Town of Tiburon

CLIMATE ACTION PLAN 2030

Adopted

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MARIN CLIMATE & ENERGY PARTNERSHIP

Tiburon by the Bay™

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LOW CARBON TRANSPORTATION	
	• Drive an all-electric or plug-in hybrid vehicle. • Bike, walk, or take transit whenever possible. • Reduce the number of miles you drive by working from home when possible. • Shut your car off when waiting in line at the ATM or in the school pick up/drop off lane.
RENEWABLE ENERGY & ELECTRIFICATION	
	• Switch to MCE Deep Green or PG&E Solar Choice 100% renewable electricity. • Install a solar energy system on your home or business and consider battery storage. • Replace appliances that use natural gas for ones that use electricity. • Investigate heat pump technology so you can swap out heaters and furnaces that use natural gas when it's time to replace them.
ENERGY EFFICIENCY	
	• Replace indoor and outdoor lights with LED bulbs and turn them off when not in use. • Have an energy assessment done for your home or business. • Upgrade insulation, seal leaks, and install a programmable thermostat. • Purchase Energy Star appliances and equipment.
WASTE REDUCTION	
	• Buy only as much as you need. • Put your food scraps in the green can and/or compost them at home. • Donate extra food and used clothing and housewares. • Don't be a "wishful" recycler. Be scrupulous about how you sort your recyclables.
WATER CONSERVATION	
	• Replace your lawn with a drought-tolerant garden. • Install a drip irrigation system, program it to run early in the morning, and check it regularly for leaks. • Install low water flow faucets, showerheads, and toilets. • Buy water-efficient dishwashers and clothes washers when it's time to replace them.
SEQUESTRATION	
	• Plant trees appropriate to your situation. • Add compost to your soil. • Purchase carbon offsets for airplane flights and other emissions that are difficult to mitigate.
COMMUNITY ENGAGEMENT	
	• Sign up for Resilient Neighborhoods and join a Climate Action Team. • Calculate and commit to reducing your carbon footprint by taking the actions identified in this plan. • Get your business certified as a Green Business with the Marin Green Business Program.

EXECUTIVE SUMMARY

Climate Action Plan 2030 is an update to the Town's first Climate Action Plan (CAP) which was adopted in 2011. The original plan identified actions to reduce greenhouse gas emissions to 1990 levels by the year 2020, consistent with the State's goal to reduce statewide emissions. Tiburon achieved that goal in 2014.

In 2016, California adopted a new state law requiring the State to reduce statewide emissions to 40% below 1990 levels by 2030. Since that time, California jurisdictions have been updating their Climate Action Plans to meet the new goal, including the County of Marin, Belvedere, San Rafael, San Anselmo, Larkspur, Novato, and Fairfax. This CAP update is designed to reduce community greenhouse gas emissions 50% below Tiburon's 1990 levels, exceeding the statewide 2030 goal, while also laying the path to achieve the State's longer-term goal to achieve carbon neutrality by 2045 through both reduction of emissions and carbon sequestration.

The CAP incorporates the Town's greenhouse gas emissions inventory for the year 2020 to calculate greenhouse gas emissions reductions for the various actions. GHG emissions totaled 43,300 $MTCO_2e$ in that year, which was approximately 16% below estimated 1990 levels. To meet the Town's 2030 goal, the Tiburon community will need to reduce emissions another 17,900 $MTCO_2e$.

The CAP identifies state and local actions and performance targets that, if fully implemented and achieved, will meet the Town's ambitious goal to reduce emission 50% below 1990 levels. The top local actions are as follows:

Electric Vehicles. The plan targets 45% of passenger vehicles registered in Marin County to be plug-in electric vehicles by 2030. (6,340 $MTCO_2e$)

Electrification of Buildings. The plan includes adoption of ordinances that will require new homes and commercial buildings to be all-electric and replacement of natural gas appliances and heating systems with high-efficient electric versions, including heat pump technology, upon burnout. (2,030 $MTCO_2e$)

Energy Efficiency. The plan includes continue promotion and participation in energy efficiency and conservation programs to reduce energy consumption in the built environment. (1,170 $MTCO_2e$)

Waste Reduction. The plan includes actions to significantly reduce organic waste from landfills. (1,830 $MTCO_2e$)

Community Education. The plan includes actions to educate and motive residents to reduce their carbon input by participating in the Resilient Neighborhoods program. (960 $MTCO_2e$)

Carbon Offsets. To ensure emissions are reduced 50% below 1990 levels by 2030, the Town will consider annually purchasing carbon offsets – preferably in a local program that sequesters carbon in Marin County – in the amount needed to bridge the gap between the GHG reduction achieved in 2030 and the target. (2,260 $MTCO_2e$)

While the CAP focuses on achieving the 2030 goal, continued implementation of the actions contained in the plan past that date will achieve the State's carbon neutrality goal for 2045. Ultimately more aggressive state, federal, and international action is required to reduce global emissions to levels that will avoid the catastrophic impacts of climate change. For this reason, the CAP contains actions to advocate at the state and federal levels for policies and actions that support the rapid transition to GHG-free energy sources, electrification of buildings and the transportation fleet, and other sweeping measures to sharply reduce greenhouse gas emissions.

CHAPTER 1: INTRODUCTION

The need for local governments to act on climate change has never been more urgent, as demonstrated by 2020's devastating wildfires layered over a global pandemic. Tiburon has long been dedicated to environmental leadership, and this plan continues that legacy by incorporating new ideas and ambitious targets. The following plan outlines a path towards reducing local greenhouse gas (GHG) emissions through the year 2030.

WHAT IS A CAP?

A Climate Action Plan (CAP) is a public document which:

- Helps us to understand how the community contributes to climate change
- Sets targets for how much to reduce these contributions by a certain year
- Outlines a path to meet that goal.

This CAP is grounded in Tiburon's understanding that climate change is already impacting California and the world and will continue to affect Marin's residents and businesses for the foreseeable future, as well as other communities around the world. The Town also recognizes that local governments play a strong role in reducing GHG emissions in their municipal operations and communities and mitigating the future impacts of climate change.

The CAP seeks to reimagine a community that is substantially less dependent on fossil fuels and provides a prosperous environment for both current and future generations, while not exporting environmental damage and GHG emissions to other parts of the Bay Area, nation, or world.

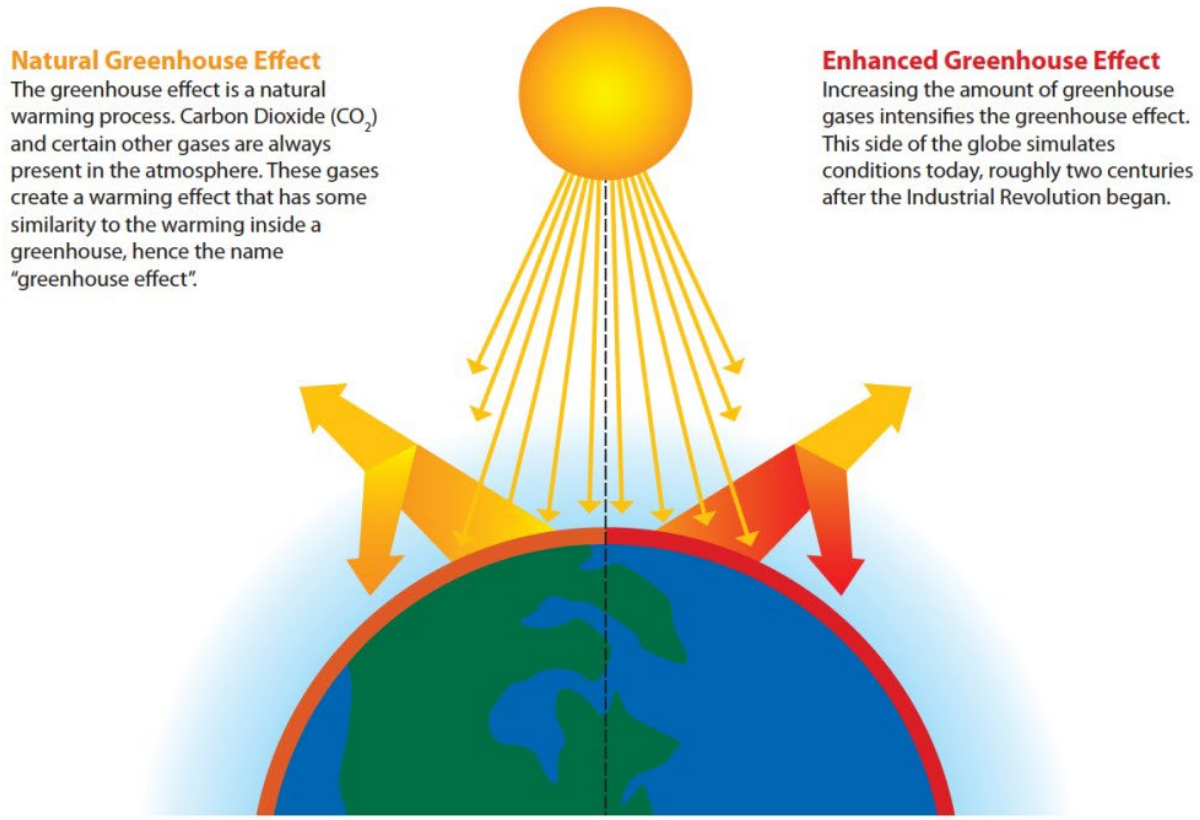
The CAP was developed with the assistance of Marin Climate and Energy Partnership (MCEP), a partnership program of Marin cities and towns, the County, and Marin regional agencies. The actions included in this plan draw on a model climate action plan developed by MCEP, which is intended to support countywide implementation efforts. Although the CAP specifically addresses the incorporated areas of Tiburon, many of the actions identified in this plan will require the coordinated effort of Marin's local governments. The model plan has already been adopted by San Rafael, San Anselmo, Corte Madera, and the County of Marin and is currently being used to update additional Climate Action Plans for other cities and towns in Marin.

Through the actions outlined in this plan, such as increasing energy efficiency in buildings, electrifying buildings and appliances, accelerating zero emission vehicle adoption, and using clean, renewable energy sources, the community can experience lower fuel and energy bills, improved air quality, reduced emissions, and an enhanced quality of life. The Town's preparation of GHG emissions inventories and Climate Action Plans are part of an ongoing planning process that includes assessing, planning, mitigating, and adapting to climate change.

What are Greenhouse Gas Emissions and How Do They Contribute to Climate Change?

Greenhouse gases (GHGs) are gases in Earth's atmosphere that allow the sun's rays to enter our atmosphere and trap the resulting heat generated by the rays. These gases are naturally occurring and make Earth suitable for life. While we depend a certain level on these gases to keep our earth habitable, certain human activities have been shown to emit GHGs, increasing their concentration in the atmosphere to unsustainable levels and trapping more heat, resulting in an increase in Earth's average temperature (Figure 1). This intensification of the natural greenhouse effect affects local and global climate patterns, and which in turn amplifies many hazards including flooding, wildfire, drought, and storms.

FIGURE 1: THE GREENHOUSE EFFECT



Source: California Waterboard/Marion Koshland Science Museum Of The National Academy Of Sciences

These GHGs include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (Table 1) [1]. Each one has a different degree of impact on climate change. To facilitate comparison across different emission sources with mixed and varied compositions of several GHGs, the term "carbon dioxide

[1] Water vapor is the most dominant greenhouse gas, but it is not measured as a part of a greenhouse gas inventory and for that reason is not included in this discussion.

equivalent" or CO_2e is used across this CAP. One metric ton of CO_2e may consist of any combination of GHGs and has the equivalent Global Warming Potential (GWP) as one metric ton of carbon dioxide (CO_2). As gathering data and quantifying emissions can be quite difficult for some sources, community inventories at the local government level typically concentrate on the three primary GHGs: CO_2, CH4, and N_20.

TABLE 1: GREENHOUSE GASES

Gas	Chemical Formula	Emission Source	Global Warming Potential
Carbon Dioxide	CO_2	Combustion of natural gas, gasoline, diesel, and other fuels	1
Methane	CH_4	Combustion, anaerobic decomposition of organic waste in landfills, wastewater, and livestock	28
Nitrous Oxide	N_2O	Combustion, wastewater treatment	265
Hydrofluorocarbons	Various	Leaked refrigerants, fire suppressants	4 to 12,400
Perfluorocarbons	Various	Aluminum production, semiconductor manufacturing, HVAC equipment manufacturing	6,630 to 11,100
Sulfur Hexafluoride	SF_6	Transmission and distribution of power	23,500

Source: International Panel on Climate Change (IPCC) Fifth Assessment Report, 100-year values, 2014

According to the U.S. Environmental Protection Agency's 2019 "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2018," the majority of GHG emissions comes from fossil fuel combustion which in turn is used for electricity, transportation, industry, heating, etc. The burning of fossil fuels occurs across nearly every sector of the global economy, in ways that have become foundational to the ways that most people move, eat, and live.

It is the charge of this plan to diminish our community's dependence on fossil fuels and drastically decrease our associated GHG emissions.

How will Climate Change Impact California and Tiburon?

As described above, the Earth's climate is warming, mostly due to human activities such as changes in land cover and emissions of certain pollutants. GHGs are the major human-induced drivers of climate change. These gases warm the Earth's surface by trapping heat in the atmosphere.

California is already experiencing climate change impacts. Sea levels along the coast of southern and central California have risen about 6 inches over the past century and even moderate tides and storms are now producing extremely high sea levels. [2] Since 1950, the areas burned by wildfire each year has been increasing, as warming temperatures extend the fire season and low precipitation and snowpack create conditions for extreme, high severity wildfires to spread rapidly. Eighteen of the state's twenty largest fires have occurred since 2003, and the

[2] Louise Bedsworth, Dan Cayan, Guido Franco, Leah Fisher, Sonya Ziaja, "Statewide Summary Report," in California's Fourth Climate Change Assessment, publication number: SUMCCCA4-2018-013, 2018, p. 31.

eight largest fires have occurred since 2017.[3] The megafires of 2020, sparked in many cases by lightning strikes, burned over 4 million acres across California.

As temperatures continue to rise, California faces serious climate impacts, including:

- More intense and frequent heat waves
- More intense and frequent drought
- More severe and frequent wildfires
- More severe storms and extreme weather events
- Greater riverine flows
- Shrinking snowpack and less overall precipitation
- Accelerating sea level rise
- Ocean acidification, hypoxia, and warming
- Increase in vector-borne diseases and heat-related deaths and illnesses
- Increase in harmful impacts to vegetation and wildlife, including algal blooms in marine and freshwater environments, spread of disease-causing pathogens and insects in forests, and invasive agricultural pests.

Overall temperatures are projected to rise substantially throughout this century. In Tiburon, temperatures are expected to rise about 4°F by 2100 if global emissions peak around 2040 and then decline, the so-called "low emissions" scenario. If the world fails to act and we continue the path we are on, temperatures are projected to rise 7°F by the end of the century (the "high emissions" scenario).[4]

As the climate changes, some of the more serious threats to public health will stem from more frequent and intense extreme heat days and longer heat waves. Extreme heat events are likely to increase the risk of heat-related illness, such as heat stroke and dehydration, and exacerbate existing chronic health conditions. Extreme heat days in Tiburon are expected to increase from 4 days to 11 days under the low emissions scenario and to as many as 19 days under the high emissions scenario.

Higher temperatures will make Marin more vulnerable to wildfire and sea level rise. By the end of the century, sea level is projected to rise 2.4 to 3.4 feet, and possibly as much as 10 feet. At 5 feet of sea level rise, flooding may inundate downtown Tiburon, Blackie's Pasture and Greenwood Cove, the Cove Shopping Center, and Paradise Cay. Flooding will be even worse during storms, which are expected to increase in frequency and intensity.

What Role Does Government Play?

International, national, and statewide GHG reduction goals and policies affect the Town's own goals and policies. Whether trying to meet or exceed those goals, California and Marin are known for their environmental stewardship and willingness to be leaders on the international and national stage.

[3] Cal Fire, "Top 20 Largest Wildfires," https://www.fire.ca.gov/media/4jandlhh/top20_acres.pdf, accessed 7/29/22.

[4] CalAdapt, https://cal-adapt.org/tools/annual-averages, accessed 7/29/22. Projected temperature increases are from the baseline 30-year period of 1961-1990.

International	• The United Nations coordinates global commitments and targets to reduce emissions (such as the Paris Climate Accord) • The United Nations also supports the advancement of climate science through the Intergovernmental Panel of Climate Change (IPCC). The IPCC coordinates the work of scientists across the world to continually update models and assess the science related to climate change. This work in turn informs the way that national, state, and local governments understand and address the human activities that contribute to climate change and the ways that climate change might impact earth's environment.
National	• Currently, there is no federal legislation mandating comprehensive GHG emissions reporting or reduction in the United States.

State	• California first established statewide GHG emission reduction targets in 2005.
	• California has used its climate goals to develop regulations to reduce emissions across a variety of sectors, including:
	  ○ Setting more strict fuel economy standards for vehicle manufacturers that would like to sell cars in the state
	  ○ Establishing energy efficiency building requirements through the State Building Code
	  ○ Direct management of emissions from power plants and other stationary sources
	• California has also used SB 375, which was passed in 2008, to reduce emissions from cars and light trucks by promoting compact mixed-use, commercial, and residential development. SB 375 required local governments in California to consider GHG emissions, leading to successful proliferation of climate action plan development throughout the state.

Local	• Looks at GHG emissions generated by their communities. • Sets long term GHG emission reduction targets that align meet or exceed statewide goals through local Climate Action Plans. • Develops policies and programs to achieve CAP GHG emission reduction goals.

United Nation's Intergovernmental Panel on Climate Change

The United Nations' Intergovernmental Panel on Climate Change (IPCC) is responsible for advancing knowledge on human-induced climate change. Its reports play a key role in the United Nations Framework Convention on Climate Change, with the Fifth Assessment Report heavily informing the landmark Paris Agreement in 2015. In December 2015, all the members of the United Nations Framework Convention on Climate Change (UNFCCC) --- including the United States, China, India, and the European Union --- signed on to the historic "Paris Agreement" at the 21st Conference of the Parties (COP21) to the UNFCCC.

The central aim of the Paris Agreement is to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above preindustrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. Additionally, the agreement aims to strengthen the ability of countries to deal with the impacts of climate change.

In 2022, the IPCC Sixth Assessment released Climate Change 2022 reports from Working Group II: “Impacts, Adaptation and Vulnerability” (February), and from Working Group III: “Mitigation of Climate Report” (April). The February report has been described as the "starkest warning yet …. of major inevitable and irreversible climate changes" and conveys the dangerous and pervasive impacts of climate change that are affecting nature, people’s lives, and infrastructure everywhere, in every region of our world. “It is clear now that minor, marginal, reactive or incremental changes won’t be sufficient. Shifts in most aspects of society are required to overcome limits to adaptation, build resilience, reduce climate risk to tolerable levels, guarantee inclusive, equitable and just development and achieve societal goals without leaving anyone behind. Any further delay in concerted anticipatory global action,” the report says, “will miss a brief and rapidly closing window of opportunity to secure a livable and sustainable future for all.” Written by 270 researchers from 67 countries, the report is “an atlas of human suffering and a damning indictment of failed climate leadership,” said António Guterres, the United Nations Secretary-General.

Global temperatures have already increased by an average of 1.1 degrees Celsius, or 2 degrees Fahrenheit, since the 19th century as humans have pumped heat-trapping gases into the atmosphere by burning coal, oil, and gas for energy, and cutting down forests. The goal of limiting global temperature increase to no more than 1.5 degrees Celsius above preindustrial levels would require nations to all but eliminate their fossil-fuel emissions by 2050, and most are far off-track. The world is currently on pace to warm somewhere between 2 degrees and 3 degrees Celsius this century, experts have estimated. And even if we cross 1.5 degrees but temperatures are brought back down later, severe, and irreversible damage could still result, the new report says.

The IPCC’s mitigation working group’s April report warns that the goal limiting global warming to 1.5 degrees Celsius, or 2.7 degrees Fahrenheit, will likely be out of reach by the end of the decade, unless emissions reductions programs are markedly accelerated. The modeled pathways that achieve this goal reduce net CO_2 emissions below 2019 levels by approximately 48% by 2030 and 80% in 2040, with similar reductions in methane and other non-CO2 greenhouse gas emissions. In answering what are the most important steps, they answer in part, “to create a low-carbon energy system, emissions must be reduced across all parts of the system, and not just one or two. This means, for example, reducing the emissions from producing electricity, driving cars, hauling freight, heating and cooling buildings, powering data centers, and manufacturing goods.”

STATE OF CALIFORNIA

In 2006, the State of California enacted the Global Warming Solutions Act (AB 32) which established a comprehensive program to reduce greenhouse gas emissions from all sources throughout the state. AB 32 required the California Air Resources Board (CARB) to develop regulations and market mechanisms to reduce California's GHG emissions to 1990 levels by 2020, representing about 30% reductions statewide, with mandatory caps starting in 2012 for significant emissions sources. Along with adopting Early Action Measures and initiating regulations for additional GHG emissions source reductions, CARB created the CAP and Trade market shortly thereafter.

In California, climate policy objectives initially proposed by Governor Jerry Brown, were codified through passage of Senate Bill (SB) 32 (Pavley, Chapter 249, Statutes of 2016) and SB 1386 (Wolk, Chapter 545, Statutes of 2016). SB 32 commits California to reducing GHG emissions 40% below 1990 levels by 2030, and SB 1386 identifies the protection and management of natural and working lands as a key strategy towards meeting this ambitious GHG emissions reduction goal. Specifically, SB 1386 directs State agencies to consider the carbon sequestration potential of natural and working lands “when revising, adopting, or establishing policies, regulations, expenditures, or grant criteria related to [their] protection and management.”

The Governor further supported these activities with Executive Order B-52-18, which calls for improved management of the State's forests, and Executive Order B-54-18, which calls for actions to protect the State's biodiversity from current and future challenges of climate change.

In September 2018, Governor Brown signed Executive Order B-55-18, which establishes a goal for California to achieve carbon neutrality (net zero emissions) by 2045 and after that, maintaining net-negative emissions (sequestering more carbon that is being emitted). These goals were codified in 2022 with the passage of AB 1279, known as the California Climate Crisis Act. While California is still working through the details of what this means and how it can be achieved, it will require both technological solutions as well as natural solutions including more and appropriate tree planting; climate-smart habitat restoration initiatives; reduction of ecological degradation; and ocean protection. Natural climate solutions and "green" infrastructure are increasingly being prioritized through several state directives and bills to reduce emissions and drawdown atmospheric GHG from natural and working lands (e.g., forests, rangelands, farmlands, wetlands, and soils) while also protecting biodiversity and nature's ability to increase our resilience to growing climate extremes. In 2019, the California Air Resources Board was finalizing guidelines and protocols for Natural and Working Lands GHG emissions reductions and sequestration guidelines (including forests, rangelands, wetlands, and farms).

The regularly updated Safeguarding California Plan shows what state government is doing to address the climate impacts we are seeing today and create a more resilient future. The 2018 Safeguarding California In Action: Climate Change Adaptation Examples from State Agencies details examples of projects and programs to increase resilience to climate change. Actions include emergency management, public health improvements, habitat restoration, reforestation and urban tree planting, permeable pavements, drought resilient lawns, climate-smart agriculture, planting of deep-rooted perennials, covering of bare soil, and water recycling.

Tiburon recognizes that keeping global warming below the 1.5 degrees Celsius threshold as recommended by the IPCC and achieving carbon neutrality in the State of California by 2045 will take concerted international, federal, and statewide action and legislation. This Climate Action Plan commits the Town to doing its part to reduce emissions from activities occurring within its borders and support broader efforts to limit and sequester global emissions.

Tiburon's CAP History & Climate Action to Date

The Town first adopted a CAP in 2011 based on a long-standing commitment to environmental stewardship and sustainability. The Plan established GHG emission levels for 2005 and established a goal to reduce emissions 15% below 1990 levels by 2020, which was in line with the State's goal to reduce statewide emissions to 1990 levels by 2020.

As of 2020, the Town had reduced emissions 29% below 2005 levels, exceeding both the Town's goal and the statewide target.

In 2020, the Town began an update to the CAP. This CAP builds on the successes of the 2011 document while setting a new emissions reduction target for 2030 and beyond.

The Town has been a pioneer in efforts to reduce GHGs. This is a partial listing of the many actions the Town has implemented since recognizing the critical need to act.

Renewable Energy & Electrification

- **Marin Clean Energy.** In 2010, the Town joined the County and several Marin cities and towns to form Marin Clean Energy (MCE), a Community Choice Energy agency. As a public agency, MCE is chartered to source

clean, competitively priced electricity on behalf of residents and businesses in participating jurisdictions. MCE provides customers with 60% - 100% renewable energy and has plans to provide all customers with 100% renewable energy by 2022.

- **Deep Green Electricity**. In 2017, the Town began purchasing 100% renewable electricity from MCE for all municipal facilities.
- **Solar Installation.** The Town installed a 22 kW solar PV system on Town Hall in 2006 and a 11 kW solar shade structure at the police station in 2021.

Energy Efficiency

- **Energy Efficiency Upgrades.** The Town has replaced some of the lighting in Town owned buildings with LEDs and replaces with energy efficient lighting during routine replacements/maintenance.
- **LED Streetlights.** The Town has converted 44% of its streetlights to LED fixtures. LED lighting uses about half the electricity of conventional lighting.
- **Green Building Ordinance.** The Town has adopted green building regulations that exceed State building code requirements since 2008.

Low Carbon Transportation

- **Electric Vehicles (EVs).** The Town's fleet includes three zero emission passenger vehicles, one electric bicycle, and one electric utility cart.
- **Bicycle and Pedestrian Network Improvements**. The Town has completed pedestrian and bicycle infrastructure and safety improvements to encourage residents, employees, and visitors to walk, bike and take transit rather than drive to their destinations. In 2016, the Town adopted an updated Bicycle and Pedestrian Master Plan that provides for a town-wide network of bicycle and pedestrian facilities, including sidewalks, paths, bike lanes, and bike routes, along with bicycle and pedestrian-related programs and support facilities.

Waste Reduction

- **Curbside Composting.** The Town update its franchise agreement with Mill Valley Refuse to provide curbside composting of green waste and food scraps.
- **Plastic Bag Ban.** In 2014, the Town adopted an ordinance that prohibits stores from providing single-use plastic carry-out bags to customers.

Community Collaboration

- **Marin Climate and Energy Partnership**. The Town is a member of the Marin Climate & Energy Partnership (MCEP). Created in 2007, MCEP is a countywide partnership that allows its members to work collaboratively, share resources, and secure funding to: 1) discuss, study, and implement overarching policies and programs, ranging from emission reduction strategies to adaptation, contained in each agency's Climate Action Plan; and 2) collect data and report on progress in meeting each partner member's individual GHG emission targets. MCEP'S website provides information on climate action plans and GHG emission in Marin and links to the Marin communities' plans and reports. MCEP's Marin Sustainability Tracker compares the progress Marin's jurisdictions are making on 11 metrics related to energy, waste, transportation, water, and GHG reduction.

CHAPTER 2: GREENHOUSE GAS EMISSIONS INVENTORY, FORECAST, AND REDUCTION TARGETS

TIBURON PROFILE

Located on a peninsula in Marin County approximately seven miles north of the Golden Gate Bridge, Tiburon is a small town with a land area of 4.5 square miles and an estimated current population of 9,540.[5] Primarily a residential community of single-family homes, Tiburon has a relatively small percentage of land devoted to multi-family development and commercial uses. There are two commercial areas that provide necessary goods and services for residents, as well as public and private schools for grades K-8, a post office, a library, police and fire stations, and a Town Hall. With abundant parks and open space, and both public and private recreational facilities, there are many recreational opportunities within town.

Tiburon enjoys a temperate climate, with cool, wet, and almost frostless winters and cool, dry summers with frequent fog or wind. Natural gas consumption rises in the winter months and fluctuates according to average low temperatures during the rainy season. Water use rises during the summer, and outdoor water use is largely dependent upon local rainfall patterns and weather conditions. Approximately 75% of Tiburon's housing stock was built before 1980, providing excellent opportunities to upgrade homes to include more energy-efficient and decarbonized features.[6] The commercial sector of the built environment, which includes retail and office buildings as well as public and government buildings, uses about 28% of all electricity and 14% of natural gas consumed in Tiburon. As such, the commercial sector has a significant role to play in reducing GHG emissions.

While there are no large employment centers, Tiburon provide about 2,910 jobs.[7] Most people who work in Tiburon also live in the county (69%), while about 7% come from Sonoma County and the rest from other Bay Area counties. Although some residents work in Tiburon (23%), a majority commute to jobs in San Francisco (35%), elsewhere in Marin County (30%), and other locations outside Marin County.[8] An estimated 60% of Tiburon residents drive to work alone, 5% carpool, 15% take the ferry, 2% take the bus, and 1% walk or bicycle. In 2018, approximately 16% of residents worked from home.[9] During the coronavirus pandemic of 2020-2021, it is estimated that average mobility, based on distance traveled, declined 55-70% in Marin County.[10] Although it is unknown how changing transportation

[5] California Department of Finance, Report E-5, January 1, 2020.

[6] U.S. Census, American Community Survey 2018 ACS 1-Year Estimates.

[7] Association of Bay Area Governments, Plan Bay Area 2040 Projections.

[8] Census Transportation Planning Products, 2012-2016 data set. These numbers do not take into account shifting employment locations due to the coronavirus pandemic of 2020-2021.

[9] U.S. Census, American Community Survey 2018 ACS 1-Year Estimates.

[10] Unacast, https://www.unacast.com/covid19/social-distancing-scoreboard?view=county&fips=06041, accessed 1/27/21.

patterns are likely to persist once the pandemic has subsided, there is an opportunity to significantly reduce vehicle miles traveled (VMT) by working at home.

Tiburon Boulevard, a state highway maintained by Caltrans, runs along the length of the peninsula and connects to Highway 101. As the principal roadway on a peninsula, most vehicle trips in Tiburon require some segment to be driven on this roadway. Walking or biking are viable ways to get around the flatter areas of town, especially in the neighborhoods located close to schools and commercial areas. There is one Class 1 multi-use path that runs along the Richardson Bay shoreline to the downtown area, where it becomes a striped bicycle lane for a short segment. More residents walking and biking to destinations will help to reduce transportation emissions, improve public health, and build community. Understanding time, safety, and access constraints to biking and walking is essential to encourage residents to shift away from single occupancy vehicles.

Public transit is limited within Tiburon, with one bus route operated by Marin Transit running between downtown Tiburon and Strawberry approximately every half hour. Marin Transit uses renewable diesel in most of its fleet and began introducing electric buses in 2019. Ferry service is located in the downtown and provides a convenient way for residents to commute to San Francisco.

With a median household income significantly higher than the average California household ($155,915 vs. $75,235) and a great majority of well-educated residents (76% have a bachelor's degree or higher), Tiburon residents, on average, have access to more resources, which may allow them to be early adopters of new eco-friendly technologies.[11] For example, Marin County is a leader in zero emission vehicles (ZEVs) in California with 12,369 ZEVs in Marin by the end of 2021, and about 5.8% of registered automobiles. In Tiburon, ZEVs make up 10.1% of all registered vehicles. Public information campaigns, incentives, and regulatory mechanisms to accelerate solar and battery storage installation, electric vehicle adoption, and electrification of buildings and appliances are strategies that can be used to reduce GHG emissions.

Community Emissions Inventory

The first step toward developing a climate action plan is to identify sources of emissions and establish baseline levels. In 2020, the Marin Climate & Energy Partnership prepared a Greenhouse Gas Emissions Inventory for Tiburon community emissions for the years 2005 through 2020. The "activity-based" inventory quantifies GHG emissions from a wide variety of sources, from the energy used to power, heat, and cool buildings, to the fuel used to move vehicles and power off-road equipment, to the decomposition of solid waste and treatment of wastewater. Emissions are quantified according to methodologies established by the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (v. 1.2). The inventory provides a detailed understanding of where the highest emissions are coming from, and, therefore, where the greatest opportunities for emissions reductions lie. The inventory also establishes a baseline emission inventory against which to measure future progress.

Community emissions are quantified according to these seven sectors:

- The **Built Environment - Electricity** sector represents emissions generated from the use of electricity in homes and commercial and public buildings and facilities, and electric vehicle charging in Tiburon.

[11] 2019 American Community Survey 5-Year Estimates.

- The **Built Environment – Natural Gas** sector represents emissions generated from the use of natural gas in homes and commercial and public buildings and facilities in Tiburon. Propane used in homes is included in this sector, representing about 1% of emissions.
- The **Transportation** sector includes tailpipe emissions from passenger vehicle trips originating and/or ending in Tiburon, a share of tailpipe emissions generated by medium and heavy-duty vehicles travelling on Marin County roads, and emissions from transit vehicles when operating within the Town limits. Electricity used to charge electric vehicles is embedded in electricity consumption reported in the Built Environment – Electricity sector.
- The **Waste** sector represents fugitive methane emissions that are generated over time as organic material decomposes in the landfill. Although most methane is captured or flared off at the landfill, approximately 25% escapes into the atmosphere.
- The **Off-Road** sector represents emissions from the combustion of gasoline and diesel from the operation of off-road vehicles and equipment used for construction and landscaping.
- The **Water** sector represents emissions from energy used to pump, convey, treat, and distribute potable water from the water source to water users in Tiburon.
- The **Wastewater** sector represents stationary, process, and fugitive GHGs that are created during the treatment of wastewater generated by the community and emissions created from energy used to process wastewater.

Community GHG emissions totaled 60,352 metric tons in 2005 and 43,307 metric tons in 2020, falling 29%, or 17,266 metric tons CO_2e. As shown in Table 2, reductions occurred in all inventoried sectors. The largest decline occurred in the Built Environment - Electricity sector, due to a 18% reduction in electricity consumption and a significant improvement in the carbon intensity of electricity. Emissions declined 83% in this sector and 9,076 metric tons between 2005 and 2020.

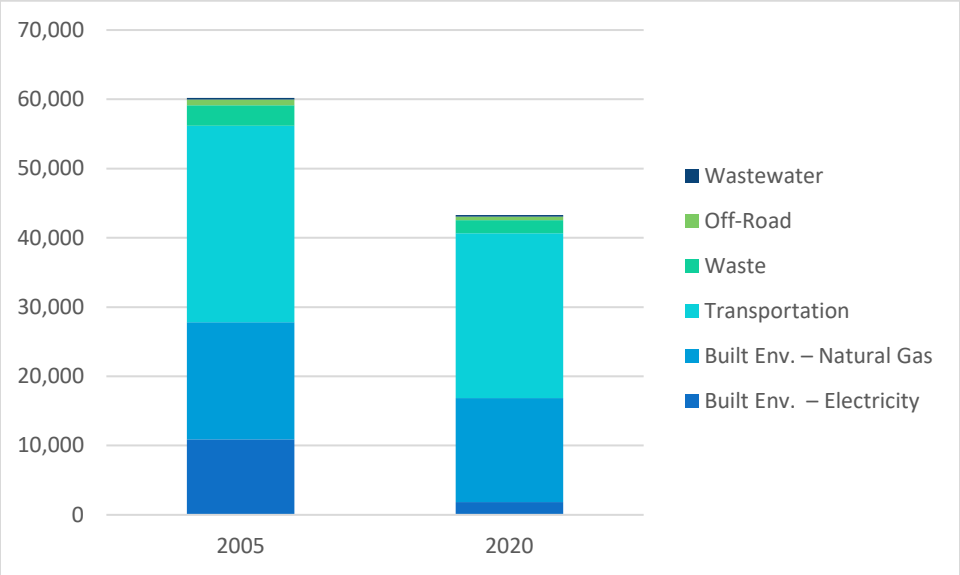
TABLE 2: COMMUNITY EMISSIONS BY SECTOR, 2005 TO 2020

Year	Built Env. – Electricity	Built Env. – Natural Gas	Transportation	Waste	Off-Road	Water	Wastewater	Total	% Change from 2005
2005	10,914	16,892	28,379	2,945	837	366	240	60,573	
2006	10,312	17,038	28,367	2,933	877	322	239	60,088	-1%
2007	13,821	16,866	28,148	2,642	1,038	433	256	63,205	4%
2008	13,687	17,345	27,745	2,200	849	399	259	62,483	3%
2009	12,153	17,187	27,749	1,896	715	402	250	60,352	0%
2010	8,643	17,889	26,449	1,864	638	231	238	55,951	-8%
2011	7,958	18,158	26,739	1,820	620	164	234	55,694	-8%
2012	8,116	17,044	26,949	1,895	610	177	243	55,035	-9%
2013	7,652	16,559	26,485	1,935	609	208	247	53,695	-11%
2014	6,989	13,773	26,016	1,960	606	187	243	49,774	-18%
2015	6,721	13,978	25,615	2,034	600	147	241	49,337	-19%
2016	5,494	14,969	25,166	2,404	594	110	232	48,970	-19%

Year	Built Env. – Electricity	Built Env. – Natural Gas	Transportation	Waste	Off-Road	Water	Wastewater	Total	% Change from 2005
2017	2,471	15,408	25,764	2,517	585	32	228	47,005	-22%
2018	2,552	14,801	25,830	2,241	571	11	228	46,234	-24%
2019	2,805	15,354	24,841	2,138	555	12	214	45,920	-24%
2020	1,838	15,045	23,789	1,889	516	14	216	43,307	-29%
2005-2020	-9,076	-1,848	-4,590	-1,055	-321	-352	-24	-17,266	
2005-2020	-83%	-11%	-16%	-36%	-38%	-96%	-10%	-29%	

Figure 2 compares sector emissions between 2005 and 2020. The chart shows how the share of emissions for the Built Environment – Electricity sector has shrunk over the years as energy use has declined and electricity has become cleaner. PG&E has been steadily increasing the amount of renewable energy in its electricity mix, which was 67% less carbon intensive in 2020 than it was in 2005. MCE Clean Energy (MCE), which began serving Tiburon in 2010, provides its customers with electricity that is generated from 60% and 100% renewable sources.

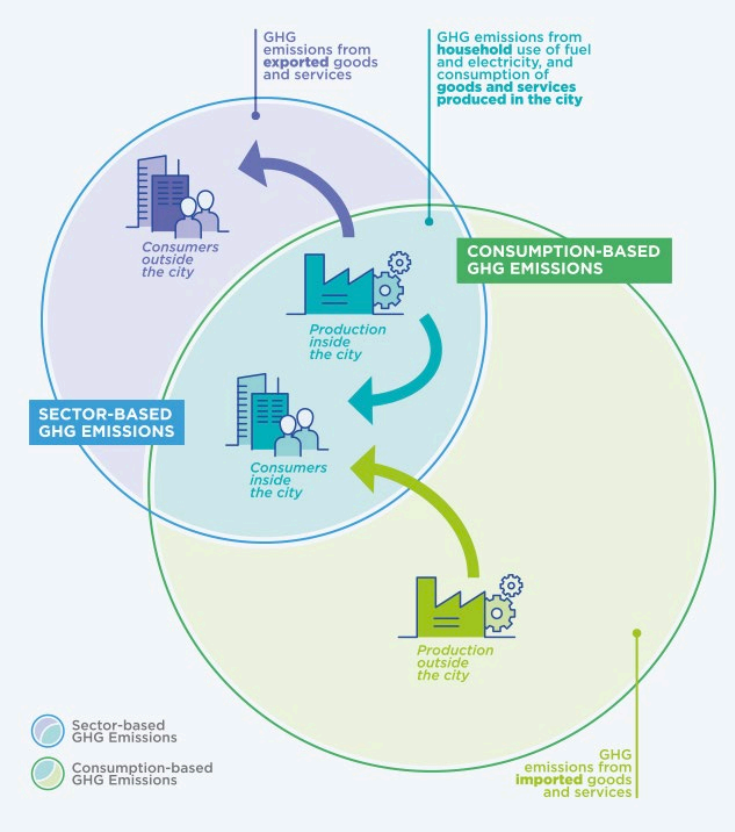
FIGURE 2: EMISSIONS BY SECTOR, 2005 AND 2020



CONSUMPTION-BASED INVENTORY

In addition to the sectors outlined above which measure the emissions that are generated within the Town's borders, there are emissions associated with the goods and services that residents in Tiburon consume. These are referred to as "consumption-based emissions". Rather than assessing emissions that are generated within a jurisdictional boundary, consumption-based inventories estimate the emissions based on the goods and services consumed within a place. This includes emissions from raw material extraction, manufacturing, distribution, retail, and disposal. Historically, local governments have only included emissions that occur within their boundaries, including emissions associated with goods that will eventually be exported (Figure 4). However, in communities like Tiburon (as in many other communities in the United States) where goods are more often imported than exported, consumption emissions can be up to 800% higher than their sector-based emissions inventory. Consumption emissions are harder to track and have fewer defined pathways for policy intervention from local governments, so the Town continues to follow ICLEI's Community Protocol and focus on actionable programs and policies to address local emissions. This CAP, wherever possible, seeks to take into account the whole picture of local contributions to climate change and includes measures to address these emissions in the built environment.

FIGURE 3: SECTOR-BASED VS. CONSUMPTION-BASED GHG



Source: C40 Cities, "Consumption-Based GHG Emissions of the C40 Cities"

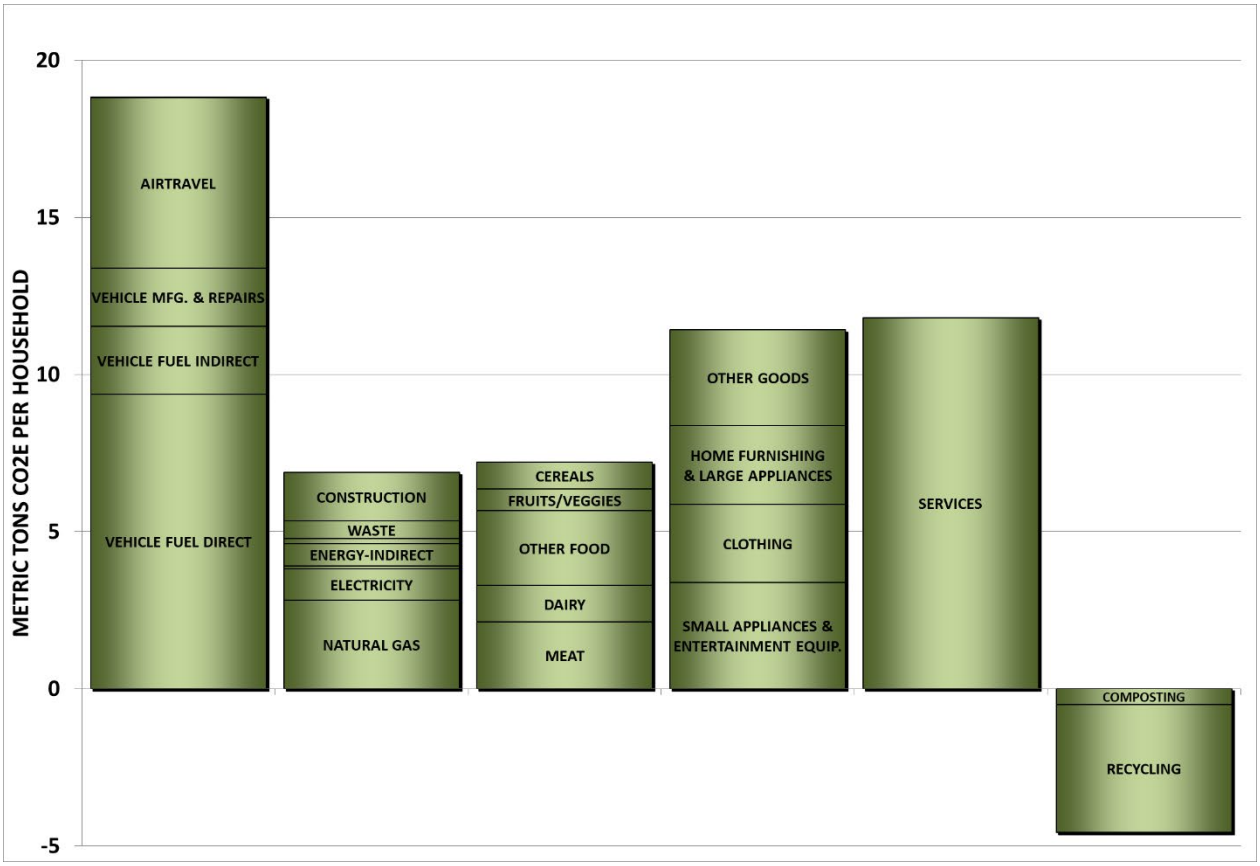
In 2016, the Bay Area Air Quality Management District (BAAQMD) and U.C. Berkeley developed consumption-based inventories for Bay Area communities to better understand how purchasing habits contribute to global climate change. A consumption-based inventory includes emission sources that don't get counted in the typical "activity-based" GHG inventory, as well as other items that are difficult to quantify like airplane travel and upstream emissions from the production, transport, and distribution of food and household goods. Figure 4 shows the results of the consumption-based inventory for Tiburon and Belvedere households. According to this inventory, the average household generates 55.6 $MTCO_2e$ per year. Under the activity-based GHG inventory, the average Tiburon household generates 11.7 $MTCO_2e$ in 2020, about 21% of the consumption-based estimate. he consumption-based inventory used data from 2013 to determine household emissions. In that year, the average Tiburon household generated 14.2 $MTCO_2e$ according to the activity-based GHG emissions inventory. For more information on the consumption-based inventories, visit https://coolclimate.org/inventory.

Although this consumption-based inventory is informative, it has not been updated since 2016 and therefore does not provide a way to track changes in emissions levels over time. Tiburon's Greenhouse Gas Inventory instead

focuses on emission sources that the Town has some control over and that can be reliably quantified using established protocols and tracked annually in order to inform decision-making and measure progress. This CAP, wherever possible, seeks to consider the whole picture of local contributions to climate change and includes measures to address these emissions. The "What You Can Do Table" at the beginning of this document includes many actions residents can take on their own to reduce their consumption-based emissions.

It is anticipated that over the period of this CAP, the methodology and metrics to inventory and reduce consumption-based emissions will advance. Given the high level of consumption-based emissions attributable to Tiburon residents, the Town will continue to monitor the availability and applicability of consumption-based inventories and protocols to incorporate these tools into the annual inventory and implementation planning process.

FIGURE 4: AVERAGE TIBURON/BELVEDERE HOUSEHOLD CARBON FOOTPRINT



Source: CoolClimate Network

COMMUNITY EMISSIONS FORECAST

The Climate Action Plan includes a business-as-usual (BAU) forecast in which emissions are projected in the absence of any policies or actions that would occur beyond the base year to reduce emissions. The forecasts are derived by "growing" 2020 emissions by forecasted changes in population, number of households, and jobs. The number of households is projected by assuming that the Town will add 639 housing units by 2030, as determined by the 6th cycle Regional Housing Needs Allocation for June 2022 through December 2030. Projected population is estimated

by assuming 2.47 persons per household, which is the current household size according to the California Department of Finance.[12] Due to the uncertain nature of actual housing development, no additional housing development and population growth is assumed after 2030. No growth is expected in jobs since the anticipated rezonings to accommodate the Town's RHNA will likely decrease the amount of commercial space in Tiburon.

Transportation emissions are projected utilizing data provided by the Metropolitan Transportation Commission (MTC), which incorporate the vehicle miles traveled (VMT) reductions expected from the implementation of Plan Bay Area 2020 and the Regional Transportation Plan adopted in 2017. These forecasts have not yet been updated to reflect Plan Bay Area 2050 and may be underestimating the VMT impacts of housing units that have been allocated to Marin County.

As shown in Table 3, emissions are expected to rise 7.1% by 2030. Forecasted emissions then decline due to the projected reduction in VMT. Emissions will be approximately 45,970 $MTCO_2e$ by 2050 under the BAU forecast, an increase of 5.8% from 2020 levels.

TABLE 3: TIBURON COMMUNITY EMISSIONS FORECAST

Forecast Category	2020	2030	2040	2050
Population	9,127	10,704	10,704	10,704
Housing Units	4,047	4,686	4,686	4,686
Households	3,714	4,353	4,353	4,353
Jobs	2,910	2,910	2,910	2,910
Emissions ($MTCO_2e$)	43,430	46,515	46,240	45,969
Change in Emissions from 2020		+ 7.1%	+6.5%	+5.8%

Community Emissions Reduction Targets

The State of California has adopted goals to reduce California's GHG emissions. Passed in 2006, the California Global Warming Solutions Act (Assembly Bill 32) established the State's first target to reduce statewide emissions to 1990 levels by 2020. Because reliable activity data is generally not available to determine 1990 emissions levels for local governments, the California Air Resources Board (CARB) recommended local governments pursue a target, comparable to the statewide target, to reduce emissions 15% below "current" emissions in its *Climate Change Scoping Plan*, which was published in 2008. Given the unreliability of 1990 data, Marin cities and towns have historically used 2005 as the baseline for its emissions inventories and has set GHG reduction goals relative to that year.

[12] While approximately 90% of the additional housing units are expected to be small multifamily units and accessory dwelling units, the expanded housing stock is expected to provide options for senior households to downsize, thus freeing up single family homes for larger families. Nonetheless, assuming 2.47 persons per household is a conservative estimate.

The State has established additional goals for future reductions. Senate Bill 32, passed in 2016, sets a target to reduce statewide emissions 40% below 1990 levels by 2030. Assembly Bill 1279, passed in 2022, established a statewide target to reduce emissions 85% below 1990 levels by 2045 and achieve carbon neutrality in that year.

This climate action plan establishes targets to reduce communitywide emissions 50% below 1990 levels, which would exceed the State's guidance for local jurisdictions, and achieve carbon neutrality by 2045 (see Table 4). The CAP contains specific actions and projects emissions reductions through the year 2030. However, the CAP actions will meet the 2045 carbon neutrality goal if continued past 2030 as follows:

- Convert 100% of light passenger vehicles and public transit buses to electric vehicles (LCT-C1, LCT-C5, LCT-M1)
- Continue to improve fuel efficiency and electrify the medium and heavy duty vehicle fleet (State Action Light and Heavy Duty Fleet Regulations)
- Prohibit natural gas end uses in all new construction (RE-C3.3)
- Convert 100% of existing appliances and heating systems in all residential and non-residential buildings to electric (RE-C3.2)
- Achieve zero-carbon electricity (RE-C2 and State Action Renewable Portfolio Standard)
- Sequester carbon dioxide and purchase carbon offsets to mitigate remaining emissions, estimated at 2,300 $MTCO_2e$ (S-C1 through S-C4)

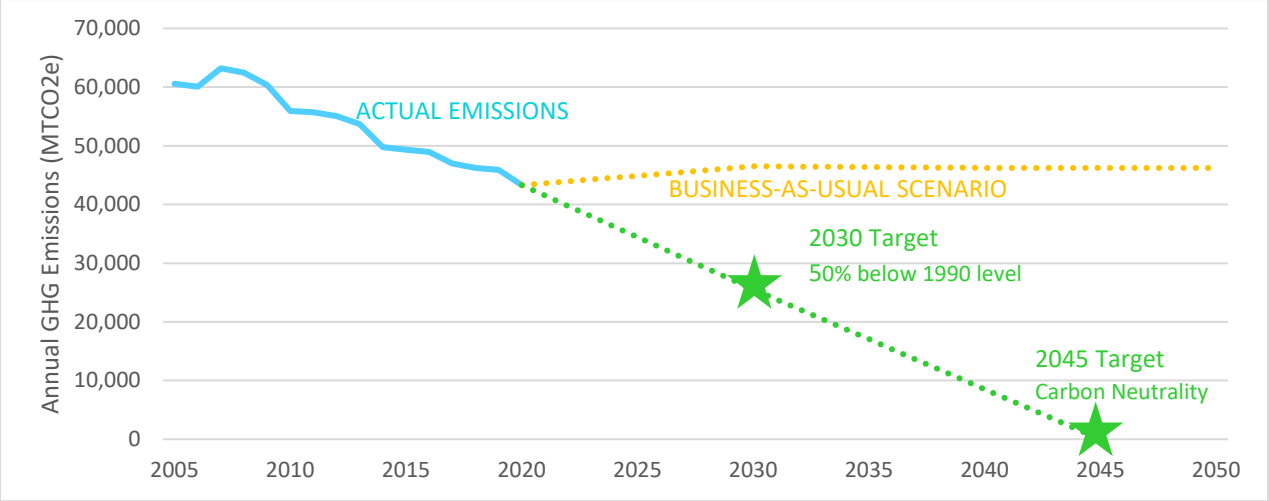
TABLE 4: GHG EMISSIONS TARGETS

	2030 Target	2045 Target
Tiburon's Target	Mitigate and sequester emissions 50% below 1990 level [13]	Carbon Neutrality
State Reference	SB 32	EO B-55-18
Emissions Limit to Meet Target ($MTCO_2e$)	25,543	0

Figure 5 shows the Town's GHG emissions trend, forecast and GHG reduction targets that will occur through both mitigation and sequestration.

[13] Consistent with the California Air Resource Board's guidance to local governments, the Town is estimating 1990 levels as 15% below 2005 levels. The 2030 target is set at 50% below that level.

FIGURE 5: COMMUNITY EMISSIONS TREND, FORECAST, AND TARGETS



The Town acknowledges that aggressive action at the State, federal and international level will be needed to achieve the IPCC's recommendation to limit global warming to 1.5 degrees Celsius and avoid the most catastrophic impact of climate change. The CAP contains actions to advocate at the state and federal levels for policies and actions that support the rapid transition to GHG-free energy sources, electrification of buildings and the transportation fleet, and other impactful measures to sharply reduce greenhouse gas emissions.

CHAPTER 3: STRATEGIES TO REDUCE GREENHOUSE GAS EMISSIONS

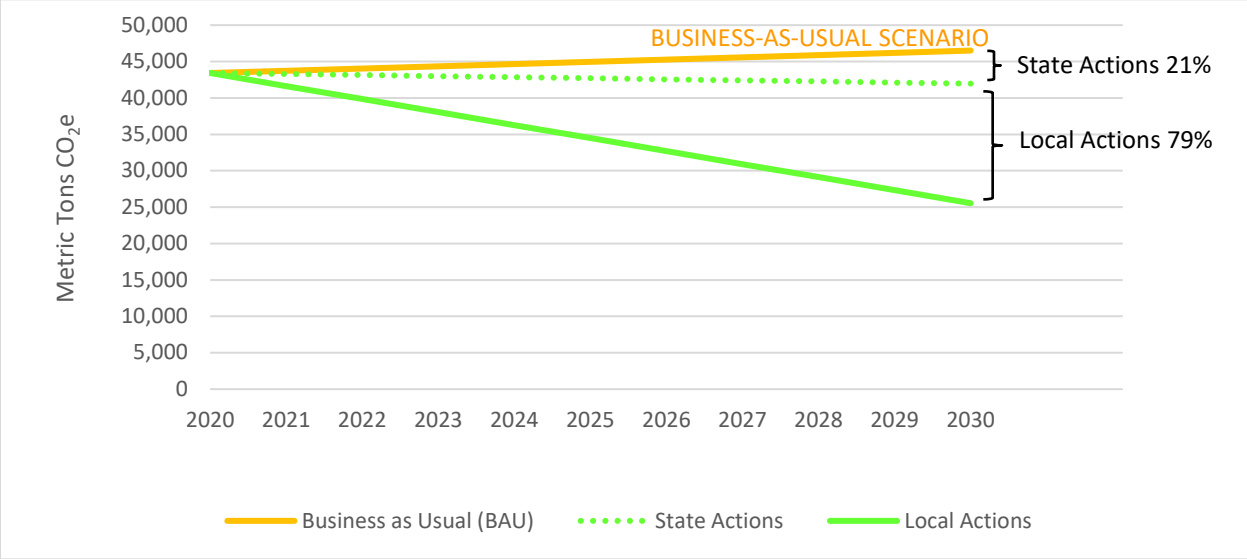
INTRODUCTION

The Climate Action Plan includes a variety of regulatory, incentive-based, and market-based strategies that are expected to reduce emissions from both existing and new development in Tiburon. Several of the strategies build on existing programs while others provide new opportunities to address climate change. State actions will have a substantial impact on future emissions. Local strategies will supplement these State actions and achieve additional GHG emissions reductions. Successful implementation will rely on the combined participation of Town staff as well as residents, businesses, and community leaders.

The following sections identify the State and local strategies included in the CAP to reduce community emissions. The projected reductions from State and local emissions reduction actions total 25,543 $MTCO_2e$ by 2030. Community emissions based on emissions reduction measures are projected to be 25,543 $MTCO_2e$ by 2030 with the full implementation of the CAP, which is 50% below 1990 levels. This outcome would exceed the SB 32 target.

As shown in Figure 6, State actions represent about 21% of the reduction expected through implementation of the Climate Action Plan. Local mitigation actions designed to reduce emissions represent about 79% of the total. However, it is important to note that some of the local actions, such as increasing the number of zero emission passenger vehicles and buses in Marin County and reducing the amount of organic waste sent to the landfill, work in tandem with State legislation, programs, and goals.

FIGURE 6: CUMULATIVE IMPACT OF REDUCTION STRATEGIES



State Actions

The Climate Action Plan incorporates State reduction strategies that have been approved, programmed, and/or adopted and will reduce local community emissions from 2020 levels. These programs require no additional local actions, although local actions may work to support these programs. State actions are quantified first and deducted from projected community emissions to provide a better picture of what still needs to be reduced at the local level to get to the overall reduction target. State actions, including regulations related to light and heavy-duty vehicles, renewable energy, and building energy codes, and their emissions reductions are shown in Table 5 and detailed in Appendix B: GHG Reduction Calculations.

TABLE 5: ESTIMATED EMISSIONS REDUCTIONS IN TIBURON FROM STATE ACTIONS

State Action	2030 Emissions Reductions $MTCO_2e$
Light and Heavy-Duty Vehicle Regulations	3,187
Renewable Portfolio Standard	533
Title 24 Building Energy Efficiency Standards	776
Total	**4,496**

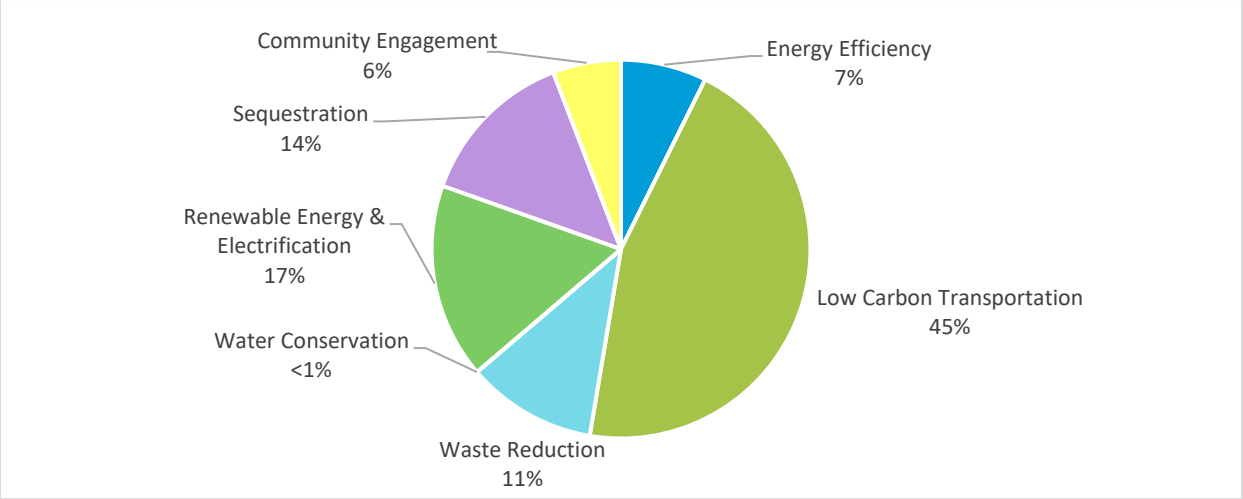
Local Greenhouse Gas Emissions Reduction Strategies

The local strategies presented in the following sections, and as summarized in Table 6 and Figure 7 below, achieve GHG emissions reductions in the community of approximately 16,476 $MTCO_2e$ in 2030.

TABLE 6: LOCAL EMISSIONS REDUCTION STRATEGIES

Strategy	GHG Reductions by 2030 ($MTCO_2e$)
Low Carbon Transportation	7,466
Renewable Energy & Electrification	2,746
Energy Efficiency & Green Building	1,209
Waste Reduction	1,830
Water Conservation	2
Sequestration	2,263
Community Engagement	960
Total	**16,476**

FIGURE 7: SHARE OF EMISSIONS REDUCTION BY STRATEGY



Each of the following sections provide a summary table of local measures and associated GHG reductions, followed by a description of the specific actions the Town will undertake to implement each measure. The methodologies and implementation targets used to calculate emissions reductions are described in Appendix B. Sometimes, there is no direct or reliable way to estimate GHG savings for a particular measure or the savings are embedded in another measure. In this case, the reason is noted below the table.

Social Equity

Climate change and equity are interconnected. Often, the communities who have contributed the least to global warming, including low-income communities, communities of color, indigenous peoples, and developing nations, suffer first and most from climate change. The Town of Tiburon acknowledges disadvantaged communities have existed and still exist in Marin County.

One definition of social equity is the "just and fair inclusion into a society in which all can participate, prosper, and reach their full potential."(1) Equity is the means to ensure equality for all. An example of how that might work with climate action measures is with energy efficiency. Giving rebates to homeowners to swap out natural gas appliances helps reduce to GHG emissions by switching to low carbon electricity. But if financial incentives are only available to those with means to purchase new appliances it leaves out a section of the community without means. Programs that acknowledge this disparity might offer bigger discounts to low-income households. Additionally, the Town acknowledges that appliance upgrades may not be a high priority for all residents. Part of the Town's on-going work is to build and nurture relationships with diverse community groups so that they can share what are their priorities and the Town can attempt to integrate those priorities into its climate action efforts.

Sustainability has been described as a three-legged stool, pointing to the need to address not just the environment and the economy, but social equity as well. It is important to consider and include our diverse community members and business interests in the development and implementation of the strategy measures in this plan. Tiburon's Diversity Inclusion Task Force, which was established in 2020 as a standing committee of the Town Council, can play a key role in ensuring that equity is central in the development, implementation, and monitoring of this plan.

Low Carbon Transportation

45% of potential reductions

More than half of Tiburon's emissions comes from transportation, and reducing these emissions is a top priority to meet our GHG emission reduction goals. Although improvements in fuel efficiency have reduced transportation emissions from passenger vehicles 16% since 2005, vehicle miles traveled by cars in Tiburon have increased 1% over the same period. Surveys show that alternative transportation rates have remained stagnant, despite improvements in the bicycle and pedestrian network and public information campaigns to encourage residents to carpool, bicycle, walk, and take transit.

All of that is changing, however, with the increasing viability and availability of zero emission vehicles (ZEVs). This is especially true in Tiburon where the majority of electricity generation comes from clean, renewable sources. ZEVs include all-battery as well as plug-in electric hybrid vehicles. Marin County is a leader in ZEV adoption rates – second only to Santa Clara County – and ZEVs already comprise about 6% of registered passenger vehicles in Marin County. In Tiburon, ZEVs make up 10% of all registered vehicles. Our goal is it increase that rate to 45% by 2030 by building out the EV charging infrastructure and encouraging ZEV ownership through incentives, public education, and development requirements. This is an aggressive target, but one that complements the State's goals to put 5 million ZEVs on the road by 2030 and to require all new passenger vehicles sold in California to be zero emission by 2035. Improvements in battery and charging technology, expected cost reductions, and automakers' commitments to significantly expand ZEV offerings point to an all-electric future. Programs that incentivize used EV car purchases and installation of EV chargers in multifamily buildings can help ensure the benefits of EV ownership are shared by all.

However, ZEVs cannot alone meet Tiburon's transportation emission reductions goals; reducing congestion, enabling better biking and walking opportunities, and incentivizing public transit all carry co-benefits and can be enjoyed by all.

What You Can Do

- Drive an all-electric or plug-in hybrid vehicle.
- Bike, walk, or take transit whenever possible.
- Reduce the number of miles you drive by working from home when possible and consolidating vehicle trips.
- Shut your car off when waiting in line at the ATM or in the school pick up/drop off lane.
- Better yet, encourage your child to walk or bike to school.

TABLE 7: LOW CARBON TRANSPORTATION STRATEGIES

ID	Strategy	GHG Reduction by 2030 ($MTCO_2e$)	Share of Sector Emissions Reduction
LCT-C1	Zero Emission Vehicles	6,340	85%
LCT-C2	Bicycling and Micromobility	218	3%
LCT-C3	Walking	13	<1%
LCT-C4	Safe Routes to School	49	1%
LCT-C5	Public Transit	68	1%
LCT-C6	Employee Trip Reduction	11	<1%
LCT-C7	Vehicle Idling	-	-
LCT-C8	Smart Growth Development	326	4%
LCT-C9	Zero Emission Landscape Equipment	372	5%
LCT-M1	Zero Emission Town Vehicles	43	1%
LCT-M2	Low Carbon Fuels	10	<1%
LCT-M3	Town Employee Commute	6	<1%
LCT-M4	Municipal Zero Emission Landscape Equipment and Small Off-Road Engines	9	<1%
TOTAL		**7,465**	**100%**

Low Carbon Transportation Actions

LCT-C1: Zero Emission Vehicles

Take actions that will result in at least 45% of registered passenger vehicles in Tiburon and Marin County to be zero emission vehicles (ZEVs), including plug-in electric vehicles (EVs) and hydrogen fuel cell electric vehicles, by 2030. Actions include:

1. Support development of a countywide EV plan that can be adopted by all Marin jurisdictions that identifies strategies to accelerate EV adoption. The plan should identify the number and type of chargers needed in each jurisdiction to achieve a minimum 45% ZEV penetration target; potential locations for public, workplace, and multi-family charging; best practices for charging station siting, installation, and signage; and model code language and guides for permit streamlining and charging infrastructure requirements.
2. Work with PG&E, MCE, Transportation Authority of Marin, and other entities to identify and develop multifamily and workplace charging sites.
    a. Conduct outreach to multifamily HOA associations and facilitate meetings with EV charging supply providers.
    b. Relax development standards to facilitate installation of EV chargers.
    c. Assist in applying for available grant funding and rebates.
    d. Contribute funding for grid infrastructure upgrades as needed.
3. Pursue opportunities to expand the Town's EV charging network by identifying suitable Level 2 and Level 3 DC fast charging locations and considering innovative programs, such as streetlight and curbside charging to serve those who do not have access to home charging.
    a. Develop a private-public partnership and install Level 3 fast chargers at public locations, such as Blackie's Pasture, sufficient to service near-term resident and visitor demand with expansion plans to service a projected Marin County population of 90,000 EVs in 2030.
    b. Assist in applying for available grant funding and rebates.
    c. Contribute funding for grid infrastructure upgrades as needed.
4. Encourage and facilitate. installation of Level 3 fast chargers in the Downtown as commercial properties are redeveloped.
    a. Facilitate meetings with property owners, developers, and EV charging equipment providers as new development is proposed.

b. Provide concessions on development standards as needed to facilitate installation of fast chargers.
c. Allow EV fast charging spaces to count towards the parking requirement for residential and commercial uses.
d. Allow advertising to be delivered at EV chargers.
e. Assist in applying for available grant funding and rebates.
f. Contribute funding for grid infrastructure upgrades as needed.
g. Develop Level 3 fast chargers sufficient to service a projected Marin County population of 90,000 EVs by 2030.

5. Provide directional signage to public EV chargers on local streets and, as appropriate, from state highways.
6. Work with the Transportation Authority of Marin (TAM), MCE, the California Energy Commission (CEC) and other entities to provide technical assistance and incentives, such as rebates, for multi-family and workplace charging sites.
7. Participate in a countywide effort by MCE, Pacific Gas & Electric (PG&E), and others to provide rebates for new or used electric vehicles.
8. As the Town's Green Building Ordinance is updated, require new and remodeled single-family, multi-family and commercial projects to install electrical service, add conduits and chargers, as appropriate, for potential electric vehicle use beyond state standards.
    a. Require all new multifamily development to provide one EV-ready parking space[14] per unit and additional EV fast chargers that are accessible to the public.
9. Participate in regional efforts and grant programs to encourage widespread availability of EV charging stations.
10. Participate in and provide funding for programs to promote EV adoption, including "Drive an EV" events and other media and outreach campaigns.
11. Encourage or require, as practicable, ride hailing and delivery service companies to utilize zero emission vehicles.
12. Promote adoption of electric bicycles, scooters, and motorcycles.

LCT-C2: Bicycling and Micromobility

Encourage bicycling and micromobility as an alternative to vehicular travel.

1. Promote bicycling and micromobility, including electric bicycles, scooters, and skateboards, through outreach channels and partner agencies.
2. Require new, remodeled, and expanded commercial, mixed use, and multifamily development to provide secure parking for electric bicycles.
3. Provide secure electric bicycle parking at Town parks and buildings.
4. Encourage schools, the library, and shopping centers to provide secure electric bicycle parking.
5. Establish and maintain a system of bicycle facilities that are consistent with the Tiburon Bicycle and Pedestrian Master Plan and "complete streets" policies.

Micromobility

Micromobility refers to forms of transportation, human-powered or electric, that can occupy space alongside bicycles. It includes electric scooters and skateboards, docked and dockless shared bikes, and other forms of small, lightweight devices operating at speeds typically below 20 mph. Micromobility devices do not have an internal combustion engine.

[14] "EV ready" means that wiring and a receptacle are installed at the parking space, in addition to electrical service capacity, so that a resident may simply plug-in a Level 2 charger.

6. Implement the Tiburon Bicycle and Pedestrian Master Plan's recommendations to support and expand bicycling.
7. Update the Tiburon Bicycle and Pedestrian Master Plan to support the use of e-bikes, electric scooters, and electric skateboards, including easily accessible charging stations for them.

LCT-C3: Walking

Encourage walking as an alternative to vehicle use.

1. Establish and maintain a system of pedestrian facilities that are consistent with the Tiburon Bicycle and Pedestrian Master Plan and "complete streets" policies.
2. Implement the Tiburon Bicycle and Pedestrian Master Plan's recommendations to support and expand walking.

LCT-C4: Safe Routes to School

Continue to support the Safe Routes to School Program and strive to increase bicycling, walking, carpooling (especially in a ZEV), and taking public transit to school.

1. Work with TAM and other organizations to promote school and student participation.
2. Identify issues associated with unsafe bicycle and pedestrian facilities between neighborhoods and schools, apply for Safe Routes to School grants, and execute plans to improve pedestrian and bicycle facilities.

LCT-C5: Public Transit

Support and promote public transit by taking the following actions:

1. Work with Marin Transit and Golden Gate Transit to maximize ridership through expansion and/or improvement of transit and ferry routes, schedules, and services.
2. Support a "Yellow School Bus" program and student use of regular transit to reduce school traffic.
3. Encourage transit providers, including school buses, to use renewable diesel as a transition fuel and to purchase electric buses whenever replacing existing buses.

LCT-C6: Employee Trip Reduction

Reduce vehicle miles traveled commuting to work through the following actions:

1. Work with the TAM, the Metropolitan Transportation Commission, and the Bay Area Air Quality Management District (BAAQMD) to promote transportation demand programs to local employers, including rideshare matching programs, vanpool incentive programs, emergency ride home programs, telecommuting, transit use discounts and subsidies, showers and changing facilities, bicycle racks and lockers, and other incentives to use transportation other than single occupant vehicles.
2. Embark on a behavior change and educational campaign to encourage employees to reduce vehicle trips.
3. Work with TAM on promoting countywide transportation demand management programs to encourage trip reduction throughout the county.

LCT-C7: Vehicle Idling

Encourage drivers and autonomous vehicles to limit vehicle idling through public outreach and engagement campaigns.

LCT-C8: Smart Growth Development

Promote land use and development policies that prioritize infill housing and mixed-use development near commercial services and transit facilities. Achieve multifamily housing development on housing opportunity sites identified in the Town's Housing Element 2023-2031 and apply existing inclusionary requirements for units affordable to lower-income households as applicable.

LCT-C9: Zero Emission Landscape and Small Off-Road Equipment

Adopt an ordinance to require the use of zero emission landscape and small off-road equipment instead of gasoline and diesel-powered equipment in all residential and commercial areas.[15] Equipment includes leaf blowers and vacuums, hedge trimmers, edgers, brush cutters, chainsaws, lawn mowers, chain saws (under 45 cc), pressure washers, and portable generators.

1. Provide information on available rebates, such as the California Air Resources Board's Clean Off-Road Equipment Voucher Incentive Project for small business and sole proprietary landscape professionals.
2. Consider offering an incentive for businesses to use zero emission landscape equipment such as a rebate on equipment purchases or discount on business license fees.
3. Explore building code modifications to support zero emission landscape equipment.

LCT-M1: Zero Emission Town Vehicles

Purchase or lease zero-emission vehicles for the Town fleet whenever feasible and when not, the most fuel-efficient models available. Achieve a 100% electric light duty vehicle fleet by 2030.

LCT-M2: Low Carbon Fuels

Use low-carbon fuel such as renewable diesel as a transition fuel in the Town's fleet and encourage the Town's service providers and joint powers agencies to do the same until vehicles are replaced with zero-emission vehicles.

LCT-M3: Town Employee Commute

Provide Town employees with incentives and/or reduce barriers to drive electric vehicles and use alternatives to single occupant auto commuting, such as discounted EV charging, transit and e-bike discounts and subsidies, secure bicycle facilities, showers and changing facilities, ridesharing services, vanpools, emergency ride home service, flexible schedules, and telecommuting when practicable.

LCT-M4: Municipal Zero Emission Landscape Equipment and Small Off-Road Engines

Replace all gas-powered leaf blowers, mowers, brush cutters, hedgers, saws, and other landscape equipment and small off-road engines, including generators and pressure washers, with zero emission equipment.

[15] Gas-powered leaf blowers and trimmers are currently prohibited in residential areas.

RENEWABLE ENERGY AND ELECTRIFICATION

17% of potential reductions

Energy that comes from renewable sources, including solar, wind, geothermal, and small hydroelectric, are the cleanest and most-environmentally friendly energy sources. Here in Marin County, where there is an abundance of sunny days, solar energy is a particularly good energy source. According to data provided by Project Sunroof, 92% of buildings in Tiburon have roofs that are solar-viable. These 3,000 roofs could generate more than the total electricity used in Tiburon in 2020. Solar energy system costs keep falling, too, which make them an attractive option for home and commercial building owners. Our Climate Action Plan projects that we can get about 28% of our electricity from locally produced solar energy systems by 2030, up from about 9% in 2020, just by maintaining current growth and more if we accelerate our growth rate.

When solar is not an option, due perhaps to a shady roof or a reluctant landlord, residents and business owners can purchase 100% renewable electricity from MCE and PG&E. MCE and PG&E electricity have a high percentage of renewable content, making it some of the cleanest electricity in the country. MCE's Light Green electricity was 99% GHG free in 2020, while MCE's Deep Green electricity comes from 100% renewable sources and is 100% GHG-free. The Town has been purchasing Deep Green electricity for governmental operations since 2017, and Deep Green currently supplies about 4% of the electricity load in Tiburon.

Since our electricity is so clean, it's a great idea – and a healthier alternative - to swap out appliances and heating and cooling systems that use natural gas for ones that use electricity. If you're constructing a new home or building, or doing a major re-model, consider going all-electric. The County's Electrify Marin program provides rebates to replace natural gas appliances with efficient electric units, including water heaters, furnaces, ranges, and cooktops. Eventually, we'll need to replace the majority of natural gas appliance and equipment in existing buildings if we're going to hit our long-term goals.

Battery prices are falling and will soon be a cost-effective option, too. If you're concerned about losing electric service during a Public Safety Power Shutoff event, solar energy combined with battery storage may be for you and is certainly a cleaner choice than generators running on natural gas or fuel. Fortunately, ongoing research and development of energy storage systems are creating new business opportunities and making an all-electric, 100% renewable future possible. Utilities will need to expand grid capacity, develop electricity storage, and ensure system reliability.

What You Can Do

- Switch to MCE Deep Green or PG&E Solar Choice 100% renewable electricity.
- Install a solar energy system on your home or business and consider battery storage.
- Replace appliances that use natural gas for ones that use electricity.
- Investigate efficient heat pump technology so you can swap out water heaters and home heating systems that use natural gas when it's time to replace them.

TABLE 8: RENEWABLE ENERGY & ELECTRIFICATION STRATEGIES

ID	Strategy	GHG Reduction by 2030 ($MTCO_2e$)	Share of Sector Emissions Reduction
RE-C1	Renewable Energy Generation and Storage	318	12%
RE-C2	GHG-Free Electricity	394	14%
RE-C3	Building and Appliance Electrification	2,033	74%
RE-C4	Innovative Technologies[1]	-	-
RE-M1	Municipal 100% Renewable Electricity[2]	-	-
TOTAL		**2,746**	**100%**

[1] There is no emissions reduction because this is a supportive action.

[2] There is no emissions reduction associated with the action because the Town was purchasing Deep Green electricity in 2020.

Renewable Energy & Electrification Actions

RE-C1: Renewable Energy Generation and Storage

Accelerate installation of residential and commercial solar and other renewable energy systems and energy storage systems.

1. Provide permit streamlining and reduce or eliminate fees, as feasible.
2. Update building codes, development codes, design guidelines, and zoning ordinances, as necessary, to facilitate small and medium-scale solar installations.
3. Encourage installation of solar panels over parking areas on commercial projects, public buildings such as schools and the Tiburon Library, and large-scale residential developments through ordinance, development review, and/or agency incentives.
4. Identify and promote financing and loan programs for residential and non-residential projects.
5. Encourage installation of battery storage in conjunction with renewable energy generation projects through outreach and partner agency incentives.
6. Encourage the use of non-fossil fuel generators now and adopt an ordinance phasing out the acquisition and use of fossil-fuel generators.
7. Collaborate with the County, Marin jurisdictions, agencies, and organizations, as appropriate, to study opportunities and specific action steps for expansion of rooftop solar and battery storage.

RE-C2: GHG-Free Electricity

Encourage residents and businesses to switch to 100% renewable electricity (MCE Deep Green, MCE Local Sol, and PG&E Solar Choice) through engagement campaigns and partner agency incentives and work with MCE Clean Energy to assure that it reaches its goal to provide electricity that is 95% GHG-free by 2022. Target 15% of the electricity load to be Deep Green in 2030.

RE-C3: Building and Appliance Electrification

Accelerate electrification of building systems and appliances that currently use natural gas, including heating systems, hot water heaters, stoves, ranges, and clothes dryers.

1. Explore opportunities to continue existing rebate programs, such as Electrify Marin and BayREN, and promote them to the community by illustrating the financial and health benefits of electrification.
2. Study alternatives and draft regulations for Council consideration that requires homeowners and landlords to replace natural gas appliances, such as water heaters, stoves, cooktops, clothes dryers, and heating systems with high-efficiency electric appliances at time of replacement where

feasible. Educate the public about the health hazards of owning and operating natural gas appliances and available incentives and rebates to replace them.

3. Prohibit the use of natural gas end uses in new residential buildings in the Town's green building ordinance that aligns with the 2022 California Building Standards code update. Extend the same prohibition to new nonresidential buildings in the 2025 code cycle, if not earlier.
4. Collaborate with the County's work to update the Green Building Code and develop a model ordinance that all Marin jurisdictions can utilize in establishing requirements for new residential, multi-family, and commercial buildings and remodels and renovations be all-electric, thereby creating consistency across all jurisdictions.

RE-C4: Innovative Technologies

Investigate and pursue innovative technologies such as micro-grids, battery storage, and demand-response programs that will improve local resilience and the electric grid's resiliency and help to balance demand and renewable energy production in cooperation with local and regional partners such as MCE and PG&E, as feasible.

1. Build upon best practices identified by Drawdown Marin/Marin CAN, such as the Marin microgrid project at the Fairfax Pavilion. Develop a study on opportunities to create solar-powered resilience microgrids with battery storage for community use that would remain powered during an electric grid outage.

RE-M1: Municipal 100% Renewable Electricity

1. Install solar energy systems at all municipal buildings and facilities where feasible and investigate and pursue innovative technologies such as battery storage and demand response programs for them.
2. Where feasible, replace natural gas appliances/equipment with electric and electrify all Town buildings and facilities, where feasible.
3. Continue to purchase 100% renewable energy for Town buildings, facilities, and vehicles through programs such as MCE Deep Green.

Energy Efficiency and Green Building

7% of potential reductions

Increasing the efficiency of buildings is often the most cost-effective approach for reducing GHG emissions. Energy efficiency upgrades, such as adding insulation and sealing leaks in heating ducts, have demonstrated energy savings of up to 20%, while more aggressive "whole house" retrofits can result in even greater energy savings. Many of these improvements can be made inexpensively and without remodeling yet can be extremely cost-efficient, such as swapping out incandescent bulbs to LED bulbs, sealing air leaks, and installing a programmable thermostat. Energy Star-certified appliances and office equipment, high-efficiency heating and air conditioning systems, and high-efficiency windows not only save energy but reduce operating costs in the long run. Rebates, financing, and tax incentives are often available for residents and businesses to help defray the cost of upgrades.

The Tiburon community has been doing a good job reducing energy use. Since 2005, electricity consumption has declined an average of 0.6% per year and natural gas consumption has declined about 0.7% each year. There are opportunities to continue to work with the utilities and other partners to promote energy efficiency and electrification programs and continue to reduce energy use.

New construction techniques and building materials, known collectively as "green building," can significantly reduce the use of resources and energy in homes and commercial buildings. Green construction methods can be integrated into buildings at any stage, from design and construction to renovation and deconstruction. The State of California requires green building and energy-efficiency through the Title 24 building codes. The State updates these codes approximately every three years, with increasing energy efficiency requirements since 2001. The State's long-term energy efficiency goals are to have all new construction to be zero net electricity. Local governments can accelerate this target by adopting energy efficiency standards for new construction and remodels that exceed existing State mandates, and by providing incentives, technical assistance, and streamlined permit processes to enable quicker adoption.

What You Can Do

- Replace indoor and outdoor lights with LED bulbs and turn them off when not in use.
- Have an energy assessment done for your home or business.
- Upgrade insulation, seal leaks, and install a programmable thermostat.
- Purchase Energy Star appliances and equipment.
- Unplug electronic appliances when not in use and set the thermostat to use less heat and air conditioning.

TABLE 9: ENERGY EFFICIENCY AND GREEN BUILDING STRATEGIES

ID	Strategy	GHG Reduction by 2030 ($MTCO_2e$)	Share of Sector Emissions Reduction
EE-C1	Energy Efficiency Programs	1,166	96%
EE-C2	Energy Audits	40	3%
EE-C3	Cool Pavement and Roofs	-	-
EE-C4	Green Building Reach Code	-	-
EE-C5	Streamline Permit Process and Provide Technical Assistance	-	-
EE-C6	Sustainable Building Materials	-	-
EE-M1	Public Lighting[1]	-	-
EE-M2	Energy Efficiency Audit and Retrofits in Town Buildings	2	<1%
EE-M3	Energy Conservation in Town Buildings	1	<1%
TOTAL		**1,209**	**100%**

[1] *There is no emissions reduction associated with this action because the Town was purchasing GHG-free electricity in 2020.*

Energy Efficiency and Green Building Actions

EE-C1: Energy Efficiency Programs

Promote and expand participation in residential and commercial energy efficiency programs.

1. Work with organizations and agencies such as the Marin Energy Watch Partnership, the Bay Area Regional Network (BayREN), MCE, Resilient Neighborhoods, and the Marin Climate & Energy Partnership to promote and implement energy efficiency programs and actions.
2. Promote programs and incentives to reduce electricity demand during peak periods, such as OhmConnect, and shift demand to times when renewable energy is being produced.
3. Continue and expand participation in energy efficiency programs as they become available.
4. Promote utility, state, and federal rebate and incentive programs.
5. Participate and promote financing and loan programs for residential and non-residential projects such as Property Assessed Clean Energy (PACE) programs, BayREN financing programs, PG&E on-bill repayment, and California Hub for Energy Efficiency Financing (CHEEF) programs.

EE-C2: Energy Audits

Investigate requiring energy audits for residential and commercial buildings at time of sale or major remodel. Requirements could include identification of electrification and energy efficiency opportunities and supporting programs could connect building owners to potential rebates and financing options.

EE-C3: Cool Pavement and Roofs

Use reflective, high albedo material for roadways, parking lots, sidewalks, and cool roofs to reduce the urban heat island effect and save energy.

1. Evaluate the use of high albedo pavements when resurfacing Town streets and re-roofing Town facilities.
2. Adopt mandatory building code measures to require new development to use high albedo material for driveways, parking lots, walkways, and patios, and cool roofing.
3. Maintain and expand the use of urban tree cover for street-level temperature reduction.

EE-C4 Green Building Reach Code

1. Adopt a green building ordinance for new and remodeled commercial and residential projects that requires green building methods, materials, and efficiency above the State building and energy codes.
2. Consider adoption of low embodied-carbon concrete standards similar to those adopted by the County.

EE-C5 Streamline Permit Process and Provide Technical Assistance

Analyze current green building permit and inspection process to eliminate barriers and provide technical assistance to ensure successful implementation of green building requirements. Work countywide to make it easier for contractors and building counter staff to simplify applications and identify incentives.

EE-C6 Sustainable Building Materials

Study alternatives and draft regulations that require use of Forest Stewardship Council certified material in new constructions, major remodels, and outdoor use and that prohibit use of non-certified old-growth and other materials.

EE-M1: Public Lighting

Replace remaining inefficient street, parking lot, and other outdoor lighting with LED fixtures.

EE-M2: Energy Efficiency Audit and Retrofits in Town Buildings and Facilities

Work with the Marin Energy Management Team to identify and implement energy efficiency projects in municipal buildings and facilities and electrification of existing building systems and equipment that use natural gas.

EE-M3: Energy Conservation in Town Buildings

Reduce energy consumption through behavioral and operational changes.

1. Establish energy efficiency protocols for building custodial and cleaning services and other employees, including efficient use of facilities, such as turning off lights and computers, thermostat use, etc.
2. Incorporate energy management software, electricity monitors, or other methods to monitor energy use in municipal buildings, where feasible.

WASTE REDUCTION

11% of potential reductions

Consumption and disposal of goods generates significant GHG emissions during manufacturing, transport, distribution, and disposal. The best way to reduce emissions is to purchase and consume less in the first place, and then find someone who can reuse whatever you no longer need before considering recycling or disposal.

Due to the way the Town accounts for community emissions, the Town's Climate Action Plan does not take credit for reducing upstream emissions. Instead, our GHG accounting is directly concerned with emissions that are created from the anaerobic decomposition of organic waste in the landfill. The decomposition process creates methane, which is 28 times more potent as a GHG than carbon dioxide. Although landfills capture most of the methane, and some use that methane to create biogas or electricity, about one-quarter of it escapes into the atmosphere.

Diverting organic material from the landfill is a clear and viable option for reducing these emissions. Paper and cardboard can be recycled. Food scraps, some paper (like napkins and paper towels), and yard waste can be composted, either at home or at the landfill. Surplus food can be donated to non-profits that distribute it to those in need. The measures below are designed to maximize diversion of organic waste from the landfill by 2030, starting with encouraging residents and businesses to recycle and compost organic waste. To meet our diversion target, the Town has adopted an ordinance that mandates recycling and will be enforcing penalties if diversion targets are not met. As a last resort, the Town will consider setting trash collection fees that enable its waste hauler to invest in machinery that can sort trash and recover all compostable and recyclable materials before they are sent to the landfill.

What You Can Do

- Buy only as much as you need.
- Buy locally grown food and eat less meat.
- Put your food scraps in the green can and/or compost them at home.
- Donate extra food and used clothing and housewares.
- Don't be a "wishful" recycler. Be scrupulous about how you sort your recyclables. Check the Recycle Right Guide for tips.

These local measures also support state legislation to significantly reduce emissions from organic waste disposal. Senate Bill (SB) 1383 establishes targets to achieve a 75% reduction in statewide for waste disposal from the 2014 level by 2025. The law also establishes a target that not less than 20% of currently disposed edible food is recovered for human consumption by 2025. In 2022, CalRecycle may begin to issue penalties for non-compliance. On January 1, 2024, the regulations may require local jurisdictions to impose penalties for non-compliance on regulated entities subject to their authority.

TABLE 10: WASTE REDUCTION STRATEGIES

ID	Strategy	GHG Reduction by 2030 ($MTCO_2e$)	Share of Sector Emissions Reduction
WR-C1	Commercial Organic Waste	151	8%
WR-C2	Residential Organic Waste	508	28%
WR-C3	Construction & Demolition and Self-Haul Waste	59	3%
WR-C4	Mandatory Waste Diversion	556	30%
WR-C5	Waste Processing Franchise Agreement and Infrastructure	532	29%
WR-C6	Extended Producer Responsibililty[1]	-	-
WR-C7	Inorganic Waste[1]	-	-
WR-M1	Waste from Town Operations	24	1%
TOTAL		**1,830**	**100%**

[1] *There is no emissions reduction associated with this action because it is a supportive action.*

Waste Reduction Actions

WR-C1: Commercial Organic Waste

Work with Zero Waste Marin, the Town's waste hauler, and nonprofits such as Extra Food to divert commercial organic waste from the landfill through recycling, composting, and participation in waste-to-energy and food recovery programs.

1. Conduct outreach and education to businesses subject to State organic waste recycling mandates (AB 1826 and SB 1383) and encourage or enforce compliance with the law.
2. Refer new and major remodel commercial and multi-family residential project proposals to the Town's waste hauler for review and comment and require projects to provide adequate waste and recycling facilities and access as feasible.
3. Encourage and facilitate commercial and multi-family property owners to require responsible use of on-site recycling facilities in lease and rental agreements and to train and regularly evaluate janitorial, landscape, and other property management services.
4. Assess capacity of existing food recovery programs, expand existing food recovery infrastructure if needed, monitor commercial generators for compliance, and conduct education and outreach.

WR-C2: Residential Organic Waste

Work with Zero Waste Marin, the Town's waste hauler, and other organizations to educate and motivate residents to utilize curbside collection services and home composting for food waste.

WR-C3: Construction & Demolition Debris and Self-Haul Waste

1. Require all loads of construction & demolition debris and self-haul waste to be processed for recovery of materials as feasible.
2. Investigate creation of an ordinance requiring deconstruction of buildings proposed for demolition or remodeling when materials of significant historical, cultural, aesthetic, functional or reuse value can be salvaged.

WR-C4: Mandatory Waste Diversion

Adopt an ordinance requiring all commercial and residential accounts to subscribe to and fully participate in waste diversion activities, including recycling and organics collection provided by the Town's waste hauler. Consider including phased implementation of the ordinance, penalties, and practical enforcement mechanisms.

WR-C5: Waste Processing Franchise Agreement and Infrastructure

1. Review and revise the Town's franchise agreement with its waste hauler to ensure adequate recycling and composting capacity is available and waste reduction and diversion targets are met.
2. Ensure organic waste collection service (including green waste, food waste, fibers, and manure) that complies with SB 1383 regulations is provided to all residents and businesses.
3. Conduct a feasibility study (including cost estimates and estimated GHG reduction metrics) and consider investing in new solid waste processing infrastructure to remove recoverable materials (recycling and organics) from the waste stream and reduce contamination.
4. Require regular residential and commercial waste audits and waste characterization studies to identify opportunities for increased diversion and to track progress in meeting targets.

WR-C6: Extended Producer Responsibility

1. Encourage the State to regulate the production and packaging of consumer goods and take-back programs.
2. Encourage on-demand product and food delivery services to reduce packaging waste and investigate requirements and incentives for same through ordinance or engagement campaigns.

WR-C7: Inorganic Waste

Promote reuse, repair, and recycling of inorganic materials, and encourage reduced use of packaging and single use items through engagement campaigns.

WR-M1: Waste from Town Operations

Increase opportunities to reduce waste at Town facilities.

1. Embark on an educational and social marketing-based campaign to increase recycling, composting, reuse, and waste reduction at Town facilities.
2. Conduct periodic waste audits of Town facilities to understand where opportunities for increased diversion lie and to track progress.

Water Conservation

>1% of potential emissions

Marin is no stranger to periodic droughts and the need to conserve water, and the community has responded by reducing per capita water use by about 23%, from 144 gallons per capita per day (gpcd) in 2005 to 111 gpcd in 2018. In addition to installing low-flow fixtures (showerheads, faucets, and toilets) and water-efficient appliances (clothes washers and dishwashers), residents and businesses are planting native, drought-tolerant species and even replacing lawns with attractive, low-water use gardens. Good thing, because as temperatures continue to rise, we will experience more droughts and more intense heat waves than before.

Tiburon's Greenhouse Gas Inventory counts emissions that are generated from the energy used to pump, treat, and convey water from the water source to water users in Tiburon. Far more emissions are created from the energy that is used to heat water, but those emissions are counted in the residential and commercial energy sectors. Therefore, the water sector comprises a much smaller share of community emissions than one might expect.

What You Can Do

- Replace your lawn with a drought-tolerant garden.
- Install a drip irrigation system, program it to run early in the morning, and check it regularly for leaks.
- Install low water flow faucets, showerheads, and toilets.
- Buy water-efficient dishwashers and clothes washers when it's time to replace them.

Water agencies that supply the Town's water are committed to using 100% renewable energy in their operations. Marin Municipal Water District (MMWD) began purchasing Deep Green electricity from MCE in 2017, and Sonoma County Water Agency, which provides 20-25% of MMWD's water started purchasing 100% renewable electricity in 2015. As a result, although we are targeting a 1% reduction in water consumption each year through 2030, emissions reductions are relatively small.

TABLE 11: WATER CONSERVATION STRATEGIES

ID	Strategy	GHG Reduction by 2030 ($MTCO_2e$)	Share of Sector Emissions Reduction
WC-C1	Community Water Use	2	100%
WC-M1	Municipal Water Use	Included in above	Included in above

Water Conservation Actions

WC-1: Water Conservation
Reduce indoor and outdoor water use in residential and commercial buildings and landscaping.

1. Work with the water district and other organizations to promote water conservation programs and incentives.
2. Educate residents and businesses about local and State laws requiring retrofit of non-compliant plumbing fixtures during remodeling and at resale.
3. Ensure all projects requiring building permits, plan check, or design review comply with State and water district regulations.
4. Encourage the installation of greywater and rainwater collection systems and the use of recycled water where available through ordinance and/or engagement campaigns.

WC-2: Municipal Water Use

Reduce indoor and outdoor water use in municipal facilities and operations.

1. Replace high water use plants and inefficient irrigation systems with water-efficient landscaping.
2. Replace inefficient plumbing fixtures with high-efficiency fixtures.
3. Use recycled water as available and practicable for parks and outdoor landscaping.

SEQUESTRATION

14% of potential emissions

Carbon sequestration is the process of capturing and storing atmospheric carbon dioxide in natural sinks such as forests, grasslands, and soil.

The natural environment has been extensively altered by human civilization, often with little consideration for how natural systems function, depriving us of the important benefits they offer. Clearing and draining of wetlands, forestlands, grasslands and other open space for agricultural production or urban development decreases or eliminates the capacity of those natural systems to store carbon. The carbon dioxide stored in soil, trees and other vegetation is released into the atmosphere when forestland and open space is converted to other uses. Restoration of these natural areas, and establishment of new ones, has the potential to sequester greenhouse gas emissions.

The Town of Tiburon supports California and County directives and statutes to capture or drawdown carbon emissions from the atmosphere from natural solutions including more and appropriate tree planting, climate-smart habitat restoration, and healthy soils initiatives. In addition to naturally pulling and storing greenhouse gasses from the atmosphere, this strategy increases the health of our local ecosystems and helps protect the vital services they provide including clean air and water, pollination, enhanced biodiversity, flood control, and increased resilience to growing climate extremes.

Many carbon-reducing actions available to the Town currently are associated with responsible tree planting and management on public and private land. Increasing tree cover improves air quality and natural cooling. To encourage ecosystem health and a reduction of fuel load, the Town could facilitate active forest management (including invasive species removal) in our open spaces.

Another potential for carbon drawdown may be found in aquatic environments, such as tidal wetlands and bays. The Town could work with the County to understand this opportunity and help shape management decisions for ecosystem health, climate adaptation, and carbon sequestration, especially as the County develops sea level rise mitigation projects such as wetland restoration.

This section contains measures to sequester carbon dioxide through planting and preservation of native, non-invasive trees and other vegetation and the development of carbon-rich soils. High quality carbon offsets can be used to fund these types of carbon sequestration projects and purchased to offset emissions that are difficult to otherwise mitigate, such as airplane flights. To meet the Town's target to reduce emissions 50% below 1990 levels by 2030, the Town will consider purchasing carbon offsets beginning in 2030, preferably from a program that sequesters carbon locally.

What You Can Do

#1 Plant trees appropriate to your situation.

#2 Add compost to your soil.

#3 Purchase carbon offsets for airplane flights and other emissions that are difficult to mitigate.

TABLE 12: SEQUESTRATION STRATEGIES

ID	Strategy	GHG Reduction by 2030 ($MTCO_2e$)	Share of Sector Emissions Reduction
S-C1	Urban Forest	n/a	-
S-C2	Carbon Sequestration	n/a	-
S-C3	Carbon Offsets	2,264	100%
S-C4	Building Materials	n/a	-
TOTAL		**2,264**	**100%**

S-C1: Urban Forest

Increase carbon sequestration and improve air quality and natural cooling through expansion and enhancement of green spaces and increasing appropriate (e.g., native, drought-resistant, fire resilient) tree cover, other vegetation, and healthy soils in Tiburon.

1. Plant and maintain additional trees on Town-owned land, including public parks, open space, medians, and rights of way, where feasible.
2. Review parking lot landscape standards to maximize tree cover, size, growth, and sequestration potential.
3. Regulate and minimize removal of large (heritage) trees and require planting of replacement trees and or sufficient fees to support mitigation planting in Tiburon's parks and open spaces. Consider potential loss of carbon sequestration when removing trees and establishing tree replacement ratios.
4. Require that the site planning, construction, and maintenance of new development preserve existing healthy trees and native vegetation on site to the maximum extent feasible. Replace trees and vegetation not able to be saved with native/appropriate species.
5. Encourage community members to plant native/appropriate trees on private land. Consider creating a tree giveaway program or providing lower-cost trees to the public through a bulk purchasing program.
6. Encourage the creation of no-till community gardens and healthy soil management on public lands by community groups and on private lands by individual households.
7. Provide information to the public, including landscape companies, gardeners, and nurseries, on carbon sequestration rates, drought tolerance, and fire resistance of different tree and vegetation species, as well as healthy soil management.
8. Collaborate with fire agencies, including Marin County Open Space District, Marin Municipal Water District, and private property owners, to manage fire-prone trees and invasive species in the open space for forest health, water cycling, soil organic matter, and reduction of fuel load.
9. Require new development, redevelopment, and infrastructure projects to implement best management practices as feasible, including low-impact development techniques, the minimal use of non-pervious surfaces in landscape design, and the integration of natural features into the project design, to naturally filter and biodegrade contaminants and to minimize surface runoff into drainage systems and creeks.

S-C2: Carbon Sequestration

Increase carbon sequestration in developed landscapes and open/natural areas.

1. Encourage and support composting to develop healthy, carbon-rich soils.
2. Manage parks and open spaces to steadily increase carbon in vegetation and soil.
3. Manage trees and invasive species in the open space for forest health, water cycling, and organic soil matter, as well as reduction of fuel load.

4. Work with the County to explore opportunities for carbon drawdown in aquatic environments, such as tidal wetlands, gullies, and bay.

S-C3: Carbon Offsets

Reduce the impact of greenhouse gas emissions through the purchase of high quality, well-vetted and verifiable carbon offsets.

1. Identify and partner with local non-profit organizations and/or businesses that actively sequester carbon in their activities (e.g., climate-smart habitat restoration or regenerative agriculture like the Marin Carbon Project) to promote a carbon offset program.
2. To close any gap that remains between actual emissions and the reduction target, the Town will consider purchasing carbon offsets in 2030, and annually thereafter, to achieve a 50% reduction below 1990 levels in communitywide emissions. Offsets should be purchased from a local program that sequesters carbon in Marin County, if available.
3. Encourage community members to purchase high quality carbon offsets that have been vetted and can be verified by credible authorities or organizations to reduce their carbon footprint through engagement campaigns.
3. Consider partnering with a local non-profit organization to promote an effective and reliable carbon offset program.
4. Focus on offsetting emissions that are difficult to mitigate otherwise, such as airplane travel.

S-C4: Building Materials

Decrease GHG emissions associated with building materials and increase the use of building materials with the highest potential for carbon storage.

1. Encourage use of sustainable, climate-friendly building materials that store more carbon dioxide than is released in their production, through agency partnerships and engagement campaigns.

COMMUNITY ENGAGEMENT

6% of potential emissions

The Climate Action Plan contains actions that the Town will undertake to reduce community emissions. While the Town can compel some action by adopting ordinances and building regulations, much of the success of the plan will depend on informing community members and encouraging them to take action on their own. The vast majority of Tiburon's GHG emissions come from the community's activity, and our residents, businesses, workers, and visitors will have to do their part to ensure we meet our reduction targets and conserve the ecosystem services that sustain life. This section details the ways in which the Town will seek public engagement and work with local businesses and community groups to achieve the emissions reductions identified for actions in other sections of the plan.

The Town has been partnering with Resilient Neighborhoods to educate and empower residents to reduce their carbon footprints. The program consists of a free 5-session covers a range of action including consumption, support of local business, diet, water, waste, home energy, transportation including air travel, and being prepared to adapt to a changing climate. To start, participants calculate their household carbon footprint and then take actions to reduce their GHG emissions by at least 5,000 pounds or 25% while also earning Resilience Points for actions like being prepared for wildfires. More than 750 Marin County households have participated in the program as of 2020, with 13 from Tiburon. The Town plans to increase participation to 25 households per year through aggressive outreach and direct funding.

What You Can Do

- Sign up for Resilient Neighborhoods and join a Climate Action Team.
- Calculate and commit to reducing your carbon footprint by taking the actions identified in this Plan.
- Get your business certified as a Green Business with the Marin Green Business Program.

TABLE 13: COMMUNITY ENGAGEMENT STRATEGIES

ID	Strategy	GHG Reduction by 2030 ($MTCO_2e$)	Share of Sector Emissions Reduction
CE-C1	Community Education	960	100%
CE-C2	Community Outreach	n/a	-
CE-C3	Advocacy	n/a	-
CE-C4	Green Businesses	n/a	-
CE-C5	Innovation and Economic Development	n/a	-

COMMUNITY ENGAGEMENT ACTIONS

CE-C1: Community Education

Work with community-based organizations, such as Resilient Neighborhoods, to educate and motivate community members to start or continue to reduce GHG emissions in their homes, businesses, transportation mode choices, and other activities, and increase community resilience through community-building activities.

1. Beginning in Fiscal Year 2023-2024, provide annual funding to Resilient Neighborhoods (RN) to graduate 25 Tiburon households each year over existing levels.
2. Utilize the Town's website, newsletter, social media channels, and counter handouts to publicize the RN program.
3. Partner with the Ranch to offer and promote the RN program as part of their community class offerings.
4. Request the library, schools, and homeowners' associations to distribute RN program flyers.
5. Engage local community groups to sign up households for the RN program.

CE-C2: Community Outreach

Implement a communitywide public outreach and behavior change campaign to engage residents, businesses, and consumers around the impacts of climate change and the ways individuals and organizations can reduce their GHG emissions and create a more sustainable, resilient, and healthier community. Emphasize and encourage citizens' involvement in reaching the community's climate goals, including innovative means of tracking milestones and comparing Tiburon's performance with other communities and with state, national, and global benchmarks.

1. Conduct outreach to a wide variety of neighborhood, business, educational, faith, service, and social organizations.
2. Inform the public about the benefits of installing energy and water efficient appliances and fixtures, electrifying homes and commercial buildings, installing solar energy systems, and purchasing 100% renewable electricity.
3. Inform the public about the benefits of using carbon-free and low-carbon transportation modes, such as driving electric vehicles, walking, bicycling, taking public transportation, and ridesharing.
4. Partner with MCE, PG&E, MMWD, Mill Valley Refuse, Transportation Authority of Marin, Marin Transit, Golden Gate Transit, and other entities to promote available financing, audits, rebates, incentives, and services to the Tiburon community.
5. Utilize the Town's website, newsletter, recognition programs, and other forms of public outreach.
6. Participate in countywide outreach and education efforts, such as Drawdown Marin.

CE-C3: Advocacy

Advocate at the regional, state, and federal levels for policies and actions that support the rapid transition to GHG-free energy sources, electrification of buildings and the transportation fleet, and other impactful measures to sharply reduce greenhouse gas emissions.

CE-C4: Green Businesses

Encourage local businesses to participate in the Marin County Green Business Program.

CE-C5: Innovation and Economic Development

Participate in local economic development and innovation working groups to explore public-private partnerships and to develop ways to decarbonize the local economy while spurring sustainable enterprise and equitable employment.

CHAPTER 4: IMPLEMENTATION AND MONITORING

Plans are only effective if they are implemented and results are carefully evaluated. The Town will prepare and report to the public an annual assessment of the progress it is making on implementing the actions contained in this Climate Action Plan and continue to quantify community and government operations GHG emissions to determine if we are on track to meet our reduction targets.

TABLE 14: IMPLEMENTATION AND MONITORING STRATEGIES

ID	Strategy
IM-C1	Annual Monitoring
IM-C2	Update GHG Emissions Inventories
IM-C3	Funding Sources
IM-C4	Update the Climate Action Plan
IM-C5	Project Compliance Checklist
IM-C6	Sustainability Coordinator

IM-C1: Annual Monitoring
Monitor and report on the Town's progress annually. Create an annual priorities list for implementation using the Implementation Table in Appendix B.

IM-C2: Update GHG Emissions Inventory
Update the GHG emissions inventory for community emissions annually.

IM-C3: Funding Sources
Identify funding sources for recommended actions and pursue local, regional, state, and federal grants as appropriate. Investigate creation of a local carbon fund or other permanent source of revenue to implement the Climate Action Plan.

IM-C4: Update the Climate Action Plan
Update the Climate Action Plan regularly to incorporate new long-term reduction targets and strategies to meet those targets.

IM-C5: Project Compliance Checklist
Develop a project compliance checklist to used when reviewing development proposals, use permit applications, and building permits to ensure compliance with Climate Action Plan measures.

IM-C6: Sustainability Coordinator
Consider creating a part-time or shared full-time Sustainability Coordinator position or contracting with a consultant to implement the CAP.

List of Abbreviations

AB	Assembly Bill
ABAG	Association of Bay Area Governments
BAAQMD	Bay Area Air Quality Management District
BAU	business-as-usual
BCDC	San Francisco Bay Conservation and Development Commission
CALGreen	California Green Building Standards
CAP	Climate Action Plan
CARB	California Air Resources Board
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
EIR	environmental impact report
EO	Executive Order
EV	electric vehicle
GHG	greenhouse gas
kW	kilowatt
kWh	kilowatt hour
IPCC	International Panel on Climate Change
LED	Light-emitting diode
MCE	MCE Clean Energy
MMWD	Marin Municipal Water District
$MMTCO_2e$	Million metric tons of carbon dioxide equivalent
MTC	Metropolitan Transportation Commission
$MTCO_2e$	metric tons of carbon dioxide equivalent
PG&E	Pacific Gas and Electric
RCP	representative concentration pathway
RPS	Renewables Portfolio Standard
SB	Senate Bill
TDM	transportation demand management
VMT	vehicle miles traveled
ZEV	zero emission vehicle

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APPENDIX A: GHG REDUCTION CALCULATIONS

GHG EMISSIONS REDUCTION SUMMARY Town of Tiburon Climate Action Plan		
	Measure	**2030 GHG Emissions Reductions ($MTCO_2e/yr$)**
Local Actions		
LCT-C1	Zero Emission Vehicles	-6,340
LCT-C2	Bicycling and Micromobility	-218
LCT-C3	Walking	-13
LCT-C4	Safe Routes to School	-49
LCT-C5	Public Transit	-68
LCT-C6	Employee Trip Reduction	-11
LCT-C8	Smart Growth Development	-327
LCT-C9	Zero Emission Landscape Equipment	-372
LCT-M1	Zero Emission Town Vehicles	-43
LCT-M2	Low Carbon Fuels	-10
LCT-M3	Town Employee Commute	-6
LCT-M4	Municipal Zero Emission Landscape Equipment and SORE	-9
EE-C1	Energy Efficiency Programs	-1,166
EE-C2	Energy Audits	-40
EE-M1	Public Lighting	n/a
EE-M2	Energy Efficiency Audit and Retrofits	-2
EE-M3	Energy Conservation	-1
RE-C1	Renewable Energy Generation and Storage	-318
RE-C2	GHG-Free Electricity	-394
RE-C3	Building and Appliance Electrification	-2,033
WR-C1	Commercial Organic Waste	-151
WR-C2	Residential Organic Waste	-508
WR-C3	C&D and Self-Haul Waste	-59
WR-C4	Mandatory Waste Diversion	-556
WR-C5	Waste Processing Infrastructure	-532
WR-M1	Waste from Town Operations	-24
WC-C1	Community Water Use	-2
S-C3	Carbon Offsets	-2,263
CE-C1	Community Education	-960
TOTAL - LOCAL ACTIONS		-16,476

State Actions	
RPS	-533
TITLE 24	-776
Light and Heavy Duty Fleet Regulations	-3,187
TOTAL - STATE ACTIONS	-4,496
Projected Emissions	
Projected BAU Community GHG Emissions	46,515
Emissions Reduction from Local and State Actions	-20,972
Projected Community Emissions with Local and State Actions Implemented	25,543
Reduction from Baseline Emissions	
2005 Community GHG Emissions	60,101
Community Emissions with Local and State Actions Implemented	25,543
% Below 2005 Emissions	58%
GHG Target in 2030 (50% below 1990 levels)	25,543
Estimated 1990 GHG Emissions	51,086
% Below 1990 Levels	50%

ZERO EMISSION VEHICLES *LCT-C1*	
Reductions ($MTCO_2e$) -6,340	2030
Targets	45% of passenger vehicles in Marin are ZEVs in 2030 (approximately 90,000 ZEVs). 25% annual growth rate of registered ZEVs in Marin.
Methodology and Assumptions	Marin has approximately 1.5% of all ZEVs in California (CEC, 2021) and 199,428 automobiles registered in the County (CEC, 2021). CARB's proposed strategy is to put 4.2 million ZEVs on the road by 2030, which is approximately 14% of light duty vehicles in California in 2030. In January 2018, Governor Brown issued Executive Order B-48-18 which set a new goal of having a total of 5 million ZEVs in California in 2030. In September 2020, Governor Gavin Newsom issued Executive Order N-79-20 which sets a goal for 100 percent of in-state sales of new passenger cars and light trucks to be zero-emission by 2035. By the end of 2021, DMV reports there were 8,307 battery EVs, 3,943 plug-in hybrid EVs, and 56 fuel cell vehicles, for a total of 12,369 ZEVs in Marin County. We assume a similar penetration rate in Tiburon. We also conservatively assume the same percentage of EVs in 2030: 68% battery EVs and 32% plug-in hybrids. 74% of the distance PHEVs drive is electric (Smart et al, 2014). EV kWh/mile is 0.32 (US Dept of Energy). Assuming the same share of ZEV ownership in 2030 as in 2021 (1.5%) means there would be approximately 75,000 ZEVs registered in Marin by 2030, or approximately 37% of existing automobile registrations. We are targeting 90,000 ZEVs in Marin in 2030, or 45% of ZEVs registered in Marin. This would require an average annual growth rate of 21%. The number of ZEVs grew 33% in Marin between 2018 and 2019, 22% between 2019 and 2020, and 14% between 2020 and 2021, for a average annual growth rate of 23%. This data suggests that an annual growth rate of 25% is feasible with aggressive local action, especially as the number of models expands and battery technology and charging improve and supply chain bottlenecks are resolved. Passenger VMT is adjusted to reflect the fact that approximately 35% of countywide commute VMT originates from workers who live outside Marin County (TAM). Measure does not apply to VMT generated by San Rafael workers and visitors who do not live in Marin.

Sources	California Air Resources Board, 2017 Scoping Plan. Smart, J., Bradley, T., and Salisbury, S., "Actual Versus Estimated Utility Factor of a Large Set of Privately Owned Chevrolet Volts," SAE Int. J. Alt. Power. 3(1):2014, doi:10.4271/2014-01-1803. U.S, Department of Energy, Alternative Fuels Data Center, https://www.afdc.energy.gov/vehicles/electric_emissions_sources.html. Sales weighted average of 2016 model year vehicles with sales in 2015: 2015 sales from "U.S. Plug-in Electric Vehicle Sales by Model" (https://www.afdc.energy.gov/data/vehicles.html); MPGs from 2016 Fuel Economy Guide (https://www.fueleconomy.gov/feg/) The International Council on Clean Transportation, "California's continued electric vehicle market development," May 2018, https://www.theicct.org/sites/default/files/publications/CA-cityEV-Briefing-20180507.pdf. US Department of Energy, "National Plug-In Electric Vehicle Infrastructure Analysis," September 2017. https://www.nrel.gov/docs/fy17osti/69031.pdf Bay Area Air Quality Management District, Vehicle Miles Dataportal, http://capvmt.us-west-2.elasticbeanstalk.com/, accessed 3/21/19. California Energy Commission, Zero Emission Vehicle and Infrastructure Statistics, https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics/light-duty-vehicle, accessed 6/16/22. Personal communication with Derek McGill, Planning Manager, Transportation Authority of Marin, dmcgill@tam.ca.gov, August 22, 2018.

Calculation

	2030	
Number of registered Marin ZEVs by end of 2020	9,709	
Projected number of registered passenger vehicles in Marin	200,000	
Percent of Marin ZEVs in target year	45%	
Number of Marin ZEVs in target year	90,000	
Percent of ZEVs in Marin assumed by EMFAC2021	8.2%	
Increase in ZEVs	80,291	
Additional ZEVs as a percent of Marin vehicles from this measure	36.8%	
Tiburon passenger VMT	63,696,150	miles
VMT from non-Marin workers and visitors	9,495,818	miles
Tiburon passenger VMT from Marin-based vehicles	54,200,332	miles
VMT from additional ZEVs	19,959,822	miles
VMT driven with electricity	18,351,061	miles
Emissions without EV program	6,918	$MTCO_2e$
Tailpipe emissions reduction with EV program	6,343	$MTCO_2e$
Electricity used by ZEVs	5,872,339	kWh
Electricity emissions from ZEVs	3	$MTCO_2e$
Emissions reduction	6,340	$MTCO_2e$

BICYCLING AND MICROMOBILITY *LCT-C2.a*	
Reductions ($MTCO_2e$) -72	2030
Targets	0.03 miles of Class IV bike paths and 1.61 miles of Class II bike lanes constructed between by 2030.
Methodology and Assumptions	Studies cited by CAPCOA show each additional mile of bike lanes per square mile increases the share of workers commuting by bicycle by 1% (CAPCOA SDT-5). We have applied this to the following population segments: • Live in/work in area • Live in/work out of area • Live in area/non-worker • Live out of area/work in area The Town's Bicycle and Pedestrian Master Plan identifies 1.61 miles of proposed Class II bike facilities and 0.03 miles of proposed Class IV facilities.
Sources	Tiburon Bicycle and Pedestrian Master Plan, July 20, 2016. Bay Area Air Quality Management District Vehicle Miles Traveled Dataportal, http://capvmt.us-west-2.elasticbeanstalk.com/data. California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," August, 2010.

Calculation

	2030	
VMT generated by targeted population segments	56,390,160	VMT
Additional Class II/IV facilities	1.6	miles
New bike facilities/sq. mile	0.4	
Reduction in local VMT	206,428	VMT
Emissions reductions	71.5	$MTCO_2e$

BICYCLING AND MICROMOBILITY *LCT-C2.b*	
Reductions ($MTCO_2e$) -147	2030
Targets	25% of local trips are completed by bicycle 2030.
Methodology and Assumptions	The measure requires the Town to aggressively pursue and require installation of secure bicycle parking for electric bicycles in order to encourage residents to take bicycles for local trips. We have applies a 20% reduction to all trips made by Tiburon residents that begin and end in Tiburon. .
Sources	Bay Area Air Quality Management District Vehicle Miles Traveled Dataportal, http://capvmt.us-west-2.elasticbeanstalk.com/data.

Calculation

	2030
VMT generated by vehicle trips that start and end in Tiburon	1,695,793 VMT
Reduction in local VMT	25%
Reduction in local VMT	423,948 VMT
Emissions reductions	147 $MTCO_2e$

WALKING *LCT-C3*	
Reductions ($MTCO_2e$) -13	2030
Targets	2% reduction in VMT for vehicle trips that start and end in Tiburon by 2030
Methodology and Assumptions	Studies cited by CAPCOA show pedestrian network improvements can reduce VMT 1-2% (CAPCOA SDT-1). We apply this to passenger vehicle trips that start and end Tiburon and assume a 2% for 2030.
Sources	California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," August, 2010. Bay Area Air Quality Management District Vehicle Miles Traveled Data Portal, http://capvmt.us-west-2.elasticbeanstalk.com/data

Calculation

	2030
Passenger vehicle trips starting and ending in Tiburon	1,868,174 VMT
% decrease in VMT due to pedestrian improvements	2.0%
Annual decrease in VMT	37,363 VMT
GHG emissions reductions	13 $MTCO_2e$

SAFE ROUTES TO SCHOOL *LCT-C4*	
Reductions ($MTCO_2e$) 0 -49	 2020 2030
Targets	Reduce school trips in family vehicle by 29%, from an average of 50% to 35%.
Methodology and Assumptions	To demonstrate the benefits of providing Safe Routes to Schools, the Marin County Bicycle Coalition recruited nine pilot schools in four different geographic locations. Initial surveys reported that 62% of the students were arriving by car, with only 14% walking, 7% biking to school, 11% carpool, and 6% arriving by bus. Every school in the pilot program held periodic Walk and Bike to School Days and participated in the Frequent Rider Miles contest, which rewarded children who came to school walking, biking, by carpool or bus. At the end of the pilot program, the participating schools experienced a 57% increase in the number of children walking and biking and a 29% decrease in the number of children arriving alone in a car. We assume a school-aged population of 1,460 in 2030 (Plan Bay Area). We assume 77% are elementary or middle school with an average trip length of 1.7 mile, and 23% are high school (9-12) with an average trip length of 2.3 miles, 180 school days, and an existing share of school trips completed in a family vehicle of 50% according to Safe Routes to School surveys taken at participating schools serving Tiburon in 2018.
Sources	US Census Bureau, American Community Survey 5-Year Estimates 2012-2016, Table B14001. Safe Routes to School Marin County, http://www.saferoutestoschools.org/sr2s_ross_valley.html Safe Routes to School Marin County, http://www.saferoutestoschools.org/history.html#success

Calculation

	2030
School population miles travelled	966,053 miles
Percent of miles driven in a family vehicle	50%
Potential percent decrease in students driving to school	29 %
VMT avoided	140,078 VMT
Emissions reductions	49 $MTCO_2e$

PUBLIC TRANSIT *LCT-C5*	
Reductions ($MTCO_2e$) -68	2030
Targets	33% of Marin Transit and Golden Gate Transit buses will use be electric and 66% will use renewable diesel by 2030.
Methodology and Assumptions	Marin Transit's Draft Fixed Route Vehicle Replacement Plan indicates 3% of its fleet will be comprised of zero emission buses in 2020 and 33% of its fleet will be zero emission by 2030. In 2019, 72% of its buses were using renewable diesel and 3% of the fixed route buses were zero emission. Marin Transit and Golden Gate Transit have been using renewable diesel since 2016. We assume 33% will be driven by electric buses utilizing MCE electricity by 2030. CARB adopted the Innovative Clean Transit (ICT) Rule in December 2018. This rule outlines a transition of California transit agencies to a zero emission fleet by 2040. 100% of transit agencies' bus purchases must be zero emission beginning in 2029. Marin Transit's Draft Fixed Route Vehicle Replacement Plan (2019) identifies purchases that will achieve the ICT zero emission fleet mandate in 2040. As of October 2019, Golden Gate Transit had not yet developed a transition plan.
Sources	Marin Transit Board of Directors Staff Report, April 1, 2019 Personal communication with Keith Nunn, Director of Maintenance, Golden Gate Transit, Oct. 22, 2019. Personal communication with Anna Penoyar, Senior Capital Analyst, Marin Transit, Oct. 22, 2019.

Calculation

	2030
Transit miles, BAU	105,196 miles
Emissions, BAU	137 $MTCO_2e$
Renewable diesel VMT	67%
Electric bus VMT	33%
Emissions	69 $MTCO_2e$
GHG emissions reductions	68 $MTCO_2e$

SMART GROWTH DEVELOPMENT *LCT-C8a*	
Reductions ($MTCO_2e$) -308	2030
Targets	Implement the Town's Housing Element and rezone sites 1-7, 9 and A-F to 30-35 du/ac and sites 8 and G to 20-25 du/ac.
Methodology and Assumptions	CAPCOA T-1 Increase Residential Density accounts for VMT reduction by a project that is designed with a higher residential density compared to the average residential density in the U.S. We apply this measure to Sites 1-9, and A-G as identified in Table 10 Site Inventory of the 2023-2031 Housing Element and assume the maximum units/per acre for each site.
Sources	California Air Pollution Control Officers Association, "Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity," December 2021. Town of Tiburon Draft 2023-2031 Housing Element, September 2022.

Calculation

	2030	
Sites 1-7, 9 and A-F		
Number of units at minimum density	368	
Annual household VMT attributed to inventory	8,400	miles
Residential density of projected housing developments	35	du/ac
Residential density of typical development	9.1	du/ac
Elasticity of VMT with respect to residential density	0.22	
Percent reduction in GHG emissions from project VMT	25.9	%
VMT reduction	800,622	miles
Sites 8 and G		
Number of units at minimum density	66	
Annual household VMT attributed to inventory	8,400	miles
Residential density of projected housing developments	25	du/ac
Residential density of typical development	9.1	du/ac
Elasticity of VMT with respect to residential density	0.22	
Percent reduction in GHG emissions from project VMT	15.9	%
VMT reduction	88,150	miles
Total GHG reduction	308	$MTCO_2e$

SMART GROWTH DEVELOPMENT *LCT-C8b*	
Reductions ($MTCO_2e$) -19	2030
Targets	Implement the Town's Housing Element and apply current inclusionary requirements to applicable new development.
Methodology and Assumptions	CAPCOA T-4 Integrate Affordable and Below Market Rate Housing accounts for VMT reduction by multifamily projects that include deed-restricted units for lower-income households, defined as up to 80% of the area's median household . The Town's Inclusionary Ordinance requires developments of at least 7 units to include 5% of the total units affordable to very-low or low income households. Therefore we apply the measure to all sites that are expected to develop 7 or more units as identified in Table 10 of the Town's draft Housing Element, i.e., Sites 1-9 and A-C and E-G.
Sources	California Air Pollution Control Officers Association, "Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity," December 2021. Town of Tiburon Draft 2023-2031 Housing Element, September 2022.

Calculation

	2030
Number of multifamily units subject to inclusionary zoning at minimum density	431
Annual household VMT attributed to inventory	8,400 miles
Percent of multifamily units dedicated as affordable lower-income housing	5.0%
Percent reduction in VMT for qualified units	28.6%
Percent reduction in GHG emissions from project VMT	1.4%
VMT Reduction	51,772 miles
Emissions reductions	19 $MTCO_2e$

EMPLOYEE TRIP REDUCTION *LCT-C6*	
Reductions ($MTCO_2e$) -11	2030
Targets	100% of covered employers provide and employee trip reduction program.
Methodology and Assumptions	CAPCOA TRT-1 indicates VMT reduction of 5.4% for suburban center location. Employer programs include: carpooling, ride matching, preferential carpool parking, flexible work schedules for carpools, a half-time transportation coordinator, vanpool assistance, bicycle parking, showers, and locker facilities. This measure assumes voluntary employee participation. BAAQMD Transportation Fund for Clean Air guidance indicates a reduction of 0.2% of commute VMT for Guaranteed Ride Home Programs. MTC identifies 20 businesses with 50 or more employees in Tiburon and "Belvedere Tiburon." We assume 100% of these employers participate in the program by 2030. We assume 240 work days per year.
Sources	California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," BAAQMD Transportation Fund for Clean Air Guidance FYE 2018.

Calculation

	2030
Number of employees working in companies with 50 or more employees	163
Number of employees targeted for program	163
Average daily VMT for Tiburon worker	14.3
Estimated annual VMT	558,079
VMT reduction	5.6%
Annual decrease in VMT	31,252
GHG emissions reductions	11

ZERO EMISSION LANDSCAPE AND SMALL OFF-ROAD EQUIPMENT *LCT-C9*	
Reductions ($MTCO_2e$) -372	2030
Targets	100% reduction in fuel used in portable landscape and small off-road equipment by 2030 due to switching to electric equipment.
Methodology and Assumptions	CARB has adopted regulations to require all newly manufactured small off-road engines (SORE) to be zero emission beginning in 2024. SORE are spark-ignition engines rated at or below 19 kilowatts. Engines in this category are primarily used for lawn, garden, and other outdoor power equipment. For this action, portable landscape equipment includes lawn mowers, leaf blowers/vacuums, trimmers/edgers/brush cutters. This equipment consumed 1,139,082 gallons of gasoline and in 23,560 gallons of diesel in Marin County 2020 (OFFROAD2021). Similar to the off-road emissions inventory, we assume 3.6% of emissions are attributable to Tiburon based on its share of countywide households in 2020. Tiburon Municipal Code Ch. 30 prohibits gas-powered leaf blowers and trimmers in residential areas. We assume a 100% reduction by 2030 due to the Town's adoption of an ordinance to require the use of zero emission SORE in residential and commercial areas by 2030.
Sources	OFFROAD2021

Calculation

	2030
SORE gasoline consumption, BAU	41,007 gallons
SURE diesel consumption, BAU	848
Reduction target	100%
Emissions reductions	372 $MTCO_2e$

ZERO EMISSION TOWN VEHICLES *LCT-M1*	
Reductions ($MTCO_2e$) -43	2030
Targets	All light-duty vehicles in Town's fleet are zero emissions by 2030.
Methodology and Assumptions	As vehicles are replaced, there will be opportunities to purchase/lease electric vehicles or improve vehicle fuel efficiency with similar models. We assume the Town will continue to purchase 100% renewable electricity, and therefore there are no emissions attributed to EV use.
Sources	Town of Tiburon 2016 Greenhouse Gas Inventory

Calculation

	2030
Gasoline consumption, 2016	9,741 gallons
Town vehicle fleet tailpipe emissions	86 $MTCO_2e$
Fuel efficiency improvement for fleet	50 %
Emissions reductions	43 $MTCO_2e$

LOW CARBON FUELS *LCT-M2*	
Reductions ($MTCO_2e$) -10	2030
Targets	100% of diesel use is replaced with renewable diesel by 2030.
Methodology and Assumptions	Emission factor for renewable diesel derived from data from Nexgen Fuel.
Sources	Town of Tiburon 2016 Greenhouse Gas Emissions Inventory http://www.nexgenfuel.com/fleets-commercial-use/

Calculation

	2030
Diesel use, BAU	1,694 gallons
Renewable diesel percentage	100%
Emissions from diesel fuel	17 $MTCO_2e$
Emissions from renewable diesel fuel	7 $MTCO_2e$
Emissions reductions	10 $MTCO_2e$

TOWN EMPLOYEE COMMUTE *LCT-M3*	
Reductions ($MTCO_2e$) -6	2030
Targets	5.6% reduction in employee commute VMT by 2030.
Methodology and Assumptions	CAPCOA Measure TRT-1. VMT reduction is 5.4% for a suburban center location. BAAQMD Transportation Fund for Clean Air guidance indicates a reduction of 0.2% of commute VMT for Guaranteed Ride Home Programs.
Sources	California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," August, 2010. BAAQMD Transportation Fund for Clean Air Guidance FYE 2018.

Calculation

	2030
Employee commute VMT, BAU	291,299 VMT
Reduction in VMT	5.6%
VMT avoided	16,313 VMT
Emissions reduction	6 MTCO2e

MUNICIPAL ZERO EMISSION LANDSCAPE EQUIPMENT AND SMALL OFF-ROAD ENGINES *LCT-M4*	
Reductions ($MTCO_2e$) -9	2030
Target	100% of landscape equipment and small off-road engines are replaced with zero emissions equipment by 2030.
Methodology and Assumptions	CARB is currently considering regulating small off-road engines (SORE) that will reduce smog-pollutant emissions from mobile sources by 80% in 2031 through a combination of regulatory and incentive approaches. SORE are spark-ignition engines rated at or below 25 horsepower or 19 kilowatts. Engines in this category are primarily used for lawn, garden, and other outdoor power equipment including generators, power washers, and utility carts. Construction and agricultural equipment are regulated by the federal government and not subject to CARB regulation. CARB's goal is to require all new sales of regulated equipment to be zero emissions equipment by 2028. Town equipment that would be subject to SORE zero emissions regulations would include blowers, mowers, hedge trimmers, brush cutters and clearing saws (under 40 cc), chain saws (under 45 cc), pressure washers, and generators. We target 100% to be replaced with zero emissions equipment by 2030.
Sources	CARB Small Engine Fact Sheet, https://ww3.arb.ca.gov/msprog/offroad/sore/sm_en_fs.pdf?_ga=2.15457782.1959742507.1598026042-1995196326.1515467224 CARB List to Determine Preempt Off-Road Applications, https://ww3.arb.ca.gov/msprog/offroad/preempt.htm Town of Tiburon

Calculation

	2030	
Number of small off-road engines replaced with zero emissions equipment	30	
Estimate annual gasoline used for small landscape equipment	1,050	gallons
Emissions reduced	9	$MTCO_2e$

ENERGY EFFICIENCY PROGRAMS *EE-C1*	
Reductions ($MTCO_2e$) -1,166	2030
Targets	Natural gas consumption is reduced an average of 0.7% per year between 2020 and 2030. Electricity consumption is reduced an average of 0.6% per year between 2020 and 2030.
Methodology and Assumptions	We are forecasting an annual electricity savings of 0.6% and an annual natural gas savings of 0.7% based on the following: The National Action Plan for Energy Efficiency states among its key findings "consistently funded, well-designed programs are cutting annual savings for a given program year of 0.15 to 1 percent of energy sales." The American Council for an Energy-Efficiency Economy (ACEE) reports for states already operating substantial energy efficiency programs, energy efficiency goals of one percent, as a percentage of energy sales, is a reasonable level to target. Natural gas consumption in Tiburon declined an average of 0.7% per year between 2005 and 2020. Electricity consumption in Tiburon declined an average of 0.6% per year between 2005 and 2020, excluding the local generation of solar energy.
Sources	National Action Plan for Energy Efficiency, July 2006, Section 6: Energy Efficiency Program Best Practices (pages 5-6). Energy Efficiency Resource Standards: Experience and Recommendations, Steve Nadel, March 2006 ACEEE Report E063 (pages 28-30).

Calculation

	2030
Residential and commercial electricity use, 2020	39,331,314 kWh
Electricity savings	2,359,879 kWh
Residential and commercial natural gas use, 2020	2,820,019 therms
Natural gas savings	197,401 therms
GHG emissions reductions	1,166 $MTCO_2e$

ENERGY AUDITS *EE-C2*	
Reductions ($MTCO_2e$) -40	2030
Targets	34 housing units implement energy efficiency projects between 2025 and 2030 due to ordinance requiring energy audits at time of sale.
Methodology and Assumptions	Assumes program will be implemented in 2025 and program will require audits at time of sale but energy efficiency projects will be voluntary. Assumes 5% of audited housing units will implement energy efficiency upgrades based on findings from the City of Berkeley's Building Energy Saving Ordinance. Assume 31% Btu energy use reduction based on demonstrated Energy Upgrade California projects completed in Marin County between June 2010 and May 2012. 135 housing units sold annually, based on 2005-2018 average (Marin County Assessor).
Sources	Marin County Assessor, http://www.marincounty.org/depts/ar/divisions/assessor/sales City of Berkeley, "Building Energy Savings Ordinance (BESO) Findings through Nov. 2016," December 7, 2016, https://www.cityofberkeley.info/uploadedFiles/Planning_and_Development/Level_3_-_Energy_and_Sustainable_Development/Energy%20Commission%20Presentation%20Berkeley.pdf Marin County Energy Watch Partnership, Dana Armanino, Sustainability Planner, County of Marin, darmanino@marincounty.org

Calculation

	2030	
Average household electricity use	7,621	kWh
Average household natural gas use	656	therms
Average number of housing units sold annually	135	units
Number of housing units provided energy audits	676	units
Percent of participating housing units	5%	
Number of housing units implementing energy efficiency projects	34	units
Electricity reduction	31%	
Natural gas reduction	31%	
Annual electricity savings	79,907	kWh
Natural gas savings	6,881	therms
Electricity emissions reduction	4	$MTCO_2e$
Natural gas emissions reduction	37	$MTCO_2e$
Total GHG emissions reduction	40	$MTCO_2e$

PUBLIC LIGHTING *EE-M1*	
Reductions ($MTCO_2e$) 0	2030
Targets	Complete conversion of remaining streetlights to LED by 2030.
Methodology and Assumptions	The Town had converted 9 of its 277 streetlights by 2018. The action assumes the Town will convert the remaining fixtures by 2030. Since the Town was purchasing 100% renewable energy in 2018 for all of its facilities, there are no additional GHG reductions for this action.
Sources	Town of Tiburon Public Works Department

Calculation

Electricity use, 2018	122,122 kWh
Electricity savings	58,061 kWh
GHG emissions reduction	0.0 $MTCO_2e$

ENERGY EFFICIENCY AUDIT AND RETROFITS *EE-M2*	
Reductions ($MTCO_2e$) -2	2030
Targets	Complete all projects by 2030.
Methodology and Assumptions	Projects to be completed are as follows: 1) Install energy-efficient lighting at Town Hall. 2) Install energy-efficiency lighting at Police Station 3) Install energy-efficiency lighting at Corporate Yard 4) Replace split gas heat condensers in Police Station 5) Replace heat pumps in Police Station 6) Install vending machine controller 6) Install window film or shade screens in Town Hall Since 2010, the Town has replaced some of the lighting in Town owned buildings with LEDs and energy efficient lighting. Therefore, some of the potential annual electricity savings identified in the Marin Energy Management report and identified in the table below has already been achieved. The Town purchased 100% renewable energy in 2018 for all of its facilities and commits to continue doing so in CAP Action RE-M1. As a result, there are no additional GHG reductions for projects that reduce electricity use.
Sources	Marin Energy Management report for the Town of Tiburon, December 9, 2010.

Calculation

Project	Annual Electricity Savings (kWh)	Annual Natural Gas Savings (therms)
Lighting - Town Hall	1,939	
Lighting - Police Station	68	
Lighting - Corporate Yard	5,247	
Split gas heat condensers - Police Station	2,216	450
Heat pumps - Police Station	14,717	
Vending machine controller	1,402	
Window film or shade screens - Town Hall	624	-20
Total savings	26,213	430
Emissions reductions ($MTCO_2e$)	0	2

ENERGY CONSERVATION *EE-M3*	
Reductions ($MTCO_2e$) -1	2030
Targets	Reduce energy use in municipal buildings by 5%.
Methodology and Assumptions	Energy management software is proven to reduce energy consumption by 10% through identifying inefficiencies within operations. A 5% reduction in energy use for miscellaneous behavioral changes by staff and mechanical operations, and upgrading to Energy Star equipment were assumed. Since the Town was purchasing 100% renewable energy in 2018 for all of its facilities, there are no additional GHG reductions for actions that reduce electricity use.
Sources	Tiburon 2016 GHG Inventory

Calculation

Electricity consumption in municipal buildings, 2018	224,397 kWh
Electricity use in municipal buildings	0 $MTCO_2e$
Natural gas consumption in municipal buildings, 2018	2,149 therms
Natural gas use in municipal buildings	11 $MTCO_2e$
Percent reduction in energy use	5%
Reduction in electricity consumption	11,220 kWh
GHG emissions reductions	1 $MTCO_2e$

RENEWABLE ENERGY & STORAGE

RE-C1

Reductions ($MTCO_2e$)	
-318	2030
Targets	Solar energy installations continue to grow by an average of 446 KW DC each year through 2030.
Methodology and Assumptions	According to Project Sunroof, 92% of Tiburon buildings have roofs that are solar-viable. These 3,000 roofs have the capacity for 53 MW DC and could generate 73,300,000 kWh per year, which is more than the 37,400,000 kWh consumed in Tiburon in 2020. By 2020, approximately 3,319 KW of solar capacity had been installed in the Tiburon area (including unincorporated areas with a 94920 zip code) and 551 KW had been installed in 2020. Based on population estimates for the Town of Tiburon and the census tracts which comprise the 94920 zip code area, we estimate 81% of the solar energy systems are located within the Town limits. We assume new distributed solar capacity will be added at the same rate as in 2020 through 2030, or 446 KW DC each year.
Sources	Project Sunroof, https://www.google.com/get/sunroof/data-explorer/place/ChIJ2cX8c6yXhYARECyyKE9Ek1Q/, accessed June 16, 2022. California Distributed Generation Statistics, "NEM Currently Interconnected Data Set," https://www.californiadgstats.ca.gov/downloads/, April 2020.

Calculation

	2030	
Estimated solar capacity added 2020 within Town limits	446	KW DC
Additional solar through 2030	4,463	KW DC
kWh generated by 1 KW solar energy system	1,450	kWh
Additional electricity produced by distributed PV	6,471,195	kWh
GHG emissions reductions	318	$MTCO_2e$

GHG-FREE ELECTRICITY *RE-C2*	
Reductions ($MTCO_2e$) -394	2030
Targets	MCE Light Green electricity is 95% GHG-free by 2022 and MCE continues to provide a Deep Green 100% GHG-free alternative. 15% of MCE load is Deep Green.
Methodology and Assumptions	The MCE Operational Integrated Resource Plan 2021-2030 states that MCE Light Green electricity is projected to be 95% GHG-free by 2022 and beyond. We have conservatively estimated a future GHG emission factor by assuming the remainder will be system power using the current emission factor set by CARB of 967.6 lbs. CO2/MWh (eGrid 2019). MCE supplied 76% of the total electricity load in Tiburon in 2020, and 5.4% of that was Deep Green. The analysis assumes the Deep Green percentage will increase to 15% by 2030.
Sources	MCE Operational Integrated Resource Plan 2021-2030 (October 5, 2020), p.21. https://www.mcecleanenergy.org/wp-content/uploads/2020/10/MCE-Operational-Integrated-Resource-Plan_2021.pdf Personal communication, Justin Kudo, MCE Manager of Account Services, jkudo@marinenergyauthority.org, July 14 and 15, 2016.

Calculation

	2030
Electricity use, BAU	39,331,314 kWh
Electricity saved through State and local actions	7,134,958 kWh
Net electricity use	32,196,356 kWh
Projected MCE electricity use (76% of total)	24,428,980 kWh
Deep Green electricity (15% of MCE load)	3,664,347 kWh
Electricity emissions w/MCE BAU	850 $MTCO_2e$
Electricity emissions w/MCE	456 $MTCO_2e$
GHG emission reductions	394 $MTCO_2e$

BUILDING AND APPLIANCE ELECTRIFICATION *RE-C3.1*	
Reductions ($MTCO_2e$) -42	2030
Targets	7 cooktops, 10 water heaters and 20 heating systems are replaced with electric versions by 2030 through a Building Decarbonization incentive program.
Methodology and Assumptions	Potential number of appliance replacements is based on a Marin County grant application for a Building Decarbonization Pilot Program, which proposes to provide cash rebates for natural gas appliance swap-outs. The pilot program application estimates the following number of replacements during the pilot program period: stoves and cooktops, 20; water heaters, 30; and furnaces and heating systems, 60. We assume 3.7% of the replacements will take place in Tiburon homes based on Tiburon's share of countywide households. We assume the program can grow at an annual rate of 25% with continued rebates and program implementation.
Sources	2009 California Residential Appliance Saturation Study, Volume 2, Page 23. http://www.energy.ca.gov/2010publications/CEC-200-2010-004/CEC-200-2010-004-V2.PDF County of Marin, Marin County Building Decarbonization Pilot Program for BAAQMD Climate Protection Grant Application, May 8, 2018.

Calculation

	2030	
Estimated annual natural gas use for stoves and cooktops	28	therms
Estimated annual natural gas use for water heaters	163	therms
Estimated annual natural gas use for space heating	306	therms
Estimated annual electricity use for stoves and cooktops	71	kWh
Estimated annual electricity use for water heaters	1,382	kWh
Estimated annual electricity use for heat pump space heating	1,213	kWh
Number of units stoves and cooktops replaced	7	units
Number of units water heaters replaced	10	units
Number of furnaces and heating systems replaced	20	units
Natural gas savings	7,946	therms
Electricity consumption	38,577	kWh
GHG emissions reduction	42	$MTCO_2e$

BUILDING AND APPLIANCE ELECTRIFICATION *RE-C3.2*	
Action	Adopt an ordinance in 2024 that requires homeowners to replace natural gas appliances, such as water heaters, stoves, cooktops, clothes dryers, and heating systems with high-efficiency electric appliances at time of replacement where feasible.
Targets	24% of residential water heaters, 19% of residential cooktops, and 12% of residential dryers are replaced with high efficiency electric appliances.
Reductions ($MTCO_2e$) -1,021.4	2030
Methodology and Assumptions	We assume the ordinance applies to water heaters, stoves, cooktops, and clothes dryers in January 2025. We assume the high end of average life expectancies for these appliances. We further assume one-third of potential water heater replacements will be deemed infeasible due to interior location of the water heater.
Sources	2009 California Residential Appliance Saturation Study, Volume 2, Table 2-8 (PG&E for dryer), Table 2-24 (PG&E for dryer), and Table 2-26 (Forecast Zone 5 for water heater and range). http://www.energy.ca.gov/2010publications/CEC-200-2010-004/CEC-200-2010-004-V2.PDF California Department of Finance, E-5 Population and Housing Estimates for 2010-2020 with 2010 Census Benchmark

Calculation

	2030
Number of housing units in Tiburon in 2020	4,049 units
Estimated annual natural gas use for stove or cooktop	28 therms
Estimated annual electricity use for induction stove or cooktop	71 kWh
% stoves and cooktops replaced	19%
Estimated annual natural gas use for water heater	163 therms
Estimated annual electricity use for heat pump water heater	1,382 kWh
% water heaters replaced	24%
Estimated natural gas use for clothes dryer	22 therms
Estimated electricity use for clothes dryer	648 kWh
% clothes dryers replaced	12%
Natural gas use eliminated	192,036 therms
Additional electricity use	76 kWh
GHG emissions reductions	1,021 $MTCO_2e$

BUILDING AND APPLIANCE ELECTRIFICATION *RE-C3.3*	
Action	Prohibit the use of natural gas end uses in new residential buildings in the Town's green building ordinance that aligns with the 2022 California Building Standards code update. Extend the same prohibition to new nonresidential buildings in the 2025 code cycle.
Reductions ($MTCO_2e$) -970.4	2030
Methodology and Assumptions	We assume adoption of an ordinance in that bans natural gas use in new residential buildings beginning in 2023 and new non-residential buildings in 2026. Replacing residential space heating systems in Climate Forecast Zone 5 that use natural gas with systems that use heat pumps and electricity reduces emissions by an average of approximately 89% (derived from CRASS, Tables 2-9 and 2-26). We assume the same emissions reduction for electrifying non-residential space heating systems. An estimated 88% of new homes use natural gas for ranges and ovens and 58% use natural gas for dryers (CRASS, Table 2-22). We assume the ordinance reduces these numbers 100%. We assume all new homes use natural gas for primary space heating and water heating (CRASS, Table 2-25). We assume the ordinance reduces these numbers by 100%. Electricity used to power these systems is regulated under Title 24, which requires solar energy to supply energy requirements. Number of new housing units is based on Plan Bay Area 2040 population and household size estimates. CAPCOA Measure BE-1 used for estimating non-residential building electricity savings subject to Municipal Code Section 16-47.040.
Sources	2009 California Residential Appliance Saturation Study, Volume 2, Table 2-8 (PG&E for dryer and heat pump), Table 2-24 (PG&E for dryer), and Table 2-26 (Forecast Zone 5 for water heater and range). http://www.energy.ca.gov/2010publications/CEC-200-2010-004/CEC-200-2010-004-V2.PDF California Energy Commission, California Commercial End-Use Survey (March 2006), https://ww2.energy.ca.gov/2006publications/CEC-400-2006-005/CEC-400-2006-005.PDF California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," August, 2010.

Calculation

Residential	**2030**	
New housing units, 2023-2030	639	units
Estimated natural gas use for space heating, per housing unit	306	therms
Estimated natural gas use for water heating, per housing unit	163	therms
Natural gas reduced beyond Title 24 requirements for heating systems	160,880	therms
Estimated annual natural gas use for cooktop and range	28	therms
Estimated natural gas use for clothes dryer	22	therms
Total natural gas reduced for appliances	23,899	therms
Estimated electricity use for cooktop and range	71	kWh
Estimated electricity use for clothes dryer	648	kWh
Total electricity used for electrified appliances	280,086	kWh
GHG emissions reductions	970.4	$MTCO_2e$

Commercial	**2030**	
Natural gas reduced beyond Title 24 requirements	0	therms
GHG emissions reductions	0.0	$MTCO_2e$

COMMERCIAL ORGANIC WASTE *WR-C1*	
Reductions ($MTCO_2e$) -151	2030
Targets	Outreach to covered businesses. 30% are correctly sorting and disposing organic material.
Methodology and Assumptions	Passed in 2014, AB 1826 requires businesses to recycle their organic waste, depending on the amount of waste they generate per week. Organic waste means food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper waste that is mixed in with food waste. The law phases in mandatory recycling of commercial organics over time. In 2017, businesses that generate 4 cubic yards of organic waste per week must arrange for organic waste recycling services and divert all organic waste they produce. In 2019, the law extends to businesses that generate 4 cubic yards or more of commercial solid waste. The State law is intended to reduce statewide disposal of organic waste by 50% by 2020. If that target is not met, the law will be extended to cover businesses that generate 2 cubic yards or more of commercial solid waste. The Town can assist Zero Waste Marin (a.k.a., the Marin Hazardous and Solid Waste Joint Powers Authority) and Marin Sanitary Service by conducting outreach, maintaining a registry of all businesses (including self-haulers) to track compliance with AB 1826, and hiring additional MSS or City dedicated to these efforts. According to CalRecycle, 55% of franchised commercial waste is recoverable for compost and mulch and paper recycling. This measure makes the following assumptions: 29% of landfilled waste is generated by commercial uses (based on electricity consumption split in the community); 60% of commercial waste will be subject to AB 1826 by 2020; and 90% of commercial waste will be subject to AB 1826 by 2030. Based on current compliance rates, this measure assumes 30% of all businesses that meet the 2019 threshold will be compliant by 2020 and 30% of all business that meet the post-2020 threshold will be compliant by 2030.
Sources	Personal communication with Kim Schiebly, Marin Sanitary Service, Kim.Scheibly@marinsanitary.com CalRecycle, 2014 Disposal-Facility-Based Characterization of Solid Waste in California: Significant Tables and Figures, https://www2.calrecycle.ca.gov/WasteCharacterization/PubExtracts/2014/SigTableFig.pdf

Calculation

	2030
Commercial waste as a percentage of total landfilled waste	27%
Commercial landfilled waste (excluding self-haul and municipal waste)	2,199 tons
Waste generated by covered businesses	1,979 tons
Recoverable organic waste generated by covered businesses (55%)	1,089 tons
Percent diverted from landfill	30%
Tons diverted from landfill	327 tons
GHG emissions reduction	151 $MTCO_2e$

RESIDENTIAL ORGANIC WASTE *WR-C2*	
Reductions ($MTCO_2e$) -508	2030
Targets	50% diversion of residential organic waste by 2030.
Methodology and Assumptions	This measure continues and expands activities already occurring, including quarterly mailings by Mill Valley Refuse, tabling at community events, a marketing campaign by Zero Waste Marin, and community education by Resilient Neighborhoods. Under this measure, the Town will utilize its website, communication tools, and social media to promote these activities and expand their reach, and encourage Mill Valley Refuse to increase and expand their outreach through other channels such as on-bill and email response messaging. A 2014 Marin Sanitary Service (MSS) waste characterization study found that 38% of residential solid waste sent to the landfill was compostable organic waste (30% food scraps, 4% food-soiled paper, and 4% plant debris). MSS estimates that approximately 1% of food waste is currently collected and composted. Curbside collection of food waste has been available in Tiburon since 2010 with weekly service for co-collection of plant debris and food scraps. Based on MSS's experience, this measure assumes an additional 5% of residential organic waste will be diverted by 2020 due to education and outreach activities. Based on the current residential waste diversion rate of 72%, we assume 50% of residential organic waste can be diverted by 2030.
Sources	Personal communication with Kim Schiebly, Marin Sanitary Service, Kim.Scheibly@marinsanitary.com

Calculation

	2030
Residential waste as a percent of total landfilled waste	73%
Residential landfilled waste (excluding self-haul and municipal waste)	5,946.5 tons
Compostable organic waste generated by residents	2,259.7 tons
Percent diverted from landfill	50%
Tons diverted from landfill	1,130 tons
GHG emissions reduction	508 $MTCO_2e$

CONSTRUCTION AND DEMOLITION DEBRIS AND SELF-HAUL WASTE *WR-C3*	
Reductions ($MTCO_2e$) -59	2030
Targets	75% diversion of C&D waste by 2030.
Methodology and Assumptions	Tiburon currently complies with the State's Green Building Code (CALGreen) by requiring development projects to direct all construction and demolition (C&D) materials to a certified facility that diverts at least 65% of nonhazardous C&D debris to recycle or salvage. However, recoverable material is still deposited in the landfill, primarily due to self-haul activity (clean-up and loads that are generated from projects not covered by CALGreen), and C&D loads that contain low percentages of recoverable material. The Town can help to maximize the amount of recoverable material by providing outreach and education to waste generators, and by working with the County and CalRecycle to require processing of all loads for recoverable materials at the landfill or processing facility. According to Zero Waste Marin, 670.74 tons of self-haul and debris box waste originating in Tiburon was landfilled in 2016. According to statewide solid waste characterizations studies, self-haul waste contains approximately 28% lumber, 3% paper, and 10% green waste, all of which could be diverted from the landfill. The measure assumes that 50% of this waste can be diverted by 2020 and 75% can be diverted by 2030, based on State mandates (SB 1383).
Sources	Personal communication with Garth Schultz, R3 Consulting Group, gschultz@r3cgi.com Personal communication with Judith Silver, Zero Waste Marin, jsilver@marincounty.org CalRecycle, "2014 Disposal-Facility-Based Characterization of Solid Waste in California: Significant Tables and Figures," October 6, 2015.

Calculation

	2030
Self-haul landfilled waste	758.6 tons
Recoverable organic waste (26.4%)	200.3 tons
Percent organic material diverted from landfill	75%
Tons diverted from landfill	150 tons
GHG emissions reduction	59 $MTCO_2e$

MANDATORY WASTE DIVERSION *WR-C4*	
Reductions ($MTCO_2e$) -556	2030
Targets	Increase commercial AB1826 compliance rate to 50% and increase residential organic waste diversion rate to 80% by 2030.
Methodology and Assumptions	This measure assumes Tiburon will adopt a mandatory waste diversion ordinance similar to the one adopted by the City of Palo Alto in January 2016 (Palo Alto Municipal Code Chapter 5.20). Palo Alto requires all residents, visitors, and businesses to place their discards in the appropriate container – recycle, compost, or garbage. There are four stopes to compliance: 1) subscribe to recycle, compost, and garbage service from the city's contract hauler; 2) set-up color-coded and labeled containers in convenient locations for patrons, employees, and residents; 3) train and educate tenants, residents, contractors and janitors about how to properly sort their waste and to ensure requirements are met; and 4) sort waste into proper containers. Requirements are phased in over time as follows: This measure assumes a similar ordinance would require all commercial accounts and multifamily buildings with 5 or more units to comply by 2020. We assume that a mandatory diversion ordinance could increase the AB 1826 compliance rate to 50% by 2030. Assuming that the ordinance is expanded to require residents to comply, we estimate an overall 80% compliance rate for residential compostable organic waste by 2030.
Sources	City of Palo Alto, http://www.cityofpaloalto.org/gov/depts/pwd/zerowaste/projects/ordinance.asp CalRecycle, "2014 Disposal-Facility-Based Characterization of Solid Waste in California: Significant Tables and Figures," October 6, 2015.

Calculation

	2030
Additional commercial organic waste diverted	544.3 tons
Additional residential organic waste diverted	677.9 tons
GHG emissions reduction	556 $MTCO_2e$

WASTE PROCESSING INFRASTRUCTURE *WR-C5*	
Reductions ($MTCO_2e$) -532	2030
Targets	Increase diversion rate of recoverable organic waste to 95% by 2030.
Methodology and Assumptions	This measure assumes that new solid waste processing infrastructure is procured by 2030, but not 2020. Waste processing infrastructure could ultimately ensure that 95% of all recoverable organic waste collected by the franchised waste hauler is diverted from the landfill by 2030.
Sources	Personal communication with Kim Schiebly, Marin Sanitary Service, Kim Scheibly, Kim.Scheibly@marinsanitary.com CalRecycle, 2014 Disposal-Facility-Based Characterization of Solid Waste in California: Significant Tables and Figures, https://www2.calrecycle.ca.gov/WasteCharacterization/PubExtracts/2014/SigTableFig.pdf

Calculation

	2030
Landfilled waste, excluding self-haul	8,291 tons
Tons diverted by other measures	2,733 tons
Diversion target (95% for 2030)	3,938 tons
Remaining tons to be diverted	1,205 tons
Recoverable organic waste (50% of total)	4,145 tons
GHG emissions reduction	532 $MTCO_2e$

WASTE FROM TOWN OPERATIONS *WR-M2*	
Reductions ($MTCO_2e$) -24	2030
Targets	75% of recoverable organic waste currently landfilled is diverted by 2030.
Methodology and Assumptions	This measure assumes 75% of recoverable organic waste currently landfilled could be diverted by 2030.
Sources	Personal communication with Charlie Wicke, Marin Sanitary Service, Charlie.Wicke@marinsanitary.com

Calculation

	2030
Waste generated by Town operations	145 tons
Recoverable organic waste (50%)	72 tons
Percent diverted from landfill	75%
Tons organic waste diverted from landfill	54 tons
GHG emissions reduction	24 $MTCO_2e$

WASTE PROCESSING INFRASTRUCTURE *WR-C5*	
Reductions ($MTCO_2e$) -519	2030
Targets	Increase diversion rate of recoverable organic waste to 95% by 2030.
Methodology and Assumptions	This measure assumes that new solid waste processing infrastructure is procured by 2030, but not 2020. Waste processing infrastructure could ultimately ensure that 95% of all recoverable organic waste collected by the franchised waste hauler is diverted from the landfill by 2030.
Sources	Personal communication with Kim Schiebly, Marin Sanitary Service, Kim Scheibly, Kim.Scheibly@marinsanitary.com CalRecycle, 2014 Disposal-Facility-Based Characterization of Solid Waste in California: Significant Tables and Figures, https://www2.calrecycle.ca.gov/WasteCharacterization/PubExtracts/2014/SigTableFig.pdf

Calculation

	2030
Landfilled waste, excluding self-haul and sludge	8,104 tons
Tons diverted by other measures	2,674 tons
Diversion target (95% for 2030)	3,850 tons
Remaining tons to be diverted	1,175 tons
Recoverable organic waste (50% of total)	4,052 tons
GHG emissions reduction	519 $MTCO_2e$

COMMUNITY WATER USE *WC-C1*	
Reductions ($MTCO_2e$) -2	2030
Targets	1% annual water consumption reduction.
Methodology and Assumptions	District-wide Marin Municipal Water District (MMWD) water consumption fell 23% between 2005 and 2018, or approximately 1.8% per year. We conservatively assume water consumption will continue to fall an average of 1% per year based on the following legislation and water conservation programs: -The Town has adopted CALGreen Tier 1 for residential buildings, which requires additional water conservation actions above the base code. -MMWD's regulations meet or exceed State law that requires single family homes and commercial and multi-family buildings to replace all non-compliant plumbing fixtures when remodeling and upon resale (resale requirement for commercial and multi-family buildings will be in effect on January 1, 2019). -MMWD provides rebates for water-efficient toilets, clothes washers, hot water recirculation systems, turf replacement, pool covers, mulch, graywater systems, and rain barrels. -MMWD provides residential and commercial building and landscape water audits and free-water saving devices (faucet aerators, showerheads, toilet leak test dye tablets, hose nozzles, etc.). -MMWD provides residential and commercial building and landscape water audits and free-water saving devices (faucet aerators, showerheads, toilet leak test dye tablets, hose nozzles, etc.). -MMWD has adopted a landscape water conservation ordinance which applies to all new construction and rehabilitated landscape projects requiring a building permit, plan check, or design review. Irrigation controllers are required under CALGreen. -New commercial and multi-family construction is required to meet CALGreen code. MMWD requires all plumbing installed, replaced, or moved on any new or existing service to have high efficiency fixtures and meet minimum requirements. -MMWD has adopted a Water Waste Ordinance and requires drinking water and linen washing upon request at restaurants and hotels. -MMWD requires applicants for new water service and applicants requesting an enlarged water service for substantial residential or commercial remodels to install a graywater recycling system to reuse the maximum practicable amount of graywater on site. -MMWD conducts outreach and provides water conservation information to water users on its website. -MMWD provides virtual water-friendly garden tours on its website .

	GHG reduction calculations are based upon the following: -The California Energy Commission estimates that it takes 3,500 kWh of electricity per million gallons to convey, treat and distribute water from the water source to the customer in northern California. -MMWD began purchasing 100% renewable electricity in 2017 and Sonoma County Water agency, which provides approximately 25% of water, began purchasing 100% renewable electricity in 2015. We assume the water agencies will continue this practice.
Sources	Personal communication with Carrie Pollard, Sonoma Marin Water Saving Partnership The Climate Registry for Sonoma County Water Agency emission factors Refining Estimates of Water-Related Energy Use in California, California Energy Commission, Dec. 2006

Calculation

	2030
Water consumption, BAU	437 MG
Annual water consumption reduction	1 %
Potential annual water savings by 2030	52 MG
GHG emissions reduction	2 $MTCO_2e$

CARBON OFFSETS *S-C3*	
Action	Reduce the impact of greenhouse gas emissions through the purchase of high quality, well-vetted and verifiable carbon offsets.
Target Reductions ($MTCO_2e$) -2,263	Purchase carbon offsets in 2030, and annually thereafter, to achieve a 50% reduction below 1990 levels in communitywide emissions.
Methodology and Assumptions	Calculated reduction represents unmitigated emissions in 2030 after all other programs are successfully implemented.
Sources	California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," August, 2010.

Calculation

	2030
Projected communitywide emissions in 2030	46,515 $MTCO_2$
Emissions reductions from successful implementation of all local and state actions	18,708 $MTCO_2$
Communitywide emissions after implementation of all local and state actions	27,806 $MTCO_2$
50% below 1990 level target	25,543 $MTCO_2$
Remaining GHG emissions to offset	2,263 $MTCO_2e$

COMMUNITY EDUCATION *CE-C1*	
Action	Work with community-based organizations, such as Resilient Neighborhoods, to educate and motivate community members to start or continue to reduce GHG emissions in their homes, businesses, transportation mode choices, and other activities, and increase community resilience through community-building activities.
Target Reductions ($MTCO_2e$) -960.4	Beginning in Fiscal Year 2023-2024, provide annual funding to Resilient Neighborhoods to graduate 25 Tiburon households each year over existing funding levels.
Methodology and Assumptions	Resilient (RN) reports that as of 8/31/21, RN had graduated 743 households from the program which collectively reduced CO_2 emissions by 9,696,323 pounds. This equates to 13,050 pounds per household, or 5.91 $MTCO_2e$. To date, the program has graduated 13 Tiburon households.
Sources	Resilient Neighborhoods, Results by Municipality, https://www.resilientneighborhoods.org/statistics-by-municipality.html, accessed 6/16/22.

Calculation

	2030
Years program is in effect	6.5 years
Emissions reductions per household	5.91 $MTCO_2$
Number of Tiburon households graduated each year	25
GHG emissions reduction	960 $MTCO_2e$

LIGHT AND HEAVY DUTY FLEET REGULATIONS *State Action*	
Program Description Reductions ($MTCO_2e$) -3,187	Current federal and State regulations and standards will reduce transportation emissions from the light and heavy duty fleet. Regulations and policies covered in EMFAC 2021 are identified in the EMFAC 2021 Technical Document. 2030
Methodology and Assumptions	Transportation emissions estimated using EMFAC 2021.
Sources	California Air Resources Board, EMFAC2021 v.1.0.1. California Air Resources Board, EMFAC2021 Volume III Technical Document v.1.0.1, April 2021. https://ww2.arb.ca.gov/sites/default/files/2021-08/emfac2021_technical_documentation_april2021.pdf

Calculation

	2030
Passenger VMT BAU	63,696,150 VMT
Passenger VMT, net reductions from other measures	44,024,883 VMT
Commercial VMT BAU	1,163,828 VMT
Emissions, BAU	16,646 $MTCO_2e$
Emissions with regulations	13,459 $MTCO_2e$
Reduction in emissions	3,187 $MTCO_2e$

RENEWABLE PORTFOLIO STANDARD *State Action*	
Program Description	Established in 2002 in Senate Bill 1078, the Renewable Portfolio Standard program requires electricity providers to increase the portion of energy that comes from eligible renewable sources, including solar, wind, small hydroelectric, geothermal, biomass and biowaste, to 20 percent by 2010 and to 33 percent by 2020. Senate Bill 350, passed in September of 2015, increases the renewable requirement to 50 percent by the end of 2030. Senate Bill 100, passed in September 2018, accelerated the RPS standard to 60 percent by 2030 and zero-carbon by 2045.
Reductions (MTCO2e) -533	2030
Methodology and Assumptions	This State Action assumes PG&E and Direct Access entities will meet the Renewable Portfolio Standard requirements and that these entities will carry the same share of the community's electricity load as in 2016. GHG reductions related to MCE's GHG reduction policies are quantified separately as a local action. California Public Utilities Code Section 454.52 requires each load-serving to procure at least 50 percent eligible renewable energy resources by 2030 and to meet the economywide reductions of 40% below 1990 levels by 2030. For 2030, the CPUC has set electric sector GHG reductions at a level that represents a 50% reduction from 2015 levels. We therefore apply a 50% reduction to PG&E and DA 2015 CO2 emission factors to forecast 2030 emission factors. CH_4 and N_2O factors are kept constant at 2018 levels.
Sources	PG&E, "Greenhouse Gas Emission Factors: Guidance for PG&E Customers," November 2015, https://www.pge.com/includes/docs/pdfs/shared/environment/calculator/pge_ghg_emission_factor_info_sheet.pdf California Public Utilities Commission "CPUC Adopts Groundbreaking Path to Reduce Greenhouse Gases in Electric Sector," Press Release Docket #: R.16-02-007, Feb. 8, 2018.

Calculation

	2030
Electricity use, BAU	39,331,314 kWh
Electricity saved through other State actions	845,397 kWh
Electricity saved through local actions	8,910,981 kWh
Net electricity use (PG&E)	6,409,857 kWh
Net electricity use (DA)	725,101 kWh
Electricity emissions, BAU	641 $MTCO_2e$
Electricity emissions w/RPS	108 $MTCO_2e$
GHG emission reductions	533 $MTCO_2e$

TITLE 24 ENERGY EFFICIENCY STANDARDS *State Action*	
Program Description	The California Energy Commission (CEC) promotes energy efficiency and conservation by setting the State's building efficiency standards. Title 24 of the California Code of Regulations consists of regulations that cover the structural, electrical, mechanical, and plumbing system of every building constructed or altered after 1978. The building energy efficiency standards are updated on an approximate three-year cycle, and each cycle imposes increasingly higher demands on energy efficiency and conservation.
Reductions (MTCO2e) -776	2030
Methodology	Estimated residential energy use assumes homes use natural gas for primary space heating and water heating. We assume all new homes install central air conditioning and outdoor lighting. Only end uses covered by Title 24 are included in the analysis. Estimated energy reductions for the 2019 building codes based on information provided by the California Energy Commission. CAPCOA Measure BE-1 used for estimating building energy savings. The analysis assumes all residential electricity use subject to Title 24 is offset by mandatory solar installation beginning with the 2019 building code. The 2022 Building Code increases establishes an energy budget based on efficient heat pumps or water heaters to encourage installation of heat pumps over gas-fueled HVAC units and requires homes to be electric-ready, with dedicated 240-volt outlets and space so electric appliances can eventually replace installed gas appliances. We assume the State Building Code will require net zero energy residential buildings beginning in 2026 and net zero energy non-residential beginning in 2029.
Sources	California Energy Commission, https://ww2.energy.ca.gov/title24/2019standards/documents/2018_Title_24_2019_Building_Standards_FAQ.pdf California Energy Commission, California Commercial End-Use Survey (March 2006), https://ww2.energy.ca.gov/2006publications/CEC-400-2006-005/CEC-400-2006-005.PDF 2019 California Residential Appliance Saturation Study, Volume 2, Table 14 (PG&E for dryer and range/oven), Table 15 (Forecasting Climate Zone 2 for heat pump and water heater), and Table 37 (Forecast Zone 2 for primary heat, water heater, dryer, and range/oven).

Calculation

Reductions from Title 24 Upgrades	Energy Savings for 2019 Code (assumed for development 2020-2022)		Projected average reduction 2023-2030 from 2020 baseline	
	Electricity Savings	Natural Gas Savings	Electricity Savings	Natural Gas Savings
Residential New Construction	100%	7%	100%	50%
Non-residential New Construction	30%	30%	50%	50%

Projected Residential Development with Title 24 Energy Reductions

	2020-2022	2023-2030	TOTAL through 2030	GHG Reductions through 2030
New Residential (units)	6	633	639	
Electricity Use BAU , subject to Title 24	7,938	837,459	845,397	
Electricity Use Savings	7,938	837,459	845,397	37
Natural Gas Use BAU, subject to Title 24	2,628	277,254	279,882	
Natural Gas Use Savings	184	138,627	138,811	738

APPENDIX B: IMPLEMENTATION TABLE

The work plan in Table B-1 contains information to support staff and community implementation of the measures to effectively integrate them into budgets, the capital improvement program, and other programs and projects. The headings included in Table B-1 are defined as follows:

Code: The abbreviation that is used to refer to the strategy in the CAP.

Strategy/Action: The strategy language used to guide actions and the specific actions that will be used to implement the strategy.

Lead Department: The lead Town department, division, or office responsible for implementing the measure. Note: Some actions may require involvement and collaboration by more than one department, division, or office. The Town Manager may assign or re-assign responsibilities, as necessary.

- ADMIN (Town Manager)
- PLN (Planning & Building)
- PW (Public Works)
- TBD (To Be Determined as Assigned by Town Manager)

Time Frame: The year by which a measure should be effective by year's end. For a measure to be effective, the necessary programs and efforts should be active, and any infrastructure or other capital improvements should be in place. Once effective, many measures will continue through 2030, so they do not have end dates. Time frames for effectively setting up the measures are described as follows:

- Ongoing (continuation of an action that has been implemented)
- Near-Term (by 2024)
- Mid-Term (by 2027)
- Long-Term (by 2030)

Town Staff Time: The estimated cost to the Town (in staff hours) to complete implementation of the measure, identified as follows:

- Low (less than 80 hours)
- Medium (80–500 hours)
- High (more than 500 hours)

GHG Reductions ($MTCO_2e$): Amount of GHG emissions reduced by 2030. If no amount is identified, either additional information is needed to quantify a GHG reduction amount or the action is supportive of another action, as described in the CAP.

Key Metrics: Targets and datapoints that the Town will use to track progress and measure success.

TABLE B-1: IMPLEMENTATION TABLE

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	TOWN STAFF TIME	GHG REDUCTION ($MTCO_2e$)	KEY METRICS
LOW CARBON TRANSPORTATION						
LCT-C1	**Zero Emission Vehicles**. Take actions that will result in at least 45% of passenger vehicles in the Tiburon to be zero emission vehicles (ZEVs), including plug-in electric vehicles (EVs) and hydrogen fuel cell electric vehicles, by 2030. Actions include:				6,340	Rate of ZEV adoption in Tiburon and Marin County. Target is 45%.
	1. Support development of a countywide EV plan that can be adopted by all Marin jurisdictions that identifies strategies to accelerate EV adoption. The plan should identify the number and type of chargers needed in each jurisdiction to achieve a minimum 45% ZEV penetration target; potential locations for public, workplace, and multi-family charging; best practices for charging station siting, installation, and signage; and model code language and guides for permit streamlining and charging infrastructure requirements.	PLN/PW	Near-Term	Low		
	13. Work with PG&E, MCE, Transportation Authority of Marin, and other entities to identify and develop multifamily and workplace charging sites.	PLN/PW	Near-Term	Medium		

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	TOWN STAFF TIME	GHG REDUCTION ($MTCO_2e$)	KEY METRICS
	a. Conduct outreach to multifamily HOA associations and facilitate meetings with EV charging supply providers. b. Relax development standards to facilitate installation of EV chargers. c. Assist in applying for available grant funding and rebates. d. Contribute funding for grid infrastructure upgrades as needed.					
	3. Pursue opportunities to expand the Town's EV charging network by identifying suitable Level 2 and Level 3 DC fast charging locations and considering innovative programs, such as streetlight and curbside charging to serve those who do not have access to home charging. a. Develop a private-public partnership and install Level 3 fast chargers at public locations, such as Blackie's Pasture, sufficient to service near-term resident and visitor demand with expansion plans to service a projected Marin County population of 90,000 EVs in 2030. b. Assist in applying for available grant funding and rebates.	PW	Near-Term	Medium		

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	TOWN STAFF TIME	GHG REDUCTION ($MTCO_2e$)	KEY METRICS
	c. Contribute funding for grid infrastructure upgrades as needed.					
	4. Encourage and facilitate installation of Level 3 fast chargers in the Downtown as commercial properties are redeveloped. a. Facilitate meetings with property owners, developers, and EV charging equipment providers as new development is proposed. b. Provide concessions on development standards as needed to facilitate installation of fast chargers. c. Allow EV fast charging spaces to count towards the parking requirement for residential and commercial uses. d. Allow advertising to be delivered at EV chargers. e. Assist in applying for available grant funding and rebates. f. Contribute funding for grid infrastructure upgrades as needed.	PW/PLN	Near-Term	Medium		

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	TOWN STAFF TIME	GHG REDUCTION ($MTCO_2e$)	KEY METRICS
	g. Develop Level 3 fast chargers sufficient to service a projected Marin County population of 90,000 EVs by 2030.					
	5. Provide directional signage to public EV chargers on local streets and, as appropriate, from state highways.	PW	Near-Term	Medium		
	6. Work with the Transportation Authority of Marin (TAM), MCE, the California Energy Commission (CEC) and other entities to provide technical assistance and incentives, such as rebates, for multi-family and workplace charging sites.	PLN/PW	Near-Term	Low		
	7. Participate in a countywide effort by MCE, Pacific Gas & Electric (PG&E), and others to provide rebates for new or used electric vehicles.	PLN/PW	Near-Term	Low		
	8. As the Town's Green Building Ordinance is updated, require new and remodeled single-family, multi-family and commercial projects to install electrical service, add conduits and chargers, as appropriate, for potential electric vehicle use beyond state standards. a. Require all new multifamily development to provide one EV-ready parking space per unit	PLN	Near-Term	Medium		

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	TOWN STAFF TIME	GHG REDUCTION ($MTCO_2e$)	KEY METRICS
	and additional EV fast chargers that are accessible to the public.					
	9. Participate in regional efforts and grant programs to encourage widespread availability of EV charging stations.	PLN / PW	Near-Term	Low		
	10. Participate in and provide funding for programs to promote EV adoption, including "Drive an EV" events and other media and outreach campaigns.	ADMIN / PLN	Near-Term	Low		
	11. Encourage or require, as practicable, ride hailing and delivery service companies to utilize zero emission vehicles.	ADMIN / PLN	Mid-Term	Low		
	12. Promote adoption of electric bicycles, scooters, and motorcycles.	PLN / PW	Near-Term	Low		
LCT-C2	**Bicycling and Micromobility** Encourage bicycling and micromobility as an alternative to vehicular travel.				218	Complete projects identified in the Town's General Plan and Bicycle and Pedestrian Master Plan. 0.03 miles of Class IV bike paths and 1.61 miles of Class II bike lanes constructed between by 2030. 25% reduction in residents' vehicle trips that start and end in Tiburon.
	1. Promote bicycling and micromobility, including e-bikes, electric scooters, and electric skateboards, through outreach channels and partner agencies.	PLN / PW	Near-Term	Medium		
	2. Require new, remodeled, and expanded commercial, mixed use, and multifamily development to provide secure parking for electric bicycles.	PLN	Near-Term	Medium		
	3. Provide secure electric bicycle parking at Town parks and buildings.	PW	Near-Term	Medium		

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	TOWN STAFF TIME	GHG REDUCTION ($MTCO_2e$)	KEY METRICS
	4. Encourage schools, the library, and shopping centers to provide secure electric bicycle parking.	PLN	Near-Term	Low		
	5. Establish and maintain a system of bicycle facilities that are consistent with the Tiburon Bicycle and Pedestrian Master Plan and "complete streets" policies.	PW	Long-Term	High		
	6. Implement the Tiburon Bicycle and Pedestrian Master Plan's recommendations to support and expand bicycling.	PW	Long-Term	High		
	7. Update the Tiburon Bicycle and Pedestrian Master Plan to support the use of e-bikes, electric scooters, and electric skateboards, including easily accessible charging stations for them.	PW	Long-Term	Medium		
LCT-C3	**Walking.** Encourage walking as an alternative to vehicular travel.				13	Complete projects identified in the Town's Bicycle and Pedestrian Master Plan and complete streets policies. 2% reduction in VMT for vehicle trips that start and end in Tiburon by 2030
	1. Establish and maintain a system of pedestrian facilities that are consistent with the Tiburon Bicycle and Pedestrian Master Plan and "complete streets" policies.	PW	Long-Term	High		
	2. Implement the Tiburon Bicycle and Pedestrian Master Plan's recommendations to support and expand walking.	PW	Long-Term	High		
LCT-C4	**Safe Routes to School.** Continue to support the Safe Routes to School Program and strive to increase bicycling, walking, carpooling (especially in a ZEV), and taking public transit to school.				49	Reduce school trips in family vehicle 29%, from an average of 50% to 35%.

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	TOWN STAFF TIME	GHG REDUCTION ($MTCO_2e$)	KEY METRICS
	3. Work with TAM and other organizations to promote school and student participation.	ADMIN / PW	Short-Term	Low		
	4. Identify issues associated with unsafe bicycle and pedestrian facilities between neighborhoods and schools, apply for Safe Routes to School grants, and execute plans to improve pedestrian and bicycle facilities.	PW	Long-Term	High		
LTC-C5	**Public Transit.** Support and promote public transit by taking the following actions:				68	33% of Marin Transit and Golden Gate Transit buses will be electric by 2030 and the remaining use renewable diesel.
	1. Work with Marin Transit and Golden Gate Transit to maximize ridership through expansion and/or improvement of transit and ferry routes, schedules, and services.	ADMIN / PW	Mid-Term	Medium		
	2. Support a "Yellow School Bus" program and student use of regular transit to reduce school traffic.	ADMIN / PW	Near-Term	Low		
	3. Encourage transit providers, including school buses, to use renewable diesel as a transition fuel and to purchase electric buses whenever replacing existing buses.	ADMIN/PW	Near-Term	Low		
LCT-C6	**Employee Trip Reduction.** Reduce vehicle miles traveled commuting to work through the following actions:				11	Number and % of employers subject to requirement that are providing transportation demand
	1. Work with Transportation Authority of Marin (TAM), the Metropolitan	ADMIN / PLN	Near-Term	Low		

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	TOWN STAFF TIME	GHG REDUCTION ($MTCO_2e$)	KEY METRICS
	Transportation Commission (MTC), and the Bay Area Air Quality Management District (BAAQMD) to promote transportation demand programs to local employers, such as rideshare matching programs, vanpool incentive programs, emergency ride home programs, telecommuting, transit use discounts and subsidies, showers and changing facilities, bicycle racks and lockers, and other incentives to use transportation other than single occupant vehicles.					programs to employees. Target is 100%.
	2. Embark on a behavior change and educational campaign to encourage employees to reduce vehicle trips.	ADMIN / PLN	Near-Term	Medium		
	3. Work with TAM on developing a county-wide Transportation Demand Management Program to encourage trip reduction throughout County.	ADMIN / PLN	Near-Term	Low		
LTC-C7	**Vehicle Idling.** Encourage drivers and autonomous vehicles to limit vehicle idling through public outreach and engagement campaigns.	ADMIN	Near-Term	Low	n/a	Projects completed. Outreach materials developed; type and frequency of outreach.
LCT-C8	**Smart Growth Development.** Promote land use and development policies that prioritize infill housing and mixed-use development near commercial services and transit facilities. Achieve multifamily housing development on housing opportunity sites identified in the Town's Housing Element 2023-2031 and apply existing inclusionary requirements for	PLN	Long-Term	High	326	Implement the updated Housing Element

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	TOWN STAFF TIME	GHG REDUCTION ($MTCO_2e$)	KEY METRICS
	units affordable to lower-income households as applicable.					
LCT-C9	**Zero Emission Landscape and Small Off-Road Equipment.** Adopt an ordinance to require the use of zero emission landscape and small off-road equipment instead of gasoline and diesel-powered equipment in all residential and commercial areas. Equipment includes leaf blowers and vacuums, hedge trimmers, edgers, brush cutters, chainsaws, lawn mowers, chain saws (under 45 cc), pressure washers, and portable generators. 4. Provide information on available rebates, such as the California Air Resources Board's Clean Off-Road Equipment Voucher Incentive Project for small business and sole proprietary landscape professionals. 5. Consider offering an incentive for businesses to use zero emission landscape equipment such as a rebate on equipment purchases or discount on business license fees.	ADMIN	Near-Term	Medium	372	100% of landscape equipment is electric by 2030.
	6. Explore building code modifications to support zero emission landscape equipment.	PLN	Mid-Term	Medium		
LCT-M1	**Zero Emission Town Vehicles.** Purchase or lease zero-emission vehicles for the Town fleet whenever feasible and when not, the most fuel-efficient models available. Achieve a 100% electric light duty vehicle fleet by 2030.	ADMIN / PW	Long-Term	Medium	43	All light-duty vehicles in Town's fleet are zero emission by 2030.

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	TOWN STAFF TIME	GHG REDUCTION ($MTCO_2e$)	KEY METRICS
LCT-M2	**Low Carbon Fuels.** Use low-carbon fuel such as renewable diesel as a transition fuel in the Town's fleet and encourage the Town's service providers and joint powers agencies to do the same until vehicles are replaced with zero-emissions vehicles.	ADMIN / PW	Near-Term	Low	10	100% of diesel use is replaced with renewable diesel by 2030.
LCT-M3	**Town Employee Commute.** Provide Town employees with incentives and/or reduce barriers to drive electric vehicles and use alternatives to single occupant auto commuting, such as discounted EV charging, transit and e-bike discounts and subsidies, secure bicycle facilities, showers and changing facilities, ridesharing services, vanpools, emergency ride home service, flexible schedules, and telecommuting when practicable.	ADMIN	Near-Term	Medium	6	5.6% reduction in employee commute VMT by 2030.
LCT-M4	**Municipal Zero Emission Landscape Equipment and Small Off-Road Engines.** Replace all gas-powered leaf blowers, mowers, brush cutters, hedgers, saws, and other landscape equipment and small off-road engines, including generators and pressure washers, with zero emission equipment.	PW	Long-Term	Medium	9	Replace all small off-road equipment with electric versions by 2030.
RE-C1	**Renewable Energy Generation and Storage.** Accelerate installation of residential and commercial solar and other renewable energy systems and energy storage systems.				318	Solar energy installations continue to grow by an average of 446 KW DC each year through 2030.
	1. Provide permit streamlining and reduce or eliminate fees, as feasible.	PLN	Near-Term	Low		

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	TOWN STAFF TIME	GHG REDUCTION ($MTCO_2e$)	KEY METRICS
	2. Update building codes, development codes, design guidelines, and zoning ordinances, as necessary, to facilitate small and medium-scale installations.					
	3. Encourage installation of solar panels over parking areas on commercial projects, public buildings such as schools and the Tiburon Library, and large-scale residential developments through ordinance, engagement campaigns, and/or agency incentives.	PLN	Mid-Term	Medium		
	4. Identify and promote financing and loan programs for residential and non-residential projects.	ADMIN/PLN	Near-Term	Low		
	5. Encourage installation of battery storage in conjunction with renewable energy generation projects through outreach and partner agency incentives.	ADMIN/PLN	Mid-Term	Low		
	6. Encourage the use of non-fossil fuel generators now and adopt an ordinance phasing out the acquisition and use of fossil-fuel generators.	ADMIN/PLN	Mid-Term	Medium		
	7. Collaborate with the County, Marin jurisdictions, agencies, and organizations, as appropriate, to study opportunities and specific action steps for expansion of rooftop solar and battery storage.	ADMIN/PLN	Mid-Term	Low		

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	TOWN STAFF TIME	GHG REDUCTION ($MTCO_2e$)	KEY METRICS
RE-C2	**GHG-Free Electricity.** Encourage residents and businesses to switch to 100 percent renewable electricity (MCE Deep Green, MCE Local Sol, and PG&E Solar Choice) through engagement campaigns and partner agency incentives and work with MCE Clean Energy to assure that it reaches its goal to provide electricity that is 95 percent GHG-free by 2022. Target 15% of the electricity load to be Deep Green in 2030.	ADMIN	Near-Term	Low	394	MCE Light Green electricity is 95% GHG-free by 2022 and MCE continues to provide a Deep Green 100% GHG-free alternative. 15% of MCE load is Deep Green, up from 5.4% in 2020.
RE-C3	**Building and Appliance Electrification.** Accelerate electrification of building systems and appliances that currently use natural gas, including heating systems, hot water heaters, stoves, and clothes dryers.					
	1. Explore opportunities to continue existing rebate programs, such as Electrify Marin and BayREN, and promote them to the community by illustrating the financial and health benefits of electrification.	ADMIN	Near-Term	Low	42	7 cooktops, 10 water heaters and 20 heating systems are replaced with electric versions by 2030.
	2. Study alternatives and draft regulations for Council consideration that requires homeowners and landlords to replace natural gas appliances, such as water heaters, stoves, cooktops, clothes dryers, and heating systems with high-efficiency electric appliances at time of replacement where feasible. Educate the public about the health hazards of owning and operating natural gas	PLN	Mid-Term	Medium	1,021	24% of residential water heaters, 19% of residential cooktops, and 12% of residential dryers are replaced with high efficiency electric appliances.

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	TOWN STAFF TIME	GHG REDUCTION ($MTCO_2e$)	KEY METRICS
	appliances and available incentives and rebates to replace them.					
	3. Prohibit the use of natural gas end uses in new residential buildings in the Town's green building ordinance that aligns with the 2022 California Building Standards code update. Extend the same prohibition to new nonresidential buildings in the 2025 code cycle, if not earlier.	PLN	Near and Mid-Term	Medium	970	Ordinance adopted.
	4. Collaborate with the County's work to update the Green Building Code and develop a model ordinance that all Marin jurisdictions can utilize in establishing requirements for new residential, multi-family, and commercial buildings and remodels and renovations be all-electric, thereby creating consistency across all jurisdictions.	PLN	Near-Term	Medium	Included above	
RE-C4	**Innovative Technologies.** Investigate and pursue innovative technologies such as micro-grids, battery storage, and demand-response programs that will improve local resilience and the electric grid's resiliency and help to balance demand and renewable energy production in cooperation with local and regional partners such as MCE and PG&E, as feasible. 2. Build upon best practices identified by Drawdown Marin/Marin CAN, such as the Marin microgrid project at the Fairfax Pavilion and develop a study on opportunities to create	ADMIN / PLN & PW	Mid-Term	Low to High	n/a	Projects identified and completed.

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	TOWN STAFF TIME	GHG REDUCTION ($MTCO_2e$)	KEY METRICS
	solar-powered resilience microgrids with battery storage for community use that would remain powered during an electric grid outage.					
RE-M1	***Municipal 100% Renewable Electricity***				0	Actions taken.
	1. Install solar energy systems at municipal buildings and facilities where feasible and investigate and pursue innovative technologies such as battery storage and demand response programs.	PW	Long-Term	High		
	2. Where feasible, replace natural gas appliances/equipment with electric and electrify all Town buildings and facilities, where feasible.	PW	Long-Term	Medium		
	3. Continue to purchase 100% renewable energy for Town buildings, facilities, and vehicles through programs such as MCE Deep Green.	ADMIN	Ongoing	Low		
EE-C1	***Energy Efficiency Programs.*** Promote and expand participation in residential and commercial energy efficiency programs.				1,166	Natural gas consumption is reduced an average of 0.7% per year between 2020 and 2030. Electricity consumption is reduced an average of 0.6% per year between 2020 and 2030.
	1. Work with organizations and agencies such as the Marin Energy Watch Partnership, the Bay Area Regional Network, MCE, Resilient Neighborhoods, and the Marin Climate & Energy Partnership to promote and implement energy efficiency programs and actions.	ADMIN/PLN	Near-Term	Medium		

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	TOWN STAFF TIME	GHG REDUCTION ($MTCO_2e$)	KEY METRICS
	2. Continue and expand participation in energy efficiency programs as they become available. 3. Promote utility, state, and federal rebate and incentive programs. 4. Participate and promote financing and loan programs for residential and non-residential projects such as Property Assessed Clean Energy (PACE) programs, PG&E on-bill repayment, and California Hub for Energy Efficiency Financing (CHEEF) programs.					
EE-C2	**Energy Audits and Retrofits.** Investigate requiring energy audits for residential and commercial buildings at time of sale or major remodel. Requirements could include identification of electrification and energy efficiency opportunities and supporting programs could connect building owners to potential rebates and financing options.	PLN	Mid-Term	Medium	40	34 housing units implement energy efficiency projects between 2025 and 2030 due to ordinance requiring energy audits at time of sale.
EE-C3	**Cool Pavement and Roofs.** Use reflective, high albedo material for roadways, parking lots, sidewalks, and cool roofs to reduce the urban heat island effect and save energy.				n/a	Actions taken.
	4. Evaluate the use of high albedo pavements when resurfacing Town streets or re-roofing Town facilities.	PW	Near-Term	Medium		
	5. Adopt mandatory building code measures to require new development to use high albedo material for driveways, parking lots,	PLN	Near-Term	Medium		

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	TOWN STAFF TIME	GHG REDUCTION ($MTCO_2e$)	KEY METRICS
	walkways, and patios, and cool roofing.					
	6. Maintain and expand the use of urban tree cover for street-level temperature reduction.	PW	Near to Long-Term	Medium		
EE-C4	**Green Building Reach Code.** 1. Adopt a green building ordinance for new and remodeled commercial and residential projects that requires green building methods, materials, and efficiency above the State building and energy codes. 2. Consider adoption of low embodied-carbon concrete standards similar to those adopted by the County.	PLN	Near and Mid-Term	Medium	n/a	Code amendments adopted.
EE-C5	**Streamline Permit Process and Provide Technical Assistance.** Analyze current green building permit and inspection process to eliminate barriers and provide technical assistance to ensure successful implementation of green building requirements. Work countywide to make it easier for contractors and building counter staff to simplify applications and identify incentives.	PLN	Near-Term	Medium	n/a	Actions taken.
EE-C6	**Sustainable Building Materials** Study alternatives and draft regulations that require use of Forest Stewardship Council certified material in new constructions, major remodels, and outdoor use and that prohibit use of non-certified old-growth and other materials.	PLN	Mid-Term	Medium	n/a	Action taken.

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	TOWN STAFF TIME	GHG REDUCTION ($MTCO_2e$)	KEY METRICS
EE-M1	**Public Lighting.** Replace remaining inefficient street, parking lot, and other outdoor lighting with LED fixtures.	PW	Long-Term	High	0	Convert 268 streetlights to LED by 2030.
EE-M2	**Energy Efficiency Audit and Retrofits in Town Buildings and Facilities.** Work with the Marin Energy Management Team to identify and implement energy efficiency projects in municipal buildings and facilities and electrification of existing building systems and equipment that use natural gas.	PW	Near-Term	Medium	2	Complete energy efficiency projects by 2030: 1) Install energy-efficient lighting at Town Hall and Police Station; 2) replace heat pumps in Police Station; 3) install vending machine controller; 4) install window film or shade screens in Town Hall.
EE-M3	**Energy Conservation in Town Buildings.** Reduce energy consumption through behavioral and operational changes. a. Establish energy efficiency protocols for building custodial and cleaning services and other employees, including efficient use of facilities, such as turning off lights and computers, thermostat use, etc. b. Incorporate energy management software, electricity monitors, or other methods to monitor energy use in municipal buildings, where feasible.	ADMIN / PW	Near-Term	Medium	1	Reduce energy use in municipal buildings by 5%.
WR-C1	**Commercial Organic Waste.** Work with Zero Waste Marin, the Town's waste hauler, and nonprofits such as Extra Food to divert commercial organic waste from the landfill through recycling,	PW	Ongoing	Medium	151	Outreach to covered businesses. 30% are correctly sorting and disposing all organic waste.

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	TOWN STAFF TIME	GHG REDUCTION ($MTCO_2e$)	KEY METRICS
	composting, and participation in waste-to-energy and food recovery programs.					
	a. Conduct outreach and education to businesses subject to State organic waste recycling mandates (AB 1826 and SB 1383) and encourage or enforce compliance with the law.	ADMIN	Ongoing	Medium		
	b. Refer new and major remodel commercial and multi-family residential project proposals to the Town's waste hauler for review and comment and require projects to provide adequate waste and recycling facilities and access as feasible.	PLN	Ongoing	Low		
	c. Encourage and facilitate commercial and multi-family property owners to require responsible use of on-site recycling facilities in lease and rental agreements and to train and regularly evaluate janitorial, landscape, and other property management services.	ADMIN/PW	Ongoing	Low		
	d. Assess capacity of existing food recovery programs, expand existing food recovery infrastructure if needed, monitor commercial generators for compliance, and conduct education and outreach.	ADMIN/PW	Near-Term	Medium		
WR-C2	**Residential Organic Waste.** Work with Zero Waste Marin, the Town's waste hauler, and other organizations to educate and motivate residents to utilize	ADMIN	Ongoing	Medium	508	50% diversion of residential organic waste.

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	TOWN STAFF TIME	GHG REDUCTION ($MTCO_2e$)	KEY METRICS
	curbside collection services and home composting for food waste.					
WR-C3	**Construction & Demolition Debris and Self-Haul Waste.**				59	75% diversion of C&D waste.
	1. Require all loads of construction & demolition debris and self-haul waste to be processed for recovery of materials as feasible.	PLN	Ongoing			
	3. Investigate creation of an ordinance requiring deconstruction of buildings proposed for demolition or remodeling when materials of significant historical, cultural, aesthetic, functional or reuse value can be salvaged.	PLN	Mid-Term	Medium		
WR-C4	**Mandatory Waste Diversion.** Adopt an ordinance requiring all commercial and residential accounts to subscribe to and fully participate in waste diversion activities, including recycling and organics collection provided by the Town's waste hauler. Consider including phased implementation of the ordinance, penalties, and practical enforcement mechanisms.	ADMIN	Near-Term	Medium	556	Increase commercial AB1826 compliance rate to 50% and increase residential organic waste diversion rate to 80% by 2030.
WR-C5	**Waste Processing Franchise Agreement and Infrastructure.** 1. Review and revise the Town's franchise agreement with its waste hauler to ensure adequate recycling and composting capacity is available	ADMIN	Long-Term	High	532	Increase diversion rate of recoverable organic waste to 95% by 2030.

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	TOWN STAFF TIME	GHG REDUCTION ($MTCO_2e$)	KEY METRICS
	and waste reduction and diversion targets are met. 2. Ensure organic waste collection service (including green waste, food waste, fibers, and manure) that complies with SB 1383 regulations is provided to all residents and businesses. 3. Conduct a feasibility study (including cost estimate and estimated GHG reduction metrics) and consider investing in new solid waste processing infrastructure to remove recoverable materials (recycling and organics) from the waste stream and reduce contamination. 4. Require regular residential and commercial waste audits and waste characterization studies to identify opportunities for increased diversion and to track progress in meeting targets.					
WR-C6	**Extended Producer Responsibility.** 1. Encourage the State to regulate the production and packaging of consumer goods and take-back programs. 2. Encourage on-demand product and food delivery services to reduce packaging waste and investigate requirements and incentives for same through ordinance and/or engagement campaigns.	ADMIN	Medium-Term	Low	n/a	Actions taken.

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	TOWN STAFF TIME	GHG REDUCTION ($MTCO_2e$)	KEY METRICS
WR-C7	**Inorganic Waste.**				n/a	Actions taken.
	1. Promote reuse, repair, and recycling of inorganic materials, and encourage reduced use of packaging and single use items through engagement campaigns.	ADMIN	Near-Term	Low		
	2. Consider adopting a Reusable Foodware Ordinance.	ADMIN	Near-Term Ordinance is being considered by Town Council	Medium		
WR-M1	**Waste from Town Operations.** Increase opportunities to reduce waste at Town facilities. 1. Embark on an educational and social marketing-based campaign to increase recycling, composting, reuse, and waste reduction at Town facilities. 2. Conduct periodic waste audits of Town facilities to understand where opportunities for increased diversion lie and to track progress.	ADMIN/PW	Near-Term	Medium	24	75% of recoverable organic waste currently landfilled is diverted by 2030.
WC-C1	**Community Water Use.** Reduce indoor and outdoor water use in residential and commercial buildings and landscaping. 1. Work with the water district and other organizations to promote water conservation programs and incentives.	PLN	Ongoing	Low	2	1% annual water consumption reduction.

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	TOWN STAFF TIME	GHG REDUCTION ($MTCO_2e$)	KEY METRICS
	2. Educate residents and businesses about local and State laws requiring retrofit of non-compliant plumbing fixtures during remodeling and at resale. 3. Ensure all projects requiring building permits, plan check, or design review comply with State and water district regulations. 4. Encourage the installation of greywater and rainwater collection systems and the use of recycled water where available through ordinance and/or engagement campaigns.					
WC-M1	**Municipal Water Use.** Reduce indoor and outdoor water use in municipal facilities and operations. 1. Replace high water use plants and inefficient irrigation systems with water-efficient landscaping. 2. Replace inefficient plumbing fixtures with high-efficiency fixtures.	PW	Ongoing	Medium	0	12% reduction in water use.
	3. Use recycled water as available and practicable for parks and outdoor landscaping.	PW	Long-Term	High		
S-C1	**Urban Forest.** Increase carbon sequestration and improve air quality and natural cooling through expansion and enhancement of green spaces and increasing appropriate (e.g., native, drought-resistant, fire resilient) tree cover, other vegetation, and healthy soils in Tiburon.				n/a	Actions taken.

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	TOWN STAFF TIME	GHG REDUCTION ($MTCO_2e$)	KEY METRICS
	1. Plant and maintain additional trees on Town-owned land, including public parks, open space, medians, and rights of way, where feasible.	PW	Long-Term	Medium		
	2. Review parking lot landscape standards to maximize tree cover, size, growth, and sequestration potential. 3. Regulate and minimize removal of large (heritage) trees and require planting of replacement trees and/or fees to support mitigation planting in Tiburon's parks and open space areas. Consider potential loss of carbon sequestration when removing trees and establishing tree replacement ratios.	PLN	Near-Term/ ongoing	Low		
	4. Require that the site planning, construction, and maintenance of new development preserve existing healthy trees and native vegetation on site to the maximum extent feasible. Replace trees and vegetation not able to be saved with native/appropriate species.	PLN	Ongoing	Medium		
	5. Encourage community members to plant native/appropriate trees on private land. Consider creating a tree giveaway event or providing lower-cost trees to the public through a bulk purchasing program.	ADMIN/PLN/PW	Mid-Term	Medium		
	6. Encourage the creation of no-till community gardens and healthy soil management on public lands by	ADMIN/PLN/PW	Mid-Term	Medium		

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	TOWN STAFF TIME	GHG REDUCTION ($MTCO_2e$)	KEY METRICS
	community groups and private lands by individual homeowners.					
	7. Provide information to the public, including landscape companies, gardeners, and nurseries, on carbon sequestration rates, drought tolerance, and fire resistance of different tree species and vegetation, as well as healthy soil management.	ADMIN/PLN	Near-Term	Medium		
	8. Collaborate with fire agencies and Marin County Open Space District, Marin Municipal Water District, and private property owners, to manage fire-prone trees and invasive species in the open space for forest health, water cycling, soil organic matter, and reduction of fuel load.	ADMIN/PLN	Near-Term	Medium		
	9. Require new development, redevelopment, and infrastructure projects to implement best management practices as feasible, including low-impact development techniques, the minimal use of non-pervious surfaces in landscape design, and the integration of natural features into the project design, to naturally filter and biodegrade contaminants and to minimize surface runoff into drainage systems and creeks.	PLN/PW	Ongoing	Low		
S-C2	**Carbon Sequestration.** Increase carbon sequestration in developed landscapes and open/natural areas.				n/a	Actions taken.

CODE	STRATEGY/ACTION	LEAD DEPARTMENT/ OFFICE	TIME FRAME	TOWN STAFF TIME	GHG REDUCTION ($MTCO_2e$)	KEY METRICS
	1. Encourage and support composting to develop healthy, carbon-rich soils.	PLN & ADMIN	Near-Term	Low		
	2. Manage parks and open spaces to steadily increase carbon in vegetation and soil. 3. Manage trees and invasive species in the open space for forest health, water cycling, and organic soil matter, as well as reduction of fuel load. 4. Work with the County to explore opportunities for carbon drawdown in aquatic environments, such as tidal wetlands, gullies, and bay.	PW / PLN	Long-Term	High		
S-C3	**Carbon Offsets.** Reduce the impact of greenhouse gas emissions through the purchase of carbon offsets. 1. Identify and partner with local non-profit organizations and/or businesses that actively sequester carbon in their activities (e.g., climate-smart habitat restoration or regenerative agriculture like the Marin Carbon Project) to promote a carbon offset program. 2. To close any gap that remains between actual emissions and the reduction target, the Town will consider purchasing carbon offsets in 2030, and annually thereafter, to achieve a 50% reduction below 1990 levels in communitywide emissions.	ADMIN	Long-Term	Low	2,263	Amount of offsets purchased in 2030. Actions taken.

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	Offsets should be purchased from a local program that sequesters carbon in Marin County, if available. 3. Encourage community members to purchase high quality carbon offsets that have been vetted and can be verified by credible authorities or organizations to reduce their carbon footprint through engagement campaigns. 4. Consider partnering with a local non-profit organization to promote an effective and reliable carbon offset program. 5. Focus on offsetting emissions that are difficult to mitigate otherwise, such as airplane travel.					
SA-C4	**Building Materials** Decrease GHG emissions associated with building materials and increase the use of building materials with the highest potential for carbon storage. 1. Encourage use of sustainable, climate-friendly building materials that store more carbon dioxide than is released in their production, through agency partnerships and engagement campaigns.	PLN	Mid-Term	Low	n/a	Outreach materials developed; type and frequency of outreach.
CE-C1	**Community Education.** Work with community-based organizations, such as Resilient Neighborhoods, to educate and motivate community members to start or continue to reduce GHG emissions in their homes, businesses, transportation	ADMIN / PLN	Near-Term	Low	960	25 Tiburon households graduate from the Resilient Neighborhoods program each year

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	mode choices, and other activities, and increase community resilience through community-building activities. 6. Beginning in Fiscal Year 2023-2024, provide annual funding to Resilient Neighborhoods (RN) to graduate 25 Tiburon households each year over existing levels. 7. Utilize the Town's website, newsletter, social media channels, and counter handouts to publicize the RN program. 8. Partner with the Ranch to offer and promote the RN program as part of their community class offerings. 9. Request the library, schools, and homeowners' associations to distribute RN program flyers. **10.** Engage local community groups to sign up households for the RN program.					between 2023 and 2030. Actions taken. Type and frequency of outreach.
CE-C2	**Community Outreach.** Implement a communitywide public outreach and behavior change campaign to engage residents, businesses, and consumers around the impacts of climate change and the ways individuals and organizations can reduce their GHG emissions and create a more sustainable, resilient, and healthier community. Emphasize and encourage citizens' involvement in reaching the community's climate goals, including innovative means of tracking milestones and comparing	ADMIN / PLN	Mid-Term	Medium	n/a	Actions taken. Outreach materials developed; type and frequency of outreach.

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	Tiburon's performance with other communities and with state, national, and global benchmarks.					
	7. Conduct outreach to a wide variety of neighborhood, business, educational, faith, service, and social organizations. 8. Inform the public about the benefits of installing energy and water efficient appliances and fixtures, electrifying homes and commercial buildings, installing solar energy systems, and purchasing 100% renewable electricity. 9. Inform the public about the benefits of using carbon-free and low-carbon transportation modes, such as driving electric vehicles, walking, bicycling, taking public transportation, and ridesharing. 10. Partner with MCE, PG&E, MMWD, Mill Valley Refuse, Transportation Authority of Marin, Marin Transit, Golden Gate Transit, and other entities to promote available financing, audits, rebates, incentives, and services to the Tiburon community. 11. Utilize the Town's website, newsletter, recognition programs, and other forms of public outreach. 12. Participate in countywide outreach and education efforts, such as Drawdown Marin.	ADMIN/PLN	Ongoing	Medium		

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CE-C3	**Advocacy.** Advocate at the regional, state, and federal levels for policies and actions that support the rapid transition to GHG-free energy sources, electrification of buildings and the transportation fleet, and other impactful measures to rapidly reduce greenhouse gas emissions.	ADMIN	Long-Term	Low	n/a	Actions taken.
CE-C5	**Green Businesses.** Encourage local businesses to participate in the Marin County Green Business Program.	ADMIN	Near-Term	Low	n/a	Number of participating Tiburon businesses.
CE-C5	**Innovation and Economic Development** Participate in local economic development and innovation working groups to explore public-private partnerships and to develop ways to decarbonize the local economy while spurring sustainable enterprise and equitable employment.	ADMIN	Mid-Term	Low	n/a	Actions taken.
IM-C1	**Annual Monitoring.** Monitor and report on the Town's progress annually. Create an annual priorities list for implementation using the Implementation Table in Appendix B.	PLN	Near-Term/ annually	Medium	n/a	Progress reports and priorities list.
IM-C2	**Update GHG Emissions Inventories.** Update the greenhouse gas emissions inventory for community emissions annually.	PLN	Near-Term/ annually	Low	n/a	GHG emissions inventory reports.
IM-C3	**Funding Sources.** Identify funding sources for recommended actions, and pursue local, regional, state, and federal grants as appropriate. Investigate	ADMIN / PLN	Long-Term	High	n/a	Funds secured.

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	creation of a local carbon fund or other permanent source of revenue to implement the Climate Action Plan.					
IM-C4	**Update the Climate Action Plan.** Update the Climate Action Plan regularly to incorporate new long-term reduction targets and strategies to meet those targets.	PLN	Long-Term	Medium	n/a	Updated plan.
IM-C5	**Project Compliance Checklist** Develop a project compliance checklist to used when reviewing development proposals, use permit applications, and building permits to ensure compliance with Climate Action Plan measures.	PLN	Near-Term	Low	n/a	Develop checklist and post on website.
IM-C6	**Sustainability Coordinator** Consider creating a part-time or shared full-time Sustainability Coordinator position or contracting with a consultant to implement the CAP.	ADMIN	Near-Term	Medium	n/a	Hire Coordinator/ contractor.