Priority Climate Action Plan

Greater Salt Lake Area Clean Energy and Air Roadmap (SL-CLEAR)

March 2024

ACKNOWLEDGEMENTS

This Priority Climate Action Plan (PCAP) was developed as a collaborative effort with contributions and input from multiple organizations and stakeholders. The project team thanks community members, local governments, and non-profit partners throughout the Salt Lake City Metropolitan Statistical Area (SLC MSA) that provided feedback and guided development of the Greater Salt Lake Area Clean Energy and Air Roadmap (SL-CLEAR).

The following organizations contributed report drafting and design along with technical analysis during development of the PCAP.

The Salt Lake City Sustainability Department ("SLCgreen") leads award-winning environmental programs that help the community conserve resources, reduce pollution, slow climate change and ensure a healthy, sustainable future for Salt Lake City. This department oversaw SLC MSA plan development efforts funded by EPA Climate Pollution Reduction Grants (CPRG), including creation of the PCAP, and coordinated engagement with local governments and other stakeholders throughout plan development. SLCgreen contracted with University Neighborhood Partners (UNP) to convene and lead an Environmental Justice Committee to inform equity-related recommendations.

Collaborative Climate LLC provides consulting services to public, private, and non-profit clients to advance durable solutions to climate change. This includes analysis and strategy for organizational and community-wide planning, plus tailored guidance on clean energy topics ranging from efficiency to renewable energy to electrification. Collaborative Climate led report development, content drafting, and certain stakeholder engagement for the PCAP in coordination with SLCgreen and ICLEI.

ICLEI is the first and largest global network of local governments devoted to solving the world's most intractable sustainability challenges. ICLEI provides standards, tools, and programs that credibly, transparently, and robustly reduce greenhouse gas emissions, improve lives and livelihoods, and protect natural resources in the communities we serve. ICLEI led greenhouse gas (GHG) inventory modelling along with quantification of GHG reduction measures for the SL-CLEAR PCAP.

DISCLAIMER

This project has been funded wholly or in part by the United States Environmental Protection Agency (EPA) under assistance agreement number 00I01400 to Salt Lake City Corporation. The contents of this document do not necessarily reflect the views and policies of the EPA, nor does the EPA endorse trade names or recommend the use of commercial products mentioned in this document.

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1.0 INTRODUCTION

The Salt Lake City metro area was provided a historic opportunity to create a regional climate plan and pursue project implementation funding through the Climate Pollution Reduction Grants (CPRG) program led by the U.S. Environmental Protection Agency (EPA). This regional effort, titled the Greater Salt Lake Clean Energy and Air Roadmap (SL-CLEAR), is led by the Salt Lake City Sustainability Department with input and support from local governments across Salt Lake County and Tooele County along with a diverse set of stakeholders across multiple sectors in the region.

SL-CLEAR is a multi-part, multi-year effort with its first major milestone being the publication of a Priority Climate Action Plan (PCAP) to highlight potential measures that reduce greenhouse gas (GHG) emissions while often cutting local air pollution and enhancing energy affordability for households, business, and other organizations. The team will build from PCAP development to encourage grant applications for CPRG Implementation Grants funding while also harnessing momentum to inform a more Comprehensive Climate Action Plan (CCAP) that identifies regional solutions to reduce GHG emissions and improve local air quality.

"SL-CLEAR is the first regional opportunity to holistically focus on climate solutions and deliver stakeholder-informed plans with ambitious goals for the SLC metro area."

This PCAP includes numerous elements foundational to climate planning such as calculation of a regional GHG footprint, identification of implementation measures to mitigate GHG emissions, evaluate implications for Low-Income and Disadvantaged Communities (LIDACs), review authority to implement solutions, and more. The PCAP should be viewed as a starting point for sustained collaboration across the Salt Lake City metro area on climate and clean air solutions that move our community forward and demonstrate leadership and innovation that can be replicated across the state and beyond.

1.1 Climate Pollution Reduction Grants Overview

The EPA CPRG program was created to provide climate planning and implementation support to states, local governments, tribes, and territories in the U.S. The program encourages the development of ambitious plans that reduce GHG emissions and other harmful air pollution across all sectors while also advancing equitable outcomes within communities.

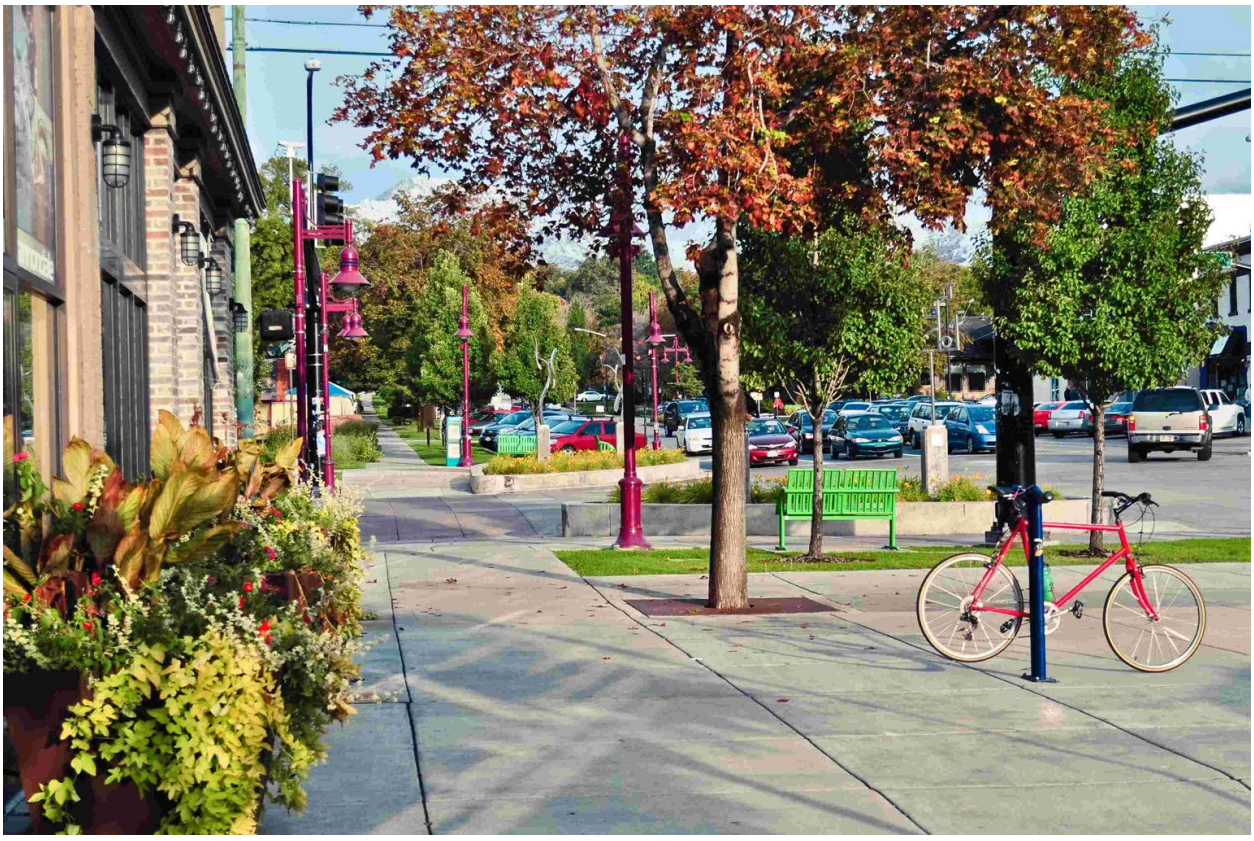

Figure 1 Walkable community space in Salt Lake City along 900 South (Image Source: Salt Lake City Corporation).

Salt Lake City chose to participate in the program and lead development of a metro area climate plan addressing emissions across Salt Lake County and Tooele County. This endeavor is a multi-year effort that is informed by input from local governments and other key stakeholders and experts across the region. The CPRG program includes development of two significant plans, a PCAP and a CCAP, plus completion of a status report. Key elements of the CPRG deliverables are included in Figure 2 below.

Plan Element	Priority Climate Action Plan	Comprehensive Climate Action Plan	Status Report
GHG Inventory	Required	Required	Update Encouraged
GHG Emissions Projections	Not Required	Required	Update Encouraged
GHG Reduction Targets	Not Required	Required	Not Required
Quantified GHG Reduction Measures	Required (priority measures only)	Required (comprehensive)	Status and Updates Required
Benefits Analysis	Encouraged	Required	Required
Low Income/ Disadvantaged Communities Benefits Analysis	Required	Required	Required
Review of Authority to Implement	Required	Required	Update Required
Intersection with Other Funding Availability	Encouraged	Required	Required
Workforce Planning Analysis	Encouraged	Required	Required
Next Steps/Future Budget and Staffing Needs	Not Required	Not Required	Required

Figure 2. Deliverable requirements from the EPA Program Guidance document (2023) for CPRG Planning Grants.

There are four major milestone dates associated with the CPRG process. Three relate to the Planning Grant process and deliverables listed in Figure 2 above and there is also a CPRG Implementation Grants deadline for organizations seeking funding to implement solutions. All major milestone deadlines are summarized here:

- **March 1, 2024**: Priority Climate Action Plan (PCAP) due to EPA
- **April 1, 2024**: Applications for Implementation Grants due to EPA
- **August 4, 2025**: Comprehensive Climate Action Plan (CCAP) due to EPA
    - *This August 2025 deadline is specific to the SL-CLEAR plan based on grant award.*
- **August 3, 2027**: Status report due to EPA
    - *This August 2027 deadline is specific to the SL-CLEAR plan based on grant award.*

The Salt Lake City Sustainability Department will continue working with local governments and other stakeholders across the SLC MSA throughout this process to complete all planning requirements and encourage eligible entities to pursue funding opportunities to implement solutions.

1.2 Priority Climate Action Plan Overview

The SL-CLEAR PCAP includes the following required sections. Additional details on each of these PCAP components are incorporated throughout the plan in subsections for each concept.

- ✓ **GHG Inventory**: A simplified GHG inventory for the SLC MSA, including Salt Lake County and Tooele County, was developed for priority sectors identified through analysis and engagement efforts.

- ✓ **GHG Reduction Measures**: Solutions to reduce GHG emissions for key sectors across the SLC MSA were identified through analysis and outreach efforts that included soliciting input from local governments, key stakeholders and experts, and residents living in Salt Lake County and Tooele County.

- ✓ **LIDAC Benefits Analysis**: Details are provided on how each identified GHG reduction measure may benefit Low-Income and Disadvantaged Communities (LIDACs) within the metro area. Per EPA program guidance, benefits "include but are not limited to: co-pollutant emission reductions (e.g., criteria air pollutants and air toxics), increased climate resilience, improved access to services and amenities, jobs created and workforce development, and decreased energy costs."

- ✓ **Review of Authority to Implement**: Implementation authority for each GHG reduction measure is detailed in the PCAP, including whether state or local governments have existing statutory or regulatory authority to implement the measure or if this authority must be obtained.

Additional information on PCAP requirements is available in the following guidance document published by EPA: CPRG: Formula Grants for Planning, Program Guidance for States, Municipalities, and Air Control Agencies.

1.3 Scope of the Priority Climate Action Plan

The EPA CPRG program provided funding to the most populous metropolitan areas in the United States to complete climate action planning. The SLC MSA was among these and includes all land in Salt Lake County and Tooele County. Additional details and demographic information for the SLC MSA is included in the Salt Lake City MSA Overview (Section 2) of this PCAP.

The PCAP process allowed discretion to each grant recipient to identify "Priority Sectors" for inclusion in this initial plan. The SL-CLEAR process identified five priority sectors, **bolded in the bulleted list below**, for its PCAP based on a variety of factors such as input from stakeholders. These factors included identifying sectors that create a significant percentage of GHG emissions within the metro area based on information from prior local and state climate plans, input from stakeholders, and the availability of technical details necessary to quantify GHG emissions in a timely manner to comply with deadlines of the CPRG process.

List of Sectors – CPRG Planning Process

- **Commercial and Residential Buildings** - *included in the SL-CLEAR PCAP*
- **Electricity Generation and/or Use** - *included in the SL-CLEAR PCAP*
- **Natural and Working Lands –** *included in the SL-CLEAR PCAP*
- **Transportation** - *included in the SL-CLEAR PCAP*
- **Wastewater Treatment –** *included in the SL-CLEAR PCAP*
- Agriculture – *will be included in the forthcoming SL-CLEAR CCAP*
- Industry – *will be included in the forthcoming SL-CLEAR CCAP*
- Waste and Materials Management – *will be included in the forthcoming SL-CLEAR CCAP*

A more comprehensive plan, titled the CCAP, will be published for the SLC MSA by August 2025 and will include all sectors from the above list. The CCAP will build from findings of the PCAP, but expand its analysis, outreach, and GHG reduction measure identification process to include all sectors. More information on the CCAP and anticipated timing and next steps is included in the Next Steps portion of this plan (Section 4.0).

1.4 Approach to Developing the Priority Climate Action Plan

The SL-CLEAR PCAP was developed through an inclusive, iterative process informed by stakeholder input and prior clean air, clean energy, and climate plans developed within the region and statewide in Utah. This section highlights the process utilized for PCAP development, including reference of existing resources that informed PCAP development, stakeholder outreach and engagement activities, and key methodologies and frameworks for technical aspects of the report.

There have been numerous climate and clean air planning and engagement efforts in the SLC MSA and across Utah in recent years. These endeavors revealed key sources of GHG emissions and air pollutants while also summarizing input from expert stakeholders and the general public on priority actions to reduce climate and air pollution and related impacts.

Existing Local Climate Plans and Cross-References

From a local government perspective, Salt Lake City government has prioritized climate actions within its operations and across the broader community for many years. This was supported by various Mayor-City Council joint resolutions and through the annual City budget process.

Below are public documents that provided a baseline of analysis and strategic, supported climate activities undertaken by Salt Lake City prior to PCAP development. To our knowledge, other SLC MSA jurisdictions have not published similar comprehensive climate documents. While the SL-CLEAR PCAP focused on broader regional emissions across the entire SLC MSA, findings from these prior, more localized documents were instructive for GHG inventory purposes and the identification of priority solution measures.

- **Sustainable Salt Lake – Plan 2015** (Published in 2013 by Salt Lake City Corporation)
    - *Salt Lake City first published a community greenhouse gas inventory in 2010. This was followed up by a holistic sustainability and climate action plan reflecting strategies that could be pursued to reduce emissions within city operations and community-wide. Sustainable Salt Lake – Plan 2015 reflected strategies for all key sectors included in the PCAP along with additional strategies and sectors that can be referenced during CCAP development.*

- **Climate Positive 2040** (Published in 2017 by Salt Lake City Corporation)
    - *In 2016, Salt Lake City's Mayor and City Council adopted joint resolutions that established goals to achieve net-100% renewable energy for electricity by 2032 and reduce community GHG emissions 80% by 2040 compared to a 2009 baseline. An interim goal was also established committing to a 50% reduction in community GHG emissions by 2030. SLCgreen published Climate Positive 2040 in 2017 to highlight ongoing efforts Salt Lake City is taking to reduce emissions from buildings, transportation, electricity generation, food systems, and material waste. Climate Positive 2040 cross-referenced numerous reports and adopted plans with more detail on underlying strategies. In 2019, Salt Lake City leaders adopted an updated goal to achieve net-100% renewable energy for electricity by 2030.*

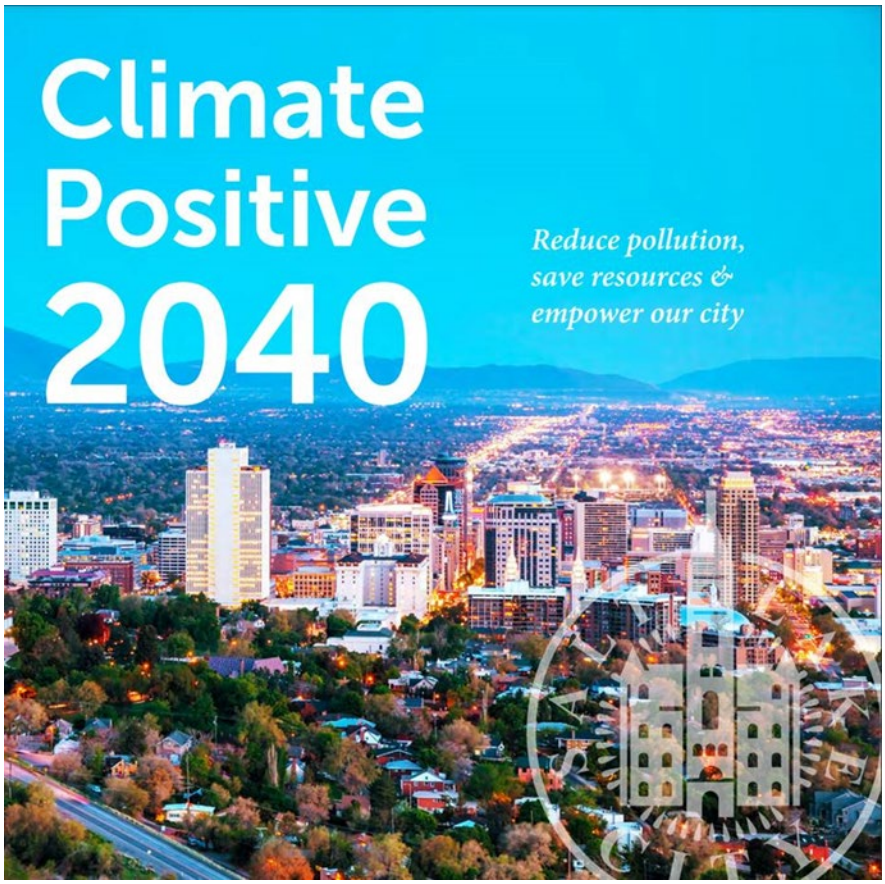

Figure 3. Cover image of the SLC "Climate Positive 2040" Plan (Image Source: Salt Lake City Corporation)

There have also been broader regional and statewide efforts in Utah to develop strategies and reduce emissions. These activities include plans related to energy and transportation systems along with air quality and climate planning efforts. A select list of these plans that provided useful context for the SL-CLEAR PCAP development process is included below.

- **Your Utah, Your Future: Vision for 2050** (Published in 2015 by Envision Utah)
    - *This report was informed by a multi-year engagement process that solicited input from more than 60,000 Utahns on priority issues and a vision for the future. The plan is complemented by a website that allows users to review summarized outcomes across 11 topical areas such as air quality, energy, and transportation and these themes have direct relevance to sectors prioritized in the SL-CLEAR PCAP. Your Utah, Your Future focuses on statewide issues and resident values whereas the SL-CLEAR process honed in on issues and attitudes more specific to the SLC MSA.*

- **2019-2050: Regional Transportation Plan** (Published in 2019 by Wasatch Front Regional Council)
    - *This transportation plan reflects trends and solutions for a multi-county region along the Wasatch Front in northern Utah, including the two counties within the SLC MSA plus additional counties and communities further north. Results of this plan helped inform the SL-CLEAR PCAP and will be useful during the upcoming CCAP development process. This transportation plan is part of a broader Wasatch Choice Vision effort that reflects additional key strategies for housing, parks, public spaces, and city and town centers that are pertinent to climate and clean air planning efforts.*

- **The Utah Roadmap: Positive Solutions on Climate and Air Quality** (Published in 2020 by the Kem C. Gardner Policy Institute)
    - *This roadmap was developed in response to a request from the Utah State Legislature and was the second major statewide climate planning effort in Utah, building off outcomes from a 2007 Blue Ribbon Advisory Council on Climate Change. The roadmap was informed by a 37-person technical advisory committee and included a multi-sector GHG inventory and associated emissions reduction*

strategies to reduce both GHGs and local air pollution. Results of this effort were instructive for development of the SL-CLEAR PCAP, which focused more specifically on the SLC MSA.

Jurisdictional Partners, Stakeholders, and Community Engagement

The above-mentioned planning and outreach efforts provided useful context to serve as a foundation for a metro area-focused PCAP for the SLC MSA. The SL-CLEAR PCAP serves a unique purpose given its geographic focus specifically on Salt Lake County and Tooele County. This metro region has not previously been the focus of a holistic climate planning and partnership effort and CPRG funding for this PCAP catalyzed novel analysis and engagement to identify GHG emissions sources and solutions.

Given the unique geographic focus of SL-CLEAR, a new and targeted stakeholder engagement process was needed to solicit input and represent the priorities of local governments and communities within the SLC MSA. Engagement efforts for the PCAP focused on the below three groups. Processes and participants from each will be re-engaged to inform development of the CCAP in 2024-25.

1. **Jurisdictional Partners and Organizational Stakeholders**: A series of eight separate virtual meetings were hosted for SLC MSA jurisdictional partners and stakeholders from April 2023 – February 2024. These meetings included background details on the EPA CPRG process and solicited input for development of the SL-CLEAR PCAP. Attendees were also encouraged to share ideas and develop partnerships to apply for EPA CPRG Implementation Grants funding for projects within the SLC MSA. Jurisdictional partners included staff from counties, cities, and towns within the SLC MSA. Stakeholders were from non-governmental organizations (NGOs) focused on air quality, climate change, energy, and transportation issues in the region. Additional stakeholders included education sector partners from K-12 and higher education institutions.

2. **Environmental Justice Committee**: An Environmental Justice (EJ) Committee was convened with the support of University Neighborhood Partners (UNP) to engage residents and community-based organizations (CBOs) representing LIDAC communities. The EJ Committee discussed issues and priorities for SL-CLEAR PCAP development

during a series of in-person and virtual meetings and will be further engaged during development of the CCAP. More information on the EJ Committee and associated findings are included in the LIDAC section of this report.

3. **General Public Survey**: An online public survey was utilized to solicit opinions and inform prioritization for the SL-CLEAR PCAP. This survey was available in English and Spanish and collected over 900 total responses from individuals living in the SLC MSA. Survey questions are available as a PDF in this link and complete survey results are available for review in this downloadable Excel file. A selection of survey responses is included in Appendix A.

Technical Approach: GHG Emissions and GHG Reduction Measures

Technical analyses, including development of a GHG inventory and quantification of GHG reduction measures, were performed by ICLEI for the SL-CLEAR PCAP. ICLEI is a non-profit organization specializing in climate planning and analysis for local governments and has extensive experience in related protocols, tools, and planning frameworks to assist with the development of GHG inventories and climate action plans.

Additional details on the approach and methodologies utilized by ICLEI are included in the PCAP Elements portion of this report (Section 3). Extensive outreach and engagement with jurisdictional partners, stakeholders, and community members informed the GHG reduction measures that were included in the SL-CLEAR PCAP.

More rigorous analysis will be conducted to create a comprehensive GHG inventory for the CCAP and additional outreach and solutions development will occur to produce a list of GHG reduction measures for this comprehensive plan. The CCAP will also focus on all sectors, as indicated in Section 1.3, and reflect a broader diversity of climate solutions.

2.0 SALT LAKE CITY MSA OVERVIEW

The SLC MSA is comprised of two counties, Salt Lake County and Tooele County, and is within the broader Salt Lake City-Provo-Ogden Combined Statistical Area (CSA) in northern Utah. The overall CSA is depicted in Figure 4 and the SLC MSA, which is the area of focus for the SL-CLEAR PCAP, is indicated in orange.

There are a total of 25 separate incorporated municipalities within the SLC MSA plus an additional 11 unincorporated places such as townships (source: Wikipedia). The SLC MSA has an estimated population of 1,266,191 residents which equates to roughly 37% of the total population of Utah. Population density within the SLC MSA is four times the average population density statewide and the vast majority of SLC MSA residents are located in Salt Lake County (sources: Census Reporter and Census Reporter).

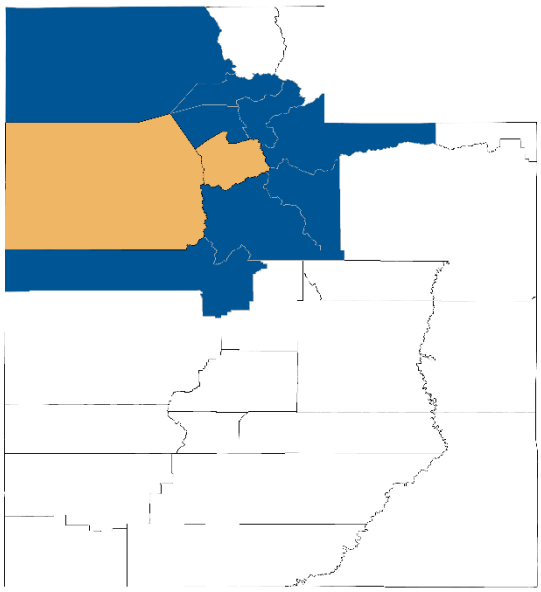

Figure 4. The SLC MSA, highlighted in orange, surrounded by the broader Salt Lake City-Provo-Ogden CSA in Northern Utah. (Source: Utah Geospatial Resource Center)

Local governments within the MSA were encouraged to participate in the SL-CLEAR PCAP development process as described in Section 1.4. An inclusive process will continue as SL-CLEAR efforts pivot to focusing on the more detailed CCAP in 2024-25 and local governments, elected officials, SLC MSA residents, and other stakeholders will be encouraged to provide feedback and inform climate and clean air priorities reflected in this plan.

Table 1 below provides summary statistics and a selection of housing metrics for the SLC MSA. These details informed the potential impact of GHG reduction measures within this PCAP and will be utilized for additional analysis during CCAP development. The housing metrics are particularly important for evaluating residential climate and clean air solutions and details summarized in the Low Income Disadvantaged Communities Benefits Analysis (Section 3.3) informed the prioritization of equity outcomes reflected in the PCAP.

Salt Lake City Metropolitan Statistical Area (SLC MSA) *Overview and Housing Metrics*	
Number of Counties - Salt Lake County and Tooele County	2
Number of Incorporated Cities and Towns	25
Geography	7,684 sq miles
Population	1,266,191
Households	448,172
People per Household	2.8
Housing Units	476,147
Estimated Number of Owner-Occupied Housing Units (68%)	323,780
Estimated Number of Renter Housing Units (32%)	152,367
Housing Type: Single Unit (70%)	333,303
Housing Type: Multi-Unit (28%)	133,321
Housing Type: Mobile Home (2%)	9,523
Median Household Income	$91,891
Estimated Population Below Poverty Line (7.4%)	93,698

Table 1. Salt Lake City Metropolitan Statistical Area (SLC MSA): Overview and Housing Metrics. Sources: Census Reporter (American Community Survey, 2022); Wikipedia.

3.0 PRIORITY CLIMATE ACTION PLAN ELEMENTS

The SL-CLEAR PCAP includes all priority elements required by EPA and details on each are incorporated in the following sections:

- 3.1 Greenhouse Gas Inventory
- 3.2 Greenhouse Gas Reduction Measures
- 3.3 Low-Income Disadvantaged Communities Benefits Analysis
- 3.4 Review of Authority to Implement

More information on the sources, methodologies, and assumptions utilized to inform calculations and estimates for the GHG inventory and GHG reduction measures is included in the appendix.

3.1 Greenhouse Gas Inventory

A simplified GHG inventory for the SLC MSA was developed for the PCAP and this effort was led by ICLEI, a non-profit specializing in local government climate planning and action. The Inventory is based on version 1.2 of the U.S. Community Protocol for Accounting and Reporting GHG Emissions and additional activities plus sources are considered in accordance with the Global Protocol for Community-Scale GHG Emissions Inventories. Due to differences in GHG inventory protocols and assumptions, estimates reflected in this PCAP may differ from prior reports and sources.

The GHG inventory covers all sectors represented by one or more actions in the Greenhouse Gas Reduction Measures section (Section 3.2). Emissions were estimated for 2021 across the entire SLC MSA boundary, including Salt Lake County and Tooele County. The data along with methodologies utilized for the PCAP will be revisited and refined as part of future development of the CCAP.

A baseline year of 2021 was selected for the GHG inventory based on data availability and the following sectors are included:

- Residential Energy

- Commercial Energy
- Industrial Energy
- Transportation & Mobile Sources
- Wastewater Treatment
- Agriculture, Forestry, and Other Land Uses (AFOLU)

The residential, commercial, and industrial energy sectors include both onsite fuel usage plus upstream emissions from electricity generation. Transportation & mobile sources reflect a variety of emissions sources, including on-road transportation, aviation, rail, waterborne, and off-road and mobile sources.

Table 2 provides a summary of SLC MSA GHG emissions modelled for the PCAP and a graphical depiction of emissions by sector is included in Figure 5. Detailed summaries of annual GHG emissions estimates for each sector and subsector along with associated methodologies and assumptions are included in the appendix.

SLC MSA GHG Inventory Summary Table for Selected PCAP Sectors *(2021 Baseline Year)*		
Sector	**Metric Tons CO2e**	**Percent of Total**
Residential Energy	2,847,940	17.4%
Commercial Energy	2,965,134	18.2%
Industrial Energy	1,971,411	12.1%
Transportation & Mobile Sources	8,319,926	50.9%
Wastewater Treatment	12,307	0.1%
Agriculture, Forestry, and Other Land Uses (AFOLU)	217,720	1.3%
TOTAL	**16,334,438**	**100.0%**

Table 2. SLC MSA Greenhouse Gas Inventory. Calculations provided by ICELI.

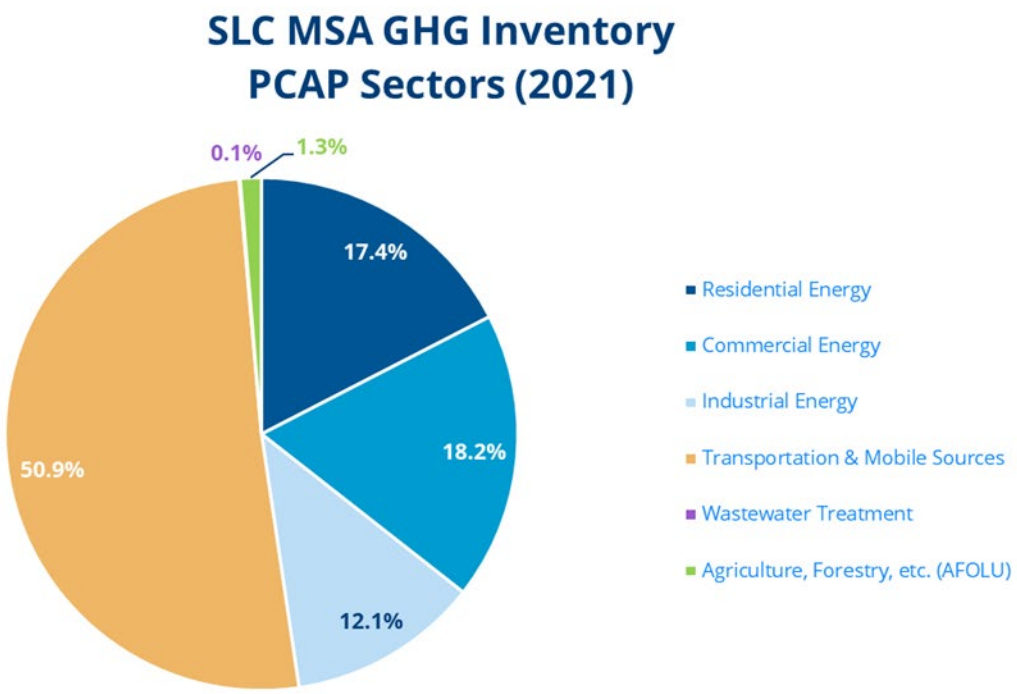

Figure 5. SLC MSA Greenhouse Gas Inventory Summary.

In addition to the overall summaries, a breakdown of GHG emissions is provided for various sectors in Figures 6 - 11. These graphs convey the relative amount of GHG emissions within a sector or subsector and can inform future climate planning and GHG mitigation priorities. The emission percentages are anticipated to change for the CCAP when alternative, and more detailed, data will be utilized to estimate GHG emissions in the SLC MSA.

Energy Sector: GHG Emissions

GHG emissions from the energy sector are included in Figure 6 and reflect emissions associated with electricity use, natural gas, and other onsite fuel for homes, buildings, and other facilities. The breakdown demonstrates the relative share of GHG emissions from the residential, commercial, and industrial built environment and conveys that commercial buildings and facilities produce the most GHG emissions (38.1%), with residential properties coming in a close second (36.6%).

A more detailed breakdown of GHG emissions by energy source (e.g., electricity, natural gas, etc.) is included for each sub-sector in the appendix.

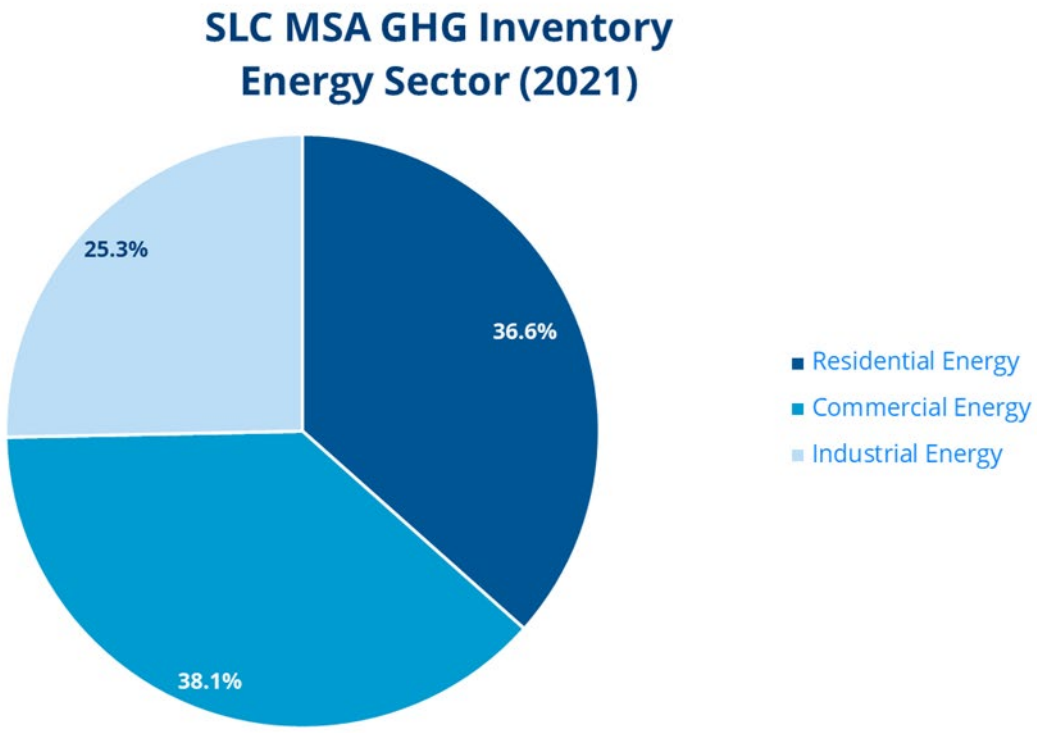

Figure 6. SLC MSA Energy Sector Greenhouse Gas Breakdown by Subsector.

Residential Energy Use

Residential homes and properties in the SLC MSA primarily create GHG emissions due to electricity use and the combustion of natural gas onsite. The combustion of natural gas for use in appliances, typically space heating, water heating, and cooking, is the leading cause of energy-related GHG emissions for residential properties in the SLC MSA with 54.7% of emissions coming from this source. An additional 43.5% of GHG emissions from residential properties are associated with electricity use and power generation facilities while just 1.8% of GHG emissions are due to the combustion of other fuels onsite (e.g., propane).

As the electric grid continues to become cleaner and powered by renewable energy resources, electricity-based emissions will naturally decrease. Additionally, the electrification of space heating, water heating, and other appliances by installing energy-efficient electric heat pumps can further reduce GHGs for residential properties throughout the SLC MSA. Encouraging all-electric new construction along with the adoption of efficient electric appliances in existing residential properties, combined with a cleaner electric grid, has the potential to significantly reduce residential GHGs in the coming years and decades.

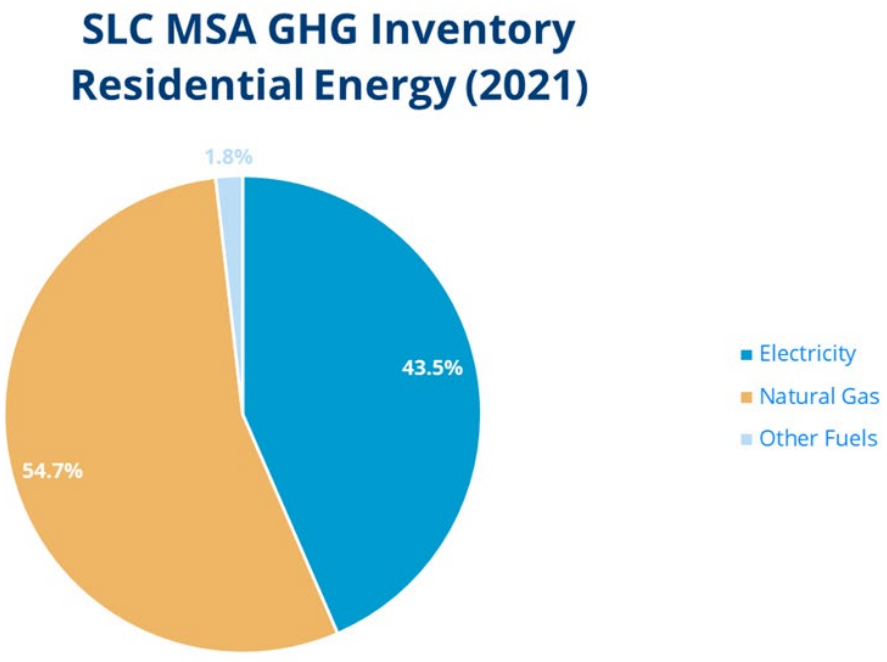

Figure 7. SLC MSA Residential Energy Sector Greenhouse Gas Breakdown by Energy Source and Fuel Type.

Commercial Energy Use

Commercial properties in the SLC MSA primarily create GHG emissions due to electricity use and the combustion of natural gas onsite. The use of electricity is the leading cause of energy-related GHG emissions for commercial properties in the SLC MSA with 55.2% of emissions coming from this activity. An additional 38.4% of GHG emissions from commercial properties are associated with natural gas use and 6.4% of GHG emissions are due to the combustion of other fuels onsite (e.g., oil, propane, etc.).

Commercial properties can reduce GHGs through efficiency upgrades and their emissions footprint will naturally decrease as the electric grid becomes cleaner. Electrifying onsite energy uses such as space heating and water heating offers significant potential to reduce GHGs over time and can curtail the 38.4% of GHG emissions currently associated with natural gas use. Similar to the residential sector, encouraging all-electric new construction along with the adoption of efficient electric appliances in existing commercial properties, combined with a cleaner electric grid, has the potential to significantly reduce GHGs in the coming years and decades.

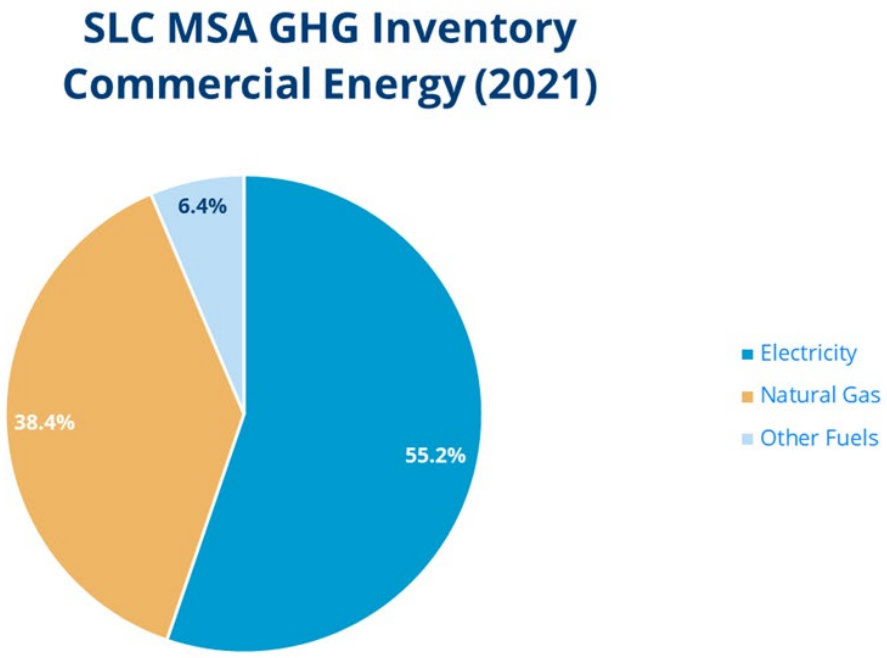

Figure 8. SLC MSA Commercial Energy Sector Greenhouse Gas Breakdown by Energy Source and Fuel Type.

Industrial Energy Use

Industrial properties account for 25.3% of GHG emissions from energy used within the built environment in the SLC MSA, but this energy use is concentrated among a relatively small number of locations. Electricity use (61.6%) is the largest contributor of GHGs from industrial energy use, followed by natural gas combustion (22.3%) and other fuels (16.1%).

Energy efficiency can play a major role in cutting GHG emissions from industrial properties. Emerging technologies and increasingly cost-effective solutions such as electrification and, in some cases, hydrogen, can help further reduce GHGs. Solution possibilities for the industrial sector, as well as other sectors in the PCAP, will be investigated further during the creation of the CCAP for the SLC MSA.

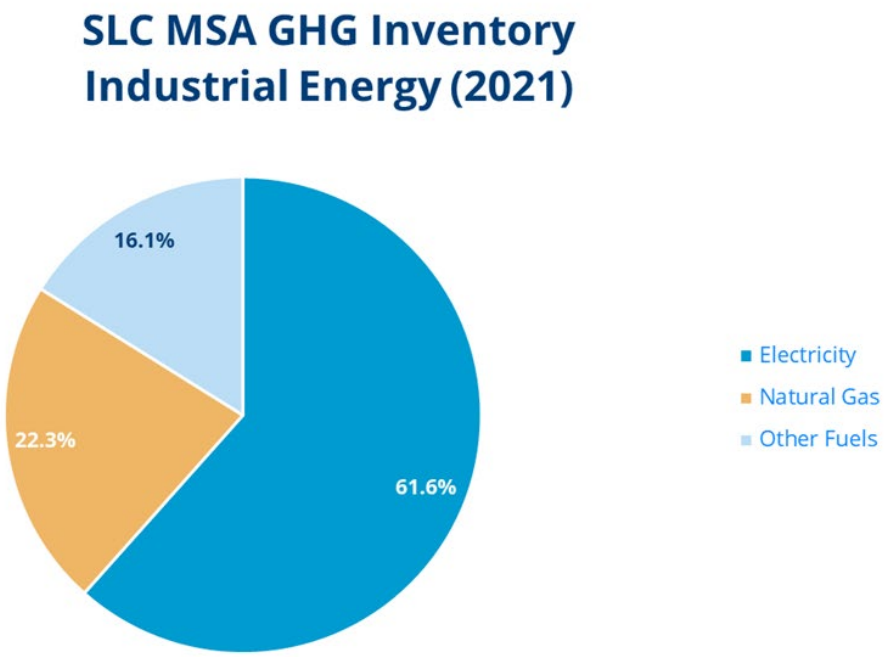

Figure 9. SLC MSA Industrial Energy Sector Greenhouse Gas Breakdown by Energy Source and Fuel Type.

Transportation Sector: GHG Emissions

Transportation and mobile sources produce the largest amount of GHGs within the SLC MSA, accounting for 50.9% of the total emissions footprint in the PCAP. These emissions come from among a handful of activities listed in Figure 10. On-road transportation (65.8%) contributes the most significant amount of GHGs in this sector, followed by aviation (24.5%) which primarily contributes emissions from flight activity at the Salt Lake City International Airport. More granular details on the metrics and methodologies used to calculate GHG emissions for this and all other sectors are included in the appendix.

Similar to the built environment, emissions from transportation and mobile sources can be mitigated through a variety of solutions. The PCAP documented many of these ideas, including active and innovative mobility, transit, and transportation electrification in the Greenhouse Gas Reduction Measures section (Section 3.2). Additional measures and more specific solutions will be evaluated as part of development of the CCAP.

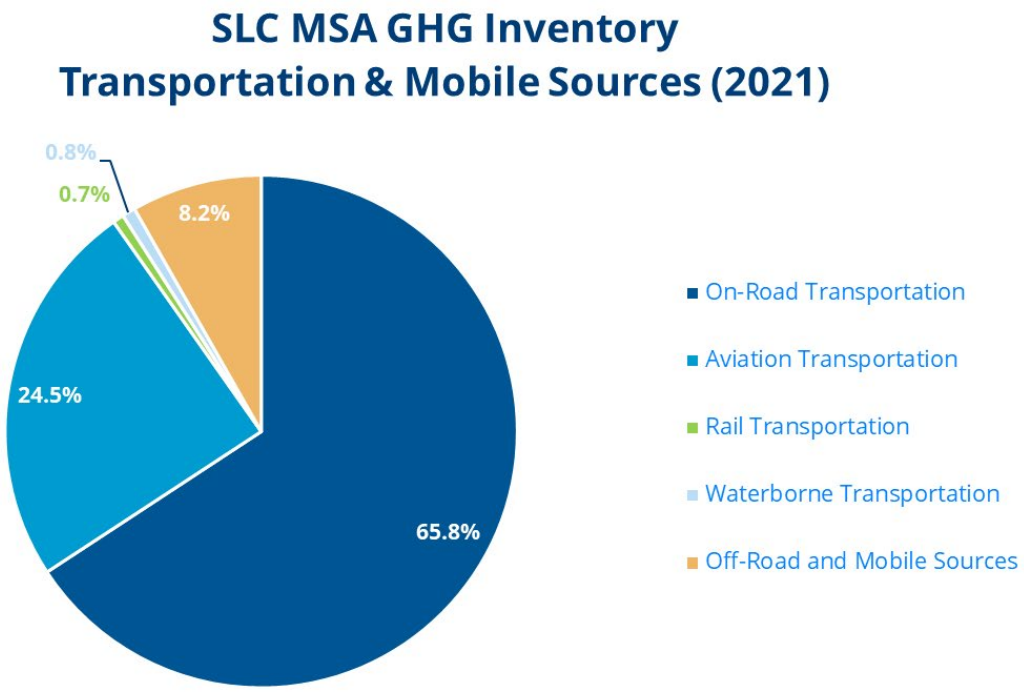

Figure 10. SLC MSA Transportation and Mobile Sources Sector Greenhouse Gas Breakdown by Transportation Type.

On-road transportation represents the largest share of transportation-related GHGs in the SLC MSA and Figure 11 below provides a breakdown of the fuels contributing to these emissions. Combustion of gasoline (70.9%) creates the highest amount of GHG emissions followed by diesel (28.6%). CNG vehicles and electric vehicles (EVs) currently contribute a relatively small amount of GHG emissions. Emissions associated with electricity generation for EVs were factored into the calculations.

A variety of activities can mitigate on-road transportation GHGs and a strong co-benefit of these solutions is the reduction of local air pollutants such as particulate matter and precursors to ozone that harm public health and contribute to chronic illnesses. Active transportation, transit, and other GHG reduction measures that reduce vehicle miles travelled (VMT) are highlighted in Section 3.2 of this report, along with the electrification of on-road transportation that can significantly reduce GHGs over time.

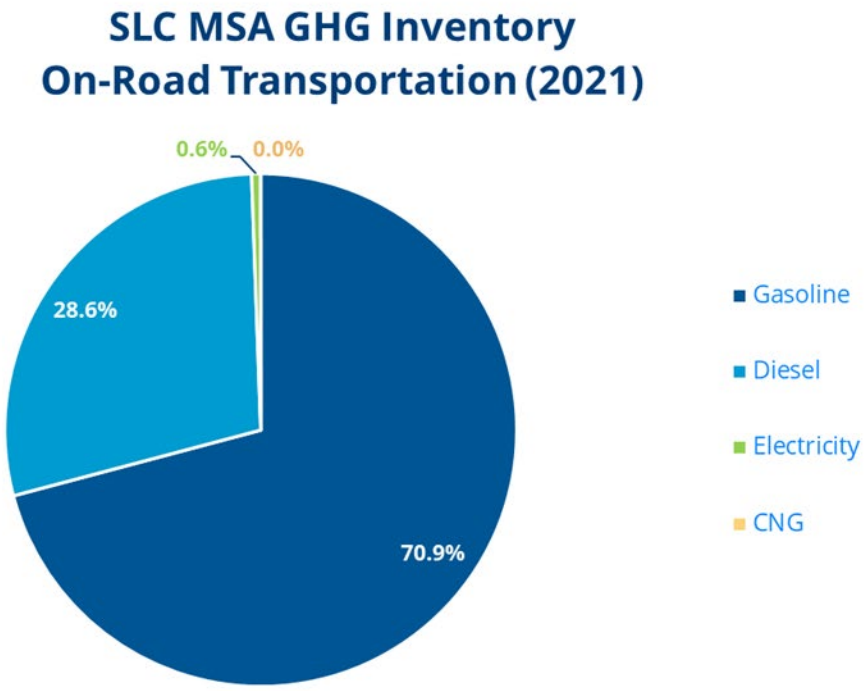

Figure 11. SLC MSA On-Road Transportation Greenhouse Gas Breakdown by Fuel Type.

3.2 Greenhouse Gas Reduction Measures

GHG reduction measures were developed for the SL-CLEAR PCAP using an inclusive outreach approach that solicited input from local governments within the SLC MSA along with other stakeholders such as non-profit and education sector partners. This approach resulted in a wide range of measures across key sectors and created opportunities for eligible entities within the SLC MSA to pursue EPA CPRG Implementation Grant proposals.

Measures were divided into two separate groups, listed below, based on GHG reduction modelling approaches. Details included in the PCAP for both Grouped Measures and Discrete Project Measures were used to inform GHG modelling efforts and ensure project eligibility for EPA CPRG Implementation Grant programming.

- **Grouped Measures**: These measures include broader categories to reduce GHG emissions along with specific measure sub-titles that convey more detailed actions. Emission reductions from grouped measures were modelled at the measure primary title level with consideration of impacts related to supporting measure sub-title actions.
- **Discrete Project Measures**: These measures were modelled for GHG reductions based on more specific project scales, geographic locations, or other attributes provided by partners and stakeholders who submitted solution ideas.

Table 3 below provides a summary of all measures included within the PCAP. Additional details on each measure are included in subsequent sections of the report.

Figure 12. Solar installations on two public facilities in Salt Lake City (Image Source: Salt Lake City Corporation)

SL-CLEAR PCAP: Summary Table of GHG Reduction Measures				
	GHG Reduction Measure Details		Cumulative GHG Reductions *(Metric Tons CO2-equivalent)*	
	Sector(s)	Measure Primary Title	Through 2030	Through 2050
Grouped Measures	Buildings	1. Residential Energy Efficiency	449,602	7,721,462
	Buildings	2. Residential Electrification	136,570	3,930,790
	Buildings	3. Commercial Energy Efficiency	491,940	7,551,082
	Buildings	4. Commercial Building Electrification	107,970	3,107,613
	Electricity	5. Residential Solar PV	701,395	4,908,093
	Electricity	6. Commercial Solar PV	584,364	4,085,955
	Transportation	7. Active and Innovative Mobility and Transit	369,387	4,876,104
	Transportation	8. Electrified Transportation: Lighter Duty Vehicles	2,550,931	37,559,482
	Transportation	9. Electrified Transportation: Heavier Duty Vehicles	991,768	23,382,351
Discrete Project Measures	Buildings	10. Affordable Housing Efficiency and Electrification	8,511	106,568
	Buildings	11. Campus Energy Commissioning	18,692	98,842
	Electricity	12. Community Choice Clean Electricity Program: Utah Renewable Communities (URC)	838,943	3,626,158
	Natural and Working Lands	13. Community Tree Canopy and Urban Forests	2,252	9,758
	Transportation	14. Municipal Vehicle Fleet Electrification	4,551	43,948
	Buildings; Electricity; Wastewater Treatment	15. Biodigester for Combined Heat and Power	35	173
Cumulative GHG Reduction Estimates - All Measures			**7,256,911**	**101,008,379**

Table 3. Summary of PCAP GHG reduction measures and associated emissions reduced.

GROUPED MEASURES

The following sections detail grouped measures to reduce GHG emissions within the SLC MSA. Grouped measures are provided for the buildings, electricity, and transportation sectors and a summarized estimate of GHG emission reductions is provided for each sector. Figures 13 and 14 below reflect estimated cumulative GHGs reduced through 2030 and 2050 for each of the three sectors where grouped measures were included.

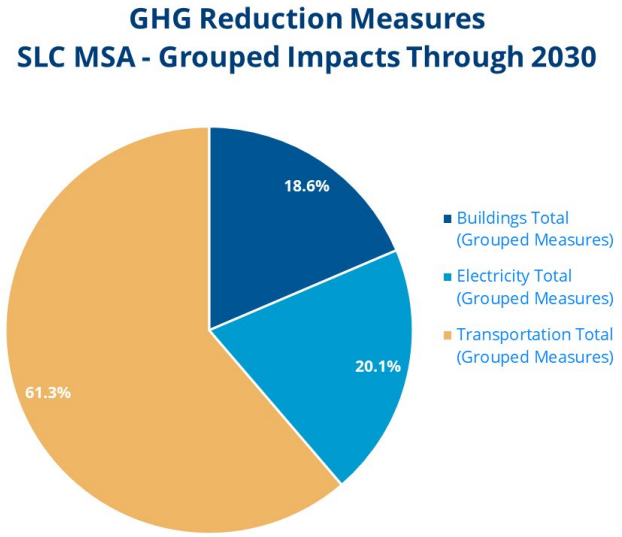

Figure 13. Summary of potential GHG emissions reductions through 2030 for Grouped Measure sectors.

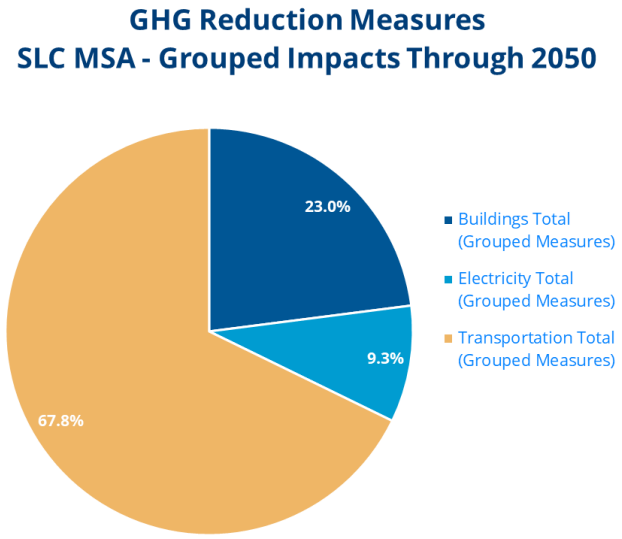

Figure 14. Summary of potential GHG emissions reductions through 2050 for Grouped Measure sectors.

Buildings Sector: Grouped Measures

This section features grouped measures that reduce GHG emissions within the buildings sector, including residential and commercial building types across the SLC MSA. Figure 15 provides a summary of estimated GHG emission reductions through 2030 and 2050 for each of the grouped measure titles that were modelled for the PCAP.

Additional details on each measure, along with specific measure sub-titles and descriptions, are included in this section. More information is available in the appendix, including assumptions and methodologies used to estimate GHG emission reductions.

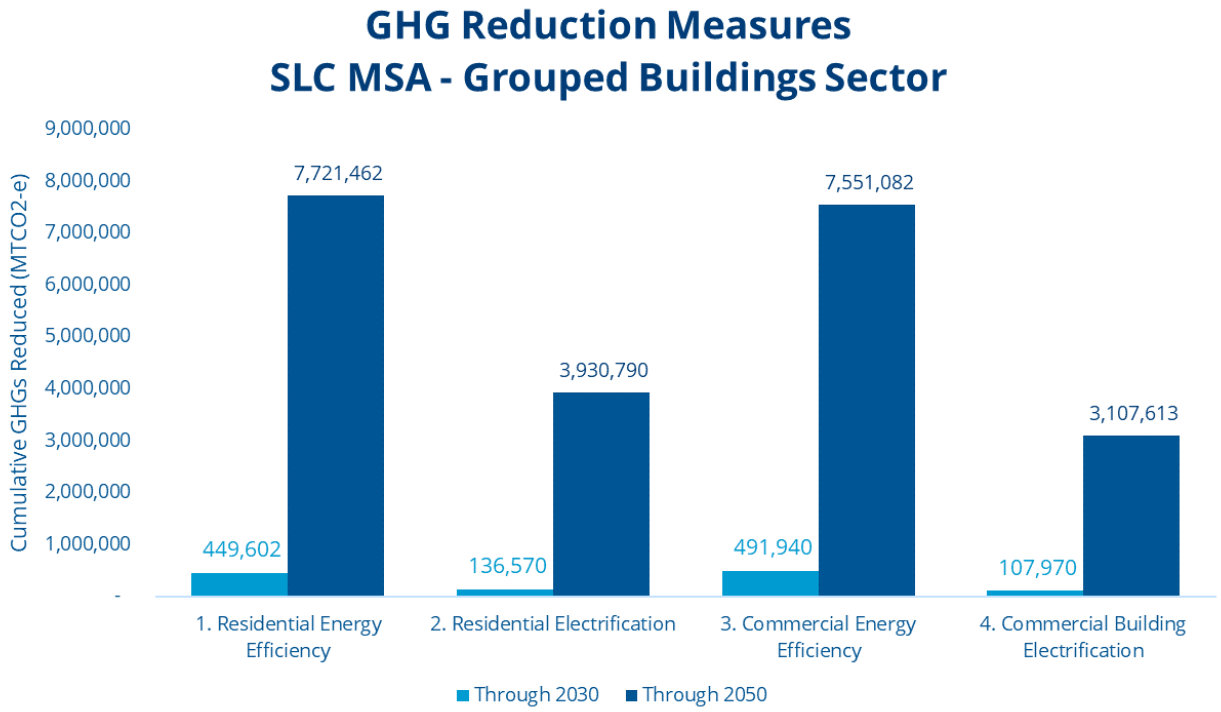

Figure 15. Estimated GHG emissions reduced through 2030 and 2050 for grouped measures in the buildings sector.

1. Residential Energy Efficiency

Applicable Sector	Buildings
Measure Summary	This group of measures improves energy efficiency within the residential housing stock, including all housing types plus new construction and retrofits.
Cumulative GHGs Reduced Through 2030	449,602 MT CO2-equivalent
Cumulative GHGs Reduced Through 2050	7,721,462 MT CO2-equivalent
GHG Modelling Assumptions	4% of existing housing units receive efficiency retrofits annually; 20% average energy savings per retrofit; 37% energy savings in new construction; Assumptions applied across the SLC MSA; More details available in appendix
Measure Subtitles and Descriptions	a. Weatherization: Programs and incentives to support residential air sealing, insulation, and other measures, including pre-weatherization improvements such as addressing health and safety issues. b. General Efficiency Measures: Programs and incentives to support additional energy efficiency improvements in residential properties such as energy-efficient lighting, low-flow water fixtures, programmable thermostats, and other improvements. c. Tariffed On-Bill Retrofit Programs: Utility-led programs that support efficiency and electrification investments in customer properties, including all residential housing types. d. One-Stop-Shop for Households and Contractors: Program to engage, educate, and inspire home energy upgrades,

	including the use of incentives and programming that streamline solutions deployment for households and contractors. This can include encouraging enrollment in utility bill assistance and other energy-related programs. e. New Construction Incentives, Codes, and Solutions: Initiatives that accelerate the deployment of energy efficient and electrified technologies and building practices in new construction, including education and incentives. This could include voluntary energy stretch codes that are encouraged at a local government or regional level.
Implementing Agencies	Local and/or State Government
Implementation Schedule and Milestones	Timing and Milestones for Modelled Grouped Measures are TBD
Authority to Implement	Government agencies have authority to create and implement incentive and engagement programs; Tariffed on-bill programs facilitated by investor-owned utilities are subject to regulation by the Utah Public Service Commission; Building codes are adopted by the State of Utah
Progress Tracking Metrics	- Number of properties and square footage receiving efficiency upgrades - Quantity of each measure installed - Estimated annual utility bill savings - Estimated annual energy use and GHGs reduced - Additional metrics determined based on specific measure implementation
Geographic Location	Within SLC MSA

Funding Sources	TBD through additional planning, prioritization, and funding activities
LIDAC Benefits Analysis	See details in separate LIDAC section of PCAP

2. Residential Electrification

Applicable Sector	Buildings
Measure Summary	This group of measures promotes efficient electrification within the residential housing stock, including all housing types plus new construction and retrofits.
Cumulative GHGs Reduced Through 2030	136,570 MT CO2-equivalent
Cumulative GHGs Reduced Through 2050	3,930,790 MT CO2-equivalent
GHG Modelling Assumptions	1% of existing housing units with natural gas are fully electrified annually; 20% of new construction is fully electrified; Assumptions applied across the SLC MSA; More details available in appendix
Measure Subtitles and Descriptions	a. HVAC Heat Pumps: Programs and incentives to encourage the deployment of electric heat pumps for heating, ventilation, and air conditioning (HVAC). b. Heat Pump Water Heaters: Programs and incentives to encourage the deployment of heat pump water heaters (HPWH). c. Electric Cooking: Programs and incentives to encourage the deployment of electric cooking technologies, including induction cooking and other options. d. One-Stop-Shop for Households and Contractors: Program to engage, educate, and inspire home electrification upgrades, including the use of incentives and programming that streamline solutions deployment for households and contractors.

	e. Heat Pump Contractor Support and Training: Engagement, training, and market development support for HVAC and water heating contractors to encourage market uptake and acceleration of heat pump deployment. f. New Construction Incentives, Codes, and Solutions: Initiatives that accelerate the deployment of energy efficient and electrified technologies and all-electric building practices in new construction, including education and incentives. This could include voluntary energy stretch codes that are encouraged at a local government or regional level.
Implementing Agencies	Local and/or State Government
Implementation Schedule and Milestones	Timing and Milestones for Modelled Grouped Measures are TBD
Authority to Implement	Government agencies have authority to create and implement incentive and engagement programs; Building codes are adopted by the State of Utah
Progress Tracking Metrics	- Number of properties and square footage receiving electrification upgrades - Quantity of each measure installed - Estimated annual utility bill savings - Estimated annual energy use and GHGs reduced - Additional metrics determined based on specific measure implementation
Geographic Location	Within SLC MSA
Funding Sources	TBD through additional planning, prioritization, and funding activities

LIDAC Benefits Analysis	See details in separate LIDAC section of PCAP

3. Commercial Energy Efficiency

Applicable Sector	Buildings
Measure Summary	This group of measures improves energy efficiency within the commercial building stock, including private sector, government, education, and other non-residential buildings and facility types. Both new construction and retrofit measures are included.
Cumulative GHGs Reduced Through 2030	491,940 MT CO2-equivalent
Cumulative GHGs Reduced Through 2050	7,551,082 MT CO2-equivalent
GHG Modelling Assumptions	4% of existing commercial space receives efficiency retrofits annually; 20% average energy savings per retrofit; 37% energy savings in new construction; Assumptions applied across the SLC MSA; More details available in appendix
Measure Subtitles and Descriptions	a. Weatherization: Programs and incentives to support non-residential property air sealing, insulation, and other measures, including pre-weatherization improvements such as addressing health and safety issues. b. Efficiency and Commissioning: Programs and incentives to support energy efficiency improvements and energy commissioning activities in non-residential properties. c. LED Lighting and Streetlighting: Programs and incentives to support the installation of energy efficient LED lighting for nonresidential properties plus the installation of LED streetlighting for government and other public facilities.

	d. Building Performance Standards: Programs and policies that catalyze energy benchmarking and improvements to reduce and often electrify energy usage, typically within larger building types. e. Building Efficiency Accelerator: Technical assistance, professional networking, best practices demonstration, and financial incentives for efficient and electrified new construction, property retrofits, and ongoing energy management. An accelerator could be for a targeted group of properties, such as government and public facilities, or allow for participation by a broader range of building types. f. Large Facility Assessments: Professional energy audits and tailored recommendations for large facility types, including suggesting improvements to reduce energy use and electrify. g. New Construction Incentives, Codes, and Solutions: Initiatives that accelerate the deployment of energy efficient and electrified technologies and building practices in new construction, including education and incentives. This could include voluntary energy stretch codes that are encouraged at a local government or regional level.
Implementing Agencies	Local and/or State Government; Educational Institutions
Implementation Schedule and Milestones	Timing and Milestones for Modelled Grouped Measures are TBD
Authority to Implement	Government agencies have authority to create and implement incentive and engagement programs; Building codes are adopted by the State of Utah
Progress Tracking Metrics	- Number of properties and square footage receiving efficiency upgrades

	- Quantity of each measure installed - Estimated annual utility bill savings - Estimated annual energy use and GHGs reduced - Additional metrics determined based on specific measure implementation
Geographic Location	Within SLC MSA
Funding Sources	TBD through additional planning, prioritization, and funding activities
LIDAC Benefits Analysis	See details in separate LIDAC section of PCAP

4. Commercial Building Electrification

Applicable Sector	Buildings
Measure Summary	This group of measures promotes efficient electrification within the commercial building stock, including private sector, government, education, and other non-residential buildings and facility types. Both new construction and retrofit measures are included.
Cumulative GHGs Reduced Through 2030	107,970 MT CO2-equivalent
Cumulative GHGs Reduced Through 2050	3,107,613 MT CO2-equivalent
GHG Modelling Assumptions	1% of existing commercial space with natural gas is fully electrified annually; 20% of new construction is fully electrified; Assumptions applied across the SLC MSA; More details available in appendix
Measure Subtitles and Descriptions	a. HVAC Heat Pumps: Programs and incentives to encourage the deployment of electric heat pumps for heating, ventilation, and air conditioning (HVAC). b. Heat Pump Water Heaters: Programs and incentives to encourage the deployment of heat pump water heaters (HPWH). c. Electric Cooking: Programs and incentives to encourage the deployment of commercial electric cooking technologies. d. Building Performance Standards: Programs and policies that catalyze energy benchmarking and improvements to reduce and often electrify energy usage, typically within larger building types.

	e. Building Electrification Accelerator: Technical assistance, professional networking, best practices demonstration, and financial incentives for efficient and electrified new construction, property retrofits, and ongoing energy management. An accelerator could be for a targeted group of properties, such as government and public facilities, or allow for participation by a broader range of building types. f. Large Facility Assessments: Professional energy audits and tailored recommendations for large facility types, including suggesting improvements to reduce energy use and electrify end uses. g. New Construction Incentives, Codes, and Solutions: Initiatives that accelerate the deployment of energy efficient and electrified technologies and building practices in new construction, including education and incentives. This could include voluntary energy stretch codes that are encouraged at a local government or regional level.
Implementing Agencies	Local and/or State Government; Educational Institutions
Implementation Schedule and Milestones	Timing and Milestones for Modelled Grouped Measures are TBD
Authority to Implement	Government agencies have authority to create and implement incentive and engagement programs; Building codes are adopted by the State of Utah
Progress Tracking Metrics	- Number of properties and square footage receiving electrification upgrades - Quantity of each measure installed - Estimated annual utility bill savings

	- Estimated annual energy use and GHGs reduced - Additional metrics determined based on specific measure implementation
Geographic Location	Within SLC MSA
Funding Sources	TBD through additional planning, prioritization, and funding activities
LIDAC Benefits Analysis	See details in separate LIDAC section of PCAP

Electricity Sector: Grouped Measures

This section features grouped measures that reduce GHG emissions within the electricity sector, including residential and commercial solar PV installations across the SLC MSA. Figure 16 provides a summary of estimated GHG emissions reductions through 2030 and 2050 for each of the grouped measure titles that were modelled for the PCAP.

Additional details on each measure, along with specific measure sub-titles and descriptions, are included in this section. More information is available in the appendix, including assumptions and methodologies used to estimate GHG emission reductions.

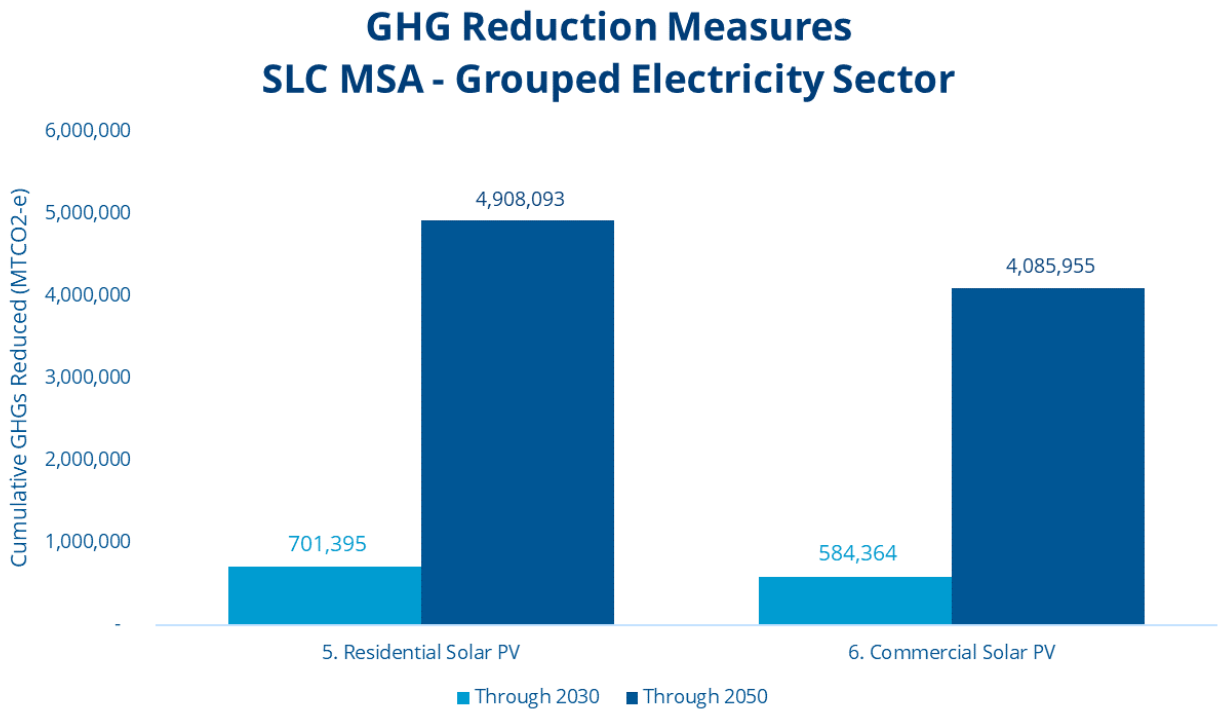

Figure 16. Estimated GHG emissions reduced through 2030 and 2050 for grouped measures in the electricity sector.

5. Residential Solar PV

Applicable Sector	Electricity
Measure Summary	This group of measures supports the deployment of solar photovoltaic (PV) and energy storage technologies on residential property types.
Cumulative GHGs Reduced Through 2030	701,395 MT CO2-equivalent
Cumulative GHGs Reduced Through 2050	4,908,093 MT CO2-equivalent
GHG Modelling Assumptions	121.3 MW of solar PV capacity are installed annually; Assumptions applied across the SLC MSA; More details available in appendix
Measure Subtitles and Descriptions	a. Retrofit Incentives and Programs: Efforts and initiatives that promote the installation of solar PV technologies for existing residential properties. b. New Construction Incentives and Programs: Efforts and initiatives that promote the installation of solar PV technologies for residential new construction properties. c. Energy Storage Incentives: Efforts and initiatives that promote the installation of energy storage technologies such as batteries for residential properties. Energy storage may be installed in tandem with solar PV or as a separate measure.
Implementing Agencies	Local and/or State Government
Implementation Schedule and Milestones	Timing and Milestones for Modelled Grouped Measures are TBD

Authority to Implement	Government agencies have authority to create and implement incentive and engagement programs
Progress Tracking Metrics	- Solar projects completed - kW solar installed - kW battery storage installed - Estimated annual kWh generation - Estimated annual utility bill savings - Estimated annual GHGs reduced - Additional metrics determined based on specific measure implementation
Geographic Location	Within SLC MSA
Funding Sources	TBD through additional planning, prioritization, and funding activities
LIDAC Benefits Analysis	See details in separate LIDAC section of PCAP

6. Commercial Solar PV

Applicable Sector	Electricity
Measure Summary	This group of measures supports the deployment of solar photovoltaic (PV) and energy storage technologies on commercial properties, including private sector, government, education, and other non-residential buildings and facility types.
Cumulative GHGs Reduced Through 2030	584,364 MT CO2-equivalent
Cumulative GHGs Reduced Through 2050	4,085,955 MT CO2-equivalent
GHG Modelling Assumptions	101.1 MW of solar PV capacity are installed annually; Assumptions applied across the SLC MSA; More details available in appendix
Measure Subtitles and Descriptions	a. Retrofit Incentives and Programs: Efforts and initiatives that promote the installation of solar PV technologies for existing commercial and other non-residential properties. b. New Construction Incentives and Programs: Efforts and initiatives that promote the installation of solar PV technologies for commercial and other non-residential new construction properties. c. Energy Storage Incentives: Efforts and initiatives that promote the installation of energy storage technologies such as batteries for commercial and other non-residential properties. Energy storage may be installed in tandem with solar PV or as a separate measure.
Implementing Agencies	Local and/or State Government

Implementation Schedule and Milestones	Timing and Milestones for Modelled Grouped Measures are TBD
Authority to Implement	Government agencies have authority to create and implement incentive and engagement programs
Progress Tracking Metrics	- Solar projects completed - kW solar installed - kW battery storage installed - Estimated annual kWh generation - Estimated annual utility bill savings - Estimated annual GHGs reduced - Additional metrics determined based on specific measure implementation
Geographic Location	Within SLC MSA
Funding Sources	TBD through additional planning, prioritization, and funding activities
LIDAC Benefits Analysis	See details in separate LIDAC section of PCAP

Transportation Sector: Grouped Measures

This section features grouped measures that reduce GHG emissions within the transportation sector, including strategies to both reduce VMT and electrify transportation across the SLC MSA. Figure 17 provides a summary of estimated GHG emissions reductions through 2030 and 2050 for each of the grouped measure titles that were modelled for the PCAP.

Additional details on each measure, along with specific measure sub-titles and descriptions, are included in this section. More information is available in the appendix, including assumptions and methodologies used to estimate GHG emission reductions.

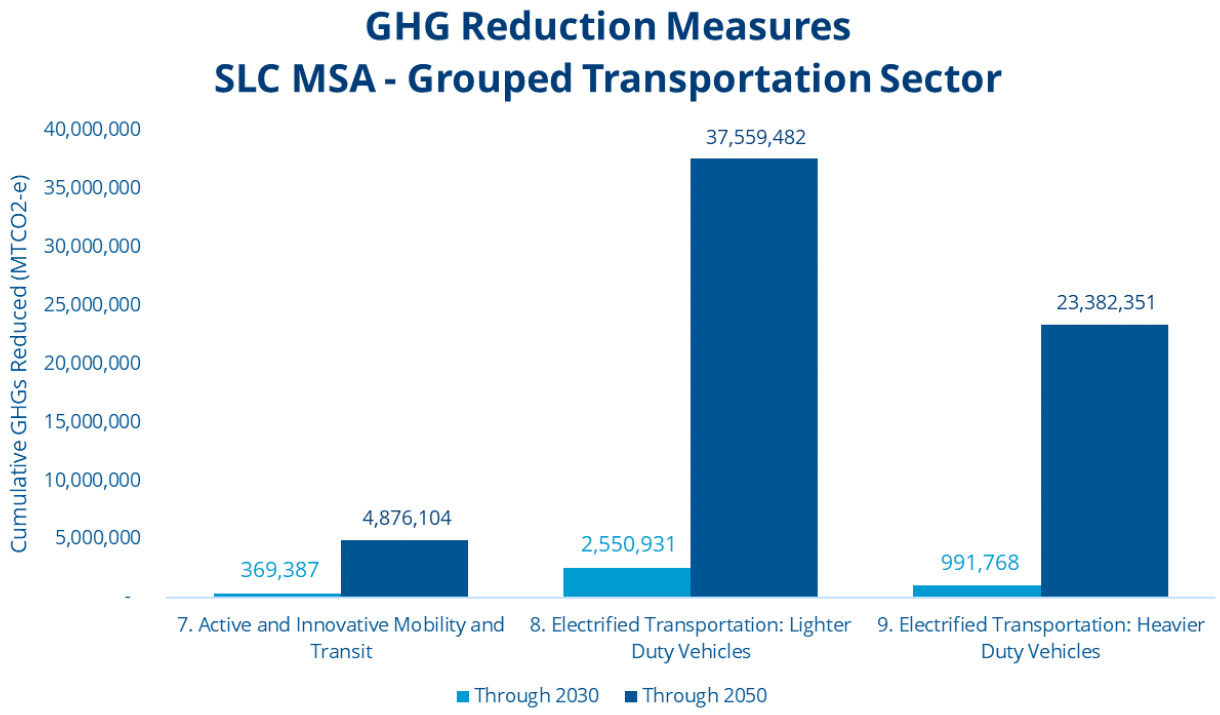

Figure 17. Estimated GHG emissions reduced through 2030 and 2050 for grouped measures in the transportation sector.

7. Active and Innovative Mobility and Transit

Applicable Sector	Transportation
Measure Summary	This group of measures promotes transportation solutions that reduce vehicle miles travelled (VMT) and associated emissions through active transportation, transit, and innovative solutions such as car sharing, micromobility, and other measures to decrease single-occupancy vehicle use.
Cumulative GHGs Reduced Through 2030	369,387 MT CO2-equivalent
Cumulative GHGs Reduced Through 2050	4,876,104 MT CO2-equivalent
GHG Modelling Assumptions	10% VMT reduction by 2050; Assumptions applied across the SLC MSA; More details available in appendix
Measure Subtitles and Descriptions	a. Bicycling Facilities, Infrastructure, Incentives, and Programs: Programs, incentives, and capital investments that enhance the safety and appeal of bicycling through physical improvements such as trails, roadway enhancements, and facilities, along with initiatives to encourage bicycle use. b. E-Bike Incentives and Programs: Programs and incentives that accelerate the deployment of electric bikes (E-Bikes) and related solutions such as bike trailers. c. Bike Sharing Facilities, Equipment, and Programs: Programs, staffing, and capital investments in shared bicycles and related facilities, such as adding e-bikes to existing fleet, expanding the number and distribution of docking stations, increasing the efficiency and capacity of maintenance operations, or

active programming in Low-Income and Disadvantaged Communities to encourage transportation mode-shift away from GHG-emitting modes.

d. Micromobility Incentives and Programs: Programs and incentives in micromobility solutions such as electric scooters that can reduce vehicle trips.

e. Complete Streets Infrastructure and Mobility Hubs: Investments in complete streets that allow for the safe use of multiple modes of transportation, including pedestrian use and bicycling, plus mobility hubs to facilitate use of transit, active transportation, and innovative transportation solutions that can reduce vehicle trips.

f. Car Sharing, Ridesharing, and Vanpool Programs: Programs and incentives for car sharing, ridesharing, and vanpool programs that reduce single-occupancy vehicle use.

g. Transit Facilities and Bus Rapid Transit Lanes: Capital investments in transit facilities and supporting infrastructure, along with solutions such as bus rapid transit (BRT) lanes, that encourage and streamline the use of transit solutions.

h. Transit Incentives and Subsidies: Programs and incentives that encourage transit use and reduce costs for participants, including subsidized or free transit use.

i. Enhanced Transportation GHG Planning: Improvements in local and regional transportation planning analyses and frameworks to ensure inclusion and prioritization of GHG impacts and associated co-benefits as significant influencers of planning outcomes, programmatic solutions, and investment priorities.

Implementing Agencies	Local and/or State Government; Educational Institutions; Transit Authority; Association of Governments
Implementation Schedule and Milestones	Timing and Milestones for Modelled Grouped Measures are TBD
Authority to Implement	Government agencies and other organizations have authority to create and implement incentive and engagement programs plus invest in infrastructure for transportation improvements
Progress Tracking Metrics	- Estimated annual amount of VMT reduced - Estimated amounts of bike use, transit use, micromobility, car sharing, and other transportation measures - Estimated annual GHGs reduced and local air pollution mitigated - Additional metrics determined based on specific measure implementation
Geographic Location	Within SLC MSA
Funding Sources	TBD through additional planning, prioritization, and funding activities
LIDAC Benefits Analysis	See details in separate LIDAC section of PCAP

8. Electrified Transportation: Lighter Duty Vehicles

Applicable Sector	Transportation
Measure Summary	This group of measures supports the deployment of lighter duty electric vehicles (EVs) and supporting charging infrastructure to replace and displace gasoline-powered vehicles. These measures support residential households plus commercial and other non-residential fleets, including those managed by the private sector, government, education, and other sector types.
Cumulative GHGs Reduced Through 2030	2,550,931 MT CO2-equivalent
Cumulative GHGs Reduced Through 2050	37,559,482 MT CO2-equivalent
GHG Modelling Assumptions	95.6% of gasoline VMT are switched to electrified options by 2050; Assumptions applied across the SLC MSA; More details available in appendix
Measure Subtitles and Descriptions	a. Residential EV Charging Equipment Incentives: Programs and incentives to support the deployment and efficient use of EV charging equipment and necessary grid upgrades for residential properties. b. Commercial and Public EV Charging Equipment Incentives: Programs and incentives to support the deployment and efficient use of EV charging equipment and necessary grid upgrades for non-residential property types. c. Residential EV Purchase Incentives: Programs and incentives to encourage the purchase of EVs by households.

	d. Commercial and Public EV Purchase Incentives: Programs and incentives to encourage the purchase of EVs for commercial and other fleets, including private sector, government, education, and other sector types. e. Education and Training: Support opportunities for technical assistance, professional networking, and best practices demonstration to encourage the adoption of EVs and EV charging infrastructure for fleets, including private sector, government, education, and other sector types.
Implementing Agencies	Local and/or State Government; Educational Institutions
Implementation Schedule and Milestones	Timing and Milestones for Modelled Grouped Measures are TBD
Authority to Implement	Government agencies and other organizations have authority to create and implement incentive and engagement programs
Progress Tracking Metrics	- Number of lighter duty vehicles electrified - Number and type of EV charging equipment installed - Estimated annual VMT of electric vehicles supported by program efforts - Estimated annual GHGs reduced and local air pollution mitigated - Additional metrics determined based on specific measure implementation
Geographic Location	Within SLC MSA
Funding Sources	TBD through additional planning, prioritization, and funding activities

LIDAC Benefits Analysis	See details in separate LIDAC section of PCAP

9. Electrified Transportation: Heavier Duty Vehicles

Applicable Sector	Transportation
Measure Summary	This group of measures supports the deployment of heavier duty electric vehicles (EVs) and supporting charging infrastructure to replace and displace diesel-powered vehicles. These measures support residential households plus commercial and other non-residential fleets, including those managed by the private sector, government, education, and other sector types.
Cumulative GHGs Reduced Through 2030	991,768 MT CO2-equivalent
Cumulative GHGs Reduced Through 2050	23,382,351 MT CO2-equivalent
GHG Modelling Assumptions	99.6% of diesel VMT are switched to electrified options by 2050; Assumptions applied across the SLC MSA; More details available in appendix
Measure Subtitles and Descriptions	a. Commercial and Public EV Charging Equipment Incentives: Programs and incentives to support the deployment and efficient use of EV charging equipment and necessary grid upgrades for non-residential property types. b. Commercial and Public EV Purchase Incentives: Programs and incentives to encourage the purchase of EVs and electric buses for commercial and other fleets, including private sector, government, education, and other sector types. c. Education and Training: Support opportunities for technical assistance, professional networking, and best practices demonstrations to encourage the adoption of EVs and EV

	charging infrastructure for vehicle and bus fleets, including private sector, government, education, and other sector types.
Implementing Agencies	Local and/or State Government; Educational Institutions
Implementation Schedule and Milestones	Timing and Milestones for Modelled Grouped Measures are TBD
Authority to Implement	Government agencies and other organizations have authority to create and implement incentive and engagement programs
Progress Tracking Metrics	- Number of heavier duty vehicles electrified - Number and type of EV charging equipment installed - Estimated annual VMT of electric vehicles supported by program efforts - Estimated annual GHGs reduced and local air pollution mitigated - Additional metrics determined based on specific measure implementation
Geographic Location	Within SLC MSA
Funding Sources	TBD through additional planning, prioritization, and funding activities
LIDAC Benefits Analysis	See details in separate LIDAC section of PCAP

DISCRETE PROJECT MEASURES

This section features discrete project measures that reduce GHG emissions across various sectors. These measures were submitted by jurisdictional partners and stakeholders during the SL-CLEAR engagement process to create the PCAP. Figure 18 provides a summary of estimated GHG emissions reductions through 2030 and 2050 for each project type that was modelled for the PCAP.

Additional details on each measure, along with specific measure sub-titles and descriptions, are included in this section. More information is available in the appendix, including assumptions and methodologies used to estimate GHG emission reductions.

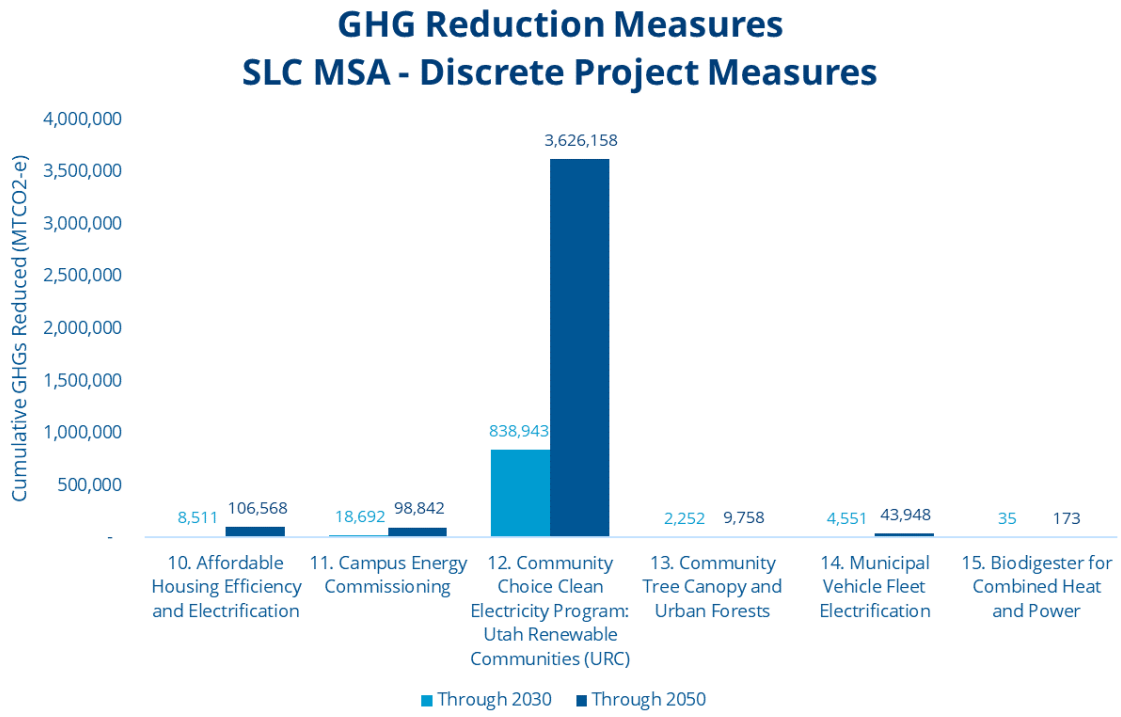

Figure 18. Estimated GHG emissions reduced through 2030 and 2050 for discrete project measures in various sectors.

10. Affordable Housing Efficiency and Electrification

Applicable Sector	Buildings
Measure Summary	This initiative in Salt Lake County aims to boost the number of highly efficient, all-electric, multi-family, affordable housing units, thereby reducing greenhouse gas emissions and criteria air pollutants in an EPA nonattainment area for PM 2.5, sulfur dioxide, and ozone. The program capitalizes on the existing momentum toward all-electric building practices, offering incentives for the installation of electric equipment like HVAC heat pumps, heat pump water heaters, and other electric appliances in new construction projects. Additionally, it will educate developers and property management firms to promote the adoption of clean energy solutions, especially in LIDACs, ensuring the resilience of Salt Lake County's building stock. Furthermore, technical support will be provided to demonstrate the environmental and economic advantages of all-electric systems, encouraging developers in the broader Intermountain West region to embrace electric building practices.
Cumulative GHGs Reduced Through 2030	8,511 MT CO2-equivalent
Cumulative GHGs Reduced Through 2050	106,568 MT CO2-equivalent
GHG Modelling Assumptions	The modelling assumed 2,100 all-electric new housing units would be constructed due to this measure. GHG emissions reductions were calculated based on assumptions described in the appendix.

Measure Subtitles and Descriptions	a. Salt Lake County All-Electric and Efficient Housing: Measure details are described in the summary above.
Implementing Agencies	Salt Lake County
Implementation Schedule and Milestones	2025-29 (*Estimated implementation through grant funding time horizon*) 1. Outreach Phase: - Develop an outreach plan aimed at engaging property developers and management companies. - Conduct one-on-one meetings and roundtable discussions to pinpoint building barriers and explore potential solutions. - Investigate product availability, procurement strategies, and liaise with manufacturers. - Duration: 1.5 years 2. Application Phase: - Design and release a competitive application process for bidding. - Salt Lake County's Housing Trust Fund board will review and approve applications for funding. - Duration: 6 months 3. Funding Distribution Phase: - Implement all-electric equipment in affordable housing projects across Salt Lake County by property developers. - Duration: 3 years

Authority to Implement	Salt Lake County has the authority to create and implement incentive and engagement programs
Progress Tracking Metrics	- Number of total housing units electrified - Number of low-income housing units electrified - Estimated annual utility bill savings (kWh, Dth, and $) for participating projects - Estimated annual GHGs reduced and local air pollution mitigated
Geographic Location	Salt Lake County
Funding Sources	There will not be additional external funding sources that Salt Lake County uses for this program, but projects may qualify for additional funding for all-electric appliances. Examples include utility rebates, IRA tax credits, and other co-funding sources.
LIDAC Benefits Analysis	See details in separate LIDAC section of PCAP

11. Campus Energy Commissioning

Applicable Sector	Buildings
Measure Summary	A program specializing in continuous building energy assessment, real-time performance monitoring, and energy efficiency upgrades on the University of Utah campus while also providing training and educational opportunities for existing and aspiring energy professionals.
Cumulative GHGs Reduced Through 2030	18,692 MT CO2-equivalent
Cumulative GHGs Reduced Through 2050	98,842 MT CO2-equivalent
GHG Modelling Assumptions	An estimated 1,296,150 square feet of facilities benefiting from commissioning activities on average annually; 2.34 kWh/sqft Electricity Savings; 0.01 MMBbtu/sqft Natural Gas Savings; More details available in appendix
Measure Subtitles and Descriptions	a. The Utah Center of Excellence for Monitoring-Based Building Commissioning: The University of Utah (U of U) is proposing a program for continuous building energy assessment, real-time performance monitoring, and efficiency improvement projects. The team would be a combination of professionals and students from U of U Campus Facilities and the Department of Energy-funded Intermountain Industrial Assessment Center (IIAC). This innovative model will leverage a trained team of energy professionals to identify campus-wide energy improvements, set up a centralized monitoring and implementation operations center, and provide continuous energy project implementation and tracking. The program will simultaneously serve as a technical assistance resource for the University of Utah while also developing the energy workforce

	of the future for Salt Lake City and surrounding areas. Further, the program will incorporate robust community engagement, stakeholder involvement, and education.
Implementing Agencies	University of Utah
Implementation Schedule and Milestones	2026-29 Estimated implementation through grant funding time horizon
Authority to Implement	The University of Utah has authority to monitor, maintain, and improve the energy performance of its facilities
Progress Tracking Metrics	- Number of facilities and total square footage served - MMBtu of natural gas saved annually - kWh of electricity served annually - Estimated annual GHGs reduced
Geographic Location	University of Utah Campus
Funding Sources	Funding sources are TBD
LIDAC Benefits Analysis	See details in separate LIDAC section of PCAP

12. Community Choice Clean Electricity Program: Utah Renewable Communities (URC)

Applicable Sector	Electricity
Measure Summary	Launch a Community Choice Clean Electricity Program in Utah available through the state's largest electricity provider, Rocky Mountain Power. Utah Renewable Communities (URC) is an interlocal cooperative agency representing 18 Utah local governments who are partnering with Rocky Mountain Power to design a new clean energy program. The URC program aims to offer customers a choice to supplement their current energy mix with additional clean electricity, up to a net-100% annual match by 2030, at a minimal cost increase.
Cumulative GHGs Reduced Through 2030	838,943 MT CO2-equivalent (communities within the SLC MSA); plus, 312,474 MT CO2-equivalent (communities outside the SLC MSA – included in State of Utah PCAP)
Cumulative GHGs Reduced Through 2050	3,626,158 MT CO2-equivalent (communities within the SLC MSA); plus, 1,350,603 MT CO2-equivalent (communities outside the SLC MSA – included in State of Utah PCAP)
GHG Modelling Assumptions	Assumed construction of 200 megawatts (MW) of Utah solar PV (proxy) with resource online in 2027; More details available in appendix
Measure Subtitles and Descriptions	a. Utility-Scale Clean Electricity Projects: The buildout of clean electricity resources sized to meet roughly half of the URC program's net-100% clean electricity target from new

	resources (modeled as 200 MW of Utah solar PV). Clean electricity projects may include integrated storage. b. Initial Required Program Administrative Costs: Administrative costs incurred by the electric utility in connection with launching the URC program. c. Energy Navigators for Household Support: up to four energy navigators would educate lower-income and disadvantaged community members about: (i) program enrollment, including how to opt-out or exit the program; (ii) available monthly bill assistance programs, including a URC bill credit designed to offset the average monthly cost; and, (iii) available incentives and resources to reduce energy burden.
Implementing Agencies	18 Utah local governments through an interlocal cooperative agency in partnership with Utah's largest electricity provider, Rocky Mountain Power; Once approved, the program will operate subject to the Utah Public Service Commission (PSC)
Implementation Schedule and Milestones	2025-29 Year 1: program approval, participation ordinances adopted, energy navigators hired, clean electricity resources identified Year 2: resource contracting finalized, resource approval Years 3-5: initial resource(s) online and generating
Authority to Implement	Utah Code 54-17-9 allows for the creation of a Program to enable eligible Utah communities to acquire renewable energy resources to serve participating customers; Final implementation requires Utah PSC approval and final ordinance adoption by participating communities within 90 days

Progress Tracking Metrics	- Number of customers participating in the URC program - Size (Megawatts) and type of new clean electricity capacity contracted - Clean energy generated annually (Megawatt-hours) by URC-supported resources - Estimated annual emissions reductions
Geographic Location	Electric customers in participating Utah communities - currently: Coalville City, Cottonwood Heights, Emigration Canyon Township, Francis City, Grand County (unincorporated), City of Holladay, Kearns, Millcreek, Moab City, Oakley City, Ogden City, Park City, Salt Lake City, Salt Lake County (unincorporated), Summit County (unincorporated), Town of Alta, Town of Castle Valley, Town of Springdale
Funding Sources	- Federal clean energy tax credits - CPRG grant to cover participant support costs amounting to the required administrative cost and the cost of roughly half of the program's new clean electricity target, plus up to four energy navigator staff positions - Low-income assistance, ongoing administrative costs, and additional resource reserve sufficient to achieve the rest of the net-100% electricity target funded through Program rates paid by participating customers - The 18 participating communities have already contributed $700,000 collectively to this effort and plan to cover up to $375,000 of statutorily required initial noticing costs
LIDAC Benefits Analysis	See details in separate LIDAC section of PCAP

13. Community Tree Canopy and Urban Forests

Applicable Sector	Natural and Working Lands
Measure Summary	This effort would prioritize tree plantings, urban forestry health, and related tree maintenance in low-income and disadvantaged communities within the MSA. Enhancing the tree canopy would deliver GHG and air quality benefits, mitigate the urban heat island effect, enhance community aesthetic, and provide other benefits to lower-income areas within the MSA.
Cumulative GHGs Reduced Through 2030	2,252 MT CO2-equivalent
Cumulative GHGs Reduced Through 2050	9,758 MT CO2-equivalent
GHG Modelling Assumptions	i-Tree Design was used to calculate the approximate benefits that individual trees provide. The tool relies on average species growth equations and other geographic parameters that are generalized from city, county, state, and climate region data. Consequently, i-Tree Design is intended to be a starting point for understanding trees' value in the community rather than a scientific accounting of precise values. Carbon dioxide sequestration values are derived from species-based biomass equations. Values (kWh and Mbtu) are converted to carbon dioxide using state-based EPA E-grid conversion values; Carbon dioxide sequestration values can vary from one location to another within a city, depending on the south to north-facing planting location, microclimate, availability of nutrient elements, shading from neighboring trees or urban structures, and species composition. Several locations in the Salt Lake Valley were modeled with i-Tree for each tree

	species and due to low (~50 pound) variations in carbon dioxide sequestration values, one single location was selected in West Valley City to calculate the CO2 sequestration benefits. A 1-inch diameter was assumed for the new trees to have at the time of planting. Three species that grow well in the valley (Locust sp., Bigleaf maple, American elm) and have contrasting canopy area and growth patterns, were chosen for modeling purposes. The species to be planted will be ultimately informed by the public. More details available in appendix.
Measure Subtitles and Descriptions	a. Salt Lake City Equity-Focused Tree Plantings and Maintenance: Measure details are described in the summary above.
Implementing Agencies	Local Governments; Salt Lake City Urban Forestry Division
Implementation Schedule and Milestones	2025-29 1. Planning Phase: Identification of locations to plant new trees, development of planting scheme, design of effective and efficient irrigation, and identification of trees that require structural pruning to facilitate healthy mature growth and avoid dangerous limb loss. Begin public process, focused on EJ Committee recommendations, to gather input for species selection and the integration of education and stewardship elements. 2. Procurement Strategy: Investigation of species availability and development of procurement strategies. 3. Implementation: Tree planting and maintenance plus addition of irrigation lines, mulch, and other site upgrades. Structured pruning to preserve canopy and large trees in other parts of the City.

	4. Outreach and communication: kick off a Tree Ambassador Program with strategies to educate the public on the ecosystem services of the urban forest and water requirements.
Authority to Implement	Local governments and the Salt Lake City Urban Forestry Division have the authority to plant and maintain trees on designated properties
Progress Tracking Metrics	- Number of species of trees planted annually - Number of species of trees maintained annually - Number of trees alive annually - Number of trees planted or maintained in LIDAC areas - Estimated annual GHGs reduced and local air pollution and temperature mitigated - Estimated noise pollution mitigated
Geographic Location	SLC MSA; West-side areas and disadvantaged community locations in Salt Lake City
Funding Sources	Project to be submitted for funding via an EPA CPRG Implementation Grant. Funding would be complemented by regular, annual City funding budgeted for the Urban Forest Program through the Salt Lake City budget.
LIDAC Benefits Analysis	See details in separate LIDAC section of PCAP

14. Municipal Vehicle Fleet Electrification

Applicable Sector	Transportation
Measure Summary	Salt Lake City would build charging infrastructure to support the electrification of fleet vehicles, which would result in significant GHG and air quality benefits. This charging infrastructure is crucial for Salt Lake City to meet its fleet electrification targets and to continue to be a leader in municipal fleet electrification within the MSA.
Cumulative GHGs Reduced Through 2030	4,551 MT CO2-equivalent
Cumulative GHGs Reduced Through 2050	43,948 MT CO2-equivalent
GHG Modelling Assumptions	51% of fleet gasoline VMT will be electrified by 2030; 8% of fleet diesel VMT will be electrified by 2030; More details available in appendix
Measure Subtitles and Descriptions	a. Salt Lake City Fleet Electrification, Charging Stations, and Grid Readiness: Salt Lake City has developed a Fleet Electrification Study identifying the vehicle charging needs and infrastructure upgrades needed at each City-owned facility. Funding is needed for implementation at key facilities where charging infrastructure is crucial to support the next phase of the City's fleet electrification. This charging infrastructure will enable Salt Lake City to acquire additional electric vehicles through City budget and other funding sources, such as federal and state grants. b. Workforce Development Program: A workforce development program would support a training and recruiting strategy for electric vehicle maintenance, charger installation and

	maintenance, and renewable energy workforce to meet the City's goals. This workforce program would serve both Salt Lake City and broader community needs, with a focus on lower-income and disadvantaged community pathways. c. Education and Training: Salt Lake City's fleet electrification efforts would be leveraged to expand EV adoption efforts with other fleet municipalities within the MSA. This would be achieved though workshops and training events focused on municipal fleet electrification to share Salt Lake City's fleet electrification successes, lessons-learned, and other strategies to remove obstacles to adoption of fleet electrification across jurisdictions in the MSA.
Implementing Agencies	Salt Lake City Corporation
Implementation Schedule and Milestones	1. Design Phase: Contract with an engineering consultant to develop 100% site design documents ~Year 1 2. Construction Phase: Construction of charging infrastructure ~ Years 2 and 3 3. Vehicle Replacements: Order electric fleet vehicles ~ Years 2 -5 (ongoing as vehicles and chargers become available) 4. Workforce Program: Identify workforce training requirements, recruiting strategies, hiring ~ Years 1 - 5 5. Technical education and training: Provide trainings and workshops to other municipalities ~ Years 2 - 5
Authority to Implement	Salt Lake City Corporation has the authority to procure and maintain fleet vehicles and charging equipment for its fleet
Progress Tracking Metrics	- Number of electric light-duty, medium-duty, and heavy-duty vehicles procured

	- Number and types of EV charging equipment - Annual kWh provided annually by EV charging equipment - Annual VMT of electrified fleet - Estimated annual GHGs reduced and local air pollution mitigated - New positions filled - Technical training/workshops offered
Geographic Location	Salt Lake City Municipal fleet locations; Potential for fleet learning activities and capacity building for additional local governments and other organizations; Broader community benefits through workforce development program and reduction of air pollutants in an EPA nonattainment area for PM 2.5, sulfur dioxide, and ozone
Funding Sources	- Utility Rebate Programs for charging infrastructure - IRS Elective pay rebates - Federal grants (if received)
LIDAC Benefits Analysis	See details in separate LIDAC section of PCAP

15. Biodigester for Combined Heat and Power

Applicable Sector	Buildings; Electricity; Wastewater Treatment
Measure Summary	Salt Lake City Department of Public Utilities (SLCDPU) is capturing biogas from a digester at an existing water reclamation facility and using it to generate combined heat and power (CHP) for the treatment process and space heating. Substantial upgrades or complete replacement of this system is needed to ensure sustained operations.
Cumulative GHGs Reduced Through 2030	35 MT CO2-equivalent
Cumulative GHGs Reduced Through 2050	173 MT CO2-equivalent
GHG Modelling Assumptions	A GHG reduction estimate was provided by SLCDPU based on internal calculations and technical evaluation of new or upgraded facility potential.
Measure Subtitles and Descriptions	a. Salt Lake City Public Utilities Clean Energy Project: Upgrades or replacement of the biodigester system will allow for efficient capture of biogas and generation of heat plus power for the water reclamation facility. This project will reduce energy use at the facility and mitigate GHG emissions associated with operations.
Implementing Agencies	Salt Lake City Department of Public Utilities (SLCDPU)
Implementation Schedule and Milestones	2025 – 2028 (Estimated implementation through grant funding time horizon) 1. Planning/Design phase: Complete design for CHP Engine Generator Replacement including electrical improvements

	required to connect into new 13.8kV plant power system and equipment procurement documents - 1 year 2. Procurement Phase: Conduct equipment solicitation and procure new CHP Engine generators and new Hot Water Boilers - 1 year 3. Implementation Phase: Construction of CHP Replacement project including installation of new Engine Generators, new Hot Water Boilers and Electrical Improvements to connect to 13.8 kV plant power system
Authority to Implement	SLCDPU has the authority to invest in capital projects and facilities for its operations
Progress Tracking Metrics	- Quantity of biogas captured annually - kWh of electricity generated annually - Space heating capacity generated annually - Estimated annual GHGs reduced
Geographic Location	SLCDPU Facility Site 1365 West 2300 North, Salt Lake City, UT 84116
Funding Sources	Funding sources are TBD
LIDAC Benefits Analysis	See details in separate LIDAC section of PCAP

3.3 Low-Income Disadvantaged Communities Benefits Analysis

Low-Income and Disadvantaged Communities: Impacts and Overview

Low-income and disadvantaged communities (LIDACs) were identified based on the Climate and Economic Justice Screening Tool (CEJST)[1] as census tracts that met 90th percentile thresholds for indicators within any of the eight categories of burden (climate change, energy, health, housing, legacy pollution, transportation, water and wastewater, or workforce development) and are at or above the 65th percentile for low-income.

In Salt Lake and Tooele counties, 34 CEJST census tracts were identified as LIDAC (see Excel file with census tract IDs). These communities have incomes that average $36,369 to $38,660[2] and face challenges in seven of the eight categories outlined by CEJST (Figure 19). Overarching themes for these LIDACs include asthma, proximity to Superfund sites, wastewater discharge, expected population loss due to climate hazards, traffic proximity, historic underinvestment, risk of flood in 30 years, housing burden, and land covered by impervious surfaces.

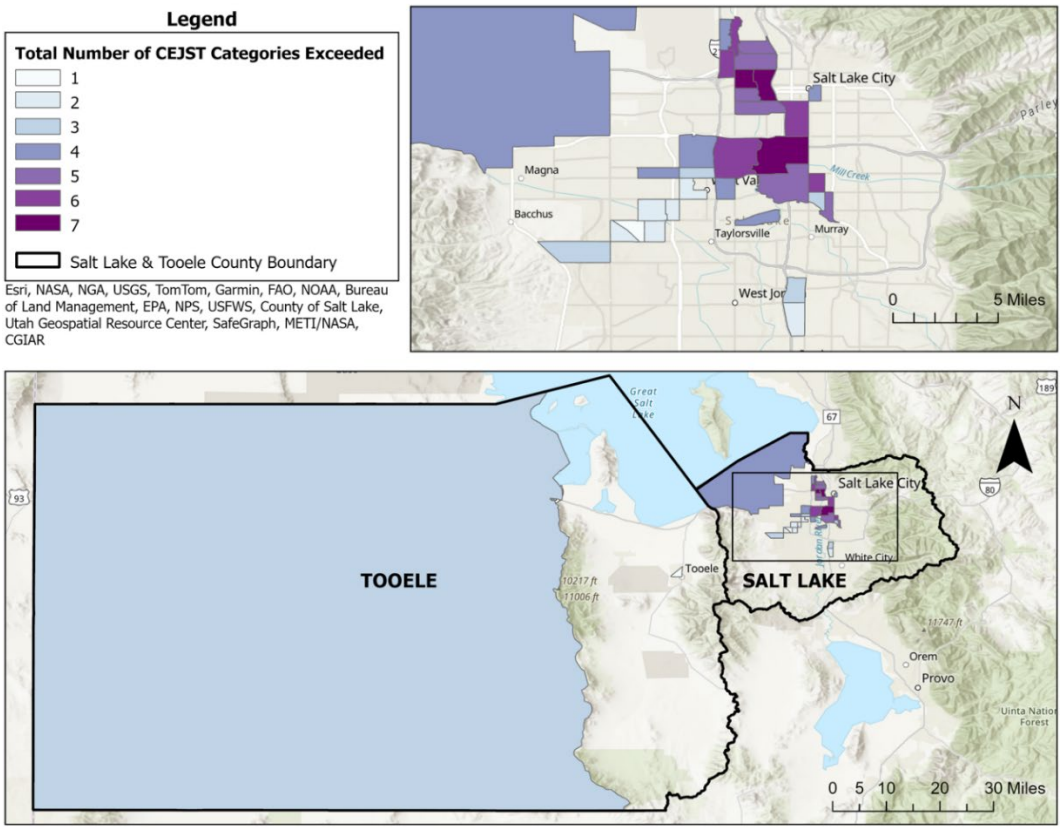

Figure 19. Map of disadvantaged communities in Salt Lake and Tooele counties and the CEJST categories that each exceeded. (Source: CEJST)

In Salt Lake and Tooele counties, disadvantaged households spend 4% of their income on energy costs, two times more than non-low-income households[2]. The national average energy burden for low-income households (LIH) is 8.6%, three times higher than for non-LIH[3]. LIH in the U.S. spend more on utilities than non-LIH due to inefficient heating and cooling[4] among other issues and LIH tend to make lifestyle cutbacks and prioritize retaining access to energy utilities, sacrificing other basic needs. This tradeoff exacerbates other social issues, such as decreased educational fulfillment and resiliency[4,5,6].

Forty-eight percent of individuals in these LIDAC census tracts are below the 200% Federal Poverty Line[1], and their population is mostly White and Hispanic/Latino[1] (Figure 20). For some, overcoming financial barriers is complicated not only due to a lack of necessary resources and opportunities, but also linguistic isolation (24% for two Salt Lake City LIDAC census tracts), and lack of high school education (21% of adults in LIDACs, on average, have completed high school, in comparison to 93% for the rest of Salt Lake and Tooele counties)[1].

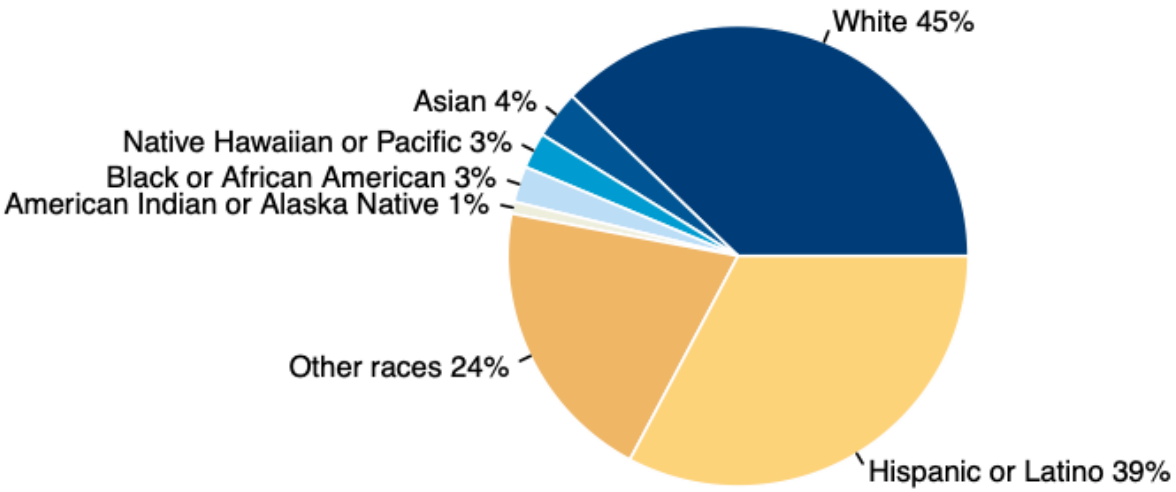

Figure 20. Race composition of Salt Lake and Tooele counties disadvantaged communities. (Percentages exceed 100% as respondents were able to select multiple answers) (Data Source: CEJST)

A study based on two representative data sets (the Residential Energy Consumption Survey and American Time Use Survey), found that affordability and accessibility remain serious issues for LIH[7] during the transition to clean energies. Weatherization and other energy efficiency programs have limited participation rates within LIH due to high upfront cost, language barriers, and time constraints. Additionally, 57% of LIH in the two counties are renter-occupied and the other 43% are owner-occupied[2]. Renters cannot control the type of most appliances

installed in their residences[8] and landlords do not have sufficient incentives to make energy efficiency investments as they often do not directly benefit from lower utility bills[7].

Studies have shown significant intraurban temperature variability with the highest temperatures in western parts of Salt Lake County[9,10] coinciding with LIDAC census tracts. These communities have very low tree cover and a high percent of impervious surfaces[11], which is one of the strongest predictors of urban heat islands[12]. In fact, thirteen of the LIDAC census tracts are above the 80th percentile for impervious surface cover in Salt Lake and Tooele counties (Figure 21). These groups are particularly vulnerable to increases in average and extreme temperatures and heat waves, made more likely due to climate change. Extreme temperatures affect health by compromising the ability of the body to regulate its internal temperature, which can result in several illnesses and worsen chronic conditions such as cardiovascular, respiratory, and cerebrovascular diseases, and diabetes-related conditions[13]. The West Valley area, where several LIDACs are located, already has elevated rates of serious health conditions, including diabetes (44% greater prevalence) and stroke (38% greater prevalence) compared to Salt Lake County as a whole[14].

People in the Salt Lake Valley experience some of the most severe winter air pollution in the nation. Wintertime levels of PM2.5 exceed national air quality standards when persistent cold air pools trap pollution close to the surface[15]. These exceedances have been associated with a 42% higher rate of emergency department visits for asthma[16] and with increased school absences[17]. The Westside of the Salt Lake Valley carries the worst burdens as air quality monitors show the most polluted hotspots in these areas[17,18]. An alarming 63% of the Salt Lake MSA LIDAC census tracts are over the 90th percentile for asthma rates (Figure 22) and one of these census tracts is also above the 90th percentile for lower life expectancy[1].

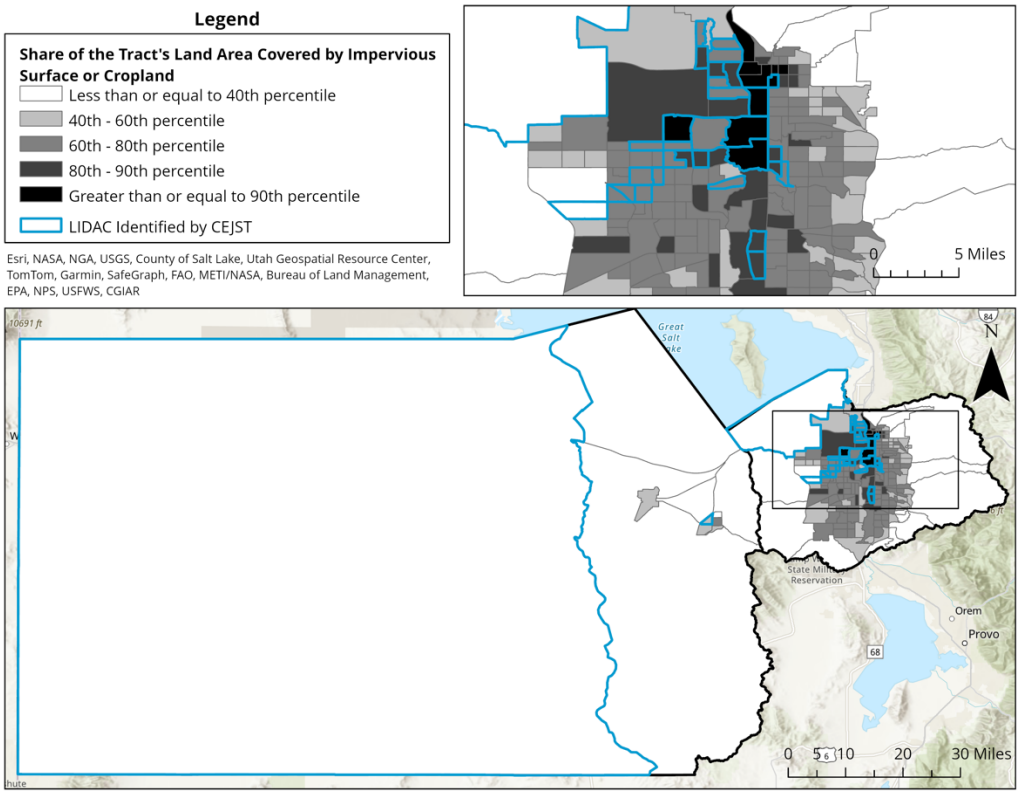

Figure 21. Impervious surfaces in Salt Lake and Tooele counties. (Source: CEJST)

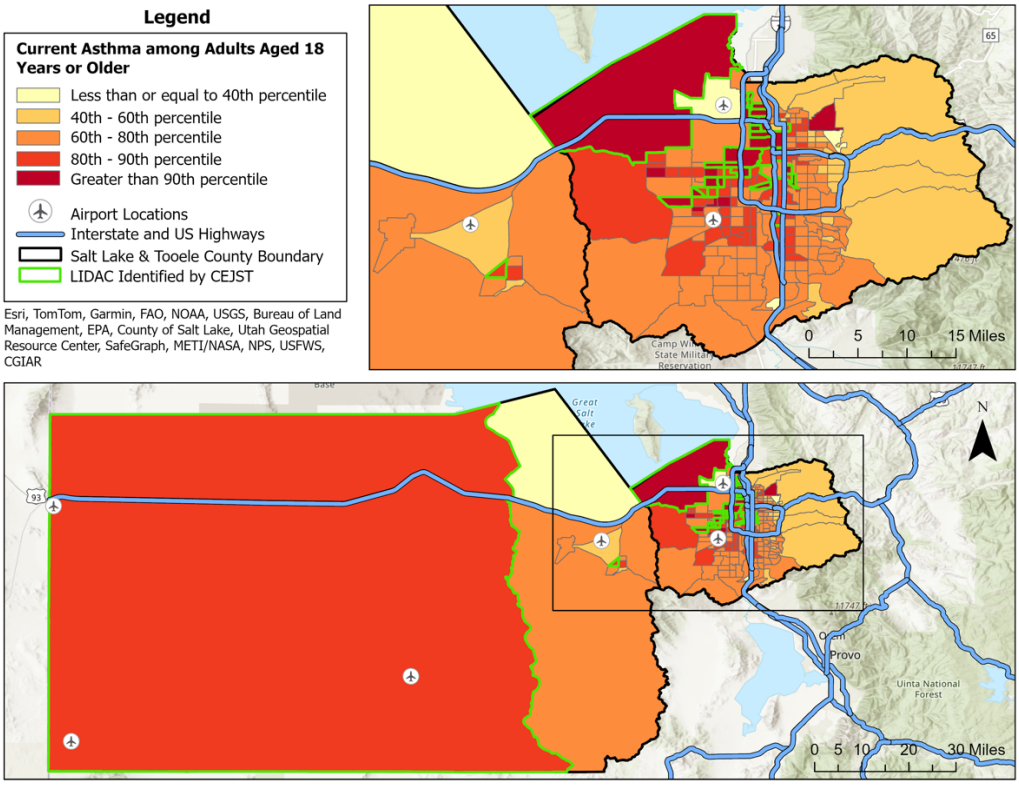

Figure 22. Asthma rates among adults aged 18 years or older. (Source: CEJST)

Air quality is worse on the Westside due, in part, to the Interstate Highways that run through the area, industrial activities, a higher concentration of warehouses and heavy-duty diesel vehicles operating in and around them, and pollution from jet engines near the Salt Lake City International Airport. Eight of the LIDAC census tracts are also above the 90th percentile for traffic proximity[1]. An engagement process that involved creation of an Environmental Justice Committee composed of residents from LIDAC communities specifically highlighted their concerns over two large projects planned for the area that might exacerbate the valley's health disparities: construction of an inland port and a highway expansion are both expected to increase truck and vehicle traffic and consequently worsen air quality.

Outdoor air pollution is not the only issue that LIDACs in the Salt Lake and Tooele counties are facing. They are also vulnerable to indoor air pollution. Seventy-five percent of LIH use natural gas as heating fuel, and Utah is highly dependent on natural gas for space and water heating plus cooking[2,19]. Appliances that use natural gas can emit carbon monoxide, formaldehyde, and other pollutants that can have harmful effects on indoor air pollution. Energy improvements that enhance efficiency, reduce costs, and improve indoor and outdoor air quality are important to increase resiliency and mitigate health impacts in LIDACs in Salt Lake and Tooele counties.

LIDACs along the Wasatch Front are diverse, vibrant, and deeply rooted communities. They have been, sadly, plagued by polluting industries, historic underinvestment, and disproportionate air pollution that is, in part, the legacy of redlining practices[20, 21]. With high rates of asthma, diabetes, and stroke, in combination with a high percentage of impervious surfaces and high-traffic proximity, they are particularly vulnerable to climate change and aggravated local air pollution. They are also trapped in a cycle of low-wage employment, along with high housing and energy costs, that combine with a lack of high school education and linguistic isolation to limit opportunities to achieve more economic resiliency. A rapid energy transformation is essential to provide clean and accessible energy for LIDACs in the Salt Lake and Tooele counties and build thriving, healthy, and resilient communities.

Expected Benefits to LIDACs from GHG Reduction Measures in PCAP

Applicable Sector: Buildings	
Measures	1. Residential Energy Efficiency 2. Residential Electrification 3. Commercial Energy Efficiency 4. Commercial Building Electrification 10. Affordable Housing Efficiency and Electrification 11. Campus Energy Commissioning
Climate Benefits	• Strategies to increase energy efficiency in the building sector such as installing heat pumps, LED lighting, weatherization and performing retrofits will reduce climate changing carbon emissions. LIDACs are more likely to be impacted by effects of climate change. • Mitigation of global warming hazards by lowering the emissions of greenhouse gases. These hazards include extreme heat, drought, flooding, and expected population loss.
Co-Pollutant Benefits	• Residential electrification transitioning from fuel-burning appliances to electric options will improve indoor air quality, especially in households that are highly dependent on natural gas for cooking. • Residential and commercial energy efficiency will reduce emissions of criteria air pollutants.
Other Benefits	• Weatherization initiatives for residents will provide increased resilience to climate change hazards, including extreme temperatures and flooding. • Retrofits and weatherization in LIDAC residences would increase energy efficiency and decrease energy bills, which is of particular importance for LIH that are already burdened by energy costs and extreme temperatures. • Weatherization and retrofits result in improved indoor temperature comfort, health, and safety. • Energy efficiency reduces energy consumption, relieving the strain on the electric grid and improving energy security. • Clean energy and efficiency growth can result in the creation of local jobs and development of a local workforce for manufacturing and installation. • Improved public health from reductions in co-pollutants (ozone, PM2.5) through more efficient appliances and residences. This translates into fewer visits to the emergency room and fewer asthma cases. • Enhanced public awareness of fossil fuel impacts on air quality and public health along with increased community engagement.
Applicable Sector: Electricity	
Measures	5. Residential Solar PV 6. Commercial Solar PV 12. Community Choice Clean Electricity Program: Utah Renewable Communities (URC)

	15. Biodigester for Combined Heat and Power
Climate Benefits	• Mitigation of global warming hazards by lowering the emissions of greenhouse gases. These hazards include extreme heat, drought, flooding, and expected population loss.
Co-Pollutant Benefits	• Clean energy generation will directly benefit LIDAC communities through reduction of co-pollutants resulting from fossil fuel combustion such as sulfur dioxide, nitrogen oxides, particulate matter, and other pollutants.
Other Benefits	• Distributed solar energy can increase resilience to the risk of climate hazards induced by climate change such as heat, drought, and flooding by providing power when the grid goes down. • Solar panels reduce ongoing electricity bills and energy burden for residents and businesses. • Diversification of energy supply with local renewable sources to reduce dependence on imported fuels and energy. • Localized and decentralized energy from solar panels and batteries can reduce strain on the electric grid and mitigate grid disruptions. • Energy-efficient solar installations and batteries will reduce cost of cooling and heating during extreme temperatures to maintain more comfortable indoor air temperatures, improving mental and physical health. • Improved public health due to indoor temperature comfort and reduction of outdoor co-pollutants (e.g. $PM_{2.5}$). This will reduce asthma cases and emergency room visits. • Enhanced public awareness of fossil fuel impacts on air quality and public health along with increased community engagement. • Economic development through the creation of local jobs in manufacturing, equipment installation, and other clean energy industries.
Applicable Sector: Transportation	
Measures	7. Active and Innovative Mobility and Transit 8. Electrified Transportation: Lighter Duty Vehicles 9. Electrified Transportation: Heavier Duty Vehicles 14. Municipal Vehicle Fleet Electrification
Climate Benefits	• Reduction of GHG emissions from single occupancy vehicles through improvements in multimodal transportation options (mobility hubs, carpooling, active transportation). • Adoption of electric vehicles, which have zero tailpipe emissions of local pollutants, will curb GHG emissions. • Mitigation of global warming hazards by lowering the emissions of greenhouse gases. These hazards include extreme heat, drought, flooding, and expected population loss.
Co-Pollutant Benefits	• A transition from internal combustion vehicles to electric vehicles will result in local reductions of co-pollutants from combustion of gasoline

	such as PM10, PM2.5, carbon monoxide, nitrogen oxides, and other pollutants.
Other Benefits	• Active transportation (biking, walking), subsidized bike share, car share and transit – all reduce transportation cost burden. • Increasing bicycle use by expanding bicycling facilities, affordable bike share, and improving cycling infrastructure, will diversify modes of transportation in areas that are dependent on automobiles. • Multimodal transportation options reduce traffic congestion and make roads safer for all travelers, plus provide improved accessibility to services and amenities for non-drivers. • Improved public health from reduction of criteria pollutants from internal combustion vehicles. • Reduction of noise pollution via transition away from internal combustion vehicles to electric vehicles. • The construction of charging stations and other cycling and transit infrastructure will create new jobs and workforce development opportunities for LIDACs. • Enhanced public awareness of fossil fuel impacts on air quality and public health along with increased community engagement. • Improved transportation infrastructure that currently lacks reliable, sustainable, and affordable transportation services.
Applicable Sector: Natural and Working Lands	
Measures	13. Community Tree Canopy and Urban Forests
Climate Benefits	• Mitigation of GHG emissions through carbon sequestration. • Mitigation of global warming hazards by lowering the emissions of greenhouse gases. These hazards include extreme heat, drought, flooding, and expected population loss. • Reduction of urban heat island effect. • Refuge from warm temperatures to passersby and local fauna.
Co-Pollutant Benefits	• Air quality improvement.
Other Benefits	• Neighborhood beautification. • Improved public health from reduction of criteria pollutants. • Reduction of noise pollution. • If strategically positioned, urban trees reduce energy use from buildings by shading and reducing wind speeds, which contributes to energy bill savings. • Encourages outdoor activities and use of clean and alternative modes of transportation. • Urban trees boost biodiversity. • Improvement in mental health, stress reduction, and other health outcomes. • Trees typically increase property values.

Table 4. Expected Benefits to LIDACs from GHG Reduction Measures.

Planned and/or Ongoing Engagement with LIDACS: PCAP and CCAP

The engagement strategy for development of the PCAP was designed to produce meaningful engagement with residents of LIDAC census tracts and was anchored in the formation of an Environmental Justice (EJ) Committee comprised of nine residents. This Committee was convened by University Neighborhood Partners (UNP), a long-term collaboration between the University of Utah and Westside Salt Lake County neighborhoods. UNP serves LIDAC communities in Salt Lake City and West Valley City, which are home to 18 of 34 LIDAC-qualified census tracts in the SLC MSA.

The EJ Committee was assembled to give LIDAC residents a place at the table during development of the PCAP and CCAP. The EJ Committee convened twice monthly, via in-person or virtual assemblies, to meet several goals of the EPA CPRG program: (1) Achieve increased resident knowledge of the risks of adverse climate impacts and an awareness of greenhouse gas emission reduction measures and impacts; (2) Evaluate and support the selection of impactful GHG reduction measures to be included in the PCAP and CCAP; and, (3) Identify other pathways to support resident ideas or address concerns related to climate impacts or mitigation strategies through federal grants, City programs, or other opportunities.

The first two meetings were convened on January 10 and 17 in 2024 to inform residents of adverse climate impacts and solution measures to reduce GHGs. Meetings the following month on February 14 and 21 built upon prior feedback of residents and focused on resident presentations of their ideas, burdens, and priorities to be considered for the selection as GHG reduction measures in the PCAP. Topics identified as important to the residents included:

- **Public Transportation**: faster and more frequent public transit routes;
- **Carpooling**: with a reward system;
- **Mitigate Pollution**: from current freeways and projected expansions, refineries, and the proposed inland port;
- **Green Space**: for community building, as an indigenous sacred site, and for mitigation of air pollution and heat;
- **Renewable Energy Systems and Electric Appliances**: vouchers or incentive programs, eco-bikes, and wind turbines to generate electricity on campus, schools, and stations;

- **Solar Alternatives**: for the Westside more generally and in partnership with the Goshute Nation;
- **Green Jobs**: for Westside residents;
- **Education**: on environmental issues; and,
- **Recycling and Waste Efforts**: where Westside areas need improvement.

Residents emphasized the importance of "meeting them where they are" and taking the time to understand their real needs and customize ways to implement solutions. Many organizations have approached them offering solutions that are not practical for their situation. For example, some residents stated that clean energy alternatives and appliances are often unaffordable. Other topics were raised regarding basic needs that, for them, are equally or more pressing than the transition to clean energy, such as the need for clean water, affordable housing, and a local high school in their neighborhood. Others expressed their frustration over polluting refineries and proposed projects like the inland port and highway expansion that they believe will inevitably negatively affect air quality in an area already subjected to the worst pollution in the valley. Some expressed a feeling of defeat about the potential to eliminate existing and proposed sources of pollution and opted to identify mitigating strategies and projects, such as planting more vegetation to filter out air pollution, providing air filters to residents, and expressing that refineries should redistribute their profits and/or provide jobs to Westside residents.

Overall, the residents remain committed to building a brighter future and envision transforming the Westside into a healthy and more connected community. Among residents, there was a widespread desire to implement nature-based solutions to mitigate the impacts of increasing temperatures and airborne pollution, and to beautify the highly impervious Westside urban landscapes. One resident proposed the creation of an indigenous sacred site to practice ceremonies and rituals and spread awareness of community and land relations through an indigenous lens. Another resident noted the potential of this indigenous sacred site to serve as a place to implement a community education model embedding environmental issues and environmental justice that is different than the traditional academic one. The need for a place for gathering, education, and community building in the Westside was commonly expressed by residents. Some think there is a significant loss of identity and belonging between current

generations and that the best way to take care of the environment is by "understanding we are part of it and knowing the history of the land". This knowledge, shared by everyone, indigenous and non-indigenous alike, is what many residents felt is a missing piece in motivating people to adopt carbon reduction measures and other environmental actions.

Invoking their roots in these communities was another common thread shared by residents. Some shared memories of growing up fishing in Utah Lake for food or growing a garden. Now, worried about the effects of air pollution, they do not let their kids play outside. They expressed their preoccupation with the coming generations losing their identity and a sense of belonging to these communities and their surrounding natural environment. Residents felt that this disconnection from community and culture leads to a general lack of environmental awareness and action. One resident said, "when you don't belong, you belong to money."

Residents feel a deep love for their neighborhood, noting: "This is where our history is. We built so much out of nothing." They also don't see moving out as an option: "We are not quitters." Instead, they want to stay and make a difference, find solutions, and be able to answer when their kids ask, "What did you do to improve the air we breathe?"

Salt Lake City is sensitive to the Westside community's concerns and is committed to facilitating their involvement in the decision-making process towards finding solutions. The City has identified one of the resident ideas as implementation-ready for EPA Implementation Grants funding and is currently planning to incorporate it within the City's grant application. Furthermore, resident feedback related to air pollution along with affordable and reliable transportation will inform additional City grant project proposals. For resident ideas that are neither implementation-ready nor directly related to GHG reduction measures or mitigation strategies, the City is working on identifying other federal grants, City programs, City Departments, and other avenues to support ideas and/or facilitate a resolution.

SLC MSA census tract IDs identified as disadvantaged in CEJST can be found in this downloadable Excel table. One sheet shows the IDs grouped by CEJST category and the other shows a simple unique list of all 34 disadvantaged census tract IDs in the SLC MSA.

3.4 Review of Authority to Implement

A review of authority to implement was conducted for each of the included GHG reduction measures and details are reflected in the summary tables in Section 3.2. None of the proposed PCAP measures faces significant statutory or regulatory barriers to implementation that are un-addressable via pathways documented with each individual measure.

An additional review of authority to implement will be conducted for the forthcoming CCAP developed for the SLC MSA.

4.0 NEXT STEPS

4.1 Comprehensive Climate Action Plan

A Comprehensive Climate Action Plan (CCAP) will be developed for the SLC MSA as one next step in the CPRG planning process. The CCAP will build upon and expand the engagement and evaluation efforts that informed creation of the PCAP, plus incorporate all required sectors in the GHG inventory and documentation of reduction measures as indicated in Section 1.3. More detailed GHG calculation methods will be leveraged for the CCAP and this will likely lead to alternative, and more accurate, emission estimates relative to what is included in the PCAP.

A variety of measure types were submitted during the PCAP process that either did not align with one of the prioritized sectors for the PCAP or were not accompanied with sufficient details to quantify GHG emission reductions. Examples of these submitted measures that were not included in the PCAP, but will be revisited for additional consideration in the CCAP include:

- Low-carbon construction materials
- Hydrogen-fueled vehicles
- Workforce training efforts in additional sectors (e.g., forestry)

The SL-CLEAR team looks forward to enhanced stakeholder engagement and evaluating these concepts along with numerous other GHG reduction measures during the 2024-25 CCAP development process for the SLC MSA.

Figure 23. Image of an event at Library Square in downtown Salt Lake City (Image Source: Salt Lake City Corporation)

5.0 CITATIONS

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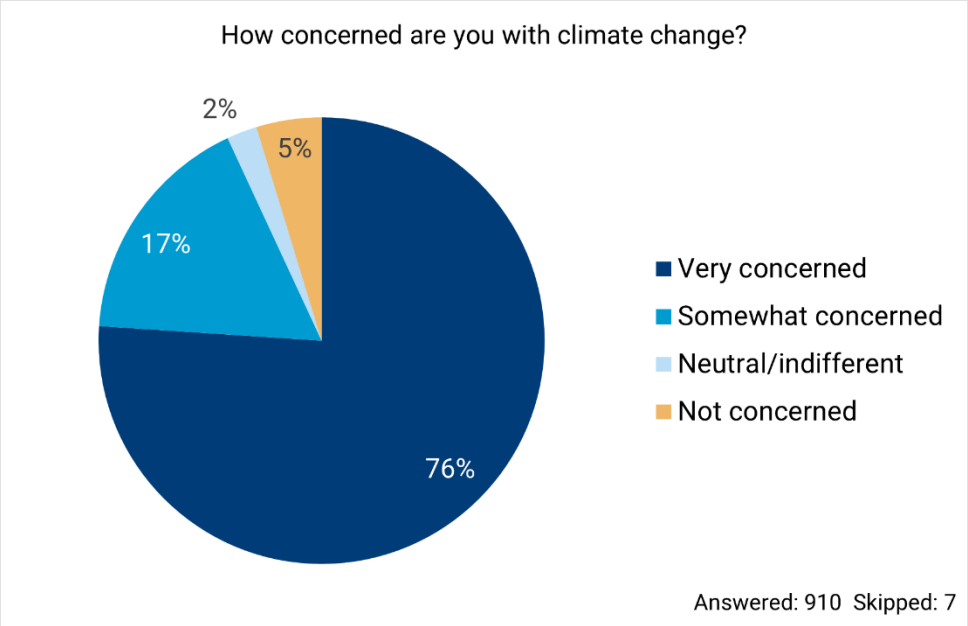
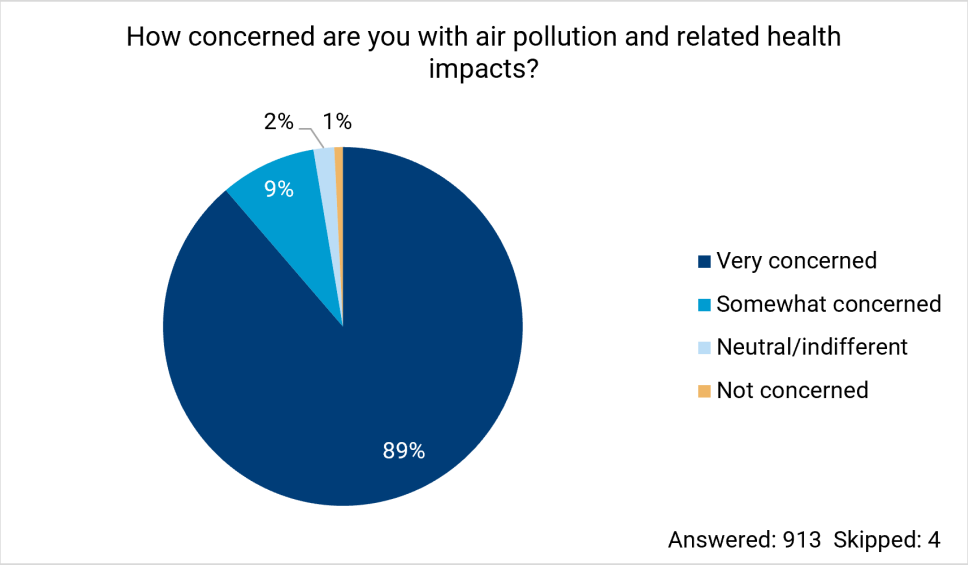
6.0 APPENDICES

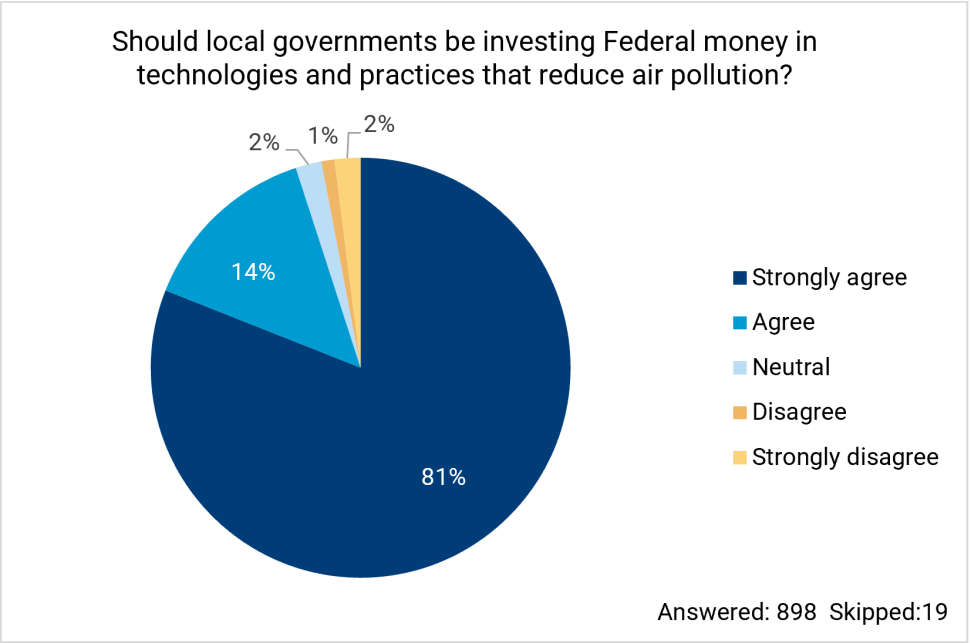
6.1 Appendix A: Public Survey Results

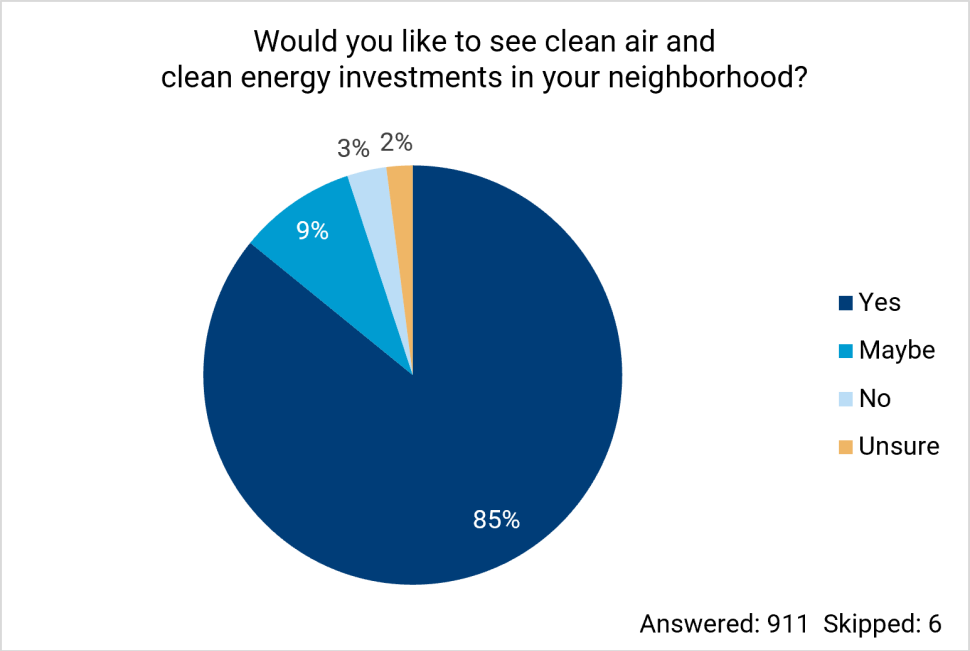
An online public survey was utilized to solicit opinions and inform prioritization for the SL-CLEAR PCAP. This survey was available in English and Spanish and collected over 900 total responses from individuals living in the SLC MSA. Survey questions are available as a PDF in this link and **complete survey results** are available for review in this downloadable Excel file.

A small selection of survey questions and associated responses from SLC MSA residents is displayed in the graphs below.






Should local governments be investing Federal money in technologies and practices that reduce air pollution?
2%
1%
2%
14%
81%
Strongly agree
Agree
Neutral
Disagree
Strongly disagree
Answered: 898 Skipped:19


Would you like to see clean air and clean energy investments in your neighborhood?
3%
2%
9%
85%
Yes
Maybe
No
Unsure
Answered: 911 Skipped: 6

Do you support clean energy and clean air dollars from the Federal Inflation Reduction Act being directed toward...			
	Strongly support %	Support %	Total support %
Residents	52%	36%	88%
Local governments and public infrastructure	59%	33%	92%
Businesses and indusry	36%	33%	69%
Public schools and universities	55%	34%	89%

Attitude toward technologies to reduce air pollution			
	Familiarity (very and somewhat) %	Attitude (very positive and positive) %	Most cited barrier
EVs	94%	75%	Too expensive (62%)
Electric bikes	90%	80%	Not practical (42%) Safety Concern (39%)
Solar panels	93%	90%	Too expensive (57%)
Heat pumps	54%	61%	Lack of knowledge (44%) Too expensive (35%)

6.2 Appendix B: Greenhouse Gas Inventory Details and Assumptions

The GHG Inventory is based on version 1.2 of the U.S. Community Protocol for Accounting and Reporting GHG Emissions and additional activities plus sources are considered in accordance with the Global Protocol for Community-Scale GHG Emissions Inventories. The inventory represents emission estimates for primary GHGs (e.g., CO2, CH4, N2O, HFCs, PFCs, SF6, and NF3) and emissions are quantified in two ways:

1. Measurement-based methodologies refer to the direct measurement of GHG emissions (from a monitoring system) emitted from a flue of a power plant, wastewater treatment plant, landfill, or industrial facility.

2. Calculation-based methodologies calculate emissions using activity data and emission factors. To calculate emissions accordingly, the following basic equation below is used: Activity Data X Emission Factor = Emissions.

Most emissions sources in the inventory are quantified using calculation-based methodologies. Activity data refer to the relevant measurement of energy use or other GHG-generating processes such as fuel consumption by fuel type, metered annual electricity consumption, and annual vehicle miles traveled.

Known emission factors are used to convert energy usage or other activity data into associated quantities of emissions. Emissions factors are usually expressed in terms of emissions per unit of activity data (e.g., MT CO2/kWh of electricity). For this inventory, calculations were made using ICLEI's ClearPath Climate Planner tool and additional details on data sources, methodologies, and gaps plus assumptions are included in the tables below.

SLC MSA GHG Inventory Detailed Table for Selected PCAP Sectors *(2021 Baseline Year)*				
Sector/Activity	**Fuel or Source**	**2021 Usage/Activity**	**Units**	**Metric Tons CO2e**
Residential Energy	Electricity	4,278,155,259	kWh	1,238,767
	Wood	1,054,098	MMBtu	10,269
	Distillate Fuel Oil No. 2	39,041	MMBtu	2,907
	Propane	624,650	MMBtu	38,765
	Natural Gas	29,280,489	MMBtu	1,557,233
	Residential Energy Total			**2,847,941**
Commercial Energy	Electricity	5,657,033,305	kWh	1,638,030
	Distillate Fuel Oil No. 2	1,299,528	MMBtu	96,754
	Propane	1,438,763	MMBtu	89,288
	Natural Gas	21,395,796	MMBtu	1,137,899
	Other Commercial Fuels[i]	-	-	3,163
	Commercial Energy Total			**2,965,134**
Industrial Energy	Electricity	4,192,878,743	kWh	1,214,074
	Natural Gas	8,243,809	MMBtu	439,860
	Gasoline	2,721	MMBtu	49
	Propane	1,979,898	MMBtu	116,091
	Distillate Fuel Oil No. 2	288,951	Gallons	3,029
	Other Industrial Fuels[i]	-	-	198,308
	Industrial Energy Total			**1,971,411**
On-Road Transportation	Gasoline	9,007,612,765	Vehicle Miles Traveled (VMT)	3,878,000
	Diesel	1,607,643,400	Vehicle Miles Traveled (VMT)	1,562,279
	CNG	7,098,018	Vehicle Miles	719

			Traveled (VMT)	
	Electricity	7,962,816	Vehicle Miles Traveled (VMT)	30,781
Aviation Transportation	Jet Kerosene	24,950,548	MMBTU	2,034,092
	Aviation Gasoline	19,928	MMBTU	1,385
Rail Transportation	Diesel	779,489	MMBTU	58,157
Waterborne Transportation	Gasoline	165,935	MMBTU	65,975
	Diesel	39,851	MMBTU	2,949
Off-Road Transportation & Mobile Sources	Gasoline	2,471,482	MMBTU	177,345
	Diesel	5,856,389	MMBTU	433,344
	CNG	126,954	MMBTU	7,840
	LPG	1,089,004	MMBTU	67,061
	Transportation & Mobile Sources Total			**8,319,926**
Wastewater Treatment	Wastewater Treatment[i]	-	-	12,308
	Water and Wastewater Total			**12,308**
Agriculture, Forestry, and other Land Uses (AFOLU)	Livestock[i]	-	-	79,251
	Crops[i]	-	-	138,469
	Land/Forestry[i]	-	-	-154,030
	AFOLU Gross Emissions[ii]			**217,720**
2021 SLC MSA GHG Emissions (Selected PCAP Sectors)				**16,334,440**

[i]Fuels and GHG emissions source types grouped together for these sources, so no unique "Units" type is displayed
[ii]ICLEI U.S. GHG Protocol does not remove Land/Forestry sequestered emissions from the AFOLU total

Transportation & Mobile Sources			
Activity/Source	**Data Source**	**Methodology**	**Data Gaps/Assumptions**
On-Road	Wasatch Front Regional Council (WFRC) 2019 MOVES Model	After WFRC provided MOVES, we aggregated data by county, fuel/vehicle type	Data is for 2019, which is the most recent year before base year (2021) Original dataset provided specific vehicle classifications, which were aggregated into Motorcycle, Passenger, Light-Duty, and Heavy Duty Original dataset provided daily VMT, which was scaled to annual using WFRC's recommendation of 325
On-Road Transit	Wasatch Front Regional Council (WFRC) 2019 MOVES Model	n/a	Included in on-road activity
Rail	EPA's 2020 National Emissions Inventory	Extracted county data by GHG type, estimated MMBtu using MT CO2/MMBTU emissions factor	Because NEI does not provide activity data, we estimated MMBtu using the MT CO2/MMBTU emissions factor
Aviation	Salt Lake City Department of Airports' Impact Tracker	Aggregated fuel consumption by fuel type	Assumed all activity is transboundary since SLCIA is a Class B airport
Waterborne	EPA's 2020 National Emissions Inventory	Extracted county data by GHG type, estimated MMBtu using MT CO2/MMBTU emissions factor	Because NEI does not provide activity data, we estimated MMBtu using the MT CO2/MMBTU emissions factor
Off-Road/Mobile	EPA's 2020 National Emissions Inventory	Extracted county data by GHG type, estimated MMBtu using MT CO2/MMBTU emissions factor	Because NEI does not provide activity data, we estimated MMBtu using the MT CO2/MMBTU emissions factor
Emissions factors	EIA's Annual Energy Review, Bureau of Transportation Statistics Average Fuel Efficiencies, and EPA's Emission Factors for Greenhouse Gas Inventories	n/a	n/a

Grid Electricity			
Activity/Source	**Data Source**	**Methodology**	**Data Gaps/Assumptions**
Residential Electricity	Energy Information Association State Energy Summaries	Extracted state electricity consumption data and downscaled using a ratio of county households out of state households	Since utility data was unavailable, this alternative was considered most applicable; this approach assumes every house uses grid electricity
Commercial Electricity	Energy Information Administration State Energy Summaries	Extracted state electricity consumption data and downscaled using a ratio of county commercial jobs out of state commercial jobs	Since utility and state commercial square footage data was unavailable, this alternative was considered most applicable
Industrial Electricity	Energy Information Administration State Energy Summaries	Extracted state electricity consumption data and downscaled using a ratio of county industrial jobs out of state industrial jobs	Since utility and state industrial square footage data was unavailable, this alternative was considered most applicable
Electricity Generation	EPA FLIGHT	Extracted site-specific data per county and directly entered raw metric tons (per GHG)	This data is recorded but emissions are not considered in the GHGI total because the majority of electricity generation emissions are assumed to be captured in the residential, commercial, and industrial electricity emissions
Emissions factors	EPA's eGRID2021	n/a	n/a

Other Sources			
Activity/Source	**Data Source**	**Methodology**	**Data Gaps/Assumptions**
Residential Stationary Fuel	Energy Information Administration State Energy Summaries	Extracted state stationary fuel consumption data and downscaled using a ratio of county households out of state households	Since utility data was unavailable, this alternative was considered most applicable
Commercial Stationary Fuel	Energy Information Administration State Energy Summaries	Extracted state stationary fuel consumption data and downscaled using a ratio based on county commercial jobs out of state commercial jobs	Since utility and state commercial square footage data was unavailable, this alternative was considered most applicable
Industrial Stationary Fuel	EPA FLIGHT	Extracted site-specific data per county and directly entered raw metric tons (per GHG)	Assumed the majority of industrial stationary fuel consumption is captured in EPA FLIGHT
Fugitive emissions from natural gas distribution	Energy Information Administration State Energy Summaries & FLIGHT	Enter natural gas consumption (MMBtu) per county	Used defaults from ClearPath Fugitive Emissions From Natural Gas Distribution Calculator
Fugitive emissions from oil and natural gas systems	EPA FLIGHT	Extracted site-specific data per county and directly entered raw metric tons (per GHG)	Assumed any emissions from natural gas distribution is captured in "Fugitive emissions from natural gas distribution"
Industrial Process & Product use	EPA FLIGHT	Extracted site-specific data per county and directly entered raw metric tons (per GHG)	GHGs are captured internally and entered as CO2 equivalent (CO2e)
Water Treatment Energy	n/a	n/a	Assumed to be captured in the commercial and/or industrial electricity and stationary fuel consumption estimates
Wastewater Treatment Energy	n/a	n/a	Assumed to be captured in the commercial and/or industrial electricity and stationary fuel consumption estimates

Wastewater Treatment	US Census Bureau	Used ClearPath's population-based calculations	Due to the unavailability of site-specific wastewater treatment operations data, we assumed the following: Yes Nitrification/Denitrification, an Industrial Commercial Discharge Multiplier of 1.25, WW generated and treated in boundary, systems are predominantly Anaerobic, Effluent discharge goes into stream/river
Agriculture: Livestock and Crops	U.S. Department of Agriculture's (USDA) 2017 Census of Agriculture, County Data	Extracted livestock headcounts and crop counts and utilized the EPA's State Inventory Tool, Agriculture Module to estimate emissions	Due to the differing categorizations of the EPA's SIT Agriculture Modules and the USDA's 2017 Census of Agriculture county data, the following categories were grouped together/assumptions were made: Milks Cows = Dairy Cows, Cows and heifers that calved = Feedlot Heifers, Cattle/calves = Calves, Beef cows = Beef Cows, Other cattle = Heifer Stockers, Hogs are all assigned to the "Market 120-179 lbs." category, Layers = Layers, Pullets for laying flock replacement = Pullets/ Chickens, Broilers and other meat-type chickens = Broilers, all sheep = Sheep on Feed
Forestry and Land Use	Land Emissions And Removals Navigator (LEARN) Tool	Extracted county-level emissions and removals for forests, changes in forestry, urban trees, etc.	This data is recorded but emissions are not considered in the GHGI total per ICLEI's US Community Protocol (emissions and removals from forestry and land use should not count towards gross emissions) Used Albuquerque, NM as the “representative urban area" for emissions factors

Stationary Fuel Emissions Factors	EPA's GHG Emission Factors Hub	n/a	n/a
Fugitive emissions from natural gas distribution	Environmental Defense Fund's (EDF) User Guide for Natural Gas Leakage Rate Modeling Tool.	n/a	n/a
Wastewater Treatment Emissions Factors	IPCC Methods for Greenhouse Gas Inventories	n/a	n/a
Agriculture Emissions factors	EPA's State Inventory Tool Agriculture Module	n/a	n/a
Forestry and Land Use	U.S. Forest Service's Forest Inventory and Analysis (FIA) database	n/a	n/a

6.3 Appendix C: Greenhouse Gas Reduction Measure Assumptions

GHG Reduction Strategies: Assumptions and Methodologies			
Measure Primary Title	**Data Used**	**Data Gaps/Assumptions**	**Data Source**
1. Residential Energy Efficiency	-4% of existing housing units receiving efficiency retrofit per year -20% Savings from efficiency retrofit of existing buildings -37% Energy savings in new buildings	-5% of building stock per year: Typical heating/cooling equipment life is around 15-20 years, and 20 years translates to 1/20, or 5%, each year. It can make sense to do an efficiency upgrade at the same time as equipment replacement - the efficiency may allow for a smaller, less expensive AC unit or furnace. This was modified to 4% to equate to 100% by 2050 -ACEE reported 10% typical energy savings for a 'light' retrofit and 29% for a 'medium' retrofit - so 20% falls in the middle between those. -Default Energy savings in new buildings was 37%, 37% improvement for new buildings comes from comparing estimated EUI (energy use intensity) for 2018 commercial model energy code with average EUI of existing commercial buildings from 2012 commercial buildings energy consumption survey. -implementation from 2026-2050	Pacific Northwest National Laboratory (PNNL), U.S. Energy Information Administration
2. Residential Electrification	-1% of existing housing units with natural gas electrified per year -20% of new construction electrified -2.45 Heat Pump Coefficient of Performance (COP) -80% Furnace Efficiency	-Default value of existing housing units with natural gas electrified per year is 5%, 5% of building stock per year: Typical heating/cooling equipment life is around 15-20 years, and 20 years translates to 1/20, or 5%, each year.	EnergyStar, Schroders (Peiser, R., & Wiegelmann, T.. "Real Estate and Sustainability: The Moral Imperative." Property Chronicle.)

3. Commercial Energy Efficiency	-4% of existing commercial units receiving efficiency retrofit per year -20% Savings from efficiency retrofit of existing buildings -37% Energy savings in new buildings	-5% of building stock per year: Typical heating/cooling equipment life is around 15-20 years, and 20 years translates to 1/20, or 5%, each year. It can make sense to do an efficiency upgrade at the same time as equipment replacement - the efficiency may allow for a smaller, less expensive AC unit or furnace. This was modified to 4% to equate to 100% by 2050. -ACEE reported 10% typical energy savings for a 'light' retrofit and 29% for a 'medium' retrofit - so 20% falls in the middle between those. -Default Energy savings in new buildings was 37%, 37% improvement for new buildings comes from comparing estimated EUI (energy use intensity) for 2018 commercial model energy code with average EUI of existing commercial buildings from 2012 commercial buildings energy consumption survey. -implementation from 2026-2050	Pacific Northwest National Laboratory (PNNL), U.S. Energy Information Administration
4. Commercial Building Electrification	-1% of existing commercial units with natural gas electrified per year -20% of new construction electrified -2.45 Heat Pump Coefficient of Performance (COP) -80% Furnace Efficiency	-Default value of existing commercial units with natural gas electrified per year is 5%, 5% of building stock per year: Typical heating/cooling equipment life is around 15-20 years, and 20 years translates to 1/20, or 5%, each year.	EnergyStar, Schroders (Peiser, R., & Wiegelmann, T. "Real Estate and Sustainability: The Moral Imperative." Property Chronicle.)

5. Residential Solar PV	-1,344.74 kWh/kW-Generation Potential -121,321.45 kW installed capacity/year	-Solar data based Satellite imagery, 3D modeling, and shade calculations from Google. Baseline years for this data vary by county. -Because Google estimates total rooftop solar capacity without consideration of technical/financial constraints, we assume 15% of estimated capacity is achievable by 2030, and another 50% is achievable by 2050 -Because google outputs rooftop solar potential by roof orientation, we assume all directional orientations are residential	Google Project Sunroof/EIE
6. Commercial Solar PV	-1,344.74 kWh/kW-Generation Potential -101,077.97 kW installed capacity/year	-Solar data based Satellite imagery, 3D modeling, and shade calculations from Google. Baseline years for this data vary by county. -Because Google estimates total rooftop solar capacity without consideration of technical/financial constraints, we assume 15% of estimated capacity is achievable by 2030, and another 50% is achievable by 2050 -Because google outputs rooftop solar potential by roof orientation, we assume all flat roof orientations are non-residential	Google Project Sunroof/EIE
7. Active and Innovative Mobility and Transit	10% Gasoline VMT Reduction by 2050	General benchmark	n/a
8. Electrified Transportation: Lighter Duty Vehicles	-95.63% of Gasoline VMT will switch to EVs by 2050 -100 MPGe	-Follows National LDV Average -Baseline subtracts out Salt Lake City Fleet Gasoline vehicles (Fleet EV turnover is modeled separately) -Assumes all 80% of new charging is in the residential sector, and	DOE Alternative Fuels Data Center, Statista, Rocky Mountain Institute (RMI)

		20% occurs in the commercial sector.	
9. Electrified Transportation: Heavier Duty Vehicles	-99.63% of Diesel VMT will switch to EVs by 2050 -17 MPGe	-Follows National HDV Average -Baseline subtracts out Salt Lake City Fleet diesel vehicles (Fleet EV turnover is modeled separately) -Assumes all new charging is in the commercial sector	DOE Alternative Fuels Data Center, Statista, Rocky Mountain Institute (RMI)
10. Affordable Housing Efficiency and Electrification	Electric use increases from 16.1 to 27.2 MMBtu per unit. This is an increase of 11.1 MMBtu per unit or 23,310 MMBtu in total. Gas use decreases from 49.5 MMBtu per unit to zero. This is a decrease of 49.5 MMBtu per unit or 103,950 MMBtu in total.	See report for more details	Salt Lake County, The Economics of All-Electric New Construction in Utah (E3 - 2022)
11. Campus Energy Commissioning (University of Utah)	~ An estimated 1,296,150 square feet of facilities benefiting from commissioning activities on average annually -2.34 kwh/sqft Electricity Savings -0.01 MMBbtu/sqft Natural Gas Savings	~ Data was based on a 50 building sample, but based on implementation schedule 35 buildings are considered. Because of this, we estimated average kwh/SqFt electricity savings and MMBtu/SqFt natural gas savings, found average SqFt per building, and scaled these averages up to 35 buildings. ~10 years of savings persistence	Intermountain Industrial Assessment Center, University of Utah

12. Community Choice Clean Electricity Program: Utah Renewable Communities (URC)	-Annual CO2e reduction from improving grid intensity	-AVERT desktop edition estimated pollution reduction from 200 MW of solar at 30.2% capacity factor, reflect PacifiCorp 2023 IRP value for Utah solar -2022 values are scaled down using an emissions factor based on NREL's Cambium SRMER Scenario -Proxy solar resources assumed online in 2027 and operating through 2050 -Because Utah's entire grid will experience GHG reduction from this program, we estimated Salt Lake MSA's % of eligible MWh is approximately 72.86%. Therefore, we applied this percentage to the total CO2e reduced. -Since this program affects all building sectors, we applied a ratio (each sector's share of electricity usage) to the total, in order to apply GHG reductions per building sector (this does not include non-energy sector baselines).	NREL; Salt Lake City Sustainability Department
13. Community Tree Canopy and Urban Forests	-American Elm, 132.46 MT/year -Bigleaf maple, 154.53 MT/year -Locust sp. (Gleditsia), 88.30 MT/year	-Sequestered CO2 totals were provided in year ranges, we chose 2025-2050, and calculated average MT reduction per species per year	Salt Lake City Sustainability Department
14. Municipal Vehicle Fleet Electrification	~51% of Gasoline VMT will switch to EVs by 2030; 100 MPGe ~8% of Diesel VMT will switch to EVs by 2030; 17 MPGe	~Since CNG conversion was insignificant compared to gasoline, it is excluded for the PCAP. ~51% turnover was originally for light-duty vehicles, however we applied this to all gasoline vehicles ~8% turnover was originally for heavy-duty, however we applied this to all diesel vehicles	Salt Lake City Sustainability Department

15. Biodigester for Combined Heat and Power	A GHG reduction estimate was provided by SLCDPU based on internal calculations and technical evaluation of new or upgraded facility potential.	A GHG reduction estimate was provided by SLCDPU based on internal calculations and technical evaluation of new or upgraded facility potential.	Salt Lake City Department of Public Utilities

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