CITY OF NATIONAL CITY

FINAL CLIMATE ACTION PLAN

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Prepared for:

City of National City

Prepared by:

Design, Community & Environment

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1 INTRODUCTION

The City of National City is joining an increasing number of California communities in developing plans to address climate change at a local level. This Climate Action Plan (CAP) addresses the major sources of greenhouse gas (GHG) emissions in National City and sets forth a detailed and long-term strategy that the City and community can implement to achieve GHG emissions reduction target. Implementation of this Climate Action Plan will guide National City's actions to reduce its contribution to global climate change and will support the State of California's ambitious emission reduction targets. The CAP will also be utilized for tiering and streamlining of future development within National City pursuant to CEQA Guidelines 15152 and 15183.5. The CAP serves as the CEQA threshold of significance within the City for climate change, by which all applicable developments within the City will be reviewed.

This chapter provides background information about climate change science, the effects and impacts of climate change, regulatory actions on climate change, and existing climate action efforts in National City.

A. Climate Change

1. Climate Change Science

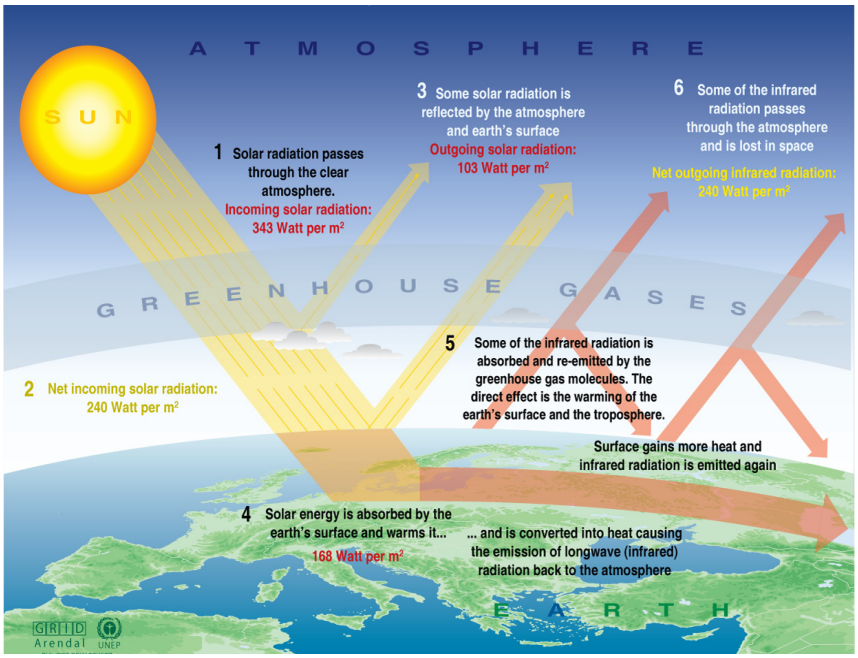
The Earth's atmosphere is composed of naturally-occurring and anthropogenic (induced by human activity) GHGs that trap heat in the atmosphere and regulate the Earth's temperature. This phenomenon, known as the Greenhouse Effect, is responsible for maintaining a habitable climate on Earth. GHGs present in the earth's lower atmosphere play a critical role in maintaining the earth's temperature as they trap some of the longwave infrared radiation emitted from the earth's surface which otherwise would have escaped to space, as shown in Figure 1-1.

Water vapor and CO_2 are the most abundant GHGs in the atmosphere. The gases that are widely seen as the principal contributors to anthropogenic climate change are CO_2, nitrous oxide (N_2O), CH_4, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). While hu-

man activity results in the release of some GHGs that occur naturally, such as CO_2 and CH_4, other gases, like HFCs, PFCs, and SF_6, are human-made.

The combustion of fossil fuels and deforestation release carbon, in the form of CO_2, into the atmosphere that historically has been stored underground in sediments or in surface vegetation. With the accelerated increase of fossil fuel combustion and deforestation since the industrial revolution of the 19th century, concentrations of GHGs have increased exponentially in the atmosphere. Increases in the atmospheric concentrations of GHGs in excess of natural ambient concentrations contribute to the enhancement of the natural greenhouse effect.

FIGURE 1-1 *THE GREENHOUSE EFFECT*



Source: UNEP/GRID-Arendal, http://maps.grida.no/go/graphic/greenhouse_effect.

This enhanced greenhouse effect has contributed to global warming, which is an increased rate of warming of the earth's surface temperature. Specifically, increases in GHGs lead to increased absorption of longwave infrared radia-

tion by the earth's atmosphere and warm the lower atmosphere further, thereby increasing evaporation rates and temperatures near the surface. Warming of the earth's lower atmosphere induces large-scale changes in ocean circulation patterns, precipitation patterns, global ice cover, biological distributions, and other large-scale changes to the earth system that are collectively referred to as climate change.

The Intergovernmental Panel on Climate Change (IPCC) was established by the World Meteorological Organization and United Nations Environment Programme to assess scientific, technical, and socioeconomic information relevant to the understanding of climate change, its potential impacts, and options for adaptation and mitigation. The IPCC estimates that the average global temperature rise between the years 2000 and 2100 could range from 1.1°C, with no increase in GHG emissions above year 2000 levels, to 6.4°C, with substantial increase in GHG emissions.[1] Large increases in global temperatures could have massive deleterious impacts on the natural and human environments. The prevailing opinion among scientists is that most of the change in temperatures observed in the last 50 years is the result of human activities.[2]

Scientific studies, best represented by the IPCC's periodic reports, demonstrate that climate change is already occurring due to past GHG emissions. Forecasting of future growth and related GHG emissions under "business-as-

[1] IPCC, 2007, *Climate Change 2007: Synthesis Report*, Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, Pachauri, R.K and Reisinger, A.(eds.)], IPCC, Geneva, Switzerland.

[2] Intergovernmental Panel on Climate Change, 2007, "Summary for Policymakers" in *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, 2007, Cambridge, United Kingdom and New York, NY, USAL: Cambridge University Press, page 10.

usual" (BAU)[3] conditions indicates large increases in those GHG emissions accompanied by an increasing severity of changes in global climate. Thus, the best scientific evidence concludes that global emissions must be reduced below current levels.

2. Effects and Impacts of Climate Change

In addition to causing an increase in average global surface temperature, rising levels of greenhouse gases have a destabilizing effect on a number of different micro-climates, conditions and systems. According to the Intergovernmental Panel on Climate Change, surface temperatures are on course to increase by between 2.5 and 10.5°F by the year 2100, with regions in the northern parts of North America and Asia heating by 40 percent above the mean increase. The increase in the temperature of the oceans is projected to accelerate the water cycle, thereby increasing the severity and rate of both storms and drought, which, along with decreased snow pack, could disrupt ecosystems, agricultural systems and water supplies.

Snow cover has decreased by 10 percent in the last forty years. Average sea levels have raised between 1/3 and 2/3 of a foot over the course of the 20th century and are projected to rise by at least another 1/3 of a foot and up to almost three feet by the year 2100. These coastal infringements on such a large scale could lead to not only significant environmental and ecosystem

[3] "Business as usual" (BAU) conditions are defined as population and economic growth in the future using current (2009) building practices and current (2009) regulatory standards. For this CAP, reference to BAU conditions are specifically defined as including current mandatory requirements, such as Title 24 (Energy Efficiency Standards); current federal vehicle mileage standards; California AB 1493 vehicle emission standards; current renewable portfolio standards, including RPS (SB 1078 and SB 107) for California regulated utilities; current County water efficiency requirements; and other existing local and State requirements. BAU conditions presume no improvements in energy efficiency, water efficiency, fuel efficiency beyond that existing today or as required by existing (2009) statute.

disturbances, but also major population displacement and economic upheaval.[4]

Although climate change is a global problem and the severity of the effects of climate change in coming decades is uncertain, projections suggest that, within California, climate change will result in significant impacts to the environment and ecosystems, which in turn will have major economic implications. Below is a summary of the potential effects of climate change in California and National City, specifically.

a. Rising Temperatures

According to the State of California Climate Action Team (CAT) 2009 Biennial Report, average statewide temperatures are anticipated to rise between 0.9 and 3.6°F over the first 30 years of the 21st century, and between 2.7 and 10.5°F over the last 30 years of the 21st century. Historically, California has experienced warm temperatures during July and August; however as the climate changes, it is likely that occurrences of warm temperatures will extend from June to September.[5] Increasing temperatures and more frequent heat waves will have serious implications for electricity demand and emergency response in California.

b. Sea Level Rise

A rise in sea level is already occurring in California, with a rise of 3 to 8 inches recorded in the last century. By 2050, average sea level in San Diego is projected to be 1 to 1.5 feet higher than today, making lasting changes to the coastline and threatening one of San Diego's greatest environmental and economic assets. Figure 1-2 shows the flood risk associated with sea level rise in National City. Streets, homes, recreation areas, businesses and boardwalks

[4] IPCC, 2007, *Climate Change 2007: Synthesis Report*, Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, Pachauri, R.K and Reisinger, A.(eds.)], IPCC, Geneva, Switzerland.

[5] California Climate Change Center, 2009, *Climate Action Team Biennial Report, Draft,* page 1.5.

Figure 1-2 National City Sea Level Rise Map

near the shoreline will experience flooding more often. Coastal habitats such as salt marshes and rocky intertidal areas will be exposed to more sea water. In Southern California, where 91 percent of wetlands have already been lost and many remaining wetlands are stressed by pollution, invasive species, and altered hydrology, sea level rise poses yet another threat to coastal wetland habitats.[6]

c. Water Supply

Based on current projections for growth and consumption levels, demand for water is expected to significantly outpace the supply available from all sources, in part because of climate change. Extended and more frequent drought conditions would reduce local groundwater supplies about 7 percent per year on average and increase the San Diego region's dependence on imported water from distant sources like the Colorado River and Sacramento-San Joaquin River Delta. Climate change is also projected to reduce the amount of water available from these imported sources. Recent projections for the Colorado River range from a 6 to 45 percent decline by 2050 as a result of the changing climate. Spring snowmelt, which historically provided a reliable supply of water after winter storms, will likely be lower due to an expected 25 percent snowpack reduction in the Sierra Nevada Mountains by 2050.[7]

Other environmental factors may limit the amount of water available for export to the San Diego region. For example, efforts such as the CALFED Bay-Delta Program are trying to balance water supply needs with environmental goals supporting freshwater habitat for fish and other wildlife in the Delta. Overall, the San Diego region faces a possible water supply shortfall of 18 percent by 2050.[8]

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[6] California Climate Change Center, 2009, *Climate Change-Related Impacts in the San Diego Region by 2050*, page 3.

[7] California Climate Change Center, 2009, *Climate Change-Related Impacts in the San Diego Region by 2050*, page 5.

[8] California Climate Change Center, 2009, *Climate Change-Related Impacts in the San Diego Region by 2050*, page 5.

d. Air Quality

Studies have shown a link between heat and the formation of ground-level ozone, the primary component of "smog." By 2050, the San Diego region is expected to experience greater exposure to ground-level ozone due to a climate change-induced increase in number of hot and sunny days. Increased ground-level ozone tends to aggravate asthma and increase airway reactivity and inflammation.[9]

e. Wildfires

The existing habitat and climate conditions make the San Diego region vulnerable to extreme fire events. Warmer temperatures and more frequent droughts caused by climate change will intensify wildfire conditions, marked by drier, more flammable vegetation and longer periods of hot, dry Santa Ana winds. By 2050, these conditions are expected to result in larger, more frequent, and longer-lasting wildfires, during summer and especially fall, when Santa Ana wind intensity is at its highest. Larger, more frequent, and longer-lasting wildfires are expected to result in loss of human life, up to billions of dollars in property damage, business closures, increased fire-fighting and emergency services costs, and expensive recovery and restoration efforts.[10]

f. Public Health

Warmer temperatures and changes in precipitation, resulting from climate change, have serious public health implications. Research suggests that the most serious effects will be related to increased frequency of extreme condition such as more intense heat waves. Severe heat conditions paired with poor air quality could increase the number of heat-related deaths, illnesses and asthma attacks throughout the state.

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[9] California Climate Change Center, 2009, *Climate Change-Related Impacts in the San Diego Region by 2050,* page 7.

[10] California Climate Change Center, 2009, *Climate Change-Related Impacts in the San Diego Region by 2050,* page 6.

Changes in climate will also affect the geographic distribution and quantity of disease-carrying vectors, such as mosquitoes and ticks. As a result, the risk of contracting infectious disease from vectors will be altered by climate change.[11]

g. Agriculture

San Diego's unique topography creates a wide variety of microclimates supporting over 200 different agricultural commodities. Between now and 2050, climate change could impact our region's agriculture, and exacerbate our water supply situation, by increasing demand for irrigation to meet higher evaporative demand associated with warmer and drier conditions. Climate change will also change the geographic distribution of crop pests, though understanding the potential for crop loss from pests requires further research.[12]

h. Ecosystems and Wildlife

Along with one other county, the San Diego region has the most plants and animals at risk of extinction in the continental United States. While in many cases human population growth and development have fragmented critical habitat areas, the impacts of climate change will compound the threats facing already vulnerable plant and animal species. Though most species are often able to adapt to changing conditions, unnaturally rapid shifts in temperature, sea level rise, and drought due to climate change may outpace the ability of some species to adapt and survive.[13]

Due to rising temperatures and changes in precipitation, chaparral and coastal sage scrub are expected to seek to move to higher elevations where temperatures are cooler and precipitation is greater. Associated animal species will adjust their ranges, though oftentimes not concurrently with the vegetation, potentially resulting in a new mix of species and ecosystems. Projected in-

[11] California Climate Change Center, 2009, *Climate Change-Related Impacts in the San Diego Region by 2050*, page 8.

[12] California Climate Change Center, 2009, *Climate Change-Related Impacts in the San Diego Region by 2050*, page 3.

[13] California Climate Change Center, 2009, *Climate Change-Related Impacts in the San Diego Region by 2050*, page 6.

creases in non-native grasses and fire frequency could also substantially reduce the range and extent of future shrublands.[14]

The "adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities" is defined by the IPCC as adaptation.

3. Regulatory Action on Climate Change

As evidence of human-induced climate change mounts, agencies and organizations from the international level to the local level are working to develop and implement solutions to control GHG emissions and slow global warming. The major efforts are described in this section.

a. International Action

The United Nations Framework Convention on Climate Change (UNFCCC), an international treaty that has been ratified by 192 countries, leads international efforts to address the threats of climate change. The Convention encourages industrialized countries to reduce their GHG emissions.

The Kyoto Protocol, an addition to the UNFCCC treaty, sets legally binding measures requiring countries to reduce collective emissions about 5 percent below 1990 levels over the five year period between 2008 and 2012. The Kyoto Protocol has been ratified by 189 countries as of late 2009. Although the United States is responsible for a large percentage of global emissions and signed the Protocol, Congress did not ratify it.

Most recently, the Copenhagen Accord was adopted at the United Nations Climate Change Conference in Copenhagen in December 2009, endorsing the continuation of the Kyoto Protocol. This is a non-binding agreement with the goal of keeping maximum global temperature rise to below 2 degrees Cel-

[14] California Climate Change Center, 2009, *Climate Change-Related Impacts in the San Diego Region by 2050,* page 6.

sius (°C) and to raise funds to enable developing countries to take action on climate change.

b. Federal Laws and Regulations

The United States is beginning to implement federal regulations or policies related to GHG emissions. In December 2009, Environmental Protection Agency (EPA) Administrator Lisa Jackson signed findings that elevated concentrations of the six key GHGs in the atmosphere endanger public health and welfare of current and future generations, and that the combined emissions of GHGs from new motor vehicles contribute to the GHG air pollution that endangers public health and welfare.[15] While the final endangerment finding does not automatically impose any requirements, it allows EPA to finalize proposed GHG emission standards for light-duty vehicles, which were proposed in conjunction with the Department of Transportation's Corporate Average Fuel Economy (CAFE) standards earlier in 2009.[16]

On December 23, 2010 EPA announced settlement agreements with several states, including California, and environmental groups that commits EPA to issuing proposed GHG regulations for fossils fuel-fired power plants, electric generating units (EGUs), and refineries. The regulations for EGUs will be issued by July 26, 2011 and final regulations by May 26, 2010. EPA will propose refinery regulations by December 15, 2011 and final regulations by November 15, 2012.

c. State Laws. Regulations, and Policies

California has been a leader among states in passing legislation to reduce GHG emissions and slow climate change. Major laws and regulations are described below.

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[15] U.S. Environmental Protection Agency website, "EPA's Endangerment Finding," http://www.epa.gov/climatechange/endangerment/downloads/EndangermentFinding_LegalBasis.pdf, accessed on March 29, 2010.

[16] U.S. Environmental Protection Agency website, http://epa.gov/climatechange/endangerment.html, accessed on March 29, 2010.

i. Energy Efficiency Standards (1978)

Title 24, Part 6 of the California Code of Regulations, Energy Efficiency Standards for Residential and Nonresidential Buildings, was established in 1978 to address a legislative mandate to reduce the State's energy consumption. The standards are updated roughly every three years to incorporate new energy efficiency goals, methods, and technologies. The 2008 standards went into effect on January 1, 2010, and require buildings to be 15 percent more energy efficient compared to the 2005 standards.

ii. Clean Car Regulations (Assembly Bill 1493, 2002)

Assembly Bill (AB) 1493, Clean Car Regulations (commonly known as the "Pavley law"), directed the California Air Resources Board (CARB) to adopt regulations to decrease GHG emissions from new passenger vehicles and light duty trucks beginning with the 2009 model year. Implementation of these fuel efficiency standards, known as the "Pavley standards," was uncertain for years due to EPA's denial of California's request for a waiver of Clean Air Act Section 209(a), which was necessary to implement the Pavley standards. However, in June 2009, the EPA granted California the authority to implement the standards.[17] These standards are anticipated to reduce GHG emissions from California passenger vehicles by 30 percent by 2016, and are estimated to result in an 18 percent GHG emissions reduction across the passenger fleet.[18]

iii. Executive Order S-3-05 (2005)

In 2005, Governor Schwarzenegger signed Executive Order S-3-05, which established the goals of reducing emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. The Executive Order identified the California Environmental Protection Agency (Cal/EPA) as the lead coordinating State agency for establishing climate change emission

[17] California Air Resources Board website, www.arb.ca.gov, accessed on March 17, 2010.

[18] California Clean Cars Campaign, 2006, Factsheet: *California's Vehicle Global Warming Pollution Reduction Regulation: How it Works.* (http://www.calcleancars.org/factsheets/staffproposal.pdf).

reduction targets in California, and designated a "Climate Action Team," a multi-agency group of State agencies, to implement Executive Order S-3-05. GHG emission reduction strategies and measures to reduce global warming were identified by the California Climate Action Team in 2006.

iv. Global Warming Solutions Act (AB 32, 2006)

In 2006, California Governor Schwarzenegger signed AB 32, the Global Warming Solutions Act, into law. The Act requires that California cap its GHG emissions at 1990 levels by 2020. AB 32 also requires that CARB identify discrete early actions to reduce emissions that could be implemented immediately, and develop a statewide scoping plan to identify how to meet the emissions reduction targets.

CARB identified a list of nine early actions, including landfill CH_4 capture, the Low Carbon Fuel Standard (LCFS) that is discussed further in the section below, and a tire pressure program. CARB's Climate Change Scoping Plan, adopted in December 2008, outlines regulations, market mechanisms, and other actions to achieve the maximum technologically-feasible and cost-effective reductions in GHG emissions by 2020.[19] The Scoping Plan recommends achieving a statewide energy mix with 33 percent from renewable energy sources, developing a California cap-and-trade program that will be part of a regional carbon market through the Western Climate Initiative, and expanding and strengthening existing energy efficiency programs and building and appliance standards.

v. Executive Order S-01-07 (2007)

Executive Order S-01-07, signed by Governor Schwarzenegger in 2007, establishes a LCFS for transportation fuels sold in California. This standard will reduce the carbon content of passenger vehicle fuels in California by at least 10 percent by 2020.

[19] California Air Resources Board website, www.arb.ca.gov, accessed on March 17, 2010.

vi. Regional Transportation and Land Use Planning Efforts (SB 375, 2008)

In 2008, California enacted Senate Bill (SB) 375 to augment AB 32 by promoting efficient land use patterns and curbing sprawl. SB 375 establishes emissions-reduction goals for which regions can plan; encourages metropolitan planning organizations (MPOs) to integrate their housing, transportation, and regional land use plans with GHG reduction goals; and provides incentives for governments and developers to implement compact and efficient growth patterns. Under SB 375, the 18 MPOs in California must prepare a "sustainable communities strategy" to reduce the vehicle miles traveled (VMT) in their regions and demonstrate their ability to reach the CARB targets. SB 375 also includes incentives to create walkable and attractive communities and to revitalize existing communities. The legislation also allows developers to bypass certain environmental reviews under the California Environmental quality Act (CEQA) if they build projects consistent with the new sustainable community strategies. SB 375 enhances CARB's ability to reach the AB 32 goals by directing the agency in developing regional GHG emission reduction targets to be achieved from the transportation sector for 2020 and 2035.

vii. Heavy Duty Vehicle GHG Emissions Reduction Measure (2008)

In December 2008, CARB adopted the Heavy Duty Vehicle GHG Emission Reduction Measure, which requires long-haul truckers to retrofit their trailers with fuel efficient tires and aerodynamic devices. This requirement will improve the fuel economy of heavy duty vehicles, reducing GHG emissions.

viii. California Climate Adaptation Strategy (2009)

The California Climate Adaptation Strategy was developed in response to Executive Order S-13-2008. The report summarizes the best known science on climate change impacts in the state to assess vulnerability and outlines possible solutions that can be implemented within and across state agencies to promote resiliency.

d. Regional Policies and Measures

i. San Diego Association of Governments Regional Comprehensive Plan

In 2004, the San Diego Association of Governments (SANDAG) adopted the Regional Comprehensive Plan (RCP), which serves as the foundation for in-

tegrating land use, transportation, infrastructure needs and public investment strategies throughout the San Diego region. The RCP defines a vision and provides a framework to connect local and regional policy decisions. It balances regional population, housing and employment growth with habitat preservation, agriculture, open space, energy and other infrastructure needs in a way that moves the region toward a sustainable future. The RCP calls for the application of "smart growth" and "sustainability" principles to help create livable communities through the integration of land use and transportation with a focus on improving urban design and walkability.[20]

ii. San Diego Regional Transportation Plan and Sustainable Communities Strategy

The San Diego Regional Transportation Plan (RTP) is the primary transportation element of the RCP, and is intended to position the region to achieve smarter, more sustainable growth that meets the transportation needs of the region. Updates to the RTP are necessary to ensure that local governments have opportunities to implement smart growth and that the design and implementation of regional transportation facilities support local smart growth. The 2030 RTP was adopted in 2007 and the 2050 RTP, which is currently underway, will be adopted in 2011.[21]

As required by SB 375, SANDAG is including a Sustainable Communities Strategy (SCS) in the 2050 RTP. This element will demonstrate how the land use patterns and transportation network, policies, and programs can work together to achieve the GHG emission reduction targets for cars and light trucks that will be established by CARB. The adopted SANDAG Smart Growth Concept Map along with regional habitat conservation areas will serve as a basis for the SCS.

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[20] SANDAG, 2010, *Climate Action Strategy*, (http://www.sandag.org/uploads/publicationid/publicationid_1481_10940.pdf), page 4.

[21] SANDAG, 2010, *Climate Action Strategy*, (http://www.sandag.org/uploads/publicationid/publicationid_1481_10940.pdf), page 4.

The SCS will include four building blocks:

- Land use component that accommodates the Regional Housing Needs Assessment (RHNA) and includes the protection of sensitive resource areas, including areas protected under habitat conservation plans;
- Transportation networks including highways, transit, and local streets and roads;
- Transportation demand management strategies; and
- Transportation system management programs and policies.

The SANDAG 2050 RTP will be the first in the state to implement SB 375 by including the SCS.[22]

iii. SANDAG Climate Action Strategy

SANDAG has developed a Climate Action Strategy (CAS) as part of a multi-year partnership with the California Energy Commission. The strategy identifies a near-term goal of reducing GHG emissions to the 1990 level by 2020 and a long-term goal of reducing GHG emissions to 80 percent below the 1990 level by 2050, consistent with AB 32 and Executive Order S-3-05. [23]

A major focus of the strategy is to identify policy measures that could help SANDAG reduce GHG emissions from passenger cars and light-duty trucks and comply with SB 375 in the 2050 RTP update (to be adopted in 2011). The CAS also identifies available policy measures to help the region integrate climate change considerations into existing planning processes affecting our

[22] SANDAG Comprehensive Land Use and Regional Growth Projects: Sustainable Communities Strategy website, http://www.sandag.org/index.asp?projectid=360&fuseaction=projects.detail, accessed on April 8, 2010.

[23] SANDAG, 2010, *Climate Action Strategy*, (http://www.sandag.org/uploads/publicationid/publicationid_1481_10940.pdf).

transportation system, land use patterns, building stock, and energy infrastructure.[24]

iv. 2009 Regional Energy Strategy

In partnership with the California Energy Commission, SANDAG prepared the 2009 Regional Energy Strategy (RES), which includes goals and policy measures intended to save energy and increase the use of clean and renewable energy sources. Many of the measures identified in the RES would also reduce GHG emissions. The RES identifies the following strategies that SANDAG and local governments could help implement in order to help the region meet the goals for energy and climate change mitigation.

- Pursue a comprehensive building retrofit program to improve efficiency and install renewable energy systems;
- Create financing programs to pay for projects and improvements that save energy;
- Utilize the SANDAG-SDG&E Local Government Partnership funding award to help local government identify opportunities and implement energy savings at government facilities and throughout their communities;
- Support land use and transportation planning strategies that reduce energy use and GHG emissions;
- Support planning of electric charging and alternative fueling infrastructure; and
- Support use of existing unused reclaimed water to decrease the amount of energy needed to meet the water needs of the San Diego region.[25]

[24] SANDAG, 2010, *Climate Action Strategy*, (http://www.sandag.org/uploads/publicationid/publicationid_1481_10940.pdf), page 11.

[25] SANDAG, 2010, *Climate Action Strategy*, (http://www.sandag.org/uploads/publicationid/publicationid_1481_10940.pdf), page 12.

v. 2009 Regional Alternative Fuels, Vehicles, and Infrastructure Report

SANDAG and the California Energy Commission developed a regional assessment of alternative transportation fuels, vehicles and infrastructure that identifies and recommends regional and local government actions to increase the use of alternative fuels and vehicles in government fleets. The report includes recommendations for local governments and the region as a whole to help increase the use of alternative fuels and vehicles, and provide the necessary infrastructure to support alternative technologies.[26]

vi. SANDAG Borders Planning and Coordination

The SANDAG Borders Planning and Coordination Division addresses planning issues on the international, interregional and tribal government levels. In 2009, the annual SANDAG binational event focused on crossborder climate change collaboration with Mexico and led to the development of the following recommendations:

- Recognize the importance of encouraging all levels of agencies and stakeholders in our San Diego – Baja California region to mutually agree on priority aspects of climate change collaboration, including mitigation, adaptation, and education strategies.
- Encourage the inclusion of strategies for collaboration and sharing information on regional climate change action plans in San Diego and Baja California.
- The Fiscal Year 2010 binational event should follow up on topics related to climate change planning.
- In Fiscal Year 2010, produce a progress report on development and actions take in climate change planning as a result of the 2009 seminar recommendations.[27]

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[26] SANDAG, 2010, *Climate Action Strategy*, (http://www.sandag.org/uploads/publicationid/publicationid_1481_10940.pdf), page 13.

[27] SANDAG, 2010, *Climate Action Strategy*, (http://www.sandag.org/uploads/publicationid/publicationid_1481_10940.pdf), page 13.

B. Existing Climate Action Efforts in National City

1. National City General Plan

The City of National City has demonstrated its commitment to sustainability through its General Plan, including the recent update that is guided by principles of sustainability. The five guiding principles of the General Plan are:

- **Development:** Recognize the importance of linking land use and transportation planning.
- **Quality of Life:** Improve the overall quality of life for everyone within National City.
- **Health and Safety:** Seek opportunities to improve public health and safety performance.
- **Education:** Emphasize the importance of schools by reintroducing them as focal points within neighborhoods.
- **Business:** Provide a framework for sound economic development strategies.

These guiding principles have informed the General Plan policies that are intended to support and promote GHG emissions reductions and local initiatives and programs to encourage sustainability in National City. New policies in the Land Use and Community Character Element promote smart growth consistent with statewide and regional planning goals and policies, encourage a mix of land uses and the development of complete neighborhoods that reduce vehicle use, encourage the development of community green space, and encourage pedestrian and bicycle use through high-quality streetscape design. The Circulation Element provides new policies to encourage transit-oriented development, promote use of public transit and provide a safe environment for walking and biking.

New policies in the Safety Element are intended to prepare the City for natural disasters that may increase as a result of Climate Change. The new Open Space and Agriculture Element includes policies to preserve existing open space, develop a city-wide urban agriculture program, manage the urban for-

est and provide adequate park space for all residents. Policies in the new Health and Environment Element are intended to provide all residents with access to healthy food and opportunities to lead healthy lifestyles. The Conservation and Sustainability Element is a new element with policies to reduce the City's carbon footprint, energy usage and waste generation to help ensure a sustainable future.

2. Local Programs and Initiatives

The City of National City has implemented several strategies to reduce energy use and emissions associated with government operations. The Public Works Department has instituted changes in managing both its fleet and its facilities that have reduced emissions below "business-as-usual" (BAU) levels. The City has implemented the following strategies to reduce emissions associated with its vehicle fleet:

- Older, less efficient equipment in all usage categories has been identified and completely removed from the fleet.
- Fleet usage has been reviewed and modified to make more efficient usage of current vehicles. New vehicle pools have been established for this purpose, which has resulted in fuel usage reductions.
- Four new fuel-efficient hybrid compact vehicles have been added to the fleet to increase overall fuel efficiency and to reduce the City's carbon footprint.

The City has also implemented the following strategies to reduce energy use in its buildings and facilities:

- Lighting is retrofitted with higher-efficiency fixtures on a replacement basis.
- Water heating temperatures were reduced to conserve energy.
- Water efficiency equipment has been installed, including waterless urinals and flow restrictors on faucets and plumbing fixture flush valves.

2 EMISSIONS INVENTORY AND FORECAST

This chapter summarizes the inventory of greenhouse gas (GHG) emissions in National City and the forecast for GHG emissions under business as usual (BAU) conditions in 2020 and 2030.

A. Emissions Inventory

The GHG emissions inventory provides the basis for creating an emissions' forecast and enables the quantification of emissions reductions associated with implemented and proposed measures.

1. Methodology

The purpose of the baseline emissions inventory is to determine the levels of GHG emissions that National City emitted in its base year. The base year used for this Plan was 2005. GHG emissions inventory data were collected statewide in 2005 because it is the baseline for GHG emissions as specified in the California Air Resources Board (CARB) Climate Change Scoping Plan, pursuant to Assembly Bill 32. The City of National City inventory was conducted using the International Council on Environmental Initiatives (ICLEI) Cities for Climate Protection inventory methodology, which allows local governments to systematically estimate and track greenhouse gas emissions from energy and waste related activities at the community-wide scale and those resulting directly from government operations. In 2009 ICLEI prepared the 2005/2006 Greenhouse Gas Emissions Inventory for National City, provided in Appendix A. This inventory serves as the basis for the revised inventory included in this CAP that was completed in 2010 based on updated data. The methodology of the 2005/2006 Greenhouse Gas Emissions Inventory is described below, followed by an explanation of how the inventory was revised for the purposes of this CAP. The 2005 base year is representative of 2010 conditions. Though vehicle miles traveled (VMT) may have increased slightly between 2005 and 2010, the GHG emissions associated with VMT have improved between 2005 and 2010 due to improvements in vehicle efficiency and emission standards, thus 2005 conditions are generally equivalent to 2010 conditions.

a. Emissions Analysis Software

To facilitate local government efforts to identify and reduce greenhouse gas emissions, ICLEI developed the Clean Air and Climate Protection (CACP) software package that estimates emissions derived from energy consumption and waste generation within a community. The CACP software determines emissions using specific factors (or coefficients) according to the type of fuel used. Emissions are aggregated and reported in terms of carbon dioxide (CO_2) equivalent units, or CO_2e. Converting all emissions to carbon dioxide equivalent units allows for the consideration of different GHGs in comparable terms. For example, methane is 21 times more powerful than CO_2 in its capacity to trap heat, so the model converts one ton of methane emissions to 21 tons of CO_2e.

The emissions coefficients and methodology employed by the CACP software are consistent with national and international inventory standards established by the Intergovernmental Panel on Climate Change (IPCC), the U.S. Voluntary Greenhouse Gas Reporting Guidelines, and, for emissions generated from solid waste, the U.S. EPA's Waste Reduction Model (WARM).

The CACP software has been and continues to be used by over 250 U.S. local governments to estimate GHG emissions. However, although the software provides National City with a sophisticated and useful tool, calculating emissions from energy use with precision is difficult. The CACP model is based upon numerous assumptions made by ICLEI, and is limited by the quantity and quality of available data. Given these limitations, model outputs should be viewed as an approximation rather than an exact value.

b. Inventory Data Sources and Creation Process

An inventory of GHG emissions requires the collection of information from a variety of sectors and sources. For community electricity and natural gas data, ICLEI consulted San Diego Gas & Electric Company (SDG&E). Transportation data was based on the San Diego Association of Governments (SANDAG) regional transportation model and revised by Fehr and Peers. Solid waste and wastewater data was provided by the County of San Diego.

Water data was provided by the local water service provider, Sweetwater Authority. City of National City staff was instrumental in providing data on government operations.

The community inventory represents all the energy used and waste produced within National City and its contribution to GHG emissions. The government operations inventory includes emissions derived from internal government operations. Government operations have however been analyzed separately from the community inventory because the government operations inventory is broken down into more specific emissions sectors than those used in the community inventory. Government emissions accounted for less than one percent of the total community emissions inventory in 2005.

There are two main reasons for completing separate emissions inventories for community and government operations. First, the government is committed to action on climate change, and has a higher degree of control to achieve reductions in its own municipal emissions than those created by the community at large. Second, by proactively reducing emissions generated by its own activities, the National City government takes a visible leadership role in the effort to address climate change. This is important for inspiring local action in National City, as well as for inspiring other communities.

National City's inventory is based on the year 2005, which is considered the baseline year by the California Air Resources Board for the purposes of Assembly Bill 32 (AB 32). When calculating National City's emissions inventory, all energy consumed in National City was included. This means that, even though the electricity used by National City residents is produced elsewhere, this energy and emissions associated with it appears in National City's inventory. The decision to calculate emissions in this manner reflects the general philosophy that a community should take full ownership of the impacts associated with its energy consumption, regardless of whether the generation occurs within the geographical limits of the community.

c. Revised Emissions Inventory

As part of this Climate Action Plan a revised GHG emissions inventory was completed in 2010 for the 2005 base year that includes updated transportation and water data. The transportation data was refined by Fehr and Peers and water usage data was provided by Sweetwater Authority.

Fehr and Peers used information provided by the San Diego Association of Governments (SANDAG) and the assumptions listed below to calculate vehicle miles traveled (VMT) in National City for the base year (2005). The complete methodology used by Fehr and Peers is provided in Appendix B. The following assumptions were applied in the VMT analysis and are consistent with the *Recommendations of the Regional Targets Advisory Committee (RTAC) Pursuant to Senate Bill 375*:

- Trips which are internal to National City are assumed to count 100 percent.
- Trips which either begin or end in National City are assumed to count 50 percent.
- Trips which are external to National City are excluded from any VMT calculations.

The Sweetwater Authority provided the total power consumption for all water production in 2005, and the percentage of water produced that was delivered to National City during that year. This provided an estimate of the amount of energy consumed to provide water to the City of National City in 2005.

2. Community-Wide Emissions Inventory

The community-wide inventory includes emissions from activities taking place within the City limits. The sectors included in this inventory are energy, transportation, solid waste, and water and wastewater.

National City's 2005 community GHG emissions were 550,670 metric tons of carbon dioxide equivalent ($MTCO_2e$) from the energy, transportation and

land use, solid waste, and wastewater sectors, as shown in Table 2-1, below. In total, per capita GHG emissions in 2005 were 9.9 $MTCO_2e$.

TABLE 2-1 **COMMUNITY-WIDE EMISSIONS INVENTORY 2005**

Sector	Metric Tons of CO_2e	Percentage of Total
Residential Energy	35,082	6.4%
Commercial/Industrial Energy	139,026	25.2%
Transportation	359,029	65.2%
Solid Waste	14,308	2.6%
Water and Wastewater	3,269	0.6%
Total	**550,714**	**100.0%**

Source: CACP Model, ICLEI, 2009 and DC&E, 2010. Government operations are included in the community emissions inventory; however they have been analyzed separately because the government operations inventory is broken down into more specific emissions sectors than those used in the community inventory. Government operations emissions accounted for less than one percent of the total community emissions in 2005.

a. Energy

Community-wide stationary energy consumption includes electricity and natural gas used for the residential and commercial/industrial sectors. Community-wide energy consumption for 2005 resulted in a total of 174,064 $MTCO_2e$, or approximately 32 percent of total community-wide emissions.

Comment [BP1]: Should this be 174,108?

National City residences consumed approximately 60 million kilowatt hours (kWh) of electricity and 3.8 million therms of natural gas, resulting in 35,082 $MTCO_2e$ emissions. 58 percent of the total residential emissions were the result of natural gas use, and 42 percent were the result of electricity consumption. Major residential energy uses include heating, refrigeration, lighting and water heating.

Commercial and industrial buildings produced a total of 139,026 $MTCO_2e$ as a result of electricity consumption and on-site combustion of natural gas.

Eleven percent of total commercial/industrial emissions were the result of natural gas use, and 89 percent were the result of electricity consumption. Natural gas is typically used in the commercial/industrial sector to heat buildings, fire boilers and generate electricity, while electricity is used for lighting, heating, and to power appliances and equipment.

b. Transportation

Transportation emissions were calculated for both on- and off-road vehicles and equipment in National City. On-road transportation emissions were derived from local jurisdiction vehicle miles traveled (VMT) data and regional vehicle and travel characteristics. The data were revised to more accurately calculate the VMT for trips internal to National City, rather than including all pass-through travel on Interstates 5 and 805 and other regional thoroughfares that run through National City. Off-road transportation emissions were obtained from the Air Resources Board model using data for San Diego County.

As with many California cities, transportation within National City's geographical boundary constitutes the greatest percentage of community-wide GHG emissions with a total of 359,029 $MTCO_2e$. Ninety-five percent of these emissions came from on-road travel on State Highways and local roads. The remaining 5 percent came from off-road vehicle use.

c. Solid Waste

Emissions from the solid waste sector are an estimate of methane generation from the decomposition of municipal solid waste and alternative daily cover sent to the landfill in the base year (2005). These emissions are not generated in the base year, but will result from the decomposition of 2005 waste over the full 100+ year cycle of its decomposition. About 75 percent of landfill methane emissions are captured through landfill gas collection systems; however the remaining 25 percent escape into the atmosphere.[1] This sector also

[1] U.S. EPA AP 42.

includes base year emissions from the decomposition of waste-in-place at the inactive Duck Pond landfill.

In 2005, the solid waste sector constituted 2.6 percent of the total GHG emissions for the National City community, producing an estimated 14,308 $MTCO_2e$ emissions.

d. Water and Wastewater

Emissions from the water sector are based on the amount of energy used to pump and convey water to National City in 2005.

Emissions from the wastewater sector are an estimate of methane and nitrous oxide generated in the process of wastewater treatment. These emissions occur at treatment facilities outside the jurisdictional boundaries and "downstream" from the National City community where the wastewater is generated. In the San Diego region, about 71 percent of wastewater treatment methane emissions are captured through biogas collection systems; however the remaining 29 percent escape into the atmosphere.[2]

The water and wastewater sector contributed 3,269 $MTCO_2e$ emissions, constituting 0.6 percent of the total community GHG emissions for National City in 2005.

3. Government Operations Emissions Inventory

National City's total government operations emissions inventory for 2006 was 5,077 $MTCO_2e$, as shown in Table 2-2 below, comprising less than 1 percent of the City's total emissions. This inventory includes emissions from employee commutes, buildings and facilities, the City's vehicle fleet, government-generated solid waste, public lighting and water/sewerage treatment.

[2] University of San Diego Energy Policy Initiatives Center, 2008, *San Diego County Greenhouse Gas Inventory*.

TABLE 2-2 **GOVERNMENT OPERATIONS EMISSIONS INVENTORY BY SECTOR 2006**

Sector	Metric Tons of CO_2e	Percentage of Total
Buildings and Facilities	1,519	30.0%
Employee Commute	1,591	32.0%
Vehicle Fleet	1,033	20.0%
Solid Waste	565	11.0%
Public Lighting	360	7.0%
Water and Sewage	8	0.2%
Total	**5,077**	**100%**

Source: CACP model, ICLEI, 2009.

a. Buildings and Facilities

National City operates multiple facilities, including fire stations, a library, a police station, recreation centers and other minor facilities. Facility operations contribute to GHG emissions in two major ways. First, facilities consume electricity and natural gas, which contribute the majority of GHG emissions from facilities. In addition, fire suppression, air conditioning and refrigeration equipment in buildings can emit hydrofluorocarbons (HFCs) and other GHGs when they leak refrigerants or fire suppressants.

In 2006, the operation of National City's facilities produced approximately 1,519 $MTCO_2e$. Of total facility emissions, 80 percent came from the consumption of electricity and 19 percent came from the combustion of natural gas. An estimated 13 $MTCO_2e$ emissions were produced from refrigerants leaked from HVAC, refrigeration or fire suppression systems.

Comme UE Can you fix the text wrapping around this table?

b. Employee Commute

Fuel combustion from employees commuting to work is another important emissions source from National City's operations. Personal employee vehi-

cles use gasoline and other fuels which, when burned, generate GHG emissions. The employee commute sector was evaluated in 2009, unlike the other government operations sectors, which were evaluated in 2006.

In 2009, employees commuting in vehicles to and from their jobs at the City emitted an estimated 1,591 $MTCO_2e$. The majority (98 percent) of respondents drove alone to work. The remaining 2 percent of all respondents commuted to work with carpools or vanpools.

c. Vehicle Fleet and Mobile Equipment

National City operates vehicles and other mobile equipment as part of their daily operations that burn gasoline, diesel and other fuels, resulting in GHG emissions. In addition, vehicles with air conditioning or refrigeration equipment use refrigerants that can leak from the vehicle. Emissions from vehicles and mobile equipment compose a significant portion of emissions within most local governments.

In 2006, National City operated a vehicle fleet with 149 vehicles. The City emitted approximately 1,033 $MTCO_2e$. Of total mobile emissions, 75 percent came from the combustion of gasoline, 20 percent came from the combustion of diesel, and the remaining 5 percent came from leaked refrigerants.

d. Solid Waste

Many local government operations generate solid waste, including paper and food waste from offices and facilities, construction waste from public works, and plant debris from parks departments, much of which is eventually sent to a landfill. Organic materials in government-generated solid waste generate methane as they decay in the anaerobic environment of a landfill. An estimated 75 percent of this methane is routinely captured via landfill gas collection systems; however, a portion escapes into the atmosphere, contributing to GHG emissions.

It is estimated that the waste disposed by National City government facilities in 2006 will cumulatively produce 27 metric tons of methane gas, or 565 $MTCO_2e$ emissions.

e. Public Lighting

Like most local governments, National City operates a range of public lighting, including traffic signals, streetlights and outdoor lighting. In 2006, public lighting in National City consumed a total of 1,011,245 kWh of electricity, producing approximately 360 metric tons CO_2e.

f. Water and Sewage

National City operates water and sewage transport equipment, including sprinkler systems and sewage pumps. Electricity consumption is the most significant source of GHG emissions from the operation of the City's water and sewage transport equipment. In 2006, the operation of water and sewage transport equipment produced approximately 8 $MTCO_2e$ emissions.

B. Emissions Forecasts

This section discusses the forecasts for GHG emissions in National City in both 2020 and 2030. Both 2020 and 2030 "business as usual" (BAU) forecasts are provided in order to maintain consistency with the California Air Resources Board (CARB) Climate Change Scoping Plan, which set the horizon year for emission reductions at 2020, and the National City General Plan, which has a horizon year of 2030. BAU assumes that the baseline rates for GHG emissions would continue into the future, with the only reductions being from State measures that are currently in place. Forecasts for both community emissions and government operations emissions are included. The forecasts are based on the 2005/2006 Emissions Inventory, described above.

1. Growth Rates

In order to model the 2020 and 2030 BAU forecasts, the compound annual growth rates were calculated for each sector, between 2005 and 2030, based on

growth associated with buildout of the General Plan. The compound annual growth rate (CAGR) for each sector was used to extrapolate the data for 2020, as shown in Table 2-3 below. GHG emissions in National City are a function

TABLE 2-3 **COMPOUND ANNUAL GROWTH RATES BY SECTOR**

Sector (unit of measure)	2005	2020	2030	CAGR %
Residential (Dwelling Units)	14,750	18,735	21,974	1.61%
Commercial (Square Footage)	8,158,180	11,235,406	13,979,772	1.99%
Transportation (Daily VMT)	1,556,000	1,837,005	2,052,000	3.49%
Solid Waste (Population)	55,622	69,294	80,231	1.11%
Water and Wastewater (Population)	55,622	69,294	80,231	1.48%

Note: 2030 data based on Realistic Buildout Capacity for General Plan 2030 from PDC. 2005 Data for Residential dwelling units based on SANDAG Current Estimates used by ICLEI. Data for Commercial and Industrial SF based on SANDAG data (2007). 2005 and 2030 VMT data provided by Fehr and Peers. 2020 data was extrapolated by using the CAGR that was calculated for growth between 2005 and 2030.

of the energy, transportation, solid waste, and water and wastewater sectors, which are shown in Table 2-4 and discussed below.

2. State Reduction Measures

The effects of measures implemented at the State level were considered in the 2020 and 2030 BAU forecasts for GHG emissions in National City. The following policies and regulations have been adopted by the State legislature and are projected to significantly reduce GHG emissions by 2020 and 2030.

i. Renewables Portfolio Standard

Established in 2002 under Senate Bill 1078 and accelerated in 2008 under California Executive Order S-14-08, California's Renewables Portfolio Standard (RPS) is one of the most ambitious renewable energy standards in the country. The RPS program requires California electricity providers to expand their renewable energy portfolio to serve 33 percent of their load through

TABLE 2-4 **COMMUNITY-WIDE EMISSIONS INVENTORY AND FORECAST BY SECTOR**

Sector	2005 ($MTCO_2e$)	2020 ($MTCO_2e$)	2030 ($MTCO_2e$)
Residential Energy	35,082	43,673	51,239
Commercial/Industrial Energy	139,026	200,452	4270,017
Transportation	359,029	321,256	357,440
Solid Waste	14,308	17,836	20,659
Water and Wastewater	3,269	4,068	4,712
Total	**550,714**	**587,286**	**704,067**

Source: CACP Model, ICLEI, 2009 and DC&E, 2010.

renewable energy sources by 2020.[3] This means that, over time, a larger and larger share of the energy electrifying homes and businesses in National City will be generated with clean power.

ii. Title 24 Energy Efficiency Standards and State Green Building Standards Code

As described in Chapter 1, Title 24, Part 6 of the California Code of Regulations, Energy Efficiency Standards for Residential and Nonresidential Buildings, was established in 1978 and has been updated every three years since then. The 2008 standards went into effect on January 1, 2010, and require buildings to be 15 percent more energy efficient compared to the 2005 standards. Also on January 1, 2010, the State Building Standards Commission

[3] California Executive Order S-14-08 was signed by Governor Arnold Schwarzenegger in November 2008. This mandate further accelerated a renewable energy portfolio standard implemented under Senate Bill 107 in 2006. California Energy Commission website, http://www.energy.ca.gov/renewables/index.html, accessed on March 29, 2010.

adopted the State Green Building Standards Code (CalGreen). CalGreen supplements Title 24 and will, upon taking effect on January 1, 2011, require all new buildings in the state to incorporate energy saving features.

iii. Clean Car Regulations (Assembly Bill 1493, 2002)

As described in Chapter 1, Assembly Bill (AB) 1493, Clean Car Regulations (commonly known as the "Pavley law"), directed the California Air Resources Board (CARB) to adopt regulations to decrease GHG emissions from new passenger vehicles and light duty trucks beginning with the 2009 model year. These standards are anticipated to reduce GHG emissions from California passenger vehicles by 22 percent by 2012 and 30 percent by 2016.[4]

iv. Low Carbon Fuel Standard

As described in Chapter 1, Executive Order S-01-07 established a Low Carbon Fuel Standard for transportation fuels sold in California. This standard will reduce the carbon content of passenger vehicle fuels in California by at least 10 percent by 2020.

3. Community-Wide Emissions

The 2020 BAU forecast for community-wide emissions is 587,286 metric tons of carbon dioxide equivalent (CO_2e), an increase of approximately 7 percent over the 2005 baseline inventory. The 2020 BAU forecast for community-wide emissions is 704,067 metric tons CO_2e, an increase of approximately 28 percent over the 2005 baseline inventory.

a. Energy

Community-wide energy consumption in 2020 includes electricity and natural gas consumption by residential buildings, commercial buildings and industrial facilities. For the residential energy sector, the 2030 dwelling units pro-

[4] California Air Resources Board, *Clean Car Standards – Pavley, Assembly Bill 1493*. http://www.arb.ca.gov/cc/ccms/ccms.htm, accessed on November 12, 2010.

jection from buildout of the Comprehensive Land Use Update for National City was used to estimate average annual compound growth in residential energy demand (1.61 percent). There were approximately 14,750 dwelling units in National City in 2005, and based on the Comprehensive Land Use Update there will be approximately 18,743 dwelling units in 2020 and 21,974 dwelling units in 2030. Residential energy consumption is projected to produce 43,673 $MTCO_2e$ in 2020 and 51,239 $MTCO_2e$ in 2030.

Using commercial and industrial square footage projections for National City based on buildout of the Comprehensive Land Use Update, it was calculated that the average annual growth in energy use in the commercial/industrial sector between 2005 and 2030 will be 2.74 percent. Based on this growth rate, commercial and industrial energy use is projected to produce 200,452 $MTCO_2e$ in 2020 and 270,017 $MTCO_2e$ in 2030.

b. Transportation

Growth in transportation emissions over the forecast period is closely related to planned transportation infrastructure investments and the associated vehicle activity, as measured in vehicle miles traveled (VMT). Fehr and Peers used the SANDAG VMT forecast for the region and refined it for National City to estimate 2020 travel activity. The 2020 BAU forecast for transportation-related emissions is 321,256 $MTCO_2e$, a decrease of approximately 10.5 percent from 2005 emissions levels. This forecast exceeds the SANDAG target of reducing GHG emissions from light cars and trucks by 7 percent from 2005 levels by 2020. The 2030 BAU forecast for transportation-related emissions is 357,440 $MTCO_2e$, a decrease of approximately 0.4 percent from 2005 emissions levels.

c. Solid Waste

Emissions associated with solid waste generation and subsequent burial in landfills are projected to grow in proportion to population. Based on buildout of the Comprehensive Land Use Update, the population of National City is forecast to grow by 1.48 percent per year. The waste sector is forecast

to produce 17,836 metric tons CO_2e in 2020 and 20,659 metric tons CO_2e in 2030.

d. Water and Wastewater

Population is the primary determinate for growth in emissions pertaining to water distribution and wastewater generation. Therefore, the average annual population growth rate of 1.48 percent from 2005 to 2020 was used to estimate future emissions from water distribution. The water and wastewater sector is forecast to produce 4,068 metric tons CO_2e in 2020 and 4,712 metric tons CO_2e in 2030.

4. Government Operations Forecast

The government operations emissions inventory developed for the baseline year 2006 was used to project future government operations emissions in National City for 2020 and 2030 under BAU conditions. The 2020 BAU forecast for government operations emissions is 5,774 metric tons of carbon dioxide equivalent (CO_2e), an increase of approximately 14 percent over the 2006 baseline inventory. The 2030 BAU forecast for government operations emissions is 6,686 metric tons of carbon dioxide equivalent (CO_2e), an increase of approximately 32 percent over the 2006 baseline inventory. Table 2-5, below presents the 2006 inventory and 2020 and 2030 BAU forecasts for government operations by sector.

Growth in government operations is based on population growth in the City between 2006 and the forecast years (2020 and 2030). The population is projected to grow by 23 percent between 2006 and 2020, and 42 percent between 2006 and 2030. GHG emissions from government operations are also projected to grow at the same rates. However, the State measures, including the Clean Car Standards (Pavley), Low Carbon Fuel Standard, and Renewables Portfolio Standard, will result in a slower rate of growth in GHG emissions from government operations.

TABLE 2-5 **GOVERNMENT OPERATIONS EMISSIONS INVENTORY AND FORECAST BY SECTOR**

Sources	2006 ($MTCO_2e$)	2020 ($MTCO_2e$)	2030 ($MTCO_2e$)
Buildings and Facilities	1,519	1,851	2,140
Employee Commute	1,591	1,722	1,995
Vehicle Fleet	1,033	1,076	1,269
Solid Waste	565	685	803
Public Lighting	360	429	507
Water and Sewage	8	11	11
Total	**5,077**	**5,774**	**6,686**

Source: CACP model, ICLEI, 2009, and DC&E, 2010.

3 EMISSIONS REDUCTION TARGET

This chapter presents the greenhouse gas (GHG) emissions reduction target for National City for the years 2020 and 2030. Many factors were considered when selecting National City's reduction targets, including international, state and regional goals for emissions reductions. The City strived to choose a target that is both aggressive and achievable given local circumstances.

A. International Targets

The Kyoto Protocol target of 7 percent below 1990 levels was the target the United States agreed to in principle at the 1997 United Nations Council of Parties meeting, but has yet to ratify in Congress. Several European nations set similar goals and some have begun action towards meeting them. The International Panel on Climate Change (IPCC) research suggests that a 60 percent reduction below 1990 levels is necessary to reverse global warming and stabilize the climate.

B. State and Local Targets

State and local factors considered in selecting the target reduction percentage included estimation of the effects of implemented and planned programs and policies, an approximate assessment of future opportunities to reduce emissions, statewide targets established in the Global Warming Solutions Act of 2006 (AB 32) and other state-level climate policy, and regional targets adopted by the San Diego Association of Governments (SANDAG). SANDAG's regional emissions reduction target is consistent with the statewide goals under AB 32 and Executive Order S-3-05.

AB 32 set the following short- and long-term goals for reducing state-wide GHG emissions:

- 2000 levels by 2010.
- 1990 levels by 2020 (15 percent below 2005 levels by 2020).

- 80 percent below 1990 levels by 2050 (83 percent below 2005 levels by 2050).[1]

Reducing GHG emissions to 1990 levels means cutting approximately 30 percent from BAU emissions levels projected for 2020, or about 15 percent from 2005 levels.[2]

The California Air Resources Board (CARB) also established a regional target, pursuant to State Bill (SB) 375, for SANDAG, for emissions from cars and light trucks, which requires a 7 percent reduction by 2020 and 13 percent reduction by 2035.

C. National City Target

National City has adopted a reduction target of 15 percent below 2005/2006 baseline emission levels by the year 2020, with additional reductions by the year 2030, for both community-wide and government operations. To reach this target, National City must reduce annual community-wide emissions by 119,279 metric tons of CO_2e from 2020 BAU levels and government operations emissions must be reduced by 1,459 metric tons of CO_2e from 2020 BAU levels (see Table 3-1). The City will strive to achieve additional reductions in GHG emissions by 2030.

[1] California Air Resources Board, 2008, *Climate Change Scoping Plan*, (http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf)

[2] California Air Resources Board, 2008, *Climate Change Scoping Plan*, (http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf)

TABLE 3-1 **NATIONAL CITY EMISSIONS SUMMARY**

	Community Emissions	Government Operations Emissions
Base Year (2005/2006)		
Quantity of CO_2e emissions in 2005/2006 (metric tons)	550,714	5,077
Target Year (2020)		
Business-as-usual projection of CO_2e emissions in 2020 (metric tons)	587,386	5,774
Percent CO_2e reduction from baseline targeted by target year (%)	15%	15%
Quantity of CO_2e reduction targeted (metric tons)	119,279	1,459
Target Quantity of CO_2e emissions in 2020 (metric tons)	468,107	4,315
Target Year (2030)		
Business-as-usual projection of CO_2e emissions in 2030 (metric tons)	704,067	6,686

Source: CACP Model, ICLEI, 2009 and DC&E, 2010.

4 PROPOSED MEASURES AND POLICIES

This chapter presents the greenhouse gas (GHG) emission reduction measures that the City of National City will implement in order to achieve the emission reduction target for the year 2020 and additional reductions by the year 2030.

The City has identified a set of emission reduction measures based on careful consideration of the emission reductions needed to achieve the reduction target, the distribution of emissions revealed in the emissions inventory, existing priorities and resources, and the potential costs and benefits of various potential emission reduction projects. The measures are divided into community-wide and government operations sectors. Community-wide measures are further divided into the following sectors: energy, transportation, solid waste, and water and wastewater. The measures were modeled using the ICLEI Climate and Air Pollution Planning Assistant (CAPPA).

Although the GHG emissions that result from government operations account for less than one percent of National City's community-wide emissions, measures taken to reduce municipal emissions show that the City is committed to action on climate change. National City is proud of the emission reduction efforts implemented to date and is committed to building on those efforts by increasing fleet fuel efficiency, reducing solid waste, and increasing energy efficiency and conservation in municipal buildings.

A. Community-Wide Measures

The energy, transportation and land use, solid waste, and water and wastewater sectors that are discussed below include measures that will reduce GHG emissions. In total, implementation of the CAP measures will reduce GHG emissions by 137,137 metric tons of CO_2e ($MTCO_2e$) from the 2020 BAU forecast. This reduction exceeds the reduction target of 119,179 $MTCO_2e$ by 17,958 $MTCO_2e$. By 2030, implementation of the CAP measures will reduce GHG emissions by 156,127 $MTCO_2e$ from the 2030 BAU forecast. A summary of the reductions by sector is provided in Table 4-1.

TABLE 4-1 **COMMUNITY-WIDE GHG EMISSION REDUCTIONS**

Sector	Total Reduction in 2020 ($MTCO_2e$)	Total Reduction in 2030 ($MTCO_2e$)
Energy Use	68,159	73,728
Transportation and Land Use	62,055	75,475
Solid Waste	929	929
Water and Wastewater	5,993	5,993
Total Reduction	137,137	156,127
BAU Emissions	587,286	704,067
Total Emissions with Reductions	450,149	547,940
% Below 2005 Baseline Emissions	18.3%	0.5%

Source: CACP, 2010; CAPPA, 2010; DC&E, 2010.

1. Energy

The energy sector measures are intended to reduce GHG emissions and energy consumption through conservation, use of energy-efficient technologies and use of renewable energy sources. The energy measures, listed below, will result in a reduction of 68,159 $MTCO_2e$ per year by 2020 and 73,728 $MTCO_2e$ per year by 2030.

a. Existing Buildings

A1.a.1 Encourage energy audits of existing buildings that inform building owners of their energy usage.

A1.a.2 Encourage energy audits at the time of sale of commercial and residential properties and provide information about potential upgrades.

A1.a.3 Support increased use of solar water heating in residential, pool and commercial uses.

A1.a.4 Adopt an energy financing program to encourage energy efficiency retrofits in existing buildings.

A1.a.5 Provide low- or no-cost weatherization improvements for low-income households.

b. New Construction

A1.b.1 Encourage private development projects to exceed the energy efficiency requirements of CalGreen by providing technical assistance, financial assistance and other incentives.

A1.b.2 Encourage LEED certification for all new commercial and industrial buildings.

A1.b.3 Increase enforcement of building energy requirements to reduce the rate of noncompliance.

c. Renewable Energy

A1.c.1 Support the SDG&E feed-in tariff or other policies that will facilitate increased, cost-effective installation of small-scale renewable energy systems like solar photovoltaics.

A1.c.2 Encourage local homebuilders to participate in the New Solar Homes Partnership to install solar photovoltaics on new homes.

d. Electricity Grid Modernization

A1.d.1 Support mechanisms that encourage installation of smart appliances that interface with smart meters and provide real time electricity pricing information to consumers.

e. Peak Electricity Demand

A1.e.1 Provide information and resources about peak demand and climate change, as well as environmental and monetary costs associated with peak electricity demand.

2. Transportation and Land Use

The following measures are intended to reduce vehicle miles traveled, reduce GHG emissions and improve air quality through a variety of strategies, including efficient land use patterns; provisions to increase transit ridership, walking, and bicycling; carbon sequestration; and use of alternative fuels. The transportation and land use measures, listed below, will result in a reduc-

tion of 62,055 $MTCO_2e$ per year by 2020 and 75,475 $MTCO_2e$ per year by 2030. The 2020 emissions reduction equates to a 28 percent reduction from 2005 levels and the 2030 emissions reduction equates to a 21 percent reduction from 2005 levels. These reductions exceed the SANDAG regional targets set by CARB for emissions from cars and light trucks, which call for a 7 percent reduction from 2005 levels by 2020 and 13 percent reduction from 2005 levels by 2035.

a. Smart Growth

A2.a.1 Foster land use intensity near, along with connectivity to, retail and employment centers and services to reduce vehicle miles traveled (VMT) and increase the efficiency of delivery of services.

A2.a.2 Reduce parking requirement in smart growth areas to discourage the use of single-occupancy vehicles.

b. Low Carbon Transportation

A2.b.1 Support the San Diego Metropolitan Transit Service (MTS) in making performance and quality improvements to existing transit service in National City.

A2.b.2 Implement bicycle corridor improvements and supportive infrastructure.

A2.b.3 Implement strategies that prioritize parking for high occupancy vehicles (HOVs) – carpools, vanpools and transit vehicles.

A2.b.4 Encourage employers to institute telework programs and alternative work schedules to reduce commuting during peak hours.

A2.b.5 Encourage employers to institute programs that provide financial incentives for commuters to reduce their vehicle trips and use alternative transportation modes like walking, bicycling, public transit and carpooling, often as an alternative to subsidized employee parking.

a) Parking Cash Out: Commuters offered subsidized parking are also offered the cash equivalent if they use alternative travel modes.

b) Travel Allowances: Financial payments provided to employees in lieu of parking subsidies. Commuters could use the travel allowance to pay for parking or for another travel mode.

c) Transit and Rideshare Benefits: Free or discounted fares provided to employees.

d) Reduced Employee Parking Subsidies: Commuters who drive would pay a portion or all of their parking costs.

c. Traffic Congestion

A2.c.1 Conduct education campaigns or similar efforts to promote fuel-efficient or "eco-driving" practices, such as reducing idling and gentle accelerations.

d. Traffic Calming

A2.d.1 Implement neighborhood traffic calming projects (e.g., replace stop-controlled intersections with roundabouts).

A2.d.2 Continue to coordinate traffic signals to facilitate efficient traffic conditions.

e. Alternative Fuel Vehicles

A2.e.1 Develop streamlined permitting requirements and standardized design guidelines and siting criteria for all types of electric charging stations.

3. Solid Waste

The following measures in the solid waste sector are intended to reduce the amount of waste going to landfills through increased reuse and recycling. The solid waste measures, listed below, will result in a reduction of 929 $MTCO_2e$ per year by 2020 and 929 $MTCO_2e$ per year by 2030.

A3.a.1 Implement a program to reduce, reuse and recycle community construction and demolition waste.

A3.a.2 Establish incentives for residents to participate in green waste recycling programs.

A3.a.3 Educate owners and residents of multi-family housing about recycling requirements and opportunities.

A3.a.4 Work with members of the Regional Solid Waste Association (RSWA) to establish a curbside composting pilot project through the EDCO waste collection service.

A3.a.5 Work with EDCO to encourage waste audits and waste reduction plans for existing and new commercial developments.

A3.a.6 Encourage EDCO to implement a restaurant food waste collection program.

4. Water and Wastewater

The following measures in the water and wastewater sector reduce potable water consumption through efficiency measures and use of wastewater where possible. The measures listed below will result in a reduction of 5,993 $MTCO_2e$ per year by 2020 and 5,993 $MTCO_2e$ per year by 2030.

A4.a.1 Adopt water efficiency principles similar to the Ahwahnee Water Principles for Resource Efficient Land Use[1] for new and existing residential and commercial developments.

A4.a.2 Support landscape design educational programs to help residential and commercial customers install low water use landscaping, thereby reducing water-related energy use.

A4.a.3 Encourage water efficiency audits at point of sale for commercial and residential properties.

A4.a.4 Work with the Sweetwater Authority to identify uses for existing unused reclaimed water to decrease the amount of water imported by the Sweetwater Authority.

A4.a.5 Identify and support programs for residential re-use of gray water to decrease the amount of energy needed to meet water needs.

B. Government Operations

The buildings and facilities, employee commute, vehicle fleet, solid waste, public lighting, and water and sewage sectors that are discussed below include measures that will reduce GHG emissions. Public lighting measures are included in the buildings and facilities sector. In total, implementation of the CAP will reduce government operations GHG emissions by 1,563 $MTCO_2e$ from the 2020 BAU forecast. This reduction exceeds the target reduction of

[1] Local Government Commission, *Ahwahnee Water Principles*, http://www.lgc.org/ahwahnee/h2o_principles.html, accessed on December 10, 2010.

1,459 $MTCO_2e$ by 104 $MTCO_2e$. By 2030, implementation of the CAP will reduce government operations emissions by 2,021 $MTCO_2e$ from the 2030 BAU forecast. A summary of the reductions by sector is provided in Table 4-2.

TABLE 4-2 **GOVERNMENT OPERATIONS GHG EMISSION REDUCTIONS**

Sector	Total Reduction in 2020 ($MTCO_2e$)	Total Reduction in 2030 ($MTCO_2e$)
Buildings and Facilities	859	1,069
Employee Commute	25	39
Vehicle Fleet	330	339
Solid Waste	0	0
Public Lighting	328	545
Water and Sewage	22	29
Total Reduction	1,563	2,021
BAU Emissions	5,774	6,686
Emissions with Reductions	4,211	4,665
% Below 2006 Baseline Emissions	17%	8%

Source: CACP, 2010; CAPPA, 2010; DC&E, 2010.

1. Buildings and Facilities (including Public Lighting)

The measures listed below will result in a reduction of 1,187 $MTCO_2e$ per year by 2020 and 1,614 $MTCO_2e$ per year by 2030.

B1.a.1 Continue to audit city buildings and facilities to quantify energy use and identify opportunities for energy savings through efficiency and conservation measures.

B1.a.2 Establish public facility energy efficiency standards and provide employees with guidelines, instructions and requirements for efficient use of facilities.

B1.a.3 Encourage all new municipal buildings and facilities to meet at least LEED Silver certification standards.

B1.a.4 Utilize all available rebates and incentives for energy efficiency and distributed generation installations, such as state public good programs and solar programs.

B1.a.5 Continue to convert street lighting, water pumps, water treatment and other energy intensive operations to more efficient technologies.

B1.a.6 Participate in peak demand reduction programs and undertake peak demand reduction measures at local government facilities.

B1.a.7 Implement off-peak scheduling of pumps, motors and other energy intensive machinery where feasible.

B1.a.8 Support the installation of solar panels on municipal facilities, including the community swimming pool.

B1.a.9 Conserve and expand parks, open space and other natural lands for carbon sequestration.

B1.a.10 Manage parks, open space and other natural areas to ensure the long-term health and viability of trees and other vegetation.

B1.a.11 Develop and implement a community-wide urban forestry management and reforestation program to significantly increase the carbon storage potential of trees and other vegetation in the community.

B1.a.12 Encourage rooftop gardens, especially for large, flat-roofed industrial, commercial and institutional buildings.

2. Employee Commute

The measure listed below will result in a reduction of 25 $MTCO_2e$ per year by 2020 and 39 $MTCO_2e$ per year by 2030.

B2.a.1 Implement programs and provide incentives to encourage reduced emissions from employee commute, including telecommuting, alternative work schedules, carpooling/vanpooling, and active transportation.

3. Vehicle Fleet

The measure listed below will result in a reduction of 330 $MTCO_2e$ per year by 2020 and 339 $MTCO_2e$ per year by 2030.

B3.a.1 Continue to integrate alternative transportation fuels and vehicles into the government fleet and the fleets of contractors.

4. Water and Sewage

The measures listed below will result in a reduction of 22 $MTCO_2e$ per year by 2020 and 29 $MTCO_2e$ per year by 2030.

B4.a.1 Audit the City's water and wastewater pumps and motors to identify the most and least efficient equipment.

B4.a.2 Develop and implement a motor/pump efficiency cycling schedule to use more efficient water or wastewater motors/pumps first.

B4.a.3 Replace least efficient water and wastewater pumps and motors with more efficient equipment.

B4.a.4 Assess, maintain and repair existing plumbing fixtures, pipes and irrigation systems in all municipal buildings and facilities.

B4.a.5 Upgrade agency plumbing and irrigation systems with state-of-the-art water-efficient technology.

B4.a.6 Encourage the use of recycled water for municipal facilities and operations, including parks and medians, where appropriate.

B4.a.7 Use compost and mulch in agency landscaping to conserve water.

5 IMPLEMENTATION, PERFORMANCE STANDARDS, AND MONITORING PROGRAM

Climate change is one of the most critical challenges facing society today. Overcoming climate change will require substantial efforts from government, organizations, and individuals. Meeting National City's reduction target will require both persistence and adaptability. The City needs to prioritize actions; mobilize residents, business owners and staff; and work with neighboring jurisdictions and regional agencies to create workable solutions. The previous chapters present and analyze reduction measures intended to reduce greenhouse gas (GHG) emissions in National City by 15 percent below 2005 baseline levels by 2020 and further reduce emissions by 2030. As described in Chapter 4, implementation of the CAP measures will exceed the reduction targets for both the community and government operations emissions. These measures represent the hard work and initiative of the City of National City to go above and beyond normal practice by proactively addressing our relationship to global climate change. This chapter outlines the steps, performance standards, and monitoring program that will be taken to implement the GHG emission reduction measures in National City.

A. Performance Standards for Reduction Measure Implementation

This chapter separates reduction measures into two main time periods for implementation: 2011 to 2015 and 2015 to 2020. Additional measures will be implemented between 2020 and 2030 as advances make new technologies and practices available. Phases indicate when implementation of the measure begins. Overall maintenance of the program will extend well beyond the allotted phase. All reduction measures will begin implementation by 2015. The quantitative reduction effects, as detailed in Tables 5-1 (Community-wide) and 5-2 (Government Operations), serve as the standards by which performance towards achievement of reduction target will be measured.

The phasing prioritization of the implementation lists was generated to identify which reduction measures are more effective and/or feasible and should therefore be implemented first. All of the reduction strategies are essential to reach the goals set forth in this CAP; however some are expected to be

TABLE 5-1 **PERFORMANCE STANDARDS FOR IMPLEMENTATION OF REDUCTION MEASURES – COMMUNITY-WIDE**

Reduction Measure	Total Reduction in 2020 ($MTCO_2e$)	Total Reduction in 2030 ($MTCO_2e$)	Implementation Phase
A2.c.1 Conduct education campaigns or similar efforts to promote fuel-efficient or "eco-driving" practices, such as reducing idling and gentle accelerations.	28,153	28,153	2011-2015
A1.a.1 Encourage energy audits of existing buildings that inform building owners of their energy usage. A1.a.2 Encourage energy audits at the time of sale of commercial and residential properties and provide information about potential upgrades.	27,112	32,681	2011-2015
A2.a.1 Foster land use intensity near, along with connectivity to, retail and employment centers and services to reduce vehicle miles traveled (VMT) and increase the efficiency of delivery of services.	26,790	40,211	2011-2015
A1.d.1 Support mechanisms that encourage installation of smart appliances that interface with smart meters and provide real time electricity pricing information to consumers.	14,894	14,894	2015-2020
A4.a.4 Work with the Sweetwater Authority to identify uses for existing unused reclaimed water to decrease the amount of water imported by the Sweetwater Authority. A4.a.5 Identify and support programs for residential reuse of gray water to decrease the amount of energy needed to meet water needs.	7,223	7,223	2011-2015
A1.e.1 Provide information and resources about peak demand and climate change, as well as environmental and monetary costs associated with peak electricity demand.	6,322	6,322	2011-2015

TABLE 5-1 **PERFORMANCE STANDARDS FOR IMPLEMENTATION OF REDUCTION MEASURES – COMMUNITY-WIDE** (CONTINUED)

Reduction Measure	Total Reduction in 2020 ($MTCO_2e$)	Total Reduction in 2030 ($MTCO_2e$)	Implementation Phase
A4.a.1 Adopt water efficiency principles similar to the Ahwahnee Water Principles for Resource Efficient Land Use for new and existing residential and commercial developments.	5,993	5,993	2011-2015
A3.a.5 Work with EDCO to encourage waste audits and waste reduction plans for existing and new commercial developments.	4,895	4,895	2011-2015
A2.b.5 Encourage employers to institute programs that provide financial incentives for commuters to reduce their vehicle trips and use alternative transportation modes like walking, bicycling, public transit and carpooling, often as an alternative to subsidized employee parking. a) Parking Cash Out: Commuters offered subsidized parking are also offered the cash equivalent if they use alternative travel modes. b) Travel Allowances: Financial payments provided to employees in lieu of parking subsidies. Commuters could use the travel allowance to pay for parking or for another travel mode. c) Transit and Rideshare Benefits: Free or discounted fares provided to employees. d) Reduced Employee Parking Subsidies: Commuters who drive would pay a portion or all of their parking costs.	3,838	3,838	2011-2030
A1.b.1 Encourage private development projects to exceed the energy efficiency requirements of CalGreen by providing technical assistance, financial assistance and other incentives. A1.b.2 Encourage LEED certification for all new commercial and industrial buildings.	2,736	2,736	2015-2020
A1.a.4 Adopt an energy financing program to	2,531	2,531	2011-2015

TABLE 5-1 **PERFORMANCE STANDARDS FOR IMPLEMENTATION OF REDUCTION MEASURES – COMMUNITY-WIDE** (CONTINUED)

Reduction Measure	Total Reduction in 2020 ($MTCO_2e$)	Total Reduction in 2030 ($MTCO_2e$)	Implementation Phase
encourage energy efficiency retrofits in existing buildings.			
A2.b.3 Implement strategies that prioritize parking for high occupancy vehicles (HOVs) – carpools, vanpools and transit vehicles.	1,743	1,743	2015-2020
A4.a.2 Support landscape design educational programs to help residential and commercial customers install low water use landscaping, thereby reducing water-related energy use.	972	972	2015-2020
A2.e.1 Develop streamlined permitting requirements and standardized design guidelines and siting criteria for all types of electric charging stations.	793	793	2011-2015
A1.c.1 Support the SDG&E feed-in tariff or other policies that will facilitate increased, cost-effective installation of small-scale renewable energy systems like solar photovoltaics. A1.c.2 Encourage local homebuilders to participate in the New Solar Homes Partnership to install solar photovoltaics on new homes.	775	775	2015-2020
A2.b.2 Implement bicycle corridor improvements and supportive infrastructure.	479	479	2015-2020
A1.a.3 Support increased use of solar water heating in residential, pool and commercial uses.	389	389	2011-2015
A1.a.5 Provide low- or no-cost weatherization improvements for low-income households.	383	383	2015-2020
A3.a.3 Educate owners and residents of multi-family housing about recycling requirements and opportunities. A3.a.4 Work with members of the Regional Solid Waste Association (RSWA) to establish a curbside composting pilot project through the EDCO waste collection service.	267	267	2011-2015

TABLE 5-1 **PERFORMANCE STANDARDS FOR IMPLEMENTATION OF REDUCTION MEASURES – COMMUNITY-WIDE** (CONTINUED)

Reduction Measure	Total Reduction in 2020 ($MTCO_2e$)	Total Reduction in 2030 ($MTCO_2e$)	Implementation Phase
A3.a.6 Encourage EDCO to implement a restaurant food waste collection pro-gram.	254	254	2015-2020
A3.a.1 Implement a program to reduce, reuse and recycle community construction and demolition waste. A3.a.2 Establish incentives for residents to participate in green waste recycling programs.	141	141	2015-2020
A2.b.4 Encourage employers to institute telework programs and alternative work schedules to reduce commuting during peak hours.	122	122	2015-2020
A4.a.3 Encourage water efficiency audits at point of sale for commercial and residential properties.	91	91	2015-2020
A2.d.2 Continue to coordinate traffic signals to facilitate efficient traffic conditions.	80	80	2015-2020
A2.a.2 Reduce parking requirement in smart growth areas to discourage the use of single-occupancy vehicles.	66	66	2011-2015
A2.b.1 Support the San Diego Metropolitan Transit Service (MTS) in making performance and quality improvements to existing transit service in National City.	62	62	2015-2020
A1.b.3 Increase enforcement of building energy requirements to reduce the rate of noncompliance.	23	23	2011-2015
A2.d.1 Implement neighborhood traffic calming projects (e.g., replace stop-controlled intersections with roundabouts).	9	9	2011-2015
Additional measures as available based technological advances.	TBD	TBD	2011-2030

Source: DC&E, 2010.

TABLE 5-2 **PERFORMANCE STANDARDS FOR IMPLEMENTATION OF REDUCTION MEASURES – GOVERNMENT OPERATIONS**

Reduction Measure	Total Reduction in 2020 ($MTCO_2e$)	Total Reduction in 2030 ($MTCO_2e$)	Implementation Phase
B1.a.2 Establish public facility energy efficiency standards and provide employees with guidelines, instructions and requirements for efficient use of facilities.	350	350	2011-2015
B3.a.1 Continue to integrate alternative transportation fuels and vehicles into the government fleet and the fleets of contractors.	259	269	2011-2015
B1.a.4 Utilize all available rebates and incentives for energy efficiency and distributed generation installations, such as state public good programs and solar programs. B1.a.5 Continue to convert street lighting, water pumps, water treatment and other energy intensive operations to more efficient technologies.	212	306	2011-2015
B1.a.6 Participate in peak demand reduction programs and undertake peak demand reduction measures at local government facilities. B1.a.7 Implement off-peak scheduling of pumps, motors and other energy intensive machinery where feasible.	207	337	2011-2015
B1.a.3 Encourage all new municipal buildings and facilities to meet at least LEED Silver certification standards.	178	296	2015-2020
B2.a.1 Implement programs and provide incentives to encourage reduced emissions from employee commute, including telecommuting, alternative work schedules, carpooling/vanpooling, and active transportation.	95	109	2011-2015
B1.a.8 Support the installation of solar panels on municipal facilities, including the community swimming pool	88	125	2015-2020

TABLE 5-2 **IMPLEMENTATION OF REDUCTION MEASURES – GOVERNMENT OPERATIONS** (CONTINUED)

Reduction Measure	Total Reduction in 2020 ($MTCO_2e$)	Total Reduction in 2030 ($MTCO_2e$)	Implementation Phase
B1.a.9 Conserve and expand parks, open space and other natural lands for car-bon sequestration. B1.a.10 Manage parks, open space and other natural areas to ensure the long-term health and viability of trees and other vegetation. B1.a.11 Develop and implement a community-wide urban forestry management and reforestation program to significantly increase the carbon storage potential of trees and other vegetation in the community.	77	77	2011-2015
B1.a.1 Continue to audit city buildings and facilities to quantify energy use and identify opportunities for energy savings through efficiency and conservation measures.	71	119	2011-2015
B4.a.7 Use compost and mulch in agency landscaping to conserve water.	11	18	2011-2015
B1.a.12 Encourage rooftop gardens, especially for large, flat-roofed industrial, commercial and institutional buildings.	5	5	2011-2015
B4.a.1 Audit the City's water and wastewater pumps and motors to identify the most and least efficient equipment. B4.a.2 Develop and implement a motor/pump efficiency cycling schedule to use more efficient water or wastewater motors/pumps first. B4.a.3 Replace least efficient water and wastewater pumps and motors with more efficient equipment. B4.a.4 Assess, maintain and repair existing plumbing fixtures, pipes and irrigation systems in all municipal buildings and facilities. B4.a.5 Upgrade agency plumbing and irrigation systems with state-of-the-art water-efficient technology.	5	5	2015-2020
B4.a.6 Encourage the use of recycled water for municipal facilities and operations, including parks and medians, where appropriate.	4	4	2011-2015

Source: DC&E, 2010.

implemented on a later timeline due to obstacles of available data, technology, or finances.

B. Implementation Funding

One of the main barriers to seeing through an implementation plan is lack of available funds. There are multiple grant and loan programs through State, federal, and regional sources to combat climate change. With the establishment of this plan for action, National City is in a position to apply for funding to implement the supporting measures in a timely fashion. Funding sources may include the San Diego Association of Governments, as a well as State and federal agencies with similar programs.

One very important current federal funding source is the American Recovery and Reinvestment Act of 2009 (ARRA). ARRA's Energy Efficiency and Conservation Block Grant (EECBG) program is in the process of awarding over $300 million directly to most California cities and counties. National City has received a $561,700 allocation for climate action planning and implementation.

In addition, funding opportunities will increase with implementation of recent State legislation. In the energy sector, SB 1754 provides for State financial assistance for installing renewable energy projects. Further, AB 2466, on the other hand, mandates that local governments be paid for the excess renewable energy they generate. With the funding from current State legislation and grant programs like those above, National City is likely to receive assistance in seeing through its climate action goals and measures.

C. Plan Adaptation, Re-Inventory and Monitoring

This CAP represents National City's community-wide response to the threat of climate change at the time of preparation. The field of climate action planning is rapidly evolving. Over the next decade, new information about cli-

mate change science and risk is likely to emerge, new GHG reduction strategies and technologies will be developed, and State and federal legislation are likely to advance. Therefore, in order to remain relevant and to be as effective as possible the CAP must evolve over time.

The Planning Division of the Development Services Department (Department) will be responsible for continually monitoring the City's progress towards meeting the reduction targets. The CAP, as a whole, will be reviewed and modified every three years to evaluate implementation and achievement of measure reductions and to identify potential plan update needs.

As part of the monitoring evaluation, the City will re-inventory their GHG emissions. The process of conducting a re-inventory will allow the City to monitor progress and report results toward local emissions reduction targets and identify opportunities to integrate new or improved measures into the emissions reduction plan. If forecast target reductions are not being met, the Department will determine which measures are not achieving the target and which measures are exceeding the target. As new technology comes online each year, the Department will consider improvements to climate science, explore new opportunities for GHG reduction and climate adaptation, and determine what innovations can be implemented to help reduce emissions to reach reduction targets.