APPENDIX G

Draft Greenhouse Gas Reduction Program (GGRP)

CITY OF HUNTINGTON BEACH

GREENHOUSE GAS REDUCTION PROGRAM

PUBLIC REVIEW DRAFT

March 2017

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EXECUTIVE SUMMARY

1. Background and Context

1.1 Purpose of the Greenhouse Gas Reduction Program

The Greenhouse Gas Reduction Program (GGRP) is the City of Huntington Beach's comprehensive approach to reduce emissions of greenhouse gases (GHGs) within the community. The GGRP establishes Huntington Beach's existing, projected, and target levels of GHG emissions and identifies how the City can achieve target levels through an extensive set of strategies, emphasizing actions that are voluntary, economically viable, consistent with community character, and advance the priorities of Huntington Beach residents, businesses, and visitors.

Huntington Beach's efforts to reduce GHG emissions are linked to a series of state-level regulations and guidance. California's official policies hold that the increased emissions of GHGs are a threat to the economic, environmental, and social well-being of the state and of individual communities. To address this risk, the state has enacted a comprehensive regulatory framework to reduce GHG emissions. This GGRP allows the City of Huntington Beach to maintain consistency with state-level actions through a locally appropriate approach. This state-level regulatory framework is discussed below.

Executive Order S-03-05

Governor Schwarzenegger issued Executive Order (EO) S-03-05 in 2005, declaring that California was vulnerable to the effects of increased GHG emissions. It sets the following GHG reduction goals for the state:

- Reduce emissions to 2000 levels by 2010[1]
- Reduce emissions to 1990 levels by 2020
- Reduce emissions to 80% below 1990 levels by 2050

Assembly Bill 32 – California Global Warming Solutions Act of 2006

Assembly Bill (AB) 32, the California Global Warming Solutions Act, codifies the goal of reducing state emissions to 1990 levels by 2020 into law. It directs the California Air Resources Board (CARB) to develop market-based and regulatory mechanisms to achieve this target. AB 32 also lists a set of early actions to reduce GHG emissions, which were adopted by CARB in 2007, and requires California's largest industrial GHG emitters to report and verify their annual emissions.

Under the requirements of AB 32, CARB must prepare a Scoping Plan, identifying the actions the state will take to meet the GHG reduction target. The Scoping Plan also identifies local governments as strategic partners in achieving the statewide reduction goal. The Scoping Plan must be updated every five years. The first major update, which CARB adopted in May 2014, lists the progress of California's actions to reduce GHG emissions and discusses opportunities to achieve further reductions. A second update, first released in December 2016 and scheduled to be adopted in June 2017, identifies additional reduction opportunities at state and local levels. This second update also provides guidance for local communities in achieving GHG reductions beyond 2020.

[1] California emissions in 2010 were approximately 4.5% below this goal.

Senate Bill 97 – 2007 Amendments to the State CEQA Guidelines

Senate Bill (SB) 97, which went into effect in 2010, directs the state to update and adopt the California Environmental Quality Act (CEQA) Guidelines to address the analysis and mitigation of GHG emissions from projects subject to the environmental review process. The updates directed lead agencies to analyze the GHG emissions of proposed projects, and reach a conclusion regarding the significance of those emissions, and if applicable, consider a range of potential mitigation measures to reduce GHG emissions to less than significant levels.

The updates also provided lead agencies the option to streamline the analysis of GHGs on a project level by using a programmatic plan or strategy to reduce community wide emissions. Qualified GHG Reduction strategies or plans must meet six requirements, as identified in the State CEQA Guidelines Section 15183.5(b). Projects located in jurisdictions with a Qualified GHG Reduction Strategy can streamline their GHG evaluation by showing compliance with the adopted strategy.

This GGRP meets these six requirements, allowing it to serve as a Qualified GHG Reduction Strategy for the City of Huntington Beach. These requirements are outlined below:

1) Quantify GHG emissions, both existing and projected over a specific time period, resulting from activities within a defined geographic area (see **Section 2**).

2) Establish a level, based on substantive evidence, below which the contribution of emissions from activities covered by the plan would not be cumulatively considerable (see **Section 4.1**).

3) Identify and analyze the emissions resulting from specific actions or categories of actions anticipated within the geographic area (see **Section 3**).

4) Specify measures or a group of measures, including performance standards that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level (see **Section 4.3**).

5) Establish a mechanism to monitor the plan's progress toward achieving the level and to require amendment if the plan is not achieving specified levels (see **Section 5.2**).

6) Be adopted in a public process following environmental review. (This requirement is addressed by the General Plan update public outreach process and Environmental Impact Report.)

Senate Bill 375 – Sustainable Communities and Climate Protection Act of 2008

SB 375 links regional transportation planning efforts, GHG reduction targets, and land use and housing allocations. It requires regional bodies known as metropolitan planning organizations to adopt plans that reduce GHG emissions through land use and transportation planning. These plans are called Sustainable Communities Strategies (SCSs) and are required to meet targets for GHG reductions that are set by CARB. The metropolitan planning organization for Huntington Beach, the Southern California Association of Governments, approved its most recent SCS in April 2016. This SCS is set to achieve an 8% reduction in per-capita vehicle GHG emissions by 2020, and a 22% reduction in per-capita vehicle GHG emissions by 2040.

Executive Order B-30-15

EO B-30-15 was issued by Governor Brown in 2015. This executive order builds on the actions of EO S-03-05 and AB 32 and establishes a 2030 GHG reduction goal for the state of 40% below 1990 levels. It directs state agencies to take a number of actions to reduce GHG emissions.

Senate Bill 32

SB 32 was adopted in 2016 and establishes a 2030 statewide GHG reduction target of 40% below 1990 levels. This bill gives the force of law to the 2030 GHG reduction goal contained in EO B-30-15, making it an official state objective.

1.2 Connection to the General Plan

The City of Huntington Beach's General Plan is a state-required policy document that serves as the City's official guide for how the community should grow and develop in order to achieve the community's physical, economic, and environmental goals. The General Plan directs City policy on several key issues, including land use, transportation, and environmental resource conservation.

The 2017 update to the City's General Plan is the culmination of extensive public participation and consideration by advisory committees and elected officials. The goals, policies, and implementation actions in the General Plan reflect the residents' and elected officials' vision for the community.

The General Plan directs the City to prepare and put into effect this GGRP in support of state policies, an action serving to carry out the goals, policies, and implementation actions in the General Plan that relate to reducing the community's GHG emissions. Specifically, the General Plan establishes the GGRP and its function in the Environmental Resources and Conservation Element under Policy ERC-5A:

> **Policy ERC-5A:** By 2020, reduce community-wide greenhouse gas emissions to 15 percent below 2005 levels. By 2040, reduce greenhouse gas emissions by 53.33 percent below the 2020 target, placing the community on a path to meet the state's 2050 greenhouse gas emissions reduction goals.

The General Plan identifies the GGRP as the mechanism for carrying out this objective. The overall strategy and goals of the GGRP are expanded upon by General Plan Policy ERC-5.E and Implementation Programs ERC-P.1, ERC-P.2, and ERC-P.3. The GGRP is also supported by numerous policies and implementation actions throughout the General Plan, which help to reduce GHG emissions. These items include strategies that reduce energy and water use, support alternative transportation, and reduce waste generation. **Table A-1** and **Table A-2** list the policies and implementation programs that support the GGRP, organized by General Plan element.

1.3 Connection to the Coastal Resiliency Program

The City of Huntington Beach Coastal Resiliency Program (CRP), being drafted in parallel with the GGRP, is intended to address the risks created or exacerbated by sea level rise in the community resulting from climate change, including increased erosion, wave- and tide-induced flooding, and storm-related flooding. It serves as a bridge between the General Plan and a future Local Coastal Plan (LCP) update. While the GGRP and the CRP do not directly inform each other and have differing objectives, strategies in the GGRP or the CRP may help advance the goals of both documents.

2. GHG Emissions Inventory and Forecast

2.1 Inventory Background

A GHG emissions inventory identifies activities in the planning area that cause GHG emissions, describes the extent to which these activities contribute to emissions totals, quantifies GHG emission levels, and

provides the base for forecasting future emissions and establishing a GHG reduction target. An inventory provides a foundation for GHG reduction activities.

The GHG inventory and forecast covers activities occurring within the Huntington Beach planning area as a result of use of energy and GHG emitting activities by residents, businesses, visitors, and local government and other institutions. Seven types of activities, known as sectors, are included in the inventory and forecast.

1) **Residential energy:** electricity and natural gas used in residential settings.

2) **Nonresidential energy**: electricity and natural gas used in nonresidential settings.

3) **Transportation**: emissions from vehicle trips (cars, trucks, buses, etc.) that begin and/or end in Huntington Beach and combust fossil fuels.

4) **Off-road equipment**: emissions from landscaping and construction emissions and vehicles.

5) **Resource management**: emissions resulting from trash thrown away by community members.

6) **Water and wastewater**: energy used to treat and pump water and wastewater, along with emissions from the processing of wastewater.

7) **Oil drilling:** fuel used to extract oil in the planning area from on-shore wells, and emissions from intentional releases of vapors and unintentional leaks from pipes and machinery as part of oil drilling activities.

GHG emissions are measured in a unit called carbon dioxide equivalent (CO_2e), which accounts for the varying potencies of different GHGs. For example, 1 unit of methane (CH_4) is about 21 times more potent as a GHG than CO_2, and so 1 unit of methane equals 21 units of CO_2e. This GGRP measures GHGs in metric tons of carbon dioxide equivalent ($MTCO_2e$).

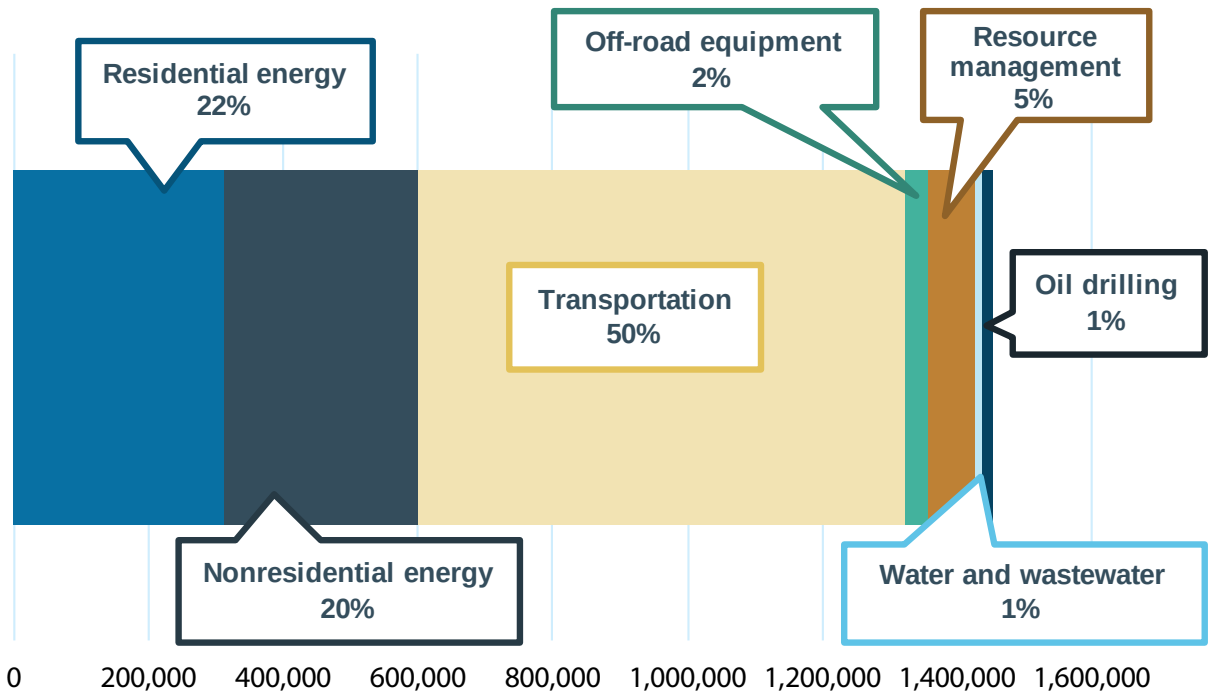
The inventory and forecast comply with the 2012 *US Community Protocol for the Accounting and Reporting of Greenhouse Gas Emissions*, commonly known as the US Community Protocol. The protocol provides guidance on how to measure and report community GHG emissions, including identifying activities that cause GHG emissions, the methods used to calculate emissions, and ensuring consistency when comparing inventories. While use of the protocol is voluntary, it is the standard for GHG inventories throughout California, and is recommended by the Governor's Office of Planning and Research.

The City prepared two inventories of GHG emissions to inform preparation of this plan. The City inventoried emissions for the calendar years 2005 and 2012. The 2005 inventory is used to set future GHG emission targets, consistent with the approach outlined in AB 32 and the State CEQA Guidelines Section 15183.5(b). The 2012 inventory estimates GHG emissions for the most recent year available at the time the inventory was prepared in 2013 and will be used as a baseline condition to inform the GHG forecast.

2.2 2005 Inventory

In 2005, activities from the inventory sectors in Huntington Beach resulted in 1,452,070 $MTCO_2e$. Transportation is the largest sector and accounted for 723,440 $MTCO_2e$, or 50% of the total. The residential energy sector was the second-largest contributor of GHG emissions with 313,310 $MTCO_2e$, or 22% of the total, followed by the nonresidential energy sector at 286,260 $MTCO_2e$ (20%). The resource management sector was the fourth-largest emitter at 67,210 $MTCO_2e$ (5%), followed by the off-road equipment sector at 35,240 $MTCO_2e$ (2%) and the oil drilling sector at 16,610 $MTCO_2e$ (1%). The water and wastewater sector was the smallest and generated 10,000 $MTCO_2e$ (1%) in 2005. The results of the 2005 inventory are shown in **Figure 2-1**.

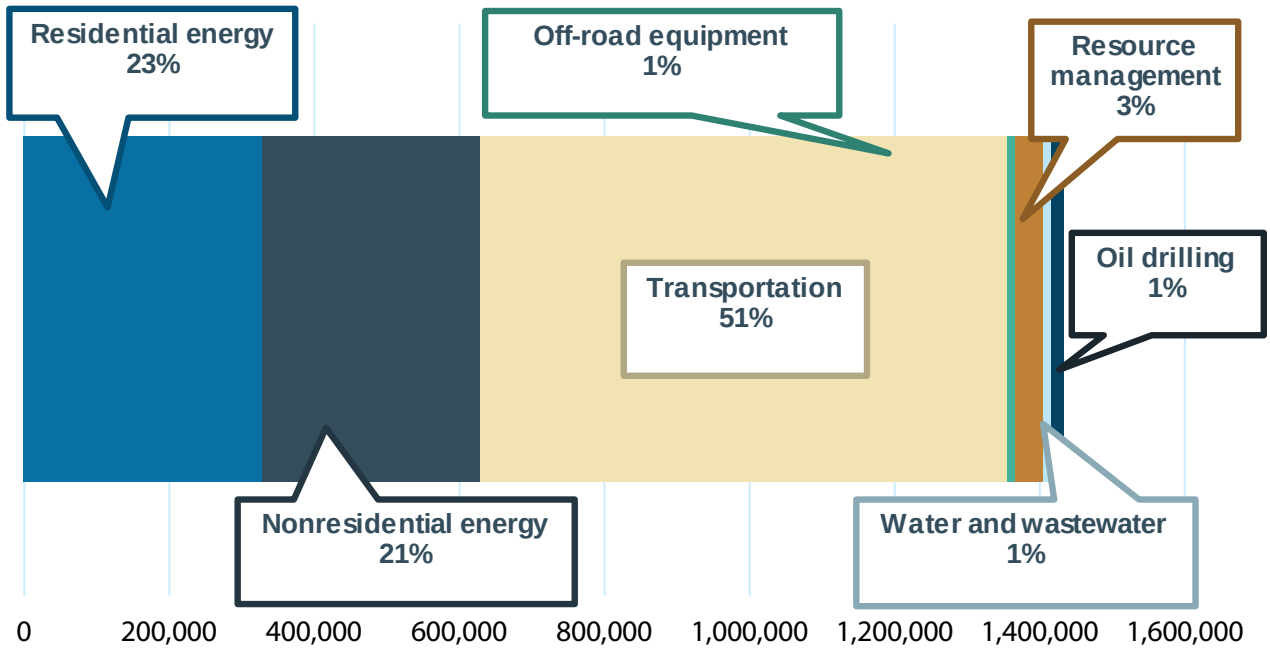
Figure 2-1: 2005 Emissions by Sector



2.3 2012 Inventory

In 2012, the total emissions in Huntington Beach were 1,432,540 $MTCO_2e$, with a fairly similar distribution of emissions as in 2005. Transportation remained the largest sector, contributing 726,190 $MTCO_2e$, or 51% of the total. Emissions from the residential energy sector totaled 327,340 $MTCO_2e$, or 23% of the total, followed by emissions from the nonresidential energy sector at 301,840 $MTCO_2e$ (21%). The solid waste sector contributed 38,620 $MTCO_2e$ (3%), with the oil drilling sector contributing 16,560 $MTCO_2e$ (1%) and the off-road equipment sector contributing 11,580 $MTCO_2e$ (1%). The water and wastewater sector remained the smallest source of emissions, generating 10,410 $MTCO_2e$ (1%). The results of the 2012 inventory are shown in **Figure 2-2**.

FIGURE 2-2: 2012 EMISSIONS BY SECTOR



Huntington Beach's total emissions showed little change between 2005 and 2012, declining by 19,530 $MTCO_2e$ (approximately 1%). However, emissions from some individual sectors increased or decreased by significantly more. **Table 2-1** compares emissions by sector for 2005 and 2012.

TABLE 2-1: HUNTINGTON BEACH GHG EMISSIONS BY SECTOR, 2005 AND 2012

Sector	2005 $MTCO_2e$	2012 $MTCO_2e$	Percentage Change, 2005–2012
Residential energy	313,310	327,340	4%
Nonresidential energy	286,260	301,840	5%
Transportation	723,440	726,190	<1%
Off-road equipment	35,240	11,580	-67%
Resource management	67,210	38,620	-43%
Water and wastewater	10,000	10,410	4%
Oil drilling	16,610	16,560	<-1%
Total	**1,452,070**	**1,432,540**	**-1%**

The San Onofre Nuclear Generating Station (SONGS) closed in early 2012. When this facility closed, Southern California Edison substituted natural gas power plants as an alternative to nuclear power. Since generating electricity from nuclear power plants does not produce GHG emissions, but generating electricity from natural gas does, this change caused an increase in emissions in the residential energy and the water and wastewater sectors. The rise in nonresidential emissions is also due to the closure of SONGS as well as to increased natural gas use by nonresidential buildings. Off-road equipment emissions declined substantially due to significantly less construction activity in 2012 compared to 2005. The decline in

resource management emissions mirrors a trend seen throughout the state, and is largely due to an increase in recycling and waste reduction strategies to keep waste out of landfills.

2.4 Forecast

The GHG forecast projects how emissions will change in the future relative to the baseline year of 2012. The forecast assumes that no new federal, state, regional, or local action will be taken to reduce GHG emissions beyond what was already in place in 2012, and so it represents a "worst case" scenario. It estimates emissions for the calendar years 2020 and 2040, for compliance with AB 32 and to match the 2040 buildout year in the General Plan, respectively.

The forecast uses expected changes in demographics to anticipate future GHG emissions. These demographic items are called forecast indicators. A list of forecast indicators and their corresponding sectors are given in **Table 2-2.**

TABLE 2-2: FORECAST INDICATORS

Indicator	Corresponding Sector	2012	2020	2040	Percent Change, 2012–2040
Population	None	192,650	197,170	211,050	10%
Households	Residential energy, off-road equipment	74,850	75,910	81,260	9%
Jobs	Nonresidential energy	77,400	83,350	93,400	21%
Service population	Resource management, water and wastewater	270,050	280,520	304,450	13%
Vehicle miles traveled	Transportation	1,544,688,480	1,630,649,720	1,814,179,890	17%

The results of the forecast for the General Plan are shown in **Table 2-3**. Since emissions from the oil drilling sector do not correspond to a particular indicator and are linked to global market activities that can be difficult to anticipate for the forecast years, the emissions associated with oil drilling are held constant at 2012 levels. Under the General Plan, the community's GHG emissions are expected to increase to 5% above 2012 levels by 2020, and 16% by 2040. The substantial increase in off-road equipment emissions is due to anticipated increases in construction activity.

TABLE 2-3: 2012–2040 FORECAST EMISSIONS BY SECTOR

Sector	2012 $MTCO_2e$	2020 $MTCO_2e$	2040 $MTCO_2e$	Percent Change, 2012–2040
Residential built environment	327,340	332,010	355,380	9%
Nonresidential built environment	301,840	321,680	355,170	18%
Transportation	726,190	755,700	840,750	16%
Off-road equipment	11,580	22,040	37,510	224%
Resource management	38,620	40,120	43,540	13%
Water and wastewater	10,410	10,800	11,730	13%
Oil drilling	16,560	16,560	16,560	0%
Total	**1,432,540**	**1,498,910**	**1,660,640**	**16%**
Percent change from 2012	**-**	**5%**	**16%**	**-**

2.5 GHG Reduction Goals

Policy ERC-5A in the General Plan directs Huntington Beach to reduce its total GHG emissions to 15% below 2005 levels by 2020, and 53.33% below the 2020 target by 2040, placing the community on a trajectory to match the state's long-term GHG reduction goals. These reduction goals are consistent with the statewide targets for GHG reduction efforts. This GGRP contains a suite of strategies capable of reducing Huntington Beach's GHG emissions to levels at or below the ones specified in Policy ERC-5A. These reduction targets are shown in **Table 2-4**.

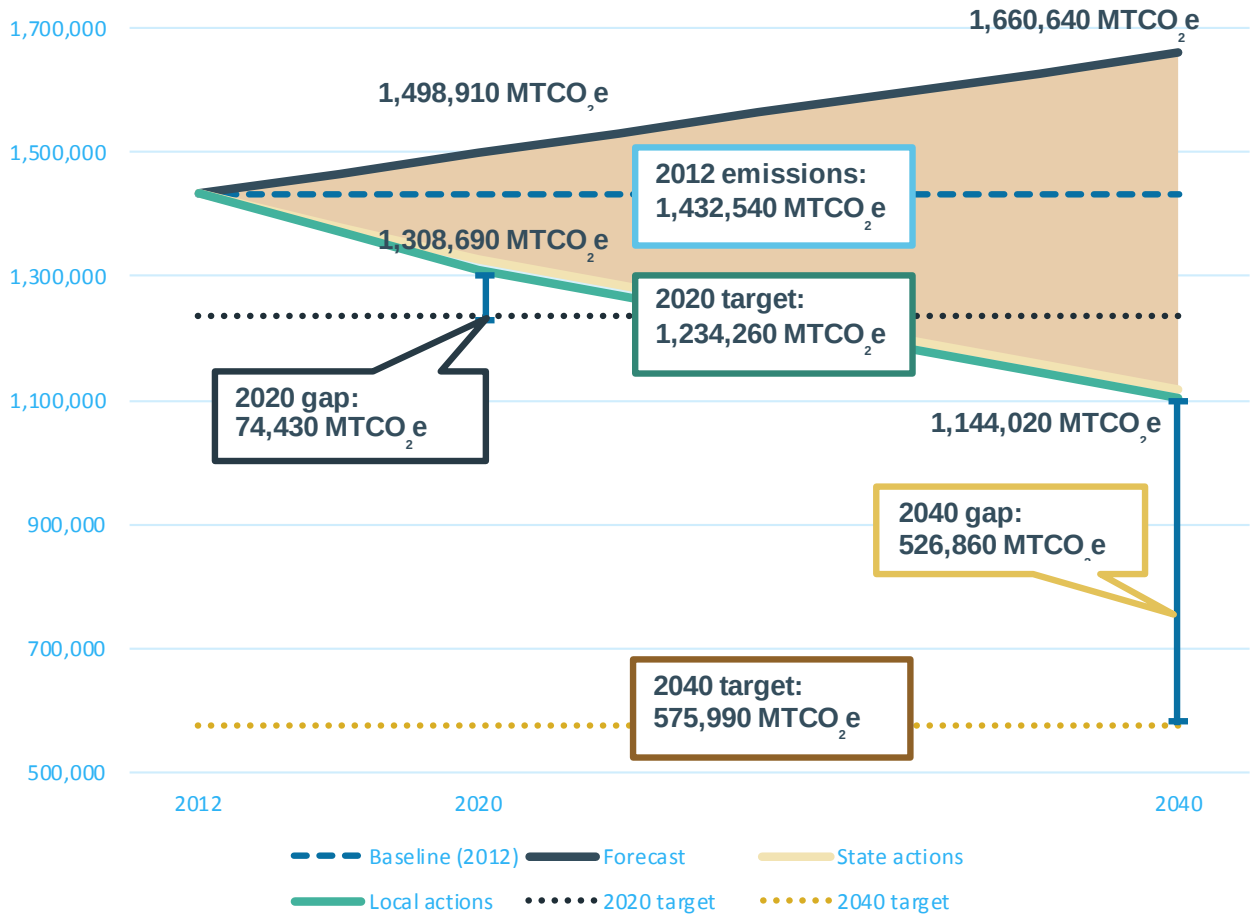
TABLE 2-4: GHG REDUCTION TARGETS

	2020 $MTCO_2e$	2040 $MTCO_2e$
GHG forecast	1,498,910	1,660,640
GHG reduction target	1,234,260	575,990

3. EXISTING GHG REDUCTION STRATEGIES

The forecast assumes that there are no federal, state, regional, or local actions taken to reduce GHG emissions, besides actions that were already in place by the baseline year of 2012. However, this scenario is not realistic, particularly given the extensive actions to reduce GHG emissions that are occurring at the state level. A number of policies are also in place locally to reduce GHG emissions. This section summarizes the existing reduction strategies applicable to Huntington Beach. These existing strategies do not fully achieve the GHG reduction goals in Policy ERC-5A, but they do achieve substantial reductions. With existing strategies, Huntington Beach is expected to be approximately 10% below 2005 levels by 2020, and 11% below the 2020 target by 2040. **Figure 3-1** shows the reductions from existing state and local reduction strategies, and the gap between the existing reduction strategies and the GHG reduction goals.

FIGURE 3-1: GHG REDUCTIONS FROM EXISTING STATE AND LOCAL REDUCTION STRATEGIES



3.1 State Reductions

The state reduction items were not in place or only partially enacted by 2012, and so are either not included in the forecast or are only partially accounted for. Every indication is that these state strategies, which are identified in the AB 32 Scoping Plan, will remain in place and will become more effective with time. As a result, it is more prudent to account for these state level strategies when anticipating Huntington Beach's future GHG emissions.

Although these state level reductions are intended to reduce California's total emissions, they have an impact at the local level and so directly reduce Huntington Beach's GHG emissions. There are four state actions that reduce local GHG emissions at a specific and measurable level, and so are included in the estimate of Huntington Beach's future GHG emissions.

1) **Clean Car Standards**: In 2002, California adopted AB 1493, the New Passenger Motor Vehicle Greenhouse Gas Emission Standards, also known as the Pavley standards. This bill requires a reduction in tailpipe GHG emissions from new vehicles sold in California between 2009 and 2016. A companion policy, the Low Carbon Fuel Standard (LCFS), was adopted in 2009 and requires a 10% reduction in the carbon intensity of all transportation fuels by 2020. These two policies, along

with expected changes in the types of vehicles driven in future years, reduce GHG emissions from on-road vehicles.

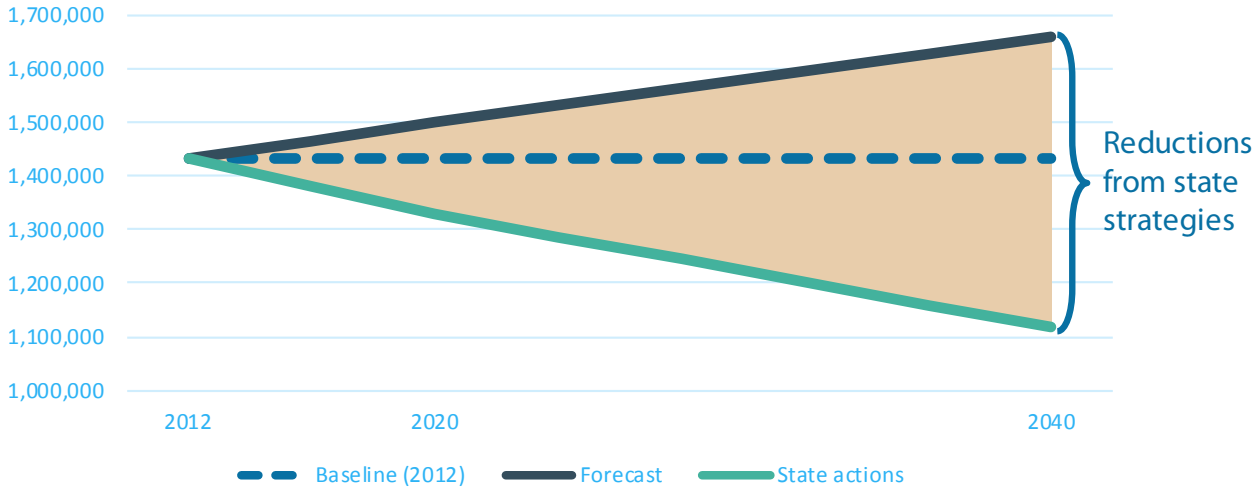
2) **Renewables Portfolio Standard**: The Renewables Portfolio Standard (RPS) was first established in 2002 and has been modified multiple times, most recently by SB 350 in 2015. It requires all of California's electricity providers, including Southern California Edison, to supply 33% of their electricity from eligible renewable resources by the end of 2020, and to supply 50% of their electricity from eligible renewable resources by the end of 2030. This policy reduces GHG emissions from electricity use, including electricity use to transport and process water and wastewater.

3) **Title 24 Energy Efficiency Standards**: Title 24, the California Building Standards Code, includes energy efficiency standards for all new construction. These statewide standards are updated every three years, generally becoming more stringent with each update, and are applied at the local level by cities and counties through project review. This policy reduces GHG emissions from electricity and natural gas use in new homes and nonresidential buildings.

4) **Coal-Free Electricity**: In 2012, Southern California Edison, the electricity provider for Huntington Beach, received permission to sell its share in the Four Corners Generating Station in New Mexico, a coal-fired power plant which was the only source of coal-supplied electricity to Southern California Edison. The California Public Utilities Commission, which regulates privately owned utilities, had previously required that Southern California Edison stop procuring electricity from coal-fired power plants by 2016. As coal is one of the most GHG-intensive sources of electricity, this policy to replace coal with other fuels will reduce GHG emissions from electricity use in homes and nonresidential buildings.

Figure 3-2 shows the GHG reduction benefit from state reduction strategies.

FIGURE 3-2: GHG REDUCTIONS FROM STATE REDUCTION STRATEGIES



3.2 Local Accomplishments

Local accomplishments are strategies taken by the City, local residents, and local businesses that reduce GHG emissions, or support reductions by providing education and resources. Key local accomplishments include the following items:

- EPIC Challenge Partnership: Huntington Beach has been awarded $1.9 million from the state and local utility companies to convert the Oak View neighborhood to an Advanced Energy Community, under the state's Electric Program Investment Charge (EPIC) program. The work will involve designing and implementing a variety of energy efficiency and renewable energy technologies. Huntington Beach will partner with the University of California, Irvine, technology firms, utilities, and the National Renewable Energy Laboratory on this effort.
- LED Streetlight Conversion: Huntington Beach is currently in the process of converting all 14,000 streetlights in the community to LED bulbs, which use less than half as much energy as the existing bulbs. LED bulbs also provide increased visibility and have lower maintenance costs, improving nighttime lighting conditions and saving the City money.
- Recycling Market Development Zone: Huntington Beach is part of the Orange County Recycling Market Development Zone, which offers economic assistance to businesses within the zone that use waste materials to produce new goods. The program provides low-interest loans, permit assistance, and help obtaining waste materials from appropriate sources.
- Sustainable Business Certification: Huntington Beach has established a program that allows local firms to become officially recognized as a sustainable business. The program, which works as part of the statewide California Green Business Program, is open to businesses of all types and sizes. Currently there are 10 certified sustainable businesses in Huntington Beach, including restaurants, cleaning services, and pet supply stores.

There are 20 identified local accomplishments, including the above programs. All local accomplishments are listed below:

- Allowing developments with affordable housing units to be built to higher densities
- Using treated groundwater to cool Boeing campus buildings
- Retrofitting a City parking garage
- Passing a Transportation Demand Management ordinance
- Allowing residents to exchange polluting lawnmowers for cleaner models
- Participating in the Local Government Energy Efficiency Partnership
- Paperwork reduction efforts in municipal operations
- Creating a Bicycle Master Plan to direct new bicycle infrastructure
- Converting City vehicles to run on compressed natural gas (CNG)
- Establishing a downtown shuttle
- Establishing financing opportunities for energy efficiency retrofits, such as home improvement and rehabilitation loans
- Converting all streetlights to LEDs
- Adopting and implementing a Municipal Energy Action Plan
- Installing solar panels on City buildings and supporting solar installations on private property

- Reducing barriers to new graywater systems
- Encouraging businesses to receive Sustainable Business Certification
- Receiving funding through EPIC Challenge Partnership
- Requiring water-efficient landscaping
- Developing a Neighborhood Electric Vehicle plan
- Participating in a Recycling Market Development Zone

4. FUTURE GHG REDUCTION STRATEGIES

4.1 Strategy Development

Huntington Beach's GHG reduction strategies are the outcome of an extensive process to determine strategies that are most appropriate to the community. These strategies are grounded in community values and objectives (including the goals and policies of the General Plan), feasibility of implementation, and past successful GHG reduction efforts. The reduction strategies in this GGRP are based on the following sources:

- The Huntington Beach GHG emissions inventory and forecast.
- A review of the existing and planned accomplishments, noting where substantial opportunities for reduction remain and if successful strategies can be implemented.
- An analysis of the goals and policies in the General Plan, as well as other regional plans such as the Southern California Association of Governments' SCS.
- A review of state adopted and evaluated GHG reduction policies, including feasible long-term strategies.
- Discussions among City staff to identify appropriate efforts.
- An audit of best practices to reduce GHG emissions in Orange County and the broader South Coast region.
- Discussions and public comments at meetings of the General Plan Update Sustainability Task Force.

These strategies were revised and refined, and ultimately reduced to 42 strategies, 36 of which have measurable GHG reduction benefits. The other six strategies do not directly lead to measurable reductions, but are supportive of other GHG reduction strategies and provide other benefits to the community. The strategies are divided into the following nine categories:

1) Land use (LU)
2) Transportation (T)
3) Alternative fuels (F)
4) Renewable energy (RE)
5) Energy efficiency (EE)
6) Off-road equipment (OR)
7) Water and wastewater (WW)
8) Resource Management (RM)
9) Community awareness (CA)

4.2 GHG Strategies

Collectively, the 42 strategies presented in this section can reduce emissions to approximately 16% below 2005 levels by 2020, and approximately 53% below the 2020 target by 2040, achieving 2020 reductions greater than specified under Policy ERC-5A. For each GHG reduction strategy, this study identifies the 2020 and 2040[2] GHG reductions from the measure, the associated policies and implementation actions in the General Plan, and the City department responsible for implementing the strategy. Implementation actions for each measure are presented in Section 5, Implementation, of this GGRP. Performance targets and assumptions underlying the estimated GHG emissions reductions for each measure are presented in the Technical Appendix that accompanies this GGRP.

Case studies, scientific publications, and other relevant documents were used as a basis to determine the GHG reduction potential of each strategy and which implementation actions would effectively carry out the intent of the measure. As with any plan or strategy that guides future actions, the City cannot say with absolute certainty that the desired effects are caused entirely by the City actions outlined in this GGRP, as other factors outside of the City's control may also have an influence. For example, some observed increases in bicycling activity may result from factors beyond those City actions specified in Strategy T-1. However, the connection between the reductions and the implementation actions are supported by substantive evidence and demonstrate reasonable causation.

Land Use Strategies

LU-1 – Improved pedestrian network: Improve the safety and convenience of the pedestrian network to support walking as a viable alternative.

A pedestrian-friendly environment provides another way for residents and visitors to get around Huntington Beach. Improving pedestrian facilities can make walking easier for residents and visitors and thereby reduce driving and GHG emissions from fossil-fueled vehicles. Walking can lead to a more active and healthy lifestyle. Pedestrian-friendly measures also encourage a more active and vibrant street environment, which can direct more foot traffic to local businesses.

2020 GHG Reduction: 840 $MTCO_2e$

2040 GHG Reduction: 3,940 $MTCO_2e$

Associated General Plan Policies: LU-3.B, LU-4.B, LU-4.E, LU-7.D, LU-8.A, LU-12.C, CIRC-3.D, CIRC-3.E, CIRC-4.C, CIRC-4.E, CIRC-5.A, CIRC-5.B, CIRC-5.E, CIRC-6.A, CIRC-6.B, CIRC-6.C, CIRC-6.D, CIRC-6.E, CIRC-6.G, ERC-1.D, ERC-1.G

Associated General Plan Implementation Actions: LU-P.1, LU-P.3, LU-P.8, LU-P.9, LU-P.13, LU-P.14, LU-P.15, LU-P.25, CIRC-P.11, CIRC-P.15, CIRC-P.16, CIRC-P.18, CIRC-P.20, CIRC-P.26, CIRC-P.27, CIRC-P.35, ERC-P.23, ERC-P.24

Responsible City Departments: Community Development, Public Works

LU-2 – Inclusionary housing units: Increase the amount of inclusionary housing in major job centers and transit-accessible areas of Huntington Beach.

[2] Measures that involve a change in electricity use will show two 2040 GHG reductions: one with implementation of Community Choice Aggregation (CCA, strategy RE-6), and one without. CCA does not affect 2020 GHG reductions because the GGRP does not evaluate the effects of implementing CCA before 2020. A measure that increases electricity use (for example, promoting electric vehicles) will show a higher GHG reduction with CCA. A measure that decreases electricity use (for example, supporting home energy retrofits) will show a lower GHG reduction with CCA.

Inclusionary housing units provide a safe and affordable home environment for disadvantaged people and families. The City has already taken action to increase the number of these units through the City's Affordable Housing ordinance and the Housing Element of the General Plan. By locating these units in job centers and transit-accessible areas, the City makes it easier for inclusionary housing residents to reduce or eliminate car use, reducing GHG emissions and improving social and economic equity in the community.

2020 GHG Reduction: 40 $MTCO_2e$

2040 GHG Reduction: 250 $MTCO_2e$

Associated General Plan Policies: LU-1.C, LU-4.B, LU-4.E, LU-5.D, LU-14.C, CIRC-6.C

Associated General Plan Implementation Actions: LU-P.1, LU-P.7, LU-P.8, LU-P.9, LU-P.10, CIRC-P.18, CIRC-P.26, CIRC-P.27

Responsible City Departments: Community Development, Office of Business Development

Transportation Strategies

T-1 – Bike ridership: Increase the scope and capacity of bicycle lanes and bicycle infrastructure in Huntington Beach.

Bicycles are already a popular mode of transit in Huntington Beach and other Southern California beach communities. They reduce GHG emissions by getting people out of cars, encourage healthy behaviors by providing exercise, and make it easier for people without access to a vehicle to get around. By building new bicycle lanes, bicycle parking, and other new bicycle infrastructure as specified in the Huntington Beach Bicycle Master Plan, the City can make biking an even better option for Huntington Beach residents and businesses.

2020 GHG Reduction: 7,930 $MTCO_2e$

2040 GHG Reduction: 9,470 $MTCO_2e$

Associated General Plan Policies: LU-3.B, LU-8.A, LU-11.B, LU-13.D, LU-14.D, CIRC-3.D, CIRC-3.E, CIRC-4.A, CIRC-4.C, CIRC-4.E, CIRC-5.A, CIRC-5.B, CIRC-5.D, CIRC-5.E, CIRC-6.A, CIRC-6.C, CIRC-6.D, CIRC-6.E, CIRC-6.F, CIRC-6.G, ERC-1.D, ERC-1.G

Associated General Plan Implementation Actions: LU-P.1, LU-P.3, LU-P.8, LU-P.9, LU-P.15, LU-P.26, CIRC-P.7, CIRC-P.11, CIRC-P.15, CIRC-P.18, CIRC-P.20, CIRC-P.26, CIRC-P.28, CIRC-P.32, CIRC-P.33, CIRC-P.35, ERC-P.24

Responsible City Departments: Community Development, Public Works

T-2 – Shared parking: Use shared parking strategies to maximize development potential while providing a sufficient supply of parking.

Parking is an important feature for new developments in Huntington Beach, and it is critical to ensure there are enough spaces. However, some developments may only need most of their parking spaces for part of the day. Shared parking allows property owners greater flexibility in the design of their developments and helps avoid creating large parking lots that are empty most of the time, while continuing to provide an adequate supply of off-street parking to meet demand.

2020 GHG Reduction: 1,030 $MTCO_2e$

2040 GHG Reduction: 12,740 $MTCO_2e$

Associated General Plan Policies: CIRC-2.D, CIRC-5.A

Associated General Plan Implementation Actions: LU-P.27, CIRC-P.18

Responsible City Department: Community Development

T-3 – Increased transit ridership: Increase transit ridership to minimize congestion, improve air quality, and promote increased mobility.

Public transit is a critical service that allows all people, including those without access to cars, a way to effectively travel within Huntington Beach and to other communities in the region. It also emits fewer GHG emissions per rider than a personal vehicle and reduces congestion on local roadways. Huntington Beach can continue to work with the Orange County Transportation Authority to allow for high-quality public transit that is fast, frequent, predictable, convenient, and safe.

2020 GHG Reduction: 3,670 $MTCO_2e$

2040 GHG Reduction: 12,060 $MTCO_2e$

Associated General Plan Policies: LU-3.B, LU-4.B, LU-11.B, LU-12.C, LU-13.D, LU-14.D, CIRC-3.A, CIRC-3.B, CIRC-3.C, CIRC-3.D, CIRC-3.E, CIRC-3.F, CIRC-4.A, CIRC-4.B, CIRC-4.C, CIRC-4.D, CIRC-4.E, CIRC-4.F, CIRC-5.A, CIRC-5.B, CIRC-6.A, CIRC-6.I, CIRC-8.D

Associated General Plan Implementation Actions: LU-P.1, LU-P.8, LU-P.9, LU-P.15, CIRC-P.8, CIRC-P.14, CIRC-P.15, CIRC-P.18, CIRC-P.20, CIRC-P.26, CIRC-P.27, CIRC-P.28, CIRC-P.33, CIRC-P.35, ERC-P.24

Responsible City Departments: Community Development, Public Works

T-4 – Carsharing: Attract carshare services to Huntington Beach and promote them as a supplemental transportation service.

Carshare services, such as Zipcar, provide vehicles to people who may need a second car only occasionally, allowing them to avoid buying a vehicle that may sit unused most of the time. These on-demand services make it easier for residents to have fewer cars, or even to avoid car ownership entirely. Similarly, ride-sourcing services such as Lyft or Uber make it easier for residents to take occasional trips as needed without relying on their own vehicles, and are also a convenient choice for visitors.

2020 GHG Reduction: 4,470 $MTCO_2e$

2040 GHG Reduction: 3,920 $MTCO_2e$

Associated General Plan Policies: CIRC-3.C, CIRC-3.F, CIRC-8.D

Associated General Plan Implementation Actions: LU-P.1, LU-P.9, CIRC-P.18, CIRC-P.20, CIRC-P.26, CIRC-P.27, CIRC-P.30, CIRC-P.35

Responsible City Department: Community Development, Public Works

T-5 – Telecommuting and alternative work schedules: Establish telecommuting and alternative work schedules to reduce peak commute traffic.

Telecommuting and alternative work schedules provide an alternative to the typical commute for flexible employees and businesses. Alternative work schedules let employees travel outside of the normal rush hour periods, resulting in a shorter commute time and less congestion, reducing GHG emissions from

vehicles. Telecommuting lets workers further reduce their commute by allowing them to work from home for some days in the week, which decreases GHG emissions and can help improve employee satisfaction.

2020 GHG Reduction: 860 $MTCO_2e$

2040 GHG Reduction: 1,440 $MTCO_2e$

Associated General Plan Policies: LU-9.D, CIRC-5.A

Associated General Plan Implementation Actions: LU-P.1, CIRC-P.8, CIRC-P.18, CIRC-P.20, CIRC-P.26, CIRC-P.27, CIRC-P.35

Responsible City Departments: City Manager, Community Development

T-6 – Transportation Demand Management: Reduce commute-related trips for major employers.

Transportation Demand Management (TDM) is a suite of strategies that helps employees, particularly at large companies and institutions, to travel to work using alternative methods. This can include biking or walking to work, taking public transit, using alternative fuel vehicles, utilizing vanpools and park and ride lots, or telecommuting, among others. Huntington Beach's existing TDM ordinance provides a foundation for additional TDM efforts that reduce GHG emissions and helps employees save money.

2020 GHG Reduction: 160 $MTCO_2e$

2040 GHG Reduction: 1,450 $MTCO_2e$

Associated General Plan Policies: LU-3.B, LU-4.B, LU-9.D, LU-11.B, LU-12.C, LU-13.D, CIRC-2.D, CIRC-3.A, CIRC-3.B, CIRC-3.D, CIRC-3.E, CIRC-3.F, CIRC-4.F, CIRC-5.A, CIRC-5.C, CIRC-5.D, CIRC-5.E, CIRC-6.A, CIRC-6.C, CIRC-6.E, CIRC-6.F, CIRC-8.D

Associated General Plan Implementation Actions: LU-P.1, CIRC-P.8, CIRC-P.14, CIRC-P.18, CIRC-P.20, CIRC-P.21, CIRC-P.26, CIRC-P.27, CIRC-P.30, CIRC-P.35

Responsible City Departments: City Manager, Community Development

T-7 – Shuttle service: Provide a year-round shuttle service for visitor destinations.

Huntington Beach in the past has provided shuttle service during busy visitor times, such as the Fourth of July or the US Open of Surfing. As feasible, the City can follow the example of many other communities and provide a year-round shuttle that serves Downtown, the beach, and other visitor destinations. This makes it easier for visitors to get around without a car, and can also provide a viable transportation alternative for local residents who work in these areas.

2020 GHG Reduction: 90 $MTCO_2e$

2040 GHG Reduction: 60 $MTCO_2e$

Associated General Plan Policies: LU-12.C, LU-13.D, LU-14.D, CIRC-3.A, CIRC-3.B, CIRC-3.C, CIRC-3.D, CIRC-3.E, CIRC-3.F, CIRC-4.B, CIRC-4.C, CIRC-4.D, CIRC-4.E, CIRC-4.F

Associated General Plan Implementation Actions: LU-P.3, LU-P.9, LU-P.15, LU-P.24, CIRC-P.8, CIRC-P.14, CIRC-P.18, CIRC-P.20, CIRC-P.27, CIRC-P.28, CIRC-P.33, CIRC-P.35

Responsible City Department: Office of Business Development

T-8 – Traffic calming: Install traffic-calming features on appropriate roadways to better allow for active transportation.

Traffic-calming features, such as speed bumps and curb extensions, help reduce traffic speeds and are particularly well suited to quiet neighborhoods. They can also be effective in busy areas with high foot and bike traffic, such as Downtown. By reducing traffic speeds, traffic-calming features make an area safer, and thus walking and biking more attractive options for pedestrians and bicyclists.

2020 GHG Reduction: 130 $MTCO_2e$

2040 GHG Reduction: 230 $MTCO_2e$

Associated General Plan Policies: CIRC-4.C, CIRC-5.B, CIRC-5.D, CIRC-5.E, CIRC-6.D

Associated General Plan Implementation Actions: LU-P.4, CIRC-P.6, CIRC-P.15, ERC-P.24

Responsible City Department: Public Works

Alternative Fuel Strategies

F-1 – Traffic signal synchronization: Continue to synchronize traffic signals along major roadways to reduce traffic idling.

Synchronized traffic signals are timed so that vehicles traveling down a roadway are not always forced to wait for long periods at red lights at each intersection. This reduces idling time, which in turn decreases GHG emissions and saves fuel. They are well-suited for major roadways, where high-vehicle speeds do not create a significant safety risk to pedestrians and bicyclists. Huntington Beach has been successful with traffic signal synchronization and can expand on these efforts to further reduce GHG emissions, especially in partnership with neighboring communities.

2020 GHG Reduction: 2,340 $MTCO_2e$

2040 GHG Reduction: 4,850 $MTCO_2e$ without CCA; 4,810 $MTCO_2e$ with CCA

Associated General Plan Policies: CIRC-1.C, CIRC-1.F, CIRC-1.I

Associated General Plan Implementation Actions: LU-P.1, CIRC-P.11, CIRC-P.13, CIRC-P.26, CIRC-P.27, ERC-P.24

Responsible City Department: Public Works

F-2 – Electric vehicles: Increase electric vehicle adoption in Huntington Beach.

Modern electric vehicles (EVs) are a new option for car buyers. They are quieter and cheaper to operate than gasoline or diesel vehicles, do not emit pollution or GHGs, and can increasingly meet the daily needs of many drivers. As the cost of EVs continues to decline and these vehicles become more popular, the City and regional partners should provide education about EVs and ensure that the local infrastructure can effectively support them.

2020 GHG Reduction: 7,790 $MTCO_2e$

2040 GHG Reduction: 37,660 $MTCO_2e$ without CCA; 47,460 $MTCO_2e$ with CCA

Associated General Plan Policies: CIRC-5.F, CIRC-8.A, CIRC-8.B, CIRC-8.C, CIRC-8.D

Associated General Plan Implementation Actions: LU-P.1, LU-P.27, CIRC-P.26, CIRC-P.27, CIRC-P.35, ERC-P.16, ERC-P.17

Responsible City Departments: City Manager, Community Development, Public Works

F-3 – Biofuel vehicles: Increase the use of biofuel-powered vehicles in the community.

Biofuels are fuels derived from organic matter such as agricultural or restaurant waste, rather than oil. Vehicles that rely on biofuels perform similarly to conventional vehicles, but emit fewer GHGs and pollutants. As state and federal policies continue to emphasize cleaner cars, there are new opportunities for biofuel vehicles to play a larger role. This can include producing biofuel locally from available sources, supporting the local economy and further reducing GHG emissions.

2020 GHG Reduction: 820 $MTCO_2e$

2040 GHG Reduction: 2,660 $MTCO_2e$

Associated General Plan Policies: CIRC-5.F, CIRC-8.A, CIRC-8.B, CIRC-8.C, CIRC-8.D

Associated General Plan Implementation Actions: LU-P.27, CIRC-P.27, CIRC-P.35, ERC-P.16, ERC-P.17

Responsible City Departments: City Manager, Community Development, Public Works

F-4 – Autonomous vehicles: Enable autonomous vehicle operation in Huntington Beach to improve mobility and increase traffic efficiency.

Autonomous vehicles are an emerging technology that will allow vehicles to drive themselves to their destination with little or no action from the driver. They open up a range of possibilities, including allowing for more fuel-efficient driving, providing increased mobility for people unable to drive, and new carsharing opportunities in which residents can request an autonomous vehicle from a shared fleet whenever needed rather than needing to purchase and maintain a personal car. As autonomous vehicles move from laboratories and test tracks to public streets, the City can take steps to ensure their safe operations, and to allow residents and businesses to reap the benefits that these vehicles offer.

2020 GHG Reduction: 0 $MTCO_2e$

2040 GHG Reduction: 12,270 $MTCO_2e$

Associated General Plan Policies: CIRC-1.I

Associated General Plan Implementation Actions: LU-P.1, CIRC-P.26, CIRC-P.30

Responsible City Department: Public Works

Renewable Energy Strategies

RE-1 – Residential solar: Expand the number of solar energy systems on new and existing single-family homes and multifamily developments.

Solar photovoltaic (PV) systems can be installed on the roofs, garages, and carports of many new and existing homes. Once in place, they generate electricity for the home to use, replacing the electricity purchased from a utility company. Homes with large enough PV systems that are sufficiently energy efficient can generate enough electricity to meet their needs during daytime hours. Extensive state, regional, and local policies can make it easier for residents to install PV systems, including how to reduce the system's costs. Some homes can also support solar water heaters, replacing some natural gas use with renewable energy.

2020 GHG Reduction: 6,000 $MTCO_2e$

2040 GHG Reduction: 45,240 $MTCO_2e$ without CCA; 28,430 $MTCO_2e$ with CCA

Associated General Plan Policies: LU-5.B, ERC-13.A, ERC-13.B, ERC-13.C, ERC-13.E, ERC-13.G

Associated General Plan Implementation Actions: LU-P.17, LU-P.27, LU-P.28, ERC-P.6, ERC-P.9, ERC-P.12

Responsible City Department: Community Development

RE-2 – Nonresidential solar: Expand the number of solar energy systems on new and existing nonresidential buildings.

Although solar energy systems are more common on homes, businesses can receive the same benefits from PV and solar water heater installations. These systems reduce dependence on utility companies, letting owners and tenants save money on their energy bills. A number of financing systems are available to businesses, and the City can expand educational and financing opportunities.

2020 GHG Reduction: 4,220 $MTCO_2e$

2040 GHG Reduction: 32,080 $MTCO_2e$ without CCA; 22,720 $MTCO_2e$ with CCA

Associated General Plan Policies: LU-5.B, ERC-5.D, ERC-12.C, ERC-13.A, ERC-13.B, ERC-13.C, ERC-13.D, ERC-13.E, ERC-13.G

Associated General Plan Implementation Actions: LU-P.16, LU-P.27, LU-P.28, ERC-P.6, ERC-P.9, ERC-P.12, ERC-P.20, ERC-P.38

Responsible City Departments: City Manager, Community Development

RE-3 – Community-shared solar: Establish community-shared solar operations in Huntington Beach to support the increased use of renewable energy.

While rooftop solar energy systems are increasingly popular, they are not always feasible for some residents and businesses. Community-shared solar allows residents and businesses to pool together and buy a share in a medium or large solar energy system, receiving the benefits provided by the system without having to install solar panels on their own roofs. These programs are supported by recent state laws and regulations, and provide another way to increase renewable energy use in Huntington Beach.

2020 GHG Reduction: 230 $MTCO_2e$

2040 GHG Reduction: 3,680 $MTCO_2e$ without CCA; 2,310 $MTCO_2e$ with CCA

Associated General Plan Policies: ERC-5.D, ERC-13.B, ERC-13.E, ERC-13.G, HAZ-5.B

Associated General Plan Implementation Actions: ERC-P.10, HAZ-P.7

Responsible City Department: City Manager

RE-4 – New zero net energy buildings: Transition to zero net energy buildings for all new construction in support of state mandates.

Zero net energy (ZNE) buildings generate as much energy as they use over the course of a year. They combine renewable energy systems with advanced energy-efficiency features, and may be any type of building, from single-family homes to large hotels or industrial facilities. California's state building code is moving in this direction, requiring new homes to be ZNE after 2020 and new nonresidential buildings to be ZNE after 2030. By establishing a framework for ZNE buildings in advance of state mandates, the City can help make sure that residents and businesses are prepared for this new requirement and are best able to take advantage of the benefits offered by ZNE buildings.

2020 GHG Reduction: 0 $MTCO_2e$

2040 GHG Reduction: 7,380 $MTCO_2e$ without CCA; 6,310 $MTCO_2e$ with CCA

Associated General Plan Policies: LU-5.B, ERC-12.A, ERC-12.B, ERC-13.C, ERC-13.A, ERC-13.B, ERC-13.C, ERC-13.D, ERC-13.G

Associated General Plan Implementation Actions: LU-P.16, LU-P.17, LU-P.27, LU-P.28, ERC-P.6, ERC-P.9, ERC-P.20, ERC-P.29, ERC-P.35, ERC-P.38, ERC-P.42, ERC-P.44

Responsible City Department: Community Development

RE-5 – Solar swimming pool heating: Use solar heating technologies for an increased number of new and existing swimming pools.

Solar water heating, which uses the sun's energy to supplement or replace natural gas in a water heater, is particularly well suited to swimming pools. Pools are most used during hot summer days, when solar energy is greatest. Solar water heating is an established technology for swimming pools, and is increasingly more economically feasible than conventional pool heaters.

2020 GHG Reduction: 260 $MTCO_2e$

2040 GHG Reduction: 1,630 $MTCO_2e$

Associated General Plan Policies: ERC-12.A, ERC-13.A, ERC-13.C

Associated General Plan Implementation Actions: LU-P.17, LU-P.28, ERC-P.6, ERC-P.9, ERC-P.12

Responsible City Department: Community Development

RE-6 – Community Choice Aggregation: Explore the feasibility of launching a community choice aggregation program to increase local control of energy sources.

Community choice aggregation (CCA, also called community choice energy or CCE) is a system that allows local governments to supply electricity to local residents and businesses while using existing utility-owned transmission and distribution systems. Local governments choose where the electricity comes from and

how much to charge, which in practice has led to an increased supply of renewable electricity at rates that have been comparable to utility companies.[3]

There are five CCA programs operating in California as of January 2017 (as shown in the footnote), with several more set to launch or under consideration.

2020 GHG Reduction: 0 $MTCO_2e$

2040 GHG Reduction: 104,660 $MTCO_2e$ with CCA[4]

Associated General Plan Policies: ERC-5.D, ERC-13.B, ERC-13.F

Associated General Plan Implementation Actions: ERC-P.13

Responsible City Department: City Manager

Community Choice Aggregation: Energy Sources and Rates

All CCA programs in California offer multiple levels of renewable energy. Customers are enrolled by default at a basic tier of renewable energy, sometimes called a "light green" tier. As of January 2017, the basic tier of renewable energy offers between 35% and 52% renewable energy, depending on the specific CCA program. Each CCA program also allows customers to choose 100% renewable energy, paying a somewhat higher electricity rate. This 100% tier is sometimes called a "dark green" tier. The renewable energy tiers of any future Huntington Beach CCA will be decided as part of the CCA's start-up activities.

The rates for basic tier service are similar to the rates for standard utility companies, such as SCE. As of January 2017, a typical home will pay lower electricity bills when participating in a CCA for four of California's five CCA programs (participants in the fifth program, Marin Clean Energy, pay slightly higher bills but receive the most renewable energy of any CCA basic tier participants). The table in the footnote below provides a rate comparison between CCAs and utility companies.

Energy Efficiency Strategies

EE-1 – Residential homeowner retrofits: Reduce the amount of energy used by existing owner-occupied households through comprehensive residential energy retrofits.

According to the US Census, approximately 76% of the homes in Huntington Beach were built before 1980, prior to the rise of energy-efficient building codes. These homes may use substantially more energy than modern homes, which can cost owners money and make the homes less comfortable. Energy-efficiency

[3] **Increase in Renewable Energy and Cost Savings from CCAs Compared to Utility Companies**

	Marin Clean Energy	Sonoma Clean Power	Lancaster Choice Energy	CleanPower SF	Peninsula Clean Energy
Increase in Renewable Energy	22%	6%	10%	5%	20%
Monthly Cost Savings	-$1.57 *	$0.96	$0.26	$0.04	$2.16

** The average home is expected to see an increase in costs when switching to MCE, due to state fees.*
Note: Costs are for an average home. Sources: CPUC 2016; LCE 2017; MCE 2017; PCE 2017; SCP 2017; SFPUC 2016

[4] This measure has no reductions if CCA is not active.

retrofits, which can range from making small changes to complete home reconstructions, allow homeowners to save money and use less energy. Numerous programs help homeowners learn about which retrofit options make the most sense and how best to finance these activities.

2020 GHG Reduction: 14,850 $MTCO_2e$

2040 GHG Reduction: 101,730 $MTCO_2e$ without CCA; 82,700 $MTCO_2e$ with CCA

Associated General Plan Policies: ERC-11.A, ERC-11.B, ERC-11.C, ERC-13.G

Associated General Plan Implementation Actions: LU-P.17, LU-P.28, ERC-P.6, ERC-P.7, ERC-P.9, ERC-P.29, ERC-P.35, ERC-P.42, ERC-P.44

Responsible City Departments: City Manager, Community Development

EE-2 – Rental unit retrofits: Improve energy efficiency in residential rental units.

Like owner-occupied homes, older rental units are often significantly less energy efficient than newer units. Although renters usually do not have much ability to retrofit their homes, effective partnerships between renters and landlords can make these actions easier, more equitable, and beneficial to everyone involved. Improvements to windows and doors, insulation, appliances, and water heaters are examples of options for energy-efficiency retrofits in rental units, and a variety of educational and financing programs make retrofits easier and more affordable.

2020 GHG Reduction: 5,870 $MTCO_2e$

2040 GHG Reduction: 36,130 $MTCO_2e$ without CCA; 29,340 $MTCO_2e$ with CCA

Associated General Plan Policies: ERC-11.A, ERC-11.B, ERC-11.C, ERC-13.G

Associated General Plan Implementation Actions: LU-P.17, LU-P.28, ERC-P.6, ERC-P.7, ERC-P.9, ERC-P.29, ERC-P.35, ERC-P.42, ERC-P.44

Responsible City Departments: City Manager, Community Development

EE-3 – Nonresidential retrofits: Reduce energy use in nonresidential buildings.

While older nonresidential buildings are affected by the same energy inefficiency issues that affect older homes, retrofitting these facilities requires a substantially different approach. Businesses use energy in a different way than homes, and so effective nonresidential energy-efficiency programs must be specially focused for these buildings. A wide range of options are available to retrofit nonresidential buildings to be more energy efficient, including strategies supported by state efforts and being potentially eligible for state-sponsored rebates.

2020 GHG Reduction: 7,790 $MTCO_2e$

2040 GHG Reduction: 64,730 $MTCO_2e$ without CCA; 46,450 $MTCO_2e$ with CCA

Associated General Plan Policies: LU-5.B, LU-13.C, ERC-11.A, ERC-11.D, ERC-13.G

Associated General Plan Implementation Actions: LU-P.16, LU-P.28, ERC-P.6, ERC-P.7, ERC-P.8, ERC-P.9, ERC-P.20, ERC-P.29, ERC-P.35, ERC-P.38, ERC-P.42, ERC-P.44

Responsible City Departments: City Manager, Community Development

EE-4 – Industrial retrofits: Reduce energy use in major industrial facilities.

Large industrial users present unique challenges for energy efficiency. These facilities usually have specialized equipment not covered by standard retrofit programs, and buildings designed to meet particular needs where conventional retrofit activities may not be feasible. Special retrofit programs, such as those aimed at reducing energy used by industrial equipment, can help address these challenges. As with other types of retrofits, financing programs are often available for industrial energy efficiency. Industrial energy-efficiency retrofits can also benefit tremendously from increased collaboration with local trade groups, offering increased opportunities for public-private partnerships.

2020 GHG Reduction: 280 $MTCO_2e$

2040 GHG Reduction: 1,380 $MTCO_2e$ without CCA; 2,740 $MTCO_2e$ with CCA

Associated General Plan Policies: LU-5.B, LU-13.C, ERC-5.D, ERC-11.A, ERC-13.G

Associated General Plan Implementation Actions: LU-P.16, LU-P.28, ERC-P.6, ERC-P.7, ERC-P.8, ERC-P.9, ERC-P.29, ERC-P.35, ERC-P.38, ERC-P.42, ERC-P.44

Responsible City Departments: City Manager, Community Development

EE-5 – Public lighting retrofits: Retrofit publicly and privately owned outdoor lights to reduce energy use.

Lighting retrofits are often the most cost-effective form of energy-efficiency retrofits, paying for themselves within a few years. Public lighting, such as streetlights, traffic signals, and lights in outdoor plazas and parks, is no exception. The City has already started retrofitting streetlights to use energy-efficient LED bulbs, and more opportunities remain for privately owned outdoor lights. Emerging options, such as renewable energy systems on lamp poles, may offer increased energy savings.

2020 GHG Reduction: 410 $MTCO_2e$

2040 GHG Reduction: 2,670 $MTCO_2e$ without CCA; 1,680 $MTCO_2e$ with CCA

Associated General Plan Policies: LU-13.C, ERC-11.A, ERC-11.C, ERC-11.D, ERC-13.G

Associated General Plan Implementation Actions: LU-P.16, LU-P.28, ERC-P.6, ERC-P.7, ERC-P.8, ERC-P.9, ERC-P.20, ERC-P.29, ERC-P.35, ERC-P.42, ERC-P.44

Responsible City Departments: City Manager Community Development

EE-6 – Swimming pool efficiencies: Reduce energy use in private swimming pools.

A swimming pool is one of the largest energy users in a home. In California, the energy use of pool pumps and heaters can be more than half of the entire home's energy use. Fortunately, a number of options can dramatically cut swimming pool energy use without affecting how the pool is used. Energy-efficient pool pumps and heaters, as well as effective use of pool covers, are cost-effective strategies. Owners of existing swimming pools can also consider installing solar water heaters (see Measure RE-5), which can help achieve further savings.

2020 GHG Reduction: 1,010 $MTCO_2e$

2040 GHG Reduction: 4,140 $MTCO_2e$ without CCA; 3,600 $MTCO_2e$ with CCA

Associated General Plan Policies: ERC-11.A, ERC-11.C, ERC-13.G

Associated General Plan Implementation Actions: LU-P.17, LU-P.28, ERC-P.6, ERC-P.7, ERC-P.9, ERC-P.29, ERC-P.35, ERC-P.42

Responsible City Department: Community Development

EE-7 – Low-income weatherization: Improve energy efficiency and comfort in low-income housing units through weatherization.

While numerous financing mechanisms are available to help residents decrease their home energy use, these conventional programs may still place the cost of energy-efficiency retrofits out of reach for low-income residents. Inefficient homes can have much higher energy bills, and inefficiency is related to livability, as inefficient homes can often be too hot or too cold for comfort. Weatherization strategies keep homes at a moderate and comfortable temperature, and are ideal for low-income housing units. These strategies reduce energy use and GHGs. Manufactured homes, which provide affordable housing for many residents, are particularly well-suited to weatherization activities.

2020 GHG Reduction: 820 $MTCO_2e$

2040 GHG Reduction: 4,180 $MTCO_2e$ without CCA; 3,840 $MTCO_2e$ with CCA

Associated General Plan Policies: ERC-11.A, ERC-11.B, ERC-11.C, ERC-13.G

Associated General Plan Implementation Actions: LU-P.17, ERC-P.6, ERC-P.7, ERC-P.9, ERC-P.29, ERC-P.35, ERC-P.42, ERC-P.44

Responsible City Departments: City Manager, Community Development

EE-8 – Electrification: Replace natural gas with electricity in new and significantly renovated homes.

As California plans for aggressive GHG reductions after 2020, electrification or fuel switching is increasingly being considered as a strategy. Electrification involves using electrically powered appliances instead of gas appliances, particularly space and water heaters. Electricity emits fewer GHGs emissions than natural gas per amount of energy, and is expected to become an even cleaner approach as renewable energy becomes a larger source of California's electricity supply. While new homes can use electrification to help meet ZNE requirements, existing buildings can also be retrofitted to be electrified, particularly if it is done as part of a larger home retrofit or renovation.

2020 GHG Reduction: 0 $MTCO_2e$

2040 GHG Reduction: 38,540 $MTCO_2e$ without CCA; 47,240 $MTCO_2e$ with CCA

Associated General Plan Policies: LU-5.B, LU-13.C, ERC-5.D, ERC-13.G

Associated General Plan Implementation Actions: LU-P.16, LU-P.17, LU-P.28, ERC-P.6, ERC-P.7, ERC-P.8, ERC-P.9, ERC-P.20, ERC-P.29, ERC-P.35, ERC-P.38, ERC-P.42, ERC-P.44

Responsible City Department: Community Development

Off-Road Equipment Strategies

OR-1 – Alternative fuel landscaping equipment: Replace gasoline and diesel landscaping equipment with hybrid and alternative fuel models.

Landscaping equipment, such as lawnmowers and leaf blowers, primarily relies on gasoline and diesel engines. This equipment can be noisy, heavily polluting, and, during times of high fuel prices, expensive to use. Hybrid and alternative fuel models, such as electric equipment, offer another choice. New hybrid and alternative fuel models can provide the same features as conventional landscaping equipment, with quieter operation and reduced pollution. Huntington Beach can set an example by using hybrid and alternative fuel landscaping equipment for City-owned facilities.

2020 GHG Reduction: 100 $MTCO_2e$

2040 GHG Reduction: 910 $MTCO_2e$ without CCA; 1,050 $MTCO_2e$ with CCA

Associated General Plan Policies: ERC-4.C, ERC-5.C

Associated General Plan Implementation Actions: CIRC-P.27, ERC-P.6

Responsible City Department: Public Works

OR-2 – Alternative fuel construction equipment: Improve air quality by reducing emissions from construction equipment.

The trend toward more fuel-efficient and alternative fuel vehicles is also reflected in off-road vehicles, such as construction equipment. Hybrid-electric, natural gas, and biodiesel-powered machinery are all viable choices that can effectively replace gasoline and diesel-fueled equipment. Huntington Beach can encourage adoption of this equipment by requesting or requiring the use of hybrid and alternative fuel construction machinery for large projects. In addition to reducing GHG emissions, this equipment can also improve air quality and reduce noise around the construction site.

2020 GHG Reduction: 460 $MTCO_2e$

2040 GHG Reduction: 1,470 $MTCO_2e$

Associated General Plan Policies: ERC-4.B, ERC-4.C, ERC-5.C

Associated General Plan Implementation Actions: CIRC-P.27, ERC-P.31, ERC-P.38

Responsible City Departments: Community Development, Public Works

Water and Wastewater Strategies

WW-1 – Indoor water efficiency: Reduce indoor water use in the community.

Long-term water reduction strategies and emergency reductions due to drought conditions have substantially reduced water use in Huntington Beach. The community has the opportunity to save even more water through new water-efficiency measures, including addressing indoor water use in both residential and nonresidential buildings. New water-efficient fixtures such as sinks, toilets, and showers go beyond state-mandated water efficiency codes, and help homes and businesses save water and reduce their utility bills. Existing buildings can also be retrofitted to use these new fixtures, and rebates can provide additional incentives to encourage widespread adoption.

2020 GHG Reduction: 110 $MTCO_2e$

2040 GHG Reduction: 700 $MTCO_2e$ without CCA; 450 $MTCO_2e$ with CCA

Associated General Plan Policies: LU-5.B, LU-13.C, ERC-16.A, ERC-16.B, ERC-16.D

Associated General Plan Implementation Actions: LU-P.16, LU-P.17, LU-P.28, ERC-P.9, ERC-P.16, ERC-P.33, ERC-P.45, PSI-P.1, PSI-P.4, PSI-P.6

Responsible City Departments: Community Development, Public Works

WW-2 – Water-efficient landscaping: Reduce the amount of water used for landscaping in Huntington Beach.

Landscapes made up of nonnative grasses and other plants often fail to receive enough water from rain in places like Huntington Beach, and so require significant amounts of irrigation water to stay healthy. Water-efficient landscapes that use drought-tolerant plants, including native species, can reduce or even eliminate the need to provide irrigation. California law requires water efficiency in new and substantially renovated landscapes, and property owners can also voluntarily replace nonnative landscapes. These water-efficient landscapes can be functional, aesthetically pleasing, and much easier and less expensive to maintain compared to lawns and other nonnative landscaping.

2020 GHG Reduction: Less than 10 $MTCO_2e$

2040 GHG Reduction: 20 $MTCO_2e$ without CCA; 10 $MTCO_2e$ with CCA

Associated General Plan Policies: LU-5.B, LU-12.A, LU-13.C, CIRC-5.F, ERC-10.D, ERC-16.A, ERC-16.B, ERC-16.C, ERC-16.D, ERC-17.D, ERC-17.E

Associated General Plan Implementation Actions: LU-P.16, LU-P.17, LU-P.27, LU-P.28, CIRC-P.18, ERC-P.9, ERC-P.16, ERC-P.26, ERC-P.33, ERC-P.45, HAZ-P.4, PSI-P.1, PSI-P.4, PSI-P.6, PSI-P.15, PSI-P.17

Responsible City Departments: Community Development, Public Works

Resource Management Strategies

RM-1 – Construction and demolition waste: Increase recycling of construction and demolition waste from new construction and renovation activities beyond the state minimum.

When a new building is constructed or an old building is demolished or retrofitted, it produces a large volume of waste. Construction and demolition (C&D) waste includes materials such as concrete, lumber, steel, and textiles. Huntington Beach has adopted an ordinance that requires 50% of C&D waste to be recycled, and the City could go farther by requiring additional C&D recycling. Higher C&D recycling standards would keep thousands of tons of waste out of landfills, and could provide new opportunities to reuse unwanted materials.

2020 GHG Reduction: 840 $MTCO_2e$

2040 GHG Reduction: 1,190 $MTCO_2e$

Associated General Plan Policies: PSI-9.A, PSI-9.E

Associated General Plan Implementation Actions: LU-P.16, LU-P.28, ERC-P.9, PSI-P.1, PSI-P.13, PSI-P.16, PSI-P.17, PSI-P.23

Responsible City Departments: Community Development, Public Works

RM-2 – Composting and organic waste: Reduce the amount of organic wastes sent to landfills.

Over 18% of waste thrown away by California homes and businesses is food waste. This waste takes up a significant amount of space in landfills and emits large volumes of GHG emissions. New state laws require communities to develop programs to keep food waste and other organic materials out of landfills, including through composting efforts. In accordance with state requirements, Huntington Beach and its waste haulers can set up composting alongside existing yard waste collection programs, and educate residents and businesses about using these new programs to reduce the amount of waste sent to landfills.

2020 GHG Reduction: 9,610 $MTCO_2e$

2040 GHG Reduction: 19,580 $MTCO_2e$

Associated General Plan Policies: PSI-9.A, PSI-9.B, PSI-9.D, PSI-9.E, PSI-9.F

Associated General Plan Implementation Actions: LU-P.16, LU-P.28, ERC-P.9, PSI-P.1, PSI-P.13, PSI-P.16, PSI-P.17, PSI-P.23

Responsible City Department: Public Works

RM-3 – Increased recycling: Improve the use of recycling bins to minimize the amount of lost materials.

Over 11% of the materials thrown away in California landfills is easily recyclable, including paper, plastic containers, glass, and aluminum cans. Huntington Beach has the chance to reduce the amount of waste sent to landfills by ensuring that more of this recyclable material goes into recycling containers rather than trash bins. Improved education, increased access to recycling programs, and innovative recycling programs that allow residents and businesses to recycle more types of materials are all ways to achieve this goal.

2020 GHG Reduction: 7,570 $MTCO_2e$

2040 GHG Reduction: 12,320 $MTCO_2e$

Associated General Plan Policies: PSI-9.A, PSI-9.B, PSI-9.C, PSI-9.D, PSI-9.E, PSI-9.F

Associated General Plan Implementation Actions: LU-P.16, LU-P.28, ERC-P.9, HAZ-P.1, PSI-P.1, PSI-P.13, PSI-P.16, PSI-P.17, PSI-P.23

Responsible City Department: Public Works

Community Awareness Strategies

GHG Reductions from Community Awareness Strategies

All community awareness reduction strategies show zero GHG reductions. Due to uncertainties about how these measures are implemented or the lack of available data, a specific GHG reduction from these measures cannot be effectively quantified. This does not mean that these measures do not reduce GHG emissions, but simply that these reductions cannot be measured. Additionally, the community awareness strategies support other measures in this GGRP that do result in quantifiable GHG reductions.

CA-1 – Energy competition: Conduct recurring energy competitions to encourage energy efficiency and conservation.

Energy efficiency competitions are one strategy to raise awareness of energy efficiency and conservation, and to help encourage reductions in community energy use. They can be organized by the City, by individuals or community organizations, or by both in a partnership, and are often done in combination with energy outreach and education campaigns. Homes, businesses, and neighborhoods that achieve significant savings in energy use can win prizes and community-wide recognition. There are also opportunities for all of Huntington Beach to participate collectively in statewide or national competitions against other communities.

2020 GHG Reduction: 0 $MTCO_2e$

2040 GHG Reduction: 0 $MTCO_2e$

Associated General Plan Policies: ERC-11.A, ERC-11.B, ERC-11.C, ERC-13.G

Associated General Plan Implementation Actions: LU-P.16, ERC-P.35, ERC-P.42, ERC-P.43

Responsible City Department: City Manager

CA-2 – Green building awareness: Raise community awareness of green building strategies for new and significantly renovated buildings.

California's building standards code, also known as Title 24, sets minimum energy and water efficiency standards for new and renovated buildings. However, buildings are not limited to the minimum standards set by Title 24, but have opportunities to go beyond the state code and reach for higher levels of green building performance. Such buildings can have lower operating costs and better energy efficiency, and may provide a healthier living and working environment. The City can support and publicize efforts to construct green buildings in the community, and can set an example by designing new and significantly retrofitted municipal buildings to go beyond minimum green building standards.[5]

2020 GHG Reduction: 0 $MTCO_2e$

2040 GHG Reduction: 0 $MTCO_2e$

Associated General Plan Policies: LU-5.B, LU-13.C, ERC-5.D, ERC-12.A, ERC-12.B, ERC-12.C, ERC-13.A, ERC-13.G

Associated General Plan Implementation Actions: LU-P.16, LU-P.17, LU-P.27, LU-P.28, ERC-P.9, ERC-P.20, ERC-P.35, ERC-P.44

Responsible City Department: Community Development

CA-3 – Buy local: Improve the visibility of locally produced goods in Huntington Beach retail markets.

Buying locally produced goods helps a community in multiple ways. It reduces the distance that products have to travel to the store, decreasing congestion and reducing emissions of air pollutants and GHGs. It also helps to keep more revenue in the community, which supports the Huntington Beach economy and benefits local residents and businesses. Additionally, this can help businesses participating in Huntington Beach's Recycling Market Development Zone, which provides economic incentives to businesses using waste materials to produce new goods. While not all goods can be locally sourced, supporting locally produced goods when feasible is environmentally responsible and boosts local economic vitality.

2020 GHG Reduction: 0 $MTCO_2e$

2040 GHG Reduction: 0 $MTCO_2e$

Associated General Plan Policies: LU-5.A, LU-5.B, LU-5.C, LU-5.E, LU-11.A, LU-11.B, LU-13.A, LU-13.B

Associated General Plan Implementation Actions: LU-P.20, LU-P.21

Responsible City Departments: City Manager, Office of Business Development

[5] The City explored requiring new construction to meet green building standards that exceed the state minimum. However, this requirement was found to not be economically feasible or appropriate for Huntington Beach, particularly given the state's efforts to strengthen green building standards to eventually require zero net energy for new construction. Voluntary efforts to promote these standards will allow building owners to pursue green building measures in a manner that is more flexible and suitable for each individual building.

CA-4 – Advanced green technologies: Establish Huntington Beach as a center for green technology research and innovation.

The emergence of green technology includes new and improved renewable energy systems, energy- and water-efficient devices, and environmentally responsible materials. The Orange County Workforce Investment Board reports that Orange County is the fourth-largest hub for green technology in the state, and the second-largest when combined with Los Angeles County. In recent years, green technology has been the third-fastest growing sector of the Orange County economy; it has grown faster than traditional sectors such as tourism and finance. As green technology becomes an increasingly important part of the Orange County and California economies, Huntington Beach is well positioned to become a hub for these businesses.

2020 GHG Reduction: 0 $MTCO_2e$

2040 GHG Reduction: 0 $MTCO_2e$

Associated General Plan Policies: LU-5.B, LU-5.E, LU-9.A, LU-9.B, LU-9.C, LU-13.B, CIRC-3.C, ERC-4.B, ERC-5.C, ERC-12.A, ERC-12.B, ERC-12.C, ERC-13.A, ERC-13.E, ERC-13.G, ERC-16.A, ERC-17.E

Associated General Plan Implementation Actions: LU-P.12, LU-P.16, LU-P.18, LU-P.28, ERC-P.9, ERC-P.11, ERC-P.19, ERC-P.20, ERC-P.44

Responsible City Department: Office of Business Development

CA-5 – Revolving loan program: Create a Green Revolving Loan program to help finance building improvements.

Even with numerous financial incentives and rebates, some types of environmentally responsible improvements can be too expensive for residents and businesses. A revolving loan program, which offers loans to community members and uses the loan repayment funds to finance future loans, can make energy-efficient retrofits and renewable energy systems more financially feasible. Multiple cities and states have established revolving loan programs for these types of improvements, including the cities of Santa Monica and Chula Vista. A Green Revolving Loan program for Huntington Beach could accelerate many of the projects detailed in the GGRP, supporting the local economy in the process.

2020 GHG Reduction: 0 $MTCO_2e$

2040 GHG Reduction: 0 $MTCO_2e$

Associated General Plan Policies: ERC-12.A, ERC-13.C, ERC-13.G

Associated General Plan Implementation Actions: LU-P.16, LU-P.17, ERC-P.35, ERC-P.44

Responsible City Department: City Manager

CA-6 – Workforce training: Maximize economic opportunities for green jobs in Huntington Beach.

As Huntington Beach and the wider South Coast region becomes a center of the emerging green economy, it is important that local residents have the opportunity to participate in this new economy and benefit from it. Workforce training programs can provide local residents with the skills needed to obtain jobs in the green economy, such as installing solar energy systems and conducting water efficiency audits. In coordination with local businesses and educational institutions, the City can help ensure that local residents have important skills that can attract green economy businesses and provide for the continued vitality of the local economy.

2020 GHG Reduction: 0 $MTCO_2e$

2040 GHG Reduction: 0 $MTCO_2e$

Associated General Plan Policies: LU-10.A, LU-10.B, LU-10.C, LU-10.D, LU-11.C, LU-13.B

Associated General Plan Implementation Actions: LU-P.12, LU-P.16, LU-P.18, LU-P.19, LU-P.31

Responsible City Departments: City Manager, Office of Business Development

CA-7 – Waste minimization: Reduce the amount of solid waste produced in Huntington Beach.

The other waste-related measures in this GGRP are intended to help keep solid waste out of landfills, and instead recycling or composting it to make new products. Huntington Beach can also work toward minimizing the amount of waste generated in the first place, regardless of whether it is intended for the compost bin, recycling center, or landfill. Waste minimization includes helping residents and businesses find alternative uses for unwanted items, such as donating or selling them to be used by others or to be reprocessed locally, including by businesses participating in the City's Recycling Market Development Zone efforts. It also includes recognizing unneeded resource use and developing ways to minimize this waste, such as making documents and forms available online rather than preparing an oversupply of print copies.

2020 GHG Reduction: 0 $MTCO_2e$

2040 GHG Reduction: 0 $MTCO_2e$

Associated General Plan Policies: PSI-9.A, PSI-9.B, PSI-9.C, PSI-9.D, PSI-9.E, PSI-9.F, PSI-9.G

Associated General Plan Implementation Actions: LU-P.16, LU-P.28, ERC-P.9, HAZ-P.33, PSI-P.1, PSI-P.13, PSI-P.16, PSI-P.17, PSI-P.23

Responsible City Department: Public Works

Emissions Reductions by Issue Area

The total reductions by issue area are shown in Table 4-1.[6]

TABLE 4-1: GHG EMISSIONS REDUCTIONS BY ISSUE AREA ($MTCO_2E$)

Issue Area	2020	2040 (no CCA)	2040 (CCA)
Land use	880	4,190	4,190
Transportation	18,340	41,370	41,370
Alternative fuels	10,950	57,440	67,200
Renewable energy	10,710	90,010	166,060
Energy efficiency	31,030	253,500	217,590
Off-road equipment	560	2,380	2,520
Water and wastewater	110	720	460

[6] As previously noted, issues that increase electricity use will have higher reductions under a CCA. Issues that decrease electricity use will have lower reductions under a CCA.

Issue Area	2020	2040 (no CCA)	2040 (CCA)
Resource management	18,020	33,090	33,090
Community awareness	0	0	0
Total	90,600	482,700	532,480

4.3 Achieving Targets

As previously mentioned, the strategies identified in the GGRP would enable Huntington Beach to meet its 2020 GHG reduction target. If the community adopts CCA, the strategies in the GGRP will also enable the community to meet its 2040 GHG reduction target. However, if CCA is not implemented, the City will have to achieve an additional GHG reduction of approximately 42,330 $MTCO_2e$ to meet the 2040 target. These reductions are shown in **Figure 4-1** and **Table 4-2**.

FIGURE 4-1: GHG TARGETS AND GGRP REDUCTIONS

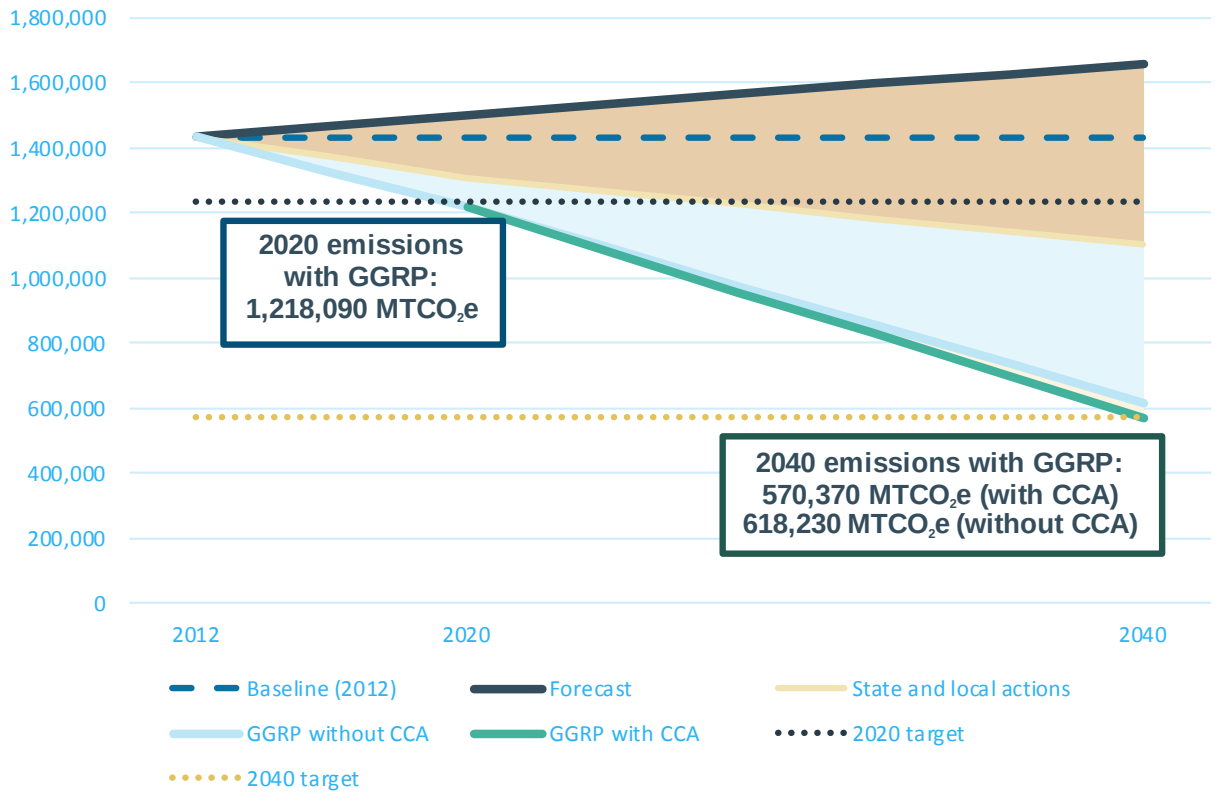


TABLE 4-2: GHG TARGETS AND GGRP REDUCTIONS

	2020	2040 (no CCA)	2040 (CCA)
Baseline emissions	1,452,070	1,452,070	1,452,070

	2020	2040 (no CCA)	2040 (CCA)
Forecast with state and local accomplishments	1,308,690	1,101,020	1,102,850
Reduction target	1,234,260	575,990	575,990
Gap between forecast and reduction target	74,430	525,030	526,860
Emissions with GGRP	1,218,090	618,320	570,370
Gap between GGRP and reduction target	-16,170	42,330	-5,620
Target met?	**Yes**	No	**Yes**

5. IMPLEMENTATION

5.1 Strategy Implementation Actions

The GHG reduction strategies in Section 4 each include a number of individual actions. These actions are specific items the City needs to carry out in order to accomplish the objective of the reduction strategy. They may include outreach and education campaigns, changes to City permitting and development processes, collaboration with other communities and state and regional agencies, and partnerships with local community and business groups. A full list of the implementation actions for each GHG reduction strategy is shown in **Table 5-1**.

TABLE 5-1: GGRP REDUCTION STRATEGY IMPLEMENTATION ACTIONS

Strategy		Implementation Actions
LU-1	Improved pedestrian network	A. Identify gaps in the community sidewalk network, including missing sidewalks or sidewalks that are not wide enough, and resolve these gaps as part of the City's Capital Improvements Program. B. Require major projects to include pedestrian passes to reduce the distance between destinations. C. Retrofit all pedestrian crossing signals to automatically display the "Walk" sign when the light turns green. D. Adjust the timing of pedestrian crossing signals as appropriate, especially in close proximity to senior communities, schools, parks and recreational facilities, the beach, and other facilities that are heavily used by elderly persons and children. E. Identify suitable places for Lead Pedestrian Interval signals and scramble intersections. F. Improve the streetscape along major corridors, including installing planters and benches, providing shade through street trees and/or building awnings and overhangs, and removing items that form a barrier to walking. G. Require new subdivisions to include frequent pedestrian walkways between the neighborhood and surrounding areas at regular intervals, and work with existing neighborhoods to improve pedestrian access. H. Require new projects along major pedestrian corridors to include pedestrian-friendly features along the ground floor, including frequent windows and doors, visually engaging design, and retail spaces. I. Support an increase in mixed-use projects, including encouraging new major nonresidential office and industrial projects to include small-scale retail and service facilities to support office and industrial workers, and requiring development projects in Mixed-Use zones to include either residential units or a diversity of nonresidential spaces.
LU-2	Inclusionary housing units	A. Encourage developers of mixed-use and multifamily projects to include more inclusionary housing units than required under the Huntington Beach Zoning Code. B. Explore opportunities for additional increased bonuses and incentives for inclusionary housing units. C. Encourage inclusionary housing as part of new development projects in the Industrial and Research/Technology land use designations. D. Work with OCTA and local employers to provide lower-cost transit passes for residents in inclusionary housing units.
T-1	Bike ridership	A. Expand the network of bike lanes in Huntington Beach, with emphasis on new bike lanes in underserved areas and areas expected to see increased development. B. Install increased bike parking on streets and at public facilities, especially bike lockers and other storage types that offer increased safety. C. Encourage private landowners to install sufficient bike parking at existing properties, and to retrofit major nonresidential facilities to include lockers and changing rooms for bicycle commuters. D. Install supportive infrastructure to improve bicycle safety and convenience, including raised pavement markers, bike boxes, green bike lanes, and bicycle detection loops at signalized intersections. E. Host bicycle safety and awareness classes for bicyclists, pedestrians, and drivers.

Strategy		Implementation Actions
		F. Coordinate with neighboring cities and OCTA to connect Huntington Beach's bicycle network with the regional system. G. Work with the Huntington Beach City School District and the Huntington Beach Union High School District to increase bike-to-school commuting. H. Regularly update the Bicycle Master Plan. I. Encourage City employees to regularly bike to work, and work with major private employers to promote bike commuting. J. Explore establishing a bike share program for Huntington Beach or participating in a regional bike share effort.
T-2	Shared parking	A. Identify areas where shared parking may be viable, including Downtown Huntington Beach, the Beach/Edinger corridor, and other areas with a large concentration of jobs and housing. B. Encourage mixed-use project developers to adopt shared parking and use the additional space for increased housing units, nonresidential space, or public space. C. Work with developers of adjacent and compatible projects to support shared parking across multiple parcels. D. Revise the minimum parking standards to allow and encourage shared parking in viable areas.
T-3	Increased transit ridership	A. Concentrate new development around major transit hubs and corridors. B. Work with OCTA to identify underserved areas for transit, and to alter bus service to address unmet transit demand. C. Provide information to Huntington Beach residents about bus service in the community, including available incentives and other benefits. D. Identify opportunities to provide reduced-cost passes to Huntington Beach residents and people who work in Huntington Beach. E. Upgrade bus stops in coordination with OCTA, including providing additional seating and shelter, real-time arrival notifications and applications, and other amenities. F. Work with OCTA to evaluate transit priority signals along major transit corridors. G. Support increased express and Bus Rapid Transit service between Huntington Beach and major job centers in other communities.
T-4	Carsharing	A. Work with carshare services to identify the potential for carshare business in Huntington Beach, and to launch carsharing if viable. B. If viable, work with developers of major multifamily and mixed-use projects to include dedicated carsharing spaces in off-street parking lots and garages. C. Promote the availability and advantages of carshare services in Huntington Beach. D. Encourage public support of carsharing and ride-sourcing. E. Work toward reform of taxi, charter vehicle, and ride-sourcing regulations to maximize social and air quality benefits.
T-5	Telecommuting and alternative work schedules	A. Encourage local employers, particularly those with 100 or more full-time employees or equivalent, to offer telecommuting and/or alternative work schedules for employees as feasible, and develop incentives for employers who offer these options.

Strategy		Implementation Actions
		B. Promote telecommuting and alternative work schedules through education and outreach campaigns to Huntington Beach residents. C. Work to establish one or more easily accessible telecommuting centers in Huntington Beach, with appropriate workspace and telecommunications infrastructure.
T-6	Transportation Demand Management	A. Continue to enforce the standards of the adopted Transportation Demand Management ordinance. B. Consider requiring new major nonresidential projects to reduce commute-related trips by 10–20% below typical conditions. C. Work with local businesses and OCTA to offer free or reduced-cost bus passes for employees. D. Monitor efforts to reduce commuter-related trips at major employers, and publicize successes in local and regional media. E. Work with major employers to promote carpool and vanpool services, including making it easy for employees to sign up for a carpool or vanpool, and offering designated priority parking for carpool and vanpool vehicles.
T-7	Shuttle service	A. Explore the feasibility of a year-round shuttle service connecting Downtown, major shopping districts, hotels, and other visitor destinations. B. Promote the availability of a shuttle service in Huntington Beach's tourism promotional material. C. Pursue funding sources, including grants and business sponsorships, to financially support an ongoing shuttle service. D. As feasible, set shuttle schedule and cost to serve as a commute mode for employees in visitor-serving facilities.
T-8	Traffic calming	A. Identify appropriate roadways for traffic calming and install traffic-calming features. B. Fund traffic-calming efforts through the Capital Improvement Program. C. Determine the most appropriate traffic-calming features for different roadways, including curb extensions, raised crosswalks, speed tables, median islands, roundabouts, and chicanes.
F-1	Traffic signal synchronization	A. Continue to synchronize traffic signals at key intersections. B. Update the Capital Improvement Program to include traffic signal synchronization as needed. C. Coordinate with neighboring communities and OCTA to support regional traffic signal synchronization.
F-2	Electric vehicles	A. In coordination with the South Coast Air Quality Management District, provide information about the benefits of battery electric and plug-in hybrid EVs, and the availability of state and federal incentives, at public events. B. Work with property owners to retrofit existing nonresidential and multifamily parking lots and garages to include charging stations for EVs and neighborhood electric vehicles (NEVs). C. Explore opportunities to offer decreased permit fees or expedited permits for EV and NEV charging stations. D. Install additional publicly accessible EV and NEV charging stations at public facilities, including Level 3 chargers as feasible. E. Work with major employers and the South Coast Air Quality Management District to support replacing conventional vehicles in business fleets with battery electric vehicles and plug-in hybrids. F. In accordance with the NEV Transportation Plan, designate key NEV routes and signs as appropriate.

Strategy		Implementation Actions
		G. Conduct training and outreach efforts to ensure the safe operation of NEVs in Huntington Beach, including for drivers of all vehicles, pedestrians, and bicyclists.
F-3	Biofuel vehicles	A. Partner with local restaurants and biofuel companies to convert restaurant waste into biofuel. B. Work with property owners to locate additional biofuel stations in the community to meet demand. C. Work with major employers and the South Coast Air Quality Management District to promote biofuel vehicles as a viable alternative to conventional vehicles as part of large fleets. D. Support the use of advanced, cleaner-burning biofuels from environmentally responsible sources as technology advances.
F-4	Autonomous vehicles	A. In conjunction with state and federal agencies, develop local regulations to allow for the safe and effective operation of semiautonomous and fully autonomous vehicles in Huntington Beach. B. Evaluate changes to parking infrastructure and policies associated with increased vehicle autonomy, and implement changes as needed. C. Support state and federal actions to allow for widespread, safe use of autonomous vehicles. D. Support efforts to increase the use of autonomous vehicles in freight shipping.
RE-1	Residential solar	A. Publicize available financial incentives to install solar energy systems on new and existing residential buildings, including property assessed clean energy (PACE) programs, and develop additional incentives internally and with neighboring communities. B. Explore ways to reduce or eliminate residential solar permit fees, and to streamline solar energy installations, beyond the requirements of AB 2188. C. Amend urban design guidelines to ensure support of on-site solar energy systems. D. Encourage new and significantly retrofitted homes and multifamily buildings to be pre-wired and pre-plumbed for rooftop solar energy systems. E. Work with owners of multifamily buildings to develop building bylaws allowing for the installation of individual rooftop solar energy systems. F. Educate residential homeowners about the benefits of on-site solar energy systems and the steps necessary to install these systems.
RE-2	Nonresidential solar	A. Work with existing nonresidential property owners to install rooftop solar energy systems, and to develop a fair balance between property owners and tenants to finance and benefit from solar energy systems. B. Promote available incentives for nonresidential rooftop solar energy systems, and work to develop additional incentives. C. Encourage new and significantly retrofitted nonresidential buildings to be pre-wired and pre-plumbed for rooftop solar energy systems. D. Encourage parking lot owners to install solar photovoltaic shade structures.
RE-3	Community-shared solar	A. Work with SCE to remove barriers to community-shared solar operations. B. Work with solar developers, property owners, and local financing institutions to explore the feasibility of community-shared solar systems as allowed by SCE, and to launch community-shared solar if found viable.

Strategy		Implementation Actions
		C. Amend the Huntington Beach Zoning Code to allow for medium-size solar photovoltaic systems in appropriate land uses. D. Promote community-shared solar and Green Tariff programs through in-person events and media campaigns.
RE-4	New zero net energy buildings	A. Work with the local development community to promote awareness of state mandates regarding zero net energy buildings, and provide information about zero net energy buildings online and as part of the City's development review process. B. Identify and remove barriers in the City's regulations to feasible zero net energy construction. C. Partner with local developers and businesses to construct demonstration zero net energy buildings to raise awareness of zero net energy systems, and to illustrate benefits and economic feasibility. D. Encourage residential and nonresidential buildings undergoing significant retrofits to achieve energy-efficiency standards beyond the state-mandated minimum. E. Explore providing financial incentives for new and significantly retrofitted buildings that achieve zero net energy standards before being required to do so. F. Construct new municipal buildings to meet zero net energy standards. G. Pursue microgrid technology and energy storage features in new municipal buildings, and encourage major project applicants to incorporate these features into their development proposals.
RE-5	Solar swimming pool heating	A. In coordination with utility providers, offer incentives for solar water heating for swimming pools. B. Provide information about solar water heating to swimming pool owners and project applicants.
RE-6	Community Choice Aggregation	A. In partnership with nearby communities to the extent possible, prepare a study on the feasibility of creating or joining a Community Choice Aggregation (CCA) program, and launch such a program if found to be feasible. B. Work with local financial institutions to help finance any CCA program the City chooses to participate in. C. Offer multiple tiers of renewable electricity to customers through any CCA program the City chooses to participate in, including a minimum tier that offers at least as much renewable electricity as Southern California Edison. D. Conduct extensive public outreach if the City chooses to participate in a CCA program, ensuring community members are aware of the program and the benefits it offers. E. Support state legislative efforts to improve the feasibility of CCA programs, and oppose legislation that imposes additional barriers to CCA programs.
EE-1	Residential homeowner retrofits	A. Provide information for homeowners about the anticipated cost savings and available incentives for residential energy retrofits, including upgraded insulation, improved doors and windows, duct and vent sealing, and more efficient appliances. B. Streamline the permit review and approval process for energy-efficiency improvements that involve significant retrofits. C. Host outreach events on residential energy retrofits. D. Explore developing additional incentives to support higher rates of energy retrofits. E. Consider offering low-cost or free home energy inspections to identify the greatest opportunities for residential retrofits.

Strategy		Implementation Actions
		F. Provide information about energy retrofits to applicants for significant retrofits as part of the permit review process. G. Develop and distribute a list of free and low-cost actions homeowners can take to reduce energy use.
EE-2	Rental unit retrofits	A. In coordination with utility providers and energy contractors, provide free home energy audits to low-income rental households, and reduced-cost energy audits to other rental households. B. Work with residential property managers and landlords to develop and use green leases, allowing energy-efficient retrofits in rental units with an equitable split of the cost and benefits between tenants and landlords. C. Inform landlords of the benefits and available incentives for energy-efficiency retrofits, especially during the permit application process for other retrofit activities. D. Work with local schools and community groups to develop a door-to-door education campaign for energy efficiency in rental units, with an emphasis on low-impact and reduced-cost actions. E. Encourage landlords to replace appliances older than 15 years with models that meet or exceed current energy-efficiency standards prior to occupation by new tenants. F. Encourage landlords to disclose home energy performance of rental units to potential tenants prior to time of lease, and provide landlords with available tools and other resources to assess energy performance.
EE-3	Nonresidential retrofits	G. Publicize available strategies to reduce energy use in nonresidential buildings through meetings with local employers and business groups, and extensively promote incentives such as property assessed clean energy (PACE), low-interest loans, and on-bill financing. H. Work with nonresidential building owners to encourage regular retrocommissioning activities. I. In coordination with utility providers, explore creating additional incentives to support the financial viability of energy efficiency retrofits in nonresidential buildings. J. Support participation in demand response programs. K. Encourage nonresidential property owners to disclose energy performance of nonresidential space prior to sale or lease. L. Publicize nonresidential energy efficiency successes in local and regional media. M. Work with nonresidential property landlords to develop and use green leases to support increased nonresidential energy retrofits. N. Work with project applicants seeking to renovate nonresidential properties to include energy efficiency retrofits as part of renovation activities.
EE-4	Industrial retrofits	A. Encourage industrial facilities to upgrade old and inefficient equipment, including boilers, chillers, and fans. B. Promote regular retrocommissioning for industrial facilities. C. Support lighting retrofits in industrial facilities, and encourage increased access to daylight in renovated industrial facilities. D. Partner with local industrial trade groups to share information about industrial energy efficiency, including information on cost savings and available funding opportunities. E. Recognize and publicize industrial facilities with successful energy-efficiency strategies.

Strategy		Implementation Actions
		F. Promote collaboration with local technology firms to support increased energy efficiency in the local industrial sector. G. If Huntington Beach establishes or participates in a CCA program, encourage industrial facilities with direct access services to switch to CCA if economically feasible and if there is sufficient energy supply.
EE-5	Public lighting retrofits	A. Continue to retrofit all City-owned streetlights with LED bulbs. B. Encourage parking lot owners to convert fixtures to energy-efficient bulbs, and consider offering incentives to provide increased financial support. C. Work with nonresidential and multifamily property owners to use energy-efficient light bulbs in outdoor lighting fixtures, particularly as part of outdoor retrofits. D. Explore using pole-mounted renewable energy systems to power streetlights and traffic signals as economically feasible.
EE-6	Swimming pool efficiencies	A. Encourage swimming pool owners to replace old pool equipment, such as pumps and heaters, with more energy-efficient models. B. Work with pool owners to install thermal covers on pools when not in use. C. Inform applicants seeking to install a new pool or to retrofit an existing one about ways to reduce swimming pool energy use, and available incentives and financing mechanisms for energy efficiency actions.
EE-7	Low-income weatherization	A. Continue to partner with community groups to conduct weatherization of low-income housing units, including mobile homes, and to pursue funding to support these activities. B. Encourage property owners to disclose whether a unit has been weatherized when selling or leasing to a low-income resident.
EE-8	Electrification	A. Promote electrification as an option during plan review for new and significantly remodeled homes and businesses, including in the pre-application phase for major projects. B. Distribute information and case studies about successful electrification efforts to project applicants. C. Coordinate with utility companies to ensure a safe and reliable supply of energy for the community as natural gas is replaced by electricity.
OR-1	Alternative fuel landscaping equipment	A. Purchase hybrid and alternative fuel landscaping equipment for City landscaping activities. B. In coordination with the South Coast Air Quality Management District, continue to work with property owners and landscaping companies to promote the availability of hybrid and alternative fuel landscaping equipment, and any incentives available. C. Work with local businesses to ensure that hybrid and alternative fuel landscaping equipment is readily available in Huntington Beach home improvement stores.
OR-2	Alternative fuel construction equipment	A. Replace City-owned construction equipment with fuel-efficient and alternative fuel models as funding becomes available. B. Work with local contractors to promote the availability of fuel-efficient and alternative fuel models. C. Explore requiring a certain proportion of construction equipment on discretionary projects to be fuel-efficient or alternative fuel models as feasible.

Strategy		Implementation Actions
WW-1	Indoor water efficiency	A. Continue to partner with the Metropolitan Water District and the Municipal Water District of Orange County to offer rebates for water efficiency retrofits, and explore creating additional incentives. B. Work with regional water agencies to offer low-cost and free water audits to homes and businesses. C. Encourage new development projects to install water fixtures that exceed the minimum state efficiency requirements. D. Continue to make presentations about indoor water conservation and to make information about rebates available to community members, including during normal and wet years.
WW-2	Water-efficient landscaping	A. Continue to provide information to community residents about water-free and drought-tolerant landscaping. B. Continue to enforce the most recent state Water Efficient Landscaping Ordinance for new landscaping, and explore opportunities to establish water efficiency standards that exceed the state minimum. C. In partnership with regional water providers, continue to make incentives available for replacing turf with water-free and drought-tolerant landscaping. D. Work with local nurseries and landscaping companies to highlight examples of drought-tolerant plants. E. Replace City-owned landscaped areas with drought-tolerant planting, except for turf used for recreation.
RM-1	Construction and demolition waste	A. Develop and adopt an ordinance requiring increased recycling of construction and demolition (C&D) waste. B. Work with contractors and local artists to establish a materials exchange and reuse program. C. Support state and federal efforts to increase recycling rates and expand markets for C&D materials.
RM-2	Composting and organic waste	A. Conduct backyard composting workshops to encourage individual composting of food scraps. B. Work with Republic Services to monitor the effectiveness of the yard waste program, and conduct education activities as needed to improve the program. C. Develop a curbside composting service for restaurants and other facilities that produce large volumes of food waste, and expand program to homes and other businesses throughout the community as feasible. D. Minimize any potential health, safety, or cleanliness issues associated with curbside yard waste and composting operations. E. Explore effective alternatives to curbside compost services, including off-site collection and sorting, that achieves a similar degree of success. F. Promote a food donation program for safe-to-eat food to minimize food waste in the community.
RM-3	Increased recycling	A. Conduct outreach efforts to ensure recycling bins are being used properly, and community members are aware of which types of materials go in each bin. B. Make recycling bins readily accessible at public facilities and streetscapes, including locating recycling bins next to all trash bins. C. Explore ways for community members to easily recycle items not currently accepted in the curbside recycling bins, including polystyrene, batteries and other universal waste, plastic bags, and electronic waste. D. Minimize waste at all City-sponsored events and events held at public facilities. E. Establish a minimum diversion rate criteria for all future waste hauler contracts that exceed state-mandated minimums.

Strategy		Implementation Actions
		F. Promote the Recycling Market Development Zone to increase the use of secondary feedstock material in local manufacturing.
CA-1	Energy competition	G. Work with utilities and local organizations to develop and implement a recurring energy competition, to reward homes, neighborhoods, and businesses that succeed in significantly reducing their energy use. H. Conduct extensive community outreach to raise awareness of the energy competition and promote high participation. I. Publicize data about energy use reductions achieved by the contest in an open and transparent way without violating privacy rules. J. Honor competition winners in a public ceremony, and publicize the event in local and regional media. K. Based on the results of the competition, prepare case studies highlighting cost-effective approaches to improve energy efficiency and energy conservation, and incorporate lessons learned from the competition into future energy efficiency and energy conservation outreach programs.
CA-2	Green building awareness	A. Make information about CALGreen voluntary tiers, LEED, BuildItGreen, and other green building standards readily available during the permit process for new development projects, and discuss applicable green building standards with project applicants. B. Explore offering incentives such as financial rebates, reduced permit fees, and expedited permitting to development projects that exceed minimum state standards for green buildings. C. Conduct community outreach to highlight the advantages of green buildings, including the economic benefits. D. Maintain a directory of green buildings in Huntington Beach, including information about the associated costs and savings of the green building features. E. Design new and substantially renovated City facilities to include green building features as examples of successful strategies. F. Develop and publicize a Huntington Beach Green Building Strategy, which will serve as a comprehensive plan to encourage and incentivize zero net energy development and green buildings, applicable to both residential and nonresidential development projects.
CA-3	Buy local	A. Work with business groups in Huntington Beach and surrounding communities to identify local sources of various goods and how to purchase them, and distribute this information online and in print as part of a Buy Local guide. B. Work with major retail chains to offer an increased supply of locally produced goods. C. Encourage a diversity of goods producers to locate in Huntington Beach to increase the types of products available from local sources. D. Develop and adopt a Buy Local policy for municipal purchases to maximize the amount of goods the City purchases from local sources, and encourage businesses in the community to adopt similar policies.
CA-4	Advanced green technologies	A. Provide information for project applicants about newly available green building technologies and features, and encourage applicants to incorporate these elements into their projects. B. Establish permitting procedures for emerging renewable energy systems and other green technologies, and work to proactively identify and remove regulatory barriers.

Strategy		Implementation Actions
		C. Use emerging green technologies as feasible in City facilities as demonstration projects. D. Encourage companies developing advanced green technologies to locate in the appropriate zones of Huntington Beach. E. Support efforts by local education and research institutions to develop and market emerging green technologies.
CA-5	Revolving loan program	A. Work with local financial institutions to develop and operate a Green Revolving Loan program, providing a financing mechanism for homes and businesses to support renewable energy, energy efficiency and conservation, and water efficiency and conservation retrofit activities. B. Minimize the interest rate of the Green Revolving Loan program, including offering no-interest loans as feasible. C. Provide information to community members about the Green Revolving Loan program, including how it operates and how community members can participate. D. Require projects financed through the Green Revolving Loan program to monitor their costs, savings, and other pertinent data, and make this data available publicly through case studies and other methods.
CA-6	Workforce training	A. Work with local schools, colleges, and job training operations to make training for green jobs widely available to individuals with different incomes and educational backgrounds. B. Pursue funding to reduce the cost of green job training for Huntington Beach residents, particularly for lower-income individuals. C. Encourage local businesses that provide green services, including rooftop solar installation, energy audits, and water efficiency retrofits, to hire Huntington Beach residents from local green training programs. D. Coordinate with the Huntington Beach Union High School District to provide green vocational training to high school students. E. Conduct trainings on sustainable businesses, and promote local Sustainable Certified Businesses.
CA-7	Waste minimization	A. Work with local organizations to identify opportunities to reuse unwanted materials in the community, including improving the ease of donating usable items to community groups and charities, and supporting local artists and manufacturers who produce art or products from waste materials. B. Explore strategies to reduce the amount of waste associated with the packaging and purchasing of food and retail products, especially waste materials that cannot be easily recycled. C. Continue to carry out the City's paper reduction efforts, including identifying ways to further reduce the amount of paper produced as part of municipal operations, and work with local businesses to adopt similar strategies. D. Establish a purchasing policy for municipal operations to buy products made from recycled materials as feasible, and encourage local businesses to adopt similar policies. E. Conduct public outreach to highlight the amount of waste produced by average residents and businesses, and to promote applicable waste minimization strategies.

5.2 GGRP Implementation Programs

While the implementation actions shown in **Table 5-1** are intended to implement individual reduction strategies, they do not establish a framework for implementation of the overall GGRP. In order to ensure that the GGRP is effectively put into practice and achieving the desired reductions, City staff and officials will have to develop and execute the GHG reduction strategies and their associated implementation actions, monitor implementation of the GGRP, and make revisions to the City's overall GHG reduction approach as needed to help meet the targets.

Specific GGRP implementation programs will help establish a framework to achieve these overall objectives. These programs, which are also included in the Implementation chapter of the General Plan, are as follows:

ERC-P.2: Greenhouse Gas Emissions Tracking

Monitor the status of greenhouse gas emissions in Huntington Beach, as directed by the Greenhouse Gas Reduction Program, and report the results to City officials and members of the public as part of an annual reporting effort, through the following actions:

- Estimate community greenhouse gas emissions to track progress toward adopted greenhouse gas emissions reduction goals of 15 percent below 2005 levels by 2020, and 53.33 percent below 2020 levels by 2040.
- Track implementation of all greenhouse gas emissions reduction measures and actions, including the status of each effort and progress toward the performance metrics in the Greenhouse Gas Reduction Program.

Department:	City Manager
Related policies:	*To be provided following adoption*
Funding source:	General Fund
Time frame:	Annually beginning in 2018

ERC P.3: Greenhouse Gas Reduction Program Maintenance

Amend the Greenhouse Gas Reduction Program regularly based on the results of annual monitoring efforts, to achieve the adopted greenhouse gas emissions reduction targets in a manner consistent with community values. Support increased implementation of successful strategies, and identify opportunities to revise strategies as appropriate.

Department:	City Manager
Related policies:	*To be provided following adoption*
Funding source:	General Fund
Time frame:	Annually beginning in 2018

ERC-P.4. Greenhouse Gas Reduction Program Funding

Secure the funding necessary to implement the strategies and implementation actions in the Greenhouse Gas Reduction Program. Identify funding sources as part of an annual report, and integrate funding needs into City department budgets, capital improvement plans, and other plans as appropriate. Pursue federal, state, regional, and local sources of funding as appropriate. Work to ensure that funds are returned to areas where GHG emissions are generated and that programs benefit the communities impacted by emissions.

Departments: City Manager, Finance Department
Related Policies: *To be provided following adoption*
Funding Source: General Fund, grant funding
Time Frame: Annually beginning in 2018

ERC-P.41. Greenhouse Gas Reduction Program Collaboration and Public Outreach

Develop partnerships with other public agencies, private organizations and non-profits, businesses and trade groups, local institutions, and members of the public to support implementation of the Greenhouse Gas Reduction Program. Establish and maintain formal partnerships with organizations that provide tools and support for GHG reduction efforts. Keep members of the public informed about ongoing Greenhouse Gas Reduction Program implementation efforts, and provide opportunities for community members to provide feedback on these efforts.

Departments: City Manager
Related Policies: *To be provided following adoption*
Funding Source: General Fund, grant funding
Time Frame: Annually beginning in 2018

GLOSSARY

Alternative fuels: Fuels that provide an alternative to conventional gasoline and diesel, including natural gas, propane, and biofuels. They typically emit fewer emissions than conventional fuels.

Autonomous vehicle: A vehicle capable of driving itself with little or no assistance from a human driver. This can include limited autonomy, such as vehicles capable of parallel parking automatically, or fully autonomous vehicles that can drive long distances by themselves.

Baseline year: The year against which future changes are measured. In this GGRP, the baseline year is 2012.

Battery electric vehicle: A vehicle propelled by electric motors, powered by on-board batteries that are regularly recharged from a wall outlet or dedicated charging device.

Biofuel: A fuel derived from organic material, including agricultural or forestry waste, organic scraps, or dedicated crops.

Bus Rapid Transit (BRT): A type of bus service that travels on dedicated lanes, has priority at signal intersections, allows for pre-payment, and is designed to reduce boarding and offboarding delays. These systems are typically faster than conventional buses.

California Air Resources Board (CARB): A division of the California Environmental Protection Agency, charged with protecting public health, welfare, and ecological resources through the reduction of air pollutants, including greenhouse gases.

California Building Standards Code (BSC): A mandatory construction code for new buildings and significant remodels. Sections of the code provide minimum standards for energy and water efficiency. The code is generally updated every three years.

California Environmental Quality Act (CEQA): A state law requiring state and local agencies to evaluate environmental impacts for activities such as development projects.

Carbon dioxide (CO_2): A colorless, odorless gas. It occurs naturally in the atmosphere, and is also emitted by burning fossil fuels and organic material.

Carbon dioxide equivalent (CO_2e): A unit of measurement that accounts for the various potencies of different greenhouse gases.

Carsharing: A program in which users can temporarily borrow a car for a short period of time for a fee. Carsharing programs often have dedicated fleets of cars and designated parking spaces.

Community Choice Aggregation (CCA): A program in which local governments procure electricity for residents and businesses. It differs from a municipal utility in that a CCA program does not own any electricity infrastructure, but relies on existing infrastructure owned by utility companies. These programs can be managed by a single local government or by multiple governments under a single agreement.

Community-shared solar: A program in which participants purchase power from an off-site solar energy system.

Direct access: A program in which participants buy power from a supplier other than the default electricity utility. Participation in direct access is primarily limited to large facilities, especially industrial operations and institutions.

Electric vehicle (EV): A vehicle powered by an electric motor.

Electrification: Replacing part or all of a building's natural gas-using appliances and machinery with electrically powered devices.

Energy conservation: Reducing energy use by turning off devices that are not in use (e.g., turning off lights when leaving a room), or using devices that do not use energy to replace devices that do (e.g., using a clothes line to dry laundry rather than a clothes dryer).

Energy efficiency: Reducing energy use by replacing devices with versions that serve the same function but use less energy, such as replacing compact fluorescent or incandescent lightbulbs with LED bulbs.

Forecast: An estimate of GHG emissions in future years.

Global warming potential (GWP): The relative potency of greenhouse gases to trap heat over their lifetime in the atmosphere. Carbon dioxide has a GWP of one, and the GWPs of all other gases are expressed relative to carbon dioxide. For example, a gas that traps 10 times as much heat as carbon dioxide is said to have a GWP of 10.

Graywater: Water collected from showers, bath tubs, bathroom sinks, clothes washers, and other sources, which can be treated and reused as non-drinkable water for uses such as watering lawns and flushing toilets.

Greenhouse gas (GHGs): A gas that traps heat in the atmosphere. While some level of GHGs in the atmosphere are necessary to maintain Earth's temperature, increasing concentrations of these gases are responsible for climate change.

Greenhouse gas inventory: An estimate of the amount of GHGs emitted to and removed from the atmosphere by human activities. Inventories may be global, but can also be limited to specific communities, states, countries, or other geographic regions.

Hybrid-electric: A device that combines a conventional gasoline or diesel-powered engine with an electric drive system, using less fuel than an entirely gasoline or diesel-powered machine.

Lead Pedestrian Interval (LPI): Allowing pedestrians to begin crossing a street a few seconds before traffic lights for vehicles turn green.

Methane (CH_4): A colorless odorless greenhouse gas, produced through activities such as the burning of fossil fuels, waste management, and agricultural operations. It is also produced when organic material decomposes in an oxygen-free environment, and is the primary component of natural gas.

Metropolitan Planning Organization: A federally funded transportation planning organization for a region, comprising representatives from local government agencies and transportation authorities. The relevant organization for most of Southern California, including Huntington Beach, is the Southern California Association of Governments.

Microgrid: A small-scale electricity distribution system that serves a single building, campus, neighborhood, or community. Microgrids often include energy generation and storage systems, and can continue to provide electrical service during power outages that affect the wider regional power network.

Neighborhood electric vehicle (NEV): A small electric vehicle with limited range and capacity, intended for short trips.

Nitrous oxide (N_2O): A greenhouse gas emitted through agricultural operations, sewage treatment, fossil fuel burning, and the production of certain acids.

Photovoltaic: Producing electricity directly from sunlight, as in a typical solar panel.

Plug-in hybrid: A hybrid-electric vehicle with on-board batteries that can be recharged by plugging the vehicle into a wall outlet or dedicated charging device. Plug-in hybrids typically travel for shorter distances on electrical power alone, and use the gasoline on diesel engine only for longer trips.

Property assessed clean energy (PACE): A financing mechanism for renewable energy, energy efficiency, and water efficiency retrofits that enables building owners to pay for the retrofits through a temporary increase in property taxes. Unlike other forms of financing, the repayment schedule is tied to the property, allowing for new owners to take responsibility for repayment if the building is sold.

Renewable energy: Energy from sources that naturally replenish themselves over a short period of time, such as solar, wind, and bioenergy.

Renewables Portfolio Standard (RPS): A state law requiring utilities in California to procure a specified amount of electricity from approved renewable sources by certain years.

Retrocommissioning: Optimizing and maintaining a building's HVAC equipment and control systems to ensure they are operating at peak efficiency and as designed. Unlike retrofit activities, retrocommissioning does not generally involve installing new equipment.

Revolving loan: A financing mechanism in which the money from loan payments is set aside to be used for making future loans.

Ride-sourcing: A program allowing users to request a vehicle ride on demand. While this may include taxis, it primarily refers to rides from a non-commercially licensed driver in a personal vehicle. Companies that operate these sort of non-taxi services are officially known as transportation network companies in California.

Sector: In the context of a greenhouse gas inventory, a category of activities responsible for greenhouse gas emissions.

Shared parking: A program allowing two or more buildings or developments to share parking lots or garages. Shared parking typically makes sense for building types who need parking at different times of the day, such as a business park and an apartment complex.

Southern California Association of Governments: The federally recognized metropolitan planning organization for most of Southern California, including Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura Counties.

Sustainable Communities Strategy (SCS): A plan that metropolitan planning organizations in California are required to prepare under Senate Bill 375. The SCS identifies a strategy to reduce greenhouse gas emissions through land use, transportation, and housing planning efforts.

Telecommuting: A program allowing people to work partially or entirely from home, enabled by advances in technology such as remote system access and online collaboration software.

Traffic calming: The act of decreasing vehicle speeds on a roadway by changing the roadway's design through a variety of different devices, including speed bumps, roundabouts, and curb extensions.

Transportation Demand Management (TDM): Encouraging or requiring residential or nonresidential developments to reduce the amount of vehicle trips they generate by promoting public transit, active transportation, carpooling, telecommuting, or other strategies.

Vehicle miles traveled (VMT): A metric used in transportation planning and related efforts which counts the total number of miles traveled by all vehicles within a certain area and time frame.

Water conservation: Reducing water use by turning off water-using devices or using them less, such as taking shorter showers.

Water efficiency: Reducing water use by replacing a water-using device with one that accomplishes the same result but uses less water, such as replacing a showerhead that uses 2 gallons every minute with one that uses only 1.5 gallons per minute.

Zero net energy (ZNE): A building that, over the course of a year, generates as much energy as it uses.

ACRONYM AND ABBREVIATIONS LIST

AB: Assembly Bill

C&D: Construction and demolition waste

CARB: California Air Resources Board

CCA: Community Choice Aggregation

CEQA: California Environmental Quality Act

CNG: Compressed natural gas

CO_2e: Carbon dioxide equivalent

EO: Executive order

EPIC: Electric Program Investment Charge

EV: Electric vehicle

GGRP: Greenhouse Gas Reduction Program

GHG: Greenhouse gas

LCP: Local Coastal Program

LED: Light emitting diode

MT: Metric ton

NEV: Neighborhood electric vehicle

OCTA: Orange County Transportation Authority

PACE: Property assessed clean energy

PV: Photovoltaic

RPS: Renewables Portfolio Standard

SB: Senate Bill

SCS: Sustainable Communities Strategy

SONGS: San Onofre Nuclear Generating Station

TDM: Transportation Demand Management

ZNE: Zero net energy

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TABLE A-1: GENERAL PLAN POLICIES SUPPORTING THE GGRP

Policy Number	Policy
Land Use Element	
LU-1.C	Support infill development, consolidation of parcels, and adaptive reuse of existing buildings.
LU-3.B	Improve trail, bicycle pathway, roadway, sidewalk, and transit connections to new development.
LU-4.B	Improve options for people to live near work and public transit.
LU-4.E	Encourage housing options located in proximity to employment to reduce vehicle miles traveled.
LU-5.B	Encourage clean, green, less intensive industrial development in areas identified in the planning area.
LU-5.C	Ensure proposed development and uses in industrial areas contribute to the City's economic development objectives and do not minimize existing uses.
LU-5.D	Explore opportunities to optimize use of underutilized or underperforming industrial land that is sensitive to surrounding uses, and to introduce new industrial uses that create both jobs and housing.
LU-7.D	Enhance intersection overlay areas to create additional pedestrian connections and appeal of the area.
LU-8.A	Reinforce Downtown as the City's historic center and as a pedestrian and bicycle-oriented village with commercial, entertainment, and recreation uses to meet the needs of residents and visitors.
LU-9.A	Establish technology or innovation districts, such as the Gothard Overlay and the Northwest Industrial Overlay, where technology infrastructure is provided specifically to support existing and new businesses.
LU-9.B	Provide technology infrastructure and services to supply necessary technological and communication tools for existing and new industry and businesses.
LU-10.A	Provide incentives to retain, expand, and capture new businesses, including research and development industries and start-ups.
LU-10.B	Promote the creation of jobs with increasing wage opportunities within the community.
LU-10.C	In partnership with regional, state, and federal agencies, provide workforce programs that facilitate workforce diversity in the city through expanded labor force training and hiring practices.
LU-10.D	Maximize the economic development services provided by the City to existing and prospective businesses and industries.
LU-11.A	Encourage a variety of commercial uses that cater to local and regional demand to create an environment that meets resident needs and increases the capture of sales tax revenues.
LU-11.B	Encourage new businesses to locate on existing vacant or underutilized commercial properties where these properties have good locations and accessibility.
LU-11.C	Maximize the economic development services provided by the City to existing and prospective businesses and industries.
LU-12.A	Require in the Urban Design Guidelines that commercial buildings and sites be designed to be consistent with and use low-impact design techniques.

Policy Number	Policy
LU-12.C	Expand shuttle services and pedestrian linkages between adjoining business areas, particularly along the coast, where a greater flow of local shoppers and visitors is encouraged.
LU-13.A	Encourage expansion of the range of goods and services provided to accommodate the needs of all residents and the market area.
LU-13.B	Capture emerging industries such as, but not limited to, "knowledge"-based industries and research and development firms.
LU-13.C	Support development of new commercial and industrial projects and retrofits of existing buildings.
LU-13.D	Improve transit and other alternative transportation options, including shuttles and safe bicycle routes, for employees who live and work in the community.
LU-14.C	Improve the availability of affordable housing and accessible transportation options for service workers.
LU-14.D	Facilitate the provision of transit and bicycling linkages between the various tourist destinations which help encourage local residents and visitors to minimize the use of automobiles.
Circulation Element	
CIRC-1.C	Monitor the capacity of principal intersections. When principal intersections approach or have reached unacceptable levels of service, consider elevating the priority of Capital Improvement Program (CIP) projects that reduce traffic congestion at these intersections.
CIRC-1.F	Require development projects to provide circulation improvements to achieve stated City goals and to mitigate to the maximum extent feasible traffic impacts to adjacent land uses and neighborhoods as well as vehicular conflicts related to the project.
CIRC-1.I	Remain informed about and involved in development of technological innovations and research to ensure Huntington Beach continues to invest in the best available traffic management systems.
CIRC-2.D	Allow for shared parking and other creative parking arrangements that optimize available parking areas, and support and collaborate with property owners to manage the available parking supply.
CIRC-3.A	Pursue an urban transit system that serves Huntington Beach, and evaluate local and regional transit service to identify areas of opportunity for existing regional transit linkages.
CIRC-3.B	Ensure that local transit is reliable and safe, and provides high-quality service to and from regional transit and destination areas.
CIRC-3.C	Use the best available transit technology to streamline and link destinations and improve rider convenience and safety.
CIRC-3.D	Require new projects to contribute to the transit and/or active transportation network in proportion to their expected traffic generation.
CIRC-3.E	Include or promote multimodal transit centers and stops that allow for seamless connections between regional and local transit systems, pedestrian and bicycle networks, and commercial and employment centers.
CIRC-3.F	Explore the possibility of locating a transportation center in or near Downtown.
CIRC-4.A	Continue to reserve abandoned rail rights-of-way for future transportation uses such as transit and bicycle facilities.
CIRC-4.B	Increase bus lines and services along commute routes and connecting to regional transit such as ARTIC, OCTA, and LA Metro.
CIRC-4.C	Use roadway improvement projects as an opportunity to enhance transit amenities and options.
CIRC-4.D	Maintain a system of transit and paratransit services that assist seniors and persons with disabilities.

Policy Number	Policy
CIRC-4.E	Provide alternative transportation options for residents and visitors to travel to Downtown.
CIRC-4.F	Increase ridership by providing attractive, comfortable, and convenient options for local transit.
CIRC-5.A	Maximize use of transportation demand management strategies to reduce total vehicle miles traveled and improve regional air quality.
CIRC-5.B	Develop complete streets that create functional places meeting the needs of pedestrians, bicyclists, wheelchair users, and motorists. Provide safe, accessible, and connected multimodal routes, especially along popular and arterial routes.
CIRC-5.C	Coordinate with neighboring jurisdictions to ensure that bicycle routes connect to and are consistent with routes in adjacent jurisdictions.
CIRC-5.D	Maintain and repair bicycle lanes and sidewalks as necessary to improve use and safety.
CIRC-5.E	Improve citywide awareness of pedestrian and bicycle safety.
CIRC-5.F	Encourage low-impact stormwater system design techniques and support alternative fuel vehicles when designing and developing complete streets.
CIRC-6.A	Provide pedestrian and bicycle routes that integrate with local and regional transit, connect destinations, and provide end-of-trip facilities.
CIRC-6.B	Designate and improve pedestrian enhancement zones (PEZs) at appropriate locations.
CIRC-6.C	Require new commercial and residential projects to integrate with pedestrian and bicycle networks, and that necessary land area is provided for the infrastructure.
CIRC-6.D	Implement and operate appropriate traffic control devices to reduce conflicts between pedestrians, bicycles, and motor vehicles.
CIRC-6.E	Ensure that bicycle and pedestrian facilities comply with accessibility provisions of the Americans with Disabilities Act.
CIRC-6.F	Increase bicycle parking in or near Downtown, near the beach, and throughout the planning area.
CIRC-6.G	Encourage the use of easements and/or rights-of-way along flood control channels, public utilities, railroads, and streets, for use by bicyclists and/or pedestrians, where safe and appropriate.
CIRC-6.I	Maintain navigable waterways in Huntington Harbour and Sunset Channel for both recreational and commuter use.
CIRC-8.A	Set forth specifications to require vehicle power or alternative fuel stations in new or substantially remodeled projects, and investigate the viability of in-lieu fees used to provide off-site charging stations.
CIRC-8.B	Encourage inclusion of power stations and alternative fuels at traditional gas stations.
CIRC-8.C	Plan for conversion of all government vehicles to alternative fuel or electricity.
CIRC-8.D	Use license and fee incentives to encourage private transportation services, such as shuttles and taxis, to convert fleets to clean energy vehicles.
Environmental Resources and Conservation Element	
ERC-1.D	Require all park improvement projects to consider ways to improve access to park facilities by foot and bicycle.
ERC-1.G	Develop a comprehensive trails network linking hiking, biking, and equestrian trails to parks, beaches, recreation facilities, and open spaces both within and outside the planning area.
ERC-4.B	Continue to require construction projects to carry out best available air quality mitigation practices, including use of alternative fuel vehicles and equipment as feasible.

Policy Number	Policy
ERC-4.C	Enforce maximum idling time regulations for off-road equipment.
ERC-5.B	Encourage oil drilling operators to implement cost-effective best practices to reduce greenhouse gas emissions associated with oil extraction.
ERC-5.C	Explore strategies to reduce greenhouse gas emissions from off-road construction and landscaping equipment.
ERC-5.D	Support efforts by the South Coast Air Quality Management District and the California Air Resources Board to decrease greenhouse gas emissions from large industrial facilities and other stationary sources.
ERC-9.B	Maximize and maintain tree coverage on public lands and in open spaces.
ERC-10.D	Support the use of native vegetation and green infrastructure in parks to manage water use, reduce urban runoff impacts, and provide natural habitat.
ERC-11.A	Publicize rebates and other financial incentives available to community members to improve energy efficiency in their homes and businesses, and market these rebates and incentives to all community members through a variety of outreach strategies.
ERC-11.B	Promote low-cost or free weatherization programs for disadvantaged residents, including low-income families and elderly individuals.
ERC-11.C	Identify ways to increase energy efficiency retrofits in multifamily buildings, renter-occupied homes, low-income homes, and leased nonresidential space through retrofits and educational programs.
ERC-11.D	Retrofit existing City facilities to be more energy efficient as opportunities arise.
ERC-12.A	Create incentives for proposed development and reuse projects to exceed the minimum energy efficiency standards established in the California Building Standards Code when constructing new residential and nonresidential buildings, including achieving zero net energy performance in advance of state-level targets.
ERC-12.B	Promote the use of passive solar design techniques in new buildings to reduce energy use for heating and cooling.
ERC-12.C	Construct all new City facilities to be more energy efficient than the minimum energy efficiency standards in the California Building Standards Code, and achieve zero net energy performance for new City facilities when possible.
ERC-13.A	Encourage the use of solar energy systems in homes and commercial businesses as a form of renewable energy, including in support of zero net energy goals.
ERC-13.B	Encourage renewable energy options that are affordable and benefit all community members.
ERC-13.C	Create incentives that promote renewable energy systems as a component of new development or reuse projects.
ERC-13.D	Maximize renewable energy capacity on municipal property and renewable energy use in City-sponsored projects and activities.
ERC-13.E	Support opportunities to increase energy storage capacity in the community.
ERC-13.F	Support community choice aggregation feasibility studies.
ERC-13.G	Support public-private partnerships on energy efficiency, energy storage, and microgrid development to achieve cost savings, reduce energy use, and improve energy reliability.
ERC-16.A	Continue to require incorporation of feasible and innovative water conservation features in the design of new development and reuse projects.

Policy Number	Policy
ERC-16.B	Encourage maximum water conservation in existing land uses, and provide incentives that encourage building owners and homeowner associations to complete water efficiency retrofits.
ERC-16.C	Require the use of recycled water for landscaping irrigation, grading, and other noncontact uses in new development or substantial retrofit projects where recycled water is available or expected to be available.
ERC-16.D	Partner with and provide information to community organizations, residents, and businesses regarding methods to reduce water use.
ERC-17.D	Continue to require that new development and reuse projects incorporate low-impact development best management practices including infiltration, rainwater capture techniques, cisterns, and graywater infrastructure.
ERC-17.E	Prioritize investment in green stormwater infrastructure that restores natural landscapes before employing other management solutions.
Natural and Environmental Hazards Element	
HAZ-5.B	Prioritize open space uses, renewable energy facilities, and other community-supporting facilities as preferred options for future use of remediated brownfield sites.
Public Services and Infrastructure Element	
PSI-9.A	Continue to exceed state solid waste reduction goals and work toward making Huntington Beach a zero-waste community.
PSI-9.B	Maintain adequate solid waste collection and disposal services to reduce traditional commercial, industrial, and residential waste.
PSI-9.C	Improve solid waste collection services associated with special events and the availability of trash and recycling receptacles in public areas, including but not limited to Downtown, Peter's Landing, Beach Boulevard, and along the beach.
PSI-9.D	Continue to expand household recycling services and provide public information regarding how community members can dispose of or recycle materials correctly.
PSI-9.E	Reduce the amount of waste disposed per employee in the business community by improving commercial recycling services and providing information to support waste reduction.
PSI-9.F	Expand the types of waste that can be recycled or otherwise diverted from the community waste stream, including organic materials in compliance with state law.
PSI-9.G	Provide public information regarding residential collection of household hazardous wastes including paint containers, electronics, household chemicals, motor oils, and pesticides, and promote development of facilities that collect these materials.

TABLE A-2: GENERAL PLAN IMPLEMENTATION PROGRAMS SUPPORTING THE GGRP

Implementation Program Number	Implementation Program
Land Use Element	
LU-P.1	Related Programs and Governmental Agencies
LU-P.3	Downtown Preservation
LU-P.4	Residential Compatibility
LU-P.7	Infill and Redevelopment
LU-P.8	Mixed-Use Development
LU-P.9	Accessibility of New Development
LU-P.10	Affordable Housing
LU-P.12	Technology and Innovation Overlay Areas
LU-P.13	Intersection Overlay Areas
LU-P.14	Housing for Industrial and Research/Technology Employees
LU-P.15	Commercial Revitalization
LU-P.17	Residential Property Maintenance
LU-P.18	Economic Development Assistance
LU-P.19	Local and Diverse Economy
LU-P.20	Commercial Diversity
LU-P.21	Retail Sales Monitoring
LU-P.24	Shuttle Services
LU-P.25	Pedestrian Networks
LU-P.26	Bicycle Infrastructure
LU-P.27	Land Use and Urban Design Standards
LU-P.28	Site Design and Quality
LU-P.31	Workforce Coordination
Circulation Element	

Implementation Program Number	Implementation Program
CIRC-P.6	Neighborhood Circulation Improvements
CIRC-P.7	Bikeway Plan
CIRC-P.8	Transportation Demand Management Ordinance
CIRC-P.13	Traffic Technology
CIRC-P.14	Transit
CIRC-P.15	Complete Streets Priority Routes
CIRC-P.16	Pedestrian Facilities and Enhancement Zones
CIRC-P.20	Alternative Transportation Mode Design Features
CIRC-P.21	Transportation Demand Management and Air Quality
CIRC-P.26	Southern California Association of Governments
CIRC-P.27	South Coast Air Quality Management District
CIRC-P.28	Orange County Transportation Authority
CIRC-P.30	Single-Occupancy Vehicle Legislation
CIRC-P.32	Transit System Coordination
CIRC-P.33	Preserve Abandoned Right-of-Ways
CIRC-P.35	Transportation Management Outreach
Environmental Resources and Conservation Element	
ERC-P.6	Energy Efficiency Audits
ERC-P.7	Energy Efficiency Retrofits
ERC-P.8	Energy Efficiency in Large Facilities
ERC-P.9	Green Building Strategy
ERC-P.10	Community Shared Solar
ERC-P.11	Energy Storage
ERC-P.12	Rooftop Solar Installations
ERC-P.13	Community Choice Aggregation

Implementation Program Number	Implementation Program
ERC-P.16	Water Efficiency and Conservation Retrofits
ERC-P.17	Alternative Vehicles for City Fleet
ERC-P.18	Renewable Fuel Stations
ERC-P.19	Municipal Microgrid
ERC-P.20	Municipal Green Buildings
ERC-P.24	Vehicle Idling
ERC-P.25	Trails Network
ERC-P.26	Green Stormwater Infrastructure in Parks and Open Spaces
ERC-P.29	Minimum Energy Efficiency Standards
ERC-P.30	Construction Activity Emissions
ERC-P.32	Water Conservation for New Development
ERC-P.35	Energy Efficiency Coordination
ERC-P.37	Air Pollutants and GHG Emissions from Stationary Sources
ERC-P.42	Energy Efficiency and Conservation Education
ERC-P.43	Energy Competitions
ERC-P.44	Green Building Demonstration
ERC-P.45	Water Efficiency and Conservation Education
Natural and Environmental Hazards Element	
HAZ-P.1	Related Programs and Governmental Agencies
HAZ-P.4	Runoff and Ponding Standards
HAZ-P.7	Alternative Brownfield Uses
HAZ-P.33	Household Hazardous Waste Disposal
Public Services and Infrastructure Element	
PSI-P.1	Related Programs and Governmental Agencies
PSI-P.4	Urban Water Management Plan

Implementation Program Number	Implementation Program
PSI-P.6	Water Reuse and Recycling Plan
PSI-P.13	Recycling and Composting
PSI-P.15	Storm Drain Improvements
PSI-P.16	Installation of Trash and Recycling Receptacles
PSI-P.17	Design Review
PSI-P.23	Recycling and Composting Outreach

TECHNICAL APPENDIX

The technical appendix provides an overview of the methods used in the GHG forecast, and summarizes the data sources and assumptions used to calculate the greenhouse gas reductions from each of the strategies in the Huntington Beach GGRP. It also presents the performance targets for each strategy, to assist with tracking of strategy implementation. The sources and assumptions are based on the following sources:

- Huntington Beach's GHG emissions inventory and forecast (2012, 2040)
- Reports and tools by government agencies
- Academic research
- Case studies in comparable communities

The baseline GHG inventory and forecast, as presented in Section 2 of the GGRP, is the foundation for the quantification activities of the strategies described in the technical appendix. Activity data, such as observed and forecasted levels of energy use, waste disposal, and vehicle miles driven, forms the foundation of all GHG reduction calculations. This approach ensures that the City's GHG reductions are tied to actual measurements of activities in Huntington Beach, allowing for a greater degree of accuracy.

The technical appendix presents sources, assumptions, and performance targets for both existing accomplishments and new strategies. Note that, as the existing accomplishment calculations rely on activities that have already occurred in Huntington Beach, there are no implementation actions or assumptions associated with these items.

FORECAST METHOD

The GHG emissions forecast is an estimate of how emissions will change in the future based on anticipated population and jobs growth in Huntington Beach, absent of any federal, state, regional, or local actions to reduce emissions. Consistent with state guidance, the GHG emissions forecast assumes that per-capita activity data remains constant at 2012 levels, and that emissions for each sector will grow at the rate as a corresponding demographic projection, known as an indicator. Demographic projections that form the basis of the General Plan are used to forecast GHG emissions. Different types of projections are used for each emission source

Demographic Projections for Huntington Beach

Indicator	Corresponding Sector	2012	2020	2040	Percent Change, 2012–2040
Population	None	192,650	197,170	211,050	10%
Households	Residential energy, off-road equipment	74,850	75,910	81,260	9%
Jobs	Nonresidential energy	77,400	83,350	93,400	21%

Indicator	Corresponding Sector	2012	2020	2040	Percent Change, 2012–2040
Service population	Resource management, water and wastewater	270,050	280,520	304,450	13%
Vehicle miles traveled	Transportation	1,544,688,480	1,630,649,720	1,814,179,890	17%

As an illustration of this approach, the 2012 GHG inventory showed that Huntington Beach's 74,850 homes used enough energy to emit 327,340 $MTCO_2e$ of emissions, or approximately 4.37 $MTCO_2e$ per home. The forecast assumes that each house will continue to use enough energy to emit 4.37 $MTCO_2e$, but that the number of houses will rise to 75,910 in 2020 and to 81,260 in 2040. This in turn means that future residential energy emissions are forecasted to be 332,010 $MTCO_2e$ in 2020 (75,910 houses multiplied by the emissions per house) and 355,380 $MTCO_2e$ in 2040 (81,260 houses multiplied by the emissions per house).

Existing Local Accomplishments

Bicycle Master Plan

Implementation Actions

There are no implementation actions associated with this item.

Assumptions

There are no assumptions associated with this item.

Emissions and Activity Data Savings

	2020	2040
Mileage Savings (VMT)	1,939,750	2,158,060
Emissions Reduction without CCA ($MTCO_2e$)	770	560
Emissions Reduction with CCA ($MTCO_2e$)	770	560

Performance Targets

	2020	2040
Miles of additional bike lanes	3	3

Sources

California Air Pollution Control Officers Association. 2010. *Quantifying Greenhouse Gas Mitigation Measures*. http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

City of Huntington Beach. 2013. *Bicycle Master Plan*. http://records.surfcity-hb.org/sirepub/cache/16/bnuz2kvcggdnfwuhscsbp1fk/346206108022016032917626.PDF.

US Census Bureau. 2012. Table B08006: Sex of Workers by Means of Transportation to Work, American Community Survey 2008-2012 [data table].

Villasenor, J. 2016. Planning Manager, Advanced Planning, City of Huntington Beach. Personal correspondence to Jeff Henderson, Michael Baker International project manager. January 22.

City CNG Fleet

Implementation Actions

There are no implementation actions associated with this item.

Assumptions

There are no assumptions associated with this item.

Emissions and Activity Data Savings

	2020	2040
Emissions Reduction without CCA ($MTCO_2e$)	Less than 10	Less than 10
Emissions Reduction with CCA ($MTCO_2e$)	Less than 10	Less than 10

Performance Targets

	2020	2040
Average annual amount of CNG used per vehicle	1,740 cubic feet of CNG per vehicle (equivalent of 10 gallons of diesel)	1,740 cubic feet of CNG per vehicle (equivalent of 10 gallons of diesel)
Number of diesel vehicles replaced with CNG vehicles	12	12

Sources

Alternative Fuels Data Center. 2014. “Alternative Fuels Data Center - Fuel Properties Comparison.” http://www.afdc.energy.gov/fuels/fuel_comparison_chart.pdf.

ICLEI - Local Governments For Sustainability USA. 2012. *United States Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions*. http://icleiusa.org/publications/us-community-protocol.

Villasenor, J. 2016. Planning Manager, Advanced Planning, City of Huntington Beach. Personal correspondence to Jeff Henderson, Michael Baker International project manager. February 4.

Home Improvement Loans

Implementation Actions

There are no implementation actions associated with this item.

Assumptions

There are no assumptions associated with this item.

Emissions and Activity Data Savings

	2020	2040
Electricity Savings (kWh)	148,350	148,350
Emissions Reduction without CCA ($MTCO_2e$)	40	30
Emissions Reduction with CCA ($MTCO_2e$)	40	20

Performance Targets

	2020	2040
Electricity savings per project	710 kWh	710 kWh
Number of projects	210	210

Sources

Villasenor, J. 2016. Planning Manager, Advanced Planning, City of Huntington Beach. Personal correspondence to Jeff Henderson, Michael Baker International project manager. February 4.

Lawnmower Exchange

Implementation Actions

There are no implementation actions associated with this item.

Assumptions

There are no assumptions associated with this item.

Emissions and Activity Data Savings

	2020	2040
Electricity Savings (kWh)	1,670	1,670
Emissions Reduction without CCA ($MTCO_2e$)	Less than 10	Less than 10
Emissions Reduction with CCA ($MTCO_2e$)	Less than 10	Less than 10

Performance Targets

	2020	2040
Number of lawnmowers exchanged for gasoline models	29	29

Sources

Salem Electric. n.d. "Home Energy Use Guide." https://www.salemelectric.com/sites/default/files/downloads/HomeEnergyUseGuide_0.pdf.

Villasenor, J. 2016. Planning Manager, Advanced Planning, City of Huntington Beach. Personal correspondence to Jeff Henderson, Michael Baker International project manager. February 4.

Local Government Energy Partnership

Implementation Actions

There are no implementation actions associated with this item.

Assumptions

There are no assumptions associated with this item.

Emissions and Activity Data Savings

	2020	2040
Electricity Savings (kWh)	2,504,820	2,504,820
Natural Gas Savings (Therms)	90,060	90,060
Emissions Reduction without CCA ($MTCO_2e$)	1,190	1,060
Emissions Reduction with CCA ($MTCO_2e$)	1,190	840

Performance Targets

There are no performance targets associated with this item.

Sources

Villasenor, J. 2016. Planning Manager, Advanced Planning, City of Huntington Beach. Personal correspondence to Jeff Henderson, Michael Baker International project manager. February 4.

Rooftop Solar

Implementation Actions

There are no implementation actions associated with this item.

Assumptions

There are no assumptions associated with this item.

Emissions and Activity Data Savings

	2020	2040
Electricity Generation (kWh)	18,571,320	18,571,320
Emissions Reduction without CCA ($MTCO_2e$)	5,300	4,280
Emissions Reduction with CCA ($MTCO_2e$)	5,300	2,680

Performance Targets

	2020	2040
kW and kWh per installation	4.42 kW per residential installation (7,050 kWh annually), 67.84 kW per commercial installation (108,270 kWh annually), 3.3 kW per industrial installation (5,270 kWh annually), and 724.7 kW per government installation (1,156,590 kWh annually)	4.42 kW per residential installation (7,050 kWh annually), 67.84 kW per commercial installation (108,270 kWh annually), 3.3 kW per industrial installation (5,270 kWh annually), and 724.7 kW per government installation (1,156,590 kWh annually)
Number of installations	1,790 residential installations, 40 commercial installations, 1 industrial installation, and 1 government installation	1,790 residential installations, 40 commercial installations, 1 industrial installation, and 1 government installation

Sources

Go Solar California. 2015. Currently Interconnected Data Set, December 31, 2015 [data table]. https://www.californiasolarstatistics.ca.gov/data_downloads.

National Renewable Energy Laboratory. 2014. PVWatts Calculator. http://pvwatts.nrel.gov/

Shuttle

Implementation Actions

There are no implementation actions associated with this item.

Assumptions

There are no assumptions associated with this item.

Emissions and Activity Data Savings

	2020	2040
Mileage Savings (VMT)	6,590	6,590
Emissions Reduction without CCA ($MTCO_2e$)	Less than 10	Less than 10
Emissions Reduction with CCA ($MTCO_2e$)	Less than 10	Less than 10

Performance Targets

	2020	2040
Number of annual shuttle riders	6,280	6,280

Sources

Villasenor, J. 2016. Planning Manager, Advanced Planning, City of Huntington Beach. Personal correspondence to Jeff Henderson, Michael Baker International project manager. February 4.

Transportation Demand Management

Implementation Actions

There are no implementation actions associated with this item.

Assumptions

There are no assumptions associated with this item.

Emissions and Activity Data Savings

	2020	2040
Mileage Savings (VMT)	92,580	92,580
Emissions Reduction without CCA ($MTCO_2e$)	40	20
Emissions Reduction with CCA ($MTCO_2e$)	40	20

Performance Targets

	2020	2040
VMT per avoided trip	2.8	2.8
Number of avoided trips	32,920	32,920

Sources

Villasenor, J. 2016. Planning Manager, Advanced Planning, City of Huntington Beach. Personal correspondence to Jeff Henderson, Michael Baker International project manager. February 4.

Water-Efficient Landscaping

Implementation Actions

There are no implementation actions associated with this item.

Assumptions

There are no assumptions associated with this item.

Emissions and Activity Data Savings

	2020	2040
Electricity Savings (kWh)	4,540	4,540
Emissions Reduction without CCA ($MTCO_2e$)	Less than 10	Less than 10
Emissions Reduction with CCA ($MTCO_2e$)	Less than 10	Less than 10

Performance Targets

	2020	2040
Water use reduction per square foot of water-efficient landscaping	5 gallons	5 gallons
Square feet of water-efficient landscaping	409,200	409,200

Sources

California Water Commission. 2015. "Water Commission Adopts Model Water Efficient Landscape Ordinance." http://drought.ca.gov/topstory/top-story-42.html.

ICLEI – Local Governments for Sustainability. n.d. “Climate and Air Pollution Planning Assistant v 1.5.”

Villasenor, J. 2016. Planning Manager, Advanced Planning, City of Huntington Beach. Personal correspondence to Jeff Henderson, Michael Baker International project manager. February 4.

LAND USE STRATEGIES

LU-1: Improved Pedestrian Network

Improve the safety and convenience of the pedestrian network to support walking as a viable alternative.

Implementation Actions

A. Identify gaps in the community sidewalk network, including missing sidewalks or sidewalks that are not wide enough, and resolve these gaps as part of the City's Capital Improvements Program.

B. Require major projects to include pedestrian passes to reduce the distance between destinations.

C. Retrofit all pedestrian crossing signals to automatically display the "Walk" sign when the light turns green.

D. Adjust the timing of pedestrian crossing signals as appropriate, especially in close proximity to senior communities, schools, parks and recreational facilities, the beach, and other facilities that are heavily used by elderly persons and children.

E. Identify suitable places for Lead Pedestrian Interval signals and scramble intersections.

F. Improve the streetscape along major corridors, including installing planters and benches, providing shade through street trees and/or building awnings and overhangs, and removing items that form a barrier to walking.

G. Require new subdivisions to include frequent pedestrian walkways between the neighborhood and surrounding areas at regular intervals, and work with existing neighborhoods to improve pedestrian access.

H. Require new projects along major pedestrian corridors to include pedestrian-friendly features along the ground floor, including frequent windows and doors, visually engaging design, and retail spaces.

I. Support an increase in mixed-use projects, including encouraging new major nonresidential office and industrial projects to include small-scale retail and service facilities to support office and industrial workers, and requiring development projects in Mixed-Use zones to include either residential units or a diversity of nonresidential spaces.

Assumptions

	2020	2040
Percent of Huntington Beach with increased pedestrian connectivity	9%	68%

Emissions and Activity Data Savings

	2020	2040
Mileage Savings (VMT)	2,108,470	15,282,880
Emissions Reduction (without CCA)	840	3,940
Emissions Reduction (with CCA)	840	3,940

Performance Targets

	2020	2040
Acres with increased pedestrian connectivity	1,550	11,880

Sources

California Air Pollution Control Officers Association. 2010. *Quantifying Greenhouse Gas Mitigation Measures*. http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf

US Census Bureau. 2015. California Places Gazetteer [data table]. https://www.census.gov/geo/maps-data/data/gazetteer2015.html.

LU-2: Inclusionary Housing Units

Increase the amount of inclusionary housing in major job centers and transit-accessible areas of Huntington Beach.

Implementation Actions

A. Encourage developers of mixed-use and multifamily projects to include more inclusionary housing units than required under the Huntington Beach Zoning Code.

B. Explore opportunities for additional increased bonuses and incentives for inclusionary housing units.

C. Encourage inclusionary housing as part of new development projects in the Industrial and Research/Technology land use designations.

D. Work with OCTA and local employers to provide lower-cost transit passes for residents in inclusionary housing units.

Assumptions

	2020	2040
Percent of new units that qualify as inclusionary housing	10%	15%
Percent of inclusionary housing residents working in Huntington Beach	30%	35%

Emissions and Activity Data Savings

	2020	2040
Mileage Savings (VMT)	97,080	950,470
Emissions Reduction (without CCA)	40	250
Emissions Reduction (with CCA)	40	250

Performance Targets

	2020	2040
Annual VMT per inclusionary housing resident working in Huntington Beach	1,720	1,520
Number of new inclusionary housing units	60	630
Number of residents in new inclusionary housing units	270	2,480

Sources

California Air Pollution Control Officers Association. 2010. *Quantifying Greenhouse Gas Mitigation Measures*. http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

TRANSPORTATION STRATEGIES

T-1: Bike Ridership

Increase the scope and capacity of bicycle lanes and bicycle infrastructure in Huntington Beach.

Implementation Actions

A. Expand the network of bike lanes in Huntington Beach, with emphasis on new bike lanes in underserved areas and areas expected to see increased development.

B. Install increased bike parking on streets and at public facilities, especially bike lockers and other storage types that offer increased safety.

C. Encourage private landowners to install sufficient bike parking at existing properties, and to retrofit major nonresidential facilities to include lockers and changing rooms for bicycle commuters.

D. Install supportive infrastructure to improve bicycle safety and convenience, including raised pavement markers, bike boxes, green bike lanes, and bicycle detection loops at signalized intersections.

E. Host bicycle safety and awareness classes for bicyclists, pedestrians, and drivers.

F. Coordinate with neighboring cities and OCTA to connect Huntington Beach's bicycle network with the regional system.

G. Work with the Huntington Beach City School District and the Huntington Beach Union High School District to increase bike-to-school commuting.

H. Regularly update the Bicycle Master Plan.

I. Encourage City employees to regularly bike to work, and work with major private employers to promote bike commuting.

J. Explore establishing a bike share program for Huntington Beach or participating in a regional bike share effort.

Assumptions

	2020	2040
Miles of new bike lanes	30	50

Emissions and Activity Data Savings

	2020	2040
Mileage Savings (VMT)	19,933,930	36,705,590
Emissions Reduction (without CCA)	7,930	9,470
Emissions Reduction (with CCA)	7,930	9,470

Performance Targets

	2020	2040
Miles of new bike lanes	30	50
Bike lane ridership commute share	2.65%	3.45%

Sources

California Air Pollution Control Officers Association. 2010. *Quantifying Greenhouse Gas Mitigation Measures*. http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf

City of Huntington Beach. 2013. *Bicycle Master Plan*. http://records.surfcity-hb.org/sirepub/cache/16/bnuz2kvcggdnfwuhscsbp1fk/34620610802201603584180 9.PDF

US Census Bureau. 2012. Table B08006: Sex of Workers by Means of Transportation to Work, American Community Survey 2008-2012 [data table].

Villasenor, J. 2016. Planning Manager, Advanced Planning, City of Huntington Beach. Personal correspondence to Jeff Henderson, Michael Baker International project manager. January 22.

T-2: Shared Parking

Use shared parking strategies to maximize development potential while providing a sufficient supply of parking.

Implementation Actions

A. Identify areas where shared parking may be viable, including Downtown Huntington Beach, the Beach/Edinger corridor, and other areas with a large concentration of jobs and housing.

B. Encourage mixed-use project developers to adopt shared parking and use the additional space for increased housing units, nonresidential space, or public space.

C. Work with developers of adjacent and compatible projects to support shared parking across multiple parcels.

D. Revise the minimum parking standards to allow and encourage shared parking in viable areas.

Assumptions

	2020	2040
Average reduction in parking spaces at new developments	15%	40%
Monthly parking cost at new unbundled developments	$10	$35
Percent of new development with unbundled parking	10%	75%

Emissions and Activity Data Savings

	2020	2040
Mileage Savings (VMT)	2,595,690	49,363,260

Emissions Reduction (without CCA)	1,030	12,740
Emissions Reduction (with CCA)	1,030	12,740

Performance Targets

	2020	2040
Residences with unbundled parking	50	4,410
Businesses with unbundled parking	10	930

Sources

California Air Pollution Control Officers Association. 2010. *Quantifying Greenhouse Gas Mitigation Measures*. http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf

T-3: Increased Transit Ridership

Increase transit ridership to minimize congestion, improve air quality, and promote increased mobility.

Implementation Actions

A. Concentrate new development around major transit hubs and corridors.

B. Work with OCTA to identify underserved areas for transit, and to alter bus service to address unmet transit demand.

C. Provide information to Huntington Beach residents about bus service in the community, including available incentives and other benefits.

D. Identify opportunities to provided reduced-cost passes to Huntington Beach residents and people who work in Huntington Beach.

E. Upgrade bus stops in coordination with OCTA, including providing additional seating and shelter, real-time arrival notifications and applications, and other amenities.

F. Work with OCTA to evaluate transit priority signals along major transit corridors.

G. Support increased express and Bus Rapid Transit service between Huntington Beach and major job centers in other communities.

Assumptions

	2020	2040
Target bus ridership level	2%	5%

Emissions and Activity Data Savings

	2020	2040
Mileage Savings (VMT)	9,230,510	46,734,420
Emissions Reduction (without CCA)	3,670	12,060
Emissions Reduction (with CCA)	3,670	12,060

Performance Targets

	2020	2040
Bus ridership commute share	2%	5%

Sources

California Air Pollution Control Officers Association. 2010. *Quantifying Greenhouse Gas Mitigation Measures*. http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf

US Census Bureau. 2012. Table B08006: Sex of Workers by Means of Transportation to Work, American Community Survey 2008-2012 [data table].

T-4: Carsharing

Attract carshare services to Huntington Beach and promote them as a supplemental transportation service.

Implementation Actions

A. Work with carshare services to identify the potential for carshare business in Huntington Beach, and to launch carsharing if viable.

B. If viable, work with developers of major multifamily and mixed-use projects to include dedicated carsharing spaces in off-street parking lots and garages.

C. Promote the availability and advantages of carshare services in Huntington Beach.

D. Encourage public support of carsharing and ride-sourcing.

E. Work toward reform of taxi, charter vehicle, and ride-sourcing regulations to maximize social and air quality benefits.

Assumptions

	2020	2040
Number of carshare vehicles	95	130
Ride-sourcing participation rate in urban TAZs	15%	15%
Ride-sourcing participation rate in compact TAZs	5%	5%
Ride sourcing participation rate in standard TAZs	1%	1%

Emissions and Activity Data Savings

	2020	2040
Mileage Savings (VMT)	11,243,840	15,210,800
Emissions Reduction (without CCA)	4,470	3,920
Emissions Reduction (with CCA)	4,470	3,920

Performance Targets

	2020	2040
VMT reduction per carshare participant	3,060	3,180
Number of carshare participants	2,850	3,900
VMT reduction per ride-source participant	830	860
Number of ride-source participants	3,050	3,270

Sources

California Air Pollution Control Officers Association. 2010. *Quantifying Greenhouse Gas Mitigation Measures*. http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

Southern California Association of Governments. 2015. *Sustainable Communities Strategy (SCS) Background Documentation Appendix*. http://scagrtpscs.net/Documents/2016/draft/d2016RTPSCS_SCSBackgroundDocumentation.pdf .

———. 2015. *Emerging Trends: Mobility Innovations*. http://scagrtpscs.net/Documents/2016/draft/d2016RTPSCS_MobilityInnovations.pdf.

Shaheen, S.A. 2011. "Carsharing: A Strategy for Reducing Carbon Footprint & Parking Policy Approaches." Conference presentation, 2011 CCPA Conference, Oakland, CA. November 3.

T-5: Telecommuting and Alternative Work Schedules

Establish telecommuting and alternative work schedules to reduce peak commute traffic.

Implementation Actions

A. Encourage local employers, particularly those with 100 or more full-time employees or equivalent, to offer telecommuting and/or alternative work schedules for employees as feasible, and develop incentives for employers who offer these options.

B. Promote telecommuting and alternative work schedules through education and outreach campaigns to Huntington Beach residents.

C. Work to establish one or more easily accessible telecommuting centers in Huntington Beach, with appropriate workspace and telecommunications infrastructure.

Assumptions

	2020	2040
Percent of employed residents telecommuting 1.5 days per week	3%	7%

Emissions and Activity Data Savings

	2020	2040
Mileage Savings	2,152,460	5,587,670
Emissions Reduction (without CCA)	860	1,440
Emissions Reduction (with CCA)	860	1,440

Performance Targets

	2020	2040
VMT reduction per telecommuting employee	860	850
Number of telecommuting employees	2,500	6,540

Sources

California Air Pollution Control Officers Association. 2010. *Quantifying Greenhouse Gas Mitigation Measures*. http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

T-6: Transportation Demand Management

Reduce commute-related trips for major employers.

Implementation Actions

A. Continue to enforce the standards of the adopted Transportation Demand Management ordinance.

B. Consider requiring new major nonresidential projects to reduce commute-related trips by 10–20% below typical conditions.

C. Work with local businesses and OCTA to offer free or reduced-cost bus passes for employees.

D. Monitor efforts to reduce commuter-related trips at major employers, and publicize successes in local and regional media.

E. Work with major employers to promote carpool and vanpool services, including making it easy for employees to sign up for a carpool or vanpool, and offering designated priority parking for carpool and vanpool vehicles.

Assumptions

	2020	2040
Percent of employers participating at voluntary level	2%	5%
Target trip reduction from voluntary participants	5%	10%
Percent of new employers participating at required level	30%	55%
Target trip reduction from mandatory participants	10%	20%

Emissions and Activity Data Savings

	2020	2040
Mileage Savings	408,490	5,629,510
Emissions Reduction (without CCA)	160	1,450
Emissions Reduction (with CCA)	160	1,450

Performance Targets

	2020	2040
VMT reduction per participating employee (exclusive of other measures)	270	1,390
Number of participating employees	1,520	4,060

Sources

California Air Pollution Control Officers Association. 2010. *Quantifying Greenhouse Gas Mitigation Measures*. http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

T-7: Shuttle Service

Provide a year-round shuttle service for visitor destinations.

Implementation Actions

A. Explore the feasibility of a year-round shuttle service connecting Downtown, major shopping districts, hotels, and other visitor destinations.

B. Promote the availability of a shuttle service in Huntington Beach's tourism promotional material.

C. Pursue funding sources, including grants and business sponsorships, to financially support an ongoing shuttle service.

D. As feasible, set shuttle schedule and cost to serve as a commute mode for employees in visitor-serving facilities.

Assumptions

	2020	2040
Average increase in per person ridership from baseline conditions	15%	25%
Drop-off in ridership from holiday weekends to regular summer weekends	20%	20%
Drop-off in ridership from regular weekends to regular weekdays	75%	75%
Drop-off in ridership from regular summer to spring/autumn	25%	25%
Drop-off in ridership from regular summer to winter	50%	50%
Average trip distance (miles)	2	2

Emissions and Activity Data Savings

	2020	2040
Mileage Savings (VMT)	228,420	248,290
Emissions Reduction (without CCA)	90	60
Emissions Reduction (with CCA)	90	60

Performance Targets

	2020	2040
VMT reduction per shuttle rider	1.34	1.34
Number of annual shuttle riders	170,470	185,290

Sources

California Air Pollution Control Officers Association. 2010. *Quantifying Greenhouse Gas Mitigation Measures*. http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

Graham, A. 2016. Acting Assistant to the City Manager/Energy & Sustainability Projects Manager, City of Huntington Beach. Personal correspondence to Aaron Pfannenstiel, Michael Baker International project manager. February 4.

T-8: Traffic Calming

Install traffic-calming features on appropriate roadways to better allow for active transportation.

Implementation Actions

A. Identify appropriate roadways for traffic calming and install traffic-calming features.

B. Fund traffic-calming efforts through the Capital Improvement Program.

C. Determine the most appropriate traffic-calming features for different roadways, including curb extensions, raised crosswalks, speed tables, median islands, roundabouts, and chicanes.

Assumptions

	2020	2040
Percent of intersections with traffic-calming features	2%	5%
Percent of streets with traffic-calming features	2%	5%

Emissions and Activity Data Savings

	2020	2040
Effective Mileage Savings (VMT)	326,130	907,090
Emissions Reduction (without CCA)	130	230
Emissions Reduction (with CCA)	130	230

Performance Targets

	2020	2040
Percent of intersections with traffic-calming features	2%	5%
Percent of streets with traffic-calming features	2%	5%

Sources

California Air Pollution Control Officers Association. 2010. *Quantifying Greenhouse Gas Mitigation Measures*. http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

Alternative Fuel Strategies

F-1: Traffic Signal Synchronization

Continue to synchronize traffic signals along major roadways to reduce traffic idling.

Implementation Actions

A. Continue to synchronize traffic signals at key intersections.

B. Update the Capital Improvement Program to include traffic signal synchronization as needed.

C. Coordinate with neighboring communities and OCTA to support regional traffic signal synchronization.

Assumptions

	2020	2040
Road miles with traffic synchronization	15	40

Emissions and Activity Data Savings

	2020	2040
Electricity Savings (kWh)	30,180	387,750
Fuel Savings (gallons)	249,260	508,200
Emissions Reduction (without CCA)	2,340	4,850
Emissions Reduction (with CCA)	2,340	4,810

Performance Targets

	2020	2040
Road miles with traffic synchronization	15	40

Sources

California Department of Transportation. 2014. *California Public Road Data 2013: Statistical Information Derived from the Highway Performance Monitoring System*. http://www.dot.ca.gov/hq/tsip/hpms/hpmslibrary/prd/2013prd/2013PRD-revised.pdf.

California Air Resources Board. 2015. EMFAC2014 Web Database. http://www.arb.ca.gov/emfac/2014.

Halkias, J., and M. Schauer. 2004. "Red Light, Green Light." http://www.fhwa.dot.gov/publications/publicroads/04nov/07.cfm.

ICLEI - Local Governments For Sustainability USA. 2012. *United States Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions*. http://icleiusa.org/publications/us-community-protocol.

F-2: Electric Vehicles

Increase electric vehicle adoption in Huntington Beach.

Implementation Actions

A. In coordination with the South Coast Air Quality Management District, provide information about the benefits of battery electric and plug-in hybrid electric vehicles, and the availability of state and federal incentives, at public events.

B. Work with property owners to retrofit existing nonresidential and multifamily parking lots and garages to include charging stations for EVs and neighborhood electric vehicles (NEVs).

C. Explore opportunities to offer decreased permit fees or expedited permits for EV and NEV charging stations.

D. Install additional publicly accessible EV and NEV charging stations at public facilities, including Level 3 chargers as feasible.

E. Work with major employers and the South Coast Air Quality Management District to support replacing conventional vehicles in business fleets with battery electric vehicles and plug-in hybrids.

F. In accordance with the NEV Transportation Plan, designate key NEV routes and signs as appropriate.

G. Conduct training and outreach efforts to ensure the safe operation of NEVs in Huntington Beach, including for drivers of all vehicles, pedestrians, and bicyclists.

Assumptions

	2020	2040
EV adoption rate	5%	28%
Percent of trips made by EV among EV-owning households	65%	80%

Emissions and Activity Data Savings

	2020	2040
Electricity Savings (kWh)	-17,590,740	-113,716,060
Effective Mileage Savings (VMT)	32,205,210	247,617,160
Emissions Reduction (without CCA)	7,790	37,660
Emissions Reduction (with CCA)	7,790	47,460

Performance Targets

	2020	2040
Annual kWh per EV	4,630	5,000
VMT per EV	13,950	17,860
Number of EVs	3,800	22,750

Sources

California Air Resources Board. 2015. EMFAC2014 Web Database. http://www.arb.ca.gov/emfac/2014.

Federal Highway Administration. 2015. *Feasibility and Implications of Electric Vehicle (EV) Deployment and Infrastructure Development*. https://www.fhwa.dot.gov/environment/climate_change/mitigation/publications/ev_deployment/fhwahep15021.pdf.

Greenblatt, J. B. 2015. *Modeling California policy impacts on greenhouse gas emissions*, *LBNL-7008E*. http://eetd.lbl.gov/sites/all/files/lbnl-7008e.pdf

F-3: Biofuel Vehicles

Increase the use of biofuel-powered vehicles in the community.

Implementation Actions

A. Partner with local restaurants and biofuel companies to convert restaurant waste into biofuel.

B. Work with property owners to locate additional biofuel stations in the community to meet demand.

C. Work with major employers and the South Coast Air Quality Management District to promote biofuel vehicles as a viable alternative to conventional vehicles as part of large fleets.

D. Support the use of advanced, cleaner-burning biofuels from environmentally responsible sources as technology advances.

Assumptions

	2020	2040
Biofuel vehicle adoption rate	0.5%	2%
Percent of biofuel vehicles using advanced biofuels	0%	50%

Emissions and Activity Data Savings

	2020	2040
Effective Mileage Savings (VMT)	2,058,420	10,308,810
Emissions Reduction (without CCA)	820	2,660
Emissions Reduction (with CCA)	820	2,660

Performance Targets

	2020	2040
VMT per biofuel vehicle	5,420	5,150
Number of biofuel vehicles	380	1,630

Sources

Alternative Fuels Data Center. 2014. “Alternative Fuels Data Center - Fuel Properties Comparison.” http://www.afdc.energy.gov/fuels/fuel_comparison_chart.pdf.

California Air Resources Board. 2015. EMFAC2014 Web Database. http://www.arb.ca.gov/emfac/2014.

Greenblatt, J. B. 2015. *Modeling California policy impacts on greenhouse gas emissions*, *LBNL-7008E*. http://eetd.lbl.gov/sites/all/files/lbnl-7008e.pdf

ICLEI - Local Governments For Sustainability USA. 2012. *United States Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions*. http://icleiusa.org/publications/us-community-protocol.

F-4: Autonomous Vehicles

Enable autonomous vehicle operation in Huntington Beach to improve mobility and increase traffic efficiency.

Implementation Actions

A. In conjunction with state and federal agencies, develop local regulations to allow for the safe and effective operation of semiautonomous and fully autonomous vehicles in Huntington Beach.

B. Evaluate changes to parking infrastructure and policies associated with increased vehicle autonomy, and implement changes as needed.

C. Support state and federal actions to allow for widespread, safe use of autonomous vehicles.

D. Support efforts to increase the use of autonomous vehicles in freight shipping.

Assumptions

	2020	2040
Percent of VMT from autonomous vehicles	0%	30%

Emissions and Activity Data Savings

	2020	2040
Effective Mileage Savings (VMT)	0	47,562,840
Emissions Reduction (without CCA)	-	12,270
Emissions Reduction (with CCA)	-	12,270

Performance Targets

	2020	2040
Average VMT per autonomous vehicle	0	1,950
Number of autonomous vehicles	0	24,380

Sources

Greenblatt, J. B. 2015. *Modeling California policy impacts on greenhouse gas emissions*, *LBNL-7008E*. http://eetd.lbl.gov/sites/all/files/lbnl-7008e.pdf

Southern California Association of Governments. 2015. *Emerging Trends: Mobility Innovations*. http://scagrtpscs.net/Documents/2016/draft/d2016RTPSCS_MobilityInnovations.pdf.

Victoria Transport Policy Institute. 2015. *Autonomous Vehicle Implementation Predictions: Implications for Transport Planning*. http://www.vtpi.org/avip.pdf.

RENEWABLE ENERGY STRATEGIES

RE-1: Residential Solar

Expand the number of solar energy systems on new and existing single-family homes and multifamily developments.

Implementation Actions

A. Publicize available financial incentives to install solar energy systems on new and existing residential buildings, including property assessed clean energy (PACE) programs, and develop additional incentives internally and with neighboring communities.

B. Explore ways to reduce or eliminate residential solar permit fees, and to streamline solar energy installations, beyond the requirements of AB 2188.

C. Amend urban design guidelines to ensure support of on-site solar energy systems.

D. Encourage new and significantly retrofitted homes and multifamily buildings to be pre-wired and pre-plumbed for rooftop solar energy systems.

E. Work with owners of multifamily buildings to develop building bylaws allowing for the installation of individual rooftop solar energy systems.

F. Educate residential homeowners about the benefits of on-site solar energy systems and the steps necessary to install these systems.

Assumptions

	2020	2040
Percent of existing households with solar PV systems	4%	35%
Percent of new households with solar PV systems	7%	50%
Percent of new households with solar water heaters	1%	10%

Emissions and Activity Data Savings

	2020	2040
Electricity Generated (kWh)	21,023,360	195,120,930
Natural Gas Savings (Therms)	600	41,930
Emissions Reduction (without CCA)	6,000	45,240
Emissions Reduction (with CCA)	6,000	28,430

Performance Targets

	2020	2040
Average kW and kWh per solar PV system	4.42 kW and 7,050 kWh	4.42 kW and 7,050 kWh
Number of existing homes with solar PV systems	2,940	25,750
Number of new homes with solar PV systems	40	1,910
Energy savings per home with solar water heater	40 kWh and 110 therms	10 kWh and 70 therms
Number of new homes with solar water heaters	10	590

Sources

Go Solar California. 2015. Currently Interconnected Data Set, December 31, 2015 [data table]. https://www.californiasolarstatistics.ca.gov/data_downloads.

ICLEI – Local Governments for Sustainability. n.d. “Climate and Air Pollution Planning Assistant v 1.5.”

National Renewable Energy Laboratory. 2014. PVWatts Calculator. http://pvwatts.nrel.gov.

RE-2: Nonresidential Solar

Expand the number of solar energy systems on new and existing nonresidential buildings.

Implementation Actions

A. Work with existing nonresidential property owners to install rooftop solar energy systems, and to develop a fair balance between property owners and tenants to finance and benefit from solar energy systems.

B. Promote available incentives for nonresidential rooftop solar energy systems, and work to develop additional incentives.

C. Encourage new and significantly retrofitted nonresidential buildings to be pre-wired and pre-plumbed for rooftop solar energy systems.

D. Encourage parking lot owners to install solar photovoltaic shade structures.

Assumptions

	2020	2040
Percent of existing businesses with solar PV systems	2%	20%
Percent of new businesses with solar PV systems	5%	35%

Emissions and Activity Data Savings

	2020	2040
Electricity Generated (kWh)	14,370,210	135,828,850
Emissions Reduction (without CCA)	4,220	32,080
Emissions Reduction (with CCA)	4,220	22,720

Performance Targets

	2020	2040
Average kW and kWh per solar PV system	67.84 kW and 108,270 kWh	67.84 kW and 108,270 kWh
Number of existing businesses with solar PV systems	130	1,250
Number of new businesses with solar PV systems	10	260

Sources

Go Solar California. 2015. Currently Interconnected Data Set, December 31, 2015 [data table]. https://www.californiasolarstatistics.ca.gov/data_downloads.

ICLEI – Local Governments for Sustainability. n.d. “Climate and Air Pollution Planning Assistant v 1.5.”

National Renewable Energy Laboratory. 2014. PVWatts Calculator. http://pvwatts.nrel.gov.

RE-3: Community-Shared Solar

Establish community-shared solar operations in Huntington Beach to support the increased use of renewable energy.

Implementation Actions

A. Work with SCE to remove barriers to community-shared solar operations

B. Work with solar developers, property owners, and local financing institutions to explore the feasibility of community-shared solar systems as allowed by SCE, and to launch community-shared solar if found viable.

C. Amend the Huntington Beach Zoning Code to allow for medium-size solar photovoltaic systems in appropriate land uses.

D. Promote community-shared solar and Green Tariff programs through in-person events and media campaigns.

Assumptions

	2020	2040
kW of community-shared solar	500	10,000

Emissions and Activity Data Savings

	2020	2040
Electricity Generated (kWh)	797,980	15,959,560
Emissions Reduction (without CCA)	230	3,680
Emissions Reduction (with CCA)	230	2,310

Performance Targets

	2020	2040
kW and annual kWh of community-shared solar system	500 kW and 797,980 kWh	10,000 kW and 15,959,560 kWh

Sources

National Renewable Energy Laboratory. 2014. PVWatts Calculator. http://pvwatts.nrel.gov.

RE-4: New Zero Net Energy Buildings

Transition to zero net energy buildings for all new construction in support of state mandates.

Implementation Actions

A. Work with the local development community to promote awareness of state mandates regarding zero net energy buildings, and provide information about zero net energy buildings online and as part of the City's development review process.

B. Identify and remove barriers in the City's regulations to feasible zero net energy construction.

C. Partner with local developers and businesses to construct demonstration zero net energy buildings to raise awareness of zero net energy systems, and to illustrate benefits and economic feasibility.

D. Encourage residential and nonresidential buildings undergoing significant retrofits to achieve energy-efficiency standards beyond the state-mandated minimum.

E. Explore providing financial incentives for new and significantly retrofitted buildings that achieve zero net energy standards before being required to do so.

F. Construct new municipal buildings to meet zero net energy standards.

G. Pursue microgrid technology and energy storage features in new municipal buildings, and encourage major project applicants to incorporate these features into their development proposals.

Assumptions

	2020	2040
Percent of new homes that are ZNE	0%	35%
Percent of new businesses that are ZNE	0%	20%

Emissions and Activity Data Savings

	2020	2040
Electricity Saved/Generated (kWh)	-	15,520,440
Natural Gas Savings (Therms)	-	698,540
Emissions Reduction (without CCA)	-	7,380
Emissions Reduction (with CCA)	-	6,310

Performance Targets

	2020	2040
Energy savings per ZNE home	0	1,160 kWh and 220 therms
Number of ZNE homes	0	2,060
Energy savings per ZNE business	0	71,070 kWh and 1,290 therms
Number of ZNE businesses	0	180

Sources

California Energy Commission. 2016. *California 2015 Integrated Energy Policy Report*. http://docketpublic.energy.ca.gov/PublicDocuments/15-IEPR-01/TN210526_20160224T115020_2015_Integrated_Energy_Policy_Report__Full_File_Size.pdf .

RE-5: Solar Swimming Pool Heating

Use solar heating technologies for an increased number of new and existing swimming pools.

Implementation Actions

A. In coordination with utility providers, offer incentives for solar water heating for swimming pools.

B. Provide information about solar water heating to swimming pool owners and project applicants.

Assumptions

	2020	2040
Percent of swimming pools with solar heaters	5%	30%

Emissions and Activity Data Savings

	2020	2040
Natural Gas Savings (Therms)	49,470	307,080
Emissions Reduction (without CCA)	260	1,630
Emissions Reduction (with CCA)	260	1,630

Performance Targets

	2020	2040
Therm savings per swimming pool with solar heater	260	250
Number of houses with solar-heated swimming pools	190	1,220

Sources

California Energy Commission. 2010. *Residential Appliance Saturation Study*. http://www.energy.ca.gov/appliances/rass.

US Department of Energy. 2004. *Heat Your Water with the Sun: A Consumer's Guide*. http://www.nrel.gov/docs/fy04osti/34279.pdf.

RE-6: Community Choice Aggregation

Explore the feasibility of launching a Community Choice Aggregation program to increase local control of energy sources.

Implementation Actions

A. In partnership with nearby communities to the extent possible, prepare a study on the feasibility of creating or joining a Community Choice Aggregation (CCA) program, and launch such a program if found to be feasible.

B. Work with local financial institutions to help finance any CCA program the City chooses to participate in.

C. Offer multiple tiers of renewable electricity to customers through any CCA program the City chooses to participate in, including a minimum tier that offers at least as much renewable electricity as Southern California Edison.

D. Conduct extensive public outreach if the City chooses to participate in a CCA program, ensuring community members are aware of the program and the benefits it offers.

E. Support state legislative efforts to improve the feasibility of CCA programs, and oppose legislation that imposes additional barriers to CCA programs.

Assumptions

	2020	2040
Percent of residential customers enrolled in "light green"	0%	85%
Percent of residential customers enrolled in "dark green"	0%	5%
Percent of nonresidential customers enrolled in "light green"	0%	73%
Percent of nonresidential customers enrolled in "dark green"	0%	2%

	"Light Green" scenario		"Dark Green" scenario	
	2020	2040	2020	2040
Percent of energy from biomass	0%	13%	0%	16%
Percent of energy from coal	0%	0%	0%	0%
Percent of energy from geothermal	0%	0%	0%	6%
Percent of energy from large-scale hydroelectric	0%	3%	0%	0%
Percent of energy from natural gas	0%	22%	0%	0%
Percent of energy from nuclear	0%	0%	0%	0%
Percent of energy from oil	0%	0%	0%	0%
Percent of energy from small-scale hydroelectric	0%	4%	0%	0%
Percent of energy from solar (photovolatic and solar thermal)	0%	22%	0%	29%
Percent of energy from wind	0%	36%	0%	49%

Emissions and Activity Data Savings

	2020	2040
Emissions Reduction (without CCA)	-	-
Emissions Reduction (with CCA)	-	104,660

Performance Targets

	2020	2040
kWh supplied by CCA	0	985,229,810
Number of "light green" customers	0 households and 0 businesses	69,070 households and 5,290 businesses
Number of "dark green" customers	0 households and 0 businesses	4,060 households and 140 businesses
Average renewable energy mix	0	76.0%

Sources

US Environmental Protection Agency. 2015. eGRID2012 Data File [data table].

———. 2015. *The Emissions & Generated Resource Integrated Database: Technical Support Document for EGRID with Year 2012 Data*. http://www.epa.gov/sites/production/files/2015-10/documents/egrid2012_technicalsupportdocument.pdf.

Energy Efficiency Strategies

EE-1: Residential Homeowner Retrofits

Reduce the amount of energy used by existing owner-occupied households through comprehensive residential energy retrofits.

Implementation Actions

A. Provide information for homeowners about the anticipated cost savings and available incentives for residential energy retrofits, including upgraded insulation, improved doors and windows, duct and vent sealing, and more efficient appliances.

B. Streamline the permit review and approval process for energy-efficiency improvements that involve significant retrofits.

C. Host outreach events on residential energy retrofits.

D. Explore developing additional incentives to support higher rates of energy retrofits.

E. Consider offering low-cost or free home energy inspections to identify the greatest opportunities for residential retrofits.

F. Provide information about energy retrofits to applicants for significant retrofits as part of the permit review process.

G. Develop and distribute a list of free and low-cost actions homeowners can take to reduce energy use.

Assumptions

	2020	2040
Percent of owner-occupied existing homes with whole-home retrofits	2%	30%
Percent of owner-occupied existing homes with HVAC retrofits	4%	45%
Percent of owner-occupied existing homes with lighting retrofits	8%	85%
Percent of owner-occupied existing homes with water heater retrofits	8%	65%
Percent of owner-occupied existing homes replacing miscellaneous appliances	10%	90%
Appliance replacement rate	30%	100%
Average years between owner-occupied single-family home renovations	30	30
Average years between owner-occupied multifamily building-wide renovations	50	50

Emissions and Activity Data Savings

	2020	2040
Electricity Savings (kWh)	30,160,240	220,852,300
Natural Gas Savings (Therms)	1,173,700	9,545,630
Emissions Reduction (without CCA)	14,850	101,730
Emissions Reduction (with CCA)	14,850	82,700

Performance Targets

	2020	2040
Average savings per single-family home	1,430 kWh and 150 therms from whole-home retrofits	1,430 kWh and 150 therms from whole-home retrofits
	90 kWh and 30 therms from HVAC retrofits	90 kWh and 30 therms from HVAC retrofits
	150 kWh from lighting retrofits	150 kWh from lighting retrofits
	40 kWh and 70 therms from water heater retrofits	40 kWh and 70 therms from water heater retrofits
	400 kWh and 0 therms from appliance retrofits	1,340 kWh and 0 therms from appliance retrofits
	5,100 kWh and 150 therms from renovations for Title 24 consistency	6,530 kWh and 240 therms from renovations for Title 24 consistency

	2020	2040
Number of retrofitted single-family homes	770 homes with whole-home retrofits 1,540 homes with HVAC retrofits, 3,070 homes with lighting retrofits 3,070 homes with water heater retrofits 3,840 homes with appliance retrofits 5,020 homes with renovations for Title 24 consistency	11,520 homes with whole-home retrofits 17,280 homes with HVAC retrofits 32,630 homes with lighting retrofits 24,950 homes with water heater retrofits 34,550 homes with appliance retrofits 21,500 homes with renovations for Title 24 consistency
Average savings per multifamily home	1,750 kWh and 40 therms from whole-home retrofits 50 kWh and 10 therms from HVAC retrofits 90 kWh from lighting retrofits 20 kWh and 30 therms from water heater retrofits 230 kWh and 0 therms from appliance retrofits 2,900 kWh and 70 therms from renovations for Title 24 consistency	1,750 kWh and 40 therms from whole-home retrofits 50 kWh and 10 therms from HVAC retrofits 90 kWh from lighting retrofits 20 kWh and 30 therms from water heater retrofits 760 kWh and 0 therms from appliance retrofits 3,710 kWh and 110 therms from renovations for Title 24 consistency
Number of retrofitted multifamily homes	80 homes with whole-home retrofits 160 homes with HVAC retrofits 320 homes with lighting retrofits 320 homes with water heater retrofits 400 homes with appliance retrofits 320 homes with renovations for Title 24 consistency	1,210 homes with whole-home retrofits 1,820 homes with HVAC retrofits 3,440 homes with lighting retrofits 2,630 homes with water heater retrofits 3,640 homes with appliance retrofits 1,360 homes with renovations for Title 24 consistency

Sources

Brown, R., Borgeson, S., Koomey, J., and Biermayer, P. 2008. U.S. *Building-Sector Energy Efficiency Potential*. Ernest Orlando Lawrence Berkeley National Laboratory, University of California. http://btech.lbl.gov/sites/all/files/lbnl-1096e.pdf.

California Energy Commission. 2010. *Residential Appliance Saturation Study*. http://www.energy.ca.gov/appliances/rass.

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EE-2: Rental Unit Retrofits

Improve energy efficiency in residential rental units.

Implementation Actions

A. In coordination with utility providers and energy contractors, provide free home energy audits to low-income rental households, and reduced-cost energy audits to other rental households.

B. Work with residential property managers and landlords to develop and use green leases, allowing energy-efficient retrofits in rental units with an equitable split of the cost and benefits between tenants and landlords.

C. Inform landlords of the benefits and available incentives for energy-efficiency retrofits, especially during the permit application process for other retrofit activities.

D. Work with local schools and community groups to develop a door-to-door education campaign for energy efficiency in rental units, with an emphasis on low-impact and reduced-cost actions.

E. Encourage landlords to replace appliances older than 15 years with models that meet or exceed current energy-efficiency standards prior to occupation by new tenants.

F. Encourage landlords to disclose home energy performance of rental units to potential tenants prior to time of lease, and provide landlords with available tools and other resources to assess energy performance.

Assumptions

	2020	2040
Percent of renter-occupied existing homes with whole-home retrofits	1%	15%
Percent of renter-occupied existing homes with HVAC retrofits	3%	20%
Percent of renter-occupied existing homes with lighting retrofits	10%	90%
Percent of renter-occupied existing homes with water heater retrofits	10%	90%
Percent of renter-occupied existing homes replacing miscellaneous appliances	15%	90%
Appliance replacement rate	50%	100%
Average years between renter-occupied single-family home renovations	30	30
Average years between renter-occupied multifamily building-wide renovations	50	50

Emissions and Activity Data Savings

	2020	2040
Electricity Savings (kWh)	12,549,500	78,703,510
Natural Gas Savings (Therms)	431,160	3,377,830
Emissions Reduction (without CCA)	5,870	36,130
Emissions Reduction (with CCA)	5,870	29,340

Performance Targets

	2020	2040
Average savings per single-family home	1,430 kWh and 150 therms from whole-home retrofits 90 kWh and 30 therms from HVAC retrofits 150 kWh from lighting retrofits 40 kWh and 70 therms from water heater retrofits 670 kWh and 0 therms from appliance retrofits 5,100 kWh and 150 therms from renovations for Title 24 consistency	1,430 kWh and 150 therms from whole-home retrofits 90 kWh and 30 therms from HVAC retrofits 150 kWh from lighting retrofits 40 kWh and 70 therms from water heater retrofits 670 kWh and 0 therms from appliance retrofits 6,530 kWh and 240 therms from renovations for Title 24 consistency
Number of retrofitted single-family homes	80 homes with whole-home retrofits 230 homes with HVAC retrofits 760 homes with lighting retrofits 760 homes with water heater retrofits 1,140 homes with appliance retrofits 980 homes with renovations for Title 24 consistency	1,140 homes with whole-home retrofits 1,520 homes with HVAC retrofits, 6,820 homes with lighting retrofits 6,820 homes with water heater retrofits 6,820 homes with appliance retrofits 3,440 homes with renovations for Title 24 consistency
Average savings per multifamily home	1,750 kWh and 40 therms from whole-home retrofits 50 kWh and 10 therms from HVAC retrofits 90 kWh from lighting retrofits 20 kWh and 30 therms from water heater retrofits 380 kWh and 0 therms from appliance retrofits 2,900 kWh and 70 therms from renovations for Title 24 consistency	1,750 kWh and 40 therms from whole-home retrofits 50 kWh and 10 therms from HVAC retrofits 90 kWh from lighting retrofits 20 kWh and 30 therms from water heater retrofits 380 kWh and 0 therms from appliance retrofits 3,710 kWh and 110 therms from renovations for Title 24 consistency
Number of retrofitted multifamily homes	220 homes with whole-home retrofits 660 homes with HVAC retrofits 2,190 homes with lighting retrofits 2,190 homes with water heater retrofits 3,280 homes with appliance retrofits 1,730 homes with renovations for Title 24 consistency	3,280 homes with whole-home retrofits 4,370 homes with HVAC retrofits 19,690 homes with lighting retrofits 19,690 homes with water heater retrofits 19,690 homes with appliance retrofits 8,920 homes with renovations for Title 24 consistency

Sources

Brown, R., Borgeson, S., Koomey, J., and Biermayer, P. 2008. *U.S. Building-Sector Energy Efficiency Potential*. Ernest Orlando Lawrence Berkeley National Laboratory, University of California. http://btech.lbl.gov/sites/all/files/lbnl-1096e.pdf.

California Energy Commission. 2010. *Residential Appliance Saturation Study*. http://www.energy.ca.gov/appliances/rass.

———. 2014. *Impact Evaluation of the California Comprehensive Residential Retrofit Programs*. http://www.energy.ca.gov/2014publications/CEC-400-2014-014/CEC-400-2014-014.pdf.

EE-3: Nonresidential Retrofits

Reduce energy use in nonresidential buildings.

Implementation Actions

A. Publicize available strategies to reduce energy use in nonresidential buildings through meetings with local employers and business groups, and extensively promote incentives such as property assessed clean energy (PACE), low-interest loans, and on-bill financing.

B. Work with nonresidential building owners to encourage regular retrocommissioning activities.

C. In coordination with utility providers, explore creating additional incentives to support the financial viability of energy efficiency retrofits in nonresidential buildings.

D. Support participation in demand response programs.

E. Encourage nonresidential property owners to disclose energy performance of nonresidential space prior to sale or lease.

F. Publicize nonresidential energy efficiency successes in local and regional media.

G. Work with nonresidential property landlords to develop and use green leases to support increased nonresidential energy retrofits.

H. Work with project applicants seeking to renovate nonresidential properties to include energy-efficiency retrofits as part of renovation activities.

Assumptions

	2020	2040
Percent of existing businesses undergoing retrocommissioning	4%	40%
Percent of existing businesses undergoing standard retrofits	2%	25%
Percent of existing businesses undergoing deep retrofits	1%	10%
Percent of existing businesses with appliance upgrades	10%	90%
Appliance replacement rate	30%	100%
Average years between nonresidential renovations	50	50

Emissions and Activity Data Savings

	2020	2040
Electricity Savings (kWh)	22,053,250	212,154,880

Natural Gas Savings (Therms)	280,980	2,967,590
Emissions Reduction (without CCA)	7,790	64,730
Emissions Reduction (with CCA)	7,790	46,450

Performance Targets

	2020	2040
Average savings per business	21,810 kWh and 280 therms from retrocommissioning 41,900 kWh and 540 therms from standard retrofits 60,840 kWh and 780 therms from deep retrofits 2,780 kWh and 40 therms from appliance upgrades 19,190 kWh and 210 therms per business with renovations for Title 24 consistency	21,810 kWh and 280 therms from retrocommissioning 41,900 kWh and 540 therms from standard retrofits 60,840 kWh and 780 therms from deep retrofits 9,270 kWh and 140 therms from appliance upgrades 32,990 kWh and 320 therms per business with renovations for Title 24 consistency
Number of retrofitted businesses	210 businesses with retrocommissioning 100 businesses with standard retrofits 50 businesses with deep retrofits 520 businesses with appliance upgrades 490 businesses with renovations for Title 24 consistency	2,100 businesses with retrocommissioning 1,310 businesses with standard retrofits 520 businesses with deep retrofits 4,710 businesses with appliance upgrades 1,970 businesses with renovations for Title 24 consistency

Sources

Brown, R., Borgeson, S., Koomey, J., and Biermayer, P. 2008. *U.S. Building-Sector Energy Efficiency Potential*. Ernest Orlando Lawrence Berkeley National Laboratory, University of California. http://btech.lbl.gov/sites/all/files/lbnl-1096e.pdf.

California Energy Commission. 2006. *California Commercial End-Use Survey*. http://www.energy.ca.gov/2006publications/CEC-400-2006-005/CEC-400-2006-005.PDF.

Pacific Northwest National Laboratory. 2011. *Advanced Energy Retrofit Guides: Office Buildings*. http://www.pnnl.gov/main/publications/external/technical_reports/PNNL-20761.pdf.

———. 2011. *Advanced Energy Retrofit Guides: Retail Buildings*. http://www.pnnl.gov/main/publications/external/technical_reports/PNNL-20814.pdf.

EE-4: Industrial Retrofits

Reduce energy use in major industrial facilities.

Implementation Actions

A. Encourage industrial facilities to upgrade old and inefficient equipment, including boilers, chillers, and fans.

B. Promote regular retrocommissioning for industrial facilities.

C. Support lighting retrofits in industrial facilities, and encourage increased access to daylight in renovated industrial facilities.

D. Partner with local industrial trade groups to share information about industrial energy efficiency, including information on cost-savings and available funding opportunities.

E. Recognize and publicize industrial facilities with successful energy-efficiency strategies.

F. Promote collaboration with local technology firms to support increased energy efficiency in the local industrial sector.

G. If Huntington Beach establishes or participates in a CCA program, encourage industrial facilities with direct access services to switch to CCA if economically feasible and if there is sufficient energy supply.

Assumptions

	2020	2040
Percent of industrial facilities upgrading boiler systems	3%	20%
Percent of industrial facilities upgrading chiller systems	3%	20%
Percent of industrial facilities upgrading fan systems	5%	35%
Percent of industrial facilities upgrading indoor lighting	10%	50%
Percent of industrial facilities enrolling in CCA	0%	10%

Emissions and Activity Data Savings

	2020	2040
Electricity Savings (kWh)	782,770	4,763,020
Natural Gas Savings (Therms)	2,170	14,460
Emissions Reduction (without CCA)	280	1,380
Emissions Reduction (with CCA)	280	2,740

Performance Targets

2020	2040

Energy reduction per participant	70 therms from boiler upgrades 3,290 kWh from chiller upgrades 6,160 kWh from fan upgrades 3,130 kWh from lighting upgrades	70 therms from boiler upgrades 3,290 kWh from chiller upgrades 6,160 kWh from fan upgrades 3,130 kWh from lighting upgrades
Number of participating industrial facilities	30 facilities upgrading boiler systems 30 facilities upgrading chiller systems 50 facilities upgrading fan systems 110 facilities upgrading lighting 0 businesses switching from direct access to CCA	220 facilities upgrading boiler systems 220 facilities upgrading chiller systems 380 facilities upgrading fan systems 540 facilities upgrading lighting 110 businesses switching from direct access to CCA

Sources

Akbari, H., and Sezgen, O. 1991. *Analysis of Energy Use in Building Services of the Industrial Sector in California: Two Case Studies*. http://www.osti.gov/scitech/servlets/purl/10179750.

ICLEI – Local Governments for Sustainability. n.d. "Climate and Air Pollution Planning Assistant v 1.5."

EE-5: Public Lighting Retrofits

Retrofit publicly and privately owned outdoor lights to reduce energy use.

Implementation Actions

A. Continue to retrofit all City-owned streetlights with LED bulbs.

B. Encourage parking lot owners to convert fixtures to energy-efficient bulbs, and consider offering incentives to provide increased financial support.

C. Work with nonresidential and multifamily property owners to use energy-efficient light bulbs in outdoor lighting fixtures, particularly as part of outdoor retrofits.

D. Explore using pole-mounted renewable energy systems to power streetlights and traffic signals as economically feasible.

Assumptions

	2020	2040
Percent of existing homes upgrading exterior lighting	10%	80%
Percent of existing businesses upgrading exterior lighting	6%	50%

Emissions and Activity Data Savings

	2020	2040
Electricity Savings (kWh)	1,428,490	11,588,700
Emissions Reduction (without CCA)	410	2,670
Emissions Reduction (with CCA)	410	1,680

Performance Targets

	2020	2040
Electricity savings per home with upgraded exterior lighting	130	130
Number of homes upgrading exterior lighting	7,470	59,790
Electricity savings per business with upgraded exterior lighting	1,270	1,270
Number of businesses upgrading exterior lighting	380	3,160

Sources

Brown, R., Borgeson, S., Koomey, J., and Biermayer, P. 2008. *U.S. Building-Sector Energy Efficiency Potential*. Ernest Orlando Lawrence Berkeley National Laboratory, University of California. http://btech.lbl.gov/sites/all/files/lbnl-1096e.pdf.

California Energy Commission. 2006. *California Commercial End-Use Survey*. http://www.energy.ca.gov/2006publications/CEC-400-2006-005/CEC-400-2006-005.PDF.

———. 2010. *Residential Appliance Saturation Study*. http://www.energy.ca.gov/appliances/rass.

EE-6: Swimming Pool Efficiencies

Reduce energy use in private swimming pools.

Implementation Actions

A. Encourage swimming pool owners to replace old pool equipment, such as pumps and heaters, with more energy-efficient models.

B. Work with pool owners to install thermal covers on pools when not in use.

C. Inform applicants seeking to install a new pool or to retrofit an existing one about ways to reduce swimming pool energy use, and available incentives and financing mechanisms for energy-efficiency actions.

Assumptions

	2020	2040

Percent of existing swimming pool owners upgrading pump and pipe systems	10%	40%
Percent of existing swimming pool owners installing covers	20%	75%
Percent of existing swimming pool owners installing solar water heating systems	0.5%	12%
Percent of new swimming pools with solar water heaters	2%	25%

Emissions and Activity Data Savings

	2020	2040
Electricity Savings (kWh)	1,559,860	6,239,450
Natural Gas Savings (Therms)	105,550	508,010
Emissions Reduction (without CCA)	1,010	4,140
Emissions Reduction (with CCA)	1,010	3,600

Performance Targets

	2020	2040
Energy use savings from homes with upgraded swimming pool systems	3,250 kWh per upgraded pool and pipe system 210 therms per upgraded pool cover 420 therms per home with solar water heater	3,250 kWh per upgraded pool and pipe system 210 therms per upgraded pool cover 390 therms per home with solar water heater
Number of homes with upgraded swimming pool systems	480 homes with upgraded pool pump and pipe systems 480 homes with upgraded pool covers 10 existing homes with solar pool heaters 0 new homes with solar pool heaters	1,920 homes with upgraded pool pump and pipe systems 1,800 homes with upgraded pool covers 290 existing homes with solar pool heaters 50 new homes with solar pool heaters

Sources

California Energy Commission. 2010. *Residential Appliance Saturation Study*. http://www.energy.ca.gov/appliances/rass.

Pacific Gas and Electric Company and Southern California Gas Company. 2007. *Codes and Standards Enhancement Initiative: 2008 CEC Title 24 Building Energy Efficiency Standards Rulemaking Procedure - Draft Report, Swimming Pools*. http://www.energy.ca.gov/title24/2008standards/prerulemaking/documents/2007-02-26-27_workshop/supporting/PGE-DRAFT_REPORT_RESIDENTIAL_SWIMMING_POOL.PDF.

Southface. 2006. Solar Pool & Shower Heating for Communities and Multifamily Developments. http://www.solaripedia.com/files/275.pdf.

US Department of Energy. 2004. *Heat Your Water with the Sun: A Consumer's Guide*. http://www.nrel.gov/docs/fy04osti/34279.pdf.

———. n.d. "Swimming Pool Covers." http://energy.gov/energysaver/swimming-pool-covers.

EE-7: Low-Income Weatherization

Improve energy efficiency and comfort in low-income housing units through weatherization.

Implementation Actions

A. Continue to partner with community groups to conduct weatherization of low-income housing units, including mobile homes, and to pursue funding to support these activities.

B. Encourage property owners to disclose whether a unit has been weatherized when selling or leasing to a low-income resident.

Assumptions

	2020	2040
Percent of existing mobile homes weatherized [1]	15%	80%

Emissions and Activity Data Savings

	2020	2040
Electricity Savings (kWh)	725,980	3,871,900
Natural Gas Savings (Therms)	115,710	617,140
Emissions Reduction (without CCA)	820	4,180
Emissions Reduction (with CCA)	820	3,840

Performance Targets

	2020	2040

[1] GHG reductions from the weatherization of low-income residential units that are not mobile homes (e.g., single-family homes or multifamily units) are included in Measures EE-1 and EE-2. Data about these other types of low-income units is not available, and so only reductions associated with mobile home weatherization are shown as part of EE-7.

Energy savings per weatherized mobile home	1,690 kWh and 270 therms	1,690 kWh and 270 therms
Mobile homes with weatherization	430	2,290

Sources

California Energy Commission. 2010. *Residential Appliance Saturation Study*. http://www.energy.ca.gov/appliances/rass.

Talbot, J. 2012. *Mobilizing Energy Efficiency in the Manufactured Housing Sector*. http://www.workingre.com/wp-content/uploads/2013/08/Mobilizing-Energy-Efficiency-in-Manufactured-Housing.pdf.

EE-8: Electrification

Replace natural gas with electricity in new and significantly renovated homes and businesses.

Implementation Actions

A. Promote electrification as an option during plan review for new and significantly remodeled homes and businesses, including in the pre-application phase for major projects.

B. Distribute information and case studies about successful electrification efforts to project applicants.

C. Coordinate with utility companies to ensure a safe and reliable supply of energy for the community as natural gas is replaced by electricity.

Assumptions

	2020	2040
Percent of new homes with full electrification	0%	40%
Percent of new nonresidential buildings with full electrification	0%	40%
Percent of existing homes that received full retrofits/renovations with additional electrification work	0%	65%
Percent of existing nonresidential buildings that received full retrofits/renovations with additional electrification work	0%	65%

Emissions and Activity Data Savings

	2020	2040
Electricity Savings (kWh)	-	-101,023,170
Natural Gas Savings (Therms)	-	11,625,220
Emissions Reduction (without CCA)	-	38,540
Emissions Reduction (with CCA)	-	47,240

Performance Targets

	2020	2040
Energy savings per electrified home	0 therms reduced and 0 kWh added	260 therms reduced and 2,260 kWh added
Number of electrified homes	0	34,040
Energy savings per electrified business	0 therms reduced and 0 kWh added	800 therms reduced and 6,990 kWh added
Number of electrified businesses	0	2,720

Sources

Greenblatt, J. B. 2015. *Modeling California policy impacts on greenhouse gas emissions*, *LBNL-7008E*. http://eetd.lbl.gov/sites/all/files/lbnl-7008e.pdf

Off-Road Equipment Strategies

OR-1: Alternative Fuel Landscaping Equipment

Replace gasoline and diesel landscaping equipment with hybrid and alternative fuel models.

Implementation Actions

A. Purchase hybrid and alternative fuel landscaping equipment for City landscaping activities.

B. In coordination with the South Coast Air Quality Management District, continue to work with property owners and landscaping companies to promote the availability of hybrid and alternative fuel landscaping equipment, and any incentives available.

C. Work with local businesses to ensure that hybrid and alternative fuel landscaping equipment is readily available in Huntington Beach home improvement stores.

Assumptions

	2020	2040
Percent of lawnmowers exchanged for electric models	6%	50%

Emissions and Activity Data Savings

	2020	2040
Electricity Savings (kWh)	-190,570	-1,588,050
Emissions Reduction (without CCA)	100	910
Emissions Reduction (with CCA)	100	1,050

Performance Targets

	2020	2040
Number of lawnmowers exchanged	3,310	27,600

Sources

California Air Resources Board. 2011. OFFROAD model. http://www.arb.ca.gov/msei/categories.htm.

Salem Electric. n.d. "Home Energy Use Guide." http://www.salemelectric.com/residential/pdfs/energy_saving_tips/home_energy/HomeEnergyUseGuide.pdf.

OR-2: Alternative Fuel Construction Equipment

Improve air quality by reducing emissions from construction equipment.

Implementation Actions

A. Replace City-owned construction equipment with fuel-efficient and alternative fuel models as funding becomes available.

B. Work with local contractors to promote the availability of fuel-efficient and alternative fuel models.

C. Explore requiring a certain proportion of construction equipment on discretionary projects to be fuel-efficient or alternative fuel models as feasible.

Assumptions

	2020	2040
Percent of all new residential units that are approved with discretionary review	45%	45%
Percent of all new nonresidential square footage that is approved with discretionary review	60%	60%
Percent alternative-fuel construction equipment required for discretionary review projects	25%	40%

Emissions and Activity Data Savings

	2020	2040
Emissions Reduction (without CCA)	460	1,470
Emissions Reduction (with CCA)	460	1,470

Performance Targets

	2020	2040
Homes approved with discretionary review	60	120
Square footage of nonresidential space approved with discretionary review	145,550	155,030

Sources

California Energy Commission. 2007. *Full Fuel Cycle Assessment: Well-to-Wheels Energy Inputs, Emissions, and Water Impacts - State Plan to Increase the Use of Non-Petroleum Transportation Fuels*. http://www.energy.ca.gov/2007publications/CEC-600-2007-004/CEC-600-2007-004-F.PDF.

Nealon, S. 2013. "Hybrid Not Always Greener." *UCR Today*, October 21. http://ucrtoday.ucr.edu/18506.

US Environmental Protection Agency. 2009. *Potential for Reducing Greenhouse Gas Emissions in the Construction Sector*. http://archive.epa.gov/sectors/web/pdf/construction-sector-report.pdf.

Water and Wastewater Strategies

WW-1: Indoor Water Efficiency

Reduce indoor water use in the community.

Implementation Actions

A. Continue to partner with the Metropolitan Water District and the Municipal Water District of Orange County to offer rebates for water efficiency retrofits, and explore creating additional incentives.

B. Work with regional water agencies to offer low-cost and free water audits to homes and businesses.

C. Encourage new development projects to install water fixtures that exceed the minimum state efficiency requirements.

D. Continue to make presentations about indoor water conservation and to make information about rebates available to community members, including during normal and wet years.

Assumptions

	2020	2040
Percent of pre-2005 homes installing water-efficient fixtures	10%	75%
Percent of pre-2005 businesses installing water-efficient fixtures	6%	60%
Percent of 2005 and later existing homes installing water-efficient fixtures	7%	75%
Percent of new homes installing beyond-code water-efficient fixtures	15%	40%
Percent of new businesses installing beyond-code water-efficient fixtures	12%	35%

Emissions and Activity Data Savings

	2020	2040
Electricity Savings (kWh)	371,370	2,857,040
Water Savings (gallons)	99,295,450	763,906,330
Emissions Reduction (without CCA)	110	700
Emissions Reduction (with CCA)	110	450

Performance Targets

	2020	2040
Water use reduction per home	12,520 gallons for existing homes and 3,440 gallons for new homes	12,530 gallons for existing homes and 3,440 gallons for new homes

	2020	2040
Number of homes with water-efficient fixtures	7,470 existing homes and 150 new homes	56,060 existing homes and 2,550 new homes
Water use reduction per business	13,060 gallons for existing businesses and 7,660 gallons for new businesses	13,060 gallons for existing businesses and 7,660 gallons for new businesses
Number of businesses with water-efficient fixtures	380 existing businesses and 20 new businesses	3,800 existing businesses and 320 new businesses

Sources

California Building Standards Commission. 2013. *California Green Building Standards Code - Matrix Adoption Table, Appendix A5: Nonresidential Voluntary Measures*. http://www.ecodes.biz/ecodes_support/free_resources/2013California/13Green/PDFs/Appendix%20A5%20-%20Nonresidential%20Voluntary%20Measures.pdf.

California Department of Housing and Community Development. 2013. "2013 CALGreen Residential Mandatory Measures." http://www.documents.dgs.ca.gov/bsc/documents/2013/2013-Green-Residential-Mandatory.pdf.

California Department of Water Resources. 2013. *California Water Plan Update 2013: Chapter 3 - Urban Water Use Efficiency*. http://www.water.ca.gov/calendar/materials/vol3_urbanwue_apr_release_16033.pdf.

City of Huntington Beach. 2011. *City of Huntington Beach 2010 Urban Water Management Plan*. http://www.huntingtonbeachca.gov/files/users/public_works/urban-water-plan.pdf.

US Environmental Protection Agency. n.d. *USEPA Water Conservation Plan Guidelines: Appendix B - Benchmarks Used in Conservation Planning*. https://www3.epa.gov/watersense/docs/app_b508.pdf.

WW-2: Water Efficient Landscaping

Reduce the amount of water used for landscaping in Huntington Beach.

Implementation Actions

A. Continue to provide information to community residents about water-free and drought-tolerant landscaping.

B. Continue to enforce the most recent state Water Efficient Landscaping Ordinance for new landscaping, and explore opportunities to establish water efficiency standards that exceed the state minimum.

C. In partnership with regional water providers, continue to make incentives available for replacing turf with water-free and drought-tolerant landscaping.

D. Work with local nurseries and landscaping companies to highlight examples of drought-tolerant plants.

E. Replace City-owned landscaped areas with drought-tolerant planting, except for turf used for recreation.

Assumptions

	2020	2040
Square feet of water-efficient residential landscaping	550,000	5,000,000
Square feet of water-efficient nonresidential landscaping	250,000	2,500,000

Emissions and Activity Data Savings

	2020	2040
Electricity Savings (kWh)	8,880	83,250
Water Savings	3,951,520	37,045,450
Emissions Reduction (without CCA)	-	20
Emissions Reduction (with CCA)	-	10

Performance Targets

	2020	2040
Water savings per acre	215,160 gallons	215,160 gallons
Number of acres with water-efficient landscaping	20	170

Sources

California Water Commission. 2015. "Water Commission Adopts Model Water Efficient Landscape Ordinance." http://ca.gov/drought/topstory/top-story-42.html.

ICLEI – Local Governments for Sustainability. n.d. "Climate and Air Pollution Planning Assistant v 1.5."

Resource Management Strategies

RM-1: Construction and Demolition Waste

Increase recycling of construction and demolition waste from new construction and renovation activities beyond the state minimum.

Implementation Actions

A. Develop and adopt an ordinance requiring increased recycling of construction and demolition (C&D) waste.

B. Work with contractors and local artists to establish a materials exchange and reuse program.

C. Support state and federal efforts to increase recycling rates and expand markets for C&D materials.

Assumptions

	2020	2040
Amount of C&D waste to be recycled	75%	90%

Emissions and Activity Data Savings

	2020	2040
Waste Savings (Tons)	14,260	20,120
Emissions Reduction (without CCA)	840	1,190
Emissions Reduction (with CCA)	840	1,190

Performance Targets

	2020	2040
Tons of C&D waste recycled	21,390 tons (net increase of 14,260 tons)	27,860 tons (net increase of 20,120 tons)

Sources

California Department of Resources Recycling and Recovery. 2015. *2014 Disposal-Facility-Based Characterization of Solid Waste in California*. http://www.calrecycle.ca.gov/Publications/Documents/1546/20151546.pdf.

California Air Resources Board. 2010. *Local Government Operations Protocol for the Quantification and Reporting of Greenhouse Gas Emissions Inventories*. http://www.arb.ca.gov/cc/protocols/localgov/pubs/lgo_protocol_v1_1_2010-05-03.pdf.

———. 2011. Landfill Emissions Tool v. 1.3. http://www.arb.ca.gov/cc/landfills/landfills.htm.

RM-2: Composting and Organic Waste

Reduce the amount of organic wastes sent to landfills.

Implementation Actions

A. Conduct backyard composting workshops to encourage individual composting of food scraps.

B. Work with Republic Services to monitor the effectiveness of the yard waste program, and conduct education activities as needed to improve the program.

C. Develop a curbside composting service for restaurants and other facilities that produce large volumes of food waste, and expand program to homes and other businesses throughout the community as feasible.

D. Minimize any potential health, safety, or cleanliness issues associated with curbside yard waste and composting operations.

E. Explore effective alternatives to curbside compost services, including off-site collection and sorting, that achieves a similar degree of success.

F. Promote a food donation program for safe-to-eat food to minimize food waste in the community.

Assumptions

	2020	2040
Percent of homes composting food waste	25%	95%
Percent of businesses composting food waste	75%	95%
Target diversion for food waste	85%	95%
Target diversion for yard waste	85%	95%
Baseline diversion for yard waste	75%	75%

Emissions and Activity Data Savings

	2020	2040
Waste Savings (Tons)	31,720	59,750
Emissions Reduction (without CCA)	9,610	19,580
Emissions Reduction (with CCA)	9,610	19,580

Performance Targets

	2020	2040
Pounds of residential waste diverted per home	230 pounds of yard waste and 520 pounds of food waste	270 pounds of yard waste and 590 pounds of food waste

Number of residential participants	75,910 homes participating in yard waste recycling and 18,980 homes participating in food waste composting	81,260 homes participating in yard waste recycling and 77,190 homes participating in food waste composting
Pounds of nonresidential waste diverted per business	2,110 pounds of yard waste and 4,620 pounds of food waste	2,390 pounds of yard waste and 5,000 pounds of food waste
Number of nonresidential participants	6,460 businesses participating in yard waste recycling and 4,850 businesses participating in food waste composting	7,240 businesses participating in yard waste recycling and 6,880 businesses participating in food waste composting

Sources

California Department of Resources Recycling and Recovery. 2015. *2014 Disposal-Facility-Based Characterization of Solid Waste in California*. http://www.calrecycle.ca.gov/Publications/Documents/1546/20151546.pdf.

California Air Resources Board. 2010. *Local Government Operations Protocol for the Quantification and Reporting of Greenhouse Gas Emissions Inventories*. http://www.arb.ca.gov/cc/protocols/localgov/pubs/lgo_protocol_v1_1_2010-05-03.pdf.

———. 2011. Landfill Emissions Tool v. 1.3. http://www.arb.ca.gov/cc/landfills/landfills.htm.

RM-3: Increased Recycling

Improve the use of recycling bins to minimize the amount of lost materials.

Implementation Actions

A. Conduct outreach efforts to ensure recycling bins are being used properly, and community members are aware of which types of materials go in each bin.

B. Make recycling bins readily accessible at public facilities and streetscapes, including locating recycling bins next to all trash bins.

C. Explore ways for community members to easily recycle items not currently accepted in the curbside recycling bins, including polystyrene, batteries and other universal waste, plastic bags, and electronic waste.

D. Minimize waste at all City-sponsored events and events held at public facilities.

E. Establish a minimum diversion rate criteria for all future waste hauler contracts that exceeds state-mandated minimums.

F. Promote the Recycling Market Development Zone to increase the use of secondary feedstock material in local manufacturing.

Assumptions

	2020	2040
Baseline diversion rate for recyclables	75%	75%
Target diversion rate for recyclables	85%	90%

Emissions and Activity Data Savings

	2020	2040
Waste Savings (Tons)	19,260	31,360
Emissions Reduction (without CCA)	7,570	12,320
Emissions Reduction (with CCA)	7,570	12,320

Performance Targets

	2020	2040
Amount of recyclables in recycling bin per participant	2,320 pounds per residence (net increase of 270 pounds per residence), and 23,450 pounds per business (net increase of 2,760 pounds per business)	2,490 pounds per residence (net increase of 410 pounds per residence), and 24,050 pounds per business (net increase of 4,010 pounds per business)
Amount of recyclables in recycling bin	87,950 tons of residential recyclables (net increase of 10,350 tons), and 75,770 tons of nonresidential recyclables (net increase of 8910 tons)	101,060 tons of residential recyclables (net increase of 16,840 tons), and 87,070 tons of nonresidential recyclables (net increase of 14,510 tons)

Sources

California Department of Resources Recycling and Recovery. 2015. *2014 Disposal-Facility-Based Characterization of Solid Waste in California*. http://www.calrecycle.ca.gov/Publications/Documents/1546/20151546.pdf.

California Air Resources Board. 2010. *Local Government Operations Protocol for the Quantification and Reporting of Greenhouse Gas Emissions Inventories*. http://www.arb.ca.gov/cc/protocols/localgov/pubs/lgo_protocol_v1_1_2010-05-03.pdf.

———. 2011. Landfill Emissions Tool v. 1.3. http://www.arb.ca.gov/cc/landfills/landfills.htm.

Community Awareness Strategies

CA-1: Energy Competition

Conduct recurring energy competitions to encourage energy efficiency and conservation.

Implementation Actions

A. Work with utilities and local organizations to develop and implement a recurring energy competition, to reward homes, neighborhoods, and businesses that succeed in significantly reducing their energy use.

B. Conduct extensive community outreach to raise awareness of the energy competition and to promote high participation.

C. Publicize data about energy use reductions achieved by the contest in an open and transparent way without violating privacy rules.

D. Honor competition winners in a public ceremony, and publicize the event in local and regional media.

E. Based on the results of the competition, prepare case studies highlighting cost-effective approaches to improve energy efficiency and energy conservation, and incorporate lessons learned from the competition into future energy efficiency and energy conservation outreach programs.

Assumptions

There are no assumptions associated with this item.

Emissions and Activity Data Savings

This is a supportive measure, and does not have direct and measurable emissions and activity data savings.

Performance Targets

There are no performance targets for supportive measures.

Sources

There are no sources for supportive measures.

CA-2: Green Building Awareness

Raise community awareness of green building strategies for new and significantly renovated buildings.

Implementation Actions

A. Make information about CALGreen voluntary tiers, LEED, BuildItGreen, and other green building standards readily available during the permit process for new development projects, and discuss applicable green building standards with project applicants.

B. Explore offering incentives such as financial rebates, reduced permit fees, and expedited permitting to development projects that exceed minimum state standards for green buildings.

C. Conduct community outreach to highlight the advantages of green buildings, including economic benefits.

D. Maintain a directory of green buildings in Huntington Beach, including information about the associated costs and savings of green building features.

E. Design new and substantially renovated City facilities to include green building features as examples of successful strategies.

F. Develop and publicize a Huntington Beach Green Building Strategy, which will serve as a comprehensive plan to encourage and incentivize zero-net energy development and green buildings, applicable to both residential and nonresidential development projects.

Assumptions

There are no assumptions associated with this item.

Emissions and Activity Data Savings

This is a supportive measure, and does not have direct and measurable emissions and activity data savings.

Performance Targets

There are no performance targets for supportive measures.

Sources

There are no sources for supportive measures.

CA-3: Buy Local

Improve the visibility of locally produced goods in Huntington Beach retail markets.

Implementation Actions

A. Work with business groups in Huntington Beach and surrounding communities to identify local sources of various goods and how to purchase them, and distribute this information online and in print as part of a Buy Local guide.

B. Work with major retail chains to offer an increased supply of locally produced goods.

C. Encourage a diversity of goods producers to locate in Huntington Beach to increase the types of products available from local sources.

D. Develop and adopt a buy local policy for municipal purchases to maximize the amount of goods the City purchases from local sources, and encourage businesses in the community to adopt similar policies.

Assumptions

There are no assumptions associated with this item.

Emissions and Activity Data Savings

This is a supportive measure, and does not have direct and measurable emissions and activity data savings.

Performance Targets

There are no performance targets for supportive measures.

Sources

There are no sources for supportive measures.

CA-4: Advanced Green Technologies

Establish Huntington Beach as a center for green technology research and innovation.

Implementation Actions

A. Provide information for project applicants about newly available green building technologies and features, and encourage applicants to incorporate these elements into their projects.

B. Establish permitting procedures for emerging renewable energy systems and other green technologies, and work to proactively identify and remove regulatory barriers.

C. Use emerging green technologies as feasible in City facilities as demonstration projects.

D. Encourage companies developing advanced green technologies to locate in appropriate zones of Huntington Beach.

E. Support efforts by local education and research institutions to develop and market emerging green technologies.

Assumptions

There are no assumptions associated with this item.

Emissions and Activity Data Savings

This is a supportive measure, and does not have direct and measurable emissions and activity data savings.

Performance Targets

There are no performance targets for supportive measures.

Sources

There are no sources for supportive measures.

CA-5: Revolving Loan Program

Create a Green Revolving Loan program to help finance building improvements.

Implementation Actions

A. Work with local financial institutions to develop and operate a Green Revolving Loan program, providing a financing mechanism for homes and businesses to support renewable energy, energy efficiency and conservation, and water efficiency and conservation retrofit activities.

B. Minimize the interest rate of the Green Revolving Loan program, including offering no-interest loans as feasible.

C. Provide information to community members about the Green Revolving Loan program, including how it operates and how community members can participate.

D. Require projects financed through the Green Revolving Loan program to monitor their costs, savings, and other pertinent data, and make this data available publicly through case studies and other methods.

Assumptions

There are no assumptions associated with this item.

Emissions and Activity Data Savings

This is a supportive measure, and does not have direct and measurable emissions and activity data savings.

Performance Targets

There are no performance targets for supportive measures.

Sources

There are no sources for supportive measures.

CA-6: Workforce Training

Maximize economic opportunities for green jobs in Huntington Beach.

Implementation Actions

A. Work with local schools, colleges, and job training operations to make training for green jobs widely available to individuals with different incomes and educational backgrounds.

B. Pursue funding to reduce the cost of green job training for Huntington Beach residents, particularly for lower-income individuals.

C. Encourage local businesses that provide green services, including rooftop solar installation, energy audits, and water efficiency retrofits, to hire Huntington Beach residents from local job training programs.

D. Coordinate with the Huntington Beach Union High School District to provide green vocational training to high school students.

E. Conduct trainings on sustainable businesses, and promote local Sustainable Certified Businesses.

Assumptions

There are no assumptions associated with this item.

Emissions and Activity Data Savings

This is a supportive measure, and does not have direct and measurable emissions and activity data savings.

Performance Targets

There are no performance targets for supportive measures.

Sources

There are no sources for supportive measures.

CA-7: Waste Minimization

Reduce the amount of solid waste produced in Huntington Beach.

Implementation Actions

A. Work with local organizations to identify opportunities to reuse unwanted materials in the community, including improving the ease of donating usable items to community groups and charities, and supporting local artists and manufacturers who produce art or products from waste materials.

B. Explore strategies to reduce the amount of waste associated with the packaging and purchasing of food and retail products, especially waste materials that cannot be easily recycled.

C. Continue to carry out the City's paper reduction efforts, including identifying ways to further reduce the amount of paper produced as part of municipal operations, and work with local businesses to adopt similar strategies.

D. Establish a purchasing policy for municipal operations to buy products made from recycled materials as feasible, and encourage local businesses to adopt similar policies.

E. Conduct public outreach to highlight the amount of waste produced by average residents and businesses, and to promote applicable waste minimization strategies.

Assumptions

There are no assumptions associated with this item.

Emissions and Activity Data Savings

This is a supportive measure, and does not have direct and measurable emissions and activity data savings.

Performance Targets

There are no performance targets for supportive measures.

Sources

There are no sources for supportive measures.