories and forecasts will be made available once completed.

Fiscal Analysis

This is an informational item with no fiscal impact.

Next Steps

Staff will continue to implement the CAP and return to City Council in 2018 with the CAP Annual Report for Reporting Year 2, fiscal year 2017-18. Staff will also make available the 2012, 2014 and 2016 GHG emission inventories and forecast once completed.

Environmental Evaluation (CEQA)

Pursuant to Public Resources Code Section 21065, receiving this annual report does not constitute a "project" within the meaning of CEQA in that is has no potential to cause either a direct or indirect physical change in the environment, or a reasonable foreseeable indirect physical change in the environment and, therefore, does not require environmental review.

Public Notification

This item was noticed in accordance with the Ralph M. Brown Act and was available for public viewing and review at least 72 hours prior to the scheduled meeting date.

Exhibits

1. Climate Action Plan Annual Report for Reporting Year 1, fiscal year 2016-17.

City of Carlsbad Climate Action Plan Annual Report

Reporting Year 1: July 1, 2016 - June 30, 2017

September 2017

City of Carlsbad
Environmental Management
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Tables and Figures

I. Introduction

The purpose of this document is to provide an update on the status of the Climate Action Plan (CAP) implementation that have occurred during the current reporting period. The CAP requires that the city annually monitor and report on CAP implementation activities, and present this report to the City Council in a public meeting. Given that CAP implementation is tied to the budget cycle, staff chose the fiscal year calendar to be the reporting period. This Year 1 annual report covers the FY 16-17 reporting period (July 1, 2016 to June 30, 2017).

II. Background on Climate Action Plan

The City of Carlsbad's Climate Action Plan (CAP) was adopted on September 22, 2015 along with the General Plan Update and associated Environmental Impact Report. The purpose of the CAP is to describe how greenhouse gas (GHG) emissions within Carlsbad will be reduced in accordance with statewide targets.

Chapter 2 of the CAP contains information about the 2011 GHG inventory conducted at the time of CAP development. A GHG inventory identifies the major sources and overall magnitude of GHG emissions in the city using standard modeling methods and protocols. Typical inputs include: electricity consumed, natural gas consumed, vehicles miles traveled, solid waste disposed, wastewater treated and potable and recycled water used.

Chapter 3 of the CAP contains a discussion of the forecasting used to determine the city's GHG targets for 2020 and 2035, as well as the GHG reductions anticipated by state and federal policies and certain General Plan policies.

Chapter 4 of the CAP describes the additional Measures and Actions that the city must pursue in order to reach its GHG emissions reduction targets.

In order to implement these additional Measures and Actions, the city needed to identify and allocate the appropriate funding. Therefore, subsequent to the CAP adoption, staff contracted with University of San Diego's Energy Policy Initiatives Center (EPIC) to study the incremental internal costs to the city for CAP implementation. All of the participating city departments and divisions were surveyed to quantify the resources needed to effectively implement the CAP. On February 23, 2016, staff presented the findings of the study to City Council and noted that these costs would be included in the FY 16-17 departmental budget requests. On June 28, 2016, the City Council approved the FY 16-17 budget, including requests for first year CAP implementation funding.

CAP implementation is a team effort involving a number of city departments and divisions, coordinated by the CAP Administrator. At the beginning of FY 16-17, staff formed an interdepartmental CAP implementation team consisting of Public Works (PW) – General

Services, PW – Traffic and Mobility, PW – Environmental Management, PW – Utilities, Community and Economic Development – Planning, Finance, City Attorney and City Manager - Communications. This team meets on an on-going basis to discuss CAP implementation activities and opportunities for collaboration.

The city conducted its first GHG inventory in 2005, which is attached to the CAP as Appendix A. As part of the CAP preparation, the city updated the 2005 inventory and prepared a 2011 inventory. Figure 1 and Table 1 below show the 2011 GHG emissions graphically and in tabular form for the entire city, including emissions from both municipal operations and the community. Municipal operations constituted approximately one percent of all GHG emissions in 2011. Since there are several different greenhouse gases, GHG emissions are typically expressed in metric tons of carbon dioxide equivalent ($MTCO_2e$) to allow for standardization and comparison.

Figure 1 – 2011 Community GHG Emissions by Sector

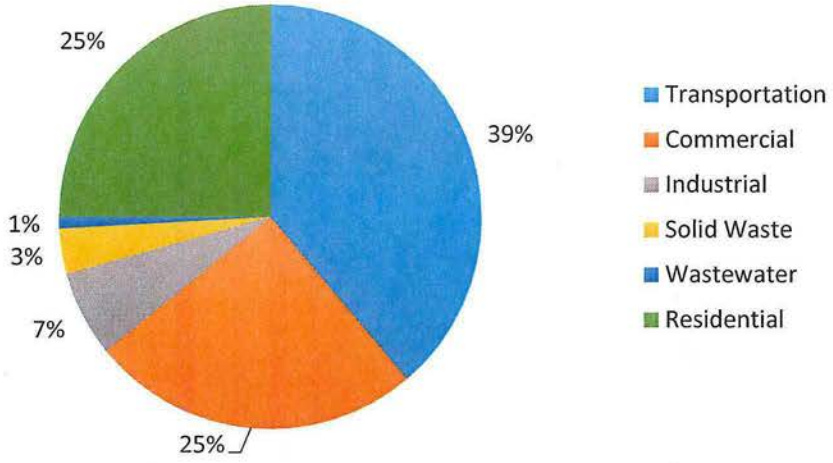

Table 1 – 2011 Community GHG Emissions by Sector

Sector	GHG Emissions ($MTCO_2e$)
Residential	176.405
Commercial	178,712
Industrial	46,248
Transportation	273,745
Solid Waste	21,719
Landfill	2,598
Wastewater	6,317
Total	**705,744**

Of the total emissions in 2011, 96 percent are attributed to the residential, commercial, industrial and transportation sectors (i.e. buildings and automobiles). This emissions profile by sector is typical of other cities and, therefore, similar to most other CAPs, Carlsbad's CAP focuses primarily on GHG emissions reductions strategies on these sectors.

Forecasts for the Carlsbad CAP were conducted for 2020 and 2035 GHG emissions using the Statewide Energy Efficiency Collaborative (SEEC) model. The CAP used the 2005 inventory as the baseline. The first step in forecasting is to determine what is known as the "Business-As-Usual" (BAU) projection. This projection is the amount of GHG emissions increase anticipated over time due to population and job growth and vehicular traffic levels. The forecast then deducts the anticipated emissions reductions derived from state and federal policies, such as low carbon fuel standards, building energy code requirements and the state's requirement for utilities to provide electricity from renewable energy sources (known as the Renewable Portfolio Standard or RPS).

The Carlsbad CAP considered another category of anticipated emissions reductions from the BAU projections: additional General Plan policies and actions. These policies and actions deal with the transportation sector and include bikeway and pedestrian system improvements, traffic calming, parking facilities and policies, and transportation improvements. After deducting these anticipated emissions reductions from the BAU projection, the model then calculates the amount of additional GHG reductions needed to reach the 2020 and 2035 targets.

The statewide targets used for the CAP are taken from Executive Order S-3-05 (EO S-3-05) and the Global Warming Solutions Act of 2006 (AB 32). EO S-3-05 calls for a reduction to 1990 levels by 2020 and 80 percent below 1990 levels by 2050. For Carlsbad, the targets are 15 percent below the 2005 baseline by 2020 and 49 percent below the 2005 baseline by 2035.

The additional reductions necessary to reach the targets are known as the CAP Measures; these measures are noted in Table 2. Each Measure has Actions, which once implemented by the city, will result in the modeled GHG emissions reductions also shown in Table 2.

Table 2 – CAP Measures and GHG Reductions

Measure Letter	GHG Reduction Measures	GHG Reduction in 2020 (MTCO2e)	GHG Reduction in 2035 (MTCO2e)
A	Install residential photovoltaic (PV) systems	2,896	10,136
B	Install commercial and industrial PV systems	3,810	13,336
C	Promote building cogeneration for large commercial and industrial facilities	305	1,067
D	Encourage single-family residential efficiency retrofits	323	1,132
E	Encourage multi-family residential efficiency retrofits	100	351
F	Encourage commercial and city facility efficiency retrofits	5,251	18,377
G	Promote commercial and city facility commissioning, or improving building operations	5,251	18,377
H	Implementation of Green Building Code	51	179
I	Replace Incandescent bulbs with LED bulbs	6,257	21,900
J	New construction residential and commercial solar water heater/heat pump installation & retrofit of existing residential	3,315	11,604
K	Promote Transportation Demand Management	6,728	23,549
L	Increase zero-emissions vehicle travel	15,474	54,158
M	Develop more citywide renewable energy projects	1,309	4,580
N	Reduce the GHG intensity of water supply conveyance, treatment and delivery	1,705	5,968
O	Encourage the installation of greywater and rainwater systems	344	1,205
Total GHG Reductions		**53,199**	**185,919**

III. CAP Measures and Actions

The CAP Measures listed in Table 2 can be grouped into four strategy areas: Energy Efficiency, Renewable Energy, Transportation and Water. For each of the Measures, there are detailed Actions that, taken together, should result in the anticipated GHG emissions reductions. Each of the Actions has an implementation timeframe. Short-term Actions must be completed within the first two years of CAP implementation; mid-term Actions must be completed within five years; and, long-term Actions begin implementation in the first two to five years but will not be completed within that timeframe.

The following section describes the progress made by the city in implementing the CAP measures and actions, organized by the different strategy areas. A more detailed description of activities conducted for each CAP Action, along with the 2035 performance goals for each Measure, is contained in Appendix A of this report. The activities involving public outreach and education are described in a separate section, since those efforts cross over all strategy areas.

A. Energy Efficiency

Energy efficiency is an important component to reducing energy consumption and lowering GHG emissions. The State of California's Energy Commission (CEC) has adopted a "loading order," a prioritized list of actions needed to reduce energy use, and energy efficiency is at the top of the list. For Carlsbad, energy efficiency CAP Measures account for almost a third of the planned GHG emissions reductions.

Measures D, E, F, G, H and I all deal with energy efficiency, both in the community and municipal operations. These Measures call for ordinances mandating energy efficiency improvements in residential and non-residential construction, commissioning of commercial and city facilities, implementation of energy conservation measures in city facilities, and promotion of energy efficiency rebate and incentive programs.

During the reporting period, staff made considerable progress in implementing the energy efficiency related Measures. Using San Diego Gas and Electric's (SDG&E) Emerging Cities Program funds, staff and the Center for Sustainable Energy (CSE) are developing residential and commercial energy efficiency ordinances, as well as a related public outreach program. The city's Municipal Projects Managers incorporated commissioning into the design of the Pine Avenue Park Community Center. Public Works – General Services replaced existing light bulbs with LEDs at the Faraday Center, City Hall and the Carlsbad City Library. They also upgraded HVAC units at several facilities.

B. Renewable Energy

The provision of energy through distributed renewable sources can significantly reduce the need for electricity from the grid and, therefore, lower GHG emissions. The CEC's loading order prioritization of energy efficiency is to lessen the amount of energy used, thereby minimizing

the size and cost of the renewable energy system needed to power the building. According to the CAP, renewable energy Measures will account for about one-fifth of the planned GHG emissions reductions.

Measures A, B, C, J and M relate to community and city renewable energy improvements. These Measures include ordinances requiring PV systems in new residential and non-residential construction and existing commercial buildings, cogeneration in larger non-residential buildings, alternative energy water heating systems, citywide renewable energy projects, and the promotion of renewable energy rebate and incentive programs. Cogeneration involves the generation of electricity and another form of energy, such as using steam to provide heating for a building.

During the reporting period, staff issued a Request for Proposals (RFP) and selected a consultant to prepare the ordinances related to PV systems and alternative energy water heating. Staff consulted with SDG&E on the infrastructure needs to support potential renewable energy projects. Using San Diego Association of Governments' (SANDAG) Energy Engineering consultant, staff began a microgrid feasibility study for the Safety Center complex, which would include renewable energy generation and storage.

C. Transportation

There are two primary facets of GHG emissions reductions related to transportation. The first is to reduce the number of miles a vehicle is driven. Each mile driven represents an emission of GHG. Reducing the length of trips, or the need to use a motorized vehicle, can significantly reduce GHG emissions. The second facet of transportation related GHG emissions is to reduce or eliminate the GHG emissions coming from vehicles. Known as low- or zero-emissions vehicles, these automobiles include alternative fueled vehicles, hybrids and electric vehicles. Taken together, the reduction of vehicle miles traveled and tailpipe emissions represent the largest single GHG reduction strategy area. In the Carlsbad CAP, transportation related Measures total over 40 percent of the planned GHG emissions reductions.

Measures K and L address the transportation related GHG emissions reductions. Measure K relates to reducing vehicle miles traveled and is closely tied to the policies contained in the General Plan Mobility Element. During the reporting period, staff entered into an agreement with SANDAG to provide consulting services to prepare a Transportation Demand Management plan and ordinance. The two year effort is a component of the larger Sustainable Mobility Plan, partially funded by a grant from Caltrans. Staff also partnered with SANDAG's iCommute program to begin developing employee commuting programs internally and among other large employers in Carlsbad.

Measure L involves reducing tailpipe emissions through the increase in the proportion of low- and zero-emission vehicles on the road. Some of the Actions in Measure L involve ordinance development, which is coupled with the ordinances being developed in the Renewable Energy

strategy area. Other activities during the reporting period included the city's purchase of 11 hybrid fleet vehicles, City Council authorization to construct electric vehicle charging stations at State Street parking lot and Stagecoach Park, and the inclusion of electric vehicle charging stations at Pine Avenue Park Community Center.

D. Water

Water conservation can lower GHG emissions because the movement of water and wastewater requires energy. Measures N and O deal with increasing energy efficiency in the potable water, recycled water and wastewater conveyance systems and the promotion of greywater and rainwater collection systems.

The Carlsbad Municipal Water District (CMWD) analyzes the energy usage of their pumps and endeavors to increase the energy efficiency of that equipment whenever it is replaced. Implementation of the Actions associated with Measures N and O will continue in the mid to long-term timeframe.

E. Public Outreach and Education

In addition to the provision of energy efficient buildings or the availability of PV systems and electric vehicles, a critical component to reducing GHG emissions is encouraging members of the public to engage in behaviors that reduce GHG emissions. Bike lanes, pedestrian improvements and transit expansion only reduce GHG emissions if people use them.

Measures C, D, E, F, G, and I all contain Actions related to public outreach and education. During the reporting period, staff began development of a multi-year, research based strategy to achieve measureable changes in public behaviors, resulting in reduced GHG emissions. Concurrent with the long term strategy, staff implemented several short term public outreach and education tactics, including:

- A website with information for residents, business owners and other public agencies.
- A banner ad and pay-per-click campaign promoting energy saving rebate programs.
- Social media (organic and paid) promotion of GHG reduction measures, including transportation demand management, water conservation, solar energy and rebates.
- Print advertising promoting GHG reduction measures.
- Articles in newsletters and newspapers promoting GHG reduction measures.
- Informational materials available at city facilities.

IV. New Development Projects

The CAP serves as an environmental review tiering document pursuant to Section 15183.5 of the State California Environmental Quality Act (CEQA) Guidelines. According to the CAP, any discretionary project that will have GHG emissions greater than 900 $MTCO_2e$ must either

demonstrate consistency with the CAP or submit a project-specific GHG analysis for review and approval.

During the reporting period, the Planning Division contracted with Ascent Environmental to develop a Climate Action Plan Consistency Checklist and accompanying Guidance for Demonstrating Consistency with the Climate Action Plan – For Discretionary Projects Subject to CEQA. These documents were implemented in draft form shortly after CAP adoption and finalized in February 2017. The Checklist and Guidelines are available at: http://www.carlsbadca.gov/services/building/forms/default.asp.

Listed below are some of the projects that were subject to discretionary CAP consistency review and the GHG reductions measures included in their project design:

Uptown Bressi (GPA 14-04)

- A minimum 375,000 kWh/yr PV system for the residential portion
- A minimum 459,270 kWh/yr PV system for the commercial portion
- All buildings comply with CalGreen Code, including EnergyStar systems and white roofs
- Solar water heating for residential recreational common areas
- Tankless water heaters for residential indoor hot water
- 75 percent of project luminaires are LED or equivalent energy efficiency
- 30 dedicated electric vehicle (EV) commercial parking spaces, 15 of which include EV charging equipment
- Pre-wiring for EV charging in all residential garages and one common area EV charging station
- Rainwater collection systems for landscaping irrigation

Viasat Bressi Ranch Campus (MP 178K)

- A minimum 1,008,000 kWh/yr PV system
- Commission all buildings for energy efficiency
- 75 percent of project luminaires are LED or equivalent energy efficiency
- Solar water heating, heat pump system or PV system providing at least 50 percent of water heating energy
- Six percent of off-street parking dedicated for EV parking, at least 50 percent of which are "EV Ready"
- Operable windows in conference rooms to provide natural ventilation

Poinsettia 61 (GPA 14-06)

- PV systems on residential rooftops
- 75 percent of project luminaires are LED or equivalent energy efficiency

- Solar water heating incorporated into rooftop PV system
- Pre-wiring for EV charging in all residential garages and common area EV charging stations

V. Monitoring

During the first year of CAP implementation, the city contracted with EPIC to assist in the development of a CAP Implementation Plan. Part of that plan will include strategies and methods to monitor the city's progress in reaching its CAP Measure performance goals and GHG reduction targets. EPIC is also on contract with SANDAG to develop a Regional Framework for Climate Planning, which will also include a section on CAP monitoring. These documents will help inform the city's CAP monitoring in future reporting years.

Monitoring of CAP implementation can be divided into two general areas: 1) progress on implementing the CAP Measures and Actions, and their corresponding performance goals; and, 2) progress in reaching the GHG reductions targets for 2020 and 2035.

Some CAP Measures lend themselves more easily to direct measurement than others. For example, there are at least two data sources for measuring the number of PV systems installed in Carlsbad. One is the Currently Interconnected Data Set, published by the California Solar Initiative. This data set shows all PV systems that have been interconnected to SDG&E's grid. The other data set is the city's EnerGov system, which tracks building permit issuance. Therefore, tracking progress for CAP Measures A and B is relatively straightforward.

Tracking energy efficiency projects is more challenging. Energy efficiency improvements can be as simple as exchanging incandescent light bulbs for LEDs or purchasing Energy Star rated appliances. Most of the CAP Measure performance goals related to energy efficiency call for a percentage reduction in energy usage for a proportion of buildings within the city. Therefore, the most effective measurement is the energy consumption data from SDG&E, which will be acquired for every biannual GHG inventory.

There are also metrics available to gauge participation in programs designed to incentivize or facilitate energy efficiency, renewable energy and electric vehicle purchase. These include SDG&E's rebates and incentives programs and CSE administered programs, such as the Self-Generation Incentive Program (SGIP) and Clean Vehicle Rebate Program (CVRP). While these data do not represent a complete picture of activity in a certain strategy area, they do offer insight that can be helpful in designing programs.

Once the CAP Implementation Plan is completed, and the Regional Framework is available, staff will determine the most suitable monitoring metrics for the CAP. These metrics, combined with the monitoring of progress in completing the CAP Measures and Actions and the biennial GHG emissions inventory and forecast, will guide staff in CAP evaluation and implementation.

VI. GHG Emissions Inventory and Forecast

A key component of CAP implementation is the monitoring of actual GHG emissions and recalibrating the forecasted GHG emissions. In early 2017, SANDAG contracted with EPIC to provide climate planning services for its member jurisdictions. One of the services offered includes conducting GHG inventories and forecasts.

During the reporting period, city staff worked with EPIC to gather the data necessary to complete a GHG inventory for calendar years 2012, 2014 and 2016. The data included: electricity and natural gas usage data from SDG&E; vehicle miles traveled data from SANDAG; water usage and wastewater discharge from the various districts serving Carlsbad; and solid waste tonnage from CalRecycle. Also necessary for GHG forecasting are the 2020 and 2035 population and job growth data from SANDAG, based upon their latest growth projections. Not all of this data was obtained by the end of this reporting period, therefore this annual report does not contain an inventory or forecast. Staff will continue to work with EPIC to gather the data, complete the inventory, and run the forecasting models and will make the information available once completed.

VII. Summary

During the first year of CAP implementation, staff made considerable progress in establishing an administrative structure and carrying out the CAP Measures and Actions. Staff is on track to complete short-term CAP Actions within the two year implementation timeframe. Staff is also ahead of schedule on some mid-term CAP Actions. During the next fiscal and reporting year, staff will continue to work and coordinate with consultants, SANDAG, SDG&E and other regional and business partners to further CAP implementation and continue to lower GHG emissions.

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Appendix A

FY 16-17 CAP Implementation Activities

by Measures and Actions

CAP Measures and Actions **2035 Performance Goals for Measures**		**FY 16-17 CAP Implementation Activities by Measures and Actions**
Timeframes in CAP: *Short-term = 1 - 2 years* *Mid-term = 2 - 5 years* *Short to Long-term & Mid-Long-term = begun but not completed in 5 years*		
A - Promote installation of residential photovoltaic systems Promote installation of residential PV systems to produce an additional 9.1 MW above already projected amounts, or the equivalent of 2,682 more homes with PV systems, by 2035.		
A-1	Temporarily - for a period of one year - suspend residential and commercial PV system permit fees, together with a publicity campaign to promote PV systems installation. *(Short-term)*	This action was deemed unnecessary due to the already increasing volume of residential and commercial PV permits. Permit fees for Carlsbad are proportionate or lower than fees in other San Diego region jurisdictions. In 2015, City Council adopted Ord. CS-285, which streamlined the permitting process for small residential rooftop solar energy systems.
A-2	On a continuing basis, ensure that regulatory provisions - such as complying with regulations for zoning, structure height, permit submittal and review, etc. - do not hinder residential and commercial PV system installation. *(Short to Long-term)*	Staff will continue to evaluate the zoning regulations and permitting process to ensure there is no hindrance of PV installations.
A-3	Adopt an ordinance, similar to those passed by Lancaster and Sebastopol, which requires new homes to install PV panels to offset a portion of their energy use. *(Short-term)*	Staff issued a Request for Proposals (RFP) in March 2017 for a consultant to prepare CAP related ordinances, including an ordinance to require PV systems on new residential construction. As of June 30, 2017 staff had selected a consultant and was in contract negotiations.
B - Promote installation of commercial and industrial photovoltaic systems Promote installation of commercial and industrial PV systems to produce an additional 10.7 MW above projected amounts, or roughly 15 percent of projected commercial and industrial electricity use.		
B-1	Adopt a commercial energy conservation ordinance requiring all new nonresidential developments with more than 50 cars surface parked or on roofs of parking structures to use PV panels over at least half of the surface/roof-parked cars, or provide equivalent energy conservation/generation by other means (over and above other requirements). *(Short-term)*	Staff issued an RFP in March 2017 for a consultant to prepare CAP related ordinances, including an ordinance to require PV systems on new non-residential construction. As of June 30, 2017 staff had selected a consultant and was in contract negotiations.

B-2	Adopt an ordinance requiring existing nonresidential developments to install PV panels to offset a portion of their energy use. *(Mid-term)*	Staff issued an RFP in March 2017 for a consultant to prepare CAP related ordinances, including an ordinance to require PV systems on existing non-residential construction. As of June 30, 2017 staff had selected a consultant and was in contract negotiations.
C - Promote building cogeneration for large commercial and industrial facilities Promote building cogeneration for large commercial and industrial facilities, with the goal of producing 6.9 MW by 2035.		
C-1	Promote cogeneration by publicizing grant opportunities and financial incentives, such as the Self-Generation Incentive Program and feed in tariffs for cogeneration systems, for renovations of existing buildings by posting these on the city's website and by other means. *(Short-term)*	Staff created a website to promote existing programs such as the Self-Generation Incentive Program.
C-2	Install cogeneration systems on all city facilities that can benefit from the installation of these systems, and apply for funding through the Energy Efficiency Financing for Public Sector Projects program, or other similar funding sources. *(Mid to Long-term)*	City staff is evaluating the effectiveness of cogeneration systems on city facilities. Preliminary indications are that no facilities meet the minimum criteria needed for effectiveness. A final determination will be made in Reporting Year 2 - FY 17-18.
C-3	Require cogeneration systems for large commercial and industrial facilities that have on-site electricity production, both for new construction and retrofits. *(Mid-term)*	Staff is assessing the types of projects that could be subject to this Action, both existing and in the future.
D - Encourage single-family residential efficiency retrofits Encourage single-family retrofits with the goal of 50 percent energy reduction compared to baseline in 30 percent of the total single-family homes citywide (approximately 10,000 single-family homes out of total of 35,000.)		
D-1	Publicize available incentive and rebate programs, such as SDG&E's Residential Energy Efficiency Program, on the city's website and by other means. *(Short-term)*	Staff created a website, implemented a digital and print ad campaign, and published articles in newsletters and newspapers.
D-2	Create a citywide "Energy Challenge," similar to the Department of Energy's Better Buildings Challenge, to promote cost-effective energy improvements, while having residents and building owners commit to reducing energy consumption. *(Short-term)*	Staff are developing a long-term strategy to encourage behaviors that reduce GHG emissions. A program such as this could become part of that strategy, based on the findings of research being conducted in 2018.

D-3	Adopt a residential energy conservation ordinance, which requires residential property owners to conduct and disclose an energy audit at the time of major renovations (as defined by the ordinance,) to ensure that homes and residential developments meet specified low cost energy efficiency measures - such as requisite ceiling insulation, insulated pipes, water heater blankets and exterior door stripping. *(Short-term)*	Using SDG&E's Emerging Cities Program funds, staff selected Center for Sustainable Energy (CSE) to develop residential and commercial energy efficiency ordinances, as well as a related public outreach program. SDG&E and CSE executed a contract on February 22, 2017. As of June 30, 2017, CSE had prepared a memoranda containing an overview of energy efficiency ordinances from other jurisdictions and possible strategies for a future Carlsbad ordinance.
E - Encourage multi-family residential efficiency retrofits Encourage multi-family retrofits with the goal of 50 percent energy reduction compared to baseline in 30 percent of the total multi-family homes citywide (approximately 5,000 single-family homes out of total of 17,000.)		
E-1	See D-1 above	See D-1 above
E-2	See D-2 above	See D-2 above
E-3	See D-3 above	See D-3 above
F - Encourage commercial and city facility efficiency retrofits Encourage commercial and city facility efficiency retrofits with the goal equivalent to a 40 percent energy reduction in 30 percent of commercial square footage citywide and in city-owned buildings by 2035.		
F-1	Undertake a program of energy efficiency retrofits for city-owned buildings, with the goal of 40 percent reduction in energy use, beginning with retrofits that would result in most substantial energy savings. *(Short-term)*	Staff replaced or upgraded HVAC units at Faraday Center, Oak Street, New Village Arts Center and CMWD administration, resulting in a 29 percent reduction in energy usage. Staff also continued implementation of the SANDAG Energy Roadmap by meeting with SANDAG consulting engineers, TRC, to identify possible energy conservation measures at the Safety Center, Fire Station #5 and the Fleet Maintenance Center.
F-2	Promote available incentive and rebate programs, such as SDG&E's Energy Efficiency Business Rebates and Incentives Program, on the city's website and by other means. *(Short-term)*	Staff created a website, implemented a digital and print ad campaign, and published articles in newsletters and newspapers. Also, on May 9, 2017, city staff partnered with the Carlsbad Chamber of Commerce's Sustainability Committee to conduct a workshop on the various rebates and incentives available to businesses for energy efficiency, renewable energy, electric vehicle infrastructure and zero-emission fleet vehicles. The event was open to the public and more than 60 people attended.

F-3	Adopt a commercial energy conservation ordinance, which requires property owners to ensure that commercial buildings meet specified energy efficiency measures - such as requisite heating, ventilation, and air conditioning improvements, service water system requirements, and improved refrigeration equipment, at time of conducting major renovations (as defined by the ordinance). *(Short-term)*	Using SDG&E's Emerging Cities Program funds, staff selected Center for Sustainable Energy (CSE) to develop residential and commercial energy efficiency ordinances, as well as a related public outreach program. SDG&E and CSE executed a contract on February 22, 2017. As of June 30, 2017, CSE had prepared memorandum containing an overview of energy efficiency ordinances from other jurisdictions and possible strategies for a future Carlsbad ordinance.
G - Promote commercial and city facility commissioning Encourage commercial and city facility commissioning, or improving existing and new building operations, with the goal equivalent to a 40 percent energy reduction in 30 percent of commercial square footage citywide and in city-owned buildings by 2035.		
G-1	Promote commercial commissioning programs on the city's website such as San Diego RCx, and similar programs for commercial buildings. *(Short-term)*	Staff created a website to promote these programs.
G-2	Commission city facilities to improve building operations and reduce energy costs, with a goal of 40 percent energy reduction in 30 percent of city facility square footage. *(Mid-term)*	The city is participating in SANDAG's Energy Roadmap program, which provides energy audits of city facilities and recommends possible energy conservation measures. The city also incorporated commissioning requirements into the design of new facilities, such as Fire Station #3 and Pine Avenue Park Community Center.
H - Implement green building measures Implementation of a five percent improvement in energy efficiency above the City of Carlsbad residential green building code (based on CALGreen, the statewide green building code), for new construction.		
H-1	Adopt residential and commercial energy conservation ordinances requiring a five percent improvement in energy efficiency for residential and nonresidential new construction, above the existing City or Carlsbad green building code. *(Short-term)*	At the time of CAP adoption, the City of Carlsbad was requiring compliance with 2013 version of CalGreen. On June 27, 2017, the city adopted the 2016 version of CalGreen, which significantly increases energy efficiency of newly constructed buildings, far beyond the five percent called for in Action H-1. For example, single family homes constructed under the 2016 standards will use about 28 percent less energy for lighting, heating, cooling, ventilation, and water heating than those built to the 2013 standards Staff is also working with the Center for Sustainable Energy, funded through the SDG&E Emerging Cities Program, to develop residential and non-residential energy efficiency ordinances (as described in Actions D-3, E-3 and F-3.)

I - Promote replacement of incandescent and halogen bulbs with LED or other energy efficient lamps Replace 50 percent of incandescent and halogen light bulbs citywide with LED or similarly efficient lighting by 2035.		
I-1	Replace 50 percent of incandescent or halogen light bulbs in city facilities with LED or similarly efficient lighting, or follow SANDAG Energy Roadmap recommendations for lighting in city facilities, whichever results in greater energy savings. *(Short-term)*	Staff conducted a lighting upgrade at the Faraday Center and City Hall. The Faraday Center project proceeded in two phases. Phase I replaced 1,278 fluorescent bulbs with 426 LEDs, resulting in a 65 percent reduction in energy use. Phase II replaced 294 fluorescent bulbs with 147 LEDs, resulting in a 40 percent reduction in energy use. The City Hall project replaced 300 existing bulbs with 100 LEDs, resulting in a 65 percent reduction in energy use.
I-2	Promote the use of LED or other energy efficient lamps by publicizing rebate programs and information from SDG&E on the benefits of the use of LED or other energy efficient lighting on the city's webpage. *(Short-term)*	Staff created a website, implemented a digital and print ad campaign, and published articles in newsletters and newspapers. Also, on May 9, 2017, city staff partnered with the Carlsbad Chamber of Commerce's Sustainability Committee to conduct a workshop on the various rebates and incentives available to businesses for energy efficiency, renewable energy, and electric vehicle infrastructure and fleet vehicles. The event was open to the public and more than 60 people attended.
I-3.i	Evaluate the feasibility of adopting a minimum natural lighting and ventilation standard, developed based on local conditions. *(Mid-term)*	Staff issued an RFP in March 2017 for a consultant to prepare CAP related ordinances, including an ordinance to require natural lighting and ventilation on new construction. As of June 30, 2017 staff had selected a consultant and was in contract negotiations.
I-3.ii	Demonstrate natural lighting and ventilation features in future facility upgrade or new construction. *(Mid-term)*	Staff is evaluating potential future city projects to demonstrate natural lighting and ventilation.
J - New construction residential and commercial solar water heater/heat pump installation & retrofit of existing residential Install solar water heaters or heat pumps on all new residential and commercial construction. Retrofit up to 30 percent of existing homes and commercial buildings to include solar water heaters or heat pumps.		
J-1	Promote the installation of residential solar water heaters and heat pumps by publicizing incentive, rebate and financing programs, such as PACE programs and the California Solar Initiative for renovations of existing buildings by posting this information on the city's website and by other means. *(Short-term)*	Staff created a website, implemented a digital and print ad campaign, and published articles in newsletters and newspapers.

J-2	Adopt residential and commercial energy conservation ordinances requiring new residential and commercial buildings to install solar water heaters or heat pumps, or use alternative energy (such as PV-generated electricity) for water heating needs. *(Short-term)*	Staff issued an RFP in March 2017 for a consultant to prepare CAP related ordinances, including an ordinance to require alternative energy water heating systems on new residential and non-residential construction. As of June 30, 2017 staff had selected a consultant and was in contract negotiations.
K - Promote transportation demand management strategies Promote Transportation Demand Management Strategies with a goal of achieving a 10 percent increase in alternative mode use by workers in Carlsbad, for a total of 32 percent alternative mode use.		
K-1	Adopt a citywide transportation demand management (TDM) plan, as described in the General Plan Mobility Element, detailing a mix of strategies to reduce travel demand, specifically of single occupancy vehicles. SANDAG's 2012 "Integrating Transportation Demand Management Into the Planning and Development Process" provides a guide to designing and implementing a TDM plan and will be used as a reference document to develop the city's TDM plan. TDM strategies evaluated in the plan include parking ordinances, subsidized or discounted transit programs, transit marketing and promotion, carsharing, parking pricing, and bike parking. *(Short-term)*	On August 23, 2016, the city entered into a Memorandum of Understanding (MOU) with SANDAG to provide consulting services to prepare a TDM ordinance and program. SANDAG contracted with Steer Davis Gleeves. During the reporting period, staff conducted educational workshops on TDM concepts and began developing the TDM program, which includes an ordinance, website and implementation manual for large employers within the city. Staff also coordinated with SANDAG's iCommute program to create an internal TDM program for city employees. The TDM effort is an integral part of a larger Sustainable Mobility Plan (SMP), partially funded through a Sustainable Communities grant from Caltrans.
K-2	Adopt a TDM ordinance, defining a minimum trip generation threshold for nonresidential development projects. The city will set performance requirements for minimum alternative mode use based on project type. All projects above the threshold shall submit a TDM plan, which includes a description of how the minimum alternative mode use will be achieved and maintained over the life of the project. Potential TDM trip reduction measures can include carpool and vanpool ridematching services; designated employees as contacts for trip reduction programs; providing a direct route to transit in coordination with NCTD; developing public-private transit partnerships; passenger loading zones; pedestrian connections; showers and clothes lockers; long–term bicycle parking and shuttle programs. (Mid-term)	Staff are implementing Actions K-1 and K-2 in unison and are developing the TDM ordinance concurrent with developing the TDM program and implementation manual. See K-1 discussion for more information.

L - Promote an increase in the amount of zero-emissions vehicle travel Promote an increase in the amount of zero-emissions vehicle (ZEV) miles traveled from a projected 15 percent to 25 percent of total vehicle miles traveled (VMT) by 2035.		
L-1	Working with industry partners, construct a "PV to EV" pilot project to install a PV charging station at a city facility (such as Faraday Center) to charge city ZEVs. The purpose of the pilot project would be to evaluate the feasibility of incorporating more ZEV into the city's fleet. *(Short-term)*	Staff is reviewing potential location(s) for the "PV to EV" pilot project(s).
L-2	Prepare a community-wide charging station siting plan, which evaluates site visibility and exposure, electric vehicle (EV) driving ranges, high volume destinations, locations with high ownership or interest in EVs, and cost of construction. *(Short-term)*	Staff worked with SANDAG to provide services through the second phase of the Plug-In San Diego program. The program's EV Expert can provide guidance and information necessary for staff to perform the community-wide siting plan in-house. The second phase of the Plug-In San Diego program did not start during the reporting period.
L-3	Construct ZEV charging stations based on the community-wide charging station siting plan described in L-2 above. The ZEV charging stations will be funded by grant funds when available, and the city will post signage directing ZEVs to charging stations. *(Mid-term)*	Full implementation of this action necessitates a completion of Action L-2. On July 26, 2016, City Council authorized execution of a contract with NRG's EVgo to construct electric vehicle charging stations at two city locations: State Street parking lot and Stagecoach Park. EV charging stations are incorporated into the design of the Pine Avenue Park Community Center.
L-4	Offer dedicated ZEV parking, and provide charging stations adjacent to ZEV parking as identified in the community-wide charging station siting plan. *(Mid-term)*	Staff issued an RFP in March 2017 for a consultant to prepare CAP related ordinances, including an ordinance to require dedicated electric vehicle charging infrastructure for new non-residential construction. As of June 30, 2017 staff had selected a consultant and was in contract negotiations.
L-5	Adopt requirements for ZEV parking for new developments. *(Short-term)*	Staff issued an RFP in March 2017 for a consultant to prepare CAP related ordinances, including an ordinance to require dedicated electric vehicle charging infrastructure for new non-residential construction. As of June 30, 2017 staff had selected a consultant and was in contract negotiations.
L-6	Adopt a residential energy conservation ordinance, similar to Palo Alto, requiring the installation of EV chargers or pre-wiring in new residential construction and major renovations. *(Short-term)*	Staff issued an RFP in March 2017 for a consultant to prepare CAP related ordinances, including an ordinance to require electric vehicle charging infrastructure or pre-wiring on new residential construction. As of June 30, 2017 staff had selected a consultant and was in contract negotiations.

L-7	Update the city's Fleet Management Program to include a low and zero-emissions vehicle replacement/purchasing policy. Increase the proportion of city fleet low and zero–emissions VMT to 25 percent of all city-related VMT by 2035. *(Short-term)*	On July 26, 2016, City Council authorized the purchase of 11 hybrid vehicles. These low emission vehicles replaced standard gas combustion engine vehicles in the city's fleet.
M - Develop more citywide renewable energy projects Produce an equivalent amount of energy to power 2,000 homes (roughly equivalent to a five percent reduction) by 2035 from renewable energy projects.		
M-1	Conduct a feasibility study to evaluate citywide renewable energy projects and prioritize accordingly. *(Short-term)*	During the reporting period, staff discussed with SDG&E the infrastructure requirements to support large renewable energy projects. Leveraging SANDAG's Energy Engineering contract with TRC, staff also began a microgrid feasibility study for the Safety Center complex on Orion Way. If implemented, the microgrid would include enough renewable energy generation and energy storage to power the entire complex in case of a blackout.
M-2	Incorporate renewable energy measures such as PV system installation on city buildings and parking lots, or microturbine installation on city facilities, with the goal of producing approximately 12,000 megawatt-hours per year. *(Mid to Long-term)*	The Pine Avenue Park Community Center incorporated PV systems in its design. Future city facilities will also be required to incorporate renewable energy.
M-3	Pursue available funding sources for the construction of renewable energy projects by the city, such as Energy Efficiency Financing for Public Sector Projects and SGIP. *(Mid to Long-term)*	Funding sources to support CAP implementation, including renewable energy projects, will be a component of the upcoming CAP Implementation Plan.
N - Reduce the GHG intensity of water supply conveyance, treatment and distribution Reduce the intensity of GHG emissions from water utilities (including water supply, wastewater, and recycled water) conveyance, treatment and distribution by eight percent by 2035.		
N-1	Improve water utilities (including water supply, wastewater, and recycled water) conveyance, treatment and distribution, and other system improvements. *(Mid to Long-term)*	Incorporating energy efficiency into system improvements is standard practice for CMWD. As systems are upgraded, staff will track and report the energy savings and estimated GHG emissions reductions.

O - Encourage the installation of greywater and rainwater systems Encourage the installation of greywater and rainwater collections systems with a goal of 15 percent of homes by 2035.		
O-1	Host workshops on greywater and rainwater collection systems through the Carlsbad Municipal Water District, or partner with existing workshop providers, for homeowners interested in installing systems suitable for their property. *(Mid-term)*	This is a mid-term action, planned for Years 3 - 5. There was no activity on this action during the reporting period.
O-2	Create a greywater design reference manual, or provide links to an existing one, for the design of greywater and rainwater collection systems. *(Mid-term)*	This is a mid-term action, planned for Years 3 - 5. There was no activity on this action during the reporting period.
O-3	Evaluate the feasibility of offering a rebate for residential greywater systems that require a permit to cover the cost of obtaining a permit. *(Mid-term)*	This is a mid-term action, planned for Years 3 - 5. There was no activity on this action during the reporting period.

Climate Action Plan Annual Report

Mike Grim, CAP Administrator

September 26, 2017

Community Vision

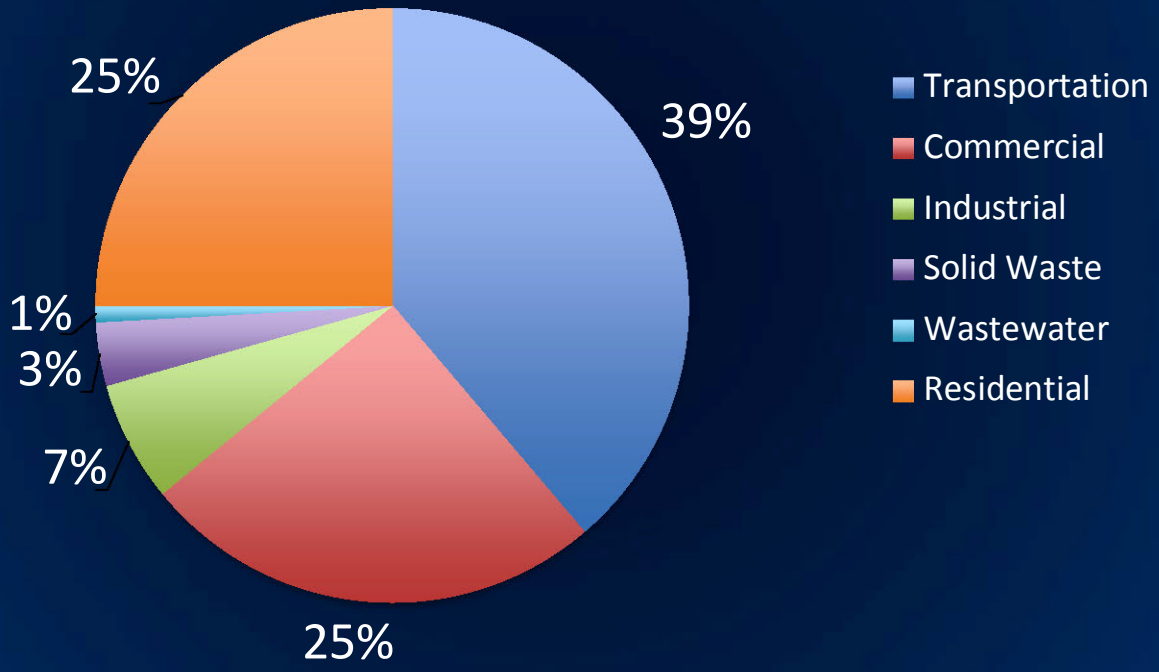
- Active, healthy lifestyles
- Walking, biking, public transit
- Sustainability
- Community design and livability

- Guiding principles

CAP Background

- Approved Sept 22, 2015
- GHG inventory and forecast
- GHG reduction measures
- Implementation structure
- Monitoring and reporting

2011 Community Emissions



GHG Emissions Reductions

- Baseline is 2005 GHG inventory
- Business as usual forecast
- GHG Reductions
  - State and federal policies
  - Additional General Plan policies
  - CAP Measures and Actions

Climate Action Plan

Measure Letter	GHG Reduction Measure	Greenhouse Gas Emissions Reduction (metric tons CO2e)
A	Install residential solar photovoltaics (PV) systems	10,136
B	Install commercial and industrial PV systems	13,336
C	Promote building cogeneration for large commercial and industrial facilities	1,067
D	Encourage single-family residential efficiency retrofits	1,132
E	Encourage multi-family residential efficiency retrofits	351
F	Encourage commercial and city facility efficiency retrofits	18,377
G	Promote commercial and city facility commissioning, or improving building operations	18,377
H	Implementation of Green Building Code	179
I	Replace incandescent bulbs with LED bulbs	21,900
J	New construction residential and commercial solar water heater/heat pump installation and retrofit of existing buildings	11,604
K	Promote transportation demand management (TDM)	23,549
L	Increase zero-emissions vehicle travel	54,158
M	Develop more citywide renewable energy projects	4,580
N	Reduce the greenhouse gas intensity of water supply conveyance, treatment, and delivery	5,968
O	Encourage installation of greywater and rainwater systems	1,205
Total Greenhouse Gas Reduction		**185,919**

CAP Strategy Areas

- Energy efficiency
- Renewable energy
- Transportation
- Water
- Public outreach and education

FY 16-17 Energy Efficiency

- Began preparing energy efficiency ordinances
- Commissioned city facilities
- Conducted HVAC upgrades and lighting replacement
- Required energy efficiency in large development projects

FY 16-17 Renewable Energy

- Issued Request for Proposals for photovoltaic solar panel ordinances
- Required renewable energy in large development projects
- Included Photovoltaic solar panels at Pine Ave Park Community Center
- Began conducting microgrid feasibility study at Safety and Service Center

FY 16-17 Transportation - Vehicle Miles

- Executed MOU with SANDAG for Transportation Demand Management program consultant
- Began iCommute program for city employees
- Partnered with SANDAG to bring iCommute program to large employers
- Required TDM in large development projects

FY 16-17 Transportation – Vehicle Emissions

- Purchased 11 hybrid fleet vehicles
- Contracted with EVgo to install public EV charging infrastructure in two locations
- Included public EV charging stations at Pine Ave Park Community Center
- Issued Request for Proposal for EV charging infrastructure ordinance
- Required EV charging in large development projects

FY 16-17 Water

- Continued increasing energy efficiency of conveyance systems during system improvements

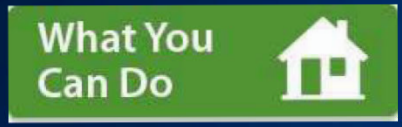
FY 16-17 Public Outreach and Education

- Began developing long-term plan to identify GHG reduction strategies
- Enhanced information on city website and digital campaign
- Promoted through social media, e-newsletter, Carlsbad Magazine
- Partnered with Chamber's Sustainability Committee for workshop and outreach


Energy Savings Rebates
Solar, Appliances and More
Find Rebates Now
City of Carlsbad


Thanks for Keeping Our Air Clean
Clean Air Checklist
Consider an electric vehicle
Install solar
Replace old appliances
Walk/bike when possible
Do a home energy audit
Get info on rebates, incentives and other programs at www.carlsbadca.gov/rebates
Carlsbad Conserves


Business Resources


What You Can Do

Next Steps

- Continue implementation
- Complete CAP Implementation Plan
- Complete GHG inventories and forecasts
- Continue local and regional partnerships
- Monitor progress
- Present FY 2017-18 annual report