‘A‘ohe hana nui ke alu ‘ia
No task is too big when done together

Hawai‘i Priority Climate Action Plan

March 1, 2024

Photo Credit: Hawai‘i Tourism Authority (HT) / Heather Goodman

A native Koa sapling, and ipu wai to water it, is lovingly planted in a historical forest land to symbolize the return to traditional practices alongside modern science for the regeneration, hope, and collaboration required for a climate ready Hawai‘i.

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Hui Participants: Mahalo nui to our partners who attended meetings and engaged in deliberations. They are:

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Forest Solutions Hawai‘i
Hawai‘i Agriculture Research Center
Hawai‘i Board of Water Supply
Hawai‘i Cattlemen's Council
Hawai‘i Climate Coalition
Hawai‘i Department of Agriculture
Hawai‘i Department of Business, Economic Development and Tourism
Hawai‘i Department of Health
Hawai‘i Department of Hawaiian Homes Lands
Hawai‘i Department of Land and Natural Resources
Hawai‘i State Energy Office
Hawai‘i Department of Transportation
Hawai‘i Energy
Hawai‘i Gas
Hawai‘i Green Growth
Hawai‘i Green Infrastructure Authority
Hawai‘i Islands Land Trust
Hawai‘i Office of the Governor
Hawai‘i Pacific University
Hawai‘i Public Utilities Commission Hawai‘i
Rangeland Stewardship Foundation
Hawaiian Airlines
Hawaiian Electric
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Acronyms and Abbreviations

AFOLU	Agriculture, Forestry, and Other Land Use
ALICE	Asset Limited, Income Constrained, and Employed
CAB	Clean Air Branch
CARP	County of Maui Climate Action and Resiliency Plan
CARPAC	Climate Action and Resiliency Plan Advisory Committee
CCMAC	Hawai‘i Climate Change Mitigation and Adaptation Commission
CE	Circular Economy
CPRG	Climate Pollution Reduction Implementation Grants
DBEDT	Department of Business, Economic Development and Tourism
DLNR	Hawai‘i Department of Land and Natural Resources
DOH	Department of Health (Hawai‘i)
DOH-CAB	Hawai‘i Department of Health-Clean Air Branch
ENSO	El Niño- Southern Oscillation Years
GHG	Greenhouse Gas
HAR	Hawai‘i Administrative Rules
HCEI	Hawai‘i Clean Energy Initiative
HPUC	Hawai‘i Public Utilities Commission
HGIA	Hawai‘i Green Infrastructure Authority
DOH	Hawai‘i Department of Health
HEER	Hawai‘i Department of Health’s Hazard Evaluation and Emergency Response
HPUC	Hawai‘i Public Utilities Commission
HRS	Hawai‘i Revised Statute
HRS	Department of Health – Clean Air Branch
HSEO	Hawai‘i State Energy Office
IPCC	Intergovernmental Panel on Climate Change
IPPU	Industrial Processes and Product Use
KCAAP	County of Kaua‘i Climate Adaptation and Action Plan
LIDAC	Low-Income and Disadvantaged Communities
LMI	Low to Moderate Income
MMT CO2e	Million metric tons of carbon dioxide equivalent
NCA5	Fifth National Climate Assessment
PCAP	Priority Climate Action Plan
RFI	Request for Information
RPS	Renewable Portfolio Standards
SLH	Session Laws of Hawai‘i
TWG	Technical Working Group
UNFCCC	United Nations Framework Convention on Climate Change
U.S. EPA	United States Environmental Protection Agency

Disclaimer

The contents of this document do not necessarily reflect the views and policies of the U.S. Environmental Protection Agency (EPA), nor does the EPA endorse trade names or recommend the use of commercial products mentioned in this document.

The measures contained herein should be construed as broadly available to any entity in the state eligible for receiving funding under the EPA's Climate Pollution Reduction Implementation Grants (CPRG) and other funding streams, as applicable.

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Introduction

The climate crisis has already cost Hawai‘i lives, a price much higher and more devastating than even the most pessimistic predicted. Hawai‘i now has a clearer understanding of the need for urgent action. This Priority Climate Action Plan (PCAP) outlines seventeen (17) actions across islands and sectors to reduce future climate impacts. To create the PCAP, the Hawai‘i Climate Change Mitigation and Adaptation Commission (CCMAC) partnered with the Hawai‘i State Energy Office (HSEO), the Hawai‘i Department of Land and Natural Resources (DLNR), all four Hawai‘i counties, and competitively selected community partners to identify immediate actions that can be taken to reduce greenhouse gases (GHG) and air pollution, create high-quality jobs, spur economic growth, and enhance the quality of life for all who live, work, and play in Hawai‘i.

The PCAP outlines Hawai‘i’s priority measures to reduce GHG emissions and achieve climate change goals in a manner that is clean, equitable, and resilient. The seventeen (17) priority measures detailed in the PCAP address GHG reductions from 2025 through 2050. These priority measures complement Hawai‘i's existing climate policies and initiatives that mitigate emissions and were chosen based on their GHG reduction potential, high degree of implementation readiness, cost-effectiveness, and the additional community benefits they provide.

The priority measures are “shovel-ready” and can be completed within the five-year performance period of the Implementation Grant. The measures will achieve significant cumulative GHG reductions by 2030 and beyond and provide substantial community benefits including reducing the cost of living through energy efficiency and improved public transportation and multimodal options, waste reduction and diversion, natural resource restoration, enhanced local food production, and the reduction of fire risk--particularly in low-income and disadvantaged communities. The measures are replicable to be “scaled up” across multiple jurisdictions to maximize GHG reductions and community benefits across the state. All the PCAP priority measures advance Hawai‘i’s climate goals and reflect the State’s Climate Change Mitigation and Adaptation Commission’s mission statement to advance strategies that are “clean, equitable, and resilient.”

Hawai‘i has high ambition in addressing climate change and is an early mover in the fight against climate change. For Hawai‘i, as with its Pacific Island neighbors, climate change is an existential threat. In 2015, to avoid the worst impacts of climate change, countries around the world signed the Paris Agreement to keep global warming “well below” 2 degrees Celsius, to limit warming to 1.5 degrees Celsius.[1] When the previous administration announced the United States' withdrawal from the Paris Agreement on June 1, 2017, Hawai‘i, expressed strong opposition to this decision, and took several actions to reaffirm its commitment to climate action. In 2017, Hawai‘i reaffirmed its commitment to the goals outlined in the Paris Agreement and established the Hawai‘i Climate Change Mitigation and Adaptation Commission (CCMAC) that provides the

[1] United Nations Framework Convention on Climate Change (2015). Paris Agreement, https://unfccc.int/sites/default/files/english_paris_agreement.pdf

strong framework for a coalition of partners at the state and county levels to address climate change issues through mitigation, adaptation, and resilience to accelerate Hawai'i's response to climate change. Hawai'i again reaffirmed this comitment with Act 238 (Session Laws of Hawaii, or SLH 2022) which codified in Hawai'i Revised Statutes (HRS) §225P-5, requires Hawai'i to reduce GHG emissions by at least 50 percent below 2005 levels by 2030 and 100% by 2045, in line with the United States' Paris Agreement commitments and Nationally Determined Contribution. [2]

Equity is at the center of Hawai'i's response to climate change. The CCMAC "recognizes the urgency of climate threats and the need to act quickly." Though climate change affects communities around the globe, the impacts of climate change are not equal, with some regions disproportionally impacted due to geographic location and socio-demographic characteristics. Climate change exacerbates existing inequalities in vulnerable and historically marginalized communities. To build climate equity, it is essential to center the voices and strengths of historically underserved communities and acknowledge the institutions and policies that are responsible for these disparities. Recognizing this, CCMAC puts equity at the center of its mission statement, to quickly "promote ambitious climate-neutral culturally responsive strategies for climate change mitigation and adaptation in a manner that is clean, equitable and resilient."

Hawai'i's four counties and HSEO (through the Department of Business, Economic Development and Tourism) are represented on the CCMAC, and for the purposes of the PCAP, comprise a Coalition. The PCAP describes the Coalition's effort to identify and advance priority measures to reduce GHG emissions in the state.

The Hawai'i PCAP is organized into the following sections to conform to the requirements and guidelines outlined by EPA:

1. Introduction
2. Greenhouse Gas (GHG) Emissions Inventory
3. Emissions Projections and Reduction Targets
4. Overview of Current State Action
5. Priority Measures for Implementation
6. Benefits Analysis
7. Low-Income/Disadvantaged Community Benefits Analysis
8. Review of Authority to Implement
9. Intersection with Other Funding Availability
10. Workforce Planning Analysis
11. Coordination and Outreach
12. Conclusion

[2] Act 238, SLH (2022), An Act Relating to Climate Mitigation, https://www.capitol.hawaii.gov/sessions/session2022/bills/GM1340_.PDF

Greenhouse Gas (GHG) Emissions Inventory

The State of Hawai‘i is committed to reducing its contribution to global climate change and has made efforts to measure and reduce statewide GHG emissions. Hawai‘i met its goal to achieve emission levels at or below Hawai‘i’s 1990 GHG emissions, excluding emissions from aviation, by January 1, 2020 (Act 234 SLH 2007). However, Hawai’i’s GHG reference, or business as usual, projections show that the state is not on track to meet the Act 238 target (50% below 2005 by 2030) or Act 15 (net negative GHG levels by 2045). The 2019 inventory highlights the need for additional GHG reductions beyond business as usual, including the priority measures in this PCAP.

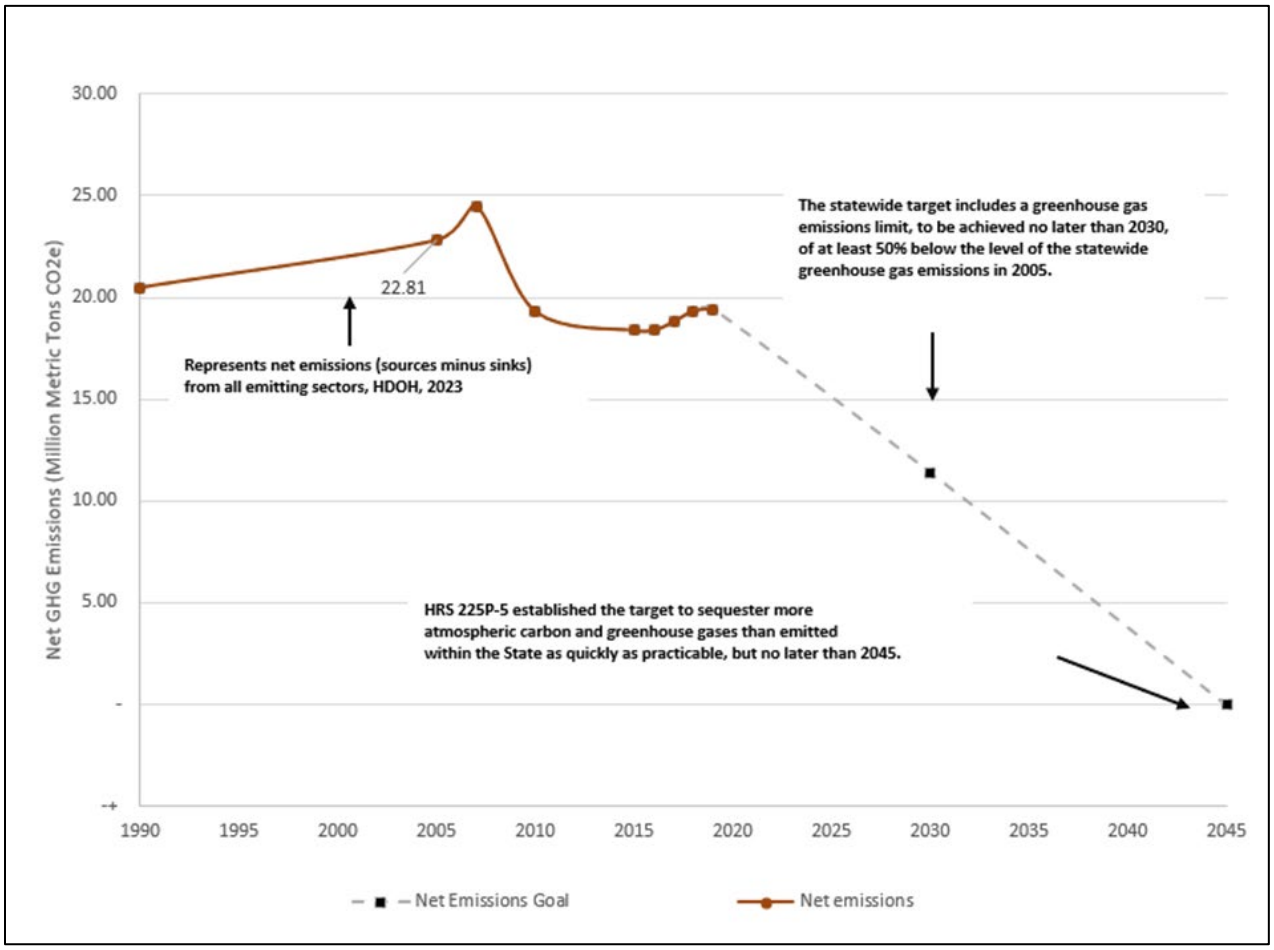
Act 238 SLH 2022, built upon Act 15 SLH 2018, which established a statewide carbon net-negative goal by 2045. In addition, Act 238 set an interim target, requiring GHG emissions be at least 50 percent below 2005 levels by 2030; and requires the DOH to complete an annual GHG inventory report to track emissions and the state’s progress toward climate targets. To track progress toward achieving Hawai‘i’s GHG reduction goals, the latest GHG inventory presents 1990, 2005, 2007, 2010, 2015, 2016, 2017, 2018, and 2019 emissions estimates; as well as emission projections for 2020, 2025, 2030, 2035, 2040, and 2045.[3]

The latest statewide Hawai‘i inventory estimates the total in-state GHG emissions to be 22.01 million metric tons of carbon dioxide equivalent (MMT CO2e) in 2019. Inclusive of emission sinks, Hawai‘i’s net GHG emissions in 2019 were 19.42 MMT CO2e. The 2019 inventory also outlines emission projections for Hawai‘i through 2045, with estimated GHG emissions (excluding aviation) of 11.58 MMT in 2020, 9.38 MMT in 2030, and 5.36 MMT in 2045.

Figure 1 shows Hawai‘i’s statewide net emissions (sources minus sinks) from 1990 to 2019 (solid blue line) as well as the emissions trajectory needed to achieve the 2030 and 2045 GHG targets (solid green line). Notably, GHG emissions have remained relatively stable from 2016 through 2019 highlighting the need for additional mitigation to achieve Hawai‘i’s ambitious GHG targets.

[3] State of Hawaii, Department of Health. Greenhouse Gas Inventory (2023). Hawai‘i Greenhouse Gas Emissions Report for 2005, 2018, and 2019, https://health.hawaii.gov/cab/files/2023/05/2005-2018-2019-Inventory_Final-Report_rev2.pdf

Figure 1: Hawai‘i GHG emissions 1990 – 2019 with Emissions Trajectory to 2030 and 2045 Targets. Data source – State Department of Health, Greenhouse Gas Inventory



GHG Methodology

The Hawai‘i Department of Health uses standards from the IPCC to estimate Hawai‘i’s GHG emissions.[4] The 2006 IPCC Inventory Guidelines are a nationally and internationally recognized standard accepted by the United Nations Framework Convention on Climate Change (UNFCCC) and the US Environmental Protection Agency (EPA).[5] While these methods are standard, states can add additional metrics to better capture their unique circumstances and policy goals.

[4] Hawai‘i State Energy Office (2023). Hawai‘i Pathways to Decarbonization: Report to the 2024 Hawai‘i State Legislature, https://energy.hawaii.gov/wp-content/uploads/2022/10/Act-238_HSEO_Decarbonization_FinalReport_2023.pdf

[5] Intergovernmental Panel on Climate Change (2006). IPCC Guidelines for National Greenhouse Gas Inventories, https://www.ipcc-nggip.iges.or.jp/public/2006gl/

To analyze emission sources, the IPCC provides estimation methods for different economic sectors. Sectors are further divided into individual categories and subcategories. For instance, in the energy sector, fuel combustion represents an emissions category while petroleum refining is a subcategory. It is important to note that estimates are as good as the granularity of input data available. Some data categories are harder to measure than others. For example, emissions from point sources such as power plants are heavily regulated, and thus tracked, whereas for transportation or agriculture sectors emissions are from nonpoint sources and therefore emissions accounting relies on standard multipliers (such as acres or population) to estimate annual emissions. For more information on how the state's inventory is compiled and calculated, see the latest inventory report, "Hawai'i Greenhouse Gas Emissions Report for 2005, 2018, 2019" found in Appendix A.[6]

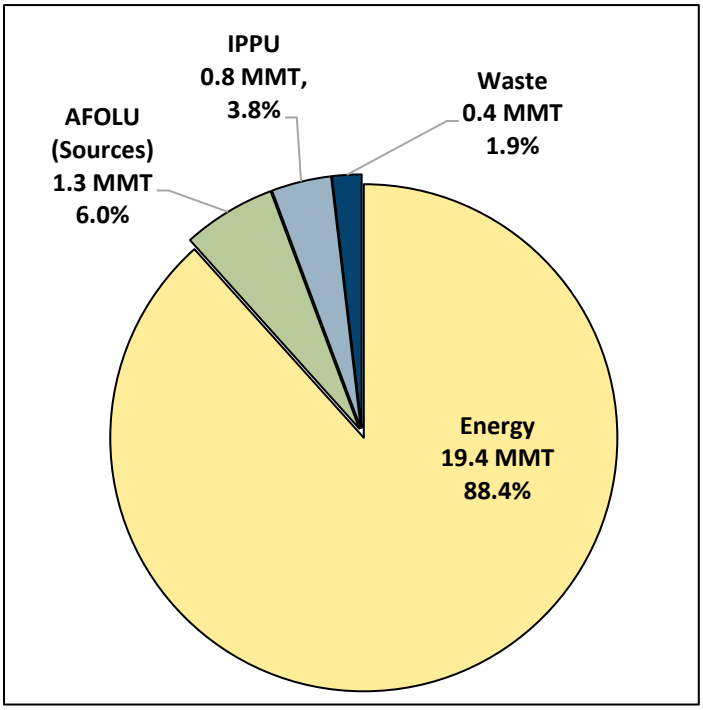
GHG Emissions by Sector

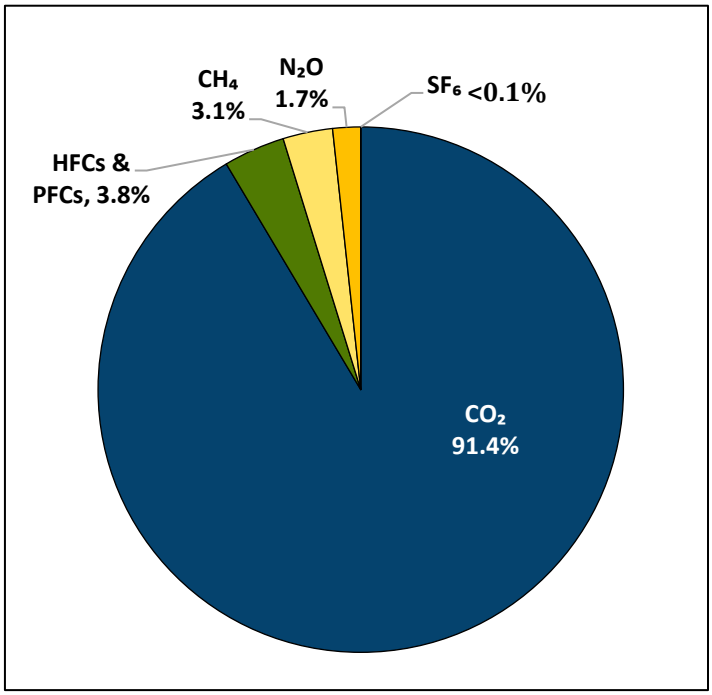
In 2019, total statewide emissions were estimated to be 22.01 MMT CO2e. The energy sector represented the largest contributor of emissions in the state accounting for 88 percent of total emissions. Other sectors made up a small portion of emissions, the Industrial Processes and Product Use (IPPU) emissions accounted for 3.8 percent of Hawai'i's emissions, the waste sector emissions were 1.9 percent of statewide emissions, and the agriculture, forestry, and other land use (AFOLU) sector sources were about 6 percent of emissions. Notably however, the AFOLU sector also provided an emissions sink of 2.6 MMT or about 12 percent of total emissions. Carbon dioxide (CO2) accounted for 91 percent of total GHG emissions, using 100-year global warming potentials from the IPCC Fourth Assessment Report.[7]

[6] State of Hawai'i, Department of Health.(n.d.). Hawai'i Greenhouse Gas Program, https://health.hawaii.gov/cab/hawaii-greenhouse-gas-program/

[7] State of Hawai'i, Department of Health.(n.d.). Hawai'i Greenhouse Gas Program, Hawaii Greenhouse Gas Emissions Report for 2005, 2018, and 2019: Final Report. https://health.hawaii.gov/cab/hawaii-greenhouse-gas-program/

Figure 2: Hawai‘i 2019 GHG Emissions by Sector and Gas





Note: percentages represent the percent of total emissions, not including sinks, excluding aviation.

Hawai‘i’s GHG Emissions by sector and category for completed inventory years are shown in Table 1 below.

Table 1: Hawai‘i Greenhouse Gas Emissions (MMT CO2e) by Sector or Category for Completed Years

Sector or Category	1990	2005	2007	2010	2015	2016	2017	2018	2019
Energy	**20.26**	**22.71**	**24.35**	**19.38**	**18.50**	**18.52**	**18.97**	**19.23**	**19.44**
Stationary Combustion	8.47	9.56	9.37	8.89	8.16	7.95	8.08	8.15	8.33
Energy Industries	6.38	8.33	8.31	7.86	7.11	7.01	7.00	7.12	7.21
Residential	0.05	0.07	0.06	0.09	0.06	0.07	0.07	0.06	0.06
Commercial	0.76	0.37	0.30	0.37	0.47	0.47	0.54	0.55	0.60
Industrial	1.29	0.80	0.69	0.56	0.51	0.39	0.48	0.43	0.45
Transportation	11.13	12.58	14.40	9.93	9.72	9.97	10.31	10.47	10.68
Ground	3.73	5.04	5.15	4.20	4.29	4.22	4.16	4.13	4.03
Domestic Marine	1.54	0.38	2.81	0.58	0.28	0.40	0.49	0.37	0.65
Domestic Aviation	3.68	6.12	4.85	3.98	4.29	4.38	4.61	4.78	4.95
Military Aviation	1.42	1.03	0.80	0.66	0.81	0.80	0.85	0.86	0.88
Military Non-Aviation	0.77	0.02	0.79	0.51	0.05	0.17	0.20	0.32	0.16
Incineration of Waste	0.18	0.15	0.15	0.19	0.27	0.27	0.23	0.26	0.28
Oil and Natural Gas Systems	0.43	0.39	0.39	0.32	0.31	0.29	0.31	0.30	0.11
Non-Energy Uses	0.04	0.04	0.04	0.05	0.05	0.04	0.04	0.04	0.04
International Bunker Fuels	*1.58*	*2.25*	*1.10*	*1.32*	*1.56*	*1.55*	*1.76*	*1.78*	*1.64*
CO_2 from Wood Biomass and Biofuels Consumption	*2.43*	*0.59*	*0.88*	*1.24*	*1.40*	*1.49*	*1.26*	*1.29*	*1.28*
IPPU	**0.17**	**0.53**	**0.58**	**0.71**	**0.83**	**0.83**	**0.83**	**0.83**	**0.84**
Cement Production	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Substitution of Ozone Depleting Substances	+	0.50	0.57	0.70	0.82	0.82	0.82	0.82	0.83

Sector or Category	1990	2005	2007	2010	2015	2016	2017	2018	2019
Electrical Transmission and Distribution	0.07	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01
AFOLU (Sources)	**1.55**	**1.22**	**1.29**	**1.24**	**1.28**	**1.29**	**1.28**	**1.48**	**1.31**
Enteric Fermentation	0.31	0.28	0.29	0.27	0.24	0.25	0.25	0.25	0.25
Manure Management	0.13	0.05	0.03	0.02	0.02	0.02	0.02	0.02	0.02
Agricultural Soil Management	0.18	0.16	0.17	0.16	0.16	0.17	0.17	0.17	0.18
Field Burning of Agricultural Residues	0.03	0.03	0.01	0.01	0.01	0.01	+	0.00	0.00
Urea Application	+	+	+	+	+	+	+	+	+
Agricultural Soil Carbon	0.80	0.68	0.67	0.76	0.82	0.82	0.83	0.83	0.83
Forest Fires	0.10	0.03	0.12	0.01	0.04	0.02	0.01	0.20	0.04
AFOLU (Sinks)	**(2.43)**	**(2.56)**	**(2.57)**	**(2.58)**	**(2.72)**	**(2.69)**	**(2.68)**	**(2.59)**	**(2.59)**
Landfilled Yard Trimmings and Food Scraps	(0.12)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)	(0.06)	(0.05)
Urban Trees	(0.51)	(0.66)	(0.64)	(0.58)	(0.60)	(0.60)	(0.61)	(0.62)	(0.63)
Forest Carbon	(1.79)	(1.86)	(1.89)	(1.95)	(2.07)	(2.04)	(2.02)	(1.91)	(1.91)
Waste	**0.93**	**0.91**	**0.82**	**0.55**	**0.47**	**0.43**	**0.40**	**0.38**	**0.41**
Landfills	0.81	0.76	0.67	0.44	0.36	0.32	0.29	0.28	0.30
Composting	0.02	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.03
Wastewater Treatment	0.11	0.12	0.12	0.07	0.07	0.07	0.07	0.07	0.07
Total Emissions (Excluding Sinks)	**22.91**	**25.37**	**27.04**	**21.88**	**21.08**	**21.07**	**21.48**	**21.92**	**22.01**
Net Emissions (Including Sinks)	**20.48**	**22.81**	**24.47**	**19.29**	**18.37**	**18.38**	**18.80**	**19.33**	**19.42**
Aviation	**5.10**	**7.14**	**5.65**	**4.64**	**5.10**	**5.18**	**5.47**	**5.64**	**5.83**
Net Emissions (Including Sinks, Excluding Aviation)	**15.38**	**15.66**	**18.81**	**14.65**	**13.27**	**13.20**	**13.33**	**13.69**	**13.59**

Source: DOH GHG Emissions Report for 2005, 2018 and 2019. Final Report. April 2023

+ Does not exceed 0.005 MMT CO2e; NO (emissions are Not Occurring).a Emissions from the incineration of waste are reported under the Energy sector, consistent with the U.S. Inventory, since the incineration of waste generally occurs at facilities where energy is recovered. b Emissions from International Bunker Fuels and CO2 from Wood Biomass and Biofuel Consumption are estimated as part of this inventory report but are not included in emission totals, as per IPCC (2006) guidelines. c Act 238 of 2022 aims for the level of statewide GHG emissions to be at least 50 percent below 2005 levels by the year 2030 (including aviation emissions).

GHG Emissions Projections and Reduction Targets

Emission Projections

Projections indicated that business-as-usual practices will not meet GHG reduction targets. A combination of top-down and bottom-up approaches were used to develop baseline projections of statewide and county-level GHG emissions for the years 2020, 2025, 2030, 2035, 2040, and 2045.[8] Several categories (residential, commercial, and industrial energy use, domestic and international aviation, non-energy uses, and composting and wastewater treatment) were projected based on either long-range forecasts for gross state or county product or future population (including visitor arrivals), using the 2019 statewide GHG inventory as a starting point. For several small categories, category-specific approaches were taken. For example, for electrical transmission and distribution, electricity sales forecasts were used to project GHG emissions. For AFOLU categories and landfill waste, emissions were projected by forecasting activity data using historical trends and published information available on future trends. For GHG-emitting sources for which there has been substantial federal and state policy intervention (energy industries, RPS, substitution of ozone-depleting substances, and transportation), bottom-up approaches were used. Due to policies affecting these sources, projected economic activities are only one component of future GHG emissions. Therefore, a more comprehensive sectoral approach was used to develop baseline projections for these emission sources.

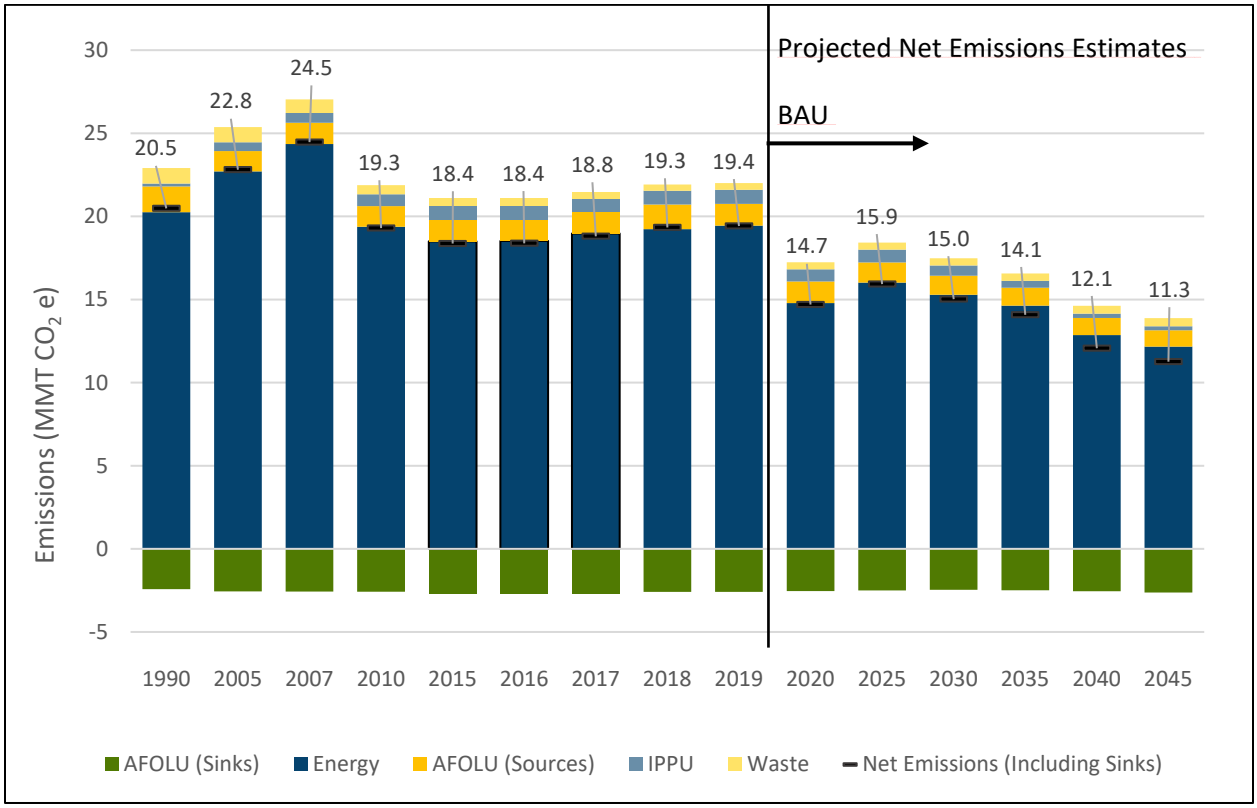
Based on the analysis presented in the latest GHG inventory report, net GHG emissions (excluding aviation) in 2020 were projected to be lower than net GHG emissions (excluding aviation) in 1990. Net GHG emissions (including aviation) in 2030 were projected to be greater than the target emissions level of 50 below 2005 levels (including aviation), and in 2045 are projected to be greater than the net-negative target. While the development of future inventory reports as well as ongoing quantitative assessment of uncertainties will further inform whether Hawai‘i met the 2020 statewide target and is going to meet the 2030 and 2045 statewide targets, this report finds that, under existing policies and economic projections, Hawai‘i is currently expected to meet the 2020 target, but is not expected to meet the 2030 and 2045 targets.

Figure 3 shows net GHG emissions for each historical and projected inventory year using the baseline scenario. Projections of statewide emissions and sinks by sector for 2020, 2025, 2030, 2035, 2040, and 2045 are summarized in Table 2. For more information on methodology, assumptions, and other details, see report “Hawai‘i Greenhouse Gas Emissions Report for 2005, 2018, 2019” found in Appendix A.[9]

[8] State of Hawai‘i, Department of Health. Greenhouse Gas Inventory (2023). Hawai‘i Greenhouse Gas Emissions Report for 2005, 2018, and 2019, https://health.hawaii.gov/cab/files/2023/05/2005-2018-2019-Inventory_Final-Report_rev2.pdf

[9] State of Hawai‘i, Department of Health.(n.d.). Hawai‘i Greenhouse Gas Program, https://health.hawaii.gov/cab/hawaii-greenhouse-gas-program/

Figure 3: Net GHG Emissions for each Historical and Projected Inventory Year



Note: Projections use baseline scenarios from the DOH Inventory.

Table 2. Hawai'i GHG Emission Projections (MMT CO2e) by Sector under the Baseline Scenario, 2020, 2025, 2030, 2035, 2040, and 2045

Sector	2020 Baseline	2025 Baseline	2030 Baseline	2035 Baseline	2040 Baseline	2045 Baseline
Energy [a]	14.79	16.02	15.29	14.63	12.86	12.16
Industrial Processes and Product Use (IPPU)	0.73	0.76	0.62	0.41	0.26	0.25
Agriculture, Forestry, and Other Land Use (AFOLU)	(1.25)	(1.29)	(1.32)	(1.41)	(1.52)	(1.64)
Waste	0.42	0.43	0.43	0.45	0.47	0.49
Total Emissions (Excluding Sinks)	**17.24**	**18.43**	**17.49**	**16.57**	**14.62**	**13.88**
Net Emissions (Including Sinks)	**14.70**	**15.93**	**15.02**	**14.08**	**12.07**	**11.26**
Aviation [b]	3.11	5.47	5.65	5.75	5.82	5.89
Net Emissions (Including Sinks, Excluding Aviation) [b]	**11.59**	**10.45**	**9.37**	**8.33**	**6.25**	**5.37**

[a] Emissions from International Bunker Fuels are not included in the totals, as per IPCC (2006) guidelines.
[b] Domestic aviation and military emissions, which are reported under the Energy sector, are excluded from this analysis.
Note: Totals may not sum due to independent rounding. Parentheses indicate negative values or sequestration.

Projections indicated that business-as-usual practices will not meet GHG reduction targets. Net emissions are projected to be 15.94 MMT CO2e in 2025, 15.03 MMT CO2e in 2030, and 11.25 MMT CO2e in 2045 far overshooting set goals. Relative to 2019, total emissions under the baseline projection scenario are modeled to decrease by 16 percent by 2025, 21 percent by 2030, and 37 percent by 2045. This trend is largely driven by the projected trend in emissions reduction from energy industries (i.e., electric power plant conversion to comply with RPS mandates), which are expected to decrease substantially between 2019 and 2045.

Overview of Current State Action

The State's role in providing an enabling policy and legislative framework is essential for local jurisdictions and communities to adequately address equity issues of mitigation, adaptation, and resilience. [10] Over the past two and a half decades, several state laws have been established to address climate change mitigation, adaptation, and resilience. As summarized in Act 32, SLH 2017, "Hawai'i has a tradition of environmental leadership, having prioritized policies regarding conservation, reduction in greenhouse gas emissions, and development and use of alternative renewable energy. The legislature has passed numerous policies and mandates over the last decade to address climate change."[11]

The priority measures listed within this PCAP complement existing policy or provide GHG reduction where policies and/or targets are lacking enforcement mechanisms or funding.

Key laws driving GHG mitigation and emission reduction in Hawai'i include:

1) HRS §225P-5. GHG Emission and Sequestration Target. Established target to "sequester more atmospheric carbon and greenhouse gases than emitted within the State as quickly as practicable, but no later than 2045", effectively establishing a net-negative emissions target.
2) HRS §342B Part VI. Relates to Air Pollution Control and Greenhouse Gas Emissions. Requires the State DOH-CAB to complete a greenhouse gas emissions inventory report each year beginning after 2017 to track emissions and determine the State's progress in the reduction of greenhouse gas emissions; establishes a GHG emission limit.
3) HRS §269-92. Renewable Energy Portfolio Standard. Requires each electric utility to meet 100% renewable energy generation by 2045. Establishes interim targets of 40% net electricity generation by December 31, 2030; 70% of its net electricity generation by December 31, 2040; and 100% of its net electricity generation by December 31, 2045. Previous target years of 10% by 2010, 15% by 2015, and 30% by 2020 were all met.
4) HRS §196-10.5. Hawai'i Clean Energy Initiative. Hawai'i's energy transition conversation first launched as the Hawai'i Clean Energy Initiative (HCEI) in 2008. In 2014, the HCEI renewed Hawai'i's commitment to setting bold clean energy goals, including achieving the nation's first-ever 100 percent renewable portfolio standards (RPS) by 2045.
5) HRS §225P-3. Establishes a statewide Climate Change Mitigation and Adaptation Commission (CCMAC). Affirms commitment to the US's pledges under the Paris Agreement to combat climate change by systematically reducing greenhouse gas emissions and improving resilience to climate change. Requires participation of the heads of several key state agencies and legislative committees.
6) HRS §269-96. Energy Efficiency Portfolio Standard (EEPS). 4,300 gigawatt hours of electricity use reductions statewide by 2030. The HPUC may establish incentives and

[11] Act 32, SLH (2017). A Bill for an Act Relating to Climate Change, https://www.capitol.hawaii.gov/slh/Years/SLH2017/SLH2017_Act32.pdf

penalties based on performance in achieving the energy-efficiency portfolio standards (EEPS) by rule or order. There is a current administrative, governor-supported bill to extend the EEPS to 2045.

7) HRS §269-121. Public benefits fee authorization. Allows a portion of the moneys collected by Hawai'i's electric utilities from its ratepayers through a demand-side management surcharge to establish public benefits fee. The public benefits fee shall be used to support clean energy technology, demand response technology, and energy use reduction, and demand-side management infrastructure, programs, and services
8) HRS §196-63 and 196-64. Hawai'i Green Infrastructure Authority (HGIA). The HGIA manages the Hawai'i Green Energy Market Securitization (GEMS) Program and brings clean energy technologies to Hawai'i ratepayers, including those who are underserved, by providing innovative financing products that result in electricity bill savings for customers with no money down. The GEMS Program is intended to create a sustainable financing structure through market-driven public-private partnerships that will open access to financing for more Hawai'i customers and democratize access to clean energy.
9) HRS §196 . Act 239 (2022) added two new sections addressing energy efficiency implementation for state facilities. Requires state facilities over 10,000 square feet to implement cost-effective energy efficiency measures, requires, where feasible and cost-effective, the design of all new state building construction to maximize energy and water efficiency and energy generation potential and to use building materials that reduce the carbon footprint of the project.
10) HRS §103D-412. Motor Vehicle requirements for state fleets. All agencies purchasing or leasing light-, medium-, and heavy-duty motor vehicles shall seek vehicles that reduce dependence on petroleum-based fuels that meet the needs of the agency. Priority shall be 1) ZEVs, 2) plug-in hybrid electric vehicles, 3) alternative fuel vehicles; and 4) hybrid electric vehicles.

Priority Measures for Implementation

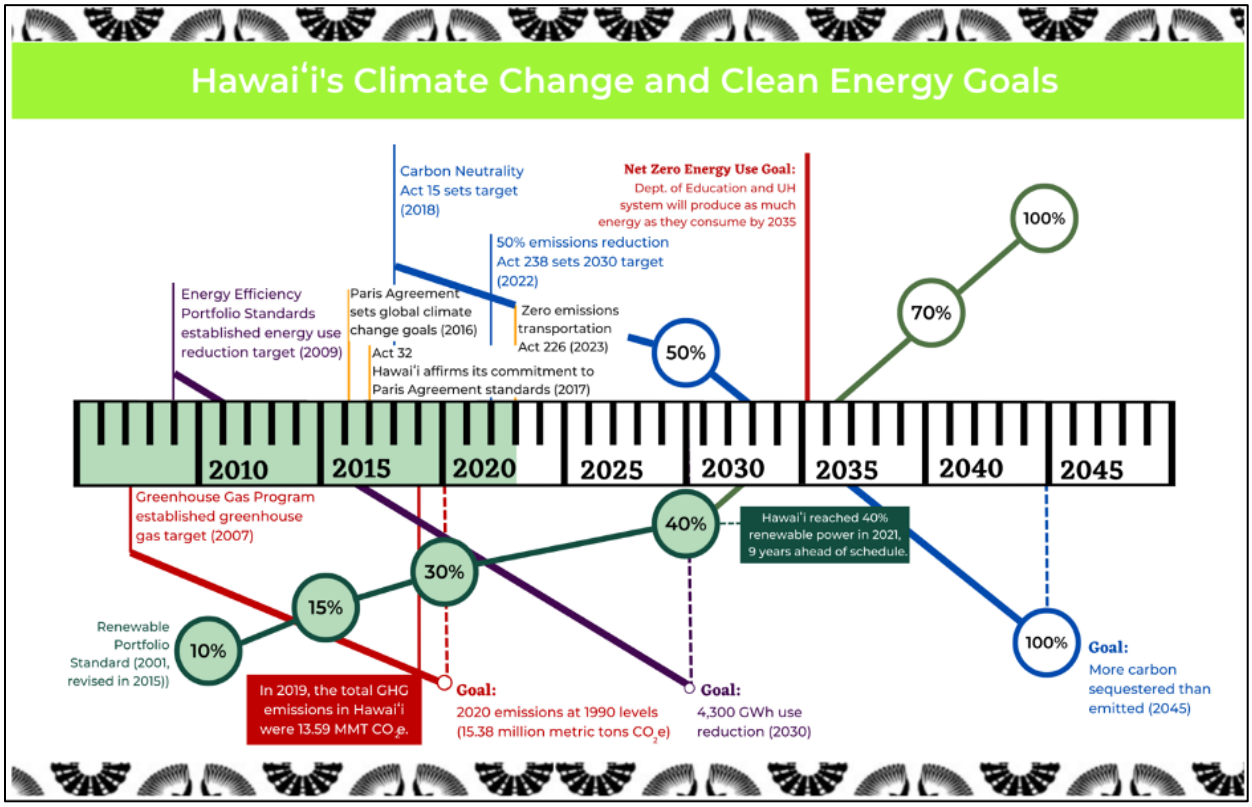
Identification and Selection Process for Priority Measures

The measures in this section have been identified as priority measures for Hawai'i to pursue funding through CPRG implementation grants. The priority measures achieve significant cumulative greenhouse gas (GHG) reductions by 2030 and beyond; achieve substantial community benefits (such as reduction of criteria air pollutants (CAPs) and hazardous air pollutants (HAPs), particularly in low-income and disadvantaged communities; are eligible for complementary funding sources to maximize measure GHG reductions and community benefits or have funding needs that are unmet by other opportunities; and, pursue innovative policies and programs that are replicable and can be "scaled up" across multiple jurisdictions of the state.

Hawai'i's priority measures accelerate climate mitigation in a manner that is equitable and provides resilience. Hawai'i's PCAP contains seventeen (17) priority measures for reducing GHG

emissions from 2025-2050 period. These priority measures are implementation ready, with each containing a full scope of work and budget. Each measure can be completed within the five-year performance period of EPA's Implementation Grant. All the priority measures described here advance Hawai'i's state climate goals and reflect the State's CCMAC mission statement to advance strategies that are "clean, equitable, and resilient." The state's many climate change and clean energy goals are outlined below in Figure 4.

Figure 4: Hawai'i Climate Change and Clean Energy Goals and Associated Timelines



Source: Hawai'i Climate Change Mitigation and Adaptation Commission

This Priority Climate Action Plan (PCAP) has been developed through a targeted engagement of key governmental agencies and community stakeholders. A statewide hui (working group) has been working since April 2023 to review the Hawai'i GHG inventory and emissions projections, and identify priority measures across the state, counties, and in the nonprofit sector. Hui members represent the Departments of Education, Agriculture, Land and Natural Resources, Transportation, Health, Business, Tourism and Economic Development, Hawai'i Emergency Management Agency, the County of Maui, the County of Hawai'i, the County of Kaua'i, and the City and County of Honolulu, and other state, county, university, and non-governmental agencies.

The hui worked through 15 sector-level technical working groups (TWGs), with topics ranging from alternative fuels, electric vehicles, and aviation to industrial processes and product usage to agriculture, land use and forestry, and wastewater. Input received through the TWGs

supported the development of this PCAP. The CCMAC and its members reviewed the hui's work and made final decisions on priority measures.

The Hawai'i PCAP also builds on Hawai'i's Act 238 Decarbonization Report, released in 2023, as well as state efforts and county climate action plans to formulate a list of priority GHG reduction and mitigation actions within key sectors--transportation, buildings, waste, agriculture, forests, and other land uses --that are ready for implementation.

The list of priority measures was developed following consultations with the hui, the CCMAC, TWGs, and stakeholders to ensure the targets key climate mitigation priorities, advance equity, and maximize co-benefits. Each measure complements existing Hawai'i climate initiatives. More details on the consultation process are provided in the Coordination and Outreach section. Outreach and community engagement is considered an ongoing process as it is critical to engage all host communities and interested groups from the earliest stages of planning to project completion and beyond.

Hawai'i's priority measures were developed through a public process and community engagement. The state issued a Request for Information (RFI) open to all state, county, and non-profit community organizations. Interested parties submitted measures through the RFI for potential inclusion in the Hawai'i PCAP. The process is described in the Coordination and Outreach Section.

Key metrics and considerations in developing priority measures include potential GHG emission reductions, geographic location, impact on low income and disadvantaged communities (LIDAC), funding need and opportunity to leverage existing funding opportunities, budget, feasibility, and ability to implement under existing authority. These are detailed in the sections that follow and quantified in the PCAP Tool for Measure Quantification, see excel workbook found in Appendix B.

Impact assessment of implementing each priority measure was done at the state-level as well as for low-income and disadvantaged communities (LIDAC). The assessment includes the distribution of co-benefits and identification of any potential adverse impacts that may require mitigation. The LIDAC section details the methodology used to identify LIDAC populations in the state.

Hawai'i's Priority Measures List

The 17 priority measures are listed below, accompanied by a short description and total anticipated GHG reductions. The order of measures presented here reflects their GHG reduction potential by sector - Transportation, Buildings, Waste, and AFOLU. The order in which a measure appears does not indicate priority over another.

To estimate the GHG reduction potential for each measure, Hawai'i has developed a PCAP Tool for Measure Quantification, see Excel workbook in Appendix B. The Summary Dashboard shows

anticipated total GHG reductions for the periods 2025-2030 and 2025-2050, program cost and cost-effectiveness of each measure, benefits and LIDAC benefits, and qualitative resilience and affordability impacts for each measure. Annual GHG reduction for each measure is summarized in the Annual Emissions Reduction tab for each year starting in 2025, till 2050. Detailed assumptions and inputs are described in the Excel tabs for each measure.

1. **Skyline Connect for Rapid Transit, Oʻahu, City and County of Honolulu**
   GHG Reduction 2025-2030 (MT CO2e): 3,771
   GHG Reduction 2025-2050 (MT CO2e): 41,485

   This is a transportation infrastructure measure to improve the connection between the Skyline rail and the bus on Oʻahu. The project will establish transit priority lanes (TPL) and island-wide transit signal prioritization (TSP) along major bus rapid transit (BRT) corridors connecting to Skyline rail. These infrastructure improvements will make transit quicker, more reliable, and increase transit ridership on Oʻahu. These additions will help to decrease driving in single-occupant vehicles by reducing comparative transit travel times and reducing GHGs through increased transit use.

   Four BRT routes will extend the reach of Oʻahu's existing zero-emission Skyline rail using electric buses to the greatest extent possible. These rapid BRT routes will align with major destinations and employ greater distances between stops to emulate rail operations. Of the 121 total miles of the four routes, 22.8 miles will operate in exclusive lanes (19% of the route miles). These routes will operate approximately 1,000 daily trips, traveling approximately 15,000 daily miles and providing capacity for more than 100,000 new transit trips and riders on these new rapid “TheBus” routes. The entire TheBus network will benefit from TSP technology, allowing late-running buses the ability to receive extra green light time and the ability to trigger signals at transit-only turns at intersections. This priority given to transit riders will increase rider satisfaction, improve travel time reliability on connecting bus services, prioritize transit as a superior mode, and grow ridership over time. Cities with comparable population and transit densities have experienced a 30% increase in ridership with TPL upgrades with a 20% reduction in travel time for passengers. We expect similar outcomes in TheBus network with both TPLs and TSP implemented on BRT lines connected to Skyline.

2. **Paratransit Fleet Electrification, Hawaiʻi Island, County of Hawaiʻi**
   GHG Reduction 2025-2030 (MT CO2e): 2,138
   GHG Reduction 2025-2050 (MT CO2e): 12,826

   The project proposes to replace the 7 gasoline-fueled minivans used for the County’s paratransit services with 12 electric vehicles to reduce the emissions associated with fueling the current fleet. The fleet is managed and operated by the County of Hawaiʻi Mass Transit Administration (MTA).

This project consists of three components: purchasing 12 EVs, hiring 5 additional drivers, and creating 5 new paratransit routes as defined by community engagement. The first component will include purchasing twelve Battery Electric 9 Seat ADA Minibusses, each with 2 wheelchair positions and a wheelchair lift. This will replace the current fleet and add an additional 5 vehicles to expand route service areas. The new fleet will also increase capacity by upgrading from 6-passenger vans to 9-passenger vans. The vans have a 75kW battery with a 1.4kW solar charging kit, and an average range of 140-200 miles per charge. Secondly, the project includes conducting outreach and engagement for new routes to include low-income and socially vulnerable residents in the route planning and to encourage residents to sign up for the new routes. Lastly, the project includes hiring and training new licensed drivers for added vehicles and routes.

3. **Expanding Honolulu's Shared Micromobility, Honolulu, Bikeshare Hawai'i**
   GHG Reduction 2025-2030 (MT CO2e): 1,550
   GHG Reduction 2025-2050 (MT CO2e): 3,101

   This measure proposes to build and upgrade active transportation infrastructure by creating new electric vehicle (including e-bikes and e-scooters) mobility hubs with chargers. The resulting shared micro-mobility will allow new service types such as e-bikes in an existing service area, as well as an expansion into new areas, especially lower-income areas, and those with less transit access late at night.

   This measure builds on the existing Biki service experience and partnerships developed over 10 years of community work. The funding support would add the capital investment in hardware and station installation to facilitate the community-based outcomes in the Department of Health funded report by HACBED, "Bikeshare Access: Barriers and Opportunities Expanding access to low-income people and communities in Honolulu."

4. **Complete Streets Infrastructure Improvements, Kaua'i, County of Kaua'i**
   GHG Reduction 2025-2030 (MT CO2e): 115
   GHG Reduction 2025-2050 (MT CO2e): 879

   An infrastructure improvement measure that is expected to significantly reduce single-occupancy vehicle trips and encourage safer and more accessible walking, biking, and transit ridership, reducing GHGs and resulting in significant co-benefits. Improving transportation infrastructure by constructing sidewalks, bike lanes, bus stops, and traffic calming measures will provide residents and visitors with affordable, safe, and reliable access to services and amenities. These projects will reduce the number of vehicles on the road, overall reducing noise pollution, will improve community accessibility, and provide households with transportation alternatives by adding or improving sidewalks, installing bike lanes, and adding bus stops. These projects will improve safety and help prevent injuries and fatalities by designating space for pedestrians and cyclists, rather than the current state of many county roads which lack facilities for vulnerable users.

These projects align with the State's Vision Zero law where all counties are required to implement a Vision Zero policy based on the FHWA's Safe System principles.

5. **Affordable Green Housing Retrofit Program, Statewide**
   GHG Reduction 2025-2030 (MT CO2e): 5,178
   GHG Reduction 2025-2050 (MT CO2e): 39,945

   The City and County of Honolulu is collaborating with the Hawai'i State Energy Office, the Hawai'i Public Utilities Commission (PUC), Kaua'i, Hawai'i, and Maui Counties to design a statewide affordable housing retrofit program for Hawai'i. This measure will support a comprehensive building retrofit program targeting existing affordable multi-family homes and provide funding for five years of operation. The program will result in more efficient, more comfortable, and safer buildings for lower income residents across the State that will save energy, lower utility bills, and improve the quality of life for multifamily building residents.

6. **Green Building Improvements Pearl City Library, O'ahu, Hawai'i State Library System**
   GHG Reduction 2025-2030 (MT CO2e): 231
   GHG Reduction 2025-2050 (MT CO2e): 1,386

   This measure will implement several green building design features including envelope upgrades, and highly efficient lighting measures for the Pearl City Public Library (PCPL) Renovation and Community Library Learning Center project to significantly reduce the existing and planned buildings' overall lifetime energy footprint and GHG emissions. The project will include education measures for library visitors.

   The Pearl City Public Library opened on Nov. 15th, 1969, and is one of the largest public libraries in O'ahu. As a regional library it was built to support not only the local community but also the smaller and midsized libraries in the region. In 1970, the population of Pearl City was roughly 19,600; as of 2021 it was 45,605. With the increasing trend in population growth, the library needs to expand and upgrade its learning spaces to meet the changing needs of the community.

   The Pearl City Public Library continues to be a vital point of social infrastructure and an anchor for the region. This project will update the existing library building to be more energy efficient with air conditioning systems, electrical and plumbing infrastructure, network upgrades and the creation of open spaces for the public. Redesigning the space will also allow HPLS to build flexible small meeting rooms for studying and larger spaces for bigger community meetings and workshops. These spaces will incorporate the latest technologies to create and ensure there are shared community learning spaces. Additionally, a new early learning center is being designed to ensure pre-k children will have a place to prepare for a successful school experience.

7. **Energy Efficiency Upgrades, Kaua‘i County, County of Kaua‘i**
   GHG Reduction 2025-2030 (MT CO2e): 1,044
   GHG Reduction 2025-2050 (MT CO2e): 9,392

   This measure will upgrade energy efficiency in three groups of County facilities: The Līhu‘e Civic Center, fire stations, and neighborhood centers. This includes exploring interior and exterior lighting and fixture upgrades to LED, film window treatments, refrigeration and other appliance upgrades, hot water heaters, air conditioning in small facilities, and more improvements based on recommendations from a forthcoming audit.

8. **Decentralized Compost Network for Hawai‘i, Statewide, Sustainable Coastlines Hawai‘i**
   GHG Reduction 2025-2030 (MT CO2e): 11,718
   GHG Reduction 2025-2050 (MT CO2e): 58,588

   This measure will expand the production, distribution, and application of compost within the islands of Hawai‘i by building a decentralized, community-based compost network with an automated compost mixing system.

   This measure addresses the lack of locally produced, nutrient-rich compost, and will help reduce incineration and landfilling in Hawai‘i. This project will elevate a compost network model as a way to inspire a new relationship with “waste,” reconnect communities to their resources and build more meaningful local agriculture by showing the scalability of this concept.

9. **Cardboard and Composting Waste Diversion Center, Hawai‘i Island, Recycle Hawai‘i**
   GHG Reduction 2025-2030 (MT CO2e): 6,075
   GHG Reduction 2025-2050 (MT CO2e): 6,075

   The proposed project aims to introduce and popularize waste diversion strategies aimed at reducing carbon pollution and providing direct benefits to the Hilo community. This project scope includes two initiatives: 1) A cardboard reuse project and 2) Partnering with Sustainable Coastlines to set up an in-vessel composting system to divert food waste and provide centralized compost for local use.

   Food waste can immediately be diverted from a local grocer. Year two would be spent acquiring the permits needed to bring food waste from other locations. Annual food waste diversion will be estimated via the sustainable coastlines project, so as to not double count emissions. Establishment of a commercial shredder in a central community space to process cardboard and box board from Downtown Hilo merchants into useable products such as plant pots, bubble wrap replacement, animal bedding, and mulch. In addition to merchants, people can bring their unwanted cardboard to be shredded and repurposed.

10. Reusable Foodware, Hawai‘i Island, County of Hawai‘i

GHG Reduction 2025-2030 (MT CO2e): 6,404
GHG Reduction 2025-2050 (MT CO2e): 30, 802

This measure proposes to support and expand an existing project, currently in the community-driven design stage, to implement a scalable reuse and refill program for food and beverage packaging in Hilo. The program includes collection, washing, and logistics infrastructure to support the circulation of reusable items through a fee for service model. GHG reductions would be the result of reduced landfill emissions from replacing single-use items with reusable foodware.

This project includes: 1) establishing a foodware reuse system that includes a washing facility, reusable foodware supplies, materials for outreach and enrollment of local businesses, and transportation of reusable foodware to and from the facility; and 2) establishing a refillable bottle and local food packaging system that includes equipment for a renewable energy-powered, commercial-grade local food production and packing hub. This project is being conducted in partnership between the County of Hawai‘i Departments of Environmental Management and Research and Development, non-profits Perpetual and Zero Waste Hawai‘i Island, and the University of Hawai‘i Sea Grant College Program.

11. Compost and Containers, Maui, County of Maui

GHG Reduction 2025-2030 (MT CO2e): 422
GHG Reduction 2025-2050 (MT CO2e): 2,201

This waste management measure will enhance sustainable practices in Maui schools. This will include the installation of dishwashers and mobile washing stations to reduce reliance on single-use materials and the diversion of food waste from landfills through composting. Reusable containers are molded from 100% food-grade ocean-bound recycled plastics found in waterways throughout North America. The BPA-free FDA-food grade plastic is collected through waste management partnerships and manufactured into various products, producing 100% recycled and recyclable food-ware containers. Any anticipated energy costs for the use washing of containers using a low temperature single tank conveyer dishwasher at 1.6 kW will be offset with the usage of a PV system. This is yet to be thoroughly fleshed out, but the Office of Innovation and Sustainability can fund such initiatives as a cost share. All Buoy products will be re-recycled after continued reuse or damage at the solar-powered facility in Northern California, producing zero waste and closing the take-out container waste loop. Approximately 700,000 plus lbs. of food waste including paper goods and 17,020 lbs. of plastics will be diverted from 37 Maui County schools annually once full participation is achieved. In addition, pilot program for the hotels in the area will be launched for the local community and business owners to showcase a new more sustainable direction for the industry particularly with the resurgence of tourism in West Maui after the catastrophic wildfire.

12. Transfer Station Life Extension for Waste Diversion, Oʻahu, Re-Use Hawaiʻi
GHG Reduction 2025-2030 (MT CO2e): 171
GHG Reduction 2025-2050 (MT CO2e): 171

This measure will extend the Oʻahu Island Transfer Station Reusable Material Collection Site project which diverts materials from landfills by 10 months. Oʻahu's landfills are slated to close in 2028 and no new site has been identified, and no plans are in place making waste diversion critical. The landfills are located adjacent to Hawaiian Homelands, which presents equity issues.

The project is a proof of concept to exhibit training, workforce development, and environmental stewardship. It is expected that the first phase will, in fact, inspire other Hawaiʻi municipalities to adopt the resource recovery functions.

13. Integrating Waste and Land Management Systems, Hawaiʻi Island, University of Hawaiʻi
GHG Reduction 2025-2030 (MT CO2e): 3,704
GHG Reduction 2025-2050 (MT CO2e): 6,989

This measure will integrate waste and land management systems to reduce GHG emissions through nutrient recapture and generation of soil carbon amendments using a Circular Economy approach on windward Hawaiʻi Island, integrating local meat processors, and agricultural producers. This project will establish compost and biochar production from waste resources. Currently, local meat processors landfill up to nine tons of animal harvest waste, accumulating 308 miles of travel, weekly. Establishment of a composting facility on site and partnership with meat processors to compost animal harvest waste can facilitate the recapture of nutrients and reduction of travel. Further, establishment of pyrolysis capacity can reduce GHG emissions by diverting their green waste to produce biochar from their biocultural restoration and reforestation efforts and invasive species removal.

This project is an opportunity to invest in establishing self-sufficiency in a largely rural county that faces challenges in accessing resources to support their agricultural economy. Investment in circular economies with relation to natural and working lands in Hawaiʻi County brings about tangible opportunities for innovation, employment, and training aligned with agricultural identities core to Hawaiʻi County. With the establishment of a local circular soil amendment market, there will be improved access to resources to growing food, building soil health, preserving native landscapes, and practicing aloha ʻāina for historically underserved producers and land stewards. Further, by acknowledging the needs of Native Hawaiian led innovation in agriculture, relationships between researchers, decision makers, and land stewards will increase and strengthen local buy-in for GHG reduction and adoption of climate-smart land management.

14. Maui Million Trees, Maui, County of Maui

GHG Reduction 2025-2030 (MT CO2e): 38,367
GHG Reduction 2025-2050 (MT CO2e): 345,302

This measure will plant one million native trees and plants to preserve and restore critical forest ecosystems in Maui Nui. Native trees will reduce CO2 emissions and mitigate flood and wildfire events improving safety for residents. 400,000 trees will be planted by 2030 with the implementation grant.

County of Maui, in coordination with Living Pono Project, Pu'u Kukui, State of Hawai'i, Maui Nui Botanical Gardens, Laukahi, and Pili Koko, will begin Phase I of its initiative to plant native trees and plant species. This ambitious reforestation effort aims to restore native Hawaiian forests since deforestation is an existential threat to Maui Nui watersheds, endemic ecology, wetlands, and flood and fire prone dryland ecosystems. Where the opportunity exists, a seed share program with the wider Maui 'ohana (family) will help provide the opportunity for the community to actively take part in conservation and foster a new generation of land stewards in their own communities.

To maximize survivorship the first phase of this initiative is to build out a nursery seedbank complex to bolster available future supply while also preparing specifically identified spaces for out planting by installing appropriate game fencing, clearing the area of invasive species, and remediating the soil as necessary depending on location conditions.

The County of Maui will use CPRG funding specifically allocated to a seed collection and propagation, nursery build-out, hydro mulching, seed dispersal, and site preparation initiative. Funding will be used for the Ōhi'a Nursery Seedbank and outplant in ʻŌhía Experimental Forest located in Nāpili-Honokōwai. By collecting seeds as a security measure in the event of wildfire and to be used for restoration projects. These seeds will ensure that Hawaiian plants will exist in the future and there will be availability for restoration. Growing plants in protected nurseries and allowing the saplings to grow in maturity will better ensure survivability when out planting. This will be done in tandem with natural seed dispersal and hydro mulching which have shown to be successful methods of reforestation in Maui and are actively utilized by the nonprofit Pu'u Kukui Watershed Preserve. CPRG funding will also be used for largescale watershed protection and habitat restoration in Lāhainā, Nāpili-Honokōwai, and West Maui for water recharge and to restore habitat degraded by invasive species. Restoration will also take place in the Kula Moku for flood mitigation and reef protection which includes reforestation of the leeward slopes and planting of native and endemic trees as riparian buffers to circumvent storm flood events in gulches.

In 2025, Maui County will begin intensive seed collection and propagation of seed stock with the nurseries being built in tandem with identifying and preparing grove reforestation locations. Once planting commences 100,000 trees will be planted annually. As the program matures the rate of planting is expected to increase with proficiency.

15. Maui Biochar, Maui, County of Maui

GHG Reduction 2025-2030 (MT CO2e): 15,609
GHG Reduction 2025-2050 (MT CO2e): 15,609

This measure will produce biochar through pyrolysis of dead or dying invasive tree species, which will be applied to soil, sequestering carbon, and improving soil quality in the county. Once the biochar is created, it will be utilized in multiple agricultural, bioremediation and reforestation efforts. All projects proposed are intended to be complementary and bolster one another's impact.

The project addresses the need for locally produced biochar in Hawai'i, and seeks to expand the infrastructure and networks needed for such production. Its use of invasive hardwoods will also help with Maui's reforestation efforts and increase climate resilience. Planting is a component of the GHG emission reduction benefits of this project and once the invasive Eucalyptus and Black Wattle is removed from the site, it will be replanted with native and endemic shrubs and trees, such as 'A'ali'i, Koa, Koai'a and others.

16. Reforestation for Carbon Removal and Sequestration, Maui, E kupaku ka 'āina

GHG Reduction 2025-2030 (MT CO2e): 2,514
GHG Reduction 2025-2050 (MT CO2e): 11,581

This measure will reforest degraded lands adjacent to the Waiehu Kou Hawaiian Homes subdivision, revitalize abandoned agricultural land, reduce wildfire risk, and increase community resilience.

The overall approach of this project is to reverse the environmental degradation and loss of carbon sink that has occurred in Waiehu over the last 150 years in combination with reducing the high level of fire risk and offsetting GHGs for the community. Application of organic and traditional Hawaiian agricultural and land management practices will guide planting and forest restoration.

The following objectives outline the scope of the project: 1.Reduce wildfire threats to residential areas (toxic GHG emissions) for the Waiehu/Hawaiian Homes community by reducing fire-prone invasive species biomass by 75 percent and removing 70 percent of Albizia trees, on 350 acres in five years. 2.Neutralize GHG emissions from tree removal by providing 100,000 yards of chipped albizia for bioremediation material to mitigate toxic soils in Lahaina, over a five-year period. 3.Increase long term carbon sequestration and ecosystem resilience by planting 2,800 food trees, 1,100 native trees, and 17,000 native

understory species on 110 acres over a five-year period. 4.Increase ecosystem and community resilience by planting 3,000 perennial and 34,000 annual Hawaiian food crop plants (short to long term carbon sequestration and local food security) on 20 acres using organic and traditional Hawaiian agricultural practices over the next five years.

17. **Energy for State and County Buildings, Statewide, Hawai‘i Green Infrastructure Authority**
    GHG Reduction 2025-2030 (MT CO2e): 13,996
    GHG Reduction 2025-2050 (MT CO2e): 112,652

    Hawai‘i Green Infrastructure Authority (HGIA) will support the deployment of renewable energy and storage systems for local government buildings to reduce energy costs, supply clean energy, and provide resilience in case of an electric grid outage. This support will include additional incentives to complement newly available “direct pay” options for local governments to receive energy tax credits and technical assistance for such projects. Such support is contingent on securing funding for this measure. This measure could be utilized by any state or sub-state government actor, including without limitation cities, counties, and the state public school system.

    In addition to directly supporting projects through technical assistance and deployment of renewable energy and storage systems, this measure will also serve to educate local governments on the available tax credits and provide technical assistance to local governments in designing such systems. As a result, this measure will catalyze widespread adoption of renewable energy and storage systems by local governments.

Table 3: Summary of Hawai‘i’s 17 Priority Measures

Priority Measure	Cumulative GHG emission reductions MTCO2e		Implementing Agency or Entity	Authorizing Agency	Geographic Scope
	2025-2030	2025-2050			
1. Skyline Connect for Rapid Transit, O‘ahu, City and County of Honolulu	3,771	41,485	City and County of Honolulu	City and County of Honolulu Department of Transportation Services	O'ahu
2. Paratransit Fleet Electrification, Hawai‘i Island, County of Hawai‘i	2,138	12,826	County of Hawai'i	County of Hawai'i Mass Transit Agency	Hawai'i Island
3. Expanding Honolulu’s Shared Micromobility, Honolulu, Bikeshare Hawai‘i	1,550	3,101	Bikeshare Hawai'i	City and County of Honolulu Department of Transportation Services	Honolulu
4. Complete Streets Infrastructure Improvements, Kaua‘i, County of Kauai	115	879	County of Kaua'i	County of Kaua'i: Public Works Department, Planning Department, Transportation Agency, and Office of Economic Development.	Kaua'i
5. Affordable Green Housing Retrofit Program, Statewide	5,178	34,945	State of Hawai‘i HSEO, PUC	Hawai‘i State Energy Office	Statewide

Table 4: Summary of Hawai‘i’s 17 Priority Measures Continued

Priority Measure	Cumulative GHG emission reductions MTCO2e		Implementing Agency or Entity	Authorizing Agency	Geographic Scope
	2025-2030	2025-2050			
6. Green Building Improvements Pearl City Library, O‘ahu, Hawai‘i State Library System	231	1,386	Hawai'i State Library System, Department of Education	Department of Accounting and General Services, State Building Code Council	Pearl City, Oahu
7. Energy Efficiency Upgrades, Kaua'i County, County of Kaua'i	1,044	9,392	County of Kaua'i	County of Kauai: Office of Economic Development, Department of Parks & Recreation, Public Works Department	Kaua'i
8. Decentralized Compost Network for Hawai‘i, Statewide, Sustainable Coastlines Hawai‘i	11,718	58,588	Sustainable Coastlines Hawai'i	Hawai'i Department of Health	Statewide
9. Cardboard and Composting Waste Diversion Center, Hawai‘i Island, Recycle Hawai‘i	6,075	6,075	Recycle Hawai'i	County of Hawai'i Planning Department, Hawai‘i Department of Health	Hilo, Hawai'i Island

Table 5: Summary of Hawai‘i’s 17 Priority Measures Continued

Priority Measure	Cumulative GHG emission reductions MTCO2e		Implementing Agency or Entity	Authorizing Agency	Geographic Scope
	2025-2030	2025-2050			
10. Reusable Foodware, Hawai‘i Island, County of Hawai‘i	6,404	30,802	County of Hawai'i	County of Hawai'i Department of Environmental Management, County Parks and Rec, State Parks, Hawai'i Department of Health	Hilo, Hawai'i Island
Priority Measure 11. Compost and Containers, Maui, County of Maui	422	2,201	County of Maui	County of Maui, Hawai'i Department of Health	Maui
Priority Measure 12. Transfer Station Life Extension for Waste Diversion, O‘ahu, Re-Use Hawai‘i	171	171	Re-Use Hawai'i	City and County of Honolulu Department of Environmental Services, Hawai'i Department of Health	O'ahu
Priority Measure 13. Integrating Waste and Land Management Systems, Hawai‘i Island, University of Hawai‘i	3,704	6,989	University of Hawai'i	Hawai'i Department of Health	Hawai'i Island
Priority Measure 14. Million Trees, Maui, County of Maui	38,367	345,302	County of Maui	County of Maui, Department of Land and Natural Resources	Maui

Table 6: Summary of Hawai‘i’s 17 Priority Measures Continued

Priority Measure	Cumulative GHG emission reductions MTCO2e		Implementing Agency or Entity	Authorizing Agency	Geographic Scope
	2025-2030	2025-2050			
Priority Measure 15. Maui Biochar, Maui, County of Maui	15,609	15,609	County of Maui	County of Maui, Hawai'i Department of Health	Maui
Priority Measure 16.Reforestation for Carbon Removal and Sequestration, Maui, E kupaku ka 'āina	2,514	11,581	E kupaku ka 'āina	Private Landowner (permission granted)	Waiehu District, Maui
Priority Measure 17. Energy for State and County Buildings, Statewide, Hawai‘i Green Infrastructure Authority	13,996	112,652	Hawai'i Green Infrastructure Authority	Hawai'i Green Infrastructure Authority	Statewide

For each priority measure, Table 4 provides additional details containing an implementation schedule and milestones, and metrics for tracking progress.

Table 7: Implementation Schedule and Milestones for Priority Measures

Priority Measure 1. Skyline Connect for Rapid Transit, Oʻahu, City and County of Honolulu	
Measure	**Associated Details**
Implementation Schedule and Milestones	Fall 2024: Project Manager staff hired. Oct 2024-Sep 2025: Design contract procurement. Jan 2025: Initial stages of service changes begin. Oct 2025: Design contract begins. Dec 2026: Finalized design plans submitted through the City's One-Time Review process. Jun 2027-Dec 2027: Construction projects bid. Jan 2028-Jun 2029: Installation of the proposed plan. Public and stakeholder outreach will be conducted throughout the project lifecycle, starting in fall of 2024 with notification of the initial service changes, which provides an opportunity to discuss additional changes and service improvements
Metrics for tracking progress	Travel/transit times; fuel savings; vehicle miles traveled; number of jobs created
Priority Measure 2. Paratransit Fleet Electrification, Hawaiʻi Island, County of Hawaiʻi	
Measure	**Associated Details**
Implementation Schedule and Milestones	Month 1: Grant award. Months 2-4: Acceptance of funds and MOA. Months 5-7: Secure contract with vendor for vehicles. Months 8-19: order vehicles. Months 20-22: Hire new positions. Months 23-26: Reconciliation. Total: 26 months
Metrics for tracking progress	Number of vehicles acquired; number of new CDL drivers trained; number of planned routes added; number of residents signed up

Priority Measure 3. Expanding Honolulu's Shared Micromobility, Honolulu, Bikeshare Hawai'i	
Measure	**Associated Details**
Implementation Schedule and Milestones	Months 1 & 12: Procurement Equipment order Months 1-6: Planning Proposed Station Siting Months 3-9: Planning Community Input Months Months 6-12: Planning Utility & SUP Permits Months Months 6-12: Training New Hardware Months 6-18: Marketing Outreach to New Areas Months 13-22: Operations Deploy Hardware Months 22-24: Planning Review & Assessment
Metrics for tracking progress	Vehicle Miles Traveled; number of rides
Priority Measure 4. Complete Streets Infrastructure Improvements, Kaua'i, County of Kauai	
Measure	**Associated Details**
Implementation Schedule and Milestones	March 2024 – May 2025: Design. March 2026 – March 2028: Construction.
Metrics for tracking progress	Fatalities and injuries; Vehicle Miles Traveled
Priority Measure 5. Affordable Green Housing Retrofit Program, O'ahu, City and County of Honolulu	
Measure	**Associated Details**
Implementation Schedule and Milestones	Phase 1, October 2023 -June 2024: Program design: conducting a Baseline Assessment of existing multi-unit residential buildings to understand end-use energy consumption and customer profiles; conducting a Market Study of potential program measures to determine appropriate cost-effective energy-saving program measures; creating a Building Data Intake Tool for building owners to supply data; developing a Building Screening Tool to identify high-priority properties; coordinating educational and training resources with workforce partners; and putting together a final Design Guidance for Building Retrofit Programs and Support measures to create a one-stop-shop service model for affordable housing including leveraging additional funding and financing support. Phase 2, July 2024- October 2025: Program Startup will focus on contracting for program operations, marketing and outreach, training participating contractors, building energy auditing, and testing of the program approach with early participants to improve the tools and methods deployed. Phase 3, October 2025 through October 2029: Full Scale Deployment (will include measure level design support, followed by financing and project management support once the first round of retrofits is under construction. The program will ramp up in scale over Phases 2 and 3 with a unit count

	of 1500 units in the final year of the program. Phase 3 will also include a detailed analysis (M&V) of program success and recommendations for Phase 4: long term program integration.
Metrics for tracking progress	Energy savings; ratepayer cost savings; decreased energy burden
Priority Measure 6.Green Building Improvements Pearl City Library, O'ahu, Hawai'i State Library System	
Measure	**Associated Details**
Implementation Schedule and Milestones	1. Schematic Design Phase [Completed 07/21/2023] 2. Design Development Phase [Completed 10/20/2023] 3. Pre-Final Design Phase [In-Progress] a. Building Permit Plans Submittal target [12/20/2023 – 01/15/2024] 4. Final Design Phase [Scheduled 01/15/2024 – 03/29/2024] a. Bid Documents Submittal to Department of Accounting and General Services [03/18/2024 – 03/29/2024] 5. Bid to Contract Phase [Scheduled 04/01/2024 – TBD] a. Advertisement & Pre-Bid Conference [Scheduled 04/01/2024] b. Bid Opening Target [06/15/2024] c. Notice to Proceed [TBD] 6. Construction Phase [TBD]
Metrics for tracking progress	Utility savings; number of visitors; number of jobs created
Priority Measure 7. Energy Efficiency Upgrades, Kaua'i County, County of Kaua'i	
Measure	**Associated Details**
Implementation Schedule and Milestones	Phase 1: Priority buildings energy audit; Phase 2: Installation and GHG savings
Metrics for tracking progress	Utility savings; number of jobs created

Priority Measure 8. Decentralized Compost Network for Hawai‘i, Statewide, Sustainable Coastlines Hawai‘i	
Measure	**Associated Details**
Implementation Schedule and Milestones	Year 1: finalized site selection, permitting for Phase 1 of the machines, hiring of compost network management, additional mapping of organic source inputs, scoping for network app development, and training. Year 2: site installation for Phase 1 machines (fabrication will begin in year 1), pilot operations at each site to develop ideal recipes based on organic inputs to each site, scoping & permitting for phase 2 machines, and reporting on GHG emissions from phase 1. Year 3: Phase 2 installations, Phase 1 reporting, continued training and capacity building, and economic forecasts based on Phase 1 results. The last half year of the project will focus on reporting on total GHG impacts, developing a comprehensive business plan, and qualitative surveys to inform the increased expansion of the network.
Metrics for tracking progress	Pounds (lbs) of compost generated; lbs of food waste diverted; number of jobs created; number of personnel trained.
Priority Measure 9. Cardboard and Composting Waste Diversion Center, Hawai‘i Island, Recycle Hawai‘i	
Measure	**Associated Details**
Implementation Schedule and Milestones	Year 1: Planning, tenant and community outreach, permitting/clean stream collection, cardboard processing, vermiculture begins, improvement and design. Year 2: Building, project opens, reusable foodware service begins, clean stream collection begins. Year 3: Tool library, repair cafe open, project capital contribution phase in. Year 4: Project elements continue.
Metrics for tracking progress	Pounds (lbs) of cardboard, food waste, foodware recycled; lbs of furniture reclaimed; number of items repaired; number of tenants; number of community members participating in program; number of jobs created; number of jobs redefined
Priority Measure 10. Reusable Foodware, Hawai‘i Island, County of Hawai‘i	
Measure	**Associated Details**
Implementation Schedule and Milestones	Month 1: Grant award. Months 2-4: Acceptance of funds and MOA. Months 1-12: System set up. Months 13-18: Pre-launch. Months 19-24: Launch. Months 25-29: Improvements.

	Months 30+: Expansion. Total: 30 months
Metrics for tracking progress	Community participatory workshops completed – 22 events, 726 individuals engaged 2. System design finalized – 10 design meetings with a public comment period 3. System established – Providers, equipment, space, and permits secured 4. Businesses enrolled – 80 enrolled in system.
Priority Measure 11. Compost and Containers, Maui, County of Maui	
Measure	**Associated Details**
Implementation Schedule and Milestones	PHASE I Schools and West Maui Tourism Hubs: 2025: 25% 2026: 50% 2027: 100% 2028: 100% and launching Phase II to cover all schools and more hotels in Maui Nui
Metrics for tracking progress	Number of community members involved; Pounds (lbs) of packaging composted; reduction in utility bills
Priority Measure 12. Transfer Station Life Extension for Waste Diversion, Oʻahu, Re-Use Hawaiʻi	
Measure	**Associated Details**
Implementation Schedule and Milestones	Phase 1: Project set up. Phase 2: Labor and materials procurement.
Metrics for tracking progress	Number of jobs created; number of people trained; Pounds (lbs) of waste diverted; lbs of specific building materials repurposed
Priority Measure 13. Integrating Waste and Land Management Systems, Hawaiʻi Island, University of Hawaiʻi	
Measure	**Associated Details**
Implementation Schedule and Milestones	Year 1: Fulfill initial contracting, permitting, and staffing needs. Year 2: Establish capacity with the installation of equipment and infrastructure and training. Year 3: Start-up production of compost and biochar with guidance from experts. Year 4: Establish testing capacity for compost and biochar products through the UHM Soil Health Environment and Ecosystem Resilience (SHEER) Lab. Year 5: Reach operational efficiency for use and sale of soil amendments, and (6) conduct life cycle analysis and economic

	evaluation to determine scalability, economic viability and make policy recommendations.
Metrics for tracking progress	Pounds (lbs) of waste diverted; number of acres restored; number of jobs created; soil health indicators (water infiltration, CEC, etc.)
Priority Measure 14. Million Trees, Maui, County of Maui	
Measure	**Associated Details**
Implementation Schedule and Milestones	Year 1: intensive seed collection and propagation of seed stock, building nurseries, preparing grove reforestation locations. Years 2-5: Planting of ʻAʻaliʻi, Koa and ʻŌhiʻa within selected sites
Metrics for tracking progress	Number of acres reforested; number of native species planted; lbs of invasives removed; number of community member involved; number of jobs created
Priority Measure 15. Maui Biochar, Maui, County of Maui	
Measure	**Associated Details**
Implementation Schedule and Milestones	This phase of the proposed biochar project will begin in Spring of 2025 (3rd Quarter FY 25) and will conclude in Spring of 2028 (3rd Quarter FY 28).
Metrics for tracking progress	Pounds (lbs) of biochar produced; lbs of invasive vegetation removed; soil amendment and water retention metrics (infiltration rates, etc.)
Priority Measure 16. Reforestation for Carbon Removal and Sequestration, Maui, E kupaku ka āina	
Measure	**Associated Details**
Implementation Schedule and Milestones	Year 1: Project setup, staff hires, equipment, invasives removal. Year 2: Native plantings, staff trainings, field prep. Year 3: Monitoring/evaluation. Year 4: maintenance. Year 5: Evaluation. Ongoing: outreach, volunteer training, maintenance
Metrics for tracking progress	Number of volunteers engaged; number of jobs created; number of native/invasive species planted/removed

Priority Measure 17. Energy for State and County Buildings, Statewide, Hawai'i Green Infrastructure Authority	
Measure	**Associated Details**
Implementation Schedule and Milestones	Year 1: Third-party administrator selected; early 2025 local governments apply for and receive funding; late 2025 projects installed early GHG reduction begin; early 2026 project installation begins
Metrics for tracking progress	Total capacity (kWh) solar installed; number of battery installations installed; energy savings

Benefits Analysis

Hawai'i's priority measures will reduce GHG emissions and provide a wide range of health, economic, and environmental benefits to communities across the state. Measures that reduce GHG often result in improvements in local air quality that impact human and environmental health. In this analysis, we have quantified the change in air pollution resulting from the seventeen priority measures including changes in nitrous oxides (NOx), fine particulate matter (PM 2.5), sulfur oxides (SO_2), carbon monoxide (CO) and volatile organic compounds (VOC). NOx can cause damage to the human respiratory system resulting in increased illness and hospitalizations due to asthma. PM 2.5 can also impact water quality and clarity. NOx, when combined with SO_2 can also contribute to acid rain, damaging environmental and ecosystem health. PM 2.5 can increase the risk of heart disease and asthma, with long-term exposure contributing to hospitalization and increased premature mortality. SO_2 can contribute to respiratory illness and exacerbate existing heart and lung conditions as well as cause environmental damage by retarding plant growth and damaging sensitive ecosystems. CO at high concentrations can impair human health and cognition. It also indirectly contributes to the formation of ozone. VOCs also lead to ozone formation in the presence of NOx resulting in increased respiratory illnesses. Table 5 presents the change in co-pollutants associated with each priority PCAP measure, including the change associated for LIDACs. For additional details, see Appendix B, the PCAP Tool.

Eight priority measures have calculated changes in co-pollutants from 2025 to 2050, including NOx, PM 2.5, SO2, and CO. Priority measures focusing on expanded transit and mobility options show reductions in air pollution. One priority measure, however, shows a marginal increase in co-pollutants. The Skyline Connect measure will increase transit options, reducing solo occupancy vehicle usage and increasing bus vehicle miles traveled. The slight increase in co-pollutants reflects increased ridership and bus miles relative to travel in light duty vehicles.

Table 8: Changes in Co-Pollutants by Priority Measure

Measure Number	Benefits Analysis: Co-Pollutant Reduction (CPRG-Related, 2025-2050)						Low-Income and Disadvantaged Communities Benefit (2025-2050)					
	NH3	NOx	PM2.5	SO2	CO	VOC	NH3 for LIDAC	NOx for LIDAC	PM2.5 for LIDAC	SO2 for LIDAC	CO for LIDAC	VOC for LIDAC
1	4.9	-11.2	33.2	0	549	0	3.9	-9	-2.5	0	439.2	0
2	0	4	0.1	0	119	0	0	3.4	0.1	0	101.2	0
3	0	4	0	30.6	0	0	0	0.2	0	15.3	0	0
4	0	0.3	0	0	8.2	0	0	0	0	0	0	0
5	0	83.6	10.2	140.5	0	0	0	83.6	10.2	140.5	0	0
6	0	3.3	0.4	0	0	0	0	3.3	0.4	0	0	0
7	0	65.5	5.3	23.5	0	0	0	32.8	2.6	11.7	0	0
8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
13	0	0.1	0.0	0	0.6	0	0	0.1	0	0	0.6	0
14	0	15.6	7.7	37	0	0	0	0	0	0	0	0
15	0	-0.1	0	0	0	0	0	0	0	0	0	0
16	0	0.8	0.4	2.3	0	0	0	0	0	0	0	0
17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note: All pollutants were measured in tonnes. Sections with N/A were not calculated.

Implementing the priority measures will have a broad range of benefits. Along with changes in co-pollutants impacting human and environmental health, implementing priority measures will also create jobs, improve quality of life, and increase resilience. Co-benefits will vary based on the specific measure. Table 6 summarizes the co-benefits associated with each priority measure using six categories: Job Creation, Improved Quality of Life (including affordability), Improved Health Outcomes (from better air quality, heat mitigation and transportation options), Improved Water Quality (from reforestation efforts), Enhanced Climate Resilience (from decreased flooding and fire risk and other climate stressors and shocks), and Increased Economic Resilience (from reduced energy costs, increase in economic opportunities and market development).

Table 9: Qualitative Impacts of Priority Measures

Priority Measure	Job Creation	Improved Daily Quality of Life	Improved Health Outcomes	Improved Water Quality	Enhanced Climate Resilience	Increased Economic Resilience
1. Skyline Connect for Rapid Transit, Oʻahu, City and County of Honolulu	Yes	Yes	Yes	No	No	Yes
2. Paratransit Fleet Electrification, Hawaiʻi Island, County of Hawaiʻi	Yes	Yes	Yes	No	No	Yes
3. Expanding Honolulu's Shared Micromobility, Honolulu, Bikeshare Hawaiʻi	Yes	Yes	Yes	No	No	Yes
4. Complete Streets Infrastructure Improvements, Kauaʻi, County of Kaua'i	Yes	Yes	Yes	No	No	Yes
5. Affordable Green Housing Retrofit Program, statewide	Yes	Yes	No	No	No	Yes

Table 10: Qualitative Impacts of Priority Measures Continued

Priority Measure	Job Creation	Improved Daily Quality of Life	Improved Health Outcomes	Improved Water Quality	Enhanced Climate Resilience	Increased Economic Resilience
6. Green Building Improvements Pearl City Library, Oʻahu, Hawaiʻi State Library System	Yes	Yes	No	No	No	Yes
7. Energy Efficiency Upgrades, Kauaʻi County, County of Kauaʻi	Yes	No	No	No	No	Yes
8. Decentralized Compost Network for Hawaiʻi, Statewide, Sustainable Coastlines Hawaiʻi	Yes	No	No	No	Yes	Yes
9. Cardboard and Composting Waste Diversion Center, Hawaiʻi Island, Recycle Hawaiʻi	Yes	No	No	No	Yes	Yes
10. Reusable Foodware, Hawaiʻi Island, County of Hawaiʻi	Yes	No	No	No	Yes	Yes
11. Compost and Containers, Maui, County of Maui	Yes	No	No	No	Yes	Yes
12. Transfer Station Life Extension for Waste Diversion, Oʻahu, Re-Use Hawaiʻi	Yes	Yes	No	No	Yes	Yes

Table 11: Qualitative Impacts of Priority Measures Continued

Priority Measure	Job Creation	Improved Daily Quality of Life	Improved Health Outcomes	Improved Water Quality	Enhanced Climate Resilience	Increased Economic Resilience
13. Integrating Waste and Land Management Systems, Hawai'i Island, University of Hawai'i	Yes	No	No	Yes	Yes	Yes
14. Million Trees, Maui, County of Maui	Yes	No	Yes	Yes	Yes	No
15. Maui Biochar, Maui, County of Maui	Yes	No	No	Yes	Yes	Yes
16. Reforestation for Carbon Removal and Sequestration, Maui, E kupaku ka āina	Yes	No	Yes	Yes	Yes	Yes
17. Energy for State and County Buildings, Statewide, Hawai'i Green Infrastructure Authority	Yes	Yes	No	No	No	Yes

Job Creation

Each of Hawai'i's priority measures will create jobs, providing economic benefits to local communities. The number, type, and duration of jobs vary by measure, but jobs will be created in skilled trade occupations that require specialized training as well as administrative and service occupations that all will contribute to Hawai'i's climate and sustainability goals. The workforce needed to implement priority measures - construction workers, carpenters, maintenance and repair workers, electricians, and heavy-duty vehicle drivers - are the skilled trades with the most

annual openings across Hawai‘i’s four counties.[12] Implementation of the priority measures will support workers across Hawai‘i and create opportunities for workforce development and training in line with the Good Jobs Hawai‘i program launched in January 2023 providing skilled training for well-paying jobs across Hawai‘i’s growing sectors, including clean energy.[13] In addition, implementing priority measures will increase demand for administrative and service jobs that bolster local economies and support families.

There is a wide diversity in the jobs created by Hawai‘i’s priority measures. The jobs span economic sectors and geographic regions and represent an opportunity to train and create a skilled clean energy workforce. Four priority measures, Skyline Connect (1), Shared Micromobility (3), Complete Streets-Kaua‘i (4), and Energy for State and County Buildings (17) require physical infrastructure leading to jobs for construction workers, engineers, and electricians. Measures focused on retrofitting facilities including Affordable Green Housing Retrofits (5), Pearl City Library (6), Energy Efficiency Upgrades-Kaua‘i (7), and Integrating Waste (13) will increase demand for electricians, carpenters, and maintenance and repair workers. The Paratransit Electrification measure (2) will create jobs for paratransit vehicle operators as well as the need for electric vehicle charging and maintenance workers. Five measures --Decentralized Compost Network (8), Cardboard and Composting (9), Reusable Foodware (10), Compost and Containers (11), and Transfer Station (12)-- create new processes for waste and waste diversion creating jobs in equipment installation, operations and maintenance, waste collection, waste treatment and disposal, and food services. Three measures--Million Trees (14), Biochar (15), and Reforestation (16)-- involve agricultural practices and will create jobs in agriculture and forestry.

Improved Daily Quality of Life

While each priority measure will improve the quality of life in Hawai‘i by reducing GHG emissions and providing co-benefits, measures expanding clean mobility options, creating affordable housing, and mitigating environmental impacts on communities will directly improve the daily quality of life for residents. Skyline Connect (1), Paratransit Electrification (2), Shared Micromobility (3), and Complete Streets-Kaua‘i (4) increase clean mobility options providing communities with safe, accessible, and affordable transportation choices. Measures increasing options for walking and biking can directly improve public health, while increased access to clean transit can reduce travel time, vehicle miles traveled, and reduce travel congestion. Along with increased mobility, Affordable Green Housing Retrofits (5) expands housing availability and reduces energy costs for households. The Pearl City Library measure (6) will provide climate-cooled public resources for residents while the Transfer Station (12) will divert waste from landfills, reducing odor and noise impacts for nearby communities.

[12] https://www.smshawaii.com/assets/hawaii-skilled-trades-workforce-analysis-final-report-06.01.2023.pdf
[13] https://energy.hawaii.gov/get-engaged/workforce-development/

Improved Health Outcomes

Climate change threatens human health through hotter temperatures, changes in precipitation and extreme weather events, worsened air quality, rising sea level, wildfires, and smoke. The health impacts of climate change are diverse, as is Hawai'i's population, leading to health disparities across different communities based on geographic location and socio-demographic characteristics. LIDAC and climate vulnerable populations are at a higher risk and are likely to experience the largest impacts to human health. Climate change exacerbates air pollution problems as increasing temperatures lead to increases in ozone concentrations which can result in increased premature mortality, respiratory and cardiovascular hospitalizations, and asthma related hospitalizations. Implementing the priority measures will reduce co-pollutants, reducing climate related health impacts, reducing medical costs, and improving the lives of residents.

Priority measures that sequester carbon by planting trees, Million Trees (14) and Reforestation (16) will impact human health by increasing carbon absorption in forests, directly reducing atmospheric carbon, and mitigating the impacts of a warming climate on respiratory and cardiovascular illness. In addition to changes in co-pollutants, priority measures that increase active mobility options, like walking and biking, can increase physical activity and improve health outcomes. Complete Streets-Kauaʻi (4), Shared Micromobility (3), and Skyline Connect (1) measures provide active transportation options incentivizing movement and increased physical activity. The Paratransit Electrification measure (2) can increase mobility options for underserved residents and visitors to Hawaiʻi.

Improved Water Quality

Priority measures reducing GHG emissions can also improve water quality, which is vital to clean drinking water and coastal waters, as well as Hawai'i's cultural heritage and economic viability. Rising sea levels can cause saltwater intrusion in groundwater and surface water degrading water sources and reducing drinking water availability. Changes in precipitation can also increase runoff of sediment and pollutants, placing additional stressors on the Hawaiʻi water system. Priority measures targeting soil enrichment and stabilization, Integrating Waste (13) and Biochar (15), can strengthen the absorptive capacity of soils, reducing runoff and improving water quality. Reforestation measures, Reforestation (16) and Million Trees (14) will mitigate flood risk which can adversely impact the quality of drinking water and coastal water.

Enhanced Climate Resilience

Changing storm paths, sea level rise, intense rainstorms, and increased wildfire risk threaten life in Hawaiʻi. Hawaiʻi's isolated location in the Pacific makes resilience to climate shocks and adaptation to climate stressors extremely important. Hawai'i, with no developed oil and gas extraction, is dependent on imported fuel, increasing the urgency to transition to clean energy and highlighting the state's vulnerability to extreme weather events. Priority measures that address waste streams and reduce energy usage, Decentralized Compost (8), Carboard and

Compost (9), Reusable Foodware (10), Compost (11), and Transfer Station (12), reduce reliance on imported fuel and enhance climate resiliency.

Priority measures that build food self-sufficiency, address soil degradation, increase resilience to heat and wildfires, and increase water security build resiliency to climate shocks such as wildfires and landslides from extreme events, and help vulnerable populations adapt better to climate stressors such as inland flooding. Integrating Waste (13), Compost and Containers (11), and Biochar (15) improve soil health increasing the capacity for Hawaiian agricultural opportunities. Reforestation (16) and Million Trees (14) will mitigate risks from extreme weather and provide heat abatement through increased green spaces. Priority measures that shift transportation away from fossil fuel dependent modes to electrified modes of transportation such as Paratransit Electrification (2), Complete Streets-Kaua'i (4), Shared Micromobility (3), and Skyline Connect (1) increase the resilience of the transportation networks in the state by providing communities with increased options for transportation.

Increased Economic Resilience

Hawai'i has the highest cost of living in the nation, and consequently one of the highest rates of homelessness. Twelve percent of the population in Hawai'i earns below the Federal Poverty Level (FPL) and an additional 30% of households are above the poverty level but Asset Limited, Income Constrained and Employed (ALICE)[14] and considered one event away from poverty. The impacts of climate change are exacerbating inequities across communities in Hawai'i, specifically in regard to affordability and economic resiliency. The 17 priority measures in the Hawai'i PCAP address the issues economic resiliency by creating new skilled labor jobs, reducing energy costs, and reducing reliance on imported goods.

Hawai'i's economy is highly dependent tourism and the service industry. During the COVID-19 pandemic, the need to diversify Hawai'i's labor market became painfully apparent as visitor numbers plummeted, leaving the state with the highest rates of unemployment in the nation. The priority measures in this PCAP address economic resilience by creating jobs in the clean energy sector, specifically in skilled trades that historically had the highest openings across counties.

Hawai'i 's geographic location and scenic beauty makes it a top travel destination, but also makes the cost of fuel and energy higher than anywhere else in the United States. Hawai'i is the most oil-dependent state in the nation which comes at a high economic cost - Hawai'i has the highest electricity prices in the nation, nearly three times the national average. Priority measures that increase clean transportation options through fuel or mode shifting reduce dependence on foreign oil and can reduce overall energy costs. These measures include Skyline Connect (1), Paratransit Electrification (2), Shared Micromobility (3), and Complete Streets-Kaua'i (4) which provide mobility options that shift passengers to lower emissions transportation that can reduce

[14] United for Alice (2021), Hawai'i State Overview, https://unitedforalice.org/hawaii

transportation costs and use of imported fuel. Priority measures that address energy use and increased energy efficiency will also enhance economic resiliency and reduce energy costs to consumers. Affordable Green Housing Retrofits (5), Pearl City Library (6), and Energy Efficiency Upgrades-Kaua'i (7) measures improve energy efficiency in residential, local, and state facilities, reducing energy demand and energy costs, specifically to LIDAC communities.

Measures reducing and diverting waste will also reduce energy costs and create sustainable infrastructure for reusing materials. Measures that reduce landfill burden and enrich soil, Decentralized compost (8), Compost and Containers (11), Integrating Waste (13), and Biochar (15) reduce energy costs associated with waste transport and energy use. Measures that reduce reliance on single use goods, Cardboard and Compost (9), Reusable Foodware (10), Transfer Station (12) will reduce costs of purchasing new items, reduce energy costs, and increase economic resiliency.

For low-income and disadvantaged communities (LIDAC) populations, these co-benefits are crucial as climate shocks and stressors impact them more severely and they have less resources to recover from them. For example, the Pearl City measure (6) addresses green building improvements in Pearl City Public Library. Pearl City's LIDAC population will benefit from a cooling space to escape rising temperatures and intense storms, as well as perform essential cultural and social functions for the community. Similarly, the Complete Streets-Kaua'i (4) measure addresses Complete Streets infrastructure improvements in the county. Such improvements will provide more affordable transportation options for LIDAC populations and contribute to increasing affordability and quality of life. Additional discussion of the impact of co-benefits on LIDAC populations is included in the LIDAC section of this report.

Priority Measures Alignment with the State's Efforts and Counties' Climate Action Plans

Numerous State and County climate and energy plans address decarbonization, climate resilience, and adaptation in Hawai'i. The PCAP priority measures align and complement the following existing state policies and plans:

1. **County of Hawai'i:** Integrated Climate Action Plan.[15]
   To accomplish the County's climate goals, the Integrated Climate Action Plan (ICAP) identifies climate mitigation and adaptation actions to be taken by Hawai'i County. The ICAP establishes a greenhouse gas emissions baseline for the County, describes the impacts of climate change on natural hazards and community systems, and sets three primary goals:
   1) Improve County capacity to implement climate action.

[15] County of Hawai'i Planning Department (2023) Integrated Climate Action Plan for the Island of Hawai'i: Greenhouse Gas Reduction and Climate Adaptation Actions to Build Local Resilience to Climate Change, https://cohplanning.konveio.com/integrated-climate-action-plan-icap-island-hawaii?document=1

2) Reduce the County's contribution to global greenhouse gas emissions.
3) Increase the resilience of County infrastructure, assets, and services.

Intervention points identified in the ICAP that are relevant to the Priority Measures proposed by County of Hawai'i are:

- Energy and Electricity Use: Strategy 1A6.1 Expand outreach for community rebate incentives by pursuing more public-private partnerships
- Transportation: Strategy 1B.2: Transition the County fleet to zero emissions
- Waste: Strategy, 1C1.3: Explore opportunities to divert waste from landfills, and 1C4: Support mulching operations to allow for soil enhancement County wide.

2. **City and County of Honolulu**: One Climate One O'ahu Climate Action Plan 2020-2025.[16] The action plan addresses decarbonization through three main sectors:
   1) Transportation
   2) Electricity
   3) Waste and Wastewater

   The Plan "...presents strategies with specific actions for the City to reduce GHG emissions from ground transportation, electricity, and waste. The City can affect emissions reductions from ground transportation by reducing VMT from passenger cars and trucks, as well as by improving City and island wide vehicle fuel efficiency. The City can influence GHG emissions reductions from the electric sector by reducing electricity consumption through energy efficiency and conservation, and by supporting island-wide renewable energy goals. The City's own facilities and operations play an important role in both strategies. Lastly, the City can reduce emissions associated with the waste sector by reducing product and material generation, and through waste repurposing to reduce the amount of waste going to end-of-life processing."

   Nine specific strategies were listed. The Priority Measures from O'ahu/Honolulu included in the PCAP each fit into the City and County's vision for decarbonization under the following strategies:

   - Strategy 2: Enable and provide multiple modes of green transportation
   - Strategy 5: Reduce energy demand by increasing energy efficiency
   - Strategy 8: Promote waste prevention
   - Strategy 9: Maximize waste resource efficiency

[16] City & County of Honolulu (n.d.) One Climate One O'ahu Climate Action Plan 2020-2025, https://static1.squarespace.com/static/5e3885654a153a6ef84e6c9c/t/6080c33e91bbf23a20b74159/1619051381131/2020-2025+Climate+Action+Plan.pdf

3. **County of Kauai:** The County of Kaua'i is in the process of creating a Climate Adaptation and Action Plan (KCAAP).[17] In addition, the 2018 Kaua'i General Plan,[18] specifically Section VIII: Energy Sustainability & Climate Change Mitigation, highlights GHG reduction, renewable energy, and clean ground transportation goals. The 2013 Kauai Multi Modal Land Transportation Plan outlines mode share goals.[19]

   The KCAAP is a roadmap for how the community will prepare for the impacts of climate change and natural hazards, as well as reduce the County's greenhouse gas emissions and meet emission reduction targets. The sectors that are addressed are: Critical Energy, Transportation & Land Use, Waste Reduction, and Natural Resource Management. The Priority Measures included from Kaua'i in the PCAP address the first two (critical Energy, and Transportation and Land Use).

4. **County of Maui:** In 2022, the County of Maui's Office of Climate Change, Resiliency, and Sustainability (CCRS)[20] a comprehensive strategy for mitigating and adapting to climate change in Maui County.

   The CARP was spearheaded by the CCRS and provides a clear and actionable set of strategies and actions to reduce our communities' contribution to climate change and to build community resilience and adaptation to current and future climate change impacts. In this way, the CARP is a two-pronged approach that addresses both mitigation by reducing greenhouse gas emissions and adaptation by increasing resiliency and preparedness. The CARP was shaped by guiding principles developed and vetted by the Climate Action and Resiliency Plan Advisory Committee (CARPAC) and the County of Maui's Resiliency Hui. The principles were further defined, vetted, and translated into 'ōlelo Hawai'i (Hawaiian Language). The climate mitigation and resiliency strategies and actions discussed in the CARP are aligned with these principles and noted throughout the plan.

   Several key strategies and actions are outlined in the CARP. The relevant ones relating to the Priority Measures include:
   - Buildings Energy Strategy 6: Reduce waste at County of Maui owned facilities and public areas,

[17] County of Kaua'i (2023). Kaua'I Climate Adaptation and Action Plan https://kauaiadaptation.com/wp-content/uploads/2023/12/KCAAP_Survey3_Summary_Mitigation_121323.pdf

[18] County of Kaua'i (2018). General Plan: Sector VIII: Energy Sustainability & Climate Change Mitigation (see page 184-190) https://www.kauai.gov/Government/Council/General-Plan-Update

[19] Kaua'i County Council (2013). Multimodal Land Transportation Plan (executive summary – page 2), https://www.kauai.gov/files/assets/public/v/1/transportation/documents/kauai-mltp-council-adopted-version.pdf

[20] County of Maui (2022). Climate Action and Resiliency Plan, https://www.resilientmauinui.org/pages/climate-action-resiliency-plan

- Waste Strategy 2: Maximize waste diversion efforts community-wide and directly support the implementation of improved diversion strategies with particular focus on organic and recyclable waste,
- Agriculture Land Use and Natural Resources Strategy 1: Bolster local and community-based efforts to advance nature-based solutions, and Strategy 2: Actively support regenerative agriculture and sustainable land reclamation.

Low-Income and Disadvantaged Community Analysis

The implementation of the measures included in this PCAP will significantly benefit low-income and disadvantaged communities (LIDACs). This section identifies each LIDAC within the jurisdiction covered by this PCAP, the outreach that was done in light of the short timeframe to develop this PCAP, and how Hawai'i intends to engage in the future.

The CDC notes how "[i]ndigenous communities of the Pacific have an inseparable connection to and derive their sense of identity from the lands, territories, and resources of their islands. Climate change threatens this familial relationship with ancestral resources and is disrupting the continuity that is required for the health and well-being of these communities (this experience is common to many tribal and Indigenous communities across the United States). Women have also been identified as a more vulnerable population to regional climate risks due to the role they have in terms of economic activities, safety, health, and their livelihoods."[21]

According to Hawai'i Department of Health's Hazard Evaluation and Emergency Response Office (HEER), "[l]ow- to moderate-income (LMI) communities are especially vulnerable because they often have less access to adequate healthcare, housing, and resources to recover from the household costs of extreme weather events. LMI communities often live in areas across Hawai'i that are already experiencing the worst effects of climate change, such as coastline and rural communities, further increasing these vulnerabilities. Systemic failures in our state and country means that there is often overlap between low-income and Native Hawaiian, racial and ethnic minorities, and marginalized groups. All climate measures taken by the State of Hawai'i must reduce these existing inequities and be guided by those communities most impacted by our changing climate."[22]

[21] Centers for Disease Control and Prevention (n.d.). Regional Health Effects - Hawai'i and US-Affiliated Pacific Islands, https://www.cdc.gov/climateandhealth/effects/hawaiiandpacificislands.htm

[22] State of Hawai'i, Department of Health (n.d.). Climate Change & Health – FAQs, https://health.hawaii.gov/heer/climate-health-faqs/

Hawai'i's population[23] consists of 10% Native Hawaiian, and other Pacific Islander, and 24.7% two or more races.[24] Rising temperatures are expected to worsen heart health, particularly in people of color who are more likely to work and live outdoors, and in urban neighborhoods that are hotter because of lack of green space and canopy cover.[25]

Context for Hawai'i's LIDAC Analysis

The State of Hawai'i Climate Change Mitigation and Adaptation Commission's statement on climate equity urges government entities in Hawai'i to:[26]

- "Use a vulnerability framework that is appropriate for Hawai'i, and incorporate cultural responsiveness, reflect indigenous voices and customary law practices to identify any inequitable distribution of benefits, burdens and processes caused by climate change impacts and policy; and
- Recognize and address the inequitable distribution of benefits, burdens, and processes, by incorporating equity considerations into their planning, policy development and implementation for climate change mitigation, adaptation and resilience (Hawai'i Climate Change Commission, 2019)."

National-level data do not adequately characterize low income and disadvantaged communities in Hawai'i. However, to comply with the requirements of the PCAP and implementation grant, this PCAP supplements national data. Hawai'i's situation is not fully captured by the CEJST tool, nor is it captured by EPA's EJScreen IRA Disadvantaged Communities Layer. LIDACs in Hawai'i are characterized differently because of unique situations on the islands, such as skewed census block and tract data, higher electricity costs, high cost of living, infrastructure limitations due to isolated geography, multicultural and multilingual communities that do not have access to FEMA lifelines,[27] which include energy, transportation, water systems, health and medical services, and other essentials for resilience and adaptation to climate change stressors and shocks. [28]

Social vulnerability describes the susceptibility of communities to the adverse impacts of pollution and encompasses a range of factors that influence a communities' ability to deal with

[23] U.S. 2020 Census (2020), Hawai'i Quick Facts, https://www.census.gov/quickfacts/fact/table/HI/PST045223
[24] Hawai'i has the nation's largest share of multiracial Americans, see research Pew article, https://www.pewresearch.org/short-reads/2015/06/17/hawaii-is-home-to-the-nations-largest-share-of-multiracial-americans/
[25] Hassanein, N (2021, Sept 25). Climate change, heat waves affect heart health, experts say. Here's why that puts people of color at higher risk, *USA Today* https://www.usatoday.com/story/news/nation/2021/09/25/climate-change-heart-health-people-color-risk/8318771002/
[26] State of Hawai'i, Hawai'i Climate Mitigation & Adaptation Commission (2019). Final Statement on Climate Equity, https://climate.hawaii.gov/wp-content/uploads/2021/02/Commision-Statement-on-Climate-Equity-FINAL.pdf
[27] U.S. FEMA (2023). Community Lifelines, https://www.fema.gov/fact-sheet/community-lifelines
[28] State of Hawai'i Department of Business, Economic Development and Tourism, Hawai'i State Data Center, Research and Analysis Division (2016). Statistical Report: Detailed Languages Spoken at Home in the State of Hawai'i, https://files.hawaii.gov/dbedt/census/acs/Report/Detailed_Language_March2016.pdf

the negative impacts of environmental hazards closely linked to GHG emissions and associated criteria pollutants. Social indicators that influence vulnerability include income, household size, age demographics, education level, access to a vehicle, etc. Vulnerability is also influenced by community proximity to power plants, landfills/hazardous waste sites, proximity to superfund sites, proximity to traffic and major throughfares, and urban heat index. Vulnerability can be reduced with GHG reduction measures that also improve access to healthy food, diverse transportation options, and green space. However, quantifying impacts of pollution reduction measures is challenging in Hawai‘i as there is major data inequity and national tools available to analyze the effects of air pollution mitigative actions on air quality and health benefits are lacking. For example, EPA’s CO-Benefits Risk Assessment Health Impacts Screening and Mapping Tool (COBRA), is unavailable for the state. While data for many of these indicators are available nationally, Hawai‘i must localize the social and climate indicators of its statewide index to understand the vulnerability of its residents more comprehensively.

As an example, specific to the Maui E kupaku ka ‘āina measure, the Climate and Economic Justice Screening Tool (CEJST) illustrates the skewed outcomes and assumptions that come from lumping distinct districts (Waikapu to Kahakuloa) into a single large census tract.[29] In this case, losing visibility of the concentration of Native Hawaiian families in Waiehu (Hawaiian Homes and older households in Waiehu town) and weighting poverty levels to federal income standards rather than what is necessary to survive in Maui. Because of this, Waiehu is designated as “not disadvantaged,” nor does the area meet any thresholds for socioeconomic or other factors, further, the risk for wildfire is not accounted for.

Identification of and Engagement with LIDACs

As the priority measures are implemented, there will be continued engagement with LIDACs to ensure that benefits are directly flowing to the intended communities. For each priority measure, benefits to LIDACs must be monitored during implementation. When possible, jobs should be filled by workers from the local community. Workforce training for skilled trades should be accessible to all potential candidates, increasing knowledge and skill sets. Tracking dollars spent in LIDACs and to the benefit of LIDACs is also necessary to ensure the intended communities are receiving maximum benefit.

Through focused outreach done by the Coalition thus far, the following recommendations have evolved:

> **Maximize existing solutions while also pursuing new opportunities.** Most of the proven, effective decarbonization solutions need to be implemented for Hawai‘i to be successful in achieving its decarbonization goals. It is critical that measures are carried out and sequenced correctly to not further burden low-income or asset-limited, income-constrained, employed

[29] U.S. EPA, Council on Environmental Quality (n.d.). Environmental Justice Mapping and Screening Tool, https://screeningtool.geoplatform.gov/en/#9.49/20.9244/-156.5395

(ALICE) households–in other words, most of Hawai'i's local working families. As a collective of public and private entities, creative solutions should be implemented, and outreach efforts combined which is particularly applicable for large projects during site selection.

Hawaiian Indigenous knowledge should help guide our energy transition. Hawaiian ancestral and indigenous knowledge should play a critical role in our pathway to net negative emissions. Consider innovation in the context of Indigenous solutions, including incentivizing implementation measures that revitalize the ahupua'a land management system, and center Native Hawaiian voices.

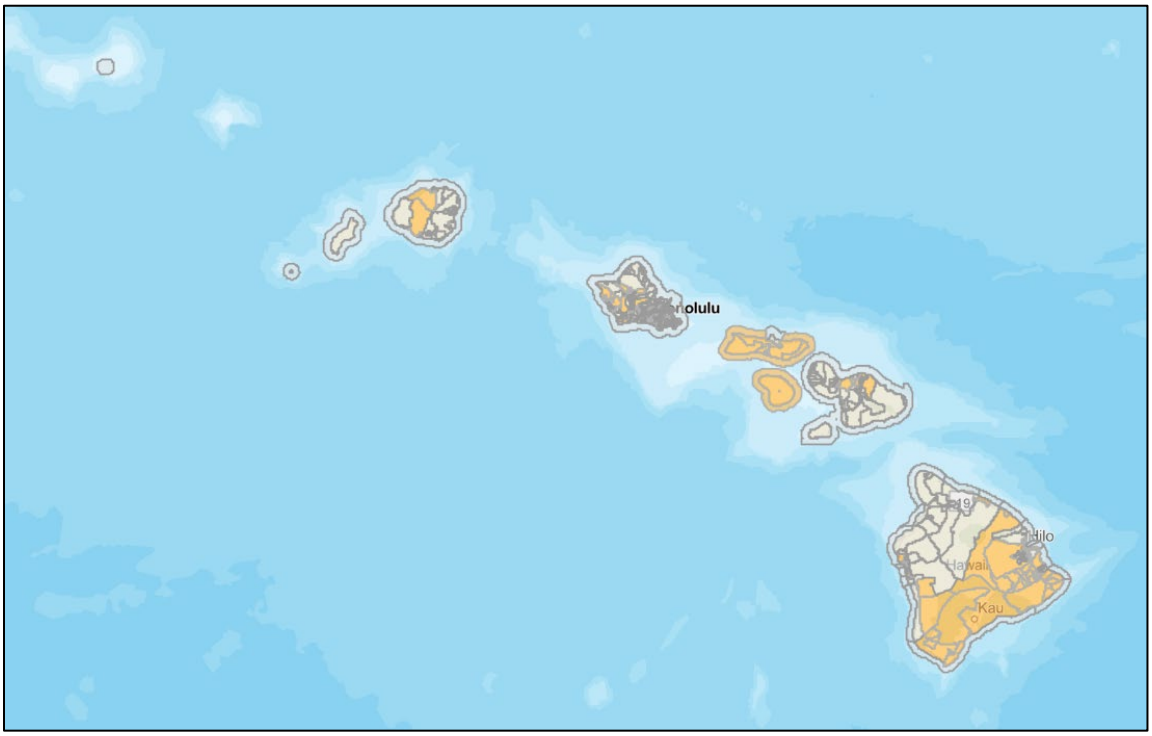
Education and community engagement are essential to successful decarbonization. The importance of building community trust cannot be overstated. Behavioral change will inevitably be a part of successful decarbonization, and while financial incentives play a role in affecting human choice, people are also driven by trusted messengers, alignment with personal values, day-to-day priorities, and more. Driving behavioral change equitably will require fundamentally reworking relationships with communities, both by the government and the private sector.

Impact of PCAP Implementation on LIDACs

Implementation of each priority measure will reduce GHG emissions, benefiting LIDAC communities. However, the geographic location of implemented measures will result in varying impacts for LIDAC communities. This PCAP relies on EPA's EJScreen data to identify LIDAC communities, using the EPA-IRA Disadvantaged Communities Screen.[30] Twenty-nine percent of Hawai'i's block groups are designated as disadvantaged using the EPA-IRA screen. Given the challenge in identifying vulnerable populations and LIDAC communities in Hawai'i using EPA tools, for each priority measure, we also augment the discussion of LIDAC impacts with additional context to better represent the comprehensive impact of implementing Hawai'i's PCAP. Figure 5 shows the block groups in Hawai'i identified as disadvantaged using EPA's EJScreen 2.0. A block group as defined by the U.S. Census is an area with roughly 600 to 3,000 residents. The size of block groups vary widely, as shown in Figure 5.

[30] U.S. EPA (n.d.). EJScreen: EPA's Environmental Justice Screening and Mapping Tool (Version 2.2), https://histategis.maps.arcgis.com/apps/webappviewer/index.html?id=59eed28ea2524031b61243d9719bf961

Figure 5: Map of EPA-IRA designated Areas Using EPA EJScreen



Skyline Connect for Rapid Transit, O'ahu, City and County of Honolulu

This transportation infrastructure measure improves the connection between the Skyline rail and bus in Honolulu. All transit routes impacted by this measure serve or pass through LIDACs with approximately 80% of the project footprint in LIDAC areas. This measure will result in job creation in LIDACs in skilled trades including construction, engineering, and electrical work. This measure improves the daily quality of life for LIDACs by reducing congestion, increasing transit convenience, and reducing travel time for riders. The Skyline Connect will reduce travel in single occupancy fossil fueled vehicles, lowering transportation costs for LIDACs. Reduced fossil fuel usage can also support positive health outcomes and reduced lifetime medical costs for vulnerable populations.

Paratransit Fleet Electrification, Hawai'i Island, County of Hawai'i

This measure replaces fossil fuel minivans with electrical vans. Eighty-five percent (85%) of established routes and pickup/drop off locations for this paratransit fleet are within EPA IRA designated areas. This measure will create jobs in LIDACs in electrical work as well as electric vehicle charging installation and vehicle maintenance. The paratransit measure also improves mobility access and convenience for vulnerable populations, reducing reliance on fossil fuel vehicles reducing GHG emissions, and improving air quality. NOx and PM 2.5 reductions in LIDACs will improve health outcomes and reduce cardiovascular and respiratory illnesses in vulnerable and low-income populations. This measure also increases climate resiliency for communities served by the paratransit fleet by increasing adaptive capacity from extreme events. Utilizing the

paratransit fleet can also improve economic resiliency by reducing spending on fossil fuels and vehicle maintenance and reducing health costs from improved health outcomes.

Expanding Honolulu's Shared Micromobility, Honolulu, Bikeshare Hawai'i
This measure builds active transportation infrastructure by creating EV mobility hubs with chargers, adding e-bikes to existing shared mobility service areas and expanding to new service territories including low-income areas and those with lower access to transit options at night. This measure expands bikeshare to Kalihi and Iwilei, one of the lowest income regions on O'ahu which is also an EPA IRA designated area. Fifty percent of this priority measure is physically installed in LIDACs. However, increased micromobility options will draw riders from surrounding communities increasing the total benefit to LIDACs.

This measure will create jobs in installation and maintenance of electric chargers, directly benefiting local economies. Increased mobility options, specifically for low income and transit underserved communities, will improve the daily quality of life for LIDACs and improve health outcomes by reducing fossil fuel combustion and encouraging active mobility. Reducing fuel costs and improving health costs from active transportation will also increase the economic resiliency of LIDACs impacted by this priority measure.

Complete Streets Infrastructure Improvements, Kaua'i, County of Kaua'i
This measure will increase walking and biking along Haleko and Kawaihau roads in Kaua'i. While the project boundaries are not within EPA IRA designated areas, the Haleko road improvements connect an EPA-IRA designated area in Līhu'e to Kaua'i's primary shopping areas improving access to retail and grocery stores for this LIDAC community which includes affordable housing, transitional housing, and a homeless shelter. This measure requires road upgrades and construction that will create jobs in construction and engineering. Given the proximity of the measure to EPA IRA designated areas, there may be workforce benefits to LIDACs. The project will reduce vehicle miles travelled through increased mobility options, promoting active mobility, and improving daily life and positive health outcomes for LICACs that utilize these road improvements.

Drainage improvements within this measure can increase climate resiliency and make communities, including nearly LIDACs, more resilient to heavy precipitation from storms. This measure will reduce fossil fuels usage and overall transportation costs for LIDACs. This measure will also reduce local air pollutants including NOx which can exacerbate existing health conditions for vulnerable populations and increase respiratory and cardiovascular illnesses. This measure has the potential to reduce health related illnesses and costs for LIDACs, even though the boundaries of the project do not fall within EPA-IRA designated areas.

Affordable Green Housing Retrofit Program, Statewide
This measure supports a comprehensive retrofit program targeting existing affordable multi-family homes. As there are income requirements for retrofit applicants and the measure is fully located in LIDAC areas. This measure will create jobs in low-income communities for skilled trades including construction, engineering, and electrical work. In addition, there will be administrative

jobs needed to operate the retrofit program. Retrofitting existing multi-family homes will improve the daily comfort of residents and insulate against heat waves which can harm human health, specifically in vulnerable and low-income communities. This measure enhances the economic resilience of LIDACs by providing improved energy efficiency and energy storage systems to reduce the load on the electric grid and reduce energy costs for residents. Increasing efficiency also has measurable co-pollutant benefits, reducing NOx, PM 2.5, and SO2 levels in LIDACs resulting in improved health outcomes for humans and sensitive ecosystems and waterways.

Green Building Improvements Pearl City Library, Oʻahu, Hawaiʻi State Library System
This measure will implement green building design features including envelope upgrades and highly efficient lighting at the Pearl City Public Library (PCLP) located in a LIDAC. The PCLP is a key community resource and provides essential services to families participating in local public housing programs. This measure will reduce costs to the PCLP and expand the library's services to include climate education services for visitors, improving the library's ability to meet the community's needs. Retrofitting PCLP will create construction and installation jobs and additional service offerings may require additional library staff. Retrofitting the library will improve the comfort of visitors and reducing reliance on fossil fuels improves air quality and supports positive health outcomes. This is of specific importance at the PCLP given its proximity to a fossil fuel fired power plant. This measure will enhance the climate and economic resilience of the community as lower energy costs can free up budget for additional community offerings.

Energy Efficiency Upgrades, Kauaʻi County, County of Kauaʻi
This measure upgrades energy efficiency in three types of County facilities, The Līhuʻe Civic Center, fire stations, and neighborhood centers. At least 50% of retrofitted county facilities will be located in EPA-IRA designated areas and with the benefits directly impacting LIDACs. Energy efficiency upgrades can include lighting upgrades, hot water heater and air conditioning upgrades, and appliance upgrades. This measure will generate jobs in the local LIDAC communities in installation and retrograde updates and improve the quality of life for community members by improving local amenities. The measures will result in reductions in NOx, PM 2.5, and SO2 through reduced reliance on fossil fuels improving health outcomes for LIDAC residents. Retrofits installed under this priority measure protect County buildings from extreme weather and heat waves, improving climate resiliency and reducing energy bills which can be redirected to other programs benefitting the local community.

Decentralized Compost Network for Hawaiʻi, Statewide, Sustainable Coastlines Hawaiʻi
This measure will expand the production, distribution, and application of compost on the island of Hawaiʻi through a network of decentralized, community-based compost facilities. While locations have yet to be chosen for the compost sites, HSEO is committed to ensure that at least 40% of the sites and the benefits associated with the project are in LIDACs. This measure will create jobs in agriculture and waste management and will improve water quality and climate resiliency by improving land productivity and strengthening soil through compost application reducing mineral and pollution run off. This measure will also reduce the amount of materials deposited in Hawaiʻi's landfills. The two landfills on the island of Hawaiʻi are adjacent to LIDACs

and reducing the amount of material going to landfills will improve the daily quality of life in communities by improving odors, reducing truck traffic, and improving air quality.

Cardboard and Composting Waste Diversion Center, Hawai‘i Island, Recycle Hawai‘i
This measure diverts cardboard and food waste from local businesses for reuse and repurposing as recycled and repurposed goods and products promoting local cultural activities while reducing GHG emissions and reducing landfill waste. This diversion center is in Hilo, which is an EPA-IRA designated area. The project would benefit the LIDAC community directly through an increase in jobs in agricultural and waste management and providing materials for the creation of goods that promote local culture. Hilo is located four (4) miles from the East Hawai‘i Reload Facility and the surrounding community will benefit from diverted landfill waste, reduced truck trips and improved air quality, and reduced methane emissions and odors. This measure also increases the economic resilience of the community by increasing jobs for local community members and artists by providing access to low cost recycled and recovered goods.

Reusable Foodware, Hawai‘i Island, County of Hawai‘i
This measure will expand an existing community-driven project to implement a scalable reuse and refill program for food and beverage packaging in Hawai‘i county. Over 30% of this measure’s benefits are anticipated to directly benefit LIDACs. This measure will create jobs in the service and waste industries and reduce reliance on single use food packing, reducing land fill waste. This measure will reduce the cost of producing food by eliminating the cost of single use containers, creating cost savings in the production and packaging of food. Diverting waste from landfills will positively impact nearby communities. On the island of Hawai‘i, one of the two established landfills is directly next to LIDACs.

Compost and Containers, Maui, County of Maui
This waste management measure will enhance sustainable practices in Maui schools including installation of dishwashers and mobile washing stations to reduce reliance on single use materials. While specific school locations have not yet been chosen, HSEO is committed to ensuring that at least 40% of the school sites and the benefits associated with the measure are in LIDACs. This measure will also have an educational component, teaching students about waste systems and environmental issues. This waste management measure will create jobs in the service and waste industries that will benefit LIDACs. In addition, the measure will divert single-use materials from landfills. 3 out of 4 landfills in Maui County are located in LIDACs, therefore waste diversion, irrespective of its source, will improve the daily quality of life for LIDACs near landfills. Eliminating single use materials can also reduce food production costs, saving the school district money that can be repurposed for other beneficial uses.

Transfer Station Life Extension for Waste Diversion, O‘ahu, Re-Use Hawai‘i
This measure extends the O‘ahu Island Transfer State Reusable Material Collection Site which diverts materials from landfills. O‘ahu’s landfills are scheduled to close in 2028 with no proposed alternative. This makes waste diversion critical to improving life on the island. While the transfer station is not located in a LIDAC, the landfill receiving its waste is in a LIDAC near indigenous communities. Diversion of waste through this measure benefits the LIDAC community of West

Oʻahu by reducing truck traffic, odors, and methane emissions. The measure also provides access to reusable materials for construction which can lower overall costs for construction, specifically housing costs.

Integrating Waste and Land Management Systems, Hawaiʻi Island, University of Hawaiʻi
This measure integrates waste and land management systems to reduce GHG emissions through on-site composting and generation of soil carbon amendments. This project is located at OK Farms which is within an EPA-IRA designated area with benefits accruing to the local community and ecosystem. This measure diverts waste from landfills reducing truck trips and transportation fuels and creates jobs in the agriculture and waste sectors in LIDACs. The measure improves soil health through application of compost and soil amendments including biochar, increasing water retention and land productivity, enhancing overall climate resiliency. The measure benefits the local ecosystem by reducing the use of synthetic pesticides and water usage. It enhances local economic resiliency by developing new soil amendment products that create a new market and revenue source for the community.

Maui Million Trees, Maui, County of Maui
This measure will plant a total of one million native trees and plants to preserve and restore critical forest ecosystems in Maui Nui, with 400,000 trees planted by 2030. While the specific locations for planting have not yet been chosen, HSEO is committed to ensure that at least 40% of the trees planted and benefits associated with the measure are in LIDACs. Native trees reduce GHG emissions and mitigate flood and wildfire events improving safety and enhancing climate resiliency of communities. This measure will create agricultural jobs and increase the soil moisture which can mitigate strains on local water resources. These benefits will accrue to LIDACs in proportion to the investment in those communities.

Maui Biochar, Maui, County of Maui
This measure will produce biochar through pyrolysis of dead and dying invasive tree species. Biochar is applied to the soil, sequestering carbon and improving soil health. While specific areas have not yet been identified for the biochar production, at least 40% of production will be in LIDACs. Biochar production will create jobs in agriculture and improve water quality and climate resiliency by improving soil health and absorption, reducing runoff and use of pesticides. This measure will also increase ecosystem health by removing invasive species and repurposing them as a soil additive. Biochar application can improve land productivity which can reduce production costs and support the agricultural industry.

Reforestation for Carbon Removal and Sequestration, Maui, E kupaku ka ʻāina
This measure will reforest degraded lands near the Waiehu Kou Hawaiian Homes subdivision. While the project is not located in a LIDAC it is downstream and within the same traditional land management area (similar to a watershed) as culturally sensitive areas and LIDACs. In addition, this measure will increase the availability of culturally important foods in communities through the increased native plants. The measure will create jobs in agriculture and will improve soil health and land productivity which can reduce food costs and food insecurity in LIDAC

communities. Reforestation can also reduce wildfire risk, providing health and ecosystem benefits.

Energy for State and County Buildings, Statewide, Hawai'i Green Infrastructure Authority
This measure will deploy renewable energy and storage systems for local government buildings to reduce energy costs, supply clean energy, and provide resilience in case of an electric grid outage. The specific locations have not yet been identified, but government buildings in LIDAC will be prioritized. This measure will create jobs in installation and maintenance of renewable energy and storage systems, providing economic benefit to local communities. Reduced energy consumption can improve health outcomes by reducing reliance on fossil fuels associated with poor health outcomes. Reduced energy usage and resilience to grid outages also reduces energy expenditures, freeing funds to be used for other governmental purposes.

Review of Authority to Implement

The Hawai'i Coalition has reviewed existing statutory and regulatory authority to implement each priority measure continued in this PCAP. All measures are implementable under existing statutes and/or county ordinances. Projects are either located in the public rights-of-way, on public land, or on private lands with the consent of the landowner. Some projects may require environmental reviews and/or ministerial permits. For any priority measure where these reviews and permits must still be obtained, this section contains a summary of actions needed by proposers/project implementers for obtaining any authority needed.

As the lead applicant for the Coalition, the HSEO has key authorities which enable the HSEO to support these decarbonization initiatives: these include statutory duties as established under HRS 196-72. Specifically, HRS [§196-72] (b)(5) "Identify market gaps and innovation opportunities, collaborate with stakeholders, and facilitate public-private partnerships to develop projects, programs, and tools to encourage private and public exploration, research, and development of energy resources, distributed energy resources, and data analytics that will support the State's energy and decarbonization goals; (14) Support economic development and innovation initiatives related to and resulting from the State's renewable energy and distributed energy resources experience, capabilities, and data analyses; (15) Facilitate the efficient, expedited permitting of energy efficiency, renewable energy, clean transportation, and energy resiliency projects by: (A) Coordinating and aligning state and county departments and agencies to support, expedite, and remove barriers to deployment of energy initiatives and projects; and (B) Identify and evaluate conflicting or onerous policies and rules that unreasonably impede project development and deployment and propose regulatory, legislative, administrative, or other solutions to applicable stakeholders."

Table 2, found on page 11, identifies the implementing entity and authorizing agency/agencies for each measure.

Authority to Implement Priority Measure 1.
Skyline Connect for Rapid Transit, Oʻahu, City and County of Honolulu
The City Department of Transportation Services (DTS) has the authority to implement roadway design changes on its facilities and will work with HDOT to directly implement the approved and developed designs and secure rights-of-entry for City contractors. The ability to deploy zero-emission bus service to connect to Skyline is encouraged in Revised Ordinances of Honolulu Chapter 15, Section 6.8: "The director shall consider using zero-emissions buses to service routes with at least one bus stop at or within 100 yards of a Honolulu High-Capacity Transit Corridor Project rail station or a multi-modal transit center." All required permits and regulatory approvals as well as public outreach will be secured during the initial project design phase. Adequate time has been included in the project schedule to allow for design iteration through the City's One-Time Review process.

Authority to Implement Priority Measure 2.
Paratransit Fleet Electrification, Hawaiʻi Island, County of Hawaiʻi
The County of Hawaiʻi Mass Transit Agency is authorized under the Americans with Disabilities Act (ADA) to provide paratransit services and is guided by Hawaiʻi County Code Chapter 18, Section 18-94 through 18-97 for Paratransit service. The Hawaiʻi County MTA currently has the authority to implement this project. The Agency's operations include the management and routine procurement of the Hawaiʻi County public transit vehicle fleets.

This project is in a strong position to be conducted in a timely fashion with few disruptions. No permits are required, and regulatory approval will be in full compliance with all vehicle registration and safety standards for the new fleet set forth in Chapter 24 of the Hawaiʻi County Code and Title 17 of the Hawaiʻi Revised Statutes. Other regulatory requirements surrounding the procurement of vehicles will be in full compliance with the State Procurement Code and HRS Chapter 103F.

The ADA of 1990 (P.L. 101-336) prohibits discrimination against qualified individuals with disabilities in transportation services offered by public entities under Title II of the ADA and private entities under Title III of the ADA. This prohibition applies regardless of whether an entity receives Federal funding, and it extends to "fixed-route" and "demand-responsive" transportation services.

Authority to Implement Priority Measure 3.
Expanding Honolulu's Shared Micromobility, Honolulu, Bikeshare Hawaiʻi
The proposing entity has current authority to carry out the measures proposed as covered in its operations and service contract with the City and County of Honolulu. New station locations and geographic areas will be added to the entity's semi-annual traffic engineering review and street use permitting process.

Authority to Implement Priority Measure 4.
Complete Streets Infrastructure Improvements, Kaua'i, County of Kaua'i

County of Kaua'i passed a Complete Streets Resolution in 2010 (resolution 2010-48) to incorporate Complete Streets principles into all roadway projects.[31] In 2009, the Hawai'i legislature amended state statutes to require the Hawai'i Department of Transportation (HDOT) and Hawaii's four county transportation departments to adopt complete streets policies that accommodate all users of the roadways, including pedestrians, bicyclists, transit users, motorists and persons of all ages and abilities.[32]

The projects will involve the County of Kaua'i's Public Works Department, Planning Department, Transportation Agency, and Office of Economic Development.

Authority to Implement Priority Measure 5.
Affordable Green Housing Retrofit Program, statewide, City and County of Honolulu (proposer) and HSEO (implementer)

§HRS 196-71 outlines the jurisdiction of the Hawai'i State Energy Office (HSEO) , which will be taking the lead for this measure proposed by the City and County of Honolulu.

According to HRS 196-71:

> "[t]he purpose of the Hawaii state energy office shall be to promote energy efficiency, renewable energy, and clean transportation to help achieve a resilient clean energy economy. In addition, the HSEO is tasked to "[l]ead efforts to incorporate energy efficiency, renewable energy, energy resiliency, and clean transportation to reduce costs and achieve clean energy goals across all public facilities; Provide renewable energy, energy efficiency, energy resiliency, and clean transportation project deployment facilitation to assist private sector project completion when aligned with state energy goals; and Engage the private sector to help lead efforts to achieve renewable energy and clean transportation goals through the Hawaii clean energy initiative."

Additionally, §HRS 196-72 enables the Chief Energy officer of the HSEO to "[d]evelop and recommend programs for, and assist public agencies in the implementation of, energy assurance and energy resilience" and "[c]ontract for services when required for the implementation [...]" of projects.

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[31] County of Kaua'i (2010). Resolution No. 210-48, Draft 1: A Resolution Establishing Complete Streets Policy for the County of Kaua'i, https://health.hawaii.gov/physical-activity-nutrition/files/2013/08/Kauai-County-Resolution-2010-48.pdf

[32] UNC Center for Health Promotion and Disease Prevention (2013). Healthy Hawaii Initiative, Hawaii Department of Health University of Hawaii at Manoa, Hawaii Complete Streets Policy, https://www.cdc.gov/nccdphp/dnpao/state-local-programs/pdf/hawaii_cs_template.pdf

Authority to Implement Priority Measure 6.
Green Building Improvements Pearl City Library, O'ahu, Hawai'i State Library System[33]
Act 239 (SLH 2022), Chapter 196, Hawaii Revised Statutes, added two new sections to part II which provide the authority for the HSLS to implement this project:
"§196- Energy efficiency implementation for state facilities. (a) State facilities shall implement cost-effective energy efficiency measures, and under §107-27, "Design of state buildings. (a) No later than one year after the adoption of codes or standards pursuant to section 107-24(c), the design of all state building construction shall be in compliance with the Hawaii state building codes [...]"

The State Library System is an independent State agency that reports directly to the Board of Education, accordingly, HSPLS is required to follow DAGS's State Building Code.

Authority to Implement Priority Measure 7.
Energy Efficiency Upgrades, Kaua'i County, County of Kaua'i
Permits will need to be obtained by the County of Kaua'i's Building Division, according to permit guidelines that adhere to § HRS Chapter 444 and Chapter 464. The projects will involve the County of Kaua'i's Public Works Department, Department of Parks and Recreation, and Office of Economic Development.

Authority to Implement Priority measure 8.
Decentralized Compost Network for Hawai'i, Statewide, Sustainable Coastlines Hawai'i
The Hawai'i Department of Health's Office of Solid Waste offers permits for green waste composting facilities. The proposer is prepared to abide by Hawaii Administrative Rules Title 11 DOH Chapter 58.1 Solid Waste Management Control Subchapter 4 (§11-58.1-41) to obtain permit approvals.

Authority to Implement Priority Measure 9.
Cardboard and Compost Waste Diversion Center, Hawai'i Island, Recycle Hawai'i
The proposer is prepared to abide by Hawaii Administrative Rules Title 11 DOH Chapter 58.1 Solid Waste Management Control Subchapter 4 (§11-58.1-41) to obtain permit approvals.

Authority to Implement Priority Measure 10.
Reusable Foodware, Hawai'i Island, County of Hawai'i
The County of Hawai'i Department of Environmental Management has authority to implement a reusable food ware program under its Administrative Rule 2-10 Relating to Polystyrene Foam Food Container and Food Service Ware Reduction.[34] In addition, in December 2007, the County

[34] County of Hawai'i Department of Environmental Management (2023). Rules of Practice and Procedure, https://records.hawaiicounty.gov/weblink/1/edoc/122975/23-04-19%20Env%20Mgt%20Rules%20of%20Practice%20and%20Procedure%20-%20Final.pdf

Council adopted Resolution 356-07 to "embrace and adopt the principles of zero waste as a long-term goal for Hawai'i County."[35]

Authority to Implement Priority Measure 11.
Compost and Containers, Maui, County of Maui
The proposer is prepared to abide by Hawaii Administrative Rules Title 11 DOH Chapter 58.1 Solid Waste Management Control Subchapter 4 (§11-58.1-41) to obtain permit approvals.

Authority to Implement Priority Measure 12.
Transfer Station Life Extension for Waste Diversion, O'ahu, Re-Use Hawai'i
The proposer already has a working site and is prepared to abide by Hawaii Administrative Rules Title 11 DOH Chapter 58.1 Solid Waste Management Control Subchapter 4 (§11-58.1-41) to extend any permit approvals necessary.

Authority to Implement Priority Measure 13.
Decarbonizing Waste Streams, Hawai'i Island, University of Hawai'i
To implement the Hawai'i Island system, the University will need to abide by Hawaii Administrative Rules Title 11 DOH Chapter 58.1 Solid Waste Management Control Subchapter 4 (§11-58.1-41) and obtain appropriate permit approvals.

Authority to Implement Priority Measure 14.
Million Trees, Maui, County of Maui
Actions will be taken on state, county and private lands and implemented through the Pu'u Kukui Watershed Preserve Partnership. Tree planting is not a regulated activity within state or county ordinances. The proposer is prepared to obtain any permits necessary under DLNR's Office of Conservation and Coastal Lands' Conservation District lands which is regulated by HAR Title 13 Chapter 5 and HRS Chapter 183C.

Authority to Implement Priority Measure 15.
Maui Biochar, Maui, County of Maui
The proposer is prepared to abide by Maui County Department of Environmental Management's rules as well as Hawaii Administrative Rules Title 11 DOH Chapter 58.1 Solid Waste Management Control Subchapter 4 (§11-58.1-41) to obtain permit approvals.

Authority to Implement Priority Measure 16.
Reforestation for Carbon Removal and Sequestration, Maui, E kupaku ka āina
Actions will be taken on private land. The landowner has granted access and authorized actions on their land.

[35] County of Hawai'i (2019). Integrated Waste Solid Waste Management Plan Update, https://records.hawaiicounty.gov/weblink/1/edoc/120882/County_of_Hawaii_Integrated_Solid_Waste_Management_Plan_2019_Update_Final.pdf

Authority to Implement Priority Measure 17.
Energy for State and County Buildings, Statewide, Hawai'i Green Infrastructure Authority
The HGIA was established by HRS §196-63 as an instrumentality of the State. The functions, powers, and duties of HGIA are defined in HRS §196-64, which states (a) In the performance of, and with respect to the functions, powers, and duties vested in the authority by this part, the authority, as directed by the director and in accordance with a green infrastructure loan program order or orders under section HRS §269-171 or an annual plan submitted by the authority pursuant to this section, as approved by the commission for the green infrastructure loan program, may: (1) Make loans and expend funds to finance the purchase or installation of green infrastructure equipment for clean energy technology, demand response technology, and energy use reduction and demand side management infrastructure, programs, and services; (4) Enter into contracts for the service of consultants for rendering professional and technical assistance and advice, and any other contracts that are necessary and proper for the implementation of the loan program; and (5) Enter into contracts for the administration of the loan program, without the necessity of complying with HRS chapter 103D.

Intersection with Other Funding Availability

Many of the priority measures included in this PCAP expand upon or complement existing programs. CCMAC has explored federal and non-federal funding sources to determine whether these sources could fund each priority measure and whether such funding is sufficient to fully implement the measure. This section describes the results of this analysis for each priority measure.

Short Description of Measures and Funding Need

Priority Measure 1. Skyline Connect for Rapid Transit, O'ahu, City and County of Honolulu.

A transportation infrastructure project to improve the connection between Skyline and TheBus on O'ahu. These infrastructure improvements will make transit quicker, more reliable, and contribute to the attractiveness of taking transit on O'ahu.

Funding needed to implement the measure: $11,000,000 (total); share requested from CPRG: $11,000,000 .

List of Funding Stream: The City will rely on a combination of City general operating funds and Federal Transit Administration (FTA) 5307 program formula funds. Previously awarded and potential future discretionary funding to fund operations of the new transit services in addition to adding new vehicles to grow the existing zero-emission bus fleet. Additional congressionally directed spending and discretionary grants are already dedicated to fortifying bicycle and pedestrian infrastructure in significant corridors parallel to the proposed routes using these TPLs. They include a 30-mile South Shore Bike Path spanning between West O'ahu in Nānākuli and UH Mānoa/Waikīkī in Honolulu and a "Safe Streets for All" planning grant to improve pedestrian safety along heavy-use transit corridors experiencing high crash and injury incidents.

Additional implementation grant dollars are necessary because: Unlike other City transportation projects, the transit lane construction is not eligible for City Capital Improvement Project bond funding since construction efforts are primarily signage, striping, and painting. Therefore, the establishment of bus lanes competes with the same budget monies that fund actual transit operations. It is difficult to justify a reduction in transit system services to establish and prioritize longer-term transit lanes, and the CPRG grant monies fill this need.

Priority Measure 2. Paratransit Fleet Electrification, **Hawai'i Island, County of Hawai'i.**

Replace 7 gasoline-fueled minivans used for the County's paratransit services with twelve (12) 2021 Demo Sunset Vans.

Funding needed to implement the measure: $7,335,393 (total); share requested from CPRG: 4,000,000.

List of Funding Stream: The Department of Research and Development applied to the Department of Transportation Charging, Fueling, and Infrastructure (CFI) Grant in May 2023 to fund $3,970,672 for transportation infrastructure, with the County committing to a 20% match of $992,668 through service usage fees. This application includes (5) additional CDL drivers and (1) a Road Supervisor position with fringe benefits, which would increase funding by $2,312,190. The anticipated announcement date for the CFI Grant may impact the total amount of CPRG funds requested.

Additional implementation grant dollars are necessary because: The Hawai'i County Mass Transit Agency does not have the capital improvement plan funds available to fund this project, and there is no planned allocation of County funds for this project.

Priority Measure 3. Expanding Honolulu's Shared Micromobility, Honolulu, Bikeshare Hawai'i.

To build and upgrade to new infrastructure by creating new e-bike and EV mobility hubs with chargers; and to facilitate shared micro-mobility that allows both new service type such as e-bikes in an existing service area and an expansion into new areas, especially lower income areas and those with less transit access late at night. Project will involve the addition of 221 e-bikes and 195 eDocks for charging the bicycles. eDocks also have compatibility to charge EVs.

Funding needed to implement the measure: $3,000,000 (total); share requested from CPRG: $3,000,000.

List of Funding Stream: The following are the funding sources the applicant has applied for, has secured, and/or will secure to implement the GHG reduction measures:

- 2016: $5 million (Secure) for system start (Secure) 1000 conventional bikes + 100 stations.
- 2017: $2.7 million (private donations to match TAP funds) for system expansion 288 bikes + 36 stations.
- 2023 – 2021: $75,000 (HEI) for fleet electrification planning.
- 2024: $500,000 (DTS C&C) pending proposed annual capital funding for existing service area.

Additional implementation grant dollars are necessary because: The proposal demonstrates a strong need for EPA CPRG implementation funding due to the very limited/ non-existing programmatic funds open to direct support of bikeshare operations and fleet electrification compared to funds that support public transit (capital and operations) and EV chargers for cars (hardware and installation). For example, the FTA currently does not define bikeshare as a form of public transit even though it performs this function and is defined as such in other countries. The existing Bikeshare system is now seven years old and much of the original hardware (station kiosks and bikes) will need to be replaced. These costs are much higher for fleet electrification: the cost to add e-bikes and the cost to electrify stations for recharging is between $10,000 to $100,000 per station versus $5,000 for a conventional station installation. While Bikeshare's existing revenue collection fully covers operations, maintenance, and insurance but not fleet electrification or expansion, and though this revenue collection is better than conventional public transit (3% to approximately 23% fare box return), it is similar in its need for support in capital investment and extending service to low-income areas.

Priority Measure 4. Complete Streets Infrastructure Improvements, Kaua'i, County of Kauai.

To implement infrastructure improvements that are expected to significantly reduce single-occupancy vehicle trips and encourage walking, biking, and transit ridership, and so, reduce GHGs and increase co-benefits.

Funding needed to implement the measure: $6,000,000 (total); share requested from CPRG: $5,000,000.

List of Funding Stream: $1,000,000 secured from the Hawai'i State Transportation Improvement Program.

Additional implementation grant dollars are necessary because: The amount requested aligns with other County roadway projects that include sidewalk construction and improvements, bike paths, and traffic calming measures. The amount requested is only for construction of greenhouse gas reduction measures and not the project's entirety.

Priority Measure 5. Affordable Green Housing Retrofit Program, statewide, City and County of Honolulu (proposer) and HSEO (implementer).

To create a comprehensive building retrofit program targeting existing affordable multi-family homes and provide it funding for its first five years of operation.

Funding needed to implement the measure: $30,200,000 (total); share requested from CPRG: $7,550,000.

List of funding stream: City FY '23 operating funds: $450,000 utilized to contract with program design consultant VEIC for Phase I, Program Design.

- Public Benefits Fund annual energy efficiency program funding as applicable (percentage of energy bills) .

- Hawai‘i State Energy Office: IRA HOMES and HEAR funding (use is broader than, but inclusive of, retrofit program) Hawai‘i is one of four states who has applied early for this funding.
- Hawai‘i Green Infrastructure Authority: Solar for All funding to provide revolving funds to projects for rooftop solar projects completed as part of deep energy retrofits (use is broader than, but inclusive of, retrofit program)
- FEMA BRIC funding may be available for battery storage systems to provide backup power in buildings with more vulnerable populations such as elderly housing.

Additional implementation grant dollars are necessary because: There is a significant amount of federal funding available for building energy retrofits today. However, building managers in the target segment have severe limits on their available time, and lack the expertise to navigate these types of projects. Without robust and well-planned efforts to identify, market to, and provide technical and financial assistance to low income building owners for comprehensive retrofits, these federal dollars are unlikely to reach older under-resourced multi-unit properties. In anticipation of this need, the City was able to fund the retrofit program design with general operating funds but does not have the resources to fund program implementation. The Inflation Reduction Act funding is essential for the success of this program. However, most IRA funding is needed to be applied towards specific measures or project types, whether it be appliances, solar systems, building level retrofits, rewiring, or EV chargers.

Priority Measure 6. Green Building Improvements Pearl City Library, O‘ahu, Hawai‘i State Library System.

To implement several green building design measures including PV + BESS, envelope upgrades, highly efficient HVAC systems, & refrigerant management measures for the PCPL Renovation and Community Library Learning Center (CLLC) project to significantly reduce the existing and new buildings’ overall lifetime emissions.

Funding needed to implement the measure: $3,310,000 (total) share requested from CPRG: $3,310,000.

List of Funding Stream: HSPLS has previously secured $26 million from the State of Hawai’i for this project.

Associated workforce development: The new CLLC is intended to support various community uses including early learning programs, childcare, library programs, kupuna (honored elder) classes, and a flexible meeting space. Additional workforce development and training is necessary for this project.

Additional implementation grant dollars are necessary because The most recent 80% project plan costs estimate for the PCPL project showed that the estimated cost for the project currently stands at $34.7 million (includes project costs + construction management fees). HSPLS has previously secured $26 million from the State of Hawai‘i for this project and seeks to secure additional funds from CPRG.

Priority Measure 7. Energy Efficiency Upgrades, Kaua‘i County, County of Kaua‘i.

To upgrade energy efficiency in three groups of County facilities: The Līhu‘e Civic Center, fire stations, and neighborhood centers. This includes exploring interior and exterior lighting and fixture upgrades to LED, film window treatments, refrigeration and other appliance upgrades, hot water heaters, air conditioning in small facilities, and more improvements based on recommendations from a forthcoming audit.

Funding needed to implement the measure: Share requested from CPRG: $1,000,000

List of Funding Stream: Actions are currently not being taken as the County of Kaua‘i currently has no funding available to conduct the actions.

Additional implementation grant dollars are necessary because: Kaua‘i County does not have the capital improvement plan funds available to fund this project, and there is no planned allocation of County funds for this project, CPRG funding is critical to initiate these programs.

Priority Measure 8. Decentralized Compost Network for Hawai‘i, Statewide, Sustainable Coastlines Hawai‘i.

To expand the production, distribution, and application of compost within the islands of Hawai‘i by building a decentralized, community-based compost network with in-vessel composting machines at the heart of the operations.

Funding needed to implement the measure: $4,040,000 Share requested from CPRG: $2,485,000

List of Funding Stream: Through matching funds and in-kind contributions, SCH will bring $1.5 million towards the project (including in-kind). SCH has a history of successful fundraising from various family foundations, and partners. While they were not awarded a USDA Fertilizer Expansion grant in 2023, they continue to seek out similar federal funds. In collaboration with Compost Kauai, the County of Kauai awarded a $48,000 start-up grant in 2023 to cover the cost of permitting and infrastructure in East Kaua‘i to be ready for an additional machine. Kokua Hawai‘i Foundation and Sustainable Molokai have also secured portions of the startup funds to build on the network.

Additional implementation grant dollars are necessary because: SCH has successfully funded the first composting machine in Hawai‘i, and a grant of this size ($2.48 million) will provide a more cohesive approach to network expansion by bringing online multiple machines in unison while providing training and management to move the project towards a future of self-sufficiency.

Priority Measure 9. Cardboard and Compost Waste Diversion Center, Hawai‘i Island, Recycle Hawai‘i .

To divert cardboard and food waste from local businesses into a communal center where discarded materials are recycled and converted into valuable resources and put back into the economy to build wealth, prevent landfill methane generation, and significantly reduce Scope 3 GHG emissions.

Funding needed to implement the measure: $500,000 (total); share requested from CPRG: $500,000

List of Funding Stream: Funding for large-scale, climate-smart sustainable materials management projects in the Hilo community has been ongoing for the past year through community partnerships. Although this collaborative proposal was well received by the Bezos Earth Fund and advanced to the final stages of approval, an ultimate decision has been on hold since BEF chose to donate $100M to Maui wildfire recovery efforts. Since the Maui tragedy, Hawai'i nonprofits find themselves in a severely constricted funding environment which makes support from out-of-state sources sorely needed.

Additional implementation grant dollars are necessary because: EPA support for this project addresses the challenge faced by Hawai'i's environmental and social justice nonprofits at a time when non-profits are finding it difficult to garner sufficient funding.

Priority Measure 10. Reusable Foodware, Hawai'i Island, County of Hawai'i.

Support and expand an existing funded project currently in the community-driven design stage to implement a scalable reuse and refill program for food and beverage packaging for the eastside of Hawai'i County. The project includes collection, washing, and logistics infrastructure to support the circulation of reusable items.

Funding needed to implement the measure: Total $4,640,000, share requested from CPRG: $2,057,188

List of Funding Stream: Hawai'i Department of Environmental Management (DEM) and non-profits Perpetual have secured funding to support their staff and Zero Waste Hawaii staff through the end of 2024 as well as to compensate partners' work on a parametric Life Cycle Assessment (LCA) model that will be customized for Hilo and will include geospatial modeling and routing optimization for the project. Additionally, this project has secured two EPA grants that will fund infrastructure equipment, supplies and technical assistance:

- EPA's Solid Waste Recycling Infrastructure Grant: $1.5 million awarded to County of Hawai'i to support basic infrastructure (transport vehicles, return bins, dishwasher, and tracking technology) for the reusable foodware program.
- EPA's Pollution Prevention (P2) Grants: Environmental Justice Through Safer and More Sustainable Products: $622,000 awarded to UH Sea Grant will fund technical assistance and equipment for local businesses, schools, and community organizations that provide meals, to enable them to make the transition to the reuse system.

Additional implementation grant dollars are necessary: To enhance the success of the current project and increase its scope and GHG reduction potential.

Priority Measure 11. Compost and Containers, Maui, County of Maui.

Waste management initiative to enhance sustainable practices in Maui schools.

Funding needed to implement the measure: $500,000 (total); share requested from CPRG: $500,000.

List of Funding Stream: The Office of Economic Development is poised to apply for multiple initiatives that collectively appeal for more than an estimated $15 million in new projects to benefit the economy, environment, and quality of life throughout Maui Nui.

Additional implementation grant dollars are necessary: Federal and state funding is vitally needed for the proposed Maui Nui Climate Pollution Reduction Program. Maui County's economy has been severely impacted by the devastating wildfires that struck Lahaina and Upcountry, Maui on August 8, 2023. The Economic Research Organization at the University of Hawaii (UHERO) has reported severe economic disruptions, with an initial 75 percent drop in visitor arrivals and a staggering $13 million per day decline in visitor spending in the weeks following the fires.

Priority Measure 12. Transfer Station Life Extension for Waste Diversion, Oʻahu, Re-Use Hawaiʻi

To extend the Oʻahu Island Transfer Station Reusable Material Collection Site project by 10 months. Oʻahu's landfills are slated to close in 2028; no new landfill site has been identified, and no plans are in place. The major landfills are located adjacent to Hawaiian Homelands, exhibiting an environmental justice issue in which waste diversion can help to alleviate.

Funding needed to implement the measure: $140,000 (total); share requested from CPRG: $140,000.

List of Funding Stream: Re-use Hawaiʻi has begun the technical aspects of applying for the EPA Environmental Justice Change grant. They are actively working with partners and stakeholders to complete the application by March, with an expected announcement in July 2024.

Additional implementation grant dollars are necessary because: The project is a proof of concept to exhibit training, workforce development, and environmental stewardship. It is expected that the first phase will inspire other Hawaiʻi municipalities to adopt the resource recovery functions.

Priority Measure 13. Integrating Waste and Land Management Systems, Hawaiʻi Island, University of Hawaiʻi

Integrate waste and land management systems to reduce greenhouse gas (GHG) emissions through nutrient recapture and generation of soil C amendments using a Circular Economy (CE) approach on Hawaiʻi Island, integrating ʻāina stewards, local meat processors and agricultural producers.

Funding needed to implement the measure: $4,000,000 (total); share requested from CPRG: $4,000,000.

List of Funding Stream: Other opportunities to fund this implementation of circular economies have been explored, but not secured. Originally, this project was proposed for the Hawaiʻi Partnership for Climate-Smart Commodities (HiCSC) but removed during re-budgeting. However, a final budget of $40M was secured through HiCSC, which can complement and leverage funding to maximize benefits. As producers implement climate-smart agricultural practices through HiCSC, there is an increased demand for C soil amendments. By producing sustainable C soil amendments production pathways, barriers to adopting climate-smart practices are dissolved. Additionally, localized production decreases the reliance imports and biosecurity risks associated with the transfer of materials between counties and out-of-state**.**

Additional implementation grant dollars are necessary because: this proposal implements an ambitious system that will achieve significant GHG reductions, by 2030 and beyond. This project pursues measures that will achieve substantial community benefits such as increases in local food security, food system sustainability, and ecosystem health. A critical deliverable will be to assess scalability of this circular economic system to decarbonize waste streams to inspire future decarbonizing projects through availability of decision metrics, thereby closing a knowledge gap.

Priority Measure 14. Million Trees, Maui, County of Maui

To plant 1 million native trees and plants to preserve and restore critical forest ecosystems in Maui Nui (Phase 1) and foster a new generation of land stewards.

Funding needed to implement the measure: $2,000,000 (total); share requested from CPRG: $2,000,000.

List of Funding Stream: The Office of Economic Development is poised to apply for multiple initiatives that collectively appeal for more than an estimated $15 million in new projects to benefit the economy, environment, and quality of life throughout Maui Nui.

Additional implementation grant dollars are necessary: Federal and state funding is vitally needed for the proposed Maui Nui Climate Pollution Reduction Program. Maui County's economy has been severely impacted by the aftermath of the devastating wildfires that struck Lahaina and Upcountry, Maui on August 8, 2023. The Economic Research Organization at the University of Hawaii (UHERO) has reported severe economic disruptions, with an initial 75 percent drop in visitor arrivals and a staggering $13 million per day decline in visitor spending in the weeks following the fires.

Priority Measure 15. Maui Biochar, Maui, County of Maui

Produce biochar through pyrolysis of dead or dying invasive tree species, which may be used to improve soil.

Funding needed to implement the measure: $940,000 (total); share requested from CPRG: $940,000.

List of Funding Stream: The Office of Economic Development is poised to apply for multiple initiatives that collectively appeal for more than an estimated $15 million in new projects to benefit the economy, environment, and quality of life throughout Maui Nui.

Additional implementation grant dollars are necessary: Federal and state funding is vitally needed for the proposed Maui Nui Climate Pollution Reduction Program. Maui County's economy has been severely impacted by the aftermath of the devastating wildfires that struck Lahaina and Upcountry, Maui on August 8, 2023. The Economic Research Organization at the University of Hawaii (UHERO) has reported severe economic disruptions, with an initial 75 percent drop in visitor arrivals and a staggering $13 million per day decline in visitor spending in the weeks following the fires.

Priority Measure 16. Reforestation for Carbon Removal and Sequestration, Maui, E kūpaku ka ʻāina.

To reforest degraded lands adjacent to the Waiehu Kou Hawaiian Homes subdivision and reduce wildfire risk and increase community resilience.

Funding needed to implement the measure: $3,150,000 (total); share requested from CPRG: $2,430,000.

List of Funding Stream: ALGH LLC is not a large corporate entity, but a local partnership with a vision for a better future for Waiehu. Together, they have contributed substantial resources (equipment, manhours) towards chipping albizia for erosion control materials for the Lahaina and Kula burn areas since September 2023. Beginning in 2024, a partnership with the State and County, FEMA, USACE and the Lahaina Jodo Mission will implement bioremediation of toxic ash/soils in Lahaina. That project covers inoculating and installing the mycorrhizae-albizia soil cover but not the costs of steady production of base material (equipment and supplies for felling, bucking and chipping albizia) necessary to meet bioremediation needs.

Associated workforce development: This project will create five full time jobs and one contract position hired from within Maui and likely to continue beyond the life of the project.

Additional implementation grant dollars are necessary because: As a nonprofit, E kūpaku ka ʻāina (EKKA) is funded by grants attached to specific projects. Maui is in a time where the majority of public and private funding has rightfully been directed to the recovery of Lahaina and Kula. Funding needs remain in the rest of Maui, and this funding will assist in fulfilling those needs.

Priority Measure 17. Energy for State and County Buildings – Hawaiʻi Green Infrastructure Authority, Statewide.

Funding needed to implement the measure: ~$35,000,000 (TBD Based on Nationwide Coalition).

List of Funding Stream: This measure intends to leverage the complementary funding available through elective pay (sometimes called direct pay) of certain clean energy tax credits (§45Y, §48E). These tax credits only cover up to 30% of the projects contemplated under this measure, which may be insufficient for some local government buildings to achieve a return on investment through cost savings from energy bills.

The following additional funding sources were identified as available for installing solar plus storage projects but are not believed to be duplicative due to different program foci: Department of Energy “Energy Efficiency and Conservation Block Grant”, EPA “Greenhouse Gas Reduction Fund”, and Federal Emergency Management Agency “Building Resilient Infrastructure and Communities.”

Associated workforce development: This will create jobs in the energy sector for solar and BESS installers. Hawaiʻi State Energy Office (HSEO) has been actively promoting clean energy and skilled trades in the state through various initiatives. This includes supporting the launch of Good Jobs Hawaiʻi, aimed at training hundreds of residents over three years, and leading the Clean Energy Sector Partnership.

Additional Implementation grant dollars are necessary because there is a dearth of funding bookmarked for solar and BESS systems on State Energy Buildings to allow for early adoption and use of the Direct Pay option. The CPRG provides CPRG funding to get a dedicated program started.

Workforce Planning Analysis

The State of Hawai‘i is committed to establishing good paying green jobs in its response to climate change mitigation and resilience, and transition to clean energy. Departments such as the DLNR promote conservation jobs through the statute-established Green Jobs Youth Corps that trains and provides career development for conservation jobs for climate resilience including sustainability, agriculture, and environmental technology. The National Disaster Preparedness Training Center’s (University of Hawai‘i) Climate-Ready Workforce proposal, and other such efforts demonstrate Hawai‘i’s commitment to workforce development in the clean energy, resilience, and climate change fields.

The CCMAC’s Climate Ready VISTA cohort through AmeriCorps, trains early career professionals to address equity and poverty issues in Hawai‘i through climate change mitigation, adaptation, and resilience. Each year, ten VISTA members work through different State and County offices on projects that engage the community, build skills, and are mentored in careers that advance a Climate Ready Hawai‘i. Working with the City and County of Honolulu’s VISTA program, this cohort helps expand capacity for the climate and poverty work that is central to the CCMAC’s mission.

The DLNR’s Green Jobs Youth Corps and Hawai‘i Youth Conservation Corps provide paid, career-building employment opportunities for individuals who are seeking alternative career opportunities in the green jobs sector. These programs strengthen participants’ skills and add important credentials to their resumes. Through their partner, Kupu, these programs have provided over 68,000 hours of youth support annually to Hawai‘i’s amazing government, non-profit, and for-profit entities receive essential work and expand the capacity of our green economy.

The HSEO actively promotes clean energy and skilled trades in the state through various initiatives, including Good Jobs Hawai‘i and Clean Energy Wayfinders. Good Jobs Hawai‘i aims to train hundreds of residents over three years in clean energy jobs and lead the Clean Energy Sector Partnership which. As of November 2023, the Initiative has offered 75 clean energy training courses to 464 participants.

The Clean Energy Wayfinders program is in its second year, with six Wayfinders: two on O‘ahu, and one each on Kaua‘i, Moloka‘i, Maui, and Hawai‘i Island. In 2023, HSEO initiated this new professional training for the Wayfinders and with funding from the University of Hawai‘i Sea Grant program. It is set to secure $1M in federal funds in early 2024 to expand the program's capacity and scope. This includes community-based technical assistance for priority clean

energy initiatives and a growing focus on keiki (children)-to-career pathways, developing energy curricula for K-12 education, and collaborating with the Department of Education's Career and Technical Education program.

HSEO has recently submitted for USDOE funds for $1.2 M to contract local community-based and national workforce partners to train the workforce needed to successfully install the home efficiency and retrofit technologies eligible for rebates under USDOE's Home Energy Rebates Program (Hawai'i has $68M allocation). The goal is to train over 300 workers by 2028. HSEO also intends to apply for the Energy Auditor Training Grant to support workforce development efforts that recruit and train residential and commercial energy auditors so more buildings will be retrofitted to meet current and future energy standards.

Building a green workforce is central to helping Hawai'i achieve its climate and clean energy goals. It will also address equity, climate and economic resilience, and quality of life for the most vulnerable groups in Hawai'i.

Coordination and Outreach

The Coalition partners consisting of the CCMAC, HSEO, and the four counties conducted extensive intergovernmental coordination and outreach in the development of this PCAP, which in turn is the result of deep community involvement in the development of county-level climate action plans. This section describes the activities used to support meaningful engagement strategies to ensure comprehensive stakeholder representation in the climate action process.

Three main methods were employed in developing this PCAP and identifying priority measures for the State of Hawai'i. They are:

1. **Establishment of Technical Working Groups, Equity Working Group, and Stakeholder Meetings**.

   The CCMAC began stakeholder meetings and created an Equity Working Group which met six times between June-December 2023 to identify the best datasets to identify low income and disadvantaged communities and give feedback on the CEJST tool. The CCMAC is also in the process of hiring a Climate Justice Data Specialist who will help to visualize disadvantaged communities as identified by local data to carry out analyses specific to Hawai'i's unique cultural, geographic, and socioeconomic context.

   The CCMAC convened 15 Technical Working Groups in 2023 to discuss and help develop the State's Priority and Comprehensive Climate Action Plans. The TWGs identified priorities, challenges, and next steps. These helped formulate the RFI.

   The Working Groups were comprised of State and County employees, as well as University researchers, and non-profit organizations, all with expertise across various areas. An

average of 10 members in each working group met frequently to discuss additional research, barriers to implementation, suggestions of next steps around policy, projects, or recommendations. The 15 groups were:

- Decarbonization EV
- Decarbonization VMT and Land Use
- Alternative Fuels
- Decarbonization of Aviation
- Electricity and Combustion Decarbonization
- Farming, Ranching, Food System Decarbonization
- Forestry
- Decarbonization of IPPU
- Marine Transportation
- Wetlands
- Waste and Material Management
- Urban Forestry
- Community Outreach Media
- Wastewater
- Buildings Energy Efficiency

2. **Issuance of a Request for Information (RFI) to Solicit Measures for the PCAP**. The State of Hawai‘i issued a Request for Information to seek interested partners for inclusion in the PCAP. Measures were solicited from the transportation, electric power, buildings, industrial, waste, water, and sustainable materials management, and agricultural sectors, and measures that enhanced carbon removal. The criteria included GHG reductions, transformative impact, demonstration of funding need, environmental impact that the measure will have, readiness of ease of implementation, cost effectiveness of the measure, impacts on LIDAC populations, a budget explaining the reasonableness of costs to implement, and the relevant experience of the partner(s).

   The RFI was distributed through the networks of coalition members comprising HSEO, DLNR, all four counties, as well as through the Outreach Working Group. This RFI was also sent out to over 800 recipients of the CCMAC’s monthly newsletter. Twenty responses from various governmental and non-governmental institutions were received, including state and county government, academia, and nonprofits. The selection committee ranked and selected seventeen measures according to criteria listed in the RFI. The RFI was a critical tool used to include community partners and subrecipients with implementation measures. In many cases, these community partners have active relationships in the communities they plan for their projects to be in.

3. **Public Presentations.** The CCMAC presented the PCAP process and invited participation at several public events including hosting a workshop at the Hawai‘i Conservation Conference a conference with over 2,000 attendees, six CCMAC public meetings, and

made annoucements at various other community, university and public engagements and forums.

Online Engagement

In addition to the three main efforts referenced above, comments and ideas were solicited through the CCMAC's website where a special page described the process and directed interested parties.[36]

The CCMAC's website notes how it intends to further the engagement undertaken in the development of the PCAP : "The State Climate Commission is the lead on this project and will be focused on inclusivity of all interested and affected stakeholders in the process of plan development and fund disbursement. This will involve gathering input from key stakeholders and communities and transparent communication. This includes community meetings, regular digital and offline updates, and producing an accessible, one-stop hub for information for both the grant and State Climate Plans.

These plans are being developed in conjunction with the Hawai'i State Energy Office's State Decarbonization Report. Plans will center on both greenhouse gas reduction (including a GHG inventory, projections, reduction targets, and measurement) and community benefits (including workforce development and benefits specifically to low income and disadvantaged community).[37]

The PCAP will be developed based on community engagement, and collaboration between the CCMAC and community members throughout the planning process. The commission will host workshops to support community and stakeholder engagement and plan them in conjunction with neighborhood boards and 'aha moku councils. Information from these meetings will be pivotal in both gathering information to be used for the plan, developing the plan, and revising existing plans."

The State Energy Office published a dedicated webpage that described how it intended to develop the requirements of Act 238 which tasks the Hawai'i State Energy Office to "analyze pathways and develop recommendations for achieving the State's economy-wide decarbonization goals".[38] Eighteen members of the community provided responses, and members can still provide comments through this site. Five webinars, attended by over 100

[36] State of Hawai'i, Climate Change Portal (2024). HI Mitigation: Climate Action Plans, https://climate.hawaii.gov/hi-mitigation/

[37] State of Hawai'i, Climate Change Portal (2024). HI Mitigation: Climate Action Plans, https://climate.hawaii.gov/hi-mitigation/

[38] Hawai'i State Energy Office (2023). Hawai'i Pathways to Decarbonization: Report to the 2024 Hawai'i State Legislature, https://energy.hawaii.gov/wp-content/uploads/2022/10/Act-238_HSEO_Decarbonization_FinalReport_2023.pdf

participants, were held to keep the community apprised of progress. Slides from these webinars are also available on the State Energy Office's website.

Further, substantial community engagement from all four counties led to the development of their action plans for climate mitigation, adaptation, and resilience. Engagement efforts are summarized below:

1. **County of Hawai'i**

"In the summer of 2021, Hawai'i County hosted three Climate Action workshops in Hilo and Kona. The County produced a Hawai'i Island Climate Action simulation for the workshops. During the workshops, the County presented the proposed Climate Action Plan scope, goals, and development process and facilitated the simulation with the group. The County formed a Climate Action Plan Working Group with the workshop participants. The Working Group met monthly from July 2021 – December 2021. The group then met every 3 months from January – June 2022. The Working Group was re-convened to review the draft plan in 2023.[39]

The Working Group advised the County on the focus of the Plan. They also helped develop and distribute a Climate Change Community Sentiment Survey with the County. The high-level results and recommendations from the survey informed the identification of co-benefits for actions and the stakeholder engagement outlined in the Implementation section.

The ICAP effort was led by the County's Climate Action Team (CAT), which includes representatives from the Research & Development and Planning departments. The CAT works closely with a community Climate Action Working Group (WG), which advises the CAT on components of the plan, rallies citizen commitment and support, and sustains transparency throughout the process.

To understand community sentiment more fully around climate change causes, impacts, and priority actions, the CAT and WG worked together to create, distribute, and analyze a community sentiment survey around climate change. The purpose of this survey was 1) to help the County better understand communities' points of view on climate change to inform future engagement opportunities; and 2) to give the County a better understanding of how effective outreach efforts are and where improvement is needed to ensure that perspectives of underrepresented communities are included.

The Climate Action Team used a survey on climate sentiment in the community from the Urban Sustainability Directors Network (USDN) platform. The team reviewed the survey template and made edits to the questions, including adding a demographics section and editing language based on issues that were pertinent to Hawai'i Island. The Climate Action Working Group gave

[39]County of Hawai'i Planning Department (2023). Integrated Climate Action Plan for the Island of Hawai'i: Greenhouse Gas Reduction and Climate Adaptation Actions to Build Local Resilience to Climate Change, https://cohplanning.konveio.com/integrated-climate-action-plan-icap-island-hawaii?document=1

feedback on the questions based on their expertise, including editing certain questions for bias. The survey was created on Google Forms and there were no paper copies printed and distributed. The survey was also created in English and was not translated into any other language. The survey was open and accepted responses from September 1, 2021, to March 1, 2022.The survey received 1,079 responses.

The survey was distributed through the County government networks, specifically the R&D and Planning Departments, and the Working Group network. The mayor's office sent a press release. The survey was then distributed through three Big Island newspapers, including Hawaii Herald-Tribune, Big Island News Now, and West Hawaii Today, and through Hawaii News Now, KHON News, and Hawaii Business Magazine. The survey was also announced on the radio and was available through the R&D website. Working Group members also reached out to professors at UH-Hilo and high schools across the island. Professors and teachers distributed the survey to their classes at their own discretion. Three elected officials distributed the survey through their networks, including Representative Nicole Lowen, Councilmember Heather Kimball, and Councilmember Rebecca Villegas. Through the Research & Development department specialist and Working Group networks, the survey was distributed to the following networks:

- Big Island Electric Vehicle Association
- Coral Reef Alliance
- Day Lum Rentals
- Hawaiian Electric users as a bill insert
- Hawai'i Energy
- Hawai'i Island Food Alliance
- Kohala Center
- Nextdoor Hāmākua
- South Kohala Coastal Partnership
- Terraformation
- Zero Waste Hawai'i

2. City and County of Honolulu

"Reaching the goals set forth in this CAP is only possible by working with the community to shape priorities and take action. O'ahu's people have been essential in shaping this plan with more than 2,000 perspectives shared at three key stages, including 672 participants at 11 early community education and engagement meetings, 760 respondents to an island wide representative survey,8 and 614 contributors at a virtual open house.9 In addition, participants in focus groups, a technical working group, and engagements with other City departments helped refine technical analysis and city-based actions.

At the first stage, 11 community meetings were held island-wide in 2018, co-hosted by Honolulu City Council members, Hawai'i Pacific University, University of Hawai'i at Mānoa, and the Chamber of Commerce of Hawai'i. Participants played an interactive "climate game" that served to foster conversation on priorities for climate action. In follow up, a Climate Action Working

Group made up of sector experts and stakeholders was formed, building on a steering committee of the Resilience Strategy. The Working Group served as a sounding board for technical analysis and proposed climate actions that were incorporated into an island-wide survey and virtual open house.

The island-wide representative survey was conducted in April 2020 to better understand how the City can enable its residents to reduce Oʻahu's GHGs. Four in five survey respondents were concerned or very concerned about climate change. Survey responses were also used throughout the CAP to provide baseline information on resident activities and preferences towards actions.

Finally, a virtual open house was held from May to June 2020 and allowed participants to provide feedback on possible climate actions as well as open-ended input. "[40]

3. County of Kauaʻi

In 2023, two in-person and one online workshop were held to "...hear community members' opinions about potential greenhouse gas reduction climate action measures to be included in the Kauaʻi Climate Adaptation and Action Plan (KCAAP) and gather input on how they might be appropriately implemented. Feedback from these workshops directly informs which strategies are included in the draft KCAAP. The main purposes of the Online and In-Person Workshops were to inform the community of carbon reduction goals and pathways, provide an overview of proposed carbon reduction strategies, capture public feedback on compiled strategies, and garner public suggestions on new strategies.

The Online Workshop was held on Zoom. It included an initial presentation, an interactive Menti poll questionnaire exercise, and a Q+A discussion. The presentation provided an overview of the KCAAP purpose, information about carbon reduction goals and pathways, and types of greenhouse gas reduction strategies that are being considered for inclusion in the plan. After each set of strategies pertaining to a sector was described, participants were directed to a Menti poll to rate each strategy. After an overview of all the strategies two additional Menti questions were posed: 1) What challenges or barriers exist when implementing these climate action strategies?; and 2) What other ideas and/or actions should the County consider?

The presentation and Menti poll exercise was immediately foll CARP owed by a Q+A and discussion led by a member of the consultant team. Its purpose was to clarify any questions the public may have as well as garner more feedback on proposed strategies or new strategies the community wants the County to consider.

The in-person Workshops were a series of events held on the South side and East side (see locations and dates in "Schedule" below). The In-person workshops were held for two-hours and

[40] City & County of Honolulu (n.d.) One Climate One Oʻahu Climate Action Plan 2020-2025, https://static1.squarespace.com/static/5e3885654a153a6ef84e6c9c/t/6080c33e91bbf23a20b74159/1619051381131/2020-2025+Climate+Action+Plan.pdf

started off with a 45-minute presentation followed by an hour in which community members could walk-through booths based on four critical sectors (clean energy, transportation and land use, waste reduction, and natural resource management). Participants were able to move between the different booths at their convenience. Each booth included a list of the different greenhouse gas reduction strategies, in which participants could rate each strategy from a scale of 1 (least support) to 5 (strongly support). A project team member was present at each booth to talk through the different actions and answer any questions community members may have about proposed strategies."

The County of Kaua'i also conducted an online survey. "The survey was available to take online using the "Consider.It" platform. The project team developed several outreach graphics and materials, such as social media images and flyers, which were distributed through various methods, including but not limited to:

- Internet-Based Outreach: County's GovDelivery listservs; KCAAP Project Website; County's social media accounts (Instagram), Organizations focused on climate work
- In-Person Outreach: pop-up events and online and in-person deep dive workshops.

The poll yielded responses from 59 participants. On average, there were about 14 opinions provided on each proposed mitigation strategy included in the four critical sectors. In total there were 608 opinions provided on all the proposed climate action strategies. In addition to this, six climate action strategy ideas were suggested by members of the public, which garnered a total of 77 opinions (an average of 13 opinions on each suggested strategy)." [41]

4. County of Maui

"The County of Maui seeks to ensure that equitable solutions are identified within the CARP so that vulnerable, low- to moderate-income (LMI) households and marginalized communities are lifted up as the strategies and actions are implemented. Climate change impacts are amplified in Maui County due to its remote island geography, and even more so within vulnerable socio-economic groups. According to the Intergovernmental Panel on Climate Change (IPCC), indigenous peoples, economically and politically disadvantaged groups, and communities that depend on local agriculture are at a disproportionate risk of climate consequences, all of which can be found in Maui County.

Acknowledging climate change's disproportionate impact on vulnerable, LMI Households and marginalized communities, the Climate Action and Resilience Plan's strategies center around climate justice. These strategies and actions also aim to reduce air and water pollution. Alongside co-creating this plan with the local community, the County of Maui engaged with local climate scientists, businesses, and policymakers to develop the following climate action and resiliency recommendations.

[41] County of Kaua'i (2023). Kaua'i Climate Adaptation and Action Plan https://kauaiadaptation.com/wp-content/uploads/2023/12/KCAAP_Survey3_Summary_Mitigation_121323.pdf

Over 1,000 perspectives were shared through surveys, interviews, talk story sessions, focus groups, and advisory committees. Among those voices, were Native Hawaiian cultural practitioners who, on several occasions, emphasized the importance of the "intangible spirit" that, through connection to ʻāina and kuleana, requires us to cultivate and manage mana (energy/authority) and maintain pilina (connection and relationship) to address climate change."[42] Engagement included over 70 community advisors representing a diverse cross-section of the Maui community, 21 community advisor workshops, 20 virtual community forums and meetings, more than 31 site visits to engage community members across the county, and over 800 respondents to five community surveys conducted.

Conclusion

The seventeen (17) actions listed in this PCAP are only a shortlist of actions that can be taken now. CCMAC's Grants to Projects Bridge[43] has identified over $1,000,000,000 in additional state and county projects that can be implemented to help reduce GHG emissions and build resilience in Hawaiʻi. The response to the RFI also indicated that many additional state, county, and community projects are ready to be implemented. The State will strive to allocate additional State funding to activate these projects and ensure Hawaiʻi is well-positioned to respond to climate change.

This PCAP is the first major deliverable under the CPRG planning grant awarded to DLNR. CCMAC and its partners will continue planning, engagement, and action to reduce emissions; invest in sustainable infrastructure, technologies, and practices; build our economy; and enhance the quality of life for all in the state of Hawaiʻi. In 2025, CCMAC will publish a comprehensive climate action plan (CCAP) that establishes equitable and sustainable economic development strategies that reduce emissions across all sectors. The CCAP will include near- and long-term emissions projections, a suite of emission reduction measures, a robust analysis of measure benefits, plans to leverage federal funding, and a workforce planning analysis. Most importantly the CCAP will be developed in collaboration with the communities that will be impacted the most.

In 2027, CCMAC will publish a status report that details implementation progress for measures included in the PCAP and CCAP, any relevant updates to PCAP and CCAP analyses, and next steps and future budget and staffing needs to continue implementation of CCAP measures.

If you have questions about this PCAP or suggestions for the upcoming CCAP and status report, contact Leah Laramee at leah.j.laramee@hawaii.gov.

[42] County of Maui (2022). Climate Action and Resiliency Plan, https://www.resilientmauinui.org/pages/climate-action-resiliency-plan

[43] Climate Change Mitigation and Adaptation Commission Grant to Projects Bridge https://climate.hawaii.gov/grants-to-projects-bridge/

Appendices

Appendix A: Hawai‘i Greenhouse Gas Emissions Report for 2005, 2018, 2019

Appendix B: PCAP Tool for Measure Quantification