

National Park Service  
U.S. Department of the Interior



CLIMATE *Friendly* PARKS

# Haleakalā National Park Action Plan

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## HALEAKALĀ NATIONAL PARK BECOMES A CLIMATE FRIENDLY PARK

As a participant in the Climate Friendly Parks (CFP) program, Haleakalā National Park belongs to a network of parks nationwide that are putting climate friendly behavior at the forefront of sustainability planning. By conducting an emission inventory, setting emission reduction goals, developing this Action Plan, and committing to educate park staff, visitors, and community members about climate change, Haleakalā National Park provides a model for climate friendly behavior within the National Park Service.

This Action Plan identifies steps that Haleakalā National Park can undertake to reduce greenhouse gas (GHG) emissions and mitigate its impact on climate change. The plan presents the park's emission reduction goals, and associated reduction actions to achieve the Park's goals. Strategies and action plan items were developed by working groups at the Pacific Islands Climate Friendly Parks Workshop.<sup>1</sup> While the plan provides a framework needed to meet the park's emission reduction, it is not intended to provide detailed instructions on how to implement each of the proposed measures. The park's Environmental Management System will describe priorities and details to implement these actions.

Haleakalā National Park intends to:

- Reduce 2008 energy GHG emissions from park operations by 20 percent by 2016.
- Reduce 2008 transportation GHG emissions from park operations by 20 percent by 2016.
- Reduce 2008 waste GHG emissions from park operations by 10 percent by 2016.
- Reduce total 2008 park GHG emissions, including visitors and concessioners, by 20 percent by 2016.

To meet these goals, Haleakalā National Park will implement strategies proposed in this plan that relate to the park's current and future emission inventories. Specifically, the plan recommends three strategies:

**Strategy 1:** Identify and implement mitigation actions that the park can independently take to reduce GHG emissions resulting from activities within and by the park.

**Strategy 2:** Increase climate change education and outreach efforts.

**Strategy 3:** Monitor progress with respect to reducing emissions and identify areas for improvement.

## THE CHALLENGE OF CLIMATE CHANGE

Climate change presents significant risks and challenges to the National Park Service and specifically to Haleakalā National Park. Scientists cannot predict with certainty the general severity of climate change nor its impacts. Average global temperatures on the Earth's surface have increased about 1.1°F since the late 19<sup>th</sup> century, and the 10 warmest years of the 20<sup>th</sup> century all occurred in the last 15 years. The single leading cause of this warming is the buildup of GHGs in the atmosphere—primarily carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O)—which trap heat that otherwise would be released into space.

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<sup>1</sup> Original notes from these workshops, including detailed action items not presented in the final plan have been archived by Haleakalā National Park and are available upon request.



The continued addition of CO<sub>2</sub> and other GHGs to the atmosphere will raise the Earth's average temperature more rapidly in the next century; a global average warming of 4-7°F by the year 2100 is considered likely.<sup>2</sup> Rising global temperatures will further raise sea levels and affect all aspects of the water cycle, including snow cover, mountain glaciers, spring runoff, water temperature, and aquatic life. Climate change is also expected to affect human health, crop production, animal and plant habitats, and many other features of our natural and managed environments.

At Haleakalā National Park, increasing temperatures, and changing precipitation patterns may alter park ecosystems, and the experience of park visitors. Haleakalā National Park, a dynamic landscape that stretches from the sea to the summit of Haleakalā at 10,023 feet has many different micro climates that harbor some of the world's most rare and endangered species. There are many cloud forest birds, some of which are endemic to Haleakalā and found only on the island of Maui, some of which are highly threatened or endangered. These forest birds are threatened by increasing temperatures as their range is limited to the slopes of Haleakalā between 4,000 to 8,000 feet. As temperatures rise, the range of mosquitoes will stretch further up the slopes of Haleakalā, invading the natural range of the forest birds and introducing avian malaria. These birds have not adapted an immune system to defend these introduced diseases and blights. The range of these birds and their population will become bottlenecked, as both are limited to the cloud forest that is defined by the cloud inversion layer (8,000 feet). The introduced malaria will slowly creep and wipe out the lower ranges of these birds. There are also hundreds of endemic and indigenous plants that are in danger of extinction, especially as temperatures continue to rise, precipitation patterns alter and our climate continues to change. The ecosystems at the Kīpahulu District of Haleakalā National Park are also deeply threatened by climate change. Sea level rise and change in precipitation temperatures have the potential to completely wipe out or significantly alter these ecosystems.

## GREENHOUSE GAS EMISSION INVENTORY AT **HALEAKALĀ** NATIONAL PARK

Naturally occurring GHGs include CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, and water vapor. Human activities (e.g., fuel combustion and waste generation) lead to increased concentrations of these gases (except water vapor) in the atmosphere.

### Greenhouse Gas Emissions

GHG emissions result from the combustion of fossil fuels for transportation and energy (e.g., boilers, electricity generation), the decomposition of waste and other organic matter, and the volatilization or release of gases from various other sources (e.g., fertilizers and refrigerants).

In 2008, GHG emissions within Haleakalā National Park totaled 2,237 metric tons of carbon dioxide equivalent (MTCO<sub>2</sub>E). This includes emissions from park operations and visitor activities, including vehicle use within the park. For perspective, a typical single family home in the U.S. produces approximately 12 MTCO<sub>2</sub> per year.<sup>3</sup> The combined emissions from park and concessioner operations, and visitor activities within the park, are roughly equivalent to the emissions from the electricity use of 186 households each year. The largest emission sector for the park is a result of visitor vehicle use totaling 1,905 MTCO<sub>2</sub>E.

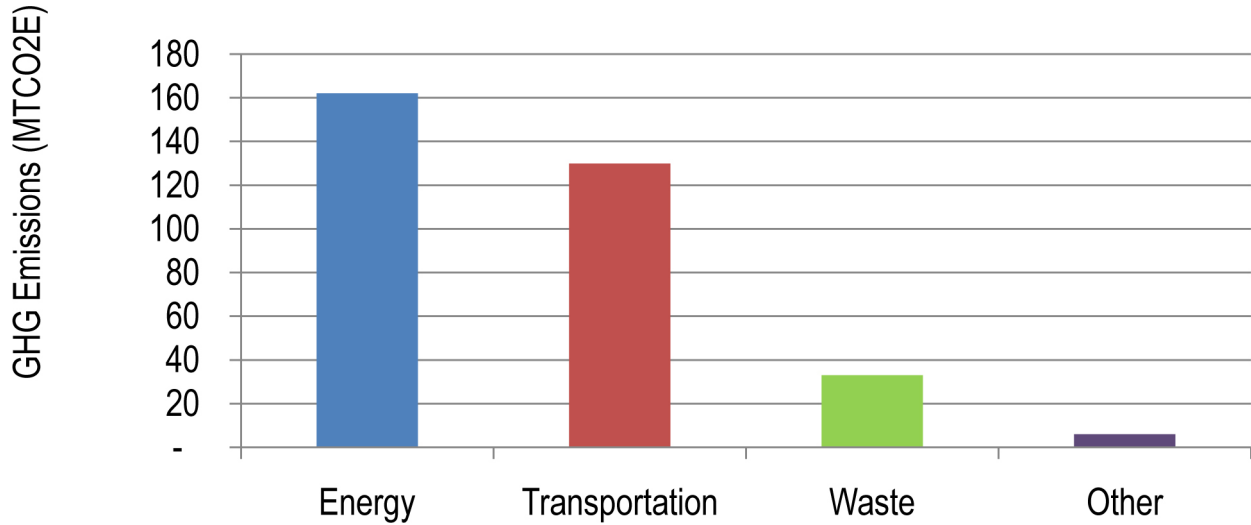
Figure 1 and Table 1, below, show GHG emissions for park operations only (not including visitor emissions). Greenhouse gas emissions resulting from park operations alone totaled 332 MTCO<sub>2</sub>E. Energy is the greatest contributor to GHGs emitted by park operations. Electricity purchased totaled 115 MTCO<sub>2</sub>E and propane consumption totaled 47 MTCO<sub>2</sub>E.

<sup>2</sup> IPCC 2007. Climate Change 2007: The Physical Science Basis. Intergovernmental Panel on Climate Change, Geneva Switzerland. Available online at < <http://ipcc-wg1.ucar.edu/wg1/wg1-report.html> >

<sup>3</sup> U.S. EPA, Greenhouse Gases Equivalencies Calculators – Calculations and References, Retrieved , Website: <http://www.epa.gov/RDEE/energy-resources/calculator.html>

## FIGURE 1

*Haleakalā National Park 2008 Park Operation Greenhouse Gas Emissions by Sector (excluding visitor emission)*



## TABLE 1

*Haleakalā National Park 2008 Park Operations Greenhouse Gas Emissions by Sector and Source (excluding visitor emissions)*

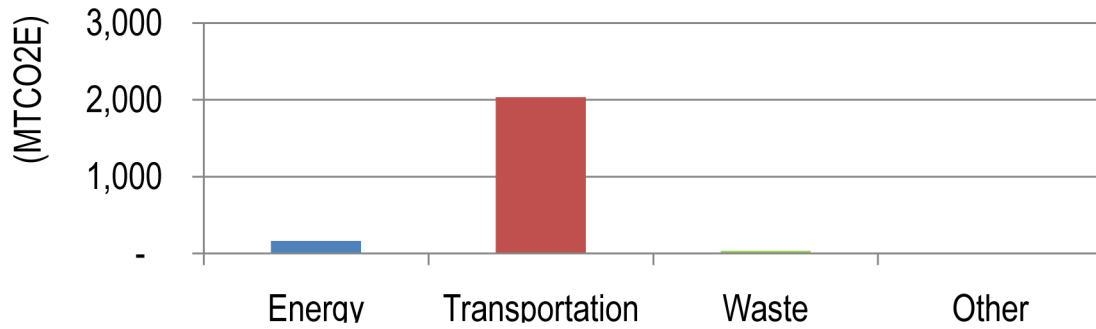
	MTCO2E
<b>Energy</b>	<b>162</b>
Stationary Combustion	47
Purchased Electricity	115
<b>Transportation</b>	<b>130</b>
Mobile Combustion	130
<b>Waste</b>	<b>33</b>
Landfilled Waste	33
<b>Other</b>	<b>6</b>
Refrigeration and Air Conditioning	6
<b>Total</b>	<b>332</b>

Note - Totals may not sum due to rounding

Not applicable data sources represented by "-"

## FIGURE 2

Haleakalā National Park 2008 Total Emissions by Sector



## TABLE 2

Haleakalā National Park 2008 Total Emissions by Sector

	MTCO2E
<b>Energy</b>	<b>164</b>
Stationary Combustion	49
Purchased Electricity	115
<b>Transportation</b>	<b>2,034</b>
Mobile Combustion	2,034
<b>Waste</b>	<b>33</b>
Landfilled Waste	33
<b>Other</b>	<b>6</b>
Refrigeration and Air Conditioning	6
<b>Total</b>	<b>2,237</b>

Note - Totals may not sum due to rounding

Not applicable data sources represented by "-"

## FIGURE 3

Haleakalā National Park 2008 Total Emissions by Park Unit



# Haleakalā National Park Responds to Climate Change

*The following actions were developed during the Pacific Islands Climate Friendly Parks Workshop on May 11<sup>th</sup> and 12<sup>th</sup>, 2010, in order to meet the park's climate change mitigation goals.*

## STRATEGY 1: REDUCE GHG EMISSIONS RESULTING FROM ACTIVITIES WITHIN AND BY THE PARK

Haleakalā National Park has developed a set of actions that the park is committed to taking in order to reduce emissions from activities within and by the park. These strategies have been prioritized based on a qualitative assessment of a set of criteria including: emission reduction potential, cost-effectiveness, feasibility, co-benefits, regional impact, and ability to rapidly implement. Actions that Haleakalā National Park will take have been presented below in order from highest to lowest priority within each sub-category.

### Energy Use Management

*Emission Reduction Goal: Reduce park operations' energy use emissions to 20 percent below 2008 levels by 2016.*

Improving energy efficiency and implementing alternative energy sources reduces park-based fuel use, lowers GHG emissions, decreases electricity consumption, and offers monetary benefits for the park. Emissions inventory results indicate that 48.94 percent of the park's GHG emissions from park operations are from energy consumption. Consequently, Haleakalā National Park identified actions it will take to reduce energy-related emissions. Presented below are the actions that are currently under way and which comprise the park's progress to date, as well as those actions the park will pursue.

#### Progress to Date

- ✓ All computers at Haleakalā National Park are ENERGY STAR certified.
- ✓ New appliances bought are ENERGY STAR or energy-saving certified.
- ✓ Kīpahulu District operates on solar energy and is completely off the grid.

### Energy Use Management – Planned Actions

#### 1 Promote energy efficiency and energy conservation in the park through behavioral change

- Encourage energy conservation in all park activities.
  - Encourage energy conservation in all park activities by shutting off lights and using natural lighting.
  - Add energy conservation to closedown checkout process (such as checking lights and electronics)
- Develop a mandatory energy-saving training program.
  - Integrate park-wide energy conservation in all employee meetings.
  - Incorporate energy conservation into new employee trainings.
  - Incorporate an energy performance reward system.
- Integrate seasonal “green” incentive program for employees.
  - Establish a Green Bucks program to complement the Safety Bucks program.
- Add energy conservation to employee performance standards.
- Institute energy conservation competitions between divisions.



- Establish an operations and maintenance schedule.
  - Assess and fix energy losses from steam, water and air leaks, non-insulated lines or tanks, non-caulked windows and other energy losses from poor maintenance.
  - Create initial operations assessment and develop an annual facility assessment.
- Implement programmable thermostat to no more than 68 degrees Fahrenheit.
  - Encourage employees to keep warm clothing at park facilities if they are cold.
- Ensure all computers' power management settings follow current ENERGY STAR recommendations.
- Continue the removal of fire rings at Hosmer's Grove and the ban on open fires.

## 2 Upgrade lighting options

- Install motion sensitive lighting.
- Install energy-efficient, night sky friendly outdoor lighting with motion sensors (low-lighting fixtures).
- Upgrade all light fixtures and bulbs in park to energy efficient bulbs.
  - Use high intensity discharge (HID) lamps and/or compact fluorescent lights (T-8's or T5's with electronic ballasts) in all fixtures used for more than three hours a day.
  - Replace fluorescent, tube bulbs with most recent energy efficient technology.
  - Replace and upgrade light ballasts.

## 3 Switch to more efficient electronics and adopt energy saving techniques

- Establish and implement green procurement policy that sets minimum energy performance standards and exceeds Federal Energy Management Program (FEMP) guidelines for all electronic equipment.
  - Continue to ensure that all new electronic/office equipment is ENERGY STAR qualified at [www.energystar.gov](http://www.energystar.gov), and rather than purchasing individual copy, fax, print, and scanning equipment, consider a multi-function device.
- Install Smart Strip power strips.
- Develop a hard drive hibernation program.

## 4 Improve and upgrade buildings, building envelopes and building structures

- Establish guidelines that would require new buildings to be oriented to maximize passive solar energy and natural ventilation.
  - At Summit District: Consider equipping new buildings with black stone (basalt) walls on south orientation to maximize heat absorption and heavily insulated walls on north orientation to minimize heat loss.
  - At Kīpahulu District: Consider equipping new buildings with white arced roofs, ventilated open ceilings, and open walls on Makai and Mauka or east and west walls to maximize air ventilation from trade winds (see LEED visitor center design at World War II Valor in the Pacific National Monument)
- Replace old inefficient boilers and heaters with new energy efficient/passive models where appropriate.

- Replace large boilers with smaller boilers grouped together in a parallel fashion to maximize heating capacity.
  - This approach is more economical and efficient than using a single large boiler because 1) the boilers can be staged to operate at or near their highest efficiency points; 2) small boilers are more efficient than large commercial boilers; 3) multiple boilers provide redundancy, which can reduce system downtime.
- Install on-demand/tank-less water heaters or solar water heaters in facilities and seasonal employee housing.
  - Research disabling, removing unnecessary hot water heaters at office buildings.
  - Research tank-less or solar water heaters for all other necessary areas (i.e., seasonal housing).
- Install insulation around the existing water heaters, pipe and coils.
- Insulate and/or improve building insulation.
  - Add R Values to improve insulation effectiveness.
  - Investigate cyclic pest exclusion PMIS implemented at PUHE.
  - PUHE was able to receive re-occurring funds to seal all facilities (pest exclusion; talk to Peter Amerling for more information).
- Implement spring-loaded hinges for doors to minimize heat loss.
- Install weather strips for doors, especially in seasonal housing, to minimize heat loss.
- Replace old windows with new windows.
  - Look for spectrally selective glass, double-glazed, low-e systems, gas filled windows, and electrochromic windows that provide better insulation and solar selectivity.
  - Investigate historic window rehab/repair; refer to NPS guide-greening historic buildings.

## 5 Utilize alternative energy sources

- Investigate the installation of wind turbines.
  - The Summit and Kīpahulu Districts of Haleakalā National Park have tremendous, consistent wind energy potential
  - Research wind turbines that can be mounted to roofs and are screened for the protection of endangered birds.
- Research alternative energy source for heating back-country cabins.
  - Phase out compressed logs in back-country cabins that require a helicopter to be flown in.
  - Research solar or wind energy to provide heat and a means of cooking in the backcountry cabins.
- Install photovoltaic panels on park buildings, parking lots and in appropriate areas.
  - Select sites where sunlight is not inhibited by trees and captures maximum, continuous sunlight throughout the day.
  - Develop and complete off-site grid tied photovoltaic system.

## 6 Measure energy use throughout the park

- Conduct an energy audit for all park buildings.
  - As part of energy audit, have recommendations made for appropriate lighting solutions for each space to reduce energy demand.
- Implement the recommendations from the Department of Energy audit. Develop integrated energy use display or energy metering to track and display energy consumption.
  - Install energy meters to measure energy use and monitor big consumers.
- Install meters on all propane lines
  - Measure propane consumption for each individual building.
  - Track and display the energy consumption to encourage energy efficient use.

## 7 Incorporate energy conservation into relationships with park contracts and partners

- Ensure that contractors and partners are aware of the energy conservation measures and initiatives of Haleakalā National Park.

## Transportation Management

*Emission Reduction Goal: Reduce park operations transportation emissions to 20 percent below 2008 levels by 2016.*

Reducing vehicle miles traveled, improving vehicle efficiency, and using alternative fuels can significantly reduce Haleakalā National Park's emissions. As the inventory results indicate, GHG emissions from transportation (including visitor emissions) comprise 91 percent of the park's overall emissions. Accordingly, in addition to the park operations emissions reduction goal, Haleakalā National Park has set a goal to reduce overall transportation emissions by 10 percent below 2008 levels by 2016. Presented below are the actions that are currently under way and which comprise the park's progress to date, as well as those actions that the park will pursue.

### Progress to Date

- ✓ There are two van pools in operation for employees at Haleakalā National Park.
- ✓ Facilities Division utilizes one GEM PEV.
- ✓ Partnering with Maui Electric Vehicle Alliance (MEVA) to investigate the feasibility of installing Level III Fast Chargers for electric vehicles in the summit district

## Transportation Management – Planned Actions

### 1 Transportation-related operational changes and behavioral changes

- Pursue and research office space in Makawao or Pukalani for employees.

- Encourage staff carpooling for commuting to work.
  - Develop carpooling information and support services for staff.
  - Increase employee participation in van pools and other carpooling opportunities.
  - Develop incentives or contest to encourage employee participation in carpools.
- Adjust employee scheduling to implement greater staff carpooling.
- Encourage staff carpooling within park.
  - Increase carpooling to job sites.
  - Increase employee carpooling between maintenance facilities and headquarters.
  - Develop best management practices.
- Reduce meeting travel.
  - Use webinars/conference calls to avoid excessive travel, both within and outside of the park.
  - Purchase necessary equipment for teleconferencing and videoconferencing.
- Promote efficient driving.
  - Use more fuel-efficient vehicles when possible.
- Prohibit visitor and employee vehicle idling.
  - Post signs and information with park idling rules (no idling over 20 seconds).
- Promote use of electric vehicles (GEMs).
- Use alternative fuel vehicles in demonstration projects to showcase new technologies.
- Promote use of front-country trail.
  - Improve front-country trail conditions.
  - Encourage employees to walk between headquarters and maintenance facilities.

## 2 Reduce visitor vehicle fuel consumption

- Investigate an alternative transportation system or shuttle bus.
  - Develop a proposal for a concessionaire-operated alternative fuel shuttle bus in the park.
  - Expand on ideas expressed in the 2004 transportation management study.
  - Request that the concessionaire operation shuttle visitors from an acquired parcel of Haleakalā ranch land to Summit; propose a route operating from Summit to Kīpahulu District.
  - Incorporate best management practices from Hawai i Volcanoes National Park.
  - Work with Hawai i Volcanoes National Park to develop an operational plan and troubleshoot logistics.
- Partner with surrounding state and local communities on alternative transportation opportunities for visitors.
  - Link in-park transportation systems to public transportation whenever feasible, through cooperation with public transportation agencies and gateway communities.
  - Partner with the County of Maui and Roberts Hawai i to develop public transportation to Haleakalā National Park.

### 3 Reduce NPS vehicle and equipment fuel consumption to rates exceeding federal requirements

- Conduct a comprehensive fleet management study.
  - Analyze park-wide fleet fuel-consumption patterns for efficiency improvements.
  - Invite third party audit if necessary.
  - Use FAST to track fuel use and analyze fleet needs with efficiency improvements.
  - Include decision on appropriate alternative fuel type in fleet management study.
  - Research new bio-diesel blends and grades.
- Conduct a third party audit of helicopter operations.
  - Evaluate necessity and frequency of helicopter operations
  - Look into alternative solutions.
- Continue to reduce interpretation vehicular mileage to Summit.
- Reduce trips into town.
  - Promote inter-division sharing of vehicles.
  - Utilize sedans instead of trucks where possible.
  - Develop a park-wide inter-division carpooling to reduce multiple daily trips into town.
- Analyze mail patterns and research the possibility of reducing mail runs into town.
- Identify certain areas to reduce or eliminate mowing, allowing these areas to return to natural state.

### 4 Replace NPS vehicles and equipment

- Right size the vehicle fleet by the number and type.
  - Use a Vehicle Allocation Methodology (VAM) to achieve a fleet that is the right size and type.
- Develop a vehicle replacement plan.
  - Evaluate AFV options: Hybrid electric vehicles (HEVs), electric vehicles, compressed natural gas (CNG), and biodiesel.
  - Replace vehicles with FLEX (flexible fuel vehicles) vehicles.
  - As older vehicles come up for replacement, order alternative fuel vehicles.
- Incorporate alternative fuel guidelines into fleet specifications.
  - Work with GSA to catalogue available AFVs and set minimum AFV goals.
- Replace two stroke engines.
  - Look for opportunities to substitute two-stroke with more efficient four-stroke engines.

### 5 Encourage appropriate vehicle maintenance

- Use bio-based lubricants and greases for applications and equipment (such as the park's Bobcat).

## Waste Management

*Emission Reduction Goal: Reduce park operations waste and wastewater emissions to 10 percent below 2008 levels by 2016 through waste diversion and reduction.*

The connection between waste and GHG emissions may not be obvious. However, waste management—in the form of source and solid waste reduction—can dramatically reduce GHG emissions. Landfills are the largest human-generated source of CH<sub>4</sub> emissions in the United States. Also, wastewater treatment plants produce nitrous oxide which has nearly 300 times the greenhouse effects of CO<sub>2</sub>. Reducing the amount of waste sent to landfills reduces CH<sub>4</sub> emissions caused by decomposition as well as the GHGs emitted from the transportation of waste. Reducing water use not only saves a limited resource, but also prevents N<sub>2</sub>O from entering the atmosphere. The less the park and its visitors consume in terms of products and packaging, the less energy is used and fewer GHGs are emitted.

Haleakalā National Park's park operations sent 26 short tons of waste to landfills and 34,300 gallons of wastewater to treatment plants. These activities emitted 33.4 MTCO<sub>2</sub>E from waste management in 2008. Diverting or reducing the park's waste stream through increased recycling and waste management efforts will reduce the amount of waste sent to landfills and the resulting emissions. Water conservation through awareness and replacement of wasteful appliances will reduce the number of gallons being sent to treatment plants. Presented below are the actions that are currently under way and which comprise the park's progress to date as well as those actions that the park will pursue.

### Progress to Date

- ✓ Haleakalā National Park gathers all water from water catchment system at Summit District.
- ✓ Haleakalā National Park has a green procurement plan.
- ✓ Haleakalā National Park has an Integrated Solid Waste Alternatives Program (ISWAP)
- ✓ Public urinals are “zero-flow” models.
- ✓ Once the second filtration system is operational, Haleakalā National Park will be recycling waste water at the summit.

## Waste Management – Planned Actions

### 1 Decrease waste through behavior change

- Engage staff to reduce and manage waste at work.
  - Encourage park staff to be responsible at work by making it easy to recycle and compost waste; make sure containers fit environment (e.g., animal-proof, rust-proof/salt air -resistant/moisture resistant, and proper size).
  - Make ceramic plates, bowls, mugs, and silverware available for employee use in lieu of disposable products.
  - Institute paperless office practices. Establish standards for double-sided printing and copying, office supply reuse, electronic correspondence procedures, electronic file storage, elimination of colored paper, etc.
  - Reduce waste generated at meetings and employee functions.
  - Take into account the amount of packaging when making purchases.

- Train park staff and contractors on waste reduction responsibilities.
  - Ensure that staff and contractors are aware of their roles and responsibilities to reduce waste. Conduct periodic trainings to inform maintenance crews about recycling/composting policies at the park.
  - Require that construction contractors reuse or recycle materials used during building renovations and new site construction/remodeling projects.
  - Require an annual training on waste reduction and green procurement for purchasers.
  - Integrate metrics on these responsibilities into performance evaluations.
- Train custodial staff in most efficient use of cleaning products.
- Train maintenance staff on waste-reduction initiatives.
  - Continually inform maintenance crews about recycling and composting policies at the park; conduct periodic trainings.

## 2 Establish new plans and policies that promote waste reduction.

- Measure the baseline solid waste generation (tons) at the park.
  - Continue to measure and record waste management data in an environmental management records system.
- Measure, track, and report waste stream data (include landfill waste and recycled waste) to monitor reductions and success in diverting waste from the landfill.
  - Record waste management data in an EMS or a spreadsheet tracking system.
- Communicate park waste policy to staff, concessioners, partners and contractors.
  - Create an orientation packet and provide information on policies and practices for recycling, green procurement, and other aspects of the parks waste management policy.
  - Conduct brown bag lunches and training seminars for all park personnel on topics related to waste reduction.
  - Include information on park sustainability, green procurement, and recycling policy in new employee orientations.
- Incorporate waste reduction into green office practices.
  - Reduce purchases where possible and avoid duplicate purchases.
  - Purchase CPG office supplies with maximum recycled content, avoid PVC supplies.
  - Purchase durable, reusable supplies, always print double sided, reuse office supplies when possible.
- Reduce waste generated at meetings and employee functions.
  - Establish guidelines for waste minimization: use durable, reusable utensils and mugs, buy in bulk, use items with reduced packaging, and provide recycling receptacles.
  - Phase out the use of plastic silverware and paper plates at employee functions.
- Create a materials and equipment exchange program.
  - Establish a formal exchange process within the park so different departments can source surplus materials internally. Old equipment that cannot be repurposed can be donated or recycled.

- Purchase products that minimize packaging.
  - Establish requirements to purchase only products with minimal packaging and packaging made of post-consumer (PC) recycled content, recyclable and/or reusable/refillable. Inform vendors of the park's packaging preference.
  - Incorporate bulk purchasing when possible.
- Reduce plastic water bottle use.
  - Implement water filling stations for visitors.
  - Draft and submit PMIS project.
  - Develop and implement program and interpretive displays similar to Hawai'i Volcanoes National Park.
- Choose hand dryers over paper towels.
  - Inventory paper towel areas that can be replaced with efficient hand dryers.
  - Install energy-efficient hand dryers throughout park facilities.
  - Research and install new technology breakthroughs in efficient hand dryers, such as "the accelerator".
- Continue leave-no-trace program for back-country permits and inform day hikers of the pack-in and pack-out policy.
  - Improve and install signage at trailheads (e.g., "Please help us reduce our waste and pack out your trash." "Last chance to recycle.")

### 3 Implement recycling and composting practices

- Continually capture all the possible waste material that can be recycled.
  - Continue to recycle cardboard, aluminum, scrap metal, glass, white paper, and no. 1 PET and 2 HDPE plastics.
  - Add mixed paper, tin, other plastics (including film), and pallets.
  - Incorporate Best Management Practices from Kalaupapa National Historic Site.
  - Find reuse opportunities or donate unwanted items. Look into cooperative waste disposal or recycling to increase volume and reduce costs/traffic.
- Implement a Construction Waste Management/Plan and Job Site Recycling Policy.
  - Require a Construction Waste Management or Recycling Plan; track quantities of recyclables.
  - Make sure contract language addresses waste plan/recycling. Check on "take-back" policies (e.g., ceiling tiles, cardboard, carpet, and drywall).
- Assign at least one full-time person to act as a park recycling leader/manager.
  - Primary responsibility of the park recycling leader/manager will be to assess and continually improve park's recycling activities.
- Start a comprehensive recycling outreach campaign aimed at park visitors.
  - Include waste prevention/recycling messages in park talks.
  - Provide recycling messages in brochures, trail guides, maps, and posters.
  - Use recycling messaging at waysides, campground display boards, and kiosks.



- Install easy-to-use recycling containers throughout park facilities.
  - Purchase containers with recycled content.
  - Place trash and recycling containers next to each other.
  - Evaluate signage; use graphics.
- Send used florescent bulbs to reclaim/recycle service center (only CFLs can be recycled on island).
  - Replace tubular florescent bulbs with compact florescent bulbs.
- Institute alkaline, lithium battery recycling locations in every office building.
  - For maintenance, routinely pick up and store in hazardous waste locker.
- Recycle or donate old computers and electronics.
  - Develop a standard operating procedure for electronic recycling (formalize current practices).
  - Recycle unusable computers and electronics.
  - Donate old equipment to schools, senior centers, etc.
  - Practice cradle-to-grave recycling to ensure toxic components are properly managed. Purchase electronics with less toxic components.
  - Reuse construction waste on-site, reuse elsewhere, or sell for recycling materials of value including lumber/wood, drywall, metal, rubble, cardboard, fixtures, hardware, and wiring.
  - Require drywall contractors to recycle waste.
  - Work with haulers to prevent contamination of waste sorting.
  - Ensure no illegal dumping occurs off job site.

#### 4 Reduce waste through green procurement

- Develop a green procurement plan.
  - Inventory products and analyze procurement trends.
  - Management approval of current green procurement plan.
  - Evaluate current purchases and reduce redundant products.
  - Institute a check system and performance standards for employees, supervisors and division chiefs.
  - Reduce card purchasers.
  - Keep records of specific purchases.
  - Adapt a list of pre-purchase questions for card purchases and attach to DI-1 form.
- Train staff on green procurement practices.
  - Conduct annual green procurement training for card holders as new eco-friendly products are constantly being introduced.
  - Encourage card purchasers to take online green purchasing training.
- Coordinate procurement practices so that surplus materials in one unit may be used by another unit.
  - Repurpose rather than discard surplus materials.
  - Establish an exchange process so different departments can source surplus materials internally.

- Develop incentives for contractors to practice green procurement practices.
  - Establish requirements for contractors to follow EPA's Comprehensive Procurement Guidelines and purchase environmentally preferable products. Specify preferred green alternatives.
  - Establish purchasing requirements for low/no-VOC insulation materials, carpets, paints, adhesives, etc.
  - Require contractors to use products that are manufactured from recycled content
  - Include language in contracts that hold contractors to same green performance standards as employees, supervisors and division chiefs.
- Adopt a list of pre-purchase questionnaires for contractors.
- Continually increase the recycled content of purchased materials.
  - Focus on office supplies, gift shop concessioners, building supplies, furniture and maintenance equipment: hoses, mulch, edging, timbers, posts, and compost with recycled content.
- Use post-consumer recycled paper in all park publications.
  - Use 100% post-consumer (PC) content, processed chlorine-free (PCF) copy paper. Consider alternative fibers (i.e., non-wood) and water-based or vegetable-based ink. Target paper reduction.
- Reduce the amount of packaging used in products sold and used in the park.
  - Let vendors know your packaging preferences.
  - Coordinate with Hawai'i Natural History Association to develop a no-bag policy.
- Inventory and substitute all cleaning supplies with non-toxic products.
  - Conduct an inventory and review of all cleaning supplies. Substitute products containing hazardous/toxic chemicals with non-toxic products.
  - Look for Green Seal Certified products and other green attributes when procuring cleaning and maintenance equipment.
- Use low/no-VOC insulation, carpets, paints, and adhesives.
- Increase the use of bio-based products.
  - Audit the bio-based products in use and look for opportunities to incorporate new products.
  - Implement petroleum product substitution program.
- Use carpet with high recycled content for any building projects.
- Continue to purchase computers, fax machines, printers and scanners that are ENERGY STAR certified.
  - Purchase only printers that are capable of printing double sided.
- Purchase locally produced materials whenever possible.
- Include new green products in newsletter and also incorporate sustainable spotlight in management team meetings.
- Promote the use of recycled content products and materials procurement within the NPS.

## 5 Reduce and reuse wastewater

- Manage point and non-point wastewater.
  - Complete the second filtration system (once operational, Haleakalā National Park will be recycling waste water at the summit).
  - Haleakalā National Park already captures storm water for use in secondary filtration system.
  - Devise/investigate storm water catchment or irrigation system in Kīpahulu.
  - Dispose of pesticides and tank rinse properly. Check state and local requirements.
- Install low-flow faucets and shower heads.
- Replace toilets with low-flow models.
  - Installed waterless urinals at Summit and Kīpahulu.
  - Look at installing composting toilets at park comfort stations.

## STRATEGY 2: INCREASE CLIMATE CHANGE EDUCATION AND OUTREACH

Climate change is a complex and easily misunderstood issue. Haleakalā National Park can play an integral role in communicating about climate change to a vast audience. A better understanding of the challenges and benefits of reducing GHG emissions can motivate staff, visitors, and community members to incorporate climate-friendly actions into their own lives. Haleakalā National Park recognizes that the greatest potential impact the park can have on mitigating climate change is through public education. Thus, the park sees public education as an end goal of any climate initiative. From increasing the efficiency of public transportation to developing a green purchasing program, the actions Haleakalā National Park takes to address climate change serve as opportunities for increasing the public's awareness of climate change. Presented below are the actions that are currently under way and which comprise the park's progress to date, as well as those actions that the park intends to pursue.

### Progress to Date

- ✓ Connecting with the community and park partners on Climate Friendly Park efforts.
- ✓ Building relationships with park concessioners, Friends Groups, local environmental groups, representatives from the local tourism/community business board, representatives from the state environment/energy departments, teachers, representatives from the regional transportation authority, and local university partners.

### Overall Outreach

Climate change awareness and education are critical parts of this action plan. Neither visitors nor park staff will make the connections necessary to take ownership of conservation efforts without adequate education. Individuals rarely have the motivation to change their lifestyles without being properly informed of the reasons. The following actions apply to park staff, visitors, and local communities.

- Host a symposium from a variety of perspectives, including native cultures as well as incorporating the Hawai'i Conservation Alliance initiatives and the past native responses to changing climates.
  - Host distance learning events on climate change.
- Disseminate information about climate-friendly actions the park is taking at conferences, meetings, and regional workshops.

- Include the science and impacts of climate change into park education tools.
  - Incorporate sessions on climate change into seasonal staff training.
  - Include Climate Friendly Parks language in kiosks and other visitor educational materials.
- Improve signage on recycling bins and offer friendly incentive reminders and messages.
  - Seek local talent to develop signs.

## Park Staff

Developing a climate change education program for park staff is vital to increasing awareness about climate change among park visitors and fostering a sense of collective responsibility among staff to help reduce park emissions. By incorporating climate change education into staff development programs, Haleakalā National Park will enable its staff to demonstrate their commitment through leading by example, and providing visitors with the tools and resources they need to reduce GHG emissions in the park and in their own communities. Potential actions include:

- Incorporate sessions on climate change into new staff training.
- Keep staff members that are part of the Green Team/Environmental Management Team informed about climate-related issues.
  - Use materials, publications, and tools available from the U.S. Environmental Protection Agency (EPA) and other agencies and organizations to mentor fellow staff about climate change.
  - Hold more green meetings that will involve the support of management team.
- Develop and strengthen Green Team partnerships with other Pacific Islands Green Teams.
- Incorporate climate change messages in monthly Green Team newsletter.
- Incorporate the “Green Minute” into management team meetings.
  - Keep management team informed of the Green Team’s objectives and progress.
- Develop a brown bag series for park staff including concessioners, partners, and occasionally visitors to educate about current climate change science, the park’s efforts, and what they can do.
- Develop consistent talking points for all staff to educate visitors on the mitigation actions that Haleakalā National Park is taking, as well as the mitigation actions that they can implement in their everyday lives.
- Create visual reminders for park employees with climate change information and tips on how employees can help reduce emissions.
- Improve signage on recycling bins and provide friendly reminders to staff and visitors.
  - Seek local talent to develop signs.

## Visitor Outreach

Understanding climate change and its consequences is essential to initiating individual behavioral change. Haleakalā National Park realizes that it has a unique opportunity to educate the public in a setting free from many of the distractions of daily life. By using existing materials, developing park-specific materials, highlighting what the park is currently doing about climate change, and encouraging visitors to reduce emissions, Haleakalā National Park can play an important role in educating the public about climate change.

Haleakalā National Park staff recognize the many different audiences that visit the park, including recreational and non-recreational park visitors, “virtual visitors” who visit the park online, school-aged visitors, local and out of town visitors, native practitioners, and external audiences. Reaching these various audiences with climate change information and engaging them in the park’s efforts requires appropriately focused messaging. The park has developed a number of strategies to reach these various audiences effectively. These strategies include:

- Educate visitors about climate change.
  - Link climate change and National Parks preservation with actions like using mass transit and alternative forms of transportation.
- Incorporate climate change information into existing park brochures.
  - Create/utilize bilingual brochures that talk about the success of the CFP program in terms of resource and economic savings where appropriate.
- Create and distribute previously produced information on climate change and its effects on National Parks in general and on your park in particular.
- Incorporate climate-friendly information into interpreter programs and talks.
- Develop a climate change link on park website.
  - Continue to educate visitors via internet, Facebook and website of waste reduction goals and other climate-friendly objectives.
- Integrate climate change themes into interpretive programs.
  - Integrate Climate Friendly Parks program with school programs using educational kits, wayside exhibits, posters, etc. Look for opportunities to educate with resources like the Climate Change Wildlife and Wildlands Toolkit. For more information, visit: <http://www.globalchange.gov/resources/educators/toolkit>
- Incorporate climate change education and activities within the Junior Ranger programs.
- Educate visitors about their recycling options at the park and at home.
  - Create visual aids about the park’s recycling activities.
- Create demonstration projects and exhibits to convey park sustainability message to visitors.
- Communicate with local communities, park visitors, and local media about actions they can take to reduce GHG emissions.
  - Encourage internal and external stakeholders to reduce their carbon footprints using tools like the EPA online household emissions calculator.

## Local Community Outreach

The gateway communities, agencies, vendors, and volunteers surrounding Haleakalā National Park can play a significant role in supporting the park's climate change mitigation goals. As such, when appropriate, park staff will assist local communities with incorporating climate change messages into community events and find partners to promote climate change education at those events, and engage with surrounding agencies to coordinate effective outreach and education efforts. Potential actions include:

- Communicate with local communities, park visitors, and local media about actions they can take to reduce greenhouse gas emissions.
  - Work with partners and staff to engage the public on climate change. Develop park programs that can be incorporated into local communities.
  - Develop specific programs in public locations to address climate change.
- Work with the surrounding community to address climate change.
  - Continue library programs and incorporate climate change outreach.
- Include community members in climate change discussions.
- Educate local community about what your park is doing to manage waste and other greenhouse gas mitigation actions.
- Set up a table at local events to address climate change.
  - Devise "Take a picture with an I'iwi" program, as climate change and avian malaria will potentially threaten the Haleakalā forest birds to a possible extinction.
- Plan a community event for Earth Day.
  - Continue to conduct programs for earth day in the local community.
- Incorporate climate change ranger's ideas/initiatives with other classmates or other universities.
  - Partner with USGS (Lloyd Loope) to develop climate change curriculum for local schools.
- Develop 4<sup>th</sup> of July float in parade addressing climate change.

## STRATEGY 3: EVALUATE PROGRESS AND IDENTIFY AREAS FOR IMPROVEMENT

By taking the actions established in Strategies 1 and 2 above, Haleakalā National Park plans to reduce its emissions to the specified goals. Achieving these goals will require an ongoing commitment by the park, which may include subsequent emission inventories, additional mitigation actions, and reevaluation of goals. As part of this strategy, Haleakalā National Park will:

- Monitor progress with respect to reducing emissions. This will include subsequent emission inventories to evaluate progress toward goals stated in this action plan.
- Develop additional emission mitigation actions beyond those listed in this plan.
- Periodically review and update this plan.
- The park will track climate friendly actions through the environmental management system.

## CONCLUSION

Haleakalā National Park has a unique opportunity to serve as a model for over 1,000,000 recreational visitors annually.<sup>4</sup> This report summarizes the operational actions the park commits to undertake to address climate change. Specifically, the park realizes its ability to educate the public and serve as a valuable model for citizens. By addressing GHG emissions within the park and sharing its successes with visitors, Haleakalā National Park will help mitigate climate change far beyond the park's boundaries.

The National Park Service faces an uncertain future due to the possible effects of climate change. However, by seriously addressing climate change impacts and reducing emissions, Haleakalā National Park will reduce its contribution to the problem while setting an example for its visitors. The strategies presented in this Action Plan present an aggressive first step towards moving Haleakalā National Park in the direction of being a Climate Friendly Parks.

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<sup>4</sup> Haleakalā National Park: Park Statistics. Available online at: <http://www.nature.nps.gov/stats/viewReport.cfm>