CITY OF NOVATO
CALIFORNIA

CLIMATE ACTION PLAN 2030

Taking action today, for all of our tomorrows

September 2025

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Thank you to the many members of our Novato community who participated in workshops and provided feedback throughout the development of this plan. Your insights, ideas, and engagement helped to bring the plan to life, and we look forward to working alongside you as *we take action together, for all of our tomorrows.*

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

The City of Novato's Climate Action Plan 2030 (CAP2030) establishes a strategic and actionable framework to reduce greenhouse gas (GHG) emissions and foster a more sustainable future. In alignment with California's SB 32 mandate to achieve a 40% reduction in statewide emissions below 1990 levels by 2030, CAP2030 identifies a comprehensive set of state, regional, and local measures that, if fully implemented, are projected to reduce Novato's emissions by 84,807 metric tons of carbon dioxide equivalent ($MTCO_2e$).

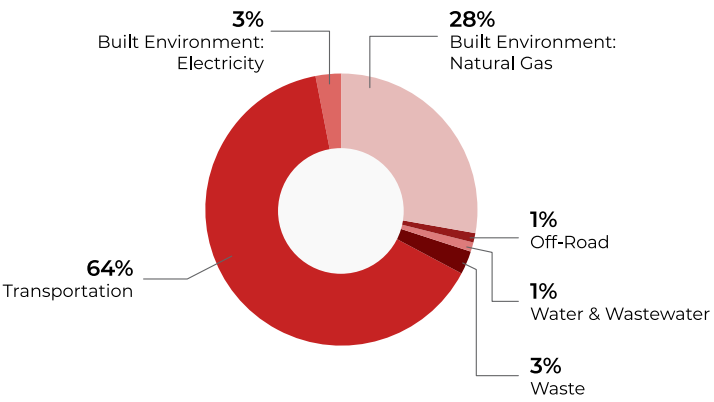
Building on the City's first Climate Action Plan adopted in 2009 and incorporated into the City's General Plan 2035, CAP2030 reflects Novato's continued leadership in environmental sustainability. Developed in partnership with the City's Sustainability Commission and guided by extensive staff and community input, CAP2030 targets the City's primary emission sources — transportation, energy, and waste — through practical and measurable strategies.

CAP2030 serves as a five-year strategic roadmap that guides local climate action, aligns with regional and state objectives, and positions Novato as a community committed to environmental stewardship. Regular monitoring, community engagement, and updates will ensure that CAP2030 remains responsive and effective as the City moves toward its 2030 emissions reduction target.

Novato's Greenhouse Gas Emissions by Sector

The majority of Novato's GHG emissions come from the transportation sector (primarily passenger vehicles) and from the use of natural gas for space heating, cooking, and heating hot water in residential and commercial buildings. While smaller in scale, additional emissions are generated from electricity consumption in buildings, as well as the waste, water, and wastewater sectors, and off-road vehicles and equipment.

Figure ES-1: GHG Emissions By Sector, 2022



Greenhouse Gas Emissions Reduction Targets

A significant portion of Novato's anticipated GHG emissions reductions are expected to come as a result of state and regional measures, which are outlined in the table below.

Assuming that these state and regional measures result in reducing GHG emissions by 38,436 $MTCO_2e$, Novato will still need to implement a range of local strategies to reduce emissions by an additional 46,371 $MTCO_2e$ to achieve the statewide GHG emissions reduction goal by 2030. The strategies below

Table ES-1: Estimated GHG Emissions Reduction in Novato from State and Regional Measures

State and Regional Measures	2030 Emissions Reductions $MTCO_2e$
California Air Resources Board: Light-and Heavy-Duty Vehicle Regulations	23,655
Bay Area Air District: Zero-Emission Appliance Standard	9,076
California Building Standards Code: Title 24	3,055
California Air Resources Board: Small Off-Road Engines Regulations	1,226
Renewable Portfolio Standard	1,081
California Air Resources Board: Innovative Clean Transit Rule	343
Total	**38,436**

have been identified as having the greatest potential to meet a significant proportion of local GHG emissions reductions.

Zero-Emission Vehicles

CAP2030 includes measures to significantly increase the number of zero-emission vehicles and assumes that 39% of vehicles registered in Marin County and 26% of registrations in Novato will be zero-emission vehicles by 2030 (GHG emissions reduction target = 30,454 $MTCO_2e$).

Building Electrification, Energy Conservation, and Energy Efficiency

CAP2030 includes the continued promotion of, and increased participation in, electrification, energy conservation, and energy efficiency programs to reduce both natural gas use and energy consumption in residential and commercial buildings, including switching out gas appliances for electric models (GHG emissions reduction target = 3,816 $MTCO_2e$).

Waste Reduction

CAP2030 includes measures to significantly increase the diversion of residential and commercial organic waste from landfills through composting and edible food recovery programs (GHG emissions reduction target = 5,856 $MTCO_2e$).

While CAP2030 is focused on achieving a 40% reduction in local GHG emissions compared to 1990 levels by 2030, continued implementation of the measures past 2030 are intended to achieve the State's carbon neutrality goal for 2045.[1] However, more aggressive state, federal, and international action will be required to reduce global emissions to levels that will avoid the catastrophic impacts of climate change.

For this reason, CAP2030 also contains measures to advocate at the state and federal levels for policies, programs, and funding that will support the transition to GHG-free energy sources, the electrification of buildings and vehicles, and the acceleration of additional high-impact measures to sharply reduce GHG emissions.

CAP2030 affirms Novato's commitment to reducing local GHG through targeted, strategic action. By aligning with the State's ambitious goals under SB 32, CAP2030 establishes a comprehensive and achievable pathway to reduce GHG by 84,807 $MTCO_2e$ by 2030. However, the success of CAP2030 will depend on the collective commitment of the City, its partners, and the broader community to implement the identified measures and adapt as new opportunities and challenges arise.

As a living document, CAP2030 will be regularly reviewed and updated to ensure it remains effective, relevant, and responsive to emerging technologies, policies, and community needs. Through sustained leadership and collaboration, Novato can realize a cleaner, more resilient, and more sustainable future for all.

[1]Executive Order B-55-18, 2018 To Achieve Carbon Neutrality

Photo Credit: Craig Solin

CHAPTER 1:
INTRODUCTION

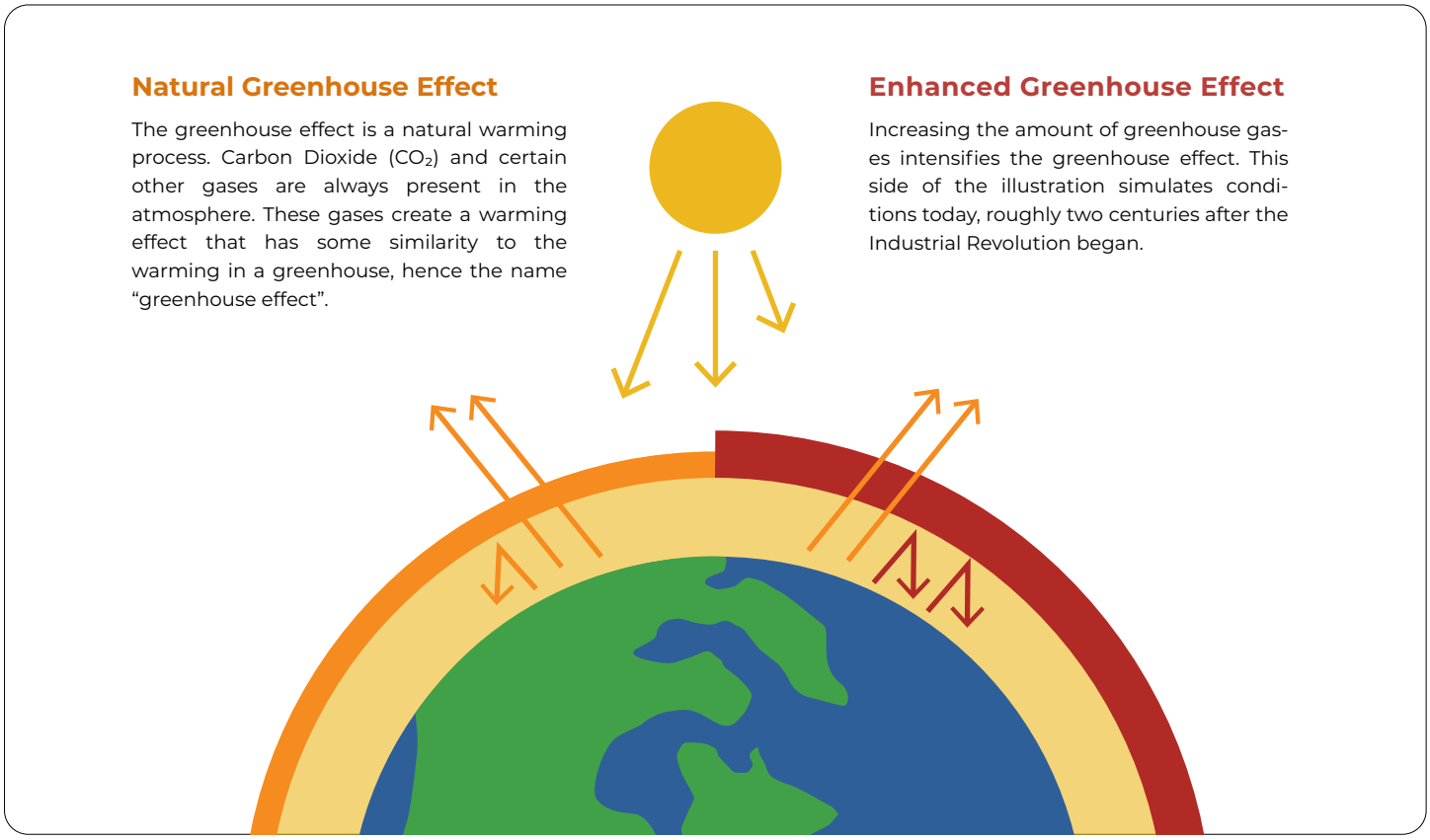
What are Greenhouse Gas Emissions and How Do They Contribute to Climate Change?

Greenhouse gases (GHGs) are gases in Earth's atmosphere that allow the sun's rays to enter our atmosphere and trap the resulting heat generated by the rays. These gases are naturally occurring and make Earth suitable for life. While we depend on a certain level of these gases to keep our Earth habitable, certain human activities have been shown to emit GHGs, increasing their concentration in the atmosphere to unsustainable levels and trapping more heat, resulting in an increase in Earth's average temperature (Figure 1).

This intensification of the natural greenhouse effect affects local and global climate patterns, which in turn amplifies many hazards including flooding, wildfire, drought, and extreme weather events.

GHGs include carbon dioxide (CO2), methane (CH4), nitrous oxide (N20), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (SF6) as listed inTable 1,[2] and each one has a different degree of impact on climate change. To facilitate the comparison across different emission sources with mixed and varied compositions of several GHGs, the term "carbon dioxide equivalent" or CO2e is used throughout CAP2030. One metric ton of CO2e (MTCO2e) may consist of any combination of GHGs and has the equivalent Global Warming Potential (GWP) as one metric ton of carbon dioxide (CO2). As data collection and emissions quantification can be difficult for some sources, community GHG emissions inventories at the local government level typically concentrate on three primary GHGs: CO2, CH4, and N2O.

Figure 1: The Greenhouse Effect



[2]Water vapor is the most dominant greenhouse gas, but it is not measured as part of greenhouse gas inventories.

Table 1: Greenhouse Gases

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

According to the U.S. Environmental Protection Agency's 2021 *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019,* the majority of GHG emissions come from the combustion of fossil fuels, which in turn are used for electricity, transportation, industry, heating, etc. The burning of fossil fuels occurs across nearly every sector of the global economy in ways that have become foundational to the way that most people move, eat, and live.

How is Climate Change Impacting California and Novato?

California is already experiencing the impacts of climate change. Over the last century, the San Francisco Bay Area has experienced eight inches of sea level rise, and even moderate tides and storms are now inundating coastlines.[3] Since 1950, areas burned each year by wildfire have been increasing, as warming temperatures extend the fire season, and low precipitation and snowpack create conditions for extreme, high-severity wildfires to spread rapidly. Nineteen of California's twenty largest fires have occurred since 2003, and the eight largest fires have occurred since 2018.[4] The megafires of 2020 burned over 4 million acres across California.

As temperatures continue to rise, California faces serious and potentially catastrophic climate change impacts, including:

- More intense and frequent heat waves and droughts
- Shrinking snowpack and changes in precipitation
- More severe and frequent wildfires
- More extreme storms and weather events
- Increase in vector-borne diseases and heat-related deaths and illnesses
- Increased impacts to vegetation and wildlife (e.g., algal blooms in marine and freshwater environments)
- Ocean acidification, hypoxia, and warming
- Accelerating sea level rise and riverine flows
- Spread of disease-causing pathogens and insects in forests, and invasive agricultural pests

Overall temperatures are projected to rise substantially throughout this century. According to CalAdapt's "medium emissions" scenario (where global emissions peak around 2040 and then decline), Novato temperatures are expected to rise 4°F by 2100.[5] Without significant action taken to address

[3]San Francisco Bay Conservation and Development Commission. Regional Shoreline Adaptation Plan, p. 23.

[4]Cal Fire, "Top 20 Largest Wildfires".

[5]CalAdapt, https://cal-adapt.org/tools/annual-averages, accessed 8/23/24. Projected temperature increases are from the baseline 30-year period of 1961-1990.

climate change, temperatures are projected to rise 7°F by the end of the century based on CalAdapt's "high emissions" scenario.

As the climate changes, some of the more serious threats to public health will stem from more frequent and intense extreme heat days and longer heat waves. Extreme heat events are likely to increase the risk of heat-related illnesses, such as heat stroke and dehydration, and exacerbate existing chronic health conditions. Extreme heat days (96.4°F and above)[6] in Novato are expected to increase from 3 days to 11 days per year by the end of the century under the "medium emissions" scenario, and from 3 days to 20 days per year under the "high emissions" scenario.

Higher temperatures will also make Novato more vulnerable to wildfire and sea level rise, which in turn poses a serious risk to critical public infrastructure and assets.

By the end of the century, sea levels are projected to rise between 1.6 and 3.1 feet, and possibly as much as 6.6 feet as a result of rapid ice sheet loss.[7] Infrastructure and assets in Novato that are most vulnerable to sea level rise include State Route 37 and the Novato Sanitary District wastewater treatment plant, as well as agricultural lands and marshlands to the east of Highway 101.[8]

[6]CalAdapt, https://cal-adapt.org/tools/extreme-heat/.

[7]California Sea Level Rise Guidance (2024), https://opc.ca.gov/wp-content/uploads/2024/05/Item-4-Exhibit-A-Final-Draft-Sea-Level-Rise-Guidance-Update-2024-508.pdf, accessed 8/23/24. Projected increases are from the 2000 baseline.

[8]County of Marin, Marin Shoreline Sea Level Rise Vulnerability Assessment, 2017.

International, Federal, State, Regional, and Local Climate Leadership

Bold leadership and aggressive goal setting are essential to tackle the climate crisis, and the table below illustrates the role that international, national, state, and regional local leaders are playing. While both California and Marin County are known for their environmental stewardship and willingness to be leaders on the international and national stage, local government leadership will be critical to achieving collective climate goals.

International	• The United Nations coordinates global commitments and targets to reduce emissions such as the *Paris Agreement*. • The United Nations also supports the advancement of climate science through the Intergovernmental Panel on Climate Change (IPCC). The IPCC coordinates the work of scientists across the world to continually update models and assess the science related to climate change. This work in turn informs the way that national, state, and local governments understand and address the human activities that contribute to climate change and the ways that climate change might impact Earth's environment.
Federal	• There is currently no federal legislation mandating comprehensive GHG emissions reporting or reduction. • The Inflation Reduction Act of 2022 and the Infrastructure Investment and Jobs Act of 2021 had represented two of the largest investments to address climate change in U.S. history. In 2025, a federal funding freeze impacted a significant number of climate-related initiatives and the long-term viability of both statutes remains uncertain.
State	• California first established statewide GHG emission reduction targets in 2005. • California has used its climate goals to develop regulations to reduce emissions across a variety of sectors, including: – Setting strict fuel economy standards for manufacturers selling vehicles in California – Establishing energy efficiency building requirements through the State Building Code – Direct management of emissions from power plants and other stationary sources • California has also enacted Senate Bill 375 (SB 375), adopted in 2008, to reduce emissions from cars and light trucks by promoting compact, mixed-use commercial and residential development. The legislation requires local governments to account for GHG emissions in their planning processes, resulting in the development of climate action plans throughout the state.
Regional	• In 2023, the Bay Area Air District (BAAD) adopted amendments to Regulation 9, Rules 4 and 6, to phase out nitrous oxide-emitting natural gas furnaces and water heaters over time, beginning with water heaters in 2027. • The Air District is also leading the development of the Bay Area Regional Climate Action Plan with an initial focus on reducing gas used in commercial and residential buildings and supporting the transition to electric vehicles.
Local	• Novato was one of the first jurisdictions in Marin to adopt a CAP in 2009 and has implemented numerous policies and programs to reduce GHG emissions since that time.

United Nation's Intergovernmental Panel on Climate Change

The United Nations' Intergovernmental Panel on Climate Change (IPCC) is responsible for advancing knowledge on human-induced climate change. Its reports play a key role in the United Nations Framework Convention on Climate Change (UNFCCC), with the IPCC's *Fifth Assessment Report* informing the landmark *Paris Agreement*, which was signed in 2016. In December 2015, all members of the UNFCCC — including the United States, China, India, and the European Union — agreed to the historic Agreement at the 21st Conference of the Parties.

The central aim of the *Paris Agreement* is to strengthen the global response to the threat of climate change by keeping a global rise in temperature well below 2 degrees Celsius this century, and to pursue efforts to limit the temperature increase to no more than 1.5 degrees Celsius above pre-industrial levels. Additionally, the Agreement aims to strengthen the ability of countries to address the impacts of climate change.

In 2022, the IPCC's sixth assessment released *Climate Change 2022* reports from Working Group II *(Impacts, Adaptation and Vulnerability, February 2022)* and from Working Group III *(Mitigation of Climate Report, April 2022)*. The February report has been described as the "starkest warning yet … of major inevitable and irreversible climate changes" and conveys the dangerous and pervasive impacts of climate change that are affecting nature, people's lives, and infrastructure everywhere, in every region of the world. The Report states that, "It is clear now that minor, marginal, reactive, or incremental changes won't be sufficient. Shifts in most aspects of society are required to overcome limits to adaptation, build resilience, reduce climate risk to tolerable levels, guarantee inclusive, equitable and just development and achieve societal goals without leaving anyone behind. Any further delay in concerted anticipatory global action will miss a brief and rapidly closing window of opportunity to secure a livable and sustainable future for all."

Written by 270 researchers from 67 countries, António Guterres, the United Nations Secretary-General stated that the report is "an atlas of human suffering and a damning indictment of failed climate leadership."

Global temperatures have already increased by an average of 1.1 degrees Celsius since the 19th century, as human activities such as deforestation and the burning of coal, oil, and gas for energy have resulted in the emission of heat-trapping gases into the atmosphere. The goal of limiting the global temperature increase to no more than 1.5 degrees Celsius above pre-industrial levels would require nations to all but eliminate their fossil-fuel emissions by 2050. However, most nations are nowhere near on track to meet this goal. Climate experts are currently estimating that global temperatures are on pace to warm somewhere between 2 and 3 degrees Celsius this century, and according to the IPCC, if the 1.5-degree Celsius threshold is crossed but temperatures are brought back down later, severe and irreversible climate change could still occur.

The IPCC Working Group III's report from April 2022 warns that the goal of limiting global warming to 1.5 degrees Celsius will likely be out of reach by the end of the decade unless emissions reduction programs are markedly accelerated. The modeled pathways to achieve this goal reduce net CO_2 emissions below 2019 levels by approximately 48% by 2030 and 80% in 2040, with similar reductions in methane and other non-CO_2 GHG emissions. In outlining the most important steps, the IPCC Working Group III states, "to create a low-carbon energy system, emissions must be reduced across all parts of the system, and not just one or two. This means, for example, reducing the emissions from producing electricity, driving cars, hauling freight, heating and cooling buildings, powering data centers, and manufacturing goods."

State of California

In 2006, the State of California enacted the landmark Global Warming Solutions Act (AB 32) which established a comprehensive program to reduce GHG emissions from all sources throughout the state. AB 32 required the California Air Resources Board (CARB) to develop regulations and market mechanisms to reduce California's GHG emissions to 1990 levels by 2020 with mandatory caps starting in 2012 for significant emissions sources. California met its 2020 emissions reduction target six years early (in 2014) and as of 2022, statewide emissions were approximately 14% below the 1990 level.[9] Along with adopting 'Early Action Measures' and initiating regulations for additional GHG emissions source reductions, CARB also created the Cap-and-Trade market shortly thereafter.

In California, climate policy objectives initially proposed by Governor Jerry Brown, were codified through passage of Senate Bill (SB) 32 *(Pavley, Chapter 249, Statutes of 2016)* and AB 1279 *(Muratsuchi, Chapter 337, Statutes of 2022)*. SB 32 commits California to reducing GHG emissions 40% below 1990 levels by 2030, and AB 1279 commits California to reducing GHG emissions 85% below 1990 levels and achieving carbon neutrality by 2045.

The City of Novato recognizes that keeping global warming below the 1.5 degrees Celsius threshold as recommended by the IPCC and achieving carbon neutrality in the State of California by 2045, will require a significant commitment to act at the international, federal, state, and regional level. CAP2030 commits the City to doing its part to reduce emissions from activities occurring within its borders, in addition to joining and supporting broader efforts to limit and sequester global emissions.

Novato Climate Leadership

Novato was one of the first communities in Marin to adopt a Climate Change Action Plan (CCAP) in 2009. The CCAP was subsequently updated and incorporated into the City's General Plan 2035, based on Novato's long-standing commitment to environmental stewardship and sustainability. General Plan 2035 was adopted in 2020 and prior to the adoption of CAP2030, it served as the City's Climate Action Plan.

In recognition of the accelerating changes to our climate and the corresponding negative impacts (e.g. drought, wildfire, species loss, extreme weather, etc.), in 2020, the Novato City Council (the Council) adopted a *Climate Emergency Resolution* (CER). Among other commitments, the CER resolved to elevate climate issues in the City's goalsetting process; to give precedence to climate mitigation and adaptation when evaluating policies, purchases, projects, and allocating resources; and to seek financial resources to support these efforts.

In 2022, the Council established a Sustainability Commission, and as part of the City's *2023-2025 Strategic Plan*, adopted a workplan item to create a standalone Climate Action Plan (CAP). The rationale for developing a separate CAP was two-fold: 1) addressing climate change is a priority for the Council, and embedding the CAP within General Plan 2035 did not provide the issue with the prominence it requires; and 2) any proposed changes to climate policies and programs within the General Plan would necessitate an amendment to the General Plan. CAP2030 builds on the successes of previous climate action planning and implementation efforts, while setting aggressive emissions reduction targets for 2030 and beyond.

CAP2030 focuses on strategies, measures, and actions to reduce GHG emissions and sequester carbon. It does not address climate adaptation and community resilience, as these topics are covered within the City's General Plan Safety Element.

Novato has been a pioneer in taking bold steps to reduce GHG emissions and below is a partial listing of the many actions the City and the Novato community have implemented since recognizing the critical need to act on climate change.

[9]California Air Resources Board, California Greenhouse Gas Emissions, 2000-2022, p.5.

Renewable Energy & Electrification

MCE

In 2012, Novato joined the County of Marin and several Marin cities and towns to form the Marin Energy Authority, a Community Choice Aggregation program, known as MCE (formerly Marin Clean Energy). As a public agency, MCE is chartered to source clean, competitively-priced electricity on behalf of residents and businesses in participating jurisdictions. MCE provides customers with 60% - 100% renewable energy through its Light Green and Deep Green products. Today, MCE provides nearly 80% of the electricity in Novato.

Deep Green Electricity

In 2017, the City began purchasing 100% renewable electricity from MCE for all municipal facilities. About 9% of MCE customers in Novato have 'opted up' to Deep Green electricity.

Solar Installations

Based on 2022 data, the Novato community has reduced electricity use by 23% since 2005. About one-quarter of this reduction is due to the installation of solar photovoltaic systems at residential and commercial properties. There are nearly 1,900 solar energy systems in Novato, and about 40% of recent installations include battery storage. The City has installed solar systems at the Margaret Todd Senior Center, Hill Gymnasium, Corporation Yard, City Hall, Gymnastics Center, and South Hamilton Park.

Electrification

Over 135 households have utilized County of Marin 'Electrify Marin' rebates since the program was established in 2019 to upgrade hot water heaters, cooktops, and heating systems. In 2022, the City replaced seven gas hot water heaters at City facilities with efficient heat pump hot water heaters with funding from MCE and PG&E.

Emissions from Water Delivery and Treatment

Emissions related to the energy used to pump, treat, and convey water have been eliminated due to Sonoma Water, North Marin Water District, and Novato Sanitary District's purchase of 100% renewable electricity.

Leaf Blowers

In 2022, the City adopted an ordinance prohibiting the use of residential and commercial gas-powered leaf blowers within Novato city limits.

Energy Efficiency & Green Building

LED Streetlights

The City has converted all streetlights to LED fixtures, which use about half the electricity of conventional lighting.

Municipal Energy Efficiency Upgrades

City staff routinely replace inefficient lighting fixtures with energy-efficient units during regular maintenance activities and in 2018, the City replaced all lighting at the Police Station with LED fixtures.

Green Building Ordinance

The City has adopted green building regulations that exceed state building code requirements since 2008. The City's current "reach" building code excludes the Tier 1 energy efficiency standards.

Mobility & Land Use

Zero-Emission Vehicles

In 2023, approximately 6% of light-duty vehicles registered in Novato were zero-emission, and in 2024, the City's fleet included five battery electric, one plug-in hybrid, and three hybrid vehicles, as well as six electric bikes.

Electric Vehicle Charging Stations

In 2024, there were a total of 104 public electric vehicle charging ports in Novato, of which 22 were at charging stations owned and operated by the City.

Electric Vehicle Education and Outreach

The City has partnered with community-based organizations and local car dealerships to provide educational events, webinars, and resources for residents who are interested in purchasing or leasing an electric vehicle (EV).

Bicycle and Pedestrian Network Improvements

The City has completed significant improvements to Novato's pedestrian and bicycle infrastructure network to encourage the use of active transportation options and public transit. In 2023, the City adopted an Addendum to the 2015 Bicycle/Pedestrian Plan that provides for a city-wide network of bicycle and pedestrian facilities, including new and upgraded sidewalks, multi-use paths, bicycle lanes, and routes.

Public Transit

Novato has three train stations (Hamilton, Downtown, and San Marin) serviced by Sonoma-Marin Area Rail Transit (SMART), in addition to a central bus depot in Downtown Novato serviced by both Marin Transit and Golden Gate Transit. The City is participating in the Sonoma/Marin electric bike share program to provide 'first-mile, last-mile' solutions to support the use of public transit.

Waste Reduction

Plastic Bag Ban

In 2014, the City adopted an ordinance to prohibit stores from providing single-use, plastic carry-out bags to customers.

Single-Use Plastic and Reusable Foodware

In 2013, the City adopted an ordinance prohibiting the use of polystyrene foam disposable packaging, and in 2023, the City adopted an ordinance to prohibit single-use plastic (including bioplastic) foodware at businesses with a food facility permit issued by the County of Marin. The ordinance also requires reusable foodware for dine-in operations, and compostable and/or all-aluminum foodware for take-out services.

Community Collaboration

Resilient Neighborhoods

The City partners with Resilient Neighborhoods to provide outreach and education on ways residents can reduce their carbon footprint. To date, 218 Novato households have successfully completed the program and have committed to reducing their households' emissions by nearly 1.4 million pounds of CO_2.[10]

Marin Climate & Energy Partnership

The City is a member of the Marin Climate & Energy Partnership (MCEP). Created in 2007, MCEP is a countywide partnership that provides a forum for members to work collaboratively, share resources, and secure funding to: 1) Discuss, study, and implement overarching policies and programs, ranging from emissions reduction strategies to climate adaptation, contained in each member's CAP; and 2) Collect data and report on progress in meeting member's GHG emissions reduction targets as outlined in their CAP.

MCEP'S website provides detailed information on GHG emissions in Marin County with links to member CAPs and GHG emissions inventories. MCEP's *Marin Sustainability Tracker* compares the progress Marin's jurisdictions are making on eleven metrics related to energy, waste, transportation, water, and emissions reductions.

[10] Resilient Neighborhoods, https://www.resilientneighborhoods.org/our-impact.html, accessed 8/23/24.

City Plans, Ordinances, and Policies Related to Climate Change

Plans

- Bicycle/Pedestrian Plan (2015, amended 2023)
- Community-Based Transportation Plan (2015)
- General Plan 2035 (2020)
- Parks Master Plan (2024)

Ordinances

- Recycling and Reuse Requirements for Construction and Demolition Projects (2011)
- Woodland and Tree Preservation (2012)
- Regulating Alteration or Removal of Trees on Private Property (2012)
- Prohibition on Use of Polystyrene Foam Disposable Food Packaging (2013)
- Regulation of Single-Use Carryout Bags (2014)
- Small Rooftop Solar Systems (2015)
- Electric Vehicle Charging Systems (2017)
- Leaf Blower Restrictions (2021)
- Prohibition on New Gas Stations (2022)
- Reusable Foodware Ordinance (2023)

Policies/Resolutions

Citywide Policies/Resolutions

- Endorsing a Draft Compact for Sustainable Bay Area (2001)
- Participating in the Cities for Climate Protection Campaign (2003)
- Endorsing the U.S. Mayors Climate Protection Agreement (2007)
- Multi-Modal Transportation Elements (2007)
- Zero Waste Policy (2007)
- Complete Streets Policy (2016)
- Climate Emergency Resolution (2020)

Administrative Policies

- Green Purchasing Policy (2008)
- Plastic Water Bottle Ban (2014)
- Integrated Pest Management Policy (2021)
- Fleet Replacement Policy (2021)
- Telecommuting Policy (2021)

Climate Action Plan 2030 Development Process

The development of CAP2030 was a collaborative effort involving City staff, the City's Sustainability Commission, public agency and nonprofit partners, and engaged community members, with support from staff at MCEP.

The strategies, measures, and actions outlined in CAP2030 are based on a model Climate Action Plan framework created by MCEP to promote coordinated climate action across Marin County. While CAP2030 has been customized to reflect Novato's specific needs and priorities, the successful implementation of several actions may benefit from (and in some cases will require) partnerships with other Marin jurisdictions and regional agencies.

The preparation of CAP2030, along with the production of annual GHG emissions inventories, reflects the City's commitment to an iterative and ongoing planning process. This process includes identifying, prioritizing, implementing, and evaluating mitigation strategies to address the impacts of climate change effectively.

CAP2030 is a public-facing document that:

- Will help our community understand how everyday actions contribute to climate change;
- Establishes clear, measurable targets for reducing GHG emissions by 2030; and
- Outlines a strategic pathway to achieve the GHG emissions reduction goals

Through the implementation of the strategies, measures, and actions identified in CAP2030, the Novato community can realize numerous co-benefits, including improved air quality, lower energy and fuel costs, and an overall enhancement in public health and quality of life.

CAP2030 is grounded in the recognition that climate change is already affecting communities around the world, and that its impacts are not experienced equally across populations. In California, climate change has significantly affected communities through increased wildfire risk, extreme heat, drought, and other challenges. The City of Novato acknowledges the critical role that local governments play in supporting their communities to take meaningful action in response to these threats.

Public Engagement and Outreach

Sustainability Commission

The City's Sustainability Commission played an integral role in the development of CAP2030, beginning in July 2023 when Commissioners received an overview of the proposed development process. Throughout the drafting of the Plan, Commissioners actively contributed ideas, insights, and feedback during both regular and special meetings of the Commission.

Community Workshops

The actions outlined in CAP2030 were adapted specifically for Novato using MCEP's Climate Action Plan template as a foundation. The actions were shared with the community through a series of interactive public workshops, hosted during Sustainability Commission meetings in the summer and fall of 2023. Workshop participants included public agency partners, community advocates, nonprofit leaders, and interested members of the public. A total of 81 individuals participated in the workshops.

The dates, topics, and participant numbers for each workshop are summarized below:

August 17, 2023 – Transportation (21 participants)

September 21, 2023 – Energy (20 participants)

October 19, 2023 - Waste & Water (18 participants)

November 16, 2023 - Adaptation & Sequestration (22 participants)

Following the completion of the public workshops, the draft actions were reviewed and refined by the Sustainability Commission before undergoing further review by City staff and external agency partners.

Community, Business, and Public Agency Outreach

The City invited a range of community and public agency partners to participate in the community workshops, including the County of Marin, Golden Gate Transit, Marin Transit, Marin County Bicycle Coalition, MCE, North Marin Community Services, North Marin Water District, Novato Fire District, Novato Sanitary District, Novato Tree Team, Novato Unified School District, Recology, Resilient Neighborhoods, Ride and Drive Clean, Sonoma-Marin Area Rail Transit (SMART), and the Transportation Authority of Marin.

City staff also hosted one-on-one meetings with several public agency partners and conducted targeted outreach to business and industry associations to gather further input and feedback.

Spanish Language Workshop

In March 2024, the City, in partnership with North Marin Community Services (NMCS), co-hosted a Spanish-language workshop to broaden community engagement in the development of CAP2030. Staff from NMCS provided a brief presentation to the thirteen attendees, followed by an informal, guided conversation.

All workshop participants expressed concerns about climate change and its impact on human health, food supplies, new epidemics, and the effect on future generations. Key topics of concern included drought, food shortages and associated increases in food prices, new diseases, temperature changes, and extreme weather. Attendees also expressed concern about the cost of adapting to climate change.

> ***"I am very worried about the uncertain future with all the changes in climate and the effects. I am concerned and wonder what is going to happen with my grandkids, as I want them to have a fulfilling life and be able to enjoy this world."***
>
> *—Workshop Attendee*

Community Survey

In February 2025, the City of Novato conducted a survey through *Open Novato* to gather community input on climate action and sustainability priorities. The survey was open from January 28 to February 23, 2025, and received 159 responses.

Key findings included:

- **Concern about Climate Change:** Nearly 73% of respondents reported being extremely concerned about the impacts of climate change on themselves and their families.
- **Top Concerns:** Participants primarily worried about the effects on future generations, the natural environment, and both individual and public health.
- **Knowledge and Barriers:** Although almost all respondents considered themselves somewhat or very knowledgeable about climate change, 37% cited uncertainty about how to begin taking action and expressed a need for more information and support.

Social Equity

Sustainability has been described as a three-legged stool, with a community's ability to balance needs related to the environment, economic development, and social equity inextricably linked.

To achieve the bold CAP2030 targets, it will be critically important to consider and include the aspirations and viewpoints of all community members to ensure that our environment is protected for many generations to come. The effects of our changing climate are already being felt, with extreme heat, poor air quality, severe weather events, drought, and flooding occurring with increased frequency. Often, the communities that have contributed the least to our climate crisis, including low-income communities, communities of color, Indigenous peoples, and developing nations, suffer first and worst from the impacts of climate change.

The City acknowledges that there are members of our community who are disproportionately impacted by climate change and is committed to ensuring that equity is considered in decision-making processes to safeguard the health and well-being for all of Novato.

Economic Vitality

To achieve our climate and social equity goals, it will be essential to also focus on the economic vitality of our community. A strong local economy is the driver of prosperity and plays a critical role in supporting the City's goals. A thriving economy generates the revenue needed to fund programs and initiatives that benefit the entire community. Many climate action measures can deliver significant returns on investment while also creating opportunities for business innovation, entrepreneurship, and sustainable economic growth. However, it is important to also recognize that increased regulation, if not carefully crafted, can sometimes drive up costs for businesses, deter growth and job creation, and slow the pace of local economic development.

Achieving balance among economic growth, environmental sustainability, and social equity requires intentional planning and collaboration. The City can advance community prosperity while simultaneously pursuing climate action and equity goals. By fostering a business environment that drives innovation, supports clean industries, and promotes equitable economic opportunities, Novato can ensure that economic development is aligned with the community's broader values.

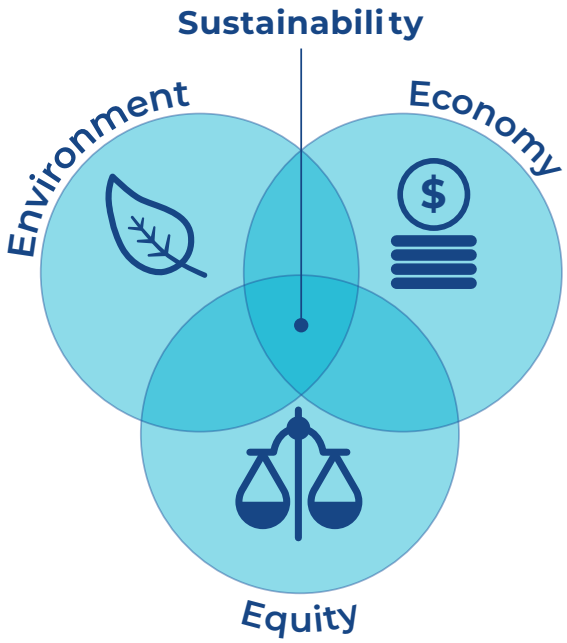


Photo Credit: Craig Solin

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

Communitywide GHG Emissions Inventory

The first communitywide GHG emissions inventory for Novato was produced in 2005. The inventory identified sources of GHG emissions, established baseline emissions levels, and served as the foundational document for the development of the City's 2009 *Climate Change Action Plan*. A subsequent emissions inventory was produced in 2010, and since 2014, MCEP has produced annual inventories for Novato, using 2005 as the baseline year to measure progress.

The 2022 communitywide GHG emissions inventory quantified emissions from a wide variety of sources including energy used to power, heat, and cool buildings; fuel used to move vehicles both around and through Novato and power off-road equipment; and decomposition of solid waste and treatment of wastewater. The 2022 inventory provided a detailed understanding of the sectors responsible for the majority of local GHG emissions and where the greatest opportunities for emissions reductions lie.

Communitywide emissions are quantified according to seven sectors utilizing methodologies established by the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (v. 1.2):

Built Environment: Electricity

Emissions generated from the use of electricity in residential, commercial, and public buildings and facilities, as well as electric vehicle charging.

Built Environment: Natural Gas

Emissions generated from the use of natural gas in residential, commercial, and public buildings and facilities. Propane used in residential buildings is included in this sector and represents about 1% of emissions.

Transportation

Emissions from passenger vehicle trips originating in and/or ending in Novato, a share (approximately 28%) of tailpipe emissions generated by medium and heavy-duty vehicles traveling on Marin County roads, and emissions from public transit vehicles when operating within City limits.

Waste

Fugitive methane emissions that are generated over time as organic material decomposes in the landfill. Although most methane is captured or flared off at Novato's landfill, approximately 25% still escapes into the atmosphere.

Off-Road Vehicles and Equipment

Emissions from the combustion of gasoline and diesel used to operate off-road vehicles and equipment used for construction and landscaping.

Water

Emissions from energy used to pump, convey, treat, and distribute potable water from the water source to water users in Novato.

Wastewater

Stationary, process, and fugitive emissions that are created during the treatment of wastewater generated by the community, as well as emissions created from energy used to process wastewater.

Communitywide GHG emissions in Novato totaled 369,971 $MTCO_2e$ in 2005 and 256,241 $MTCO_2e$ in 2022, a decrease of 31%, which is equivalent to 18% below estimated 1990 emissions.[11] As shown in Table 2, reductions have occurred in all inventoried sectors except the Wastewater sector, with the largest decline occurring in the Built Environment: Electricity sector. Emissions from electricity consumption dropped 88% due to several factors including a 23% reduction in electricity usage, an increase in solar installations, and a significant decrease in the carbon intensity of electricity. The second largest decline was in the Transportation sector, mainly due to improvements in vehicle fuel efficiency and the use of alternatively fueled cars.

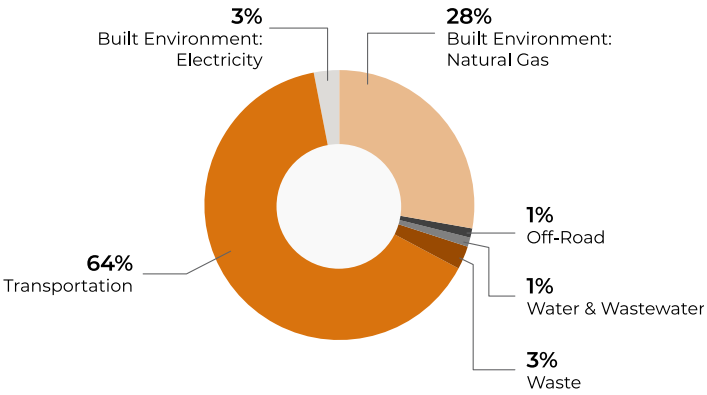
[11]Reliable sector-based greenhouse gas (GHG) emissions data is generally not available to accurately quantify 1990 emissions levels for local governments. The California Air Resources Board (CARB) has recommended local governments pursue a target, comparable to the statewide target, to reduce emissions 15% below "current" emissions as outlined in CARB's 2008 Climate Change Scoping Plan. Given the lack of available data for the year 1990, Marin cities and towns have historically used the year 2005 as the baseline for its emissions inventories.

Table 2: Communitywide GHG Emissions by Sector, 2005 to 2022

Year	Built Environment: Electricity	Built Environment: Natural Gas	Transportation	Waste	Off-Road	Water	Wastewater	Total	% Change from 2005
2005	71,53	75,742	196,458	16,835	4,391	3,875	1,133	369,971	0%
2006	68,690	77,826	191,930	16,795	4,628	4,003	1,142	365,014	-1%
2007	88,954	76,657	188,878	15,389	5,587	2,337	1,165	378,968	2%
2008	90,536	77,534	185,720	12,813	4,585	2,838	1,173	375,198	1%
2009	85,950	77,418	184,029	11,035	3,868	3,008	1,178	366,485	-1%
2010	65,990	78,505	175,942	10,797	3,441	1,230	1,184	337,090	-9%
2011	58,927	85,899	175,758	10,542	3,345	891	1,191	336,552	-9%
2012	61,833	78,454	174,929	10,941	3,279	774	1,206	331,417	-10%
2013	56,345	79,766	170,734	11,125	3,259	859	1,218	323,307	-13%
2014	52,010	65,417	173,514	11,261	3,242	938	1,233	307,615	-17%
2015	47,879	69,169	173,384	11,672	3,209	679	1,240	307,232	-17%
2016	37,975	66,597	168,803	13,688	3,156	568	1,240	292,027	-21%
2017	19,296	70,631	168,290	14,302	3,098	368	1,237	277,222	-25%
2018	20,251	70,350	166,103	12,689	3,016	0	1,233	273,641	-26%
2019	20,895	71,980	169,625	12,079	2,922	0	1,228	278,729	-25%
2020	14,747	69,053	166,781	11,001	2,835	0	1,212	265,629	-28%
2021	11,943	69,361	168,870	9,069	2,986	0	1,203	263,432	-29%
2022	8,456	70,536	164,214	8,711	3,140	0	1,185	256,241	-31%
Change from 2005	-63,082	-5,206	-32,244	-8,124	-1,252	-3,875	52	-113,730	
% Change from 2005	-88%	-7%	-16%	-48%	-29%	-100%	5%	-31%	

Figure 2 shows the relative contribution of emissions from the inventoried sectors in 2022. Sectors responsible for the lion's share of emissions are Transportation and the Built Environment: Natural Gas and reducing emissions in these sectors is critical to meeting Novato's long-term GHG reduction goals.

Figure 2: GHG Emissions by Sector, 2022



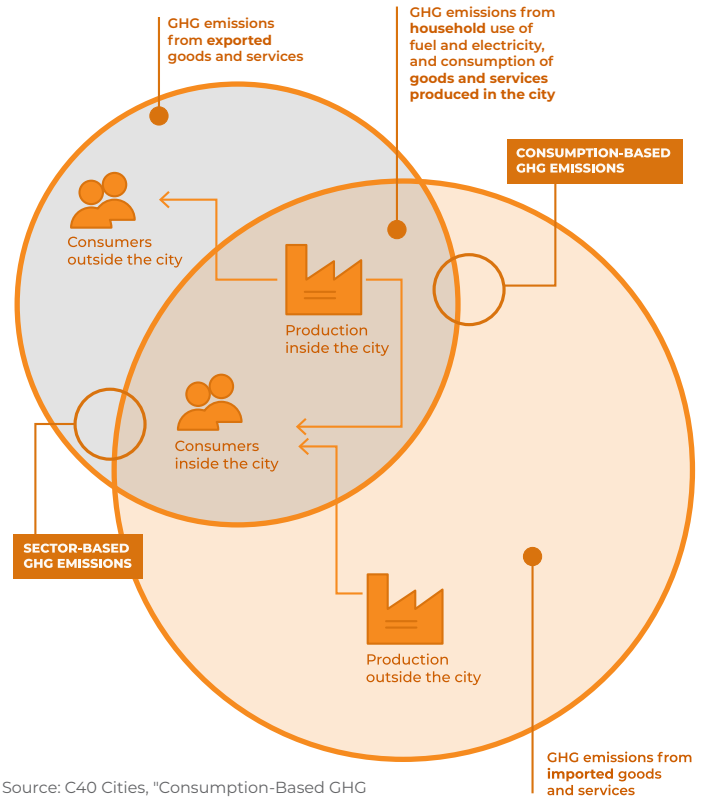
Consumption-Based Inventories

In addition to the sectors outlined above, which measure the GHG emissions generated by sector-based activities occurring *within* City boundaries, there are also significant emissions associated with the goods and services purchased and consumed by Novato's residents and businesses. These emissions are referred to as consumption-based GHG emissions and include the total emissions associated with the production, transportation, use, and disposal of goods and services consumed by a community.

Historically, local governments have only quantified emissions that occur within their boundaries, including emissions associated with goods and services that will eventually be exported (Figure 3). However, in communities like Novato (as in many other communities in the United States) where goods are more often imported than exported, consumption-based GHG emissions can be up to 800% higher than sector-based emissions.

In 2016, the Bay Area Air District (BAAD) and U.C. Berkeley produced consumption-based GHG emissions inventories for Bay Area communities, including Novato, to better understand how

Figure 3: Sector-Based vs. Consumption-Based GHG Emissions



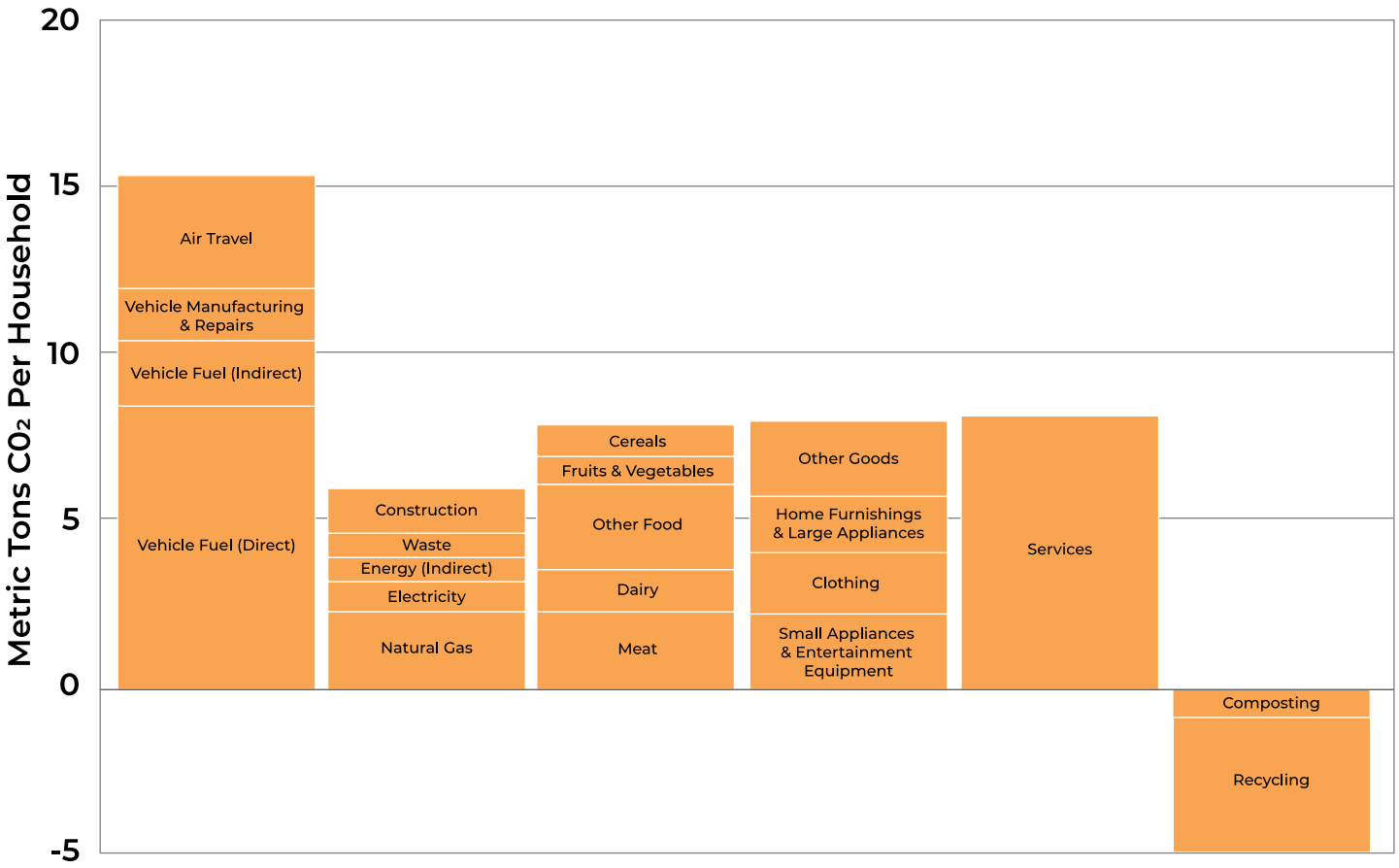
Source: C40 Cities, "Consumption-Based GHG Emissions of the C40 Cities"

household purchasing habits contribute to global climate change. These consumption-based inventories included emissions sources that are not typically quantified in a sector-based GHG inventory, as well as sources that are difficult to quantify like airplane travel and upstream emissions from the production, transport, and distribution of food and household goods.

Figure 4 shows the results of the 2016 consumption-based GHG emissions inventory for Novato households. According to the inventory, the average Novato household generates 45.0 $MTCO_2e$ per year. Under the sector-based GHG inventory, the average Novato household generated 12.5 $MTCO_2e$ in 2022, about 28% of the consumption-based estimate.[12] Although the consumption-based inventory is informative, it has not been updated since 2016 and there is no reliable methodology available to accurately track changes in emission levels over time.

[12]The 2016 consumption-based GHG emissions inventory used data from 2013 to determine household emissions. In that year, the average Novato household generated 145.8 $MTCO_2e$ according to the sector-based GHG emissions inventory, about 35% of the consumption-based estimate. For more information on the consumption-based inventories, visit https://coolclimate.org/inventory.

Figure 4: Average Novato Household Consumption-Based Emissions, 2016



As consumption-based GHG emissions are harder to track and have fewer defined pathways for policy and program interventions from local governments, the City follows the International Council for Local Environmental Initiatives (ICLEI) U.S. Community Protocol (V1.2) with a focus on actionable, sector-based policies and programs to address local emissions. By focusing on sector-based GHG emissions within the City's control, it can advance policies and programs that can be reliably quantified using established protocols and tracked annually to inform decision-making and measure progress.

However, it is expected that methodologies and metrics to quantify and reduce consumption-based GHG emissions will advance during the implementation period of CAP2030. Given the high level of consumption-based GHG emissions attributable to Novato households, the City will continue to monitor the applicability of new protocols and will incorporate these tools into CAP2030 planning and annual emissions inventory process, whenever possible.

Communitywide GHG Emissions Forecast

CAP2030 includes a business-as-usual (BAU) forecast in which GHG emissions are projected in the absence of any policies or actions that would occur beyond the base year to reduce emissions. The forecasts are derived by "growing" 2022 communitywide GHG emissions by forecasted changes in population, number of households, and local employment.

The number of households projected assumes that the City will add 2,580 housing units by 2030, as reported in the City's *6th Cycle Housing Element* (both pipeline projects and potential new housing developments). Population projections are estimated by assuming 2.46 persons per household, which is the current household size according to the California Department of Finance.[13] Due to the uncertain nature of actual housing development, no additional housing development and population growth is assumed after 2030, and no significant growth is

[13]While approximately 80% of the additional housing units are expected to be small multifamily units and accessory dwelling units, the expanded housing stock is expected to provide options for senior households to downsize, thus freeing up single family homes for larger families. Nonetheless, the 2.46 persons per household estimate is on the conservative side.

expected in either the retail or commercial employment sectors.

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 2050*.

As shown in Table 3, GHG emissions are expected to rise 6.5% by 2030. Forecasted emissions then decline due to the projected reduction in VMT. Emissions are projected to be approximately 270,114 $MTCO_2e$ by 2050 under the BAU forecast, an increase of 45.4% from 2022 levels.

Table 3: Novato GHG Emissions Forecast

Forecast Category	2022	2030	2040	2050
Population	51,936	56,711	56,711	56,711
Housing Units	21,337	23,917	23,917	23,917
Households	20,566	23,053	23,053	23,053
Jobs	26,910	26,910	26,910	26,910
Emissions ($MTCO_2e$)	256,241	256,937	271,519	270,114
Change in Emissions from 2020		+6.50%	+6.00%	+5.40%

Communitywide GHG Emissions Reduction Targets

Consistent with state GHG emissions reduction goals, CAP2030 establishes targets to reduce communitywide emissions 40% below 1990 levels and achieve carbon neutrality by 2045 (see Table 4).

Figure 5 shows the City's communitywide GHG emissions trend, forecast, and reduction targets that will occur through both mitigation and carbon dioxide removal (sequestration, carbon capture and storage, etc.) strategies.[14]

Since the majority of local GHG emissions come from the exhaust generated by passenger cars (referred to as light-duty vehicles), and from natural gas burned for space heating, cooking, and heating hot water in residential and commercial buildings. CAP2030 emphasizes the importance of electrifying both our vehicles and buildings as the key to meeting the City's 2030 GHG reduction goals.

Chapter 3 outlines specific strategies, measures, and actions to achieve Novato's emissions reduction targets through the year 2030, and Novato can expect to meet the state's 2045 carbon neutrality goal if the following measures are implemented past 2030:

- All light-, medium-, and heavy-duty vehicles and small off-road equipment are replaced with zero-emission models; and
- Gas appliances and heating systems in all buildings are replaced with electric models; and
- Electricity generated or purchased by residents and businesses is carbon-free; and
- Residential and commercial organic waste is reduced 95% below 2014 levels

[14]For a review of carbon dioxide removal strategies, see the IPPC fact sheet at https://www.ipcc.ch/report/ar6/wg3/downloads/outreach/IPCC_AR6_WGIII_Factsheet_CDR.pdf.

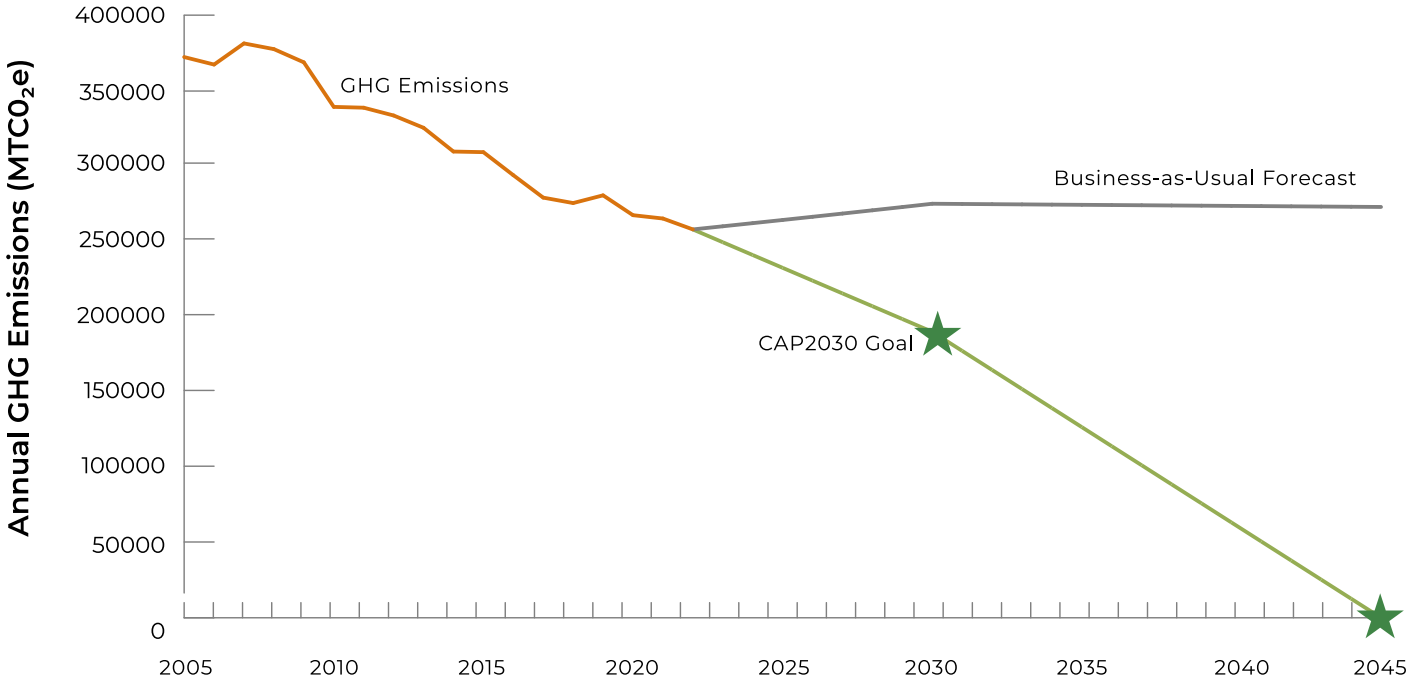
The City acknowledges that urgent action will also be needed at the regional, state, federal, and international level to achieve the IPCC's recommendation to limit global warming to 1.5 degrees Celsius and avoid the most catastrophic impacts of climate change. CAP2030 contains specific actions related to advocacy at the regional, state, and federal levels for policies and programs that will accelerate the rapid transition to GHG-free energy sources, the electrification of both buildings and vehicles, as well as other high-impact measures to sharply reduce GHG emissions.

Table 4: Communitywide GHG Emissions Reductions Targets

	2030 Target	2045 Target
Novato Target	Reduce emissions 40% below 1990 level[15]	Reduce emissions 85% below 1990 level and achieve carbon neutrality
State Reference	SB 32	AB 1279
Emissions Limit to Meet Target	188,685 $MTCO_2e$	47,171 $MTCO_2e$ 0 $MTCO_2e$ with carbon dioxide removal

[15]Consistent with the California Air Resource Board's guidance to local governments, the City is estimating 1990 levels as 15% below 2005 levels.

Figure 5: Communitywide GHG Emissions Trend, Forecast, and Reduction Targets



CHAPTER 3:
STRATEGIES, MEASURES, AND ACTIONS TO REDUCE GREENHOUSE GAS EMISSIONS

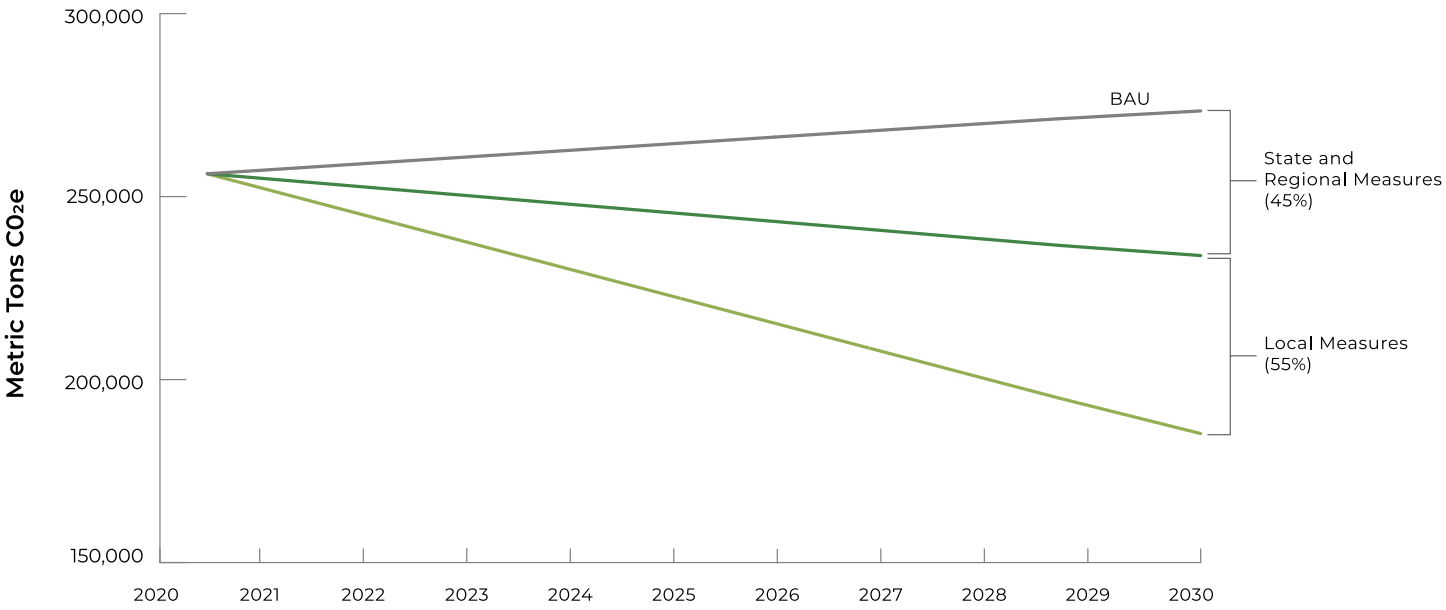
Introduction

CAP2030 includes a variety of regulatory, incentive-based, and market-based strategies that are projected to reduce GHG emissions in Novato. Several of the strategies build on existing programs, while others provide new opportunities to address climate change. State and regional policies and programs will have a significant impact on future emissions, and the local strategies, measures, and actions outlined in CAP2030 will supplement these to achieve additional GHG emissions reductions.

Total estimated communitywide emissions in 2022 were 256,241 $MTCO_2e$ and the following sections identify state, regional, and local measures projected to reduce communitywide emissions by 84,807 $MTCO_2e$ by 2030. Should these reductions be achieved, Novato's total GHG emissions are projected to be 188,130 $MTCO_2e$ by 2030, which is 40% below 1990 levels.

As shown in Figure 6, state and regional measures represent about 45% of the GHG emissions reductions expected upon full implementation of CAP2030, with local measures representing the remaining 55%. However, it is important to note that some of the local measures (such as increasing the number of zero-emission, light-duty vehicles and buses in Marin County, phasing out gas-powered landscape equipment, and reducing the amount of organic waste sent to the landfill) work in tandem with state and regional regulations, policies, and programs.

Figure 6: Cumulative Impact of GHG Emissions Reduction Strategies



State and Regional Measures

CAP2030 incorporates state and regional GHG emissions reduction measures that have been approved, programmed, and/or adopted, and are expected to further reduce local community emissions compared to 2022 levels. While these measures do not require additional local action, local measures may work to support these programs.

For the purposes of CAP2030, state and regional measures are quantified first, and then deducted from projected communitywide emissions to provide a fuller picture of what is required at the local level to achieve the overall GHG emissions reduction target. State and regional measures, including regulations related to light and heavy-duty vehicles, gas heaters, building energy codes, small off-road engines, renewable energy, and renewable diesel use, and their associated emissions reductions are shown in Table 5 and detailed in Appendix A: Greenhouse Gas Emissions Reduction Calculations.

Table 5: Estimated GHG Emissions Reductions in Novato from State and Regional Measures

State and Regional Measures	2030 Emissions Reductions $MTCO_2e$
California Air Resources Board - Light and Heavy-Duty Vehicle Regulation	23,655
Bay Area Air District - Zero-Emission Appliance Standard	9,076
California Building Standards Code - Title 24	3,055
California Air Resources Board - Small Off-Road Engines Regulations	1,226
Renewable Portfolio Standard	1,081
California Air Resources Board - Innovative Clean Transit Rule	343
Total	**38,436**

Local Measures

CAP2030 local measures are framed around six focus areas: Mobility & Land Use (ML); Buildings & Energy (BE); Materials & Waste (MW); Natural & Urban Landscapes (NL); Community Engagement (CE); and Implementation & Monitoring (IM). Each focus area includes a summary of strategies and a table of measures, followed by specific actions the City will undertake in partnership with the community including residents, businesses, public agencies, and non-governmental organizations. The methodologies and implementation targets used to calculate emissions reductions are described in Appendix A. With some of the measures, there is no direct or reliable way to estimate associated GHG emissions reductions or the reductions are embedded in another measure. In this case, the reason is noted below the respective table of measures.

Measures are categorized either as a community measure (ML-**C**1 for example), which aims to reduce overall communitywide emissions, or a municipal measure (ML-**M**1 for example), which focuses on emissions from City operations.

As summarized in Table 6 below, local measures are projected to achieve a reduction in communitywide GHG emissions of approximately 46,371 $MTCO_2e$ by 2030.

Table 6: GHG Emissions Reductions by Focus Area for Local Measures

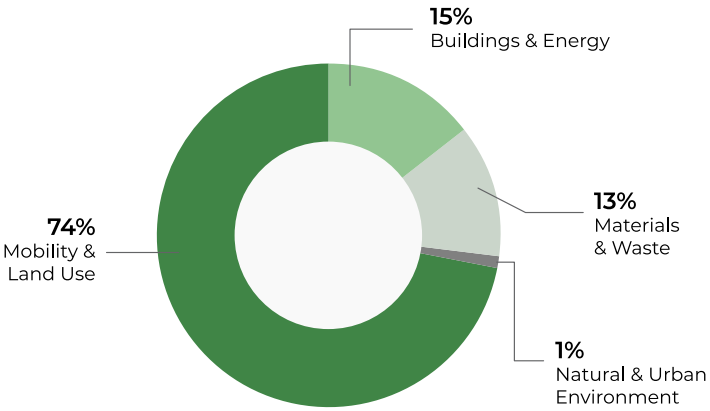
Focus Area	GHG Reductions by 2030 ($MTCO_2e$)	Share of Total Local Reductions
Mobility & Land Use (ML)	34,585	75%
Buildings & Energy (BE)	5,366	12%
Materials & Waste (MW)	5,880	13%
Natural & Urban Environment (NU)	540	1%
Community Engagement (CE)	-[1]	-
Implementation & Monitoring (IM)	-[1]	-
Total	46,371	100%

[1] There are no emissions reductions in these focus areas because the measures are supportive of the other focus areas.

Figure 7 shows the relative contribution of emissions reductions for the four focus areas that have quantifiable GHG reduction targets. Three-quarters of reductions are projected to come from Mobility & Land Use measures, 15% from Buildings & Energy measures, 13% from Materials & Waste measures, and 1% from Natural & Urban Landscapes measures.

Novato's municipal operations emit a very small percentage of overall communitywide emissions, and in 2016 (the last time the City conducted an inventory of emissions related to City operations), they totaled 1,760 $MTCO_2e$, or less than 1% of communitywide emissions. Although these emissions are relatively small comparatively, the City recognizes the importance of modeling leadership and best practices for the community. The municipal measures in CAP2030 total 371 $MTCO_2e$, which are estimated to reduce local government operations emissions at least 40% below the estimated 1990 level.

Figure 7: Focus Area Share of Projected Local GHG Emission Reductions



MOBILITY & LAND USE

75% of potential GHG emissions reductions

STRATEGY 1
Multimodal Mobility and Connectivity

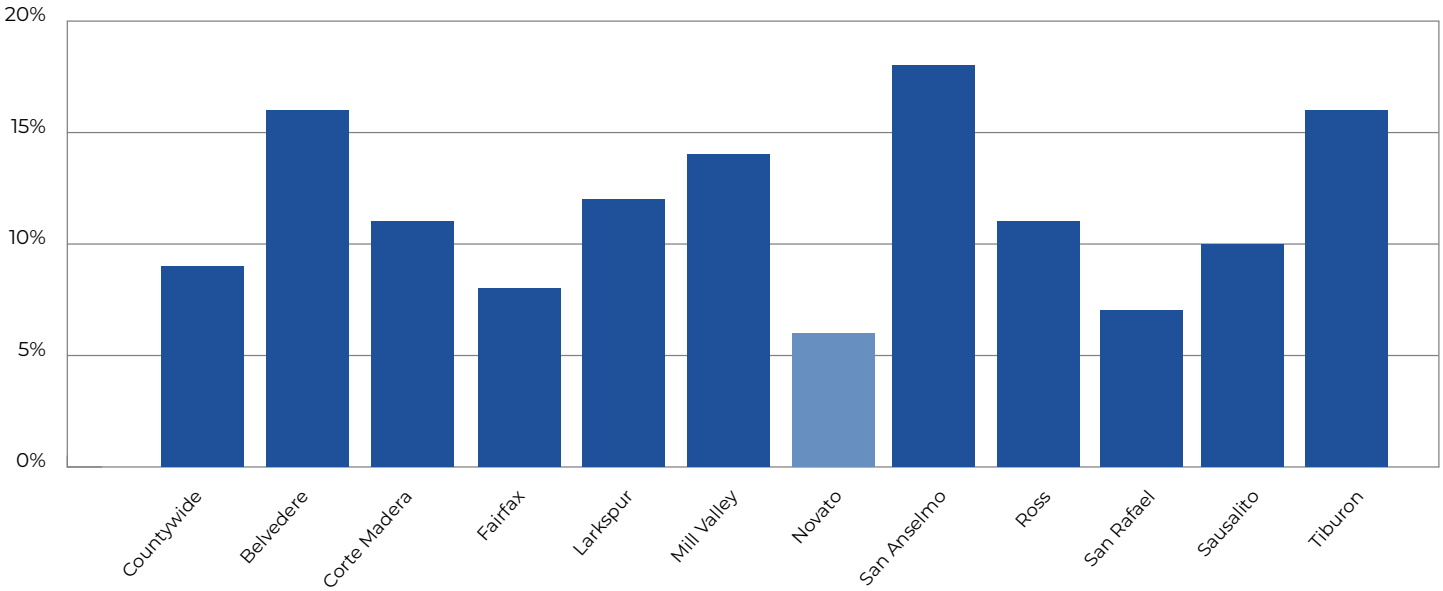
According to Novato's *2022 GHG Emissions Inventory Report*, 64% of communitywide emissions are related to transportation, predominantly from the use of light-duty passenger vehicles. However, between 2005 and 2022, Novato reduced transportation-related GHG emissions by 17%, mostly due to advancements in vehicle fuel efficiency and an increase in the use of alternatively fueled cars, while VMT increased by 1% over the same period. Reducing emissions from the transportation sector will need to be a top priority if Novato is to meet its GHG emissions reduction goals.

Surveys show that while people working from home have more than doubled in recent years,[16] the use of alternative modes of transportation has declined, despite improvements to the bicycle and pedestrian network and public information campaigns to encourage carpooling, cycling, walking, and taking public transit. As a result, accelerating and supporting the adoption of zero-emission vehicles (ZEVs) is Novato's most likely pathway to meet its ambitious GHG reduction targets. ZEVs include battery electric vehicles, as well as plug-in hybrid electric vehicles, and fuel cell electric vehicles.

Marin County is a leader in California ZEV adoption rates – second only to Santa Clara County. ZEVs already comprise about 9.3% of registered light-duty vehicles in Marin County. By the end of 2023, ZEVs made up approximately 6.3% of all registered vehicles in Novato (see Figure 8). To achieve the GHG emissions reduction measure related to ZEV adoption, registrations will need to account for almost one quarter of all vehicle registrations in Novato by 2030.

Supporting the build-out of a reliable and affordable ZEV charging infrastructure network, encouraging ZEV ownership through the promotion of incentives, and increasing public education will be essential to achieve this aggressive target. Novato's CAP goals related to ZEVs complement the state's goal to put 5 million ZEVs on the road by 2030 and the requirement that all new passenger vehicles sold in California be ZEVs by 2035.

Figure 8: Zero-Emission Vehicle Adoption Rates by Marin Jurisdiction, 2022



Source: California Energy Commission, Zero-Emission Vehicle and Infrastructure Statistics.

Note: Data provided by the California Energy Commission is by zip code and may therefore include unincorporated areas. The data shown here for Novato represents zip codes 94945, 94947, 94948, and 94949.

[16]U.S. Census Bureau, American Community Survey

Improvements in battery and charging technology, increased affordability of both new and used ZEVs, availability of incentives (particularly for low-income drivers) and commitments from automakers to significantly expand ZEV offerings all points to an all-electric transportation future. Programs that promote and incentivize used EV car purchases and the installation of EV chargers in multifamily buildings will also help ensure the benefits of EV ownership are shared by all.

However, increasing the number of ZEVs alone will not enable Novato to achieve its transportation-related GHG reduction targets. Reducing congestion, promoting carpooling, and increasing the use of active transportation modes such as biking, walking, and micromobility, in addition to increasing public transit ridership, will also be essential to meeting targets.

COMMUNITY MEASURES AND ACTIONS

Measure ML-C1: Zero-Emission Vehicles
Accelerate the transition to zero-emission vehicles

a. Accept the *Marin Countywide Electric Vehicle Acceleration Strategy* and develop a two-year work plan that identifies responsibilities, timelines, funding sources, and specific targets for each action selected. In future years, prioritize actions from the Strategy for implementation on a biennial basis.

b. Implement zero emission vehicle (ZEV) policies and programs that will result in at least 39% of passenger vehicles registered in Marin County to be ZEVs by 2030 and 26% ZEVs in Novato.

c. Document and promote Novato's ZEV registration data as a means of tracking progress. As data becomes available from the state, compare local ZEV adoption rates to countywide, regional, and state benchmarks to evaluate policy and program effectiveness. Revise policies and programs as needed to achieve the ZEV adoption target for 2030.

d. Adopt green building standards that facilitate and accelerate the transition to ZEVs, micro-mobility, and reduced car dependence, and ensure new construction can meet future demand to avoid unnecessary retrofitting costs by requiring multi-family and workplace ZEV charging infrastructure to exceed minimum state building code requirements.

e. Work with MCE, PG&E, the Transportation Authority of Marin (TAM), and other entities to identify multi-family and workplace sites appropriate for available ZEV charging infrastructure incentive programs.

f. Conduct outreach and education to owners and property managers of multi-family buildings and workplace sites to promote ZEV charging incentive programs and encourage installation of charging infrastructure.

g. Pursue opportunities to promote equitable access by installing Level 2 and Level 3 DC fast charging in locations not served by the private market. Study the feasibility of implementing innovative programs such as installing ZEV chargers at streetlight and curbside locations to increase equitable access to charging.

h. Consider partnering with EV charging vendors to identify potential City-owned locations for EV chargers that may be installed at a reduced cost. Include reliability requirements in any such agreements.

i. Promote incentives and develop targeted policies to support ZEV adoption and the installation of EV charging infrastructure in low-income and disadvantaged communities.

j. Encourage the installation of ZEV charging infrastructure in existing commercial parking lots and gas stations by streamlining the permit process and reducing financial barriers, if practicable.

COMMUNITY MEASURES AND ACTIONS

k. Participate in regional and coordinated local procurement efforts, outreach activities, and planning initiatives to accelerate ZEV adoption.

i. Participate in programs to promote ZEV adoption, including "Drive a ZEV" events and education and outreach campaigns produced by agency, community, and nonprofit partners. Promote these programs through City communication channels and seek opportunities to promote ZEVs at local events within Novato, including parades, festivals, and similar gatherings. Tailor outreach strategies and messages to targeted audiences (e.g., single-family, multi-family, low-income).

Measure ML-C2: Active Transportation
Encourage walking, bicycling, and micromobility as an alternative to vehicular travel

a. Continue to establish a well-maintained, safe, and connected bicycle and pedestrian network and facilities that are consistent with the City's *Bicycle/Pedestrian Plan* and *Complete Streets* policy and implement recommended programs from the *Bicycle/Pedestrian Plan.* Facilitate access throughout the City, particularly to and from local schools and transportation facilities.

b. Consider long-term maintenance and improvement of multi-use pathways and bicycling and pedestrian facilities consistent with the City's *Bicycle/Pedestrian Plan* and *Complete Streets* policy in the City's Capital Improvement Program planning and budgeting process.

c. Coordinate with the Complete Streets and Pathways Oversight Committee to identify and prioritize pedestrian, bicycle, and micromobility projects with the greatest potential for reductions in vehicle miles travelled, including short- and long-term bikeway projects, and bicycle parking facilities.

d. Consider maintenance and construction of infrastructure to improve pedestrian safety including lighting, sidewalks, and crosswalks in the City's Capital Improvement Program planning and budgeting process.

e. Promote safe bicycling and micromobility (including electric-bikes, scooters, and skateboards) through outreach channels and partner agencies.

f. Require at least one long-term, covered, and secure bicycle space for every unit, plus guest bicycle parking, for new multi-family buildings. Continue to require new and remodeled commercial buildings to install bicycle parking facilities as per CALGreen (Title 24, Part 11) Tier 1 requirements.

g. Continue regional collaboration efforts to establish a bike and/or scooter share program, particularly at mobility hubs and SMART stations.

h. Explore partnering with community organizations to offer secure bike parking at City-sponsored and other large public events.

Measure ML-C3: School-Related Travel
Increase green trips to schools

a. Continue to work with Novato Unified School District, the Transportation Authority of Marin, Safe Routes to Schools, and other organizations to increase bicycling, walking, carpooling, and taking public transit to school.

b. Identify opportunities to improve bicycle and pedestrian facilities between neighborhoods and schools, including applying for Safe Routes to Schools grants.

COMMUNITY MEASURES AND ACTIONS

Measure ML-C4: Public Transit
Increase transit ridership

a. Continue to partner with Marin Transit, Golden Gate Transit, and SMART to grow ridership through promotion of transit options that maximize the use of public transit.

b. Work with the Transportation Authority of Marin, Marin Transit, SMART, and others to implement 'first and last mile' programs and services (including shuttles and bike/scooter share) to make public transit more convenient.

c. Encourage Novato Unified School District and private schools in Novato to promote discounted student transit passes and the use of public transit to reduce school traffic.

Measure ML-C5: Employee Trip Reduction
Reduce vehicle miles traveled related to commuting

a. Work with the Transportation Authority of Marin, the Metropolitan Transportation Commission, and the Bay Area Air District to promote transportation demand management programs to local employers, including rideshare matching, vanpool incentives, emergency ride home, telecommuting, transit discounts and subsidies, showers and changing facilities, bicycle racks and lockers, bicycle and pedestrian pathways, 'first and last mile' programs connecting transit to local workplaces, and other incentives to reduce the number of single occupancy vehicles.

b. Update the City's *Trip and Travel Demand Reduction Measures Ordinance* to reflect the most recent Bay Area Air District regulations.

c. Work with the Metropolitan Transportation District to identify and notify Novato-based businesses that are out of compliance with Bay Area Air District's *Commuter Benefits Program* and encourage them to provide transportation demand management programs.

Measure ML-C6: Traffic System Management and Vehicle Idling
Reduce emissions from idling

a. Seek funding to implement signal synchronization and explore the feasibility of implementing intelligent traffic management systems to minimize wait times at traffic lights, improve traffic flow, and guide vehicles to available parking.

b. Explore transit signal priority development in transit priority corridors.

c. Consider the installation of roundabouts, rather than signals or stop signs, to reduce idling, improve traffic flow, reduce energy use, and increase safety, wherever feasible.

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

MUNICIPAL MEASURES AND ACTIONS

Measure ML-M1: Fleet Modernization
Transition the City's fleet to zero- and/or low-emission vehicles

a. Develop a fleet electrification plan for light, medium, and heavy-duty vehicles based on cost, availability, and suitability using a phased approach consistent with the California Air Resources Board's *Advanced Clean Fleet* regulations.

b. Amend the City's *Fleet Replacement Policy* with the goal to convert 100% of the light-duty fleet to zero-emission vehicles by 2030, with exceptions permitted for Police Department vehicles.

c. Purchase or lease zero-emission vehicles for the City's fleet whenever feasible, and when not, procure the most fuel-efficient models available.

d. Promote the City's procurement of zero-emission vehicles and charging infrastructure to the public.

Measure ML-M2: Low-Carbon Fuels and Idling Reduction for City Fleet Vehicles
Reduce emissions from the use of fossil fuels

a. Continue to use low-carbon fuel such as renewable diesel as a transition fuel in the City's fleet and encourage the City's service providers to do the same until vehicles are replaced with zero-emission vehicles.

b. Adopt administrative policies to minimize idling of City vehicles.

Measure ML-M3: City Employee Commuting
Encourage City employees to use green commuting options

a. Consider offering City employees incentives to reduce barriers and encourage alternatives to single-occupant vehicle commuting, such as transit use discounts and subsidies, bicycle facilities, showers and changing facilities, ridesharing services, vanpools, emergency ride home service, flexible schedules, and telecommuting when practicable.

STRATEGY 2

Sustainable Land Use Planning

Sustainable land use planning reduces VMT and transportation emissions by locating higher-density housing near transit facilities, retail, and entertainment. This enables residents to use active transportation methods to access stores and services and take public transportation to jobs and other longer-distance locations.

The City's *General Plan 2035 6th Cycle Housing Element* identifies viable sites for high-density and transit-oriented development and contains policies and programs to facilitate a variety of housing types affordable at all income levels.

COMMUNITY MEASURES AND ACTIONS

Measure ML-C7: Smart Growth Development
Reduce vehicle miles traveled through smart growth development

a. Continue to promote land use and development policies that prioritize higher density infill housing and mixed-use development near commercial services and transit facilities, as opposed to development in peripheral areas that require use of vehicles to access transit and services.

b. Achieve multi-family housing development on housing opportunity sites identified in the City's Housing Element 2023-2031 and apply existing inclusionary requirements for units affordable to lower-income households, as applicable.

c. Encourage new commercial developments to enhance the pedestrian experience by creating pedestrian zones, pathways, and access points and using landscaping, lighting, and physical barriers from vehicular traffic to improve security and safety.

d. Encourage, and where possible require, the provision and maintenance of bus stops, bus shelters, benches, lighting, turnouts, turnarounds, and related facilities in major new commercial, industrial, residential, and institutional developments that might be served by transit, when supported by transit agencies. Consult and coordinate with transit agencies early in the approval process when development is proposed.

e. Participate in the implementation of the Transportation Authority of Marin's *Countywide Transportation Plan.*

TABLE 7

GHG EMISSIONS REDUCTIONS FROM MOBILITY & LAND USE MEASURES

1 Multimodal Mobility and Connectivity

Measure	GHG Reduction by 2030 ($MTCO_2e$)	Share of Emissions Reduction
ML-C1: Zero-Emission Vehicles	30,454	88%
ML-C2: Active Transportation	1,278	4%
ML-C3: School-Related Travel	372	1%
ML-C4: Public Transit	5	>1%
ML-C5: Employee Trip Reduction	7	>1%
ML-C6: Traffic System Management and Vehicle Idling	663	2%
ML-M1: Fleet Modernization	227	1%
ML-M2: Low-Carbon Fuels and Idling Reduction for City Fleet Vehicles	21	>1%
ML-M3: City Employee Commuting	13	>1%

2 Sustainable Land Use Planning

Measure	GHG Reduction by 2030 ($MTCO_2e$)	Share of Emissions Reduction
ML-C7 Smart Growth Development	1,545	4%

TOTAL	34,586	100%

BUILDINGS & ENERGY

12% of potential reductions

STRATEGY 1
Renewable Energy

Energy that comes from renewable sources such as solar, wind, geothermal, and small hydroelectric, are the cleanest, most environmentally-friendly energy sources available. In Marin County, where sunny days are abundant, solar energy is a particularly good energy source. According to data provided by Environmental Insights Explorer,[17] 95% of residential and commercial buildings in Novato have roofs that are solar-viable, and these 17,700 roofs could generate more than the total electricity used in Novato in the year 2022. CAP2030 projects that Novato can generate about 19% of the community's required electricity from locally-produced solar energy systems by 2030, up from about 6% in 2022, just by maintaining the current pace of annual installations.

Solar energy systems combined with battery storage make both residential and commercial buildings more energy resilient, since they can be operated during a power outage or when power is curtailed during an emergency. In these situations, using solar energy plus battery storage, rather than running a generator powered by fossil fuels is a cleaner option.

When solar is not an option, residents and businesses can purchase 100% renewable electricity from MCE.[18] The high renewable content of MCE electricity products makes them some of the cleanest electricity products in the country. In 2022, MCE's Light Green electricity was 95% GHG-free while MCE's Deep Green electricity comes from 100% renewable sources and is 100% GHG-free. In 2024, 74% of Novato residents and businesses purchased Light Green electricity and almost 9% purchased the Deep Green product. CAP2030 proposes measures to increase the Deep Green enrollment rate to 13% by 2030.

As more all-electric buildings come online, utilities are expanding grid capacity and developing electricity storage to ensure system reliability. In addition, ongoing research and development of energy storage systems are creating new business opportunities and making an all-electric, 100% renewable energy future possible.

[17]The Environmental Insights Explorer is at https://insights.sustainability.google/

[18]As of the publication date of CAP2030, PG&E was not offering a renewable electricity product to residential and non-residential customers as per California Public Utility Commission directive in Decision 21-12-036. https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M433/K096/433096271.PDF

COMMUNITY MEASURES AND ACTIONS

Measure BE-C1: Renewable Energy Generation and Storage
Support the transition to 100% clean, renewable energy

a. Accelerate the installation of residential and commercial solar and battery storage systems through streamlined permitting, engagement campaigns, and promotion of available incentives.

b. Consider developing an ordinance to require the installation of solar carports in parking areas in new commercial projects and large-scale residential developments. Encourage existing developments to install solar carports through development review when remodeling and/or agency incentives.

c. Identify and promote financing and loan programs for residential and commercial renewable energy projects including those that benefit low-income and historically marginalized neighborhoods and residents.

Measure BE-C2: Clean Electricity in Residences and Businesses
Promote renewable electricity and ensure sufficient grid capacity

a. Encourage residents and businesses to switch to 100 percent renewable electricity (e.g., MCE Deep Green and MCE Local Sol) by highlighting the benefits of clean energy through engagement campaigns and promoting partner agency incentives.

b. Work with Marin jurisdictions to plan future electricity demand and interconnection needs, and coordinate with the utilities to build local capacity and energy resiliency.

MUNICIPAL MEASURE AND ACTIONS

Measure BE-M1: Clean Electricity Use in Municipal Facilities
Use 100% renewable electricity for City buildings and facilities

a. Incorporate the installation of solar energy systems and battery storage at municipal buildings and facilities into the City's Capital Improvement Program plan, whenever feasible, and budget to optimize energy resiliency and renewable energy use.

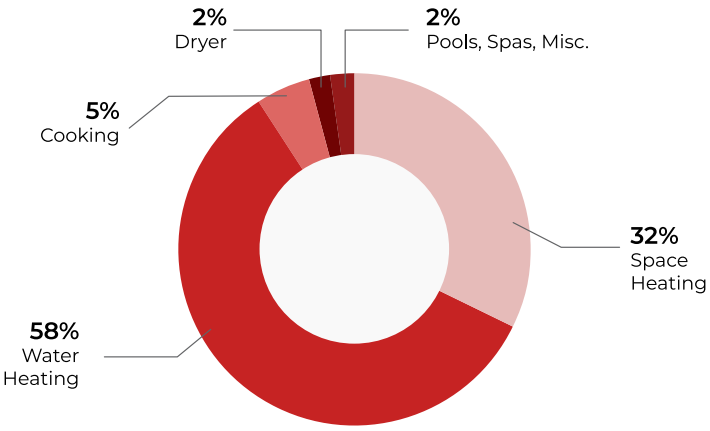
b. Continue to purchase 100% renewable electricity for City-owned facilities.

STRATEGY 2
Building Decarbonization

Renewable electricity is a cleaner, safer, and healthier energy source when compared to natural gas, and swapping out gas appliances and heating systems for electric models will be critical to meet Novato's long-term GHG reduction goals. As shown in Figure 9, most gas consumption in California residential buildings is used for water heating (59%), and space heating (32%).

As per Bay Area Air District regulations, the installation of new gas water heaters will be prohibited starting in 2027, and residential gas heating systems starting in 2029.

Figure 9: Residential Gas Consumption by End Use in California, 2019



Source: 2019 California Residential Appliance Saturation Survey

COMMUNITY MEASURE AND ACTIONS

Measure BE-C3: Building Electrification
Accelerate the electrification of Novato's residential and commercial buildings

a. Consider adopting Marin County's *Building Electrification Roadmap* to equitably and rapidly transition to an all-electric, energy-efficient future.

b. Leverage the City's communication platforms, including newsletters, website, print materials, and social media, to share information on the benefits of building electrification. Provide educational materials and handouts at the permit counter and promote local, regional, and state programs that offer technical assistance, incentives, rebates, and concierge services to support the electrification of residential and commercial buildings.

c. Advocate for increased funding from local, regional, and state agencies, and financing options such as utility on-bill financing and repayment programs.

d. Partner with other Marin jurisdictions to establish a 'hub' to provide information, demonstrate building electrification technologies, and provide in-person, online, and/or telephone education and support.

e. Explore partnering with trusted community-based organizations to conduct outreach and education on the benefits of building electrification to targeted populations, such as low-income households, older adults, and historically marginalized communities.

f. Streamline the building permit process for heat pump hot water and space heaters and electrical panel upgrades. Consider implementing a fee reduction pilot program to incentivize conversion of natural gas appliances to electric.

MUNICIPAL MEASURE AND ACTION

Measure BE-M2: Electrification of City-Owned Buildings
Transition City-owned buildings to be all-electric

a. Utilize Facility Condition Assessment Reports to plan the replacement of natural gas-powered appliances with electric models and incorporate into the City's Capital Improvement Program plan and budget.

STRATEGY 3
Energy Resilience

Climate resilience refers to the ability of a community to prepare, respond to, and recover from the effects of climate change. Energy resiliency means having systems and processes in place to allow the community to function during a power outage or when California's electric grid is stretched beyond its capacity.

Community members can support resiliency of the electric grid by installing solar energy and battery storage systems that can operate when they are not connected to the grid, and by utilizing programs that shift energy usage to times when there is plenty of renewable energy on the grid.

Many communities are also beginning to construct 'resilience hubs' to support residents and local government operations during emergencies and power outages. These hubs are designed to operate independently of the grid and often combine solar energy systems, battery storage, electric vehicle charging, and indoor spaces for cooling, heating, relief from wildfire smoke, Wi-Fi access, and device charging.

COMMUNITY MEASURE AND ACTIONS

Measure BE-C4: Innovative Technologies
Explore opportunities to increase local energy resilience

a. Investigate and pursue innovative technologies and programs such as resiliency hubs with microgrids, community solar initiatives, and demand-response programs to enhance local resilience, strengthen the electric grid's reliability, balance energy demand, and maximize renewable energy utilization.

b. Explore partnering with solar developers to increase access to local, affordable, clean energy for low-income and historically disadvantaged residents.

STRATEGY 4
Energy Conservation & Efficiency

Reducing overall energy use is the most cost-effective, impactful action residents and businesses can take to reduce energy-related GHG emissions. Since 2005, electricity consumption in Novato's residential and commercial buildings has declined an average of nearly 1% per year (excluding the increase in solar energy generation) and natural gas consumption has declined about 0.5% each year. There are numerous opportunities to continue to work with utilities and other partners to promote energy conservation and electrification programs to continue to reduce energy use.

Increasing the efficiency of existing buildings by implementing energy upgrades, such as insulating walls and ceilings, installing LED lighting, sealing leaks in heating ducts, and installing a programmable thermostat, can result in energy savings of up to 20%, while more aggressive "whole house" retrofits (such as replacing windows) can result in even greater energy savings. Choosing Energy Star-certified appliances and office equipment, high-efficiency heating and air conditioning systems, and high-efficiency windows not only saves energy but reduces operating costs in the long run. A wide array of rebates, incentives, and financing are available to help defray the cost of energy efficiency upgrades. Ensuring that a building uses energy efficiently is an important first step before considering more costly upgrades such as solar energy systems or installing new heating and/or cooling systems.

COMMUNITY MEASURES AND ACTIONS

Measure BE-C5: Energy Conservation and Efficiency Programs
Promote and expand participation in residential and commercial energy conservation and efficiency programs

a. Promote the benefits of energy efficiency, including demand response incentives.

b. Partner with community organizations and local and regional agencies to implement outreach and educational campaigns to promote energy conservation as a no-cost solution to reduce emissions.

c. Promote financing and loan programs for residential and non-residential projects such as Property Assessed Clean Energy programs, PG&E on-bill financing, and California Hub for Energy Efficiency Financing programs.

Measure BE-C6: Energy Audits
Reduce energy use in existing buildings

a. Collaborate with utilities and local, regional, and state agencies to promote energy audits for residential and commercial buildings. Explore opportunities to involve youth in energy auditing processes on Novato Unified School District campuses.

Measure BE-C7: Streamlined Permitting and Technical Assistance
Streamline processes that support green building and retrofits

a. Analyze current building permit and inspection processes to eliminate barriers and explore promoting and/or providing technical assistance to ensure successful implementation of green building requirements and electrification projects.

b. Coordinate with other Marin jurisdictions to adopt consistent building code requirements, where practicable.

MUNICIPAL MEASURE AND ACTIONS

Measure BE-M3: Municipal Energy Conservation and Efficiency
Reduce energy use in City buildings and facilities

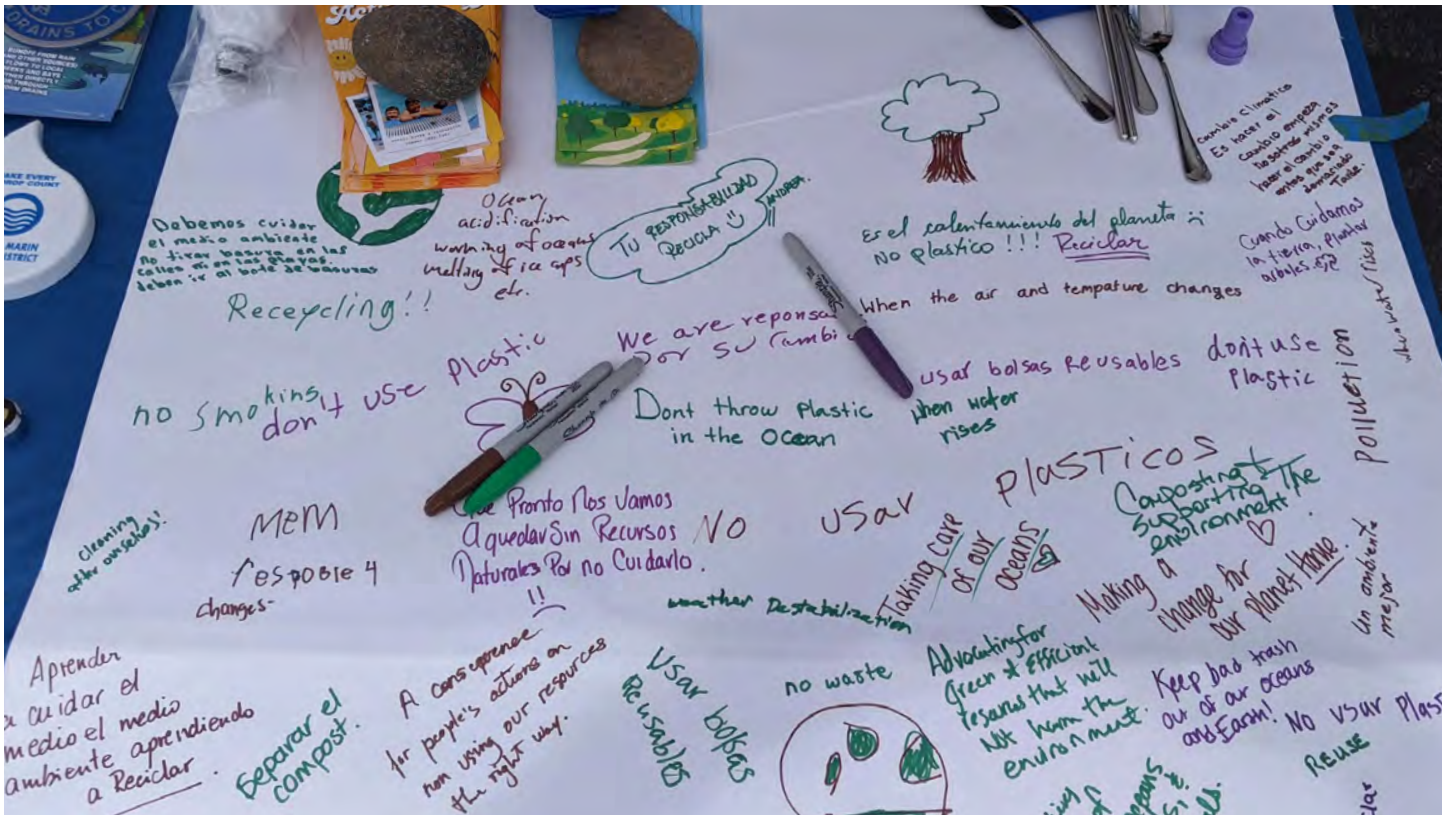
a. Reduce energy consumption through energy efficiency projects, employee education campaigns, and operational modifications.

b. Establish energy efficiency protocols for employees and building custodial services including thermostat use and turning off lights and computer monitors.

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

d. Conduct energy efficiency audits at least every two years at City buildings and facilities and implement recommended energy efficiency projects whenever the return on investment is less than, or equal to, the service life of the equipment.

e. Pilot the use of high albedo pavements when resurfacing City parking lots and re-roofing City facilities.



STRATEGY 5
Green Building

New construction techniques and building materials, collectively known as "green building," can significantly reduce the use of resources and energy in residential and commercial buildings. Green construction methods can be integrated into buildings at any stage, from design and construction to renovation and deconstruction.

Two regulations related to green building – California Energy Code (Title 24, Part 6) and California Green Building Standards Code (Tile 24, Part 11) – are codified in the California Code of Regulations and these regulations are enforced locally by the City of Novato.

The California Energy Code mandates stringent energy efficiency standards for buildings to reduce GHG emissions, enhance energy conservation, and promote the use of renewable energy technologies. The California Green Building Standards Code (known as CALGreen) focuses on sustainable construction practices, such as water conservation, energy savings, and reducing a building's carbon footprint. CALGreen is mandatory for commercial, residential, and public school buildings. The state updates both codes on a three-year cycle, and on occasion, will update the codes mid-cycle.

Local governments can adopt energy efficiency standards for new construction and remodels that exceed existing state mandates (referred to as 'reach codes'), but these standards must be cost-effective and approved by the California Energy Commission.

COMMUNITY MEASURES AND ACTIONS

Measure BE-C8: Green Building Reach Codes
Advance the construction of green buildings

a. Consider adopting green building requirements more stringent than the base building code such as CALGreen Tier 1, as permitted by State law.

Measure BE-C9: Cool Pavement and Roofs
Reduce the heat island effect and save energy

a. Encourage the use of cool roofs for new construction and encourage the use of reflective, high albedo material for roadways, parking lots, sidewalks, and re-roofs to reduce the urban heat island effect and save energy.

Measure BE-C10: Low-Carbon Concrete
Reduce emissions from concrete use

a. Adopt low embodied-carbon concrete standards in alignment with those adopted by the County of Marin.

STRATEGY 6
Indoor Water Conservation

Marin is no stranger to periods of significant drought, and these are expected to become more frequent and prolonged due to climate change. Recognizing the critical need to conserve water, the Novato community has reduced water consumption by about 39%, from 152 gallons per capita per day (GPCD) in 2005 to 89 GPCD in 2022. Novato's water agency, North Marin Water District, provides rebates, water audits, and other programs to assist with water conservation efforts, and requires water-efficient fixtures above base California building code regulations for remodels and new construction. Residents and businesses are playing their part by installing low-flow fixtures (showerheads, faucets, and toilets) and by purchasing water-efficient appliances. CAP2030 sets a target of continuing to reduce water consumption by 1% each year through 2030.

COMMUNITY MEASURE AND ACTIONS

BE-C11: Potable Water Use
Reduce indoor water use in residential and commercial buildings

a. Partner with North Marin Water District and Marin-Sonoma Water Saving Partnership to promote residential and commercial water conservation programs and incentives.

b. Explore opportunities to collaborate with North Marin Water District on conservation-focused educational workshops for residents.

c. Ensure all projects requiring City building permits, plan check, and/or design review comply with North Marin Water District regulations.

MUNICIPAL MEASURE AND ACTIONS

BE-M4: Municipal Indoor Water Use
Reduce indoor water use in municipal facilities and operations

a. Evaluate current municipal water management strategies and identify opportunities to reduce water use.

b. Develop a phased plan to replace inefficient plumbing fixtures with high-efficiency fixtures.

TABLE 8

GHG EMISSIONS REDUCTIONS FROM BUILDINGS & ENERGY MEASURES

1 Renewable Energy

Measure	GHG Reduction by 2030 ($MTCO_2e$)	Share of Emissions Reduction
BE-C1: Renewable Energy Generation and Storage	1,184	22%
BE-C2: Clean Electricity	257	5%
BE-M1: Clean Energy Use in Municipal Facilities	0	-

2 Building Decarbonization

Measure	GHG Reduction by 2030 ($MTCO_2e$)	Share of Emissions Reduction
BE-C3: Building Electrification	603	11%
BE-M2: Electrification of City-Owned Buildings	67	1%

3 Energy Resilience

Measure	GHG Reduction by 2030 ($MTCO_2e$)	Share of Emissions Reduction
BE-C4: Innovative Technologies	– [1]	–

4 Energy Conservation & Efficiency

Measure	GHG Reduction by 2030 ($MTCO_2e$)	Share of Emissions Reduction
BE-C5: Energy Conservation and Efficiency Programs	3,230	60%
BE-C6: Energy Audits	– [2]	–
BE-C7: Streamlined Permitting and Technical Assistance	– [2]	–
BE-M3: Municipal Energy Conservation and Efficiency	25	<1%

TABLE 8

GHG EMISSIONS REDUCTIONS FROM BUILDINGS & ENERGY MEASURES

5 Green Building

Measure	GHG Reduction by 2030 ($MTCO_2e$)	Share of Emissions Reduction
BE-C8: Green Building Reach Codes	– [2,3]	–
BE-C9: Cool Pavements and Roofs	– [2]	–
BE-C10: Low-Carbon Concrete	– [3]	–

6 Indoor Water Conservation

Measure	GHG Reduction by 2030 ($MTCO_2e$)	Share of Emissions Reduction
BE-C11: Potable Water Use	– [1]	–
BE-M4: Municipal Indoor Water Use	– [1]	–

TOTAL	5,366	100%

[1]There is no emissions reduction associated with this measure because the local government and/or agency already uses 100% renewable electricity.

[2] This is a supportive measure and emissions reductions are rolled up into other quantified measures.

[3] There is no emissions reduction associated with this action because it is designed to reduce consumption-based emissions.

MATERIALS & WASTE

13% of potential reductions

STRATEGY 1
Materials Management & Waste Reduction

The City supports the Waste Management Hierarchy, a framework that ranks options for managing waste from most to least preferred.

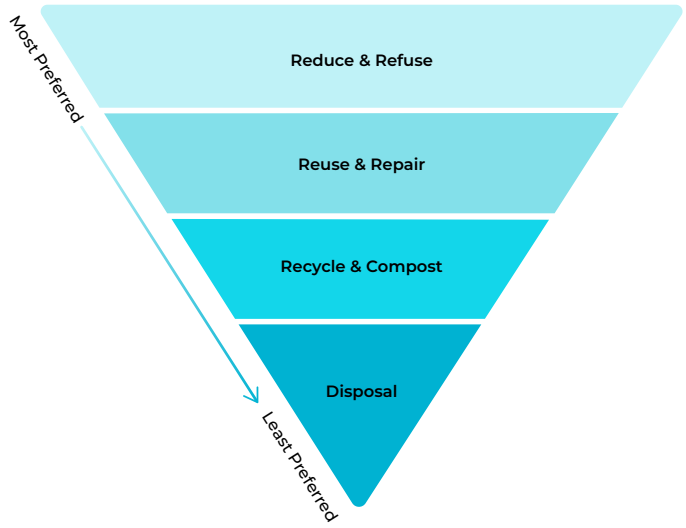
The most effective approach is to avoid waste altogether *(Reduce & Refuse)* by buying only what is needed and choosing reusable items over single-use products. Next is *Reuse & Repair*, which extends the life of products through practices such as shopping second-hand, fixing items, or donating goods. *Recycling & Composting* follow, helping keep materials that can be made into new products or soil amendments out of the landfill.

The least preferred option is *Disposal*, which includes landfilling or incineration. Because these methods consume resources and create environmental impacts, they are considered a last resort.

The consumption of products and materials results in GHG emissions at every phase of the manufacturing, transportation, distribution, and disposal process. Reducing the amount and wasting less of goods and materials consumed, purchasing locally-grown and made items, shopping second-hand, and donating reusable items rather than throwing them away are the most immediate ways to reduce emissions.

In addition, although many plastics are labeled 'recyclable', in practice only around 9 percent of all the plastic waste generated globally is recycled.[20] Single-use plastic items such as straws and cutlery often end up as litter in the environment, eventually making their way to local waterways. Plastics not just are harmful to marine life, fish, and birds, they also release GHG emissions during their manufacturing process. To reduce the prevalence of single-use plastics, in 2022, Novato adopted a Reusable Foodware Ordinance that prioritizes the use of reusables and prohibits the use of single-use plastics (including bioplastics).

Figure 10: The Waste Management Hierarchy



[20]United Nations Development Program, https://stories.undp.org/why-arent-we-recycling-more-plastic

COMMUNITY MEASURES AND ACTIONS

Measure MW-C1: Waste Prevention, Reduction, Reuse, and Repair
Promote the Waste Management Hierarchy to reduce waste to landfill

a. Collaborate with public agencies, community organizations, local businesses, schools, and libraries, and utilize the full range of City outreach channels to educate residents and businesses on the benefits of waste prevention, reduction, reuse, and repair.

b. Encourage the purchase of local, bulk, durable, reusable, refillable, and repairable products to reduce consumption-based emissions. Partner with community-based organizations to conduct outreach and education.

c. Partner with Zero Waste Marin, Marin County Libraries, and Novato Unified School District to establish lending libraries (tools, toys, costumes, etc.), makerspaces focusing on reusing and recycling materials, repair cafés/fix-it clinics, and clothing swaps.

d. Promote programs for hard to recycle items (e.g., mattresses) and hazardous waste such as paint, e-waste, batteries, and household chemicals.

e. Identify potential locations for reuse, repair, upcycling, rental, and refill businesses and encourage these businesses to locate in Novato.

f. Enhance partnership with Novato Sanitary District, Recology, and Zero Waste Marin to reduce waste to landfill.

Measure MW-C2: Single-Use Disposable Items and Packaging
Reduce single-use plastic and packaging waste

a. Partner with the County of Marin to ensure compliance with the Reusable Foodware Ordinance and support outreach and education efforts to local businesses.

b. Collaborate with Novato Unified School District to explore strategies to implement a reusable foodware program.

c. Require development of an approved Zero Waste Management Plan for all permitted special events (e.g., Art & Wine Festival, Rock the Block, etc.).

Measure MW-C3: Building Materials
Increase reuse, innovative repurposing, and recycling of construction and demolition materials

a. Collaborate with Zero Waste Marin, Novato Sanitary District, and Recology to develop and distribute educational resources to promote reuse, innovative repurposing, and recycling options for building materials.

b. Explore opportunities to increase building deconstruction (rather than demolition) and the reuse of building materials, particularly wood.

MUNICIPAL MEASURE AND ACTIONS

Measure MW-M1: Municipal Waste Prevention, Reuse, and Recycling Practice sustainable procurement of goods and services and reduce waste to landfill
a. Review City purchases of single-use, disposable items and replace them with reusable and durable alternatives, whenever possible.
b. Install water bottle refilling stations in City buildings and at public-facing City facilities.
c. Continue to support and expand upon the City's reuse program for surplus office supplies.
d. Develop a Zero Waste Plan for Citywide operations and embed in City purchasing policies.
e. Develop an educational campaign to promote waste prevention, reduction, and reuse within municipal operations.

STRATEGY 2
Recycling & Composting

Due to the way the City accounts for communitywide emissions (sector-based vs. consumption-based), CAP2030 does factor in upstream emissions from processes such as manufacturing, transportation, distribution, and disposal. As a result, Novato's waste-related GHG emissions accounting only quantifies emissions that are generated from the anaerobic decomposition of organic waste in the landfill.

The process of organic waste decomposition creates methane, a GHG that is 28 times more potent than carbon dioxide over a 100-year period. Although many landfills capture methane and some use the methane to create biogas or electricity, about one-quarter of the gas escapes into the atmosphere.

Diverting organic materials from the landfill is a clear and viable option for reducing these emissions. Paper and cardboard can be recycled; food scraps, paper products like pizza boxes, napkins, and paper towels, and yard waste can all be composted, either in a home compost system or at the landfill.

In the United States, household food waste accounts for up to 50% of all food wasted; equivalent to 6 cups of food per week, at an annual cost of approximately $1,500 for a four-person household. In certain circumstances, surplus food can be donated to non-profits that will distribute it to those in need.

CAP2030 aligns with state legislation designed to significantly reduce GHG emissions from the disposal of organic materials in landfills. Adopted in 2016, SB 1383 established targets to achieve a 75% reduction in statewide organic waste disposal from the 2014 level by 2025. The law also established a target of recovering no less than 20% of currently disposed edible food for human consumption by 2025.

COMMUNITY MEASURES AND ACTIONS

Measure MW-C4: Organic Waste Diversion
Increase edible food recovery and reduce organic waste to landfill

a. Continue partnering with Novato Sanitary District, Recology, and Zero Waste Marin to support implementation of commercial and organic waste diversion programs to meet SB 1383 requirements.

b. Support Novato Sanitary District, Zero Waste Marin, Novato Unified School District, and local non-profit organization efforts to increase recovery and redistribution of edible food in Novato to meet SB 1383 requirements.

c. Encourage the community to notify food recovery organizations of fruit-producing trees for gleaning activities and promote this service to the community during fruit production season.

d. Collaborate with Novato Sanitary District, Recology, Zero Waste Marin, and other organizations to identify outreach and education opportunities to motivate residents and business to utilize curbside collection services for organic waste.

e. Encourage Marin Master Gardeners to offer Master Composter Training to educate the public on the benefits of compost and to increase backyard composting.

Measure MW-C5: Waste, Recycling, and Composting Infrastructure
Ensure equitable access to landfill, recycling, and organic waste infrastructure

a. Amend the Novato Municipal Code to comply with state law to require that all new multi-family residential, new non-residential projects, and remodels of existing non-residential projects provide adequate individual and common storage areas for recyclable and organic waste before collection by waste hauler, to avoid requests for waivers.

b. Amend the Novato Municipal Code to comply with state law to require that all existing multi-family and commercial properties provide adequate landfill, recycling, and organic waste infrastructure to meet state waste diversion goals, reduce litter, facilitate waste sorting, and reduce contamination.

c. Work with the Novato Sanitary District to ensure that the Novato community continues to have access to a recycling center and household hazardous waste facility for the collection of recyclable materials and hazardous household waste.

MUNICIPAL MEASURES AND ACTIONS

Measure MW-M2: Municipal Waste Recycling and Composting
Improve sorting of waste for recycling and composting

a. Provide interior and exterior collection and storage areas for recyclables and composting in City facilities.

b. Conduct a waste audit of City facilities to identify opportunities for increased waste diversion.

c. Develop an educational campaign to promote recycling within municipal operations.

Measure MW-M3: Organic Materials and Recycled Content Product Procurement
Comply with SB 1383 requirements related to organic materials and recycled content product procurement

a. Partner with Zero Waste Marin to develop a program to procure and utilize organic materials to meet SB 1383 requirements.

b. Implement a program to meet SB 1383 recycled content product procurement requirements.

TABLE 9

GHG EMISSIONS REDUCTIONS FROM MATERIALS & WASTE MEASURES

1 Materials Management & Waste Reduction

Measure	GHG Reduction by 2030 ($MTCO_2e$)	Share of Emissions Reduction
MW-C1: Waste Prevention, Reduction, Reuse, and Repair	– [1]	-
MW-C2: Single Use Disposable Items and Packaging	– [1]	-
MW-C3: Building Materials	– [1,2]	-
MW-M1: Municipal Waste Prevention, Reduction, and Reuse	– [1]	-

2 Recycling & Composting

Measure	GHG Reduction by 2030 ($MTCO_2e$)	Share of Emissions Reduction
MW-C4: Organic Waste Diversion	5,856	100%
MW-C5: Waste, Recycling, and Composting Infrastructure	– [2]	–
MW-M2: Municipal Recycling and Composting	24	<1%
MW-M3: Organic Materials and Recycled Content Product Procurement	– [2]	–

TOTAL	5,880	100%

[1]There is no emissions reduction associated with this measure because it reduces non-organic waste and/or upstream emissions waste.

[2] There is no emissions reduction associated with this measure because it is a supportive measure.

NATURAL & URBAN ENVIRONMENT

<1% of potential reductions

STRATEGY 1
Carbon Sequestration

Novato is fortunate to be home to thousands of magnificent, mature trees on both public and private property which provide numerous ecological benefits such as supporting biodiversity, reducing soil erosion, and enhancing the aesthetic appeal of our urban and rural landscapes.

These trees act as carbon sinks, absorbing carbon dioxide during photosynthesis and storing it in their biomass. Protecting and caring for them is an essential strategy for reducing carbon in the atmosphere.

Studies have shown that a young tree sapling can capture and store approximately 1 to 1.3 pounds of carbon annually, and while planting new trees is essential, caring for trees that are already in the ground is equally important. For example, a 50-year-old tree can sequester over 100 pounds of carbon each year, while simultaneously providing an extensive range of ecosystem services. Utilizing nature-based solutions such as planting trees and drought-tolerant plants (particularly species native to Novato) also helps to enhance the biodiversity of plants and animals in our community.

Increasing the tree cover on both private and public lands can enhance local carbon sequestration, help mitigate the impacts of climate change and improve overall air quality. Promoting tree planting and conservation efforts is a vital component of CAP2030.

COMMUNITY MEASURES AND ACTIONS

Measure NU-C1: Urban Forest
Preserve and expand the urban forest

a. Revise *Tree Removal Guidelines* to discourage the removal of mature and/or heritage trees. Require replacement trees be a minimum of 15-gallon size or require payment in-lieu to support mitigation planting in parks and open spaces.

b. Continue to require that new developments provide a comprehensive assessment of existing vegetation on site and provide a plan to preserve existing healthy trees and native vegetation on site, to the maximum extent feasible. If trees and vegetation are unable to be preserved, require in-lieu fee to mitigate loss and fund replacement planting in parks and open spaces.

c. Update the *Approved Street Tree List* using the latest scientific data to identify species suited to Novato's growing conditions, resilient to projected climate changes, supportive of wildfire safety, and effective in enhancing biodiversity and carbon sequestration.

d. Maintain age and species diversity of native woodlands and preserve the health of both native and non-native trees and other vegetation, wherever feasible.

e. Revise parking lot landscape standards to increase inside dimensions of tree wells to ensure long-term health of newly planted trees.

f. Require a three-year maintenance and replacement plan be implemented for all trees planted in new parking lots and developments, with an assessment provided by a qualified arborist at the end of the three-year establishment period.

g. Promote the benefits of providing regular maintenance of existing trees on private land to safeguard long-term tree health and sequester carbon. Educate the community about regulations related to heritage trees to ensure that they are protected.

Measure NU-C2: Healthy Soils
Increase carbon sequestration in soil

a. Partner with community-based organizations to develop, incentivize, and implement on-site composting programs, and encourage the use of locally produced compost to create healthy, carbon-rich soils.

b. Provide information to the community, including landscape companies, gardeners, and nurseries, on carbon sequestration rates, drought tolerance, and fire resistance of different tree and vegetation species, as well as healthy soil management.

c. Continue to require new development, redevelopment, and infrastructure projects to implement best management practices including low-impact design techniques, the minimal use of non-pervious surfaces in landscape design, and the integration of natural features into project design, to naturally filter and biodegrade contaminants, minimize surface runoff, and reduce erosion.

MUNICIPAL MEASURES AND ACTIONS

Measure NU-M1: Trees on Public Land
Preserve and expand the urban forest on public land

a. Consider adopting a Tree Management Program for trees on City-owned land and the public right-of-way, establishing varieties, size and spacing requirements, and priority planting schedules. The program should include standards for both the City and adjacent property owners in accordance with Chapter 15 of the Novato Municipal Code and should consider species appropriate for projected climate changes and consistent with wildfire resilience efforts.

b. Establish volunteer training and education programs in partnership with community organizations to plant and maintain trees on public land.

c. Protect native woodlands and significant trees on public lands. Enhance the urban forest and wildlands by planting additional trees needed to maintain age and species diversity, ensuring the proper and timely pruning of trees, and removal of non-native species, particularly if they are invasive or pose a threat to native species.

d. Maintain and expand the use of urban tree cover for street-level temperature reduction and apply to become an Arbor Day Foundation *Tree City USA*.

Measure NU-M2: Healthy Soils on Public Lands
Protect and increase soil health on public land

a. Identify suitable locations on City-owned land for the application of recycled organic materials (e.g., compost and mulch) to meet SB 1383 procurement requirements.

b. Pilot organic turf management techniques where and when feasible and cost-effective.

c. Review *Integrated Pest Management Policy* and explore opportunities to further reduce the use of chemical pesticides and fertilizers.

STRATEGY 2
Outdoor Water Conservation

Approximately two-thirds of potable water is used outdoors, mostly for irrigation. In a continuous effort to save water and reduce water bills, residents and businesses are planting native, drought-tolerant species and even replacing lawns with attractive, low-water use gardens.

As temperatures continue to rise due to climate change, periods of drought and extreme heat will likely become more prevalent, increasing the imperative for water conservation. The threat of wildfire also necessitates the need to create defensible spaces around homes and plant fire-resistant trees and bushes.

COMMUNITY MEASURES AND ACTIONS

Measure NU-C3: Water Conservation
Reduce water used for irrigation and landscaping

a. Partner with North Marin Water District and Marin-Sonoma Water Saving Partnership to promote residential and commercial outdoor water conservation programs and incentives for water-smart landscaping.

b. Explore opportunities to collaborate with North Marin Water District on conservation-focused educational workshops on outdoor water use for residents and training programs for professional landscapers.

c. Ensure all projects requiring City building permits, plan check, or design review comply with North Marin Water District regulations, the Model Water Efficient Landscape Ordinance, and state regulations prohibiting the irrigation of non-functional turf at commercial and industrial sites (AB 1572).

d. Promote North Marin Water District and Novato Fire Department landscaping recommendations that reduce fire risk and promote the use of drought tolerant, locally adapted plant species.

Measure NU-C4: Recycled Water Use
Increase recycled water use

a. Consider adopting an ordinance requiring the use of recycled water for landscaping in new developments if recycled water is available.

Measure NU-C5: Rainwater Harvesting and Greywater Capture
Increase residential rainwater harvesting and installation of greywater systems

a. Encourage North Marin Water District to adopt an ordinance requiring the installation of water systems that utilize greywater for irrigation for new residential construction, including ADUs, and in major retrofits.

b. Promote North Marin Water District rainwater harvesting and greywater system incentives and rebate programs.

c. Encourage North Marin Water District to exempt residential rainwater and greywater systems that do not connect to the potable water system from backflow device requirements.

MUNICIPAL MEASURE AND ACTIONS

Measure NU-M3: Municipal Outdoor Water Use Reduce water used for irrigation and landscaping
a. Evaluate current municipal water management strategies and identify opportunities to reduce water use.
b. Review all locations with irrigated turf and develop strategies to comply with state regulations prohibiting the irrigation of non-functional turf (AB 1572).
c. Develop a phased plan to replace inefficient plumbing fixtures with high-efficiency fixtures.
d. Work with North Marin Water District to explore opportunities to expand the existing recycled water infrastructure for irrigation purposes at City facilities wherever feasible and cost-effective.

STRATEGY 3
Zero-Emission Landscaping & Off-Road Equipment

The City of Novato prohibits the use of gasoline-powered leaf blowers, and, as of January 2024, the California Air Resources Board required that all newly manufactured small off-road engines (SORE) sold in California be zero-emission.

SORE are defined as spark-ignition engines rated at or below 19 kilowatts, and engines in this category are primarily used for lawn, garden, and other outdoor power equipment. They include leaf blowers, lawn mowers, riding mowers, edgers, hedge trimmers, string trimmers. log splitters, small chainsaws, pressure washers, and portable generators.

Fossil fuel-powered off-road equipment contributes to outdoor air pollution and GHG emissions; however, affordable and reliable electric models of this equipment are now widely available.

COMMUNITY MEASURE AND ACTIONS

Measure NU-C6: Zero-Emission Landscape and Small Off-Road Equipment
Accelerate the transition to electric off-road equipment

a. In coordination with other Marin jurisdictions, introduce regulations to ban the use of small off-road engines, such as portable generators, mowers, chainsaws, edgers, hedge trimmers, string trimmers, log splitters, and pressure washers, and develop a plan for enforcement.

b. Consider promoting financial incentives and technical assistance to support income-qualified residents to transition to non-fossil fuel, small off-road engines.

c. Encourage the use of non-fossil fuel onsite generators with a focus on high-use generators. Promote the use of spider boxes for construction sites and inverter generators for targeted uses.

MUNICIPAL MEASURE AND ACTIONS

Measure NU-M4: City-Owned Small Off-Road Equipment
Transition to electric landscaping equipment and portable generators

a. Replace gasoline-powered portable generators and landscape equipment with zero-emission models.

TABLE 10

GHG EMISSIONS REDUCTIONS FROM NATURAL & URBAN ENVIRONMENT MEASURES

1 Carbon Sequestration

Measure	GHG Reduction by 2030 ($MTCO_2e$)	Share of Emissions Reduction
NU-C1: Urban Forest	7	1%
NU-C2: Healthy Soils	– [1]	–
NU-M1: Trees on Public Lands	2	<1%
NU-M2: Healthy Soils on Public Land	– [1]	–

2 Outdoor Water Conservation

Measure	GHG Reduction by 2030 ($MTCO_2e$)	Share of Emissions Reduction
NU-C3: Water Conservation	– [2]	–
NU-C4: Recycled Water Use	– [2]	–
NU-C5: Rainwater Harvesting and Greywater Capture	– [2]	–
NU-M3: Municipal Outdoor Water Use	– [2]	

3 Zero-Emission Landscaping & Off-Road Equipment

Measure	GHG Reduction by 2030 ($MTCO_2e$)	Share of Emissions Reduction
NU-C6: Zero-Emission Landscape and Small Off-Road Equipment	525	97%
NU-M4: City-Owned Small Off-Road Equipment	6	1%

TOTAL	540	100%

[1] There is no emissions reduction associated with this action because there is no practical methodology to quantify sequestered emissions.

[2] There is no emissions reduction associated with this measure because the water agency uses 100% renewable electricity.

COMMUNITY ENGAGEMENT

STRATEGY 1
Outreach & Education

CAP2030 contains 19 Strategies, 54 Measures, and 161 actions to reduce communitywide emissions and build a sustainable community. While the City can compel some action by adopting regulations, much of the success of CAP2030 will depend on informing and mobilizing community members to take individual action. As the vast majority of Novato's GHG emissions come from community activities, residents, businesses, workers, and visitors will all need to play their part.

MEASURES AND ACTIONS

Measure CE-C1: Community Education
Educate community members on ways to reduce their climate impacts

a. Work with public, nonprofit, and community-based organizations, such as Resilient Neighborhoods, to educate and motivate community members to reduce GHG emissions in their homes and businesses.

Measure CE-C2: Community Outreach and Engagement
Conduct outreach to and engage all community members

a. Implement public outreach and behavior change campaigns to engage residents, businesses, and consumers around the impacts of climate change and the ways individuals and organizations can reduce their GHG emissions and create a more sustainable, resilient, and healthier community.

b. Emphasize and encourage community involvement in achieving Novato's climate goals, including innovative means of tracking milestones and comparing Novato's performance with other communities and with state, national, and global benchmarks.

c. Conduct meaningful outreach and engagement with a wide variety of neighborhood, business, educational, faith, service, and social organizations. Develop programs in collaboration with community groups and the public, seeking to address environmental and social equity goals and reduce or avoid disparate impacts.

d. Utilize the City's website, newsletter, recognition programs, and other forms of public outreach to educate and engage with the community.

e. Participate in countywide outreach and education efforts.

f. Utilize culturally relevant communication vehicles, including conducting workshops and publishing materials in the primary language of affected populations.

STRATEGY 2
Advocacy

Collaboration with regional and state agencies is essential to the successful implementation of CAP2030 and achieving Novato's GHG emissions reduction targets. Ultimately, more aggressive state, federal, and international action will be required to reduce global emissions to levels that will avoid the catastrophic impacts of climate change. However, advocacy at the state and federal levels by local governments for policies and actions that support the rapid transition to GHG-free energy sources, accelerate the electrification of buildings and vehicles, and sharply reduce GHG emissions is of paramount importance.

MEASURE AND ACTION

Measure CE-C3: Advocacy
Advocate for regional, state, and federal programs and funding to assist with CAP2030 implementation

a. Ensure inclusion of sustainability efforts in the City's Legislative Agenda including advocating for policies and actions that support the rapid transition to a circular and climate resilient economy, GHG-free energy sources, electrification of buildings and vehicles, and other high impact measures to accelerate the reduction in GHG emissions.

STRATEGY 3
Circular Economy and Green Businesses

Transitioning to a green and circular economy creates new business and employment opportunities that support economic growth without harming the environment.

To meet the ambitious targets of CAP2030, it will be necessary to prepare and develop the building trades workforce in Marin to meet the increased demand for renewable energy, energy efficiency, and electrification services. Growing and expanding this pipeline of tradespeople presents a unique opportunity for Novato and will be critical to achieving a rapid transition to a decarbonized community.

Existing businesses can also play a key role in the transition to a green economy by taking steps to reduce the environmental impacts of their operations.

MEASURES AND ACTIONS

Measure CE-C4: Workforce Development
Support the growth of a building decarbonization workforce

a. Partner with the County of Marin, other jurisdictions, workforce development groups, business associations, and educational institutions to accelerate contractor training to ensure an adequate supply of trained professionals to meet anticipated building electrification demand.

Measure CE-C5: Green Businesses
Encourage local businesses to adopt sustainable practices

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

b. Promote certified green businesses on the City's website.

Measure CE-C6: Innovation and Economic Development
Foster a thriving and sustainable local economy

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

IMPLEMENTATION & MONITORING

STRATEGY 1
CAP2030 Implementation

Achieving the GHG emissions reduction target outlined in CAP2030 is dependent on several factors including the commitment of the City to prioritize and allocate resources to implement CAP2030 strategies, measures, and actions; ensuring that City staff and partner agencies consider climate impacts in decision-making processes; and the willingness of the community to take action to reduce Novato's local emissions.

MEASURES AND ACTIONS

Measure IM-C1: Implementation Prioritization
Prioritize CAP2030 strategies, measures, and actions for implementation

a. Assess strategies, measures, and actions against impact, co-benefits, cost, and probability of implementation.

b. Develop a *CAP2030 Implementation Plan*, along with annual workplans, to guide and support the implementation of priority actions.

Measure IM-C2: Funding CAP2030 Implementation
Seek funding to support CAP2030 implementation

a. Identify funding sources to implement CAP2030 strategies, measures, and actions.

b. Investigate the creation of a local carbon fund or other permanent source of revenue to implement CAP2030.

Measure IM-C3: CAP2030 Consistency Checklist
Develop project review checklist to confirm CAP2030 consistency

a. Develop a checklist to be used when reviewing development proposals, use permit applications, and building permits to ensure consistency with CAP2030 measures.

STRATEGY 2
Tracking CAP2030 Progress

The City will track and evaluate progress on the implementation of CAP2030 priorities via the City's Sustainability Dashboard and will report to the community on an annual basis. The City will also continue to produce comprehensive GHG emissions inventories to assess progress toward achieving reduction targets to determine if the City is on track to meet its goals.

MEASURES AND ACTIONS

Measure IM-C4: CAP2030 Reporting
Track, evaluate, and report on CAP2030 progress

a. Track and evaluate CAP2030 progress by producing GHG emissions inventory reports for communitywide emissions annually and every five years for municipal emissions.

b. Present GHG emissions inventory reports to the Sustainability Commission and City Council and update the City's Sustainability Dashboard accordingly.

STRATEGY 3
Updating CAP2030

CAP2030 will be reviewed and revised periodically to incorporate new long-term GHG emissions reduction targets based on updated federal, state, and regional legislation, emerging issues and innovations, technological advances, and community priorities.

MEASURES AND ACTIONS

Measure IM-C5: Review and Revise CAP2030
Periodically review CAP2030 and revise accordingly

a. Update the Climate Action Plan regularly, preferably every five years, to incorporate new long-term GHG reduction targets and strategies and to address emissions reduction shortfalls. When revising the Climate Action Plan, take into account any measures that are not being implemented, are no longer relevant to the community, are underperforming, or should be updated or added due to new technologies or other advances.

Photo Credit: Craig Solin

GLOSSARY OF TERMS

Baseline	The first year an annual greenhouse gas inventory is completed; a calculated level of annual emissions against which future inventories can be compared.
Business-as-Usual (BAU)	Regarding GHG emissions forecasts, a BAU scenario is based on a continuation of current trends in activity and does not account for GHG emissions reductions resulting from laws and regulations adopted by local, regional, state, or federal agencies.
Bioplastics	Plastics made from renewable sources like plants, aiming to reduce reliance on fossil fuels and sometimes offering better environmental outcomes like biodegradability.
CALGreen Tier 1	A voluntary level of the California Green Building Standards Code that exceeds the mandatory requirements with additional sustainability measures for new construction.
Cap-and-Trade	A market-based system that sets a limit (cap) on total emissions and allows companies to buy and sell emission permits (trade) to achieve cost-effective emissions reductions.
Carbon capture	Process of capturing carbon dioxide before it enters the atmosphere and storing it for centuries or millennia.
Carbon dioxide	A way to measure and equalize the different warming potencies of the six internationally recognized GHGs. Measuring emissions in terms of CO_2e helps to normalize all GHG emissions to CO_2, which is the most prevalent GHG emitted by human activities and has a global warming potential (GWP) value of 1.
Carbon dioxide removal	A range of technologies and approaches that aim to remove carbon dioxide directly from the atmosphere and store it durably in geological, terrestrial, or ocean reservoirs, or in products.
Carbon-intensive	Describes activities, processes, industries, or products that result in a high amount of carbon dioxide or other greenhouse gas emissions per unit of output or activity.
Carbon neutrality	All GHG emissions emitted into the atmosphere balanced in equal measure by GHGs that are removed from the atmosphere, either through carbon sinks (i.e., natural or anthropogenic systems that absorb or hold more carbon than they emit) or CCUS. (See also “Net Zero GHG Emissions”).
Carbon sequestration	Process of capturing, securing, and storing carbon from the atmosphere in vegetation such as grasslands or forest, as well as in soils and oceans.
Circular economy	An economic system based on the reuse and regeneration of materials or products, especially as a means of continuing production in a sustainable or environmentally friendly way
Climate change adaptation	Adjustments in ecological, social, or economic systems in response to the current or expected effects of climate change.
Climate change mitigation	Reduction or removal of greenhouse gas emissions from the atmosphere to prevent the planet from warming to more extreme temperatures.

Climate Change Scoping Plan	The State of California's climate action plan, which is designed to provide a statewide strategy for achieving the GHG reduction targets established in AB 32 and subsequent laws.
Co-benefit	Additional positive benefits that are not the primary intent of GHG reduction measures.
Communitywide greenhouse gas emissions inventory	A communitywide GHG emissions inventory identifies the sources, activities, and sectors that generate emissions from activities within the city and the relative contributions of each.
Complete streets	Standards or policies that ensure the safe and adequate accommodation of all users of the transportation system, including pedestrians, bicyclists, personal conveyance and micromobility users, public transportation users, children, older individuals, individuals with disabilities, motorists, and freight vehicles.
Consumption-based GHG inventory	Accounts for the emissions associated with the goods and services consumed within a specific geographic area, regardless of where those goods and services were produced.
Cool pavements	Paving materials and technologies designed to reflect more solar radiation and absorb less heat than conventional pavements, helping to lower surface temperatures and reduce the urban heat island effect.
Cool roofs	Roofing materials and designs that reflect more sunlight and absorb less heat than conventional roofs, leading to lower building energy consumption for cooling and reduced urban heat island effects.
Composting	A process by which organic materials such as yard waste, grass, tree trimmings, and raw kitchen scraps are converted to fertilizer through controlled decomposition.
Decarbonization	The reduction or elimination of carbon dioxide emissions from a process such as manufacturing or the production of energy.
Early action measures	Immediate or near-term steps and strategies implemented to begin reducing greenhouse gas emissions and addressing climate change impacts proactively, often before longer-term plans are fully in place.
Electrification	The GHG emissions associated with the manufacturing, transportation, installation, maintenance, and disposal of building materials.
Energy resilience	The ability to adapt to interruptions in the supply of energy, for example, Public Safety Power Shutoffs.
Energy Star-certified	Products and buildings that meet strict energy efficiency guidelines set by the U.S. Environmental Protection Agency (EPA), signifying they perform better than standard models and save energy.
Energy storage	CAP2030ture of energy produced at one time (e.g., high production with low demand) so that it can be used at another time (e.g., low production with high demand). Building more energy storage allows renewable energy sources to power more of the electric grid.
General Plan	A mandatory local government plan in California that serves as a blueprint for local land use and meeting the community's long-term vision for the future.

Global Warming Potential (GWP)	The relative potency of various GHGs when compared to carbon dioxide. The GWPs for various greenhouse gases are used to calculate the total CO_2e from emissions sources for use in GHG inventories.
Greenhouse effect	A warming of Earth's surface and atmosphere caused by the presence of greenhouse gases, which has been enhanced by human activities resulting in the release of excess greenhouse gases.
Greenhouse gas emissions reduction target	A goal of reducing GHG emissions a certain amount by a specified point in time; typically reflected as a percent reduction from a historic baseline by a certain year.
Green infrastructure	The range of measures that use plant or soil systems, permeable pavement or other permeable surfaces or substrates, stormwater harvest and reuse, or landscaping to store, infiltrate, or evapotranspirate stormwater and reduce flows to sewer systems or to surface waters.
Heavy-duty vehicle	Vehicles with a GVWR (gross vehicle weight rating) greater than 26,000 pounds. Includes weight classes 7 and 8.
High emissions scenario	Also known as RCP 8.5, a high-end emissions scenario where greenhouse gas emissions continue to rise throughout the 21st century.
Hypoxia	A condition in which the body or a region of the body is deprived of adequate oxygen supply at the tissue level.
Incentive-based	Refers to mechanisms that encourage desired behaviors or actions by offering rewards, such as financial benefits, rebates, or tax credits, for adopting sustainable practices.
First-mile, last-mile	Refers to the transportation method used during the final distance traveled to work, school, or an event, typically when public transit is the primary mode of transportation, but the system does not completely reach the desired destination
Light-duty vehicle	Vehicles with a GVWR (gross vehicle weight rating) under 10,000 pounds. Includes weight classes 1 and 2.
Low-embodied carbon	Refers to materials, products, or construction practices that require less energy and generate fewer greenhouse gas emissions during their extraction, manufacturing, transportation, installation, and disposal phases.
Market-based	Refers to mechanisms that use economic signals and market forces to achieve environmental goals, such as cap and trade or carbon pricing, by creating a financial incentive or disincentive related to environmental impact.
Medium emissions scenario	Also known as RCP 4.5, a mid-range emissions scenario where global emissions peak by 2040 and then decline.
Medium-duty vehicle	Vehicles with a GVWR (gross vehicle weight rating) between 10,001 – 26,000 pounds. Includes weight classes 3, 4, 5, and 6.
Microgrid	A local electrical grid with defined electrical boundaries, acting as a single and controllable entity, and with the ability to operate in grid-connected and in island mode.

Micromobility	Any small, low-speed, human- or electric-powered transportation device, including bicycles, scooters, electric-assist bicycles, electric scooters (e- scooters), and other small, lightweight, wheeled conveyances.
Off-road equipment	Any non-stationary device powered by an internal combustion engine or electric motor used primarily off roadways, such as those used for agricultural, landscaping, or construction purposes.
Organic waste	Solid waste containing material originated from living organisms and their metabolic waste products, including but not limited to food, green waste, landscape and pruning waste, applicable textiles and carpets, wood, lumber, fiber, manure, biosolids, digestate and sludges
Reach code	A local ordinance that adopts building energy efficiency standards that go beyond the state's minimum energy code (like CALGreen), aiming for greater energy savings and greenhouse gas reductions.
Resilience hub	A community-serving facility that supports residents and local government operations during emergencies and power outages. The hub is designed to operate independently of the grid and often combines a solar energy system, battery storage, and electric vehicle charging, which operate outside of emergencies to provide renewable energy and reduce greenhouse gas emissions. A resilience hub also provides a site for gathering, sharing information, and accessing resources. During emergencies, indoor space provides cooling, heating, relief from wildfire smoke, Wi-Fi access, and device charging.
Resiliency	The ability to anticipate, prepare for, respond to, and recover from hazardous events, trends, or disturbances related to climate.
Renewable energy	Renewable energy is energy derived from natural sources that are replenished at a higher rate than they are consumed.
Riverine	Refers to areas, habitats, or processes associated with or occurring along a river, including its banks, floodplains, and the flow of water.
Social equity	In the context of CAP2030, the term social equity means the just distribution of the benefits of climate action efforts and the alleviation of unequal burdens created by climate change.
Transportation demand management	The application of strategies and policies to reduce travel demand of single-occupancy private vehicles, traffic congestion, or to redistribute this demand in space or in time.
Urban heat island effect	A phenomenon whereby urban areas experience higher air temperatures than surrounding non-urban areas due to dense concentrations of pavement, buildings, and other surfaces that absorb and retain heat. Trees, green roofs, and vegetation can help reduce urban heat island effects by shading building surfaces, deflecting radiation from the sun, and releasing moisture into the atmosphere.
Vehicle Miles Traveled (VMT)	VMT is a measure of how much motor vehicle activity occurs on the roadway network in total miles traveled over a given period of time, and it is a key input into measuring GHG emissions from motor vehicles broadly at various scales.
Vehicle Miles Traveled (VMT)	VMT is a measure of how much motor vehicle activity occurs on the roadway network in total miles traveled over a given period of time, and it is a key input into measuring GHG emissions from motor vehicles broadly at various scales.

LIST OF ABBREVIATIONS

AB	Assembly Bill
BAAD	Bay Area Air District
BAU	Business-as-Usual
CALGreen	California Green Building Standards
CalRecycle	California Department of Resources Recycling and Recovery
CAP	Climate Action Plan
CARB	California Air Resources Board
CCAP	Climate Change Action Plan
CH_4	methane
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
EV	electric vehicle
GHG	greenhouse gas
GWP	global warming potential
ICLEI	International Council for Local Environmental Initiatives
IPCC	Intergovernmental Panel on Climate Change
kW	kilowatt
kWh	kilowatt hour
LED	Light-emitting diode
MCEP	Marin Climate & Energy Partnership
MT	metric ton
$MTCO_2e$	metric tons of carbon dioxide equivalent
NMCS	North Marin Community Services
N_2O	nitrous oxide
PG&E	Pacific Gas and Electric Company
SB	Senate Bill
SF_6	sulfur hexafluoride
SMART	Sonoma-Marin Area Rail Transit
UNFCC	United Nations Framework Convention on Climate Change
VMT	vehicle miles traveled
ZEV	zero-emission vehicle

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APPENDIX A: Greenhouse Gas Emissions Reduction Calculations

GREENHOUSE GAS EMISSIONS REDUCTION SUMMARY Novato Climate Action Plan 2030		
Local Actions	**Measure**	**2030 GHG Emissions Reductions ($MTCO_2e$)**
ML-C1	Zero-Emission Vehicles	-30,454
ML-C2 (1)	Active Transportation - Bicycling and Micromobility	-14
ML-C2 (2)	Active Transportation - Bicycling and Micromobility	-1,105
ML-C2 (3)	Active Transportation - Walking	-159
ML-C3	School-Related Travel	-372
ML-C4	Public Transit	-5
ML-C5	Employee Trip Reduction	-7
ML-C6	Traffic System Management and Signal Synchronization	-663
ML-M1	Fleet Modernization	-227
ML-M2	Low-Carbon Fuels and Idling Reduction for City Fleet Vehicles	-21
ML-M3	City Employee Commuting	-13
ML-C7 (1)	Smart Growth Development	-684
ML-C7 (2)	Smart Growth Development	-861
BE-C1	Renewable Energy Generation and Storage	-1,184
BE-C2	Clean Electricity	-257
BE-C3	Building Electrification	-603
BE-M2	Electrification of City-Owned Buildings	-67
BE-C5	Energy Conservation and Efficiency	-3,230
BE-M3	Municipal Energy Conservation and Efficiency	-25
MW-C4	Organic Waste Diversion	-5,856
MW-M2	Municipal Waste Recycling	-24
NU-C1	Urban Forest	-7
NU-M1	Trees on Public Land	-2
NU-C6	Zero-Emission Landscape Small Off-Road Equipment	-525
NU-M4	Municipal-Owned Small Off-Road Equipment	-6
TOTAL - LOCAL MEASURES		**-46,371**

State and Regional Measures	
California Air Resources Board - Light and Heavy Duty Fleet Regulations	-23,655
Bay Area Air District – Zero-Emission Appliance Standard	-9,076
California Building Standards Code - Title 24	-3,055
California Air Resources Board - Small Off-Road Engines Regulations	-1,226
Renewable Portfolio Standard	-1,081
California Air Resources Board - Innovative Clean Transit Rule	-343
TOTAL - STATE ACTIONS	**-38,436**
Projected Communitywide Emissions	
Projected 'Business-as-Usual' Greenhouse Gas Emissions	272,937
Emissions Reduction from Local and State Measures	-84,807
Projected Emissions with Local and State Measures Implemented	188,147
Reduction from Baseline Emissions	
2005 Communitywide Greenhouse Gas Emissions	369,971
40% below 1990 level target	188,685
Communitywide Emissions with Local and State Measures Implemented	188,147
Amount over/(under)	539
% Below 2005 Greenhouse Gas Emissions	49%
Estimated 1990 Greenhouse Gas Emissions	314,475
% Below 1990 Levels	40%
Greenhouse Gas Emissions per Service Population	2.25

ZERO-EMISSION VEHICLES (ZEVs) ML-C1	
GHG Emissions Reductions by 2030	- 30,454 $MTCO_2e$
Targets	• 39% of light-duty vehicles registered in Marin are ZEVs in 2030 (approx. 80,730 ZEVs). • 26% of light-duty vehicles registered in Novato are ZEVs by 2030 (approx. 13,500 ZEVs). • 23% average annual growth rate of registered ZEVs in Marin and Novato.
Methodology & Assumptions	Marin has approximately 1.4% of all ZEVs in California (CEC, 2024). CARB's proposed strategy is to put 4.2 million ZEVs on the road by 2030, which is approximately 14% of light-duty vehicles in California in 2030. In January 2018, Governor Brown issued Executive Order B-48-18 which set a new goal of having a total of 5 million ZEVs in California in 2030. In September 2020, Governor Gavin Newsom issued Executive Order N-79-20 which sets a goal for 100 percent of in-state sales of new passenger cars and light trucks to be zero-emission by 2035. By the end of 2022, DMV reports there were 10,933 battery EVs, 4,544 plug-in hybrid EVs, and 62 fuel cell vehicles, for a total of 15,449 ZEVs in Marin County. There were a total of 207,242 passenger vehicles registered in Marin. ZEVs represented 7.5% of all light-duty vehicles in Marin. By the end of 2022, DMV reports there were 1,720 battery EVs, 860 plug-in hybrid EVs, and 8 fuel cell vehicles, for a total of 2,588 ZEVs in Novato. There were a total of 51,208 passenger vehicles registered in Novato. ZEVs represented 5.1% of all light-duty vehicles in Marin. Year-to-date ZEV sales in California show 84% of new vehicle sales are BEVs and 16% are PHEVs. CAP2030 assumes the same percentage of ZEV types in 2030: 84% battery EVs and 16% 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 2022 (1.4%) means there would be approximately 70,000 ZEVs registered in Marin by 2030, or approximately 34% of existing automobile registrations. The target is 80,730 ZEVs in Marin in 2030, or 39% of ZEVs registered in Marin. This would require an average annual growth rate of 23%. The number of ZEVs grew 22% between 2019 and 2020, 27% between 2020 and 2021, 25% between 2021 and 2022, and 24% between 2022 and 2023, for an average annual growth rate of 24.5%. This data suggests that an annual growth rate of 23% is feasible with aggressive local action. 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 Novato workers and visitors who do not live in Marin.

Sources	California Energy Commission, Zero-Emission Vehicle and Infrastructure Statistics, https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics/light-duty-vehicle, accessed 5/24/24.
	US Department of Energy, "National Plug-In Electric Vehicle Infrastructure Analysis," September 2017. https://www.nrel.gov/docs/fy17osti/69031.pdf 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. Personal communication with Derek McGill, Planning Manager, Transportation Authority of Marin, dmcgill@tam.ca.gov, August 22, 2018.

Calculation

	2030	
Number of registered Marin ZEVs by end of 2022	15,449	units
Projected number of registered passenger vehicles in Marin	207,000	units
Percent of Marin ZEVs in target year	39	%
Number of Marin ZEVs in target year	80,730	units
Percent of ZEVs in Marin assumed by EMFAC2021	8.2	%
Increase in ZEVs	65,281	units
Additional ZEVs as a percent of Marin vehicles from this measure	30.8	%
Novato passenger VMT	368,768,824	miles
VMT from non-Marin workers and visitors	53,285,439	miles
Novato passenger VMT from Marin-based vehicles	315,483,385	miles
VMT from additional ZEVs	97,250,956	miles
VMT driven with electricity	86,514,451	miles
Emissions without EV program	31,991	$MTCO_2e$
Tailpipe emissions reduction with EV program	30.660	$MTCO_2e$
Electricity used by ZEVs	27,684,624	kWh
Electricity emissions from ZEVs	206	MTCO2e
Emissions reduction	30,454	MTCO2e

ACTIVE TRANSPORTATION: BICYCLING AND MICROMOBILITY ML-C2 (1)	
GHG Emissions Reductions by 2030	-14 (MTCO2e)
Targets	7.29 miles of proposed multi-use paths (Class I), 8.79 miles of proposed bicycle lanes (Class II), and 7.41 miles of proposed bicycle routes (Class III) constructed by 2030.
Methodology & Assumptions	CAPCOA T-20 Expand Bikeway Network identifies a 0.25 percent increase in commute cycling for every 1 percent increase in bike lane distance. The following methodology has been applied to the following population segments: • Live in/work in area • Live in/work out of area • Live in/nonworker • Live out of area/work in area The City's 2015 Bicycle and Pedestrian Plan identifies 7.29 miles of proposed multi-use paths (Class I), 8.79 miles of proposed bicycle lanes (Class II), and 7.41 miles of proposed bicycle routes (Class III).
Sources	Novato Bicycle/Pedestrian Plan, March 24, 2015. Bay Area Air Quality Management District Vehicle Miles Traveled Dataportal, https://capvmt.mtcanalytics.org/data. California Air Pollution Control Officers Association, "Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity," December 2021.

Calculation

	2030	
VMT generated by targeted population segments	320,662,772	VMT
Existing Class I, II, III, and IV bikeways in Novato	29.53	miles
Additional Class I/II/IV facilities	16.08	miles
Bicycle mode share in community	0.4	%
Vehicle mode share in community	75.3	%
Average one-way bicycle trip length in community	2.1	miles
Average one-way vehicle trip length in community	12.4	miles
Elasticity of bike commuters with respect to bikeway miles/10,000 population	0.25	
% reduction in emissions from employee commute vehicle travel in community	0.01	%
Reduction in local VMT	41,666	VMT
Emissions reductions	13.7	$MTCO_2e$

ACTIVE TRANSPORTATION: BICYCLING AND MICROMOBILITY ML-C2 (2)	
GHG Emissions Reductions by 2030	-1,105 $MTCO_2e$
Targets	5% of local trips are completed by bicycle in 2030.
Methodology & Assumptions	The measure requires the City to increase multifamily bicycle parking requirements and require installation of secure bicycle parking in high-traffic areas to encourage residents to take bicycles for local trips. A 5% reduction has been applied to all trips made by Novato residents that begin and end in Novato.
Sources	Bay Area Air Quality Management District Vehicle Miles Traveled Dataportal, https://capvmt.mtcanalytics.org/data.

Calculation

	2030	
VMT generated by vehicle trips that start and end in Novato	67,197,283	VMT
Reduction in local VMT	5%	
Reduction in local VMT	3,359,864	VMT
Emissions reductions	1,105	$MTCO_2e$

ACTIVE TRANSPORTATION: WALKING ML-C2 (3)	
GHG Emissions Reductions by 2030	-159 $MTCO_2e$
Targets	Complete pedestrian facility improvements identified in the Novato Bicycle/ Pedestrian Plan.
Methodology & Assumptions	CAPCOA measure T-18 Provide Pedestrian Network Improvement shows pedestrian network improvements can reduce household up to 3.4%. According to CAPCOA, a study found that a 0.05 percent decrease in household vehicle travel occurs for every 1 percent increase in the sidewalk-to-street ratio (Frank et al. 2011; Handy et al. 2014). The Novato Bicycle and Pedestrian Plan identifies opportunities to improve sidewalk connectivity and the pedestrian network, including intersection alterations, mid-block crossings, sidewalk improvements, and 7.29 miles of new shared-use paths. The Bicycle and Pedestrian Plan identifies 152 miles of centerline roadway in Novato. The Novato Public Works Department estimates 300 miles of sidewalks.
Sources	California Air Pollution Control Officers Association, "Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity," December 2021. Novato Bicycle and Pedestrian Plan, March 24, 2015. Bay Area Air Quality Management District Vehicle Miles Traveled Data Portal, http://capvmt.mtcanalytics.org/data Personal communication with Gretchen Schubeck, Sustainability Programs Coordinator, City of Novato, June 24, 2024.

Calculation

	2030	
Household vehicle miles traveled	397,201,754	VMT
Existing miles of sidewalks	300	miles
Proposed miles of sidewalk improvements and shared use paths	7.29	miles
Increase in sidewalk length	2%	
Elasticity of household VMT	0.05	
Percent reduction in household VMT	0.12%	
Reduction in VMT	482,600	miles
GHG emissions reductions	159	$MTCO_2e$

SCHOOL-RELATED TRAVEL ML-C3	
GHG Emissions Reductions by 2030	-372 (MTCO2e)
Targets	Reduce school trips in family vehicle 29%, from an average of 64% to 45%.
Methodology & Assumptions	To demonstrate the benefits of providing Safe Routes to Schools, the Marin County Bicycle Coalition recruited nine pilot schools in four different geographic locations. Initial surveys reported that 62% of the students were arriving by car, with only 14% walking, 7% biking to school, 11% carpool, and 6% arriving by bus. Every school in the pilot program held periodic Walk and Bike to School Days and participated in the Frequent Rider Miles contest, which rewarded children who came to school walking, biking, by carpool or bus. At the end of the pilot program, the participating schools experienced a 57% increase in the number of children walking and biking and a 29% decrease in the number of children arriving alone in a car. CAP2030 assumes a similar school-aged population of 8,890 in 2030 as in 2023, and that 66% are elementary or middle school with an average trip length of 1.7 miles, and 34% are high school (9-12) with an average trip length of 2.3 miles, 180 school days, and an existing share of school trips completed in a family vehicle of 64% according to Safe Routes to School surveys taken at participating schools serving Novato in 2019.
Sources	US Census Bureau, American Community Survey 5-Year Estimates 2022, Table B01001. Safe Routes to School Marin County, https://www.saferoutestoschools.org/about/resources/ Safe Routes to School Marin County, http://www.saferoutestoschools.org/history.html#success

Calculation

	2030	
School population miles travelled	6,096,888	miles
Percent of miles driven in a family vehicle	64	%
Potential percent decrease in students driving to school	29	%
VMT avoided	1,131,582	VMT
Emissions reductions	372	$MTCO_2e$

PUBLIC TRANSIT ML-C4	
GHG Emissions Reductions by 2030	-5 (MTCO2e)
Targets	Increase Marin Transit ridership by 25%.
Methodology & Assumptions	Marin Transit does not plan on increasing service unless additional funding can be secured. However, there is potential to increase ridership through promotion, transit-oriented development, employer bus passes, and other strategies. Emissions reduction target assumes a 25% increase in ridership utilizing excess capacity on existing buses.
Sources	Personal communication with Cathleen Sullivan, Director of Planning, Marin Transit, June 11, 2024.

Calculation

	2030	
Total passenger miles in Novato (2022)	59,250	miles
Targeted increase in transit use	25	%
Reduction in VMT	14,813	miles
GHG emissions reductions	5	$MTCO_2e$

EMPLOYEE TRIP REDUCTION ML-C5	
GHG Emissions Reductions by 2030	-7 ($MTCO_2e$)
Targets	100% of covered employers provide an employee trip reduction program.
Methodology & Assumptions	CAPCOA T-5 Implement Commute Trip Reduction Program (Voluntary) indicates a VMT reduction of 4%. Voluntary Commute Trip Reduction programs must include the following: 1) employer-provided services, infrastructure, and incentives for alternative modes such as ridesharing, discounted transit, bicycling, vanpool, and guaranteed ride home, and 2) information, coordination, and marketing for these services, infrastructure, and incentives. Bay Area Metro administers the Bay Area Commuter Benefits Program. In 2024, Bay Area Metro identified four unregistered businesses with 50 or more employees in Novato and estimated 183 unregistered employees. In addition, 35 employers' registrations had lapsed because they had not completed their annual renewal to update their programs. CAP2030 assumes 100% of these employers participate in the program by 2030 with 240 workdays per year.
Sources	California Air Pollution Control Officers Association, "Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity," December 2021. Personal communication with Christine Maley-Grubi, Associate Program Coordinator, Bay Area Metro, May 28, 2024.

Calculation

	2030	
Estimated number of employees working in unregistered companies with 50 or more employees	183	employees
Number of employees targeted for program	183	employees
Average daily VMT for Novato worker	12.6	miles
Estimated annual VMT	552,124	miles
VMT reduction	4.0	%
Annual decrease in VMT	22,085	miles
GHG emissions reductions	7	$MTCO_2e$

TRAFFIC SYSTEM MANAGEMENT AND VEHICLE IDLING ML-C6	
GHG Emissions Reductions by 2030	-663 ($MTCO_2e$)
Targets	Complete signal synchronization and intelligent traffic management projects to minimize wait times at traffic lights and improve traffic flow.
Methodology & Assumptions	In FY 2013/14, the City completed a project under the Metropolitan Transportation Commission's Program for Arterial System Synchronization. The project developed and optimized timing plans for weekday AM, midday, and PM peak periods for 36 signals citywide, and weekend AM and PM periods for five signals along Rowland Blvd. The corridors encompass all major arterials within the City of Novato: San Marin Dr, Diablo/De Long Ave, Rowland Blvd, Ignacio/Bel Marin Key Blvd, Redwood Blvd, Novato Blvd., and Nave Dr. The program reduced annual fuel consumption by 116,257 gallons and had an expected lifetime gasoline savings of 581,283 gallons over five years. CAP2030 assumes a re-synchronization project with intelligent traffic management could yield similar fuel savings after adjusting for a projected number of EVs.
Sources	Metropolitan Transportation Commission Program for Arterial System Synchronization (PASS) FY 12/13 Cycle Fact Sheets, https://mtc.ca.gov/sites/default/files/Summary_with_all_project_Fact_Sheets.pdf.

Calculation

	2030	
Fuel savings in FY 2013/14	116,257	gallons
Projected fuel savings after adjusting for ZEVs	75,567	gallons
GHG emissions reductions	663	$MTCO_2e$

FLEET MODERNIZATION ML-M1	
GHG Emissions Reductions by 2030	- 227 ($MTCO_2e$)
Targets	50% of vehicles using gasoline in City's fleet are zero-emissions by 2030.
Methodology & Assumptions	As vehicles are replaced, there will be opportunities to purchase/lease electric vehicles or improve vehicle fuel efficiency with similar models. CAP2030 assumes the City will continue to purchase 100% renewable electricity, and therefore there are no emissions attributed to EV use. The City is subject to the CARB Advanced Clean Fleet regulation which requires local government fleets to ensure, beginning January 1, 2024, that 50 percent of their annual vehicle purchases per calendar year are zero-emissions. Beginning January 1, 2027, 100 percent of vehicle purchases must be zero-emissions. Emergency vehicles as defined in California Vehicle Code section 165, school buses, and others are exempt. The City fleet includes public works trucks and equipment, police cars and motorcycles, fire trucks, and vehicles for use by other department staff. In 2022, City vehicles and equipment fleet using gasoline consumed 51,817 gallons of gasoline. The City currently has five electric passenger vehicles in its fleet.
Sources	City of Novato

Calculation

	2030	
Gasoline consumption, 2022	51,817	gallons
City vehicle fleet tailpipe emissions	455	$MTCO_2e$
ZEV replacement	50	%
Emissions reductions	227	$MTCO_2e$

LOW-CARBON FUELS AND IDLING REDUCTION FOR CITY FLEET VEHICLES ML-M2	
GHG Emissions Reductions by 2030	-21 ($MTCO_2e$)
Targets	100% of diesel use is replaced with renewable diesel.
Methodology & Assumptions	Renewable diesel combustion results in approximately 60% fewer GHG emissions than regular diesel. It is made from waste products, not from agricultural products like ethanol. Chemically, it is the same as diesel so it is a "drop-in" fuel, which means it can be mixed with regular diesel. Renewable diesel burns cleaner, so it is easier to clean engines and reduces vehicle maintenance costs. It can cost about the same as regular diesel because there are fewer taxes on it. In 2022, the City fleet and off-road equipment consumed 3,490 gallons of diesel. The City began using renewable diesel in 2022.
Sources	Emission factor for renewable diesel derived from data from Nexgen Fuel. City of Novato http://www.nexgenfuel.com/fleets-commercial-use/

Calculation

	2030	
Diesel use in 2021	3,490	gallons
Renewable diesel percentage	100	%
Emissions from diesel fuel in 2021	36	$MTCO_2e$
Emissions from renewable diesel fuel	15	$MTCO_2e$
Emissions reductions from renewable diesel	21	$MTCO_2e$

CITY EMPLOYEE COMMUTING ML-M3	
GHG Emissions Reductions by 2030	-13 ($MTCO_2e$)
Targets	4% reduction in municipal employee commute VMT by 2030.
Methodology & Assumptions	CAPCOA T-5 Implement Commute Trip Reduction Program (Voluntary) indicates a VMT reduction of 4%. Voluntary Commute Trip Reduction programs must include the following: 1) employer-provided services, infrastructure, and incentives for alternative modes such as ridesharing, discounted transit, bicycling, vanpool, and guaranteed ride home, and 2) information, coordination, and marketing for these services, infrastructure, and incentives.
Sources	California Air Pollution Control Officers Association, "Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity," December 2021.

Calculation

	2030	
Employee commute VMT, BAU	950,214	VMT
Reduction in VMT	4	%
VMT avoided	38,009	VMT
Emissions reduction	13	$MTCO_2e$

SMART GROWTH DEVELOPMENT ML-C7 (1)	
GHG Emissions Reductions by 2030	-685 ($MTCO_2e$)
Targets	Implement the City's Housing Element and develop parcels at 30+ du/ac.
Methodology & Assumptions	CAPCOA T-1 Increase Residential Density accounts for VMT reduction by a project that is designed with a higher residential density compared to the average residential density in the U.S. The City's draft Housing Element identifies four projects that are proposed for development in excess of 30 du/ac: • AMG #1 at 1316-1320 Grant Ave., 1020 Fourth St. - 225 units on 1.2 acres (189.2 du/ac) • AMG #2 at 1212-1214 Grant Ave. - 67 units on 0.37 acre (181.1 du/ac) • AMG #3 at 1107-1119 - 198 units on 0.85 acre (232.9 du/ac) • Village at Novato, 7506 & 7530 Redwood Blvd. - 178 units on 5.9 acres (30.4 du/ac) The measure indicates a maximum reduction of 30%, which is applied here.
Sources	California Air Pollution Control Officers Association, "Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity," December 2021. City of Novato 6th Cycle Housing Element Update, Revised Public Hearing Draft, April 2024.

Calculation

	2030	
Number of units	668	units
Annual household VMT attributed to inventory	10,385	miles
Average residential density of projected housing developments	80.3	du/ac
Residential density of existing development	0.0	du/ac
Elasticity of VMT with respect to residential density	0.22	
Percent reduction in GHG emissions from project VMT	30	%
VMT reduction	2,081,224	miles
Emissions reductions	685	$MTCO_2e$

SMART GROWTH DEVELOPMENT ML-C7 (2)	
GHG Emissions Reductions by 2030	-861 ($MTCO_2e$)
Targets	Implement the City's Housing Element and apply current inclusionary requirements to applicable new development.
Methodology & Assumptions	CAPCOA T-4 Integrate Affordable and Below Market Rate Housing accounts for VMT reduction by multifamily projects that include deed-restricted units for lower-income households, defined as up to 80% of the area's median household income. CAP2030 applies this measure to the "Project Pipeline - Approved or Under Construction" sites identified as including lower-income affordable units in the City's Housing Element: • 8161 Redwood Blvd., (Habitat for Humanity) - 80 units total, 40 lower-income • 101 Landing Court - 32 units total, 7 lower-income • 826 State Access Road, (Homeward Bound) - 40 units total, 40 lower-income • 773-777 San Marin Drive (Fireman's Fund) - up to 1,300 units total, subject to inclusionary zoning • North Redwood Drive & Pinkston Drive (Valley Oaks) - 81 units total, 8 lower-income • 1787 Grant Avenue (AMG #1) - 35 units total, subject to inclusionary zoning • 1316-1320 Grant Avenue (AMG #2) - 225 units total, 179 lower-income • 1212-1214 Grant Avenue (AMG #3) - 67 units total, 47 lower-income • 1107-1119 - 198 units total, 138 lower-income • Village at Novato, 7506 & 7530 Redwood Blvd. - 178 units total, 25 lower-income • 115 San Pablo Ave. - 91 total units, 36 lower-income • 200 Landing Ct. - 28 units total, 3 lower-income • 970 C. St. - 32 units total, 4 lower-income
Sources	California Air Pollution Control Officers Association, "Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity," December 2021. City of Novato 6th Cycle Housing Element Update, Revised Public Hearing Draft, April 2024.

Calculation

	2030	
Number of multifamily units subject to inclusionary zoning	2,387	units
Annual household VMT attributed to inventory	10,385	miles

Number of units dedicated as affordable lower-income housing	881	units
Percent of multifamily units dedicated as affordable lower-income housing	36.9	%
Percent reduction in VMT for qualified units	28.6%	%
Percent reduction in GHG emissions from project VMT	10.6%	%
VMT Reduction	2,616,754	miles
Emissions reductions	861	$MTCO_2e$

RENEWABLE ENERGY GENERATION AND STORAGE BE-C1	
GHG Emissions Reductions by 2030	-1,184 ($MTCO_2e$)
Targets	Solar energy installations continue to grow at the 2024 rate through 2030.
Methodology & Assumptions	According to Environmental Insights Explorer, 95% of Novato buildings have roofs that are solar-viable. These 17,700 roofs have CAP2030acity for 472 MW DC and could generate 662,000,000 kWh per year, which is significantly more than the 228,000,000 kWh consumed in Novato in 2022. By 2022, approximately 20,636 KW AC of solar capacity had been installed in the Novato area (including unincorporated areas with Novato zip codes). Based on population estimates for the City of Novato and the census tracts which comprise the Novato zip code areas, CAP2030 estimates 88% of the solar energy systems are located within the City limits. Solar installation was growing in Novato at an average annual increase of 32% between 2020 and 2022. New CPUC rules on net metering that went into effect in April 2023 have changed the economics of solar installation and have made it more challenging to recover installation costs. This has led to a significant drop in solar installations. Annualized 2024 Q1 solar installation data indicates installations are 44% below the 2023 rate and are estimated to total 2,319 KW DC in 2024 (vs. 4,256 KW DC in 2023). Due to the new net metering regulations, CAP2030 the 2024 installation rate will continue through 2030.
Sources	Environmental Insights Explorer, https://insights.sustainability.google/, accessed September 20, 2024. California Distributed Generation Interconnected Project Sites Data Sets, https://www.californiadgstats.ca.gov/downloads/#_nem_cids, March 31, 2024.

Calculation

	2030	
Estimated solar capacity added 2024 within City limits	2,052	KW DC
Additional solar 2022 - 2030	22,015	KW DC
kWh generated by 1 KW solar energy system	1,450	kWh
Additional electricity produced by distributed PV	31,921,039	kWh
GHG emissions reductions	1,184	$MTCO_2e$

CLEAN ELECTRICITY BE-C2	
GHG Emissions Reductions by 2030	-257 ($MTCO_2e$)
Targets	7.8% of MCE load in Novato is Deep Green by 2030.
Methodology & Assumptions	The MCE Operational Integrated Resource Plan 2021-2030 states that MCE Light Green electricity is projected to be 95% GHG-free by 2022 and beyond. CAP2030 therefore assumes no decrease in the MCE emission factor due to additional GHG-free content. MCE supplied 71% of the total electricity load in Novato in 2022, and 7.4% of that was Deep Green. MCE currently enrolls new customers in Deep Green as the default option, although customers may elect to switch to Light Green. Deep Green subscriptions increased from 4.36% in 2022 to 4.74% in 2023. The analysis assumes the Deep Green percentage will increase the same amount through 2030.
Sources	MCE Operational Integrated Resource Plan 2021-2030 (October 5, 2020), p.21. https://www.mcecleanenergy.org/wp-content/uploads/2020/10/MCE-Operational-Integrated-Resource-Plan_2021.pdf MCE 2022 Power Content Label, https://www.mcecleanenergy.org/energy-suppliers/

Calculation

	2030	
Electricity use, BAU	237,966,389	kWh
Electricity reduced through State and local actions	31,884,225	kWh
Net electricity use	206,082,164	kWh
Projected additional Deep Green percentage of total MCE load in 2030	7.78	%
Projected MCE electricity use (73% of total)	162,764,348	kWh
Additional Deep Green electricity (7.78% of MCE load)	12,663,066	kWh
Electricity emissions w/MCE BAU	3,252	$MTCO_2e$
Electricity emissions w/MCE	2,996	$MTCO_2e$
GHG emission reductions	257	$MTCO_2e$

BUILDING ELECTRIFICATION BE-C3	
GHG Emissions Reductions by 2030	-586 ($MTCO_2e$)
Targets	665 cooktops, 110 water heaters, and 281 heating systems are replaced with high-efficiency, electric versions by 2030 through incentives, outreach, education, permit streamlining, and green building regulations.
Methodology & Assumptions	The County of Marin's 'Electrify Marin' program issued 136 rebates to electrify gas appliances in Novato between January 2019 and November 28, 2023, reducing GHG emissions 160.2 $MTCO_2e$, for an average of 27 appliance retrofits per year. CAP2030 assumes that the 'Electrify Marin' program will continue to be funded by the County and that voluntary retrofits will grow 50% each year through 2030 and prior to the year BAAQMD regulations take effect.
Sources	2019 California Residential Appliance Saturation Study (RASS), Volume 2, https://www.energy.ca.gov/publications/2021/2019-california-residential-appliance-saturation-study-rass County of Marin, Marin County Building Decarbonization Pilot Program for BAAQMD Climate Protection Grant Application, May 8, 2018.

Calculation

	2030	
Estimated annual gas use for stoves and cooktops	24	therms
Estimated annual gas use for water heaters	273	therms
Estimated annual gas use for space heating	240	therms
Estimated annual electricity use for stoves and cooktops	395	kWh
Estimated annual electricity use for water heaters	680	kWh
Estimated annual electricity use for heat pump space heating	1,482	kWh
Number of units stoves and cooktops replaced	665	units
Number of units water heaters replaced	110	units
Number of furnaces and heating systems replaced	281	units
Gas savings	113,430	therms
Electricity consumption	786,791	kWh
GHG emissions reduction	586	$MTCO_2e$

ELECTRIFICATION OF CITY-OWNED BUILDINGS BE-M2	
GHG Emissions Reductions by 2030	-67 ($MTCO_2e$)
Targets	10% reduction in municipal building gas consumption.
Methodology & Assumptions	The action states that where feasible, the City will incorporate into its facilities plan actions to replace gas appliances/equipment with electric and electrify City buildings. The Margaret Todd Senior Center, Gymnastics Center, and Hamilton Community Center are potential candidates for electrification. CAP2030 further assumes no net electricity emissions due to the City's purchase of 100% GHG-electricity (BU-M1). In November 2022, the City replaced seven gas water heaters with efficient electric hot water heat pumps. At time of installation, the heaters were projected to save 8,812 therms of natural gas annually. CAP2030 assumes an additional 10% of gas savings through additional electrification measures.
Sources	Personal communication with Gretchen Schubeck, Sustainability Programs Coordinator, City of Novato, June 17, 2024.

Calculation

	2030
Municipal natural gas consumption (2022)	47,142 therms
Gas savings from gas water heater replacement	8,812 therms
Additional reduction in natural gas consumption	10 %
Total savings	12,645 therms
Emissions reductions	67 $MTCO_2e$

ENERGY CONSERVATION AND EFFICIENCY BE-C5	
GHG Emissions Reductions by 2030	-3,230 ($MTCO_2e$)
Targets	Residential and commercial gas consumption in buildings is reduced an average of 0.5% per year between 2022 and 2030. Electricity consumption is reduced an average of 1% per year between 2022 and 2030.
Methodology & Assumptions	CAP2030 forecasts an annual electricity savings of 1% and an annual gas savings of 0.5% 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. Gas consumption in residential and commercial buildings in Novato declined an average of 0.4% per year between 2005 and 2022. Electricity consumption in Novato declined an average of 0.9% per year between 2005 and 2022, excluding estimated local distributed generation of solar energy.
Sources	National Action Plan for Energy Efficiency, July 2006, Section 6: Energy Efficiency Program Best Practices (pages 5-6). Energy Efficiency Resource Standards: Experience and Recommendations, Steve Nadel, March 2006 ACEEE Report E063 (pages 28-30).

Calculation

	2030	
Residential and commercial electricity use, 2022	237,966,389	kWh
Annual electricity reduction	1	%
Electricity savings	19,037,311	kWh
Residential and commercial natural gas use, 2022	13,171,876	therms
Annual natural gas reduction	0.5	%
Natural gas savings	526,875	therms
GHG emissions reductions	3,230	$MTCO_2e$

MUNICIPAL ENERGY CONSERVATION AND EFFICIENCY BE-M3	
GHG Emissions Reductions by 2030	-25 ($MTCO_2e$)
Targets	Reduce energy use in municipal buildings by 10%.
Methodology & Assumptions	The City is exploring participating in MCE's Strategic Energy Management Program as well as working with an energy services company to identify opportunities to reduce energy use. Energy management software is proven to reduce energy consumption by 10% through identifying inefficiencies within operations. Since the City was purchasing 100% renewable energy in 2020 for all of its facilities, there are no additional GHG reductions for actions that reduce electricity use.
Sources	Personal communication with Gretchen Schubeck, Sustainability Programs Coordinator, City of Novato, June 17, 2024.

Calculation

	2030	
Electricity consumption in municipal buildings, 2022	1,097,701	kWh
Emissions from electricity use in municipal buildings	0	$MTCO_2e$
Natural gas consumption in municipal buildings, 2022	47,142	therms
Emissions from natural gas use in municipal buildings	251	$MTCO_2e$
Percent reduction in energy use	10%	
Reduction in electricity consumption	109,770	kWh
GHG emissions reductions	25	$MTCO_2e$

WATER CONSERVATION BE-C11 and NU-C3	
GHG Emissions Reductions by 2030	- 0 ($MTCO_2e$)
Targets	1% annual water consumption reduction.
Methodology & Assumptions	District-wide North Marin Water District (NMWD) water consumption fell 39% between 2005 and 2022, or approximately 2.2% per year. CAP2030 assumes water consumption will continue to fall an average of 1% per year based on the following legislation and water conservation programs: -The City has adopted CALGreen Tier 1 for residential buildings, which requires additional water conservation actions above the base code. -NMWD'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 upon resale. -NMWD provides rebates for water-efficient toilets, clothes washers, hot water recirculation systems, low water use plants, turf replacement, mulch, weather-based irrigation controllers, pool covers, greywater systems, and rain catchment. -NMWD provides free residential and commercial building and landscape water audits and free shower heads, faucet aerators, and hose nozzles. -NMWD 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. NMWD requires all plumbing installed, replaced, or moved on any new or existing service to have high efficiency fixtures and meet minimum requirements. -NMWD has adopted a Water Waste Ordinance and requires drinking water and linen washing upon request at restaurants and hotels. -NMWD conducts outreach and provides water conservation information to water users on its website. -NMWD participates in water-friendly garden tours. GHG reduction calculations are based upon the following: -The California Energy Commission estimates that it takes 3,500 kWh of electricity per million gallons to convey, treat and distribute water from the water source to the customer in northern California. -NMWD began purchasing 100% renewable electricity in 2018 and Sonoma County Water agency, which provides approximately 80% of water, began purchasing 100% renewable electricity in 2015. CAP2030 assumes the water agencies will continue this practice.
Sources	Personal communication with Carrie Pollard, Sonoma Marin Water Saving Partnership. City of Novato2022 Communitywide GHG Inventory Refining Estimates of Water-Related Energy Use in California, California Energy Commission, Dec. 2006

Calculation		
	2030	
Water consumption, BAU	1,789	MG
Annual water consumption reduction	1	%
Potential annual water savings by 2030	143	MG
GHG emissions reduction	0	$MTCO_2e$

ORGANIC WASTE DIVERSION MW-C4	
GHG Emissions Reductions by 2030	-5,856 ($MTCO_2e$)
Targets	Increase edible food recovery by 20% and reduce organic waste to landfill by 75% by 2025 from 2014 level.
Methodology & Assumptions	Passed in 2014, AB 1826 requires businesses to recycle their organic waste, depending on the amount of waste they generate per week. Organic waste means food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper waste that is mixed in with food waste. The law phases in mandatory recycling of commercial organics over time. In 2017, businesses that generate 4 cubic yards of organic waste per week were required to arrange for organic waste recycling services and divert all organic waste they produce. In 2019, the law extended to businesses that generate 4 cubic yards or more of commercial solid waste. The state law is intended to reduce statewide disposal of organic waste by 50% by 2020. If that target is not met, the law will be extended to cover businesses that generate 2 cubic yards or more of commercial solid waste. Passed in 2016, SB 1383 established targets to achieve a 50% reduction in the level of the statewide disposal of organic waste from the 2014 level by 2020 and a 75% reduction by 2025. The law grants CalRecycle the regulatory authority required to achieve the organic waste disposal reduction targets and establishes an additional target that not less than 20% of currently disposed edible food is recovered for human consumption by 2025. The State's Green Building Code (CALGreen) requires residential and non-residential development projects to recycle and/or salvage for reuse a minimum of 65% of the non-hazardous construction and demolition waste
Sources	City of Novato 2022 Communitywide GHG Inventory

Calculation

	2030	
Waste emissions less government operations, 2014	11,208	$MTCO_2e$
Reduction in waste emissions	75	%
Targeted GHG emissions	2,802	$MTCO_2e$
Waste emissions less government operations, 2022	8,658	$MTCO_2e$
GHG emissions reduction	5,856	$MTCO_2e$

MUNICIPAL WASTE RECYCLING MW-M2	
GHG Emissions Reductions by 2030	-24 ($MTCO_2e$)
Targets	75% of organic waste currently landfilled is diverted by 2030.
Methodology & Assumptions	This measure assumes 75% of organic waste currently landfilled could be diverted by 2030.
Sources	City of Novato 2016 Local Government Operations GHG Emissions Inventory

Calculation

	2030	
Waste emissions generated by City operations, 2022 (est.)	53	$MTCO_2e$
Reduction in waste emissions	75%	
Targeted GHG emissions	13	$MTCO_2e$
Waste emissions, 2022	37	$MTCO_2e$
GHG emissions reduction	24	$MTCO_2e$

URBAN FOREST NU-C1	
GHG Emissions Reductions by 2030	-7 ($MTCO_2e$)
Target	Plant 40 new trees each year between 2025 and 2030.
Methodology & Assumptions	Institute a community bulk purchasing program resulting in the planting of 40 new trees per year beginning 2026. 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 new trees planted each year	40	trees
Number of years	5	years
Number of trees planted over period in active growing stage in inventory year	200	trees
GHG emissions reduction from sequestration	7.1	$MTCO_2e$

TREES ON PUBLIC LAND NU-M1	
GHG Emissions Reductions by 2030	-2 ($MTCO_2e$)
Target	Plant 10 new trees on public land each year between 2025 and 2030.
Methodology & Assumptions	Undertake a municipal program to plant more City trees, resulting in the planting of 10 new trees per year beginning 2026. 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 new trees planted each year	10	trees
Number of years	5	years
Number of trees planted over period in active growing stage in inventory year	50	trees
GHG emissions reduction from sequestration	1.8	$MTCO_2e$

ZERO-EMISSION LANDSCAPE AND SMALL OFF-ROAD EQUIPMENT NU-C6	
GHG Emissions Reductions by 2030	-525 ($MTCO_2e$)
Targets	100% reduction in fuel used in portable landscape and small off-road equipment by 2030 due to switching to electric equipment.
Methodology & Assumptions	CARB has adopted regulations to require all newly manufactured small off-road engines (SORE) sold in California that use gasoline to be zero-emission beginning January 1, 2024. SORE are spark-ignition engines rated at or below 19 kilowatts. Engines in this category are primarily used for lawn, garden, and other outdoor power equipment. They include log splitters, portable generators, pressure washers, chainsaws less than 45 cc, edgers, hedge trimmers, lawn mowers, leaf blowers, riding mowers and string trimmers. For this action, portable landscape equipment includes lawn mowers, leaf blowers/vacuums, trimmers/edgers/brush cutters. This equipment consumed 1,139,082 gallons of gasoline and 23,560 gallons of diesel in Marin County in 2022 (OFFROAD2021). Similar to the off-road emissions inventory, CAP2030 assumes 19.7% of emissions are attributable to Novato based on its share of countywide households in 2022. CAP2030 assumes a 100% reduction by 2030 due to the City's adoption of an ordinance to require the use of zero-emission SORE in residential and commercial areas by 2030. Emissions reductions attributed to the CARB regulation are quantified separately as a State action.
Sources	OFFROAD2021 v.1.0.1, https://arb.ca.gov/emfac/offroad/emissions-inventory/6dacb072fb74f04dca1abee1964bb0ab59f4975f California Air Resources Board, SORE Applicability Fact Sheet, https://ww2.arb.ca.gov/resources/fact-sheets/sore-applicability-fact-sheet

Calculation

	2030	
SORE gasoline consumption, BAU	199,400	gallons
Reduction target	100%	
Emissions reduced from State measure	1,226	$MTCO_2e$
Emissions reduction from local measure	525	$MTCO_2e$

MUNICIPAL-OWNED SMALL OFF-ROAD EQUIPMENT NL-M4	
GHG Emissions Reductions by 2030	-6 ($MTCO_2e$)
Targets	100% reduction in fuel used in portable landscape and small off-road equipment by 2030 due to switching to electric equipment.
Methodology & Assumptions	CARB has adopted regulations to require all newly manufactured small off-road engines (SORE) sold in California that use gasoline to be zero-emission beginning January 1, 2024. SORE are spark-ignition engines rated at or below 19 kilowatts. Engines in this category are primarily used for lawn, garden, and other outdoor power equipment. They include log splitters, portable generators, pressure washers, chainsaws less than 45 cc, edgers, hedge trimmers, lawn mowers, leaf blowers, riding mowers and string trimmers. For this action, portable landscape equipment includes lawn mowers, leaf blowers/vacuums, trimmers/ edgers/brush cutters. This equipment consumed 1,139,082 gallons of gasoline and 23,560 gallons of diesel in Marin County in 2022 (OFFROAD2021). Similar to the off-road emissions inventory, we assume 19.7% of emissions are attributable to Novato based on its share of countywide households in 2022. CAP2030 assumes a 100% reduction by 2030 due to the City's adoption of an ordinance to require the use of zero-emission SORE in residential and commercial areas by 2030. Emissions reductions attributed to the CARB regulation are quantified separately as a State action. The City's SORE inventory and fuel consumption are estimated based on jurisdictions of similar size.
Sources	OFFROAD2021 v.1.0.1, https://arb.ca.gov/emfac/offroad/emissions-inventory/6dacb072fb74f04dca1abee1964bb0ab59f4975f California Air Resources Board, SORE Applicability Fact Sheet, https://ww2.arb.ca.gov/resources/fact-sheets/sore-applicability-fact-sheet

Calculation

	2030	
Number of small off-road engines replaced with zero-emission equipment	63	units
Estimate annual gasoline used for small landscape equipment	2,205	gallons
Emissions reduced from State measure	14	$MTCO_2e$
Emissions reduced from local measure	6	$MTCO_2e$

LIGHT AND HEAVY-DUTY FLEET REGULATIONS State Measure	
Program Description	Current federal and State regulations and standards will reduce transportation emissions from the light and heavy-duty fleet. Regulations and policies covered in EMFAC 2021 are identified in the EMFAC 2021 Technical Document.
GHG Emissions Reductions by 2030	-24,298 ($MTCO_2e$)
Methodology and Assumptions	Transportation emissions estimated using EMFAC 2021.
Sources	California Air Resources Board, EMFAC2021 v.1.0.1. California Air Resources Board, EMFAC2021 Volume III Technical Document v.1.0.1, April 2021. https://ww2.arb.ca.gov/sites/default/files/2021-08/emfac2021_technical_documentation_april2021.pdf

Calculation

	2030	
Passenger VMT BAU	368,768,824	VMT
Passenger VMT, net reductions from other measures	287,065,509	VMT
Commercial VMT BAU	42,187,122	VMT
Emissions, BAU	142,384	$MTCO_2e$
Emissions with regulations	118,086	MTCO2e
Reduction in emissions	24,298	MTCO2e

BAY AREA AIR QUALITY MANAGEMENT DISTRICT REGULATIONS Regional Measure	
GHG Emissions Reductions by 2030	-9,076 ($MTCO_2e$)
Methodology & Assumptions	The Bay Area Air Quality Management District has adopted regulations that will ban the sale and installation of small natural gas water heaters in the Bay Area in 2027 and natural gas heating systems in 2029. The sale and installation of large commercial and multi-family water heaters will be banned in 2031. CAP2030 applies the BAAQMD regulation to the replacement of existing hot water heaters in existing single-family homes and heating systems in existing single-family and multifamily residential development. New construction is addressed in the State Action Title 24. Water heaters have a life expectancy of 8-12 years. Gas heating systems have a life expectancy of 16-20 years. CAP2030 assumes the high end of average life expectancies for these appliances. CAP2030 assumes hot water and heating system replacements use heat pump technology. According to the EPA, an ENERGY STAR certified heat pump water heater uses 70% less electricity than a conventional electric model.
Sources	2019 California Residential Appliance Saturation Study (RASS), Volume 2, https://www.energy.ca.gov/publications/2021/2019-california-residential-appliance-saturation-study-rass United States Environmental Protection Agency, "Choose an ENERGY STAR Heat Pump Hot Water Heater," May 2021. https://www.energystar.gov/sites/default/files/tools/HPWH_BuyingGuide_May2021.pdf#:~:text=Heat%20pump%20water%20heaters%20make%20the%20same%20amount,1%2F3%20the%20cost%20than%20conventional%20electric%20water%20heaters. Department of Finance, Report E-5, 2022

Calculation

	2030	
Number of single-family homes with gas water heaters	14,410	units
Estimated annual gas use for water heater	273	therms
Estimated annual electricity used for heat pump water heater	680	kWh
Number of water heaters replaced	4,803	units
Number of housing units with gas heating systems	16,792	units
Estimated gas use for heating system	240	therms
Estimated annual electricity used for heat pump heating system	1,441	kWh
Number of heating systems replaced	1,679	units

Gas use eliminated	1,714,318	therms
Additional electricity use	5,687,851	kWh
GHG emissions reductions	9,076	$MTCO_2e$

TITLE 24 BUILDING ENERGY EFFICIENCY STANDARDS State Measure	
GHG Emissions Reductions by 2030	-3,055 ($MTCO_2e$)
Methodology & Assumptions	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 2022 Building Code establishes an energy budget based on efficient heat pumps or water heaters to encourage installation of heat pumps over gas-fueled HVAC units and requires homes to be electric-ready, with dedicated 240-volt outlets and space so electric appliances can eventually replace installed gas appliances. CAP2030 assumes these requirements reduce natural gas consumption by 50%.
Sources	California Energy Commission, https://ww2.energy.ca.gov/title24/2019standards/documents/2018_Title_24_2019_Building_Standards_FAQ.pdf

Calculation

Reductions from Title 24 Upgrades	Projected average reduction 2023-2030 from 2020 baseline	
	Electricity Savings	Natural Gas Savings
Residential New Construction	100%	50%
Non-residential New Construction	50%	50%

Projected Residential Development with Title 24 Energy Reductions

	2023-2030	TOTAL through 2030	GHG Reductions through 2030
New Residential (units)	2,560	2,560	
Electricity Use BAU, subject to Title 24	3,386,880	3,386,880	
Electricity Use Savings	3,386,880	3,386,880	73
Natural Gas Use BAU, subject to Title 24	1,121,280	1,121,280	
Natural Gas Use Savings	560,640	560,640	2,982

SMALL OFF-ROAD ENGINES REGULATION State Measure	
GHG Emissions Reductions by 2030	-1,226 ($MTCO_2e$)
Methodology & Assumptions	CARB has adopted regulations to require all newly manufactured small off-road engines (SORE) sold in California that use gasoline to be zero-emission beginning January 1, 2024. SORE are spark-ignition engines rated at or below 19 kilowatts. Engines in this category are primarily used for lawn, garden, and other outdoor power equipment. They include log splitters, portable generators, pressure washers, chainsaws less than 45 cc, edgers, hedge trimmers, lawn mowers, leaf blowers, riding mowers and string trimmers. For this action, portable landscape equipment includes lawn mowers, leaf blowers/vacuums, trimmers/edgers/brush cutters. Regulated SORE consumed 1,012,182 gallons of gasoline in Marin County in 2022 (OFFROAD2021). Similar to the off-road emissions inventory, we assume 19.7% of emissions are attributable to Novato based on its share of countywide households in 2022. We assume an average life expectancy of 10 years for SORE equipment.
Sources	OFFROAD2021 v.1.0.1, https://arb.ca.gov/emfac/offroad/emissions-inventory/6dacb072fb74f04dca1abee1964bb0ab59f4975f California Air Resources Board, SORE Applicability Fact Sheet, https://ww2.arb.ca.gov/resources/fact-sheets/sore-applicability-fact-sheet

Calculation

	2030	
SORE gasoline consumption in Novato, 2022	199,400	gallons
Years regulation is in effect	7	years
Emissions reduction from local action	1,226	$MTCO_2e$

RENEWABLE PORTFOLIO STANDARD State Measure	
GHG Emissions Reductions by 2030	-1,081 ($MTCO_2e$)
Methodology & Assumptions	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. 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 2022. GHG reductions related to MCE's GHG reduction policies are quantified separately as a local action. California Public Utilities Code Section 454.52 requires each load-serving to procure at least 50 percent eligible renewable energy resources by 2030 and to meet the economywide reductions of 40% below 1990 levels by 2030. In 2022, PG&E electricity came from a mix of renewable (38%), large hydroelectric (8%), nuclear (49%), and natural gas (5%) energy sources and was 95% GHG-free. Although the percentage of renewable energy is required to be increased to 60%, this could occur by replacing non-GHG emitting energy sources. CAP2030 does not assume any improvement in the 2030 emission factor over the 2022 factor. For 2030, the CPUC has set electric sector GHG reductions at a level that represents a 50% reduction from 2015 levels. CAP2030 applies a 50% reduction to the DA 2015 CO2 emission factors to forecast 2030 emission factors. CH_4 and N_2O factors are kept constant at 2022 levels.
Sources	PG&E 2022 Power Content Label, https://www.pge.com/content/dam/pge/docs/account/billing-and-assistance/power-content-label.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	237,966,389 kWh
Electricity saved through other State actions	3,386,880 kWh
Electricity saved through local actions	82,892,034 kWh
Net electricity use (PG&E)	20,700,220 kWh

Net electricity use (DA)	11,184,004	kWh
Electricity emissions, BAU	3,077	$MTCO_2e$
Electricity emissions w/RPS	1,996	$MTCO_2e$
GHG emission reductions	1,081	$MTCO_2e$

INNOVATIVE CLEAN TRANSIT RULE State Measure	
GHG Emissions Reductions by 2030	-343 ($MTCO_2e$)
Targets	31% of Marin Transit and Golden Gate Transit buses will be electric and 69% will use renewable diesel by 2030.
Methodology & Assumptions	The Innovative Clear Transit (ICT) regulation was adopted by the California Air Resources Board (CARB) in December 2018 and became effective on October 1, 2019. The regulation requires public transit agencies in California to gradually transition their fleets to zero-emission technologies. The rule requires a percentage of new bus purchases to be zero-emission buses (ZEBs) starting for small transit agencies like Marin Transit in 2026, when 25% of purchases need to be ZEBs. In 2029, 100% of purchases are required to be ZEBs. Each transit agency must adopt and submit a Zero-Emission Bus Rollout Plan to CARB by June 30, 2023, describing how the agency will meet the targets. Marin Transit's Zero-Emission Bus Rollout Plan (2023) indicates 31.6% of its fleet will be comprised of zero-emission buses in 2030. In 2022, 97% of its fixed route buses were using renewable diesel and 3% were zero-emission. Marin Transit and Golden Gate Transit have been using renewable diesel since 2016. CAP2030 assumes 31% will be driven by electric buses utilizing MCE electricity by 2030.
Source	Marin Transit Zero-Emission Bus Rollout Plan (2023). Golden Gate Bridge, Highway, and Transit District, Zero-Emission Bus Rollout Plan (2021). Personal communication with David Davenport, Golden Gate Transit, May 24, 2024. Personal communication with Cathleen Sullivan, Marin Transit, May 24, 2024.

Calculation

	2030	
Marin Transit miles, BAU	719,021	miles
Golden Gate Transit miles, BAU	405,300	miles
Emissions, BAU	1,096	$MTCO_2e$
Marin Transit renewable diesel VMT	68.5	%
Marin Transit electric bus VMT	31.5	%
GGT Renewable diesel VMT	69	%
GGT electric bus VMT	31	%
Emissions	753	$MTCO_2e$
GHG emissions reductions	343	$MTCO_2e$