

Jackson Hole Climate Action Collective

A CLIMATE ACTION ROADMAP FOR JACKSON HOLE, WYOMING



2023



JACKSON HOLE CLIMATE ACTION COLLECTIVE

The Jackson Hole Climate Action Collective is an all-volunteer non-profit organization founded in 2020. We are working towards a just and equitable climate future for Teton County and the Greater Yellowstone region through policy, advocacy, education, and community mobilization. We embrace inclusive community action that supports a wide range of people and organizations to achieve a just climate future.

We would like to give thanks to the many people who contributed ideas and support for this Roadmap. And we are excited to meet and work with so many others as the ideas we have collectively identified here—and those that follow as a result of the dialog our Roadmap prompts—advance into action.

If you are interested in joining or supporting our Collective in advancing this critical climate action work, please contact us:

jhclimateactioncollective@gmail.com
jhclimateactioncollective.org
facebook.com/jhclimateactioncollective
instagram.com/jhclimateactioncollective

BOARD OF DIRECTORS

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Reade Dornan

Jennifer Evans

Sophie Lamb

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Victoria Parker

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FOREWORD

Reade Dornan, JHCAC Co-Founder

May 1, 2023

Enclosed is the Jackson Hole Climate Action Collective Roadmap for Climate Action, which is meant to speed the effort towards the 2030 Resolution for Net Zero Carbon Reduction. It is the culmination of a two-year project that lays out a compact and comprehensive overview of climate action activities already accomplished by the Town of Jackson and Teton County along with suggestions for the next important steps. It is based on approved public documents, so much of it can be adapted immediately to federal, state, local government, and other grant applications.

This Roadmap has six sectors with suggestions for immediate actions toward climate mitigation. Each sector begins with a short paragraph on the specific issues and then includes a matrix of our suggestions for goals and the crucial next steps.

A similar Climate Action Plan has already been completed in many other Rocky Mountain towns of comparable size and budget (Aspen, Park City, etc.). We hope our Roadmap provides a strong start to a more complete document provided by the Town of Jackson and Teton County officials, who will want to align it with existing regulations and policies. It will also need a final vetting and updating by technical experts. After final adoption of the Roadmap or its successor, we hope it will generate immediate action and there will be regular follow up, continued monitoring, tracking, and reporting progress, including coordinating, and updating the greenhouse gas emissions inventory and the Roadmap.



Photo: MaKenzie Cooper via Unsplash

ACKNOWLEDGEMENTS

To begin, we, from the Jackson Hole Climate Action Collective, acknowledge we are currently living, gathering, and learning as colonizers in the unceded and occupied territory of the Eastern Shoshone, Shoshone-Bannock, Northern Arapaho, Cheyenne and many other indigenous Peoples whose past, present and future generations steward these lands. We acknowledge their deep connection to this place established and passed on through innumerable generations living and carrying out their hopes, their dreams, and their lives on these lands from which they were displaced. We encourage you to take a moment to consider the many legacies of violence, displacement, migration, and settlement that bring each of us together here in the present. We honor and respect traditional ecological knowledge and seek its wisdom.

EXECUTIVE SUMMARY

The Jackson Hole Climate Action Roadmap is a citizen-produced set of strategies and actions from the Jackson Hole Climate Action Collective that could guide decision makers in the Town of Jackson (TOJ) and Teton County, Wyoming (TC) in the face of historically unprecedented warming during the 21st century. We cannot afford to do nothing. The altered West of the future will be the result of steady incremental changes—rising average temperatures, milder winters with more precipitation falling as rain, and extreme weather that disrupts the order of things. Rising temperatures, extreme heat, drought, wildfire on rangelands, and heavy downpours are expected to increasingly disrupt agricultural productivity in the United States. And, in fact, our community has already undertaken a number of actions to address climate change. This Climate Action Roadmap intends to support and amplify these prior efforts and commitments with an emphasis on **ACTION**.

This Roadmap is not intended to be an exhaustive or definitive list of needed actions in Jackson to mitigate climate impacts. We envision this Roadmap as a living document, with its contents as seeds that grow into a larger set of actions, supported by specific commitments to greenhouse gas emission reductions, considerations of equity, and other actions from our local governments and others in a position to make a difference.

This table summarizes the overarching goals we have established for six sectors, along with strategies to accomplish them. Example tactics and additional supporting information may be found in the body of the document.

EXECUTIVE SUMMARY CONT.

	GOALS	STRATEGIES
TRANSPORTATION	Reduce greenhouse gas emissions from transportation	Reduce vehicle miles traveled by individuals/households and businesses using fossil fuel burning vehicles—shift travel to methods with lower carbon production, including mass transit, ride sharing, bicycle and foot
		Increase use of clean energy motor vehicles through investments in new clean energy vehicles and supporting infrastructure, especially while federal tax credits are available
		Develop and implement plan for reducing greenhouse gas emissions and associated impacts from air travel to and from Jackson Hole Airport
BUILDING ENERGY USE	Reduce greenhouse gas emissions from energy use in buildings	Adopt and enforce building codes that advance decarbonization in new and existing buildings
		Increase available financial incentives and other support for energy efficient building retrofits
		Advance efficient building electrification through policies, incentives, and workforce/market development efforts, especially in new construction
		Conduct aggressive outreach and education to residents, visitors, and businesses to increase uptake of above strategies and to change behavior to reduce energy consumption
ENERGY SUPPLY	Reduce greenhouse gas emissions from energy supply	Increase onsite renewable energy generation in residential, commercial, and government buildings
		Decrease greenhouse gas emissions from energy supply procured by Lower Valley Energy
		Ensure future availability of clean energy supply

EXECUTIVE SUMMARY CONT.

	GOALS	STRATEGIES
WATER	Reduce water waste and increase water quality	Runoff capture by the Town of Jackson
		Runoff capture by Teton County landowners
		Reduce hillside erosion
		Increase homeowners' and developers' contributions to water conservation
VEGETATION	Promote stewardship of vegetation and land to achieve highest level of carbon sequestration	Collaborative human stewardship from property owners and land managers to maintain healthy landscapes
		Preserve and enhance riparian corridors
		Promote healthy, more fire-resistant forests
		Incorporate plants into building codes
		Reduce lawn fertilizing and irrigation
WASTE	Lower emissions resulting from waste management process and promote zero waste activities	Meet Integrated Solid Waste & Recycling Zero Waste program goals and beyond for 60% diversion from landfill
		Improve public and visitor knowledge about efforts to reduce waste, why, and how to do it
		Work with local construction and demolition companies re: best practices for disposal and sorting of waste materials including wood, concrete, metal, etc.
		Conduct Circular Waste Economy program education throughout the community

Fully implementing the Roadmap strategies goes beyond the authority of any individual, local government department, or non-profit or collective of non-profits. Because many of these projects require agreement among multiple stakeholders, substantial amounts of government funding, the cooperation of multiple public agencies and city franchisees, Teton County and the Town of Jackson must assume the leadership and large responsibility for assembling public and private partnerships to implement many of the projects. The transition of this Roadmap to a Climate Action Plan will require addition of measurable goals, with timebound commitments and regular tracking of progress.

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<p>The bottom line: take heart and review our collective behaviors and regulations, looking for ways we can help the situation depending on our circle of influence, willingness, collaboration, and action. Remember that every small step serves to make a difference. Scientific tracking and results tell us we have until 2030 to make a meaningful difference. Acting NOW is of utmost importance.</p>	
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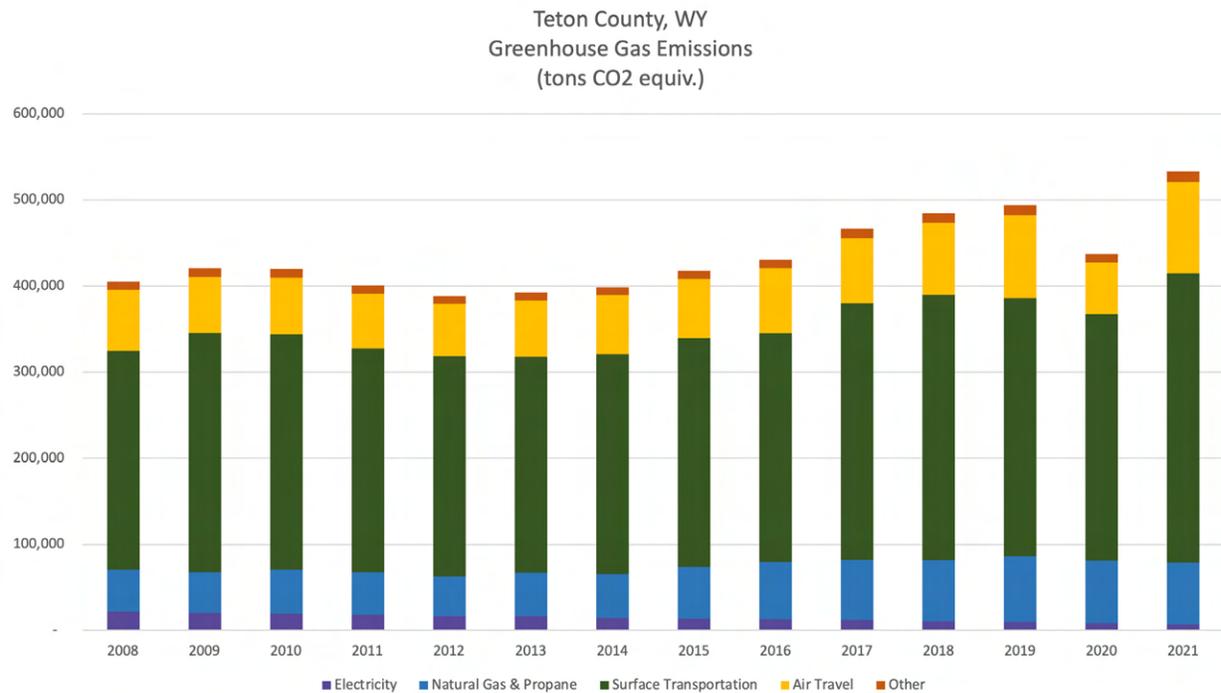
Cover Photo: Cora Leach via Unsplash

INTRODUCTION

The Jackson Hole Climate Action Roadmap is a citizen-produced set of strategies and actions from the Jackson Hole Climate Action Collective that could guide decision makers in the Town of Jackson (TOJ) and Teton County, Wyoming (TC). Consideration may be given to Teton Valley, Idaho, adjacent public lands, travel corridors, and gateway communities to achieve greenhouse gas reduction and its impact on the planet. It addresses both root causes of fossil fuel use and other contributors to environmental degradation. The Roadmap urges and incentivizes businesses, tourists, and residents, through voluntary efforts, public/private partnerships, and government action to reduce greenhouse gas emissions (GHGs) and fossil fuel use as well as promote sustainability in all vital sectors.

Climate Action Goal: In accordance with TOJ April 6, 2020 Resolution, the Jackson/Teton County Comprehensive Land Use Plan and Town of Jackson’s budgetary goals for sustainability, the aspirational goal is carbon neutrality by 2030.

This chart demonstrates that we have a heavy lift to reach that goal:



Source: Jackson-Teton County 2022 Indicators Report

INTRODUCTION CONT.

Carbon neutrality may best be achieved by overall reduction of greenhouse emissions (including methane) as measured against the baseline year for our metrics of Year 2006. Residents, businesses, and community leaders working together need to continue shaping the valley's development and preserving our natural environment and wildlife, while promoting economic opportunity and quality of life for current and future generations.

Building on past achievements, the Roadmap recommends future actions. It is divided into six climate sectors:

- **TRANSPORTATION**
- **BUILDING ENERGY USE**
- **ENERGY SUPPLY**
- **WATER**
- **VEGETATION**
- **WASTE**

Action recommendations for each sector include considerations of social equity, economic vitality, affordability, community health and safety, and recovery from natural disasters.

SECTION 1: CLIMATE CHANGE IN THE ROCKY MOUNTAINS

SECTION 1.1 A DESCRIPTION OF PRESENT CONDITIONS AND A PROJECTION OF WHAT'S COMING

Recent US Forest Service climate models anticipate what's coming in all five Rocky Mountain Region states. The Intermountain states are expected to experience historically (1975–2005) unprecedented warming during the 21st century. Historically observed trends for the region indicate that temperatures have increased by 1.0 - 2.5 degrees Fahrenheit, precipitation trends have been highly variable with a slightly increased trend of 0.5 - 2.1%, and snowpack has declined by 16-22% over the past 50 years. The overall trend has been toward a drier interior West in which any potentially higher precipitation levels will eventually be offset by rising temperatures. Winter of 2022-23 precipitation levels have been significantly higher, though not predictable. The effect on the Snake River, a headwater to the Columbia River basin, is not known at this time.

Models also project trouble ahead (2071–2090). By 2050, winter temperatures in the region could increase by as much as 6 °F. In some places, average winter temperatures could rise above a biologically meaningful threshold, above freezing in some areas. For spring temperatures, the projected average increase is 3 - 4 °F above the historical record. Warmer average temperatures will cause dry seasons to last longer and become more extreme. Summers are expected to be unusually warm with near drought conditions. The northern states can expect similar conditions. Signs point to a lighter winter snowfall and that snowmelt will come earlier in the spring, leading to a decrease in river run-off during the hotter months of the year. According to the 2021 Greater Yellowstone Area (GYA) Climate Assessment, the GYA anticipates snowpack melting during winter itself. Glaciers millennia old are fast melting and could be gone in a quarter century. Snowpack has functioned like massive natural reservoirs. Less ice and snow, melting glaciers, and earlier run-offs point to lower river and dam levels as well as lower aquifer levels and a reduced clean water supply. Changing rain and snow patterns are causing lower river levels and disruption in animal migration. Some evidence of seasonal shifts in blooming times for plants also affect bird migrations and insect populations. These studies have used the Frank Craighead Notebooks as the baseline for change.

With less heat-reflecting snow and ice, hotter summers raise the fire danger. A relatively small increase in temperature means the difference between a season with a fire and one without. Rising temperatures, extreme heat, drought, wildfire on rangelands, and heavy downpours are expected to increasingly disrupt agricultural productivity in the United States, with expected increases in challenges to livestock

SECTION 1: CLIMATE CHANGE IN THE ROCKY MOUNTAINS

health, declines in crop yields and quality, sustainable food security, and price stability.

Businesses are feeling these effects: a group of nearly 7,000 national companies reporting to the “Climate Disclosure Project,” endorsed by the SEC (Securities and Exchange Commission), estimated they face nearly \$1 trillion in climate change-related risks, many of which they assessed were highly likely to occur—and would affect them in the next several years. And a diverse group of stakeholders—from consumers and employees to financiers and activists—is increasingly pressuring businesses to act.

Locally, outdoor recreation, tourist economies, and quality of life are reliant on benefits provided by our natural environment that will be degraded by the impacts of climate change in many ways. A 2015 study by the Charture Institute “The Coming Climate: Ecological and Economic Impacts of Climate Change on Teton County” spells out these changes in detail. Jackson Hole Mountain Resort, Snow King, and Grand Targhee National Forest depend on strong snow seasons. Snow levels are retreating up mountains. For ski areas in the Rockies to remain economically viable, they will have to move lifts and snowmaking above their current base operations. Even then, they will struggle as climate change devastates skiing found at lower elevations; skiing conditions in regional ski areas will in decades to come be no longer be reliable. But without winters they will no longer be feeder venues; meaning, revenue for Rocky Mountain resorts will tumble. Businesses related to eco-guiding, hunting, fishing, cycling, and hiking will feel the brunt of climate unreliability. For example, the flash flood that closed Yellowstone National Park in June 2022 caused significant damage to road and Park infrastructure and affected gateway communities in unanticipated ways, including serious loss of business.



Photo: Karsten Winegeart via Unsplash

SECTION 1: CLIMATE CHANGE IN THE ROCKY MOUNTAINS

Furthermore, many Indigenous peoples reliant on natural resources for their economic, cultural, and physical well-being are uniquely affected by climate change. The impacts of climate change on water, land, and other natural resources, as well as infrastructure and related services are expected to increasingly disrupt the livelihoods and economies of Indigenous peoples, including agriculture and agroforestry, fishing, recreation, and tourism. One ominous example is the massive fish kills from low river and lake levels and fertilizer run-off into nature's waters. High levels of nitrogen and phosphorus lead to increased algae growth and hypoxia ("dead zones") or the suffocation of fish. This dynamic is hastened by drought conditions that leave dangerously low amounts of water in rivers and lakes. Locally, the Snake River has been named among the most endangered waterways of North America. A multi-state effort is underway to eliminate four dams on the Snake to protect the salmon and the river.

SECTION 1.2 WHAT IF WE DO NOTHING?

An increase in greenhouse gases in the earth's atmosphere from the combustion of fossil fuels has been determined to be a dominant human caused driver of climate change. According to scientific studies, at least 40% of climate change is human caused. In the GYA, a substantial contributor is emissions from internal combustion engines, or vehicles. The serious roadway congestion of the past few years is crystal clear evidence of the concern. An increasing consideration is wildfire, both local and regional.

The altered West of the future will be the result of steady incremental changes—rising average temperatures, milder winters with more precipitation falling as rain, and extreme weather that disrupts the order of things. Rising temperatures, extreme heat, drought, wildfire on rangelands, and heavy downpours are expected to increasingly disrupt agricultural productivity in the United States. Expected increases in challenges to livestock health, declines in crop yields and quality, and changes in extreme events in the United States and abroad threaten rural livelihoods, sustainable food security, and price stability.

These trends have occurred even as Jackson Hole has experienced significant population growth. Since the 1960s the valley's population has increased more than tenfold. The increased number of people driving cars and other transportation, using energy in buildings, and consuming materials in Jackson Hole has increased the presence of greenhouse gases and the degradation of the environment, such as an impact on wildlife, more waste, and possibilities for water pollution.

In Jackson Hole and Grand Teton National Park, the Cherture Institute points to trouble for the cold-dependent species such as the pika, wolverines, snowshoe

SECTION 1: CLIMATE CHANGE IN THE ROCKY MOUNTAINS

hare and moose. It also shows concern for trees such as the white bark pine, limber pine and lodgepole pine and the ominous takeover of invasive species such as pine bark beetle and cheatgrass increasing the spread of wildfires. Other wildlife groups express concern for wolves, the mule deer, the sage grouse, and mountain lions under threat of largely man-made conditions and an all-important ecosystem vulnerability.

Jackson Hole can expect environmental changes; some of it will be “irretrievable.” As the Charture Institute points out, “If more people seek to visit and move to Teton County because of its relatively more pleasant climate (especially in summer), population growth will pressure already scarce housing opportunities and add congestion to already congested roadways.” Any steps toward mitigation and adaptation for wildlife and vegetation are crucial. Addressing climate change will clearly depend on a reduced human impact by lowering energy consumption, producing meaningful offsets, and taking further measures to reduce greenhouse emissions. It may also rely on limiting growth and changing the way we manage resources.

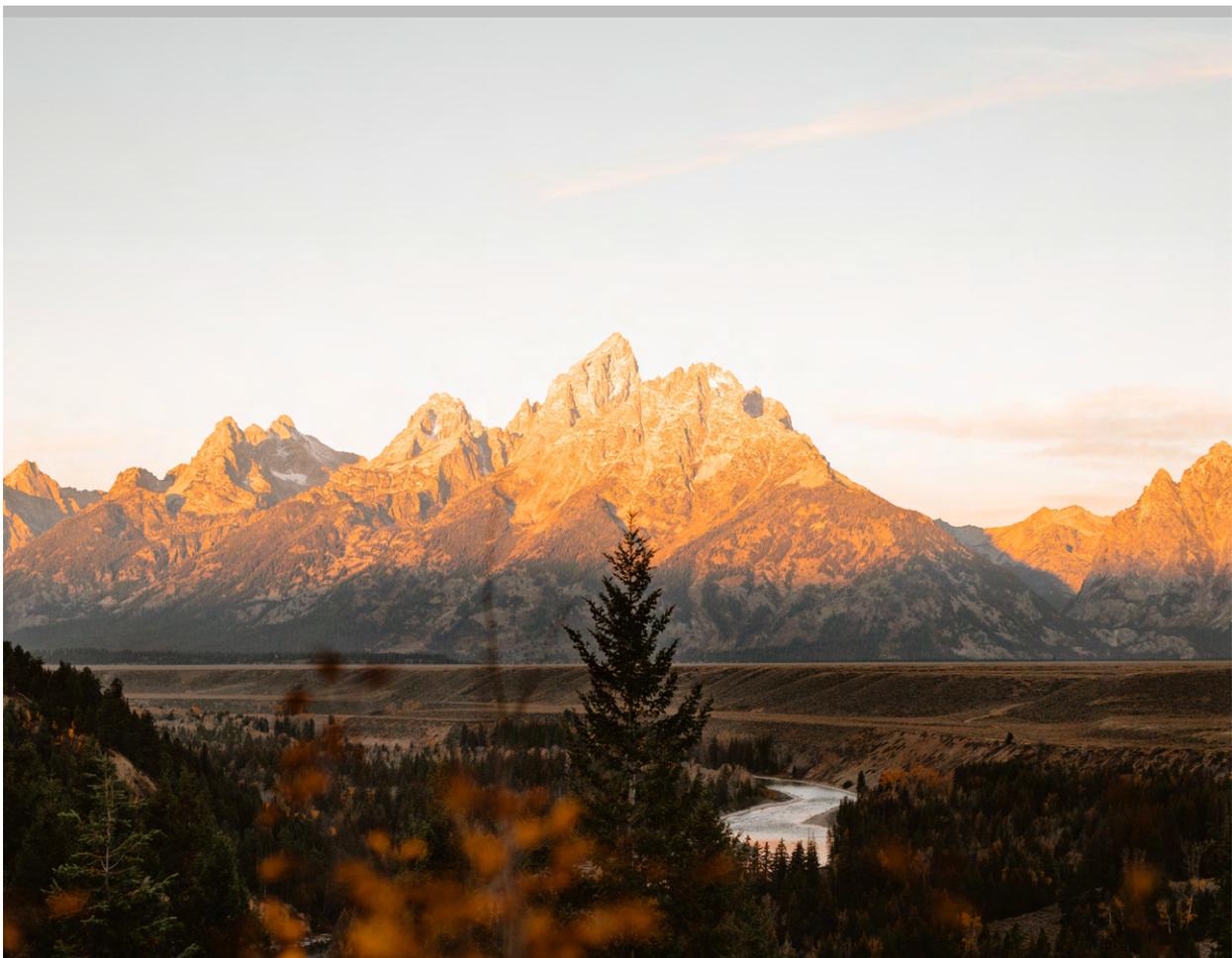


Photo: Kenn Buxton via Unsplash

SECTION 1: CLIMATE CHANGE IN THE ROCKY MOUNTAINS

Even more important, the impact of climate change covers millions of acres adjacent to Jackson Hole, an area many times larger than that defined by our valley. The current best available information and data analysis found for the entire Greater Yellowstone Area may be in the Greater Yellowstone Climate Assessment Report, released in 2021. Known as the GYCA 2021, it is the result of on-going research project involving US Geological Survey scientists and scholars from the University of Wyoming and Montana State University, scientific communities, public land managers and non-profits from three states (WY, ID, and MT). The report identifies these issues among others:

Annual precipitation increase of 9-15%. Nevertheless, the combination of elevated temperatures and higher evaporation rates will make future conditions drier in summer. Of particular interest are six watersheds: The Wind River Indian Reservation, the Crow Indian Reservation, Yellowstone National Park, Grand Teton National Park, Fort Hall Indian Reservation, and the Greater Yellowstone Ecosystem.

Multiple threats to lands surrounding Yellowstone and the Grand Tetons including the Kilgore (Eastern Idaho) Gold Mining Project and the proposed gold mining on public lands north of Yellowstone, disrupting ecosystems through stripping of vegetation and heavy water use.

250,000 acres (about the area of San Antonio, Texas) of critical, protected habitat for grizzly bears, wolves, elk, moose, and the elusive lynx and wolverine in the Custer Gallatin National Forest. This land preservation has been addressed in the 2019 Gateway Protection Act, reauthorizing Land and Water Conservation funds and withdrawing some federal lands from mining. The 1872 Mining Law needs to be updated to secure clean drinking water and relieve taxpayers from paying over 50 billion for pollution caused by hard rock mining.

Relocation of Yellowstone's Wild Bison. The Tribes of Fort Peck, InterTribal Buffalo Council, National Park Service, and non-profit partners like Greater Yellowstone Coalition are working to give bison the best chance at meaningful restoration. Central to these efforts is the Bison Conservation Transfer Program and the collaborative partnership working to support and expand it to reduce the need for Yellowstone bison culling.

The survival of Yellowstone's grizzly bear population. Some of the strategies include advocating for new land protections in critical bear habitat, voluntary livestock allotment buyouts, and funding range riders and electric fencing.

SECTION 1: CLIMATE CHANGE IN THE ROCKY MOUNTAINS

SECTION 1.3 VISITATION MANAGEMENT IN JACKSON HOLE

Approximately 2.5 million people visit Jackson Hole each year. No surprise. Jackson Hole is at the gateway of two of America's premiere national parks. Yellowstone National Park and Grand Teton National Park jointly form the Greater Yellowstone



Photo: Elijah Hall via Unsplash

Ecosystem that hosts spectacular views of wildlife that cannot be found anywhere else in the lower 48 states. The Tetons are some of the most photogenic in the U.S. and the Bridger Teton National Forest is the largest of its kind in America. The land attracts outdoor enthusiasts of all sorts. In a year's time, waves of summer and winter sports people outnumber the 23,500 locals approximately ninety-six to one, contributing significantly to the accumulations of greenhouse emissions, the impact on wildlife, and food and human waste. Surrounded 97% by public lands, Jackson's infrastructure--its roadways, commercial, residential, and governmental spaces--is severely restricted. Heavy visitation to the restaurants, lodging, retail businesses, and hospital overloads housing availability, seasonal staffing, and emergency health services. At the same time, tourism is the bread-and-butter of the economy, so the gaps need to be addressed.

In recent years, there has been increasing attention to mitigating the impacts of visitation on Jackson Hole. The nonprofit Riverwind Foundation was founded in 1999. It serves as a think tank in Jackson Hole for mitigating the impact of residents and visitors on the economy, community, and ecosystem. The Foundation speaks up for maintaining the character of Jackson Hole and for managing both visitors and residents to high impact areas. The Foundation initiated the Sustainable Destination Program in 2012 for creating policies, programs, and projects, and practices of environmental stewardship, social responsibility, and economic vitality in the public and private sectors.

As of February 2023, a comprehensive "Sustainable Destination Management Plan" (SDMP), prepared under the auspices of the Jackson Hole Travel and Tourism Board, has been published. It contains many recommendations specific to tourism and overlapping with this Roadmap, including a specific goal to reduce climate risks and enhance destination resilience. The SDMP includes four initiatives under this goal, including demonstrating Teton County's leadership in reducing tourism's carbon footprint, establishing science-based reduction targets for the tourism economy aligned with net-zero climate goals, educating visitors and residents about carbon emissions and create actionable opportunities to collectively reduce their carbon footprint, and guiding, supporting, and incentivizing tourism businesses to reduce their carbon footprint. Each initiative includes a detailed set of priority actions.

SECTION 2: CLIMATE ACTION VISION AND PRINCIPLES FOR FURTHER ACTION

The vision for the Climate Action Roadmap offers next steps for immediate measures for moving forward. A comprehensive approach requires us to rethink the architecture of past events, shift priorities, and coordinate the ways we address energy consumption and waste production. It will require new collaborations, innovations, willingness, and consideration of diverse perspectives for meaningful change to occur. Larger achievements will depend on a focused, coordinated, and planned effort that builds on the significant work accomplished to date.

GOALS OF THIS ROADMAP ARE AS FOLLOWS:

- Harness the excellent resources, talents, inventories, and studies currently available or under development by local government, educational institutions, industries, and non-profit groups
- Develop and implement a blueprint to support a sustainable future for the Jackson Hole region and follow through on projects that make the most effective use of our resources.
- Support Jackson/Teton County Comprehensive Plan goal of protecting ecosystem health for the benefit of all.

2.1 SUGGESTED GUIDING PRINCIPLES

How we achieve a significant reduction of GHGs matters. Effective collaboration and aggregate action by community groups and government are vital to achieving the climate action vision and sector goals. Therefore, the Roadmap calls on the community of the Greater Yellowstone Area to lead on climate action through the following principles:

- Reflect local values as expressed by and through the Jackson/Teton County Comprehensive Plan
- Reduce the consumption of non-renewable energy
- Reduce greenhouse gas emissions through well-planned land use, development and by harnessing ecosystem services (i.e., water, forestry, and habitat)
- Reduce greenhouse emissions through transportation upgrades
- Increase energy efficiency in buildings
- Reduce greenhouse gas emissions through waste management and water conservation
- Ensure energy supply reliability and affordability while protecting the natural environment.

SECTION 2: CLIMATE ACTION VISION AND PRINCIPLES FOR FURTHER ACTION

2.2 PRIORITIZATION OF CLIMATE EQUITY

This Roadmap seeks to be situated on and guided by climate justice and equity principles. Influential and positive climate action must consider those being affected first and worst. We must recognize that those who are most affected and have the fewest resources to adapt to climate change are also the least responsible for greenhouse gas emissions. These groups of people include indigenous, Black, Brown, low-income communities, women, children, and other marginalized communities. The historical and current oppression of these groups is intertwined with the climate injustice they have faced. Climate justice means those who have the resources to address the climate crisis shall use them to protect these vulnerable communities. Additionally, we should be guiding tools for action into the hands of those on the frontlines of climate change and provide help to those already experiencing the impacts of climate change.

In Jackson, as the impacts of climate change worsen, so will the effects on these groups of people. As the days get hotter, those without air conditioning in their homes and those who work outside will suffer the most, and these are often residents who already struggle and experience stress in other categories such as financially or security of housing. The additional health concerns and financial stress due to the rising temperatures provide an example of “compounding climate impacts.” As hot streaks and cold snaps become more common, energy bills will become more expensive, causing more stress to low-income communities. Folks who reside in cramped living spaces with many other housemates will be more at risk of growing rates of viruses due to climate change. Changing temperatures and seasons will heighten food prices, causing additional harm to low-income families. Indigenous communities who have maintained crop and food traditions for generations will have to adapt their ways of life as changes to the environment occur, losing aspects of their heritage.

The list of potential climate injustices goes on. However: this Roadmap seeks to set out priorities, goals, and actions that will lessen the injustice on these communities and bring justice through climate action. People of all socio-economic classes, of all races and educational levels must join and fight the climate crisis within their own capabilities. Everyone has something different to contribute to climate action whether that be monetarily, legally, through advocacy or education. As you read on, situate yourself in the climate fight by considering your own identities and where you fit into the climate puzzle.

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES

This Roadmap includes overarching goals for each of the six sectors and specific examples of next-step actions for achieving a reduction of regional GHGs, either directly or indirectly.

THE INITIAL SET OF STRATEGIES INCLUDED IN TABULAR FORM FOR EACH SECTOR IN THIS ROADMAP HAVE BEEN PRIORITIZED USING THESE GENERAL CRITERIA:

- Potential impact for reducing carbon emissions
- Achievable, practical
- Costs can be estimated, and funding is available — or potentially available
- Political viability
- Leadership in place

Many of these strategies and actions have already been identified—in the Comprehensive Plan, Integrated Transportation Plan, Sustainable Destination Management Plan and other planning efforts and resolutions. The Climate Action Roadmap intends to support and amplify these prior efforts and commitments with an emphasis on ACTION. The Roadmap is not intended to be an exhaustive or definitive list of needed actions in Jackson to mitigate climate impacts. We envision this document and its contents as seeds that grow into a larger set of actions, supported by specific commitments to greenhouse gas emission reductions and other actions from our local governments and others in a position to make a difference.

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES



Photo: Ant Rozetsky via Unsplash

Since surface and air transportation produced a combined 83% of all greenhouse house emissions in Teton County in 2021, no actions would be more effective than targeting reduction of these impacts in Teton County. Tackling the problems of public transportation, private vehicle traffic, and airport pollution should take precedence over all other plans for achieving low emissions. The Wyoming Department of Transportation (WYDOT), the TOJ and the County—incentivized by congestion on the three main arteries (state highways 22, 390 and 26-89)—have laid the groundwork by promoting the use of alternative fuels, advocating increased bicycle and e-bicycle use, limiting downtown parking, and developing a local and regional public transit system. Future actions should build on these accomplishments. See prioritized list in matrix below.

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES

GOAL REDUCE GREENHOUSE GAS EMISSIONS FROM TRANSPORTATION

STRATEGY Reduce vehicle miles traveled by individuals/households and businesses using fossil fuel burning vehicles—shift travel to methods with lower carbon production, including mass transit, ride sharing, bicycle and foot

★ EXAMPLE TACTICS

Increase frequency and geographic extent of bus service to increase ridership, including to airport and Grand Teton National Park; more convenient bus scheduling; commuter passes; build dedicated bus lanes and favorable traffic lights

Continue to expand infrastructure and other support to increase active transportation trips, including by bicycle and foot

Implement a Transportation Demand Management program, with a robust public education component

Implement land use planning strategies that support GHG reductions from transportation, including incentives and disincentives related to siting, parking requirements, impact fees, etc.

👤 EQUITY CONSIDERATIONS

Motor vehicle ownership is expensive—increasing alternatives increases mobility of lower income populations

Opportunity to increase Universal Access

✓ OTHER CO-BENEFITS (HEALTH, COST, ETC.)

Reduced traffic congestion, cleaner air, improved health if using human-powered modes, reduced stress

📖 POLICIES AND RESOURCES

Comprehensive Plan

TOJ 2030 Resolution for Net Zero Carbon Reduction

Jackson Teton Integrated Transportation Plan

2020-2025 START Routing Plan

Town of Jackson Complete Streets Policy and 2015 Community Streets Plan

STRATEGY Increase use of clean energy motor vehicles through investments in new clean energy vehicles and supporting infrastructure, especially while federal tax credits are available

★ EXAMPLE TACTICS

Public/private funding for increased use of electric vehicles by private persons, businesses, and government entities, including purchase of electric vehicles by government (e.g., school buses) and increased charging infrastructure throughout the region

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES

EQUITY CONSIDERATIONS

Clean energy vehicle purchases by government bring benefits to people who cannot afford the investments on their own

OTHER CO-BENEFITS (HEALTH, COST, ETC.)

Improved air quality; reduced operating costs

POLICIES AND RESOURCES

Comprehensive Plan

TOJ 2030 Resolution for Net Zero Carbon Reduction

STRATEGY Develop and implement plan for reducing greenhouse gas emissions and associated impacts from air travel to and from Jackson Hole Airport

★ EXAMPLE TACTICS

Revise air travel operations procedures

Alternative aviation fuels

Impact fees linked to GHG emissions

EQUITY CONSIDERATIONS

Most of these emissions are coming from sources that are out of reach for lower income individuals, so they experience the detriments without receiving the benefits

OTHER CO-BENEFITS (HEALTH, COST, ETC.)

Improved air quality

POLICIES AND RESOURCES

2030 Resolution

Jackson Hole Airport Greenhouse Gas Emissions Inventory - 2017

POTENTIAL SOURCES OF FUNDING

Federal grant programs (Inflation Reduction Act, Bipartisan Infrastructure Law, Infrastructure Investment and Jobs Act), Town and County general funds, Specific Purpose Excise Tax (SPET), Lodging Tax, WYDOT

IMPLEMENTATION PARTNERS

Town of Jackson, Teton County, Teton County School District, WYDOT, Yellowstone Teton Clean Cities, National Park Service, Jackson Hole Airport, local businesses, and non-governmental organizations (NGOs)

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES

BUILDING ENERGY USE



Photo: Danny Holland via Unsplash

Energy use (electricity, natural gas, and propane) in the buildings sector accounted for approximately 15% of Jackson Hole’s CO₂ emissions in 2021 according to Jackson/Teton County Indicators data. The Jackson/Teton County Comprehensive Plan sets out principles for achieving sustainable energy use in buildings, including reduced consumption of non-renewable energies and the increase of energy efficiency in buildings. This Roadmap aspires to build on work already done to date by the TOJ, Teton County, the Energy Conservation Works Joint Powers Board, and other public and private entities in Jackson Hole. Up to 2022, key steps have already been taken by the TOJ and Teton County to reduce greenhouse emissions in energy use, and several of those are listed in Appendix A. Our suggestions for next steps are outlined in the matrix below.

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES

GOAL REDUCE GREENHOUSE GAS EMISSIONS FROM ENERGY USE IN BUILDINGS

STRATEGY Adopt and enforce building codes that advance decarbonization in new and existing buildings

★ EXAMPLE TACTICS

Adopt 2021 International Energy Conservation Code, which addresses energy efficiency on several fronts including cost savings, reduced energy usage, conservation of natural resources and the impact of energy usage on the environment

Adopt stretch code. A stretch code is a locally mandated code or alternative compliance path that is more aggressive than base code, resulting in buildings that achieve higher energy savings.

Adopt net zero energy code. This would result in new buildings having net zero energy consumption over the course of a year. That is, a building will produce as much energy as it consumes, achieving zero energy usage.

Provide training in new requirements to relevant trades

👉 EQUITY CONSIDERATIONS

Extends benefits to all building stock, though up-front costs could be a burden to lower income customers

✓ OTHER CO-BENEFITS (HEALTH, COST, ETC.)

Reduced operating costs and lower energy burden

Improved indoor air quality

Code revision also offers opportunity to address climate resiliency/adaption measures, such as reduced water use and protection from wildfires

📄 POLICIES AND RESOURCES

2021 International Energy Conservation Code

New Buildings Institute Building Decarbonization Code

STRATEGY Increase available financial incentives and other support for energy efficient building retrofits

★ EXAMPLE TACTICS

Maximize available incentives from Lower Valley Energy for weatherization (air sealing and insulation), efficient space and water heating equipment and appliances

Develop and implement a dedicated program for low-income customers

Secure federal funds for building retrofits

Develop targeted approaches for all primary building segments: public, commercial, single, and multi-family, owner occupied, and renter occupied

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES

EQUITY CONSIDERATIONS

Low- and moderate-income customers will need a dedicated approach and resources
Target both deed-restricted and naturally occurring affordable housing (e.g., mobile homes)

✓ OTHER CO-BENEFITS (HEALTH, COST, ETC.)

Reduced operating costs

POLICIES AND RESOURCES

American Council for an Energy Efficient Economy
Lower Valley Energy
Energy Conservation Works
US Department of Energy

STRATEGY Advance efficient building electrification through policies, incentives, and workforce/market development efforts, especially in new construction

★ EXAMPLE TACTICS

Include incentives (financial and otherwise) for electrification of new construction in Land Development Regulations (LDRs)

Promote use of green building programs and principles such as Passive House and Living Buildings in new private and public construction

Provide training and other resources to support electrification for upskilling of existing workforce and new workforce entrants in trades related to building construction (envelope, HVAC, architects, etc.)

Implement all-electric affordable housing projects

EQUITY CONSIDERATIONS

Target new affordable housing projects by working with housing providers to include energy efficiency and renewable energy measures in project plans and to secure funding

Conduct informational town meetings and community outreach

✓ OTHER CO-BENEFITS (HEALTH, COST, ETC.)

Health benefits from eliminating combustion of fossil fuels

POLICIES AND RESOURCES

New Buildings Institute
Passive House Institute US
International Living Future Institute
United States Green Building Council

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES

STRATEGY Conduct aggressive outreach and education to residents, visitors, and businesses to increase uptake of above strategies and to change behavior to reduce energy consumption

★ EXAMPLE TACTICS

Conduct broad reaching, branded public education campaign (e.g., Road to Zero Waste)

Develop central repository of resources to support education and action

👤 EQUITY CONSIDERATIONS

Dedicated strategies for Latinx population, including Spanish language marketing and establishing outreach partnerships with trusted advisors

Make sure all information is translated and accessible to all communities

✓ OTHER CO-BENEFITS (HEALTH, COST, ETC.)

Reduced energy burden

📄 POLICIES AND RESOURCES

American Council for and Energy Efficient Economy

Sustainable Destination Management Plan

POTENTIAL SOURCES OF FUNDING

Federal grant programs (including HOMES (Inflation Reduction Act)); Energy Conservation Works, Lower Valley Energy, Town and County general funds, Energy Mitigation Program funds, SPET, Lodging Tax

IMPLEMENTATION PARTNERS

Town of Jackson, Teton County, Energy Conservation Works, Lower Valley Energy, Travel and Tourism Board, NGOs, local homebuilding and HVAC industries

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES



Photo: Giorgio Trovato via Unsplash

Chapter 2 of the Jackson/Teton County Comprehensive Plan includes a principle of reducing non-renewable energy use. Jackson Hole’s energy supply is already comparatively low in carbon emissions. Lower Valley Energy (LVE) procures a large majority of its electricity supply—some 82%--in the form of hydroelectric power from Bonneville Power Administration. It also offers customers the option of purchasing 100% renewable electricity at a higher rate through its Green Power program. As a result, emissions from electricity supply accounted for only 1.3% of greenhouse gas emissions in Teton County in 2021.

Natural gas and propane contribute more significantly to greenhouse gas emissions in Jackson Hole, 13.4% in 2021. Natural gas pipelines are a significant source of methane gas. Methane is significantly more effective than CO₂ at trapping heat in the atmosphere—by a factor of 25 over a 100-year time frame based according to the International Panel on Climate Change. The strategy for decarbonizing the energy supply in Jackson Hole must therefore focus on shifting supply from natural gas and propane to carbon free sources of energy through utility-scale procurements and at the site level (e.g., rooftop and community solar) within regulatory constraints imposed by the State of Wyoming. At the same time, persistent drought in the western region of the United States calls into question the long-term availability of electricity generated using water from rivers. Planning for alternative sources of supply of clean energy is an important climate adaptation strategy. This section of the Roadmap offers goals and strategies to decarbonize Jackson Hole’s energy supply and to plan for future energy needs.

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES

GOAL REDUCE GREENHOUSE GAS EMISSIONS FROM ENERGY SUPPLY

STRATEGY Increase onsite renewable energy generation in residential, commercial, and government buildings

★ EXAMPLE TACTICS

Upgrade building regulations to incentivize installations

Community solar

Provide financial incentives

Aggregated purchase program, providing lower prices the more people purchase

Develop educational campaign around federal tax credits

Implement recognition/awards program to highlight efforts

👉 EQUITY CONSIDERATIONS

Persons of all incomes should have equal access to renewable energy—additional support (financial, technical, etc.) may be required for lower income customers

✓ OTHER CO-BENEFITS (HEALTH, COST, ETC.)

Health benefits from reduced emissions inside and outside buildings

📖 POLICIES AND RESOURCES

US Department of Energy

US Environmental Protection Agency

Solarize Massachusetts

STRATEGY Decrease greenhouse gas emissions from energy supply procured by Lower Valley Energy

★ EXAMPLE TACTICS

Conduct assessment of financial impacts to LVE of shifting gas customers over time to carbon-free energy sources

👉 EQUITY CONSIDERATIONS

Equalize cost of supply: Green Power offer currently comes at a price premium, which makes it challenging for lower income customers to participate

✓ OTHER CO-BENEFITS (HEALTH, COST, ETC.)

A growing body of scientific research is showing adverse health impacts (e.g., asthma) from the combustion of natural gas; also safety risks (e.g., explosions) from distribution

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES

STRATEGY Ensure future availability of clean energy supply

★ **EXAMPLE TACTICS**

Develop an energy supply resiliency plan

👉 **EQUITY CONSIDERATIONS**

Price increases from supply constraints will disproportionately be borne by lower income customers

POTENTIAL SOURCES OF FUNDING

Federal grant programs (Inflation Reduction Act); Energy Conservation Works, Lower Valley Energy, Town and County general funds, Energy Mitigation Program funds, SPET, Lodging Tax

IMPLEMENTATION PARTNERS

Town of Jackson, Teton County, Energy Conservation Works, Lower Valley Energy, local businesses, and NGOs

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES



Photo: Benkamin Massello via Unsplash

One may wonder why water is of basic importance in mitigating climate impacts from carbon emissions. As described below, it has much influence on healthy vegetative landscapes that nurture ecosystems in the GYA, sequester carbon and dampen fire regimes.

Out of the Greater Yellowstone Ecosystem spring three major U.S. River systems—the Yellowstone, the Snake, and the Green. Even so, the agricultural industry in Wyoming and Idaho has been forced to plan for severe water shortages soon. More frequent and intense weather events have led to intense precipitation in some places on earth but not everywhere. In the Rocky Mountain West, drought contributes to wildfires as an annual event. Climate scientists predict that this shift in weather patterns will restrict access to potable water and impact the food supply. Increased drought looms and so does heavier than usual precipitation, with runoff causing river and stream pollution, when contaminants like fertilizer and animal waste are picked up. The probability of deadly landslides is increased. The unpredictability of climate change is thus making it difficult for local populations to count on a clean, plentiful water supply for human use, their crops, and livestock. The impact on wildlife habitats—birds, fish, and mammals—is also raising alarms.

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES

Until recently, the fresh, potable water supply in Jackson Hole has come from a hodgepodge of sources—namely, private wells, use of local rivers, the Town of Jackson, and Special Water Districts overseen by the State of Wyoming. But a ten-fold increase in population in the last 50 years has placed unprecedented pressures on the antiquated system. As of July 29, 2022, after studying river flow data, ground water moisture, surface water levels, precipitation, and vegetation health, the Teton Conservation District (TCD) declared a “severe drought” for much of the county. The NGO Protect Our Water (POW)—Jackson Hole makes the point that most of the water in the Snake River is not in the river; it is in the gravel. The Snake River is Jackson’s Hole’s largest gravel-bed river system with a less visible underground aquifer and an even deeper, massive underground aquifer. It is the “interaction between surface water in the river and groundwater throughout the valley [that is] fundamental to the health of the Snake River ecosystem.” It is the upwelling of the waters through the aquifers and the floodplain that maintains the system. This is the area that needs the most protection.

The Town of Jackson and Teton County have determined that it is time to think more comprehensively about managing our water supply—to protect the waterways, to monitor, protect and upgrade water quality valley wide, and to educate the public to promote water conservation. A unified plan to protect and improve the Valley’s water quality is being drawn up by Teton County and the Town of Jackson. So far, the Town of Jackson, Teton County, and the Teton Conservation District have taken initiatives (listed in Appendix A) toward achieving goals.

The JHCAC Roadmap below intends to complement the Town and County initiatives by focusing exclusively on the conservation of water in Jackson Hole. A prioritized outline of suggestions by the Environmental Protection Agency for conservation toward a sustainable supply of clean water follows. Note how many of the suggestions, already identified by the TOJ and the County, only need more follow-through. The policies cited below are taken from Appendix F of the 2012 Comprehensive Plan, Principle 1.2.

Work on water ecosystem services has been undertaken by Teton Conservation District, WY Game and Fish, Teton Valley, neighborhoods, and ‘friends’ groups since 1946. The Conservation District facilitates extensive monitoring of well water, snowpack runoff, springs, and cold-water fisheries in the region.

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES

GOAL REDUCE WATER WASTE AND INCREASE WATER QUALITY

STRATEGY Runoff capture by the Town of Jackson

★ **EXAMPLE TACTICS**

Increased underground storage and detention vaults under parking lots; rain gardens; swales; stormwater trenching

👤 **EQUITY CONSIDERATIONS**

Reclaimed water in residential neighborhoods, important for mobile homes and subdivisions

✓ **OTHER CO-BENEFITS (HEALTH, COST, ETC.)**

Flood control; water conservation; ecological restoration

📄 **POLICIES AND RESOURCES**

Comprehensive Plan policies and strategies

STRATEGY Runoff capture by Teton County landowners

★ **EXAMPLE TACTICS**

Detention wetlands in more open spaces

👤 **EQUITY CONSIDERATIONS**

Low income homes are often situated in the most vulnerable locations

✓ **OTHER CO-BENEFITS (HEALTH, COST, ETC.)**

Temperature moderation for high density development

Protection of living, storage areas below ground

Mitigate damage from storm events

📄 **POLICIES AND RESOURCES**

Teton County, WY

Teton Conservation District

Comprehensive Plan policies and strategies

STRATEGY Reduce hillside erosion

★ **EXAMPLE TACTICS**

Additional tree planting; additional hillside seeding and invasive plant reduction; retaining structures

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES

EQUITY CONSIDERATIONS

Prevent dangerous landslides for residents and drivers

OTHER CO-BENEFITS (HEALTH, COST, ETC.)

Retain accesses for all in a safe manner

POLICIES AND RESOURCES

Teton County, WY

Teton Conservation District

Comprehensive Plan policies and strategies

STRATEGY Increase homeowners' and developers' contributions to water conservation

★ EXAMPLE TACTICS

“Blue roofs” technology to control stormwater runoff; permeable driveways; cisterns for gardens

Conduct local education to encourage water conservation (TOJ, TC, TCD, POW and schools)

Collaborate between governments, homeowners' associations (HOAs), non-profits and schools

EQUITY CONSIDERATIONS

More secure, higher quality water supply for all

OTHER CO-BENEFITS (HEALTH, COST, ETC.)

Ability to grow food and native plants on site

POLICIES AND RESOURCES

Comprehensive Plan policies and strategies

STRATEGY Regenerative gardens and lawns

EQUITY CONSIDERATIONS

Food costs are disproportionately higher for low income populations

OTHER CO-BENEFITS (HEALTH, COST, ETC.)

Ability to grow food and native plants on site

POLICIES AND RESOURCES

Need awareness and participation of the private and business sector in implementing government policies

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES

POTENTIAL SOURCES OF FUNDING

Federal grant programs (Inflation Reduction Act, Bipartisan Infrastructure Law, Infrastructure Investment and Jobs Act), State of WY, Town and County general funds, SPET, Lodging Tax, philanthropy, private landowners (e.g., HOAs)/ developers

IMPLEMENTATION PARTNERS

Town of Jackson, Teton County, POW, TCD

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES

VEGETATION



Photo: Deanna Lewis via Unsplash

Vegetation (flora) has many roles to play in contributing to life on Earth and, especially in the Greater Yellowstone Ecosystem, long recognized as one of the most intact in the U.S. Every plant, from the tiniest plankton and algae to wildflowers and crops to ancient trees are part of the biosphere on which we depend. Lately, the importance of flora in maintaining the needed conditions for life is being more seriously and extensively noted. This is especially true when it comes to carbon sequestration. Carbon dioxide (CO₂) from burning fossil fuels and industrial processes has overloaded Earth's atmosphere, causing global warming and resulting climate disruption. Plants are nature's contribution to helping rebalance the atmosphere for more stable and harmonious environmental conditions. According to the journal

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES

Nature, results show that by 2100, under high-emission scenario, greening will mitigate land warming by 0.71 ± 0.40 °C, and 83% of such effect (0.59 ± 0.41 °C) is driven by the increase in plant carbon sequestration, while the remaining cooling (0.12 ± 0.05 °C) is due to biophysical land-atmosphere interactions.

Plants take in CO₂ for their own growth cycles, return needed nutrients to the soil and release oxygen into the air. Healthy soils and native plants create rich habitat for wildlife, one of the GYA's valued resources. They are also key to abundant grazing lands, as well as food production.

In drought conditions, as is being experienced in the mountain West in 2022 and for some 20 years prior, plants can also fuel much dreaded wildfire, causing death and destruction.

Learning about the cause and effect of our actions in the landscape and its ecosystems is essential for beneficial outcomes and the vitality of those ecosystems, a goal of Jackson/Teton County Comprehensive Land Use Plan. This, however, is more than a good citizen policy issue. In fact, it is, over time, about life on Earth.

Locally, we have excellent resources, including the Teton Conservation District and its Land Resources Specialist, along with local ranchers who have been experimenting with Holistic Resource Management principles on their properties, which adds nutrients to the plants and soil. Their knowledge and experience need wider sharing and collaboration, along with historical indigenous practices. TCD also supports the Trout Friendly Lawns program, regenerative farming, and Salmon Safe, all addressing healthy plant communities and water quality. Teton County Weed & Pest can help control invasive plant species. Grand Teton National Park is engaged in a multi-year program to restore native vegetation in the Mormon Row area, where early farming and ranching occurred. Buffalo, and other ungulates, may be helping achieve goals by working the soil with their hooves and manure.

Below are a few immediate suggestions for achieving peaceful co-existence with Mother Nature.

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES

GOAL PROMOTE STEWARDSHIP OF VEGETATION AND LAND TO ACHIEVE HIGHEST LEVEL OF CARBON SEQUESTRATION

STRATEGY Collaborative human stewardship from property owners and land managers to maintain healthy landscapes

★ EXAMPLE TACTICS

- Remove invasive species
- Practice fire defense
- Practice Holistic Resource Management principles
- Plant trees, grow food
- No till; use cover, or second, crops
- Provide some greenspace/pervious surface in all development
- Minimize chemical use and run-off from lawns and fields

👉 EQUITY CONSIDERATIONS

- Safer neighborhoods
- Neighborhoods where equity populations live often have less tree cover and they don't therefore benefit from associated cooling benefits
- Higher food prices disproportionately affect lower income populations

✓ OTHER CO-BENEFITS (HEALTH, COST, ETC.)

- Less fire/flood prone neighborhoods
- Preserve personal and community safety & welfare
- Provide ecosystem benefits and wildlife habitat
- Remove CO₂ from air and sequester in soil
- Moderate heat in summer, esp. in urban/high density areas
- Absorb and filter H₂O.
- More green space=Less anxiety/better mental health

📄 POLICIES AND RESOURCES

- Mountain Neighbor Handbook
- Incorporate stakeholder recommendations (e.g., TCD, Game & Fish, US Forest Service, Teton Area Wildfire Protection Coalition, TC Weed & Pest) into Comp. Plan, as much as possible
- Consider policy work done by Natural Resources Stakeholder Group for Comp Plan updates
- Coordinate with public land managers. Foster meaningful, regular dialogue, agreements, and actions

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES

STRATEGY Preserve and enhance riparian corridors

★ **EXAMPLE TACTICS**

- Limit livestock access to streams
- No development within riparian zones
- Ample setback for structures and/or septic systems

✓ **OTHER CO-BENEFITS (HEALTH, COST, ETC.)**

- Provides wildlife habitat and movement corridors
- Protects property from flooding
- Protects water quality
- Adds to community quality of life

📄 **POLICIES AND RESOURCES**

- Review current development regs. for ample setbacks

STRATEGY Promote healthy, more fire-resistant forests

★ **EXAMPLE TACTICS**

- Assure that development regs. and approvals align with the goal
- Inform the public about fire defense actions for private property
- Cooperate with relevant agencies to enhance fire resistance
- Incentivize appropriate efforts

👏 **EQUITY CONSIDERATIONS**

- Better air quality means lower medical bills
- More opportunity to explore wild spaces without air quality level concerns

✓ **OTHER CO-BENEFITS (HEALTH, COST, ETC.)**

- Protect and enhance both public and private properties
- Protect biodiversity
- Reduce damage and loss to property
- Reduce financial burden to emergency services/taxpayer
- Promotes healthy air

📄 **POLICIES AND RESOURCES**

- State, local, and federal regulations/resources needed, along with co-operative agreements

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES

STRATEGY Incorporate plants into building codes

★ **EXAMPLE TACTICS**

- Blue, green, white roofs
- Reduce impervious surfaces
- Roof capture of water

👉 **EQUITY CONSIDERATIONS**

Green spaces increase mental health and clean air for all

✓ **OTHER CO-BENEFITS (HEALTH, COST, ETC.)**

Apartment and other residential dwellers benefit with better structure temperature regulation, more ability to grow food, etc.

📄 **POLICIES AND RESOURCES**

Building codes and Comp. Plan

**The state of Wyoming needs to get on board with supportive actions and policies.

STRATEGY Reduce lawn fertilizing and irrigation

★ **EXAMPLE TACTICS**

- Review golf course practices and enforce regulations and/or monitor adherence to guidelines
- Educate public to advantages of ready lawn responsible lawn care
- Monitor residential lawn practices

✓ **OTHER CO-BENEFITS (HEALTH, COST, ETC.)**

Fewer toxic chemicals affect wildlife and human health

📄 **POLICIES AND RESOURCES**

Re-institute golf course guidelines/regulations

POTENTIAL SOURCES OF FUNDING

New Inflation Reduction Act funding for climate actions, 1% for the Tetons, Town and County, Game and Fish, Teton Conservation District

IMPLEMENTATION PARTNERS

Town of Jackson, Teton Conservation District, Game and Fish, TOJ and TC Planning and Building Depts. monitoring/enforcement staff, Teton County Weed & Pest

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES



Photo: Sigmund via Unsplash

Teton County has a decades long history of attention to solid waste management, beginning with the need to secure a new landfill site once the pioneer site was reaching capacity in the 1980s. After investigation of 32 potential sites, the then Solid Waste Advisory Committee recommended collaboration with neighboring Sublette County, with their agreement, and construction of a trash transfer station, the solution has lasted for several decades with waste-hauling trucks traveling about 100 miles to the Sublette landfill. Since that time, Bonneville County, ID has been a cooperator allowing landfilling some 90 miles from Jackson Hole. This trash transfer solution was funded by SPET funds.

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES

Meanwhile, the non-profit Jackson Community Recycling assisted in minimizing waste hauling with a robust recycling program that has since been incorporated into county jurisdiction as Integrated Solid Waste and Recycling (ISWR). A condition of creating the ISWR program was that it be considered an 'enterprise fund' and pay for its own operations. Current goals include 60% diversion rate of waste by 2030. Recently, a robust food waste composting program has been added to operations at the trash transfer site, partnering with private enterprise and local commercial food outlets.

In order to have a positive effect on minimizing carbon emissions, it is time to take a fresh look at the constraints on a successful program with remaining challenges. ISWR staff believes the best option for reducing carbon emissions is reducing the trips of waste-hauling trucks to Idaho. Food waste composting has recently been instituted. Conscientious separation of recyclable or reusable materials by individuals and businesses is an essential element of successful waste handling and financial remuneration for materials sent to market. Our local community has been helpful, but much more attention must be paid to visitor behavior and disposal options. Public information must be frequent and widespread.

An over-arching, more widespread education on reducing waste and recycling and reusing items should be spread through the town. Small communities like Jackson provide ample opportunity for a circular waste economy.

Recently, to improve public safety and bear survival, bearproof containers have been mandated county-wide. Regulations are being implemented in the fourth quarter of 2022 and by April 1st, 2023 in town. Food habituated bears are often euthanized, as people are averse to having them rifling through trash containers, on their porches or in their kitchens.

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES

GOAL LOWER EMISSIONS RESULTING FROM WASTE MANAGEMENT PROCESS AND PROMOTE ZERO WASTE ACTIVITIES

STRATEGY Meet ISWR Zero Waste program goals and beyond for 60% diversion from landfill

★ EXAMPLE TACTICS

- Utilize alternative fuel waste-hauling trucks
- Implement Pay as You Throw program
- Review other waste reduction equipment for efficiency & safety
- Ask County to relax enterprise criteria for major purchases such as vehicles and potential proven reduction package plants
- Mandate cardboard recycling in Town
- More widely distribute neighborhood recycling bins and pick-up

👏 EQUITY CONSIDERATIONS

- Improved air quality
- Landfill disposal price can be obstacle for families to dispose of items

✓ OTHER CO-BENEFITS (HEALTH, COST, ETC.)

- Reduce heavy truck traffic to landfill
- Reduce personal vehicle trips to centralized locations

📄 POLICIES AND RESOURCES

- Include waste reduction considerations in development reviews and permit approvals

STRATEGY Improve public and visitor knowledge about efforts to reduce waste, why, and how to do it

★ EXAMPLE TACTICS

- With local educators and non-profits, produce up-to-date videos and curriculum re: best practices for waste reduction, for school use & public information

👏 EQUITY CONSIDERATIONS

- Less waste also means better practice of reduce, reuse, recycle, which means less of a need to purchase additional items and use personal funds

✓ OTHER CO-BENEFITS (HEALTH, COST, ETC.)

- Diminishes methane production
- Eases periodic challenge for finding landfill sites
- Conserves natural resources
- Minimizes toxic materials in waste stream

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES

POLICIES AND RESOURCES

Strongly suggest space and best practices for waste handling, storage and collection when reviewing development proposals and issuing permits

STRATEGY Work with local construction and demolition companies re: best practices for disposal and sorting of waste materials including wood, concrete, metal, etc.

★ **EXAMPLE TACTICS**

Support ISWR, Riverwind, and other relevant entities in encouraging and informing proper waste disposal behavior and beneficial choices

EQUITY CONSIDERATIONS

Leftover materials such as wood and metal are often of use to others

A more circular waste system could allow for better disposal/reuse of these materials

✓ **OTHER CO-BENEFITS (HEALTH, COST, ETC.)**

Better working conditions at the recycling center and community recycling sites

Better community health and safety

POLICIES AND RESOURCES

Work with local policymakers on laws regarding construction waste

STRATEGY Circular Waste Economy program education throughout the community

★ **EXAMPLE TACTICS**

Large-scale clothing swaps

Promotion of current second-hand stores (Browse and Buy, Headwall Sports, Home Again)

Larger-scale reuse of materials from construction, restaurants, rental homes, ski and bike rental shops, etc.

EQUITY CONSIDERATIONS

Provides lower-income communities with greater opportunity to acquire goods

Buying second-hand saves money

✓ **OTHER CO-BENEFITS (HEALTH, COST, ETC.)**

Extra income for individuals selling items

Reduces waste and need for landfill sites

Provides business for current second-hand stores

Buying fewer additional items means contributing to the fossil fuel economy less

POLICIES AND RESOURCES

Work with local non-profits and current second-hand stores to promote this education

SECTION 3: CLIMATE PRIORITIES, GOALS AND STRATEGIES

POTENTIAL SOURCES OF FUNDING

IRA grants, Town and County general funds, tipping fees, Lodging Tax

IMPLEMENTATION PARTNERS

Local voters/residents, County Commissioners, Town of Jackson, private developers, Town and County planning depts, federal agencies, local non-profits, second-hand stores, Shacks on Racks

SECTION 4: THE ROAD AHEAD

Fully implementing the Roadmap strategies goes beyond the authority of any individual, local government department, or non-profit or collective of non-profits. Because many of these projects require agreement among multiple stakeholders, substantial amounts of government funding, the cooperation of multiple public agencies and city franchisees, Teton County and the Town of Jackson must assume the leadership and large responsibility for assembling public and private partnerships to implement many of the projects. Jackson Hole NGOs and individuals may form a citizens' "carbon army" to tackle some problems, and businesses will be called upon to participate in and suggest innovative programs, but the ultimate leadership must fall on the town and county governance.

The transition of this Roadmap to a Climate Action Plan will require addition of measurable goals, with timebound commitments and regular tracking of progress. Additional technical expertise is needed to employ data to better understand our carbon footprint, to use forecast modules, and to better understand where best to put our money to achieve our carbon neutrality by 2030. "Clear Path," from ICLEI Local Governments for Sustainability USA, offers a robust tool to towns and counties for cutting carbon pollution, for planning policies, and for tracking projects and trends. Currently, a grant from the Community Foundation, managed by Legacy Works, enables a dashboard to track certain greenhouse gas contributors. The Town and County also track GHG emissions by source and report them annually through their Indicators Project. These resources may contribute to the final analysis.



Photo: Jasper Gribble via Unsplash

AFTERWORD

While there may be some of us seeking the silver bullet of solutions in the community-based Roadmap regarding our response, and progress, toward more peaceful co-existence with nature's gifts and tantrums, the difficult reality is that it will take understanding and effort by most of us, doing the best we can, over an extended time, to stabilize our climate. Scientist Bill McKibben has said, "The most important thing an individual can do right now is be not such an individual."

The task is not impossible, but it IS challenging. In other words, there is no easy way out, but humans do have the capacity and knowledge available to them to achieve goals to not only stabilize, but improve, our relationship with Earth's resources and weather. Traditional Ecological Knowledge (TEK) from those of our species who have the longest history of practicing co-existence should be listened to and acknowledged for their contributions. Modern day thinking and research, such as Kate Raworth's [Doughnut Economic Theory](#) can help us learn what is needed to conserve resources as well as to beneficially utilize them. The common theme of both ancient wisdom and cutting-edge advice is that we are all connected. An idea that can, and does, serve us well.



Photo: Cora Leach via Unsplash

We, in the Greater Yellowstone Area (GYA), have the advantage of a somewhat clearer slate, with rich resources, more than many places. Will we preserve and enhance those assets? Or not. Time, attention, and perseverance will be required. Setting priorities is needed. Is all life being considered? Ecosystem function and viability are essential if we are to thrive. Financial investment is needed.

Our intent is to provide, in one place, ideas and potential beneficial actions with the prospect for the most progress in the shortest timeframe. Bundling actions may provide a clear approach for individuals, households, local governments, and

AFTERWORD CONT.

businesses. For example, bundle the most positively beneficial actions related to transportation emissions, known to be a significant contributor to carbon footprint in our area. The work of an MIT associated analysis, called En-ROADS, is a global climate simulator of 30 policies that is readily understood and interactive. Carbon pricing is essential for consideration. Other important resources for this Roadmap include the 2021 GYA Climate Assessment (utilizing research from universities in MT, WY, ID and public land managers); the communities of Milwaukie and Bend, OR; the UN Intergovernmental Panel on Climate Change (UN IPCC); the local Charture Institute, and our own experiences and study.

This Roadmap is offered as a tool to gather thinking and help set policy priorities in the days ahead. We are in unknown territory where various actions need to be prioritized asap in order to have a positive influence on a thorny problem. The State of Wyoming is also key to effective progress. No small ask.

THE BOTTOM LINE: Take heart and review our collective behaviors and regulations, looking for ways we can help the situation depending on our circle of influence, willingness, collaboration, and action. Remember that every small step serves to make a difference. Scientific tracking and results tell us we have until 2030 to make a meaningful difference.

ACTING NOW IS OF UTMOST IMPORTANCE.

- Sandy Shuptrine, JHCAC board member

APPENDIX A: SELECT HISTORY OF CLIMATE ACTIONS IN JACKSON HOLE

1970S:

First beginnings of community planning at the urging of a citizens' advocacy group (ENACT) and implemented through the County Commissioner's three advisory citizen planning committees. Supported by this early advocacy, public surveys, and values clarification, the first Teton County Comprehensive Land Use and Development Plan, encouraged in WY State Statute in 1972, was approved by the Board of County Commissioners in 1978, with professional consultant assistance. Underlying interests were water quality, wastewater treatment, habitat and open spaces, and development density.

1980S:

The decade for solid waste management, prompted by the local landfill crisis with the pioneer landfill site reaching capacity. Thirty-two potential county sites were investigated and evaluated by an advisory group appointed by commissioners. In the end, voters approved one of the first successful Special Purpose Excise Tax (SPET) ballot measures in the county for constructing a trash transfer station in co-operation with Sublette County. Methane monitoring and planning for future site management was undertaken at the BLM site south of Jackson and continues. Current goal is to reduce landfilled waste by 60%.

Southern Teton Area Rapid Transit (START) bus system was instituted for public transportation in 1987. Upgrades and innovation continue to this day with expanded routes for commuters, more environmentally sound fuels, adding in-town bikes, on-demand service and more. START is jointly funded by town and county and overseen by Town Public Works Dept. Electric vehicles are currently part of the fleet.

1990S:

Recycling was instituted for the public in various ways, beginning with Jackson Community Recycling, a non-profit, which initially ran the drive-thru program on a site offered by the Town of Jackson (once their original sewer plant site) and later integrated into a new facility in Adams Canyon, ultimately run by Teton County Integrated Waste and Recycling (ISWR).

A 3-year collaborative planning effort with the Town of Jackson and Teton County to upgrade the Comprehensive Plan to include both local jurisdictions was completed in 1994. Prior to that, the town did not have a comprehensive plan. Several reviews and upgrades to this joint plan, and development regulations, have occurred with the most recent being 2020.

APPENDIX CONT.

A Pathways Task Force and Department were established, a plan developed, and pathway construction initiated, along with safer streets to schools and sidewalks for pedestrians in town. The non-profit, Friends of Pathways, was founded to add to the effort.

DEQ and County Engineering cooperated for P.M. 10 air quality monitoring.

2000S:

Lower Valley Energy launches its Green Power program in 2003, providing its owners with the option of purchasing 100% renewable energy. In subsequent years, Jackson Hole Mountain Resort and Town of Jackson are among the LVE owners to purchase 100% Green Power.

Mayor Barron endorsed the Climate Protection Agreement at Conference of Mayors in 2005.

In 2007, with cooperation of Town of Jackson, Teton County and Lower Valley Energy an initiative known as 10 x 10 was begun. The goal was to reduce energy use by local government 10% by 2010. The goal was met and exceeded at 17% reduction. Subsequently, Energy Conservation Works (ECW) was formed in 2009 as a Joint Powers Board by town, county and LVE.

Solar projects power the wastewater treatment plant, and other public facilities. A more recent solar array is helping to power facilities in Adams Canyon (Recycling, Fire/EMS, Animal Shelter, and others).

Electric vehicle infrastructure started, by local governments and private business in co-operation with Yellowstone-Teton Clean Cities (associated with the US Dept. of Energy).

2010S:

TOJ passed an idle free resolution, initiated by high school student Willie Neal.

Home Ranch Welcome Center renovations by town achieved LEED Gold Certification.

An Integrated Transportation Plan was produced as an addendum to the Comprehensive Plan in 2014-2015 and updated in 2020. It focuses on transit development, active transportation, and transportation demand management.

The Charture Institute published the “The Coming Climate: Ecological and Economic Impacts of Climate Change on Teton County” in collaboration with Teton Research Institute and Teton Science Schools.

APPENDIX CONT.

EARLY 2020S:

Mayor Pete Muldoon convenes a public meeting to ramp up citizen action on climate matters.

TOJ passed a resolution for achieving carbon neutrality by 2030.

TOJ created Ecosystem Stewardship position.

Teton County added a Regional Transportation Planning Administrator to staff.

Teton Conservation District continued water quality, wildfire defense programs, and published “The Mountain Neighbor Handbook”, especially for those new to JH.

Jackson Hole Climate Action Collective formed with initial project being this Roadmap.



Photo: Brie Odom via Unsplash

GLOSSARY

Adaptation: Actions and efforts directed to increasing community and operational functionality and resiliency to extreme events or during prolonged economic, environmental, and social system changes due to climate change

Blue, green, white roofs: Roofs that collect water, provide space for plants, or reflect sunlight for cooling.

Carbon Dioxide equivalent: Unit for comparing the relative potency of effect of other greenhouse gases using carbon dioxide as the standard unit of measure - 1, referred to as CO₂e. Ex. Methane is 34, CO₂ is 1

Carbon footprint: The amount of greenhouse gases that can be attributed to the activities and processes of an organization, differentiating between owned and supply chain emission sources and boundaries. Methodologies vary but are aligning over time.

Carbon intensity: The amount of greenhouse gases emitted per unit of energy consumed.

Circular Waste Economy: An economy that keeps materials, products, and services in circulation for as long as possible.

Climate: The prevailing weather conditions in a geographic area over an extended period.

Co-benefits: The discrete, additional community benefits beyond emissions reductions (mitigates and adapts in one action, leverages existing efforts, revenue generation or cost avoidance, health and safety, opportunity for social equity, community support, economic development of a cluster etc.).

Consumption-based Greenhouse Gas inventory: Local, sector-based emissions, in addition to emissions that are generated during production and delivery of imported goods, energy and food consumed within the community, and exclude sector-based emissions from local production that are exported.

Cost effectiveness: Marginal cost or savings compared to the business-as-usual scenario divided by metric tons of carbon dioxide equivalent mitigation potential over the lifespan of the action.

Energy burden: percentage of gross household income spent on energy costs.

Greenhouse gases (GHGs): those in the atmosphere that contribute to the greenhouse effect. The Kyoto Protocol defined 6 greenhouse gases including carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydro fluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆), and nitrogen trifluoride (NF₃). Increased concentration of these gases (e.g., carbon dioxide, methane, nitrous oxide) are emitted into the atmosphere by human activity and natural phenomena.

GLOSSARY CONT.

GHG inventory: Like a carbon footprint, a GHG inventory measures anthropogenic (humanmade) greenhouse gas resulting from the activities within a defined boundary – such as operational control of an organization; a city’s geographic boundary; or lifecycle impacts of a particular product or project. Indicator/metric – a unit or standard of measure to gauge performance.

Holistic Resource Management: A systems theory developed by Allan Savory, of the Savory Institute, to utilize ungulates, their hooves and manure for abundant grass growth.

Mitigation: Actions directed toward reducing greenhouse gas emissions that contribute to climate change and the extent to which we experience significant changes in weather, food, water, human health, etc.

Mitigation potential: Average annual achievable Scope 1 and Scope 2 reductions of carbon dioxide from fossil fuel combustion or anthropogenic process emissions.

Net Zero [Carbon, Emissions, Energy]: Net zero emissions means cutting greenhouse gas emissions to as close to zero as possible, with any remaining emissions re-absorbed from the atmosphere, by oceans and forests for instance. In the buildings context, net zero energy means reducing energy use as much as possible and then meeting any remaining needs from zero emissions forms of energy such as wind and solar.

Parts Per Million (PPM): The concentration of a gas, carbon dioxide, in the air. Climate modeling is based off different concentrations of carbon dioxide in the atmosphere. As of 2017, the average global CO₂e is ~406. Pre-Industrial concentrations of CO₂e were ~280.

Pay As You Throw: In communities with pay-as-you-throw programs (also known as unit pricing or variable-rate pricing), residents are charged for the collection of municipal solid waste—ordinary household trash—based on the amount they throw away. This creates a direct economic incentive to recycle more and to generate less waste.

Sector-based Greenhouse Gas inventory: Local emissions from energy use by homes, businesses, and vehicles and from landfilling solid waste and wastewater treatment.

Sequestration: The biological capture of a material or gas, referenced to carbon dioxide within an ecosystem or living system (e.g., ocean, soil, tree). Ex. Plants sequester carbon in wood and soil. Mechanical systems aim to inject CO₂ into underground reservoirs or embody CO₂ in minerals such as chalk and other inert elements.

Transportation Demand Management: Transportation demand management describes programs and projects that aim to provide more competitive transportation options to driving alone, reduce trips and improve traffic congestion without building

RESOURCES

Below is a partial list of resources that can be used as tools to access funding, information, and data towards mitigating climate change.

LOCAL

[Charture Institute](#)

Davies, Rob. "[A Mindset for the Age of Humans](#)," 2022 Wyoming Climate Summit in Lander and in Jackson.

[Energy Conservation Works](#)

[Hole Food Rescue](#)

[Integrated Solid Waste & Recycling](#)

[Lander Climate Action Network](#)

[Lower Valley Energy](#)

[Protect Our Water Jackson Hole](#)

[Riverwind Foundation](#)

[Shacks on Racks](#)

Southern Teton Area Rapid Transit ([START](#))

[Teton Area Wildfire Protection Coalition](#)

[Teton Conservation District](#)

[Teton County Weed & Pest District](#)

[Town of Jackson](#)

[Yellowstone-Teton Clean Cities](#)

NATIONAL AND INTERNATIONAL

[American Council for and Energy Efficient Economy \(ACEEE\)](#)

[Boise, Idaho. Boise's Climate Action Map. Our Community's Plan for Climate Action, 2018](#)

[Centers for Disease Control's Climate and Health Program](#)

[City of Aspen, 2017. Aspen's Climate Action Plan: A Roadmap to Our Sustainable Future](#)

[City of Aspen, 2017. Greenhouse Reduction Toolkit: How to Take Action in Your Community](#)

[City of Bend, Oregon Climate Action Plan: Climate Mitigation Strategies and Actions, 2022-2025](#)

RESOURCES CONT.

[The Climate Disclosure Report](#)

[Columbia International Research Institute for Climate and Society Seasonal Forecasts](#)

[Crested Butte, CO Climate Action Plan, 2019](#)

[En-Roads Climate Solutions Simulator](#)

[ICLEI–Local Governments for Sustainability USA](#)

[International Living Building Institute](#)

[Jackson Hole Energy and Emissions Inventory for 2008](#)

[National Aeronautics and Space Administration \(NASA \)Climate](#)

[New Buildings Institute](#)

[National Oceanic and Atmospheric Administration \(NOAA\) Climate](#)

[Phius \(Passive House Institute United States\)](#)

[Solarize Massachusetts](#)

[Summit County, CO Climate Action Plan, Strategies for a Sustainable Future, 2018](#)

[Summit County, UT Climate Action Plan, 2015](#)

[UN Environment Programme Emissions Gap Report](#)

[United Nations Climate Reports](#)

[United Nations Intergovernmental Panel on Climate Change \(IPCC\)](#)

[United States Environmental Protection Agency \(US EPA\)](#)

[United States Forest Service Climate Change Resource Center](#)

[United States Green Building Council](#)

[The White House Clean Energy for All](#)

[The White House Opportunities To Accelerate Nature-Based Solutions: A Roadmap For Climate Progress, Thriving Nature, Equity, & Prosperity: A Report To The National Climate Task Force, 2022](#)

[Zero Tool](#)

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[Greater Yellowstone Climate Assessment Report, 2021](#). Draft Greater Yellowstone Climate Assessment Open for Public Review.

[Jackson Hole Travel & Tourism Board, 2023](#). Teton County Sustainable Destination Management Plan 2022-2027.

[Raworth, Kate, 2023](#). Doughnut Economics for 21st century thriving.

[Teton Conservation District, Town of Jackson, Teton County, and Jackson Hole Land Trust, 2022](#). Mountain Neighbor Handbook

[Teton County. Energy Mitigation Program](#).

[Town of Jackson/Teton County, 2022. 2022 Annual Indicator Report and Databook](#).

[Town of Jackson/Teton County, 2020](#). Comprehensive Plan.

[Town of Jackson/Teton County, 2020](#). Integrated Transportation Plan.

[Town of Jackson, 2020](#). Resolution 20-05: A Resolution of the Jackson Town Council to Adopt A Goal to Achieve Carbon Neutrality by 2030.

[Town of Jackson, 2014](#). 40x20 Action Plan.

[United States Environmental Protection Agency, 2022](#). Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2020:

[WyACT: Wyoming Anticipating Climate Transitions 2022](#).

DESIGN BY KENNA SARAЕ

KENNASARAЕ.COM

HELLO@KENNASARAЕ.COM