Community-Defined Decarbonization:

Reflecting Rural and Tribal Desires for an Equitable Clean Energy Transition in Washington

September 2022

Clean Energy Transition Institute

About the Clean Energy Transition Institute

The Clean Energy Transition Institute is a Seattle-based nonprofit organization whose mission is to accelerate an equitable clean energy transition in the four Northwest states—Idaho, Montana, Oregon, and Washington.

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Executive Summary

The Clean Energy Transition Institute conceived the project that resulted in *Community-Defined Decarbonization: Reflecting Rural and Tribal Desires for an Equitable Clean Energy Transition in Washington* with two goals: (1) to understand the barriers to decarbonizing buildings for the state's rural and Tribal low-income, energy-burdened households, and (2) to determine whether decarbonization strategies and clean energy development could address energy inequities in these communities.

There is a paucity of research dedicated to examining how decarbonizing rural and Tribal communities could potentially address their unique energy disparities. Most energy policy research focuses on cities and urban centers, the conclusions of which do not transfer to rural areas. Energy burden in rural Washington is tied to racial and Tribal inequities, and there is wide variability in how different rural communities throughout the state experience energy burden.

We interviewed 24 community leaders, nonprofit staffers, and government agency representatives who work with rural and Tribal communities in Washington State to understand affected communities' priorities for addressing energy burden and whether they thought decarbonization could address the energy inequity they experience. Our interviews suggested many community-identified strengths, challenges, and desires that could be leveraged for more tailored climate and energy solutions in rural and Tribal communities across the country.

We also applied quantitative analyses to publicly available datasets to understand community-level energy inequities and their relationship to socioeconomic disparities. We reviewed research on energy burden, efficacy of weatherization and energy efficiency programs, and the potential for decarbonization to address economic and public health outcomes.

Overview of Findings

The combined quantitative and qualitative research suggests that **building decarbonization solutions**—energy efficiency/weatherization, electrification, distributed renewable energy, vehicle-to-grid technologies, energy demand management, and fuel-switching to clean energy—**cannot be advanced without addressing the fundamental inequity that exists in rural and Tribal housing** and the **energy burden that low-income rural and Tribal households face**.

Addressing these inequities will require an interdisciplinary approach, with community-defined desires as the solution. Ultimately, there are several opportunities that can and should be leveraged in partnership with rural and Tribal communities, such as organizational collaboration, workforce development, and community leadership.

The high-level summary of findings include:

CHALLENGES

- The legacy of mistreatment, disruption of Tribal lands, and disinvestment that state and federal institutions have imposed on Indigenous populations in Washington State serves as a foundation for distrust among Tribal community members.

- Political polarization and historic disinvestment in rural communities have made community members hesitant to accept government funds or form trusting partnerships necessary for clean energy development.

- The quality of housing stock in low-income rural and Tribal communities not only poses inequitable energy burdens, but also health and safety risks to residents, which are likely to be exacerbated by changes in climate.

- Rural homes are often unable to participate in weatherization programs due to program requirements for the entire home to meet health and safety standards (versus one or more individual upgrades), which programs and households typically cannot afford.

- The lack of licensed contractors who are willing to meet the additional administrative and certification requirements of federally funded programs poses a significant barrier to scaling energy efficiency in rural areas.

- The complex patchwork of existing weatherization and energy efficiency programs is difficult for local community organizations and households to navigate, especially given a lack of funding for administrative capacity, which hampers efforts to access funds and programs.

- Existing energy efficiency programs miss some groups entirely: renters rarely benefit, and temporary agricultural workers and undocumented individuals are ineligible.

STRENGTHS

- Culturally relevant programming and participatory approaches work effectively with rural and Tribal communities in Washington, so long as there is community participation along the way.

- Investing in youth and workforce development can help promote social and economic growth in rural and Tribal communities, providing important resources for weatherization, construction improvements, and energy efficiency upgrades.

- Intra-organizational collaboration is an important component for solving problems, sharing resources, and addressing interdisciplinary challenges in rural and Tribal communities.

- Research assistance for data collection and grant applications can be an important resource for nonprofit agencies in rural and Tribal communities to make funds more accessible.

- Rural and Tribal community members desire affordable and healthy housing and sustainable economic opportunities.

- Energy sovereignty has different definitions across rural and Tribal communities, and community involvement and leadership development opportunities should be increased so that communities are able to define and achieve their desired clean energy goals.

- Tribal-to-Tribal networks for sharing information and ideas are considered an important component for reaching energy sovereignty.

- A realignment of policies, markets, utilities, and funding would help to reimagine existing programs and delivery systems.

- There is a desire to provide centralized and flexible funding to communities to enable the scaling of programs that are more tailored to the unique needs of Washington's rural communities.

- Programs should quantify the value of non-energy benefits, such as economic development, public health outcomes, and affordable housing, to make the case for flexible state funding. But quantification of non-energy benefits alone will not address the question of adequate funding to pay the costs associated with realizing those benefits.

- Training a local workforce for weatherization jobs, and for construction in general, is a priority, as well as providing job security and financial stability for trained workers in rural and Tribal communities.

- Rural community leaders mentioned the need to provide flexible funds and opportunities for weatherization and youth/workforce development.

- Broadband access was mentioned as an important infrastructure priority among those interviewed. While broadband access is required to enable grid-connected buildings and energy demand management, its primary value today to rural communities is decreasing isolation and increasing access to distance learning and telemedicine.

Substantial investment is necessary to meet the scale and pace of decarbonization that the state's greenhouse gas emission reduction targets demand. That investment must provide **sustained financial support** for local technical assistance and administrative capacity to ensure that rural and Tribal communities can successfully execute on decarbonization programs **that they have designed** to address their multiple housing stock issues. The current system of funding for weatherization in rural areas needs to be redesigned by and for rural and Tribal community members.

While it is possible that building decarbonization strategies, such as energy efficiency, renewable energy, and building electrification, could address Washington's rural and Tribal communities' energy challenges, they are not the primary focus for these communities. Fundamental non-energy

needs for affordable, healthy, socially/environmentally just housing stock; economic development; and public health improvements must be addressed in tandem with, if not before, any decarbonization strategy.

Jessica Gigot and Dean Luce, Harmony Fields Farm/Dean J. Koepfler

1 Introduction

The technical and economic analysis that the Clean Energy Transition Institute (CETI) provided for the Washington 2021 State Energy Strategy found that Washington's rural communities were substantially energy burdened, and are often faced with economic disparities and a lack of infrastructural investment (Washington State Department of Commerce, 2020a).

That finding catalyzed this project with two goals: (1) to understand the barriers to decarbonizing buildings for the state's rural and Tribal low-income, energy-burdened households, and (2) to determine whether decarbonization strategies and clean energy development could address energy inequities in these communities.

Washington State has adopted ambitious greenhouse gas emissions targets—50% below 1990 levels by 2030; 70% below 1990 levels by 2040; net-zero emissions in 2050 (Chapter 70A.45.020 RCW)—that require swift decarbonization of all energy sectors, including the built environment (Washington State Legislature, 2020). It is critical that policies, programs, and investment be tailored to the unique circumstances of Washington's rural and Tribal communities.

We examined the barriers for Washington's rural residents to decarbonize buildings, the potential for distributed renewable energy to benefit rural areas, the extent to which decarbonizing rural housing stock has public health benefits, and economic development opportunities from rural building decarbonization.

We start with an examination of rural community racial and ethnic composition, the history of electrification in Washington State, and a discussion of energy insecurity and energy burden with a description of the federal and state programs that are designed to address them. We then explain the methods of literature review and qualitative, quantitative, and spatial analysis used to produce this study and describe the desire-based framework used to analyze the 24 interviews CETI conducted from January to June 2021 with rural and Tribal community members and nonprofit and government agencies.

The paper intentionally centers the observations that interviewees shared and uses research from the literature review and the quantitative analysis to support the interviews and to provide additional context. Section 3 presents the themes and findings identified in the interviews organized by socioeconomic, regulatory, and market aspects of decarbonization and divided into challenges, strengths, and desires.

1.1 Definition of a Rural Community

For this study, the definition of a rural community was a census tract that lies beyond a metropolitan tract (Ross et al., 2018). To classify tracts, we used the categorical RUCA codes that delineate

metropolitan (1–3), micropolitan (4–6), small town (7–9), and rural (10) tracts. Thus, rural was defined as tracts categorized as groups 4–10 (Figure 1).
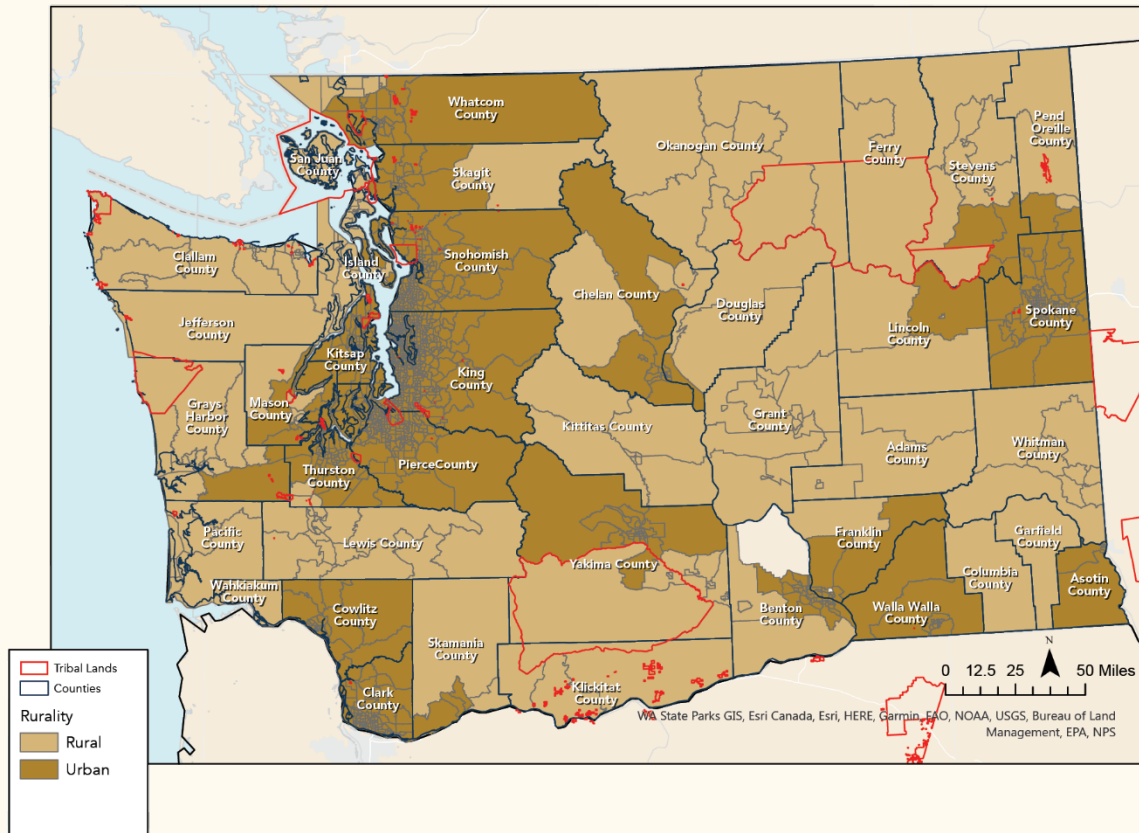
Figure 1. Classification of urban (brown) and rural (tan) counties using USDA RUCA codes (United States Department of Agriculture, 2019).

1.2 Defining Energy Insecurity and Burden

Energy burden is a common measure of energy insecurity. By measuring the annual share of a household's income toward energy bills, researchers can understand the range of energy insecurity present in communities. The average energy burden in the United States is 3.1%, which means that households across the nation tend to spend 3% of their annual income on energy costs (Drehobl et al., 2020).

However, energy burden is not distributed equally in the United States, with the most vulnerable households experiencing the most energy insecurity. Energy insecurity is more likely to impact low-income households, racial and/or ethnic households, rural households, and communities with health-sensitive populations (i.e., children, disabled, or elderly individuals) (Bednar & Reames, 2020; MacDonald et al., 2020).

Energy insecurity is associated with negative health outcomes and increased financial instability (Frank et al., 2006; Hernández, 2013). For example, when compared to children from low-income families receiving energy bill assistance, low-income children in non-recipient households had greater adjusted odds of being at risk for nutritional growth problems and acute hospital admission (Frank et al., 2006).

Individuals living in energy-insecure households are also more likely to have to choose between heating their homes and paying for food or medicine, and are at a greater risk of house fires, respiratory illness, and even death associated with extreme temperatures (Hernández, 2013; Reames, 2016; Wilson & Katz, 2009).

Understanding the inequities of energy insecurity is critical for achieving **energy justice**, or the equitable access and distribution of energy systems and services, due process, and representation in decision-making, with special consideration for marginalized or vulnerable people (Sovacool et al., 2017). Given the relationship between the built environment, climate change, and public health, applying a justice lens is critical to addressing energy security and reducing energy burden in rural and low-income communities in Washington State.

1.3 Rural Community Racial and Ethnic Composition

Knowing the racial and ethnic makeup of rural communities in Washington State is crucial for understanding socioeconomic disparities. According to the United States Census, the state is majority white non-Hispanic (61.6%), with the following additional racial and ethnic representation: Hispanic (Latinx, hereafter) (18.7%), Non-Hispanic Black (12.4%), Non-Hispanic Asian (6%), and Non-Hispanic American Indian and Alaska Native (Native, hereafter) (1.1%) (United States Census Bureau, 2019). A closer look into the state's history provides context for racial and ethnic profiles of rural communities.

For the members of Washington's 29 federally recognized Tribes, the state's demographics were largely shaped by the removal of Native individuals from their ancestral lands. Beginning in 1854, Washington's first territorial governor negotiated several treaties with Native individuals of the Pacific Northwest (Keller, 1988). Conflict between Native peoples and state governments continued throughout the 20th century, as federal and state governments slowly redefined the meaning of sovereignty, and the United States and individual states came to hold power over land rights, criminal law, and governance (Keller, 1988).

Today, the word Tribal is used to define the sovereign-dependent Tribes and their citizens. However, Native individuals are more than the categories that the United States has imposed on them, and terms such as "Native" or "Indigenous" may often be used by Native descendants to describe their identities.

The variable definition of sovereignty tends to favor the state over Tribal bodies, leaving Tribal community members wary of governmental relationships. Native-identifying individuals make up less than 1% of all urban communities, and 4% of rural ones (United States Census Bureau, 2019).

Washington's agricultural production and federal labor policies also significantly shaped its rural communities. In 1942, the United States granted temporary guest worker visas as part of the Immigration and Nationality Act (INA), a program referred to as the Bracero Program (Gamboa, 1981). Spanish for "strong-armed ones," the legislation allowed workers from Mexico to temporarily fill the labor shortages that the United States was experiencing during World War II.

Although the Bracero Program ended in 1964, the H-2 sections of the INA continued to facilitate the flow of temporary workers in and out of the United States. The immigration of Latinx families to the state aligns closely with agricultural and logging production, which are largely located in rural communities. On average, Latinx individuals in Washington State make up 10.9% of all urban communities and 16.6% of rural ones, with additional H-2A workers employed on a temporary basis (United States Census Bureau, 2019).

The relationships between race/ethnicity, poverty, and rurality are a fundamental component of Washington State, representing communities that are likely to be most at risk to climate change despite contributing very little to emissions. Moreover, for rural communities with more than 15% of Latinx individuals (median of Latinx populations in Washington communities is 7.82%), the median energy burden is 3%, and the ratio of the number of people whose income falls below the poverty line (poverty rate) is 16.5%.

This compares to urban communities with more than 15% of Latinx individuals, which will allocate 2% of their annual income to energy bills and have an average poverty rate of 14.9%. This means a four-person Latinx family living below the federal poverty line (annual income $26,500) could expect to pay upwards of $800 a year for energy bills in a rural community, as compared to $530 in an urban one.

Moreover, for rural communities with more than 5% of Native-identifying individuals (median of Tribal populations in Washington communities is less than 1%), the median energy burden is 4%, and its median poverty rate is 20.4%, as compared to urban communities with more than 5% of Native-identifying individuals, which will allocate 3% of their annual income to energy bills, with a median poverty rate of 16.2%. This means a four-person Native-identifying family living below the federal poverty line (annual income $26,500) could expect to pay upwards of $1,060 a year in a rural community, as compared to roughly $800 in an urban one.

Importantly, while the compounding socioeconomic inequities that rural communities face in Washington State can be connected to environmental and social injustices, all individuals in rural communities are disproportionately impacted. Individuals in rural communities not only face far greater energy burdens, but their community's capacity to organize around collective change they

would like to see, such as improved job opportunities, cleaner energy sources, and racial equity, is often hampered by socioeconomic challenges.

1.4 History of Electrification in Rural Washington

The compounding challenges associated with poverty and inequitable infrastructural development in rural Washington State were a common theme identified throughout the interviews we conducted. Thus, the state's energy history must be understood before identifying new development policies.

Electrification began in Washington State at the beginning of the 20th century in Seattle, with Seattle Electric Company providing electricity to residences in 1900 at a cost six times our current rates (City of Seattle, 2022). Despite the growing private interest in electricity, public efforts quickly began to shape the utilities landscape. In 1914, 41 cooperative members in Tacoma, Washington, created Parkland Light and Water Company, and today it is the nation's oldest mutual utility, providing some of the most affordable power in the country to approximately 4,700 customers (Parkland Light and Water Co., 2022).

In 1929, a grassroots organization of farmers, the Washington State Grange, collected over 60,000 signatures to pose Initiative No. 1 to the legislature, allowing rural communities to form publicly owned utilities (Power and Water Districts, 1931). In 1930, a statewide election passed the measure (now codified in RCW Title 54), and it went into effect the following year (WPUDA, 2022). Three years later, Mason County Public Utility District (PUD) was formed, the first PUD in the state (WPUDA, 2022).

Federal initiatives also shaped the energy and water systems in Washington State. In 1936, the Rural Electrification Act (REA) was established by President Roosevelt, providing opportunities for rural farmers across the nation to gain access to electricity (Public Power Council, 2022). A year later, the Bonneville Power Act (BPA) was created to expand the transmission system throughout the Northwest and encourage hydroelectric power created by dams in the Columbia River Basin (Public Power Council, 2022).

The act established *preference*, which gave preferential access to PUDs for low-cost clean energy, a policy that remains in effect today. In 1942, the Washington Rural Electric Cooperative Association (WRECA) was established (WRECA, 2022). Today, WRECA represents more than 20 mutual electric companies and rural electric cooperatives, allowing customers to set their own rates and ensure affordable rates (Washington Rural Electric Cooperative Assn., 2022).

While rural electrification helped to provide accessible energy to the public, the decision to harness hydrokinetic power came at the expense of many rural and Tribal communities in Washington State. Damming multiple rivers caused irreparable harm to fisheries, ecosystem services, cultural sites, and

the food security of many (Guarino, 2013). Thus, not all clean energy sources are free of social or environmental impact, and the harm can last for generations.

Together, these collective initiatives transformed rural energy access in the Northwest, with many public and cooperative-based utilities remaining in the 21st century. Today, there are 14 cooperatives associated with the WRECA and 28 PUDs in Washington State (WRECA, 2022; WPUDA, 2022). In 2000, RCW 54 authorized PUDs to provide broadband access to their customers, an effort to provide telecommunications infrastructure to rural communities (Washington State Legislature, 2021) (Figure 2).

Sean Butenschoen of Probably Shouldn't Distillery and Ecotech Solar installer/Dean J. Koepfler

Figure 2 provides a high-level timeline of the history of electrification in rural Washington.
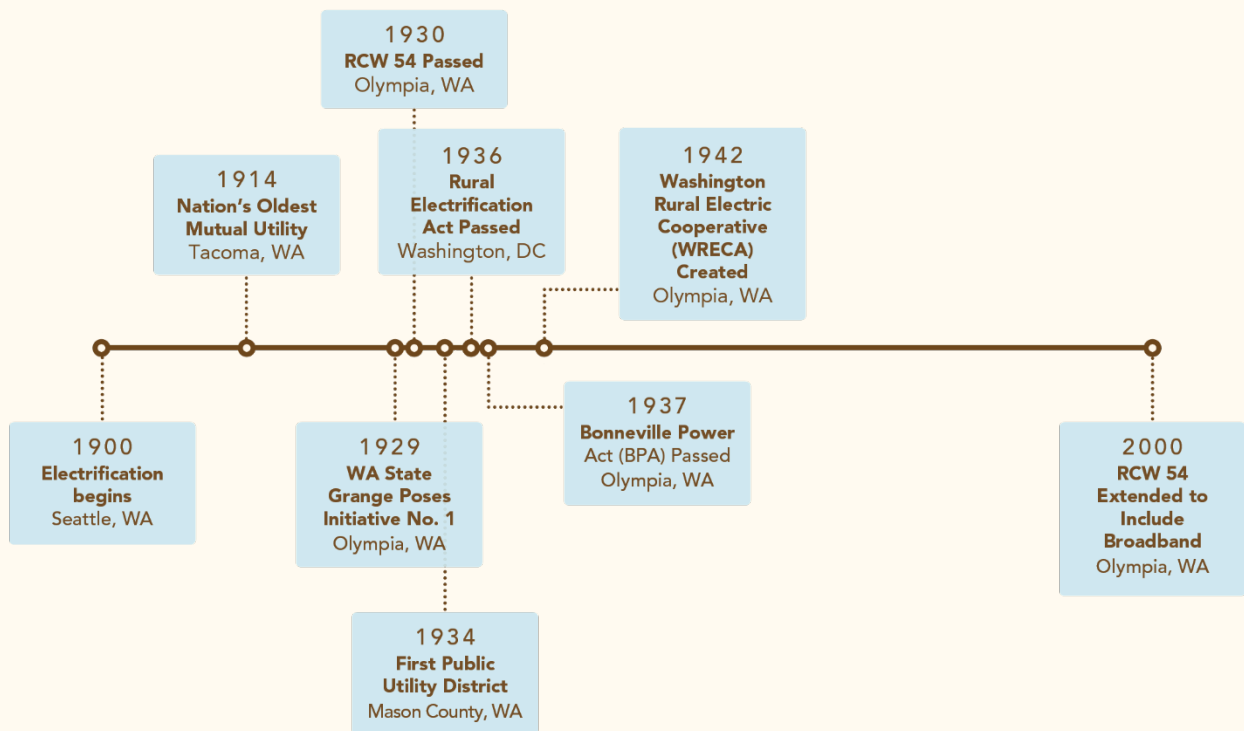
1930
RCW 54 Passed
Olympia, WA

1914
Nation's Oldest Mutual Utility
Tacoma, WA

1936
Rural Electrification Act Passed
Washington, DC

1942
Washington Rural Electric Cooperative (WRECA) Created
Olympia, WA

1900
Electrification begins
Seattle, WA

1929
WA State Grange Poses Initiative No. 1
Olympia, WA

1937
Bonneville Power Act (BPA) Passed
Olympia, WA

2000
RCW 54 Extended to Include Broadband
Olympia, WA

1934
First Public Utility District
Mason County, WA

Figure 2. Timeline of local, statewide, and national initiatives that transformed Washington State's energy access for rural communities.

1.5 Federal and State Programs for Reducing Energy Insecurity

The Environmental and Energy Study Institute (EESI) defines **energy efficiency** as "using less energy to perform the same task," a seemingly simple concept that has proven difficult to implement at the scale and pace required to combat climate change (Environmental and Energy Study Institute, 2021; Goldstein et al., 2020).

Minimizing energy waste is especially critical in the residential sector because roughly 20% of the United States' carbon emissions can be traced back to housing (United States Energy Administration, 2021). Given the current housing stock in the United States, it is estimated that decarbonizing the electrical grid alone will not meet the 2050 Paris Agreement's emissions reduction target of 80% (Goldstein et al., 2020). Thus, retrofitting homes to reduce their energy waste will be crucial for meeting global, national, and statewide decarbonization efforts in the following decades.

Retrofitting homes to reduce energy waste is not a new strategy and is often referred to as **weatherization**. Weatherizing a home can include several different improvements organized into four categories: mechanical (e.g., replacing heating/cooling systems), building shell (e.g., insulating

walls), electric and water (e.g., installing more efficient appliances), and health and safety (e.g., evaluating mold risks) (United States Department of Energy, 2021b).

By reducing energy waste, weatherization helps to alleviate **energy insecurity**, or the physical and economic burdens associated with energy-inefficient housing stock (United States Department of Health and Human Services, 2021).

This section outlines existing federal and state weatherization programs.

1.5.1 Federal Assistance Programs

There are two forms of federal assistance dedicated to reducing energy insecurity at the household level (Table 1). The first is the **Weatherization Assistance Program (WAP)**, which the U.S. Congress initially funded in 1976 to reduce weatherization project costs for low-income households (United States Department of Energy, 2021a).

Soon after WAP was passed, Congress passed the **Low-Income Housing Energy Assistance Program (LIHEAP)**. Today, individual households receive LIHEAP assistance from the Department of Health and Human Services (HHS) for energy bills and some weatherization and minor home repairs (United States Department of Health and Human Services, 2021). All clients receiving LIHEAP are also income-eligible to receive WAP assistance.

Although LIHEAP and WAP provide an invaluable service to low-income households across the nation, research indicates that LIHEAP serves only 25% of eligible households and WAP benefits even fewer (United States Department of Energy, 2015).

The **Rural Energy for America Program (REAP)** provides loan financing and grant assistance to farmers or small-business owners in rural communities to invest in renewable energy or efficiency upgrades (United States Department of Agriculture, 2015).

1.5.2 State Assistance

There are several statewide initiatives aimed at reducing energy waste and improving residential energy efficiency (Table 1).

The **Bonneville Power Administration (BPA) Low-Income Energy Efficiency Program** is a weatherization assistance grant program provided to low-income residents located in BPA's service area (Washington, Oregon, Idaho, and parts of bordering states). The budget for BPA's assistance program is $5.5–$6 million annually, and individual state budgets are based on income-qualifying residents in each state (Bonneville Power Administration, 2020).

The Washington State Legislature created the **Washington State Matchmaker Low-Income Weatherization Program (now known as the state Weatherization Plus Health funding)** in 1987 to provide additional funds by utilizing matching dollars from local utilities, property owners, and others. The legislature has authorized the use of state capital funds each biennium since 1991. The Matchmaker program doubles the state-provided fund for low-income weatherization assistance and lowers residential energy usage by an average of 25% (Office of Energy Efficiency and Renewable Energy, 2022).

In 2015, the Washington legislature expanded the Matchmaker program to include **Weatherization Plus Health (Wx+H),** an initiative for healthy homes and energy efficiency. Wx+H is the first low-income assistance program in the nation to provide integrated housing and health services, build community partnerships, and encourage innovative intervention and prevention models for healthy housing (Schueler, 2018).

This fund source enables weatherization providers to effectively use all their other fund sources by filling in the budget needed when federal funding or utility contributions are restricted to a per measure cost or limit the amount of funding that can be used to make a home weatherization-ready. Healthy home interventions reduce the prevalence of asthma, respiratory diseases, and other home health risks such as slips, trips, and falls to improve health outcomes in low-income communities, thereby reducing healthcare costs.

The **Community Energy Efficiency Program (CEEP)** was created in 2009 and is managed by the Washington State University Energy Program (WSU EP). CEEP provides energy efficiency upgrades for harder-to-reach households and small businesses, such as low-to-moderate-income households, residents in rental or manufactured housing, and homes heated with oil, propane, or wood (Washington State University Energy Program, 2016). This is a small-scale project ($2.5 million/year) that provides services in limited areas of the state. WSU EP is currently seeking CEEP development proposals for residential decarbonization.

The following two tables summarize different federal and state programs that address energy insecurity among rural and Tribal communities. Table 1 focuses on weatherization and energy efficiency programs for individuals. Table 2 is from the Washington State Department of Commerce and lists all clean energy grant programs from 2021 to 2023.

Table 1. Federal and state programs for addressing energy insecurity among rural and Tribal community members in Washington State. Table adapted from the American Council for an Energy-Efficient Economy (2018).

Program type	Program	Provider	Funding source	Notes
Energy efficiency and weatherization	Weatherization Assistance Program (WAP)	Administered by Washington State Department of Commerce (DOC) Services provided by local agencies and Tribes	Federal and state taxpayers	Federal program through the U.S. Department of Energy (DOE) that provides weatherization assistance for low-income households
	Weatherization Plus Health (Wx+H) Program	Administered by Washington State DOC Services provided by community action agencies (CAAs) and local governments	Washington State taxpayers	Combines energy and cost-saving weatherization improvements with measures that help to improve the home environments for children and adults who have asthma, other respiratory illnesses, or slip, trip, or fall hazards
		Administered by Washington State DOC Services provided by community action agencies (CAAs) and local governments	Washington State taxpayers	The state Weatherization Plus Health funding increases resources for low-income home weatherization by leveraging federal and local matching dollars and resources from utilities, rental owners, and other sources. This fund source enables weatherization providers to effectively use all their other fund sources by filling in the budget needed when federal funding or utility contributions are restricted to a per measure cost or limit the amount of funding that can be used to make a home weatherization-ready or address healthy home interventions
	Low-Income Energy Efficiency State and Tribal Grant Program	Community agencies and Tribal organizations	Bonneville Power Administration	Weatherization assistance grant funding for states and Tribes within BPA's service territories
	Community Energy Efficiency Program (CEEP)	Administered by Washington State University Services provided by Washington utilities and local agencies	Washington State capital budget	CEEP was originally funded through the Department of Energy's State Energy Program and the American Recovery and Reinvestment Act of 2009 (funding ended in 2012)

Bill assistance	Low-Income Home Energy Assistance Program (LIHEAP)	Administered by Washington State DOC Services provided by local agency	Federal and state taxpayers	Federal fuel assistance program designed to help low-income earners pay heating and cooling bills
	Other low-income bill assistance programs	Investor-owned utilities, municipal utilities, and cooperative utilities	Utility ratepayers, private contributions	
	Modified rate design, rate discounts or waivers, and modified billing methods	Investor-owned utilities, municipal utilities, and cooperative utilities	Utility ratepayers	
Financing options for efficiency upgrades	Rural Energy Assistance Grant Program (REAP)	Administered by state Rural Development office of the U.S. Department of Agriculture	Federal taxpayers	Loan financing and grant funding to agricultural producers and rural small businesses for renewable energy systems or to make energy efficiency improvements
	Home Rehabilitation Loan Program	Local Community Action rehabilitation agencies	Washington State Capital Budget	Deferred loan for rural, low-income households that need repairs and improvements on their primary residence for health, safety, or durability
	Sustainable Energy Trust	Washington State Housing Finance Commission	Washington State Capital Budget	Low-interest loans for affordable housing, Tribes, and nonprofits.

House in Jefferson County, WA/Clean Energy Transition Institute

Table 2. Washington State Clean Energy Grant Programs (2021–2023), provided by Washington State Department of Commerce.

Program	Who is eligible?	What types of projects are eligible?	Estimated funding	What is the timeline?
Energy Retrofits for Public Buildings				
Solar	■ Local agencies, such as cities, towns, and special districts ■ Public higher-education institutions	Solar panel systems connected to public buildings and facilities. Systems must be less than 100kW and net metered.	$1.2 million	Applications are due May 25.
Energy Efficiency	■ K–12 public school districts ■ State agencies ■ Federally recognized Tribal governments	Energy efficiency retrofits at existing public buildings and facilities that result in energy and operational cost savings.	$1.5 million	Applications are due May 25.
State Project Improvement Grants	■ State agencies named by the State Efficiency and Environmental Performance (SEEP) office Executive Order 20-01.	Improvements to already-funded state projects to increase energy efficiency and environmental performance.	$4.4 million	Request for applications is open. Applications will be accepted until all funding is awarded.
Clean Energy Fund				
Grid Modernization	■ Retail electric utilities ■ Community organizations, local governments, and federally recognized Tribal governments in partnership with retail electric utilities	Advancing community resilience by supporting the integration of renewable energy sources, distributed energy resources, and microgrids.	$10.6 million	Request for applications expected to open in late 2022.
Grants to Nonprofit Lenders	■ Nonprofit lenders	Loan programs that connect small businesses, nonprofits, multi-family building owners, and homeowners with low-cost financing for clean energy projects.	$5.3 million	Clean Energy Fund 4 and 5 appropriations were awarded in September 2021.

Electrification of Transportation Systems	- Federally recognized Tribal governments - Local governments - Small retail electric utilities - State agencies	Round 1: Innovative approaches to integrate and manage electrical load for increased electric vehicle charging equipment, with a particular focus on communities and populations disproportionately burdened by air pollution, climate change, or lack of transportation services. Round 2: EVSE installation to fill gaps in rural communities and support long-distance travel.	$2.9 million, with $970,000 solely for Tribal governments and small retail utilities to integrate load through capital asset investments.	Request for applications expected to open in mid-2022.
Research, Development, and Demonstration	- Washington-based research institutions - Nonprofits - Private businesses - Tribal governments - Local governments	Strategic research and development for new and emerging clean energy technologies that advance the state's climate goals, create opportunities for economic and job growth, and strengthen technology supply chains.	$4.8 million	Request for applications expected to open in fall 2022.
Rural Clean Energy and Dairy Digester Bioenergy	- Rural: To be determined - Bioenergy: Applicants that own, operate, and/or service anaerobic digesters located at dairies in Washington State	Rural: Innovative clean energy projects in rural communities such as beneficial electrification, organic waste management, and biological carbon sequestration. Bioenergy: Dairy digester bioenergy projects that produce renewable natural gas and biofertilizers, reduce emissions, and improve soil health and air and water quality.	Rural: $2.8 million, with $921,500 solely for projects of Tribal governments Bioenergy: $1.8 million	Request for applications expected to open in late 2022.
Building Electrification and High Efficiency Heat Pumps	To be determined	Demonstrations of grid-enabled, high-efficiency, all-electric buildings that significantly reduce greenhouse gas emissions, accelerate the path to zero-energy, and demonstrate early adoption of grid-integration technology.	$9.7 million	Program under development. Request for applications expected to open in late 2022.

2 Methods and Framing

2.1 Methodological Overview

From October 2020 to June 2021, we conducted 24 semi-structured interviews via Zoom with rural and Tribal community members, as well as nonprofit organizations and government agencies. Nonprofit and government agency interviewees were selected based on their work to improve economic development and community health in these communities, and their understanding of the potential for decarbonization to both reduce carbon emissions and bring socioeconomic improvement to these communities.

Participants were identified using CETI's network of technical and economic analysts, as well as a participant referral approach, which asks interviewees to identify other potential participants using their professional and community networks. (See Supplementary Information: Interview List.)

Figure 3 shows the types of stakeholder groups that were interviewed.
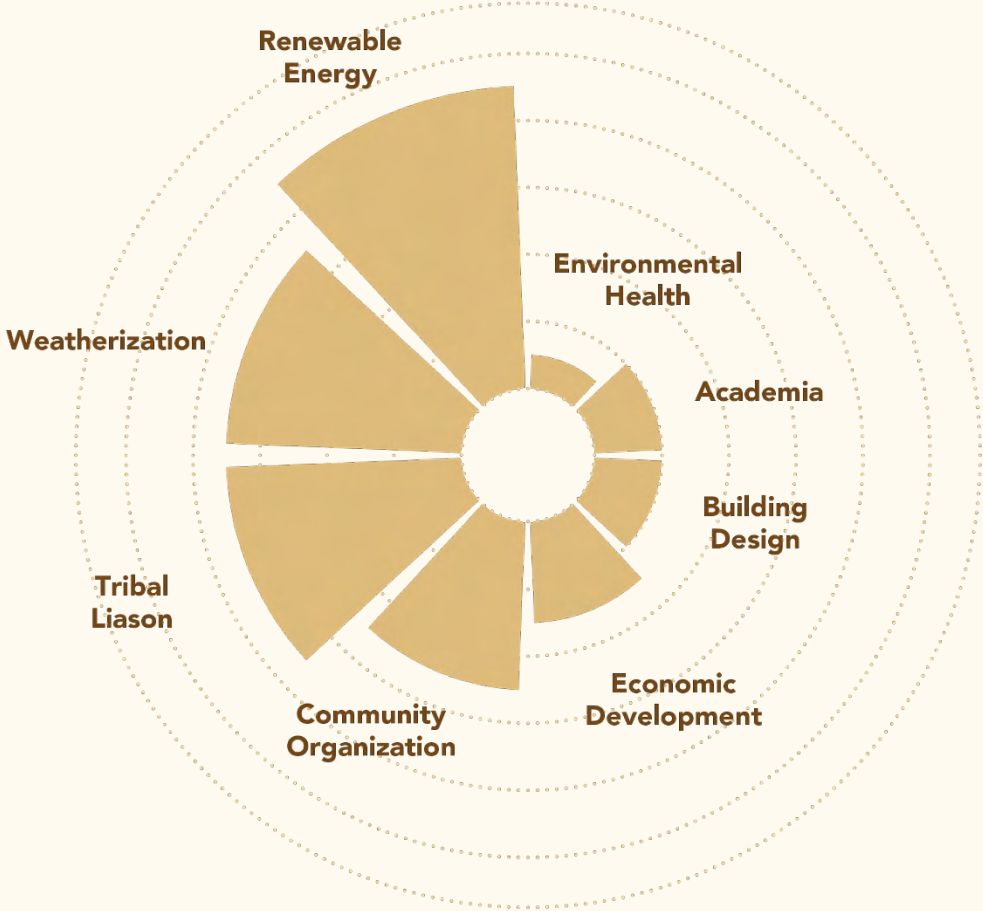

Figure 3. Types of stakeholder groups engaged in the process.

The interviews were transcribed using the software otter.ai [v.2.1.65] and summarized by several team members for consistency. The transcripts were coded and tallied for overarching themes using an approach outlined by Dr. Catherine Pope and colleagues (2000). Reoccurring strengths, challenges, and desires were organized into three overarching categories: socioeconomic, market, and regulatory, similar to Dr. Tony Reames's work (Reames, 2016).

In addition to analyzing the results of the oral interviews, we also conducted a literature review and quantitative and spatial analyses. The decision to compile statistics, historical background, and academic literature after the interviews were conducted and analyzed was intentional because we are not experts in rural and Tribal aspirations for their respective communities.

Rather, we chose to center the themes and findings identified in the interviews, using data analyses and additional literature to support the ideas that emerged in the interviews. Initial manuscripts were shared with all participants to ensure themes were adequately summarized before the publication of this report.

All data analyses were conducted in RStudio [v.1.3.1056], using five-year American Community Survey estimates, the U.S. Department of Energy's Low-Income Energy Affordability Data (LEAD) tool, the U.S. Department of Agriculture's Rural-Urban Commuting Area (RUCA) Codes, and the American Housing Survey for the years 2014–2018 (Ma et al., 2019; United States Census Bureau, 2019; United States Department of Agriculture, 2019; United States Department of Housing and Urban Development, 2021). Maps were visualized in ArcGIS Pro [v.2.8.0].

2.2 Desire-Based Framework

We used a desire-based framework to interpret, summarize, and publish this report. Applying a desire-based lens helps researchers form a more holistic understanding of how people and communities experience their lives (Tuck & Yang, 2014). Desire-based research can be summarized by five core tenets.

1. Desire-based research is asynchronous. It acknowledges painful pasts and harnesses them as wisdom to be used for reshaping and reimagining the future.
2. Desire-based research is a privilege and a responsibility, in which the researcher must refuse to replicate narratives that uphold structures of power and oppression.
3. Desire-based research aims to unsettle the common narrative that low-income and communities of color are damaged.
4. Desire-based research redefines how we learn from others, forging new theories alongside underrepresented communities.
5. Desire-based research communicates creativity, allowing alternative forms of thinking, knowing, and living to converge.

We believe it is important to understand state-facilitated racism and dispossession alongside grassroots organizing for community power. The history of rural and Tribal communities provides a critical lens for imagining the future, while remaining aware of the past. We know that Washington State government has—and continues to be—both a proponent of and a threat to equitable rural and Tribal development.

Our goal for this project was to highlight community-identified desires for clean energy transitions, while also being transparent about knowledge that may have been overlooked due to the small sample size of people we spoke to and the fact that we spoke only to community leaders. Thus, the decision to highlight challenges, strengths, and desires as community members defined them for themselves acknowledges the existence of networks of individuals working to improve and reimagine the places that they call home.

3 Community-Identified Needs for Equitable Rural Building Decarbonization

3.1 Summarized Themes

The commonly identified challenges, strengths, and desires, and the frequency with which they were mentioned, are summarized in Figures 4–7. Figure 4 provides an overview of the challenges, strengths, and desires that interviewees identified, divided into three categories: socioeconomic, market, and regulatory. Figures 5, 6, and 7 show the prevalence of the themes by category, using the color-coding for each category to carry through on the bar charts.

Solar Panels on Skokomish Community Center, designed as a Net Zero project/Doug Walker Photography

01. SOCIOECONOMIC

Challenges
- Legacy distrust
- Community capacity
- Climate threats
- Poor infrastructure
- Health risks
- Misinformation/ political polarization

Strengths
- Community outreach
- Culturally-relevant programming
- Community-led design
- Data analysis/research
- Youth development
- Community organizing for power

Desires
- Community involvement
- Affordable and safe housing
- Infrastructural investments
- Climate mitigation
- Leadership development

02. MARKET

Challenges
- Workforce recruiting and retainment
- Expansive service areas
- Administrative capacity
- Equitable employment opportunities

Strengths
- Wrap-around worker services

Desires
- Accessible clean energy workforce
- Increased administrative capacity
- Tribal-Tribal connections

03. REGULATORY

Challenges
- Funding restrictions
- Poor housing stock
- Interest-free loan programs
- Patchwork funding
- Limited opportunity for renters

Strengths
- Multi-organizational collaboration
- Funding application assistance
- Utility collaboration
- Deferral pilot program

Desires
- Additional funds
- Funding flexibility
- Pre- and post-testing
- Organizational collaboration
- Energy sovereignty
- Open-data sources
- Landlord incentives

Figure 4. Overview of challenges, strengths, and desires identified in interviews.

With Figure 5, we see the prevalence of identified **challenges** for rural and Tribal residential building decarbonization based on the number of times the themes were raised in the interviews.

Figure 5. Prevalence of community-identified challenges for rural and Tribal residential building decarbonization.

With Figure 6, we see the prevalence of identified **strengths** for rural and Tribal residential building decarbonization based on the number of times the themes were raised in the interviews.
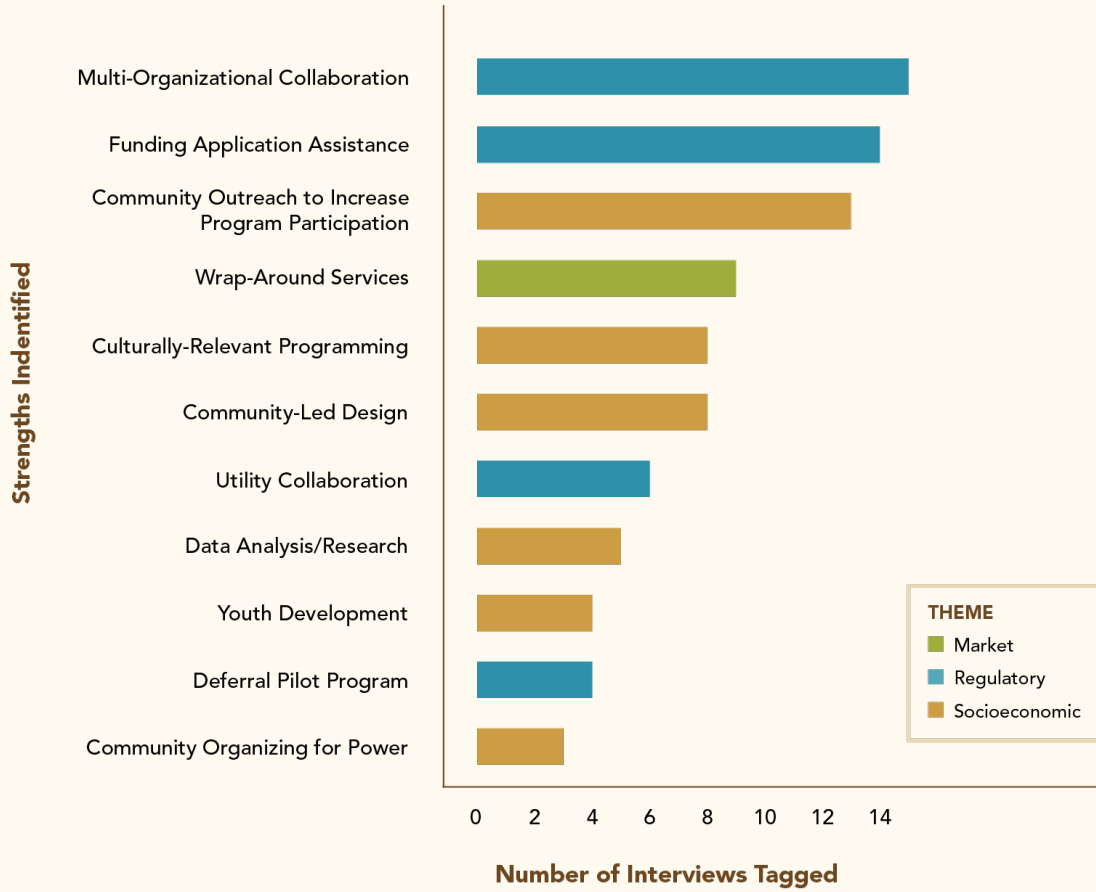
Figure 6. Prevalence of community-identified strengths for rural and Tribal residential building decarbonization.

With Figure 7, we see the prevalence of identified **desires** for rural and Tribal residential building decarbonization based on the number of times the themes were raised in the interviews.
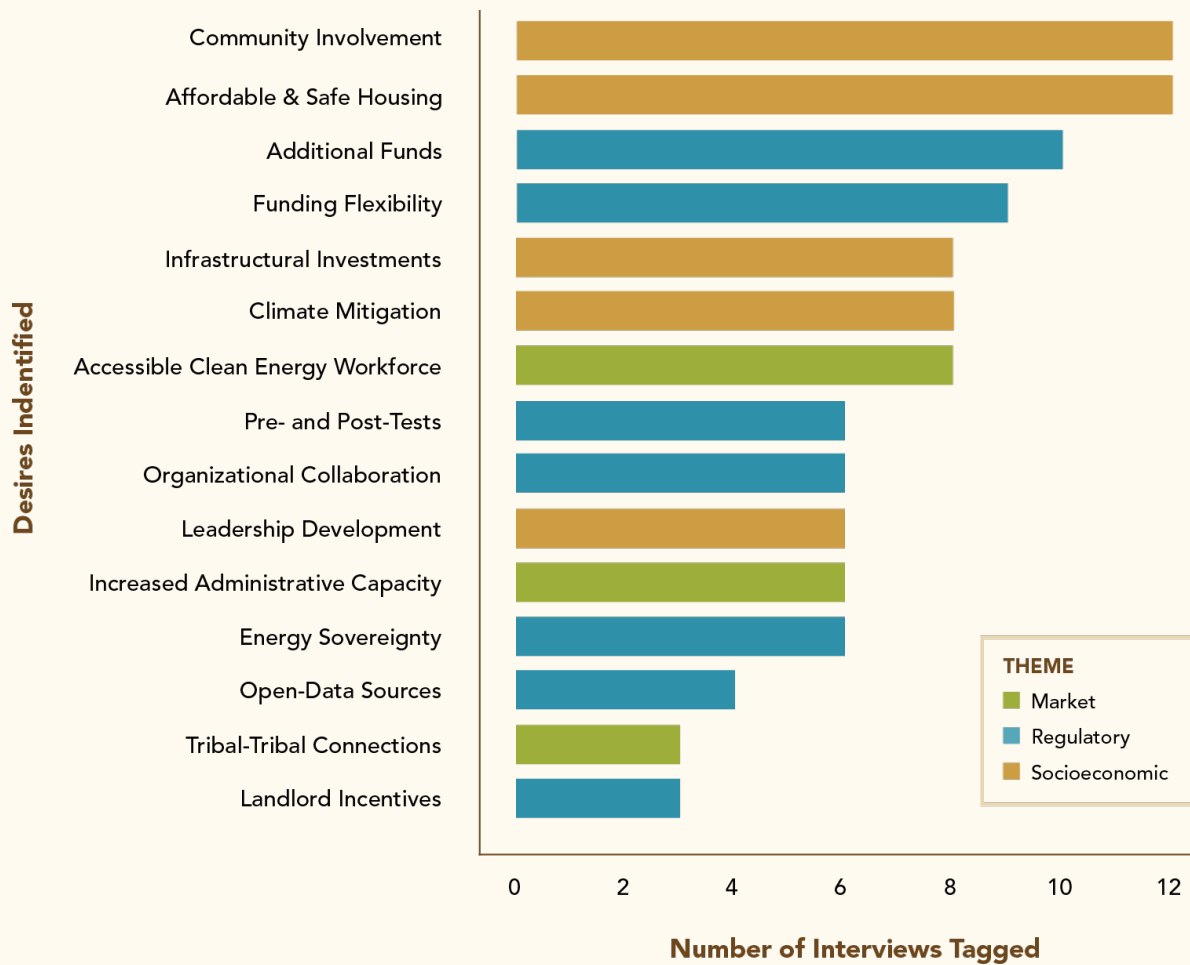
Figure 7. Prevalence of community-identified desires for rural and Tribal residential building decarbonization.

3.2 Socioeconomic Aspects of Decarbonization

3.2.1 Socioeconomic Challenges

3.2.1.1 Rural Energy Burden

Despite efforts to provide affordable energy to the non-urban parts of the state, rural communities in Washington have a median energy burden that is 1.5 times greater than their urban counterparts (Figure 8). Moreover, the energy costs associated with rural communities range from 2% to 8%, as compared to 1% to 5% in urban communities.
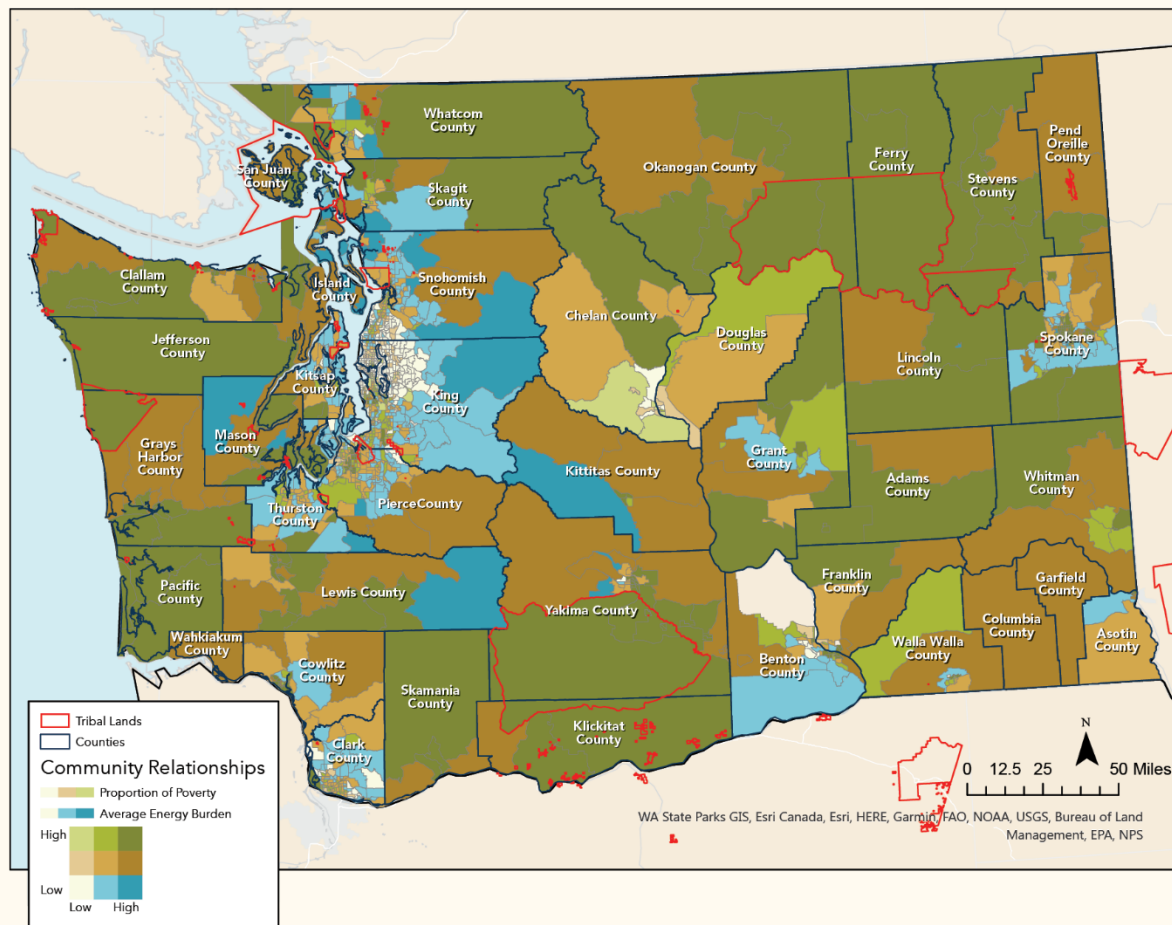
Figure 8. Map showing proportion of individuals in communities living at or below the federal poverty line, paired with average energy burden.

This means that a person making the median income in Washington State ($77,006) could pay $770–$3,850 on energy bills in an urban community, versus $1,540–$6,160 in a rural one. The costs associated with energy bills are often made more significant by compounding socioeconomic challenges, such as increased housing burden and lessened economic opportunities (Hernández et al., 2016).

3.2.1.2 Limited Broadband Access and Transportation

Rural communities have less access to broadband connection and affordable transportation, a theme repeatedly identified in interviews that cited poor infrastructure as a challenge (Figures 4 and 5). Broadband access was the single most important infrastructure priority interviewees raised. While broadband access is required to enable grid-connected buildings and energy demand management, its primary value to the interviewees was connecting communities, decreasing isolation, and increasing access to distance learning and telemedicine.

Ryan Berendsen, Director of Affordable Housing at Rural Resources Community Action in Colville, discussed the lack of broadband in rural communities:

> "I think the first thing would be the broadband issue, to be able to get people connected. What used to be a luxury is now almost a necessity, especially in this area where everybody is so spread apart." — Ryan Berendsen

In addition to broadband access, interviewees noted the challenges associated with limited access to affordable, reliable transportation, which hinders travel to places that are critical to their well-being. Roni Holder-Diefenbach, Executive Director of the Economic Alliance of Okanogan County and Vice Chair of the North Central Washington Workforce Development Council, shared:

> "They [Okanogan County Transit Authority] have several buses [that] are taking people and moving people around in Omak and Okanogan because this is the hub of all economic activity . . . [it's] also where the county seat is. It's also where people access services, such as DSHS [Department of Social and Health Services], WorkSource, and medical clinics—all of these different places that people have appointments for and have to travel to." — Roni Holder-Diefenbach

Figure 9 shows the proportion of individuals in communities living without internet access, paired with the proportion of those living without access to a vehicle.
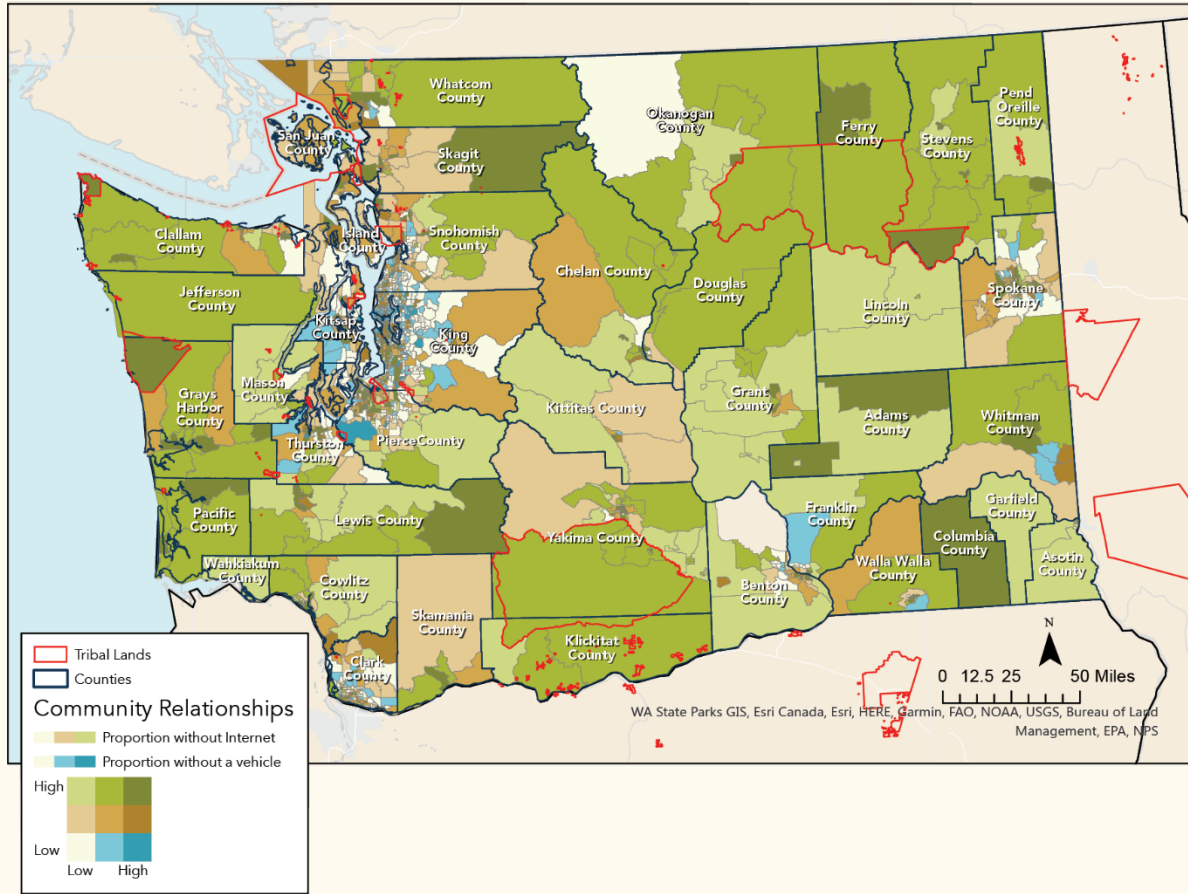
Figure 9. Map showing proportion of individuals in communities living without internet access, paired with proportion of those living without access to a vehicle.

3.2.1.3 Manufactured Housing

When considering equitable building decarbonization for rural and Tribal communities, it's imperative to consider not only the affordability, but also the quality of the housing stock. Many families struggle to secure safe and affordable housing in rural communities. It is far more likely that homeowners are unable to afford housing repairs, let alone energy efficiency upgrades.

For example, among rural communities with poverty rates greater than 10% (the state median is 9.7%), the median proportion of households facing housing burden (the share of owner- and renter-occupied households spending more than 30% of income on housing) was 27.6%. Housing stock in rural and Tribal communities also tends to include more manufactured homes: the median for rural communities inhabiting manufactured homes is 13% of residents versus 1.5% in urban communities (Figure 9).

Rural community members living in manufactured homes have a median energy burden that is 1.5 times greater than urban communities. For communities with more than 10% of residents living in

manufactured homes, energy burden ranges from 2% to 8%, whereas the range is 1% to 5% for communities with fewer than 10% of members in manufactured housing.

This means that a person making the median income in Washington State ($77,006) and living in a manufactured home in a rural community could pay upwards of $6,160 annually on energy bills, while someone making the same median income living in an urban community in non-manufactured housing might expect to pay as little as $770.

Figure 10 shows the proportion of the population living in manufactured housing, paired with average energy burden.

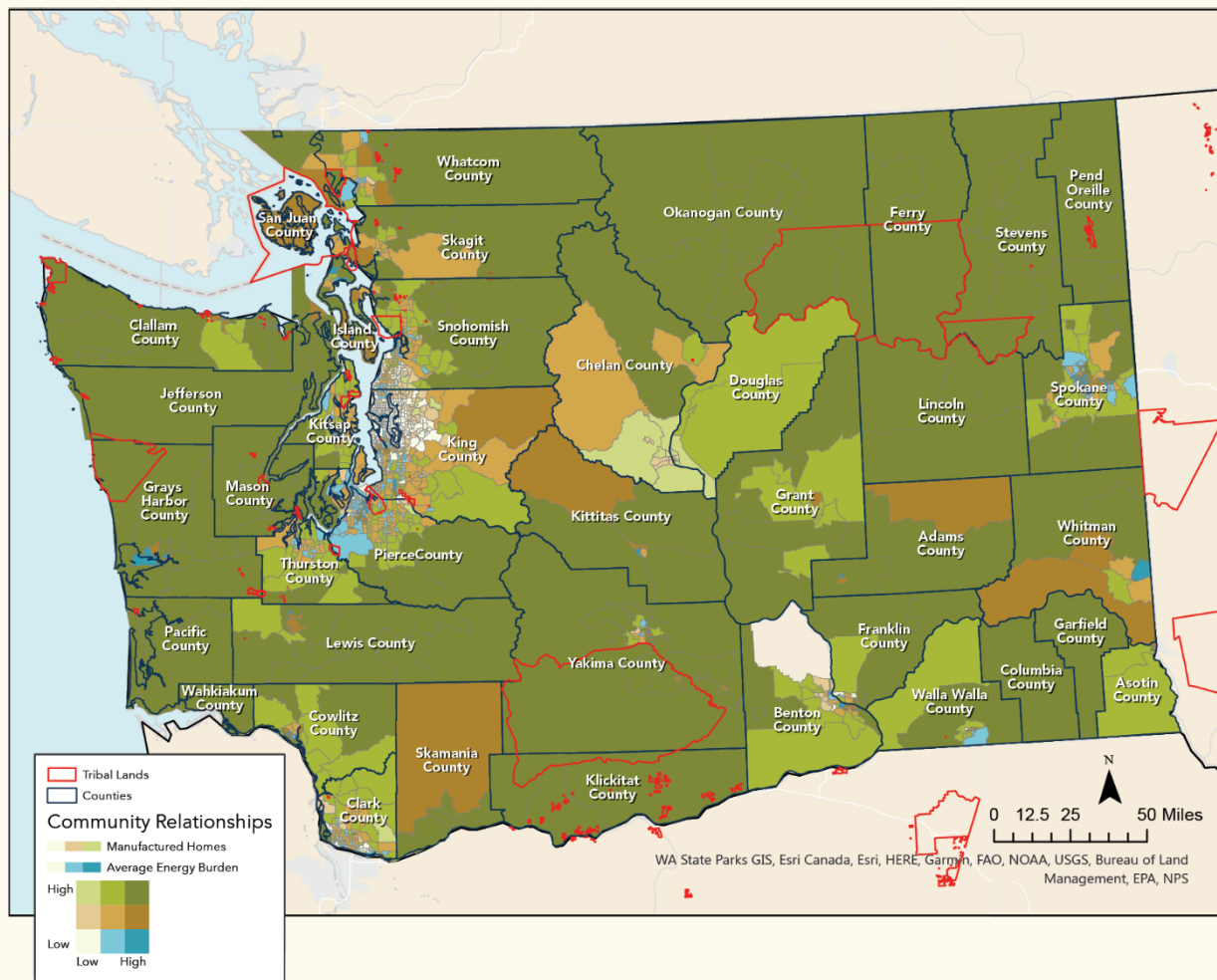*Figure 10. Map showing proportion of households living in manufactured housing, paired with average energy burden.*

In addition to revealing the impact of the overwhelming burden of housing costs and maintenance, many of our interviewees considered the safety of homes a significant challenge to decarbonization (Figure 5).

Stina Janssen, Co-Founder and Director of Firelands Workers United/Trabajadores Unidos, an organization of working families devoted to organizing for union jobs in sectors caring for people and place in rural Washington State's timber country, discussed the health risks of poor housing stock in rural Washington communities and the challenges associated with maintaining and repairing single-family and mobile homes:

> "Many of our members live in trailers or mobile homes in mobile home parks, and much of this housing is falling apart and unhealthy for our families. It's full of mold and our kids have respiratory illnesses. It's uninsulated and too expensive to heat, and people are cold and sick all winter. We live in a super rainy part of the country and people don't have the money to make repairs; roofs are leaking and caving in, and we don't have the money to maintain the housing."
> — Stina Janssen

3.2.1.4 Health Impacts of Unhealthy Housing

Unhealthy housing for low-income families poses significant health risks to vulnerable individuals in rural Washington State. When compared to urban and suburban communities, Washington's rural communities have on average 6% more elderly populations, 5% more individuals living with disability, and 5% more individuals living under the poverty line (United States Census Bureau, 2019).

Disproportionate health risks associated with the quality of housing stock in rural communities is often a product of poverty, where homeowners struggle to maintain their homes when faced with elevated rent/mortgage burden and elevated energy bills, which result in several direct and indirect impacts on human health (Swope & Hernández, 2019). Not only does the poor quality of housing stock contribute to energy burden inequities and increased carbon emissions, it also adds increased health costs, yet another burden for disadvantaged communities with limited access to affordable healthcare.

Emergency asthma visits have been tied to historical discriminatory practices, suggesting that housing, community, and health are inextricably linked (Nardone et al., 2020). In Washington State, families reporting an annual income of less than $10,000 were 2.26 times more likely to report the presence of asthma when compared to those with household incomes of more than $75,000 (Washington State Department of Health, 2018). Among Washington State counties, non-urban counties had the highest prevalence of asthma among adults, nearly 30% greater than urban counties (Center for Disease Control, 2021).

Erin McTigue, a Smoke Management Coordinator and Indoor Air Specialist for the U.S. Environmental Protection Agency (EPA) Region 10, works to promote better air quality, heating, and ventilation for healthy homes. She observed that housing, health, and energy efficiencies are inextricably linked, and having different agencies to address public health, environmental protection, and energy efficiency only complicates the distribution of resources for healthy housing.

> "When we think about air pollution, we typically only think about lung diseases like asthma, but there are so many other demonstrated impacts of air pollution on health — cardiovascular health, immune response, brain function. This is an area in which we've [EPA] been trying to develop a more holistic message and approach." — Erin McTigue

Interviewees also spoke to the challenges associated with changing climates, such as warming temperatures and increased rates of wildfires in Washington State. For example, interviewees in Okanogan County mentioned that several families chose not to rebuild after fires decimated homes in the area. The Okanogan complex wildfire was one of the worst in Washington State's history, burning over 300,000 acres of land, destroying 120 homes, and killing three people (Bush & Bernton, 2015).

Families that do choose to stay in fire-prone areas are far more likely to require housing that is firesafe, requiring additional investments in landscaping and materials. The health risks associated with air quality are also likely to be exacerbated by our changing climate, impacts that will disproportionately affect rural communities (Reid & Maestas, 2019).

3.2.1.5 Political Polarization and Legacy of Distrust

A final socioeconomic theme identified in our interviews was the political polarization that exists within rural communities and between rural and urban communities (Figures 4 and 5). Often, opposition to the energy transition is tied to questions about the permanence of jobs, association with liberal ideologies, and concerns about the reliability of new technologies (Olson Hazboun, 2018).

Climate change will likely only compound this polarization as resource-dependent communities face a decline of job opportunities in agriculture, logging, and fishing. Stina Janssen shared that

rural community members might feel resistant to energy transition due to political polarization, not necessarily because they do not think that climate change is real:

"There are wealthy corporate interests that want to shield their agenda with the lives of working people. We are living the heat waves—some members reported temperatures of 115 degrees in their mobile homes during the 2021 wave, others got heat stroke at work. We are living the floods and wildfires. Climate change is affecting our health and livelihoods. But the problem comes from both sides: we're flooded with right-wing messages on the radio or TV that sow mistrust, exploit our fears, and erode our sense of agency to make government programs work for our communities. And on the other hand, there are environmental messages that feel like they are about wealthy people in big cities that also alienate rural working-class people. We are still living in the shadow of the timber wars. Stuck between these dominant narratives, we are working to make meaning of climate change in our daily lives and develop a sense of possibility and real pathways to make a climate-stable, healthy future with plenty of good union jobs possible in rural Washington State." — Stina Janssen

Tribal communities must overcome legacy distrust from state and federal governments to form partnerships and receive funding, a challenge that cannot be overlooked. Stephanie Bostwick, Department Chair and Engineering Instructor at Northwest Indian College, shared the challenge of legacy distrust and utility collaboration:

"There's still resistance to working with the utility. And part of that comes from . . . [past utilities that] came in and hooked up on the Reservation. They didn't ever get permission to come in and do that, they just did it . . . there's definitely still distrust and resentment within the community . . . it's hard for people to want to even move forward with any kind of relationship with the utility." — Stephanie Bostwick

3.2.2 Socioeconomic Strengths

3.2.2.1 Community Outreach and Data Analysis/Research

Interviews commonly identified the value of tailored community outreach (Figures 4 and 6). Interviewees explained that rural communities vary significantly across the state, and projects must be developed to meet the unique needs of a community to ensure success. Andrea Axel, Executive Director of Spark Northwest, noted that this is critical for building an equitable clean energy future:

> "We think it's important that clean energy planning center on the concerns of marginalized communities. That knowledge and expertise is key to designing a successful project." — Andrea Axel

Interviewees also identified research assistance as an effective strategy for helping community agencies and organizations advocate for additional funds and plan effective projects. Jack Newman, the Director of Clean Energy Solutions at Säzän Environmental Services, spoke to the importance of bottom-up, participatory approaches for involving rural and Tribal members in small-scale renewable energy projects.

Newman mentioned the Solarize model, a grassroots campaign to help residents achieve solar power through community organizing, technical assistance, project management, bulk purchasing for economies of scale, and fund access. After three years of operating, Solarize campaigns have contributed over 1.7 MW of energy from distributed photovoltaics in the Pacific Northwest (Irvine et al., 2014). Jack shared:

> "[The Solarize model] allows a selected contractor to commit on a community-wide initiative, which includes some standardization on the system option they're going to provide. Following a series of educational workshops, community members (homeowners) can opt in to the free site assessments and proceed with a solar PV rooftop installation. This model provides contractors with a streamlined approach to project development, reducing soft costs through educational workshops and engagement, resulting in a bulk purchase of solar equipment to reduce installation costs for the program participants. Traditionally, this program has been offered as neighborhood-specific campaigns for homeowners, which does result in overall cost savings through economies of scale." — Jack Newman

3.2.2.2 Culturally Relevant Programming and Community-Led Design

Developing and enhancing community buy-in is a key component of innovation diffusion, a process by which new ideas are communicated through social channels in a community (Oldenburg & Glanz, 2004). This theory is especially important for increased acceptance of pro-environmental behaviors in rural America because technological advances in clean energy are not embraced as readily as they are in urban communities (Hammond, 2009).

Thus, to improve the perceptions of residential energy efficiency assistance, it is advantageous to employ the close-knit nature of rural communities to communicate new ideas. Of the many community-identified strengths, ties in rural communities were identified as a powerful force for rural and Tribal communities (Figures 4 and 6). Roni Holder-Diefenbach shared the strengths of familial ties in her Okanogan County community:

> "Usually, there's aunts and uncles and kids and grandmas and grandpas, which is great. . . . It takes a village to raise a child for the Tribal community, and the same with our Latino [families]." — Roni Holder-Diefenbach

When interviewees identified the strengths associated with family ties and community networks, they often suggested that community involvement and organizing were critical to rural decarbonization projects. Ultimately, participants felt that successful projects in their communities were those where community members advocated for outcomes that they had defined for themselves.

Dan Glenn, Architect at 7 Directions Architects, described the value of involving community members in environmentally sustainable, net-zero energy efficiency housing projects:

> "We appeal to the culture, because we design culturally and environmentally responsive housing, and environmental sustainability is cultural in its approach. With things like water for the Puyallup [Tribal Nation], they're highly dependent on the Puget Sound and fishing. [So we prioritized] water quality and protecting groundwater [throughout the design process]." — Dan Glenn

This sentiment was echoed for projects with other Tribal communities. Mikhaila Gonzales, Project Manager for Spark Northwest, argued that the most critical component of engaging Tribal communities in clean energy projects is the identification of a "champion," or a trusted and well-known community member who can raise awareness and garner support for a community-based project.

> "If I don't have a team to work with me on it, it's just not gonna happen. So, we build the team first, and then, what buildings they are interested in." — Mikhaila Gonzales

3.2.3 Socioeconomic Desires

3.2.3.1 Affordable and Safe Housing

Interviewees discussed affordable and safe housing as one of the most pressing needs for equitable decarbonization (Figures 4 and 7). Often, improving housing stock not only serves to increase the number of homes eligible for state-facilitated energy efficiency improvements, but interviewees also envisioned myriad non-energy benefits, such as improved health, community participation, and economic development.

Ernie Rasmussen, formerly Tribal Liaison for the Department of Commerce in Okanogan and now Digital Equity Manager at the agency, described his vision for affordable and safe housing stock that members in his community would be proud to live in:

> "If we were to start talking about how do we actually break the cycle of intergenerational poverty and what we're seeing in the condition of the housing stock, [we ask ourselves] where can we create those types of [housing] developments? They become where we're creating a community of choice where people choose to live, where they feel like they've got opportunity." — Ernie Rasmussen

3.2.3.2 Community Involvement and Leadership Development

As Washington works toward more equitable clean energy policies, it will be imperative to involve rural community members to chart the path they define for themselves. Interviewees identified a desire for culturally relevant programming and leadership development (Figures 4 and 7).

Community members referred to the pre-existing strengths in their community, and highlighted interest in increasing the number of opportunities for community members of all ages and identities to become involved in their community. Stephanie Bostwick of the Northwest Indian College described her desire for community involvement:

> "Every community is going to be different in terms of how people feel about everything. Every decision starts with a community meeting and getting feedback from individuals on 'what are your thoughts on this?' Pieces of that are educating people, and pieces of that are really listening to people's feelings about relationships that exist, and conflicts that exist." — Stephanie Bostwick

3.2.3.3 Youth Development and Community Organizing for Power

Many interviewees spoke to the importance of preserving rural communities and families (Figures 4 and 7), which largely hinges on the economic opportunities for youth:

> "We have to do a better job of connecting our students to these different occupations. They're going to be our future leaders, decision makers, and the ones who are going to be running our local businesses." — Roni Holder-Diefenbach

In addition to investing in local youth and providing long-term job opportunities, interviewees viewed community organizing as a strength in rural communities. Ernie Rasmussen described the value of collective power for realizing community projects:

"Community organizations, thought leadership, folks that have perhaps experience in other communities and have seen other models and how they can work have attained some of the critical mass necessary for that work to take hold and begin real projects in their community." — Ernie Rasmussen

Efforts to increase workforce training accessibility and invest in youth development are already underway in Washington communities. For example, the Okanogan Community Action Resource, Event, and Training Center aims to provide construction job training to youths, veterans, and others to establish a sustainable workforce that earns family-supporting wages and promotes weatherization repairs and energy investments in low-income and Tribal housing. While previous training certification programs required daily travel in inclement conditions, the local training program will improve access for trainees and promote community uptake of energy/carbon conservation standards.

"We saw the need to solve the worker shortage with our talented community members that wanted to learn the skills while giving back to our low-income elders and families. With our training center we aim to establish a resource of locally trained and certified workers, who have a path out of poverty and will also be helping reduce the backlog of homes in desperate need of repair and weatherization."
— Lael Duncan

COMMUNITY ENTRANCE

Architectural Rendering of Proposed Okanogan Community Action Resource, Event, and Training Center

3.3 Regulatory Aspects of Decarbonization

3.3.1 Regulatory Challenges

3.3.1.1 Patchwork Funding and Funding Restrictions

When describing regulatory aspects of rural and Tribal decarbonization, two of the most common challenges mentioned were patchwork funding and funding restrictions associated with community-level and statewide assistance programs (Figures 4 and 5). Interviewees often felt that limited and restrictive funding affected their ability to create long-term change in their communities. Vince Schueler, a Senior Energy Program Analyst for the WSU Energy Program, spoke to the challenges of restrictive funding in weatherization programs:

> "It [limited funding] makes it really hard to build momentum. We have this sort of boom-and-bust cycle. We've built some fairly powerful infrastructure with our funding, but most of that [money] disappeared." — Vince Schueler

Schueler noted that Washington built a fairly strong community infrastructure with American Rescue and Recovery Act and CEEP investments 10 years ago, but much of that disappeared when funding decreased. This was also the case with the original Weatherization Plus pilots in 2017 when established capacity evaporated after the state capital budget was delayed almost a year.

He further explained that flexible Wx+H funding is in the capital budget and approved on a two-year cycle, ranging from $10 to $25 million per biennia. CEEP funding is also biennia to biennia with no guarantees. A similar pattern exists with Covid-relief funding and DOE infrastructure funding, a one-time grant with a five-year cycle.

Erin McTigue expressed a similar challenge in her efforts at the EPA in collaboration with Tribal communities in the Pacific Northwest:

> "Communities that I've seen have the most success in reaching their end goal have creatively braided together different sources of funds. It's challenging though — there are a lot of resources and programs available, but each has different requirements. Navigating those systems is complicated and time-intensive." — Erin McTigue

3.3.1.2 Housing Deferral

To qualify for WAP, homes are first assessed for the weatherization scope of work. Homes are ineligible if they have been previously weatherized any time after September 1994 (Policy 2.1.3, Washington State Department of Commerce, 2018). This is regardless of homeownership or the type of weatherization completed.

Energy audits require an assessment of weatherization measures, identified health and safety (H&S) repairs necessary before installation, and a list of repairs necessary to ensure the function of weatherization materials (Washington State Department of Commerce, 2021). However, if the estimated costs associated with H&S are too extensive, energy auditors must defer the home and suggest alternative forms of assistance for repairs.

Repairs responsible for deferrals in Washington State include but are not limited to 1) health issues associated with the installations of weatherization materials, 2) costly building structure or mechanical systems fixes, 3) workers' health risks associated with sewage or sanitary systems, 4) housing that's been condemned or identified by local or state officials as posing problems, 5) mold/moisture risks, 6) elevated carbon monoxide levels, and 7) the prevalence of lead-based paint or asbestos-containing materials (Policy 5.1.3., Washington State Department of Commerce, 2018).

The discussion of home deferrals came up often in interviews (Figures 4 and 5). Ryan Berendsen of Rural Resources Community Action in Colville mentioned the challenges associated with deferred housing as they relate to low-income housing, weatherization assistance, and energy efficiency upgrades:

"We have to focus more on making sure that we do some health and safety stuff also. We run into a lot of things when you go into a 1970s single-wide mobile home and you walk up to the door and you can see an inch-and-a-half gap in the door, and then you go inside, and half of the floors are rotted out and the bathtub is cracked and leaking through to the belly." — Ryan Berendsen

While identifying homes that cannot withstand weatherization repairs is critical to ensuring energy efficiency, without substantive assistance or preliminary funds necessary to make repairs, it's unlikely that a low-income homeowner will acquire the funds necessary to meet eligibility standards.

In addition to the inequities that deferrals cause, there are also socioeconomic trends that persist. Studies on national deferrals found rates to be highest among households with elderly persons, children, and persons with disabilities (43%, 36%, and 36%, respectively) (Tonn et al., 2015). Understanding the vulnerabilities associated with poverty, elderly and adolescent persons, and individuals living with disabilities is critical because most deferred homes are related to health and safety repairs, exposing individuals to ongoing risk.

Approximately 20% of the Washington State population (more than 1.5 million individuals) lives at or below the income qualification thresholds for WAP's eligibility requirements (see Figure 11). But the Washington State Department of Commerce's WAP 2020 plan for the number of homes to be weatherized was set at 2,953, significantly falling short of the number of homes that are eligible and in need of energy efficiency retrofits (Washington State Department of Commerce, 2020b). These gaps are most prevalent in rural and Tribal communities, where the median proportion of income-eligible households is 28%, as compared to 17% of urban communities (United States Census Bureau, 2019). John Baker, Housing Construction Leader for the Okanogan County Community Action Council, confirmed these challenges anecdotally:

"We've mainly been going out, and we do audits, and I will say that there's definitely a 50% deferral rate, if not more, like, sometimes [it] is upwards of 70%." — John Baker

Before

After

Home retrofit by Okanogan County Community Action Council/John Baker
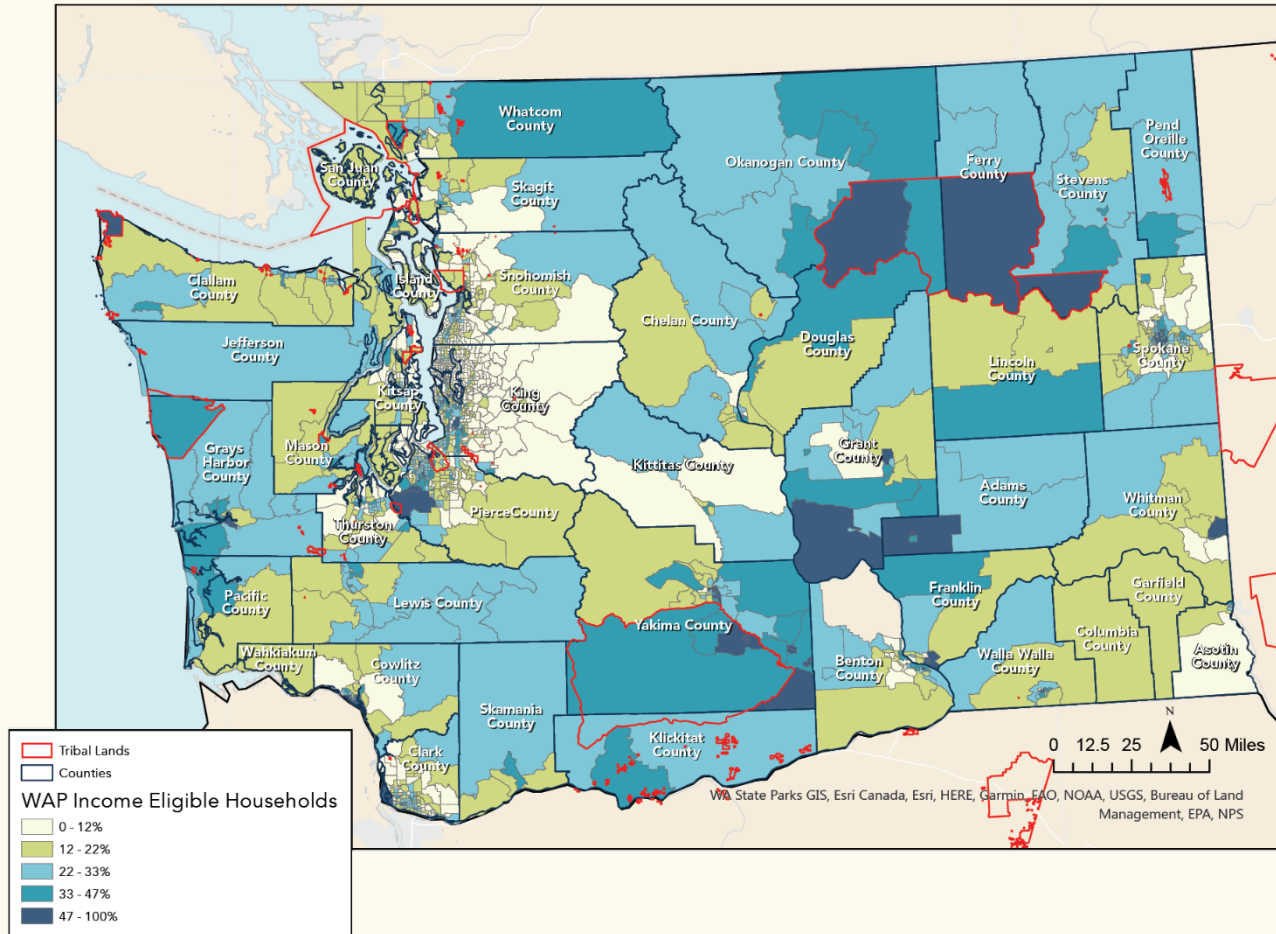
Figure 11. Map showing proportion of income-eligible households for the Low-Income Weatherization Assistance Program using federal poverty level (eligibility is 200% of federal poverty level [FPL] or 60% of state median income [SMI], whichever is higher).

3.3.2 Regulatory Strengths

3.3.2.1 Multi-Agency Collaboration and Funding Assistance

Despite the challenges associated with regulatory standards, interviewees suggested that multi-agency collaboration afforded the flexibility and resources necessary to ensure costs were covered for projects (Figures 4 and 6). Many interviewees used several forms of grants and funding sources to reach their goals, something they viewed as necessary to operate within the patchwork of funding sources.

Erin McTigue spoke to the value of a multi-agency collaboration at the EPA, in which Tribal communities, government, and non-government organizations across the Pacific Northwest work collaboratively to provide education, outreach, and community-based research toward a shared goal of community health and well-being. In addition to the value of shared vision, McTigue

suggested that collaboration provides a crucial opportunity for sharing and really understanding funding opportunities:

> "One of the main things that we've seen come out of [the Tribal Indoor Environments Team] is a better understanding of how each funding agency works and specifically how each resource can be used. When we learned to speak another agency's language, we often found that our respective funds could be used more broadly than we understood previously. For example, some agencies speak to rehab and construction, while others speak to environmental remediation, and the work itself may be the same. We hope this helps to increase access to and use of funds that were previously ruled out." — Erin McTigue

Along with sharing funding opportunities, many interviewees suggested that programs providing application assistance for grant opportunities was a significant strength. Several interviewees mentioned GRID Alternatives, a nonprofit organization that works to provide affordable renewable energy, transportation, and jobs in disadvantaged communities. The nonprofit provides technical support and assistance for predominantly community-led projects. Stephanie Bostwick suggested that Washington State could create a similar program to support rural and Tribal communities:

> "It seems like [GRID Alternatives is] a really good framework that if the state government wanted to build that within their own jurisdiction or build an agency that also did something similar . . . so more Tribes are able to access the funding and get solar projects done in time and swiftly." — Stephanie Bostwick

3.3.2.2 Pilot Programs

When discussing strengths associated with current regulations, Ryan Berendsen spoke to the value of flexible funds for deferred housing where a $76,000 pilot program resulted in five to six remediated homes. Increases in health and safety repair funds have been implemented across the United States and may be well positioned under President Biden's American Rescue Plan Act. For example, the Renew Detroit program was able to triple its home repair budget, from $6 million to $17 million (City of Detroit, 2021).

Spark Northwest's partnership with a farming cooperative in western Washington is another program that provided renewable energy and also advanced members' broader goals of being a leader in sustainable agriculture practices. Andrea Axel described this strength:

> "An example we're proud of is Community-2-Community, which is a cooperative, worker-owned farm in Whatcom County. They designed a clean energy plan to further their goals of energy independence and then we helped them secure funding to install a solar project on the farm. That installation will offer energy savings and also establish the farm as a leader in environmental stewardship, in keeping with their values." — Andrea Axel

3.3.3 Regulatory Desires

3.3.3.1 Additional Funds and Funding Flexibility

The most common regulatory desire across interviewees who live in different parts of Washington and serve in different organizational capacities is the need for additional funds and funding flexibility (Figures 4 and 7). Increasing funding and flexibility is critical for accelerating the clean energy transition in rural and Tribal communities because it allows community organizations to tailor offerings to the needs of their communities.

This sentiment was echoed in nearly all aspects of energy transition and workforce. Rural and Tribal community leaders needed additional flexibility and sustained financial support to implement the changes they envisioned for their communities. Additional flexibility would also allow agencies to work together to patch their funds and establish shared goals, so that local governments, Tribal governments, and small rural electrical cooperatives have less administrative burden to shoulder.

Kelsey Moldenke, a Senior Planner for the Quinault Indian Nation, examined the importance of creating flexible policies and providing financial support in his work to relocate the town of Taholah due to sea-level rise:

> "Each rural community is different. They have their own histories and economic issues that they may face. So, I think for that reason, too, I wanted to make sure that we can start peeling back the layers and making sure that whatever policy is written in the future is tailored to rural and Tribal communities." — Kelsey Moldenke

Research indicates that small-scale energy generation improves the quality of life of rural residents, but will not meet the economic and social goals of rural residents without involving community members in end-use designs and needs (Baldwin et al., 2015). Providing flexible and accessible funding is also critical for reimagining the energy distribution system for rural and Tribal communities. To develop small-scale energy projects that meet the needs of community members, Jack Newman mentions the importance of making funds more accessible:

> "Washington State has experienced institutionalized challenges with access to funding resources for remote communities to strengthen electric service reliability through microgrid deployment. With previous rounds of grants only available to utilities, and smaller Public Utility Districts and Co-Ops not having capacity to apply, the result is more larger utility-owned installations in urban centers. The Clean Energy Fund Grid Modernization grant program, which has historically only been available to utility companies as applicants on behalf of end users, is a significant driver for energy resilience projects like microgrid systems. . . Clean Energy Fund round 5 is the first tranche of funding that allows Tribal communities to directly apply for Grid Modernization grants, which aim to improve electric service reliability and energy resilience." — Jack Newman

Providing more flexibility for pre-weatherization repairs and health and safety requirements could help many families realize countless non-energy benefits and accelerate the clean energy transition. Washington State University's Vince Schueler mentioned the value of funding flexibility:

> "Weatherization agencies can use more flexible funding, because they do need that, and they can do some good things with it. And actually, without flexibility they are not able to spend the federal money." — Vince Schueler

3.3.3.2 Assessment Measures

There was also interest in increased pre- and post-assessments for weatherization projects, so that workforce and community agency partners might better measure the impacts of projects on the health, well-being, and affordability of their beneficiaries (Figures 4 and 6).

Ryan Berendsen mentioned that measuring the energy burden impacts as well as the non-energy benefits of his team's efforts would be useful to his Community Action Partnership (CAP), because weatherization benefits can be difficult to capture without mixed-method program evaluations. Collecting pre- and post-measures at the household and community level might help CAPs define future goals, make decisions, and advocate for additional pilot funding. He reflected:

> "We follow up with a client [anecdotally] . . . [but] we don't actually look as far as bills going up or down, and that's kind of an interesting part, especially here in rural counties."
> — Ryan Berendsen

3.3.3.3 Organizational Collaboration and Data Availability

In addition to the previously described regulatory desires, many rural and Tribal community interviewees envisioned programs that provided social services and energy benefits to community members in need. Many spoke to the importance of interdisciplinary approaches in the clean energy transition that would tackle environmental, health, economic, and social challenges in collaboration with other organizations (Figures 4 and 7).

For example, despite the fact that Washington State's Wx+H program is the first health and housing initiative in the nation to address respiratory health, there are still challenges that persist, many of which are related to staff capacity and organizational limitations (Schueler, 2018). Jennifer Grove, Managing Director of Energy Programs in Communities at the Washington State Department of Commerce Clean Energy Fund, spoke to this challenge, describing her vision for providing holistic health and housing services with the help of an interdisciplinary team:

> "If I could dream up the dream program for Weatherization Plus Health, it would be a model where we have partnerships extending across the state with trained experts that understand community health and who can assist with behavior and medication management. Our team of building scientists can be activated to holistically address the building and tune the living environment to be healthier and safer."
> — Jennifer Grove

3.3.3.4 Energy Sovereignty

Several interviewees also suggested the significance of energy sovereignty (Figures 4 and 6), which can hold different meanings for different rural and Tribal communities.

For rural communities, energy sovereignty is often seen as the ability to make community-level decisions about the types and scale of renewable energy projects. The concept of self-determination is an important component of rural life and should be acknowledged in project development. This was expressed in an interview with Jack Newman:

> "Community-led projects that prioritize education, engagement, workforce training, and equitable distribution of energy benefits in the communities where they are located are critically important for a just transition to clean energy. We have seen tremendous leadership in tribal communities on this front, especially by pairing project-based learning opportunities with technical training providers, and including tribal members in the project planning, development, operation, and maintenance." — Jack Newman

For Tribal nations, energy sovereignty is an opportunity to cut ties with colonial systems, forge a self-reliant energy system, and harness the economic and environmental benefits of clean energy (Stefanelli et al., 2019). Tribal energy sovereignty movements are being realized across the nation, a sentiment echoed by Reuben Martinez, now Tribal Liaison at Spark Northwest and Tribal Liaison for Renewable Northwest at the time of the interview. He offered his definition of energy sovereignty:

> "Energy sovereignty's meaning is going to change depending on who you talk to, but I've seen a general misconception around the term. Sovereignty is not interchangeable with independence, and these are the words that people tend to conflate together. I like to think of the idea [sovereignty] more as a web rather than a crown, which is what I naturally think of when the term 'sovereignty' comes out. If we think about energy sovereignty more as a web of interconnected relationships, then we have to navigate in order to achieve the goals we set for ourselves." — Reuben Martinez

For Stephanie Bostwick, Tribal energy sovereignty provides an opportunity to decrease energy insecurity and improve energy resilience and quality of life for people living on reservations in Washington:

> "Tribes are sovereign nations. So, energy sovereignty is really important just for the non-reliance on an external entity . . . the other reason that energy sovereignty is really important for Tribes is that when there are power outages, Tribes are often the last people to get their power back. They often face weeklong or two-week-long outages. And you're talking some of the most impoverished people in the country, and they lose access to their food, they lose access to medications, and they don't have heat or anything. Having a microgrid in place, just to handle those emergency situations, is imperative, not just from a sovereignty perspective, but a living perspective." — Stephanie Bostwick

3.3.3.5 Landlord Incentives

The final regulatory desire that interviewees mentioned was additional incentives for property owners, so that renters might also benefit from weatherization and energy efficiency upgrades (Figures 4 and 6). This is a well-documented challenge associated with energy efficiency policies, called the **split incentive**, which describes the fact that property owners do not see the benefit of paying for energy efficiency upgrades, as their tenants pay the utility bill and therefore would receive the benefit of the decreased costs for energy, not the property owner. This creates high energy costs for low-income renters (Bird & Hernández, 2012). Jack Newman mentioned the desire for improved policy to address the split incentive in his interview, describing how low-income renters are likely to shoulder the financial burden of a landlord's decisions:

> "Without policy or program solutions to provide equitable distribution of clean energy benefits, such as Virtual Net Metering, there are barriers in terms of incentivizing a landlord or property owner to allocate energy savings from an energy retrofit or solar PV installation to low-income tenants. While solar installations on low-income multifamily housing reduce operation costs for the housing provider, we have not yet seen a standardized model for helping properties recoup their investment in clean energy while allocating meaningful energy savings to tenants and helping reduce their energy burden." — Jack Newman

3.4 Market Aspects of Decarbonization

3.4.1 Market Challenges

3.4.1.1 Expansive Service Areas and Administrative Capacity

CAPs are deeply rooted in the communities they serve and have a strong desire to provide the weatherization and energy efficiency services that their constituents might benefit from. CAPs support rural counties—at times multiple counties—and must travel long distances to provide energy audits and weatherization services, which causes administrative costs to add up (Figures 4 and 5).

Complicated fund application processes and limitations on using funding for administrative purposes hamper the scale and pace required for weatherization and energy efficiency to meet Washington's decarbonization goals. This creates a serious challenge for CAPs, which are required to allocate 90% of the state and federal funds they receive to local community agencies, leaving inadequate funding for the CAP's administrative costs.

Depending on the utility service area that the county falls in, funds can vary widely across the state for administrative purposes and travel for CAP staff and contractors. There are additional restrictions on the funding for CAPs that limit accommodating these overhead costs entirely. Lael Duncan, Executive Director of the Okanogan County Community Action Council, described the challenges associated with limited administrative capacity and expansive service areas:

> "There isn't an understanding on the part of people in Olympia of what it takes to do the work on a home that may be 50 to 70 miles away from our main office. We work on that home. We go out and do an audit. We go back, we often have multiple meetings with the client. We go to check on the work on a regular basis that the contractors are doing. All of that adds up in terms of our staff time and the very real costs of improvements." — Lael Duncan

3.4.1.2 Workforce Recruitment and Retainment, Equitable Opportunity

In addition to limited administrative capacity, interviewees commonly identified access to workforce as a barrier to residential weatherization improvements (Figures 3 and 4). This trend is common across the United States, as workers opt out of the energy retrofit business to take similar jobs in the construction industry or with electrical/HVAC firms. In a two-year follow-up survey with weatherization staff, 25% of auditors, 27% of crew chiefs, and 40% of crew members had left the

field of low-income weatherization, and only 5% of departed employees remained in the home retrofit field (Tonn et al., 2015).

Washington State has faced the challenge of retaining workforce: one study found that 86% of surveyed energy efficiency employers suggested that employing qualified employees was "difficult" or "very difficult" (Hardcastle, 2020). Smaller agencies in rural communities were more than twice as likely as their urban counterparts to identify the acquisition of workers with the necessary knowledge, skills, and abilities as a workforce challenge (Hardcastle, 2020).

Our interviewees echoed these findings, as individuals spoke to the challenges of hiring and retaining workforce for low-income weatherization agencies. Amanda Rains, a member of the Innovation and Program Development for the Housing Improvement and Preservation Unit at the Washington Department of Commerce, described this challenge:

"I just heard from a utility this week saying 'we can't find electricians to work with our program. What are we going to do?' There's a ton of construction work available right now. So, these construction firms are getting to pick and choose what jobs they're willing to take. Unless they've really bought into the mission of low-income weatherization, helping families that have a relationship with the Community Action Program network, or the CAP agency in their territory, it's really hard to bring in new people." — Amanda Rains

Among the challenges associated with workforce retainment, several interviewees identified inaccessibility of workforce certification as a barrier to rural and Tribal decarbonization. Workforce certification is crucial for low-income weatherization efforts because the U.S. Department of Energy's Quality Work Plan requires specific certification for auditors, inspectors, and contractors. Vince Schueler of the WSU Energy Extension Program explained this challenge:

"Because [weatherization] involves federal money, there's a 400-page manual, all sorts of stuff that you have to do [to obtain workforce certification], which makes it really challenging to scale up low-income weatherization."
— Vince Schueler

Schueler also drew attention to the Washington State Department of Commerce's 526-page 2021 Weatherization Manual and 328-page Standard Work Specification document (National Renewable Energy Laboratory, 2022; Washington State Department of Commerce, 2021). He noted that the challenge is not just obtaining formal certification, which is extensive and time-consuming to maintain, but also the additional detailed procedures, knowledge, and documentation that is required of contractors who install measures and of agencies that perform the intake processes, scope projects, operate crews, or oversee contractor hiring and quality assurance.

Inaccessibility of weatherization certification classes for local community members further complicates this challenge. Roni Holder-Diefenbach described the inaccessibility of certification programs in Okanogan, and the distance that rural community members often must travel to gain the necessary certifications:

> "There was a two-year HVAC certification program that the local community college was teaching at our local campus, but they couldn't find an instructor the second year. So, all of the students that were in that program—and there [were] like 22—had to drive to Wenatchee every day; the travel time to get to class was almost two hours one way. We lost half of them because they did not have reliable transportation, or they could not afford the additional expense to travel. It has been a huge challenge. If these students had completed the program, they would have been offered wage jobs that could have supported their families." — Roni Holder-Diefenbach

Ultimately, the complex requirements and inaccessibility of certifications for workers place weatherization agencies in a precarious position, constantly worried about staffing shortages. Ryan Berendsen noted this struggle as it relates to his CAP in Colville:

> "We have so few contractors around here, and then the contractors that we have, they have a lot of work. But all the administrative hoops and all the things that we make them do, it makes it a lot less attractive. I've got a few HVAC contractors, but if one of [the workers] decides they're done, I don't know what I'm going to do." — Ryan Berendsen

Interviewees also identified limited workforce opportunities for undocumented individuals as a theme. Failure to provide legal documentation excludes families from receiving LIHEAP/WAP assistance and impedes individuals from receiving the workforce certification necessary for well-paying job opportunities in their communities. Thus, insistence on formal requirements in communities with high proportions of undocumented individuals has the potential to exclude entire populations from economic opportunity and undermine the development of a local and reliable workforce for weatherization updates.

3.4.2 Market Strengths

3.4.2.1 Wraparound Worker Services

Interviewees described the importance of providing educational opportunity, economic support, and organizational infrastructure to bolster local employment and youth development (Figures 4 and 6). Roni Holder spoke to the value of investing in local workforce development, especially young people, in her community, suggesting that the investments made in local careers offer long-term benefits:

"As a private business owner (electrical/HVAC contractor), we've utilized the trainee/apprenticeship program, hired our local adults and youth, and several have worked their way through the program and now they're certified journeymen electricians and HVAC techs." — Roni Holder-Diefenbach

This sentiment was echoed by Stephanie Bostwick, who described the value of educational opportunity and youth development for Tribal communities in Washington, where students were encouraged to explore job opportunities that would benefit their own communities:

"Our college is partnering with the Lummi Indian Business Council to ensure our students and community members have the opportunity to participate in the solar installations going up in the community. The college has a mock roof where individuals can train and learn about the process prior to climbing up on a real structure to install panels."
— Stephanie Bostwick

3.4.3 Market Desires

3.4.3.1 Accessible Clean Energy Workforce

Many interviewees also highlighted an interest in promoting more equitable workforce development opportunities, in which women-owned and people-of-color-owned businesses should be the first to benefit (Figures 4 and 7). Steve Gelb, Seattle Director of Emerald Cities Collaborative, highlighted this desire:

> "We do see the electrification part of [decarbonization] as requiring a lot of technical skills and contracting, and so on. And we really want that to be accessible to local people-of-color-owned businesses and women-owned businesses."
> — Steve Gelb

In addition to local, people-of-color-, and women-owned employment opportunities, Stina Janssen of Firelands/Workers United identified the need to make opportunities accessible to immigrants, who often have relevant skill sets but who face barriers to employment. She suggested workforce cooperatives or subcontractor positions for local inclusion opportunities:

> "We want more public sector union jobs in this field where workers have collective bargaining power, benefits, and a living wage—jobs you can raise a family on. And ideally, people are repairing and weatherizing the homes in their own communities. But until we get immigration reform, these may not be available to immigrants without papers. So in the interim, we want to explore other ideas: worker-owned cooperatives as subcontractors, for instance."
> — Stina Janssen

3.4.3.2 Tribal–Tribal Information-Sharing Networks

In addition to investing in and training a local clean energy workforce, several Tribal community leaders described a desire for information-sharing networks between Tribal community members in the Pacific Northwest (Figures 4 and 7).

> "I hope at some point that I'll know the right questions to ask for my Tribe, so that I can help build internal capacity not just for us, but for all Tribes. I know there is a hunger to know more about these topics, but it can be hard for people to find the time to invest in these projects. Part of the internal capacity-building I want to help with is something that can be self-perpetuating, or self-sustaining, and focusing [on] younger folk so that these ideas and concepts are introduced early." — Reuben Martinez

3.4.3.3 Increased Administrative Capacity

Many rural and Tribal community leaders mentioned the desire to increase administrative capacity, either through sustained funding, organizational collaboration, or additional employment to meet their goals (Figures 4 and 7). For example, Vince Schueler mentioned the importance of organizational infrastructure for scalable alternative weatherization models:

> "The reality is that the organizational infrastructure to do [actionable energy efficiency programs] is not present in a lot of places. If you're actually trying to go and do these things, you have to think about building organizational infrastructure, and sustainable organizational infrastructure to actually deliver these alternative models."
> — Vince Schueler

Similarly, Nick Cusick, the Climate Resiliency Program Manager for Pierce Conservation District, mentioned the potential for increased diversity that might occur when increasing administrative capacity, specifically as it related to farmer outreach initiatives:

> "USDA offers another outreach grant program . . . specifically for socially disadvantaged farmers and ranchers. . . . [S]omething that we just have not done well over the history of the program is prioritizing the farmers that really need and could benefit most from grant assistance. It's been very much a first-come, first-served basis and so 95% of the people that we help are white/Caucasian. What another outreach partner would allow us to do is connect with Latino farmers and others [historically marginalized farmers]." — Nick Cusick

Solar installation on Lummi school/Spark Northwest

4 Conclusion

Fundamental inequities exist among low-income rural and Tribal communities—namely housing, energy burden, and historical infrastructural investment—and those **inequities must be addressed before, or in conjunction with, building decarbonization solutions.** Further, **rural and Tribal community members must co-create the solutions for housing, infrastructure, and energy as Washington State attempts to meet its ambitious decarbonization goals.**

When asked to envision equitable decarbonization, interviewees desired an energy future that emphasized affordable and safe housing, leadership development, community involvement, an accessible workforce, Tribal–Tribal learning communities, energy sovereignty, and flexible funds.

Results from our interviews suggest many strengths that could be leveraged to meet the desires of rural and Tribal communities. Community-led design, youth development, and inter-organizational collaboration were seen as valuable to providing decarbonization services to rural and Tribal communities. Concomitantly, challenges that must be addressed include quality of housing and infrastructure, legacy distrust, workforce recruitment, and funding restrictions.

Community-Defined Decarbonization: Reflecting Rural and Tribal Desires for an Equitable Clean Energy Transition was intended to understand the challenges, strengths, and desires associated with a more equitable climate and energy future for the state of Washington. To continue working toward these goals, two actions should be taken.

1. Provide support to rural and Tribal communities to ensure they are benefitting from current and future federal and state funding opportunities. The Washington 2021 State Energy Strategy explicitly calls out the need to address rural and Tribal community inequities and is committed to providing direct funding to communities impacted by pollution or change in climate. At the same time, the Biden Administration has prioritized funding to enable an equitable clean energy transition.

2. Invest in opportunities for community involvement by emphasizing community-engaged planning, youth leadership development, and Tribal consultation with rural and Tribal communities.

Defining, implementing, and improving decarbonization strategies for rural and Tribal communities will be an iterative, collaborative, and humbling experience, and overlooking those who have been historically disinvested can no longer be an option.

5 Supplementary Information

5.1 Interviewee List

Andrea Axel is the Executive Director of [Spark Northwest](#), a nonprofit in Seattle devoted to community partnership, renewable energy projects, and policy reform in the Pacific Northwest.

John Baker is the Housing Construction Leader for [Okanogan County Community Action Council](#) (OCCAC), a CAP in Okanogan. OCCAC is a community-based nonprofit, focused on empowering and educating community members to alleviate poverty.

Eleanor Bastion is a Senior Program Manager at Amazon. At the time of her interview, she was the Climate and Clean Energy Policy Manager for [Washington Environmental Council](#), a nonprofit organization in Seattle dedicated to protecting, restoring, and sustaining Washington's environment for all.

Ryan Berendsen is the Director of Affordable Housing for [Rural Resources Community Action](#), a CAP in Colville serving Stevens, Lincoln, Ferry, Whitman, and Pend Oreille Counties and focused on providing short- and long-term solutions to rural community members in northeastern Washington.

Stephanie Bostwick is Department Chair and Engineering Instructor at [Northwest Indian College](#), located on the Lummi Reservation. Bostwick founded the engineering program, emphasizing renewable energy and Tribal energy sovereignty.

Nick Cusick is the Climate Resiliency Program Manager for [Pierce County Conservation District](#) in Puyallup. Pierce County Conservation District collaborates with community members to create a just food system, improve water quality, promote sustainable agriculture, and recover wildlife habitat.

Mia Devine is a Project Manager at [Spark Northwest](#).

Lael Duncan is the Executive Director of [OCCAC](#).

Steve Gelb is the Northwest Regional Director for [Emerald Cities Collaborative](#) (ECC) in Seattle. ECC is a nonprofit working to develop clean energy, green infrastructure, and other sustainable development projects that benefit low-income communities and communities of color.

Dan Glenn is a Principal of [7 Directions Architects](#), an architectural firm in Seattle that uses community participatory design processes to design culturally and climate responsive architecture projects.

Mikhaila Gonzales is a Project Manager at [Spark Northwest](#).

Jennifer Grove is the Managing Director of Energy Programs in Communities at the Washington State [Department of Commerce Clean Energy Fund](#) in Olympia. The Washington State Department of Commerce is a state agency that collaborates with businesses, local governments, Tribes, and community-based organizations to promote sustainable economic growth.

Roni Holder-Diefenbach is the Executive Director of the [Economic Alliance](#) and Chair of the [North Central Washington Workforce Development Council](#) in Okanogan. The Economic Alliance is a nonprofit that works to facilitate relationships between private, government, and Tribal entities to promote economic growth in Okanogan County. The North Central Washington Workforce Development Council is an education and training program in Wenatchee.

Linda Irvine was a Program Director at [Spark Northwest](#) at the time of the project and has since retired.

Stina Janssen is the Executive Director of [Firelands](#) Workers United/Trabajadores Unidos, an organization of working families organizing for good union jobs in rural Washington State's timber country.

Cindy Jayne is a Chair on the [Port Townsend-Jefferson County Climate Action Committee](#), a board of community members responsible for developing the Jefferson County Climate Action Plan.

Rachel Koller is the Managing Director at [Shift Zero](#), a network of organizations in Seattle dedicated to energy efficiency and climate action to increase the number of zero-carbon buildings in Washington State.

Reuben Martinez is a Tribal Liaison at Spark Northwest. At the time of his interview, Reuben was a Tribal Liaison for [Renewable Northwest](#), an advocacy organization in Portland, Oregon. Renewable Northwest is dedicated to decarbonizing the Northwest and accelerating the transition to renewable energy.

Erin McTigue is a Smoke Management Coordinator and Indoor Air Specialist at the U.S. [Environmental Protection Agency Region 10](#) in Seattle. The EPA is a federal agency that works to protect the environment and promote environmental health and community well-being.

Kelsey Moldenke is the Indigenous Planning Lead at Dillon Consulting Limited. At the time of his interview, Kelsey was a Senior Planner for the [Quinault Indian Nation](#) on the Olympic Peninsula.

Jack Newman is the Director of Clean Energy Solutions at [Säzän Environmental Services](#) in Seattle. Säzän is an engineering and consulting firm dedicated to optimizing a resilient future.

Amanda Rains is the Senior Program and Evaluation Supervisor at the Washington State [Department of Commerce Weatherization Programs](#) in Olympia.

Ernie Rasmussen is the Digital Equity Manager at the Washington State Department of Commerce. At the time of his interview, Ernie was the Tribal Liaison for the Department of Commerce in Okanogan.

Vince Schueler is a Senior Energy Program Analyst for the [Washington State University Energy Program](#) in Olympia. The WSU Energy Program operates as a consulting firm, providing technical assistance to small businesses, utilities, local and state governments, federal agencies, and more.

5.2 Team Positionality Statements

Aditi Bansal (she/they) grew up in a small city in postcolonial Northern India as part of a middle-class family. They were raised by two parents dedicated to their children's education and who instilled strong notions of justice in them. In their early teenage years, they moved from a small city in India to a suburb in Ohio, and then a bigger "metropolitan" city in Ohio. Through these rapid, transformative transitions, they faced economic precarity and racial-, class-, and gender-based discrimination, which informed their vision for a just world. While they never lived in a rural community, they are familiar with the rural-urban divide through their familial ties to specific rural communities in India. As for rural contexts in the U.S., Aditi is grateful for all the interview participants, who were incredibly generous with their time and willingness to share their concerns, challenges, and perspectives on decarbonization on behalf of their respective communities.

Mariah Caballero (she/her) grew up in rural eastern Washington as a third-generation member of a tight-knit agricultural community. As the daughter of two elementary educators, her studies were supported and greatly influenced by her parents, one of whom is proudly Mexican American and one of whom is a cornerstone of her school district. Mariah identifies as a biracial female, and her research interests have been largely shaped by the community she grew up in. She is currently a doctoral student at Vanderbilt University in the Community Research and Action program. Mariah has experience in qualitative and quantitative environmental justice research, equitable energy and water systems, and community theory. She contributed to the theoretical framing, interview analyses, quantitative analyses, and drafting of the report. Despite having spent the majority of her life in rural Washington, she understands that her lived experiences may be different from others in similar communities, which may have influenced the interpretation of these results. She is grateful to the interviewees for their feedback throughout the process.

Eileen V. Quigley (she/her) grew up in New York City and its environs, the product of an Irish Catholic family. Eileen identifies as a white female in her 60s, whose career has spanned several years as a journalist, editor, and manager of national and regional nonprofit organizations dedicated to progressive causes and independent media. Eileen moved from New York to Seattle in 1988 to edit a quarterly journal on Pacific Northwest economics,

politics, and culture. Since 2009, she has worked on projects that examine the social, economic, and environmental consequences of unmitigated climate change. She ran a program that worked with small and medium-sized Northwest communities to develop strategies to reduce carbon emissions, where she learned the critical importance of community-driven decarbonization. She started the Clean Energy Transition Institute in 2018 to provide analytics and research for accelerating an equitable clean energy transition in the Northwest.

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