



Silverton Energy Plan



June 1, 2019
Authored by Sustainable Silverton,
a citizen volunteer group pursuant to
City of Silverton Resolution
10-18.2018

Cover: Spillway for the new Silverton hydroelectric power plant in 1905. After running through the generators, the water was diverted to the Fischer Flouring Mill before returning to Silver Creek.

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SilvertonMuseum.org

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Introduction and Overview

Silverton, Oregon, located about 60 miles south of Portland in the heart of the Willamette Valley, is well known as Oregon's Garden City; a tribute to The Oregon Garden, as well as the Silverton Garden Club. Silver Creek runs through the center of town. Century old commercial buildings have been preserved and continue to serve as a magnet for tourists. Community events, parades, fairs, murals, and art events are all supported by community volunteers. People who live in Silverton come because it is a nice place to live.

There has long been a community-wide will to invest in clean energy solutions that save citizens money while helping protect the natural environment and enhance the local economy. Silverton was one of the first cities in the United States to build a unique environmental conservation project that pumped warm, treated wastewater from its treatment plant uphill to The Oregon Garden where it cools by flowing through a series of filtering lake/ponds before entering Silver Creek. Additionally, public and private investments in energy efficiency and renewable energy in Silverton have continued to grow. Silverton residents and businesses have actively participated in Oregon Energy Trust programs since 2002. A local residents' group formed and achieved concrete outcomes around the issue of making Silverton a Bronze Certified bike friendly city .

Energy Challenges and Opportunities

Our planet's average temperature is rising. Rising temperatures impact weather and climate, leading to heat waves and drought, dwindling snowpack and stream flows, severe storms and flooding, an increase in wildfires, and more. These events are occurring more regularly, threatening local industries such as agriculture, food production, manufacturing, and outdoor recreation. Human actions contribute to climate change and fossil fuel consumption is the major contributor to ozone depletion.

Silverton spends roughly \$23 million each year on fossil fuels. Nearly all that money leaves Silverton and rarely, if ever, returns. By reducing our dependence on fossil fuels, we can help Silverton achieve greater independence and security.

Natural disasters, exacerbated by the rising global temperature, threaten our way of life. Since Silverton imports all its liquid fuels from out of state, events such as severe winter storms, wildfires, or a massive natural disaster (such as a potential Cascadia Subduction Zone earthquake) could leave Silverton without gasoline, diesel, and propane, and would likely cause power outages.

The city's dependence on out-of-state fuels also leaves us vulnerable to volatile price changes from national and international markets, yet rapid changes in energy markets are opening up new possibilities for communities when it comes to energy generation and purchasing decisions. The falling prices of advanced technologies, ranging from solar panels to storage systems, challenge conventional models of centralized power plants and present opportunities for distributed energy generation and control. Additionally, technology price reductions suggest that electric vehicles and autonomous vehicles will become a cost-competitive alternative to combustion, human-operated vehicles, with a growing number of projections suggesting a worldwide transition to electric vehicles within 20 years.

Advancements in energy technologies—from distributed generation, to battery storage, to smart grid systems, and electric vehicles are creating new opportunities to enhance the resilience

of energy systems at a local level. These innovations hold the promise of being able to supply energy to support critical public services during and following a major disruptive event, like a rupture of the Cascadia Subduction Zone, a major cyberattack, or catastrophic weather event. In addition, advances in technology hold promise that the cost of energy use for citizens can be reduced going forward.

City Council Support

Sustainable Silverton feels that communities have a responsibility to address the risks associated with climate change and natural disasters. Silverton can do this by looking at our energy use – one of the community’s biggest expenses – to determine ways to more efficiently and cost-effectively procure and use energy.

Recognizing this, the City Council of Silverton adopted Resolution 18-10 (2018) affirming their support for a local energy study. The Resolution authorized Sustainable Silverton, a citizens advisory committee, to begin the study in cooperation with the City and its Environmental Management Committee.

Sustainable Silverton began by studying similar plans developed by the County of Hood River and the City of Corvallis. Sustainable Silverton obtained permission to use elements of these studies in its draft of a plan for Silverton, being mindful of the scale and resources available.

At the suggestion of the Environmental Management Committee, Sustainable Silverton scheduled a series of meetings with members of the community, including local service clubs, private businesses, non-profit organizations, community members, and city staff, with the intent of involving the community in making recommendations to the study. The study has been well received and many useful suggestions are incorporated into our recommendations.

Elements of these recommendations relate in some way to the City’s comprehensive plan, last updated in 2002. When the final energy plan is adopted by the City Council, the comprehensive plan should be amended and updated to reflect the goals of the energy plan.

Purposes of the Energy Plan

Sustainable Silverton identified six overall goals:

1. Reduce energy costs for the city and residents
2. Reduce Greenhouse Gas (GHG) Emissions
3. Improve resiliency in times of crises
4. Increase investment in energy production and efficiency
5. Improve redundancy and utilization of local sources of renewable energy (Such as wind and solar)
6. Improve overall sustainability

Six Action Areas

The strategies and actions in this plan are categorized into the following six action areas:

- Buildings and Energy
- Land Use and Transportation
- Consumption and Waste
- Food and Agriculture
- Urban Natural Resources
- Health, Social Services, and Community Well-Being

Each section includes a description of the action area, as well as the highest ranked strategies and mitigation and adaptation actions for the community at large and for city policy. The first three sections (i.e. Buildings and Energy, Land Use and Transportation, and Consumption and Waste) are the primary target areas for mitigation actions, because the Silverton community can impact fossil fuel usage the most in these areas.

Recommendations for Implementation

The plan puts forward a list of action steps that the city, business community, and citizens can take to contribute toward a more a more resilient and sustainable Silverton. These steps will also lead to greater economic independence and a healthier lifestyle. Included in the recommendations for strategies and action are references to programs that assist with implementation and funding. Some agencies, for example The Energy Trust of Oregon, provide a broad range of energy conservation services for every level of energy user: city government, commercial, industrial, and homeowner (or renter). Other agencies tailor their expertise to areas like building design, agriculture, water, transportation, et al.

Creating a Sustainable Silverton Team

It will be important for Silverton to provide follow-up continuity for the recommendations herein. For this reason we are recommending that City Council authorize Sustainable Silverton to continue meeting with interested parties from every sector of the economy, including city staff as available, to conduct ongoing research, resource development, and citizen engagement. This recommendation does not envision that additional funding will be needed.

There is precedent for this recommendation. Marion County EarthWISE is a program dedicated to reducing waste and implementing technologies in support of conservation and sustainability. EarthWISE offered to partner with Sustainable Silverton in an effort to implement the recommendations of this study. EarthWISE is already working with the city and several local businesses. They look forward to expanding their work in Silverton.

Fossil Fuel Expenditures in Silverton

Developing a baseline energy consumption inventory is a first step in planning for a fossil energy reduction in Silverton. For this plan, “energy” refers to power or heat produced from fuels or processes and used for a variety of applications, including transportation, heating, cooking, and electricity generation. In Silverton, energy is largely consumed in the form of natural gas, electricity, gasoline, and diesel fuel.

To complete the energy and emissions inventory, we compiled energy use data for Silverton using metrics and data taken from Oregon Department of Transportation (ODOT), the Hood River Energy Plan, Portland General Electric (PGE), NW Natural, and a statewide study authored by Eric Strid, retired technology executive and senior board member with Power Oregon.

Sustainable Silverton, with leadership from City Council and staff, requested energy consumption data from the following utilities and service providers:

Portland General Electric (PGE) is a Fortune 1000 public utility based in Portland, Oregon. It distributes electricity to customers in parts of Multnomah, Clackamas, Marion, Yamhill, Washington, and Polk counties – 44% of the inhabitants of Oregon. Founded in 1888 as the Willamette Falls Electric Company, PGE has been an independent company for most of its existence.

NW Natural, formerly Northwest Natural Gas Company, is a investor owned utility headquartered in Portland, OR. Primarily a natural gas distributor, the company services residential, commercial, and industrial customers in Western Oregon and Southwest Washington in the Pacific Northwest.

Motor Vehicle Emission Simulator (MOVES) is an emissions modeling system that estimates emissions and vehicle miles traveled for mobile sources at the national, state, and county level. The Oregon Department of Transportation uses MOVES as a required tool for generating energy, emissions, and fleet information. MOVES has been developed over a period of nearly two decades by the Environmental Protection Agency (EPA). MOVES uses vehicle registration data by vehicle type and estimates vehicle miles traveled and fuel consumption by using the amount of state roads in the county and published fuel consumption data per vehicle type. It has been shown that these default assumptions represent the actual fuel consumption with an accuracy level sufficient to meet the needs of this study.¹

The following exhibit (*Table 1*), shows energy consumption for Silverton in three areas: Electricity, Natural Gas, and Transportation. The data, which is subject to change as the utilities refine their metrics, demonstrates that Silverton spent approximately \$2 million on energy in 2018. Transportation is the largest category of consumption.

1Information obtained from Andrew Dick, Oregon Department of Transportation, February, 2017

Table ! – Silverton Fossil Fuel Use Summary 2016-18

Fossil Fuels	2016 Cost	2017 Cost	2018 Cost
Electricity (kWh)*	\$4,276,832.00	\$4,364,114.00	\$4,449,276.00
Natural Gas (therms)	\$2,340,653.00	\$2,894,500.00	\$2,722,143.00
Transportation (gal)	\$15,278,505.00	\$15,590,312.00	\$15,902,118.00
TOTAL	\$21,895,990.00	\$22,848,926.00	\$23,073,537.00

Table 1 data derived from information provided by PGE, NW Natural, and ODOT that was amended to eliminate energy provided from non-fossil sources. These data should be used as an approximation only.

What We Can Do

The sections that follow identify the high priority actions recommended by this report. This section was developed to encourage citizens to explore ways to implement the recommendations and to discover funding opportunities. A Sustainable Silverton Team of citizen volunteers has been recommended to assist in this process.

Buildings and Energy

What is in the Buildings and Energy category?

The Buildings and Energy category addresses energy used in residential, commercial, and industrial buildings in Silverton. Buildings require energy both in their construction and operation. While the environmental (including GHG emissions) impacts of construction are noticeable, the day-to-day energy use of a building after construction adds up to a much greater impact over a building's life. Operational energy consumption can be overlooked as the major source of long-term emissions, and therefore, as an opportunity for mitigation. The energy used in Silverton's buildings is primarily provided by two privately owned public utilities: Portland General Electric and Northwest Natural Gas.



Generally, commercial and residential building systems use energy for lighting, appliances, computers, mechanical systems for heating, ventilating and air conditioning, and other lifestyle-related choices. For industrial buildings, energy sources may be different, especially for heat, steam, and other mechanical energy. Some of the other energy sources considered are wood waste and other energy dense waste products.

Why does it matter?

The emissions from buildings represent approximately 39 percent of the U.S. CO₂ emitted (21% in residential, 18% in commercial).² Residential buildings have a longer lifespan than other energy consuming systems (according to the Center for Climate and Energy Solutions), so retrofitting and planning for lower energy consumption, while keeping people comfortable in changing conditions, can make a significant impact on fossil fuel consumption and building-related green house gases. According to the U.S. Environmental Protection Agency, in developed nations, people spend up to 90% of their lives in buildings, so incorporating passive systems such as insulation into buildings is essential to provide comfort and greater energy efficiency in both colder and hotter conditions.³ There are additional benefits that can result from increased energy efficiency (i.e., home weatherization) and reduced fossil fuel use (i.e., off-setting fossil fuel use with renewable resources and conservation), such as lower energy bills and decreased environmental and health impacts.

The tables below contain the high priority actions in this category.

² <https://www.eesi.org/files/climate.pdf>

Strategies for the Community At Large

Table 2 – Mitigation

STRATEGY	ACTION
Energy Conservation, Efficiency, and Renewables	Increase deployment of energy efficiency improvements (such as weatherization, solar attic vents, daylighting, shading, insulation of foundations, fuel efficient appliances, etc.) in new and existing buildings, as well as onsite renewables for commercial and residential sectors.
Home Performance Ratings	Implement an energy performance rating program for homes, so that current occupants, as well as prospective buyers/renters, can make informed decisions on managing and projecting energy use/cost. Home owners should be encouraged to get their homes rated. Homeowner energy audits are provided by Energy Trust of Oregon upon request.
Promote Electric and Lower-Carbon Fueled Vehicles	Accelerate transition to electric vehicles.
Local Renewables Development	Support distributed solar energy development.
Energy Conservation, Efficiency, and Renewables	Increase smaller housing options to reduce energy consumption, and environmental impacts of construction.
Water Conservation and Efficiency	Increase deployment of water efficiency measures in existing buildings and new construction.
Building Preservation	Promote adaptive reuse of historic or older buildings and weatherize to code.

Table 3 - Adaptation

STRATEGY	ACTION
Energy Conservation, Efficiency, and Renewables	Encourage passive daylight, shading, ventilation, insulated building envelopes, etc.
Water Conservation and Efficiency	Increase deployment of high efficiency and composting toilets. Increase appropriate use of grey water and rainwater to offset production of potable water.

Strategies for the City

Table 4 - Mitigation

STRATEGY	ACTION
Energy Conservation, Efficiency, and Renewables	Energy audits of City facilities and feasibility studies to determine passive to active systems to reduce energy and fuels in buildings.
	Convert remaining applicable City facility lights to LEDs, prioritized by cost-effectiveness and explore converting all street/signal lights to solar powered.
	Implement cost-effective building system upgrades and integrate energy efficiency improvements into all applicable capital improvement projects. Target efficiency improvements where the highest energy usage and losses are occurring.
	Identify and target water efficiency improvements where the highest water usage and losses are occurring.
Purchasing	Shift towards 100% renewable (ideally), or at least carbon free electricity.
Energy Management	Develop and implement utility performance management plans, to include performance tracking for all City-owned buildings and facilities.
	Evaluate natural gas and methane use and practices at the Wastewater Treatment Plant. Analyze and implement strategies to increase methane reuse for vehicle fuel, heating buildings or for other beneficial purposes.
	Evaluate feasibility for solar installation and collecting heat from spill water at the public pool.
Green Buildings	Design/construct all new City facilities to meet or exceed LEED Gold energy and water efficiency standards.

Table 5 - Adaptation

STRATEGY	ACTION
Asset Management	Consider climate change impacts in evaluating the asset's lifespan, replacements, and repairs.
Wastewater Facilities Management	Consider new systems approach for the Wastewater Treatment Plant to increase its resiliency and avoid power outages in food events. Evaluate potential to reduce demand for nutrient processing at the WWTP by employing Low Impact Development (LID) techniques and installing residential and commercial reuse systems (i.e., greywater and rainwater systems).
Resiliency	Ensure that for the new City Hall and Police Station includes resources to include high-efficiency energy use and onsite energy production storage, such as solar and/or geothermal.

Land Use and Transportation

What is in the Land Use and Transportation category?



The Land Use and Transportation category considers the use of land and its proximity to other uses, which sets the demand for transportation and the vehicles that move goods and people. This is true for residential, commercial, industrial, and institutional sectors. Whether it is industrial uses for moving materials and supplies in and goods out, running errands, commuting to work, or accessing services and recreational opportunities, how the community develops will determine the transportation infrastructure needed to serve the land uses. For example, increased urban density and mixed uses can result in reduced reliance on automobiles for local services.

The Southern Pacific Train depot on North Water Street, ca 1898. No longer limited to the speed of a horse, Silverton rushed into the 20th Century.

The transportation infrastructure can enable or prevent certain travel modes and vehicle types from functioning. The modes range from active transportation such as walking and biking to mass transit such as buses to personal vehicles to freight and utility vehicles. Behind each of these modes are varying sources of energy with their own GHG footprints and range from food, to liquid fuels, to electricity. This category addresses the relationships between land use patterns and transportation requirements, and seeks to identify actions that can reduce community GHGs by reducing fuel consumed, and therefore, GHGs emitted through the transportation system.

Why does it matter?

Transportation fuels are the source of 28% of U.S. emissions.⁴ Vehicles and energy sources are changing rapidly and provide the community with genuine options for GHG reduction and climate change adaptation. Fleet fuel economy improvements, switching to alternative fuels and electric vehicles, and transitioning to a planned environment and modes of travel that reduce reliance (and vehicle miles traveled) on single occupancy vehicles, can significantly reduce the community's long-term GHG emissions, air pollution, and result in other co-benefits to the community. For example, a 2012 report by the Union of Concerned Scientists showed the pollution equivalency to miles per gallon of electric vehicles (EVs) based upon regional electric grid mixes.⁵ Given that Renewable Energy Portfolio standards continue to rise, the MPG equivalency of EVs will rise over time.

The tables below contain the high priority actions in this category.

⁴ <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>

⁵ https://www.ucsusa.org/sites/default/files/legacy/assets/documents/clean_vehicles/electric-car-global-warming-emissions-report.pdf

Strategies for the Community At Large

Table 6 – Mitigation

STRATEGY	ACTION
Land Use/Development to Reduce Car Dependency	Increase walkable, node-oriented, mixed-use development that includes housing and services.
Transportation Demand Management	Reduce vehicle miles traveled and single occupancy vehicle trips and ownership. Develop land use and transportation system alternatives, including use of public transportation, that will reduce long-term GHG emissions.
Transportation System Management	Reduce idling and congestion.
Facilitate Active Transportation	Create network of bike and pedestrian corridors, and enhance visual and physical safety protection measures.
Electric and Lower-Carbon Fueled Vehicles	Accelerate transition to electric and other higher efficiency and low-carbon fueled vehicles.

Table 7 – Adaptation

STRATEGY	ACTION
Flood Protection	Plan to ensure that access to all parts of Silverton by all transportation modes is maintained in case of flood.
Land Use / Development	Contain the urban growth boundary (UGB) to protect farmland (outside UGB) and accommodate new population growth (inside UGB). Increase applications of “low impact development.” (LID, a land planning and engineering design approach to manage stormwater runoff as part of green infrastructure).

Strategies for the City

Table 8 – Mitigation

STRATEGY	ACTION
Purchasing and Specifications	Require responsible carbon footprint when specifying concrete and/or asphalt in large quantities for projects.
Fleet Fuel Efficiency	Right size transit, heavy duty and light duty vehicles, increase fuel efficiency and use of low carbon fuels and electricity. Consider electric vehicles and hybrids where duty cycle allows - especially sedans.
Transportation Demand Management	Allow telecommuting when and where appropriate. Promote employee use of alternate commute modes, including carpooling, transit system, walking and biking.

Design Standards	Evaluate street design to encourage alternate modes while maintaining access for emergency vehicles.
Purchasing and Specifications	Incorporate contractor fuel efficiency/emissions standards into bids and contracts to ensure construction contractors working for the City use fuel efficient and low polluting vehicles and equipment.

Table 9 – Adaptation

STRATEGY	ACTION
Flood / Fire Protection	Prepare transportation system for long duration events (e.g., weather, outages etc.).
	Review standards for stormwater management for anticipated climate change impacts (e.g., increased flooding).
	Evaluate food potential for roads, bike paths, and sidewalks.

Consumption and Waste

What is in the Consumption and Waste category?



Tapping into the groundwater, as a means of supplementing decreasing supplies, ca

The Consumption and Waste category considers everything in the lifecycle of consumer goods from extraction of raw materials to manufacturing, packaging, distribution, product use, and associated energy and resource demands and finally, disposal. Although “embodied” GHG emissions are in everything we buy due to the energy used to produce and transport them, they are mostly invisible and therefore are discounted (unless they are goods like appliances or other products that require energy to operate). That embodied energy is produced generating some level of GHGs generating some level of GHGs. Reusing, buying used,

buying durable products, recycling and recovering energy

1932. _____ from materials that cannot be reused can significantly

reduce the GHGs associated with product manufacturing. Diverting food and vegetative waste from the garbage/landfill, composting, anaerobic digestion and landfill gas capture and use can reduce GHG emissions by preventing the “fugitive emissions” associated with organic matter decay. Biomethane also can be used as a local source of lower carbon fuels for hauling fleets.

Why does it matter?

The consumption of goods, foods, and services typically makes up about half of a community’s GHG emissions. Most consumption emissions occur elsewhere and are often overlooked because of this. Wiser consumption, like purchasing locally or buying more durable goods, can reduce emissions by decreasing the travel required to get the product to you or by lessening the need for replacement goods in the future. Waste comprises a smaller portion of the community’s GHG emissions (< 1%).

Awareness of packaging, especially plastics, has been identified as a major factor for environmental degradation. However, plastic is primarily a fossil fuel product. Enacting laws and promoting plastic alternatives can be part of the solution when striving to reduce our dependence on fossil fuels.

The tables below contain the high priority actions in this category.

Strategies for the Community At Large

Table 10 - Mitigation

STRATEGY	ACTION
Waste Reduction Materials	Reduce consumption and packaging, promote reuse and “free-cycling,” increase recycling.
Waste Reduction-Food	Reduce the volume of food waste generated and sent to the landfill.
Reuse and Repair	Promote reuse and repair.
Procurement	Increase purchasing of materials containing recycled material content, that have reduced packaging, and that can be returned to the manufacturer for remanufacturing, reuse, or full recycling.

Table 11 - Adaptation

STRATEGY	ACTION
Materials Management	Maintain and plan for infrastructure and service adequacy for materials management under warming conditions and extreme events.
Model Programs	Increase resource efficiency in schools and other organizations, increase participation in local programs such as Marion County master Recycling classes and EarthWIISE.

Strategies For The City

Table 12 - Mitigation

STRATEGY	ACTION
Purchasing	Evaluate elements of supply chain that have highest impact to carbon footprint - prioritize efforts accordingly.
	Procure major purchases based on total ownership/lifecycle cost, with priority given to low carbon content, especially lower carbon paving, throughout the supply chain. Include maintenance and operations in setting procurement guidance (see DEQ’s low carbon purchasing toolkit for local government). Evaluate the need for paving at City- owned facilities and use environmentally friendly alternatives where possible.
	Establish a local forum for sharing best low carbon purchasing practices (include purchasing experts from major institutions like hospital, schools, and county).
	Cut paper use 10% each year, ultimately reducing paper use by 25%.
Waste Reduction	Work with hauler to increase opportunities for Waste Reduction.

Food and Agriculture

What is in the Food and Agriculture category?

The Food and Agriculture category includes everything related to our food production, delivery and distribution. It can also relate to local food distribution networks that support low income people or people with restricted mobility, and that divert food from the waste stream. Farms of all types serve Silverton directly, and are a driver in the Silverton area’s economy because of agricultural exports.

Why does it matter?



variety

Farms are a source of income and food for much of the Silverton community. Changing physical conditions due to climate change may require new crops and/or new cropping regimes and agricultural practices due to weather, pests, weeds, and water availability. Local food production also may change due to changing availability or cost of food transported into the community from elsewhere. A general shift in food consumption toward an increasingly plant-based diet can reduce GHG emissions generated by the meat and dairy sectors, which are significantly more GHG producing than plant-based agriculture. Agriculture may provide a carbon sequestration opportunity and agricultural practices are evolving to include methods that are less fuel and carbon-

based chemical intensive. In a resource-constrained world, local agriculture could focus on feeding the local community as a first priority. Severe climate events could impact the local food supply, which may impact disadvantaged community members disproportionately. In a more optimistic scenario, Silverton’s agriculture segment of the economy can continue to prosper and create incomes. There are also co-benefits that can result from strategies such as community gardens that can support community livability and provide increased food security to some community members, and from local agricultural practices that generally improve the environment.

The tables below contain the high priority actions in this category.

Strategies for the Community At Large

Table 13 – Mitigation

STRATEGY	ACTION
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Food Purchasing	Increase purchasing of local, low carbon content food alternatives throughout the community. Create and participate in food harvesting networks to reduce waste from fruit trees and crops.
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Food Awareness	Increase public knowledge and awareness of the impacts of food purchasing and dietary choices on climate.
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Table 14 – Adaptation

STRATEGY	ACTION
Local Food System	Increase participation in and accessibility to local food programs, including community supported agriculture (CSA) programs, and encourage neighborhood-scale food production.
Edible Landscapes	Model and promote edible landscaping and gleaning.

Strategies for the City

Table 15 – Mitigation

STRATEGY	ACTION
Food Purchasing	Adopt and implement purchasing plan for city agencies and functions to promote local and low carbon content food purchasing.
Food Awareness	Promote local food production via program support and public education.

Table 16 – Adaptation

STRATEGY	ACTION
Local Food System	Make land available for community gardens. Implement city- wide plan for diversion of deer.
Edible Landscapes	Prohibit no edible landscaping clauses for all new residential construction/home owner’s association projects.

Urban Natural Resources

What is in the Urban Natural Resources category?

The Urban Natural Resources category addresses the natural systems that support the soil, air, water, plants, and animals in the city. Urban natural systems addressed in this area include: streams, their riparian areas and contributing watersheds; drinking water sources; natural and constructed drainage features that filter, retain, and clean storm water; wetlands; wooded natural areas; vegetated open space areas; and the inventory of trees that create an “urban forest.”

Why does it matter?

The collective community maintenance and management of urban natural resources contributes to GHG emissions in only a very modest way, and can offset the release of GHGs in a modest way as well, through sequestration of carbon and cooling the environment. However, protecting, maintaining and enhancing natural resources within the urban environment can support the community’s preparedness and resiliency to predicted impacts of climate change.



Increased heat, draught, and extreme weather events are predicted to occur in the coming decades will challenge our infrastructure and services, and may threaten community health and the adequacy of local vegetation, habitat and water supplies that sustain local communities. Wetlands, healthy streams and drainageways, and open areas that provide groundwater recharge can help mitigate flash peak stormwater/flood flows that might otherwise overwhelm constructed infrastructure, and can help maintain groundwater aquifers and water quality in the face of prolonged drought. In warmer conditions, urban forests provide local heat reduction and can provide relief in hot weather for high risk populations without access to air conditioned spaces, such as low income people and those with limited mobility.

Urban green spaces can provide important fish and wildlife habitats and increased livability for Silverton citizens as well as education and outreach opportunities. Vegetation provides soil retention and water filtration, which can help urban infrastructure functions, prevent landslides and bank failures, and protect wildlife habitat. All of these environmental and natural resource protection strategies provide general livability and sustainability co-benefits to the community.

The following tables contain the high priority actions in this category.

Strategies for the Community At Large

Table 17 - Mitigation

STRATEGY	ACTION
Urban Heat Reduction and Drought Tolerance	Protect existing trees and increase new tree planting and climate appropriate vegetation on private and public lands and rights-of-way.
Water Supply and Conservation	Increase focus on water conservation and options for appropriate usage.

Strategies for the City

Table 18 – Mitigation

STRATEGY	ACTION
Integrated Pest Management	Adopt and implement citywide Integrated Pest Management (IPM) policies. Consider need for inputs (water, fertilizer, etc) and manage towards zero using permaculture and best practices, such as combination planting. Develop a plan for staff training. Forbid sale of Round-Up and promote alternatives to dealing with common noxious weeds. Provide public education and access to affordable less toxic, more water-efficient alternatives.
Equipment and Fuels	Create purchasing policy specifying electric lawn mowers, chain saws, leaf blowers, and weed eaters.

Table 19 – Adaptation

STRATEGY	ACTION
Natural Resources Asset Management	Update / maintain natural features inventories to support monitoring and management of climate-sensitive and other significant natural resources.
	Evaluate and monitor street trees and vegetation, modify species selections as appropriate to address climate change.
	Create a landscaping policy for our facilities that considers options for using native vegetation, firewise/waterwise landscaping and rain gardens.
	Leverage local, state, and federal partners for a more comprehensive approach to natural resource management in the City.
	Create both large and small networks of natural areas with diverse functions and habitats.
	Implement a trial "Park Pesticide Free" designation for city parks.
	Create more community gardens.
	Require use of native species in all public projects.

Stormwater Management	Reduce piped stormwater flows and peaks by incorporating public stormwater assets that infiltrate, store and slow peak stormwater flows.
Infrastructure Planning and Management	Update water, stormwater and wastewater master plans to address climate change. Context should include framing stormwater and wastewater as resources including planning to expand the use of reclaimed water for irrigation and other non-potable uses.
	Plan new city facilities with Green Infrastructure.
	Train staff to maintain green infrastructure (which have different skills and methods than traditional infrastructure maintenance) and provide adequate tools.
Urban Heat Reduction	Remove barriers to planting trees in right-of-ways.
Watershed Planning	Partner with local, regional, and state agencies, as well as local watershed councils, to encourage water conservation and efficiency, expand and diversify the water supply, and protect and improve the quality of the watershed.
	Consider water contracts that monetarily reward lower water consumption with lower rates.

Health, Social Services & Community Well-Being

What is in the H, SS, & CWB category? The Health, Social Services and Community Well-Being category addresses community health, care and assistance programs, emergency services, and preparedness (or risk management) for potential/predicted negative community impacts of climate change. Changing conditions (such as increases in temperature, extreme weather, and fires), regulations and energy sources will create new and sometimes unanticipated changes that will affect people in many ways. The need to mitigate the affect that these changes have on Silverton residents creates opportunities to create health through active modes.



Silverton participates in the Healthy Eating Active Living Program. The H.E.A.L., program is a way of encouraging an active and healthy lifestyle for residents. As we become more aware of the impact of fossil fuel use on our local economy and environment, programs like H.E.A.L. will become more important for our community health and welfare.

Why does it matter?

Changing conditions such as increased energy costs, will disproportionately affect the lower income populations. With the migration of people, flora and fauna may introduce new challenges such as fauna-carried diseases, and loss of existing native habitats that maintain natural system functions. More extreme weather events may threaten lives, such as elderly or health-compromised people in prolonged heat waves. Prolonged and extreme rains, or rapid snowmelt can cause flooding and landslides, and heat waves and droughts may bring wildfires that threaten neighborhoods at the urban-wildland interface. There are also co-benefits that can result from strategies that promote increased community awareness and preparedness for things like hazards, disasters, and disease vectors, and the availability of services in the community to provide support.

The following tables contain the high priority actions for this category.

Strategies for the Community At Large

Table 20 – Mitigation

STRATEGY	ACTION
Community Health Research and Planning	Address community health impacts of climate change and the capacity for treatment.
Emergency Preparedness (Responders / Service Providers)	Address emergency response needs related to the impacts of climate change.
Community Awareness and Individual Preparedness	Increase community’s awareness of potential climate change risks and adaptive actions they can take.

Table 21 – Adaptation

STRATEGY	ACTION
Education / Emergency Preparedness	Educate City staff on Silverton’s energy plan and identify what role staff can play in addressing health and social service needs.
Prepare for Fuel Shortages	In case of power outages, ensure operability of backup generators and other vital systems; investigate transition to non-fossil fuel alternatives.

Appendix

CITY OF SILVERTON RESOLUTION

18-10

A RESOLUTION OF THE SILVERTON CITY COUNCIL SUPPORTING A CLIMATE CHANGE/ENERGY USE STUDY TO BE CONDUCTED BY SUSTAINABLE SILVERTON

WHEREAS, Sustainable Silverton, a local grassroots organization, addressed the Council at its February 5, 2018 meeting and indicated that climate change threatens to significantly impact the surrounding natural environment and resources on which Silverton's economy and livability depend; and

WHEREAS, Sustainable Silverton noted that Silverton must anticipate the effects that reduced stream flows, severe storms, prolonged drought, increasing wildfire risks, and other predicted shifts in the natural environment will have on food security, business supply chains, recreation, tourism, and quality of life in the City; and

WHEREAS, the group also stated that the cost of clean energy technologies has fallen quickly and distributed energy systems are on the horizon; and

WHEREAS, Sustainable Silverton requested the City Council be proactive in the face of the changing energy sector and the changing climate by adopting a resolution to support a study to be conducted by Sustainable Silverton that will look at strategic energy use opportunities and climate change mitigation needs specific to Silverton; and

WHEREAS, the City recognizes our community partners PGE and Northwest Natural as significant stakeholders and invites their contributions to this study.

NOW THEREFORE, BE IT RESOLVED BY THE CITY OF SILVERTON, AS FOLLOWS:

Section 1: The City Council acknowledges that both the climate and the energy sector are changing: the City is facing reduced snowpack and increased drought and forest fires, but also has the ability to reduce emissions and increase the City's resiliency.

Section 2: The City Council acknowledges it has the opportunity to make decisions about how climate changes and energy sector advances are addressed using a proactive approach. The City will study how it can use strategic energy planning to ensure optimum benefits and mitigate future challenges.

Section 3: The City Council supports a Sustainable Silverton study concerning the strategic energy use opportunities and climate change mitigation needs specific to the City.

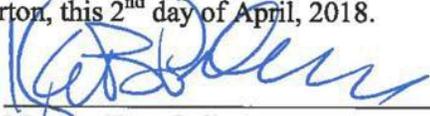
Section 4: The Study will be performed by Sustainable Silverton with minimal assistance from the City in acquiring data, if available, and will be completed within the first half of this year, 2018.

Section 5: The City wishes to involve the public and stakeholders in the preparation of the study through its Environmental Management Committee.

Section 6: The City Council agrees to consider the results and recommendations of the study.

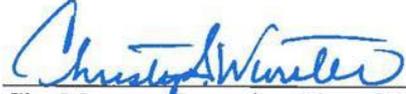
Section 7: That this resolution is and shall be effective after its passage by the City Council.

Resolution adopted by the City Council of the City of Silverton, this 2nd day of April, 2018.



Mayor, City of Silverton
Kyle Palmer

ATTEST



City Manager/Recorder, City of Silverton
Christy S. Wurster

Resources for Funding and Help

The following list is a start at uncovering available resources that can help us to advance toward a fossil free economy:

Energy Trust of Oregon, Solar Electric Incentive Program. Energy Trust of Oregon's Solar Electric Incentive Program, launched in May 2003, is available to customers of Pacific Power and PGE who install new photovoltaic (PV) systems on new or existing homes, commercial and community buildings, farms, and municipal facilities.

Rural Energy for America Program (REAP). Grants and loans. Provides financial assistance to agricultural producers and rural small businesses in rural America to purchase, install, and construct renewable energy systems, make energy efficiency improvements to non-residential buildings and facilities, use renewable technologies that reduce energy consumption, and participate in energy audits and renewable energy development assistance. Federal Modified Accelerated Cost Recovery System (MACR). Businesses may recover investments in certain property through depreciation deductions.

PGE – Residential Energy Efficiency Rebate Program. Offers a variety of rebates to residential customers for energy efficient improvements.

IRS – Residential Energy Conservation Subsidy. Energy conservation subsidies provided (directly or indirectly) to customers by public utilities are non-taxable. Includes installations or modifications primarily designed to reduce consumption of electricity or natural gas, or to improve the management of energy demand.

IRS – Residential Renewable Energy Tax Credit. A taxpayer may claim a credit of 30% of qualified expenditures for a system that serves a dwelling unit located in the United States that is owned and used as a residence by the taxpayer. Expenditures with respect to the equipment are treated as made when the installation is completed. If the installation is at a new home, the "placed in service" date is the date of occupancy by the homeowner. Expenditures include labor costs for on-site preparation, assembly or original system installation, and for piping or wiring to interconnect a system to the home. If the federal tax credit exceeds tax liability, the excess amount may be carried forward to the succeeding taxable year.

Business Energy Investment Tax Credit. Applies to the installation of solar Water Heat, Solar Space Heat, Geothermal Electric, Solar Thermal Electric, Solar Thermal Process Heat, Solar Photovoltaics, Wind (All), Geothermal Heat Pumps, Municipal Solid Waste, Combined Heat & Power, Fuel Cells using Non-Renewable Fuels, Tidal, Wind (Small), Geothermal Direct-Use, Fuel Cells using Renewable Fuels, Microturbines, Energy Efficient Commercial Building Tax Deduction. Equipment Insulation, Water Heaters, Lighting, Lighting Controls/Sensors, Chillers, Furnaces, Boilers, Heat pumps, Air conditioners, Caulking/Weather-stripping, Duct/Air sealing, Building Insulation, Windows, Siding, Roofs, Comprehensive Measures/Whole Building, Other EE, and Tankless Water Heaters are tax deductible.

Renewable Energy Production Tax Credit. The federal renewable electricity production tax credit (PTC) is an inflation-adjusted per-kilowatt-hour (kWh) tax credit for electricity generated by qualified energy resources and sold by the taxpayer to an unrelated person during the taxable year. Wind facilities commencing construction by December 31, 2019, and all other qualifying facilities commencing construction by January 1, 2018 can qualify for this credit.

State Energy Loan Program. The Oregon State Energy Loan Program (SELP) was created in 1981 after voters approved a constitutional amendment authorizing the sale of bonds to finance small-scale, local energy projects and is administered by the Oregon Department of Energy. The sale of bonds is made on a periodic basis and, occasionally, may be done to accommodate a particularly large loan request. Loans are available to individuals, businesses, schools, cities, counties, special districts, state and federal agencies, public corporations, cooperatives, tribes, and non-profits. School districts receive special rates.

New Homes Incentive Program. Energy Trust's New Homes Program offers builders cash incentives for energy efficient measures included in new homes where the measures exceed the building code minimum requirements. Lighting upgrades, whole home performance upgrades, higher levels of insulation, high- efficiency equipment, better windows, air sealing and solar systems are eligible for incentives under this offering. The more energy-efficient a home is above code, the more incentives a builder can qualify for.

Small Wind Incentive Program. The Energy Trust of Oregon's Small Wind Incentive program provides resources and cash incentives for customers of Portland General Electric and Pacific Power that are installing turbines up to 50 kilowatts (kW). To qualify for incentives, the installation site must be at least one acre, have average yearly wind speeds of 10 mph or higher, be connected to an electric utility, and be located within approximately 1,500 of a utility electrical meter. The tower must be between 70 - 180 feet high.

Residential Energy Star Appliance Rebate System. Energy Trust of Oregon offers rebates for Energy Star clothes washers to Oregon residential electric service customers of Portland General Electric (PGE) and Pacific Power and to Oregon residential natural gas service customers of NW Natural.

Multifamily Home Energy Solutions Program. Energy Trust of Oregon offers owners of multi-family properties, with two or more units, cash incentives for upgrades to windows, appliances, water heaters, building envelope, heating and cooling, energy efficient lighting and more.

Industrial and Agricultural Production Efficiency Program. Energy Trust of Oregon offers the Industrial and Agricultural Production Efficiency Program to customers of Portland General Electric, Pacific Power, and NW Natural. In order to qualify for these rebates, customers must be contributing to the Public Purpose Charge. Energy Trust offers technical assistance and cash incentives for industrial processes of all kinds — including large industrial, manufacturing and small industrial, wineries, food processing, cold storage, agricultural, greenhouses, irrigation districts, and water/wastewater treatment. Standard prescriptive incentives include lighting, green motor rewinds, heat pumps, variable speed drives, and premium HVAC equipment. Other rebates designed to fit the needs of specific industrial processes also exist. For example, there are irrigation system rebates for agricultural customers and compressed air rebates for small manufacturing customers.

New Buildings Program. Energy Trust of Oregon offers commercial businesses in Oregon a menu of services and incentives for new building construction or major renovation projects which utilize energy efficient equipment and design standards. New construction or major renovation projects may qualify for financial assistance and technical support in the following areas: professional support incentives, installation incentives and post-occupancy incentives.

Commercial Energy Efficiency Rebate for Existing Buildings. Energy Trust of Oregon offers incentives for commercial and institutional customers of any of the state's investor owned utilities to increase the energy efficiency of their existing buildings. The standard incentive program provides prescriptive rebates for the retrofit of insulation, water heaters, lighting equipment, and HVAC equipment, as well as equipment specific to data centers, grocery stores, and the food service and lodging industries. For more information on incentives specific to different industries, see the Energy Trust web site. Projects must be pre-approved before making and equipment purchases or initiating any work.

Electric and Hybrid Vehicle Rebates and Tax Deductions. Federal tax deductions and State rebates apply to purchases of new electric and hybrid vehicles. The maximum savings in Oregon can be \$10,000.

Food Availability. Food produced locally leaves a smaller carbon imprint and has higher nutritional value than food trucked in from commercial growers. Locally sourced organic food may be found at the Saturday Farmers Market from late Spring to early Fall in Silverton. An indoor Farmers Market is offered in Winter months. Participating farmers provide home services on an annual basis.

Hydropower and Geothermal Energy. The Energy Trust of Oregon has staff dedicated to helping cities, businesses and homeowners evaluate local resources and technologies that utilize hydropower and geothermal energy.

LEED Building Standards. The U.S. Green Building Council (USGBC) works with architects and builders to transform the way buildings and communities are designed, built and operated, enabling an environmentally and socially responsible, healthy, and prosperous environment that improves the quality of life.

Oregon Clean Power Cooperative. Partners with local government to install clean energy facilities and to increase installations of solar energy systems on nonprofit and government facilities, driven by the U.S. Department of Energy's SunShot Community Challenge.

Sustainable Northwest. Founded in 1994 and based in Portland, Sustainable Northwest works with local governments and businesses throughout Oregon to pioneer sustainability energy conservation solutions.

Change the Course. Works with local conservation groups to fund and bring together the public, corporations, and on-the-ground conservation organizations to raise awareness about fresh-water, reduce water footprints, and restore flows and health to vital freshwater ecosystems.

Solar Oregon. Conducts workshops, advocates for pro-solar policies to help homeowners and communities navigate and accelerate the development of solar energy in Oregon. Works with local government, businesses and non-profit organizations to reduce our energy footprint. Located in Portland.

PACE. Property Assessed Clean Energy (PACE) is a financing mechanism that enables low-cost, long-term funding for energy efficiency, renewable energy and water conservation projects. PACE financing is repaid as an assessment on the property's regular tax bill, and is processed the same way other local public benefit assessments (sidewalks, sewers) have been for decades. Depending on local legislation, PACE can be used for commercial, nonprofit and residential properties.

Oregon Foundations. Meyer Foundation, The Oregon Community Foundation, and the Ford Family Foundation all have an interest in funding local sustainability projects in rural communities.

WyEast, a non-profit advisory group. WyEast delivers education, outreach and on-the-ground technical assistance to agricultural producers and rural small businesses to accelerate the demand for energy efficiency and renewable energy project. PECE. PECE is a nonprofit corporation dedicated to creating the new energy economy. They are considered leaders in the field of energy resource management, with expertise in designing and implementing community energy programs for utility and government agency clients. Founded 1979 in Portland, Oregon.

Marion Soil and Water District. MSWD provides education, funding, and technical assistance to groups working to improve water quality and conservation in Marion County. The scope of their work includes support for conservation education, eradication of invasive species, and erosion control.

Marion County EarthWISE. Provides waste reduction and energy conservation education and technical assistance to businesses and cities in Marion County.

Mid – Willamette Valley Community Action Agency. Provides low income weatherization services to all of Marion County.