A photograph of a young fern plant with delicate, feathery fronds growing in a grassy field. In the foreground, a traditional Hawaiian water container (hue) is visible, featuring a brown, textured surface with black geometric patterns. The background shows a blurred landscape of green hills and trees under a bright sky. A large, faint, stylized watermark of a Hawaiian symbol is visible across the center of the image.

DRAFT Hawai'i Climate Action Pathways 2025

Executive Summary

'A'ohe hana nui ke alu 'ia

No task is too big when done together

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Project Consulting Firm: Modeling work was performed by Sustainability Solutions Group (SSG).

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

| | |
|---|---|
| Agripelago | Hawai'i Department of Business, |
| Audubon Society | Economic Development and Tourism |
| Aloha Carbon | Hawai'i Department of Health |
| Birds, Not Mosquitoes | Hawai'i Department of Hawaiian Homes |
| Bishop Museum | Lands |
| Blue Planet Foundation | Hawai'i Department of Land and Natural |
| Center for Getting Things Started | Resources |
| Citizens' Climate Lobby | Hawai'i State Energy Office |
| City and County of Honolulu | Hawai'i Department of Transportation |
| Climate Action Advisory Council | Hawai'i Energy |
| Climate Future Forum | Hawai'i Gas |
| Climate Resilience Collaborative | Hawai'i Green Growth |
| Conservation International | Hawai'i Islands Land Trust |
| Council for Native Hawaiian Advancement | Hawai'i Invasive Species Council |
| County of Hawai'i | Hawai'i Green Infrastructure Authority |
| County of Kaua'i | Hawai'i Office of the Governor |
| County of Maui | Hawai'i Pacific University |
| Elemental Impact | Hawai'i Public Utilities Commission |
| Forest Solutions Hawai'i | Hawai'i Rangeland Stewardship |
| Hanalei Initiative | Foundation |
| Hawai'i Agriculture Research Center | Hawai'i Wildfire Management |
| Hawai'i Alliance of Nonprofit Organizations | Organization |
| Hawai'i Alliance for Progressive Action | Hawai'i Workforce Funders Collaborative |
| Hawai'i Bicycling League | Hawaiian Airlines |
| Hawai'i Board of Water Supply | Hawaiian Electric |
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Kupu
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Mālama Learning Center
Maui Economic Opportunity
Maui Forest Bird Recovery Project
Maui Huliau Foundation
Maui Metropolitan Planning Organization
Maui Ocean Center
Molokai Community Service Council
NOAA – National Oceanic Atmospheric
Administration
O'ahu Metropolitan Planning Organization
Office of Planning and Sustainable Development
Pacific Biodiesel
Par Hawai'i
Pilina 'Āina
Pono Pacific
Purple Mai'a
Recycle Hawai'i
Resilient Oahu
Roberts Hawai'i
Sierra Club
Surfrider
Sustainable Coastlines

Teran J. Young Foundation
The Climate Ready Hawai'i AmeriCorps
The Nature Conservancy
VISTA Cohort
The Qan Group
Ulupono Initiative
University of Hawai'i
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Sustainability and Resilience
USDA Forest Service
Vibrant Hawai'i
Wai Clean Water
We Are Oceania
Zero Waste Kaua'i

1 Charting a Course Toward Regenerative Resilience

In the vast expanse of the Pacific Ocean, the Hawaiian Islands stand as both paradise and sentinel. A stunning archipelago where crystal-clear waters meet volcanic peaks, and where the effects of our changing climate are felt with particular intensity. Today, Hawai'i faces a critical crossroads. The state that has long been a beacon of natural beauty and cultural richness now confronts rising seas, devastating wildfires, invasive species, and energy costs that burden every household. Yet from this challenge emerges an unprecedented opportunity: Hawai'i's comprehensive Climate Action Pathway represents not just a response to crisis, but a bold reimagining of how island communities can thrive in harmony with their environment.



The Urgency of Now

The climate crisis is no longer a distant threat for Hawai'i, it is a daily reality shaping the lives of every resident across all four counties. Families watch as coastal roads flood with increasing frequency, farmers struggle with unpredictable weather patterns, and communities grapple with electricity bills that are more than triple the national average. The devastating 2023 Maui wildfires served as a stark reminder that climate change has already cost Hawai'i lives.

Through extensive community engagement involving over 7,000 residents across 82 events, Hawai'i's people have spoken clearly about their concerns. Flooding tops the list, followed by sea level rise and coastal erosion, daily reminders of the ocean's increasing reach into communities that have called these shores home for generations. Invasive species threaten native ecosystems that took millions of years to evolve, while high energy costs force families to choose between powering their homes and meeting other basic needs.

But Hawai'i's residents haven't just identified problems, they've demanded solutions. This Climate Action Pathway emerges from that grassroots call for action, representing the collective voice of communities who refuse to accept climate change as an inevitable fate.

2 A Vision Rooted in Tradition, Focused on Innovation

Hawai'i's Climate Action Pathway is built on the foundation of aloha 'āina a principle that has guided Native Hawaiian communities for over a thousand years. The plan recognizes that true climate resilience cannot be achieved through technology alone, but must include nature based solutions and be grounded in the wisdom of traditional resource management systems like the ahupua'a, which sustainably managed resources from mountain to sea.



This cultural foundation supports an ambitious technical framework. Hawai'i has committed to reducing greenhouse gas emissions by 50% below 2005 levels by 2030, and achieving net-negative emissions by 2045—meaning the state will remove more carbon from the atmosphere than it produces.

These aren't abstract targets; they represent a fundamental transformation of how energy is generated, how people move around the islands, how food is grown, and how communities manage resources.

The plan's 23 comprehensive measures span six critical sectors, each designed to address specific challenges while contributing to the broader goal of island-wide resilience. From generating 100% renewable electricity by 2045 to planting 11 million native trees, from electrifying transportation to creating a circular economy that eliminates waste, every measure is calibrated to deliver multiple benefits: reducing emissions, lowering costs, creating jobs, and strengthening communities.

3 Hawai'i's Emission Projections: What to Expect, Where We Stand

Hawai'i has committed to seriously cutting planet-warming greenhouse gas (GHG) emissions to address climate change. To keep track of progress, experts analyze state emissions and predict future trends based on population, energy use, and policies in place.

The Current Picture

- Key state goals:
 - o By 2030: Emissions should be 50% lower than 2005 levels.
 - o By 2045: Achieve "net-negative" emissions – removing more carbon than produced.
- Energy use – mainly from transportation and electricity – makes up more than 85% of Hawai'i's emissions.
- In 2022, Hawai'i's net greenhouse gas emissions, after subtracting carbon captured by forests, were about 17.8 million metric tons of carbon dioxide equivalent (MMT CO₂e).
- When aviation, international and domestic flights to Hawai'i are included emissions are significantly higher .

The Road Ahead: Projections

- Without additional action ("business as usual"), emissions are expected to fall gradually but won't meet the state's future targets.
- By 2025, statewide emissions are expected to be 17.45 MMT CO₂e.
- By 2030, projections show emissions dropping to about 15.5 MMT CO₂e – still short of the 11.4 MMT CO₂e target for the decade.
- By 2045, emissions are projected to be 10.35 MMT CO₂e significantly short of net negative target unless major new measures are taken.

What Drives the Change?

- Federal investments under the Bipartisan Infrastructure Law (BIL) and Inflation Reduction act including grid modernization, community solar, tax credits, energy and efficiency retrofits were expected to drive down nationwide emissions by 40%.
- New federal policies are clawing back that funding and recalling policies that support climate action, limiting states abilities to drive change
- Affordability, safety and public health are all drivers of climate action.

What Needs to Happen for Success?

- Accelerate clean energy transitions (solar, wind, efficiency).
- Electrify transport and reduce car dependence.
- Invest in carbon capture (like tree planting and soil health).
- Address aviation and marine emissions.
- Work together across government, business, and community.

Bottom line

Hawai'i is making progress but must pick up the pace to meet its climate promises. Meeting these targets means healthier communities, protection from climate impacts, and securing Hawai'i's unique environment for future generations.

| <u>Sector</u> | 1990 | 2005 | 2020 | 2022 | 2025 Baseline | 2030 Baseline | 2035 Baseline | 2040 Baseline | 2045 Baseline |
|--|--------------|--------------|--------------|--------------|------------------|------------------|------------------|------------------|------------------|
| Energy | 20.25 | 22.72 | 14.66 | 17.95 | 17.69 | 15.92 | 14.08 | 13.25 | 11.52 |
| Industrial Processes and Product Use (IPPU) | 0.18 | 0.5 | 0.76 | 0.85 | 0.8 | 0.66 | 0.44 | 0.28 | 0.26 |
| AFOLU (Sources) | 1.47 | 1.1 | 1.1 | 1.11 | 1.03 | 0.98 | 0.93 | 0.89 | 0.85 |
| AFOLU (Sinks) | (2.40) | (2.50) | (2.43) | (2.48) | (2.44) | (2.41) | (2.44) | (2.52) | (2.60) |
| Waste | 1.01 | 0.98 | 0.41 | 0.4 | 0.36 | 0.35 | 0.34 | 0.33 | 0.32 |
| Total Emissions (Excluding Sinks) | 22.9 | 25.29 | 16.93 | 20.32 | 19.89 | 17.91 | 15.79 | 14.74 | 12.95 |
| Net Emissions (Including Sinks) | 20.51 | 22.78 | 14.5 | 17.83 | 17.45 | 15.51 | 13.34 | 12.23 | 10.35 |
| Aviation | 5.11 | 7.16 | 3.17 | 5.67 | 6.1 | 6.24 | 6.32 | 6.38 | 6.4 |
| Net Emissions (Including Sinks, Excluding Aviation) | 15.4 | 15.62 | 11.33 | 12.16 | 11.35 | 9.26 | 7.02 | 5.85 | 3.94 |

Hawai'i Net GHG Emissions Estimates and Projections (MMT CO₂ Eq.) (Including Sinks and Aviation). Note, Emission estimates include sinks and domestic aviation emissions, figure taken from Hawai'i Energy Office, Hawai'i Pathways to Decarbonization

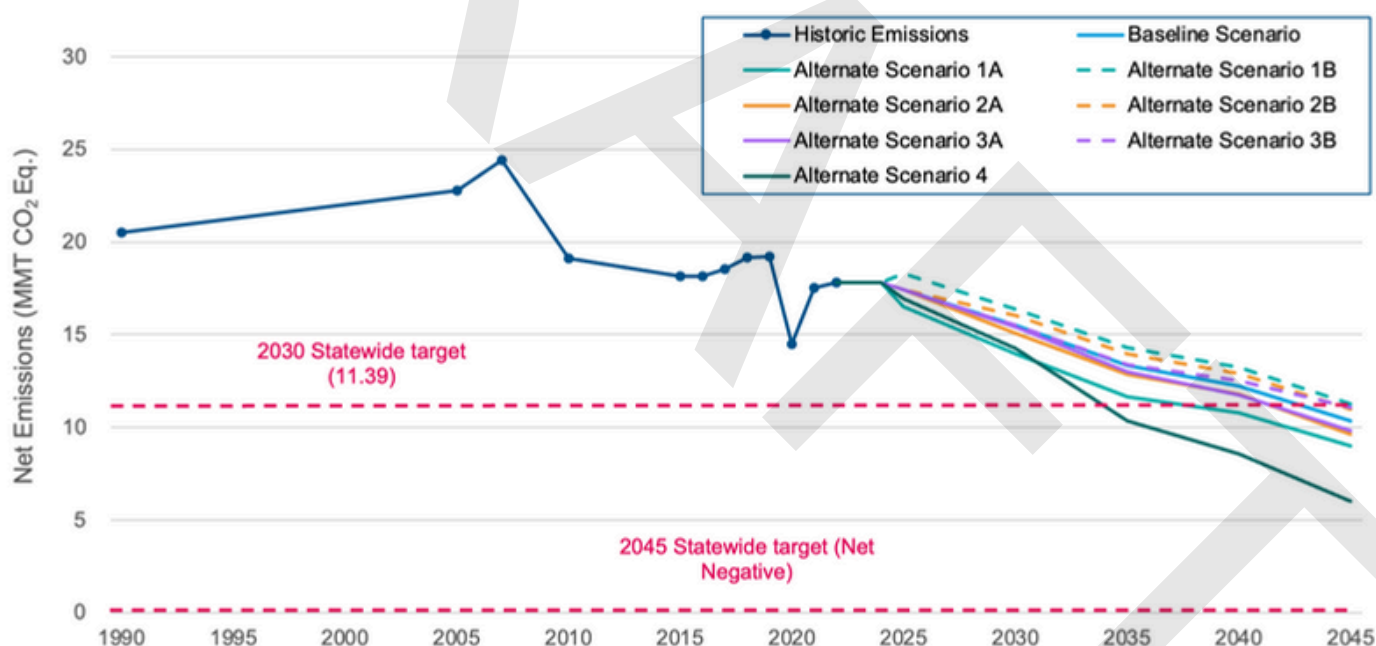


To figure out how Hawai'i's greenhouse gas emissions might change in the future, experts started with the state's 2022 emissions data and then looked at different factors that could make emissions go up or down. These factors include how much energy residents, businesses, and industries use, how many people fly to and from Hawai'i, and how much waste the state creates. To estimate these changes, they use predictions about population growth and the strength of Hawai'i's economy, including how many visitors are expected. Because the future can take different paths, the experts created several "what if" scenarios:

- **Oil Prices:** One set of scenarios (1A and 1B) looks at what happens if oil prices go really high (1A) or stay low (1B) in the years ahead.
- **Renewable Energy:** A second set (2A and 2B) considers how quickly Hawai'i could add renewable energy like solar and wind power. Scenario 2A imagines a fast and ambitious push for renewables, while 2B is more conservative and continues at the current pace.
- **Transportation Technology:** A third pair of scenarios (3A and 3B) looks at how quickly people switch to electric cars, with one imagining lots of electric vehicles on the roads (3A) and the other assuming slower adoption (3B).

By looking at these possibilities, the state can prepare for a range of futures. A table in the report lists Hawai'i's actual greenhouse gas emissions from past years (1990, 2005, 2020, and 2022) and then shows the projected emissions—under these different scenarios—for 2025, 2030, 2035, 2040, and 2045.

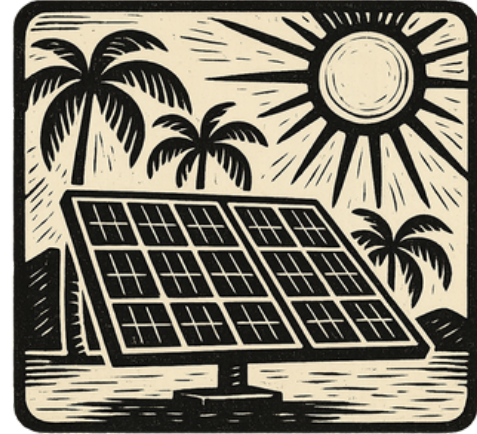
In simple terms: these projections help leaders make better decisions by showing how changes in oil prices, renewable energy, and technology could shape the state's climate future



Hawai'i GHG Emissions for 1990, 2005, 2020, and 2022 and Projections by Sector under the Baseline Scenario for 2025, 2030, 2035, 2040, and 2045 (MMT CO₂ Eq.) Note data from DOH, Hawai'i Greenhouse Gas Emissions Report for 2022

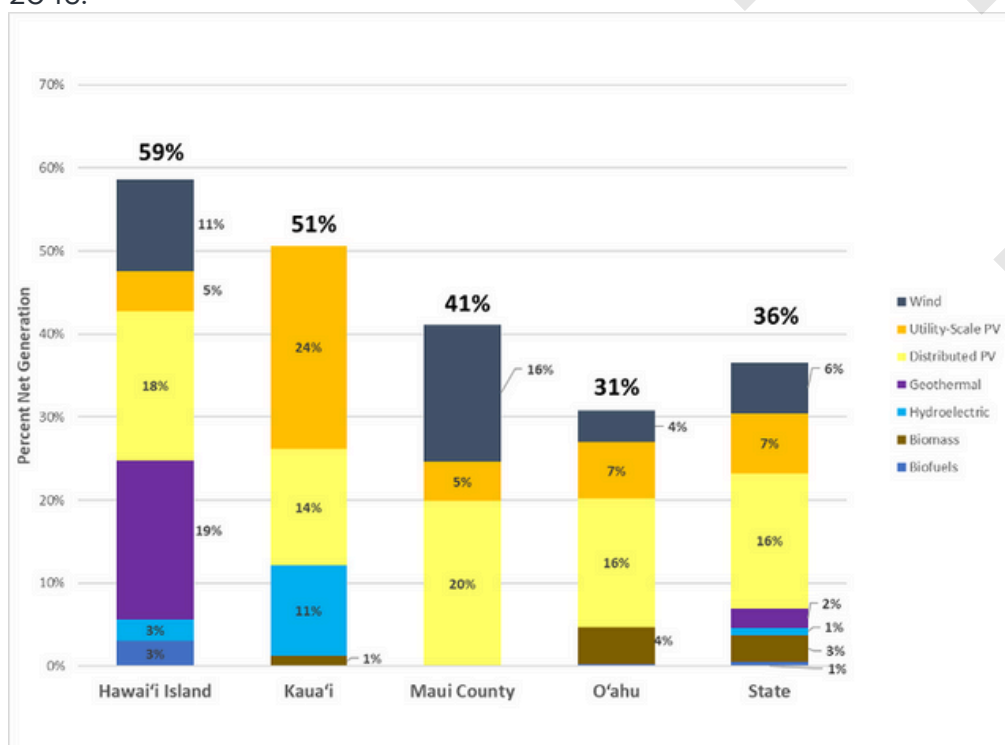
4 Transforming Energy: From Dependence to Abundance

At the heart of Hawai'i's climate challenge lies energy dependence. As the most isolated populated landmass on Earth, Hawai'i has historically relied on importing nearly all its energy, creating vulnerability to global price shocks and supply disruptions while generating substantial emissions. The plan's energy transformation represents perhaps the most significant economic opportunity in the state's modern history.



The renewable energy transition is already underway, with solar panels gleaming from rooftops across all islands and wind turbines generating clean power. By 2024, Hawai'i reached 36% renewable electricity generation, but acceleration is needed to reach sub negative goals. The goal: generate an additional 5,925 gigawatt-hours of clean electricity through expanded solar, wind, geothermal, and sustainable biodiesel by 2045.

For residents, this means energy independence and stable, lower electricity costs. The plan includes solarizing 10,000 rooftops annually through 2030, with a particular focus on ensuring low- and moderate-income households can access these money-saving technologies. Building energy efficiency measures will reduce consumption by 46% by 2040, while new construction will meet the latest energy codes and incorporate solar water heating systems.



Renewable Portfolio Standards by Energy for 2024, Source PUC Docket 2007-0008, compiled by Hawai'i State Energy Office

5 Reimagining Transportation: Clean, Connected, Affordable

Transportation accounts for a major portion of Hawai'i's emissions, and the state's island geography presents unique challenges. How do you decarbonize inter-island travel? How do you reduce the emissions from the millions of visitors who fly to the islands each year? This guidance document tackles these questions with innovative, multi-modal solutions.

The ground transportation transformation begins with electrification. All state light-duty vehicles will be electric by 2030, supported by a rapidly expanding charging network. But the plan goes beyond simply swapping gas cars for electric ones – it fundamentally reimagines how people move around the islands. Investment in public transit, bicycle infrastructure, and pedestrian-friendly communities will reduce vehicle miles traveled by 20%, creating healthier, more interconnected livable communities while cutting emissions.

For aviation, critical to Hawai'i's tourism economy and inter-island connectivity, the CAP promotes sustainable aviation fuel that can reduce lifecycle emissions by 65–80% compared to conventional jet fuel. By 2040, the goal is for 20% of aviation fuel to be sustainable, with long-term exploration of hydrogen and electric aircraft for shorter inter-island routes.



6 Aloha 'Āina: Nature as Climate Solution



Perhaps no aspect of the plan better embodies the integration of traditional wisdom and modern climate science than the massive ecosystem protection and restoration proposed in the Agriculture, Forestry and Other Land Use (AFOLU) sector. Building on the Native Hawaiian understanding that healthy land and water systems are the foundation of all life, the plan commits to planting 11 million native trees and plants, protecting 843,000 acres of priority watersheds, restoring 20 wetland and traditional fishpond (loko'ia) sites and regenerating soil through sustainable agricultural, ranching and ecosystem land management practices.

These aren't just environmental projects, they're climate infrastructure. Forests capture and store carbon while capturing clean water, reducing flood risk, and supporting native species. Urban trees cool neighborhoods, reducing the need for energy-intensive air conditioning. Restored wetlands filter pollutants and provide natural storm protection. Together, these nature-based solutions will remove 20.8 million metric tons of CO2 equivalent from the atmosphere between 2026 and 2050. The restoration prioritizes areas that provide multiple benefits: degraded lands that can reduce wildfire risk, county-owned properties that can be reforested, watershed areas critical for clean water, and urban areas where trees can improve health and resilience while addressing heat impacts.

Healthy soils are a cornerstone of Hawai'i's regenerative climate vision, embodying the values of mālama 'āina (to care for the land) and aiming to revitalize the very foundation of island life its soil. Recognizing that healthy soils are more than just the medium for crops, but living carbon banks essential to biodiversity, water retention, and long-term productivity, this initiative seeks to restore soil health and local food systems while advancing climate resilience for all Hawai'i residents. Measures act on a circular philosophy to integrate waste and land management systems to transform organic byproducts into vital soil amendments, such as compost and biochar, thereby capturing carbon, reducing synthetic fertilizer use, and closing nutrient loops between communities, farms, and natural ecosystems. Supported by state and county investments and infused with traditional Hawaiian ecological knowledge, measures promote regenerative agriculture, encourages the application of science-based and Indigenous practices, and invests in infrastructure that empowers farmers, ranchers, and land stewards. Through collaborative partnerships and a focus on education, technical assistance, and hands-on stewardship, measures transform degraded lands into vibrant, carbon-rich ecosystems, creating climate solutions and pathways for food sovereignty, economic opportunity, and the perpetuation of cultural wisdom deeply rooted in Hawai'i's landscapes.

7 Waste as Resource: The Circular and Wellbeing Economy

One of the most innovative aspects of Hawai'i's Climate Action Plan is its embrace of a circular and wellbeing economy—an approach that recognizes waste as a resource and prioritizes community wellbeing alongside environmental health. Drawing inspiration from traditional Hawaiian resource management, where nothing was wasted and everything had multiple uses, the plan reimagines the modern economy.

The waste transformation is dramatic: from the current 24% waste diversion rate to 70% by 2030 and 90% by 2050. But this isn't just about recycling more – it's about fundamentally redesigning systems. Regional material recovery hubs will integrate advanced sorting facilities, remanufacturing centers, and repair marketplaces. A decentralized composting network will turn organic waste into soil amendments for local food production.

The CAP proposes a 30% tax credit to reward businesses achieving high levels of closed-loop material use, while a virgin material surcharge will make recycled materials more competitive. Neighborhood material banks will provide tool library-style access to appliances and equipment, reducing the need for individual ownership. Kūpuna (elder) repair circles will teach traditional mending techniques, preserving cultural knowledge while extending product lifecycles.

By 2035, the goal is a 63% material circularity rate, meaning nearly two-thirds of all materials will be reused, recycled, or repurposed rather than extracted new. This represents a fundamental shift from a linear "take-make-waste" economy to a regenerative system that strengthens communities while reducing environmental impact.



8 Community at the Center: Equity and Empowerment

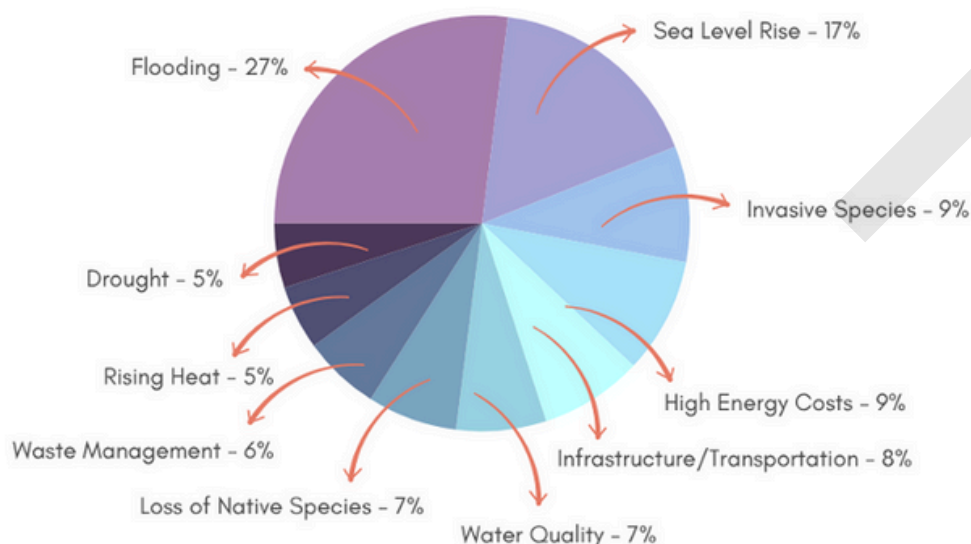
Throughout every aspect of the CAP runs a commitment to equity and community empowerment. Climate change disproportionately affects low-income and indigenous communities and climate solutions must address these disparities rather than exacerbate them. The CAP developed a comprehensive approach to identifying Low-Income and Disadvantaged Communities (LIDACs), including all Hawaiian Homelands tracts and using localized indicators that capture the unique vulnerabilities of each island.

The CAP ensures that 40% of benefits flow to these communities through targeted programs including solar installations with no upfront costs, energy efficiency retrofits that reduce monthly bills,

workforce development programs that create pathways to well-paying green jobs, and community-led resilience planning that puts residents in control of their own solutions.

The CAP recognizes that a skilled workforce is essential for achieving climate goals. It anticipates significant job growth in sectors such as regenerative agriculture, renewable energy, green building, disaster preparedness, land management, clean transportation, and waste management. Strategies include strengthening workforce partnerships across public, private, non-profit, labor, and academic entities; conducting workforce gap analyses; and developing sector-specific technical skills through targeted training, certifications, and earn-and-learn models.

Community Feedback on Climate Change concerns



9 The challenges ahead

Investing in Resilience

Implementing this comprehensive vision requires substantial investment, an estimated \$2.23 billion over the next three years alone. But this isn't just a cost; it's an investment in Hawai'i's economic future and energy security. Every dollar spent on renewable energy reduces dependence on imported fossil fuels. Every efficiency retrofit lowers household energy bills. Every electric vehicle reduces maintenance costs and improves air quality.

The financing strategy is diversified and innovative. The recently enacted "Green Fee" on visitor accommodations directly links tourism revenue to climate action, generating approximately \$100 million annually. Federal programs like the Inflation Reduction Act and Bipartisan Infrastructure Law, which are currently being dismantled by the present Federal administration, have provided crucial support, with over \$685 million already secured for various climate initiatives. Going forward Hawai'i will have to be innovative and resourceful in seeking sources of support and investment towards its climate resilience.

The plan also recognizes the need to engage private sector investment and philanthropy more strategically. With high-net-worth individuals having ties to Hawai'i, there's an opportunity to mobilize transformative private investment in climate solutions. Insurance companies, facing mounting claims from climate disasters, have a direct financial interest in supporting resilience investments.

Regulatory and Permitting Complexities

Navigating Hawai'i's intricate regulatory and permitting landscape can significantly impede the pace of implementation. Existing policy and regulatory barriers, coupled with potential uncertainty around emerging technologies (e.g., tariffs on clean energy technologies), can discourage private investment and delay project initiation. Streamlining these processes while upholding environmental safeguards and ensuring community input will be critical. This requires close collaboration between regulatory bodies, project developers, and affected communities to develop clear, efficient pathways for climate-aligned projects.

Inter-Agency and Cross-Sector Coordination

While the CAP highlights an impressive institutional framework and extensive coordination efforts involving numerous state offices, agencies, county planning offices, legislative representatives, and a wide array of "Hui Participants" (partners from non-profits, academia, and the private sector), the sheer breadth of these stakeholders presents an ongoing coordination challenge. Ensuring harmonized efforts across federal, state, and county agencies, aligning diverse county-level climate action plans with statewide goals, and fostering genuine, sustained partnerships with the private sector and communities will require continuous communication, shared understanding, and adaptive governance. The document itself emphasizes the need to "deepen and continue partnerships," underscoring that this is an ongoing endeavor, not a one-time achievement.

The Path Forward

Implementation has already begun, with renewable energy projects coming online, electric vehicle adoption accelerating, and restoration projects breaking ground across the islands. But the full transformation envisioned in this plan will require sustained commitment from all sectors of society—government, business, nonprofits, and communities working together with the urgency the climate crisis demands.

The CAP acknowledges significant challenges ahead: securing sustained funding, navigating complex permitting processes, coordinating across multiple jurisdictions, and maintaining public support through what will inevitably be a long-term transformation. But it also recognizes that Hawai'i has unique advantages: strong environmental values, innovative spirit, collaborative governance structures, and communities with deep connections to the land and ocean.

Perhaps most importantly, the plan embodies hope, not the passive hope that problems will solve themselves, but the active hope that comes from having a clear vision and the tools to achieve it. It recognizes that while climate change presents existential challenges, responding to those challenges can create opportunities to build the kind of society many have long dreamed of, one that runs on clean energy, provides meaningful work for everyone, manages resources sustainably, and prioritizes the wellbeing of both people and planet.

The path is clear, the community is engaged, and the work has begun. Hawai'i's climate future is being written today, one solar panel, one native tree, one community project at a time. The question isn't whether this transformation is possible – it's how quickly it can be achieved and how broadly its lessons can be shared with a world desperately in need of climate hope and practical solutions.

Now we want to hear from you

The table in the following section summarizes the 23 measures (policies, programs, projects) that are key to meeting the targets set in Hawai'i's Climate Action Pathway. More details of each measure and the background and targets of each sector are provided in the sector specific chapters in the full Climate Action Pathway document which is available to download on this [LINK](#) (or by scanning the QR code) where you can also submit your comments and feedback on the Pathway.

The Climate Commission is now looking for feedback on this draft plan before the final version of the Pathway is published at the end of 2025.



| SECTOR | MEASURE DESCRIPTION | TARGET |
|--|---|---|
| ENERGY | | |
| 1. INCREASE RENEWABLE ENERGY GENERATION TO REPLACE FOSSIL FUEL ELECTRICITY GENERATION EMISSION REDUCTIONS (2030-2045) - 20.6 MMT CO ₂ e | <p>Increase the presence of utility-scale and distributed solar photovoltaic (PV), onshore wind, geothermal, and biodiesel to replace current fossil fuel electricity generation.</p> <p>Support the development of utility-scale renewable energy projects for selected Stage 3 projects and forthcoming Integrated Grid Planning procurements, particularly paired solar projects. Consider an interagency task force under HRS §196-1.5 to regularly monitor development timelines, permit status, and identify potential roadblocks..</p> | <p>Increase electricity generation by:</p> <ul style="list-style-type: none"> 273.66 GWh (gigawatt hour) biodiesel 1703.9 GWh distributed solar PV (photovoltaic) 318.0 GWh geothermal 984.3 GWh onshore wind 2645.5 GWh utility-scale solar PV by 2045. |
| 2. PERMITTING IMPROVEMENTS TO MEET RENEWABLE PORTFOLIO STANDARD (RPS) TIMELINES | <p>Identify permitting improvements to meet RPS timelines, facilitate community benefits, and explore dispute resolution outside of court.</p> | |
| 3. EFFICIENCY IMPROVEMENTS TO POWER PLANTS THAT USE FOSSIL FUELS | <p>Require efficiency improvements to power plants that use fossil fuels to ensure that power plant replacements significantly reduce energy waste, which will save fuel cost and emissions.</p> | |
| BUILDINGS ENERGY EFFICIENCY | | |
| 4. SOLAR PANELS Implement solar PV and hot water in buildings. Renewable energy & storage EMISSION REDUCTIONS (2026-2050) - 10 MMT CO ₂ e | <p>Increase residential solar photovoltaic (PV) and solar hot water access for all residential and non-residential buildings.</p> <ul style="list-style-type: none"> - 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. | <p>Increase capacity of PV systems in residential buildings:</p> <ul style="list-style-type: none"> - Solarizing 10,000 rooftops annually for 5 years (until 2030) - From 2030 solarizing at an increase rate of 7% per year. <p>Increase capacity of PV systems in non-residential buildings:</p> <ul style="list-style-type: none"> - To reach a capacity of 4,146 MW (megawatt) by 2050. - Require new buildings to incorporate solar PV capacity. <p>New residential buildings have solar water heaters, reducing an average of 19% of energy consumption in households.</p> <ul style="list-style-type: none"> - Reduce energy consumption in new households an average of 19% through solar water heater installation. |

| SECTOR | MEASURE DESCRIPTION | TARGET |
|--|--|---|
| BUILDINGS ENERGY EFFICIENCY | | |
| 5. BUILDING ENERGY EFFICIENCY AND UPGRADES EMISSION REDUCTIONS (2026-2050) - 4.7 MMT CO₂e | <p>Upgrade existing buildings to decrease energy consumption and reduce energy demand by increasing energy efficiency in residential and non-residential buildings.</p> <p>Continue to support energy efficiency programs, policies, and incentives that save residents money.</p> <p>Supporting Actions:</p> <ul style="list-style-type: none"> -Energy Audits -Low flow and energy efficient appliances and fixtures -Weather proofing -Technical training for state and county facilities personnel | <p>Reduce building energy consumption by 46.6% by 2040</p> |
| 6. NEW BUILDING EMISSION REDUCTIONS (2026-2050) - 0.0012 MMT CO₂e | <p>Decrease energy consumption in new buildings by adopting the progressive energy efficiency building codes.</p> <p>Workshops and technical training for contractors and state and county facilities personnel.</p> | <p>Adopt 2021 International Energy Conservation Code building standards in new buildings by 2030 for a decrease of 10% in energy consumption.</p> |
| GROUND TRANSPORTATION | | |
| 7. VEHICLES ELECTRIFICATION Transit & government vehicles electrification Commercial vehicles electrification | <p>Electrify ground transportation</p> <ul style="list-style-type: none"> - Transition all State fleets to electric vehicles. - Electrify County buses & vehicles. - Expand transportation options for visitors including electric vehicle rentals, shuttles and transportation passes. - Expand electric vehicle charging infrastructure - Require electric vehicle charging in new buildings | <p>All state cars and light-duty trucks are electric or zero emission vehicles by 2030.</p> <p>All state medium- and heavy-duty vehicles are electric or zero emission vehicles by 2045.</p> <p>Require 25% of new commercial building parking spaces to have charging capacity for electric vehicles.</p> <p>Require 100% of all new residential buildings, hotels and long stay commercial building parking spaces to have charging capacity for electric vehicles.</p> |
| 8. FUEL DE-CARBONIZATION EMISSION REDUCTIONS (2026-2050) - 35.6 MMT CO₂e | <p>Decarbonize ground transportation fuels, through the supporting actions:</p> <ul style="list-style-type: none"> - Support Clean Fuel Standard, Carbon Tax or other Legislation to increase clean fuel use. Conduct an Affordability Study to find the best legal framework for Hawai'i's particular resources and challenges. | <p>Reduce vehicle fuel use emissions by decarbonizing gasoline with ethanol blends (20%, 25%, 50%, 85%).</p> <p>100% of County bus fleets to use renewable fuel by 2035</p> |

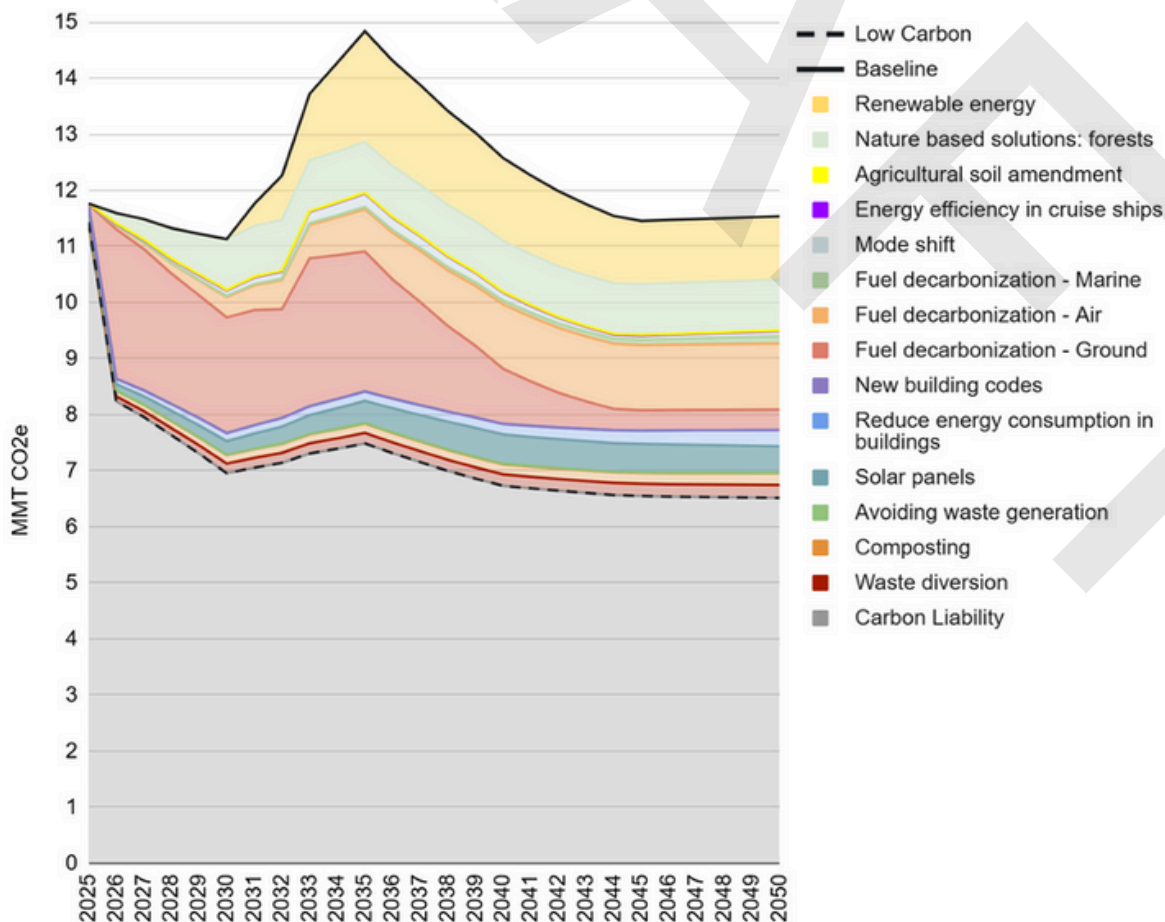
| SECTOR | MEASURE DESCRIPTION | TARGET |
|---|---|---|
| GROUND TRANSPORTATION | | |
| 9. MODE SHIFT EMISSION REDUCTIONS (2026-2050) - 3.0 MMT CO₂e | Switch transportation modes to: walking, biking and transit. - Implement 5-Yr Priority Multimodal Network connecting residents to work and play through bike lanes, sidewalks, bus-only transit lanes and streets and pedestrian prioritization. - Land Use Planning: strategically site & incentivize affordable, compact & transit-oriented development - Transit, Bicycling & Walking initiatives such as county transit free for youth, and rebates for electric bikes and scooters, incentives for ridesharing and vanpool participation - Assess and implement road usage pricing programs after multimodal infrastructure is installed. | Reduce VMT by 20% through active transportation, building compact, complete communities, increasing transit use, and road pricing programs actions. |
| AIR TRANSPORTATION | | |
| 10. FUEL DE-CARBONIZATION EMISSION REDUCTIONS (2026-2050) - 20.6 MMT CO₂e | Decarbonize air transportation fuels - Support Clean Fuel Standard, Tax Credit, <u>Carbon Tax</u> or other Legislation to increase Sustainable Aviation Fuel (SAF) affordability - Advise and participate in a SAF industry working group that meets quarterly and addresses barriers to meeting SAF goals and targets - Incentivize locally grown SAF farmers & producers - Assess existing infrastructure, Supply Chain and Distribution Pathways for SAF - Monitor developments in scale up of zero carbon fuels such as eSAF and green hydrogen - Engage with airlines regarding use of aircraft powered by zero carbon fuels for intra-island flights such as green hydrogen | Reduce airplane emissions by blending sustainable aviation fuels (SAF) with jetfuel (20% by 2040). |
| 11. REDUCE FUEL CONSUMPTION IN AIR TRANSPORTATION | Reducing aviation fuel consumption in airports, through the supporting actions: - Revise airline scheduling to stagger departures and arrivals to reduce idling - Optimize aircraft ramp movements to prevent congestion and delays - Complete airspace modernization strategy and implement - Expand number of gates to reduce aircraft idling time following landing | Reduce airplane emissions by 20% of current levels by increasing the fuel-efficient operation of airplanes. |
| 12. ELECTRIFICATION | Electrify air transportation operations and aircrafts through the supporting actions: - Conversion of airfield vehicles to electric - Conversion of ground support equipment to electric - Installation/expansion of EV charging infrastructure to support landside vehicles - Engage with airlines regarding use of aircraft powered by electricity for intra-island flights Conversion of all mobile equipment to electric | Reduce airport operation and airplane emissions by electrifying aircraft and ground operations vehicles. |

| SECTOR | MEASURE DESCRIPTION | TARGET |
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| MARINE TRANSPORTATION | | |
| 13. FUEL DECARBONIZATION EMISSION REDUCTIONS (2026-2050) - 1.5 MMT CO2e | Promote the use of renewable fuels such as biodiesel, e-methanol, e-ammonia, bio-Liquified Natural Gas, and green hydrogen in marine transportation vessels. | Reduce marine vessel emissions through clean fuel blends (15% by 2050). |
| 14. ENERGY EFFICIENCY IN CRUISE SHIPS EMISSION REDUCTIONS (2026-2050) - 0.2 MMT CO2e | Implement fuel consumption efficiency in cruise ships, some of the supporting actions are: - Reduce number of cruise ship calls - Reduce size of cruise ships allowed to dock | Reduce cruise ship emissions through fuel efficiency measures (10% more efficient by 2035). |
| AFOLU (Agriculture, Forestry and Other Land Uses) | | |
| 15.AGRICULTURAL SOIL AMENDMENT EMISSION REDUCTIONS (2026-2050) - 0.2 MMT CO2e | Capture carbon in soils - Integrate waste and land management systems to recapture nutrients and generate soil carbon amendments integrating 'āina stewards, local meat processors, and agricultural producers. - Biochar pilot program for carbon soil capture. - Invest in infrastructure and facilitates for climate-smart implementation practices - Increase technical assistance and resources for land stewardship and agricultural production. | Improve soil management to capture and store 10% more carbon. |
| 16. NATURE BASED SOLUTIONS (FORESTS AND WETLANDS) EMISSION REDUCTIONS (2026-2050) - 20.8 MMT CO2e | Restore forests and wetlands and protect existing native ecosystems through land acquisition, invasive species management, and wildfire prevention. Implement the Strategic Plan for Hawai'i Wetlands Enhance tree equity in urban spaces increasing resilience and offsetting urban heat island effect. | Planting 11 million native trees. Preserve 23,000 acres of forested lands. Protecting 30% of Priority Watersheds, 843,000 acres, by 2030. Restore 20 wetland and loko'ia(traditional fishpond aquaculture) Increase urban forestry canopy |

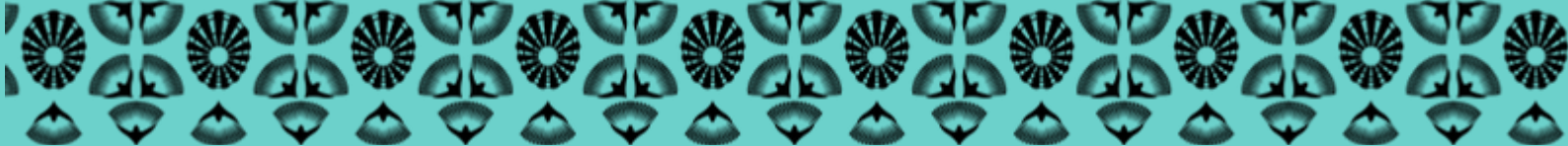
| SECTOR | MEASURE DESCRIPTION | TARGET |
|--|--|---|
| WASTE | | |
| 17. WASTE DIVERSION Waste Diversion Centers. EMISSION REDUCTIONS (2026-2050) - 4.7 MMT CO₂e | <p>Divert waste from final disposal (landfill or waste to energy).</p> <ul style="list-style-type: none"> - Infrastructure investments in Regional Material Recovery Hubs with advanced sorting facilities, remanufacturing centers, repair and reuse marketplaces. *Battery and solar panel repurposing *Construction material/waste recycling hubs - Extension of the O'ahu Island "Transfer Station Reusable Material Collection Site" project. - Installation of dishwashers and mobile washing stations to reduce food waste and reliance on single-use materials. - Implementing a reuse and refill program for food and beverage packaging (collection, washing, and logistics infrastructure to support the circulation of reusable items). -Urban mining ventures recovering metals from landfills | <p>Waste being diverted from final disposal or treatment to reach:</p> <ul style="list-style-type: none"> - 70% by 2030 - 90% by 2050 |
| 18. COMPOSTING Decentralized Compost Network for Hawai'i. EMISSION REDUCTIONS (2026-2050) - 4.3 MMT CO₂e | <p>Divert organic waste from landfills through composting.</p> <ul style="list-style-type: none"> - Expanding the production, distribution, and application of compost by building a decentralized, community-based compost network in controlled conditions in sealed containers for accelerated composting. | <p>As part of overall waste reduction goals:</p> <ul style="list-style-type: none"> - 70% by 2030 - 90% by 2050 |
| 19. AVOIDING WASTE GENERATION EMISSION REDUCTIONS (2026-2050) - 0.2 MMT CO₂e | <p>Legislation that enhances the Advisory Council Structure envisioned in H.B.1326, Zero Waste Bill (2023). Implement recommendations from Department of Health's upcoming Extended Producer Responsibility Report requiring manufacturers to be responsible for waste produced in packaging and end of life of products.</p> | <p>Existing Packaging Waste Advisory Council expands into the Hawai'i Circular Economy Commission, incorporating:</p> <ul style="list-style-type: none"> - Representatives from tourism, construction, and shipping industries and Environmental justice advocates <p>10% reduction in waste generation rates by 2040.</p> |

| SECTOR | MEASURE DESCRIPTION | TARGET |
|--|---|--|
| CIRCULAR AND WELLBEING ECONOMY | | |
| 20. ECONOMIC INCENTIVES TO ACCELERATE CIRCULAR INNOVATION | <p>Tax reforms favoring circular practices such as products and materials that can be repaired, reused or composted, use of and reuse or products for a long period of time and sharing of resources and materials.</p> <p>Establish statewide Buy Clean policies to purchase low carbon products.</p> <p>Incorporate Green Budgeting in the state budget process to track where funding is being spent.</p> <p>Supporting actions:</p> <ul style="list-style-type: none"> -Improve incorporation options for cooperatives: multi-stakeholder cooperatives and worker-owned cooperatives. -Establish a Circular Economy consortium to support transition and encourage innovation in the sector | <p>30% tax rebates for companies achieving 50% closed-loop material use.</p> <p>Levies on non-recycled plastics, metals, and textiles: 5% in 2026 to 20% by 2030</p> <p>Establish Buy Clean standards across 8 categories (paper, construction, etc.)</p> <p>Green budgeting for “Green Fee” by 2026 and State budget by 2030.</p> |
| 21. CULTURAL INTEGRATION AND COMMUNITY EMPOWERMENT | <p>Establish resilience grant program in collaboration with state and counties offices to support programs that build community resilience to climate hazards, threats, risks and impacts. Examples could include:</p> <ul style="list-style-type: none"> - Tool libraries for appliances, gear. - Repair circles and material swaps - Microgrids - Food banks - Emergency management - Job and skill training | <p>Resilience programs in all identified LIDAC communities</p> |
| 22. MONITORING FRAMEWORK | <p>Ensure regulating agencies are adequately staffed and compensated to ensure thorough expert, timely approvals, and robust enforcement.</p> <p>Consumption-based inventory of GHG to supplement the production-based inventory to more holistically account for imported emissions.</p> <p>Development of Circular Economy Index (measuring re-use of materials) and ‘Āina Resilience Matrix (combining measures of soil health and native species recovery metrics).</p> <p>Tourism Industry specific accounting of energy use, vehicle miles travelled and waste.</p> | |

| SECTOR | MEASURE DESCRIPTION | TARGET |
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| CIRCULAR AND WELLBEING ECONOMY | | |
| 23. EDUCATION & WORKFORCE DEVELOPMENT | <p>Expand Department of Education's Career and Technical Education Program for high schools and Hawai'i community colleges to include more green jobs and externship opportunities.</p> <ul style="list-style-type: none"> -Identify skillsets and pathways needed in different green job sectors -Additional positions at DOE -Integrate stackable credentials to create carer pathways <p>Expanding opportunities and incentives for teacher training and curriculum development in green jobs.</p> <p>Increase the number of paid apprenticeships, pre-apprenticeship and project-based learning in the workplace in green job sectors.</p> <ul style="list-style-type: none"> - Increase capacity at DLIR to coordinate. -Integrate stackable credentials to create carer pathways - Collaboration across government, communities, workforce systems, labor unions, industry, community-based organizations, and educational institutions. | <p>Strengthen the ecosystem of state, non-profit and private actors working in the green jobs and climate education and circular economy space through supporting initiatives that:</p> <ul style="list-style-type: none"> - bring climate education to schools - bridge schools with the workplace offering project-based learning opportunities. |



Combined Reduction in GHG in MMT CO₂e from Measures in the CAP



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The Hawai'i Climate Change Mitigation and Adaptation Commission (CCMAC) consists of a multi-jurisdictional effort between 20 different departments, committees, and counties. It is co-chaired by the Department of Land and Natural Resources and the Office of Planning.

CCMAC

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