TOWN OF FAIRFAX
STAFF REPORT
SPECIAL JOINT MEETING OF
TOWN COUNCIL AND CLIMATE ACTION COMMITTEE
March 17, 2021

TO: Mayor and Town Council

FROM: Garrett Toy, Town Manager

SUBJECT: Conduct joint study session with the Climate Action Committee to discuss the updated Climate Action Plan (CAP)

RECOMMENDATION

Conduct the study session to discuss the proposed updated Climate Action Plan.

BACKGROUND

At their March 3, 2021 meeting, the Town Council received the draft CAP and a brief presentation in anticipation of tonight's joint study session with the Climate Action Committee to discuss the CAP.

The Town Council is not taking any formal action regarding the CAP this evening, as this is only a study session.

FISCAL IMPACT

None at this time.

ATTACHMENT

Draft Climate Action Plan (dated February 22, 2021)

FAIRFAX

CLIMATE ACTION PLAN 2030

Draft of February 22, 2021

ACKNOWLEDGEMENTS

LAND ACKNOWLEDGEMENT

Fairfax Town Council acknowledges that we are located on the un-ceded ancestral lands of the Coast Miwok people of present-day Marin County. We honor with gratitude the land itself, and all of its ancestors: past, present and emerging.

FAIRFAX TOWN COUNCIL

Bruce Ackerman
Barbara Coler
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Renee Goddard
Stephanie Hellman

FAIRFAX CLIMATE ACTION COMMITTEE

Walt Vernon
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FAIRFAX TOWN STAFF

Garrett Toy, Town Manager
Ben Berto, Director of Planning and Building Services

COMMUNITY PARTNERS

Sustainable Fairfax
Resilient Neighborhoods

O'ROURKE & ASSOCIATES

Christine O'Rourke, Principal

WHAT YOU CAN DO

COMMUNITY OUTREACH AND ENGAGEMENT	
	• Learn about and reduce your carbon footprint by taking the actions identified in this Plan. • Complete a Resilient Neighborhoods program with a team of community members. • Create a zero-carbon strategy and timeline for your household.
TRANSPORTATION-*37% of potential reductions*	
	• Drive an all-electric or plug-in hybrid vehicle or motorcycle. • Bike, walk, scooter, skateboard or take transit as much as possible. • Reduce the number of miles you drive by working from home when possible. • Shut off your gas-powered vehicle when idling.
RENEWABLE ENERGY & ELECTRIFICATION-*34% of potential reductions*	
	• Switch to MCE Deep Green or PG&E Solar Choice 100% renewable electricity. • Install a solar energy system and/or battery storage on your home and/or business. • Replace appliances that use natural gas with ones that use electricity. • Investigate efficient heat pump technology when replacing water heaters and home heating and cooling systems.
ENERGY EFFICIENCY-*5% of potential reductions*	
	• Upgrade insulation, seal leaks, and install a programmable thermostat. • Have an energy assessment done for your home and/or business. • Purchase Energy Star appliances and equipment. • Replace indoor/outdoor lights with LED bulbs and turn off when not in use.
WASTE REDUCTION-*6% of potential reductions*	
	• Evaluate every purchase and buy only what you need. • Avoid food waste and put food scraps in green bin, compost or worm bin. • Purchase locally produced items and shop locally whenever possible. • Recycle and/or repair as much as you can and donate reusable items.
WATER CONSERVATION-*<1% of potential reductions*	
	• Buy energy-efficient dishwashers and clothes washers and only run them when full. • Install low water flow faucets, showerheads, and toilets. • Replace water intensive landscape with drought-tolerant and fire-resistant plants. • Install a drip irrigation system; capture and utilize rain water.

PREFACE: A Vision for Fairfax in 2030

Visualize what Fairfax could feel like in 2030, the year that our Climate Emergency Resolution says we will achieve carbon neutrality…

In 2030, Fairfax takes pride, as it always has, in leading by example. Our vibrant and beautiful town and surroundings are more the focus of people's lives than the personal consumption that drove the last century.

Almost every home in Fairfax, whether owner-occupied or rented, has been upgraded with insulation, efficient electric appliances, solar generation and storage of energy wherever possible. The Town government took the lead on this, creating a local microgrid, and running all its buildings and vehicles on renewable energy.

Meanwhile the state-wide electric grid has become 100% renewable, with storage so that fossil fueled generation is no longer required for nighttime or winter use. MCE, which Fairfax was so instrumental in creating, is an example for the world.

Transportation has taken a major and welcome shift away from the old paradigm of individually-owned fossil-fueled vehicles clogging the roads and parking in every available space. Now most everyone regularly uses shared electric transportation, transit, bicycles and electric bikes. The Town center no longer looks like a parking lot, our narrow streets are far more passable, the town is quieter, the air is cleaner, and people love meeting each other as they move about. We've reclaimed our community.

The town has done a great deal to become resilient – we eat locally grown food, we can keep our electricity on when the larger grid fails, and of course we're leaving fossil carbon in the ground. We're prepared for fires, and relieved to see the wildland fire seasons starting to become less destructive. Taking good care of our water, we can deal with the variability in rainfall that we're going to have to live with for decades to come as we draw down the carbon in the atmosphere.

Our collective progress on so many of these fronts is known, followed and discussed by all citizens. A sense of possibility and excitement has replaced the denial, fatalism and dread that was so sadly present back in 2020, the lowest point in our nation's history. We all know that it took far too long for society to wean itself off fossil fuels and rampant consumerism, but we're on a strong and joyous path of healing now.

Section 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 COVID-19 pandemic. The Town of Fairfax has long been dedicated to environmental leadership, and this plan continues that legacy by incorporating new ideas and ambitious targets. In fact, in the face of this urgency, the Fairfax Town Council passed a resolution in March of 2019 declaring a Climate Emergency and set a goal of zero emissions by 2030, in alignment with the latest report from the Intergovernmental Panel on Climate Change (IPCC). Working together, we are making a difference for our collective future.

The following plan outlines a path towards reducing local greenhouse gas (GHG) emissions through the year 2030. This policy guidance is invaluable. Annually, the Fairfax Climate Action Committee, in collaboration with Town staff and the Town Council, will develop an annual action plan and requested funding budget for actions to be taken that year, using this plan for guidance and incorporating best available resources, technology, and funding sources.

Social Equity

It is important to note first that 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 Fairfax acknowledges disadvantaged communities have existed and still exist outside of and within Marin County and the Town of Fairfax seeks to design and implement solutions relevant to all peoples. This requires internal and external on-going work to normalize, organize, and internalize equity principles and approaches.

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] When considering regulations and incentives to promote actions that reduce GHG emissions, it's important to consider the effect on all Fairfax residents and businesses. For example, financial incentives to replace natural gas appliances with electric appliances may only be available to those with the means to buy new appliances. It is important to develop programs that address this disparity so that no one is excluded.

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

[1] *PolicyLink, "The Equity Manifesto."*

include our diverse community members and business interests in the development and implementation of the strategies in this plan.

In 2020 Fairfax established the Racial Equity and Social Justice Committee (RESJ), which could play a role in ensuring that equity is centered throughout this major work.

What Is a Climate Action Plan?

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

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

This CAP is grounded in the Town of Fairfax's understanding that climate change is already impacting California and the world and will continue to affect our town's residents and businesses for the foreseeable future, as well as other communities around the world. The Town of Fairfax 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.

This CAP, at its core, 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.

Climate Action Globally and Locally

In December 2015, all the members of the United Nations Framework Convention on Climate Change (UNFCCC)[2] 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 pre-industrial 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."

[2] As of May 2019, 194 states and the European Union have signed the Agreement. 185 states and the EU, representing more than 88% of global greenhouse gas emissions, have ratified or acceded to the Agreement, including China, the United States and India.

The Intergovernmental Panel on Climate Change's (IPCC) Special Report on Global Warming of 1.5 Degrees Celsius (October, 2018) to the UNFCCC found that to avoid long lasting or irreversible climate change impacts and stay below 1.5º C warming since the industrial era, global net human-caused emissions of carbon dioxide (CO2) need to fall by about 45% from 2010 levels by 2030[3], reaching around 2050 'net zero' emissions (carbon emissions balanced with carbon removal from the atmosphere). In addition, roughly 500 billion tons of human-caused CO2 emissions already in the atmosphere must be removed over the decades ahead. The report finds that this would require "rapid and far-reaching" transitions in land, energy, industry, buildings, transport, and cities. Per the IPCC, every bit of warming matters, every action matters, every year matters, every choice matters and every fraction of a degree *less* of warming will reduce the toll on humans, ecosystems and economies.

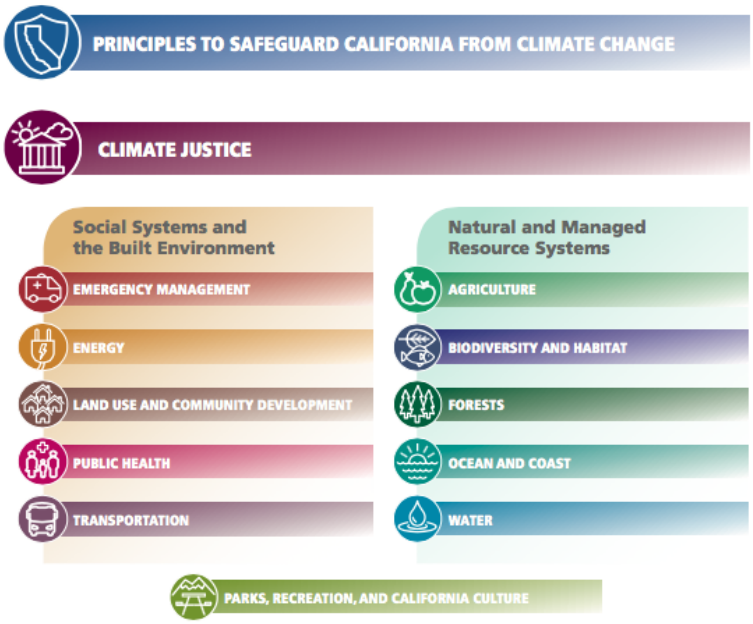
In California, climate policy objectives initially proposed by Governor Jerry Brown, were codified through passage of Senate Bill (SB) 32 (Pavley, Chapter 249, Statutes of 2016) and SB 1386 (Wolk, Chapter 545, Statutes of 2016). SB 32 commits California to reducing GHG emissions 40% below 1990 levels 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). While California is still working through the details of what this means and how it can be achieved, it will require both technological solutions and 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

[3] ~68% from 1990 levels based on 2010 global CO2 emissions of 33.5 Gt and 1990 global CO2 emissions of 22.29 Gt (see more here). Global CO2 emissions reached 37.1 Gt in 2018, up 2.7% compared to the year before (see more here).

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.

Going beyond the ambition of the State of California, the Town of Fairfax is setting a target of 100% GHG emissions reduction by the year 2030 (from a 2005 baseline or 45% below 1990 levels), establishing a goal of community-scale carbon neutrality by 2030, and creating a "Framework for a Post-Carbon Community" to guide the Climate Action Plan update process. A "post-carbon community" can be defined as one that provides for economic and social opportunity across all ages, cultures, and abilities without producing net greenhouse gas emissions nor contributing to ecosystem degradation.



By adopting ambitious greenhouse gas emissions reductions and developing sequestration targets as well as measurable adaptation, hazard mitigation and ecological conservation measures, our community will continue to demonstrate local climate action leadership while aligning with the urgency of recent IPCC climate science findings, the Paris Agreement and the vision of California Executive Order B-55-18.

Fairfax's Climate Actions

The adoption of the Fairfax General Plan in 2012 has helped preserve a livable, walkable community with abundant open space, and led to the creation of the first Climate Action Plan and the Climate Action Committee. On the non-governmental side, Sustainable Fairfax has led a host of initiatives, events, and fostered education for many years.

Fairfax has long been a leader in moving toward zero waste, with mandatory use of curbside collection of recyclables and organic waste; visionary actions to reduce packaging in retail and food take-out; mandatory construction waste recycling; and a host of other ongoing actions.

The Town has long waived permit fees for solar and EV charger installations, has led in allowing/encouraging greywater systems and water catchment, and converted its streetlights to LED. A PACE program also helps homeowners increase energy efficiency.

The Safe Routes to Schools program was pioneered in Fairfax, and has been replicated in communities nationwide. Bicycling is used widely in the town for transportation, cargo carrying, and recreation thanks to the ongoing improvements in the Bicycle and Pedestrian Master Plan.

Fairfax was a strong lead in the creation of MCE Clean Energy, beginning with a large part of the supporting legislation, AB117, being written in the town.

A detailed compilation of Fairfax's actions related to climate may be found on the Climate Action Committee website: Fairfax Climate Action Scorecard.

We support the following guiding values and strategies as the framework for achieving carbon neutrality and a post-carbon economy, as created by the City of Fremont, CA.

FRAMEWORK FOR A POST-CARBON COMMUNITY

Guiding Values

- **Equity & Access**: Ensure that all people have the opportunity to benefit equally from climate solutions, while not taking on an unequal burden of climate impacts.
- **Efficiency & Innovation:** Promote the efficient use of resources and the adoption of clean and climate-smart technologies and techniques.
- **Human Health & Wellness:** Safeguard and enhance the ability of the community to live, work, play, connect, and thrive in a healthy social and physical environment.
- **Ecosystem Health & Green Infrastructure:** Protect and restore natural and working ecosystems to mitigate the worst impacts of climate change while also providing nature's benefits from clean air and water to flood mitigation, carbon sequestration and biodiversity conservation.
- **Resiliency & Capacity Building:** Provide education and training on the opportunities offered by a more resilient future and encourage sustainable behaviors across all sectors of the community.

Key Strategies

- **Clean & Renewable Power**: Deploy and efficiently use clean, renewable, and locally sourced electricity generated onsite or transmitted through the power grid.

- **Electrification & Fossil Fuel Phase-Out**: Upgrade and replace carbon-intensive, fossil fuel-based infrastructure and combustion power throughout the transportation and building sectors with clean electric power.
- **Carbon Sequestration**: Drawdown carbon dioxide and other greenhouse gases from the atmosphere through ecological and/or technological methods to capture and store in plants, soils, water systems, and other solid, long-term forms.
- **Mobility & Connectivity:** Develop and enhance safe, multimodal, accessible, equitable, intelligent, and clean motorized and non-motorized travel options, transit modes, transportation infrastructure, and community connectivity.
- **Resource Conservation & Elimination of Waste:** Conserve natural and manufactured resources by means of the responsible production, consumption, reuse, and recovery of products, packaging, and materials.
- **Restorative Ecology & Green Infrastructure:** Restore, rehabilitate, and repurpose degraded, damaged, or destroyed ecosystems and habitats through active interventions. Incorporate green infrastructure and ecosystem services into community design.
- **Climate Adaptation & Resilience:** Prepare for, limit, learn from, and adapt to the negative effects of climate change through proactive and holistic planning and response at infrastructural, ecological, cultural, and institutional levels.

Adaptation and Community Resilience

Actions to address climate change are divided into two categories: mitigation, the reduction of greenhouse gases and other causes of climate change, and adaptation, actions to protect people and places from the effects of climate change. This Climate Action Plan addresses the former but as we know all too well, worldwide and certainly in California and Marin we are already experiencing the effects of climate change. Every year, we hear about more wildfires, more heat waves, longer droughts, more intense storms, less snowpack, and less fresh water. Annual average air temperatures have already increased by about 1.8 °F in California, and that number will likely double even if the world can reduce emissions 80% by 2050.

Marin is working to adapt to these impacts of climate change, including safety risks from the increased likelihood of wildfires and landslides, health impacts from heat exposure and wildfire smoke, negative impacts to agriculture, species, and natural resources, flooding from sea level rise and more intense storms. Fairfax needs to prepare as well. Although sea level rise has no direct impact on the Town of Fairfax, the indirect impact will be huge. Most Fairfax residents commute out of town to their places of employment and also for recreation, an option which may be severely restricted with sea level rise and an increasing number of days of flooding. In fact, all of Marin's communities will likely need to welcome "climate refugees."

According to a County press release on January 13, 2021, "the County of Marin has been working to update its Local Hazard Mitigation Plan (LHMP), a document that helps mitigate the impacts of natural disasters. The LHMP lays out a process to prepare for, and lessen the impacts of, specified natural hazards that are most likely to impact Marin, such as earthquakes, wildfires, floods, debris flows, wind damage, and tsunamis. The most recent LHMP and was broadened to include local towns, cities, and special districts as planning partners. Staff from the Marin County Sheriff's Office of Emergency Services, the Marin County Fire Department, the Marin County Community Development Agency and the Marin County Department of Public Works are starting work on the next plan, slated to be adopted in 2023. Keeping the plan updated keeps Marin jurisdictions eligible for Federal Emergency Management Agency (FEMA) funding both before and after emergencies. FEMA's grant program helps pay for LHMP planning.

"There have been a lot of advances in science and changes to environmental conditions in recent years, and that's why these plans are continually updated every five years as required by law," said Community Development Agency Planner Heather Dennis. "For instance, we keep applying lessons learned from every wildfire, and we have additional mapping of risks that weren't available for our last LHMP update." All of Marin's towns and cities will participate in the plan's update along with the North Marin Water District and the Marin County Flood Control and Water Conservation District. The multijurisdictional partnership was formed to pool resources and create a uniform hazard mitigation strategy that can be applied consistently to the defined planning area and used to ensure eligibility for specified grant funding success."

While this CAP contains some measures that address adaptation, a more complete plan for infrastructure, goals, policies and programs needs to be developed countywide, in collaboration with Marin's municipalities and the County. On September 11, 2020 the 2019-2020 Marin County Civil Grand Jury issued their report, "Climate Change: How Will Marin Adapt?" This report details six recommendations including the convening of "a multi-jurisdictional task force charged with developing a single, comprehensive multi-jurisdictional adaptation strategy for all of Marin." It also calls on the Board of Supervisors to form a new Office of Sustainability and Resilience devoted to climate change mitigation and adaptation, with a centralized grant-seeking function. Additionally, the report seeks support for the broadening of the Marin Climate & Energy Partnership (MCEP), from each of its members, of which Fairfax is one, for support in overall climate change planning efforts. The Town of Fairfax looks forward to working collaboratively toward any of these recommended actions and initiatives if they develop over the next few years.

Additionally, California Government Code Section 65302(g)(4), requires that cities and counties update their General Plan Safety Elements to address climate adaptation and resiliency strategies across the full breadth of hazard and safety issues associated with climate change. The Town of Fairfax will include these considerations in any updating of the Safety Element and/or the General Plan.

Building local community resilience is key in these times. Numerous activities in Fairfax are addressing this need. For instance, there are currently 9 Firewise communities in Fairfax, working to create defensible space around hardened homes, with evacuation maps supporting the need to exit to community refuge areas or to designated locations in the event of a wildfire, emergency, or other disaster requiring evacuation. Also, a nascent neighborhood organizing program is underway to support the creation of NRGs, Neighborhood Response Groups, with block captains or area leads who gather resident information and assist in the education and preparedness of the community for all types of disasters. Resilience means the ability to recover from or adjust easily to misfortune or change. Preparing for and dealing with climate change will certainly enhance our community's resilience.

[INSERT PHOTO]

Section 2: REDUCING GREENHOUSE GAS EMISSIONS

Fairfax is located in Marin County, one of the most affluent counties in California and the United States. With wealth comes purchasing power. The more we collectively consume, the higher our GHG emissions are and the more significant our impact on the planet. Currently, local governments can measure GHG emissions two ways: production-based or consumption-based.

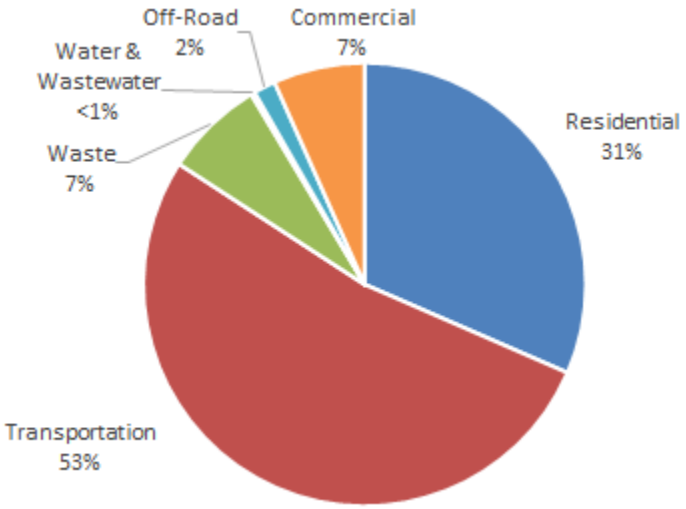
Traditionally, per the US Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (ICLEI USA), local governments measure GHG emissions occurring within their geographic boundaries, known as community emissions, or production-based. A discussion of consumption-based emissions will follow this section.

To measure community emissions, local governments collect data on activities in the following sectors:

- Transportation–100% of trips that take place entirely within Fairfax, 50% of trips that start elsewhere and end in Fairfax or start in Fairfax and end elsewhere
- Energy–residential and commercial
- Off-Road Equipment–lawnmowers, construction equipment, agricultural equipment etc.
- Water & Wastewater–processed, treated, and delivered
- Waste–disposed at landfills in the County and waste sent to outside facilities

In the Town of Fairfax, as shown in Figure 1, the majority of community emissions come from vehicle trips generated by our residents and businesses. We generated 40,044 metric tons of carbon dioxide equivalents ($MTCO_2e$; includes CO2 and other warming GHG) in 2005. By 2018, emissions had dropped to 29,943 $MTCO_2e$, a 25% reduction. This is well below the State and locally-adopted target for Fairfax, which is 15% below baseline (2005) emissions by 2020. While emissions declined in all sectors, the largest reductions were due to energy conservation and efficiency, a reduction in the carbon intensity of electricity, and improvements to vehicle fuel efficiency. Emissions from Town operations, which make up less than 1% of community-wide emissions, fell 45% by 2016. For more details, see the Town's *Greenhouse Gas Inventory for Community Emissions for the Year 2018*.

FIGURE 1: COMMUNITY EMISSIONS BY SECTOR, 2018



Consumption-Based Emissions Inventory (CBEI)

In addition to the sectors outlined above, which measure the community emissions that are generated within the town's borders, there are also emissions associated with the goods and services that residents in Fairfax consume. These are referred to as "consumption-based emissions," "embodied emissions" or "life cycle emissions (the overall impact of particular a behavior or activity from production to disposal)." Rather than assessing emissions that are generated within a community or 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 when these activities occur outside the jurisdictional boundary.

Historically, local governments have only included emissions that occur within their boundaries, including emissions associated with the production of goods that will eventually be exported. However, in communities like Marin County (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 Marin jurisdictions continue 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.

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 our purchasing habits contribute to global climate change. A consumption-based emissions inventory includes sources that don't get counted in the typical "in-boundary" 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 2 shows the results of the consumption-based emissions inventory for Fairfax households.

Although this consumption-based inventory is informative, it is not updated regularly and therefore does not provide a useful way to track changes in emissions levels over time. The Fairfax 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. 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 whenever it becomes feasible.

According to this consumption-based inventory, the average Fairfax household generates 41.8 $MTCO_2e$ per year or more than 4 times more than the activity-based emissions inventory of about 8.9 $MTCO_2e$ per household per year (calculated per household based on the Town's community-wide emissions of 29,943 $MTCO_2e$).

In essence, our consumption drives climate change more than anything and although Fairfax is meeting its state targets for strict "activity-based" emissions reductions, we as a community have a long way to go. For more information on this and to see carbon footprints by census tract, visit the SF Bay Area Carbon Footprint Map. To learn how to measure and reduce your household carbon footprint, check out the Resilient Neighborhoods program. The graph below shows the relative impact of all the sources of emissions that make up a household carbon footprint.

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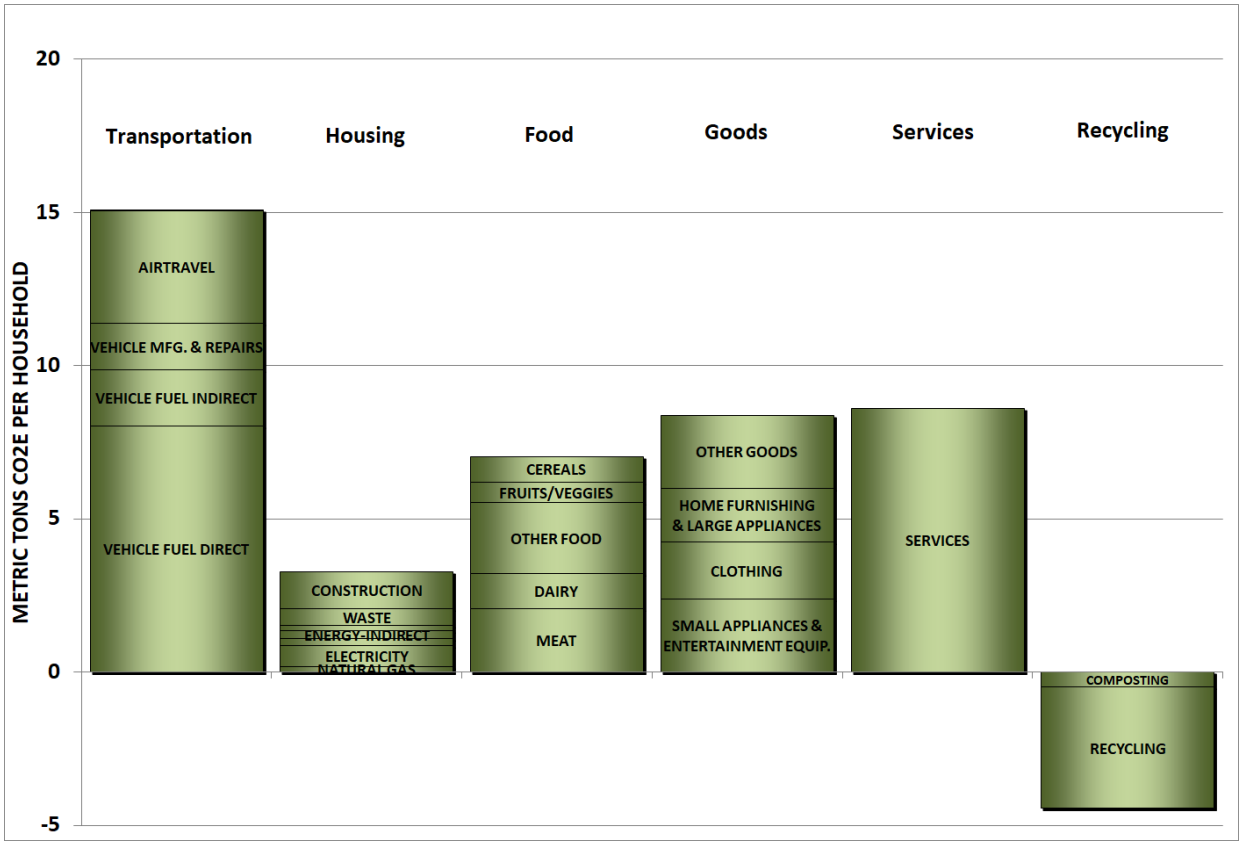
FIGURE 2: AVERAGE FAIRFAX HOUSEHOLD CARBON FOOTPRINT



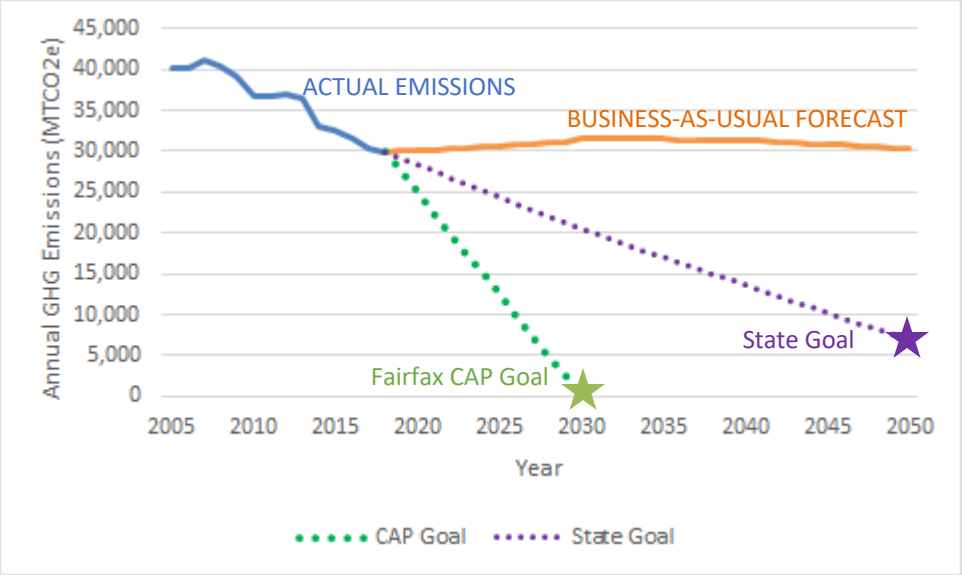
Source: CoolClimate Network

Community Emissions Forecast and Reduction Targets

The CAP 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 increasing 2018 emissions using forecasted changes in population, number of households, and jobs according to projections developed by the Association of Bay Area Governments. Transportation emissions are projected utilizing data provided by the Metropolitan Transportation Commission, which incorporate the vehicle miles traveled (VMT) reductions expected from the implementation of Plan Bay Area 2040 and the Regional Transportation Plan adopted in 2017. Emissions are expected to rise about 5.1% by 2030 and 4.9% by 2040. Although the regional agencies have not made official projections for 2050, adjusting projected 2040 emissions by the California Department of Finance's projection for Marin County population for 2050 suggests emissions will be approximately 30,280 $MTCO_2e$ by 2050 under the BAU forecast.

The CAP establishes targets that exceed the State's goals. Our community's goal is a 100% GHG emissions reduction target by the year 2030 from a 2005 baseline. This means emissions need to drop to 31,484 $MTCO_2e$ by 2030. The community emissions trend, forecast, State targets, and local targets are shown in Figure 3 below.

FIGURE 3: EMISSION TREND, FORECAST AND STATE TARGETS

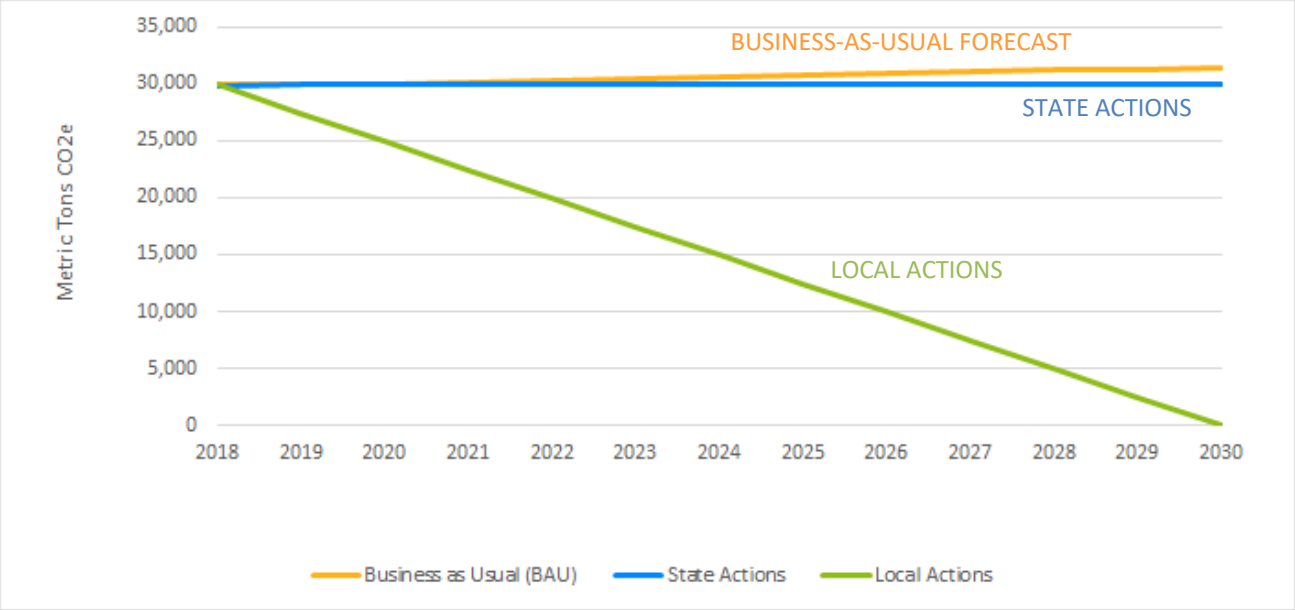


Actions to Reduce Greenhouse Gas Emissions

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

The following sections identify the State and local strategies included in the CAP to reduce emissions in community and government operations. Emissions reductions are estimated for each strategy; combined, they show that our community could reduce emissions 100% by 2030. As shown in Figure 4, State actions represent about 5% of the reduction expected through implementation of Fairfax's CAP, while local actions represent about 95%.

FIGURE 4: CUMULATIVE IMPACT OF GHG REDUCTION STRATEGIES



Summary of State Greenhouse Gas Reductions

The CAP incorporates State reduction strategies that have been approved, programmed and/or adopted and will reduce local community emissions from 2018 levels. These programs require no local actions. They are quantified and deducted from projected Fairfax emissions in order to provide a better picture of what still needs to be reduced at the local level to get to the overall GHG reduction targets. State actions and emissions reductions are shown in Table 1 and detailed in the appendix.

TABLE 1: EMISSIONS REDUCTIONS IN FAIRFAX FROM STATE OF CALIFORNIA ACTIONS

State Action	Emissions Reductions by 2030 ($MTCO_2e$)	% Reductions
Light and Heavy-Duty Vehicle Regulations	1,330	89%
Title 24 Energy Efficiency Standards	129	9%
Renewable Portfolio Standard	37	2%
Total	**1,496**	**100%**

Local Measures to Reduce Greenhouse Gas Emissions

Each of the following sections provide a summary table of local measures and associated GHG reductions, followed by a description of the specific actions we 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 GHG reduction is identified as "not applicable" or "n/a." For example: Community Engagement is essential for success in many of the measures set forth throughout the Plan, but counting savings in this section would then be double-counting savings from other measures such as those in Transportation or Energy. People need to know about a program to take advantage of it, but the actual emissions reductions will come from participating in the program itself. Therefore, the savings is counted for that program.

Summary of Local Strategies

The local mitigation measures, summarized in Table 2 below, achieve greenhouse gas emissions reductions in the community of approximately 29,988 $MTCO_2e$ in 2030.

TABLE 2: EMISSIONS REDUCTIONS FROM LOCAL STRATEGIES

Strategy	GHG Reductions by 2030 ($MTCO_2e$)	% Reductions
Transportation	11,022	37%
Renewable Energy & Electrification	10,321	34%
Energy Efficiency	1,428	5%
Waste Reduction	1,818	6%
Water Conservation	1	<1%
Sequestration	5,398	18%
Total	**29,988**	**100%**

Note: some numbers may be slightly off due to rounding.

These local mitigation measures are detailed in the following sections:

1. Community Outreach and Engagement (O)
2. Transportation (T)
3. Renewable Energy & Electrification (R)
4. Energy Efficiency (E)
5. Waste Reduction (W)
6. Water Conservation (C)
7. Sequestration (S)
8. Implementation and Monitoring (I)

Together, the projected reductions from State and local actions total 31,484 $MTCO_2e$ by 2030, which means the Town will achieve net zero emissions by 2030.

1. COMMUNITY OUTREACH AND ENGAGEMENT (O)

The Fairfax 2030 Climate Action Plan contains actions that the Town, its residents, businesses, schools, faith-based groups and community-based organizations can undertake to reduce our emissions to zero-net carbon by 2030. Much of the success of our plan will depend on informing, educating and motivating our community members and encouraging them to take action on their own, while the Town can compel more comprehensive action through specific programs and by adopting ordinances and regulations. This section, first and foremost, 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.

Educating residents on ways they can reduce their carbon footprint happens in a number of ways and one of those has involved the Town partnering with Resilient Neighborhoods through their free 5-session program that educates participants about strategies and resources to improve home energy efficiency, shift to renewable energy, use low-carbon transportation, conserve water, reduce waste, and adapt to a changing climate. The Town has also partnered with Sustainable Fairfax for many years to motivate residents to reduce, reuse, recycle, compost and address the myriad of actions required to impact climate change.

Our Town will undertake the actions listed below to further engage our community in emissions reductions and conservation efforts to secure a healthy and vibrant Fairfax well into the future.

TABLE 10: COMMUNITY OUTREACH AND ENGAGEMENT MEASURES – FROM THE COMMUNITY AND TOWN GOVERNMENT

ID	Measure	Milestone
O-1	Community Education	# and types of outreach
O-2	Community Outreach	# and types of outreach
O-3	Green Business	# of businesses adopting Green policies
O-4	Advocacy	
O-5	Funding Strategies	

O-1 Community Education. Educate and motivate community members on ways to reduce greenhouse gas emissions in their homes, businesses, transportation modes, and other activities.

- Host workshops and educational events in collaboration with our community-based organizations including the local library and possibly neighboring towns
- Encourage the use of online tools to determine one's household carbon footprint and how to make appropriate reductions through lifestyle changes and household practices

- Encourage the ongoing formation of local Resilient Neighborhood teams
- Collaborate with neighborhood response groups and Firewise USA® communities to inform and publicize the activities and strategies of the Fairfax Climate Action Committee
- Utilize the Fairfax Climate Action Committee website, the Town's website, newsletters, social media, public service announcements and advertisements, recognition programs, presentations, events, and other forms of public education and outreach.
- Educate the public about the environmental benefits of actions such as:
    - purchasing 100% renewable electricity
    - using carbon-free and low-carbon transportation modes and shared transportation
    - electrifying homes and commercial buildings
    - installing solar energy systems
    - installing energy and water efficient appliances and fixtures
    - eating less meat and dairy products
    - growing food at home
    - purchasing locally-produced food

O-2 Community Outreach. Based on A Vision for Fairfax in 2030, implement a communitywide public outreach and behavior change campaign to engage residents, businesses, and educational, faith, social and cultural organizations 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.

- Create and distribute a survey to residents to gain feedback and input on current initiatives and strategies
- Prioritize promotion of programs that have the greatest greenhouse gas reduction potential while utilizing the latest social science on behavior change.
- Emphasize and encourage citizens' involvement in reaching the community's climate goals, including innovative means of tracking milestones (such as the Fairfax greenhouse gas meter) and comparing Fairfax's performance with other communities and with state, national and global benchmarks.
- Partner with MCE, PG&E, MMWD, Marin Sanitary Service, Transportation Authority of Marin, Marin Transit, Golden Gate Transit, SMART, and other entities to promote available financing, audits, rebates, incentives, and services to the Fairfax community.
- Create stories and “shareable content” that can be used by bloggers, businesses, non-profits, social media, and traditional media.
- Use creative methods to engage the public, such as games, giveaways, prizes, contests, simple surveys, digital tools, and “pop-up” events.
- Develop pilot programs using community-based social marketing and other social science-based techniques to effect behavior change.
- Participate in countywide outreach and education efforts, such as Drawdown Marin.

O-3 Green Businesses. Encourage local businesses to implement new and improved existing business practices to reduce GHG emissions

- Work with the Fairfax Chamber of Commerce to encourage local businesses to participate in the Marin County Green Business Program.
- Provide information to businesses about the Marin County Green Business Program including through the business license renewal program.
- Promote businesses in Fairfax who participate in the Marin County Green Business Program.

O-4 Advocacy. Advocate at all levels of government for policies, funding and actions that support the rapid transition to a GHG-free community.

O-5. Funding Strategies. Research and promote innovative funding strategies to support initiatives and goals for an equitable and just transition to a GHG-free world.

[INSERT PHOTO]

2. TRANSPORTATION (T)

37% of potential reductions

The process of transporting ourselves around accounts for more than 50% of our community emissions and individually in Marin, nearly half of our carbon footprint comes from driving gasoline automobiles. Hence driving a zero emissions vehicle (ZEV) can make a substantial difference in addressing climate change. In nearly every way, electric vehicles are simply better than gas-powered cars and the need to transition as soon as possible to the aggressive goal of 100% zero emission vehicles is imperative.

Marin County has been a leader in ZEV adoption-second only to Santa Clara County and Fairfax can become a leader as well. The number of electric vehicle options has increased dramatically in recent years, and promises to continue to grow. As the number of models increases and costs drop, the viability of ZEV's grows steadily, with the electric infrastructure improving as well.

Our plan is to encourage ZEV ownership through public education and incentives in collaboration with programs such as Drive Clean Bay Area. New cars are typically out of the reach of low-income household budgets, but programs that incentivize used EV car purchases through income qualified rebates, and bulk, discount purchasing of new cars are planned across the County and State. The installation of many more EV chargers at multi-residential buildings, businesses, schools, in public parking lots and in low-income areas can also help ensure that the benefits of EV ownership are shared by all.

That said, we can't rely on ZEV's alone to meet our transportation reductions; reducing congestion, encouraging ride-sharing and shared ownership of vehicles, enabling better biking and walking opportunities, and incentivizing public transit all carry co-benefits and can be enjoyed by all. See the excellent book *Three Revolutions: Steering Automated, Shared, and Electric Vehicles to a Better Future*, by Daniel Sperling, for long-range thinking on transportation.

[INSERT PHOTO]

Our community will take the following actions to reduce emissions from transportation sources

TABLE 3: TRANSPORTATION MEASURES TO REDUCE GHG EMISSIONS – FROM COMMUNITY AND TOWN OPERATIONS

ID	Measure	GHG Reduction by 2030 ($MTCO_2e$)
T-1	Zero Emission Vehicles	10,648
T-2	Bicycling	25
T-3	Walking	7
T-4	Safe Routes to School	31
T-5	Public Transit	77
T-6	Carpooling	83
T-7	Traffic System Management and Vehicle Idling	46
T-8	Smart Growth Development*	n/a
	Community Subtotal	*10,648*
T-9	Renewable Carbon Fuels	105
	Town Operations Subtotal	*105*
TRANSPORTATION GHG REDUCTIONS TOTAL		**11,022**

**Emissions reductions due to smart growth development are embedded in vehicle miles traveled projections utilized in the development of the emissions forecast. In order to avoid double-counting, they are not included here.*

T-1: Zero Emission Vehicles

Implement the initiatives below that will result in 100% zero emission vehicles (ZEVs), including plug-in electric vehicles (EVs) and hydrogen fuel cell electric vehicles, used by Fairfax residents, businesses and the Town by 2030. In Marin County, 40% of individual carbon footprint comes from passenger vehicles so switching to an EV, particularly when plugging into 100% renewable electricity, can cut footprint in half.

- **Increase the visibility and awareness of EVs as a necessary transportation option.**
    - Participate with Drive Clean Bay Area's public awareness campaign for benefits of EV ownership, available rebates, preferential utility rates and pricing, and expected electricity costs as compared to gasoline powered transportation, through mechanisms including the Town newsletter, website, and neighborhood social media, and over-the-counter handouts developed by EV organizations, at Town Hall.
    - Promote county wide efforts by Drive Clean Bay Area, MCE, PG&E, and others to provide rebates for new or used electric vehicles and/or charging stations.
    - Seek opportunities to promote EVs at Town events, such as by running a Public Service Announcement during, and including EV/E-Bikes in, the Fairfax Parade.
    - Support Drive Clean Bay Area in coordinating test drive events with local EV dealers, manufacturers, and related non-profit organizations to familiarize residents with EV technology and use these forums to present information about available federal and state incentives which significantly reduce costs.

- Target policies to support new and used ZEVs for income qualified and disadvantaged community members.
- Apply decals to Town EVs upon purchase to promote the Town's use of Zero Emission Vehicles. [Decals available from Drive Clean Bay Area].

- **Fund EV/ZEV strategy and projects while disincentivizing gasoline cars**
  - Investigate a vehicle fee on all gasoline powered vehicles owned or leased by Town residents. The fee could be equal to the cost of procuring offsets for the average emissions for the class of vehicles. (The fees could be calculated as follows: SUV/Truck - gas only; SUV/Truck - hybrid; automobile - gas only; automobile hybrid. E.g., the amount of fee could be 15,000 miles x average mileage of vehicle class x $20/ton CO2e).
    - Adopt an ordinance to become effective in 2025 if possible.
    - Fees could go back into the community via incentive programs that promote zero emissions transportation.

- I**ncrease and accelerate EV use within the Town.**
  - Promote a county-wide effort to require, as practicable, ride hailing companies to utilize zero emission vehicles and to strongly promote ride-sharing.
  - Promote a county-wide effort to deploy county-wide shared electric vehicle and bicycle and/or scooter program. (see T-2 Bicycling)
  - Implement more stringent requirements for pre-wiring new single family and multifamily construction, as well as substantial remodels, for EV chargers. (*see new building ordinances*)
  - Require new and remodeled commercial projects to install a minimum number of electric vehicle chargers for use by employees, customers, and residents.
  - Purchase or lease EVs for Town fleet as vehicles are replaced, to be completed by 2030.
  - Continue to offer streamlined permitting process and waive permit fees for EV charging infrastructure.
  - Affirm that charging spaces designated for EVs count toward meeting minimum parking requirements for business owners and builders.
  - Adopt ordinance to phase out use of all fossil-fueled off-road construction vehicles.

- **Advance an efficient distribution of public charging infrastructure that is optimized for future technologies and EV demand.**
  - Increase the number of public charging stations and locations, taking advantage of all relevant grants, including funds available through TAM, PG&E, MCE, and BAAQMD.
  - Install chargers for Town vehicles.
  - Install EV charging stations for all public parking lot improvements, including parks.
  - Work with MCE, PG&E, and other entities to identify multi-family and workplace charging sites appropriate for available incentive programs.

- Encourage local organizations and workplaces, (e.g., churches, schools, library) to install publicly available charging stations.
- Provide wayfinding signage to public EV chargers and link to existing wayfinding programs.

T-2: Bicycling

Encourage bicycling, e-bikes, and e-scooters as an alternative to automobile travel. Establish and maintain bicycle infrastructure that is consistent with the Town's Bicycle and Pedestrian Plan and Complete Streets policies. Implement the Bicycle and Pedestrian Plan's recommendations to support and expand bicycling.

T-3: Walking

Encourage walking as an alternative to vehicular travel and continue the Fairfax sidewalk improvement program. Establish and maintain pedestrian infrastructure that is consistent with the Town's Bicycle and Pedestrian Master Plan and Complete Streets policies. Implement the Bicycle and Pedestrian Plan's recommendations to support and expand walking.

T-4: Safe Routes to School

Continue to support the Safe Routes to School Program and strive to increase bicycling, scootering, walking, carpooling, and taking public transit to school.

T-5: Public Transit

Support and promote reduced fare-free public transit by taking the following actions (possibly in coordination with neighboring Ross Valley towns):

- Work with Marin Transit and Golden Gate Transit to maximize ridership, including adding more bike spaces on buses.
- Find ways to subsidize use of public transportation for low-income residents.
- Work with SMART, TAM, employers, and others to provide first and last mile programs, such as ride-sharing services or shuttle buses, to maximize utilization of the train.
- Encourage continuation of the "Yellow School Bus" program and student use of regular transit to reduce school traffic.
- Work with other towns to advocate to transit providers and school bus providers to purchase electric buses whenever replacing existing buses.

T-6: Carpooling

- Work with the Transportation Authority of Marin and the Bay Area Air Quality Management District to promote transportation demand programs to local employers, including rideshare matching programs, vanpool incentive programs, emergency ride home programs, telecommuting, and incentives to use transportation other than single occupant vehicles.
- Advocate for implementation of carpooling through ride-hailing apps such as Lyft and Uber.

T-7: Traffic System Management and Vehicle Idling

- Implement signal synchronization and/or transportation network improvements to minimize or eliminate wait times at traffic lights and to reduce congestion through increased traffic flow, in collaboration with neighboring towns when appropriate.
- Encourage drivers and autonomous vehicles to limit vehicle idling through implementing behavior change and engagement campaigns, especially at schools.

T-8: Smart Growth Development

Maintain existing zoning that allows for infill, higher density, and mixed-use development near transit and within walking distance to shopping, schools, and services.

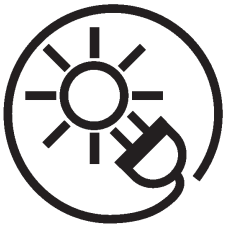
T-9: Renewable Carbon Fuels

Use renewable diesel as a transition fuel in the Town's fleet and encourage the Town's service providers to do the same until vehicles are replaced with zero-emissions vehicles.

[INSERT PHOTO]

3. RENEWABLE ENERGY & ELECTRIFICATION (R)

34% of potential reductions



Energy that comes from renewable sources, including appropriately-sited solar, wind, geothermal, and small hydroelectric, are the cleanest and most-environmentally friendly energy sources. Here in California, where there is an abundance of sunny days, solar energy is a particularly good energy source. According to Project Sunroof (November 2018), 65% of Fairfax buildings have roofs that are solar-viable. These 1,700 roofs could generate over 23.1 million kWh per year. Solar 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 20% of our electricity from locally produced solar energy systems by 2030, up from about 10% currently, without exceeding the current growth rate.

When solar is not an option or only provides a portion of your electricity needs, 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 and GHG-free content, which means it's some of the cleanest electricity in the country. What's more, MCE's goal is to provide 100% renewable and GHG-free electricity to all its customers by 2025. Considering that MCE currently carries 78.6% of the total electricity load in Fairfax, that action alone will significantly reduce emissions. The remainder of the electricity load in Fairfax is 19.7% PG&E, and 1.7% other direct access.

Since our electricity is so clean, and getting cleaner, it's a great idea to swap out appliances and heating and cooling systems that use natural gas for ones that use electricity. Increases in natural gas production have been identified as the single largest cause of a recent major increase in the global warming compound methane in the Earth's atmosphere (see Cornell University Methane Lab information here and here). While CO2 stays in the atmosphere far longer than methane, methane is 86 times more powerful as an atmospheric warming compound than CO2 over 20 years.

[INSERT PHOTO]

Our community will take the following actions to reduce emissions from energy use.

TABLE 5: RENEWABLE ENERGY & ELECTRIFICATION MEASURES TO REDUCE EMISSIONS - FROM COMMUNITY AND TOWN OPERATIONS

ID	Measure	GHG Reduction by 2030 ($MTCO_2e$)
R-1	Building and Appliance Electrification	9,138
R-2	Municipal Building and Appliance Electrification	19
R-3	100% GHG-Free Electricity	737
R-4	Renewable Energy Generation and Storage	164
R-5	Ban the use of on-site fossil-fuel generators	71
R-6	Electrify all landscape equipment	191
R-7	Innovative Technologies	n/a
RENEWABLE ENERGY GHG REDUCTIONS TOTAL		**10,321**

Note: The Town purchased Deep Green electricity for all of its operations in 2016. Therefore, additional reductions are not counted here.

R-1: Building and Appliance Electrification

- Adopt an ordinance that requires all new construction to be all-electric starting in January 2022.
- Adopt an ordinance that phases in requirements to replace natural gas appliances and equipment with electric appliances and equipment at time of replacement.
- Adopt additional measures that would require replacement of all natural gas consumption/combustion by existing residential and commercial buildings by 2030.

R-2: Municipal Building and Appliance Electrification

- Replace all natural gas consumption/combustion and electrify all Town buildings by 2030.
- Improve energy efficiency of town buildings.
- Establish a town-wide goal to become carbon neutral by setting an internal price on carbon equivalent to the purchase of carbon offsets, and using that fund to incentivize projects by residents to reduce their carbon footprint.

R-3: 100% GHG-Free Electricity

Assist residents and businesses in switching to 100 percent renewable electricity (MCE Deep Green, MCE Local Sol, and PG&E Solar Choice, or on-premise renewables).

R-4: Renewable Energy Generation and Storage

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

- Continue to provide permit streamlining and waive electrical permit fees, as feasible.

- Encourage installation of solar panels on carports and over parking areas on commercial projects and large-scale residential developments through incentives, engagement campaigns, or ordinance.
- Identify and promote incentives, available financing and loan programs for residential and non-residential projects.
- Encourage installation of battery storage in conjunction with renewable energy generation projects through engagement campaigns and partner agency incentives.

R-5: Phase out the use of on-site fossil-fuel generators
Adopt an ordinance phasing out the use of fossil-fuel generators in the Town of Fairfax.

R-6: Electrify all landscape equipment
Adopt Ordinance to phase out use of all fossil-fuel landscape equipment.

R-7: Innovative Technologies
- Investigate and pursue innovative technologies such as microgrids, distributed solar generation, distributed 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.
    - Pavilion as a Community Resiliency Center: Add battery storage and other modernization of the solar equipment currently residing in the Pavilion so that the Pavilion itself can remain powered ("island") during an electric grid outage. Finish this work in time to benefit the community as soon as possible.
    - Town Operations Microgrid: As a second phase after the Pavilion is given the ability to island, extend this capability to other Town buildings including Town Hall/Police Department, Fire Station, Community Center, Women's Club and Corporate Yard. As a part of this work, consider locations for batteries and addition of more solar generation, *e.g.,* solar shade structures in the Pavilion Parking Lot.
    - In all the above microgrid design and implementation, work with MCE, Drawdown Marin and other agencies as possible, both to support Fairfax work and to educate and encourage other jurisdictions to pursue similar initiatives.
- Use the Town microgrid as a tool to raise the level of involvement in climate and resiliency work throughout Fairfax.
    - Prominently demonstrate the operation of innovative Town technologies, including through tours and live web content, and through schools and the Chamber of Commerce.
    - Consider means of funding the Town microgrid that could involve citizens investing in local work.
    - Find ways to support businesses' becoming able to island during power outages, thus supporting both the businesses, their patrons, and the Town.
- Educate and inspire residents and businesses to make improvements in their own emissions through demonstration on Town buildings, information given during permitting processes,

and tours and web content highlighting both government and commercial/residential installations.

[INSERT PHOTO]

4. ENERGY EFFICIENCY (E)

5% of potential reductions

Increasing the efficiency of buildings is often the most cost-effective approach for reducing greenhouse gas emissions from buildings. Energy efficiency upgrades, such as adding insulation and sealing heating ducts, have demonstrated energy savings of up to 20%, while more aggressive "whole house" retrofits can result in even greater energy savings. Many "low-hanging fuit" 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 significantly reduce operating costs in the long run and greatly improve the comfort of the home. Nonetheless, some upgrades can be expensive, particularly for low-income households, so the Town participates in programs that provide rebates, free energy audits, and financing options for residents and businesses.

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 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 energy efficiency goals are to have all new residential construction be zero net electricity by 2020 and all new residential and commercial construction to be zero net energy by 2030. Local governments can accelerate this target by adopting energy efficiency standards for new construction and remodels that exceed existing State mandates, or by providing community education, incentives, technical assistance, and streamlined permit processes to enable quicker adoption.

[INSERT PHOTO]

Our community will take the following actions to reduce emissions in the built environment.

TABLE 4: ENERGY EFFICIENCY MEASURES TO REDUCE GHG EMISSIONS – FROM COMMUNITY AND TOWN OPERATIONS

ID	Measure	GHG Reduction by 2030 ($MTCO_2e$)
E-1	Ordinances for Construction of Energy-Efficient Buildings	17
E-2	Streamline Permit Process and Provide Technical Assistance	n/a
E-3	Energy Audits	26
E-4	Energy Efficiency Programs	1,369
E-5	Cool Pavement and Roofs	8
	Community Subtotal	***1,420***
E-6	Municipal Energy Efficiency Retrofits	7
E-7	Municipal Energy Conservation	1
	Town Operations Subtotal	***8***
ENERGY GHG REDUCTIONS TOTAL		**1,428**

E-1: Ordinances for Construction of Energy-Efficient Buildings

- Adopt requirements to phase out natural gas, beginning with new construction, then substantial remodels.
- Consider adopting the most aggressive state, county, and Reach Codes possible in future years.

E-2: Streamline Permit Process and Provide Technical Assistance

- Eliminate barriers in the current building permit and inspection processes and provide technical assistance to ensure successful implementation of green building requirements and best practices.
- Participate in countywide efforts to make it easier for contractors and building counter staff to simplify applications and identify incentives.

E-3: Energy Audits

- Promote energy audits for all residential, commercial, and municipal buildings.
- Require energy audits for residential and commercial buildings at the time of resale and major remodel.

E-4: Energy Efficiency Programs

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

- Develop a process by which renters can obtain energy usage and efficiency information for rental units.

- 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.
- Promote utility, state, and federal rebate, financing, and incentive programs.

E-5: Cool Pavement and Roofs.
Use high albedo (reflective) material for roadways, parking lots, and sidewalks to reduce the deleterious effects of the urban heat island effect and save energy.

- Evaluate the use of highly reflective pavements when resurfacing Town streets.
- Adopt mandatory building code measures to require new development to use high albedo material for roofs, driveways, parking lots, walkways, and patios.

E-6: Municipal Energy Efficiency Retrofits
Implement energy efficiency projects in municipal buildings and facilities based on energy audits.

E-7: Municipal Energy Conservation.
Reduce energy consumption through behavioral and operational changes.

- 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.
- Incorporate energy management software, electricity monitors, or other methods to monitor energy use in municipal buildings.

[INSERT PHOTO]

5. WASTE REDUCTION (W)

6% of potential reductions

The things we buy, consume, and discard generate a lot of waste as well as greenhouse gas emissions during manufacturing, transport, distribution and disposal. Our throwaway culture creates an overwhelming amount of waste that ends up in landfill or as litter on land and in our waterways.

For Fairfax, the greatest opportunity for reducing GHG emissions from waste lies in managing residential and commercial organic waste. Organic waste in the landfill generates methane, a greenhouse gas that is 86 times more potent that carbon dioxide over a 20-year period.

Fairfax passed an ordinance requiring residents to deposit food and compostable waste in the green bins for pickup by Marin Sanitary Services. Fairfax also receives deliveries of free compost for residents' use. Adding a similar ordinance for commercial organic waste can reduce related GHG significantly.

Other actions we can all take to reduce waste:

- Purchase and consume less stuff in the first place.
- Bring reusable containers and bags when purchasing groceries and other goods.
- Find someone who can reuse whatever you no longer need before considering recycling or disposal.
- When recycling, refer to the Marin Sanitary Service "Where does it go, Joe?" online tool to learn what materials go where.

The Fairfax Climate Action Committee collaborates with Sustainable Fairfax to inform residents and businesses of sustainable practices and to implement the Fairfax Climate Action Plan.

[INSERT PHOTO]

Our community will take the following additional actions to reduce emissions from waste.

TABLE 6: WASTE REDUCTION MEASURES TO REDUCE EMISSIONS– FROM THE COMMUNITY AND TOWN OPERATIONS

ID	Measure	GHG Reduction by 2030 ($MTCO_2e$)
W-1	Residential Organic Waste and Waste Diversion (Fairfax Municipal Code Section 8.08.130)	1,201
W-2	Trash, Inorganic, and Packaging Waste	n/a
W-3	Commercial Edible Food recovery	46
W-4	Commercial Organic Waste	537
W-5	Mandatory Commercial Waste Elimination and Diversion	n/a
W-6	Waste from Town Operations and Facilities	23
W-7	Construction & Demolition Debris and Self-Haul Waste	11
W-8	Waste Processing Infrastructure	n/a
TOTAL WASTE GHG REDUCTIONS		**1,818**

W-1: Residential Organic Waste and Waste Diversion (Fairfax Municipal Code Section 8.08.130). Town residents will make maximum use of curbside collection services and home composting for food waste.

- Work with Zero Waste Marin, Marin Sanitary Service, Sustainable Fairfax, and other organizations to support and enforce the current food-waste composting and recycling ordinance.
- Work with Sustainable Fairfax and/or other organizations to provide free educational services to show residents how to recycle and compost correctly, and reduce landfill waste container size and costs.

W-2: Trash, Inorganic, and Packaging Waste

- Work with Sustainable Fairfax and other organizations to develop a robust, collaborative campaign to promote refuse, reuse, repair, and recycling of inorganic materials including single-use plastic items.
- Promote Extended Producer Responsibility. Limit consumer goods packaging in collaboration with Sustainable Fairfax or other organizations by encouraging on-demand delivery services like Amazon and Blue Apron to reduce packaging waste and investigate requirements and incentives for engagement campaigns.

W-3: Commercial Edible Food recovery

Work with businesses to achieve 100% diversion of unwanted edible food through food recovery programs by 2025.

W-4: Commercial Organic Waste
Accomplish 100% diversion of commercial organic waste from the landfill through organic waste recycling/composting, and organic waste-to-energy or similar programs by 2025 or other programs to achieve highest and best use of these materials within the Town of Fairfax.

- Work with Sustainable Fairfax, Zero Waste Marin, Marin Sanitary Service, and other organizations to conduct outreach and education to businesses subject to State organic waste recycling mandates (AB 1826) and enforce compliance with the law.
- Adopt necessary Town ordinances to mandate compliance.

W-5: Mandatory Commercial Waste Elimination and Diversion
Require use of reusable containers, packaging, and foodware in lieu of single-use, disposable, bioplastic materials, and recyclable materials by 2025.

- Educate about and enforce the single-use foodware reduction ordinance (Fairfax Municipal Code Section 8.72) across commercial institutions with the goal of elimination of single-use plastic by 2023.
- Enforce state laws requiring waste elimination activities by commercial establishments.
- Adopt an ordinance requiring mandatory commercial subscription to and participation in waste diversion activities by all businesses regardless of size, including recycling collection provided by Marin Sanitary Service or other similar programs.
- Work with Sustainable Fairfax and Marin Sanitary Service to educate businesses on how to recycle and compost correctly and reduce landfill waste.
- Research and support reusable food container programs.

W-6: Waste from Town Operations and Facilities
Reduce, reuse, compost, and, as a last resort, recycle, waste at Town facilities. Conduct periodic waste audits of Town facilities to understand where opportunities for increased diversion lie and to track progress.

W-7: Construction & Demolition Debris and Self-Haul Waste
Enforce the Town construction & demolition debris material recycling ordinance.

W-8: Waste Processing Infrastructure
Review and revise the Town's franchise agreement with the resource recovery service (for example, Marin Sanitary Service) to ensure waste reduction and diversion targets are met. Consider requiring the Town's resource recovery service to conduct a feasibility study and consider investing in new solid waste processing infrastructure to remove recoverable materials (recycling and organics) from the waste stream and reduce contamination.

- Conduct residential and commercial waste audits and waste characterization studies to identify opportunities for increased diversion and to track progress in meeting targets.
- Investigate the feasibility of adding a small fee recouped by the Town as part of the resource recovery service to help fund waste reduction programs.
- Collaborate with other towns and the county to move our waste hauler to zero net GHG for operations.

6. WATER CONSERVATION (C)

<1% of potential reductions

Our community and our state continue to experience periodic droughts and the need to conserve water is still of utmost importance. As climate change raises temperatures around the globe, we can expect more droughts and more intense heat waves, making water conservation more important than ever. In addition, we may not always be able to rely on water from Sonoma County Water Agency, which currently provides 20-25% of MMWD's water. Where we can make a difference is in taking action to reduce water use and ensure this precious resource will continue to be available to all.

In our area the largest use of water is in landscaping for residential and commercial properties, and therefore deserves particular attention.

Greenhouse gas emissions (GHG) related to water use are already low. Our Greenhouse Gas Inventory counts emissions that are generated from the energy used to pump, treat and convey water from the water source to Fairfax water users. Fairfax's water suppliers, Marin Municipal Water District (MMWD) and Sonoma County Water Agency, are already using 100% renewable energy to deliver our water. Therefore, further opportunities for reducing GHG are small, given it's only 1% of our total community emissions.

Energy and emissions used to heat water are more significant, but are counted in the residential and commercial sectors, so are not addressed here.

Our community will take the following additional actions to support water conservation.

TABLE 7: WATER CONSERVATION MEASURES TO REDUCE EMISSIONS –COMMUNITY AND TOWN OPERATIONS

ID	Measure	GHG Reduction by 2030 ($MTCO_2e$)
C-1	Water Use Requirements	n/a
C-2	Community Water Use	1
C-3	Municipal Water Use	included in above

Note: The Town purchased Deep Green electricity for all of its operations in 2016. Therefore, additional reductions are not counted here.

C-1: Water Use Requirements

Adopt Cal Green Tier 2 regulations for new construction in 2020.

C-2: Community Water Use

Reduce indoor and outdoor water use in residential and commercial buildings and landscaping.

- Work with Marin Municipal Water District (MMWD) and other organizations to promote water conservation programs and incentives.

- Enforce local and State laws requiring retrofit of non-compliant plumbing fixtures during remodeling and at resale.
- Ensure all projects requiring building permits, plan check, or design review comply with State and MMWD regulations.
- Encourage maximum permissible use of grey-water for residential and commercial use.
- Adopt ordinance mandating water saving measures from drought-times to be used all the time.

C-3: Municipal Water Use

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

- Work with MMWD to review all accounts, and work with conservation manager to reduce consumption.
- Replace high water use plants, lawns and inefficient irrigation systems with xeriscaping and carbon sequestering landscaping.
- Continue to regularly replace all plumbing fixtures with the highest-efficiency fixtures.
- Implement greywater systems in all town facilities where possible.
- Implement use of non-potable water (purple piping) for irrigation and other permissible uses where possible.
- Install rainwater catchment systems where feasible.

[INSERT PHOTO]

7. SEQUESTRATION (S)

n/a potential reductions

The Town of Fairfax supports County and California 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 GHG pollution 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 climate extremes.

The Marin Carbon Project is one example of an initiative that will greatly increase carbon sequestration at the County level. It is an integral part of Drawdown: Marin. To date, 19 carbon farm plans have been completed, encompassing 8,307 acres of farmland in Marin County. Estimated total annual sequestration benefit through 2020 is 9204 $MTCO_2$ (Metric Tons of Carbon Dioxide).

Emerging drawdown technologies will likely be scaled up over the years ahead. As local approaches become viable, they will be considered by the Town for future CAP updates.

Given the limited opportunities available to the Town of Fairfax for high-impact local sequestration projects, one option to consider is signing up for carbon offset programs that support partner organizations and businesses who actively sequester carbon on a regular basis. Both the town and individual residents can purchase carbon offsets to support these types of programs.

This section focuses on currently known natural approaches to sequestering carbon dioxide in both the built and natural environments, by the community, Town committees, and the Town operations combined.

Our community will take the following actions to support sequestration.

TABLE 8: SEQUESTRATION MEASURES TO REDUCE EMISSIONS –COMMUNITY AND TOWN GOVERNMENT

ID	Measure	Milestone	Estimated Carbon Sequestered
S-1	Urban Forests and Ecosystems	# new trees planted; # of Town outreach efforts and implementation initiative; # of new home “carbon gardens”; # of new green roofs	18
S-2	Habitat Restoration and Soil Regeneration	# of acres managed for carbon sequestering trees, other vegetation and soil	n/a yet
S-3	Carbon Offsets	# voluntary natural climate solution offsets	5,380
S-4	Building Materials	# new buildings using net carbon-sequestering materials in place of other materials;	n/a yet

S-1: Urban Forests and Ecosystems

Increase carbon sequestration and improve air quality and natural cooling through increasing appropriate (e.g., native, drought resistant, fire resilient/resistant) tree cover, other vegetation, and healthy soils in Fairfax, balanced with fire-safety concerns.

- Plant additional trees on Town-owned land, including public parks, open space, medians, and rights of way, where feasible.
- Continue to regulate and minimize removal of large trees and require planting of replacement trees and other appropriate vegetation.
- Require that the site planning, construction, and maintenance of new development preserve existing healthy trees and native vegetation on site or off-site to the maximum extent feasible, considering fire safety. Replace trees and vegetation not able to be saved, consistent with fire department Vegetation Management Plans.
- Recommend that community members plant appropriate tree species on private land.
- Evaluate creating a tree giveaway event or providing lower-cost trees to the public through a bulk purchasing program.
- Encourage the creation of community gardens and healthy soils management on public lands by community groups and on private lands by individual households including on-site composting.
- Provide information to the public, including landscape companies, gardeners, and nurseries, on carbon sequestration rates, drought tolerance, soil management, and fire resistance of different tree and vegetation species as well as healthy soils management.
- Develop parking lot landscape standards to maximize tree cover, size, growth, and sequestration potential possibly in conjunction with EV panel shade structures.
- Support Marin farms using sustainable methods for producing produce, dairy, or meat.

S-2: Habitat Restoration and Soil Regeneration

Increase carbon sequestration in the built environment, developed landscapes, and open space/natural areas.

- Increase carbon sequestration potential of local habitat, such as streamside forests, through climate-smart restoration.
- Encourage and support composting and biochar for application to develop healthy, carbon-rich soils as appropriate.
- Manage parks and open spaces to steadily increase carbon capture in vegetation and soil.
- Manage trees and invasive species in the open space for forest health, water cycling, and soil organic matter as well as reduction of fuel load.

S-3: Carbon Offsets

- 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) to promote a carbon offset program.

- Encourage community members to purchase carbon offsets to reduce their carbon footprint through engagement campaigns, focusing on emissions that are currently difficult to mitigate otherwise, such as airplane travel.
- In 2030, and every year thereafter, the Town will procure sufficient Carbon Offsets to completely offset the Town emissions not already eliminated by other sections of this plan. These offsets could either be purchased from the then-operating markets or used to finance a local fund to pay for GHG infrastructure improvements.

S-4: Building Materials

- Encourage use of climate-friendly building materials that store more carbon dioxide than is released in their production through agency partnerships and engagement campaigns.
- Adopt an ordinance requiring the use of low carbon concrete in new construction based on the County's model ordinance (Ordinance No. 3717, adopted November 2019).

[INSERT PHOTO]

8. IMPLEMENTATION AND MONITORING (I)

This Fairfax 2030 Climate Action Plan will only be effective if it's implemented and the results are carefully evaluated. Each year, the Climate Action Committee will create a 12-month implementation action plan to address specific goals for that year, with the approval of the Town Council. Also, the Town, with the assistance of the Marin Climate & Energy Partnership (MCEP) consultant, will prepare an annual GHG Inventory to assess the progress being made on implementing the measures contained in this Climate Action Plan to determine if we are on track to meet our reduction targets. Funding for our initiatives will require research and creativity, within our town and from outside regional, state and federal sources.

The Plan is meant to be a living document and can be amended as needed, with the approval of the Town Council. A more formal update of the plan will be considered in 2025.

Our community will take the actions below to implement and monitor the CAP.

TABLE 16: IMPLEMENTATION AND MONITORING MEASURES BY THE COMMUNITY AND TOWN GOVERNMENT

ID	Measure	Milestones
I-1	Annual Monitoring	Report back
I-2	Update GHG Emissions Inventories	Report back
I-3	Identify and Secure Funding Sources	# of proposals, # successful, $ secured
I-4	Update the Climate Action Plan	Updates as needed
I-5	Project Compliance Checklist	Review # completed, distributed, communicated

I-1: Annual Monitoring
Monitor and report on the Town's progress annually in implementing the Climate Action Plan. Create an annual action plan for implementation.

I-2: Update GHG Emissions Inventories
Update the greenhouse gas emissions inventory for community emissions annually and every five years for government operations.

I-3: Identify and Secure Funding Sources
Identify funding sources for recommended actions, and pursue local, regional, state, and federal grants as appropriate. Investigate creation of local funding sources such as a local carbon fund or carbon offset program to implement the Climate Action Plan.

I-4: Update the Climate Action Plan
Update the Climate Action Plan as needed to incorporate new long-term reduction targets and strategies to meet those targets.

I-5: Project Compliance Checklist

Develop a project compliance checklist to use when reviewing development proposals, use permit applications, and building permits to ensure compliance with Climate Action Plan measures.

[INSERT PHOTO]

APPENDIX A: State Pillars & DRAWDOWN: Marin

IMAGE: CALIFORNIA'S 6 PILLARS CLIMATE STRATEGY

The State of California established the Six Pillars framework in 2015 that include:

1. reducing today's petroleum use in cars and trucks by up to 50%;
2. increasing from one-third to 50% our electricity derived from renewable sources;
3. doubling the energy efficiency savings achieved at existing buildings and making heating fuels cleaner;
4. reducing the release of methane, black carbon, and other short-lived climate pollutants;
5. managing farm and rangelands, forests and wetlands so they can store carbon; and
6. periodically updating the state's climate adaptation strategy: Safeguarding California.

The measures contained in this Town of Fairfax Climate Action Plan are designed to support and implement the Six Pillars and the goals of California's 2017 Climate Change Scoping Plan on a local level.

IMAGE: DRAWDOWN: MARIN

The County of Marin, noting the need for all residents and businesses to actively reduce emissions and plan for climate adaptation has created an engagement framework based on the research and

book by local author, entrepreneur, and environmentalist Paul Hawken called DRAWDOWN: Marin. DRAWDOWN: MARIN is a comprehensive, science-based, community-wide campaign to do our part to slow the impacts of climate change. It is an effort to recognize our need to reduce our "carbon footprint" and to provide a road map to doing so. Like the State's Six Pillars, there are six areas of focus: (1) Renewable Energy, (2) Transportation, (3) Buildings and Infrastructure, (4) Local Food and Food Waste, (5) Carbon Sequestration, and (6) Climate Resilient Communities.

In 2017, the County Board of Supervisors launched Drawdown: Marin and in 2018, the County Community Development Agency began a two-year planning process called Drawdown: Marin that engaged residents, businesses, and subject matter experts in a comprehensive, science-based, county-wide campaign to identify actions that will dramatically reduce GHG emissions, address equity, and increase community resilience.

As described in the Drawdown: Marin Strategic Plan (2020), the initiative identified 29 solutions, seven of which were endorsed by the Executive Steering Committee for immediate implementation by various entities. One of the endorsed solutions is to build a microgrid and Community Resilience Center at the Fairfax Pavilion. The proposed project leverages existing solar photovoltaic systems at the Fire and Police Stations and the Pavilion and adds additional solar, batteries, and a new inverter. The project will utilize Self-Generation Incentive Program funding, the MCE Resilience Fund, and other funding sources to build the project. When complete, it will serve as a community gathering space during emergency events such as public safety power shut-off (PSPS) events, showcase the latest battery storage technology, and educate and inspire other cities and towns to pursue similar projects.

The County of Marin, at the request of County youth, also passed a resolution in February 2019 calling for the federal government to pass a Green New Deal based on the resolution proposed in Congress earlier that month and affirming its commitment to the Paris Climate Accord and environmental sustainability.

APPENDIX B: GHG Reduction Calculations

GHG EMISSIONS REDUCTION SUMMARY Fairfax Climate Action Plan 2030		
Code	**Strategy**	**GHG Emissions Reductions in 2030** ($MTCO_2e/yr$)
Local Actions		
T-1	Zero Emission Vehicles	-10,648
T-2	Bicycling	-25
T-3	Walking	-7
T-4	Safe Routes to School	-31
T-5	Public Transit	-77
T-6	Carpooling	-83
T-7	Traffic System Management and Vehicle Idling	-46
T-9	Renewable Carbon Fuels	-105
R-1	Building and Appliance Electrification	-9,138
R-2	Municipal Building and Appliance Electrification	-19
R-3	100% GHG-Free Electricity	-737
R-4	Renewable Energy Generation and Storage	-164
R-5	Generators	-71
R-6	Electrify All Landscape Equipment	-191
E-1	Ordinance for Construction of Energy-Efficient Buildings	-17
E-3	Energy Audits	-26
E-4	Energy Efficiency Programs	-1,369
E-5	Cool Pavement and Roofs	-8
E-6	Municipal Energy Efficiency Audit and Retrofits	-7
E-7	Energy Conservation	-1
W-1	Residential Organic Waste	-1,201
W-3	Commercial Edible Food Recovery	-46
W-4	Commercial Organic Waste	-537
W-6	Waste from Town Operations and Facilities	-23
W-7	C&D Debris and Self-Haul Waste	-11
C-2	Community Water Use	-1
S-1	Urban Forest	-18
S-2	Carbon Offsets	-5,380
TOTAL - LOCAL ACTIONS		-29,988

State Actions	
RPS	-37
TITLE 24	-129
Light and Heavy Duty Fleet Regulations	-1,330
TOTAL - STATE ACTIONS	-1,496
Projected Emissions	
Projected BAU Community GHG Emissions	31,484
Emissions Reduction from Local and State Actions	-31,484
Projected Community Emissions with Local and State Actions Implemented	0
% below 1990 levels without offsets	100%

ZERO EMISSION VEHICLES *T-1*	
Reductions ($MTCO_2e$) -10,648	2030
Targets	100% of passenger vehicles used by Fairfax residents and businesses are ZEVs in 2030 and all charge with 100% GHG-free electricity.
Methodology and Assumptions	Marin has approximately 1.5% of all ZEVs in California (DMV, 1-1-19) and 197,609 automobiles registered in the County (DMV, 2019). 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 January 2019, DMV reports there were 4,309 battery EVs, 2,747 plug-in hybrid EVs, and 60 fuel cell vehicles, for a total of 7,116 ZEVs in Marin County. We assume a similar penetration rate in the unincorporated areas. We also conservatively assume the same percentage of EVs in 2030: 61% battery EVs and 39% 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 2019 (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 approximately 80,000 ZEVs in Marin in 2030, or 40% of ZEVs registered in Marin. This would require an average annual growth rate of 25%. The number of ZEVs grew 33% in Marin between 2018 and 2019. This data suggests that an annual growth rate of 25% is feasible, especially as the number of models expands and battery technology and charging improves. 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 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/)

	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 Department of Transportation, "California County-Level Economic Forecast 2018-2050," September 2018. California Department of Motor Vehicles, Estimated Vehicles Registered by County for the Period January 1 through December 31, 2018" and "Fuel Type by County as of 1/1/2019." 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 in January 2019	7,116	
Projected number of registered passenger vehicles in Marin	199,141	
Percent of Marin ZEVs in target year	100%	
Number of Marin ZEVs in target year	199,141	
Increase in ZEVs	192,025	
Additional ZEVs as a percent of Marin vehicles	96.4%	
Fairfax passenger VMT	40,187,127	miles
VMT from non-Marin workers and visitors	5,045,616	miles
Fairfax passenger VMT from Marin-based vehicles	35,141,510	miles
VMT reduced by other local measures	420,296	miles
VMT from additional ZEVs	33,480,505	miles
VMT driven with electricity	30,085,582	miles
Emissions without EV program	11,582	$MTCO_2e$
Tailpipe emissions reduction with EV program	10,648	$MTCO_2e$
Electricity used by ZEVs	9,627,386	kWh
Electricity emissions from ZEVs	-	$MTCO_2e$
Emissions reduction	10,648	$MTCO_2e$

BICYCLING *T-2*	
Reductions ($MTCO_2e$) -25	2030
Targets	0.18 miles of Class I multi-use paths and 0.30 miles of Class II bike lanes constructed 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 Fairfax Bicycle and Pedestrian Master Plan Table 5-1 identifies 0.18 miles of proposed Class I bike facilities and 0.30 miles of proposed Class II facilities.
Sources	Fairfax Bicycle and Pedestrian Master Plan (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	33,740,270 VMT
Additional Class I and II facilities	0.5 miles
New bike facilities/sq. mile	0.2
Reduction in local VMT	72,625 VMT
Emissions reductions	25.1 $MTCO_2e$

WALKING *T-3*	
Reductions ($MTCO_2e$) -7	2030
Targets	2% reduction in VMT for vehicle trips that start and end in unincorporated communities 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 in Fairfax and assume 2% reduction in VMT 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 Fairfax	971,293 VMT
% decrease in VMT due to pedestrian improvements	2.0%
Annual decrease in VMT	19,426 VMT
GHG emissions reductions	7 $MTCO_2e$

SAFE ROUTES TO SCHOOL *T-4*	
Reductions ($MTCO_2e$) -31	2030
Targets	Reduce school trips in a family vehicle by 29%, from an average of 39% to 28%.
Methodology and Assumptions	The Fairfax Bicycle and Pedestrian Master Plan includes a recommendation for the Town to continue to support Safe Routes to School programs and infrastructure improvements. 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. Plan Bay Area 2040 projects 1,140 school-age children in the Fairfax in 2030. We assume an elementary school (K-5) age population of 2,854 with an average trip length of 1.7 mile, a middle school (6-8) population of 3,983 with an average trip length of 1.7 miles, a high school (9-12) population of 3,298 with an average trip length of 2.3 miles, 180 school days, and an average share of school trips completed in a family vehicle of 39% according to Safe Routes to School surveys taken at participating schools serving Fairfax in 2018.
Sources	Fairfax Bicycle and Pedestrian Master Plan (2018). US Census Bureau, American Community Survey 5-Year Estimates 2014-2018, Table S0101. Plan Bay Area 2040 Projections, http://projections.planbayarea.org/. Marin County Safe Routes to School Program Evaluation, September 2016. Average school trip lengths provided by Transportation Authority of Marin. Safe Routes to School Marin County, http://www.saferoutestoschools.org/history.html#success

Calculation

	2030
School age population	1,140
Elementary school population	309
Middle school population	411
High school population	420
School population miles travelled	788,412 miles
Percent of miles driven in a family vehicle	39%
Potential percent decrease in students driving to school	29%
VMT avoided	89,169 VMT
Emissions reductions	31 $MTCO_2e$

PUBLIC TRANSIT *T-5*	
Reductions ($MTCO_2e$) -77	2030
Targets	33% of Marin Transit and Golden Gate Transit buses will be electric and 66% will use renewable diesel by 2030.
Methodology and Assumptions	Marin Transit reports 3,674,440 revenue miles in FY 18/19 and 2.0% of those miles within Fairfax. Golden Gate Transit reports 3,467,056 revenue miles in FY 18/19 and 2.1% of those miles in Fairfax. 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	146,752 miles
Emissions, BAU	173 $MTCO_2e$
Renewable diesel VMT	67%
Electric bus VMT	33%
Tailpipe emissions	96 $MTCO_2e$
GHG emissions reductions	77 $MTCO_2e$

Carpooling *T-6*	
Reductions ($MTCO_2e$) -83	2030
Targets	Increase carpooling rate from 3% to 6%.
Methodology and Assumptions	Census data shows that carpooling rates have averaged 6% since 2010, but have decreased in recent years, falling to 3% in 2018. We are assuming that targeted programs to local employers can increase the carpooling rate to the historical average.
Sources	U.S. Census, American Community Survey 5-Year Estimates, Table B08006, "Means of Transportation to Work" Bay Area Air Quality Management District Vehicle Miles Traveled Data Portal, http://capvmt.us-west-2.elasticbeanstalk.com/data Personal communication with Corey Dodge, Bay Area Metro, 9/11/20

Calculation

	2030
Annual VMT for employees who live outside Fairfax, 2030	7,969,190
Targeted increase in carpooling	3%
Annual decrease in VMT	239,076
GHG emissions reductions	83

TRAFFIC SYSTEM MANAGEMENT AND VEHICLE IDLING *T-7*	
Reductions ($MTCO_2e$) -46	2030
Methodology and Assumptions	The Town of Fairfax, in conjunction with the Town of San Anselmo, the City of San Rafael, and the Town of Ross, received a grant from the Metropolitan Transportation Commission's Program for Arterial System Synchronization in FY 13/14 to deploy optimized signal timing plans for the 16 traffic signals along Sir Francis Drake Boulevard and Red Hill Avenue/4th Street. The project was estimated to save 161,344 gallons of fuel in the first year and 432,813 gallons over the 5-year lifetime. We assume infrastructure could be installed to make the system adaptive, similar to what the County and the City of Larkspur are doing on the western end of SFD, and that continued adjustments in synchronization will retain original fuel savings through 2030. TAM's Origin-Destination Data Collection Report documents that 3% of vehicle trips on Sir Francis Drake Boulevard west of Hwy 101 start and/or end Fairfax. We apply this percentage to the total fuel consumption savings identified in the PASS project.
Sources	Metropolitan Transportation Commission, "Program for Arterial System Synchronization (PASS) FY 13/14 Cycle Fact Sheet" Fehr & Peers for Transportation of Marin, "TAM Origin-Destination Data Collection Draft Report," March 14, 2017

Calculation

	2030
Gasoline fuel savings	161,344 gallons
% of trips starting and/or ending in Fairfax	3%
Total emissions reductions	46 $MTCO_2e$

RENEWABLE CARBON FUELS *T-9*	
Reductions ($MTCO_2e$) -105	2030
Targets	All Town vehicles are replaced with EVs.
Methodology and Assumptions	Emissions are based on Town's vehicle fleet in 2010, which was comprised of 8 police vehicles, 9 Public Works trucks, and 1 Building Department vehicle.
Sources	Marin Climate & Energy Partnership, Town of Fairfax 2016 Greenhouse Gas Inventories for Community and Government Operations Emissions

Calculation

	2030 B
Gasoline consumption, 2018 (estimated)	10,861 gallons
Diesel consumption, 2018 (estimated)	800 gallons
Emissions from gasoline consumption	97 $MTCO_2e$
Emissions from diesel consumption	8 $MTCO_2e$
Fuel reduction for fleet using gasoline	100%
Fuel reduction for fleet using diesel	100%
Emissions reductions	105 $MTCO_2e$

ORDINANCES FOR CONSTRUCTION OF ENERGY-EFFICIENCY BUILDINGS *E-1*	
Reductions ($MTCO_2e$) -17	2030
Targets	Implement green building reach code that provides options for all-electric, limited mixed fuel, and fuel construction for new single family and multi-family buildings for the 2019 building code cycle.
Methodology	CAPCOA Measure BE-1 used for estimating building energy savings. We assume ordinance is adopted in 2021. We assume ordinance banning natural gas in new construction is adopted in 2023. We assume a 27% improvement in energy efficiency for residential buildings, similar to the mixed fuel compliance method which requires a total compliance margin of 10 EDR. We assume a 10% improvement in energy efficiency in non-residential buildings, similar to the mixed fuel compliance method.
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

Residential	**2030**
Percent over Title 24 Energy Requirements	27 %
New construction electricity use, BAU	27,389 kWh
New construction electricity use, after Title 24	0 kWh
Additional reduction in electricity use	0 kWh
New construction natural gas use, BAU	13,507 therms
New construction natural gas use, after Title 24	12,656 therms
Additional reduction in natural gas use	3,077 therms
GHG emissions reductions	16 $MTCO_2e$

Commercial	**2030**
Percent over Title 24 Energy Requirements	10 %
New construction electricity use, BAU	62,659 kWh
New construction electricity use, after Title 24	43,861 kWh
Additional reduction in electricity use	1,140 kWh
New construction natural gas use, BAU	3,040 therms
New construction natural gas use, after Title 24	2,393 therms
Additional reduction in natural gas use	172 therms
GHG emissions reductions	1 $MTCO_2e$

ENERGY AUDITS *E-3*	
Reductions ($MTCO_2e$) -26	2030
Targets	31 housing units implement energy efficiency projects between 2022 and 2030 due to ordinance requiring energy audits at time of sale.
Methodology and Assumptions	Assumes program will be implemented in 2022 and 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. 78 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, 2018	4,627 kWh
Average household natural gas use, 2018	445 therms
Number of housing units sold annually	78 units
Number of housing units provided energy audits	626 units
Percent of participating housing units	5%
Number of housing units implementing energy efficiency projects	31 units
Electricity reduction	31%
Natural gas reduction	31%
Annual electricity savings	44,903 kWh
Natural gas savings	4,323 therms
Electricity emissions reduction	3 $MTCO_2e$
Natural gas emissions reduction	23 $MTCO_2e$
Total GHG emissions reduction	26 $MTCO_2e$

ENERGY EFFICIENCY PROGRAMS *E-4*	
Reductions ($MTCO_2e$) -1,369	2030
Targets	Electricity and natural gas consumption is reduced an average of 1% per year between 2018 and 2030.
Methodology and Assumptions	We are forecasting an annual electricity savings of 1% and an annual natural gas savings of 1% 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. MCE Clean Energy's Implementation Plan states "MCE's goal is to increase annual savings through energy efficiency programs to two percent (combined MCE and PG&E programs) of annualized electric sales…by the end of 2018." Electricity consumption declined an average of 0.9% per year in the unincorporated areas between 2005 and 2018. Natural gas consumption declined an average of 1.3% per year between 2005 and 2018.
Sources	Marin Clean Energy Revised Community Choice Aggregation Implementation Plan and Statement of Intent, July 18, 2014. 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, 2018	23,502,191 kWh
Electricity less State actions	23,502,191 kWh
% electricity reduced each year	1%
Electricity reduction	2,820,263 kWh
Residential and commercial natural gas use, 2018	1,869,843 therms
% natural gas reduced each year	1%
Natural gas reduction	224,381 therms
GHG emissions reductions	1,369 $MTCO_2e$

COOL PAVEMENT AND ROOFS *E-5*	
Reductions ($MTCO_2e$) -8	2030
Targets	10% of paved surfaces in the urbanized areas are converted to high-albedo surfaces by 2030.
Methodology and Assumptions	On average, for metropolitan areas studied, vegetation covers about 29-41% of the area, roofs 19-25%, and paved surfaces 29-39% (Akbari, 2008). For the Town, we assume paved surfaces cover 29% We assume 1% of the pavement in the urbanized areas will be replaced with high albedo content each year. Pavement has a potential for a 0.15 to 0.25 increase in albedo (Akbari, 2008); we have conservatively assumed a 0.15 change in albedo. 0.29 *0.1 * 0.15 = Net change of 0.004 for 2030. - a 10K decrease in temperature for a 0.25 increase in albedo (Akbari) - 10 Kelvin = 10 Celsius - Electricity demand in cities increases by 2–4% for each 1 degree Celsius increase. Assume 3% for Fairfax.
Sources	Akbari, Hashem and Rose, Leanna Shea, "Urban Surfaces and Heat Island Mitigation Potentials," Journal of the Human-Environmental System, Vol. 11; No. 2: 85-101, 2008.

Calculation

	2030
Percent of urbanized unincorporated area covered in pavement	29%
Percent of paved area with high albedo pavement	10%
Albedo change	0.004
Temperature decrease	0.174 Celsius
Reduction in electricity use	127,132 kWh
Reduction in emissions	8 $MTCO_2e$

MUNICIPAL ENERGY EFFICIENCY AUDIT AND RETROFITS

E-6

Reductions ($MTCO_2e$) -7	2030
Targets	Complete identified projects. Convert remaining inefficient streetlights to LED.
Methodology and Assumptions	As of 2018, the Town had converted 49 of its 599 streetlights to LED, or 8%. We estimate electricity consumption for the remaining 550 streetlights can be reduced 50% by converting to LED. Energy efficiency projects were identified by the Marin Energy Management Team in the Town's 2014 CAP. We assume they have not yet been completed. There are no GHG reduction savings for reduced electricity use because the Town was purchasing 100% renewable electricity in 2018.
Sources	Proposed energy-efficiency projects and estimated energy savings based on Energy Management Study for the Town of Fairfax prepared by the Marin Energy Management Team on June 8, 2006. Marin General Services Authority, "Street Light Maintenance and Repair Services Agreement - Exhibit B," May 14, 2020.

Calculation

	2030
Electricity savings from energy efficiency projects	1,095 kWh
Natural gas savings from energy efficiency projects	1,240 therms
Estimated electricity consumption for inefficient streetlights	186,535 kWh
Reduction in electricity for streetlights	50%
Reduction in electricity consumption	94,363 kWh
Reduction in natural gas consumption	1,240 therms
Emissions reductions	7 $MTCO_2e$

MUNICIPAL ENERGY CONSERVATION *E-7*	
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. There are no GHG reduction savings for reduced electricity use because the Town was purchasing 100% renewable electricity in 2018.
Sources	Marin County Sustainability Team

Calculation

	2030
Electricity consumption in municipal buildings and facilities, 2018	86,465 kWh
Natural gas consumption in municipal buildings and facilities, 2018	5,157 therms
Percent reduction in energy use	5%
Reduction in electricity consumption	4,323 kWh
Reduction in natural gas consumption	258 therms
GHG emissions reductions	1 $MTCO_2e$

BUILDING AND APPLICANCE ELECTRIFICATION (A) *R-1*	
Action	Adopt a reach building code that requires all new construction to be all-electric starting in the 2022 code cycle.
Reductions ($MTCO_2e$) -554.3	2030
Methodology and Assumptions	We assume adoption of an ordinance in that bans natural gas use in new residential and non-residential buildings beginning in 2023. We further assume all electricity consumption in new buildings is GHG-free.
Sources	

Calculation

	2030
Natural gas use eliminated	62,196 therms
GHG emissions reductions	554.3 $MTCO_2e$

BUILDING AND APPLICANCE ELECTRIFICATION (B) *R-1*	
Action	Adopt an ordinance that phases in requirements to replace natural gas appliances and equipment with electric appliances and equipment at time of replacement. Adopt additional measures that would require elimination of all natural gas consumption/combustion by existing residential and commercial buildings by 2030.
Reductions ($MTCO_2e$) -8,583.5	2030
Methodology and Assumptions	We assume the ordinance in Scenario A applies to stoves, water heaters and dryers in January 2022 and to furnaces in 2025. We further assume all electricity consumption is GHG-free.
Sources	2009 California Residential Appliance Saturation Study, Volume 2, Tables 2-26 (Forecast Zone 5) and 2-24 (PG&E). 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 20122-2020 with 2010 Census Benchmark

Calculation

	2030
Natural gas use eliminated	1,613,857 therms
GHG emissions reductions	8,583.5 $MTCO_2e$

MUNICIPAL BUILDING AND APPLIANCE ELECTRIFICATION *R-2*	
Reductions ($MTCO_2e$) -19	2030
Targets	Eliminate all natural gas consumption/combustion in all Town buildings by 2030.
Methodology and Assumptions	In 2017, natural gas consumption in Town buildings and facilities was as follows: Town Hall/Police Department: 1,027 therms Community Building: 318 therms Corporation Yard: 2,771 therms Women's Club: 1,041 therms
Sources	Marin Energy Watch Partnership

Calculation

	2030
Natural gas usage for Town buildings	5,157 therms
Natural gas reduced through other actions	1,498 therms
Natural gas reduced	3,659 therms
GHG emissions reduction	19.5 $MTCO_2e$

100% GHG-FREE ELECTRICITY *R-3*	
Reductions ($MTCO_2e$) -737	2030 B
Targets	MCE electricity is 100% GHG-free by 2030.
Methodology and Assumptions	The MCE 2019 Resource Integration Plan states that MCE electricity is projected to be 94% GHG-free in 2020 and 100% GHG-free by 2022. MCE supplied 78.6% of the total electricity load in Fairfax in 2018.
Sources	MCE 2019 Integrated Resource Plan (November 2018). https://www.mcecleanenergy.org/wp-content/uploads/2019/01/MCE-2019-Integrated-Resource-Plan_11-8-2018_V_12-21-18.pdf

Calculation

	2030
Electricity use, BAU	24,354,721 kWh
Electricity saved through State actions	183,760 kWh
Less electricity saved through local energy efficiency and renewable energy actions	5,607,579 kWh
Net electricity use	18,563,383 kWh
Projected MCE electricity use	14,593,654 kWh
Electricity emissions w/MCE BAU	737 MTCO2e
Electricity emissions w/MCE	0 MTCO2e
GHG emission reductions	737 MTCO2e

RENEWABLE ENERGY GENERATION AND STORAGE *R-4*	
Reductions ($MTCO_2e$) -164	2030
Targets	Solar energy installations continue to grow by an average of 174 KW AC each year through 2030.
Methodology and Assumptions	According to Project Sunroof, 63% of buildings in Fairfax have roofs that are solar viable. By the end of 2019, 1,705 KW AC of solar capacity had been installed in Fairfax. Since 2013, an average of 174 KW has been installed annually. We assume new distributed solar capacity will be added at the same rate as 2013-2019 through 2030, or 174 KW AC each year.
Sources	Project Sunroof, https://www.google.com/get/sunroof/data-explorer/place/ChIJgfgHWFeWhYARUBSCSoS-4DM/, accessed September 18, 2020. California Distributed Generation Statistics, "NEM Currently Interconnected Data Set," https://www.californiadgstats.ca.gov/downloads/, as of January 31, 2020.

Calculation

	2030
Solar capacity added 2019	114 KW AC
Average solar added annually	174 KW AC
Additional solar 2020-2030	1,736 KW AC
kWh generated by 1 KW solar energy system	1,450 kWh
Additional electricity produced by distributed PV	2,516,596 kWh
GHG emissions reductions	164 $MTCO_2e$

Ban the use of on-site fossil fuel generators *R-5*	
Reductions ($MTCO_2e$) -71	2030
Targets	100% reduction in fuel used in generators by 2030 due to switching to electric equipment.
Methodology and Assumptions	Portable generators consumed 242,482 gallons of diesel in 2018 in Marin County (OFFROAD2017). Similar to the off-road emissions inventory, we assume 3.3% of emissions are attributable to Fairfax based on its share of countywide households in 2018. We assume a 100% reduction in 2030 due to the Town's action to ban the use of fossil fuel generators by 2030.
Sources	OFFROAD2017 v. 1.0.1

Calculation

	2030
Portable generators diesel consumption, BAU	8,004 gallons
Emissions from portable generators, BAU	71 $MTCO_2e$
Reduction target	100%
Emissions reductions	71 $MTCO_2e$

ELECTRIFY ALL LANDSCAPE EQUIPMENT *R-6*	
Reductions ($MTCO_2e$) -191	2030
Targets	2030: 100% reduction in fuel used in landscape equipment by 2030 due to switching to electric equipment.
Methodology and Assumptions	For this action, landscape equipment includes lawn mowers, leaf blowers/vacuums, trimmers/edgers/brush cutters. This equipment consumed 623,785 gallons of gasoline in 2018 (OFFROAD2007). Similar to the off-road emissions inventory, we assume 3.3% of emissions are attributable to Fairfax based on its share of countywide households in 2018. We assume a 100% reduction in 2030 due to the Town's action to ban the use of gasoline portable landscape equipment by 2030.
Sources	OFFROAD2007

Calculation

	2030
Landscape equipment gasoline consumption, BAU	21,428 gallons
Emissions from portable landscape equipment, BAU	191 $MTCO_2e$
Reduction target	100%
Emissions reductions	191 $MTCO_2e$

RESIDENTIAL ORGANIC WASTE *W-1*	
Reductions ($MTCO_2e$) -1,201	2030
Targets	100% diversion of recoverable residential organic waste by 2030.
Methodology and Assumptions	According to CalRecycle's 2014 Waste Characterization Study, 84.6% of statewide franchised residential organic waste is recoverable. Based on electricity consumption split, we assume 70% of Fairfax's landfilled waste is residential waste.
Sources	CalRecycle, "2014 Disposal-Facility-Based Characterization of Solid Waste in California: Significant Tables and Figures," Tables 44 and 50, October 6, 2015.

Calculation

	2030
Residential waste as a percent of total landfilled waste	70%
Residential landfilled waste	4,988.4 tons
Recoverable organic waste	84.6%
Percent recoverable organics waste diverted from landfill	100%
GHG emissions reduction	1,201 $MTCO_2e$

COMMERCIAL EDIBLE FOOD RECOVERY *W-3*	
Reductions ($MTCO_2e$) -46	2030
Targets	Achieve 100% diversion of unwanted edible food by 2025.
Methodology and Assumptions	According to CalRecycle's 2018 Waste Characterization Study, 4.4% of the statewide franchised commercial disposed waste stream is composed of potentially donatable food.
Sources	CalRecycle, "2018 Facility-Based Characterization of Solid Waste in California: Significant Tables and Figures," Table 6, May 15, 2020.

Calculation

	2030
Commercial food waste	2,148.3 tons
Potentially donatable food	94.5 tons
Percent donatble food diverted from landfill	100%
GHG emissions reduction	46 $MTCO_2e$

COMMERCIAL ORGANIC WASTE *W-4*	
Reductions ($MTCO_2e$) -537	2030
Targets	100% diversions of commercial organic waste
Methodology and Assumptions	According to CalRecycle's 2014 Waste Characterization Study, 89.3% of statewide franchised commercial organic waste is recoverable. Based on electricity consumption split in the community, we assume 30% of landfilled waste is generated by commercial users.
Sources	CalRecycle, 2014 Disposal-Facility-Based Characterization of Solid Waste in California: Significant Tables and Figures, Tables 44 and 48, https://www2.calrecycle.ca.gov/WasteCharacterization/PubExtracts/2014/SigTableFig.pdf

Calculation

	2030
Commercial waste as a percentage of total landfilled was	30%
Commercial landfilled waste (excluding donatable food, self-haul, sludge, and municipal waste)	2,115 tons
Recoverable organic waste, excluding donatable food	89.3%
Percent diverted from landfill	100%
GHG emissions reduction	537 $MTCO_2e$

WASTE FROM TOWN OPERATIONS AND FACILITIES *W-6*	
Reductions ($MTCO_2e$) -23	2030
Target	100% of recoverable organic waste currently landfilled is diverted by 2030.
Methodology and Assumptions	According to CalRecycle's 2014 Waste Characterization Study, 89.3% of statewide franchised commercial organic waste is recoverable.
Sources	CalRecycle, 2014 Disposal-Facility-Based Characterization of Solid Waste in California: Significant Tables and Figures, Tables 44 and 48, https://www2.calrecycle.ca.gov/WasteCharacterization/PubExtracts/2014/SigTableFig.pdf

Calculation

	2030
Waste from Town operations and facilities	90 tons
Recoverable organic waste	89.3%
Percent of organic waste diverted from landfill	100%
GHG emissions reduction	23 $MTCO_2e$

CONSTRUCTION AND DEMOLITION DEBRIS AND SELF-HAUL WASTE *WR-C3*	
Reductions ($MTCO_2e$) -11	2030
Targets	100% diversion of recoverable C&D waste currently landfilled by 2030.
Methodology and Assumptions	Fairfax 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 CalRecycle to require processing of all loads for recoverable materials at the landfill or processing facility. According to Zero Waste Marin, 57.39 tons of self-haul and debris box waste originating in Fairfax was landfilled in 2016, which we use as a proxy. 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 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	57.4 tons
Recoverable organic waste (67.7%)	68%
Percent recoverable organic material diverted from landfill	100%
GHG emissions reduction	11 $MTCO_2e$

COMMUNITY WATER USE *C-2*	
Reductions ($MTCO_2e$) -1	2030
Targets	1% annual water consumption reduction.
Methodology and Assumptions	Water consumption in he MMWD service area fell 23% between 2005 and 2018, or approximately 1.9% per year. We conservatively assume water consumption will continue to fall an average of 1% per year based on the following legislation and continued implementation of water conservation programs: -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 conduct outreach and provides water conservation information to water users on its website and through newsletters. -MMWD provides virtual water-friendly garden tours on its website . GHG reduction calculations are based upon the following: -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	321 MG
Annual water consumption reduction	1%
Potential annual water savings	38 MG
GHG emissions reduction	1 $MTCO_2e$

URBAN FORESTS AND ECOSYSTEMS *S-1*	
Reductions ($MTCO_2e$) -18	2030
Target	Plant 300 net new trees each year between 2020 and 2030.
Methodology and Assumptions	Sequestration: CAPCOA Measure V-1. Assumed default annual sequestration rate of .0354 MTCO2 accumulation per tree per year and an active growing period of 20 years. Thereafter, the accumulation of carbon in biomass slows with age, and will be completely offset by losses from clipping, pruning, and occasional death.
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
Annual sequestration rate per tree	0.0354 $MTCO_2$
Number of net new trees planted each year	50
Number of years	10
Number of trees planted over period in active growing stage in inventory year	500
GHG emissions reduction from sequestration	18 $MTCO_2e$

LIGHT AND HEAVY DUTY FLEET REGULATIONS *State Action*	
Program Description	Current federal and State regulations and standards will reduce transportation emissions from the light and heavy duty fleet. These include: 1. Pavley Standards which increase fuel economy standards for light-duty vehicles for 2009-2016 model years. 2. Advanced Clean Cars Program which will reduce greenhouse gas and smog emissions for light-duty vehicles sold between 2017 and 2025. New automobiles will emit 34 percent fewer GHG emissions and 75 percent fewer smog-forming emissions. 3. ARB Tractor -Trailer Greenhouse Gas Regulations which accelerate the use of low rolling resistance tires and aerodynamic fairing to reduce GHG emissions in the heavy-duty truck fleet. 4. Heavy Duty GHG Emissions Standards (Phase One) which establish GHG and fuel efficiency standards for medium duty and heavy duty engines and vehicles for 2014-2018 model years.
Reductions ($MTCO_2e$) -1,330	2030
Methodology and Assumptions	Transportation emissions estimated using EMFAC 2017. Emission factors have been adjusted to account for the SAFE Vehicle Rule Part One and the Final SAFE Rule. In order to be consistent with the methodology used in the Greenhouse Gas Inventory, results are adjusted to reflect the global warming potential of methane and nitrous oxide as reported in the IPCC Fifth Assessment Report.
Sources	California Air Resources Board, EMFAC2017 v.1.0.2. California Air Resources Board, EMFAC2014 Volume III - Technical Documentation, v1.0.7, May 12, 2015 California Air Resources Board, "EMFAC Off-Model Adjustment Factors for Carbon Dioxide (CO2) Emissions to Account for the SAFE Vehicle Rule Part One and the Final SAFE Rule," June 26, 2020, https://ww3.arb.ca.gov/msei/emfac_off_model_co2_adjustment_factors_06262020-final.pdf?utm_medium=email&utm_source=govdelivery

Calculation

	2030 Scenario
Passenger VMT BAU	40,187,127 VMT
Passenger VMT, net reductions from other measures	9,681,249 VMT
Commercial VMT BAU	2,381,876 VMT
Emissions, BAU	6,084 $MTCO_2e$
Emissions with regulations	4,754 $MTCO_2e$
Reduction in emissions	1,330 $MTCO_2e$

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) -37	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 entity 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 CO_2 emission factors to forecast 2030 emission factors. CH_4 and N_2O factors are kept constant at 2018 levels.
Sources	GHG Calculator, version 3c_Oct2010. https://ethree.com/public_projects/cpuc2.php 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	24,354,721 kWh
Electricity saved through other State actions	183,760 kWh
Electricity saved through local actions	5,607,579 kWh
Net electricity use (PG&E)	3,655,290 kWh
Net electricity use (DA)	314,439 kWh
Electricity emissions, BAU	416 $MTCO_2e$
Electricity emissions w/RPS	380 $MTCO_2e$
GHG emission reductions	37 $MTCO_2e$

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. The California Energy Commission's 2007 Integrated Policy Report established the goal that new building standards achieve "net zero energy" levels by 2020 for residences and by 2030 for commercial buildings.
Reductions (MTCO2e) -129	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. We assume 107 new units will be built between 2018 and 2030, based on Plan Bay Area Projections for number of households. Estimated energy reductions for the 2016 and 2019 building codes based on information provided by the California Energy Commission. CAPCOA Measure BE-1 used for estimating building energy savings. We assume all residential electricity use subject to Title 24 is offset by mandatory solar installation beginning with the 2019 building code.
Sources	California Energy Commission, 2016 Energy Standards Overview (June 15, 2016), https://www.lgc.org/wordpress/wp-content/uploads/2016/02/2016-Energy-Standards-Overview-California-Energy-Commission.pdf 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 2009 California Residential Appliance Saturation Study (CRASS), Volume 2. http://www.energy.ca.gov/2010publications/CEC-200-2010-004/CEC-200-2010-004-V2.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. California Department of Finance, E-5 Report, City/County Population and Housing Estimates, 4/1/20.

Reductions from Title 24 Upgrades	2016 Reductions from 2013 Standards (assumed for development after 2018)	Energy Savings for 2019 Code (assumed for development 2020-2022)		Projected average reduction 2023-2030 from 2018 baseline	
	Energy Savings	Electricity Savings	Natural Gas Savings	Electricity Savings	Natural Gas Savings
Residential New Construction	28.00%	100%	7%	100%	50%
Non-residential New Construction	5.00%	30%	30%	50%	50%

Projected Residential Development with Title 24 Energy Reductions

	2018-2019	2020-2022	2023-2030	TOTAL through 2030	GHG Reductions through 2030
New Residential (units)	11	29	67	107	
Electricity Use BAU , subject to Title 24	440	27,389	63,907	91,736	
Electricity Use Savings	7	27,389	63,907	91,303	5
Natural Gas Use BAU, subject to Title 24	5,159	13,507	31,517	50,183	
Natural Gas Use Savings	1,301	851	15,758	17,911	95

Projected Non-Residential Development with Title 24 Energy Reductions

	2018-2019	2020-2022	2023-2030	TOTAL through 2030	GHG Reductions through 2030
Electricity Use BAU, Subject to Title 24	11,139	62,659	146,204	220,003	
Electricity Use Savings	557	18,798	73,102	92,457	6
Natural Gas Use BAU, subject to Title 24	541	3,040	7,094	10,675	
Natural Gas Use Savings	19	648	3,547	4,214	22

APPENDIX C: Community Engagement Process

The Fairfax community was engaged in the development of this Climate Action Plan through several means. First, a regular blog was posted on the website of the Fairfax Climate Action Committee and some comments were noted there on an on-going basis.

Second, a survey was posted on the Town's website and available to community members from September 1 through December 31, 2020. The responses to that survey are detailed below.

Third, Fairfax community members were invited to contribute ideas and concerns during a series of Community Workshops held via Zoom on October 19, November 9, and December 14, 2020 and continued into 2021 on January 11, February 8, and March 8. The workshops were facilitated by the Chair of the Fairfax Climate Action Committee and typically began with a short presentation about a section of the Plan, and then open dialogue was encouraged during which feedback and ideas were sought. Attendance ranged from 5-15 community members.

On March 3, 2021, the Fairfax 2030 Climate Action Plan was presented to the Town Council for discussion and public comment. A joint special meeting with Town Council and the Climate Action Committee is planned for March 17 to review it in further detail.

The goal is to have a final Fairfax Climate Action Plan 2030 adopted by the Town Council no later than June 30, 2021.

Survey Data Summary