

Ashland

Climate & Energy

Action Plan



MARCH 2017



Acknowledgments

This document was formally adopted by the Ashland City Council on March 7, 2017

2015-2017 City Council

*Greg Lemhouse
Mike Morris*

*Rich Rosenthal
Stefani Seffinger*

Dennis Slattery

Mayor John Stromberg

Project Acknowledgments

AD-HOC CLIMATE AND ENERGY ACTION PLAN COMMITTEE (2015-2017)

Claudia Alick, Oregon Shakespeare Festival
Cindy Bernard, Chamber of Commerce
Stuart Green, Ashland Food Co-op
Gregory Jones, Southern Oregon University
James McGinnis, Conservation Commission
Claire Pryor, Student – Ashland High School
Louise Shawkat – Resident

Roxane Beigel-Coryell, Conservation Commission
Issac Bevers, Student-Ashland High School
Jim Hartman, Ashland High School
Marni Koopman, Conservation Commission
Sarah Lasoff, Student-Ashland High School
* Rich Rosenthal, City Council
Bryan Sohl, Conservation Commission

* Committee Chair

PROJECT TEAM

CONSULTANT TEAM

Andrea Martin, Cascadia Consulting Group
Marc Daudon, Cascadia Consulting Group
Jeff Golden, Independent Consultant
Oregon Climate Change Research Institute (OCCRI) at Oregon State University
Jill Simmons, Evergreen Strategic
David Van't Hoff, Independent Consultant

CITY OF ASHLAND

Adam Hanks, Project Manager
Diana Shippet, Administration

Roadmap



INTRODUCTION

What is a climate and energy action plan, anyway? And why does Ashland need one?



PLAN ORGANIZATION

Get the lay of the land. This section introduces the plan's six focus areas and how they are structured.



CLIMATE CHANGE & ASHLAND

Learn about Ashland's greenhouse gas emissions footprint, anticipated climate change impacts, and the city's collaborative and inclusive approach to climate action.



VISION FOR THE FUTURE

A glimpse of Ashland in 2050—a sustainable, healthy, happy, and resilient community—and the initiatives that will shape how to get there.



BUILDINGS & ENERGY



URBAN FORM, LAND USE & TRANSPORTATION



CONSUMPTION & MATERIALS MANAGEMENT



NATURAL SYSTEMS



PUBLIC HEALTH, SAFETY & WELL-BEING



CROSS-CUTTING STRATEGIES

STRATEGIES & ACTIONS BY FOCUS AREA

This plan is divided into six focus areas, listed above. Each focus area section includes an introduction to its impact and importance, progress to-date, goals and benchmarks, and the strategies and actions that will get us there. Each broad strategy (e.g., “support cleaner energy sources”) is driven forward by specific priority actions that focus on mitigation, adaptation, or both (e.g., “enhance production of on-site solar energy from City facilities”).

IMPLEMENTATION PLAN

The body of the plan lays out the “what” and the “why”; the implementation plan addresses the “how” and the “when,” including the structure and timeframe of priority actions, which City departments are responsible for accomplishing them, and how progress will be tracked.



CLIMATE TRENDS SUMMARY

This summary provides more information on projected climate change impacts and trends in Ashland, including changes in temperature, precipitation, and natural hazard risk.

PUBLIC ENGAGEMENT PROCESS OVERVIEW

The public provided valuable input that helped shape the plan. See when and how the public was consulted, and how public input was used in the plan.

EMISSIONS MODELING AND TARGET-SETTING METHODOLOGY

Take a behind-the-scenes look at the process used to model Ashland's greenhouse gas footprint and set emissions-reduction targets.

ASHLAND GREENHOUSE GAS INVENTORY

This document summarizes the city's emissions by sector and activity type from 2011 through 2015, and sets the emissions baseline used to identify goals and prioritize strategies and actions throughout this plan.





EXECUTIVE SUMMARY

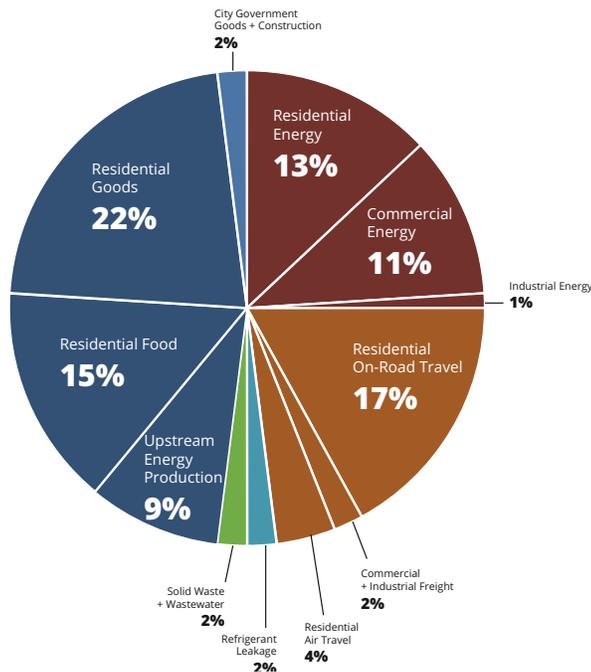
Executive Summary

WHY A CLIMATE AND ENERGY PLAN?

Climate change is already affecting Ashland and the surrounding region, and its impacts are projected to become much more severe in the coming decades. To minimize harmful impacts and play its part in curbing global carbon pollution, Ashland needs to take bold steps to reduce greenhouse gas emissions and build resiliency. This plan lays out a foundation for the City of Ashland to reduce its emissions and improve its resilience to future impacts of climate change on its environment, infrastructure, and people.

Greenhouse Gas Emissions

According to the City's 2015 greenhouse gas inventory, The vast majority (83%) of Ashland's emissions stem from five main sources: production of residential goods and food, residential travel, residential and commercial energy use, and upstream energy production. In 2015, Ashland's greenhouse gas (GHG) emissions footprint was approximately 300,000 metric tons of carbon dioxide equivalent (MT CO₂e), representing 0.5% of Oregon's total emissions.



Climate Impacts

The impacts of climate change will have tangible effects on public health and quality of life for Ashland's residents and visitors. In addition to the direct dangers of wildfires, flooding, and extreme weather events made worse by climate change, secondary effects of more extreme temperatures, snowpack declines, and wildfire smoke include health and livelihood impacts to sensitive and exposed populations, heightened threats to species and habitats, and consequences for local natural resources and economies such as agriculture, outdoor recreation, and tourism.

**BY THE 2080S,
ASHLAND WILL
LIKELY SEE...**



An **86% decrease** in winter snowpack



90 more days of extreme heat annually

A **7 to 12°F increase** in temperature on the hottest day of the year



More than 1" of additional rainfall during heavy storms



More frequent and severe droughts, heat waves, and wildfires

Source: Oregon State University, 2016

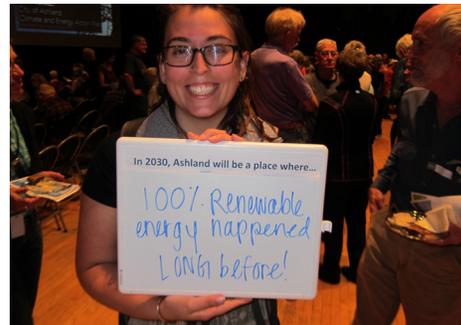
HOW DID WE GET HERE?

The Ashland Climate and Energy Action Plan represents the culmination of a year-long process of engagement, input, and review. Many individuals and organizations played a role in shaping this plan. It incorporates input from:

- Over **240 community members** who attended a public open house.
- Over **135 individuals** who responded to an online survey.
- Representatives from over **15 local organizations, businesses, and institutions** who participated in interviews.
- Over **30 City staff members** who participated in facilitated workshops.
- **13 members** of the Mayor-appointed ad-hoc committee.

Formation of the plan was also informed by the following approaches:

- Leveraging and building on **progress to-date** and **existing plans and programs**.
- Emphasizing **equity** and **co-benefits**.
- Customizing strategies to fit **Ashland's unique context**.
- Prioritizing actions that help meet Ashland's **climate goals and vision**.



What will these impacts mean for Ashland's future?

These climate changes will threaten Ashland's people, resources, and economy. Here are some examples of challenges Ashland could face:



PEOPLE

Sensitive and exposed populations like the very young, elderly, those with respiratory illness, and outdoor workers will be at risk from wildfire smoke and heat-related illnesses.



ENVIRONMENT

High elevation plants and wildlife will need to adapt to shifting or diminishing habitats.



RESOURCES & ECONOMY

Seasonal and climate-dependent industries such as agriculture, outdoor recreation, and tourism will be threatened under changing conditions.

ASHLAND'S CLIMATE VISION FOR 2050 IS TO BE A RESILIENT COMMUNITY THAT HAS ZERO NET GREENHOUSE GAS EMISSIONS, EMBRACES EQUITY, PROTECTS HEALTHY ECOSYSTEMS, AND CREATES OPPORTUNITIES FOR FUTURE GENERATIONS.

GOALS AND TARGETS

The plan's overarching goals and targets focus on addressing climate change risks by reducing Ashland's emissions of climate pollution ("climate mitigation") and preparing the city for unavoidable impacts ("climate adaptation"):

1

Reduce Ashland's contribution to global carbon pollution by reducing greenhouse gas emissions associated with City, residential, commercial, and industrial activities.

For the Ashland community:

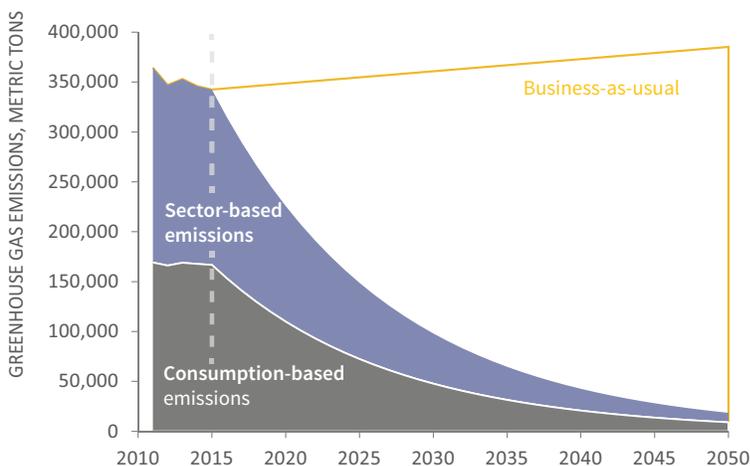
Reduce overall Ashland community greenhouse gas emissions by 8% on average every year to 2050.

For City of Ashland operations:

Attain carbon neutrality in City operations by 2030, and reduce fossil fuel consumption by 50% by 2030 and 100% by 2050.

2

Prepare the city's communities, systems, and resources to be more resilient to climate change impacts.



STRATEGIC INITIATIVES

The following **overarching strategic initiatives** were identified to guide the strategies and actions presented in this plan. While the strategies and actions in this plan are organized by focus areas such as Buildings and Energy, Transportation and Land Use, and Natural Systems, these initiatives cut across these focus areas to emphasize synergistic and integrated solutions for addressing climate in Ashland.

- **Transition to clean energy.**
- **Maximize conservation of water and energy.**
- **Support climate-friendly land use and management.**
- **Reduce consumption of carbon-intensive goods and services.**
- **Inform and work with residents, organizations, and government.**
- **Lead by example.**

STRATEGIES AND ACTIONS

The Climate and Energy Action Plan presents strategies, priority actions, and other potential actions for six focus areas:



Buildings & Energy



Urban Form, Land Use & Transportation



Consumption & Waste



Natural Systems



Public Health, Safety & Well-being



Cross-Cutting Strategies

The plan lays out specific actions within the following strategies:

URBAN FORM, LAND USE + TRANSPORTATION

- Strategy ULT-1.** Support better public transit and ridesharing.
- Strategy ULT-2.** Make Ashland more bike and pedestrian-friendly.
- Strategy ULT-3.** Support more efficient vehicles.
- Strategy ULT-4.** Support more climate-ready development and land use.
- Strategy ULT-5.** Increase the efficiency of City fleet vehicles and employee commuting.

PUBLIC HEALTH, SAFETY + WELL-BEING

- Strategy PHSW-1.** Manage ecosystems and landscapes to minimize climate-related health impacts.
- Strategy PHSW-2.** Promote a sustainable local economy that minimizes emissions and vulnerability.
- Strategy PHSW-3.** Minimize public health impacts.
- Strategy PHSW-4.** Minimize public safety impacts.

CONSUMPTION + MATERIALS MANAGEMENT

- Strategy CM-1.** Reduce consumption of carbon-intensive goods and services.
- Strategy CM-2.** Support sustainable and accessible local production and consumption.
- Strategy CM-3.** Expand community recycling and composting.
- Strategy CM-4.** Reduce food waste.
- Strategy CM-5.** Improve the sustainability of City operations and purchases.

NATURAL SYSTEMS

- Strategy NS-1.** Promote ecosystem resilience.
- Strategy NS-2.** Manage and conserve community water resources.
- Strategy NS-3.** Conserve water use within City operations.

BUILDINGS + ENERGY

- Strategy BE-1.** Support cleaner energy sources.
- Strategy BE-2.** Encourage increased building energy efficiency and conservation.
- Strategy BE-3.** Maximize efficiency of City facilities, equipment & operations.
- Strategy BE-4.** Improve demand management.
- Strategy BE-5.** Prepare and adapt buildings for a changing climate.

CROSS-CUTTING STRATEGIES

- Strategy CC-1.** Educate and empower the public.
- Strategy CC-2.** Educate and empower City staff.
- Strategy CC-3.** Mainstream and integrate climate considerations.
- Strategy CC-4.** Engage with other governments and organizations around climate policy and action.

NEXT STEPS

This Climate and Energy Action Plan is only the beginning of an ongoing process. The Implementation Plan provides a framework for launching the implementation phase of the plan. This phase will require the City and community to take priority actions—outlining specific plans of action and resource needs among responsible parties—while monitoring and benchmarking progress along the way. As details are outlined during this implementation phase, more specific quantitative goals and milestones will be created, driving the pace of strategy implementation. This plan provides a proposed structure for ongoing plan implementation, monitoring, evaluation, and adaptive management, as well as a list of key actions to be taken in the initial phase of implementation.





INTRODUCTION

ASHLAND CLIMATE & ENERGY ACTION PLAN

INTRODUCTION

Introduction

Home of the Oregon Shakespeare Festival, Southern Oregon University, and abundant natural beauty and recreation opportunities, the City of Ashland is a great place to live and visit. Climate change threatens the vitality, livelihood, and surrounding environment that make Ashland what it is, with anticipated increases in severe heat, water scarcity, wildfire risk, and storm events. By the 2080s, scientists project that Ashland will experience more than an 80% decrease in winter snowpack, 90 more days of extreme heat annually, and more than an inch of additional rainfall during heavy storms.¹

The City of Ashland has a responsibility to address climate change risks by reducing emissions and preparing the city for unavoidable impacts. Cities around the world are leading in this endeavor, including more than 125 cities and counties in the United States that signed the Compact of Mayors agreement to cut greenhouse gas emissions and prepare for climate change. Governments in the Pacific Northwest have led the charge on climate action, including the State of Oregon, which established a statewide target to reduce emissions by 75% below 1990 levels by 2050. Other Oregon cities have set greenhouse gas action goals, including Corvallis, Eugene, and Portland.

The City of Ashland has already taken initial steps to address climate change. Achievements include the solar power incentive program, home energy efficiency incentive programs, participation in and support of community outreach and awareness events such as Climate Week in 2015, and integration of climate change impacts into the Water Master Plan and 2016 Ashland Forest Plan. However, more work is needed. According to scientific models, to prevent the worst impacts of climate change, Ashland, along with the rest of the world, will have to reduce its greenhouse gas emissions

by 8% per year.² Every year this reduction is not met will mean that more reduction will be needed in the future.

Ashland's foundational Climate and Energy Action Plan (CEAP) provides a strategic framework and long-term vision for reducing greenhouse gas emissions and preparing for climate change in the city. It represents the culmination of a year-long process of engagement, input, and review from the public, key community stakeholders, City staff, and a Mayor-appointed committee. Participants voiced their concerns and priorities through online surveys, three public open houses, interviews, and facilitated workshops with City staff and committee members. This plan builds on this input and community progress to date by presenting a coordinated set of goals and strategies to guide City and community action.

This plan provides a roadmap for Ashland to sustain economic, social, and environmental prosperity for current and future generations of residents and visitors. **It represents the beginning of an ongoing and evolving process.** Implementation of the actions and attainment of targets set forth in this plan requires a long-term, dedicated effort by the Ashland community and all City departments and staff. As detailed in the Implementation Plan, the Ashland Climate and Energy Action Plan will be updated every three years to ensure that the city's actions toward addressing climate change are up-to-date, sufficient for meeting the City's goals, and beneficial for all. As progress is made and actions are underway, this plan and its future updates will serve as a foundation for taking meaningful action toward reducing greenhouse gas emissions and building resiliency to climate impacts in and around Ashland.

¹ Source: Oregon State University (2016).

² Source: Hansen (2016).

Plan Organization

The plan presents goals, targets, strategies, and potential actions for mitigating and adapting to climate change. It is organized into six focus areas:



Buildings and Energy: Energy used in residential, commercial, and industrial buildings, as well as opportunities to reduce energy use, expand renewable energy production, and prepare buildings for a changing climate.



Urban Form, Land Use, and Transportation: The form and function of land and transportation systems, including ways to reduce greenhouse gas emissions through urban planning, design, improved land use practices, and clean and efficient transportation systems.



Consumption and Materials Management: The lifecycle of goods and materials, including opportunities to reduce emissions associated with manufacturing, use, and disposal.



Natural Systems: Air, water, and ecosystem health, including opportunities to reduce emissions and prepare for climate change through improved resource conservation and ecosystem management.



Public Health, Safety, and Well-being: Health and assistance programs for disadvantaged populations, including preparing health, social, and emergency systems for climate change.



Cross-Cutting Strategies: Activities that address climate change more generally or across multiple sectors.

For each focus area, this document tells the story of Ashland’s climate goals, progress to date, and strategies and actions for achieving those goals. The strategies and actions are presented in order of priority as articulated by the public, City staff, **ad hoc** committee, and the practices and plans of other cities and communities. They are organized in the following manner:

Strategies represent a thematic groupings of actions that all work toward a specific goal. Strategies within each focus area are ordered by priority.

Priority Actions are actions within a strategy that were prioritized, or shortlisted, from a broader set of potential actions. These priority actions underwent a more thorough assessment that evaluated cost, effectiveness, feasibility, and co-benefits. These actions are ordered from highest to lowest priority as identified through the evaluation process.

Other Actions are opportunities that were identified as potential actions but were not considered high-priority through the public and stakeholder engagement process.

Priority Actions are labeled by scope of impact, as follows:

Breadth of Impact



affects **community**-wide operations and climate goals.



affects **municipal** operations and climate goals.

Type of Impact



addresses **mitigation** goals (lowers GHG emissions).



addresses **adaptation** goals (builds resilience to climate impacts).



addresses **both mitigation and adaptation** goals.



V
A
R
S
I
T
Y



CLIMATE CHANGE & ASHLAND

Climate Change & Ashland

According to the International Panel on Climate Change (IPCC), to have a likely chance of averting the most dangerous of climate change impacts, the world must reduce emissions enough to keep global temperatures from rising more than 2 degrees Celsius. This amount of emissions is called the world's "carbon budget" and the world is already on track to spend the remainder of this budget in just three decades.³ The risks of climate change, including sea level rise, forest fires, and water shortages, exponentially increases with every degree of warming above 2 degrees. The following sections detail how Ashland may experience and contribute to climate change in the coming years.

³ Source: World Resources Institute (2014)

HOW WILL CLIMATE IMPACT ASHLAND?

Regional projections indicate that by the 2080s, Ashland could experience the following climate-driven environmental changes:⁴



Heavy rainfall and drought risk

+0.8-1.3 in rainfall increase
during the heaviest rain days
+4-6 day increase in the longest dry spells^{*}
More winter precipitation



Temperature increase and extreme heat

+7-12° F increase in the hottest day of the year
+39-90 more days a year of warm spells



Wildfire risk

+30% increase in probability of large wildfires^{**}
-40 year decrease in average time between fires^{***}
Increased burn acreage



Changes to snowpack and water availability

-71 to -86% decline in April 1 snowpack in the Middle Rogue subbasin
More precipitation as rain instead of snow
Earlier spring snowmelt
Higher winter streamflow
Lower summer streamflow

⁴ These ranges represent mean projections under the high emissions scenario (RCP 8.5). Source: Oregon State University, 2016

^{*} Some models show decreases

^{**} Source: Stavros, Abatzoglou, Larkin, McKenzie, & Steel (2014).

^{***} Source: Sheehan, Bachelet, & Ferschweiler (2015).

Climate Impacts

Every community will experience climate change differently. The geography, ecosystems, economy, demographic makeup, and social networks of a community all influence how climate change will affect a community and its ability to cope and adapt. In Ashland, more volatile rainfall patterns will increase the frequency and severity of droughts and flooding. More frequent extreme heat events will pose a danger to vulnerable residents. Snowpack will decrease, putting the City's water resources at risk. Plant and animal species will also be affected – some positively and negatively. Increases in temperature, combined with less consistent precipitation, will increase the frequency and severity of wildfires.

The impacts of climate change will have tangible effects on public health and quality of life for Ashland's residents and visitors. In addition to the direct dangers of wildfires, flooding, and extreme weather events made worse by climate change—including injury, death, and the destruction of property and livelihoods—there will be a variety of lesser-known impacts on Ashland's population. Wildfire smoke, for example, can cause serious health complications, especially for those with asthma or other respiratory conditions. Similarly, more frequent and severe heat waves can be deadly, especially for young children, the elderly, and exposed persons such as outdoor workers. Other changes, such as decreased summer stream flow and reduced snowpack, could have significant quality-of-life impacts on Ashland's residents, many of whom enjoy outdoor recreation and rely on the water supplied by the local watershed for their livelihoods. Ashland could even experience an influx of "climate refugees" who are displaced from their homes due to climate change impacts elsewhere.

Unfortunately, many of these climate risks will disproportionately affect certain groups. In the United States, communities of color, non-English speaking households, and low-income populations have historically been underserved by public programs and investments, resulting in limitations such as fewer transportation options, less resilient housing, and less reliable healthcare options. These inequities may limit the ability of these populations to respond to the impacts of climate change or benefit from new investments and actions taken to address climate pollution.

What will these impacts mean for Ashland's future?

These climate changes will threaten Ashland's people, resources, and economy. Here are some examples of challenges Ashland could face:



PEOPLE

Sensitive and exposed populations like the very young, elderly, disabled, those with respiratory illness, and outdoor workers will be at risk from wildfire smoke and heat-related illnesses.



ENVIRONMENT

High elevation plants and wildlife will need to adapt to shifting or diminishing habitats.



RESOURCES & ECONOMY

Seasonal and climate-dependent industries such as agriculture, outdoor recreation, and tourism will be threatened under changing conditions.

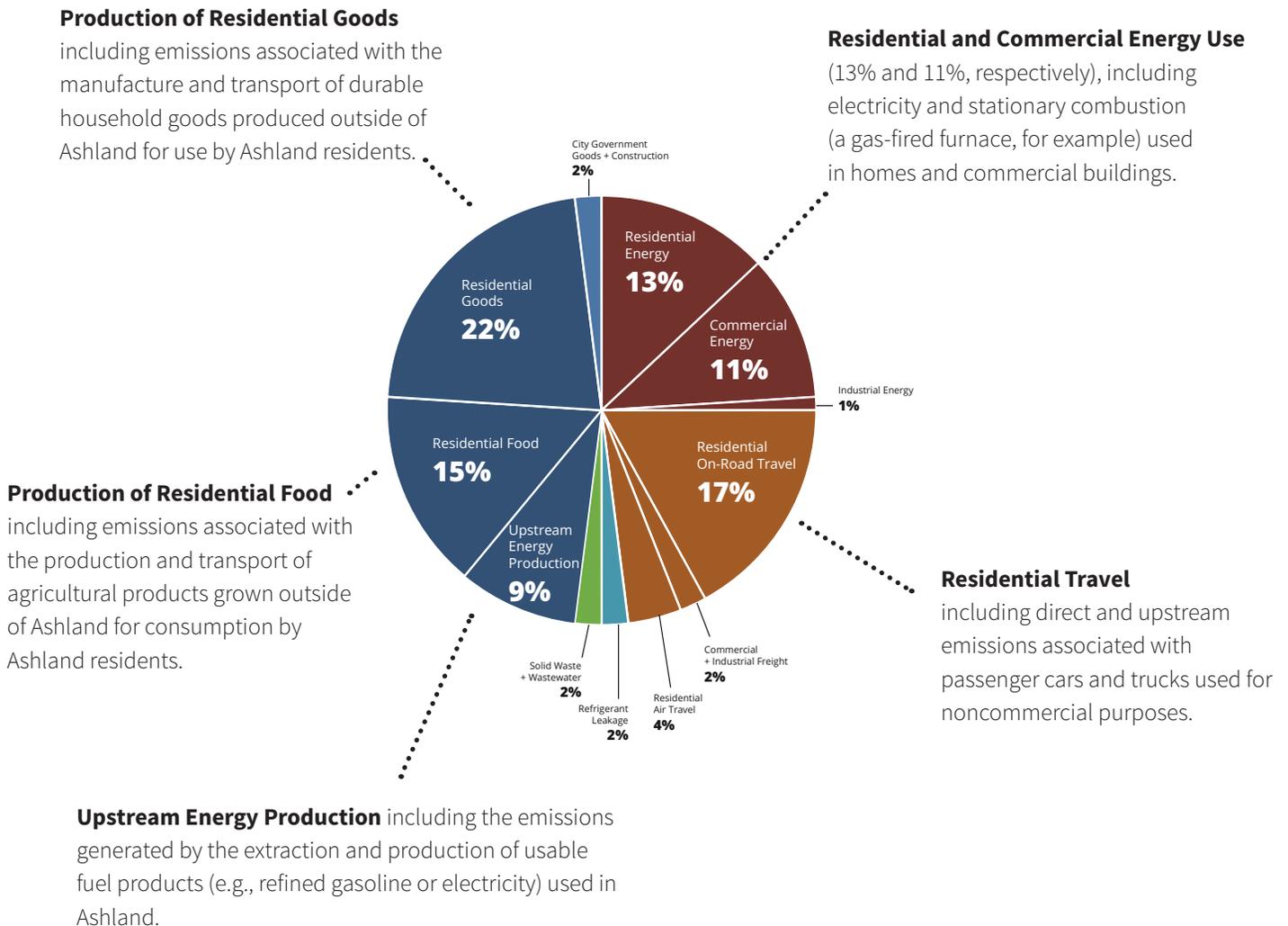
Ashland's Greenhouse Gas Emissions

To keep global greenhouse gas emissions below what is needed to avoid 2 degrees Celcius warming, the IPCC estimates that global emissions need to be reduced by 40 to 70% by 2050, and that carbon neutrality needs to be reached by the end of the century. In 2015, the City commissioned a greenhouse gas inventory to understand and characterize the sources of Ashland’s emissions and trends in emissions over time. In 2015, Ashland’s greenhouse gas (GHG) emissions footprint was approximately 300,000 metric tons of carbon dioxide equivalent (MT CO2e), representing 0.5% of Oregon’s total emissions. The vast majority (83%) of Ashland’s emissions stem from five main sources: production of residential goods and food, residential travel, residential and commercial energy use, and upstream energy production.⁵

⁵ Source: Good Company (2016).

WHERE DO EMISSIONS COME FROM?

The chart below shows how different sources and sectors contribute to Ashland’s 2015 carbon footprint.



Consumption-based emissions include emissions generated outside of the community to produce the goods and food consumed by Ashland residents.

Level of certainty: LOW

What's included?

- Household consumption of food and goods
- City government consumption, including from the production of goods and some purchased services
- Fuel production

Sector-based emissions include locally-produced emissions from buildings, cooling systems, and water and waste processing.

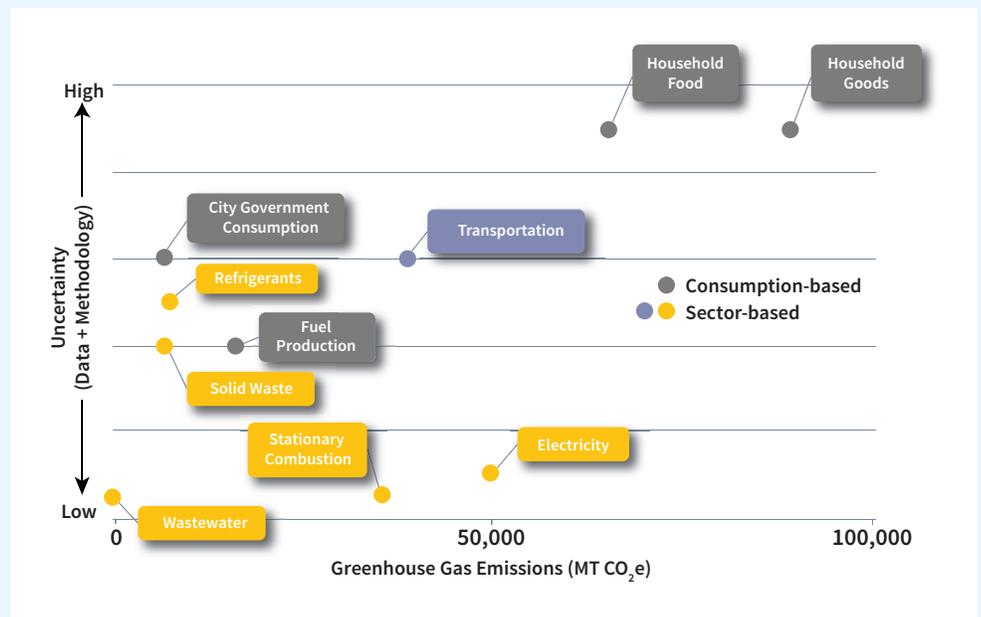
Level of certainty: HIGH

What's included?

- Building energy use in residential, commercial, and industrial sectors
- Transportation energy use
- Methane emissions from waste disposal
- Wastewater treatment
- Emissions from refrigerants

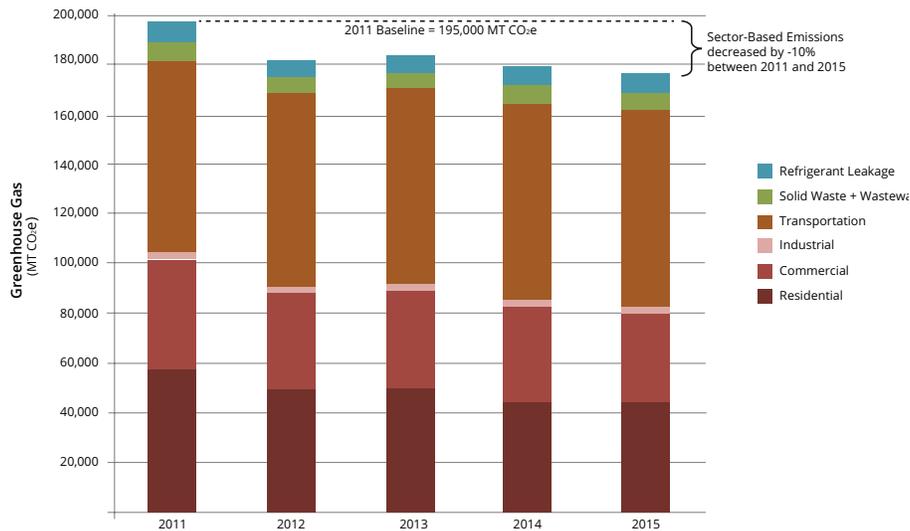
There is some degree of uncertainty in any GHG inventory. This uncertainty can come from incomplete data or uncertainty in translating units of activity into emissions.

Understanding the sources of uncertainty should improve future inventory and reporting efforts, including prioritization of additional data-gathering, framing inventory results, and developing mitigation goals and tracking systems.



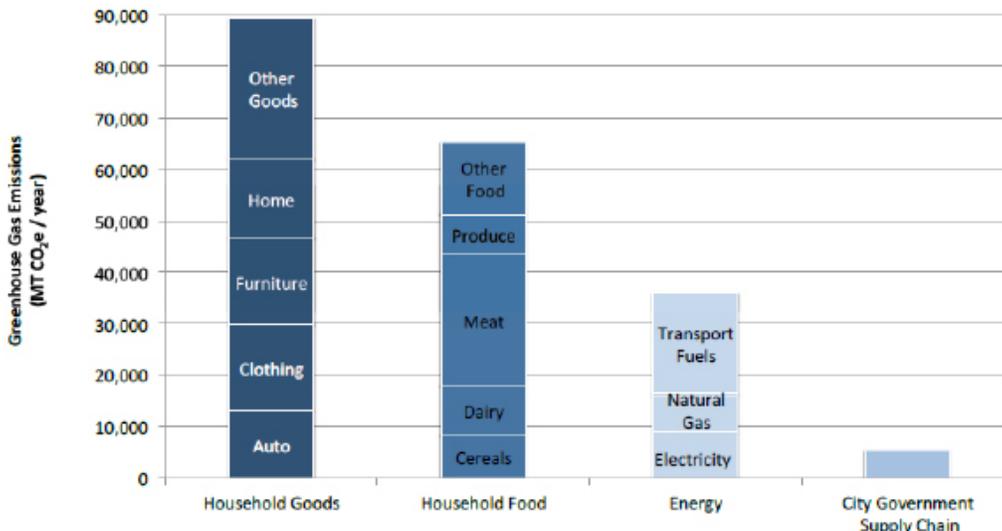
HOW HAVE ASHLAND'S EMISSIONS CHANGED OVER TIME?

Ashland's per-household GHG emissions have decreased nearly 6% over the past five years. Households in Ashland are producing nearly 25% fewer GHG emissions than the average Oregon household. Nearly all of Ashland's GHG reductions can be attributed to changes in emissions from the built environment. Together, residential, commercial, and industrial buildings saw their GHG emissions footprint decrease by 21% from 2011 to 2015, largely due to increased renewable electricity on the regional grid, decreased electricity use in the residential sector, and decreased natural gas use due to warmer winters.



HOW DO CONSUMPTION EMISSIONS STACK UP?

Emissions from household goods are dominated by home construction, furniture, clothing, and vehicle purchases, while the production of meat accounts for a large share of food consumption emissions from Ashland residents. The chart below shows these and other sources of consumption-based emissions in Ashland for the 2015 fiscal year.



Building on a Foundation

Ashland has already made notable progress toward reducing both its community emissions and its vulnerability to the potential impacts of climate change. Ashland has a variety of plans, policies, programs, and studies that are connected to the needs and solutions for addressing climate change issues and challenges. Some of these documents already emphasize climate solutions described in this plan, while others will need to be updated to integrate climate change and climate action. Where linkages are clear, this plan highlights “levers” in existing plans and programs and brings them together to address a common goal.



This plan builds on the great work Ashland has done to-date to present a more coordinated and strategic pathway toward realizing the city’s climate vision.



City-supported events like the Ashland Climate Challenge have engaged the Public around climate issues.



The community solar project Solar Pioneer II gives citizens an opportunity to purchase locally-generated renewable energy.



The City recently completed a City Facilities Energy Audit that identified energy efficiency upgrade opportunities at City facilities.



A retro-commissioning incentive program provides financial and technical assistance to tune up energy systems in commercial and residential buildings.



A new city Water Master Plan will incorporate future climate risks to water supply and quality into future service planning and activities.

WHAT ARE WE DOING RIGHT NOW?

Below are examples of plans, programs, policies, and studies that link to the goals and actions of the Climate and Energy Action Plan:

PLANS

- Comprehensive Plan
- Water Master Plan
- Transportation System Plan and Regional Transportation Model
- Economic Development Strategy
- Neighborhood Master Plans
- Emergency Management Plan
- Community Wildfire Preparation Plan
- 2016 Ashland Forest Plan
- Ashland Trails Master Plan

PROGRAMS

- Emergency management
- Community Emergency Response Team (CERT)
- Firewise
- Forest Resiliency Project
- Water conservation incentive and outreach
- Energy efficiency assistance
- Solar incentives
- Renewable Energy Certificates (RECs)
- Nature Center education

POLICIES

- Land use code
- Wildland-urban interface (WUI) code and fire code
- Energy contract with BPA

STUDIES

- City facility efficiency and solar assessment
- Solid waste and recycling annual report
- Renewable energy assessment
- GHG inventory

A Coordinated Effort

Climate change is a cross-cutting issue. Contributions of greenhouse gas emissions stem from activities across sectors and sources, from transportation and energy to buildings and materials management. Strategies to prepare for climate change cut across traditional disciplines, ranging from water and natural resource management to public health and safety.

Multifaceted challenges require integrated solutions. Many of the solutions and strategies presented in this plan are not new, and many are already part of existing City plans, programs, and policies that are focused within individual City departments. This plan brings those solutions together in an integrated and strategic way to address the climate challenge, and where needed, proposes adjustments or expansions to meet climate goals. Implementing this plan requires forging relationships and coordinating across traditional departmental and stakeholder boundaries to form synergistic, efficient, and effective solutions.

This plan primarily focuses on strategies and actions that Ashland's City government can take to help address climate challenges. However, **all parties have a role and must be a part of the solution**, including Ashland residents, businesses, organizations, and government. This plan provides suggestions for actions that residents, visitors, businesses, and organizations can take to play their part in tackling climate change.



"Combating climate change is a fundamental responsibility for everyone, everywhere. The status quo is clearly unacceptable.

For the sake of future generations, making progress, together, as a community, is urgent."

Rich Rosenthal,

Ashland City Councilor and Chair of the CEAP ad-hoc committee

Key Terms

GREENHOUSE GAS

A gas that absorbs and emits thermal radiation in the atmosphere, contributing to the “greenhouse effect” by preventing heat from leaving the atmosphere. CO₂ is the most common greenhouse gas, but this category also includes methane, nitrous oxide, ozone, and even water vapor (picture a humid day). Greenhouse gases vary greatly in the strength and persistence of their warming effect; for example, methane has a greenhouse effect approximately 72 times stronger than CO₂, but its atmospheric lifespan is much shorter.

ENERGY

For this plan, “energy” refers to power or heat produced from fuels or processes and used for a variety of applications, including for transportation, heating, cooking, and electricity generation. In Ashland, energy is largely consumed in the form of natural gas, electricity, and gasoline. The majority of electricity consumed by Ashland residents is purchased from Bonneville Power Administration, which provides electricity largely from hydro and nuclear resources. Other sources of electricity for Ashland include locally-produced solar and hydropower, and sources from the regional electricity grid, which include coal, biomass power, and other renewable sources such as wind.

CLIMATE MITIGATION

Strategies and actions focused on slowing the pace and lessening the severity of climate change by reducing or offsetting greenhouse gas emissions. Overarching Goal 1 on page 30 focuses on mitigation.

CLIMATE ADAPTATION

Strategies and actions focused on changing behavior, land use, and environmental management to prepare, protect, and build resilience of infrastructure, ecosystems, public health, and quality of life to anticipated effects of climate change. Overarching Goal 2 on page 32 focuses on adaptation. Although used interchangeably in this plan, there are slight differences between climate adaptation, and resilience. The strategies and actions in this plan address both climate adaptation and resilience.

Adaptation refers to action to prepare for and adjust to new conditions, thereby reducing harm or taking advantage of new opportunities.*

Resilience refers to the capacity of a social or ecological system to continue to function despite disturbances.

SOCIAL EQUITY

Maintaining or creating a “level playing field” or equality of opportunity, often through 1) simple fairness and equal treatment, 2) distribution of resources to reduce inequalities in universal programs and services, and 3) redistribution of resources to level the playing field through targeted programs.** Social equity is a cornerstone of this plan—see the “Climate and Equity” section on page 40 for more information on the role of equity in climate action and the ways in which equity is reinforced through the Ashland Climate and Energy Action Plan.

*National Climate Assessment, 2014

** Norman-Major, 2011. “Balancing the Four E’s; or Can we Achieve Equity for Social Equity in Public Administration?” *Journal of Public Affairs Education*. 17(2), 233–252

*Ashland's climate vision for 2050 is to be a **resilient** community that has **zero net** greenhouse gas emissions, embraces **equity**, protects **healthy ecosystems**, and creates opportunities for **future generations**.*



She tells you that you're signed up to cook for tomorrow's nightly co-housing community dinner. "Yes, I remember. I do it every other Wednesday," you say, shaking your head and smiling slightly at her redundant yet endearing reminder.



A Summer Day in 2050

BY ISAAC BEVERS

Ashland High School class of 2017 and Ashland Climate and Energy Action Plan Ad-Hoc Committee member (2016-17)

Your eyes slowly open. The light from the morning summer sun seeps through the pergola on the south side of the apartment. A musing gratefulness for the grapevine it supports, which absorbs the summer sun, keeping your house cool, spreads in your senses, not yet separated from your mind by the day's plans. Sliding out of bed, you open the window and peer through the leaves. The smell of fresh bread and fresh-brewed coffee, accompanied by the hum of cheerful conversation, waft up from the street below. Occasionally, an electric car or bus silently passes by. A smile flits across your face as you watch a father calmly follow his two children as they excitedly weave through bicycles and pedestrians towards the awnings denoting the open air market nearby.

Realizing the air is clear of smoke for the first time in a week, you decide to go for a walk. The heat of the day looms in your mind, so you decide a short cool adventure through town to the Fairy Ponds is ideal. As you prepare for the day in the snug but well-designed space, the question of a local architect, Paula Laporte, crosses your mind; "Have you ever seen a bird's nest with a spare bedroom?" Arriving in the kitchen you take out the rice, lentils, and locally grown vegetables from last night's intentionally vegetarian dinner, place it in the willow basket-backpack, and go down the stairs to the street.

Emerging into to the small courtyard, you become distracted by the community garden's delights. Furtively, you take a ripe pear tomato from the same wall as your bedroom, put it into your mouth, and savor the concentrated sunlight. You exchange greetings with Eleanor, your older neighbor as she snips a few roses for her table. She tells you that you're signed up to cook for tomorrow's nightly co-housing community dinner. "Yes, I remember. I do it every other Wednesday," you say, shaking your head and smiling slightly at her redundant yet endearing reminder. Before leaving, you glance back and up at the roof tiles. Though they look like slate, you know they're powering the entire building.

Avoiding distraction, you decide not to walk through the market. As you go down East Main, you notice the changes from your youth. In the store fronts it is difficult to find any plastic or metal, and the colors displayed are reminiscent of the earth and the plants on your frequent strolls.

After walking through Lithia, soft and green, with playing children and late-morning sun-bathers, you reach the forest. Many of the Douglas Firs and the Big leaf Maples are dead or sickly, and the texture of the forbs has changed, yet the creek still flows and the hillsides have not eroded. They are held by the roots of young Ponderosa Pines and White Oaks planted 20 years ago.

You are hot and sweaty, and have reached your destination. You slide into the largest pool, shallower than when you were young, but still thigh-deep, dunk yourself in its refreshing coolness, climb onto a warm rock, bask in the heat, and are grateful.

Overarching Goals

This Climate and Energy Action Plan provides a strategic path toward achieving two primary goals:

GOAL 1: Reduce Ashland’s contribution to climate change by **reducing community greenhouse gas emissions.**

GOAL 2: Prepare the city’s communities, systems, and resources to be **more resilient to climate change impacts.**

Goal 1: Reduce Greenhouse Gas Emissions

Cities play an important role in reducing greenhouse gases. More than 80% of Americans and 50% of the world’s population live in urban areas. Therefore, the design of cities, including their built environment and transportation systems, strongly influence GHG emissions. Ashland recognizes that it must minimize its negative impact on the global environment. While urgent action is needed, many climate actions cannot be completed overnight, so a long-term approach is needed to achieve deep reductions.

The Climate and Energy Action Plan presents the following long-term targets for reducing greenhouse gas emissions associated with city and community activities:

For the community:

- Reduce overall Ashland community greenhouse gas emissions by 8% per year, on average.

For City of Ashland operations:

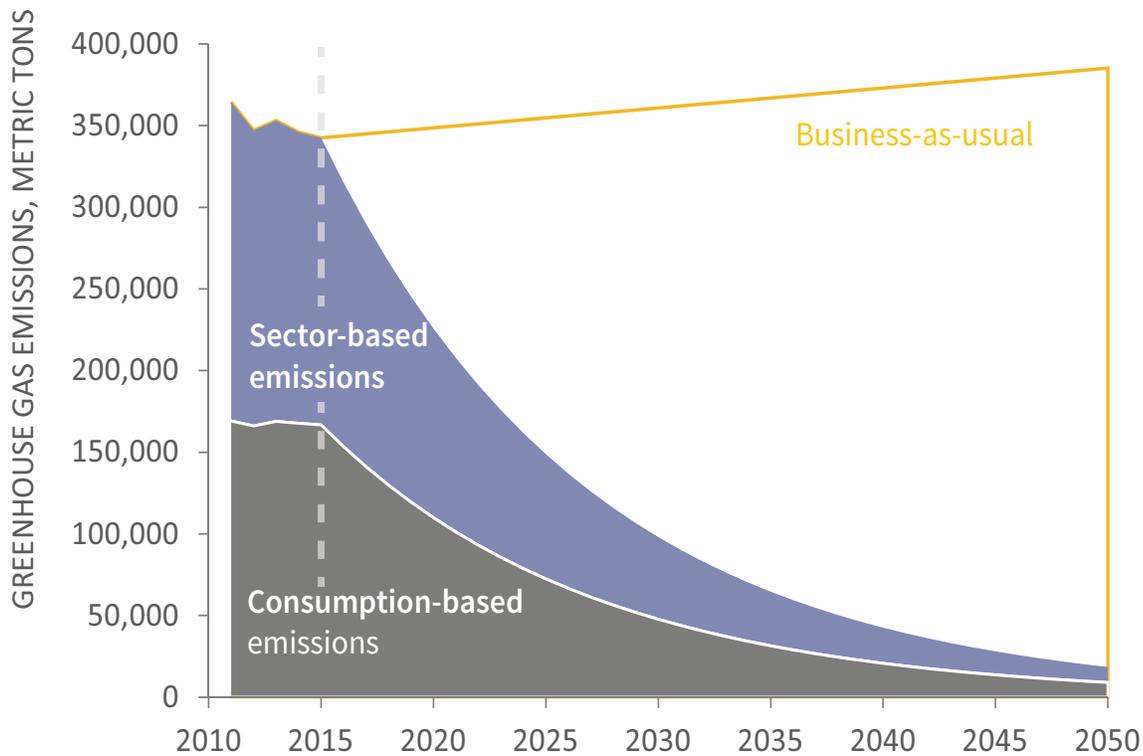
- Reach carbon neutrality by 2030.
- Reduce fossil fuel consumption by 50% by 2030 and 100% by 2050.

The 8% annual target represents emissions reductions necessary to prevent the worst climate change impacts (see the Methodology appendix for more information). Specifically, it identifies how much the world on average would need to cut emissions each year to result in a concentration of carbon dioxide in the atmosphere under 350 parts per million.

To further underscore the importance of setting and reaching this target, this plan recommends that the community and city targets and related goals be adopted by ordinance. This action indicates to the community the highest level of commitment by the City Council to take meaningful action.

ASHLAND'S TARGETED GHG EMISSIONS

8% per year average reduction in total emissions



The strategies and actions in this plan are a starting point and strategic framework for making and assessing progress over time. This plan does not provide a pathway for achieving this target, as the target represents a degree of action that cannot be accurately modeled using current greenhouse gas accounting methodologies. Consequently, some real-world reductions in Ashland may not be reflected in near-term GHG inventories because available tools for evaluating consumption-related emissions do not currently capture changes in Ashland's consumption behaviors. This plan assumes that methodologies will be refined in the future to enable more accurate measurement of emission reductions. For example, the Oregon Department of Environmental Quality is developing a tool that can be used to more accurately quantify consumption-based emissions, and will be applied to Ashland's next GHG inventory.

Emissions reductions were modeled against the proposed higher-level strategies in this plan. The "Moving the Needle: A Thought Experiment" section summarizes outcomes for that modeling exercise to reveal how various actions taken by the City and community could result in measurable emissions reductions.

Goal 2: Prepare for Projected Climate Change Impacts

Ashland will experience varying impacts of climate change at different times. Some of the impacts are already being felt, including lower snowpack and more smoke and heat in the summer.⁵ As climate changes our environment and its systems and resources, Ashland will need to anticipate the changes and take action to mitigate or adapt to the impacts.

This goal calls for Ashland to recognize these climate change threats and take actions to ensure that Ashland can withstand the impacts while sustaining or improving quality of life for all its citizens. These actions could include approaches to minimizing the community's exposure to climate impacts, the sensitivity of people or infrastructure that are exposed, or capacity to adjust or bounce back.



Vision for the Future

A Strategic Approach

This plan presents a strategy that is customized to Ashland's unique characteristics. Ashland can influence its ability to address or prioritize particular climate and energy strategies as a result of its:

- **Utility ownership.** Ashland's electricity utility is municipally owned, which grants the City direct control over utility operations, business decisions, and related program activities.
- **Energy mix.** Ashland purchases energy from Bonneville Power Administration, which is largely sourced by hydropower.
- **Engaged community.** Ashland citizenry are highly engaged in community issues and activities.
- **Political will.** Ashland's leadership is historically supportive of innovative actions and environmental leadership.
- **History of climate action.** Ashland has a long history of environment- and climate-related policies and actions to build upon, including the first community solar project in Oregon and effective energy efficiency programs.
- **Heavy tourism influence.** Ashland's industry is largely tourist-based, meaning that a portion of the city's greenhouse gas emissions comes from the behavior of visitors over which the City has less direct influence. Ashland's interactions with tourists could also potentially give Ashland's actions a greater geographic reach, however, as visitors bring the Ashland experience back home with them.
- **Small city in a rural environment.** Ashland is a small town, which brings both benefits and challenges. On one hand, governments of small communities can have more direct contact and influence over their services and utilities. On the

other hand, smaller communities have fewer available resources for climate action compared to larger cities, and advocating for changes at the state and national level could be more difficult.

- **Direct influence on water supply.** Ashland has direct ownership and control over much of its water supply. However, climate change will impact that supply.
- **Progressive state-level activities.** The State of Oregon has introduced ambitious climate policies and regulations, as well as tools and resources for supporting local climate action.

Given these particular characteristics coupled with information on Ashland's greenhouse gas emission sources and anticipated impacts from climate change, the following **overarching strategic initiatives** were identified to guide the strategies and actions presented in this plan. While the strategies and actions in this plan are organized by focus areas such as Buildings and Energy, Transportation and Land Use, and Natural Systems, these initiatives, described in the following sections, cut across these focus areas to emphasize synergistic and integrated solutions for addressing climate in Ashland.

- Transition to clean energy.
- Maximize conservation of water and energy.
- Support climate-friendly land use and management.
- Reduce consumption of carbon-intensive goods and services.
- Inform and work with residents, organizations, and government.
- Lead by example.

Transition to clean energy

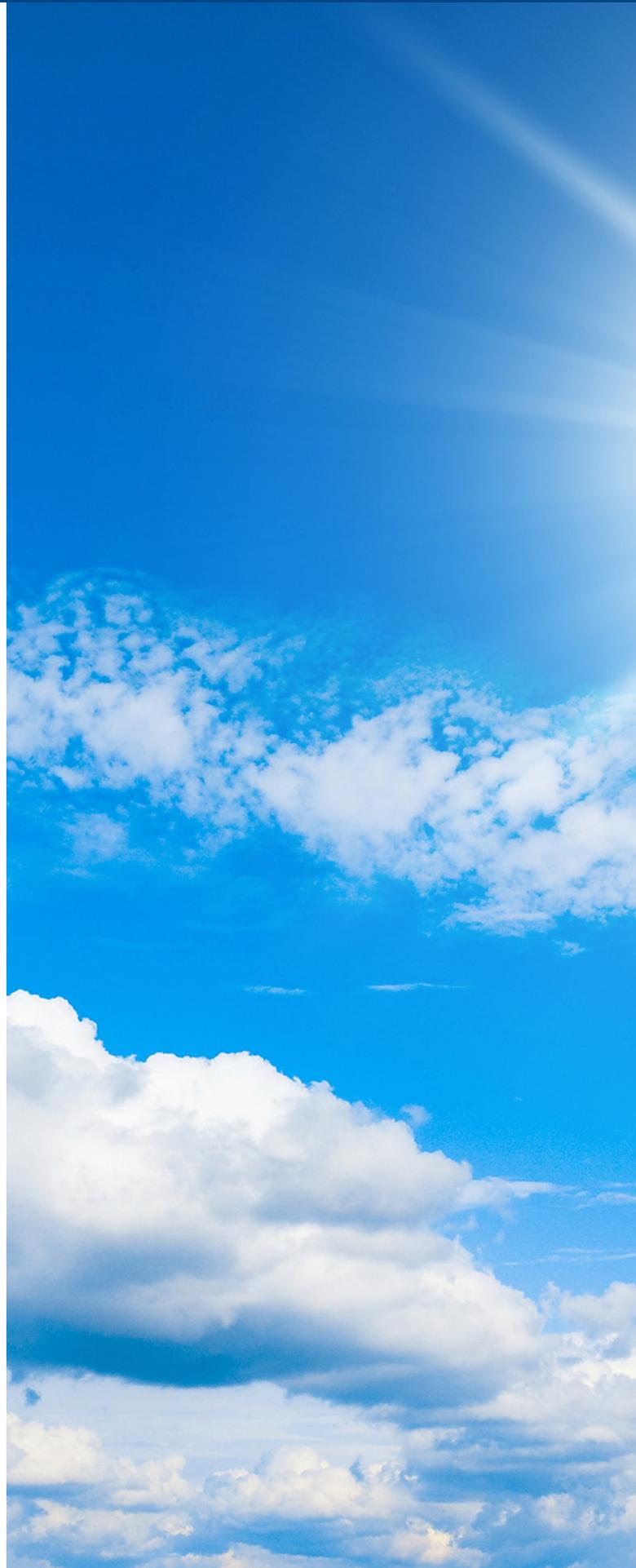
Energy used for buildings and transportation makes up half of Ashland's historic greenhouse gas emissions. Most of these emissions are from the combustion of natural gas by residential and commercial buildings, electricity consumption, and gasoline used to fuel residential on-road travel.

Addressing energy-related emissions requires a combination of reduced and lower-carbon energy use. The majority of energy consumed by Ashland's buildings is purchased from Bonneville Power Administration (BPA), which sources its electricity largely from hydro and nuclear power. The majority of energy consumed by Ashland's transportation sector comes from the direct combustion of gasoline and diesel fuel. Switching existing fuels, such as natural gas and gasoline, to cleaner fuels such as low-carbon electricity can lower the overall emissions profile of Ashland's current energy use and reduce reliance on fossil fuels. Furthermore, the introduction of new clean energy sources, such as local renewable energy, as well as increased conservation and energy efficiency, can help offset the increased electricity loads caused by fuel-switching and increased cooling demands anticipated under future climate change. These actions in combination act synergistically to reduce total energy-related emissions.

The following Climate and Energy Action Plan strategies are cornerstones of this clean energy transition:

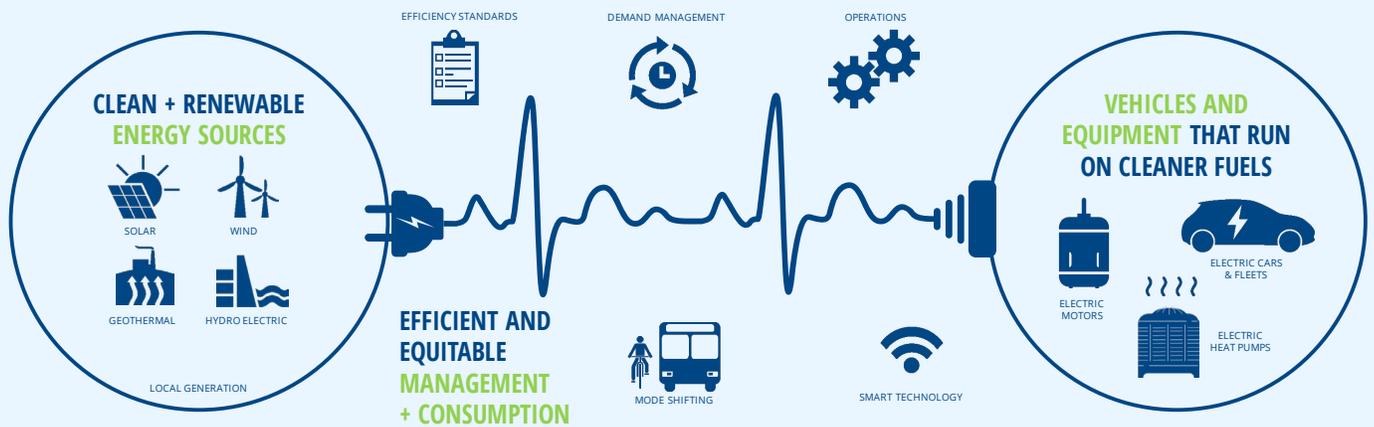
- Support cleaner energy sources.
- Support more efficient vehicles.
- Improve energy demand management.

Example actions within these strategies include supporting community solar projects, smart grid technologies, and actions and initiatives that accelerate fuel-switching such as electric vehicle infrastructure requirements.



ASHLAND'S CLEAN ENERGY FUTURE: A BALANCED, COST-NEUTRAL APPROACH

Transitioning to a clean energy future in Ashland will require a combination of increased fuel-switching, clean renewable energy sourcing, and efficiency. Taking this three-pronged approach will allow the electric utility to offset potential revenue losses from efficiency and off-grid electrical consumption with new revenues from switching gas-fueled cars and natural gas-heated homes to electric vehicles and electricity-heated homes. Through this strategy, Ashland will be able to lower its overall energy consumption, costs, and associated emissions.



CITY OF ASHLAND'S CLEAN ENERGY FUTURE

Maximize conservation of water and energy

The production and use of energy and water resources for the built environment greatly influences Ashland's greenhouse gas emissions and vulnerability to climate impacts. Energy used by buildings accounts for almost a third of Ashland's greenhouse gas emissions. Water consumption for residential and commercial buildings and surrounding green spaces puts considerable stress on community water resources, which may become more scarce and in greater demand as temperatures increase and summer water availability declines.

Reducing water and energy resource use associated with Ashland's built environment will cut emissions, ease loads on the utility, and help secure resource supply and resiliency in a changing climate. The introduction of cleaner energy sources can reduce energy-related emissions to an extent, but improved energy use efficiency will also be required to achieve deep emission reductions. In general, cutting emissions through energy efficiency improvements can be more cost-effective than adding new renewable energy sources. The following Climate and Energy Action Plan strategies support water and energy efficiency:

- Encourage increased building energy efficiency.
- Adapt buildings to a changing climate.
- Manage and conserve community water resources.

Example actions include adjusting land use codes and incentives to support resource-efficient design, water reuse, and/or on-site storage systems; sponsoring building energy retrofit programs and water conservation rebate programs; introducing rate-based incentives; and providing educational materials aimed at awareness and behavior change. The introduction of passive and heat-tolerant building principles can also reduce cooling energy needs during heat waves and minimize heat-related public health impacts.

Support climate-friendly land use and management

The use and management of Ashland's lands play a significant role in both reducing greenhouse gas emissions and preparing for climate impacts. Development that promotes walking, biking, and riding transit reduces emissions from on-road vehicles that account for the majority of transportation-related emissions. Proper management and conservation of land resources can also support ecosystem services such as water storage and flow attenuation, shade, and biodiversity that make the city and its resources more resilient to threats posed by climate change.

Strategies in the Climate and Energy Action Plan that support climate-friendly land use and management are:

- Make Ashland even more friendly for people walking and biking to reduce dependence on vehicles.
- Support better public transit and ridesharing.
- Support more climate-ready development and land use.
- Promote ecosystem resilience.
- Manage ecosystems and landscapes to minimize climate-related health impacts.
- Manage and conserve community water resources.

Actions within these strategies feature transit-oriented development and infrastructure that supports walking and biking. Also, improved management and conservation of natural resources such as water and green spaces in and outside the city can help prepare the city for changes in temperatures, water availability, and wildfire risk.

Reduce consumption of carbon-intensive goods and services

The production and delivery of goods and services consumed by Ashland households contribute almost half of Ashland's greenhouse gas emissions. These goods and services include food, furniture, home construction materials, electronics, and clothing; and the production of transport fuels, natural gas, and electricity consumed in Ashland. Certain foods, such as meats, are more carbon-intensive to produce than dairy and grains, and therefore contribute the largest proportion of food-related emissions.

Despite the large contribution of household consumption to Ashland's greenhouse gas footprint, the City of Ashland has little direct control over household purchasing behavior and product manufacturing and transportation. As a result City-initiated options to reduce emissions from this source are limited. However, it is expected that as global markets and energy sources become greener over time, so too would the goods and services that Ashlanders consume. Strategies in the Climate and Energy Action Plan that contribute toward reducing emissions associated with consumption of goods and services are:

- Reduce consumption.
- Support sustainable and accessible local production and consumption.

These strategies promote reduced consumption, facilitating marketplaces for reuse and sharing such as tool-lending libraries and reuse fairs, expanding the construction and demolition debris code to promote material salvage; sustaining local food production such as through farmers' markets and community gardens; and distributing outreach and education materials on the impacts of consumer choices.

Inform and work with residents, organizations, and government

Reducing greenhouse gas emissions and building resilience to climate impacts in Ashland is a community-wide effort. Everyone, including residents, businesses, organizations, institutions, and departments within the City itself, must understand what is needed and work together to take action. This strategy involves the City working closely internally and with the public, local stakeholder groups, and other jurisdictions and agencies to communicate climate priorities, coordinate action, and inspire change. The City must continue to learn from and listen to these parties to ensure that actions are coordinated, relevant, and effective. This strategy involves paying particular attention to equity considerations in the context of climate change (see "Climate and Equity" section on page 113). Specific strategies within the Climate and Energy Action Plan that support this education and coordination effort include:

- Educate and empower the public.
- Educate and empower City staff.
- Mainstream climate considerations.
- Enhance City communication and coordination to minimize public health and safety impacts.
- Promote a sustainable local economy that minimizes emissions and vulnerability.
- Engage with other governments and organizations on regional, statewide, national, and international climate policy and action.

Lead by example

Although emissions from the City of Ashland's operations make up a relatively small proportion of the community's overall greenhouse gas emissions, City leadership in reducing its own operational emissions can inspire community action, enhance operational efficiencies, and reduce costs. This strategy involves the City taking actions to reduce its own GHG emissions footprint and make City operations more climate resilient, including by training internal staff, optimizing City facilities, and improving equipment and purchasing processes. Strategies in the Climate and Energy Action Plan that support City leadership are:

- Maximize energy efficiency of City facilities, equipment, and operations.
- Increase the efficiency of City fleet and employee commuting.
- Improve sustainability of City operations and purchases.
- Conserve water use within City operations.

VISION FOR THE FUTURE
ASHLAND CLIMATE & ENERGY ACTION PLAN





Moving the Needle: A Thought Experiment

This plan sets forth an ambitious goal for reducing greenhouse gas emissions in Ashland. What does a reduction target of **8% per year** (95% reduction by 2050) mean for the average Ashlander and how the City operates? What kinds of changes would need to happen in Ashland to really move the needle on emissions?

This section provides a hypothetical experiment to demonstrate how a few example changes in Ashland's behaviors and infrastructure could result in meeting slightly less than half of the required greenhouse gas emission reductions. It is merely a thought experiment to demonstrate the linkage between behavior and emissions — the scenario presented does not necessarily reflect what is realistic or would result by taking the actions in this plan. For more information on how specific actions in this plan may contribute toward Ashland's greenhouse gas emission reduction goal, see the "What will this plan achieve?" section on page 43.

If the Ashland community made the achievements listed in the table below, then the community would be able to reduce its greenhouse gas emissions by an estimated **38% below 2015 levels by 2050**, equivalent to each Ashland resident and business reducing its footprint by about 1.4% per year. These estimates are based on assumptions from similar analyses conducted by other municipalities and organizations in the Pacific Northwest.

The progress that Ashland makes toward reducing its GHG emissions will also be influenced by broader state, regional, national, and international initiatives and policies. The federal Clean Power Plan, for example, if enacted, will reduce the GHG emissions associated with the U.S. energy grid by making power plants operate more cleanly and efficiently and expanding the capacity for zero- and low-emitting power sources. In 2016, the State of Oregon enacted legislation requiring Oregon's major electricity suppliers to obtain 50% of their power from renewable sources by 2040. The law also sets a timetable for eliminating coal-fired electric power in the state, and it establishes a community solar program for Oregon. These and other anticipated regulations and programs, such as changes to the federal Corporate Average Fuel Economy (CAFE) standards, will further contribute toward Ashland's emissions reduction goals and were taken into account in this analysis.

Ashland could achieve a **38% reduction** in greenhouse gas emissions **by 2050** if the community...



CONSUMPTION

- Reduced consumption-related emissions by 30% through activities such as product reuse, reducing meat consumption, or introduction of a carbon tax on products and services.



ENERGY

- Reduced energy use by 50% through energy efficiency measures.
- Shifted 50% of grid electricity consumption to distributed renewable energy generation.
- Transitioned 90% of natural gas used in buildings to electricity.



TRANSPORTATION

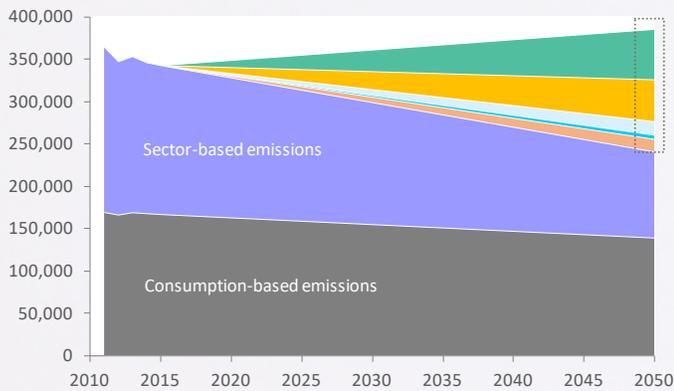
- Shifted 25% of motorized travel to walking or biking.
- For the remaining motorized travel:
 - Shifted 80% of private vehicles to electric vehicles.
 - Shifted 50% of commercial vehicles to electric vehicles.
 - Increased the average fuel efficiency of light-duty vehicles to 54.5 miles per gallon.

What if?

A significant contributor to Ashland's modeled emissions reductions is the transition of liquid fuels like gasoline and diesel to electricity as more drivers switch to electric vehicles. However, there is some uncertainty around the exact makeup of Ashland's future electricity sources. The model above assumes that 55% of electricity is from zero-emission sources by 2050. However, if Ashland were to have zero-emission electricity by 2050, then the emission reductions would increase from 46% to 54%—equivalent to an average reduction of 1.9%, instead of 1.4%, per Ashland resident per year.

VISION FOR THE FUTURE

ASHLAND CLIMATE & ENERGY ACTION PLAN



The figure below shows how **Ashland could achieve a 38% reduction in emissions**, and example actions in the plan that could contribute.

Consumption (15%)

- CM-1-2 Supporting “collaborative consumption” projects
- CM-3-3 Strengthening the Demolition Debris and Diversion ordinance
- CM-5-1 Introducing environmentally preferable purchasing guidance

Renewable energy (4%)

- BE-1-2 Encouraging on-site and community solar energy production
- BE-3-1 Installing solar at City facilities
- BE-4-1 Introduction of virtual net metering

Transportation (1%)

- ULT-1-1 Promoting transit, carpooling, and car-sharing
- ULT-2-1 Expanding bicycle infrastructure
- ULT-3-2 Requiring EV charging infrastructure in new development



Energy efficiency (13%)

- BE-2-2 Requiring building energy scores
- BE-2-3 Addressing energy efficiency barriers in rent/lease properties
- BE-2-4 Establishing energy efficiency standards for affordable housing

Transitioning from natural gas to electricity (4%)

- BE-1-1 Developing a comprehensive electricity utility plan
- BE-2-1 Increasing energy efficiency program participation
- BE-3-1 Implementing City facility improvements

What will this plan achieve?

The modeled emission reductions in this section provide a sense of what could be achieved if Ashland took aggressive action on climate change by implementing actions set forth in the Plan. Reductions are presented as groupings of similar actions, but do not precisely represent the reductions associated with those actions. This is due to challenges in attributing emission reduction values to individual actions.

Potential emission reductions associated with individual actions can be difficult to quantify with certainty due to their interdependent nature. For example, reduced emissions associated with switching from gasoline to electric vehicles will depend largely on the mix of energy sources used to generate electricity and the average fuel economy of the vehicles. Emissions associated with use of electricity will in turn be affected by other actions in this plan, such as increased local renewable energy production. It is therefore difficult and counterproductive to single out reductions associated with any individual action.

Assessing emissions reductions is also complicated by uncertainty in underlying variables and assumptions. The efficacy of expanded education and outreach efforts around home energy efficiency will depend on many factors, including the populations to which outreach will be conducted, the extent to which the City has already reached existing residences, as well as external factors, such as the state of the economy, which influences people's willingness to take risks and invest in new technologies.

Given these limitations, actions in this plan were not quantitatively modeled for efficacy. Rather, actions were qualitatively assessed relative to other potential actions using a set of criteria that included estimated emissions reduction potential. Qualitative assessment informed the order of priority actions in this plan. It is expected that, at the time of implementation, the City will undertake more detailed modeling efforts to quantify anticipated outcomes.

What's in a goal?

Ashland has chosen to pursue a science-based target for cutting community greenhouse gas emissions, which means that the community is committed to doing its part towards preventing the worst impacts of climate change. This thought experiment demonstrates the extent of what would be needed to achieve these real emission reductions. Meeting this target means changing the way Ashland moves, lives, and functions as a community. It will not be easy, but it will be critical for addressing this global crisis that threatens our current and future livelihoods.

Climate and Equity

Equity is central to addressing climate change. Many of the countries most responsible for contributing to climate change, such as the United States, will not bear the brunt of global climate change impacts. Countries and communities that were not large historical emitters of greenhouse gases, such as small island nations, Arctic villages, and developing coastal communities, are facing a rapidly changing environment of thawing ice, flooded coasts, and extreme storms. Many of these communities do not have the resources or capabilities to protect, restore, or adapt to these changing conditions. It is the responsibility of the United States and its communities, as historical and current contributors to the problem, to be a committed and proportionate part of the solution.

This plan provides a foundation for ensuring that Ashland contributes to being part of the climate change solution.

Climate change will also have a disproportionate impact on some local populations. In Ashland, elderly, low-income, disabled, and minority populations will be most vulnerable to many changing climate conditions, such as threats from severe heat, wildfire smoke exposure, and flooding.⁶ These populations may also suffer from other secondary impacts of climate change, such as risks to seasonal employment and agricultural productivity. **Ashland will need to commit special focus when implementing all actions in this plan to ensure the continued and improved prosperity and quality of life of these populations in the face of a changing climate.**

Actions to address these inequities, such as reducing urban heat islands or providing disaster preparedness assistance to at-risk communities, will pay dividends not just for those populations but also for the greater Ashland community. When everyone is healthy, employed, and safe, the community enjoys greater economic and social stability and prosperity.

Elements of the Plan that Emphasize Equity

Equity is integrated throughout Ashland's Climate and Energy Action Plan. For example, the following plan elements emphasize and address equitable climate action:

- An **ambitious greenhouse gas emissions reduction target** that acknowledges the responsibility of developed societies to minimize harmful impacts to those who did not contribute to the problem.
- **Actions that focus on supporting vulnerable populations**, who will disproportionately suffer from many climate change impacts.
- **Including equity in prioritization criteria** for evaluating potential actions.
- **Progress indicators** that track equitable implementation of the plan, such as percent of Ashland residents experiencing health issues or with access to cooling centers.
- An **implementation plan** that calls for equity to be considered in the implementation phase of every action.

Co-Benefits

In addition to the larger societal benefits that result from equitable and inclusive climate action, many strategies and actions in this plan result in other co-benefits, such as enhanced natural aesthetics, public health, economic vitality, or quality of life. For example, the introduction of energy-saving equipment and behaviors not only addresses climate goals, but can also lower energy costs for residents and citizens. **This plan prioritizes these “win-win” solutions that benefit both the climate and other facets of the Ashland community.** Co-benefits associated with each action are identified with icons in the Implementation Plan.

Co-benefits considered in prioritizing the strategies and actions of this plan include the following:



Support for low-income and disadvantaged communities. When implemented carefully and correctly, actions such as local green job training and subsidy programs for energy efficiency upgrades can be especially helpful for low-income and disadvantaged communities.



Public health. Some actions that reduce greenhouse gas emissions also promote healthier lifestyles, such as supporting more people walking and biking and eating less carbon-intensive foods.



Quality of life and well-being. Many climate actions can also improve quality of life for Ashland citizens, such as benefits of green jobs to the local economy and creation of more comfortable and inviting homes through energy efficiency improvements.



Local habitat, recreation and aesthetic. In addition to enhancing ecosystem resilience, minimizing heat impacts, and storing carbon, actions that improve natural habitat and tree cover can also enhance natural beauty and provide recreational opportunities for visitors and residents.

“In urban settings, neighborhoods with low socioeconomic status have some of the highest needs for climate adaptation and resilience-building efforts. Applying the concept of social equity to these efforts can help ensure that all communities are involved.”

U.S. Climate Resilience Toolkit

THE CLIMATE AND ENERGY ACTION PLAN AT-A-GLANCE

The table below summarizes the strategies and actions of this plan, detailed by focus area in the following sections.

BUILDINGS + ENERGY

SCOPE / TYPE

Strategy BE-1. Support cleaner energy sources			
BE-1-1.	Develop a comprehensive plan for the Municipal Electric Utility.	C	Mi
BE-1-2.	Promote switching to low and non-carbon fuels.	C	Mi
BE-1-3.	Facilitate and encourage solar energy production.	C	Mi/Ad
BE-1-4.	Enhance production of on-site solar energy from City facilities.	M	Mi/Ad
Strategy BE-2. Encourage increased building energy efficiency and conservation.			
BE-2-1.	Expand participation in energy efficiency programs & promote climate-friendly building/construction.	C	Mi/Ad
BE-2-2.	Require building energy scores to identify and incentivize cost-effective energy efficiency improvements.	C	Mi/Ad
BE-2-3.	Identify and adopt strategies to reduce energy efficiency barriers in rent/lease properties.	C	Mi/Ad
BE-2-4.	Establish minimum energy efficiency standards for the affordable housing program.	C	Mi/Ad
Strategy BE-3. Maximize efficiency of City facilities, equipment & operations.			
BE-3-1.	Use results from City Facilities Energy Audit to prioritize Capital Improvement Plans (CIPs) & maintenance improvements.	M	Mi
Strategy BE-4. Improve demand management.			
BE-4-1.	Expand the current net meter resolution to include and incorporate virtual net metering.	C	Mi
BE-4-2.	Implement utility-level smart grid technologies to facilitate efficiency and distributed energy solutions.	C	Mi
Strategy BE-5. Prepare and adapt buildings for a changing climate.			
BE-5-1.	Encourage heat-tolerant building approaches such as cool roofs and passive cooling.	C	Mi/Ad

URBAN FORM, LAND USE + TRANSPORTATION

Strategy ULT-1. Support better public transit and ridesharing.			
ULT-1-1.	Coordinate with neighboring local governments to promote use of transit, carpooling, and car-sharing.	C	Mi
ULT-1-2.	Work with RVTD to implement climate-friendly transit.	C	Mi
ULT-1-3.	Establish policies to support development near transit hubs without displacing disadvantaged populations.	C	Mi
ULT-1-4.	Evaluate feasibility of expanded local transit options.	C	Mi
Strategy ULT-2. Make Ashland more bike- and pedestrian-friendly.			
ULT-2-1.	Implement bicycle- and pedestrian-friendly actions in the Transportation System Plan and Downtown Parking Management Plan.	C	Mi
ULT-2-2.	Explore opportunities to convert to shared streets where appropriate to provide multimodal connectivity.	C	Mi
Strategy ULT-3. Support more-efficient vehicles.			
ULT-3-1.	Implement a local fuel-related tax.	C	Mi
ULT-3-2.	Revise land use codes to require EV charging infrastructure at multifamily and commercial developments.	C	Mi
ULT-3-3.	Develop and provide information about electric and hybrid vehicles on the City website.	C	Mi
Strategy ULT-4. Support more climate-ready development and land use.			
ULT-4-1.	Regulate new development in the Wildfire Lands Overlay part of the urban growth boundary.	C	Ad
ULT-4-2.	Revise community development plans to favor walkable neighborhoods and infill density.	C	Mi
ULT-4-3.	Modify the WUI code to include construction techniques appropriate for wildfire-prone areas.	C	Ad
Strategy ULT-5. Increase the efficiency of City fleet vehicles and employee commuting.			
ULT-5-1.	Provide carpool and vanpool parking, charging stations, and parking for EVs for City employees.	M	Mi
ULT-5-2.	Conduct a city fleet audit and use it to set policy and targets.	M	Mi
ULT-5-3.	Purchase verified carbon offsets to offset City staff travel.	M	Mi

CONSUMPTION + MATERIALS MANAGEMENT

Strategy CM-1. Reduce consumption of carbon-intensive goods and services.			
CM-1-1.	Implement an education campaign for waste and consumption reduction strategies.	C	Mi
CM-1-2.	Support “collaborative consumption” community projects.	C	Mi
CM-1-3.	Determine and implement effective ways to reduce and track consumption based emissions.	C	Mi
Strategy CM-2. Support sustainable and accessible local production and consumption.			
CM-2-1.	Partner with nonprofit organizations to promote the purchase of climate-friendly food and products.	C	Mi
CM-2-2.	Expand community gardening and urban agriculture.	C	Mi/Ad
Strategy CM-3. Expand community recycling and composting.			
CM-3-1.	Improve recycling programs, implement new education and outreach, and expand public space recycling.	C	Mi
CM-3-2.	Update the multi-family recycling ordinance to encourage more diversion.	C	Mi
CM-3-3.	Strengthen the Demolition Debris and Diversion ordinance to enhance enforcement, diversion, and reuse.	C	Mi
Strategy CM-4. Reduce food waste.			
CM-4-1.	Support edible food donation.	C	Mi/Ad
CM-4-2.	Provide a best practices guide to help households and businesses reduce food waste and consumption.	C	Mi/Ad
CM-4-3.	Evaluate opportunities for recycling of commercial food waste.	C	Mi/Ad
Strategy CM-5. Improve the sustainability of City operations and purchases.			
CM-5-1.	Introduce environmentally preferable purchasing (EPP) guidelines for City procurement.	M	Mi
CM-5-2.	Assess the feasibility of co-digesting food waste and biosolids at the wastewater treatment facility.	M	Mi

NATURAL SYSTEMS

Strategy NS-1. Promote ecosystem resilience.		
NS-1-1. Manage forests to retain biodiversity, resilience, and ecosystem function and services in the face of climate change. Use best available science to inform fire management and planning.	C	Ad
NS-1-2. Use green infrastructure such as bioswales, permeable pavement, other pervious surfaces to reduce flood risk and minimize sediment entry into creeks from trails and roads.	C	Ad
NS-1-3. Undertake restoration efforts to retain and restore native fish and riparian species.	C	Ad
NS-1-4. Map and protect areas that provide ecosystem services.	C	Ad
Strategy NS-2. Manage and conserve community water resources.		
NS-2-1. Evaluate incentives for practices that reduce use of potable water for nonpotable purposes and recharge ground water.	C	Mi/Ad
NS-2-2. Explore water-efficient technologies on irrigation systems and consider requiring them during permitting.	C	Mi/Ad
NS-2-3. Expand water conservation outreach and incentive programs for residents and businesses.	C	Mi/Ad
Strategy NS-3. Conserve water use within City operations.		
NS-3-1. Evaluate the potential for installation of rainwater collection systems at City facilities for graywater uses, and investigate opportunities for graywater reuse at existing and new City facilities and properties.	M	Mi/Ad
NS-3-2. Implement efficiency recommendations from the City facilities water audit.	M	Mi/Ad

PUBLIC HEALTH, SAFETY + WELL-BEING

Strategy PHSW-1. Manage ecosystems and landscapes to minimize climate-related health impacts.		
PHSW-1-1. Promote the expansion of tree canopy in urban heat islands or areas that need air conditioning.	C	Ad
Strategy PHSW-2. Promote a sustainable local economy that minimizes emissions and vulnerability.		
PHSW-2-1. Engage leading employers in a dialogue on climate action.	C	Mi/Ad
PHSW-2-2. Support organizations, such as SOU, in evaluating risks to local food sources under climate change.	C	Ad
Strategy PHSW-3. Minimize public health impacts.		
PHSW-3-1. Work with vulnerable populations to create specific adaptation strategies that address public health.	C	Ad
PHSW-3-2. Identify and minimize potential urban heat impacts.	C	Ad
PHSW-3-3. Develop or enhance heat-warning systems for employees and the public.	C	Ad
Strategy PHSW-4. Minimize public safety impacts.		
PHSW-4-1. Update the City's emergency response plan and ensure that preparation and updates recognize and address likely climate change impacts.	C	Ad
PHSW-4-2. Identify and address populations and essential City services within the 100-year flood zone.	M	Ad

CROSS-CUTTING STRATEGIES

Strategy CC-1. Educate and empower the public.		
CC-1-1. Create a formal public outreach and education plan to inform the community about climate actions.	C	Mi/Ad
CC-1-2. Support capacity of community groups to implement climate mitigation and adaptation initiatives.	C	M
CC-1-3. Assess the feasibility of a City-sponsored carbon offset program.	C	M
Strategy CC-2. Educate and empower City staff.		
CC-2-1. Ensure all City departments educate their staff members about the Climate and Energy Action Plan.	M	Mi/Ad
Strategy CC-3. Mainstream and integrate climate considerations.		
CC-3-1. Consider climate change in all City Council policy, budgetary, or legislative decisions and as part of the Council Communication document template.	M	Mi/Ad
CC-3-2. Incorporate CEAP goals and actions in future updates of city plans.	M	Mi/Ad
CC-3-3. Include consideration of climate action goals within the scope of every appropriate City Advisory Commission.	M	Mi/Ad
Strategy CC-4. Engage with other governments and organizations around regional, statewide, national, and international climate policy and action.		
CC-4-1. Engage with other governments and organizations around climate policy and action.	M	Mi/Ad

SCOPE OF IMPACT		TYPE OF IMPACT		
KEY	C	affects community-wide operations + climate goals.	Mi	addresses mitigation goals (lowers GHG emissions).
	M	affects municipal operations + climate goals.	Ad	addresses adaptation goals (builds resilience to climate impacts).
			Mi/Ad	addresses both mitigation + adaptation goals.





BUILDINGS & ENERGY

Buildings & Energy

While many people think of greenhouse gas emissions, they picture cars and trucks; however, commercial, residential, and industrial buildings are some of the largest energy users—and thus responsible for a large portion of greenhouse gas emissions. Ashland's built environment accounts for more than one-quarter (27%) of the city's total emissions, more than all types of transportation combined. This represents a significant opportunity to reduce emissions and help Ashland meet its reduction targets. On the plus side, because building emissions are primarily due to energy used for electricity, heating, and cooling, energy efficiency measures can dramatically reduce building emissions. Installing efficient lighting, heating, ventilation, and air conditioning (HVAC) systems, windows and insulation, and other upgrades can significantly reduce the amount of energy a building requires.

Because most buildings' energy use in Ashland is predominantly in the form of electricity, changes in the fuel mix used to generate electricity—for example, by replacing a coal-fired power plant with wind turbines—reduce the GHG emissions footprints of all buildings that draw electricity from the grid. These factors, among others, contributed to a reduction of 21% in overall emissions from Ashland's built environment from 2011 to 2015. The impact of energy efficiency improvements

was especially pronounced among residential homes, which saw a 9% decrease in electricity demand over the same period.

Climate change will have complicated effects on Ashland's built environment. On one hand, warmer winters will mean buildings require less energy to heat, which will cause natural gas use to decline. The number of heating degree days—a measure of the number of degrees that a day's average temperature is below 65°F, commonly used to describe heating energy demand in buildings—decreased by 20% between 2011 and 2015, contributing to a 13% drop in natural gas use. Conversely, reduced snowpack due to climate change may affect regional hydropower capacity, and increased temperatures will increase energy demand for cooling during the dry summer months. The projected increase in wildfire frequency and severity may also put transmission lines at risk, making electricity less reliable in the region.



Progress to Date

Ashland's commercial, residential, and industrial building energy use declined 21% from 2011 to 2015. These changes were due largely to increased renewable electricity in the regional grid, decreased electricity use in the residential sector, and reduced natural gas use from warmer winters.

Ashland owns its own electric utility, which means that the City has greater control over its electricity rates and programs compared to other cities. This arrangement has contributed to the City's progress in supporting community renewable energy and improving building systems efficiency. The City has implemented three successful programs focused on expanding renewable energy sources and improving the energy efficiency of existing residential, commercial, and government buildings:

- A **retro-commissioning incentive program** provides financial and technical assistance to tune up energy systems in commercial and residential buildings. This program offers incentives to building owners and occupants to upgrade or replace building systems—including lighting, HVAC, heating—with newer and more efficient equipment.
- **Solar Pioneer II**, a 63.5-kilowatt City-sponsored community solar project, gives citizens the opportunity to “adopt” one of its 363 panels as a way to purchase local renewable energy.
- A **City Facilities Energy Audit** identified energy efficiency opportunities at the City's own facilities.

Goals and Indicators

Goals

- Reduce greenhouse gas emissions associated with Ashland's building energy use.
- Increase energy and water efficiency in City and private buildings.
- Protect Ashland's building stock and energy supply from climate impacts.

Potential Indicators

- Commercial and residential building energy use and associated emissions.
- Local clean renewable energy production.
- Energy and water use per unit building area.
- Proportion of buildings that use heat-resistant materials, passive buildings, and/or white roofs.

Strategies and Actions

Strategy BE-1. Support cleaner energy sources.

Efforts to support cleaner energy sources will minimize harmful pollution associated with energy use and help meet the additional energy needs as climate change causes temperatures to rise. This strategy deals with enhancing the use of cleaner fuels through fuel-switching in residential and commercial buildings and renewable energy production and generation.

PRIORITY ACTIONS

C **Mi** BE-1-1. Develop a comprehensive plan for the Municipal Electric Utility.

The transition to low-carbon energy such as renewables will require taking a broad-level approach that transcends traditional utility boundaries. Although some aspects would not fall under the traditional purview of the utility, a comprehensive energy plan for the Municipal Electric Utility that addresses clean renewable energy, energy efficiency, and electrification of the transportation sector will provide a more strategic path forward for maximizing societal benefits and achieving climate goals. This plan would set targets, address policy and service issues, and identify potential solutions related to comprehensive energy planning. For example, the plan could delineate energy rate structures and efficiency/conservation program funding levels, targets for installation of solar photovoltaics within the City's distribution grid, a long-term strategy for wholesale power acquisition, and demand management. The recently adopted 10% new, local, and clean energy by 2020 ordinance is a key policy decision that would play a large role in development and shaping of this plan.

C **Mi** BE-1-2. Promote switching to low and non-carbon fuels.

With relatively clean electricity sources, Ashland has great potential to reduce GHG emissions through switching from higher-carbon fuels such as natural gas and gasoline to lower-carbon electricity. This action calls for the City to work across departments in a coordinated and strategic manner to identify ways to promote this kind of fuel switching in the community.

C **Mi** **Ad** BE-1-3. Facilitate and encourage solar energy production.

Local generation of renewable energy can offset emissions associated with energy consumption from the electric grid, and in some cases, may also mitigate climate-related risks to the hydropower electricity supply due to snowpack declines and increased drought risk. This action calls for the City to support increased solar energy production in Ashland, such as through the installation of a large-scale community solar project or rooftop solar panels on buildings in the community. It is worth noting that City-sponsored community solar has faced cost challenges in the past, so this action would need to address potential financial hurdles, like finding a nongovernmental organization or institution to sponsor the project or by developing new models and policies to facilitate community interest and investment, such as virtual net metering and solar production aggregation. The new Oregon Renewable Energy Cooperative Law will facilitate this process, allowing renewable energy cooperative corporations to be created and capitalized without the requirement of securities registration. It will also be important to ensure that new renewable energy installations do not negatively impact natural habitats or ecosystems.

M

BE-1-4. Enhance production of on-site solar energy from City facilities.

Mi
Ad

Enhancement of solar energy production capacity at City facilities and City-owned parking lots would reduce electricity demand from the grid, set an example for the Ashland community, and provide reliable power for both the City operations and broader community.

OTHER ACTIONS

- Establish a solar recognition program for neighborhoods or populations who support renewables, such as for those who meet a certain percentage of electricity needs through renewable energy.
- Coordinate with Oregon cities to promote and reinforce standards around renewable energy, such as higher renewable portfolio standards and requirements for new construction.
- Develop promotional materials that encourage solar investments.

Solar Pioneer I and II

From 2000 to 2002, the City of Ashland, in collaboration with the Bonneville Environmental Foundation, implemented the Solar Pioneer I project, involving installing photovoltaic arrays totaling 30 kilowatts (kW) at the Civic Center, Oregon Shakespeare Festival, and Southern Oregon University. The project was funded in part by voluntary contributions from more than 260 ratepayers, who paid small surcharges on their utility bills to support the project. In addition to bringing renewable energy to the city, the program aimed to inform Ashland residents about solar energy.

Building on the success of the first round of the program, Ashland launched Solar Pioneer II in 2007, which used the same community funding mechanism to finance a 63.4-kW photovoltaic system on the City service center.



Strategy BE-2. Encourage increased building energy efficiency and conservation.

In addition to changing the energy source, cutting energy use within buildings presents another opportunity to reduce emissions. This strategy presents actions to reduce energy consumption through efficiency improvements in the commercial and residential sectors.

PRIORITY ACTIONS

 BE-2-1. Increase outreach efforts to expand participation in energy efficiency programs and promote climate-friendly practices in building and construction.

Ashland currently provides energy conservation incentives and educational materials to residents and businesses through its electric energy efficiency programs. The program currently provides guidance for conducting home energy audits, as well as incentives for weatherization, improved heating and cooling, and more efficient appliances. Expanded outreach efforts will ensure that all Ashland residents are aware of these valuable programs and understand actions they can take to be more energy efficient in the home. For example, the City could discuss with businesses ways to reduce energy use through appliance or lighting upgrades. The City could also explore other ways to promote climate-friendly buildings, such as through introducing new mandates into the land use code that require mitigation (e.g., reduced energy use) and/or adaptation (e.g., increased cooling) elements in the built environment.



BE-2-2. Require building energy scores to identify and incentivize cost-effective energy efficiency improvements.

Energy used in Ashland's building stock accounts for more than one-quarter of the city's greenhouse gas emissions. The City could require and facilitate energy audits and/or scores for Ashland's buildings, perhaps triggered at the point of sale or permitting phase for new development or major remodels. For example, the City of Portland requires commercial buildings over a certain size threshold to annually report their energy use. The City also recently proposed a policy that would require sellers of single-family homes to obtain a home energy performance report and disclose the report to the City and prospective home buyers. The audits could educate property managers about energy use and opportunities, help the City understand building energy use, and facilitate implementation of energy-saving measures.



BE-2-3. Identify and adopt strategies to reduce energy efficiency barriers in rent/lease properties.

Residents and businesses who own their properties often have stronger incentives to invest in energy efficiency technologies and equipment than those who rent or lease their homes and offices. Although more difficult to motivate, the introduction of energy efficiency approaches in rental and lease properties presents a significant opportunity for reducing emissions from buildings.

C

Mi
Ad

BE-2-4. Establish minimum energy efficiency standards for the affordable housing program.

Ashland's Affordable Housing Program is an ongoing program that provides incentives to promote affordable housing development and requirements for affordability. The establishment of minimum energy efficiency standards for these housing units present a valuable opportunity to make homes more comfortable and energy efficient for residents, while also lowering energy bills and supporting those most in need.

OTHER ACTIONS

- Coordinate with other cities to establish and implement more energy-efficient building code standards.
- Restart the energy and green business challenges.
- Expand partnership with the school district to support energy efficiency programs and solar installation.
- Enhance retailer, contractor, and building professional training and awareness of best practices and rebates.
- Implement a program to pay for actual energy savings instead of upfront payments for modeled savings.
- Explore opportunities to encourage increased shading of homes and other buildings, such as through increased tree canopy cover or design features.



Strategy BE-3. Maximize efficiency of City facilities, equipment & operations.

Although City buildings contribute only a small proportion of the city's overall emissions, efficiency improvements to City facilities can allow the City to lead by example and communicate to residents that energy-efficient buildings can be beautiful, affordable, and comfortable. This strategy aims to reduce emissions associated with the City's built environment and promote energy conservation.

PRIORITY ACTION

M BE-3-1. Use results from City Facilities Energy Audit to prioritize City Facilities Capital Improvement Plans (CIPS) and maintenance improvements.

Mi City facilities frequently undergo routine maintenance and improvement projects. This action calls for using an evaluation of City facilities to identify opportunities for energy (and water) efficiency upgrades. The evaluation could be used to integrate more energy-efficient practices and equipment into City maintenance schedules and prioritize efficiency upgrades within capital improvement plans (CIPs).

OTHER ACTIONS

- Continue to monitor and adjust load-shifting measures at the wastewater treatment facility.
- Pursue Leadership in Energy and Environmental Design (LEED) or ENERGY STAR certification for existing and new City buildings. Adopt the LEED for Existing Buildings (LEED-EB) rating system or equivalent to guide operation, management, and upgrade of the City's existing building inventory.

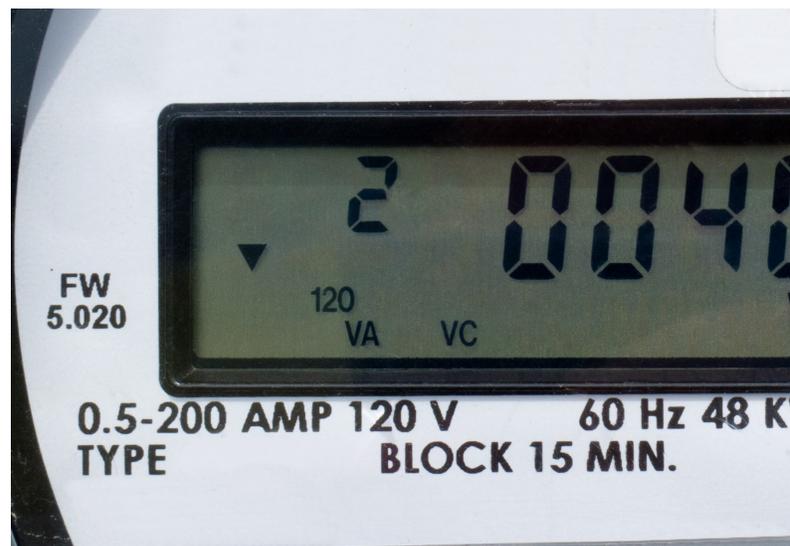
Strategy BE-4. Improve demand management.

Managing the timing and intensity of energy demand can help make sure that more polluting forms of energy are not needed during peak times of high demand.

PRIORITY ACTIONS

C BE-4-1. Expand the current net meter resolution to include and incorporate virtual net metering.

Mi Net metering allows customers who generate their own electricity to sell the excess electricity back into the grid. Traditional net metering works at the level of the individual electricity meter, where excess energy supplied to the grid results in running the meter backwards. Virtual net metering, on the other hand, credits energy generation that occurs at another location against one's electricity bill. Working outside the utility meter enables residents to experience the financial benefits of generating renewable energy even if they are unable to generate the electricity on their own property. Expanding current net metering will make energy generation more cost-effective and available to Ashland's residents, including through such mechanisms as community solar.



C BE-4-2. Implement utility-level smart grid technologies to facilitate efficiency and distributed energy solutions, such as storage.

Mi

Implementing new energy solutions requires bringing the electricity delivery systems, or the “grid,” into the 21st century. Updating the grid involves enabling automation, remote control, and two-way communication. These updates help the grid to handle sources of electricity like wind and solar power and to integrate electric vehicles. Smart grids also collect data and allow residents to better understand their energy use and identify energy-saving opportunities. Implementing smart grid technologies will enable the adoption of clean energy solutions, and complementary strategies promoting renewable energy, electric vehicles, and energy efficiency will help realize the environmental benefits of the smart technologies.

Strategy BE-5. Prepare and adapt buildings for a changing climate.

The City can promote actions that help adapt buildings to withstand climate impacts such as extreme heat and wildfire, as well as protect building dwellers and visitors through improved design and functionality.

PRIORITY ACTIONS

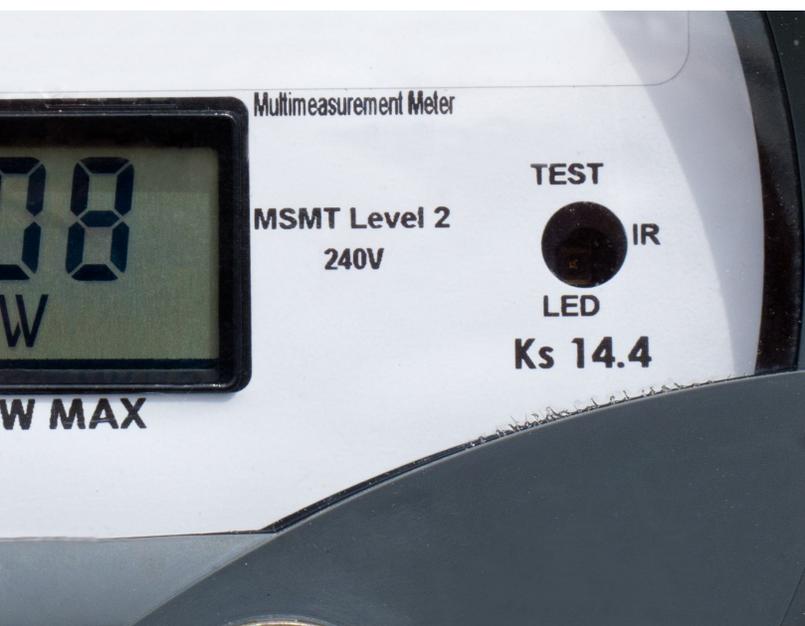
C BE-5-1. Encourage heat-tolerant building approaches such as cool roofs and passive cooling.

Ad

Buildings play a role in both withstanding climate change impacts as well as providing infrastructure to protect people from impacts. Buildings will be subject to potential increased flooding, extreme temperatures, and exposure to wildfires. At the same time, buildings can also shelter inhabitants and visitors from many of these impacts. To optimize the built environment to address climate change, the City can encourage heat-tolerant building approaches, such as cool roofs that block heat, green roofs, and passive cooling features such as improved air circulation designs. There are many venues available to encourage the public and developers to adopt these building approaches, including through education and incentive programs.

OTHER ACTIONS

- Consider future climate conditions when designing or upgrading City buildings and incorporate resilience-building elements such as heat-resistant materials, passive cooling, and white roofs.
- Enhance resiliency of building energy to fluctuations in energy markets and supply.

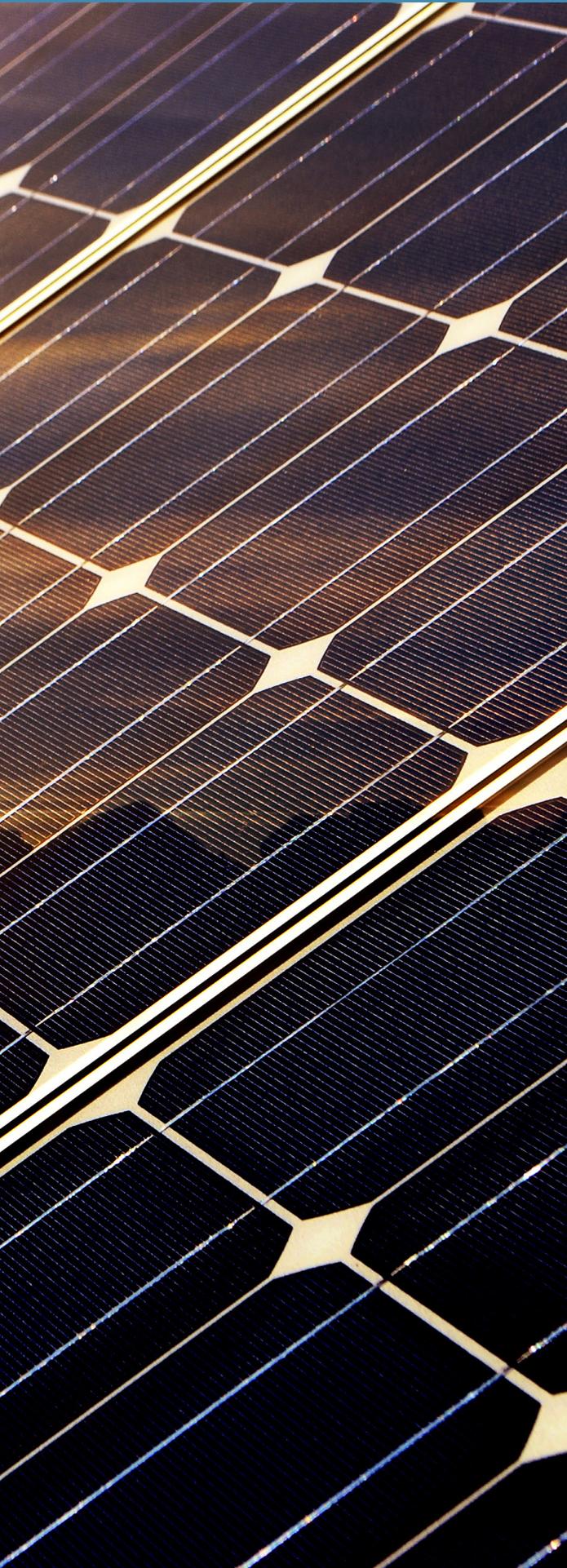




Southern Oregon University

Southern Oregon University (SOU) has used its position as one of Ashland’s leading institutions to advance sustainability programs, both on campus and by serving as a hub to connect with and support the community. SOU’s ongoing sustainability efforts include implementing energy efficiency and solar power projects, reducing waste, and conducting greenhouse gas inventories to assess its progress in reducing emissions. SOU was one of the first universities in the country to offset 100% of its energy and water use, with on-site renewable energy generation, carbon offset credits, and Water Restoration Certificates. The university also worked closely with Bee City USA—an organization that honors cities for their commitment to supporting pollinators—to create Bee Campus USA, an offshoot designation that recognizes pollinator-friendly campuses.





The Role of the Community

Here are some actions that everyday Ashland residents and organizations can take to make a difference in addressing climate change within our buildings and energy systems:



Make your home or business **energy- and water-efficient.**

Simple improvements can make a big difference for energy and water use. Weatherization, equipment upgrades, and basic behavior changes can also make your space more comfortable and lower utility bills.



Explore participation in **renewable energy** programs.

Community solar programs provide opportunities for residents to participate in renewable energy programs without needing to install solar panels on their own roofs. There are increasing options for residents to participate in these programs, including the development of a new statewide community solar program that will soon be available to all Oregon residents.



Think small before you rent or buy.

Consider what size home or business you need, and consider downsizing to avoid having to spend more on energy.





URBAN FORM, LAND USE & TRANSPORTATION

Urban Form, Land Use & Transportation

The movement of goods and services is central to Ashland's economy and community—and one of the largest GHG-emitting sectors. Emissions from the transportation sector made up nearly one-quarter (23%) of the city's total emissions in 2015. Residential on-road vehicle use accounts for nearly three-quarters of the sector's emissions, followed by residential air travel. While emissions from buildings have decreased markedly since 2011, transportation emissions have seen no significant change. This speaks to the challenge of reducing emissions from vehicles, the vast majority of which burn fossil fuels and, unlike buildings, are difficult to retrofit in ways that improve their efficiency or reduce GHG emissions.

While electric vehicles are becoming more available and affordable, near-term progress on reducing Ashland's transportation-related emissions can focus on reducing reliance on personal vehicles by improving public transit access and convenience, and by improving urban design to support higher densities while keeping housing affordable. Also worth noting are potential climate-driven impacts on alternative forms of transportation. With increased temperatures and wildfire-induced smoke, biking and walking may become more hazardous and thus increase reliance on vehicles. Addressing challenges like these is crucial to improving the resilience and reducing the greenhouse gas emissions footprint of Ashland's transportation.

Climate change also puts Ashland's infrastructure at greater risk of damage or destruction. More frequent and severe wildfires and floods may threaten roads, bridges, and real estate, and hotter summers may increase the rate of deterioration of some building materials. Culverts and road crossings may not be sized

to withstand increased flooding, and roads bordering rivers and streams may be at risk of inundation. The City, its residents, and private property owners will need to work together to reduce the risks that extreme weather events pose to Ashland's infrastructure.

Progress to Date

Ashland has made strides in incorporating climate and sustainability priorities into its land-use policies. Many of Ashland's existing plans and standards address activities that contribute toward emissions from the transportation sector, including the Transportation System Plan, local land use code, and Comprehensive Plan. Some examples of climate-friendly actions and requirements in these plans are:

- Street standards and street classifications in the **Transportation System Plan** promote shared streets that incorporate infrastructure for people walking, biking, and riding mass transit.
- The City's **Comprehensive Plan** and street standards highlight connectivity as a requirement in new development.
- The City's **land use code** has a "Pedestrian Places" component, which encourages the creation of walkable mixed-use areas that "encourage walking, bicycling, and transit use."

Goals and Indicators

Goals

- Reduce community and City employee vehicle miles traveled and greenhouse gas emissions.
- Improve vehicle efficiency and expand low-carbon transport, including within the City's fleet.
- Support local and regional sustainable growth.
- Protect transportation infrastructure from climate impacts.

Potential Indicators

- Transportation emissions.
- Community vehicle miles traveled.
- Emissions per mile traveled.
- Average city "Walk Score."
- Transit and bicycling ridership.

Strategies and Actions

Strategy ULT-1. Support better public transit and ridesharing.

Rogue Valley Transportation District (RVTD) provides Ashland's primary public transit service for visitors and residents. RVTD provides intercity and regional public transit within Jackson County, serving the city of Ashland as well as Talent, Phoenix, and Medford with fixed-route bus and dial-a-ride paratransit service.

Residents have voiced a desire for expanded public transit options, including more frequent and accessible downtown bus service, cleaner-fueled public transit vehicles (e.g., electric buses), and other public transit systems such as shuttles or trolleys. These options can reduce per-person emissions associated with residential on-road transportation, as well as reduce congestion, save fuel costs, and provide transportation options for those who cannot afford or choose not to own a personal vehicle.

PRIORITY ACTIONS

C **Mi** ULT-1-1. Coordinate with neighboring local governments to promote use of transit, carpooling, and car-sharing.

Ashland is already a member of the Rogue Valley Transportation District (RVTD), which provides shared bus service to cities throughout the greater Jackson County area. Currently, RVTD is examining a Bus Rapid Transit (BRT) line in their 2040 Transit Master Plan. Using RVTD as a model, the City together with nearby jurisdictions, can support, promote, and potentially provide additional service offerings, such as carpooling and car-share programs, that expand transportation options within each community and strengthen important connections to other areas in the Rogue Valley.

C
Mi ULT-1-2. Work with RVTD to implement climate-friendly transit, including continuing to move towards more efficient buses and expanded ridership.

The City and neighboring jurisdictions in the RVTD already have a longstanding and successful partnership that has brought public transit to residents throughout the area. Recently, RVTD introduced the One Bus Away app, allowing riders to view schedule and arrival information in real time. In 2016, RVTD also began piloting an electronic fare called TouchPass that allows riders to purchase card passes that can be reloaded from a computer or mobile device. This action calls on Ashland to use its position as a partner in the RVTD to continue to improve the convenience, sustainability, and accessibility of its services.

C
Mi ULT-1-3. Establish policies to support development near transit hubs without displacing disadvantaged populations.

Transit-oriented development (TOD) increases housing density within walking distance of transit hubs. Creating a TOD zoning overlay or similar policy could reduce car use, but Ashland will need to design any policy carefully to avoid unintended consequences, such as gentrification that threatens housing affordability and could displace vulnerable populations.

M
Mi ULT-1-4. Evaluate the feasibility of expanded local transit options.

Rogue Valley Transportation District currently offers the only bus service in Ashland, and service and routes are limited. This action calls on the City to evaluate options for additional intra-city service to augment existing RVTD service and provide more public transit options to residents. This assessment would involve determining potential transit providers, assessing demand, identifying possible routes, and estimating costs and funding sources for purchasing and operating a transit fleet.

OTHER ACTIONS

- Provide additional park-and-ride lots to promote public transit and reduce downtown congestion.

Strategy ULT-2. Make Ashland more bike- and pedestrian-friendly.

On-road transportation generates nearly one-fifth of Ashland’s total emissions. It is difficult to substantially improve the fuel efficiency of existing cars and trucks, so one of the most feasible methods of reducing emissions is to make other forms of transportation more desirable. A city that supports people walking and biking not only reduces the need for residents to drive but also offers the public health co-benefit of encouraging exercise.

PRIORITY ACTIONS

C ULT-2-1. Implement bicycle- and pedestrian-friendly actions in the City's Transportation System Plan and Downtown Parking Management Plan.

Mi

For bicycling to be considered a viable alternative to driving, the City will need to invest in infrastructure to improve its safety and convenience. For example, the City could encourage installing bike lanes at schools and arteries connecting to schools, expand urban trails, or provide dedicated bicycle infrastructure downtown or at area hotels. The City should commit to implementing bicycle-related actions in the Transportation System Plan and Downtown Parking Management Plan, such as 1) installation of bike intersection safety improvements; 2) increased bike lane infrastructure; and 3) expansion of on- and off-street bike racks, shelters, and sharing. The Ashland Trails Master Plan also provides a roadmap for improving urban trail infrastructure.

M ULT-2-2. Explore opportunities to convert to shared streets where appropriate to provide multimodal connectivity.

Mi

Shared streets are popular because they offer improvements for people walking and biking while preserving vehicle access. This action will spur Ashland to assess which streets or corridors may make sense to convert to shared streets due to their current use, potential future use, location, or other considerations.

OTHER ACTIONS

- Provide incentives for employer-sponsored bicycle programs, including for City employees.
- Conduct a community survey to understand barriers to biking.
- Implement projects that reallocate a portion of the right-of-way to spaces that are friendly to people walking, such as installation of parklets where appropriate.
- Further evaluate options for reducing vehicle use downtown in future updates of the transportation system plan.

Strategy ULT-3. Support more-efficient vehicles.

With on-road vehicle use responsible for nearly 20% of Ashland's overall emissions, improving the overall efficiency of the cars and trucks used throughout the city could have a significant impact on meeting greenhouse gas reduction goals. While most vehicles already on the road are likely not cost-effective to retrofit, the City can make progress by focusing on providing education, incentives, and support for hybrids, electric vehicles (EVs), and other cleaner-fueled vehicles.

PRIORITY ACTIONS

C ULT-3-1. Implement a local fuel-related tax.

Mi Having a sense of the baseline use of fossil fuels for transportation can help Ashland shape the most effective fuel-switching policies and incentives possible. A local gas tax or a carbon tax on gasoline and diesel would serve as an indicator of fuel demand, while also providing the City with funds that could be used to improve transportation infrastructure, expand public transit options, or invest in other actions. A gas tax would also encourage drivers to change their behavior to reduce their use of fossil fuels.

C ULT-3-2. Revise land use codes to require EV charging infrastructure at multifamily and commercial developments.

Mi Lack of charging infrastructure is a barrier to expanded use of electric vehicles. Additionally, residents in multifamily buildings typically have little say in whether their buildings offer the charging equipment necessary to support electric vehicle use. Requiring new multifamily and commercial developments to provide charging stations will make electric vehicle use possible and practical for a larger segment of Ashland's population by giving them the ability to charge their vehicles near where they live, work, and shop.

C ULT-3-3. Develop and provide information about electric and hybrid vehicles and incentive programs on the City website.

Mi The technology and market for hybrids and EVs can be difficult for consumers to decipher. Educating the public on these vehicles—and the rebates and incentives available for them—is an easy and low-cost early step that can make the process of choosing and purchasing one of these vehicles more straightforward. The City could also explore opportunities to work with organizations like Drive Oregon to organize promotional events and with dealerships to increase availability of electric vehicles.

OTHER ACTIONS

- Expand and increase enforcement of anti-idling policy.
- Initiate a partnership with Tesla to install a supercharging EV station in Ashland.
- Designate a portion of downtown parking spaces for EVs.
- Promote low-carbon fuels and technologies in taxicabs and for-hire vehicles.

Strategy ULT-4. Support more climate-ready development and land use.

Ashland’s population is growing, and with a larger population comes new development. Updating zoning requirements and land-use policies can shape new development to be as climate-resilient as possible.

PRIORITY ACTIONS

C
Ad ULT-4-1. Regulate new development in the Wildfire Lands Overlay part of the urban growth boundary.

The Wildfire Lands Overlay includes areas where homes and buildings are in close proximity with undeveloped lands. Evidence from other cities indicates that wildfires are most deadly and destructive when they burn into denser neighborhoods on the outskirts of town. Regulating building materials and vegetation management as part of new development in the Wildfire Lands Overlay can reduce the risk of severe damage as the frequency and intensity of wildfires increase.

C
Mi ULT-4-2. Revise community development plans to favor walkable neighborhoods and infill density.

Ashland has a series of long-range planning documents that guide development across Ashland districts, neighborhoods, and natural areas. Revisiting these plans to ensure that they support climate-ready development needs, such as walking, biking, transit, parking management, and climate adaptation features, will ensure that Ashland development is consistent with the City’s climate goals and commitments. It will be important to ensure that these activities do not come at the expense of

higher housing costs, which could disadvantage low-income populations.

C
Ad ULT-4-3. Modify the WUI code to include construction techniques appropriate for wildfire-prone areas.

Ashland’s Wildland Urban Interface (WUI) zones are the most wildfire-threatened parts of the city, and the risk of wildfires affecting these areas will only increase as climate change increases the frequency and severity of fires. Modifying the WUI code to require more resilient construction techniques can minimize the risk that new structures built in the WUI are damaged or destroyed by fire.

OTHER ACTIONS

- Require, through a Brush Ordinance, property construction and maintenance for “defensible space.”
- Consider regulating further construction or expansion in the WUI part of the urban growth boundary (UGB).
- Evaluate future climate impacts on transportation infrastructure and operations, including critical needs for emergency response, goods and services movement, and community access.
- Change zoning to minimize development in high flood-risk areas.

Strategy ULT-5. Increase the efficiency of City fleet vehicles and employee commuting.

To move Ashland toward a future of low-carbon transportation, the City should lead by example. While the City's own emissions are relatively small compared to personal and commercial vehicle use, there is an opportunity to make internal improvements that demonstrate its commitment to supporting efficient vehicles, alternative fuel sources, and public/shared transportation.

PRIORITY ACTIONS

M
Mi ULT-5-1. Provide carpool and vanpool parking, charging stations, and parking for EVs for City employees.

Supporting multiple commute options for City employees is an important step on the path to reducing the use of fossil fuels for transportation, one of Ashland's biggest sources of greenhouse gas emissions. Encouraging the use of ridesharing, vanpooling, and alternative fuel vehicle use among City staff will set an example for private citizens and serve as tangible evidence of the City's commitment to sustainability. Furthermore, some of this infrastructure—EV charging stations, for example—can be opened to the public, increasing its positive impact. The City could also pursue new policies and programs for encouraging City employees to drive less for their daily commute.

M
Mi ULT-5-2. Conduct a city fleet audit and use it to set policy and targets for higher-efficiency vehicles, vehicle-sharing across departments, and out-of-town vehicle use.

Conducting an audit of the City's vehicles is a straightforward and low-cost action that sets the stage for policies to govern the fuel efficiency of the fleet and/or mandate a transition to alternative fuel vehicles over time.

M
Mi ULT-5-3. Develop policy to require the purchase of verified carbon offsets to offset City staff travel.

Ashland has no control over the policies, fuel sources, and infrastructure of jurisdictions beyond the city limits. Purchasing carbon offsets is a straightforward action that allows the City to extend its commitment to reducing its emissions to staff who travel for work reasons. Furthermore, if the City's offset payments are invested in local projects, they can provide a wide range of co-benefits to the local community.

OTHER ACTIONS

- Improve biking amenities at City facilities such as showers, lockers, and covered/secured bike parking.
- Take advantage of potential opportunities under the new state clean fuels program.
- Increase incentives for sustainable City employee commuting such as through competitions or cost shares.



Rogue Valley Transportation District

The Rogue Valley Transportation District pools resources and shares service across a number of cities in the greater Jackson County area, while keeping costs down by taking advantage of economies of scale. The RVT currently operates seven routes that provide vital intercity public transit connections that enable car-free travel throughout the Rogue Valley, reducing the need for Ashland residents to own cars and providing greater mobility for children, students, the elderly, and others who may not be able to or want to drive.

In addition to providing standard bus service, the RVT operates a paratransit service that is available to senior citizens, people with disabilities, or others who are unable to use the standard bus service. In 2016, Jackson County voters approved a levy that restored Saturday and evening services, as well as expanded service to southwest Medford, Rogue Regional Medical Center, and the Rogue Community College Table Rock Campus.



The Role of the Community

Here are some actions that everyday Ashland residents and organizations can take to make a difference in addressing climate change.



Take a **walk**, ride a **bike**, or take **public transit**.

Leaving your personal vehicle behind when commuting or running errands can make a big difference for your carbon footprint and can also be a healthy and enjoyable alternative to driving.



Purchase a **fuel-efficient** vehicle.

When purchasing your next personal vehicle, consider more efficient alternatives such as hybrid or electric vehicles.





CONSUMPTION & MATERIALS MANAGEMENT

Consumption & Materials Management

Upstream emissions from the production and transportation of food and goods account for 48% of Ashland’s total emissions—more than any other sector.

A large portion of food emissions are from the production of meat, and household goods emissions are largely from home construction, furniture, clothing, and vehicle purchases. Because Ashland’s industrial sector is small and there is no significant agriculture within city limits, the Ashland community relies almost entirely on imported goods, food, and energy products to meet its needs. Encouraging greater local food production would have emissions reduction benefits while simultaneously improving food security and availability for Ashland’s residents. Climate change may disrupt global supply chains and thereby affect the cost of household goods and services that local residents and businesses rely on.

In some cases, buying “local” can reduce the lifecycle greenhouse gas emissions associated with the goods and services we buy—but not always. A peer-reviewed study found that the production of food accounts for 83% of the average American food-related greenhouse gas footprint, while the transport of food only represents 11% of lifecycle emissions.⁶ A reduction in red meat consumption can therefore be a more effective means to reduce a household’s food-related climate footprint than “buying local.” The strategies in this plan address both the production and transportation emissions associated with consumption of food and goods.

While emissions from consumption are large, they are “indirect” emissions that are not under the same level of community control as the local, sector-based emissions.

While Ashland might change local development codes to address building energy, there is no similar ability to influence production efficiencies for imported goods and services. Therefore, Ashland’s potential actions related to consumption and materials management mostly center on influencing consumption behavior and supporting a variety of local and/or more sustainable purchasing options for its residents.

Climate change is also expected to increase stressors such as pests, disease, and drought on the region’s small local agriculture sector, potentially reducing the availability of local food. Global climate change could also disrupt global markets and supply chains, potentially resulting in global price increases and resource scarcities.

⁶ Source: Weber and Matthews (2007).

Progress to Date

Ashland exemplifies its commitment to reduced waste and local sourcing through a variety of programs, ordinances, and offerings, such as the following:

- **Bans on plastic bags and polystyrene containers:** In 2014, the City approved an ordinance to substantially reduce consumption of single-use plastic carryout bags. The City also bans polystyrene foam food packaging at local restaurants, retail food vendors, and nonprofit food providers.
- **Community garden programs, farmers' markets, and co-ops:** Ashland enjoys a number of venues for growing and purchasing locally produced food, including at four City-sponsored community gardens, the Rogue Valley Growers and Crafters Market, and at retailers like the Ashland Food Co-op.
- **Residential curbside recycling programs and outreach:** Recology provides curbside recycling service to Ashland residents, as well as education and outreach programs on backyard composting and reduce/reuse best practices. Recology also provides a drop-off recycling center for some hard-to-recycle materials.

Goals and Indicators

Goals

- Reduce solid waste and wastewater greenhouse gas emissions.
- Increase waste diversion through waste prevention, recycling, and composting.
- Reduce consumption of climate-intensive food, products, and services.
- Support locally-produced products.

Potential Indicators

- Solid waste and wastewater greenhouse gas emissions.
- Waste diverted from landfill to recycling and composting.
- Consumption-related emissions.
- Number of community gardens and farmers markets.

Strategies and Actions

Strategy CM-1. Reduce consumption of carbon-intensive goods and services.

Because the City cannot directly influence how goods are produced outside its jurisdiction, its main feasible option is to reduce the use of targeted carbon-intensive goods and services by encouraging residents to change their consumer habits, such as by supporting shared use programs that reduce the need to own products.

PRIORITY ACTIONS

C
Mi CM-1-1. Implement an education campaign for waste and consumption reduction strategies.

Private consumption of food and goods is the largest single source of Ashland’s greenhouse gas emissions. While the City does not have the ability to directly control or reduce these emissions, it can encourage sustainable habits and purchasing decisions that target common sources of waste and carbon-intensive consumption. For example, the City could continue to include tips and instructions for energy-saving opportunities within City bills and newsletters, or provide additional information and outreach for replacing inefficient appliances, opting-out of junk mail, and exploring available reuse stores.

C
Mi CM-1-2. Support “collaborative consumption” community projects.

Collaborative consumption reduces demand for new products by facilitating the sharing and/or repair of existing products in the community. Tool libraries, for example, allow community members to avoid purchasing new tools by instead borrowing from a communal pool of donated tools. The City can explore how best to encourage sustainable consumption and sharing activities like tool libraries and repair cafes, such as through mini-grant programs.

C
Mi CM-1-3. Determine and implement effective ways to reduce and track consumption based emissions.

Current approaches for tracking and mitigating consumption-based emissions are coarse and relatively undefined. The City should continue to evaluate new approaches and tools for more accurately and effectively addressing this important emissions source.

Strategy CM-2. Support sustainable and accessible local production and consumption.

Supporting environmentally responsible production of goods and food locally—in or around Ashland—is beneficial because it eliminates the emissions associated with shipping goods to the city and gives the City greater influence over sustainable production practices.

PRIORITY ACTIONS



CM-2-1. Partner with nonprofit organizations to promote the purchase of local food and products.



One way the City can support sustainable local food production is to work with independent organizations to showcase and support climate-friendly retailers and products. The City could work with systems such as the Ashland School District, Southern Oregon University, and Asante Ashland Community Hospital to incorporate “climate-friendly first” food purchasing.



CM-2-2. Expand community gardening and urban agriculture opportunities.

Increasing the land and resources available for local agriculture can help satisfy a portion of the city’s demand for food, reducing the quantity of food that must be imported from outside the region. “Greening” public spaces can have numerous co-benefits, too, including offsetting the urban heat island effect and providing garden space to those who do not have yards. The City could work to expand existing local food programs at community gardens, schools, parks, and rooftops, such as by encouraging farms to work directly with organizations such as churches or schools to provide community-supported agriculture (CSA) programs.

OTHER ACTIONS

- Consider climate change-related risks to local supply chains in implementation of the economic development strategy.
- Work with nonprofits and universities to create outreach and training materials about agricultural practices that reduce greenhouse gas emissions and increase diversity and drought resistance.

Strategy CM-3. Expand community recycling and composting.

Diverting more waste away from the landfill is one of the most direct strategies Ashland can focus on to reduce the environmental impacts of the city's consumption. While the City cannot influence upstream production methods at factories and farms beyond its city limits, minimizing downstream waste has a clear and measurable positive impact that will help Ashland move toward its sustainability goals.

PRIORITY ACTIONS

C CM-3-1. Improve recycling programs, implement new education and outreach, and expand public space recycling.

Making recycling a convenient and straightforward process is crucial to helping Ashlanders to reduce waste disposal and increase diversion from the landfill. Education and outreach, better signage, and placing more bins in public areas are some of the potential ways to improve recycling in Ashland.

C CM-3-2. Update the multi-family recycling ordinance to encourage more diversion.

Mi Historically, increasing diversion rates from multi-family residential waste streams has been challenging. The City should update and expand recycling standards and requirements for existing and future multifamily housing to increase recycling diversion rates consistent with the Council approved recycling program updates. These actions should be implemented in accordance with recommendations provided by the ad-hoc Recycle Center Committee.

C CM-3-3. Strengthen the Demolition Debris and **Mi** Diversion ordinance to enhance enforcement and increase diversion and reuse.

Due in large part to the sheer quantity of material involved, home demolition has an outsized impact on Ashland's materials management strategy. Targeting buildings for reuse and salvage not only reduces the quantity of material being sent to the landfill, but also creates a local market of recovered building materials that can be used again in new construction projects, remodels, and landscaping. This actions calls for enhancing Ashland's current Demolition Debris and Diversion ordinance so that it is more strictly enforced and encourages further diversion and reuse of building materials. The City could explore the introduction of mandates for a greater percentage of deconstruction over time and also consider efforts to promote reuse of those materials in new construction projects.

OTHER ACTIONS

- Implement an education campaign for waste and consumption reduction strategies such as replacing inefficient appliances, opting-out of junk mail, and reuse stores.
- Examine options for expanding commercial and residential composting; assess the feasibility of establishing a permitted facility to compost or anaerobically digest organic materials and food waste.
- Improve City facilities to encourage waste reduction, such as by installing water bottle-filling stations.

Strategy CM-4. Reduce food waste.

Production of food is a large emissions source, and, unfortunately, a significant portion of the food that makes it into Ashland’s homes and businesses spoils or is otherwise wasted. Reducing this waste—and using the remaining food waste productively—will ensure that Ashland gets the most benefit possible out of its food. In addition to reducing the GHG emissions associated with wasted food, edible food that would have gone to waste can be donated to residents who might otherwise struggle to afford groceries.

PRIORITY ACTIONS



CM-4-1. Support edible food donation through coordination with the food bank and donations from City and community partner events.

The environmental benefits of reducing food waste means there is more food to share with those in need. This action calls on the City and community to work with the food bank to make sure edible leftover food at public events ends up on dining tables, not in the landfill.



CM-4-2. Provide a kitchen best practices guide to help households and businesses reduce food waste and consumption.

Educating residents and businesses on how to reduce food waste is a low-cost option to reduce wasted food, a preventable source of greenhouse gas emissions.



CM-4-3. Evaluate opportunities for recycling of commercial food waste.

While reducing food waste by addressing its root causes is the best option, some food waste will always remain. The City can serve a central role in taking advantage of this waste stream by arranging for discarded food to be used for energy production, including the use of cooking oil for biodiesel and biofuels. The City could also consider working with Recology to provide organic waste pickup services.

OTHER ACTIONS

- Seek grant funds to launch a food waste reduction campaign for residents, such as the U.S. Environmental Protection Agency’s Food: Too Good to Waste program.

Strategy CM-5. Improve sustainability of City operations and purchases.

City operations account for a relatively small portion of Ashland's emissions, they are a relatively easy target for sustainability improvements because the City has direct control over them.

PRIORITY ACTIONS

M

CM-5-1. Introduce environmentally preferable purchasing (EPP) guidelines for City procurement.

Mi

Creating an EPP policy is a low-cost action that would guide City staff to choose more sustainable products and services by modifying the procurement process. While the complexity of Ashland's existing procurement process may make this action more difficult to implement, it is worth considering because a wide range of cities similar to Ashland have successfully implemented EPP policies of their own. For example, the City could require evaluation of electronic equipment using the Electronic Product Environmental Assessment Tool (EPEAT).

M

CM-5-2. Assess the feasibility of co-digesting food waste and biosolids to generate electricity at the wastewater treatment facility.

Mi

Generating electricity from the gases captured from decomposing organic matter is a win-win strategy: it prevents harmful GHGs from entering the atmosphere, and it creates electricity that can offset the wastewater treatment facility's energy use or be fed back onto the power grid.

OTHER ACTIONS

- Promote online citizen services (such as permitting and bill payment) to reduce paper use and car trips.
- Evaluate the use of low-carbon concrete and/or recycled asphalt shingles on City buildings.
- Evaluate feasibility of increased use of recycled aggregate in residential street construction and sidewalks.



Rogue Valley Farm to School

The Rogue Valley Farm to School (RVF2S) program’s mission is to educate children about our food system through hands-on programs, and bring healthy, local foods to their school cafeterias. RVF2S has relationships with five local farms in the valley, including The Farm at SOU. The organization facilitates the purchase of locally grown produce by schools, assists food service staff with estimating annual produce needs, and helps farmers use this information to plan their seasonal planting. It also facilitates field trips to farms and the creation of sustainable on-site gardens at schools.



The Role of the Community

Here are some actions that everyday Ashland residents and organizations can take to make a difference in addressing climate change.



Eat carbon-friendly.

Animal products are extremely GHG-intensive to produce compared to plants. Eating less meat and dairy can make a big cut in food consumption emissions. Eating regionally-grown food that is suitable for the southern Oregon climate can also make a difference through reduced transportation-related emissions.



Plan, prepare, and store food carefully to waste less food.

Studies show that in America, approximately 40% of food never makes it to our dining tables—meaning the water, fertilizer, farm equipment, and transportation involved in producing this food and getting it to your refrigerator is wasted. Planning carefully when you shop and storing food properly can go a long way toward reducing food waste, and save you money, too.



Buy less new stuff.

The purchase of manufactured goods is one of the largest contributors to Ashland’s GHG emissions. Consider buying reused or borrowing items you only use infrequently to help reduce these emissions.



Buy things that last.

The fewer items you purchase, the better for the environment. Investing in quality items that last longer often also makes sense for your wallet, since you don’t have to keep replacing items when they break.





NATURAL SYSTEMS

Natural Systems

Although not formally accounted for in Ashland's greenhouse gas emissions inventory, natural ecosystems such as forests and wetlands capture and store carbon, acting as a greenhouse gas "sink." Proper ecosystem management optimizes this process of carbon sequestration and minimizes the potential risk of greenhouse gas emissions from wildfires.

The 2016 Ashland Forest Plan puts forth forest management objectives that take into account the important role of forests in a changing climate. Some relevant objectives from the plan include:

- Reducing the likelihood of high-severity fire through strategically placed fuels treatments and subsequent implementation of prescribed underburning to maintain reduced fuels and less fire-prone conditions;
- Managing for both growth and maintenance of older forests that may sequester and retain large amounts of carbon over time;
- Focusing on protection and restoration of diverse forest structures, plant communities and associated genetic resources which are important mechanisms of resilience;
- Emphasizing multiple tree species management including species well selected to thrive in future warmer and drier conditions such as pines, hardwoods and shrub species (within prescribed spatial considerations for their potential to aggravate fire potential and hazard); and
- Monitoring and control of invasive plant species that are prone to establishment and/or expansion in changing climates.

Many of Ashland's natural systems and surrounding natural areas will be harmed by climate change, threatening the ecosystem services they provide such as water filtration, flood abatement, pollination, recreation, and fire protection. Importantly, the effects of climate change on natural systems are interrelated and may compound each other; for example, more frequent and severe droughts will increase the risk of wildfires. Changes in temperature, snowpack, and the abundance of diseases and pests will stress sensitive and high-elevation plants, wildlife, and ecosystems such as the northern spotted owl, anadromous fish populations, and mid-elevation coniferous forests.⁷ Other stressors, such as habitat loss and pollution, exacerbate this risk by minimizing habitat connectivity and aggravating existing sensitivities.

Climate change may also benefit some species and ecosystems. For example, a species whose pathogens are sensitive to drought may experience reduced pathogen risk. However, these rarer cases are not the focus of this plan.

⁷ Source: Geos Institute (2016).

Progress to Date

The City of Ashland works within its city limits and with partners outside its limits to promote sustainable management and conservation of its natural ecosystems. Here are some ways the City is currently taking action:

- The **Ashland Forest Resiliency Project** has produced planning documents that consider optimized forest fuel management and wildfire planning in the face of climate change.
- A new city **Water Master Plan** will incorporate future climate risks to water supply and quality into future service planning and activities.
- The City promotes **drought-tolerant landscaping** through education, outreach, and technical assistance.
- The City water utility has a **tiered rate structure** to provide incentives for conservation among the largest water uses.
- The **2016 Ashland Forest Plan** calls for over 500 acres of wildfire hazard reduction in and around the City, over 150 acres of commercial thinning, and the establishment of a controlled underburning program to continually reintroduce the natural role of fire in our fire-dependent ecosystem.



Goals and Indicators

Goals

- Enhance ecosystem health and resilience.
- Ensure sustained access to clean air and drinking water.

Potential Indicators

- Acres of protected and restored habitat.
- Acres of forest maintained.
- Stream water quality.
- Water supply and consumption.

Strategies and Actions

Strategy NS-1. Promote ecosystem resilience.

Climate change has the potential to significantly disrupt local ecosystems by altering precipitation patterns, increasing average temperatures, and making extreme weather events more frequent and severe. These changes can affect a wide range of ecosystem features and functions, from causing fish die-offs to disrupting pollinators. Local government policies and actions will play a key role in protecting ecosystem elements from climate-related threats.

PRIORITY ACTIONS

C NS-1-1. Manage forests to retain biodiversity, resilience, and ecosystem function and services in the face of climate change. Use best available science to inform fire management and planning to manage ecosystem health, community safety, and carbon storage.

Responsible management of existing natural areas within and surrounding Ashland will bolster ecosystem health and prevent the breakdown of important ecosystem functions. The 2016 Ashland Forest Plan discusses these critical needs and considerations for City-owned forests in the context of a changing climate, and presents management approaches for balancing forest resilience, climate mitigation, and other priorities. The Ashland Forest Resiliency Stewardship Project addresses forest resilience beyond City-owned properties

through a plan that includes thinning smaller trees, reducing flammable fuels, and conducting controlled burns. Through these activities and close monitoring, adaptive management, and incorporation of future climate change projections into forest management and planning, the City will address climate change threats ecosystem stability and public health and safety.

C

Ad

NS-1-2. Use green infrastructure such as bioswales, permeable pavement, other pervious surfaces to reduce flood risk and minimize sediment entry into creeks from trails and roads.

Runoff from rainwater and snowmelt can carry pollutants and sediment into ecologically sensitive waterways. Pollution due to runoff and flooding in urban areas will likely become a more common—and more serious—problem for Ashland as climate change alters precipitation patterns and increases the frequency of severe rainstorms. Green infrastructure allows water to infiltrate into the soil, reducing the amount of polluted runoff that flows into sensitive creeks, wetlands, and other waterways. The City should continue to promote green infrastructure where possible and consider green infrastructure as a default option for on-site stormwater management.

C
Ad NS-1-3. Undertake restoration efforts to retain and restore native fish and riparian species, including enhancement of fish-friendly operations and habitat at Reeder Reservoir and in Ashland and Bear Creeks.

The fish and riparian species that call southern Oregon home will likely be increasingly stressed by water scarcity and other climate-driven impacts on the health of local waterways. Undertaking habitat restoration and protection efforts not only supports healthy stocks of these species, but can provide co-benefits to residents and visitors by creating beautiful natural environments for visitors to enjoy and educational opportunities for residents to understand and appreciate native ecosystems and species. The City delineates Riparian Management Areas (RMAs), and the City's Stream and Wetland Enhancement Guide provides a resource for learning to control erosion, manage invasive plants, and cultivate a healthy, native landscape. The 2016 Ashland Forest Plan lays out ecosystem service-driven management priorities within the over 5 miles of stream and 96 acres of riparian areas, as well as calls out specific opportunities for fisheries enhancement along Bear and Ashland Creek.

C
Mi
Ad NS-1-4. Map and protect areas that provide ecosystem services, such as remnant spring, wetland, and late successional forest habitats, through improved public lands management/ownership and promotion of conservation easements and private open spaces.

This action focuses on identifying and prioritizing the protection of the most important elements of the local ecosystem through public ownership and conservation easements. The 2016 Ashland Forest Plan provides a variety of maps that could be used to begin prioritizing areas for protection.

OTHER ACTIONS

- Update the City's approved street tree guide and landscape design standards for new development for tree species appropriate for a future local climate.
- Assess the deployment of ecosystem market approaches as a means to protect and restore ecosystems efficiently and effectively, such as by paying upstream landowners for water-friendly management of their lands.
- Complete a carbon inventory/assessment of the watershed area to support decision making on forest management.

Strategy NS-2. Manage and conserve community water resources.

While minimizing the City's water use internally is important, conserving water in the community can have a greater impact due to its scale. Water conservation can have double benefits in the face of a changing climate: it can help the community be more prepared for drought, and also reduce stress to aquatic ecosystems and thereby enhance the resiliency of those ecosystems to a variety of climate and non-climate stressors. Through education, policy, and incentives the City can encourage the community to make meaningful water use reductions.

PRIORITY ACTIONS



NS-2-1. Evaluate incentives for practices that reduce use of potable water for nonpotable purposes and recharge groundwater.

Incentives can be a valuable tool to reduce water use and encourage the installation of rainwater collection and water reuse systems. As a bonus, these systems offer stormwater prevention co-benefits. Similar incentives have been used successfully in a number of other cities. The viability and benefits of these practices are currently being examined as part of Ashland's Comprehensive Water Master Plan update, including exploration of options to promote and install graywater reuse at community gardens and other local urban agricultural areas, or better understand the rela-

OTHER ACTIONS

- Introduce a system whereby when a new building is permitted, a conversation is triggered around the introduction of feasible new technologies that reduce water and wastewater.
- Manage upstream flows to minimize downstream flood risk, such as through habitat protection, restoration, or adjusted reservoir management.
- Explore new technologies for treating wastewater for use.

tionship and tradeoffs between tree density and water availability.



NS-2-2. Explore water-efficient technologies on irrigation systems and consider requiring them during the permitting process.

Landscaping irrigation uses large quantities of water. Requiring advanced irrigation systems, especially for large commercial or multifamily properties, could have a significant impact on the city's water use. This action could also involve promotion of water-efficient landscape design and maintenance through revision of Site Design and Use Standards in the land use code.



NS-2-3. Expand water conservation outreach and incentive programs for residents and businesses.

Providing additional education and support to residents and businesses can help reduce water use by identifying easy, cost-effective ways to reduce water use; for example, by installing low-flow fixtures and faucet aerators. The City may consider providing additional financial incentives to encourage widespread adoption of these upgrades or to make more costly water-saving upgrades financially feasible all households, including lower-income families. This action could involve facilitating sustainability certifications, such as under the Salmon Safe certification program, at local businesses.

Strategy NS-3. Conserve water use within City operations.

While the City’s internal operations account for a relatively small portion of Ashland’s overall emissions, conserving resources sets a visible example that residents and businesses in the community can follow. Water use, in particular, will be important to minimize in the future: with more frequent and severe droughts due to climate-driven changes in precipitation and snowpack, Ashland and the surrounding area will have to manage its water resources to minimize the impacts of increasing water scarcity.

PRIORITY ACTIONS

 NS-3-1. Evaluate the potential for installation of rainwater collection systems at City facilities for graywater uses, and investigate opportunities for graywater reuse at existing and new City facilities and properties.



This action aims to reduce the quantity of filtered, potable water used at City facilities by using rainwater for nonpotable uses, such as toilet-flushing and irrigation. Graywater recycling could further reduce the quantity of fresh, clean water used by the City for nonpotable purposes.

 NS-3-2. Implement efficiency recommendations from the City facilities water audit.



The City is currently in the process of conducting an audit of water use at its facilities. The audit will help the City identify opportunities to reduce waste and improve the water efficiency of its operations.

OTHER ACTIONS

- Update City landscaping standards for reducing water consumption and chemical use.

The Ashland Forest Resiliency Project

The Ashland Forest Resiliency Project (AFR) is a ten-year stewardship project in the City's municipal watershed that aims to reduce wildfire risk and promote ecosystem resiliency on approximately 7,600 acres of land. The project is a collaborative effort between the Rogue River-Siskiyou National Forest, the City of Ashland, The Nature Conservancy, and the Lomakatsi Restoration Project. AFR focuses on restoring open forest conditions and reintroducing beneficial low-intensity fire to prevent damaging summer wildfires while saving large, old trees and preserving key habitat elements and ecosystem processes. In addition to implementing ecological forestry with workforce training and adaptive monitoring elements, the project includes an education component that has delivered presentations, tours, and field activities to more than 2,500 local students and citizens. AFR has recently expanded its reach to private and municipal lands over a broader 58,000 acre landscape to promote restorative work in ecologically important settings that also increase community wildfire safety.



The Role of the Community

Here are some actions that everyday Ashland residents and organizations can take to make a difference in addressing climate change.



Install **rain gardens, rain barrels, or cisterns** on your property.

Work with the City to learn about options for reducing stormwater runoff and increasing water storage and reuse at your home or business.



Be waterwise in your daily household water consumption.

Install water-efficient fixtures, take shorter showers, irrigate at night, and otherwise reduce water use.



Support **habitat protection and restoration**.

Volunteer at a habitat restoration event, donate to land conservancy or education organizations, and get outside!







PUBLIC HEALTH, SAFETY & WELL-BEING

Public Health, Safety & Well-being

Climate change may seem removed from issues of health, safety, and security, its effects may have significant impacts on Ashland's population. Increased heat waves, flooding, and wildfires threaten the health and safety of all residents, and Ashland's outdoor industry workers, the elderly and very young, and low-income populations are especially vulnerable.

Rafting, skiing, and other outdoor recreation industries may suffer from reduced snowpack and reduced summer flows, affecting workers throughout the local tourist industry. Increased wildfire risk will stress emergency services and increase the number of homes within wildfire risk areas. While many of the strategies and actions in other sections of this report have positive direct impacts or co-benefits on public health and safety, these issues are important enough to merit specific discussion. Without healthy, happy, and secure citizens, Ashland will not thrive.

Note: Emissions associated with public health, safety, and well-being are encapsulated in other sectors of the greenhouse gas inventory and therefore cannot be independently evaluated.

Progress to Date

Although the City of Ashland has limited influence over the health and social security of its residents, the City has made great strides in supporting the local economy and preparing for emergency events:

- **Firewise Ashland** provides residents of the wildland urban interface with the knowledge and skills necessary to prepare for wildfires.
- The **Social Service Grant and Community Development Block Grant** programs support disadvantaged and at-risk populations.
- The annual **Ashland is Ready** workshop provides emergency planning assistance and information for residents.



Goals and Indicators

Goals

- Protect public health from air pollution and climate impacts.
- Improve community capacity to understand, prepare for, and respond to climate change security risks.

Indicators

- Air quality
- Number of people that can be accommodated by available cooling centers.
- Tree canopy cover.
- Homes within the WUI.
- Percent of Ashland residents experiencing health issues such as asthma.

Strategies and Actions

Strategy PHSW-1. Manage ecosystems and landscapes to minimize climate-related health impacts.

With average temperatures on the rise and extreme weather events predicted to become more common due to climate change, Ashland will need to consider adapting its management of the cityscape and ecosystems to protect its residents' quality of life.

PRIORITY ACTIONS

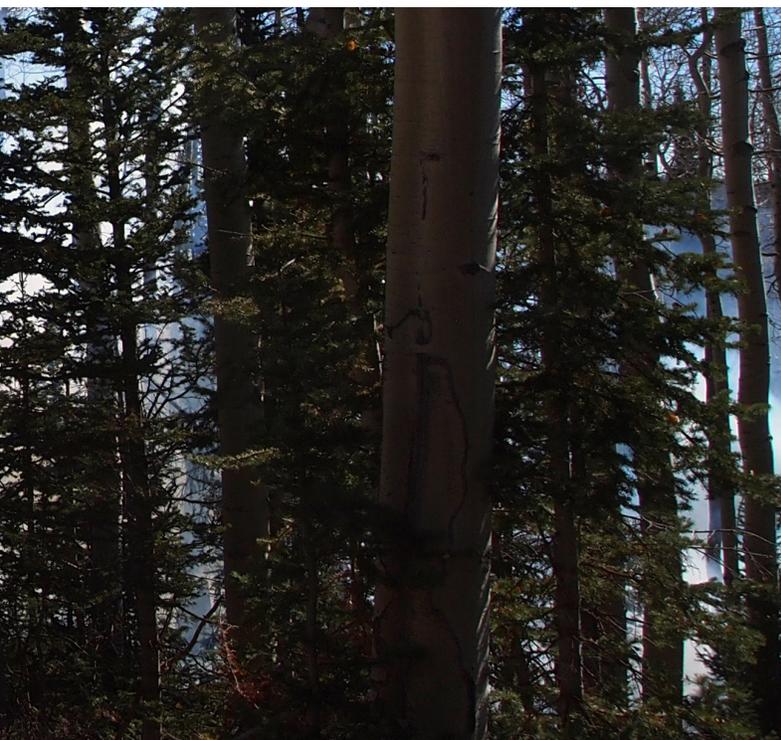
C PHSW-1-1. Promote the expansion of tree canopy in urban heat islands or areas that need air conditioning such as schools.

Ad

The urban heat island effect can have serious impacts on public health and quality of life, including causing heat-related fatalities among elderly or otherwise vulnerable people. The City can reduce this effect by increasing tree canopy cover in targeted areas that do not currently have adequate shade or air conditioning, as well as promote and educate citizens about the benefits of shading with trees and building features.

OTHER ACTIONS

- Evaluate and implement slash removal methods that minimize smoke production, such as air curtain burners.
- Develop an incentive program to convert fuel-burning lawn equipment such as gas-powered lawn mowers and blowers to electric.
- Evaluate opportunities to plant additional trees near city facilities to reduce heat island.



Strategy PHSW-2. Promote a sustainable local economy that minimizes emissions and vulnerability.

Becoming more sustainable and preparing for the effects of climate change will require more than government action; the private sector also plays a central role. The City can serve as a thought leader, facilitator, and central coordinator to spur climate action by a wide variety of independent businesses.

PRIORITY ACTIONS

 PHSW-2-1. Engage leading employers in a dialogue on climate action, for example, by organizing and facilitating roundtables.



This action involves bringing local employers together with City staff and independent experts to discuss how climate change will affect their businesses, how to minimize those risks, and how to effectively incorporate climate and sustainability concerns into their businesses.



PHSW-2-2. Support organizations, such as SOU, in evaluating risks to local food sources under climate change.

As discussed in Strategy CW-2, local food production minimizes greenhouse gas emissions associated with food transport, supports the local economy, and brings other sustainability benefits. As part of the City's work to support and expand local agriculture, it can consider supporting the work of other organizations to evaluate how local food sources may be stressed or affected by climate change, and how best to navigate the challenges to ensure that local farms remain viable and productive. This work would include researching new crops, technologies, and innovative approaches, and working with farmers to adapt to climate change.

OTHER ACTIONS

- Work with businesses to assess their climate change vulnerability and plan for the future.

Strategy PHSW-3. Minimize public health impacts.

Many of the facilities and services provided by the City can also serve as important venues for adapting to climate change. This strategy identifies ways that the City can work with the community to minimize public health impacts from climate change, such as heat, respiratory, and pathogen-related illnesses. This strategy also includes opportunities for the City to adjust or repurpose its current activities and facilities to help minimize public health threats, such as its libraries, parks, and emergency management services.

PRIORITY ACTIONS

C
Ad PHSW-3-1. Work with vulnerable populations to create specific adaptation strategies to address public health risks.

Some populations and areas of the city will be more vulnerable to climate impacts than others. The City can work to minimize the impacts on its most at-risk populations and areas by working with residents and local organizations to identify and implement customized solutions. For example, outlying areas exposed to wildfires or low-lying homes and businesses in flood zones could receive tailored trainings to ensure readiness for the risks of their location. The City could work with at-risk populations such as the elderly or disabled to identify specific challenges in the face of a changing climate and customized solutions such as accessible cooling centers or additional health services.

C
Ad PHSW-3-2. Identify and minimize potential urban heat impacts.

Climate change is expected to increase the number and severity of heat waves in Ashland, putting vulnerable people at greater risk of heat-related health complications and reducing the quality of life for all Ashland residents. The City can take steps to minimize the risks presented by heat waves by identifying where heat-related impacts will be most pronounced and working to encourage and/or directly implement strategies for offsetting these impacts, such as by designating cooling centers through the city, improving cooling systems in schools and senior centers, and incentivizing cooling strategies such as cool roofs/pavements and expanded tree canopy.

C
Ad PHSW-3-3. Develop or enhance heat-warning systems for employees and the public.

Heat-warning systems help minimize the health dangers associated with extreme heat by giving the public a chance to plan ahead to avoid being outside or take refuge at a designated cooling center during the hottest periods.

OTHER ACTIONS

- Educate public and public health professionals about health risks posed by climate change, including potential changes in air quality and impacts on mental health.
- Adjust City-sponsored outdoor activity schedules and plan for indoor alternatives to accommodate longer and hotter summer seasons.

Strategy PHSW-4. Minimize public safety impacts.

Climate stress adds additional burdens to City safety services. This strategy involves taking measures within City operations and current services to protect the public from injuries caused by extreme events like wildfires and flooding.

PRIORITY ACTIONS

C
Ad PHSS-4-1. Update the City's emergency response plan and ensure that preparation and updates recognize and address likely climate change impacts.

From wildfires to floods, the emergencies that Ashland faces will increasingly be linked to climate change. The City can protect its citizens from these emergencies by incorporating climate projections and likely impacts into its existing emergency response plan.

C
Ad PHSS-4-2. Identify and address populations and essential City services that are within the 100-year flood zone.

Climate-driven changes in precipitation and snowmelt patterns will likely increase the frequency and severity of flooding in the city. One way Ashland can mitigate the damage of severe floods is by identifying populations and essential services in flood-prone areas and working to relocate or protect them. This action could include examining adjustments to the Water Resources Ordinance chapter of the land use code, which stipulates setback requirements for properties located within at-risk areas.

OTHER ACTIONS

- Expand and publicize the Ready, Set, Go! Evacuation program.
- Utilize federal and state reporting and monitoring assets, such as the National Oceanic and Atmospheric Administration's Hazard Mapping System, to prepare for smoke and wildfire impacts.



The Role of the Community

Here are some actions that everyday Ashland residents and organizations can take to make a difference in addressing climate change.



Assemble an **emergency kit**.

Jackson County offers tips and checklists to help residents create emergency kits for their homes and cars. Visit the Jackson County Emergency Management website or contact Jackson County for more information.



Stay informed.

Sign up for Citizen Alert!, a free program from Jackson County that sends community alerts to your phone and email when you register online.



Prepare your home for the extremes.

Understand the risk of flooding or wildfire to your home, and take action to safeguard your home. Ashland provides free Firewise assessments for properties at potential risk of wildfire. Find more information at the City's Ready, Set, Go! evacuation website.



Understand the risks and how to mitigate them.

Injuries from heat exhaustion and wildfire smoke can be exacerbated by conditions such as dehydration, diabetes, heart conditions, and obesity. Staying healthy, avoiding harmful activities, and taking proper precaution can make sure you and your family are safe from deadly heat- and smoke-related illnesses.



Firewise Ashland

Ashland is part of Firewise Communities/USA, a national program that empowers neighbors to work together to reduce the wildfire risk around homes. The City received its first Firewise Communities/USA recognition award in 2011, and now the program recognizes twenty-five different Ashland neighborhoods with 4 in the process. The program provides a framework for residents living within the wildland/urban interface (WUI) for proactive mitigation efforts like addressing home construction and fire-resistant landscaping. These actions are designed to help houses withstand wildland fire without intervention like fire-fighting services. For more information or to become a Firewise neighborhood, visit ashlandfirewise.org or call Ashland Fire and Rescue.





CROSS-CUTTING STRATEGIES

Cross-Cutting Strategies

Progress to Date

Addressing climate change requires working across sectors to incorporate climate change considerations into all that we do. Only through a coordinated and multifaceted effort can significant progress be made. The City of Ashland has demonstrated a commitment to comprehensive climate action through development of this Climate and Energy Action Plan. Prior to the plan, the City also completed its first citywide greenhouse gas inventory, which served as an essential benchmark for understanding and taking action against the community's greatest GHG emission sources. The City has also hosted a number of public outreach and engagement events around climate change and sustainability, including the Ashland Climate Challenge in 2015.

Goals and Indicators

Goals

- Increase awareness of city climate goals and needs.
- Integrate climate change considerations into day-to-day City operations, planning, and decisionmaking.

Potential Indicators

- Public and City staff knowledge and understanding of climate change issues and actions.
- Number of City plans or activities that incorporate climate change considerations.



Strategies and Actions

Strategy CC-1. Educate and empower the public.

Addressing community-wide emissions starts with ensuring that the public understands climate change and what they can do to address the challenge. This strategy involves not just enhancing public knowledge, but also continuing to learn and understand the needs and challenges the public faces in taking action. It focuses on finding ways to address the public's needs and challenges through incentives, education, and behavior change programs.

PRIORITY ACTIONS

C CC-1-1. Create a formal public outreach and education plan to inform the community about climate actions and progress.



An informed community is critical to empowering and inspiring climate action. The outreach and education plan will inform residents about climate actions, what they accomplish, how they can be accessed or used, and how the community is progressing toward its targets.



CC-1-2. Support capacity of neighborhood and community groups to implement climate mitigation and adaptation initiatives.

Every community is different in how it affects and is affected by climate change. To accommodate these differences and to empower communities to take action, the City should provide resources and support for neighborhoods that wish to tackle climate change directly. Options could include providing resource guides or checklists, venues for community meetings, or mini-grant programs for specific adaptation actions. This action could include plans to conduct outreach specifically to schools and other important institutions and organizations in the city.



CC-1-3. Assess the feasibility of a City-sponsored carbon offset program.

In cases in which additional local, on-site emission reductions are not possible, the purchase of offsets can help the community attain additional emission reductions needed to meet the city's climate mitigation goals. The City should explore options for facilitating purchase of offsets by Ashland community members, such as through development of an online tool or interface.

OTHER ACTIONS

- Develop a climate-ready recognition program.



Strategy CC-2. Educate and empower City staff.

Tasked with implementing the Climate and Energy Action Plan, City staff and leadership must understand threats and issues related to climate change and the actions needed to address it. This strategy deals with ensuring that all City departments inform their staff members about the Climate and Energy Action Plan and clarify their roles and expectations for its implementation.

M
Mi
Ad CC-2-1. Ensure all City departments educate their staff members about the Climate and Energy Action Plan.

This action includes identifying the expectations, roles, and responsibility of each department in meeting specific community and City operations actions within the Climate and Energy Action Plan.

Strategy CC-3. Mainstream and integrate climate considerations.

As a cross-cutting issue, climate change should be integrated into all other City activities and processes, as relevant. This means that any decision that could affect or be affected by climate change should explicitly address that connection and ensure coherence with the city's climate action goals. For example, climate change should be considered in all City Council policy, budgetary, or legislative decisions, and as part of regular City Council communications.

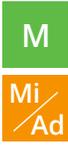
M
Mi
Ad CC-3-1. Consider climate change in all City Council policy, budgetary, or legislative decisions and as part of the Council Communication document template.

Council decisions present key points in the policy-setting process for incorporating and considering City priorities. Analyzing how policy, budgetary, and legislative decisions may affect or be affected by climate change during these key decision points will provide further assurance that no new policy or decisions hinder progress toward reaching Ashland's climate goals.

M
Mi
Ad CC-3-2. Incorporate CEAP goals and actions in future updates of city plans.

To enhance integration of climate change across City activities, climate mitigation and resiliency goals set forth in this plan should be promulgated through future updates of related City plans. Example plans to which this action would apply include the City Comprehensive Plan, Water Master Plan, Transportation System Plan, Neighborhood Master Plans, Forest Plan, and Emergency Management Plans.





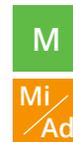
CC-3-3. Include consideration and perpetuation of climate action goals within the scope of every appropriate City Advisory Commission.

There are a variety of existing City Commissions that focus on topics related to climate change. This action involves making an explicit connection to the role of climate change in the purview of these Commissions, and formalizing the inclusion of climate considerations and goals into the activities and objectives of those Commissions.



Strategy CC-4. Engage with other governments and organizations around regional, statewide, national, and international climate policy and action.

The City of Ashland can learn from the experience of others, and a larger, unified coalition can be more powerful. This strategy involves coordinating with other local governments that have set ambitious climate targets, such as Eugene, Portland, Seattle, and Fort Collins, to learn from their experiences, share best practices, and together advocate for broader regional, state, and national action and leadership.



CC-4-1. Engage with other governments and organizations around regional, statewide, national, and international climate policy and action.

Ashland should continue to collaborate with neighboring cities to share information and foster coordinated and unified action. The City should lead and pursue a partnership model, such as the King County-Cities Climate Collaboration in Washington State, to coordinate and enhance the effectiveness of local government climate and sustainability action within its region.



NEXT STEPS

The goals, strategies, and actions presented in this plan signify an ambitious step forward for the Ashland community.

Although sustainable living, operations, and management is not new to Ashland, this plan pulls together the strong momentum and action that already exists in the city and provides a coordinated and intentional strategy going forward. Making progress on these goals will require Ashland's government and community to work together and commit dedicated time and resources.

This Climate and Energy Action Plan is only the beginning of an ongoing process. The accompanying Implementation Plan provides a framework for launching the implementation phase of the plan. This phase will require the City and community to take priority actions--outlining specific plans of action and resource needs among responsible parties--and monitoring and benchmarking progress along the way.

As details are outlined, more specific quantitative goals and milestones can be created, driving the pace of strategy implementation. The Implementation Plan also details the proposed structure for ongoing plan implementation, monitoring, evaluation, and adaptive management, as well as a list of key actions to be taken in the first year of implementation. It concludes with a discussion of how the goals and strategies of this plan fit with a potential ordinance establishing binding greenhouse gas emission reduction targets.

Through careful and committed action by all Ashlanders, and with this plan as a basis, the city can achieve its vision of becoming a resilient community that has zero-net greenhouse gas emissions, embraces equity, protects healthy ecosystems, and creates opportunities for future generations.

Implementation Plan

This implementation plan sets forth a proposed structure and schedule for implementation of the Climate and Energy Action Plan (CEAP). It contains the following sections:

- **Year 1 Implementation Summary:** A summary of key tasks to be accomplished in Year 1 of CEAP implementation, described in more detail in the following sections.
- **Oversight:** An ongoing structure for ongoing citizen oversight and involvement in CEAP implementation and long-term plan updates.
- **Accountability and Enforcement:** Potential policy mechanisms for ensuring that the CEAP is implemented to its full potential.
- **City Staffing and Leadership:** A structure for ongoing City staff resources and leadership for ensuring implementation of the CEAP and its ongoing success.
- **Funding:** Potential funding mechanisms and opportunities for financing specific CEAP actions.
- **Monitoring and Evaluation:** A mechanism and set of metrics for monitoring and evaluating CEAP progress and updating the plan as necessary.
- **Equity:** Guidance for ensuring that equity is considered in CEAP implementation.
- **Near-term Actions:** CEAP actions to be implemented by 2020.
- **Implementation Schedule:** Implementation detail for each priority CEAP action, including relative measures of action cost and effectiveness; accompanying co-benefits; timeframes for implementation; and responsible departments.

Year 1 Implementation Summary

The focus in 2017 will be on establishing the institutional foundation for plan implementation and taking initial steps on key priority actions. Table 1 provides a schedule and key milestones for Year 1. Key activities to undertake are:

- **Formalize the city’s commitment** to CEAP actions and goals (e.g., ordinance).
- **Create and hire a full-time , permanent City CEAP staff position** that also includes clear high level management oversight and direction.
- **Form and convene a permanent City Advisory Commission** to provide guidance and oversight of plan implementation and future plan updates as described in the plan.
- **Create an internal City Climate Action Team** for City operations actions and to assist in coordinating the implementation of community actions that span multiple City departments.
- **Designate potential funding sources** for individual actions and identify additional funding needs and opportunities for ongoing plan implementation.
- **Establish CEAP progress indicators** and corresponding baselines and targets (including equity indicators).
- Determine and formalize Ashland’s approach to incorporating **equity considerations** into plan implementation.
- Commence priority **near-term CEAP actions.**

Oversight

A Citizen Advisory Commission is recommended to oversee implementation of the CEAP. The Commission will be composed of stakeholders who represent Ashland residents, have interest, experience or expertise on climate-relevant topics or related policy work, and/or represent key community or civic organizations that may play a role in implementation.

Roles of the advisory committee could include:

- Monitoring and tracking progress towards meeting CEAP goals.
- Providing recommendations to the Climate and Energy Coordinator regarding CEAP progress and implementation.
- Ensuring that the CEAP stays up-to-date over time, with a focus on the three-year plan update cycle
- Reviewing and making recommendations as part of the three-year greenhouse gas (GHG) inventory update process

It is expected that the Commission will meet at least quarterly, and likely more often in the early stages of implementation.

Accountability and Enforcement

Adoption of this Climate and Energy Action Plan will demonstrate the City of Ashland’s commitment to addressing the challenge of climate change in the Ashland community. Establishing a more formal City commitment to CEAP goals, such as through an ordinance, would be seen by many as reinforcing the importance of this plan and could help ensure implementation of CEAP actions and measurable progress toward meeting CEAP goals over time. A formal commitment can also be a considerable asset in the pursuit of grant funds and other funding sources to assist in the implementation of the plan.

Table 1. Schedule and key milestone for Year 1 CEAP implementation.

Item	FY17 Q1	FY17 Q2	FY17 Q3	FY17 Q4
Citizen Advisory Commission				
Ordinance				
City Staffing and Leadership				
Internal City Climate Action Team				
Identification of Specific Funding Sources				
Progress Indicators				
Equity Considerations				
Priority Near-Term Actions				

City Staffing and Leadership

The plan calls for the creation and hiring of a new, full-time City Climate and Energy staff position dedicated to and charged with coordinating both internal and external implementation of the CEAP.

Job responsibilities of the position include the following:

- Provide lead staff support to the CEAP Advisory Commission.
- Work with City departments to facilitate, design, and track strategy and action implementation.
- Develop and lead outreach efforts with external stakeholders, including public, to encourage taking actions identified in the CEAP.
- Provide leadership and direction to the City's internal advisory team on implementation activities, tracking, progress updates and developing advisory team recommendations to relevant internal and external implementing parties.
- Lead development and presentation of annual CEAP progress reports, as well as plan updates.
- Develop and implement a system to systematically review, adjust, and update plan strategies and actions as needed.
- Develop and lead the planned three year update cycle for the community and city greenhouse gas inventory
- Implement and maintain a dashboard or other interactive and publicly accessible platform for tracking and communicating progress to internal and external stakeholders.

The Climate and Energy staff position will have the following qualifications:

- Familiarity and working experience with both climate mitigation and adaptation, including greenhouse gas accounting methodologies and climate change projections and anticipated impacts.
- Experience managing climate-related programs that involve both internal and external stakeholders.
- Experience with public outreach and citizen engagement, preferably at the local municipal level.
- Experience managing climate-related programs that involve both internal and external stakeholders.

It is anticipated that an internal Climate Action Team will be formed within the City to coordinate and implement CEAP actions. The following departments should be represented as part of the Climate Action Team:

- Community Development (including Building Division and Planning Division)
- Ashland Municipal Utility (Electric)
- Administration
- Parks and Recreation
- Conservation
- Public Works
- Fire

Funding

Funding for near-term actions of the CEAP will come from a variety of sources within the City budget depending on the type of action, the responsible department, and the legal and operational limitations of the particular funding source. Additionally, some of the actions recommended in the plan are expansion of existing City programs or efforts and therefore already have funding sources. However, incremental funding increases may be needed to meet the higher level of action called for in the plan.

Current and potential funding sources include:

- City general fund
- Electric Utility revenues
- Stormwater Utility revenues
- Water Utility revenues
- Bonneville Power Administration
- Federal and state grants
- Revolving loan funds
- Newly identified funding sources

As the implementation commences in earnest, City staff and the proposed CEAP advisory committee should pay particular attention to additional funding sources. This examination should include exploration of specific grant opportunities targeted at individual plan actions, potential new local revenue streams such as from a carbon/fuel tax, and multi-jurisdiction or public/private partnerships to provide the resources needed for City and community goal achievement.



OFFSETS

Every time Ashland completes its greenhouse gas inventory, the City and community can evaluate the need to purchase carbon offsets to help meet emission reduction goals. Offsets provide a pathway for achieving emission reductions beyond what can be achieved internally.

Purchasing offsets means counting emission reductions achieved by another party and often in another geographic area. For example, Ashland could purchase offsets from Bonneville Environmental Foundation, which offers emissions reduction credits from regional and global renewable energy projects, forest enhancement projects, and waste methane and heat capture projects.

When an entity sells their carbon offsets, those emission reductions cannot be counted by anyone except the party that purchased the offsets, thereby minimizing the risk of double counting.

Monitoring and Evaluation

Progress toward meeting CEAP targets and goals will be evaluated and tracked on an action-by-action basis with an overall progress report for all actions and activities provided on at least an annual basis. If possible, qualitative updates will be available on a quarterly basis.

The plan will be evaluated and updated on a three-year cycle to ensure that plan strategies and actions reflect the latest knowledge and best practices around climate mitigation and adaptation. The plan will also be reevaluated to assess whether actions are sufficient to meet emission reduction goals and, if not, to add new or expanded actions to the plan. To facilitate the three-year update, the Ashland community and City greenhouse gas inventories will also be updated on recurring cycle, one year in advance of the plan update process. This cycle will provide City staff and the proposed commission with concrete measurement results to inform plan evaluation and updates.

At a minimum, the following indicators will be tracked and reported on at least an annual basis. Due to data availability limitations, some of these indicators will require establishment of baseline and target values for meeting CEAP goals—to be developed in Year 1 of implementation. Additionally, it is expected that some methodologies for measuring some indicators, such as consumption-based greenhouse gas emissions, will evolve and improve over time.

Further development and build-out of the monitoring and evaluation indicators likely form a significant opportunity for the proposed new commission to work on as an early oversight activity.

Equity indicators will also be monitored, as available (see “Equity” section on page 113).

Potential Progress Indicators

CEAP Goal	Primary Goal	Indicator	Target	2015 Baseline
Overarching Goal 1: Reduce GHG Emissions				
	Mi	Community GHG emissions (mtCO ₂ e)	8% reduction per year	342,480
	Mi	City GHG emissions (mtCO ₂ e)	0 by 2030	10,757
	Mi	Fossil fuel consumption (MMBTU)	50% reduction by 2030; 100% reduction by 2050	Unknown
Overarching Goal 2: Prepare for Climate Impacts				
	Ad	N/A (see individual focus areas)	N/A	N/A
Buildings and Energy				
Reduce building GHG emissions.	Mi	Building GHG emissions (mtCO ₂ e)	8% reduction per year	82,426
Increase energy and water efficiency in City and private buildings.	Mi	Energy & water use per square foot (MMBTU/sf & CCF/sf)	TBD	Unknown
Protect Ashland's building stock and energy supply from climate impacts.	Ad	Proportion of buildings that use heat-resistant materials, passive heating/cooling, and/or white roofs (%) Local renewable energy production (%)	TBD	Unknown
Urban Form, Land Use & Transportation				
Reduce transportation GHG emissions.	Mi	Transportation GHG emissions (mtCO ₂ e)	8% reduction per year	79,000
Reduce community & City employee vehicle miles traveled.	Mi	Vehicle miles traveled (miles)	TBD	Unknown
Improve vehicle efficiency and expand low-carbon transport, including within City's fleet.	Mi	Emissions per mile traveled (mtCO ₂ e/mile) Transit ridership (passenger miles) and bicycling	TBD	Unknown
Support local and regional sustainable growth.	Mi/Ad	Average city "Walk Score"	TBD	53 ^a
Protect transportation infrastructure from climate impacts.	Ad	TBD	TBD	TBD
Consumption & Materials Management				
Reduce solid waste & wastewater GHG emissions.	Mi	Solid waste & wastewater GHG emissions (mtCO ₂ e)	% reduction per year	6,923
Increase waste diversion through waste prevention, recycling, and composting.	Mi	Waste diverted from landfill to recycling and composting (%)	TBD	Unknown

IMPLEMENTATION PLAN

ASHLAND CLIMATE & ENERGY ACTION PLAN

Potential Progress Indicators, Continued

CEAP Goal	Primary Goal	Indicator	Target	2015 Baseline
Reduce consumption of climate-intensive food, products, and services.	Mi	Consumption-related emissions (mtCO ₂ e)	8% reduction per year	166,731
Support locally-produced products.	Mi Ad	Community gardens (#) Farmers markets (#)	TBD	4 gardens; 1 farmers market
Natural Systems				
Enhance ecosystem health and resilience.	Mi Ad	Water quality (EPA score out of 100) Acres of forest maintained Acres of protected and restored habitat	TBD	Water quality = 60/100 ^b Over 2,000 acres of forests maintained ^c
Ensure sustained access to clean air and drinking water.	Ad	Water consumption (avg MGD)	TBD	4.5 MGD ^d
Public Health, Safety & Security				
Protect public health from air pollution and climate impacts.	Ad	Air quality (EPA score out of 100) Cooling center capacity (# people) Tree canopy cover (%)	TBD	Air quality = 70/100 ^b
Improve community capacity to understand, prepare for, and respond to climate change security risks.	Ad	# homes in the wildland urban interface (WUI)	TBD	1,400 homes ^e
Cross-Cutting Strategies				
Increase awareness of city climate goals and needs.	Mi Ad	Public and staff knowledge and understanding of climate change issues and actions (e.g., # students engaged in AFR project)	TBD	(e.g., over 2,000 students ^f)
Integrate climate considerations into City operations, planning, and decision-making.	Mi Ad	Number of other City plans or activities that incorporate climate change considerations	TBD	2 (Water Master Plan Update; 2016 Ashland Forest Plan)

^a Source: <https://www.walkscore.com/OR/>

^b Source: <http://www.bestplaces.net/health/city/oregon/ashland>

^c Source: http://www.ashland.or.us/Files/Fall_2016Flyer_Updated_9272016_Final%20Draft.pdf

^d Source: <http://www.ashland.or.us/Page.asp?NavID=17045>

^e Source: <http://www.ashland.or.us/Page.asp?NavID=13511>

^f Engaged in AFR project from 2010 to 2014 (Source: 2016 Ashland Forest Plan)

Equity

Each action of the CEAP should be implemented in an equitable manner that addresses Ashland’s unique equity issues and concerns. The sections below provide suggestions for ensuring equitable implementation of the CEAP. It is expected that specific criteria and indicators will be determined and formalized in Year 1 of CEAP implementation.

explicitly integrated into the cross-cutting strategy CC 3 1 “Consider climate change in all City Council policy, budgetary, or legislative decisions. Incorporate climate action considerations/relationship as part of the Council Communication (staff report) document template.” The inclusion of equity considerations as part of the standard formal communication template for City Council deliberation and decision making ensures that equity related impacts of City Council decisions are by default considered in the deliberation and able to be understood and commented on by the public.

Equity Considerations

When planning for implementation, the City should consider equity impacts and potential benefits. For example, the City of Portland put forth the following equity considerations in implementation of their Climate Action Plan:

EQUITY CONSIDERATIONS

Disproportionate impacts	Does the proposed action generate burdens (including costs), either directly or indirectly, to communities of color or low-income populations? If yes, are there opportunities to mitigate these impacts?
Shared benefits	Can the benefits of the proposed action be targeted in progressive ways to reduce historical or current disparities?
Accessibility	Are the benefits of the proposed action broadly accessible to households and businesses throughout the community — particularly communities of color, low-income populations, and minority, women and emerging small businesses?
Engagement	Does the proposed action engage and empower communities of color and low-income populations in a meaningful, authentic and culturally appropriate manner?
Capacity building	Does the proposed action help build community capacity through funding, an expanded knowledge base or other resources?
Alignment and partnership	Does the proposed action align with and support existing communities of color and low-income population priorities, creating an opportunity to leverage resources and build collaborative partnerships?
Relationship building	Does the proposed action help foster the building of effective, long-term relationships and trust between diverse communities and local government?
Economic opportunity and staff diversity	Does the proposed action support communities of color and low income populations through workforce development, contracting opportunities or the increased diversity of city and county staff?
Accountability	Does the proposed action have appropriate accountability mechanisms to ensure that communities of color, low-income populations, or other vulnerable communities will equitably benefit and not be disproportionately harmed?

IMPLEMENTATION PLAN

ASHLAND CLIMATE & ENERGY ACTION PLAN

Equity Indicators

Progress toward advancing equity through implementation of the CEAP will also be assessed as part of the monitoring and evaluation process. Identification and baseline assessment of relevant indicators will be an important part of Year 1 implementation. Potential process and outcome indicators related to climate resilience implementation identified by the National Association for the Advancement of Colored People (NAACP), for example, including the following:

EXAMPLE CLIMATE RESILIENCE PROCESS / OUTCOME INDICATORS

Infrastructure	Solar and wind installation – community level, home, commercial/business (mapping/distribution)
Economic Development and Jobs	New, local jobs created
Food Security	Businesses temporarily or permanently closed (net new businesses)
Housing	Community Workforce Agreements for redevelopment projects
Healthcare Services	Households identified as food insecure
Emergency Management	Property values increased or reduced
Planning and Decision Making	Health care and mental health facilities

Phase I Actions

The following twenty actions were identified as Phase I priority actions. Actions were identified as Phase I that meet one or more of the following criteria:

- **Easy, early wins** – relatively straightforward actions that demonstrate climate action and help the City hit the ground running on making progress toward climate goals.
- **Foundational steps** – actions that set the stage or guide direction for other actions.
- **Complex, but important initiatives** – actions that will make a big difference but may be challenging or resource-intensive to implement, so getting started as early as possible will be important.
- **Windows of opportunity** – actions align with or could synergize with other City plans, projects, or initiatives, and so should be implemented concurrently.

	Scope	Type	Criterion
Buildings and Energy			
BE-1-1. Develop a comprehensive plan for the Municipal Electric Utility. Initiate planning process in 2017.	C	Mi	Foundational step
BE-1-2. Promote switching to low- and non-carbon fuels. Integrate as part of planning in BE-1-1.	C	Mi	Complex, but important
BE-1-3. Facilitate and encourage solar energy production. Begin exploring increased local solar energy production as part of the 10-by-20 ordinance implementation.	C	Mi/Ad	Window of opportunity
BE-1-4. Enhance production of on-site solar energy from City facilities. Prioritize and development implementation plan and funding for recently completed City facility solar audit.	M	Mi/Ad	Window of opportunity
BE-2-1. Increase outreach efforts to expand participation in energy efficiency programs and promote climate-friendly building and construction. Update the land use code for conservation housing density bonus, expand participation in City's Smartbuild program, and expand zero-interest loan program opportunities.	C	Mi	Easy, early win
BE-3-1. Use results from City Facilities Energy Audit to prioritize City Facilities Capital Improvement Plans (CIPs) and maintenance improvements. Budget funds are secured to begin this action immediately.	M	Mi	Easy, early win
Urban Form, Land Use & Transportation			
ULT-1-2. Work with RVTD to implement climate-friendly transit. Begin conversations with RVTD to begin transitioning to lower emission buses and exploring ways to expand access and ridership.	C	Mi	Complex, but important
ULT-2-1. Implement bicycle- and pedestrian-friendly actions in the City's Transportation System Plan and Downtown Parking Management Plan. Begin implementing capital improvement plans as part of TSP implementation.	C	Mi	Window of opportunity
ULT-2-2. Explore additional opportunities to convert to shared streets where appropriate to provide multimodal connectivity. Pursue East Main St super-sharrow concept through Transportation Commission.	M	Mi	Window of opportunity
ULT-3-2. Revise land use codes to require EV charging infrastructure at multifamily and commercial developments. Draft revised code.	C	Mi	Complex, but important
ULT-3-3. Provide information about electric and hybrid vehicles and incentive programs on the City website.	C	Mi	Easy, early win
ULT-4-1. Regulate new development in the Wildfire Lands Overlay part of the urban growth boundary. Explore available policy instruments or incentives for regulating building materials and vegetation management for new development.	C	Ad	Complex, but important

IMPLEMENTATION PLAN

ASHLAND CLIMATE & ENERGY ACTION PLAN

	Scope	Type	Criterion
Consumption and Materials Management			
CM-2-1. Partner with nonprofit organizations to promote the purchase of climate-friendly food and products. Implement as part of Economic Development Strategy 1.3: local import substitution.	C	Mi	Easy, early win
CM-2-2. Expand community gardening and urban agriculture. Offer additional trainings, programs, and gardening areas.	C	Mi/Ad	Easy, early win
Natural Systems			
NS-1-1. Manage forests to retain biodiversity, resilience, and ecosystem function and services in the face of climate change. Use best available science to inform fire management and planning. Continue efforts as part of the Ashland Forest Resiliency Project, and implement actions in the 2016 Ashland Forest Plan.	C	Ad	Window of opportunity
NS-1-3. Undertake restoration efforts to retain and restore native fish and riparian species. Identify and create new restoration sites, and continue maintaining existing sites.	C	Ad	Easy, early win
NS-2-2. Explore water-efficient technologies on irrigation systems and consider requiring them during permitting.	C	Mi/Ad	Complex, but important
Public Health, Safety and Well-being			
PHSW-2-1. Engage leading employers in a dialogue on climate action. Convene ongoing, organized meetings in partnership with the Chamber of Commerce.	C	Mi/Ad	Foundational step
PHSW-3-1. Work with vulnerable populations to create specific adaptation strategies that address public health.	C	Ad	Foundational step
Cross-Cutting Strategies			
CC-1-1. Create a formal public outreach and education plan to inform the community about climate actions.	C	Mi/Ad	Foundational step
CC-1-2. Support capacity of neighborhood and community groups to implement climate mitigation and adaptation initiatives. Begin identifying and engaging in a dialogue with community groups and populations.	C	Mi/Ad	Foundational step
CC-1-3. Assess the feasibility of a City-sponsored carbon offset program. Begin evaluating options and associated costs and benefits.	C	Mi	Foundational step
CC-2-1. Ensure all City departments educate their staff members about the Climate and Energy Action Plan. City CEAP Coordinator can engage with each department.	M	Mi/Ad	Foundational step
CC-3-1. Consider climate change in all City Council policy, budgetary, or legislative decisions and as part of the Council Communication document template.	M	Mi/Ad	Complex, but important
CC-3-2. Incorporate CEAP goals and actions in future updates of city plans.	M	Mi/Ad	Window of opportunity
CC-3-3. Include consideration and perpetuation of climate action goals within the scope of every appropriate City Advisory Commission.	M	Mi/Ad	Foundational step
CC-4-1. Engage with other governments and organizations around climate policy and action. Join a formal organization such as ICLEI to explore best practices and establish relationships with peer communities.	M	Mi/Ad	Foundational step

Phase II Actions

The following forty actions were identified as Phase II priority actions. Priority actions that were not identified as Phase I were assigned as Phase II.

	Scope	Type
Buildings and Energy		
Strategy BE-2. Encourage increased building energy efficiency and conservation.		
BE-2-2. Require building energy scores to identify and incentivize cost-effective energy efficiency improvements.	C	Mi/Ad
BE-2-3. Identify and adopt strategies to reduce energy efficiency barriers in rent/lease properties.	C	Mi/Ad
BE-2-4. Establish minimum energy efficiency standards for the affordable housing program.	C	Mi/Ad
Strategy BE-4. Improve demand management.		
BE-4-1. Expand the current net meter resolution to include and incorporate virtual net metering.	C	Mi
BE-4-2. Implement utility-level smart grid technologies to facilitate efficiency and distributed energy solutions.	C	Mi
Strategy BE-5. Prepare and adapt buildings for a changing climate.		
BE-5-1. Encourage heat-tolerant building approaches such as cool roofs and passive cooling.	C	Ad
Urban Form, Land Use & Transportation		
Strategy ULT-1. Support better public transit and ridesharing.		
ULT-1-1. Coordinate with neighboring local governments to promote use of transit, carpooling, and car-sharing.	C	Mi
ULT-1-3. Establish policies to support development near transit hubs without displacing disadvantaged populations.	C	Mi
ULT-1-4. Evaluate the feasibility of expanded local transit options.	M	Mi
Strategy ULT-3. Support more-efficient vehicles.		
ULT-3-1. Implement a local fuel-related tax.	C	Mi
Strategy ULT-4. Support more climate-ready development and land use.		
ULT-4-2. Further revise community development plans to favor walkable neighborhoods and infill density.	C	Mi
ULT-4-3. Modify the WUI code to include construction techniques appropriate for wildfire-prone areas.	C	Ad
Strategy ULT-5. Increase the efficiency of City fleet vehicles and employee commuting.		
ULT-5-1. Provide carpool and vanpool parking, charging stations, and parking for EVs for City employees.	M	Mi
ULT-5-2. Conduct a city fleet audit and use it to set policy and targets.	M	Mi
ULT-5-3. Develop policy to require the purchase of verified carbon offsets to offset City staff travel.	M	Mi
Consumption and Materials Management		
Strategy CM-1. Reduce consumption of carbon-intensive goods and services.		
CM-1-1. Implement an education campaign for waste and consumption reduction strategies.	C	Mi
CM-1-2. Support “collaborative consumption” community projects.	C	Mi
CM-1-3. Determine and implement effective ways to reduce and track consumption based emissions.	C	Mi

IMPLEMENTATION PLAN

ASHLAND CLIMATE & ENERGY ACTION PLAN

	Scope	Type
Strategy CM-3. Expand community recycling and composting.		
CM-3-1. Improve recycling programs to make them easier to use and implement new education and outreach to increase recycling in all sectors; expand public space recycling.	C	Mi
CM-3-2. Update the multi-family recycling ordinance to encourage more diversion.	C	Mi/Ad
Strategy CM-4. Reduce food waste.		
CM-4-1. Support edible food donation.	C	Mi/Ad
CM-4-2. Provide a kitchen best practices guide to help households and businesses reduce food waste and consumption.	C	Mi/Ad
CM-4-3. Facilitate recycling of commercial food waste.	C	Mi/Ad
Strategy CM-5. Improve sustainability of City operations and purchases.		
CM-5-1. Introduce environmentally preferable purchasing (EPP) guidelines for City procurement.	M	Mi
CM-5-2. Assess the feasibility of co-digesting food waste and biosolids to generate electricity at the wastewater treatment facility.	M	Mi
Natural Systems		
Strategy NS-1. Promote ecosystem resilience.		
NS-1-2. Expand use of green infrastructure such as bioswales, permeable pavement, other pervious surfaces to reduce flood risk and minimize sediment entry into creeks from trails and roads.	C	Ad
NS-1-4. Map and protect areas that provide ecosystem services.	C	Ad
Strategy NS-2. Manage and conserve community water resources.		
NS-2-1. Evaluate the value and potential for incentives for practices that reduce use of potable water for nonpotable purposes and recharge ground water.	C	Mi/Ad
NS-2-3. Expand water conservation outreach and incentive programs for residents and businesses.	C	Mi/Ad
Strategy NS-3. Conserve water use within City operations.		
NS-3-1. Evaluate the potential for installation of rainwater collection systems at City facilities for graywater uses, and investigate opportunities for graywater reuse at existing and new City facilities and properties.	M	Mi/Ad
NS-3-2. Implement efficiency recommendations from the City facilities water audit.	M	Mi/Ad
Public Health, Safety, and Well-being		
Strategy PHSW-1. Manage ecosystems and landscapes to minimize climate-related health impacts.		
PHSW-1-1. Promote the expansion of tree canopy in urban heat islands or areas that need air conditioning such as schools.	C	Ad
Strategy PHSW-2. Promote a sustainable local economy that minimizes emissions and vulnerability.		
PHSW-2-2. Support organizations, such as SOU, in evaluating risks to local food sources under climate change.	C	Ad
Strategy PHSW-3. Optimize City services to minimize public health impacts.		
PHSW-3-2. Identify and minimize potential urban heat impacts.	C	Ad
PHSW-3-3. Develop or enhance heat-warning systems for employees and the public.	C	Ad
Strategy PHSW-4. Optimize City services to minimize public safety impacts.		
PHSW-4-1. Update the City's emergency response plan and ensure that preparation and updates recognize and address likely climate change impacts.	C	Ad

Implementation Schedule

The table starting on the following page details when, why, and by whom all priority actions in the CEAP will be implemented. The list includes additional information on each action, including co-benefits and relative, qualitative estimates of implementation costs and effectiveness in meeting CEAP goals. The CEAP also includes additional actions that were not listed as “priority”—these actions will be implemented on an opportunistic and as-needed basis.

Phases

Phases for CEAP priority actions are designated by budget biennials and represent the relative sequence of actions in the CEAP. All actions are slated for near-term commencement; it is expected that longer-term actions will be identified during the three-year plan update process. Actions identified as Phase II could be initiated in Phase I, but not at the expense of completing Phase I actions.

- Phase I: Complete by 2020
- Phase II: Complete by 2025

Departments

Actions are labeled by the primary department responsible for implementation. It is expected that many of these primary departments will need to work with other supporting departments and/or external stakeholders to fully and successfully implement the action:

- Community Development (including Building Division and Planning Division)
- Ashland Municipal Utility (Electric)
- Administration
- Parks and Recreation
- Conservation Division
- Public Works
- Police / Fire

Co-benefits



Benefits low-income or disadvantaged communities



Benefits local habitats, recreation, or natural aesthetic



Benefits households, local economy, City operations budget, or jobs



Benefits public health (e.g. by enhancing local air quality)

Relative Rankings

- \$ Lower relative implementation cost
- \$\$ Moderate relative implementation cost
- \$\$\$ Higher relative implementation cost



Effective in meeting CEAP goals



More effective in meeting CEAP goals



Most effective in meeting CEAP goals

IMPLEMENTATION PLAN

ASHLAND CLIMATE & ENERGY ACTION PLAN

	Scope	Type	Cost	Effectiveness	Co-benefits	Phase	Responsible Department
Buildings and Energy							
Strategy BE-1. Support cleaner energy sources.							
BE-1-1. Develop a comprehensive plan for the Municipal Electric Utility.	C	Mi	\$\$\$	⚡⚡⚡		I	Electric/Conservation
BE-1-2. Promote switching to lower-carbon fuels	C	Mi	\$\$	⚡⚡		I	Electric/Conservation
BE-1-3. Facilitate and encourage solar energy production.	C	Mi/Ad	\$\$	⚡⚡		I	Electric/Conservation
BE-1-4. Enhance production of on-site solar energy from City facilities.	C	Mi/Ad	\$\$	⚡		I	Public Works
Strategy BE-2. Encourage increased building energy efficiency and conservation.							
BE-2-1. Increase outreach efforts to expand participation in energy efficiency programs and promote climate-friendly building and construction.	C	Mi	\$\$	⚡⚡	⚖️	I	Conservation
BE-2-2. Require building energy scores to identify and incentivize cost-effective energy efficiency improvements.	C	Mi/Ad	\$\$	⚡⚡		II	Community Development
BE-2-3. Identify and adopt strategies to reduce energy efficiency barriers in rent/lease properties.	C	Mi/Ad	\$	⚡⚡⚡	⚖️	II	Conservation
BE-2-4. Establish minimum energy efficiency standards for the affordable housing program.	C	Mi/Ad	\$	⚡	⚖️	II	Community Development
Strategy BE-3. Maximize efficiency of City facilities, equipment & operations.							
BE-3-1. Use results from City Facilities Energy Audit to prioritize City Facilities Capital Improvement Plans (CIPs) and maintenance improvements.	M	Mi	\$	⚡		I	Public Works
Strategy BE-4. Improve demand management.							
BE-4-1. Expand the current net meter resolution to include and incorporate virtual net metering.	C	Mi	\$\$	⚡⚡		II	Electric
BE-4-2. Implement utility-level smart grid technologies to facilitate efficiency and distributed energy solutions.	C	Mi	\$\$\$	⚡⚡⚡	💰	II	Electric
Strategy BE-5. Prepare and adapt buildings for a changing climate.							
BE-5-1. Encourage heat-tolerant building approaches such as cool roofs and passive cooling.	C	Ad	\$	⚡⚡	💰	II	Community Development
Urban Form, Land Use & Transportation							
Strategy ULT-1. Support better public transit and ridesharing.							
ULT-1-1. Coordinate with neighboring local governments to promote use of transit, carpooling, and car-sharing.	C	Mi	\$	⚡⚡		II	Public Works
ULT-1-2. Work with RVTD to implement climate-friendly transit.	C	Mi	\$	⚡⚡	🚑	I	Public Works
ULT-1-3. Establish policies to support development near transit hubs without displacing disadvantaged populations.	C	Mi	\$	⚡⚡	⚖️	II	Community Development
ULT-1-4. Evaluate the feasibility of expanded local transit options.	M	Mi	\$\$\$	⚡⚡	🚑	II	Public Works
Strategy ULT-2. Make Ashland more bike- and pedestrian-friendly.							
ULT-2-1. Implement bicycle- and pedestrian-friendly actions in the City's Transportation System Plan and Downtown Parking Management Plan.	C	Mi	\$\$\$	⚡⚡⚡	🚑	I	Public Works
ULT-2-2. Explore opportunities to convert to shared streets where appropriate to provide multimodal connectivity.	M	Mi	\$\$\$	⚡⚡⚡	🚑	I	Public Works

IMPLEMENTATION PLAN

ASHLAND CLIMATE & ENERGY ACTION PLAN

	Scope	Type	Cost	Effectiveness	Co-benefits	Phase	Responsible Department
Strategy ULT-3. Support more-efficient vehicles.							
ULT-3-1. Implement a local fuel-related tax.	C	Mi	\$	⚡⚡⚡		II	Administration/Legal
ULT-3-2. Revise land use codes to require EV charging infrastructure at multifamily and commercial developments.	C	Mi	\$	⚡⚡⚡	🏠⚡	I	Community Development
ULT-3-3. Provide information about electric and hybrid vehicles and rebates on the City's website.	C	Mi	\$	⚡⚡		I	Conservation
Strategy ULT-4. Support more climate-ready development and land use.							
ULT-4-1. Regulate new development in the Wildfire Lands Overlay part of the urban growth boundary.	C	Ad	\$	⚡⚡⚡	🌲	I	Community Development/Fire
ULT-4-2. Further revise community development plans to favor walkable neighborhoods and infill density.	C	Mi	\$	⚡⚡⚡	🏠⚡	II	Community Development
ULT-4-3. Modify the WUI code to include construction techniques appropriate for wildfire-prone areas.	C	Ad	\$	⚡⚡		II	Community Development
Strategy ULT-5. Increase the efficiency of City fleet vehicles and employee commuting.							
ULT-5-1. Provide carpool and vanpool parking, charging stations, and parking for EVs for City employees.	M	Mi	\$\$	⚡	🏠⚡	II	Public Works
ULT-5-2. Conduct a city fleet audit and use it to set policy and targets.	M	Mi	\$	⚡		II	Public Works
ULT-5-3. Develop policy to require the purchase of verified carbon offsets to offset City staff travel.	M	Mi	\$	⚡		II	Administration
Consumption and Materials Management							
Strategy CM-1. Reduce consumption of carbon-intensive goods and services.							
CM-1-1. Implement an education campaign for waste and consumption reduction strategies.	C	Mi	\$	⚡⚡		II	Administration
CM-1-2. Support "collaborative consumption" community projects.	C	Mi	\$	⚡⚡	💰	II	Administration
CM-1-3. Determine and implement effective ways to reduce and track consumption based emissions.	C	Mi	\$	⚡⚡		II	Administration
Strategy CM-2. Support sustainable and accessible local production and consumption.							
CM-2-1. Partner with nonprofit organizations to promote the purchase of climate-friendly food and products.	C	Mi	\$	⚡⚡	💰	I	Administration
CM-2-2. Expand community gardening and urban agriculture opportunities.	C		\$\$	⚡⚡	⚖️	I	Administration/Parks
Strategy CM-3. Expand community recycling and composting.							
CM-3-1. Improve recycling programs to make them easier to use and implement new education and outreach to increase recycling in all sectors; expand public space recycling.	C	Mi	\$\$	⚡		II	Conservation
CM-3-2. Update the multi-family recycling ordinance to encourage more diversion.	C	Mi	\$	⚡		II	Conservation
CM-3-3. Strengthen the Demolition Debris and Diversion ordinance to enhance enforcement and increase diversion and reuse.	C	Mi	\$\$	⚡⚡		II	Conservation
Strategy CM-4. Reduce food waste.							
CM-4-1. Support edible food donation.	C	Mi/Ad	\$	⚡	⚖️	II	Conservation
CM-4-2. Provide a kitchen best practices guide to help households and businesses reduce food waste and consumption.	C	Mi/Ad	\$	⚡⚡		II	Conservation

IMPLEMENTATION PLAN

ASHLAND CLIMATE & ENERGY ACTION PLAN

	Scope	Type	Cost	Effectiveness	Co-benefits	Phase	Responsible Department
CM-4-3. Evaluate opportunities for recycling of commercial food waste.	C	Mi/Ad	\$ \$	⚡⚡		II	Conservation
Strategy CM-5. Improve sustainability of City operations and purchases.							
CM-5-1. Introduce environmentally preferable purchasing (EPP) guidelines for City procurement.	M	Mi	\$	⚡		II	Administrative Services
CM-5-2. Assess the feasibility of co-digesting food waste and biosolids to generate electricity at the wastewater treatment facility.	M	Mi	\$ \$ \$	⚡⚡		II	Public Works
Natural Systems							
Strategy NS-1. Promote ecosystem resilience.							
NS-1-1. Manage forests to retain biodiversity, resilience, and ecosystem function and services in the face of climate change. Use best available science to inform fire management and planning to manage ecosystem health, community safety, and carbon storage.	C	Ad	\$	⚡⚡⚡	🌲	I	Fire
NS-1-2. Use green infrastructure such as bioswales, permeable pavement, other pervious surfaces to reduce flood risk and minimize sediment entry into creeks from trails and roads.	C	Ad	\$	⚡⚡	🌲	II	Community Development
NS-1-3. Undertake restoration efforts to retain and restore native fish and riparian species.	C	Ad	\$ \$	⚡⚡	🌲	I	Parks & Recreation
NS-1-4. Map and protect areas that provide ecosystem services.	C	Ad	\$ \$	⚡⚡	🌲	II	Parks & Recreation
Strategy NS-2. Manage and conserve community water resources.							
NS-2-1. Evaluate the value and potential for incentives for practices that reduce use of potable water for nonpotable purposes and recharge ground water.	C	Mi/Ad	\$ \$	⚡⚡⚡	🌲	II	Conservation
NS-2-2. Explore water-efficient technologies on irrigation systems and consider requiring them during the permitting process.	C	Mi/Ad	\$ \$	⚡⚡⚡		I	Conservation
NS-2-3. Expand water conservation outreach and incentive programs for residents and businesses.	C	Mi/Ad	\$ \$	⚡	💰	II	Conservation
Strategy NS-3. Conserve water use within City operations.							
NS-3-1. Evaluate the potential for installation of rainwater collection systems at City facilities for graywater uses, and investigate opportunities for graywater reuse at existing and new City facilities and properties.	M	Mi/Ad	\$ \$	⚡		II	Public Works
NS-3-2. Implement efficiency recommendations from the City facilities water audit.	M	Mi/Ad	\$ \$	⚡		II	Public Works
Public Health, Safety, and Well-being							
Strategy PHSW-1. Manage ecosystems and landscapes to minimize climate-related health impacts.							
PHSW-1-1. Promote the expansion of tree canopy in urban heat islands or areas that need air conditioning such as schools.	C	Ad	\$	⚡⚡	🌲	II	Parks & Recreation/ Community Development
Strategy PHSW-2. Promote a sustainable local economy that minimizes emissions and vulnerability.							
PHSW-2-1. Engage leading employers in a dialogue on climate action, for example, by organizing and facilitating roundtables.	C	Mi/Ad	\$	⚡⚡	💰	I	Conversation
PHSW-2-2. Support organizations, such as SOU, in evaluating risks to local food sources under climate change.	C	Ad	\$	⚡	💰	II	Administration
Strategy PHSW-3. Optimize City services to minimize public health impacts.							
PHSW-3-1. Work with vulnerable populations to create specific adaptation strategies to address public health risks.	C	Ad	\$	⚡⚡	⚖️	I	Administration/Fire

IMPLEMENTATION PLAN

ASHLAND CLIMATE & ENERGY ACTION PLAN

	Scope	Type	Cost	Effectiveness	Co-benefits	Phase	Responsible Department
PHSW-3-2. Identify and minimize potential urban heat impacts.	C	Ad	\$ \$	⚡	 	II	Parks & Recreation/Fire
PHSW-3-3. Develop or enhance heat-warning systems for employees and the public.	C	Ad	\$	⚡		II	Fire
Strategy PHSW-4. Optimize City services to minimize public safety impacts.							
PHSW-4-1. Update the City's emergency response plan and ensure that preparation and updates recognize and address likely climate change impacts.	C	Ad	\$	⚡⚡⚡		II	Fire
PHSW-4-1. Identify and address populations and essential City services that are within the 100-year flood zone.	C	Ad	\$ \$	⚡⚡		II	Public Works
Cross-Cutting Strategies							
Strategy CC-1. Educate and empower the public.							
CC-1-1. Create a formal public outreach and education plan to inform the community about climate actions and progress.	C	Mi / Ad	\$	⚡⚡		I	Administration
CC-1-2. Support capacity of neighborhood and community groups to implement climate mitigation and adaptation initiatives.	C	Mi / Ad	\$	⚡⚡		I	Administration
CC-1-3. Assess the feasibility of a City-sponsored carbon offset program.	C	Mi / Ad	\$	⚡⚡		I	Administration
Strategy CC-2. Educate and empower City staff.							
CC-2-1. Ensure all City departments educate their staff members about the Climate and Energy Action Plan.	M	Mi / Ad	\$	⚡		I	Administration
Strategy CC-3. Mainstream and integrate climate considerations.							
CC-3-1. Consider climate change in all City Council policy, budgetary, or legislative decisions and as part of the Council Communication document template.	M	Mi / Ad	\$	⚡⚡⚡		I	Administration
CC-3-2. Incorporate CEAP goals and actions in future updates of city plans.	M	Mi / Ad	\$	⚡⚡⚡		I	Administration
CC-3-3 Include consideration and perpetuation of climate action goals within the scope of every appropriate City Advisory Commission.	M	Mi / Ad	\$	⚡⚡		I	Administration
Strategy CC-4. Engage with other governments and organizations around regional, statewide, national, and international climate policy and action.							
CC-4-1. Engage with other governments and organizations around regional, statewide, national, and international climate policy and action.	M	Mi / Ad	\$	⚡		I	Administration



THE
OREGON
PLAN FOR
Salmon &
Watersheds

OREGON



Fish & Wildlife

Spring Chinook

conservation plan has been adopted to
guide management of Rogue River spring
The conservation plan centers on
restoring numbers of





References

Dalton, M. M. (2016). *Climate Trends & Projections*. Oregon Climate Change Research Institute, City of Ashland, Oregon.

Geos Institute. (2016). *Climate Change Vulnerability Assessment for Ashland and the Rogue Valley*.

Good Company. (2016). *City of Ashland: Greenhouse Gas Inventory (2011-2015)*.

Hansen, J. E. (2016). *Declaration of James E. Hansen, PhD, in Support of Western Environmental Law Center and Our Children's Trust's Comments on Proposed Clean Air Rule*.

Sheehan, T., Bachelet, D., & Ferschweiler, K. (2015). *Projected major fire and vegetation changes in the Pacific Northwest of the conterminous United States under selected CMIP5 climate futures*. *Ecological Modelling*, 317, 16–29. <http://doi.org/10.1016/j.ecolmodel.2015.08.023>

Stavros, E. N., Abatzoglou, J., Larkin, N. K., McKenzie, D., & Steel, E. A. (2014). *Climate and very large wildland fires in the contiguous western USA*. *International Journal of Wildland Fire*, 23(7), 899–914.

Weber, C. L., & Matthews, H. S. (2007). *Food-miles and the Relative Climate Impacts of Food Choices in the United States*. *Environmental Science and Technology*, 42, 3508-3515.

World Resources Institute. (2014). *The Carbon Budget*. Retrieved from <http://www.wri.org/resources/data-visualizations/infographic-global-carbon-budget>





Appendices

CLIMATE TRENDS SUMMARY

This summary provides more information on projected climate change impacts and trends in Ashland, including changes in temperature, precipitation, and natural hazard risk.

PUBLIC ENGAGEMENT PROCESS OVERVIEW

The public provided valuable input that helped shape the plan. See when and how the public was consulted, and how public input was used in the plan.

EMISSIONS MODELING AND TARGET-SETTING METHODOLOGY

Take a behind-the-scenes look at the process used to model Ashland's greenhouse gas footprint and set emissions-reduction targets.

ASHLAND GREENHOUSE GAS INVENTORY

This document summarizes the city's emissions by sector and activity type from 2011 through 2015, and set the emissions baseline used to identify goals and prioritize strategies and actions throughout this plan.



CITY OF
ASHLAND