EXHIBIT A

City of Wilsonville

Draft Climate Action Plan

WILSONVILLE
OREGON

Prepared by
Sustainability Solutions Group

Prepared for
City of Wilsonville

August 15, 2025

Sustainability
Solutions Group

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Acronyms

BAU	Business as Usual
BAP	Business as Planned
BAPWIG	Business as Planned with Grid Improvements
BAPWOG	Business as Planned without Grid Improvements
CO2	Carbon Dioxide
CO2e	Carbon Dioxide Equivalent
EV	Electric Vehicle
GHG	Greenhouse Gas
ICE	Internal Combustion Engine
LC	Low Carbon
LCWIG	Low Carbon with Grid Improvements
LCWOG	Low Carbon without Grid Improvements
LDV	Light Duty Vehicle
MMBtu	Metric Million British Thermal Units
MTCO2e	Metric Tons of Carbon Dioxide Equivalent
ODOT	Oregon Department of Transportation
RNG	Renewable Natural Gas
Solar PV	Solar Photovoltaic
ZEV	Zero-emissions vehicle

Executive Summary

The City of Wilsonville has developed this Climate Action Plan to support and enhance its existing municipal and regional strategies and to ensure it is aligned with the State of Oregon's greenhouse gas reduction goals.[1] These goals are to reduce emissions across all sectors and communities in Oregon by at least 45% by 2035, and by 80% by 2050.

Reaching these goals will require ambitious and rapid action across the community of Wilsonville and ongoing support from the State in the form of legislation and policies. However, this work will not only ensure that community emissions are reduced, it will also decrease both the municipality's annual costs to heat and cool buildings, and to fuel and maintain vehicles , and energy and transportation costs for residents and for businesses, and it will improve the quality of life for all who call Wilsonville home.

This Plan:

- Identifies ten significant climate actions in five areas that constitute a pathway for Wilsonville to reduce its greenhouse gas emissions by 58% by 2035 and by 83% by 2050;
- Ensures that all who live and work in the community can benefit from this transition by increasing the number of good, long-term jobs, making home ownership[2] and transportation more affordable and healthy, and by supporting both the social and natural resilience of the community.
- Emphasizes the role of the City as a leader - decarbonizing its own operations, stimulating the development of skills in the local labor force, ensuring Wilsonville's economy attracts strong industries, and ensuring Wilsonville's future is healthier, greener, and more resilient in the future;
- Reflects input provided by community members and City staff;
- Includes an initial set of implementation measures that will allow the City to move directly from creating this Plan to implementing it.

[1] State of Oregon. Executive Order 20-04. 2020. https://www.oregon.gov/gov/eo/eo_20-04.pdf

[2] Improving the energy efficiency of new and existing homes and switching them from fossil fuel heating to electric heat pumps dramatically reduces residential energy consumption, reducing household energy bills. Adding rooftop or community solar systems further decreases household energy costs by providing free electricity for the 25 year lifetime of the system. Even when the capital costs of making these changes are included in this calculation, over the lifetime of ownership, the more energy-efficient homes that use only renewable electricity are much more affordable to own and keep at comfortable and healthy temperatures.

The actions in this Plan were selected from the most effective approaches to decarbonization currently available and refined for Wilsonville's energy and climate context. They have also been selected to improve housing affordability for residents, reduce municipal operating costs and energy costs for industry, improve air quality and healthy living conditions, and increase access to inexpensive and non-polluting modes of transportation. The ten actions that were modeled for Wilsonville include:

- Four actions relating to Buildings and Industry;
- Two actions relating to Transportation;
- Two actions relating to Renewable Energy;
- One action relating to Solid Waste; and
- One action relating to Green Infrastructure.

The project to create this Plan included calculating Wilsonville's energy consumption and emissions in 2018, as a baseline against which the impact of different actions could be compared. Then, five future scenarios were modeled:

- The **'Business as Usual' (BAU) scenario** reflects what can be expected if Wilsonville's population and economy grow as projected and the climate continues to warm but nothing else changes. In this case, energy consumption and greenhouse gas emissions will increase by over 20% by 2050. **In addition to exacerbating the climate crisis, this will translate to increased energy costs for Wilsonville's residents and businesses.** The municipality's energy and fuel costs will also increase, as will its costs for infrastructure maintenance and repair due to more extreme and frequent extreme weather events. This is often referred to as 'the cost of doing nothing'; it is explored further in the section of this document about the Social Cost of Carbon.
- Two **'Business as Planned' (BAP) scenarios** were modeled on top of the BAU conditions. These scenarios added to the impact of existing State climate and energy legislation and the City's various strategies. In both of these scenarios, energy consumption fell by 2%, which is positive but minimal. The difference between the two BAP scenarios was that one included the decarbonization of the electricity grid by 2040, and the other did not. If the electricity grid is emissions-free by 2040, the community's total emissions will decrease by 55% by 2050. If however, the grid retains its 2018 emissions factor until 2050, Wilsonville's total emissions will increase by 4% by 2050. This is a dramatic difference which highlights the importance of decarbonizing electricity. **Both BAP scenarios demonstrate that the current municipal strategies and State legislation are not sufficient to reach the emissions reduction goals.**
- Two **'Low Carbon' (LC) scenarios** were then modeled on top of the BAP conditions. These scenarios added to the impact of the ten actions mentioned above. In both LC scenarios, the community's total energy consumption decreased by 41% between 2018 and 2050. **This in itself translates into long-term financial savings for the**

community.[3] If the grid is emissions-free by 2040, emissions will fall by 58% by 2035 and 83% by 2050. If the grid retains its 2018 emissions factor, by 2050 emissions will only have fallen 69%. **Therefore, if the pathway of ten low-carbon actions outlined in this Plan are carried out according to the schedule provided and the State-wide grid decarbonizes by 2040, Wilsonville will reach its climate goals.**

This Plan also provides analysis for each action to the extent to which it will also provide additional benefits to the City that will ensure that it is a thriving city well into the future.

[3] Although utilities are forecasting rising energy costs, installing on-site renewable electricity such as solar PV systems provides a rapid return on investment and then provides free electricity to the owner for the lifetime of the equipment.

Introduction

Climate Context

Global Climate Change Damages Local Infrastructure and Well-Being

Scientists worldwide agree that human activity is driving dangerous climate warming around the globe. This warming is caused by greenhouse gases (GHGs) that are released primarily when people burn fossil fuels to produce energy.[4] When we burn gasoline, diesel, natural gas, etc., to heat buildings, operate vehicles, ships and aircraft, and operate industrial and manufacturing facilities, we release volumes of greenhouse gases that are so large, they far exceed our planet's natural capacity to absorb them. As a result, they accumulate in the atmosphere where, due to their chemical nature, they trap heat and cause global temperatures to rise.

In Oregon, communities are already experiencing the damaging and costly effects of climate change, including more frequent and severe extreme weather events such as record-breaking heatwaves, wildfires, and floods.

The Wilsonville area has not been spared. In 2020, Clackamas County experienced two wildfires. The Riverside Incident burned 138,054 acres, destroyed 139 structures, and caused four injuries; and the Clackamas Fire Complex burned 11,210 acres.[5] In June of the following year, the Portland Metro region experienced a major heatwave, with temperatures reaching 114°F near Wilsonville.[6] This weather event led to short-term business closures,[7] shattered local records and resulted in 123 deaths across the region.

Extreme weather events are expected to become more frequent and severe in Oregon. Rising temperatures will likely lead to more heat waves and extremely hot days. More winter precipitation is projected to fall as rain rather than snow, leading to increased flash flooding, and reduced groundwater recharge. At the same time, wildfire risk will likely increase due to

[4] Herring, David. US National Oceanic and Atmospheric Administration (NOAA). 2020. 'Isn't there a lot of disagreement among climate scientists about global warming?' https://www.climate.gov/news-features/climate-qa/isnt-there-lot-disagreement-among-climate-scientists-about-global-warming Accessed June 3, 2025.
[5] Clackamas Fire. 2021. "Clackamas Fire Siege". https://clackamasfire.com/wp-content/uploads/2021/01/2021-01-21-AAR-Executive-Summary-Final.pdf. Accessed May 7, 2025.
[6] National Weather Service. Aurora State Airport weather station USW00094281. https://www.weather.gov/wrh/timeseries?site=KUAO&hourly=true. Accessed May 7, 2025.
[7] NOAA. Storm Events Database. Event ID: 961302. https://www.ncdc.noaa.gov/stormevents/eventdetails.jsp?id=961302. Accessed June 4, 2025.

longer dry seasons and increased stress on forests from drought and pests.[8] To limit the worst of future warming and avoid the most severe consequences, global and local efforts must focus on rapidly reducing greenhouse gas emissions.

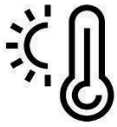
	Name	Description	Historical (1961 - 1990)	Future (2050s, RCP 8.5)
	**Average Daily Max Temperature**	Average of the highest temperature reached each day, calculated over the year	**56.1 °F**	**64.2 °F**
	**Hot Days**	Number of days where the maximum temperature is over 90°F	**4 days**	**17 days**
	**Very Hot Days**	Number of days where the maximum temperature is over 100°F	**0 days**	**2 days**
	**Freezing Days**	Number of days where the minimum is less than 32°F	**114 days**	**71 days**
	**Dry Days**	Number of days when precipitation is less than 0.01 inch.	**149 days**	**159 days**
	**Wet Days**	Number of days when precipitation is more than 1 inch.	**15 days**	**16.9 days**

Figure 1: Climate projections for Wilsonville under a high-emissions scenario.[9]

[8] 2021 State Agency Climate Change Adaptation Framework. https://www.oregon.gov/lcd/CL/Documents/2021_CLIMATE_CHANGE_ADAPTATION_FRAMEWORKandBlueprint.pdf

[9] All projections come from the U.S. Climate Resilience Toolkit Climate Explorer (Version 3.1). The future projections are based on global climate models for the Coupled Model Intercomparison Project Phase 5 (CMIP5), using the RCP 8.5 scenario for the 2050s. The historical data is based on the observed averages from 1961 to 1990. http://toolkit.climate.gov/home.

GHG Emission Reduction Targets

In 2015, the international community[10] signed the Paris Agreement, a major climate treaty with the goal of limiting global temperature rise to 1.5°C above pre-industrial levels. This threshold is considered a critical safeguard — exceeding it greatly increases the likelihood of extreme weather, more frequent and intense wildfires, rising sea levels, and shifts in flood and drought patterns that would cause severe and lasting damage to people and ecosystems. In its 2023 Synthesis Report, the Intergovernmental Panel on Climate Change (IPCC) emphasized the urgent need for deep and immediate reductions in greenhouse gas emissions to stay within the 1.5°C limit.[11]

The State of Oregon has established a series of GHG emissions reduction targets over time. The first goal, set by the Legislature in 2007, aimed to cut emissions to 75% below 1990 levels by 2050. In 2020, Executive Order 20-04 issued by Governor Kate Brown revised this goal, increasing the long-term target to an 80% reduction by 2050 and adding an interim goal of a 45% reduction by 2035.[12] Most recently, in 2023, the Oregon Climate Action Commission released the Climate Action Roadmap to 2030, which recommended strengthening the long-term target to a 95% reduction below 1990 levels by 2050 to align with the best science on limiting warming to 1.5°C.[13] Figure 2 presents these emission reduction targets.

In alignment with Executive Order 20-04, the City of Wilsonville aims to reduce community-wide emissions by 45% by 2035, and by 80% by 2050 compared to 2018 levels.[14]

[10] As of May 2025, 194 nations and the European Union had ratified the Paris Agreement. UNFCC. https://unfccc.int/process-and-meetings/the-paris-agreement
[11] IPCC. 2023. "AR6 Synthesis Report: Climate Change 2023. 2023 Synthesis Report". Retrieved from https://www.ipcc.ch/report/ar6/syr/
[12] State of Oregon. 2020. "Executive Order 20-04". https://www.oregon.gov/gov/eo/eo_20-04.pdf
[13] State of Oregon. 2023. "Oregon Climate Action Roadmap". https://climate.oregon.gov/tighger
[14] 2018 was selected as a baseline year for the target as 1990 data for the City of Wilsonville is not available.

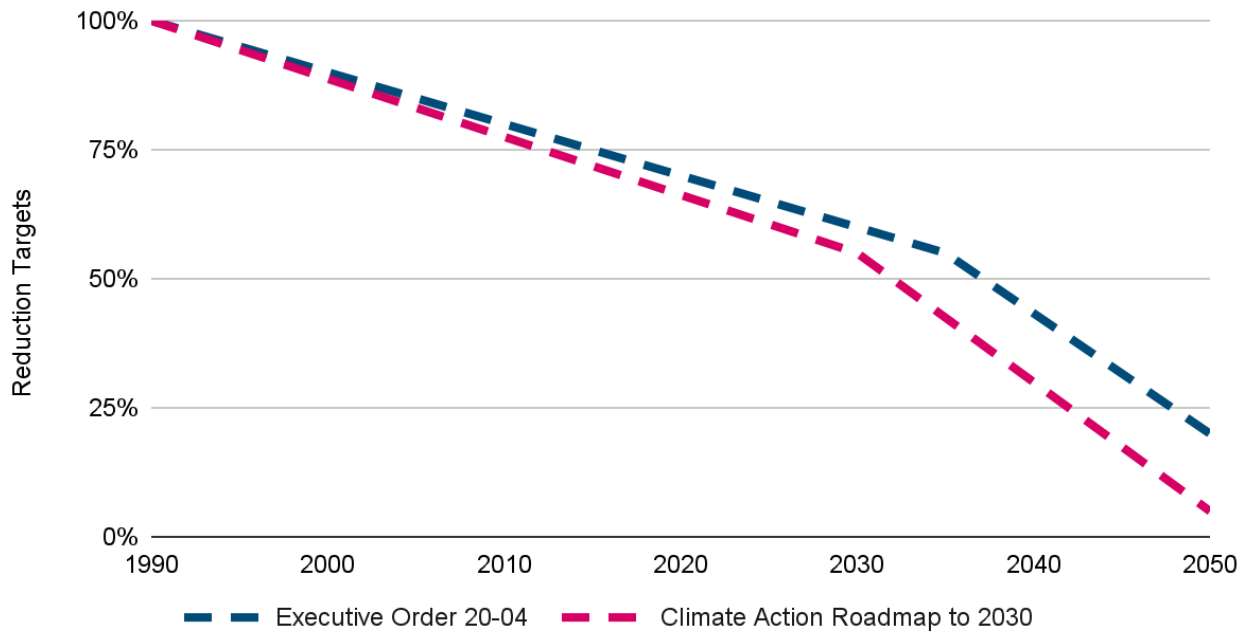


Figure 2: The State of Oregon's most recent climate targets.

About this Plan

Overview

This Climate Action Plan (CAP) is Wilsonville's first comprehensive climate change mitigation action plan. It provides the City with a comprehensive pathway of actions that will reduce its community-wide emissions by 45% by 2035 and 80% by 2050. This will align the community with the State's GHG reduction targets as outlined in Governor Brown's Executive Order 20-04.[15]

This Plan also provides projections of Wilsonville's future energy use and emissions in 'Business-as-Usual' and 'Business-as-Planned' scenarios, insights into the economic, social and financial benefits of taking climate action, and a set of initial implementation measures which Wilsonville can use to move directly into implementing the CAP.

The Plan was informed by technical modeling and analysis, as well as input from community members, local businesses, City staff, and the Planning Commission. The project was completed between 2024 and 2025, as shown in Figure 3.

[15] State of Oregon. Executive Order 20-04.

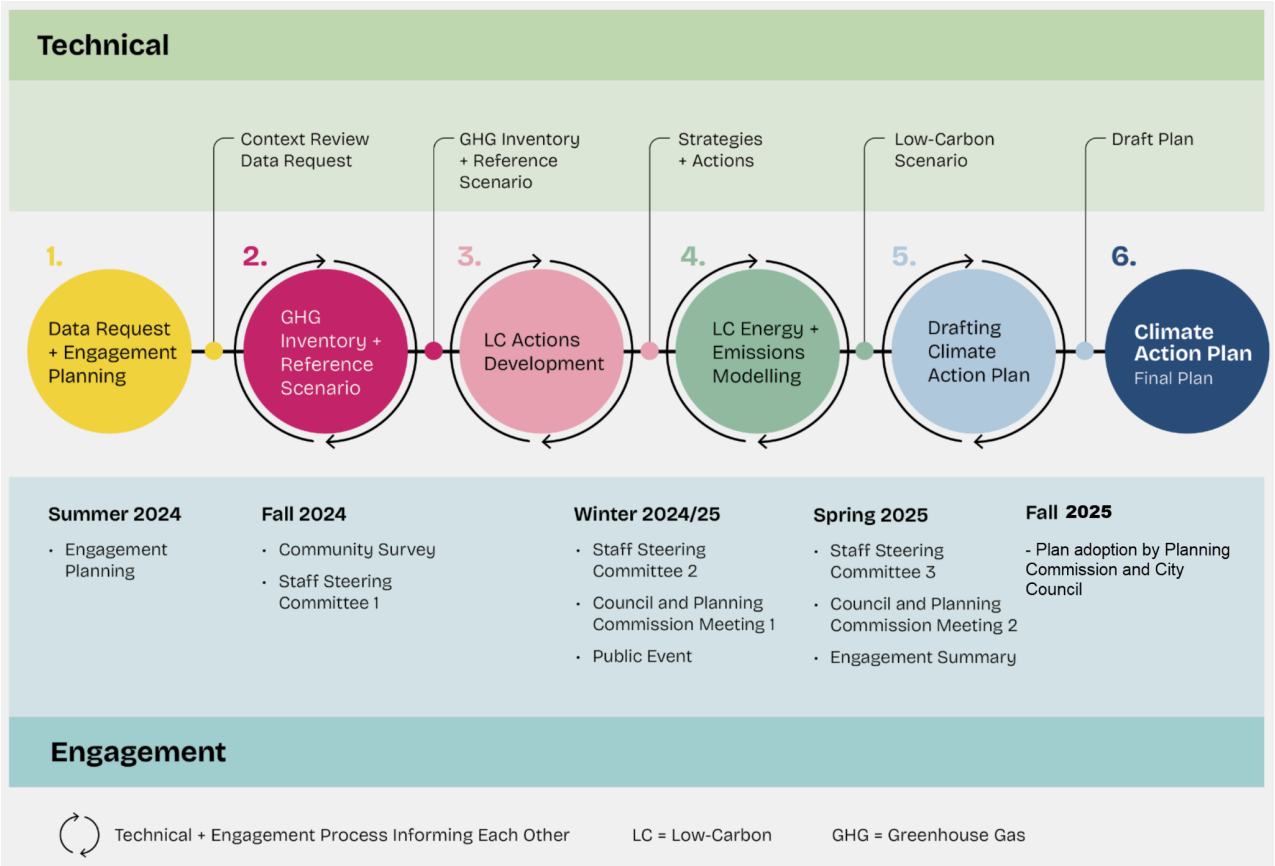


Figure 3: Project timeline for technical modeling and engagement.

Technical modeling

In this project, SSG's ScenaCommunity modeling software was used to calculate Wilsonville's total energy use and emissions for a baseline calendar year (2018), and then to model five future scenarios for Wilsonville. The data used for this was collected from the City of Wilsonville, the State of Oregon, the Federal census, the EPA, and other sources.[16]

The following five scenarios were modeled to calculate the community's future annual energy use and greenhouse gas emissions annually from 2018 to 2050:

- **Business-as-Usual (BAU)**: The intent of this scenario was to demonstrate how Wilsonville's energy consumption and emissions can be expected to change if the community continues to operate as it did in 2018. It reflected only the impacts of population, employment, and household growth, and ongoing improvements in vehicle fuel efficiency on Wilsonville's energy consumption and emissions. It was assumed that energy sources and consumption, transportation modes and patterns, and

[16] All data sources and assumptions are documented in the Data, Methods and Assumptions Manual provided by SSG to the Wilsonville Project Team.

land-use plans in this scenario would remain the same as they were in the baseline year of 2018.

- **Business as Planned without Grid Improvements (BAPWOG)**: This modeled scenario built upon the BAU scenario, adding the impacts of approved municipal strategies and plans, and all but one of the State's legislated targets on Wilsonville's total energy use and emissions. The results from this scenario therefore show the impact of the Advanced Clean Vehicles legislation, regularly improved building codes, and some densification in Wilsonville. (The State legislation that was excluded from this scenario was its Clean Energy Targets Bill,[17] which requires that by 2040 the electricity grid produces no emissions.)
- **Business as Planned with Grid Improvements (BAPWIG)**: This scenario is the same as the BAPWOG scenario except that it also includes the impact of the State's Clean Energy Targets Bill, adding the impact of decarbonizing the electricity grid by 2040.
- **Low Carbon without Grid Improvements (LCWOG):** Like the BAPWOG scenario, the LCWOG scenario does not reflect the grid-wide decarbonization of electricity that would occur as a result of Oregon's Clean Energy Targets Bill. Instead, this scenario used the BAPWOG scenario as a base and then added actions that were selected to ambitiously reduce Wilsonville's total energy use and emissions from all sources in the community.
- **Low Carbon with Grid Improvements (LCWIG)**: The LCWIG scenario is the same as the LCWOG scenario, except that it also includes the impact of the State's Clean Energy Targets Bill, adding the impact of decarbonizing the electricity grid by 2040.

The baseline and these five scenarios are described in more detail in the subsequent sections of this Plan.[18]

Engagement

As part of the planning process, the project team also engaged with a diverse range of people and organizations who were interested and will be affected by Wilsonville's climate action initiatives. Engagement efforts were aimed at several parties, including City of Wilsonville residents, staff, elected officials, and local businesses and industry leaders.

The primary goals of the project's engagement activities were to consult with community members and businesses to understand their concerns about climate change and to gather ideas for reducing GHG emissions. The project team also aimed to involve City staff throughout the development of the plan to help identify opportunities, and flag potential barriers to implementation. City Councilors and Planning Commissioners were also consulted at key project milestones to provide feedback and guidance.

[17] State of Oregon. 2021. "Clean Energy Targets Bill". https://www.oregon.gov/deq/ghgp/pages/clean-energy-targets.aspx.
[18] More information about the technical modeling is included in the Data, Methodology, and Assumptions Manual provided as part of this project by SSG to Wilsonville.

Key engagement activities included a pop-up event, an open house, two community questionnaires, two industry questionnaires, an industry forum, a middle school presentation, and several information sessions and presentations with staff and elected officials, as detailed in Table 1.

Table 1: Summary of engagement activities.

Interested and Affected Party	Date	Activity
City Residents	August 22, 2024	Pop-Up Event
	October - November 2024 April - May 2025	Community questionnaires
	January 16, 2025	Open House
Staff	November 18, 2024	Information Session #1: Emission Reduction Actions
	March 24, 2025	Information Session #2: Implementation Measures
	June 30, 2025	Information Session #3: Draft Climate Action Plan
Boards	January 8, 2025	Planning Commission Presentation: Emission Reduction Actions
	February 3, 2025	City Council Presentation: Emission Reduction Actions
	August 13, 2025	Planning Commission Presentation: Draft Climate Action Plan
	September 4, 2025	City Council Presentation: Draft Climate Action Plan
	October 15, 2025	Planning Commission Presentation: Final Climate Action Plan
	November 3, 2025	City Council Presentation: Final Climate Action Plan
Youth	January 31, 2025	Meridian Creek Middle School Session
Industry	October - November 2024 April - May 2025	Industry questionnaires
	January 16, 2025	Industry Forum

Please see the Engagement Summary Report provided to the Wilsonville Project Team for detailed information on the engagement activities and findings.

Background

Community Support

The City hosted two community questionnaires to gather input on climate action. The questionnaires contained the same questions used by Clackamas County during the development of their Climate Action Plan in 2022, allowing for a comparison of responses over time. Wilsonville posted the questionnaire first in 2024, but had a relatively low response rate. The City re-released the questionnaire in 2025 and mailed postcards to all households to encourage participation. A total of 262 community members participated in at least one of these questionnaires.

Experiences of Climate Change

The majority of questionnaire respondents said they had personally experienced the effects of climate change, as shown in Figure 4. Residents noted shifting seasonal patterns, such as milder winters and earlier springs. Many cited extreme events, including extreme heat, ice storms, heavy rain, and property damage. Several also described the growing impact of wildfires and smoke, citing poor air quality and near-evacuation experiences.

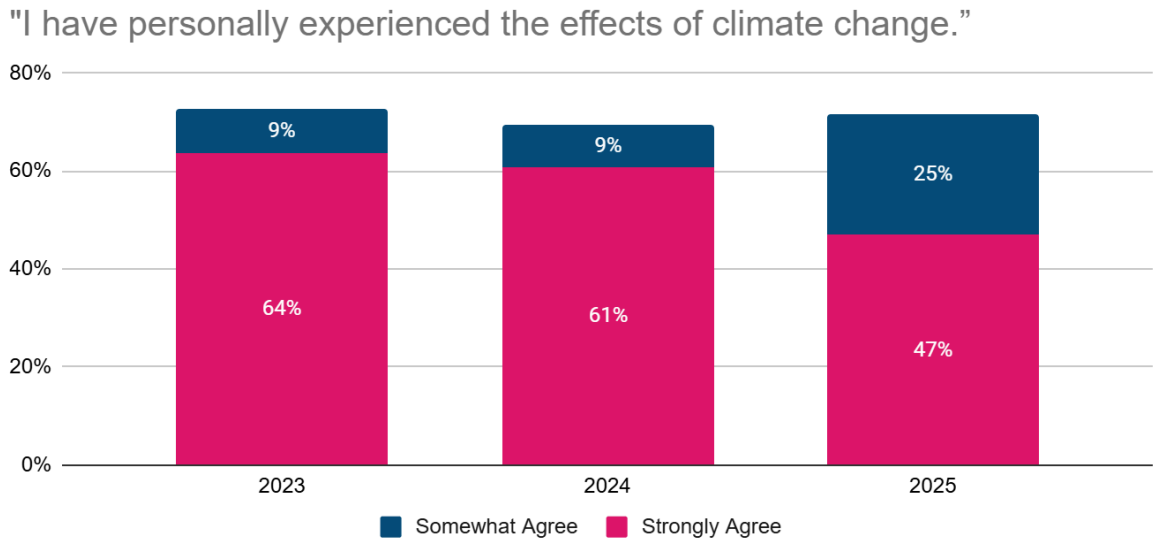


Figure 4: Responses to the question: "How much do you agree or disagree with the following statement? I have personally experienced the effects of climate change."

Importance of Addressing Climate Change

Most community members also indicated that climate change is important to them, as shown in Figure 5. Across the three questionnaires, between 67% and 76% of participants said the issue was either very or somewhat important to them. While the questionnaires are not statistically representative, the results suggest that climate change continues to be a priority for many community members.

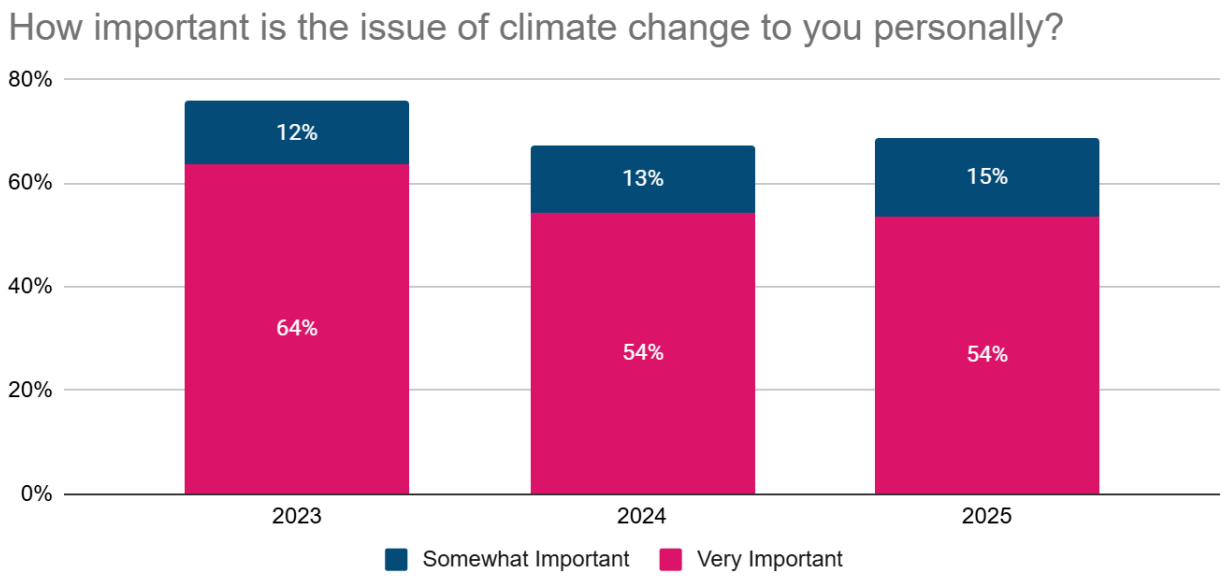


Figure 5: Responses to the question: "How important is the issue of climate change to you personally?"

Responsibility for Climate Action

The questionnaire also explored community members' views on who should be responsible for addressing climate change. Participants were allowed to select multiple options. The results were weighted across the questionnaires based on the number of respondents and are shown in Figure 6. One quarter of respondents indicated that all of the parties listed were responsible for addressing climate change. The most frequently selected individual option was the federal government, followed by the state government and then individuals. Only 5% of respondents indicated that none of the listed groups should be responsible for addressing climate change.

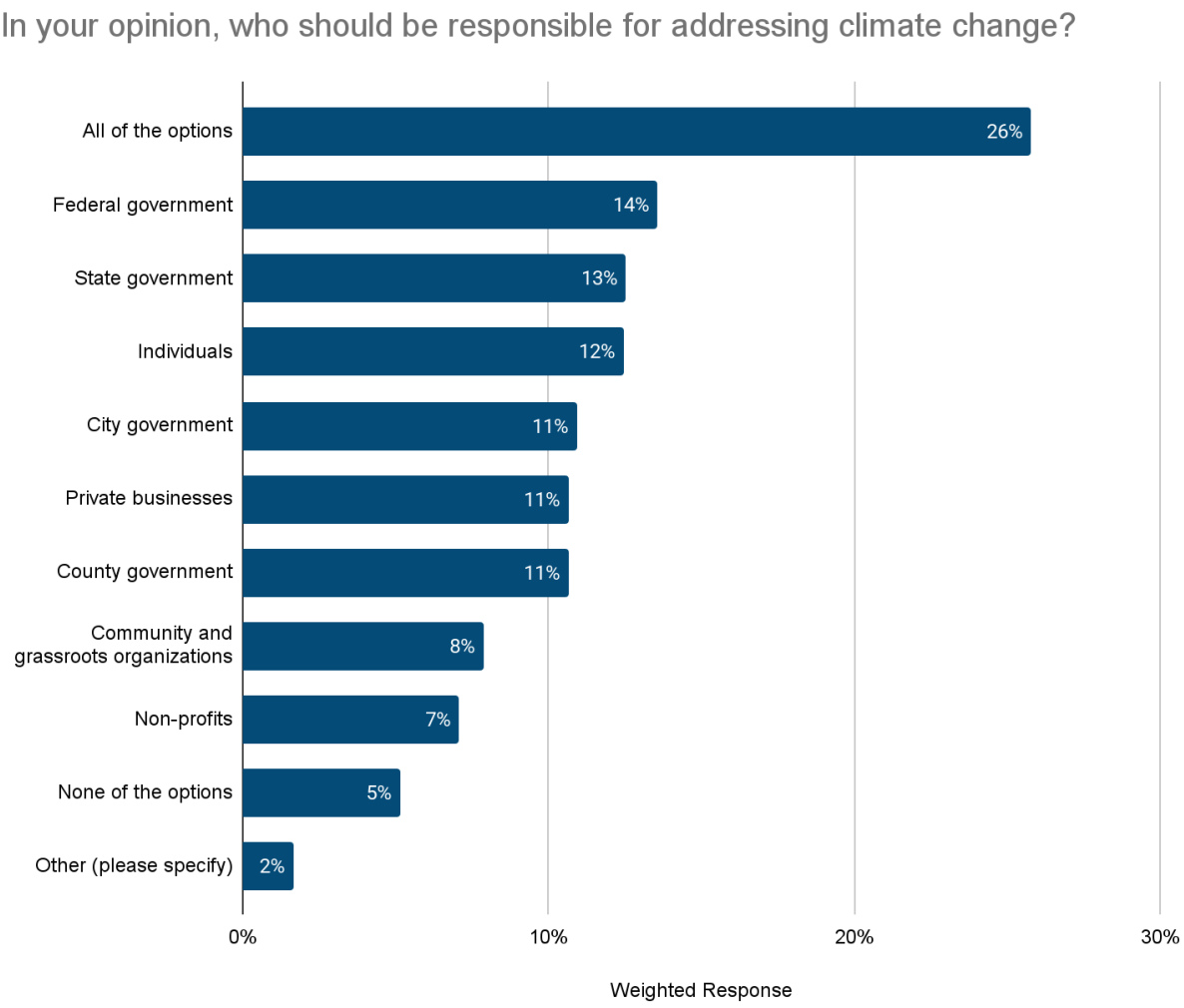


Figure 6: Weighted responses to the question: "In your opinion, who should be responsible for addressing climate change?"

The results of these questionnaires indicate that:

1. Over 70% of respondents are noticing the impacts of climate change in their own lives;
2. Over 65% of respondents indicate that climate change is somewhat or very important to them personally;
3. Respondents want to participate in taking action, and hold all members of the community and levels of government responsible to some degree for addressing climate change.

This is an empowering message for Wilsonville's City Council members and for City Administration:

There is strong and consistent support among questionnaire respondents for the City of Wilsonville to take action to address climate change, to support its residents in doing so, and to work with all other levels of government, businesses, and other affected entities to do what is within their power to do to reduce the greenhouse gases that cause climate change.

This support communicates the community's desire for the City to invest in the changes that are necessary to reduce greenhouse gas emissions, and to ensure the community has a sustainable future. It is recommended that Wilsonville continue to regularly questionnaire the population to monitor the community's level of support, and to continue to share the results with the public, City staff and City Council.

State-Led Climate Action

Oregon has implemented several laws and programs aimed at reducing GHG emissions across the state. The Clean Energy Targets bill (2021) requires electricity utilities to reduce emissions from electricity generation, and establishes a target of 100% renewable electricity by 2040.[19] The Climate Protection Program (2024) established a cap on GHG emissions from fossil fuels (i.e. natural gas, diesel, gasoline, and propane) that will get smaller over time. If this Program continues successfully, these emissions should fall by 90% by 2050 from the average 2017 to 2019 baseline.[20]

In the transportation sector, Oregon has adopted Advanced Clean Car II (2022) standards requiring all new light-duty vehicles sold by 2035 to be zero-emissions vehicles.[21] Additionally, the Advanced Clean Trucks Rule (2021) mandates that manufacturers sell an increasing share of medium- and heavy-duty zero-emissions vehicles. These requirements reach 40% for Class 7 and 8 trucks, 55% for Class 2b to 3 trucks and vans, and 75% for Class 4 to 8 trucks by 2035.[22]

In the land use and transportation sectors, Oregon's Climate Friendly and Equitable Communities (CFEC) program requires cities to reduce emissions through urban planning. This includes designating walkable areas that support mixed-use development and sustainable transportation. Within the Portland Metropolitan region, Wilsonville's Town Center meets the definition of Climate Friendly Areas.[23] The program also requires cities to reform

[19] State of Oregon. 2021. Clean Energy Targets Bill.
[20] State of Oregon. 2024. "Climate Protection Program". https://www.oregon.gov/deq/rulemaking/Pages/CPP2024.aspx
[21] State of Oregon. 2022. "Advanced Clean Cars II". https://www.oregon.gov/deq/rulemaking/Pages/CleanCarsII.aspx
[22] State of Oregon. 2021. "Advanced Clean Trucks Rule". https://www.oregon.gov/deq/aq/Documents/cfpMHDtruckRulesFAQ.pdf. Note that state authority to implement this rule was revoked by Congress in June 2025; however state authorities are continuing to work with the auto industry to achieve these targets.
[23] As defined by Oregon's Climate Friendly and Equitable Communities Program. https://www.oregon.gov/lcd/cl/pages/cfec.aspx

parking management, expand access to electric vehicle charging in mixed-use and multi-unit developments, and prioritize multi-modal transportation projects.

These State-led policies and programs have been incorporated into Wilsonville's climate action planning process.

The Role of Wilsonville

While these State programs will reduce GHG emissions, there are several reasons why cities like Wilsonville still have an essential role to play in addressing climate change.

Firstly, **not all of the City's emissions are addressed by state-wide legislation**. For example, the State does not yet have a commercial or residential building energy and emissions reporting and reduction program in operation; however these buildings produce 37% of Wilsonville's emissions.[24] Municipalities have authorities such as land-use policy, zoning, and building permitting which can be leveraged to help expedite a reduction in building energy use and emissions.

Secondly, **the success of state-wide legislation is not guaranteed**. For example, the Clean Energy Targets bill (2021) does not dictate how electric utilities are to achieve the required reductions, nor do municipalities have the authority to control this. This puts the onus on the many participants in the electrical grid to forecast production capabilities for 'new' technologies, retire old assets, invest in and construct new ones, adapt generation, storage, transmission, and distribution networks, and then finally to coordinate sufficiently to ensure that the grid will continue to provide stable, affordable and reliable electricity to agreed service levels. Although there are financial penalties for failure, they do not guarantee success.

Furthermore, much of Oregon's legislation focuses on cleaning the electrical grid and capping fossil fuel consumption while transitioning to electric vehicles. Electric vehicles, population growth, and the installation of clean technologies like heat pumps will increase the demand for electricity across Oregon. **Parallel investments in energy efficiency improvements and local renewable projects would offset this increase in electricity demand** and ease the transition. Cities like Wilsonville can play a role in encouraging energy efficiency improvements and solar photovoltaic systems, which can reduce the burden on the state grid and decrease the likelihood of the demand for electricity exceeding the supply.

Fourthly, **the shift to non-emitting energy sources and to more energy-efficient facilities brings many additional benefits to cities and their residents**. For example, more

[24] The State has passed House Bill 3409, which will require commercial buildings to meet a Building Performance Standard that is currently in development. Depending on the targets that are developed for this Standard, this will help reduce energy consumption.

energy-efficient homes are less expensive to heat and cool than conventional homes. Buildings in which natural gas stoves, furnaces and clothes dryers are replaced with electric models will increase electricity consumption, but will have much healthier indoor air quality.[25]

It's also important to note that many of the costs of adapting to climate change and of repairing infrastructure from damage caused by climate change are borne by municipalities. Repairs to stormwater infrastructure, sewers and roadways are examples of municipal costs that are already increasing due to climate change, and this is requiring cities to redirect money to cover these costs. Municipalities that take action now to both reduce emissions and improve resilience are investing to reduce their own future costs. Ultimately, **upgrading this infrastructure comprehensively and early, and investing in local, zero-emissions energy generation, directly reduces the local damage caused by these events and increases the community's resilience, ultimately saving money for the municipality**.

More than a 'Climate Plan'

Municipal climate actions have come a long way since the first climate action plans were written in the early 2000s. In fact in 2025, the financial business case for climate action is just as compelling as the environmental reasons are. This means that it's becoming easier for cities to justify taking these climate actions than to justify continuing with the status quo.

'Clean' technologies are now proven solutions

Some of the most important 'clean' technologies have now been available for decades. Solar photovoltaic (PV) panels for example, have been viable, affordable and commercially available since the 1980s. In the last decade, the labor force has become familiar with solar installation and maintenance, just as HVAC technicians have become skilled in installing air source heat pumps for both space heating/ cooling and water heating. The costs of installing these systems continue to fall as mass manufacturing practices improve.[26] Government policies, net-metering programs, and utility and transmission readiness now make solar PV a straightforward option for municipalities, corporations, and homeowners.

In essence, in 2025 the risks that once would have been associated with adopting 'new technologies' have been largely eliminated.

[25]Lewis, Tanya. 'The Health Risks of Gas Stoves Explained'. Scientific American. January 19, 2023. https://www.scientificamerican.com/article/the-health-risks-of-gas-stoves-explained/

[26] According to the Wood Mackenzie Power & Renewables and SEIA's Q1 2025 report: "An average-sized residential system has dropped from... $40,000 in 2010 to roughly $26,880. Recent utility-scale prices range from $16 to $35/ MWh, competitive with all other forms of generation. https://seia.org/research-resources/solar-industry-research-data/

Taking climate action reduces municipal costs

Municipal climate actions reduce costs in both a city's operating and capital budgets. The costs to heat and cool energy-efficient facilities using zero-emissions sources are already less variable and lower than the costs of using fossil fuels.[27]

The cost to charge and maintain fleet vehicles is significantly lower than the cost to fuel and maintain ICE vehicles (including the costs of chargers).[28]

Building new developments in existing urban areas - extending buildings upwards rather than extending a city's footprint outwards - reduces municipal costs associated with extending roadways, as well as water, wastewater, fire suppression and power infrastructure out into suburbs. It also avoids the destruction of natural lands and resources that would otherwise be subsumed into urban sprawl.

Climate actions can provide municipalities with new revenue sources

Both climate actions, and the way those actions are implemented can provide opportunities for cities to establish new revenue sources. Here are some examples of ways in which other communities are generating revenue for the City while contributing to a reduction in community emissions:

- Add a climate surcharge to all public parking (as done recently in Portland). This charge reminds people that there is an environmental cost to driving a personal vehicle, and gently discourages the behavior. Funds from this surcharge are directed into improving alternative modes of transportation.
- Install solar PV on city facility rooftops, over parking lots, and in low-value land such as highway roadsides, to realize revenue from electricity fed into the grid.[29] The French Prairie Solar Station at the interchange of Interstates 5 and 205 offsets operational costs in a similar way for ODOT.
- Create municipal waste management services that re-sell construction materials from dismantled buildings, receive organic waste to produce and sell compost, and collect fats, oils and greases to generate renewable natural gas for sale to industry. A similar program operates at the Gresham wastewater treatment facility.[30]

[27] International Energy Agency. "North America: Shares of Renewables" web page. https://www.iea.org/regions/north-america/renewables. Accessed May 27, 2025.
[28] McKinsey & Company. Automotive and Assembly. "Why the economics of electrification make this decarbonization transition different." 2023. https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/why-the-economics-of-electrification-make-this-decarbonization-transition-different
[29] See the ODOT Solar Highway Program for more information. ttps://www.oregon.gov/odot/Programs/Pages/Solar-Highway.aspx
[30] City of Gresham, Oregon. "Wastewater Treatment Plant" web page. https://www.greshamoregon.gov/environmental-services/water-services/wastewater-treatment-plant/.

- Sell residual energy or heat generated at city facilities such as IT data centers, wastewater treatment facilities or underground piping, or other large-scale energy users within city operations.

In fact, there are many ways in which climate change actions improve a city's ability to thrive and ensure that it endures sustainably in the future. Table 2 provides some of the key 'Thriving City Benefits'; specific examples will be discussed throughout this Plan.

Table 2: Thriving City Benefits.

Benefit	Icon	Description
Economic and Job Growth	EJG	Investments in clean energy, infrastructure, and innovation can create new jobs, attract new industries, and support long-term economic resilience.
Affordability for Residents	AR	Climate action can lower household and business costs over time by reducing energy bills, transportation expenses, and exposure to climate-related damages. This improves long-term home affordability.[31]
Financial Benefits for the Municipality	FBM	Climate actions can significantly reduce a municipality's operating costs through reduced energy consumption, more stable pricing, less maintenance, and even new or increased revenue streams.
Improved Health & Air Quality	HAQ	Cleaner air, expanded green spaces, and safe options for walking and biking contribute to improved physical and mental health across the community.
More Accessible Mobility	AM	Climate action can improve access to affordable, safe, and reliable transportation options such as public transit, biking, and walking.
Improved Energy Security	ES	Distributed renewable energy and energy efficiency improvements help make the power grid more reliable, flexible, and resilient to extreme weather.
Resilient Nature & Biodiversity	NB	Protecting and restoring natural areas supports local biodiversity, improves air and water quality, provides shaded, cooler areas reducing the urban heat island effect, and strengthens community resilience to climate change impacts.
Climate Resilience	CR	Changes such as making buildings more energy-efficient helps communities prepare for and respond to extreme

[31] World Resources Institute. "12 Reasons Climate Action is Good for the United States Economy." https://www.wri.org/insights/12-reasons-climate-action-good-united-states-economy

Benefit	Icon	Description
		weather, flooding, wildfire, and other climate-related risks.
Reduced Waste	WR	Reducing waste decreases greenhouse gas emissions, conserves natural resources, and supports cleaner, more sustainable communities.

Planning Paradigm

Although there are many decarbonization initiatives a city can pursue, they typically fall into one of five strategic approaches, shown in Figure 7. These approaches include: **Avoid, Reduce, Replace, Remove, and Offset**. Wilsonville's CAP was guided in part by prioritizing actions based on the approach they take:

- The top priority is to completely **avoid** activities and fuels that produce emissions.
- This is followed by **reducing** emissions-producing activities, and the amount of energy used through efficiency improvements.
- After efficiency is significantly improved, decarbonization requires **replacing** the use of fossil fuels with zero-emissions energy sources to satisfy the remaining energy demand.
- Protecting existing natural systems (such as trees and wetlands) and technological systems (such as carbon capture and sequestration) to **remove** emissions from our atmosphere. While these are useful, they can only sequester a small amount of the emissions we continue to produce.
- Finally, if the community has emissions it is currently unable to eliminate, the concept of '**offsets**' allows the community to pay someone else to eliminate more of their emissions instead. This approach can be useful, however in practice it has significant challenges. This approach should only be used if no alternative is available, and until a better option is found.

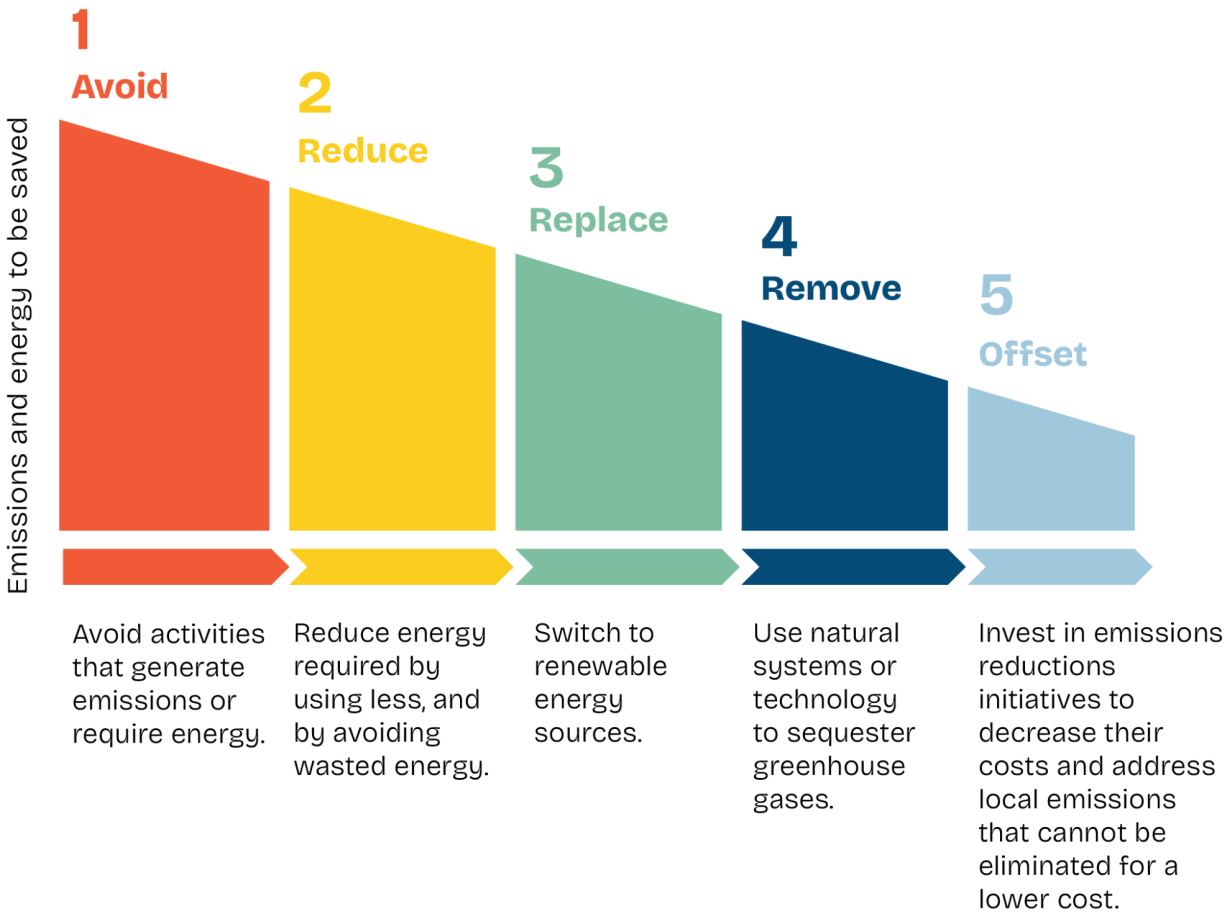


Figure 7: ARRRO Planning Philosophy.

Wilsonville's Current and Future Energy Use and Emissions

2018 Inventory

Using the ScenaCommunity methodology, the project team compiled a community-wide energy and GHG emissions inventory for one calendar year, drawing on data from the City of Wilsonville, State and federal agencies, and other sources. The inventory is organized into five key sectors: transportation, commercial buildings, residential buildings, industrial facilities, and solid waste. The year 2018 was selected as the baseline because it provided the most comprehensive and consistent data across all sectors.

Figures 8 and 9 illustrate energy consumption and GHG emissions in Wilsonville for 2018. **In that year, the community of Wilsonville consumed 179 metric million British thermal units (MMBtu) of energy per person or 4,200,000 MMBtu community-wide, and emitted 12 metric tons of carbon dioxide equivalent (MTCO2) per person, or approximately 285,000 MTCO2e community-wide.**[32]

The transportation sector was the largest consumer of energy, accounting for approximately 50% of total use. Residential and commercial buildings each represented about 19%, while industrial facilities comprised the remaining 13%. GHG emissions followed a similar pattern, with transportation responsible for 48% of emissions. Commercial buildings contributed 21%, residential buildings 16%, industrial facilities 14%, and solid waste less than 1%.

[32] For comparison, in 2019 the City of Tigard consumed 129 MMBtu of energy and emitted 10.7 MTCO2e of emissions per person.

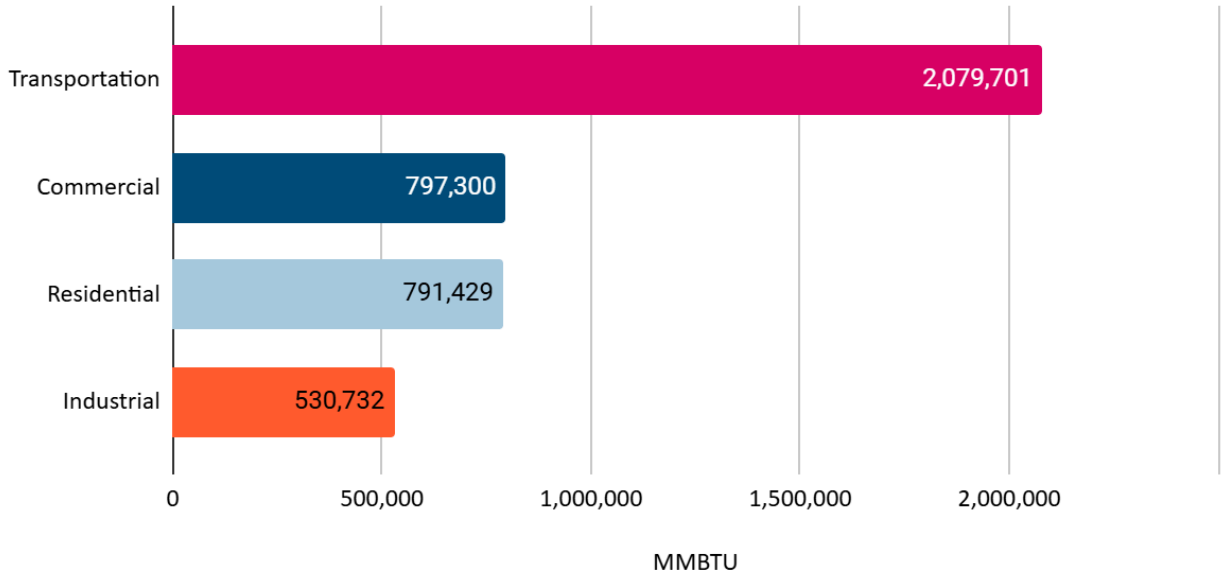


Figure 8: Wilsonville's 2018 energy consumption (MMBTU) by sector.

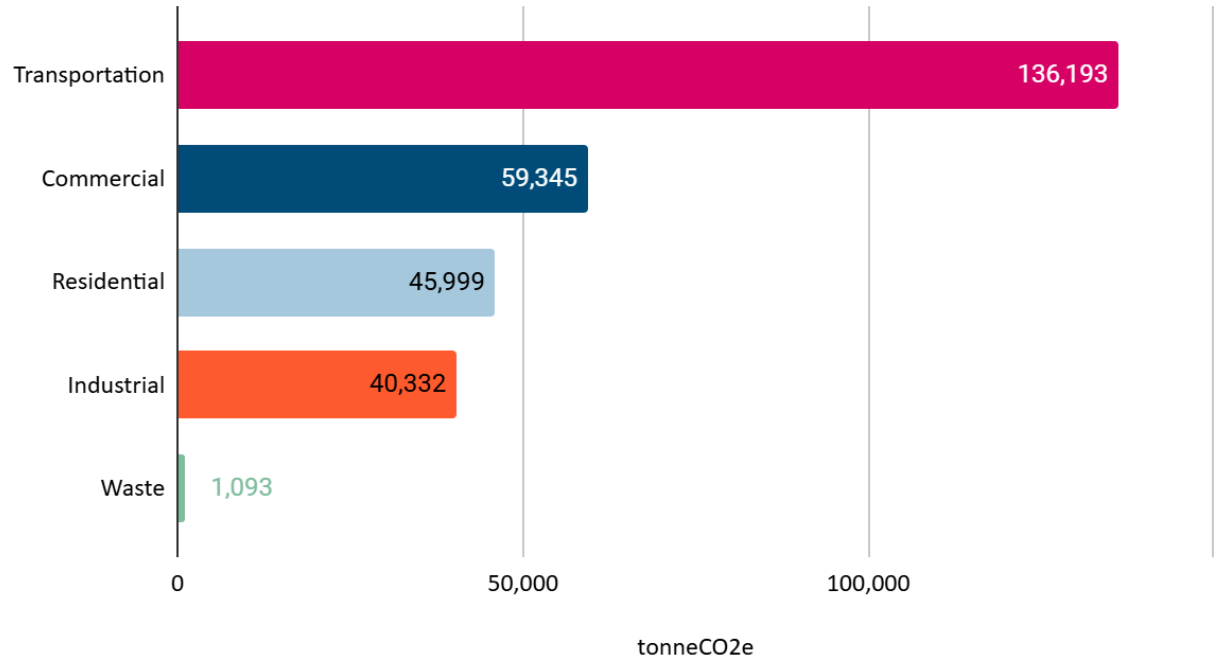


Figure 9: Wilsonville's 2018 GHG emissions (MTCO2e) by sector.

Transportation was the largest source of both energy use and emissions, driven by the City's high rate of vehicle use. In 2018, an estimated 93% of trips in Wilsonville were made by

personal vehicles. Even short trips tend to be made in vehicles: 86% of trips that were less than one mile were made in personal vehicles. This indicates an opportunity to reduce GHG emissions by encouraging a mode shift to more sustainable forms of transportation, including walking, biking, and transit, especially for shorter trips. Cities can encourage this by investing in active transportation infrastructure such as bicycle lanes and permitting denser, mixed-use developments.

Commercial and residential buildings were the second largest source of emissions, contributing a combined total of 42% of GHG emissions. Natural gas accounts for approximately 42% and 30% of GHG emissions in residential and commercial buildings, respectively, in the baseline year. Most of the remaining GHG emissions come from grid electricity. This highlights the importance of transitioning away from natural gas use by installing heat pumps in buildings and decarbonizing the electrical grid.

Future Business-as-Usual Scenario

After the baseline inventory was completed, a business-as-usual (BAU) scenario was modeled. The scenario forecasted Wilsonville's energy use and GHG emissions annually out to the year 2050 if no changes are made to the City's buildings, transportation patterns, energy sources, and technologies, and the City's population increases over this time by 30% (1% annually).

Figures 10 and 11 show that in the BAU scenario, between 2018 and 2050, Wilsonville's projected energy consumption and GHG emissions will both increase by 22 - 23%. Transportation emissions would slightly decrease during this period due to improved fuel standards and an uptake in electric vehicles, while industrial emissions slightly increase. Most of the new energy and GHG emissions would be associated with new residential and commercial buildings to support the City's population growth and economic development.

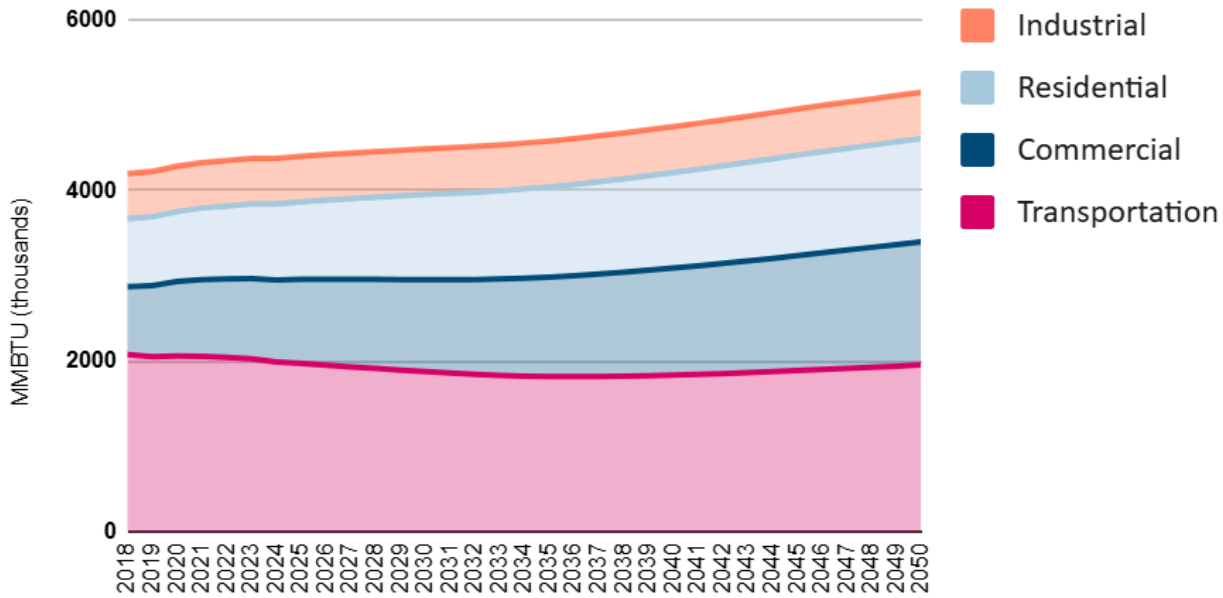


Figure 10: Wilsonville's energy consumption (MMBTU) by sector in the BAU scenario, 2018 - 2050.

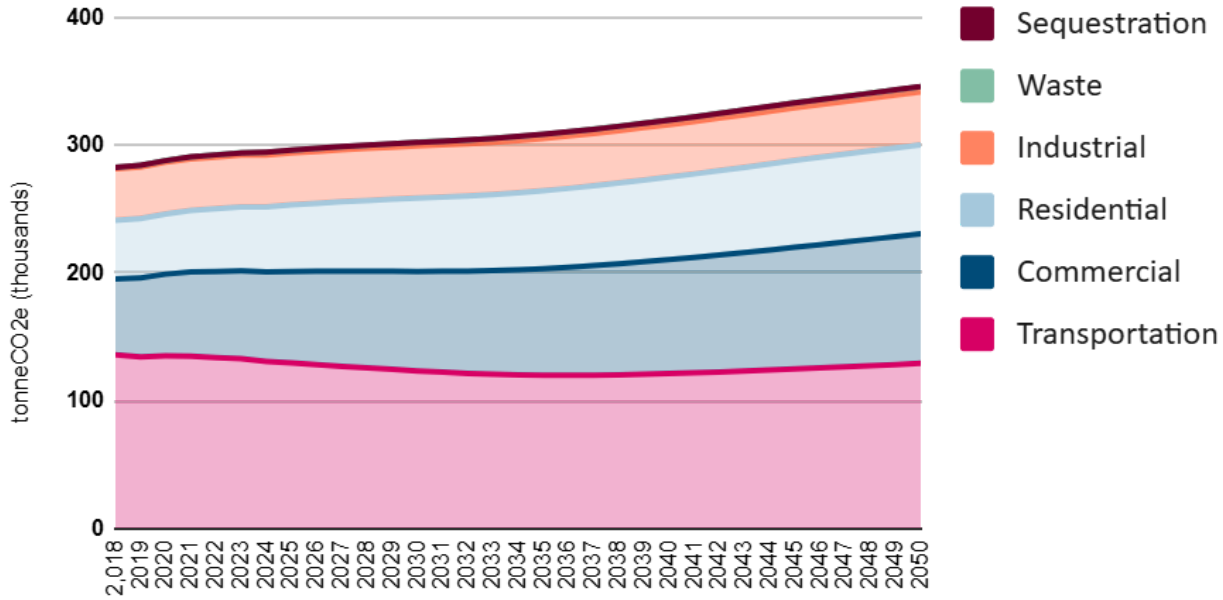


Figure 11: Wilsonville's GHG emissions (MTCO2e) by sector in the BAU scenario, 2018 - 2050.

Two Future Business-as-Planned (BAP) Scenarios

After the BAU scenario, two Business-as-Planned (BAP) scenarios were modeled. **Both BAP scenarios illustrate the impact of Wilsonville's and Oregon's existing, approved legislation, plans and policies on the community's future energy use and GHG emissions.** Specifically, both BAP scenarios assume that Oregon fully implements the current Advanced Clean Cars II and Advanced Clean Trucks standards. This means that the results show the impact of a) all new light-duty vehicles being electric or plug-in hybrid electric, and b) a growing share of new medium- and heavy-duty vehicles being zero-emissions, by 2035. Both scenarios also reflect the assumption that building codes continue to improve regularly, making new buildings more energy-efficient, and that 1.5% of existing buildings are weatherized annually through Oregon's Healthy Homes Grant Program.

BAP without and with Grid Improvements

The only difference between the two BAP scenarios is the emissions factor of the electrical grid.

The first BAP scenario (BAP without Grid Improvements) assumes that the GHG reduction targets required by Oregon's Clean Energy Targets Bill are not met, and the electrical grid emissions factor remains at current levels.

The second BAP scenario assumes that the GHG reduction targets set by Oregon's Clean Energy Targets bill are achieved, resulting in 100% renewable electricity by 2040.

Energy Consumption

The amount of energy consumed by the community is the same for both BAP scenarios, all the way out to 2050. The graph in Figure 12 shows Wilsonville's projected annual energy consumption for both BAP scenarios, by sector, out to 2050. Overall, in this time period, energy consumption would decrease by approximately 2%.

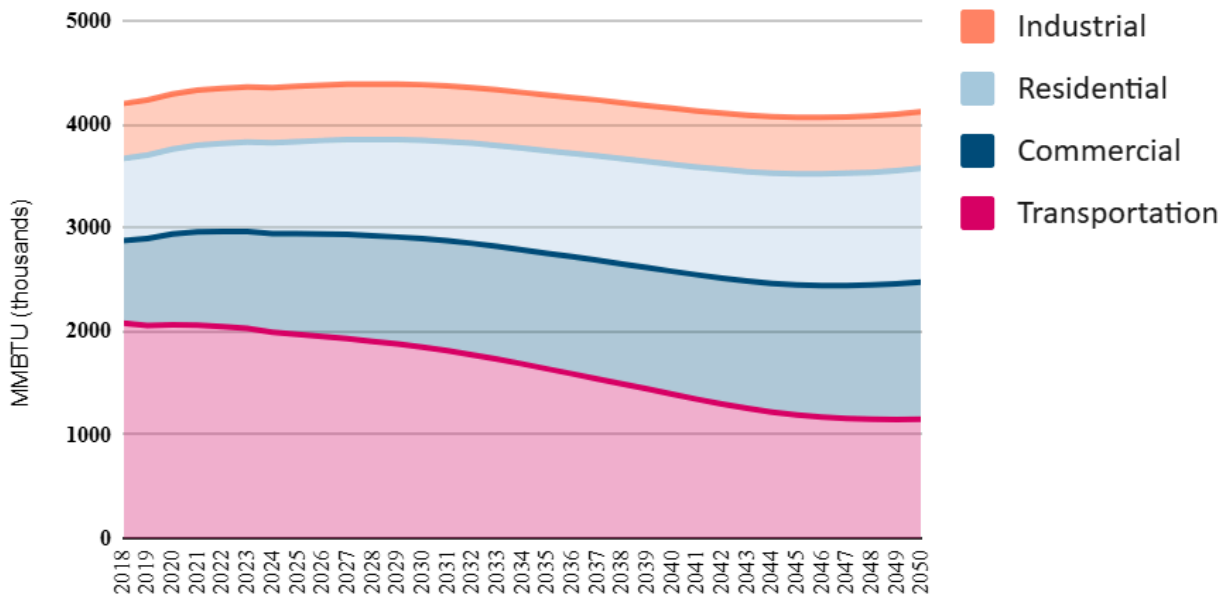


Figure 12: Wilsonville's energy consumption (MMBTU) by sector in the two BAP scenarios, 2018 - 2050.

In the transportation sector, the reduction in energy consumption is almost 50%. This is due to the fact that electric and hydrogen vehicles are both much more energy-efficient than gas and diesel-powered vehicles. So, as Wilsonville's vehicles are switched to zero-emissions models, the total energy required for transportation falls significantly.

This improvement, however, is almost entirely offset by increases primarily in energy consumption in the residential and commercial building sectors. This tells us that from the perspective of energy demand, the current rate of building code improvements will not keep up with the impact of population and economic growth in Wilsonville.

Greenhouse Gas Emissions

The greenhouse gas emissions produced in the two BAP scenarios are different. This is shown in Figure 13.

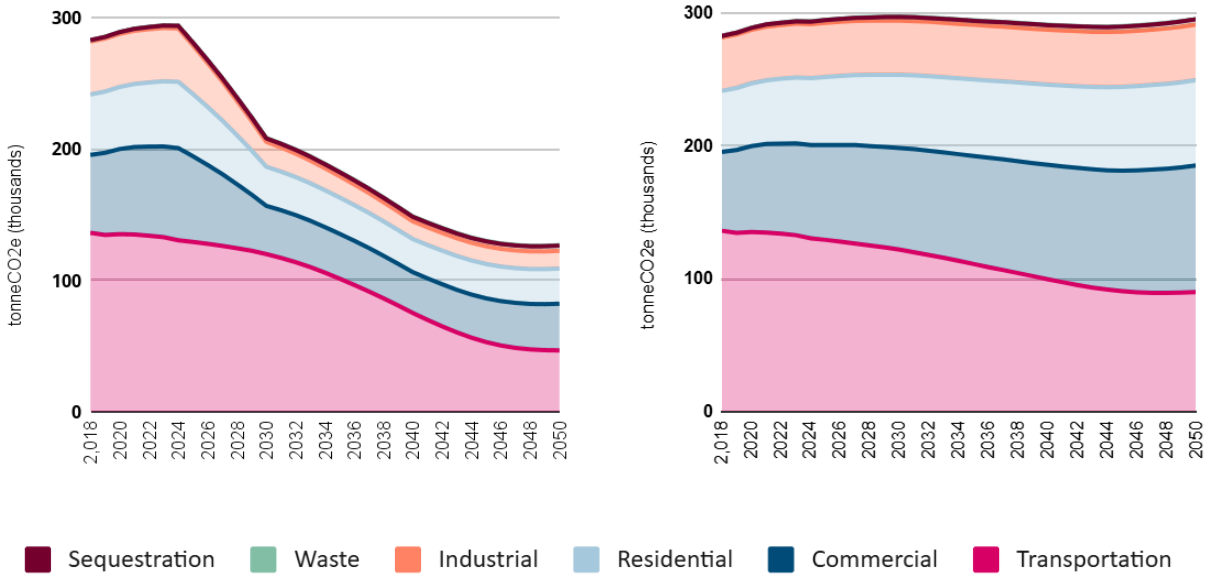


Figure 13: Wilsonville's GHG emissions (MTCO2e) by sector in the BAP scenarios with grid emission reductions (left) and without grid emission reductions (right), 2018 - 2050.

Comparing emissions in these two scenarios allows us to see the importance of decarbonizing the electrical grid to overall GHG emissions reductions in Wilsonville (and the State as a whole). In the scenario where Oregon meets its electrical grid emissions reduction targets, Wilsonville's total GHG emissions decline by 55% by 2050. In contrast, if the grid continues with the same energy mix it had in 2018, Wilsonville's total emissions in 2050 will be 4% higher than they were in 2018 - even if existing trends (such as ZEV adoption) continue, and other existing energy efficiency plans are completed.

Two things become clear from this:

1. Current rates of 'clean technology' adoption combined with Wilsonville's existing initiatives will not be sufficient to meet the community's emission reduction goals. More effort is required.
2. The decarbonization of electricity - both on the grid and with local renewable systems - is critical to reducing emissions and to providing a long-term source of energy for the majority of Wilsonville's energy needs.

Two Future 'Low Carbon' Scenarios

The project team used the results of the BAU and BAP scenarios to select a set of 'low carbon' actions that would effectively reduce Wilsonville's energy use and eliminate the community's greenhouse gas emissions. Several factors were considered when selecting these actions. These included:

- The climate action planning paradigm introduced earlier in the report;
- The necessity of the action to reach the State's climate goals on the timeline required;
- Selecting actions that would maximize the community's economic development in future growth industries;
- Making life more affordable for Wilsonville's residents and businesses;
- Reducing the City's long-term operating costs, and improving the resilience of its infrastructure; and,
- The City's authority to carry out the action.

The selected actions were then laid out on a specific timeline to ensure that they build upon each other to optimize benefits to the community and take the greatest advantage of financial investments involved. They were modeled on top of (or in addition to) the BAP without Grid Improvements scenario. This final combination of actions on a timeline is the Low Carbon (or LC) scenario. It is described in the next section of this Plan, entitled Low-Carbon Actions. They constitute a pathway for Wilsonville to reach its GHG reduction goals, and to ensure long-term economic and social sustainability for the community.

LC without and with Grid Improvements

As with the BAP scenarios, two variations of the low-carbon actions were modeled. In the first scenario, the electrical grid does not decarbonize; instead, the electricity emissions factor remains at its current level. This is the Low Carbon without Grid Improvements (LCWOG) scenario. In the second scenario, the grid does switch to zero-emissions, renewable energy sources by 2040. This is the Low Carbon with Grid Improvements (LCWIG) scenario.

Energy Consumption

As with the BAP scenarios, future energy consumption is the same for both LC scenarios. Energy consumption in the LC scenarios are, however, much lower than in any of the BAU or BAP scenarios. By implementing the actions in the Low Carbon scenarios, Wilsonville's total energy consumption decreases by 41% between 2018 and 2050. Figure 14 displays the projected energy consumption for the Low Carbon scenarios.

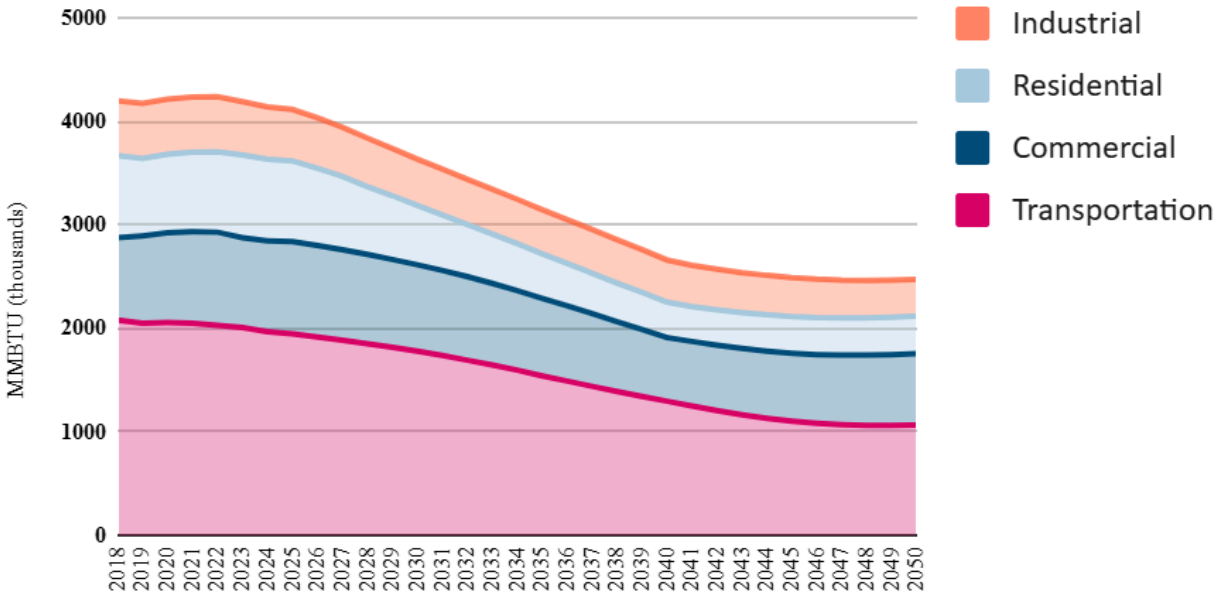


Figure 14: Wilsonville's energy consumption (MMBTU) by sector in the two Low Carbon scenarios, 2018 - 2050.

This reduction is due to a number of important changes:

1. The actions include making both existing and new buildings significantly more energy-efficient in the very near future. This reduces the energy that will be required to heat and cool buildings, even as the population grows and new construction continues.
2. Switching from furnaces (even high-efficiency furnaces) to emissions-free heating and cooling systems like heat pumps increases energy efficiency from approximately 96% to 300-400% efficiency. This dramatically reduces total energy consumption in the community.
3. Gas and diesel vehicle engines are only approximately 25% efficient; this means that 75% of the fuel purchased to run an ICE vehicle is lost in the combustion process and in heat, and is not used to actually move the vehicle.[33] On the other hand, electric and hydrogen-fueled vehicles are approximately 87% efficient. As a result, as more ICE vehicles are retired and replaced with zero-emission vehicles, much less energy is required to transport goods and people, even as the population increases.

These reductions in energy consumption translate into long-term financial savings in the form of avoided energy costs for all Wilsonville residents, businesses, and for the City.

[33] U.S. Environmental Protection Agency. "Electric Vehicle Myths" webpage.

Greenhouse Gas Emissions

The pathway of the modeled low carbon actions alone (i.e. without considering the impact of the electrical grid) reduces Wilsonville's total annual emissions by 69% (from 282,963 MTons in 2018 to 86,850 MTons) in 2050. This is a dramatic reduction that highlights how effective local action is, and how important Wilsonville's implementation of these actions will be to ensure the community has a sustainable future. The impact of individual actions, and groups of actions, are described in the Low Carbon Actions section of this document.

There is also a difference in the emissions produced by the two LC scenarios. This is shown in Figure 15.

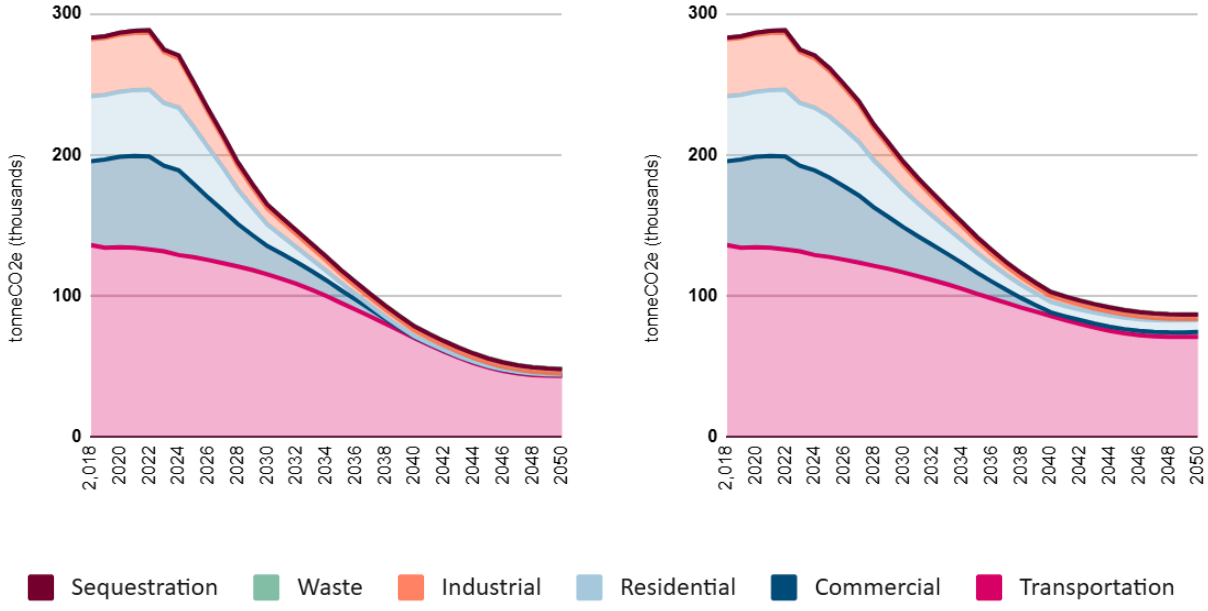


Figure 15: Wilsonville's GHG emissions (Thousands of Mt CO2e) 2018 - 2050, by sector in the Low Carbon scenarios. Low Carbon with Grid Improvements (LCWIG) is on the left, and Low Carbon without Grid Improvements (LCWOG) is on the right.

In the Low Carbon with Grid Improvement (LCWIG) scenario, Wilsonville's total emissions fall by 58% in 2035 (exceeding the State's 2035 goal by 13%), and 83% in 2050 (exceeding the State's goal by 3%. By contrast, while the LCWOG scenario also reduces emissions by 58% by 2035, by 2050, it has only eliminated 69% of Wilsonville's emissions.

The Social Cost of Carbon

The difference between the two LC scenarios is most evident in the fact that the LCWIG scenario achieves significant emission reductions much sooner than the LCWOG scenario.

This is significant because reducing emissions **rapidly** is crucial to avoiding the most catastrophic effects of climate change. Those catastrophic effects are realized as costs society must pay to repair damaged and destroyed infrastructure, expand stormwater capacity and backup power, increase healthcare services for heat stroke, develop crop treatments for new pests and diseases, and support for residents without access to cool buildings and clean water during storm events.

This concept of the cost to society of not addressing climate change is called the **'social cost of carbon' (or SCC)**. Resources for the Future provides regularly updated calculations of the SCC in the U.S. for each decade into the future. Their current calculation of the SCC is $226 USD / Metric ton of emissions.[34]

The concept of assigning a societal cost to each ton of emissions released helps us understand the long-term, financial value of reducing our emissions as fast as possible. In the case of Oregon's electricity grid, if it can switch to 100% clean, renewable power by 2040 (as in the LCWIG scenario), this will eliminate over 441,000 **more** Mtons of emissions from Wilsonville, between 2018 and 2050, than the LCWOG scenario. Using the social cost of carbon, we can translate these avoided emissions into a value of $99,666,000 in avoided social costs.

Furthermore, a large portion of the costs (up to 88% in some studies[35]) imposed by the impacts of climate change are borne by local and state governments. This makes sense: as climate change increases, the frequency and severity of damaging storms, excessive heat, and power outages also increase, and the impact of this plays out intensely in urban settings. The infrastructure that is damaged from waste and stormwater networks, to roads and public buildings, and to utility services - is often municipally-owned or managed. This can leave a municipality unable to provide services when they are needed most and also struggling to pay for extensive and regular repairs.

It is in every municipality's interest to support the State in its efforts to decarbonize the grid by 2040, and to take every action within the city's authority to reduce its community emissions.

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[34] This is the SCC value for the year 2030 from the Resources for the Future, 'Social Cost of Carbon Explorer' website. https://www.rff.org/publications/data-tools/scc-explorer/. Accessed June 18, 2025.

[35] Wesseller, Sarah. Yale Climate Connections. "Stuck with the bill: Local governments deluged with rising climate damage costs." https://yaleclimateconnections.org/2022/09/stuck-with-the-bill-local-governments-deluged-with-rising-climate-damage-costs/. Accessed June 18, 2025.

Summary

Five future energy and emissions scenarios were modeled for Wilsonville. Figure 16 shows the emissions reductions associated with each scenario, alongside the reduction targets (from Executive Order 20-04[36]) of 45% by 2035 and 80% by 2050 relative to 2018 levels.

The Business-as-Planned with Grid Improvements (BAPWIG) scenario, which reflects existing state-level policies including grid decarbonization, achieves only a 55% total reduction in emissions by 2050.

The Low Carbon without Grid Improvements (LCWOG) scenario, which includes State policies (excluding decarbonization of the electricity grid) and local climate actions, only achieves a 69% reduction by 2050.

Only the Low Carbon scenario with Grid Improvements (LCWIG) scenario meets the State's goal to reduce emissions by at least 80% by 2050.

This highlights the fact that both state-wide and local actions will be essential to achieving Wilsonville's long-term climate goals. It also indicates that Wilsonville should both support the State's legislation and encourage as much local renewable electricity generation as possible, for the benefit of its community members and itself corporately.

[36] Executive Order 20-04 uses 1990 as a baseline. For this plan, 2018 was selected as a baseline year for the target as 1990 data for the City of Wilsonville is not available.

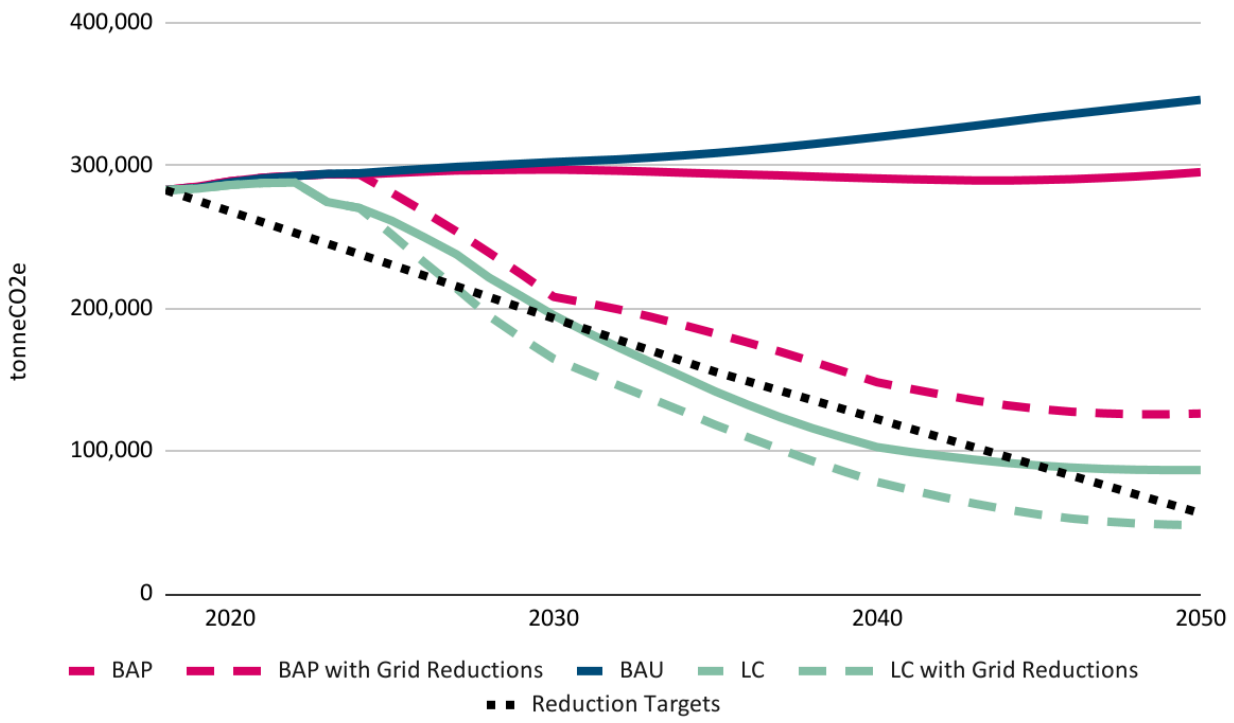


Figure 16: Summary of Wilsonville's GHG emissions (MTCO2e) by scenario, 2018 - 2050.

Low Carbon Actions

Overview

This section explores what climate actions are, specifically as compared to implementation measures. It then discusses the specific actions included in Wilsonville's Low Carbon scenarios, and the impact each can have on emissions and on the community's overall well-being into the future.

What is a climate action?

Climate actions provide a clear description of the extent and speed of change that is factually required to meet the community's goals. They are not intended to reflect how politically palatable or operationally feasible the action may be. Rather, they provide a scientifically based 'guiding star'. The timeline of climate actions in this Plan are a reference to compare the community's progress to ensure Wilsonville remains on track to meet its goals.

Climate actions are also modelable. This means they are expressed as a quantifiable change that occurs over time, like the following. (Note that this is not a real action from Wilsonville's Climate Action Plan.)

'Beginning in 2028, 35% of all new vehicles sold in Wilsonville will be electric vehicles.'

What is an implementation measure?

Climate actions do not describe **how** this will be achieved - whether it will be through incentives, regulations, etc. **Implementation measures describe the programs, policies, incentives and other tools the City will deploy to ensure that the climate actions are achieved.** An initial set of Implementation Measures that have been reviewed by Wilsonville's staff is provided in Appendix A. These constitute a starting point that will need to be reviewed and revised regularly and quickly become more ambitious to realize the benefits described in this Plan.

Emissions Impact Summary

The impact of each of Wilsonville's climate actions is shown in Figure 17 and 18. These are wedge diagrams. The line that runs almost horizontally across the top of the graph represents Wilsonville's emissions in the BAU scenario, if no actions are taken to address climate change.

Below are a series of colored wedges, each of which represents the impact of one of the actions described below.

Figure 17 highlights the LCWIG scenario (in which the electricity grid is fully decarbonized by 2040), and Figure 18 highlights the LCWOG scenario (in which the state grid targets are not achieved). If the latter scenario occurs, further local actions (in addition to what was modeled like maximizing rooftop solar potential and procuring green electricity) will become critical for Wilsonville to meet its climate goals.

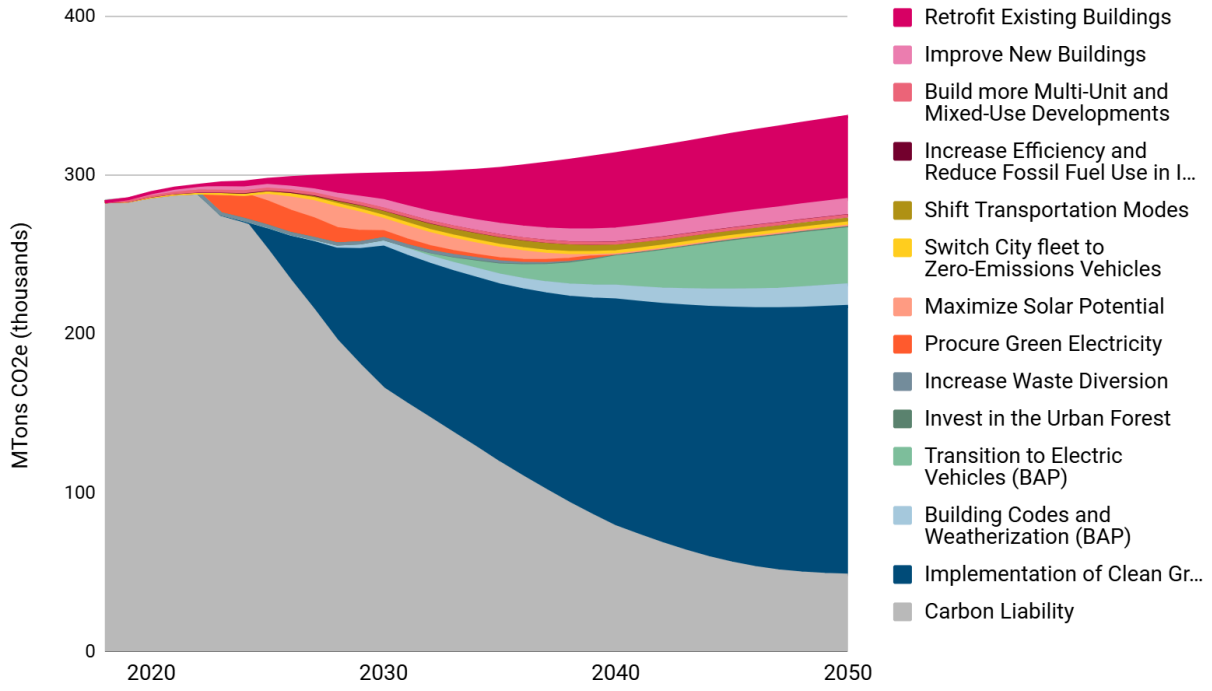


Figure 17: Emission reductions over time for each action in the Low Carbon with Grid Improvements (LCWIG) scenario.

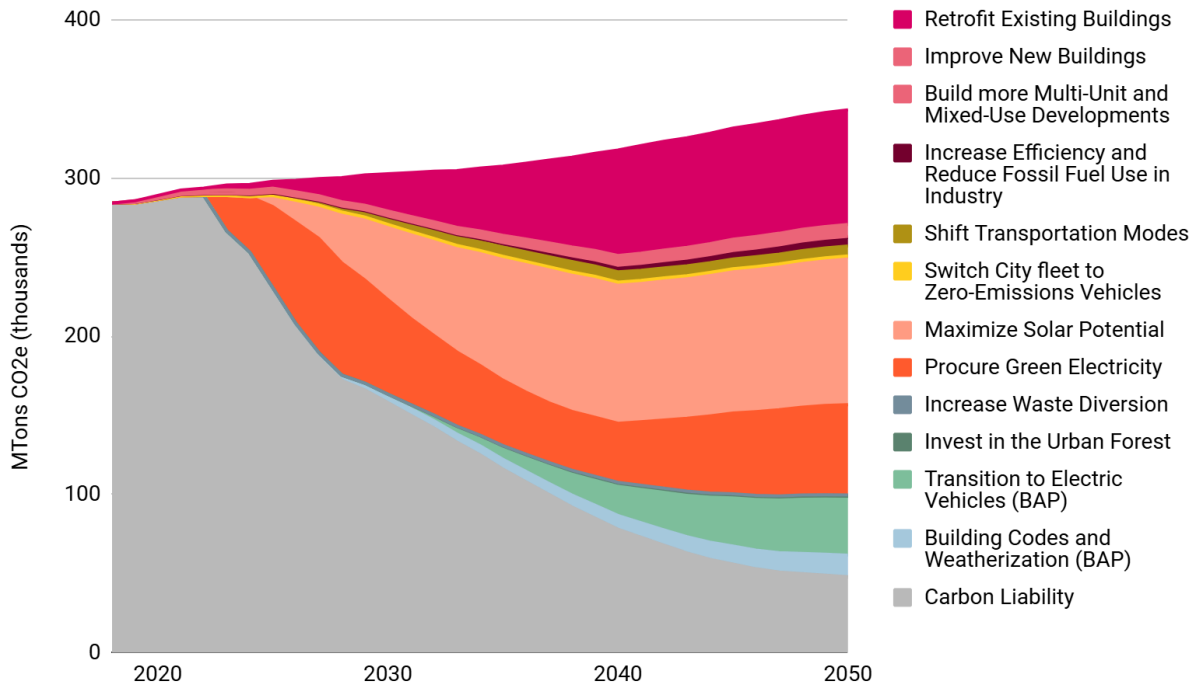


Figure 18: Emission reductions by action in the Low Carbon without Grid Improvements (LCWOG) scenario.

These diagrams illustrate that many actions initially only reduce a small amount of emissions, but their impact grows rapidly over time. This illustrates the importance of starting this work immediately.

City Leadership

The first few years of many of these actions are critical to 'normalizing' these changes, helping Wilsonville's residents, businesses and City staff become familiar with them. As people begin to adopt heat pumps, install solar systems and switch to ZEVs, these actions will become 'normal'.

Monitoring the challenges encountered in those first few years and adapting quickly will be a key way that the City of Wilsonville can ease and speed up the transition. For example:

- Changes may be required to City permitting processes to ensure that installing heat pumps is as easy or easier than installing a furnace.
- Construction workers will need to be taught new building standards and more solar PV installers may be required. The City can work with the State, community colleges and trade programs to anticipate this need and develop programs to ensure a sufficient local work force is available and ready to benefit from the demand for their skills.

- Additional ZEV charging infrastructure and energy storage will be required, but where and how quickly will require analysis and planning.
- Active transportation infrastructure can be implemented and adjusted quickly to ensure it adapts to residents' needs and makes them feel comfortable enough to continue using it.
- Retrofitting the City's own facilities, setting higher energy standards for its own new corporate buildings, and switching its own fleet to zero-emissions vehicles are also vital ways the City should demonstrate leadership in taking action on climate change. Taking these steps will also help educate the community, and support the development of a local, skilled workforce.

If the City of Wilsonville takes a proactive, flexible, and supportive approach to these initial years, the benefits of these changes quickly become self-evident, and the changes will become self-perpetuating. As implementation continues, the City will need to actively monitor and report on the programs, policies, incentives and educational initiatives, and the progress being made. Many of these City initiatives will require regular updates to improve uptake or ensure that the desired changes are accelerating.

Wilsonville's Climate Actions

The next section of the Plan describes the low-carbon actions that the City of Wilsonville can either directly control, lead, or strongly influence. There are ten climate actions grouped into five categories:

- Buildings and Industry
- Transportation
- Renewable Energy
- Solid Waste
- Green Infrastructure

For each sector and/ or action, the following is provided:

- Identification of the sources of emissions in Wilsonville that will be reduced by the action.
- A description of the action, and how it interacts with other actions to maximize emissions reductions, cost savings, and other benefits.
- The specific wording of the action that was modeled.
- A high-level indication of the up-front cost/savings and long-term cost/ savings to implement the action.
- Icons indicating how the action also supports Wilsonville's ability to thrive economically and socially by addressing additional urban challenges. (These icons are described in Table 2: Thriving City Benefits Legend.)

Buildings & Industry

Buildings are responsible for just over half of Wilsonville's GHG emissions. In 2018, residential and commercial buildings were responsible for 37% of the City's emissions, while industry was responsible for another 14%. Given the scale of these emissions, three Low Carbon actions were developed for buildings and industry. These include retrofitting existing buildings, improving new buildings, and improving industrial efficiency.

Retrofit Existing Buildings

This action also provides the following Thriving City benefits: Affordability for Residents, Financial Benefits for the Municipality, Economic and Job Growth, Improved Health and Air Quality, and Improved Energy Security

The City of Wilsonville has a relatively new housing stock, with nearly half of all residences having been built after 1999. And whereas 25% of homes across Clackamas County as a whole were built before 1969, only 3% of homes in Wilsonville existed before this date. This reflects the City's significant growth over the past two decades.

Despite this however, energy used to heat and cool, light, and run appliances in Wilsonville's residences produced 16% of the community's total emissions in 2018. Energy used in commercial buildings was responsible for a further 21% of total emissions in the same year.

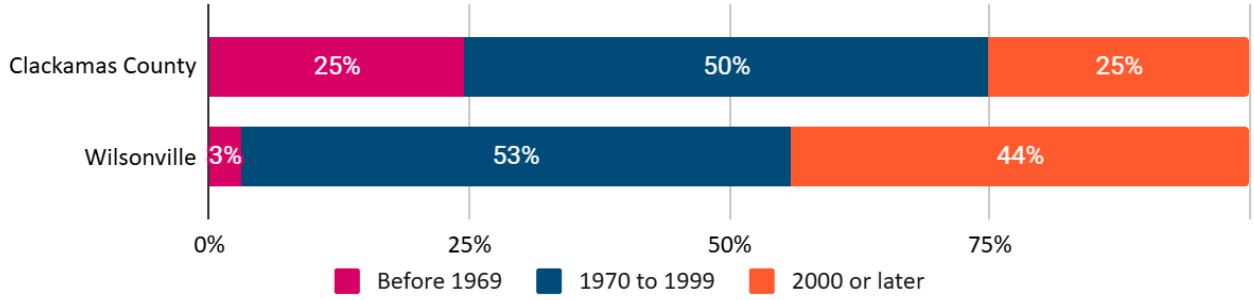


Figure 19: Era of construction for residential buildings in Clackamas County and Wilsonville, 2023.[37]

Emissions from energy used in both residential and commercial buildings must be reduced first by retrofitting the buildings to be more energy-efficient. These retrofits often include upgrading insulation and windows, sealing air leaks, and upgrading to more energy-efficient windows and doors. Fossil fuel heating systems and appliances must then be replaced with

[37] Source: American Community Survey 2023 5-Year Data, Table B25034.

zero-emissions alternatives such as electric heat pumps (with or without backup electric resistance heat) for space heating and cooling, and for domestic water heating.

These upgrades provide long-term energy cost savings for owners and tenants. They also reduce the amount of temperature fluctuation within a building and delay the impact of power outages on indoor temperatures. In addition, the removal of natural gas and wood furnaces improves indoor air quality and provides healthier living spaces particularly for children and those with respiratory ailments.

Immediate Cost and Long-Term Savings

The up-front cost to retrofit buildings depends on the condition and age of the building. Because most of Wilsonville's buildings were constructed after 2000, less retrofit work will likely be required, and the associated cost will also be lower than in older communities.

Retrofitting buildings provides secure, long-term cost savings to homeowners, businesses and to the City in terms of its own facilities. On other projects SSG has worked on in Oregon, the average household that underwent retrofits and conversion to zero-emissions systems saved more than $1000 annually in energy costs.

Modeled Action

Beginning in 2025, existing buildings in Wilsonville are gradually retrofitted to reduce thermal energy consumption by 40% and plug load energy consumption by 10%. By 2040, all existing buildings have been retrofitted to this standard.

Emissions Reduction

Between 2025 and 2050, this action will eliminate a total of 463 kt CO2e in residential buildings and 579 kt CO2e in commercial buildings. Together this constitutes 25% of the total emissions reductions achieved by this Plan.

Improve New Buildings

This action also provides the following Thriving City benefits: Affordability for Residents, Improved Health and Air Quality, Improved Energy Security

In Oregon, building codes are adopted at the state level, and all local jurisdictions, including the City of Wilsonville, are required to enforce the statewide code. The State typically updates its building codes every several years to align with international standards and best practices.[38] As a result, the City does not have the authority to mandate more stringent requirements for new buildings than those set by the State.

[38] https://www.oregon.gov/bcd/codes-stand/pages/codebook-history.aspx

However, the City can encourage or incentivize developers to adopt Oregon's optional Residential and Commercial Reach Codes, which go beyond the base code to improve energy efficiency. Under the 2023 Residential Reach Code, new dwellings must follow one of three compliance paths: the ENERGY STAR Single-Family New Homes National Program, the U.S. Department of Energy Zero Energy Ready Home Program, or the Passive House US (Phius) 2021 Certification.[39]

Given this context, while the BAP scenarios assume that the State will adopt new building codes every five years, the LC scenarios include actions reflecting the City's ability to incentivize, and otherwise ensure that more buildings achieve higher energy efficiency standards.

Immediate Cost and Long-Term Savings

On average, the construction of new buildings to a net-zero emissions standard generally increases the up-front costs by 4% relative to building to code. This incremental cost is quickly offset by significantly lower energy costs the building will require. This is because the energy required by the building will be provided largely by on-site renewable energy systems that will provide power almost for free for the life of the building.

In the context of increasing affordable housing, building to a net-zero standard significantly improves the long-term affordability of home ownership.

Modeled Action

By 2030, 25% of new buildings constructed in Wilsonville meet net-zero standards; by 2040, this standard is met by 50% of newly constructed buildings.

Emissions Reduction

Compared to the Business as Planned scenario, this action will reduce GHG emissions by 152,000 MTCO2e in residential buildings and 154,000 MTCO2e in commercial buildings between 2025 and 2050. Together this constitutes 7% of the total emission reductions achieved by the actions in this Plan.

Build more Multi-Unit and Mixed-Use Developments

This action also provides the following Thriving City benefits: Affordability for Residents, Improved Health and Air Quality, More Accessible Mobility

Encouraging more multiunit and mixed-use development is a key strategy for reducing GHG emissions. These types of developments typically support more efficient land use, reduce the need for car travel, and make it easier for residents to bus, walk, or bike to destinations. These

[39] https://www.oregon.gov/bcd/codes-stand/Pages/reach.aspx

developments also increase housing diversity and affordability. As noted earlier, Oregon's Climate Friendly and Equitable Communities (CFEC) program requires cities to plan for a Climate Friendly Area, which must be well-served by multi-modal transportation, and be large enough to accommodate 30% of housing needs.

Within the Portland metropolitan areas, existing centers included in the 2040 Growth Concept are considered Climate Friendly Areas, including Wilsonville's Town Center.[40] The Town Center area was updated in 2019 to be a walkable, mixed-use, and transit-supportive area, and is consistent with CFA requirements. This action is based on these state requirements.

Immediate Cost and Long-Term Savings

Multi-unit residential buildings can be more expensive to construct than single-family homes. However, when they are planned in coordination with transportation and infrastructure planning, many of these incremental costs can be reduced significantly. For example, a community with less land dedicated to vehicle parking is much less expensive for a developer to build. If that community is also provided with access to excellent walking, biking and transit, the residents will also be able to travel as required without having to own a personal vehicle. This reduces the cost burden on residents for transportation and makes life much more affordable overall.

Modeled Action

30% of Wilsonville's new housing will be built in the Town Center area of the city.

Emissions Reduction

This more compact development will reduce GHG emissions by 15,000 MTCO2e between 2025 and 2050 relative to the BAP scenario. This constitutes only 0.4% of the total emissions eliminated by this Plan; however, this action enables subsequent actions to achieve larger emissions reductions.

This action aligns with:

- Wilsonville Town Center Plan (2019)

Increase Efficiency and Reduce Fossil Fuel Use in Industry

This action also provides the following Thriving City benefits: Economic and Job Growth, Improved Energy Security

Industry plays a key role in Wilsonville's local economy, and in 2018 was responsible for 14% of the community's total emissions. One of the most effective actions the City can take is to

[40] https://www.wilsonvillelibrary.org/citycouncil/page/city-council-15

encourage or require local industry businesses to invest in energy efficiency improvements. These types of changes include upgrading to more efficient motors and HVAC systems, upgrading the efficiency of fans, ensuring all lighting is LED, and optimizing compressed air systems.

Manufacturers can also reduce energy consumption and emissions by adopting ongoing behavior and process improvement methodologies such as Lean Continuous Improvement[41], maximizing circularity, replacing treated water with recycled water for cooling processes, etc.

In addition to improving efficiency, industrial operations in Wilsonville will need to significantly reduce their use of fossil fuels. In 2018, fuel oil, propane and natural gas accounted for just over 40% of Wilsonville's industrial energy consumption. As noted earlier, Oregon's Climate Protection Program set a declining cap on GHG emissions from fossil fuels, with a goal of reducing emissions by 90% by 2050 from 2017 to 2019 levels.

The climate action for industry reflects these two parts: improving energy efficiency and replacing fossil fuels with electricity.

Immediate Cost and Long-Term Savings

Industrial energy efficiency and decarbonization measures have varying levels of cost associated with them. Process improvement initiatives can produce significant results at a low cost; whereas replacing a blast furnace with an arc furnace in a steel manufacturing facility can be very expensive.

Many changes however, such as upgrading motive equipment[42] and investing in variable speed fans can be timed to align with regular equipment maintenance and replacement schedules, to spread the impact of additional costs over time. Upgrading to more efficient equipment often reduces a company's energy costs, providing them with long-term cost savings. In addition, many successful industrial and manufacturing companies are familiar with the need to invest upfront to reduce their long-term operating costs and are willing to do so. However, they may be unaware of the new, energy-efficient, and 'decarbonized' technologies their business could benefit from. Here again, the City can play a role in encouraging and recognizing business for their efforts to make these changes.

Modeled Action

Part I: Industrial facilities in Wilsonville will implement measures that reduce their total energy consumption by 20% by 2050.

Part II: Natural gas used by industry will be reduced by 50% by 2035, and by 90% by 2050. It will be replaced with electricity.

[41] Michigan Tech. 'What is Lean' web page.' https://www.mtu.edu/improvement/learn/what/
[42] Motive equipment is equipment that moves things, such as conveyor belts and assembly robots.

Emissions Reduction

Part I: Energy efficiency measures in industry will reduce Wilsonville's emissions by 55,000 MTCO2e between 2025 and 2050.

Part II: Replacement of natural gas with electricity will also reduce Wilsonville's total emissions by 55 MTCO2e between 2025 and 2050.

This two-part action constitutes approximately 3% of the total emission reductions in this Plan.

Renewable Natural Gas

Renewable natural gas (RNG) is produced by capturing and refining methane emissions from organic waste sources such as landfills, wastewater treatment facilities, and agricultural operations. Because it comes from 'renewable sources' and not from fossil fuels, it is considered a renewable source of energy. However, if we burn it faster than it can be replaced, we are still increasing the total amount of greenhouse gases in the atmosphere, and in this case, RNG cannot be considered a renewable source of energy.

In addition, the availability of RNG is expected to remain very limited for the foreseeable future. A 2017 study by the Oregon Department of Energy estimated that the state's total RNG production potential using anaerobic digestion amounts to approximately 10 billion cubic feet per year. This represents only about 4.5% of Oregon's annual natural gas consumption.[43] The use of RNG should therefore be limited to situations in which there are no alternatives, such as steel manufacturing which requires very high temperatures that cannot be achieved with electricity. RNG should not be used to heat buildings, domestic water, or clothes dryers, because highly efficient, electric alternatives are available for all of these purposes. Additionally, the use of RNG should be stopped as soon as a truly zero-emissions alternative is available.

Based on this, the use of RNG was not included as a viable emissions reduction strategy in Wilsonville's Low Carbon scenarios.

[43] Oregon Department of Energy. "Biogas and Renewable Natural Gas Inventory SB 334 (2017): 2018 Report to the Oregon Legislature." September 2018. https://www.oregon.gov/energy/Data-and-Reports/Documents/2018-RNG-Inventory-Report.pdf

Transportation

Shift Transportation Modes

This action also provides the following Thriving City benefits: Affordability for Residents, More Accessible Mobility, Improved Health and Air Quality

Transportation is the largest source of emissions in Wilsonville, accounting for 48% of community-wide emissions in 2018. Many residents rely on private vehicles for most of their trips, due to limited transit service and active transportation infrastructure. In 2018, more than 90% of personal trips in Wilsonville were taken by car, as shown in Figure 20. Given that municipalities in Oregon have significant authority over transportation planning, Wilsonville has an important role in supporting a shift to more sustainable modes and reducing vehicle miles travelled.

Immediate Cost and Long-Term Savings

Owning, operating and maintaining a private vehicle is the second largest cost (after owning a home) the average American will have during their lifetime.[44] Being able to depend upon active transportation and shared transportation significantly reduces this cost and makes life more affordable for residents.

[44] American Automobile Association. "AAA Your Driving Costs: The Price of New Car Ownership Continues to Climb." 2024. http://newsne-aaa.iprsoftware.com/news/aaa-your-driving-costs-the-price-of-new-car-ownership-continues-to-climb

Modeled Action

Improve transit service and active transportation infrastructure to support a gradual reduction in the number of trips taken in private vehicles from 91% in 2018 to 79% in 2040. Approximately 2% of these trips (primarily those that are less than 2 miles in distance) should shift to walking and cycling, and 10% of these trips should shift to transit. This shift is shown in Figure 20.

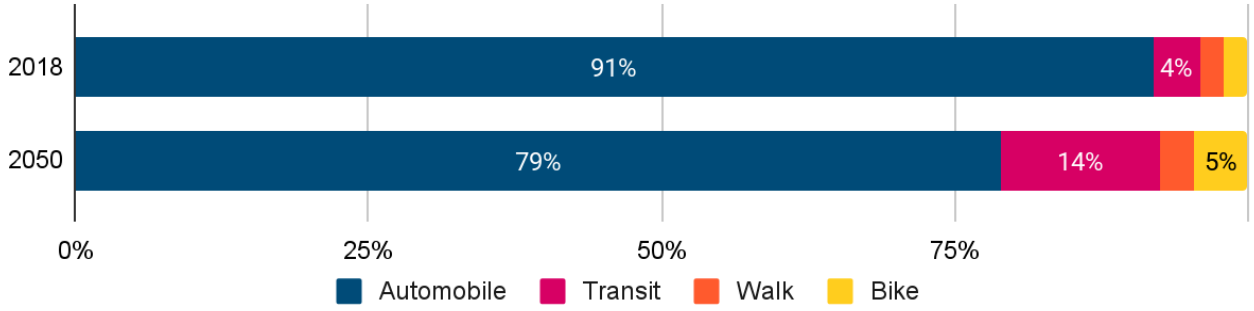


Figure 20: Modeled mode share for all person trips in 2018 and 2050 in the Low Carbon Scenario.

Emissions Reduction

This modal shift would result in an estimated emissions reduction of 125 $ktCO_2e$. This is 3% of the total reductions achieved by the actions in this Plan.

This action aligns with:

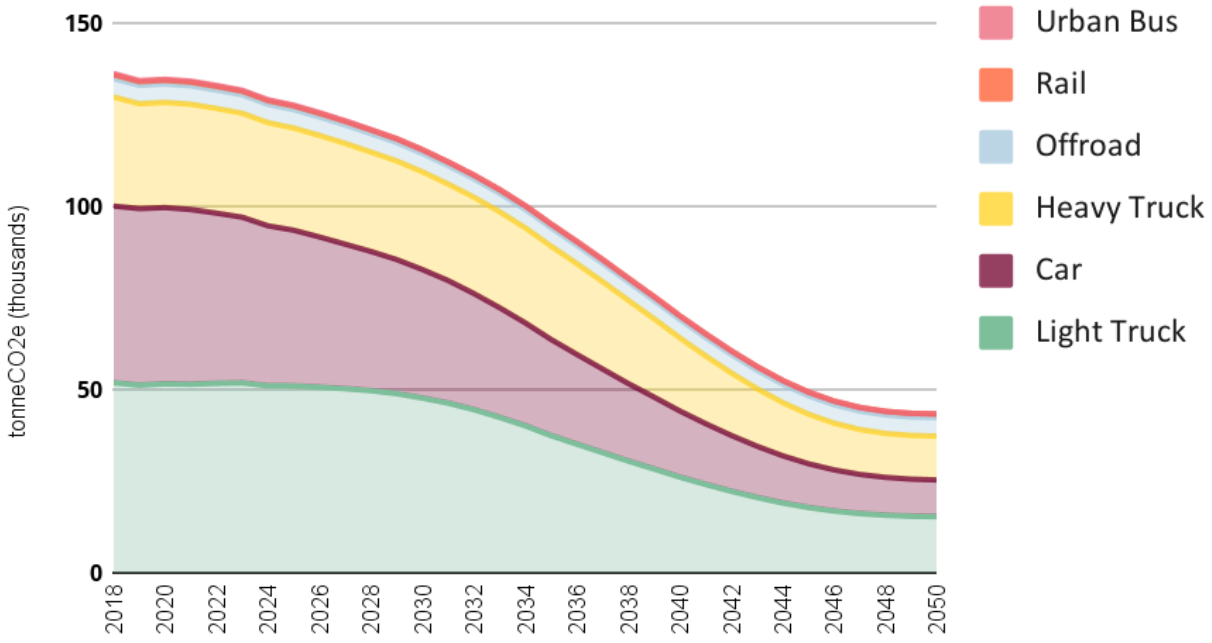
- Bicycle and Pedestrian Master Plan (2006)
- Transportation System Plan (2013)
- SMART Transit Master Plan (2023)

Switch City fleet to Zero-Emissions Vehicles

This action also provides the following Thriving City benefits: Affordability for Residents, Improved Health and Air Quality

In addition to shifting toward more sustainable modes of travel, reducing transportation emissions will also require a significant transition to electric vehicles. As of 2018, fewer than 1% of vehicles in Wilsonville were ZEVs or plug-in hybrid electric vehicles. However, as noted earlier in the plan, Oregon has adopted ambitious regulations to phase in ZEVs. These include the Advanced Clean Trucks Rule (2021) and the Advanced Clean Cars II regulation (2022). The Clean Trucks Rule requires that an increasing share of new medium- and heavy-duty vehicles sold in Oregon are ZEVs. The Advanced Clean Cars II regulation mandates that all new light-duty vehicles sold must be ZEVs[45] by 2035.

Because this is a legal requirement, the emissions reductions associated with this shift are captured in the BAP scenario. The reduction in total transportation emissions as a result of this legislation is shown in Figure 21.



[45] The legislation specifically requires that the vehicles be electric or plug-in hybrid electric models.

Figure 21: Remaining transportation emissions by vehicle type in the Low Carbon scenario with grid emission reductions.

However, the City of Wilsonville can support this shift in a number of ways.

Under the State's Climate Friendly and Equitable Communities (CFEC) program, the City is to ensure that a portion of parking spaces in new multi-unit and mixed-use developments are ZEV-ready. The City can also install ZEV charging stations, and reduce the cost of parking for electric vehicles, as noted in Appendix A.

The City can also switch its own vehicle fleet to zero-emissions models, earlier rather than later. The conversion of the City's fleet therefore was included as a Low Carbon action.

Immediate Cost and Long-Term Savings

Purchasing a new ZEV currently costs more than purchasing a new ICE vehicle. The incremental cost is higher for medium and heavy-duty vehicles than for light-duty vehicles. However, the cost for new electric light duty vehicles (LDVs) is expected to fall to be the same as the cost of new ICE vehicles before 2030.[46] The purchase prices for medium and heavy-duty zero-emissions vehicles are expected to be the same as their ICE equivalents by the mid-2030s.

Modeled Action

By 2030, all new light duty vehicles purchased by the City will be ZEVs. By 2035, all light duty vehicles in use by the City will be zero-emissions, and all new medium and heavy-duty vehicles purchased by the City will be zero-emissions. By 2040, all medium and heavy-duty vehicles in use by the City will be zero-emissions.

Emissions Reduction

Switching the city fleet to zero-emissions vehicles at this pace will eliminate 11,000 MTCO2e of emissions between 2025 and 2050 in Wilsonville.

This action aligns with:

- SMART Climate Action Plan (2022)

[46] Rocky Mountain Institute. 2023. "X-Change: Cars. The end of the ICE Age". https://rmi.org/insight/x-change-cars/

Renewable Energy

Maximize Solar Potential

This action also provides the following Thriving City benefits: Affordability for Residents, Improved Energy Security

Wilsonville has limited influence over GHG emissions from the state-wide electrical grid. While Oregon's Clean Energy Targets bill (2021) commits utilities to delivering 100% renewable electricity by 2040, the legislation does not prescribe how this target will be achieved. Success depends on the ability of numerous participants to coordinate investments, retire outdated infrastructure, integrate new technologies, and maintain reliable service. Although financial penalties exist for noncompliance, they do not guarantee progress.

However, Wilsonville can maximize its solar energy potential by incentivizing and requiring the installation of ground-mount, rooftop and building-integrated solar photovoltaic (PV) systems, in conjunction with battery and other energy storage systems. These systems strengthen the City's local energy resilience and provide a reliable source of clean, local energy, resulting in reduced GHG emissions even if the state-wide grid is not fully decarbonized by 2040. The action modeled for this Plan takes maximum advantage of Wilsonville's suitable, available rooftop surfaces. (Additional capacity from ground-mount and building-integrated solar PV systems was not included in this action but could be explored by Wilsonville in the future.)

Immediate Cost and Long-Term Savings

Solar PV systems have a relatively high initial cost to install. In many locations, utilities, municipalities, states, and federal programs offer stackable rebates to reduce this initial cost.

In the long term, these systems can provide owners with free electricity for the lifetime of the system. With net-metering, utilities pay solar system owners for excess electricity they generate and feed that excess electricity back into the grid. This arrangement benefits home owners with solar systems. It also constitutes a significant long-term cost reduction measure for municipalities like Wilsonville, and for corporations to install these systems on as many of their buildings as possible.

Modeled Action

Residential building owners install a total of 10 MW of rooftop solar PV capacity in approximately 315 systems across the city, and commercial building owners install 323 MW of capacity across 84 systems.

Emissions Reduction

This action would reduce emissions by an estimated 1,372 $ktCO_2e$ between 2025 and 2050 compared to the BAP scenario. This constitutes 33% of the total emissions eliminated by the low carbon actions in this Plan.

Procure Green Electricity

In addition to increasing the installation of solar PV systems, Wilsonville can reduce emissions by encouraging residents and businesses to procure green electricity from utilities such as Portland General Electric (PGE). In 2018, over 10% of the electricity used in Wilsonville came from renewable sources, qualifying the City as an EPA-designated Green Power Community. PGE offers several voluntary programs, such as Green Future Choice, Green Future Block, Green Future Enterprise, and Green Future Impact that allow residential and commercial customers to purchase renewable electricity for a small additional cost.[47] For example, the Green Future Choice program allows customers to procure 100% renewable energy for approximately one cent more per kilowatt-hour, or about $5 more per month for the average home.

Immediate Cost and Long-Term Savings

As described above, the incremental cost to purchase green power is low for both residential and business customers. This makes this action easier for many to adopt. However, it also does not provide the long-term financial savings that installing a solar PV system would provide.

Modeled Action

Procurement of green electricity increases to 34% of the community's total electricity consumption by 2030 and 44% by 2040.

Emissions Reduction

While this 2040 assumption does not impact emissions in the Low Carbon scenario where the state grid is fully decarbonized by 2040, it does provide emissions reductions if state-level emission reduction targets are not met. Under a scenario where grid emissions remain unchanged, increased green electricity procurement in Wilsonville would result in an incremental reduction of 1,202 $ktCO_2e$ compared to the BAP scenario. This constitutes 29% of the total emissions eliminated between 2025-2050 by the actions in this Plan.

[47] PGE. "Clean Energy Choices." https://portlandgeneral.com/energy-choices/renewable-power

Solid Waste

Increase Waste Diversion

This action also provides the following Thriving City benefits: Reduced Waste

Reducing and diverting organic waste is an important climate action because when food scraps and other biodegradable materials break down in landfills, they release methane, which is a very potent greenhouse gas. Solid waste disposal is a growing concern across the Portland metropolitan area, as many local landfills are reaching their capacity to store waste. This makes it even more important that cities like Wilsonville find ways to divert their waste from these landfills.

In 2018, approximately two-thirds of Wilsonville's organic waste was diverted from landfills.

The City has a contract with Republic Services of Clackamas and Washington County to provide waste collection services, including weekly curbside garbage and recycling, yard debris and food scraps, glass bottles, batteries, dumpster rentals, and bulky waste removal. Wilsonville can continue to promote waste diversion and reduction through targeted policies and programs.

Immediate Cost and Long-Term Savings

There are numerous ways to divert waste from rescuing edible food from the waste stream, to increasing composting, to installing anaerobic digestion. The cost of these varies significantly, as do the long-term financial savings.

Modeled Action

Organic waste sent to landfills is reduced or diverted by an additional 50% by 2030 relative to the year 2018.

Emissions Reduction

This action eliminates a total of 8,000 $MTCO_2e$ between 2025 and 2050, relative to the Business-as-Planned scenario. This is less than 1% of the total emissions eliminated by the Low Carbon actions in this Plan.

Green Infrastructure

Invest in the Urban Forest

This action also provides the following Thriving City benefits: Climate Resilience, Resilient Nature & Biodiversity, Improved Health and Air Quality.

While most strategies in this Plan focus on reducing GHG emissions at the source, another complementary approach is to sequester carbon through natural systems such as trees. Although tree planting alone cannot offset the need for deep emissions reductions due to its relatively modest carbon sequestration potential, it can still contribute to the city's climate goals. Tree planting also delivers multiple co-benefits, such as helping Wilsonville adapt to climate change by reducing the urban heat island effect.

The City of Wilsonville recently adopted its first Urban Forest Management Plan, which includes a goal to increase tree canopy coverage from 30% to 36% by 2046. Achieving this goal will require planting approximately 27,000 new trees over the next 25 years. This effort is included in the Low Carbon Scenario, which assumes the Urban Forest Management Plan is fully implemented.

Immediate Cost and Long-Term Savings

The up-front cost to plant and maintain trees in Wilsonville is low. The long-term benefits of increased tree coverage include reduced costs to remove air pollution, reduced need to increase stormwater capacity, and less energy consumed to cool buildings that are immediately adjacent to large trees.

Modeled Action

Between 2025 and 2050, Wilsonville will plant approximately 27,000 new trees and ensure that at least 95% of them are still alive and healthy in 2050.

Emissions Reduction

An additional 27,000 trees will sequester approximately 3 $ktCO_2e$ between 2025 and 2050, compared to the BAP scenario. This constitutes less than 1% of the total emissions eliminated between 2025 and 2050 as a result of the actions in this Plan.

This action aligns with:

- Parks and Recreation Master Plan (2018)
- Urban Forest Management Plan (2021)

Conclusion

Wilsonville is a community whose growing population and economy is currently projected to increase its total energy use and greenhouse gas emissions between now and 2050. Like many North American cities, it also faces pressures to increase affordable housing, decrease the cost of living, and increase community services while reducing municipal costs.

This Climate Action Plan outlines a pathway that will tackle all of these diverse problems.

Specifically, the development of this Plan prioritized actions that **avoid** emissions altogether, followed by those that will **reduce** the community's total energy consumption. In terms of climate change mitigation, this will result in Wilsonville reducing its emissions in the near term, and its energy requirements in the long term.

However, these categories of actions will also:

- Decrease energy costs for households, companies and the City itself;
- Increase affordable and accessible transportation options in Wilsonville;
- Provide opportunities to convert some high-cost municipal services into new municipal revenue streams.

The third priority in developing this plan was to **replace** the use of fossil fuels with zero-emissions, renewable energy sources for transportation, building heating and cooling, water heating, manufacturing and industry.

However, this category of actions will also:

- Further improve the long-term affordability of home ownership in Wilsonville;
- Reduce the City's annual energy costs to heat and cool its buildings and facilities; and,
- Reduce the City's operating costs required to operate its vehicle fleet and equipment.

This positions this Climate Action Plan as a strategy that can support the global work to reduce greenhouse gas emissions, while also ensuring Wilsonville remains an affordable, healthy and economically thriving community in the future.

The Role of Community Partners

Achieving Wilsonville's GHG reduction targets will require coordinated action across all sectors. While the City plays a vital role, it cannot meet its climate goals alone. Meaningful progress depends on strong collaboration with the state government, the private sector, and local residents.

Fortunately, Oregon has ambitious GHG reduction goals and legislation that Wilsonville can leverage to support its transition. Regulations such as the Clean Energy Targets bill provides strong impetus for electricity utilities to eliminate their emissions completely by 2040. The Climate Protection Program's cap on fossil fuel emissions, and the Advanced Clean Car II and Advanced Clean Truck rules should expedite significant reductions in transportation and industrial emissions across the state. The State could take additional steps to improve the Building Code in order to reduce overall energy consumption and ensure the grid can meet demand as fossil fuel technologies are replaced by electric alternatives.

The private sector is equally important. Businesses must invest in energy efficiency and low-carbon technologies, while also helping to build a skilled workforce capable of supporting the transition. This includes training workers to retrofit buildings, install renewable energy systems, and maintain zero-emissions vehicles.

Residents also have a key role to play. While systemic changes are essential, individual actions collectively contribute to reducing emissions. These actions might include retrofitting homes, using public transit more often, reducing household waste, or switching to an electric vehicle. By working together, these partners can help Wilsonville successfully transition to a low-carbon future.

Next Steps

The success of this Plan will depend on Wilsonville moving quickly from planning into implementing this work. A number of steps should be undertaken immediately after adopting this Plan. This include:

Establishing Governance to ensure success

The implications of this Plan reach across all operational areas of the City, and coordinating among them will be crucial to keeping the organization aligned. This will require that the Plan is championed at the highest levels, and that City staff with appropriate authority are made responsible for ensuring that the work continues on schedule. It will also require that the work contained within this CAP is carefully coordinated among departments with regular meetings, and clear alignment on overarching principles. When issues arise, a process should be established to escalate them and receive decisions that support the team's continued progress.

Monitoring, Reporting and Improving

Closely related to the governance structure, a process to monitor the City's performance on key indicators for this Plan (e.g. the rate of ZEV uptake) should be established. The indicators

should be updated at least annually, to allow City staff to monitor the effectiveness of incentives, education and other initiatives in achieving the rapid transition outlined in this Plan. This information should be published publicly, communicated and celebrated with an annual report to Council that includes quantified measures of the progress on each action, as well as energy savings, and other quantifiable and non-quantifiable benefits realized. Where appropriate the City should calculate and publish:

- The cost to the City per Mton of emissions eliminated (also known as the marginal abatement cost) to implement each program.
- Progress on key performance indicators such as the total capacity of solar PV systems and battery backup in Wilsonville, the number of EVs vs ICE vehicles, and per capita annual Mtons of waste.
- An annual report of the community's greenhouse gas emissions, and the social cost of carbon calculation for those emissions.

Policy and Strategy Alignment

Climate action will need to be integrated into many of the City's existing policies, directives and strategies. An initiative should be established to a) review all such documents in order to identify those requiring changes or improvements, and b) update them in cooperation with the departments that use them. This should be coordinated with education and championed by senior leadership to ensure the organization understands how this Plan impacts their daily work.

Financial Analysis

Implementation of this Plan will require that a financial analysis of the actions (outlining capital costs, energy costs/ savings, maintenance costs, revenue opportunities) be completed soon after approving the Plan. This will allow the City to identify budgetary requirements both for immediate initiatives, and for longer-term planning, and to quantify the long-term savings that will arise from many of the initial investments required.

Appendix A: Implementation Measures

The following are a set of implementation measures that have been reviewed and recommended by Wilsonville staff. They describe ways in which the City can help catalyze the change required in Wilsonville so that the community can realize the benefits of these changes as soon as possible.

The description of each measure below has been evaluated to indicate whether it will (as currently worded) provide major, moderate, or minor benefits in terms of the Thriving City Benefits, or whether it will provide no benefit or even a negative change.

Legend

Thriving City Benefits	**Benefit Potential**
Economic and Job Growth = EJG Affordability for Residents = AR Financial Benefits for Municipality = FBM Improved Health and Air Quality = HAQ More Accessible Mobility = MAM Improved Energy Security = ES Resilience Nature and Biodiversity = NB Climate Resilience = CR Reduced Waste = RW	Major = **xxx** Moderate = **xx** Minor = **x** None or negative impact = **0**

It should be noted that this list of measures is a starting point, and some of these measures will have a small impact on emissions. **If the City were to implement only these measures, some benefits would be realized, but it would not be sufficient to achieve the community's climate goals or maximize the Thriving City benefits.** More ambitious measures as well as regular monitoring, reporting on, and improvement of all measures will be required to ensure the success of this Plan.

Measure	Description	EJG	AR	FBM	HAQ	MAM	ES	NB	CR	RW
Buildings										
Retrofit Municipal Facilities	The City's facilities managers would undertake deep energy retrofits of existing city buildings and replace their fossil fuel systems with zero emissions alternatives. These retrofits could include better insulation, energy-efficient windows, and other improvements. These changes would reduce operational costs, and improve energy efficiency, comfort, and durability.	x	x	xxx	x	0	xx	0	xx	x
Encourage the Oregon Residential and Commercial Reach Codes	New developments would be encouraged through incentives to follow the Oregon Residential Reach Code and Commercial Reach Code, which include higher energy efficiency standards than the standard building codes. These optional codes provide builders and homeowners with a choice to construct buildings that use less energy and perform more efficiently.	xx	xxx	x	xx	0	xx	0	xx	x
Develop a Home retrofit navigator program	A program would be created to guide homeowners through the process of making energy efficiency and climate resilience upgrades. This service would provide resources, support, and information to simplify retrofitting projects.	xx	xxx	x	xx	0	xx	0	xx	x
Continue to encourage the development of Accessory Dwelling Units	The City would continue to encourage the development of small, secondary homes on residential properties, such as backyard cottages or basement apartments, known as Accessory Dwelling Units (ADUs). This would help raise awareness of existing regulations, making it easier for homeowners to add these units. These include requirements in Frog Pond East and South neighborhoods to include middle housing, such as ADUs. The City will continue to find new ways to encourage neighborhood development in which dwellings support stronger social networks and community and environmental resilience, are more energy-efficient, and cost less to heat and cool.	x	x	0	0	0	x	0	x	0
Continue to encourage the development of	The City currently incentivizes green roofs in several ways. The Public Works Construction Standard Specifications allow for reduced stormwater requirements when a green	x	x	x	xx	0	0	x	x	x

Measure	Description	EJG	AR	FBM	HAQ	MAM	ES	NB	CR	RW
green roofs	roof is installed. Buildings in the Town Center area may also be eligible for waivers for some specific development standards if the building includes a green roof. Wilsonville will continue to encourage green roofs through these incentives, monitor program success, and gradually expand the program until eventually large buildings are required to have green roofs. This will support carbon sequestration, enhanced biodiversity habitat, cooler and cleaner outdoor air, and reduced need for stormwater management.									
Encourage[48] Energy Benchmarking and Auditing	The City would introduce a program to encourage owners of larger buildings (e.g. >25,000 sq ft) to track and report their energy use and water consumption annually. This would be supported with training on how to monitor energy use, and a rebate for the cost of having a comprehensive energy audit completed on the building. Over time, building owners who monitor energy use reduce their consumption by approximately 7% without further investment. This would require additional staff capacity.	x	xx	x	x	0	xx	0	xx	xx
Develop a PACE Financing for Energy Efficiency program	The City would support the implementation of a commercial Property Assessed Clean Energy (PACE) program to help property owners fund energy efficiency and renewable energy upgrades. PACE financing allows businesses to receive upfront funding for improvements to commercial buildings, such as solar panels or insulation, and repay the cost over time through an assessment on their property tax bill. This program makes energy upgrades more accessible by offering long-term, low-risk financing that stays with the property rather than the individual owner.	x	xx	0	x	0	xx	0	xx	xx
Encourage development in the Town Center	The City's Town Center area is master planned to be a walkable and mixed-use center with multi-modal transportation opportunities. The design and development standards in the Town Center code encourage the incorporation of green building methods and site design.	x	x	0	xx	xx	x	x	x	0

[48] The impact of this measure would be much greater if this became required, as it is in Portland. See the Commercial Building Energy Reporting program: https://www.portland.gov/bps/climate-action/energy-reporting

Measure	Description	EJG	AR	FBM	HAQ	MAM	ES	NB	CR	RW
Encourage transit-oriented development	The City would promote mixed-use and residential development near transit, in alignment with the City's Equitable Housing Strategic Plan. This could increase transit ridership and create more walkable communities.	x	xx	0	x	xx	xx	x	xx	x
Industry										
Encourage[49] the procurement of Low Carbon Concrete for the City	The City would require the use of 'low-carbon' concrete in construction projects to reduce greenhouse gas emissions. Following Portland's example, this would involve choosing concrete mixes with a lower environmental impact. The City should also consider using concrete in which CO2 has been sequestered and concrete that is only as strong as it needs to be for each situation in which it's being used.	0	0	x	x	0	0	0	0	x
Promote funding opportunities for industrial decarbonization	The City would raise awareness of available funding and technologies[50] to support industries in reducing emissions and improving energy efficiency.	x	xx	0	xx	0	x	0	x	xx
Offer tax incentives for industrial energy efficiency improvements	The City would provide tax reductions or waive fees[51] to industrial facilities that achieve measurable improvements in energy efficiency. This incentive would encourage businesses to adopt cleaner technologies and reduce overall energy consumption.	0	x	x	0	0	x	0	x	xx
Transportation										
Expand the Employer Commute	The City would continue supporting and promoting the Employee Commute Options (ECO) program, which encourages large employers to offer commuting	0	x	x	x	x	x	x	x	0

[49] The impact of this measure would be much greater if this became required, as it is in Santa Monica, CA, Marin County, California and New York City, as well as other areas. See the Marin County Low Carbon Concrete Code for details: https://www.stopwaste.org/concrete.

[50] Examples include Energy Trust's Industry Programs (https://www.energytrust.org/programs/industry/), the USDA's Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program (https://www.rd.usda.gov/programs-services/energy-programs/biorefinery-renewable-chemical-and-biobased-product-manufacturing-assistance-program) the Federal Business Energy Investment Tax Credit (ITC), and others.

[51] Examples may include fees for permits, inspections, administrative fees, or larger value fees such as infrastructure development fees. City staff should work with industry to identify costs which if reduced would incentivize industry to make the required changes.

Measure	Description	EJG	AR	FBM	HAQ	MAM	ES	NB	CR	RW
Options program	alternatives. This could include carpooling, discounts on bikes and bike equipment, guidance or support to add secure bike parking, showers and change rooms at work locations, 'Find a Bike Buddy' programs, competitions among buildings, transit support[52], and other strategies to reduce single-occupancy vehicle trips.									
Expand the Safe Routes to School Program	The City would enhance efforts to educate and encourage students and families to walk, bike, or take the bus to school safely. This includes collaborating with schools, community organizations, and families to make routes safer and more accessible for all students.	0	x	0	x	x	0	0	x	0
Increase investments in active transportation infrastructure and amenities	The City would continue expanding and improving active transportation options by implementing the Transportation Systems Plan. This includes enhancing infrastructure for walking, biking, and rolling, improving safety and accessibility for all ages and abilities, and adding amenities that support active transportation like secure bike racks, showers and storage, at key locations.	x	xx	x	xx	xx	x	x	x	0
Offer "Welcome to Wilsonville" rebates on bike purchases to new residents	The City would provide new residents with a rebate on bike purchases, along with information on local bike routes and infrastructure. This initiative would encourage cycling as a transportation option.	x	x	0	x	x	0	0	x	0
Reform Parking Requirements	The City is implementing parking reforms as required by the state's Climate Friendly and Equitable Communities program. These changes will eliminate minimum parking requirements throughout the City, and require electric vehicle (EV) charging infrastructure in new parking areas of a certain size. All parking areas are required to provide tree canopy coverage, with parking lots over half an acre required to provide 40% tree canopy coverage, with the option to reduce canopy coverage if solar panels are installed. These changes will encourage shifts to transit use and active transportation, allow land that would have been	x	xx	x	x	x	x	x	xx	0

[52] Transit is already free in Wilsonville.

Measure	Description	EJG	AR	FBM	HAQ	MAM	ES	NB	CR	RW
	used for parking to be used for other purposes, and ensure environmental mitigation measures are implemented in areas used for parking.									
Purchase zero emission fleet vehicles when feasible	The City would evaluate the purchase of zero emission vehicles when purchasing new fleet vehicles. If the following criteria are met, the City will purchase them: they meet or exceed the needs and intended use as determined jointly by the department end user and the fleet manager; they are currently available in the marketplace; their purchase price falls within the available budget; and ongoing product support in terms of parts and service is available. This process will ensure a consistent, strategic approach to reducing emissions across city operations. [53]	0	0	x	0	0	0	0	0	0
Create or join a buyer's alliance for fleet vehicles and equipment	The City would collaborate with other municipalities, agencies, or organizations to form or join a buyer's alliance for zero-emissions fleet vehicles and equipment. By pooling demand, the alliance could help secure better pricing, expedite delivery, and encourage manufacturers to scale up production of cleaner alternatives. This approach would also support industry-wide adoption by helping to standardize procurement processes for zero-emissions technology.	0	x	xxx	x	0	x	0	x	x
Plan for EV Charging at Municipal Facilities	The City will continue to identify locations and opportunities to improve community access to EV charging. This will include taking advantage of grants, partnerships, and opportunities to charge fleet vehicles, and coordinating this work to reflect the needs of the whole city as it transitions to zero emissions vehicles. While current vehicle usage may not justify installation at all locations, the need for workplace charging infrastructure is expected to grow over time. The City can explore alternative facility locations, monitor evolving demand, and seek external funding or partnership opportunities to support future installations as fleet	0	x	0	x	x	x	0	x	0

[53] Note: With adjustments and/ or in combination with related measures, this action would have major, long-term financial benefits for the municipality.

Measure	Description	EJG	AR	FBM	HAQ	MAM	ES	NB	CR	RW
	electrification progresses.									
Increase the frequency of transit service	The City would enhance transit service by increasing bus frequency on key routes and expanding weekend service. These improvements would make public transportation more convenient and accessible for residents and commuters.	x	x	0	x	x	0	0	x	0
Add more regional transit connections	The City would expand regional transit connections to improve access to neighboring communities. As recommended in the SMART Transit Master Plan, this could include more frequent service to Tigard, West Linn, Oregon City, Clackamas Town Center, Woodburn, Salem, and Keizer, making regional travel more convenient and reliable.	x	x	0	x	x	0	0	x	0
Develop a small new Transit Hub in the Town Center	The City would create a small transit hub in the Town Center east of I-5 to improve bus connections and reduce delays. As outlined in the SMART Transit Master Plan, this hub would include shelters, a bus turnaround, and an operator break room, making transit more direct and reliable. The hub could also include secure bike parking to allow commuters to travel the first/last mile of their trip by bike.	x	xx	0	x	xx	0	0	x	0
Update Land Use Regulations to Gradually Reduce Gas Stations:	The City would explore the possibility of revising its zoning and development codes to gradually reduce the number of gas stations over time. This measure would support a shift away from fossil fuel infrastructure and encourage investment in electric vehicle charging, alternative fuels, and other low-emission transportation options.	0	x	0	x	0	x	x	x	x
Encourage hybrid work arrangements where feasible	The City would promote flexible work options by encouraging businesses and organizations to adopt hybrid work models where feasible. Supporting remote work can help reduce commuting-related emissions, decrease traffic congestion, and improve overall quality of life.	x	x	x	0	x	0	x	x	0

Measure	Description	EJG	AR	FBM	HAQ	MAM	ES	NB	CR	RW
Renewable Energy										
Install solar panels on municipal facilities when retrofitted	When city buildings next undergo maintenance or renovations, solar panels would be installed wherever possible. This would take advantage of upgrades to add renewable energy systems efficiently.	x	0	xx	x	0	xx	x	xx	x
Work with utilities to plan and install renewable energy storage that increases Wilsonville's resilience	The City should work with utilities as they plan for their own transitions to renewable energy, to help plan locations of energy storage throughout the city, ensuring that key locations (such as hospitals) are prioritized to have highly available and reliable energy, and to help optimize the network as a whole.	xx	x	x	0	0	xxx	0	xx	0
Make the purchase of renewable energy easier than the purchase of non-renewable energy	Residents and businesses would be encouraged by default to choose renewable electricity programs offered by their utility provider, and would need to go through additional purchasing steps to buy non-renewable energy. These programs would allow customers to support clean energy sources by purchasing carbon-free electricity.	0	0	0	xx	0	xx	xx	x	0
Provide solar education for businesses and homeowners	The City would offer resources and programs to help businesses and homeowners understand solar energy's benefits, costs, and installation process. This would support informed decision-making and increase awareness of available incentives.	x	x	0	x	0	x	x	x	0
Offer an additional rebate for home solar installations	Offer residents a rebate that can be stacked on top of the Energy Trust rebates, when they install solar panels on their home. This would further reduce the up-front costs of installation for the homeowner.	x	xx	0	x	0	x	x	xx	0

Measure	Description	EJG	AR	FBM	HAQ	MAM	ES	NB	CR	RW
Solid Waste										
Promote reuse and repair	The City would support programs and incentives that encourage repairing and reusing items instead of discarding them. This could include promoting repair cafés, tool libraries, and second-hand material exchanges to reduce waste and extend the life of products.	0	x	0	0	0	0	0	x	xx
Develop a Circular Procurement Policy	The City would integrate circular economy principles into its purchasing processes by prioritizing reusable, recyclable, and sustainably sourced materials. This could include selecting vendors that minimize waste, supporting food recovery efforts, and encouraging the use of reclaimed or repurposed materials in public projects.	x	0	0	x	0	0	x	xx	xx
Reduce food waste at municipal buildings and operations	The City would implement strategies to minimize food waste in municipal facilities, such as improving purchasing practices, encouraging food donation, and expanding composting. These efforts would help reduce waste and support sustainability in government operations.	0	0	x	x	0	0	x	x	xx
Refine and Expand Solid Waste Pricing	The City would enhance its existing variable rate waste collection system by introducing a more progressive pricing structure that increases the cost per gallon of trash as container sizes increase. This approach builds on the current system, where smaller containers are less expensive, by further incentivizing waste reduction and making higher-volume waste disposal proportionally more costly. Recycling and composting service rates would also be reviewed and adjusted as needed to reduce their costs for residents to encourage diversion from landfill	0	0	xx	x	0	0	x	x	xx
Continue to promote composting	The City would continue encouraging residents and businesses to participate in composting programs through an “I compost food waste” campaign. This effort would help reduce landfill waste, lower emissions, and support healthier soils by diverting organic materials from the trash.	0	x	x	x	0	0	x	x	x

Measure	Description	EJG	AR	FBM	HAQ	MAM	ES	NB	CR	RW
Water & Wastewater										
Assess waste heat recovery from the sewer system	The City would study the potential to capture and use heat from underground sewer pipes to provide low grade heating for nearby buildings. This could help reduce overall energy consumption and improve efficiency in municipal and private facilities.[54]	x	x	x	x	0	x	0	x	0
Address emissions from the Wastewater Treatment Plant	The City will undertake an evaluation of the most appropriate ways to eliminate methane emissions and reduce energy use at Wilsonville's wastewater treatment plant. The process should include benchmarking the energy performance of the facility, and identifying required changes that can be implemented in combination with planned infrastructure upgrades. While anaerobic digestion may not be currently compatible with Wilsonville's treatment systems, a formal evaluation will provide the City with a pathway to optimizing treatment of increasing wastewater volumes with the need to reduce operational costs, taking advantage of waste heat and energy, improving air quality, and potentially producing renewable energy. This may include operational improvements, energy efficiency upgrades, and integration of low-emission technologies as part of long-term resource and infrastructure planning.	x	0	xx	xx	0	x	xx	x	x
Evaluate Remote Read Water Meters	The City will continue to evaluate process improvements with associated emissions, cost and time benefits. A specific example is the opportunity to install remote water meters throughout the community. These water meters can be read remotely, eliminating the time, fuel and costs associated with having to drive to each building to read a meter. They can also provide residents with information about the amount of water they are consuming, which will help them become aware of their role in conserving fresh, treated water.	0	0	x	x	0	0	0	x	x

[54] The study, while relatively low in direct impact, is a prerequisite to installing systems to recover waste heat, which could provide significant financial benefits to the municipality and local businesses.

Measure	Description	EJG	AR	FBM	HAQ	MAM	ES	NB	CR	RW
Green Infrastructure										
Encourage wildfire resilient construction and landscaping	The City would promote wildfire resilient construction and landscaping practices to help protect homes and properties in high-risk areas. This would involve identifying high risk areas. These practices could include encouraging the use of ignition resistant building materials, fire-adapted native plants, and the creation of defensible space around structures, along with guidance on ongoing maintenance to reduce wildfire risk.	x	0	x	x	0	0	x	xx	0
Use Drought-Tolerant Landscaping in City Parks	The City would update high-maintenance landscapes in parks with low-water, climate-friendly plants. This would reduce water use, lower maintenance costs, and create more sustainable green spaces.	0	0	x	xx	0	x	x	x	0
Develop tree planting program for homeowners	The City would create a program to support homeowners in planting trees on their properties. This could include providing resources, guidance, or incentives to encourage the planting of climate resilient and native tree species.	x	x	0	xx	0	0	x	xx	0
Promote tree manual for homeowners	The City would promote its existing tree manual, which provides guidance on selecting and caring for climate resilient tree species. This resource helps homeowners make informed choices to support healthy, sustainable landscapes.	0	0	0	x	0	0	x	x	0
Continue to manage invasive species	The City would continue efforts to control invasive plants and animals that threaten local ecosystems. This includes using methods like hand removal and other treatments to support the growth of native species and maintain healthy natural areas.	0	0	x	xx	0	0	xx	x	0
Continue Backyard Habitats Certification Program	The City would continue supporting local property owners in creating wildlife friendly yards through the Backyard Habitats Certification Program. This program helps residents reduce invasive species, limit pesticide use, and conserve water while enhancing natural habitats.	0	0	0	x	0	0	xx	x	0

Measure	Description	EJG	AR	FBM	HAQ	MAM	ES	NB	CR	RW
Initiate a program focused on planting and maintaining enough trees to increase the urban forest canopy by 6%.	The City would initiate a program specifically focused on planting 27,000 trees, and ensuring that they are kept healthy and alive well into the future. The guiding goal of this initiative will be to increase the urban forest canopy by 6% consistent with the Urban Forest Management Plan.	x	0	0	xx	0	0	xxx	xx	x