progression energy™

Progression Hawaii Offshore Wind, Inc.

Unsolicited Application for a Section 585 Commercial Wind Lease on the Outer Continental Shelf Offshore of the South Coast of Oahu

Progression Hawaii Offshore Wind, Inc.

1110 Nu'uanu Avenue
Honolulu, HI 96813

1300 NW Northrup ST
Portland, OR 97209

October 8, 2015

progression energy™

Progression Hawaii Offshore Wind, Inc.

October 8, 2015

Mr. Douglas Boren
Chief, Renewable Energy Section
Bureau of Ocean Energy Management
760 Paseo Camarillo, Ste. 102
Camarillo, CA 93010

Dear Mr. Boren:

Progression Hawaii Offshore Wind, Inc., is pleased to provide you with the enclosed Unsolicited Application for a Section 585 Commercial Wind Lease on the Outer Continental Shelf Offshore of the South Coast of Oahu. Progression would like to lease the area described herein (the "Lease Area") for the purpose of developing an up to 400MW floating offshore wind farm to be interconnected via undersea 138 kV High Voltage Alternating Current cables into the Hawaiian Electric Oahu electricity grid (the "Project").

Some of the highlights of the Project include:

- Project Site vetted over 3 years with >100 stakeholder meetings to ensure highest likelihood of success of the Project.
- Hawai'i-based development team with a proven track record of completing renewable energy projects in the State of Hawai'i.
- As presently planned, the Project provides approximately 25% of Oahu's electricity while impacting less than 5 acres of land.
- Helps Hawai'i take a major step in meeting its 100% Renewable Portfolio Standard objectives, reducing the cost and volatility of its energy supply, and utilizing a domestic energy resource.
- The Project's Levelized Cost of Energy is similar to solar with the added benefits of a grid-friendly generation profile and ancillary services that Oahu's electricity grid needs. This grid friendliness translates into real cost savings, especially as renewable energy penetration increases on Oahu's grid.
- Provides economic and educational development opportunities through utilization of the local supply chain, direct employment, educational and research programs, and taxes and community benefit payments.

Please feel free to contact me if you have any questions or need additional information.

Sincerely,

Chris Swartley

Chris Swartley
Chief Executive Officer
Progression Hawaii Offshore Wind, Inc.
Company #: 15054

Contents

Appendices

Tables

Figures

Definition of Key Terms

BMP: Best Management Practices

BOEM: The United States Bureau of Ocean Energy Management, Department of the Interior

BOP: Balance of Plant

COD: Commercial Operations Date

COMSUBPAC: Commander, Submarine Force U.S. Pacific Fleet

CZMA: Coastal Zone Management

DBEDT: The State of Hawaii Department of Business and Economic Development

DEIS: Draft Environmental Impact Study

DLNR: Hawaii Department of Land and Natural Resources

DoD: Department of Defense

DPP: Honolulu Department of Planning and Permitting

EA: Environment Assessment

EFH: Essential Fish Habitats

EIS: Environment Impact Statement

EPA: Environmental Protection Agency

EPC: Engineering Procurement Construction

ESA: Endangered Species Act

FADs: Fish Aggregating Devices

HCDA: Hawaii Community Development Authority

HECO: Hawaiian Electric Company

HRC: Hawaiian Range Complex

HRS: Hawaii Revised Status

HVAC: High Voltage Alternating Current

HVDC: High Voltage Direct Current

ISO: Independent System Operator

JBPHH: Joint Base Pearl Harbor-Hickam

LCOE: Levelized Cost of Energy

Lease Area: The OCS Blocks, or portions thereof, for which Progression is submitting this Application for the purpose of a long-term commercial lease with BOEM

LIDAR: Light Detection and Ranging, an instrument using light to determine wind resource

MACRS: Modified Accelerated Cost Recovery System

MBTA: Migratory Bird Treaty Act

MMPA: Marine and Mammal Protection Act

N45: Chief of Naval Operations Energy and Environment Readiness Division

NEPA: National Environmental Policy Act

NEXRAD: Next Generation Weather Radio

NMFS: National Marine Fisheries Service

NOAA: National Oceanic and Atmospheric Administration

O&M: Operations and Management

OCS: Outer Continental Shelf

OEM: Original Equipment Manufacturer

OTEC: Ocean Thermal Energy Conversion

PPA: Power Purchase Agreement

Principle Power: Principle Power, Inc.

Progression Energy: Progression Energy, LLC, a Delaware limited liability company and parent to Progression Hawaii Offshore Wind, Inc.

Progression: Progression Hawaii Offshore Wind, Inc., a Delaware Corporation formed in 2015 by Progression Energy, LLC and its equity investors in order to continue the development of the Project that Progression team members have been pursuing since 2012.

Project: An up to 400MW offshore wind energy facility in the Lease Area and related high-voltage submarine cables to transmit power to HECO substations

PTC: Production Tax Credit

RDT&E: Research and Development Test and Evaluation

SOEST: The University of Hawai‘i School of Ocean Environment Science and Technology

STEM: Science, Technology, Engineering and Math

USFWS: U.S. Fish and Wildlife Service

WestPac: Western Pacific Region Fishery and Management Council

WindFloat Unit: A single WindFloat foundation with an 8-10MW offshore turbine and associated electrical infrastructure

WindFloat: A semi-submersible floating foundation technology proprietary to Principle Power

Introduction

Progression Hawaii Offshore Wind, Inc. ("Progression") is pleased to submit this unsolicited application for a Section 585 Commercial Lease on the Outer Continental Shelf (OCS) offshore the south coast of Oahu pursuant to 30 CFR 585.230(f) (the "Application"). Progression proposes an up to 400MW floating offshore wind project ("Project").

The Project will utilize Principle Power's WindFloat semi-submersible floating foundation and a leading offshore wind turbine with a nameplate capacity of between 8-10MW (one WindFloat, turbine, together with associated infrastructure, is a "WindFloat Unit" or "Unit").

Depending on the turbine nameplate capacity, the entire project will comprise between 40 to 50 WindFloat Units sited approximately 1 to 1.5 miles apart. Subject to further seafloor analysis, the Units will likely be anchored to the sea floor with drag embedded anchors and connected with one another via a submerged low-voltage collection system. The collection system will collect the electricity from all of the WindFloat Units to a floating substation. The substation will transform the Project voltage to 138kV, which is the voltage of the HECO High Voltage Alternating Current ("HVAC") grid, and transmit the Project's electricity via 2 HVAC cables to land.

As a part of its wind resource analysis, Progression has found that the Hawai‘i offshore region sees an enhanced area of wind resource due to easterly trade winds being funneled in between the major land bodies of the State. Due to this, the site of interest sees a preponderance of the resource from one direction of the wind rose, ENE (**Figure 1**), which is advantageous in siting offshore wind turbines. With this sharply orientated wind rose, Progression designed a layout that contains downwind spacing of 12-16 rotor diameters. Designing large spacing between rows in the prevailing wind direction will reduce direct wake loses on the wind farm, thus increasing efficiency within the array. In addition, Progression also designed the array to be only 4 rows deep in order to reduce accumulated wake losses known as the Large Wind Farm Effect. The cross-wind spacing is 8-10 rotor diameters.

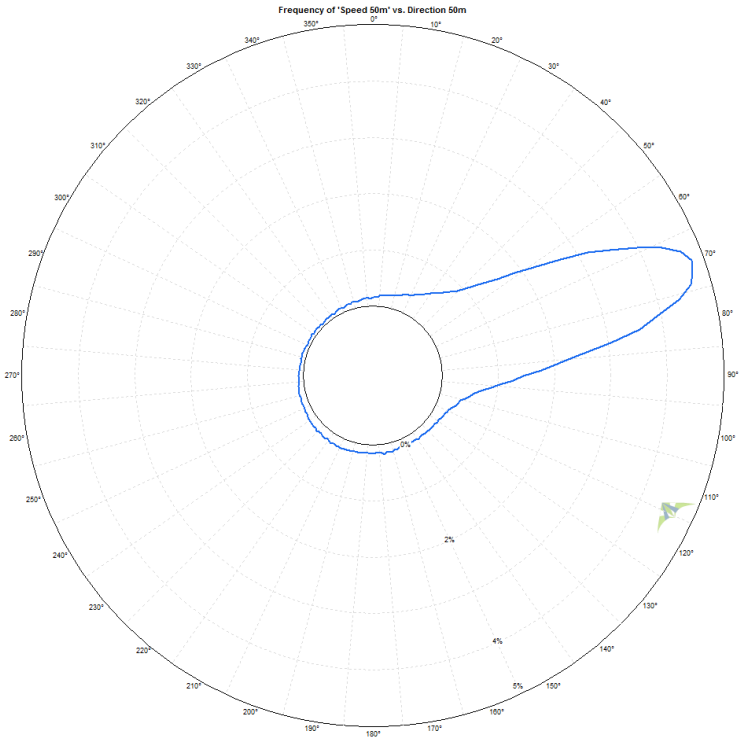


Figure 1. Wind Rose

Data: National Aeronautics and Space Administration
Modern-Era Retrospective Analysis for Research and Applications ("MERRA")

The entire Lease Area is 121 square miles with an average depth of 2,700 feet (**Figure 2**). This assumes a fully built 400MW project utilizing 8MW turbines. The leased area also allows enough leeway for changes in the layout due to later-stage geological/geophysical studies, further stakeholder input, and wind turbine selection and micrositing. Progression will endeavor to make the final project footprint as small as possible, while still maintaining an array layout that enables efficient energy production.

The Project is being developed in three stages:

- **Phase I: COMPLETE: 2012-2015**: Proof of concept and stakeholder outreach. Stakeholder outreach will continue throughout the Project development.
- **Phase II: ONGOING**: Submit lease application to The United States Bureau of Ocean Energy Management, Department of the Interior ("BOEM").
- **Phase III: 2016-2023**: Later-stage development and construction of the Project. The Project will be constructed in two phases:
    - Construction Phase I: Q4 2020 – Q4 2021. COD PHASE I: Q1 2022
    - Construction Phase II: Q4 2021 – Q4 2022. COD PHASE II: Q1 2023

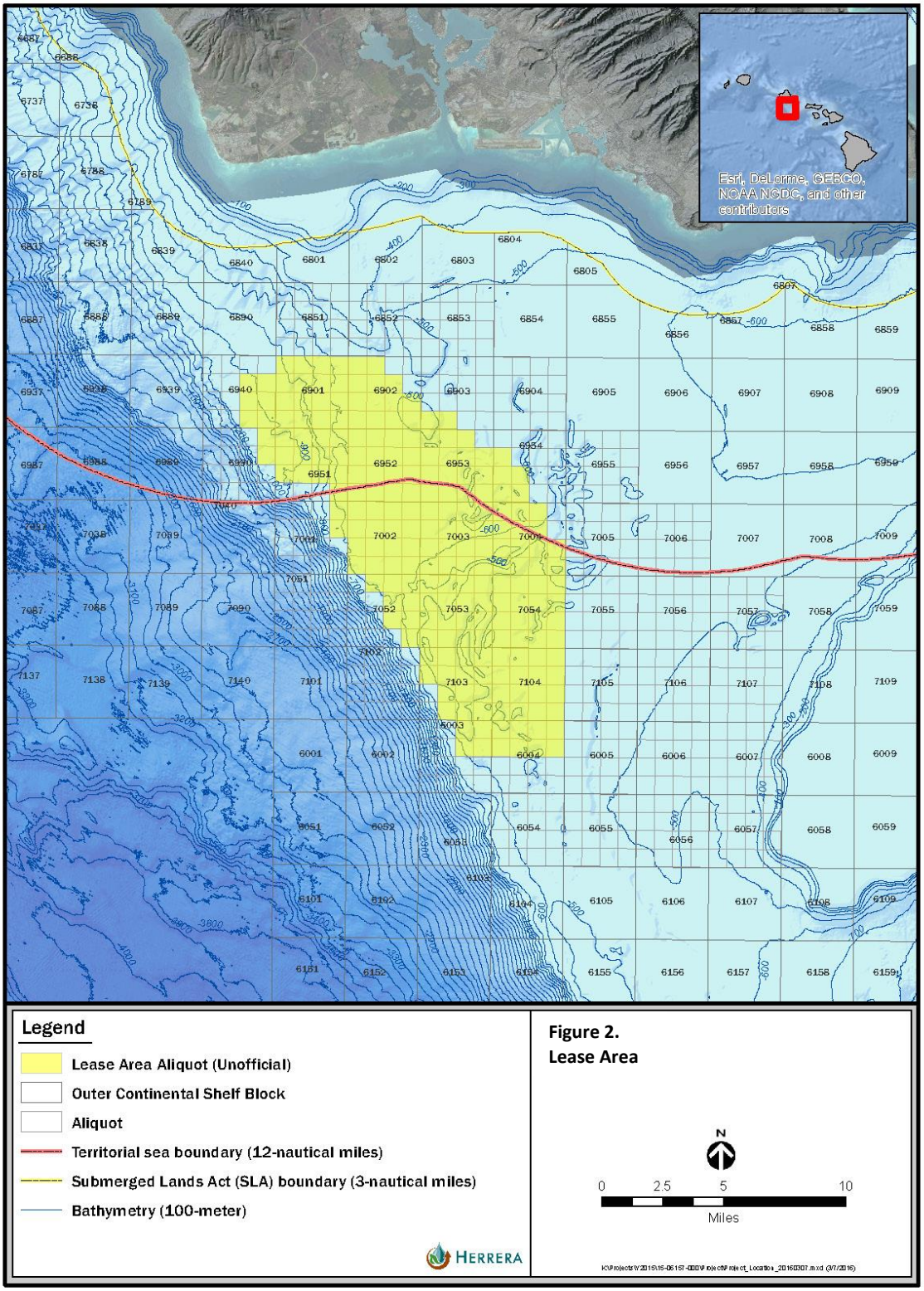


Figure 2. Lease Area

1 Lease Area for Commercial Development

Members of the Progression team selected the Project area by first performing desktop studies to identify areas that had:

- Sufficient wind resource
- Acceptable depth for the WindFloat technology of between 1,640-3,280 feet
- Acceptable proximity to shore to utilize HVAC technology
- No obvious fatal flaws with respect to environmental, community, transportation, Native Hawaiian and military interests.

From these desktop studies, members of the Progression team identified five sites that met the above siting criteria (**Figures 3-6**).

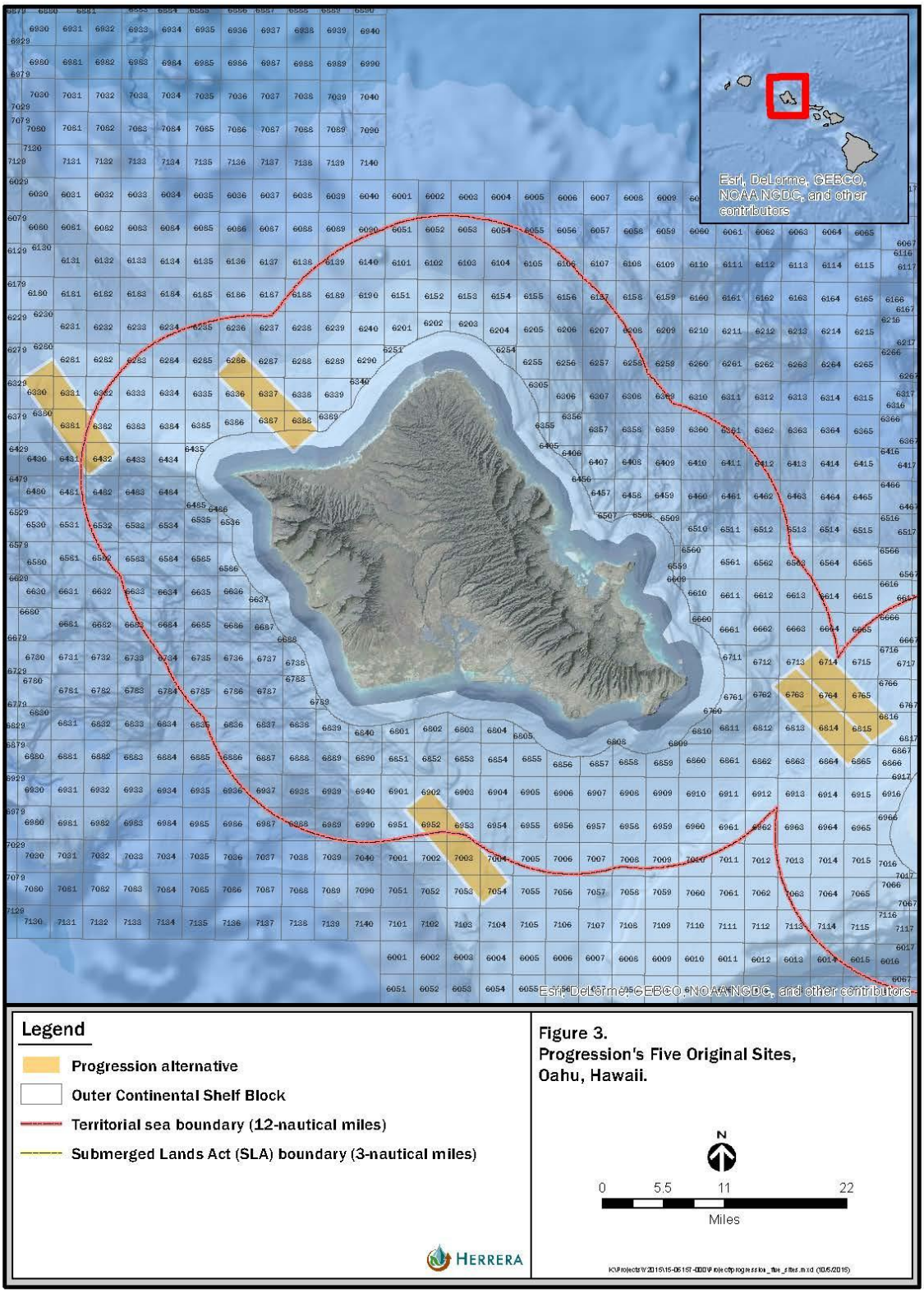


Figure 3. Progression's Five Original Sites

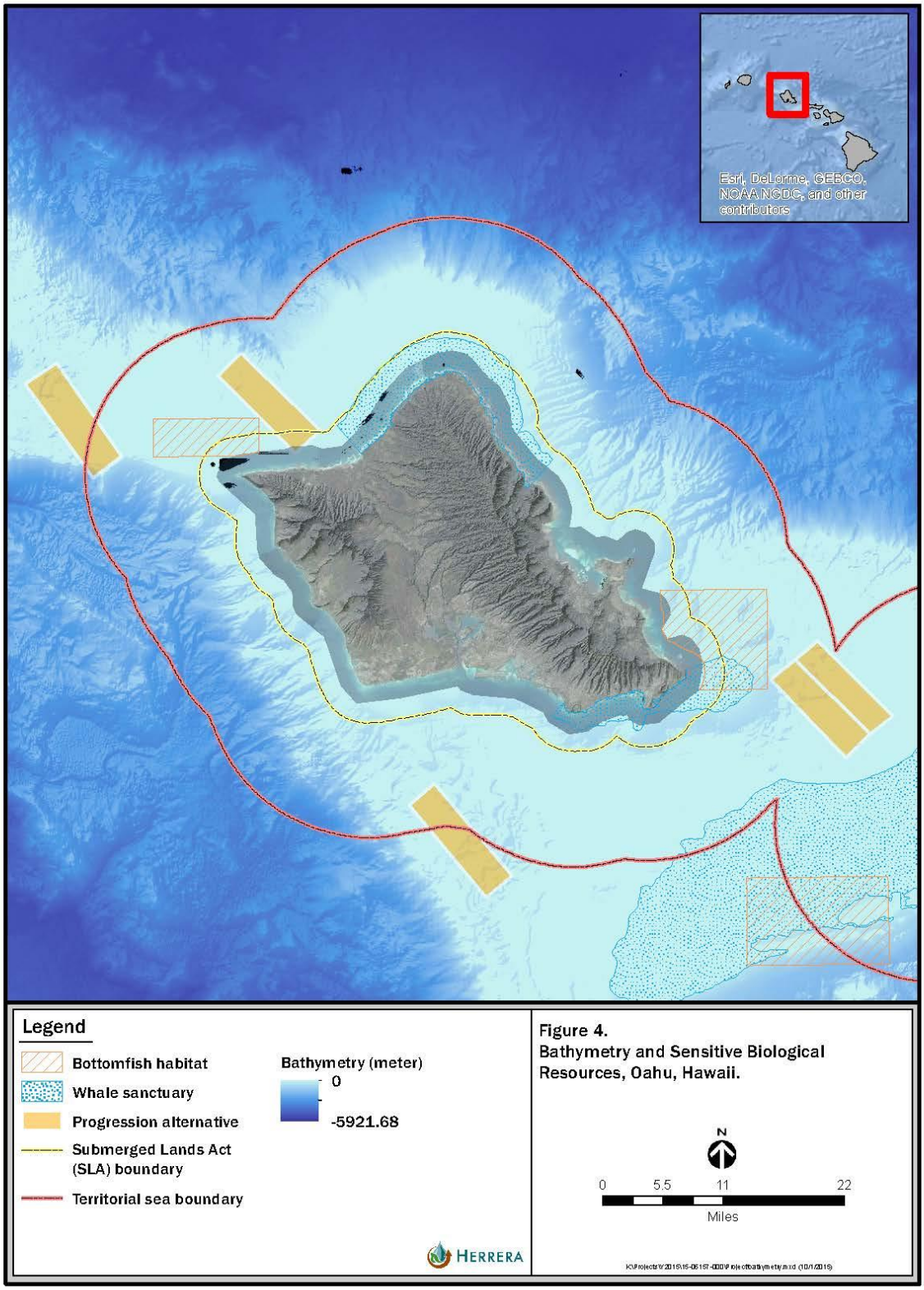


Figure 4. Bathymetry and Sensitive Biological Resources

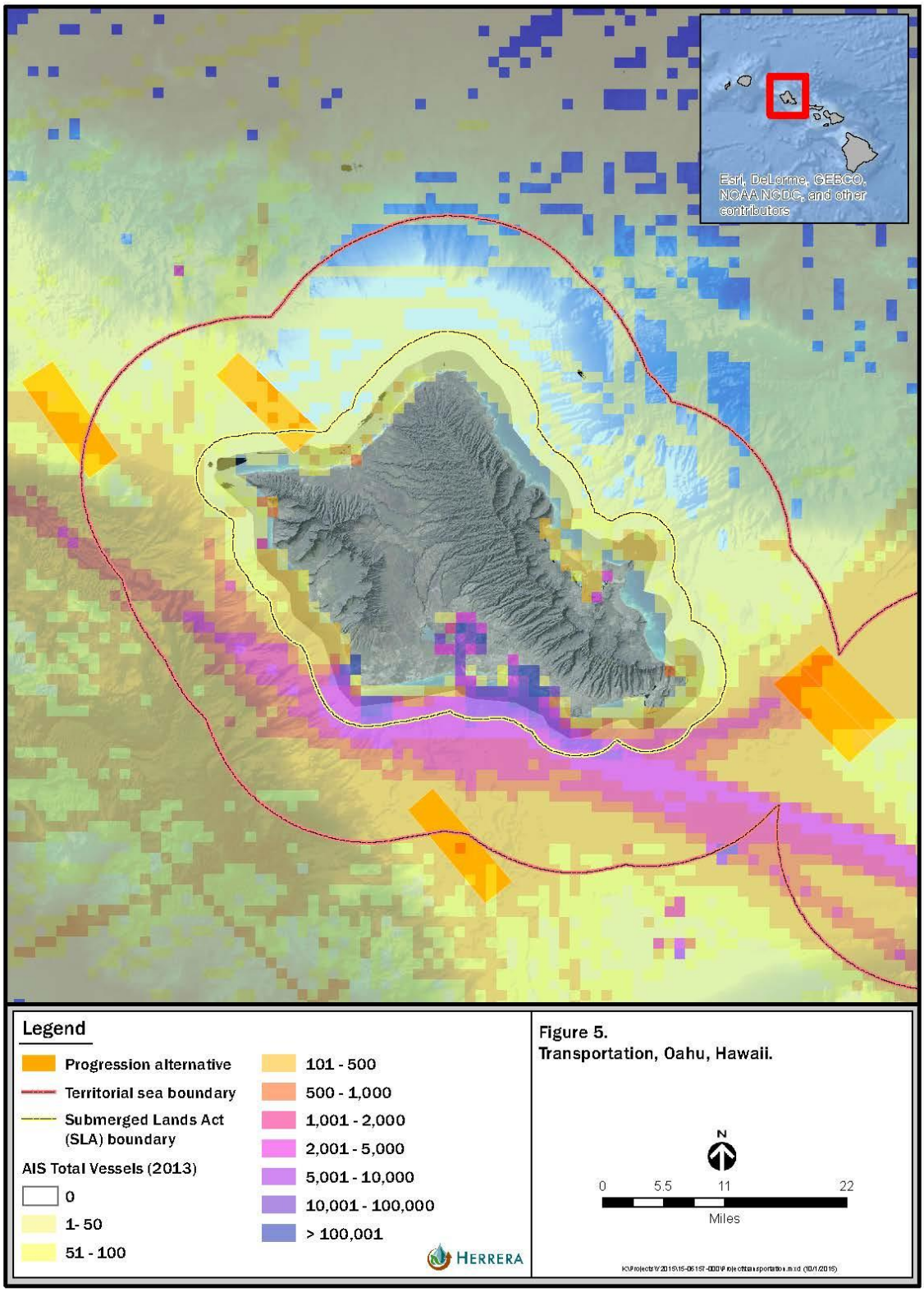


Figure 5. Transportation

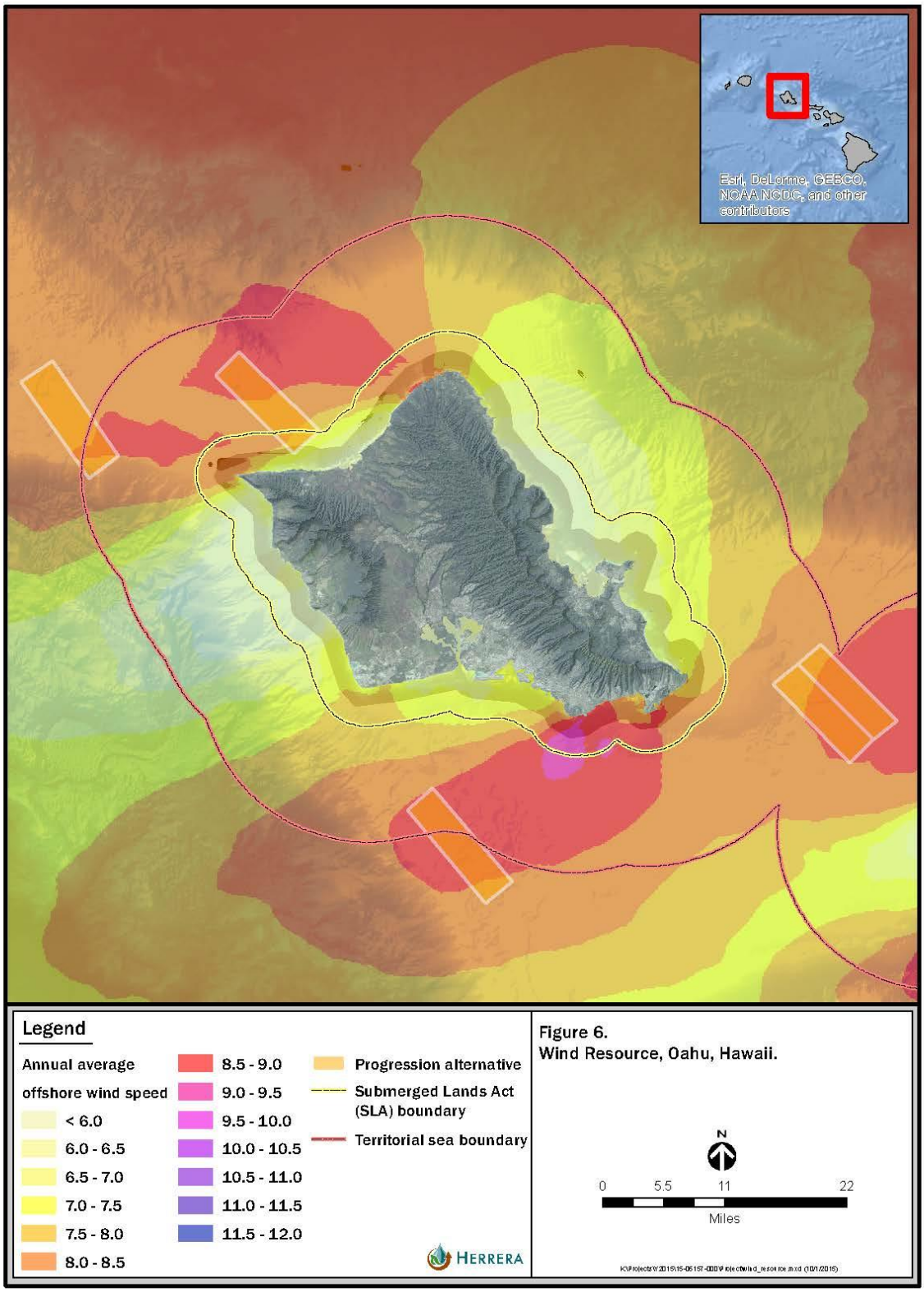


Figure 6. Wind Resource

Members of the Progression team, joined by Principle Power, then conducted more than 100 stakeholder meetings between 2012-2015 to determine the feasibility of the sites chosen and the general level of acceptance for the concept of a floating offshore wind project near the island of Oahu. Of the five sites proposed to stakeholders, there was sufficient support for the consideration of the Project Site by stakeholders leading to its submission in this lease Application.

Progression also received strong feedback across a range of stakeholders that the other four sites would be untenable. According to stakeholders, the North Shore Sites were too visible from North Shore beaches and communities, and too close to sensitive biological resources. The sites in the Oahu/Molokai channel were thought to be untenable due to shipping traffic, visuals from both Oahu and Molokai, and Native Hawaiian interests and canoe races such as the Molokaʻi Hoe, which is in its 63rd year. Progression will continue stakeholder engagement in relation to this proposed Project Site and recognizes that there are still military interests to address.

Regarding outreach to the military, the Progression Team has been working with the military at a number of different levels in order to successfully site the Project. Progression has met with personnel within the Navy Secretariat, Navy N45, COMSUBPAC and other operational personnel, and the Department of Defense Siting Clearinghouse.

Progression will also coordinate with BOEM, the Department of Defense, and the Military Services through BOEM's state task force (defined in 30 CFR Part 585) and the Pentagon's mission compatibility review process (defined in 32 CFR Part 211). Through all of these processes, Progression hopes to site an economically viable project while impacting military interests as little as possible.

To Summarize: Progression has done this extensive and lengthy stakeholder engagement in order to create the highest likelihood of success for this Project and for acceptance of offshore wind in Hawaiʻi in general. Progression is by no means finished with stakeholder engagement and its stakeholder list grows every month. Progression will continue to listen and engage with stakeholders throughout the life of the project, both as a part of the NEPA process and also through informal consultations and meetings.

The proposed Project Site includes 19 OCS blocks. The northern-most boundary of Project begins approximately 9 miles SSE of Barber's Point (with the closest WindFloat Units being approximately 10 miles SSE of Barber's Point) and extends roughly 18 miles SSE. At its widest point, the Project extends from east to west approximately 10 miles. The entire Lease Area is 121 square miles with an average depth of 2,700 feet. Project Lease Area OCS blocks/aliquots are shown in **Table 1**.

Table 1. OCS Lease Area Blocks

OCS Blocks	Aliquots
6940	G,H,K,L,O,P
6901	ALL
6902	A,B,E,F,G,I,J,K,L,M,N,O,P
6903	M,N
6990	D,H
6951	A,B,C,D,E,F,G,H,I,J,K,L,P
6952	ALL
6953	A,B,C,E,F,G,H,I,J,K,L,M,N,O,P
6954	E,I,J,M,N
7001	D,H
7002	ALL
7003	ALL
7004	A,B,C,E,F,G,I,J,K,L,M,N,O,P
7052	B,C,D,G,H,K,L,P
7053	ALL
7054	ALL
7103	A,B,C,D,E,F,G,H,J,K,L,N,O,P
7104	ALL
6003	C,D,G,H
6004	A,B,C,D,E,F,G,H

2 Objectives & Facilities

Progression's objective is to develop an economically viable project that significantly increases Hawai'i's energy security by decreasing its reliance on imported fossil fuels for electricity generation, while minimizing the Project's impact on the environment and other uses of the area. Toward this end, the Progression Team began its stakeholder outreach in 2012 by seeking meetings with stakeholders who were most likely to have an objection or concern with an offshore wind farm. Progression did this to determine feasibility of the concept and to gain a better understanding of potential issues and concerns to mitigate. Progression will continue to engage in discussions with stakeholders throughout the development, construction, and operation of the Project. Extensive studies to be performed as a part of the Project development will also ensure that impacts are understood and minimized where possible. Further discussion concerning stakeholder engagement and environmental issues can be found in **Sections 3.1** and **4** respectively.

Progression will strive to appropriately balance the twin goals of achieving the lowest cost of energy for ratepayers while maximizing economic development in the region. The following section explores the economic impacts of the Project.

2.1 Economic Development Objectives

A key Progression objective in developing, constructing and operating an offshore project near the island of Oahu in Hawai'i is to enhance economic development in the State of Hawai'i. Economic development impact will stem from four sources: (1) utilization of the local supply chain, (2) direct employment, (3) educational and research programs, and (4) taxes and community benefit payments.

The Project will also result in substantial indirect economic benefits to the local community, such as revenue from the purchase of fuel, insurance, food, services and supplies made by local supply chain manufacturers, construction contractors and Progression during the development, construction and operation of the Project. A further significant contribution to economic development in Hawai'i will be the Project's impact on stabilizing electricity generation prices on the island of Oahu. By substantially decreasing reliance on imported fossil fuels for electricity generation, the Project will lower the impact of unpredictable global oil prices on electricity prices in Hawai'i. Through fixed energy costs, the Project will reduce price volatility and lower the overall costs of goods and services.

2.1.1 Local Supply Chain

Progression's approach for maximizing economic development in connection with the Project will include local sourcing of subcontractors, materials, and equipment. During construction and operations, this will include professional services, harbor facilities, vessels and supply chain components involved in the fabrication and/or assembly, deployment, and operation and maintenance of the WindFloat Units. Progression will seek to include a local sourcing provision in its larger contracts, including the construction contract. In addition, Progression and Principle Power intend to work together to help the turbine Original Equipment Manufacturer ("OEM") identify suitable local sources for materials and services.

2.1.2 Direct Jobs

The Project will yield a significant number of employment opportunities over the course of its development, construction, and operations and maintenance. During development, the Progression Team has and will work with a number of professional service firms from Hawai‘i who have the institutional knowledge and capabilities to assess everything from community outreach, permitting and visual simulations to bathymetry, underwater technologies, electrical engineering, and location of unexploded ordnance and chemical munitions. The construction phase of the project will create the most direct jobs over a 2.5 year period, including pre-construction activities. The construction is also an important opportunity to develop local specialized expertise associated with offshore floating platforms which can expand opportunities for Hawai‘i businesses throughout the Asia-Pacific region, where floating offshore is becoming increasingly important, while also supporting post-secondary education curricula. The operations and maintenance (“O&M”) phase of the Project will create permanent jobs in a variety of fields including biology and general wind farm maintenance. Progression will also seek to train and hire locally when filling permanent O&M jobs. The Progression Team will collaborate with county, state, and federal efforts to expand and sustain Hawai‘i’s Green Energy workforce.

2.1.3 Training, Educational, and Research Opportunities

Given its geography and natural resources, Hawai‘i is a leader in determining how best to utilize its robust natural resources to meet its energy needs. Many companies, agencies, and organizations look to the cutting-edge development of energy technology in Hawai‘i to serve as demonstration projects for replication nationally and globally. A large utility-scale wind energy project offshore in Hawaiian waters will hold significant interest for various organizations and consortia ranging from educational opportunities to support for commercial industries such as fisheries. Progression has begun stakeholder outreach with organizations such as the University of Hawai‘i’s School of Ocean and Earth Science and Technology (“SOEST”), and the Western Pacific Regional Fishery and Management Council (WESTPAC), to discuss potential opportunities to increase collaboration and learning between wind energy and ocean resource management. Progression intends to work with the many organizations within SOEST to provide educational and research opportunities related to various areas from meteorology to clean energy and marine science. Additionally, as the Project develops, Progression will seek ways to support the Ocean and Bio Science Sectors of HI2, the University of Hawai‘i Innovation Initiative, which seeks to build a $1B research enterprise with the Hawaii Executive Conference and other community groups.

Progression will also seek collaborative efforts with cultural organizations to determine how best to incorporate Native Hawaiian cultural practices, language, and tradition into its project. Native Hawaiians have a longstanding history as expert way finders, natural resource managers, and fishermen. The wind farm provides an excellent opportunity to marry cutting-edge technology with longstanding cultural practices to perpetuate and promote educational opportunities related to Native Hawaiian culture, custom, and language.

Progression will seek opportunities to collaborate with federal agencies such as the National Oceanic and Atmospheric Administration (NOAA) and its sub-agencies, U.S. Fish and Wildlife Service, State of Hawai‘i Department of Fish and Wildlife Service, and environmental organizations to develop additional research and educational opportunities related to the study of marine resource management and wildlife. Progression will also work with the State of Hawai‘i’s Department of Labor and Industrial Relations and

various workforce development initiatives to provide employment and training opportunities for local Hawai‘i residents during the development, construction, and operation and maintenance of the facility.

Progression is committed to establishing and maintaining long-term partnerships with Hawai‘i-based organizations to support community empowerment, jobs, environmental stewardship and the perpetuation of Native Hawaiian culture, tradition, and language

2.1.4 Taxes and Community Benefit Payments

Progression will explore and will continue to expand on its discussions with stakeholders to determine community-based priorities to be addressed in a community benefits agreement focused on supporting continued progress in clean energy, support for increased educational opportunities related to science, technology engineering and math (STEM) programs, preservation, the incorporation of Native Hawaiian cultural practices into project design and operations, perpetuation of Native Hawaiian language, support for marine biology, fisheries, and various efforts to preserve Hawai‘i’s natural resources and marine environment.

2.2 Facilities

2.2.1 WindFloat Floating Foundation

Due to water depths surrounding Oahu, traditional fixed foundations are not an option for an offshore project. Due to this, Progression team members have worked with Principle Power, Inc. (“Principle Power”) since 2012 to develop and design the project in order to use Principle Power’s WindFloat semi-submersible floating foundation. Of the existing floating foundation technologies, the WindFloat technology is both the best suited for the open ocean environment and closest to commercialization of any existing technology.

There are three principal advantages to the WindFloat:

1. Its static and dynamic stability provides sufficiently low pitch performance to enable use of commercial offshore wind turbines
2. Its design and size allow for onshore assembly
3. Its shallow draft allows for depth independent siting and wet tow, fully assembled and commissioned, to sites not visible from shore

Figure 7. WindFloat being towed to its site off the coast of Portugal

Please review a short video of the construction and deployment of a WindFloat Unit by following this link: https://www.youtube.com/watch?v=i6pdp8wyQ8A

Originally developed for the offshore oil and gas industry to access 'marginal' fields that did not justify multi-billion dollar investments in drilling platform design and construction, the WindFloat's general design has been in effective service for decades. The WindFloat is a semi-submersible, column-stabilized offshore platform with water entrapment plates, an asymmetric mooring system, and an offshore wind turbine located on one of the columns. The practically pitch- and yaw-free performance allows the use of existing offshore wind turbines with only minor modifications. The WindFloat is based on a platform design that has been developed specifically to achieve exceptional stability performance while reducing structural weight and project installation costs.

Three columns (**Figure 8**, **Items 1, 2, and 3**) provide buoyancy to support the turbine and stability from the water plane inertia. Columns like these are common in floating offshore platforms; they rely on standard industry criteria for their design. It is important to note that such rules have been designed to extremely low failure rates for structures undergoing heavy operational burdens, such as Mobile Drilling Units. Design requirements include the ability to withstand collisions with supply vessels, the ability to support heavy equipment including rotating machinery, and frequent moves over large distances. Ongoing studies have minimized structural weight while ensuring robustness in the design.

Figure 8.WindFloat Diagram

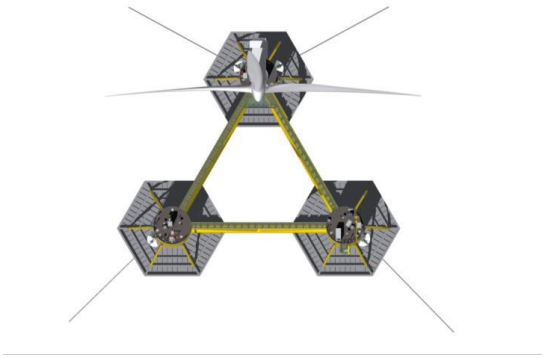


Figure 9.Mooring Layout

The stabilizing columns are spread out forming an equilateral triangle between the three column centers. A boat landing (4) is installed on one or two of these columns to access the structure. The columns are interconnected with a truss structure composed of main beams (5) connecting columns and bracings (6) connecting main beams to columns or other main beams. Minimal deck space is required between the tops of the columns. The WindFloat Diagram shows a gangway (7) connecting one column to the next and is the main deck element. Additional areas may be used to support secondary structures, such as auxiliary solar cells, and to provide access around the wind turbine tower. The height of the deck is positioned such that the highest expected wave crests will not damage deck equipment. At all times, including at its lowest point, the turbine blade sweep will remain significantly above wave crests. Horizontal plates (8) at the bottom of the columns, increase the added mass, and therefore shift the natural period away from the wave energy, and increase the viscous damping in roll, pitch, and heave. Stiffeners cantilevered from the bottom of the columns, with bracings (9) tying these stiffeners back to the columns support the plates. The water-entrapment plates provide additional hydrodynamic inertia to the structure due to the large amount of water displaced as the platform moves.

Permanent water ballast, inside the bottom of the columns, is used to lower the platform to its target operational draft, once installed. An active ballast system, called the Hull Trim System, moves water from column to column to compensate for the mean wind loading on the turbine. This movable ballast compensates for significant changes in wind speed and direction. It aims to keep the tower at a mean pitch angle of 0 degrees to optimize turbine performance and reduce fatigue. Up to 600 tons of ballast water can be transferred in approximately 30 minutes using two independent flow paths with redundant pumping capability. The active ballast compartment is located in the upper half of each column. The damage design

case includes the possibility of all the active ballast water being in the sub optimal or "worst case" compartment. The float design is such that turbine reliability and performance can be maintained at very high levels of availability in the range of 97 – 99 %.

An offshore wind turbine **(10)** requires little requalification from existing fixed onshore turbines. The tower is made of a number of sections with constant diameter and varying wall thickness that are welded together. At its lower end, the turbine tower extends into the column in order to maximize continuity of the structure, leading to minimized stress concentration in critical areas of the structure where bending moments are highest due to the wind-induced overturning moment and where large tubulars connect to the other stabilizing columns. The connection is located above the wave zone, with a clearance above the largest wave crests. The tower diameter is smaller than the column. A heavily stiffened top-of-column section is designed to carry the tower loads into the column shell. The yaw bearing is installed at the top of the tower and keeps the turbine headed into the wind.

Depending on analysis of seafloor conditions and cost, three or four mooring lines per WindFloat (**Figure 8-9** (**11 and Mooring Layout**)) are arranged in an asymmetrical fashion, and are made of conventional components: drag-embedment anchors, chains, steel wires, shackles, fairleads and chain stoppers. At this location it is anticipated that three lines will be the preferred mooring solution.

The original WindFloat adaptation to the oil and gas platform development occurred between 2003 and 2007. The idea to use a small oil platform as a floating support structure for offshore wind turbines required development of numerical simulation tools, their validation through physical model testing in a wave tank, and feasibility studies. These five years of accumulated data resulted in the WindFloat configuration that was subsequently refined into the unit that was built and installed in Portugal in 2011.

The Portugal WindFloat Project was designed with guidance from various industry standards. Selected provisions from the following design codes were used:

- Rules for Building and Classing Mobile Offshore Drilling Units, 2006
- API RP 2SK, Recommended Practice for Design and Analysis of Station keeping, Systems for Floating Structures, 2005
- API RP 2A-WSD Recommended Practice for Planning, Designing and Constructing Fixed Offshore Platforms - Working Stress Design, 22nd edition
- DNV-OS-C101 Design of Offshore Steel Structures, General (LRFD method), April 2004 [October 2007]
- DNV-OS-C201 Structural Design of Offshore Units (WSD method), April 2005 [April 2008]
- DNV-RP-C201 Buckling Strength of Plated Structures, October 2002
- DNV-RP-C202 Buckling Strength of Shells, October 2002

Today, with the publication of the American Bureau of Shipping's (ABS) Guide for Building and Classing Floating Offshore Wind Turbine Installations, WindFloat installations can be classed, meaning that their design, construction and installation procedures can be formally certified by a qualified third party.

With the ability to commercially class floating offshore wind structures, and the ongoing success of the WindFloat product, Principle Power is engaged in project development activities for WindFloat deployments throughout the world.

2.2.2 Turbines

Both Progression and Principle have relationships with top-tier offshore turbine vendors through previous and existing work. Progression and Principle will collaborate to choose the best wind turbine for the Project. Selection criteria include:

- Wind Resource Regime
- Cost
- Financiability
- Vendor quality and delivery/operational history

The WindFloat will be custom designed to carry a particular turbine.

2.2.3 Collection System and Interconnection Facilities

The following discussion describes the electrical collection system to gather and transmit power from each wind turbine generator to a central collection substation for transformation and transmission via undersea AC cables. Considering that HECO's largest contingency is driven by the 203MW AES Hawaii Plant, Apex has designed the Project to utilize two HVAC cables and POIs to allow HECO to maintain its reliability criteria based on the loss of its largest single contingency.

Collection System

The collection system will be designed to accommodate up to 50 – 8 MW Wind Turbine Generators (WTG's) for a total of up to 400 MW. Progression will modify the system if a turbine is chosen with a higher nameplate capacity.

The proposed project will be built out in two – 200 MW phases. The collection system for each phase will consist of 8- 34.5 kV circuits connecting two blocks of 25 WTG's for a total of 16 collection circuits each rated to carry 25 MW each. The collection circuits will terminate at the 34.5 kV bus through individual circuit breakers.

The undersea 34.5 kV WTG collection circuits will connect to each WTG platform. Each circuit will be cross-linked polyethylene (XLP) insulated design, rated at 600 amps, and will be capable of accommodating the connection/collection of generation output of either 4 or 5 WTG. Cables will be in a triplex configuration, armored and shielded.

Substation

The 34.5/138 kV collector substation will accommodate both 200 MW phases. The substation will be centrally located within the wind turbine arrays and will be constructed on a floating platform similar to those that support each wind turbine. The configuration of the substation will consist of a gas insulated,

stainless steel, and compact design to protect the electrical components from the salt air environment. A 34.5 kV sectionalized collector bus will be rated for 3400 amps, with each bus section capable of terminating the 8 – 34.5 kV collection circuits for each 200 MW phase of the project. The 34.5 kV portion of the collector substation will have a design configuration with an operating and transfer bus to accommodate 8 – 34.5 kV collection circuits, one bus tie breaker and a low side main step up transformer termination for each 200 MW phase.

Each 200 MW phase will consist of 2 – 105 MVA, 34.5/138 kV back to back main step up transformers. The back to back main step up transformer configuration will allow for smaller components for shipping, handling, placement, and access on the platform, and added reliability. The transformers will be oil insulated and completely contained with all bus work and disconnects consistent with an overall gas insulated design. The high side of the transformers will terminate to a 138 kV breaker which will provide line (undersea cable) and transformer protection.

Interconnection: Undersea Cables

The 138 kV cables will be XLP insulated, rated at 850 amps, and capable of accommodating a full 200 MW of generation. During construction the cables will be installed through 138 kV breakers at the collector substation. The cables will be laid on the ocean or buried in a trench terminating on shore at two Points of Interconnection to the HECO 138 kV transmission grid. As the cables get close to shore, slant drilling will be employed to place the cables under sensitive reef and shallow water eco systems. Once on shore the cable will terminate through potheads supported by a steel dead end structure containing disconnect switches and lightning protection as the high voltage circuits transition to overhead transmission line construction.

Further environmental and interconnection studies will be performed to complete the routing of the cable, both the undersea and landfall sections. For the purpose of preliminary design, Progression used the following studies:

1. The State of Hawai‘i Department of Business and Economic Development (DBEDT) and SOEST Interisland Cable Ocean Floor Survey Reports 1-4. 2009-2010
2. OTEC Hawaii Site Assessment Interim Survey Report Prepared by Sound & Sea Technology, Inc. 2010
3. Preliminary Desktop Study for a Marine Power Cable (LANAI-OAHU) Makai Ocean Engineering, Inc. July 26, 2007
4. Status and Perspective on the Big Wind/Cable project. Navigant Consulting, Inc. April 19, 2011

2.2.4 Vessels

One of the advantages of the WindFloat is that it can be assembled in harbor and so will not need expensive and specialized offshore construction vessels. The WindFloat Units will rely on standard towing vessels to deploy them or bring them into harbor in the unlikely event that major repairs are needed.

2.2.5 Construction Port

The construction port serves several functions in the installation of the Project including the receipt and storage of the WindFloat, the wind turbine, and other project components; the assembling of the WindFloat and wind turbines; and as a place of embarkation for vessels and construction crews. The port will have specific laydown areas that will become staging areas for assembly, along with sufficient berthing space for loading and offloading. The construction port will also, by necessity, become a hub in the supply chain for the Project. The port area vicinity will support maintenance of vessels, transportation interface, personnel support, and numerous other economic development and second and third-tier employment opportunities for businesses. Local support and infrastructure will benefit from this development. In order to stage the construction of an offshore wind farm, a port must meet certain minimum requirements, including:

- Access channel depth of at least 32 feet (10 meters)
- Minimum of 820-984 (250-300 meters) of dedicated berthing frontage
- Quayside bearing capacity of approximately 10 tons/m^2 (9,071 kilograms)
- Minimum of 20-30 acres (.08-.12 square kilometers) of available staging area ready and reliable access to intermodal transfer to support road/rail/water transport of components for assembly
- U.S. Government support offices (U.S. Coast Guard, among others) located in the vicinity

2.2.6 Operations and Maintenance Port

The primary consideration in selecting an O&M port is the proximity to the Project site, in order to minimize the amount of time maintenance crews spend travelling to and from the site, and the expenditure of fuel during those trips. The experience of offshore wind farms in Europe indicates that one or more crew vessels will be travelling to the wind farm site every day for preventative maintenance. In addition, the Project team is investigating the potential to incorporate helicopter landing pads onto the platforms to decrease travel time to and from the project site for routine maintenance. Because of the increased speed of air travel, it is less necessary that these helicopter facilities be located immediately proximate to the Project site.

The space and technical requirements for an offshore wind operations and maintenance port consist of a harbor and channels large and deep enough to accommodate crew vessels the size of a standard tugboat, a berth for two or three such vessels, space landside for a modest warehouse for spare parts (not the major turbine components) and operations facility, and space should a WindFloat Unit be brought in for major repairs.

3 General Schedule of Proposed Activities

This section provides details concerning the three phases of the development of the Project:

- **Phase I: COMPLETE: 2012-2015**: Proof of concept and stakeholder outreach. Stakeholder outreach will continue throughout the Project development.
- **Phase II: ONGOING**: Submit lease application to The United States Bureau of Ocean Energy Management, Department of the Interior ("BOEM").
- **Phase III: 2016-2023**: Later-stage development and construction of the Project. The Project will be constructed in two phases:
    - Construction Phase I: Q4 2020 – Q4 2021. COD PHASE I: Q1 2022
    - Construction Phase II: Q4 2021 – Q4 2022. COD PHASE II: Q1 2023.

3.1 Phase I: Proof of Concept and Stakeholder Outreach

Phase I, which began in August 2012 and was completed in October of 2015, consisted of speaking with a wide variety of Project stakeholders. The goal of this phase was to meet with stakeholders in order to:

- Understand the feasibility, risks and economics of the Project.
- To get feedback on Project sites.
- To begin a dialogue with stakeholders as a foundation for positive discussions and support for the Project.

Progression determined that it had substantially completed Phase I objectives after meeting more than 100 stakeholder organizations and finding that:

- A wide variety of stakeholders were interested in and/or supportive of the project concept.
- Participants provided valuable feedback on siting, permitting and future negotiation with stakeholders.
- Levelized Cost of Energy (LCOE) is competitive in price.

Below (**Table 2**) is a summary of the types of stakeholders Progression and Principle Power met along with an example of that type.

Table 2. Stakeholder Types and Examples

Stakeholder	Example 1	Example 2
Policy	Hawaii Department of Business, Economic Development & Tourism	Congressional Delegation
Regulatory	Public Utilities Commission	State of Hawai'i Department of Land and Natural Resources
Community	Hawaii Fishermen's Alliance for Conservation & Tradition	Life of the Land
Military	Assistant Secretary of the Navy, Energy, Installations and Environment	Chief of Naval Operations, Energy and Environmental Readiness Division (N45)
Environmental	US Fish and Wildlife	NOAA, Humpback Whale Sanctuary
Native Hawaiian	DOI Office of Native Hawaiian Affairs	Office of Hawaiian Affairs
Technology	Hawaii Renewable Energy Development Venture	University of Hawai'i School of Ocean and Earth Science Technology

As the Project progresses, Progression has taken a more public role in engaging with Hawai'i stakeholders. For example, Hawaii Lodging and Tourism Association ("HLTA") invited Progression to present at its annual General Membership Meeting on the Island of Maui in October, 2015. Considering that lodging and tourism is Hawai'i's leading industry, opportunities like this are critical to the Project's success and to building confidence in offshore wind as a key component of Hawai'i's energy future.

In 2012, stakeholders initially expressed some skepticism regarding the feasibility of offshore wind due to a universal assumption that waters off of Oahu were too deep for offshore wind. However, after Progression/Principle team members explained the technology and its planned approach to development, initial skepticism shifted to genuine interest and/or support of the Project. Overall, initial stakeholder meetings achieved Progression and Principle Power's intent to:

- Inform and educate stakeholders that offshore wind is technically feasible in Hawai'i utilizing the WindFloat technology.
- Establish Progression/Principle Power as credible companies willing to invest the time, resources, and relationships to develop and operate a project in Hawai'i utilizing Hawai'i business practices and norms.
- Establish relationships with stakeholders as a foundation for continued dialogue throughout the life of the project.

As stated previously in this Application, Progression has been engaging with the Navy and DoD directly. Progression will also coordinate with BOEM, the Department of Defense, and the Military Services through BOEM's state task force (defined in 30 CFR Part 585) and the Pentagon's mission compatibility review process (defined in 32 CFR Part 211). Through all of these processes, Progression hopes to site an economically viable project while impacting military interests as little as possible.

To Summarize: Progression has done this extensive and lengthy stakeholder engagement work in order to create the highest likelihood of success for this Project and for acceptance of offshore wind in Hawai'i in general. Progression is by no means finished with stakeholder engagement and its stakeholder list grows every month. Progression will continue to listen and engage with stakeholders throughout the life of the project, both as a part of the NEPA process and also through informal consultations and meetings.

3.2 Phase II: BOEM Lease

After initial technical analysis and introduction of the concept of the Project to potential stakeholders without finding any fatal flaws for the proposed Project Site, Progression is presently moving forward with Phase II of the Project which includes submitting this lease Application to BOEM. Stakeholder outreach will continue in Phase II and intensify as the Project becomes more public.

3.3 Phase III: Later-Stage Development and Construction of the Project

In this phase, Progression will move into the Construction and Operations Plan process with BOEM and initiate state and local permitting. At this time, Progression plans to install a Light Detection and Ranging ("LIDAR") device to gather data before initiating project financing. Progression will also initiate turbine selection at this time.

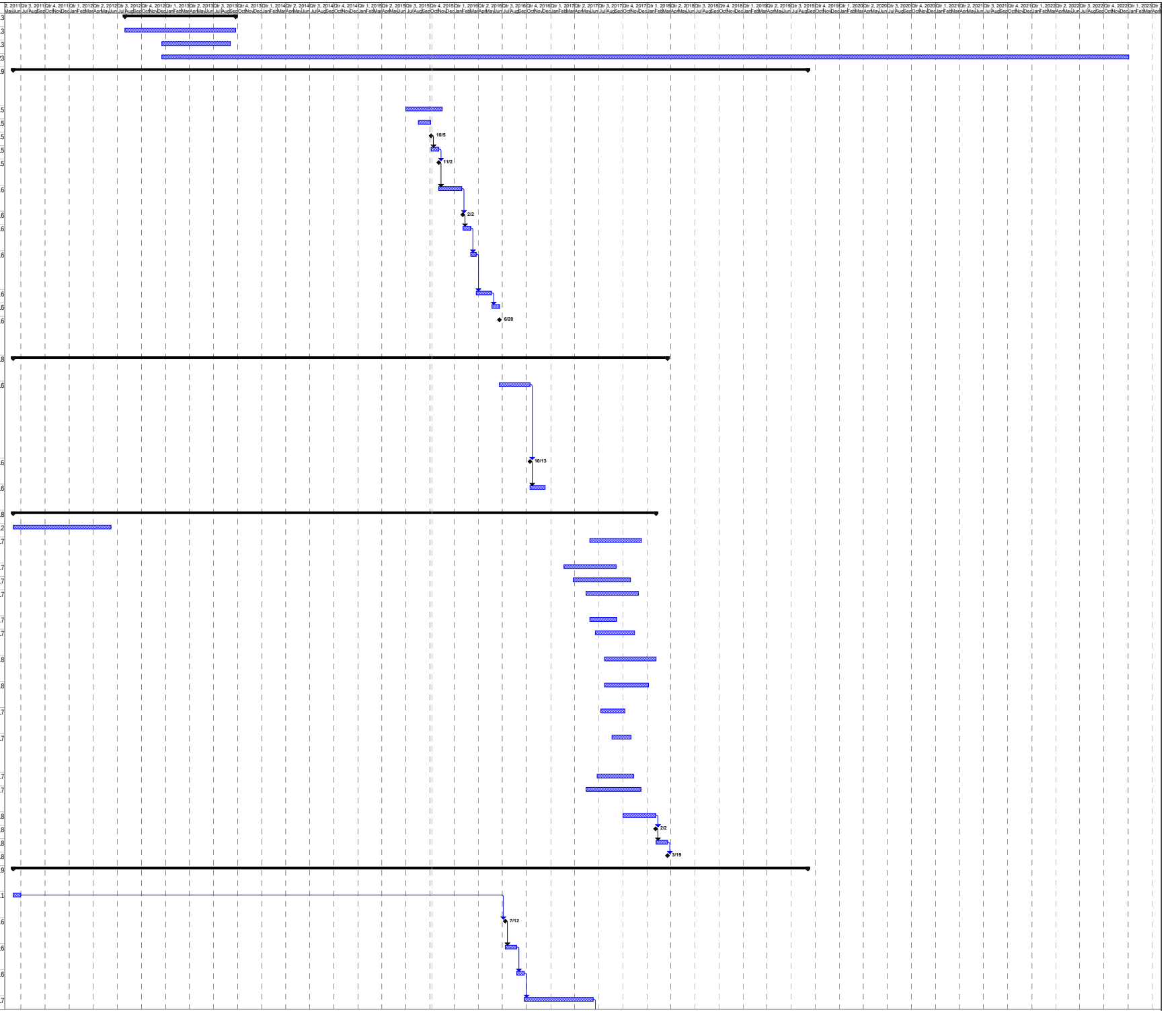
Progression anticipates BOEM approval of the Construction and Operations Plan by Q1 2018/Q4 2019 (depending on non-competitive/competitive process) and securing financing for the construction and operations of the Project by Q2 2020. Construction Notice to Proceed in 2020 will be followed by approximately nine months of final engineering and procurement. This phase will include final geotechnical analysis, final engineering, preparation of the port staging area, fabrication of foundations, and delivery of turbines. Upon completion of final engineering and procurement, Progression will proceed to construction. Progression anticipates COD of 200MWs by Q1 2022 and up to the full 400MWs by Q1 2023.

The schedule for steps in the site approval, licensing, and lease processes will depend on agency review and response times, which will vary. Federal actions, including the BOEM lease, will require compliance with the National Environmental Policy Act ("NEPA") through an Environmental Assessment ("EA") or Environmental Impact Statement ("EIS"). State and County permits and approvals will require compliance with State Chapter 343 environmental compliance laws and regulations. Permits and approvals are discussed further in **Section 4**. Please see **Figure 10** below for Project Development Schedule.

3.4 Decommissioning

The Project will be designed to have a useful life of 25 years. With proper operation and maintenance, however, an even longer useful life is expected. Progression believes the Project will possess significant residual value at the end of its useful life through equipment repowering or replacement with more efficient technology. The WindFloat is expected to have a longer useful life than today's offshore wind turbines (i.e., greater than 25 years), and the WindFloat's inherent stability and decoupled installation methodology (i.e., floating foundation and mooring separate hardware) mean that each unit can be removed/decommissioned from its project site intact and towed back to shore for potential reuse. After detachment from its mooring apparatus, the WindFloat can be easily towed to shore for turbine replacement and/or foundation reconditioning. Preliminary estimates suggest that the costs for reconditioning are significantly less than those required for new WindFloats and may result in highly attractive economics.

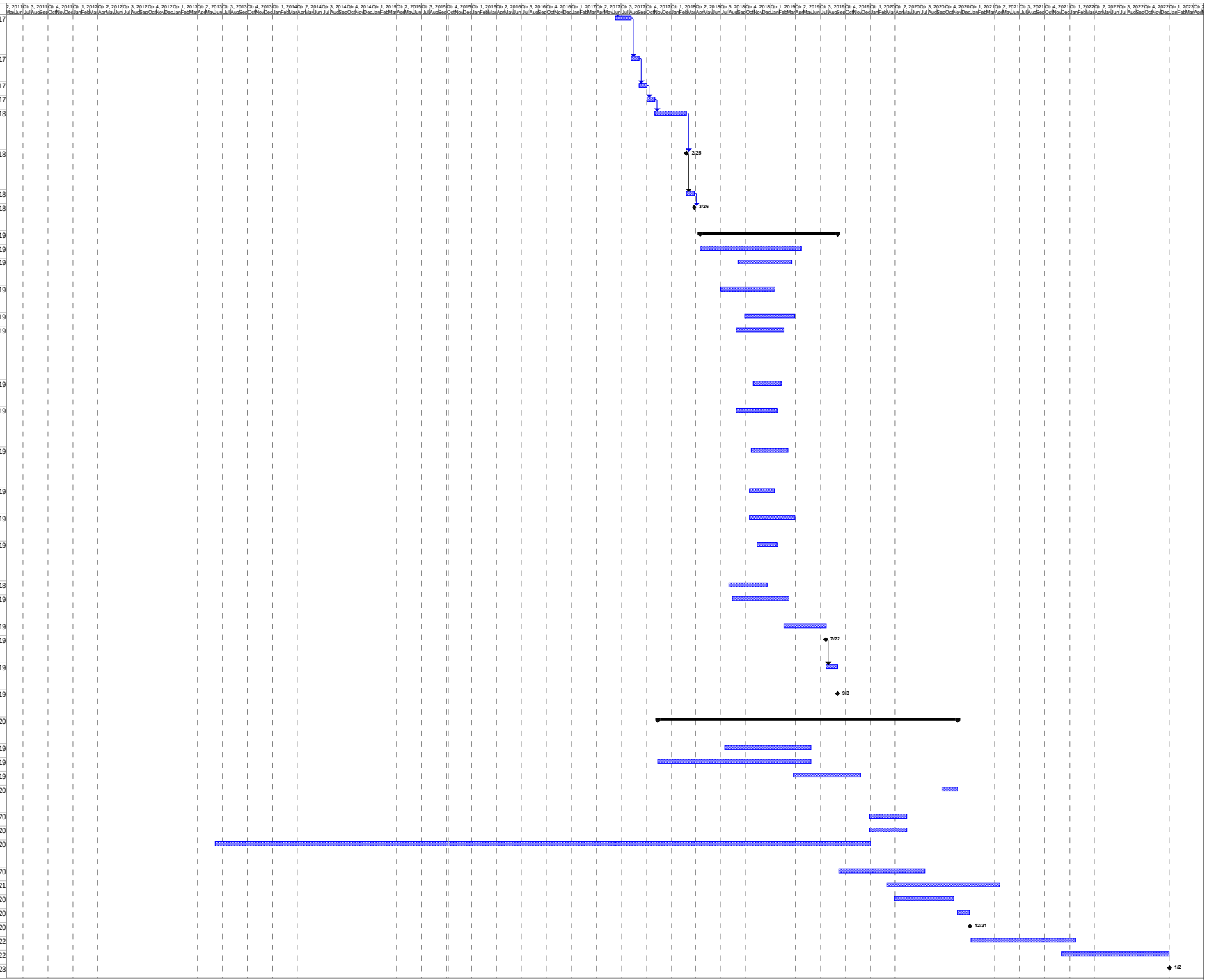
ID	Task Name	Duration	Start	Finish
1	Phase I: Pre Development	435 days	Mon 7/30/12	Sun 9/22/13
2	Proof of Concept/Initial S	435 days	Mon 7/30/12	Sun 9/22/13
3	Stakeholder Meetings	269.25 days	Mon 12/17/12	Mon 9/2/13
4	Stakeholder Meetings	3800 days	Mon 12/17/12	Mon 1/2/23
5	Phase II and III: BOEM Lease Acquisition and Federal Permitting	3123.25 days	Thu 6/2/11	Tue 9/3/19
6	Studies	143.88 days	Tue 6/30/15	Sun 11/15/15
7	Prepare Application	48.5 days	Mon 8/17/15	Fri 10/2/15
8	Submit Applicataion to B(	0 days	Mon 10/5/15	Mon 10/5/15
9	BOEM Reviews Applicati	30 days	Mon 10/5/15	Mon 11/2/15
10	BOEM Deems Application Complete	0 days	Mon 11/2/15	Mon 11/2/15
11	BOEM Processes Lease Application	90 days	Tue 11/3/15	Thu 1/28/16
12	Task Force Meeting	0 days	Tue 2/2/16	Tue 2/2/16
13	Consultation with State Task Force	30 days	Wed 2/3/16	Wed 3/2/16
14	Preparation of Federal Register Notice to Solicit Competitive Interest	21.75 days	Thu 3/3/16	Wed 3/23/16
15	Public Comment Period	60 days	Thu 3/24/16	Fri 5/20/16
16	Evaluation of Comments	30 days	Mon 5/23/16	Mon 6/20/16
17	Determination of Non-Competitive/Compet Interest	0 days	Mon 6/20/16	Mon 6/20/16
18	Determination of Non-Competitive Interest	2571.75 days	Thu 6/2/11	Mon 3/19/18
19	Progression Prepares Construction and Operations Plan or Site Activities Plan (SAP)/Construction Operations Plan (COP)	120 days	Mon 6/20/16	Thu 10/13/16
20	Progression Submits COP or SAP/COP	0 days	Thu 10/13/16	Thu 10/13/16
21	BOEM Determines COP or COP/SAP Complete	60 days	Fri 10/14/16	Sat 12/10/16
22	NEPA EIS and CZM	2526.13 days	Thu 6/2/11	Sun 2/4/18
23	Avian Studies	384.25 days	Thu 6/2/11	Wed 6/6/12
24	Geophysical and Geotech Studies	203 days	Mon 5/29/17	Sun 12/10/17
25	Benthic Habitat Stu	205 days	Mon 2/20/17	Tue 9/5/17
26	Aquatic Studies	225 days	Mon 3/27/17	Mon 10/30/17
27	Historic/Cultural Studies (Offshore and Upland)	205 days	Mon 5/15/17	Tue 11/28/17
28	Socioeconomic stu	105 days	Mon 5/29/17	Thu 9/7/17
29	Threatened and Endangered Species	154 days	Mon 6/19/17	Tue 11/14/17
30	Wetland Delineation (Cable)	201.88 days	Mon 7/24/17	Sun 2/4/18
31	Geological and Geophysical Surveys	172 days	Mon 7/24/17	Sat 1/6/18
32	Navigational Risk Assesment	95 days	Mon 7/10/17	Mon 10/9/17
33	Sound Studies (Construction and Operation)	75 days	Mon 8/21/17	Wed 11/1/17
34	FAA	143 days	Sun 6/25/17	Fri 11/10/17
35	Engineering and Design	215 days	Mon 5/15/17	Fri 12/8/17
36	Compile COP	128.25 days	Mon 10/2/17	Fri 2/2/18
37	Submit COP to BOEM	0 days	Fri 2/2/18	Fri 2/2/18
38	BOEM Reviews COP	44.5 days	Mon 2/5/18	Mon 3/19/18
39	BOEM Approves COP	0 days	Mon 3/19/18	Mon 3/19/18
40	Determination of Competitive Interest	3123.25 days	Thu 6/2/11	Tue 9/3/19
41	BOEM Prepares Call for Information	30 days	Thu 6/2/11	Thu 6/30/11
42	BOEM issues Call for Information	0 days	Tue 7/12/16	Tue 7/12/16
43	Public Comment Period	45 days	Tue 7/12/16	Wed 8/24/16
44	BOEM Area Identification	30 days	Wed 8/24/16	Thu 9/22/16
45	NEPA EA	270 days	Thu 9/22/16	Sat 6/10/17



Project: Hawaii Development Schedule
Date: Wed 10/7/15

Task
Split
Milestone
Summary
Project Summary
External Tasks
External Milestone
Inactive Task
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
Progress
Deadline

ID	Task Name	Duration	Start	Finish
46	BOEM Issues Proposed Sale Notice	60 days	Sat 6/10/17	Sun 8/6/17
47	BOME Issues Final Sale Notice	30 days	Mon 8/7/17	Mon 9/4/17
48	Lease Auction	30 days	Tue 9/5/17	Tue 10/3/17
49	Lease Award	30 days	Wed 10/4/17	Wed 11/1/17
50	Progression Prepares Site Activities Plan	120 days	Thu 11/2/17	Sun 2/25/18
51	Progression Submits Site Activities Plan (SAP)	0 days	Sun 2/25/18	Sun 2/25/18
52	BOEM Reviews SAP	30 days	Sun 2/25/18	Mon 3/26/18
53	BOEM Deems SAP Complete	0 days	Mon 3/26/18	Mon 3/26/18
54	NEPA EIS and CZM	522.5 days	Tue 4/17/18	Tue 9/3/19
55	Avian Studies	384 days	Tue 4/17/18	Mon 4/22/19
56	Geophysical and Geotech Studies	204 days	Mon 9/3/18	Mon 3/18/19
57	Benthic Habitat Studies	205 days	Mon 7/2/18	Tue 1/15/19
58	Aquatic Studies	188.5 days	Fri 9/28/18	Thu 3/28/19
59	Historic/Cultural Studies (Offshore and Upland)	182.25 days	Mon 8/27/18	Mon 2/18/19
60	Socioeconomic studies	105 days	Mon 10/29/18	Thu 2/7/19
61	Threatened and Endangered Species	155 days	Mon 8/27/18	Wed 1/23/19
62	Wetland Delineation (Cable)	139 days	Sun 10/21/18	Mon 3/4/19
63	Navigational Risk Assesment	95 days	Mon 10/15/18	Mon 1/14/19
64	Geological and Geophysical Surveys	172 days	Mon 10/15/18	Sat 3/30/19
65	Sound Studies (Construction and Operation)	75 days	Mon 11/12/18	Wed 1/23/19
66	FAA	145 days	Wed 8/1/18	Tue 12/18/18
67	Engineering and Design	215 days	Mon 8/13/18	Fri 3/8/19
68	Compile COP	160 days	Mon 2/18/19	Mon 7/22/19
69	Submit COP to BOEM	0 days	Mon 7/22/19	Mon 7/22/19
70	BOEM Reviews COP	45 days	Mon 7/22/19	Tue 9/3/19
71	BOEM Approves COP	0 days	Tue 9/3/19	Tue 9/3/19
72	Phase II and III: Local, State and Other Permitting	1139.13 days	Mon 11/13/17	Mon 11/16/20
73	Local Permitting	327.25 days	Mon 7/16/18	Mon 5/27/19
74	State Permitting	581 days	Mon 11/13/17	Mon 5/27/19
75	OCS Air Permit	254.75 days	Mon 3/25/19	Mon 11/25/19
76	Stormwater and erosion control	60 days	Sun 9/20/20	Mon 11/16/20
77	Facility Design Report	140 days	Mon 12/30/19	Wed 5/13/20
78	Facility Information Report	140 days	Mon 12/30/19	Wed 5/13/20
79	Meteorological Data Collection and Studies	2488 days	Tue 6/4/13	Wed 1/1/20
80	Financing	326.25 days	Sun 9/8/19	Sat 7/18/20
81	Equipmnet Procurement	427 days	Mon 3/2/20	Sun 4/18/21
82	Contractor Selection	223.63 days	Mon 3/30/20	Sun 11/1/20
83	Pre Construction and Monit	45 days	Sun 11/15/20	Mon 12/28/20
84	Start of Construction	0 days	Thu 12/31/20	Thu 12/31/20
85	Construction Phase I	396.63 days	Mon 1/4/21	Sat 1/22/22
86	Construction Phase II	409 days	Wed 12/1/21	Fri 12/30/22
87	COD Phase 1 and II	0 days	Mon 1/2/23	Mon 1/2/23



Project: Hawaii Development Schedule
Date: Wed 10/7/15

Task | Milestone | Project Summary | External Milestone | Inactive Task | Inactive Summary | Duration-only | Manual Summary | Finish-only | Deadline
Split | Summary | External Tasks | Inactive Task | Inactive Milestone | Manual Task | Manual Summary Rollup | Start-only | Progress

4 Lease Area Characterization and Critical Environmental Issues

4.1 Introduction

Progression will thoroughly study the environmental, social and cultural impacts/interactions of the Project on/between the ocean, land and human communities as a part of federal, state and local permitting. This includes construction and operational impacts/interactions. In particular, the BOEM lease for the Project will require analysis and study pursuant to the National Environmental Policy Act ("NEPA"), which defines policy and procedures for the consideration of environmental issues in federal agency planning and decision-making. NEPA implemented regulations are established by the President's Council on Environmental Quality, and require that federal agencies prepare an EIS if the agency's proposed action might significantly affect the quality of the human environment. The EIS must disclose significant environmental impacts and inform decision makers and the public of the reasonable alternatives to the proposed action. Presidential Proclamation 5928, issued December 27, 1988, extended the exercise of United States sovereignty and jurisdiction under international law to 12 nautical miles (13.8 miles) offshore; however, the Proclamation expressly provides that it does not extend or otherwise alter existing federal law or any associated jurisdiction, rights, legal interests, or obligations.

Progression will complete the necessary technical studies and reports that must be written to meet the requirements of federal laws and regulations, as well as state and local laws and regulations. Consultation with agencies is required to accomplish avoidance, minimization, or mitigation of impacts. Progression has already started this process by meeting with agencies such as US Fish and Wildlife, National Oceanographic and Atmospheric Administration, Bureau of Ocean Energy Management, Hawai‘i Department of Land and Natural Resources, Hawaii Planning office and Honolulu Planning Office. Technical studies will be documented and circulated as required to, at a minimum, meet the requirements of NEPA and the State of Hawai‘i's environmental law, Hawaii Revised Statues (HRS) Chapter 343. These studies will take two to three years or longer for review and approval.

Land use approvals will be necessary as the cables come onto land. Jurisdiction varies according to whether landfall is made on military land. All other lands, both public and private, are subject to City & County of Honolulu approvals or Hawaii Community Development Authority (HCDA). Some of these approvals may work concurrently with the federal and state permitting processes.

The key environmental issues are listed below:

- Marine geology
- Marine biological resources (avian resources, benthic habitat, coral reefs, fish species and Essential Fish Habitat, marine mammals, listed, threatened and endangered species)
- Physical oceanography and meteorology
- Geology
- Air quality
- Water quality
- Noise and visual resources

- Marine transportation/commerce
- Military operations
- Airspace utilization – civilian and military
- Commercial and recreational fishing
- Cultural and historic resources
- Tourism and Recreation
- Socioeconomics and Environmental Justice
- Public services, infrastructure and utilities
- Artificial reefs
- Natural hazards, hazardous materials, offshore dump sites, unexploded ordinance
- Social and Cultural
- Traditional Fishing practices
- Cultural and Archeological
- Viewplanes

In addition to NEPA compliance, the Project will be required to comply with the following federal environmental laws, regulations and Executive Orders.

- Executive Order 12114, Environmental Effects Abroad of Major Federal Actions
- National Historic Preservation Act Section 106
- Endangered Species Act (ESA) (16 U.S.C. 1531 to 1543)
- Migratory Bird Treaty Act
- Federal Aviation Act
- Coastal Zone Management Act
- Rivers and Harbors Act
- Magnuson-Stevens Fishery Conservation and Management Act
- Clean Air Act
- Federal Water Pollution Control Act (Clean Water Act)
- National Historic Preservation Act
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

- Executive Order 13045, Environmental Health and Safety Risks to Children
- Executive Order 13423, Strengthening Federal Environmental, Energy and Transportation Management
- Executive Order 13089, Coral Reef Protection;
- National Marine Sanctuaries Act

Major State and Local Approvals

- Coastal Zone Management Act (CZMA).
- Special Management Area (SMA) and the Shoreline Setback Area, an SMA Permit and a Shoreline Setback Variance (SSV) will be required from the City & County of Honolulu.
- Construction will require a Building Permit from Honolulu Department of Planning and Permitting.

While Progression will study the issues above in detail as a part of the federal, state and local permitting processes, Progression has already started preliminary investigation of most of these issues through stakeholder outreach, informal agency consultation and data collection. As stated earlier in this Application, one of the goals of three years of stakeholder outreach was to elicit feedback and information regarding the five original sites from which Progression chose the present Project Area. Progression is appreciative of the input from the following agencies and stakeholders, and their help in elucidating the potential environmental, cultural and social impacts/interactions of the Project.

- Hawaii Fishermen's Alliance for Conservation and Tradition
- Outdoor Circle
- Life of the Land
- Blue Planet Foundation
- Hawaii Lodging and Tourism Association
- University of Hawai'i School of Ocean and Earth Science and Technology
- The City and County of Honolulu Department of Planning
- Honolulu City Council
- Hawaii Office of Hawaiian Affairs
- Hawaii Department of Business, Economic Development & Tourism
- Hawaii Department of Land and Natural Resources
- Hawaii Office of Planning
- Department of Interior, Office of Native Hawaiian Affairs
- Department of Interior, Bureau of Ocean Energy Management

- National Oceanic and Atmospheric Administration
- United States Department of the Navy
- United States Department of Defense
- United States Coast Guard
- United States Fish and Wildlife Service
- Federal Aviation Administration
- United States Department of Energy

Progression's stakeholder engagement is ongoing and the stakeholder list grows every month. Progression will continue to listen and engage with stakeholders throughout the life of the project, both as a part of the federal, state and local permitting processes, and through continued informal consultations and meetings.

Please also refer to **Appendix I**, the "Guide to Renewable Energy Facility Permits in the State of Hawai'i," January 2013, State of Hawai'i, Department of Business Economic Development and Tourism, which contains a comprehensive list of required permits and approvals for energy projects in Hawai'i.

4.2 Critical Issues

The following is a synopsis of the issues that Progression has started to investigate with agencies and other stakeholders and will continue to study throughout the development, construction and operation of the Project.

4.2.1 Benthic Habitat: Geomorphology, Geology, Biology, and Bathymetry

Bottom Sediments in the WindFloat area of the Project are expected to be primarily silty sand, clay and mud. The undersea cables that connect the WindFloats to the HECO grid will traverse a number of ocean floor and bottom sediment conditions including reef, reef rubble, rocks and sand (**Figure 11**). In consultation with SOEST, Progression also expects an area of deep water coral between the project site and landfall. When making its final cable routing decisions, Progression intends to route around or under any areas of special sensitivity on the sea-bottom.

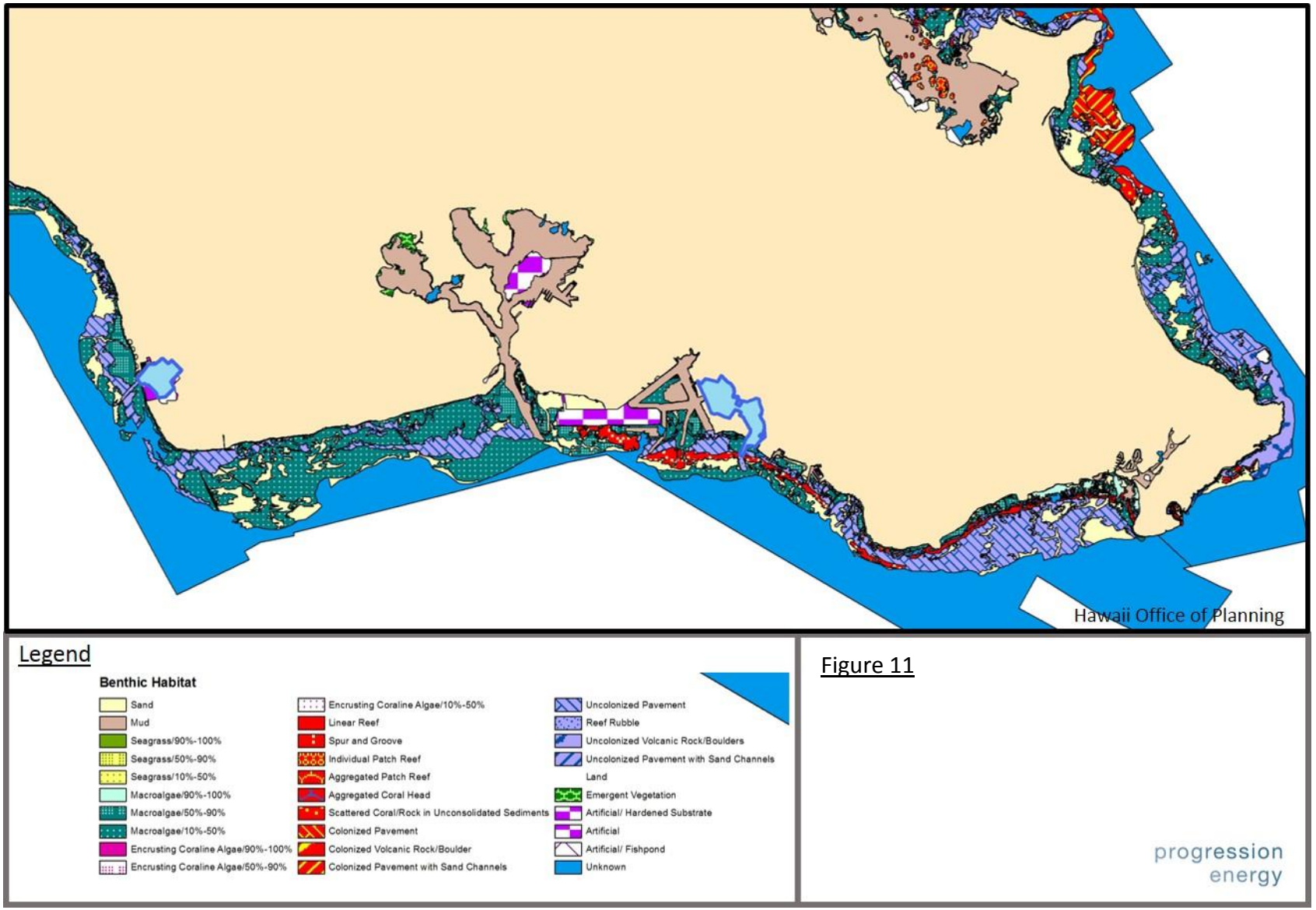


Figure 11. Benthic Habitat

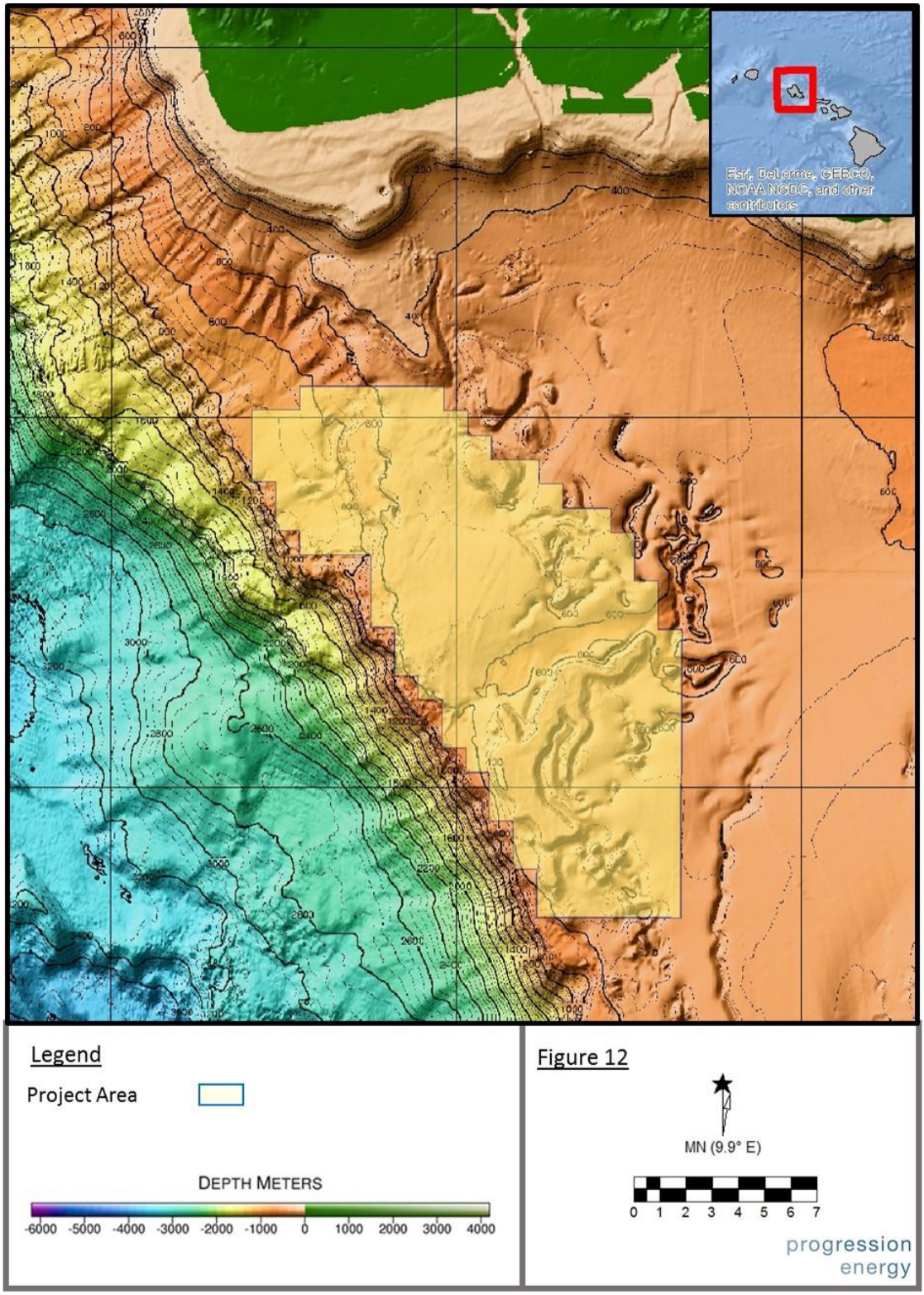


Figure 12. Bathymetry

4.2.2 Offshore Fishing and Essential Fish Habitat

Offshore fishing interests and concerns are complex and are varied among and within fishing communities (commercial, recreational, cultural etc.). For example, some members of the fishing community are in favor of the Project creating what will essentially be a large Fish Aggregating Device ("FAD"). Others are concerned about the potential impacts of a large FAD on fish koas ("houses" or natural congregating areas), fish migration patterns and the interaction among FADs, fish and seabirds.

As the WindFloat Units will be between 1-1.5 miles apart, there will be sufficient room for fishing vessels to fish within and traverse the Project Site. As long line and drag fishing are not allowed within the Lease Area, there is not a concern with potential conflicts with this type of fishing activity. Progression will continue to work with fishing communities, NOAA and USFWS throughout the development, construction and operations of the project to ensure that impacts are understood and/or minimized.

Approximately 100 acres of Essential Fish Habitat for bottom fish exists within the Project area. The Project's undersea cable will also traverse an area of Essential Fish Habitat for bottom fish. These areas will be further studied to minimize impacts (**Figure 13**).

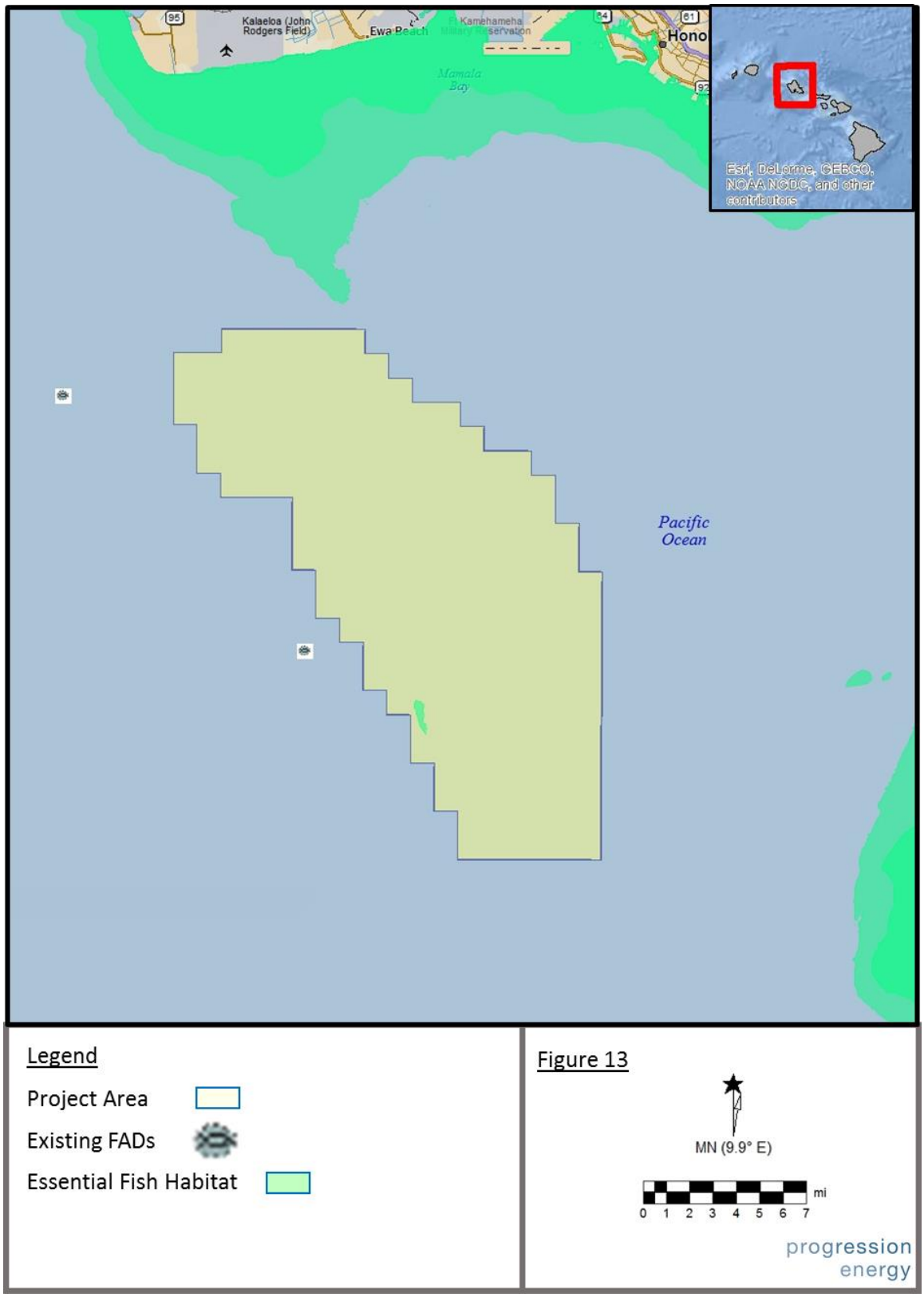


Figure 13. FADs and Essential Fish Habitat

4.2.3 Marine Mammals

The Project Site is approximately 9 miles west of the Hawaiian Islands Humpback Whale National Marine Sanctuary and surface density of humpback whales is categorized as low in the Lease Area (**Figure 14**). However, marine mammals do traverse the project site, some of which are listed as threatened and endangered, such as humpback whales, sea turtles and Hawaiian monk seals. Progression will work with NOAA and other relevant agencies and stakeholders to better understand the interaction between the project and marine mammals and work to understand and/or minimize any impact on the mammals. Floating offshore construction has much less sound and other impacts than fixed foundation construction due to the fact that the WindFloat is towed to its site and anchored, using conventional equipment, rather than foundations being sunk and/or pile driven into the seafloor. However, there exist operational sounds from the wind turbines that will be propagated into the ocean waters. Previous studies suggest that these can be both difficult to detect and accurately separate from ambient sounds in the environment, but the potential for interaction/impact will be examined. **Figures 14** and **15** depict the sanctuary and other marine managed areas. Please refer to **Appendix II** for a list of endangered species in Hawai‘i.

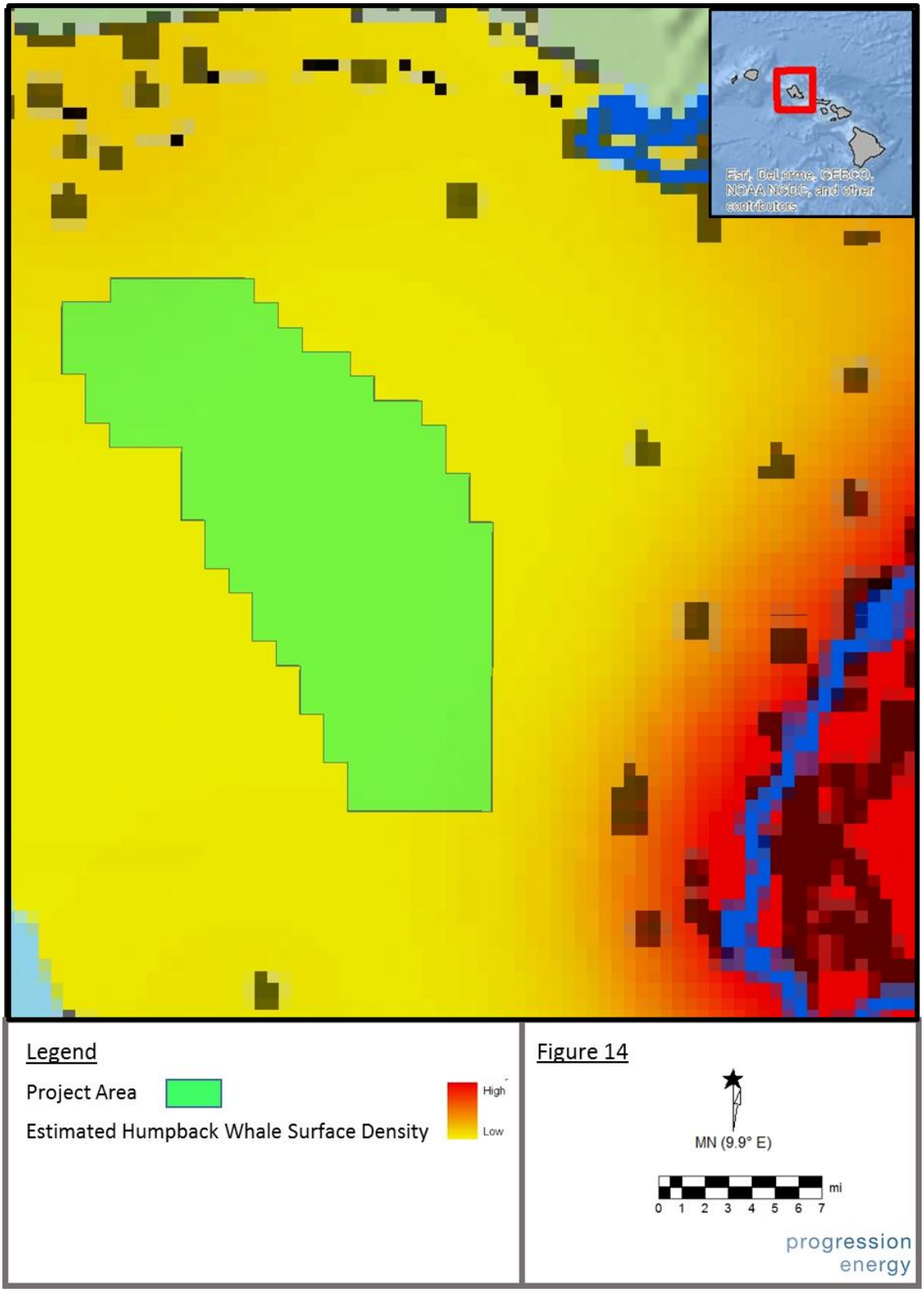


Figure 14. Estimated Humpback Whale Surface Density

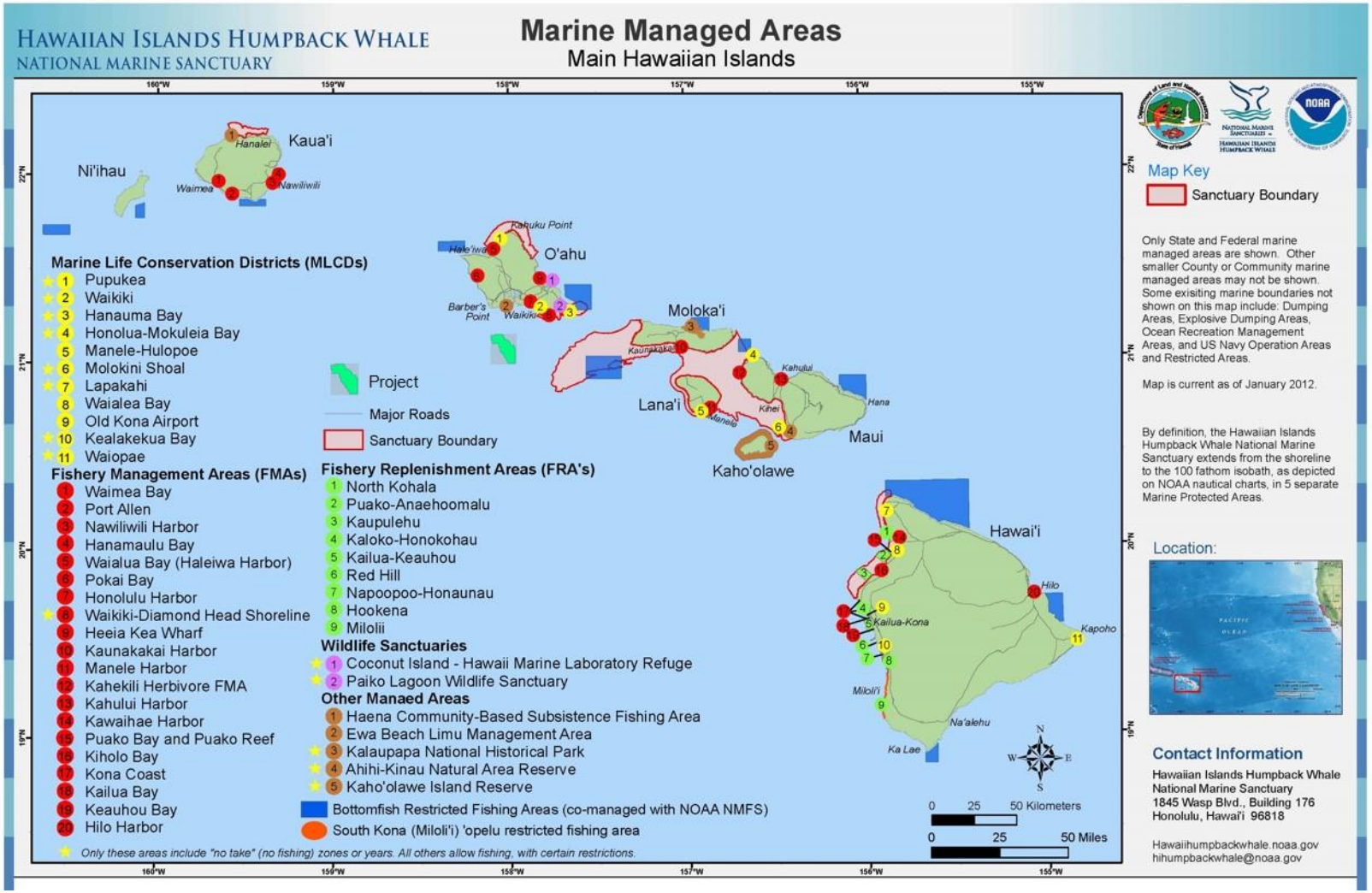


Figure 15. Marine Managed Areas

4.2.4 Avian

The waters offshore of Hawai‘i provide habitat to avian species, some of which are listed as threatened and endangered such as the Newell's shearwater and Hawaiian Petrel. Progression will work closely with NOAA, USFWS and other agencies and stakeholders during the development, construction, and operations of the Project to minimize the impact on these species. Please refer to **Appendix II** for a list of endangered species in Hawai‘i.

4.2.5 Native Hawaiian Ocean Uses and Practices

Progression recognizes the important role the ocean plays in Native Hawaiian history and cultural practice, and has begun discussions to better understand the potential impacts that the Project may have on Native Hawaiian uses of the ocean including fishing (offshore, shoreline and fishponds) aquaculture, food gathering, trade, transportation, communication, and religious and cultural practices. Progression will continue and deepen these conversations during development, construction and operations of the Project, as well as conduct a cultural study as a part of the permitting process.

4.2.6 Coastal Resources: Coastal Fishing, Recreation, and Tourism

As there is a high density of coastal resources utilized in the Barber’s Point area where the Project’s undersea cables are planned to make landfall (**Figure 16**), Progression will work with the residents and other users of these areas to ensure that the potential impacts from the cables are understood and minimized.

Recreation and Tourism is the leading industry in Hawai‘i and there exist numerous and economically important recreational and tourist facilities on the south shore of Oahu (**Figure 17**). Progression will continue to engage with the recreation and tourism industry and work to understand and minimize impacts throughout the development, construction and operations of the Project.

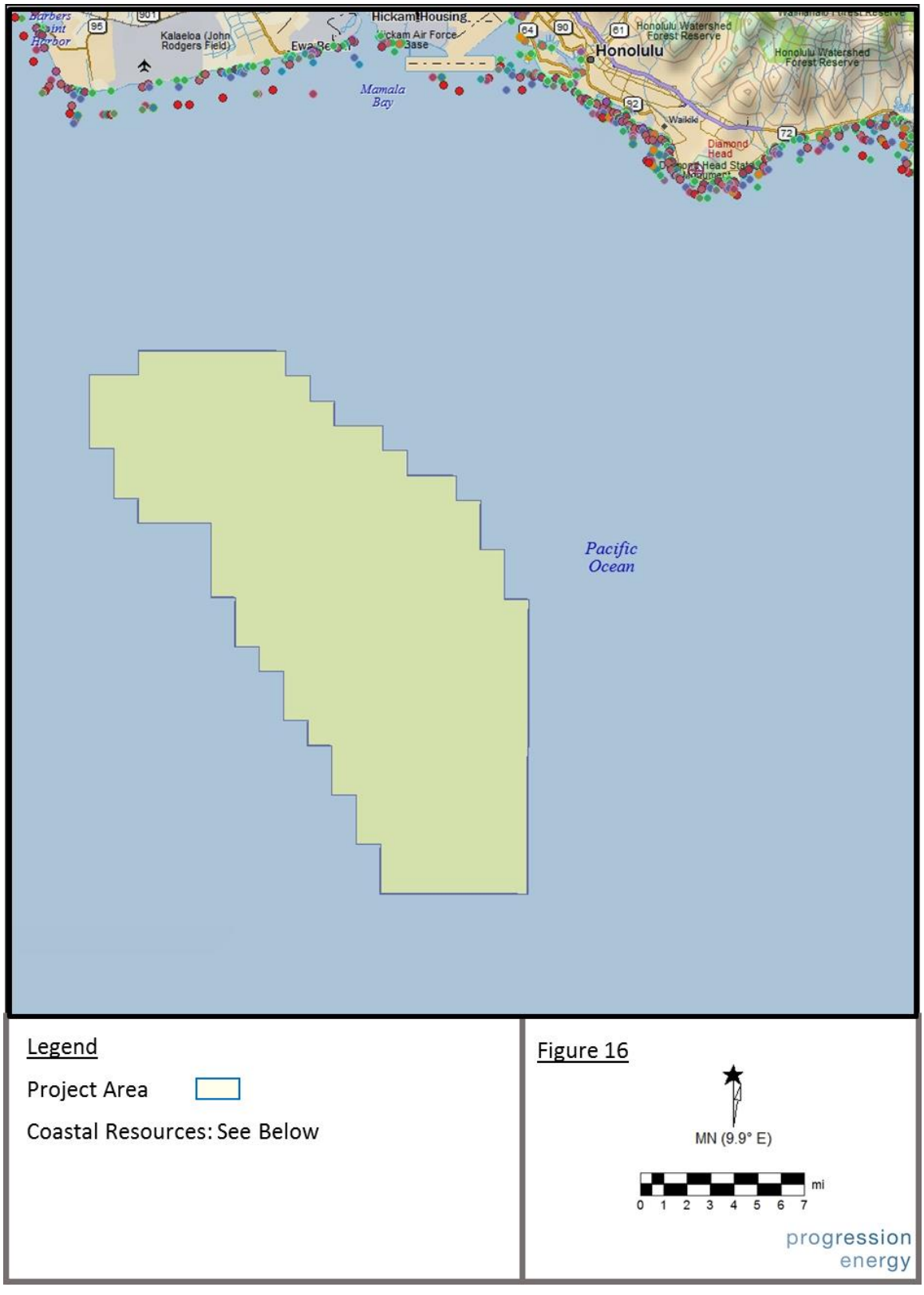


Figure 16. Coastal Resources

Figure 16 Legend

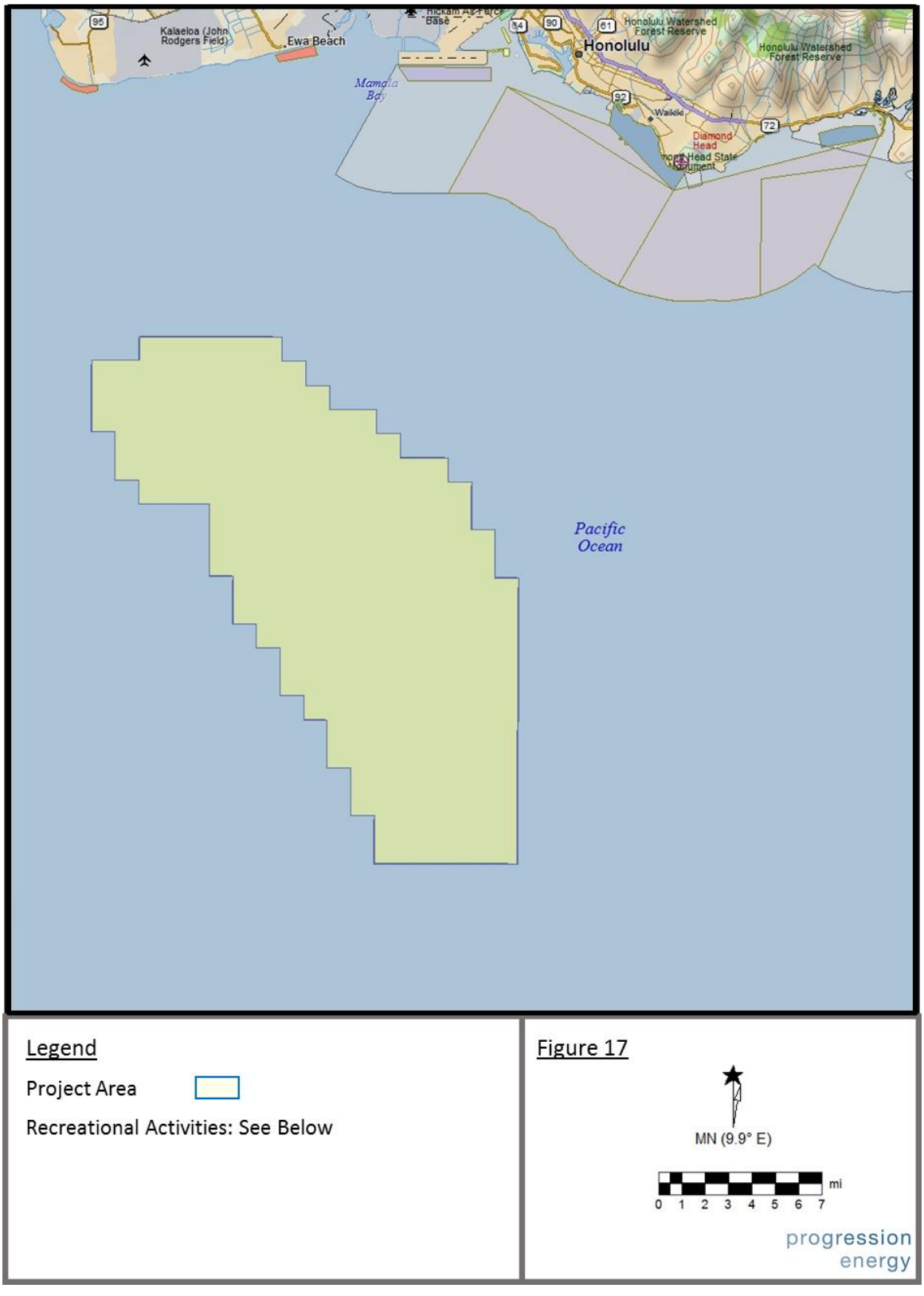


Figure 17. Recreation

Figure 17 Legend

4.2.7 Visual Planes

Progression Energy sited the project far enough from shore to minimize visual impacts. As a part of the development of the Project, Progression will produce visual simulations that render, as much as possible, an accurate visual representation of the Project from important cultural, recreational, tourist, residential and natural visual receptors as identified through conversations with agencies and other stakeholders.

4.2.8 Marine Transportation and Commerce

The south shore of Oahu experiences a high density of commercial, cultural, recreational and military marine traffic. While the project is sited outside of the highest density areas (**Figure 18**), Progression will investigate further the interaction between the Project and these ocean uses, both formally in the permitting process and informally with continued conversations with agencies and other stakeholders.

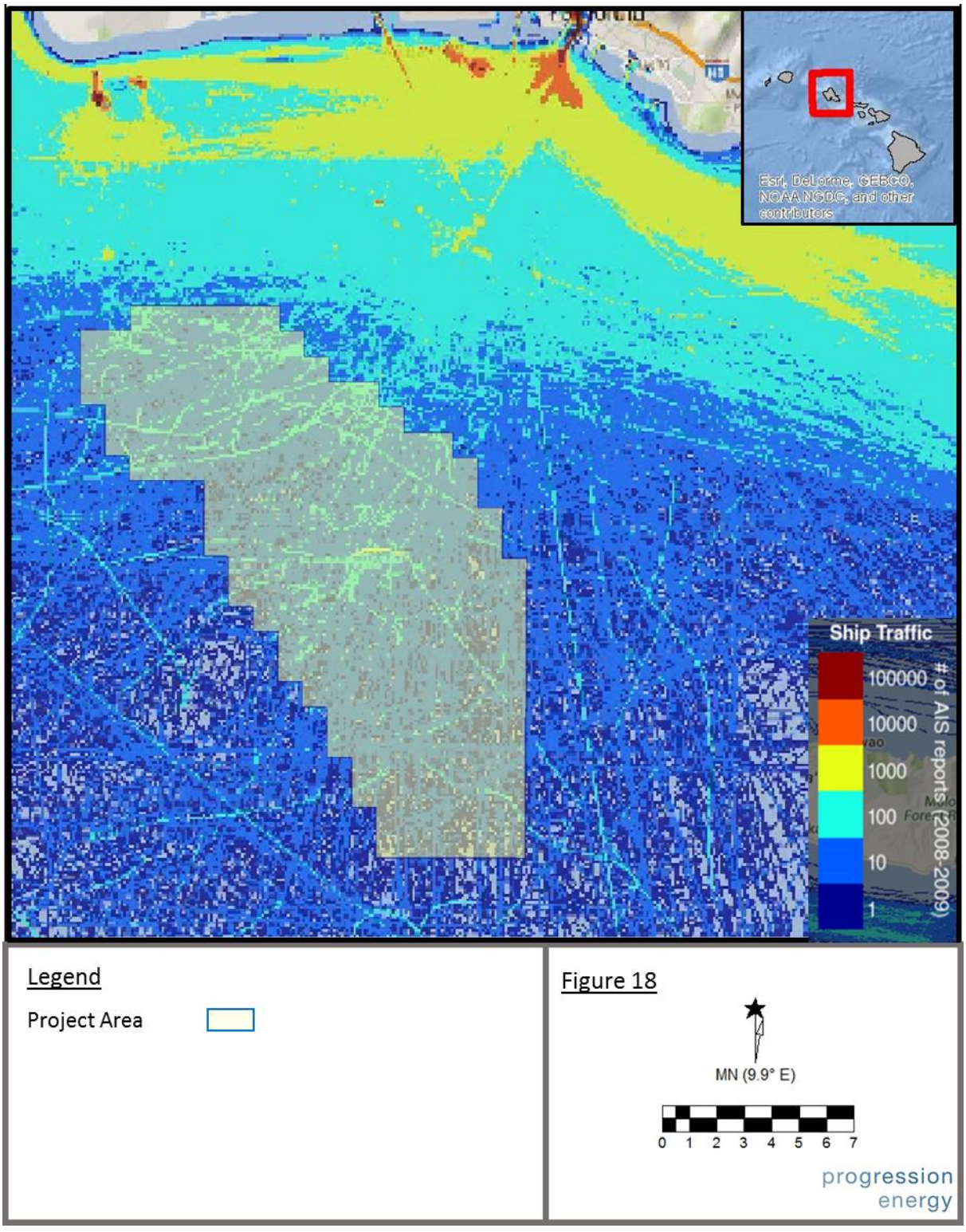


Figure 18. Marine Traffic Density

4.2.9 Ocean Infrastructure

Progression reviewed known locations of undersea cables, platforms, rafts, mooring buoys, aids to navigation and sewer lines (**Figure 19**). Further study will be undertaken to minimize the risk of interaction between Project components with existing infrastructure.

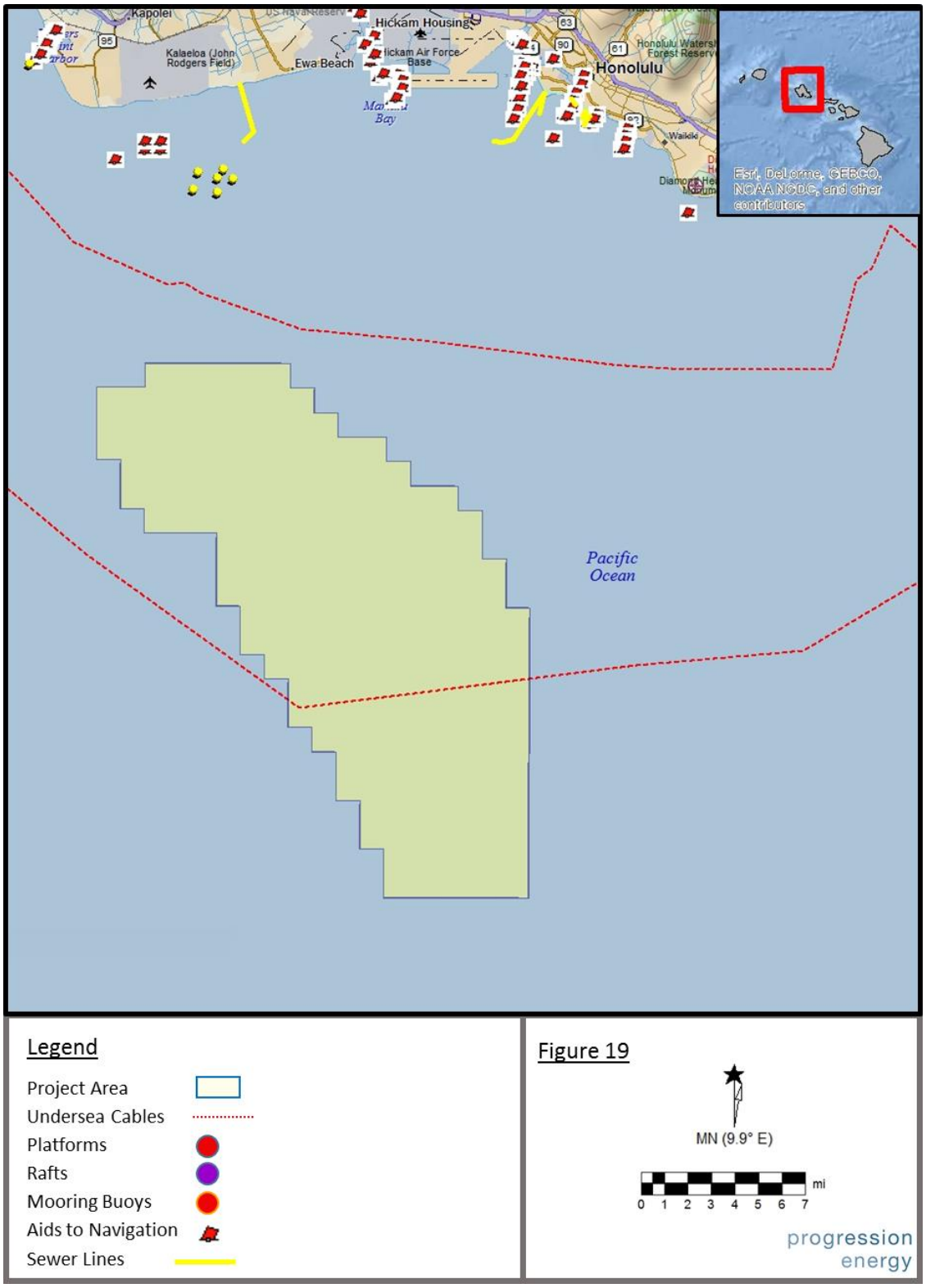


Figure 19. Ocean Infrastructure

4.2.10 Hazards

Progression reviewed known locations of wrecks, submerged buoys, obstructions, dumping areas, explosive dumping areas, and unexploded ordnance (**Figure 20**). There also exists additional military ordinance that was located by SOEST as a part of the Hawaii Undersea Military Munitions Assessment ("HUMMA"). Finally, the southeast section of the Site Area is coterminous with a designated explosive dumping area. Progression will further study these areas and coordinate with agencies and stakeholders during the development of the Project. As final cable design and routing decisions are made, Progression plans to avoid areas of high concentration of hazards.

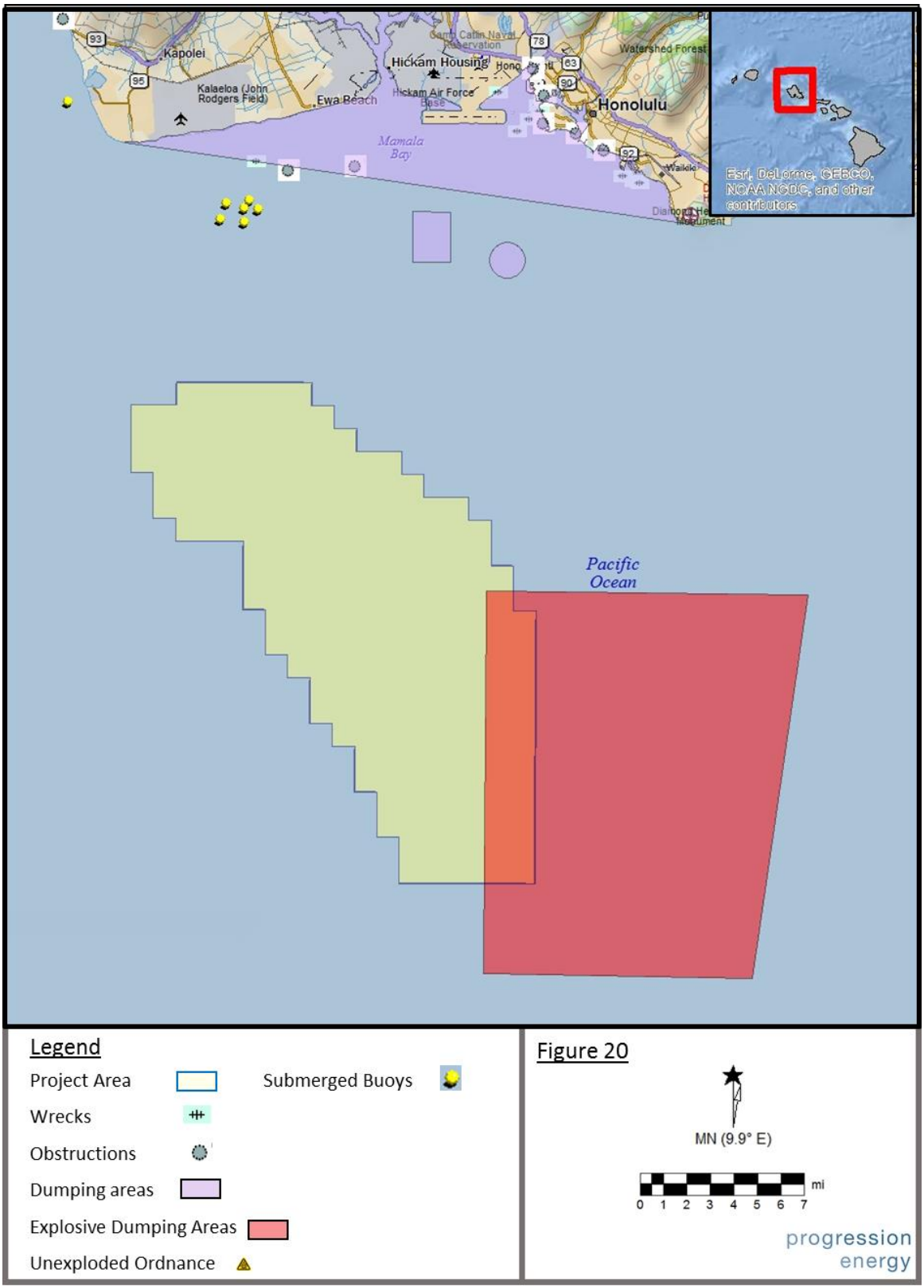


Figure 20. Hazards

4.2.11 Submarine Cable Landfall and Interconnection

Progression has worked to identify submarine cable landings and interconnection routes to substations in the Barber's Point area in order to have minimal impact on natural, social and cultural resources. Presently, Progression plans to land the cables in and traverse to the substations through industrial/commercial areas.

4.2.12 Aviation and Airspace

The northernmost section of the project is approximately 10 miles SSW of Honolulu International Airport and Joint Base Pearl Harbor-Hickam ("JBPHH") and 9 miles south of Kalaeloa Airport. Progression will apply to the Federal Aviation Administration for a Notice of Proposed Construction or Alteration in Airspace.

4.2.13 Department of the Navy and Department of Defense

The Project and related facilities are within the Hawaii Range Complex and Hawaii Operating Area (**Figures 21-25**: Source: Hawaii Range Complex, Final Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS)/Volume 1 of 5/Chapters 1-3/May 2008) and are proximal to JBPHH. Existing and planned military uses in the general area of the Project are numerous. As stated earlier, members of the Progression team have been working with the military at different levels over the past three years in order to optimally site the Project. Progression has met with personnel within the Navy Secretariat, Navy N45, COMSUBPAC and other operational personnel, and the Department of Defense Siting Clearinghouse. Progression will also coordinate with BOEM, the Department of Defense, and the Military Services through BOEM's state task force (defined in 30 CFR Part 585) and the Pentagon's mission compatibility review process (defined in 32 CFR Part 211). Through all of these processes, Progression intends to site an economically viable project while as much as possible accommodating military interests.

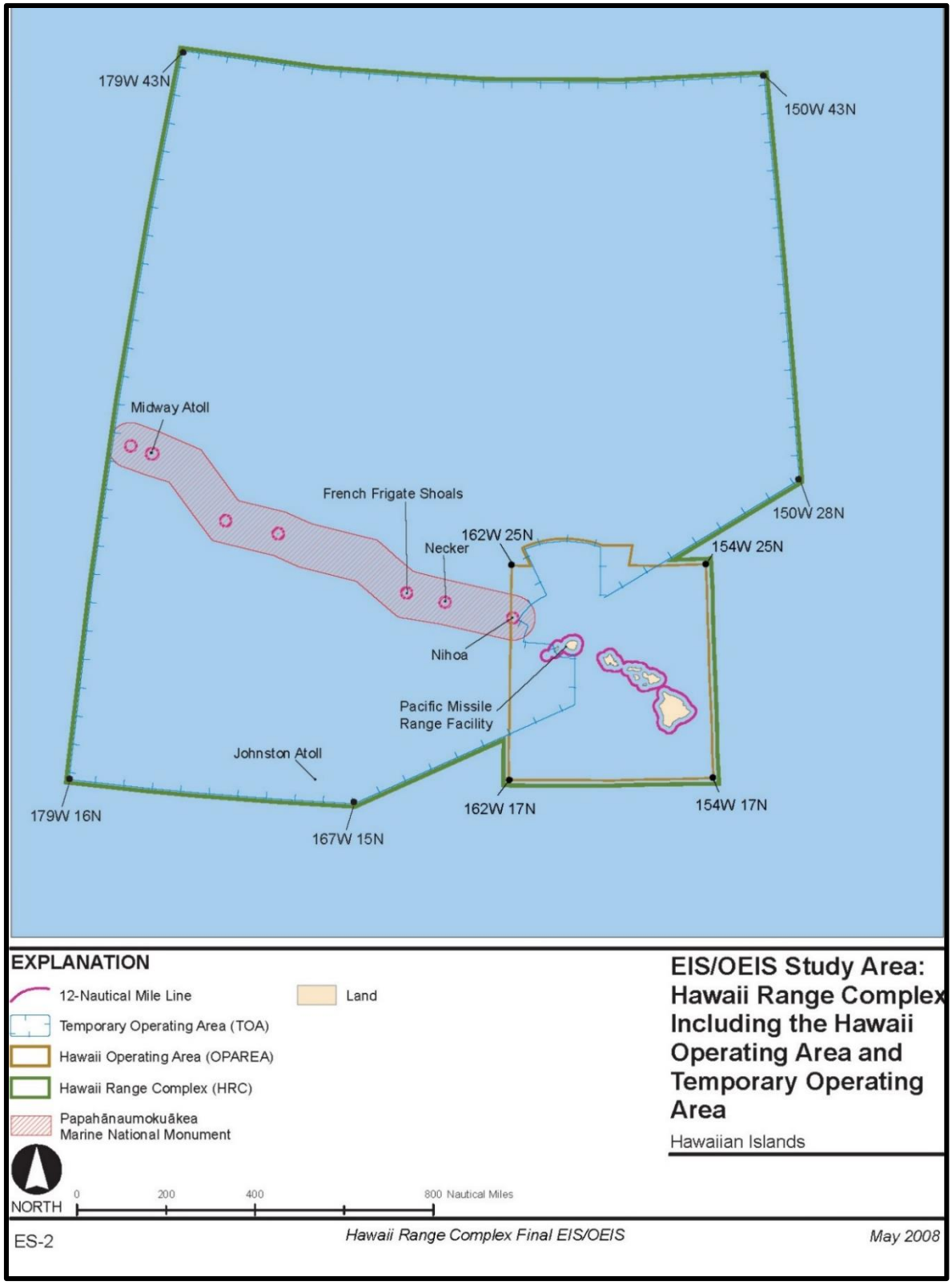


Figure 21. Hawaii Range Complex, Operating Area and Temporary Operating Area

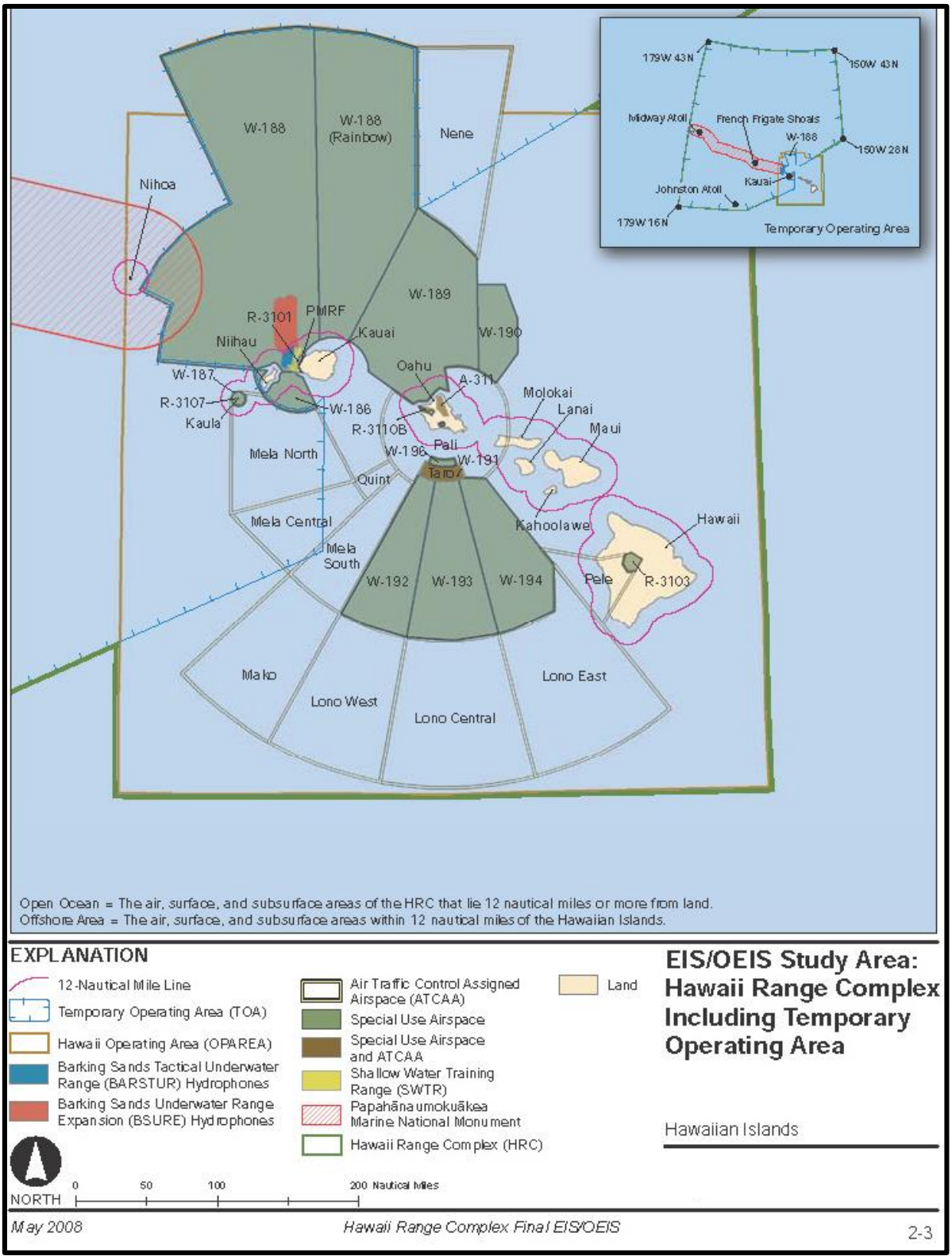


Figure 22. Hawaii Range Complex and Temporary Operating Area

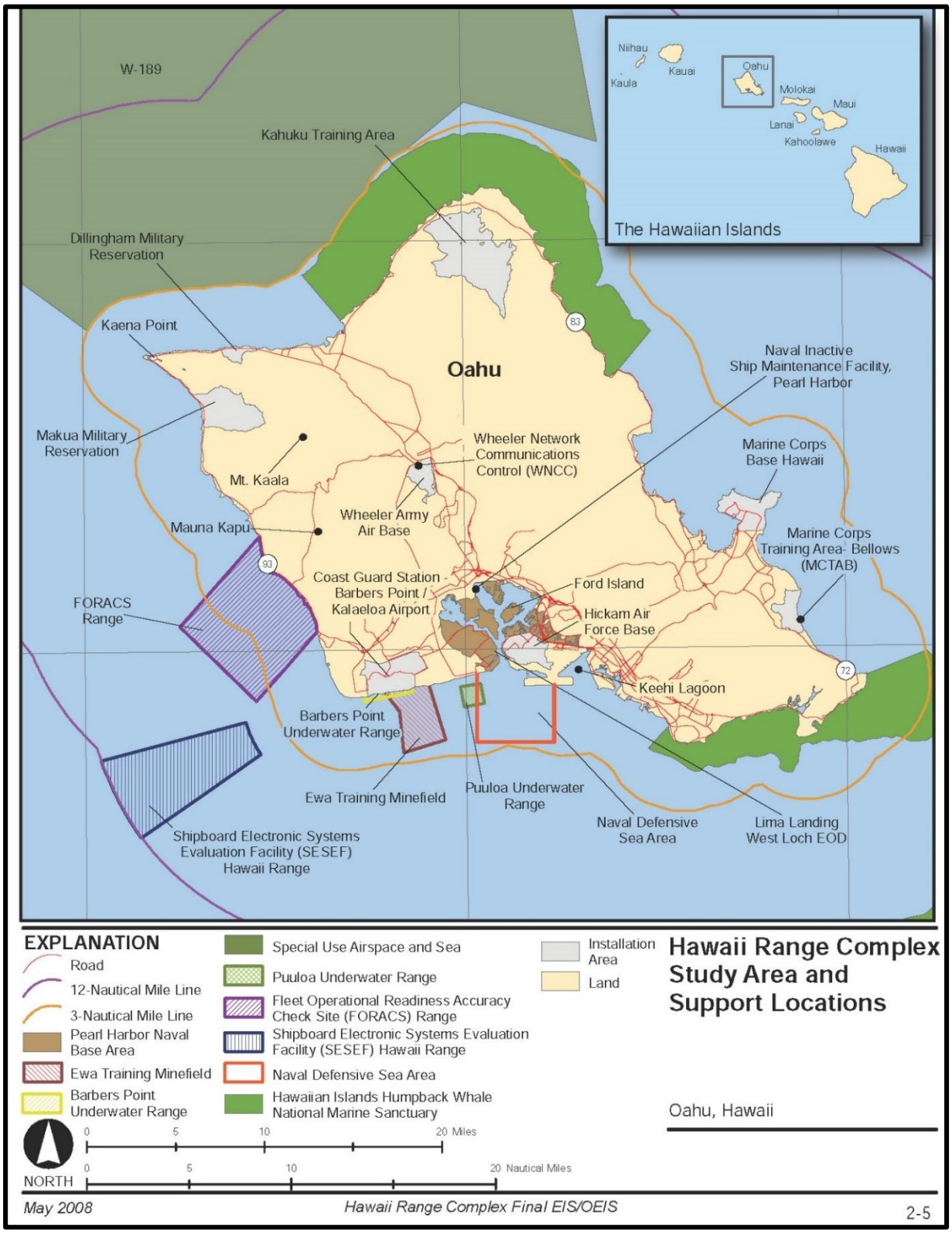


Figure 23. Hawaii Range Complex, Oahu

Figure 24. Exercise Areas

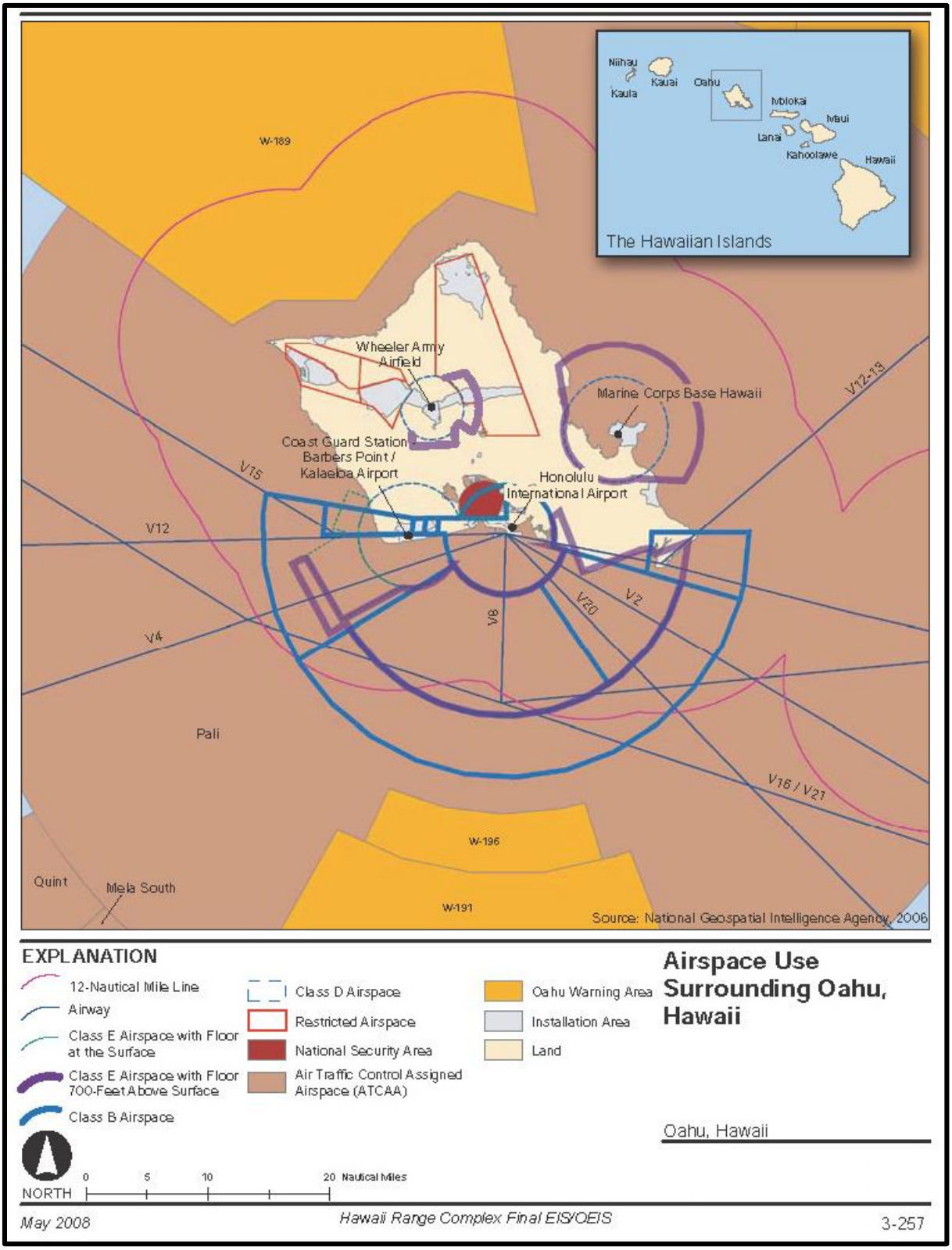


Figure 25. Airspace

5 Legal, Technical and Financial Qualifications

5.1 Legal Qualification

Pursuant to 30 CFR 585.106, Progression Hawaii Offshore wind is legally qualified to hold an offshore lease.

5.2 Technical Capability

Pursuant to 30 CFR 585.106 and 585.107 please find the following addressing Progressions Technical Capability.

The Project will be developed by Progression, and include substantial collaboration with Principle Power. The Progression/Principle Team has already worked together on this project for more than 3 years. Most of the stakeholder meetings have been conducted with this joint team. Furthermore, Progression and Principle have and will continue to collaborate in the siting and development of the project to ensure its technical and economic viability. It is Progression and Principle's view that, considering the unique nature of the WindFloat, it is in both parties' interests to have early and ongoing collaboration to ensure the highest likelihood of successfully developing the project and deploying the WindFloat.

5.2.1 Progression's Technical Capability

Progression's team has been assembled in order to both cover all of the areas of expertise needed to develop a project of this complexity and magnitude, and to develop the project in a way that has the highest likelihood of success considering Hawai'i's unique cultural, business and political environment. It would be difficult to create a better team for the development of this Project in particular. The individuals of this team are either world class or singular in her/his:

- Field of expertise
- Successful track record of renewable energy development in Hawai'i and renewable energy development in general
- Ability to successfully "Get to Yes" with the DoD/Navy
- Ability to successfully navigate the politics and institutions of Hawai'i and Washington DC
- Experience with and installation of floating foundation technology

The Progression Development Team has been an integral part of billions of Dollars of wind and other renewable energy facilities in Hawai'i and throughout the United States.

5.2.2 Third-Party Support

While the Progression Team is well suited to cover all of the needs of the Project at present time, this project will require the expansion of the team into a consortium, which will include Engineering, Procurement and Construction ("EPC") firms, vendors, and financial investors. Progression team members have existing relationships and have worked with a number of all of these types of organizations. Specifically, Progression will contract with the following types of firms as the project progresses:

- Community Relations and Government Affairs: This is a critical function as there is a tremendous amount of stakeholder involvement
- An environmental consulting firm to optimize siting and to navigate the local, state and federal permitting processes.
- Geophysical, geotechnical and metocean engineering firm(s) to understand the geology of the Project area and impacts of ocean currents in order to optimize siting and design of the anchors and cabling.
- An Owner's Engineer to oversee the design of the facility and port upgrades.

5.3 Financial Capability

Pursuant to 30 CFR 585.106 and 585.107 please find the following addressing Progressions Financial Capability.

The Progression Team has both in-house financial expertise, and due to the team's >150 years of combined experience in the energy industry in Hawai'i, Mainland US, and internationally, has developed strong relationships with providers of equity and debt sufficient to complete project.

Progression anticipates that construction and long-term financing for the Project will be provided by a combination of sources:

- Sponsor equity from corporate and/or institutional investors (insurance companies, pension funds, etc.), and possibly from EPC/BOP contractors and turbine equipment suppliers.
- Tax equity from financial institutions or corporations seeking a return on investment through the monetization of tax benefits.
- Debt from bank loans and/or institutional markets (private placement/bond). Commercial banks, insurance companies, and pension funds have been active in the wind energy project finance debt market for many years. Progression anticipates continued strong support for wind energy project finance from the debt capital markets.

In order to attract this capital, the Project will need to achieve key milestones, including a lease, a PPA, and necessary permits.

5.4 About Progression Hawaii Offshore Wind, Inc.

5.4.1 About Progression

Progression Hawaii Offshore Wind, Inc. is a US Corporation formed in 2015 by Progression Energy, LLC and its equity investors, including investors from Hawai'i, in order to continue the development of the Project that Progression team members started in 2012.

Progression has an address of 1300 NW Northrup Street, Portland, OR 97209.

A majority of Progression Hawaii Offshore Wind, Inc. is owned by Progression Energy, LLC, a private Limited Liability Company, with a minority ownership by Progression investors, including investors from Hawai‘i.

5.4.2 Not filed for Bankruptcy and No Adverse Financial Proceedings

Progression Hawaii Offshore Wind, Inc. has not filed for bankruptcy, nor has it experienced any adverse financial proceedings.

5.4.3 No Legal or Regulatory Actions

Progression Hawaii Offshore Wind, Inc. has not had any adverse legal or regulatory actions taken against it in the past 5 years.

APPENDIX I Guide to Renewable Energy Facility Permits in the State Of Hawai‘i

Guide to Renewable Energy Facility Permits in the State of Hawaii

Version 3

April 2015

DBEDT
STATE OF HAWAII • DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

HAWAII STATE Energy Office

Notice

The *Guide to Renewable Energy Facility Permits in the State of Hawaii* is designed to help readers understand the permitting process for renewable energy projects in Hawaii. It is not a legal document and should not be relied on exclusively to determine legal requirements; some permits and licenses not included in this Guide may be necessary for a particular project. This Guide is not meant to be a substitute for hiring a professional permitting consultant. The State of Hawaii Department of Business, Economic Development, and Tourism (DBEDT) strongly recommends that a renewable energy developer proposing a large or complex facility discuss it with an expert familiar with community engagement in Hawaii, local environmental and land use permits, and other approvals to expedite permitting. The State of Hawaii is not responsible for delays or losses should the processing of a permit or approval differs from that described in this Guide. DBEDT also recommends directly contacting the permitting agencies relevant to a specific project when project details have been established.

Acknowledgements

This Guide was produced as part of the Hawaii Clean Energy Initiative (HCEI), a partnership between the State of Hawaii, the US Department of Energy (DOE), and many local stakeholders vested in Hawaii's energy security, independence, and costs. DBEDT would like to give special thanks to USODE for providing project direction and funding, the National Renewable Energy Laboratory and Sentech Hawaii, LLC for initiating this project, PB Americas (aka Parsons Brinkerhoff) for initial development of this comprehensive Guide and its online counterpart, the Renewable Energy Permitting Wizard, and to Tetra Tech, Inc. for the 2014 revisions to both resources and the associated Permit Briefs. Support from many federal, state, and county agencies made this Guide, the Permit Briefs, and the Permitting Wizard possible. DBEDT very much appreciates their input on this initiative and many other energy-related efforts.

Table of Contents

Figures

Tables

Chapter 1 – Introduction

Purpose

This Guide and its companions, the online **Renewable Energy Permitting Wizard**[1] and **Permit Briefs**,[2] were created to assist in understanding the permitting process for renewable energy facilities in the State of Hawaii. These resources, hosted at the HSEO's **Developer & Investor Center**,[3] are intended to help identify permits that may be required for a specific renewable energy project, agencies involved, estimated processing timelines, and the general processing steps for each permit. The Briefs also contain tips and nuances to help the processing of permits for renewable energy projects based on guidance provided by the agencies. Discussion of other project development considerations is also included to support appropriate project siting and efficient project permitting. This Guide is intended for developers of commercial-scale renewable energy projects. Residential renewable energy projects can find information at the Hawaii State Energy Office (HSEO) Permit Briefs website (Footnote 2).

Note: Permit processes and requirements are dynamic. Developers are urged to contact the relevant permitting agencies early in the development process to confirm that an approval or permit is applicable to a proposed project, to encourage good communication with the permitting agencies, and to ensure the understanding of the most current rules, policies, and procedures. Developers are also urged to retain experts in Hawaii's regulatory landscape.

The State of Hawaii has a bold energy agenda – achieve 70% clean energy by the year 2030. Along with reducing our islands' dependency on fossil fuels and increasing efficiency measures, the clean energy plan is also contributing to the state's economic growth. Because Hawaii is committed to re-powering the clean energy market, we have embraced bold solutions that will help develop this competitive industry making Hawaii one of the leaders in the clean energy race. HSEO is leading the charge and has embarked on a strategic plan to position Hawaii as a proving ground for clean energy technologies and accelerate our transformation to a clean energy economy.

The state's policy is to increase Hawaii's renewable energy generation while maintaining the world-renowned environmental quality and lifestyle residents and visitors enjoy. This requires all projects to balance technical, economic, environmental, and cultural considerations. Hawaii is home to over 496 endangered or threatened flora and fauna species (approximately 326 with designated critical habitat), countless active cultural and historic sites from the coastline to the mountains, fragile indigenous ecosystems, pristine coastlines, and view planes (USFWS 2010a, USFWS 2010b). In addition to Hawaii's valued natural resources, limited land area increases competition for viable sites, with proposed land uses often subject to rigorous public and regulatory scrutiny. To ensure the protection of these resources, the federal, state, and county agencies have developed a comprehensive set of environmental and land use laws and regulations. Developers must work with numerous agencies – and different offices within those agencies – to meet regulations and receive

[1] http://wizard.hawaiicleanenergyinitiative.org/
[2] http://energy.hawaii.gov/renewable-energy-project-permitting-in-the-State-of-hawaii
[3] http://energy.hawaii.gov/developer-investor

permits to proceed with their projects. For these reasons, successful developers use professionals familiar with local permitting and utility interconnection processes to fully comprehend the succession of approvals required before a developer can start selling power or fuel to the utility.

Overview of Renewable Energy Technologies

Hawaii's unique location, geography, and resources, make several types of renewable energy technologies viable in the state. The renewable energy technologies addressed in this Guide are listed below. See Chapter 4 for guidance on permitting a project for each type of energy technology in Hawaii.

Bioenergy and Biofuels

Bioenergy includes many technologies that use organic matter to produce energy or fuel. Direct combustion uses fibrous biomass such as sugarcane, banagrass, or wood from dedicated crops. One example of this technology currently in operation in Hawaii is Hawaiian Commercial & Sugar's direct combustion bagasse biomass power plant on Maui.

Biodiesel power uses diesel fuel produced from oil crops or used cooking grease/oil, which is currently Hawaii's primary biofuel feedstock (see Pacific Biodiesel's biodiesel production facilities). Other biofuel technologies currently in operation and proposed for Hawaii seek to extract fuel from organic feedstocks, such as algae, for direct use in non-diesel engines. The Hawaii Bioenergy Master Plan (Hawaii Natural Energy Institute 2009) and The Potential for Biofuels Production in Hawaii (Black & Veatch 2010) are two resources that provide thorough discussion of Hawaii's bioenergy potential.[4]

Geothermal

Geothermal energy systems use heat that radiates naturally from the earth, which can be used directly for heating and cooling buildings (direct use) or can be used to generate electricity through steam turbine thermal power stations. Hawaii's geothermal resources are capable of electricity production, while potentially significant on the islands of Hawaii and Maui, is typically found a mile or more below the earth's surface. The direct-use application of geothermal in Hawaii has also been considered for development, particularly for agricultural (hot house) use. Hawaii's only operational geothermal facility is Ormat's Puna Geothermal Venture (PGV); a 38 megawatt (MW) air-cooled combined cycle binary system facility located in the Puna District of Hawaii Island.

Hydroelectric

Hydroelectric produces electrical power through the use of the gravitational force of falling or flowing water. Hydropower has been in use in Hawaii for ~100 years, dating back to early plantation generation units. Current hydroelectric generation in Hawaii consists of numerous diversion power plants throughout the islands, also known as "run-of-the-river" or "run-of-ditch" facilities. Pumped-storage and impoundment (dam) hydroelectricity, currently being proposed on

[4] http://energy.hawaii.gov/resources/hawaii-state-energy-office-publications

Kauai and other islands, can provide energy storage and power on demand by pumping water from a lower elevation reservoir to a higher elevation reservoir using low-cost off-peak electric power. During periods of peak energy demand, the water in the upper reservoir is released and harnessed to create electricity using hydroelectric turbines. The US Army Corps of Engineers' (USACE) Hydroelectric Power Assessment – State of Hawaii (USACE 2011) provides detailed information on the potential for hydropower at numerous waterways in Hawaii (see HSEO Publications website).

Marine Hydrokinetic Energy

Marine hydrokinetic (MHK) energy refers to a marine energy technology that relies on the use of kinetic energy in ocean water, such as wave, tidal, and current devices for energy generation. Most MHK power generation involves technologies still under development, such as the Wave Energy Test Site (WETS) planned for implementation in 2015 or 2016 in Kaneohe Bay off Oahu. All MHK technologies are assumed to involve the following facilities: marine power cables from the generation facility to the shore, land/sea transition structures at the shoreline, and connection structures to the grid.

Ocean Thermal Energy Conversion

Ocean thermal energy conversion (OTEC) refers to the use of temperature gradients between deep seawater and surface water to drive a closed-cycle system using a working fluid such as anhydrous ammonia. Deep cold water and warmer surface water can be drawn, and effluent water released, through large-diameter pipes. A floating or land-based platform is used for the heat exchanger system, and an undersea power cable connects the floating platform to an onshore land/sea transition site and grid. A land-based pilot OTEC project is currently under construction at the Natural Energy Laboratory of Hawaii Authority (NELHA) near Kailua-Kona, Hawaii. The facility will utilize one of NELHA's three sets of deep water pipelines, which deliver sea water from depths of up to 3,000 feet.

Solar

Utility-scale solar energy production includes two general technologies: photovoltaic (PV) systems and solar-thermal systems/concentrated solar power (CSP). PV cells convert sunlight to electricity directly. Solar thermal/CSP systems convert solar energy to heat which is then used to generate electricity by producing steam or heat exchange. PV is predominant in Hawaii, with numerous solar farms currently operating throughout the state; the biggest to date being 12 MW (Kauai), with farms as large as 65 MW being proposed. As of print, no solar thermal/CSP facilities are in operation in Hawaii. The existing ground-mounted photovoltaic facilities in Hawaii require an average of approximately 4 to 7 acres per MW capacity of the project.[5]

Waste-to-Energy and Biomass Conversion Facilities

Municipal solid waste (MSW) and construction and demolition (C&D) waste can be used to generate energy at waste-to-energy (WTE) plants, which can also include the capture and conversion of

[5] Hawaii Energy Facts and Figures (Nov. 2014) http://energy.hawaii.gov/wp-content/uploads/2014/11/HSEO_FF_Nov2014.pdf

landfill gas to energy. Incineration and other high temperature systems are considered thermal treatment. Besides direct combustion, other thermal processes include gasification, pyrolysis, and thermal depolymerization. Anaerobic digestion and mechanical biological treatment are non-thermal processes that produce fuel from MSW or biomass. There is currently one MSW WTE facility operating in Hawaii: the ~ 90 MW H-Power facilities on Oahu operated by the City and County of Honolulu and Covanta. Other counties are also considering MSW WTE as a waste management and energy generation strategy. There are no utility-scale bioconversion facilities currently in operation in Hawaii; however, the technology is being evaluated by various counties.

Wind

Wind turbines convert the kinetic energy of wind to mechanical power through the basic principle of spinning blades attached to a generator. Hawaii's consistent winds make wind an attractive form of renewable energy generation, provided facility impacts are addressed.

Onshore Wind

Land-based wind turbines can be used for both distributed and utility-scale power production. There are currently 7 "utility-scale" wind farms in operation in Hawaii; with others in the development and planning stages. Hawaii's topography offers a wide range of siting needs, with the existing wind farms requiring between 3.2 to 23.8 acres per MW capacity of the project.[6] There are also numerous distributed (50-150 feet high) turbines in operation and being planned throughout the islands, which are ideally suited for rural and more isolated (agricultural, municipal) facilities.

Offshore Wind

Offshore wind is generally only considered to be suitable for utility-scale projects; most manufacturers of offshore wind turbines are testing models with capacities of 5 to 7 MW and rotor diameters of 400 to 500 feet. Depending on the depth of water, offshore turbines may be mounted on solid structures or floating platforms. Hawaii's steep bathymetry, protected marine life, and high-traffic coastal waters are challenges faced by the off-shore wind industry.

Outline of the Development Process for Renewable Energy Projects

This section presents an overview of the development process for commercial-scale renewable energy projects in Hawaii. Developers will typically use the following steps, starting with the evaluation of a potential site and ending with decommissioning.

[6] Hawaii Energy Facts and Figures (Nov. 2014) http://energy.hawaii.gov/wp-content/uploads/2014/11/HSEO_FF_Nov2014.pdf

Siting and Due Diligence

The first step in the development process for a renewable energy project is to identify a location that is appropriate for a particular renewable energy technology. Suitability of a location can consider a variety of parameters, including:

1. Is the renewable energy resource sufficient (e.g., enough wind, sun, biomass, geothermal)?
    - While energy generation potential requires site-specific assessment, HSEO has numerous Publications on the resource potential of various renewable energy technologies in Hawaii.[7]
    - HSEO's **Renewable EnerGIS** also provides information on the resource potential for sites specified by the user, as well as site-specific information relevant to siting and permitting.[8]
2. Is land available, and can it be secured to construct the energy facility infrastructure?
    - Use of public lands in Hawaii typically requires applicants to undergo a competitive bidding process; however, Hawaii law provides for direct lease negotiations for public land for renewable energy projects provided certain conditions are met and processes are followed (HRS 171-95 and -95.3). Use of public land also carries additional processes apart from typical processes to secure private land. A summary of State Agency Land Leases provides information on this process.[9]
    - Public land management agencies in Hawaii include, but are not limited to: Department of Land and Natural Resources (DLNR); Department of Hawaiian Home Lands (DHHL); Agribusiness Development Corporation (ADC); Hawaii Department of Agriculture (HDOA); Hawaii Community Development Authority (HCDA); Natural Energy Laboratory of Hawaii Authority (NELHA); Department of Transportation (HDOT); and, Federal Department of Defense (DOD). Prior to approaching an agency, developers should ensure their proposed project(s) fit within the mission of the agency charged with managing the land.
3. Is there potential to impact significant biological, cultural, scenic, or socioeconomic resources?
    - A review of studies conducted at, or adjacent to, targeted sites can provide valuable information on resources to be protected. Consult the agencies charged with overseeing these resources for information and possible access to relevant reports (i.e., State Historic Preservation Division within DLNR, Division of Forestry and Wildlife within DLNR, Office of Hawaiian Affairs, Department of Business, Economic Development & Tourism).
    - The Hawaii Office of Environmental Quality Control (OEQC)'s online EA and EIS Library[10] houses all Environmental Assessments and Environmental Impact Statements conducted in Hawaii. These documents are valuable for assessing specific sites and the impacts from specific technologies in Hawaii. These documents also provide a list of potential permits required for the project.

[7] http://energy.hawaii.gov/resources/hawaii-State-energy-office-publications
[8] http://energy.hawaii.gov/resources/renewable-energis-map
[9] http://www.hnei.hawaii.edu/sites/dev.hnei.hawaii.edu/files/State%20Agency%20Land%20Leases_%20Oct%202012.pdf
[10] http://health.hawaii.gov/oeqc/

4. Is transmission and interconnection to the electrical grid available?
    - For more information, visit HSEO's Utility Resources website[11] or see the "Utility Permits and Approvals" section of this Guide.
5. Is there an agreement with a utility or some other end user to purchase the energy produced from the project to make it economically feasible?
    - For more information, visit HSEO's Utility Resources website[12] or see the "Utility Permits and Approvals" section of this Guide.

Some agencies and organizations have established guidance for specific renewable energy technologies or locations, such as:

- US Fish and Wildlife Service (USFWS) Land-Based Wind Energy Guidelines (2012)
- City and County of Honolulu Solar Farm Guidelines (2014)
- Airport Cooperative Research Program (ACRP) Guidebook for Energy Facilities Compatibility with Airports and Airspace (2014)
- US Environmental Protection Agency (EPA) Handbook on Siting Renewable Energy Projects While Addressing Environmental Issues (contaminated properties)

Critical Issues Analysis

As interconnection and site access are being explored, developers may conduct a critical issues analysis (CI Analysis) early in the siting process. The CI Analysis includes a review of publically available environmental information on the potential site and any alternative sites, and will identify the important natural and environmental resource issues and potential permits required for the type of energy facility on a specific site. This information typically includes land use designations, including zoning, threatened and endangered species, waters or wetlands, archaeological and cultural resources, site contamination, existing and future uses, and potential community issues. Often a site visit is conducted as part of this analysis.

A CI Analysis is used to identify any fatal flaws, make an early assessment of risk, and to determine whether to go forward with the project at that specific site. Understanding the general project components and site characteristics such as land use designations, zoning, potential significant natural and environmental resources, and impacts to said resources allows an early assessment of the regulatory drivers for each project. The developer should identify early in the development process the federal, state, and county regulatory issues that will influence the project. The CI Analysis process should also provide a clear sense of the local communities' position(s) on a proposed project before significant investments are made for a particular site.

Transmission Capacity Issues and Regulatory Approval

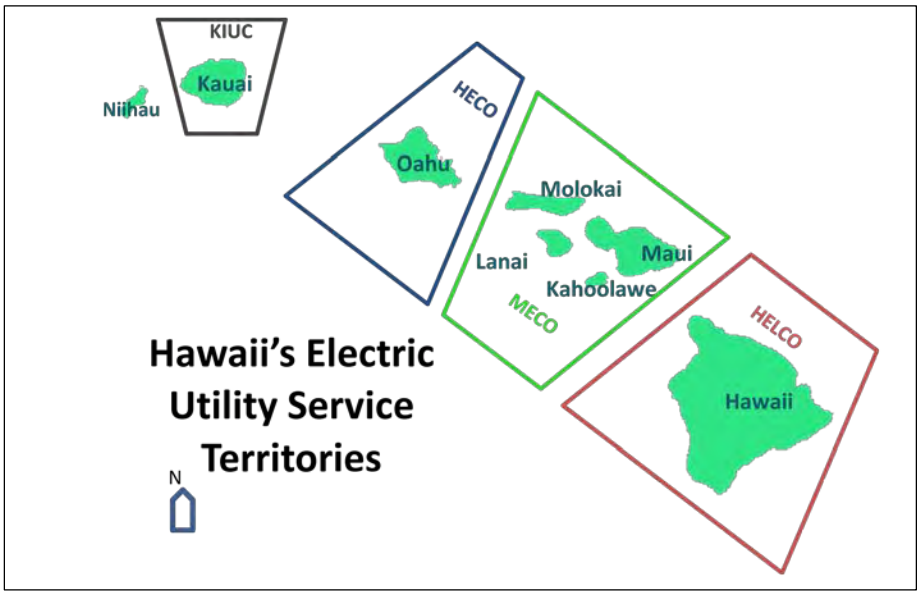
Hawaii's relatively small electrical grids can impact siting and permitting by dictating which distribution circuits (geographical areas) can safely absorb energy from a third party producer. The appropriate utility – Hawaiian Electric Company (HECO) on Oahu, Maui Electric Company (MECO)

[11] http://energy.hawaii.gov/developer-investor/utility-resources
[12] Id.

in Maui County, Hawaii Electric Light Company (HELCO) on Hawaii Island, and Kauai Island Utility Cooperative (KIUC) on Kauai – must be contacted early in the planning stages to discuss project interconnection to the electrical grid.

Note: Ability to interconnect to the targeted circuit is a priority during the utility review and approval process.

Figure 1. Map of Utilities in Hawaii



The local utility and the Hawaii Public Utilities Commission (PUC) are responsible for ensuring grid reliability and safety, and power quality. Consequently they have set interconnection standards for those proposing new connections to ensure proper performance of the entire distribution grid. Each project will require its own degree of interconnection analysis and cost. An Interconnection Requirement Study (IRS) or similar study may be required for renewable energy projects wishing to connect to any one of Hawaii's utility-owned electrical grids. Typically, this study is conducted by the appropriate utility with its contractor, at the expense of the party wishing to interconnect to the grid. An IRS may also be required for smaller, distributed energy projects depending on their location, local circuit conditions, and the size of the system. The IRS will also determine the equipment necessary for the proposed project to safely and reliably interconnect to the utility grid.

Note: Recognizing that some projects submitted for permit approval will not be approved by the utility; some permitting agencies will inquire on, and may in some cases request evidence of, the status of the projects' interconnection and PUC approval. Local permitting agencies are becoming increasingly familiar with the critical pathways of interconnection and PUC approval.

Hawaii's utilities are regulated somewhat differently. For example, HECO, MECO, and HELCO are subject to the Competitive Bidding Framework (Framework) adopted by the PUC in 2006, whereas KIUC is not. The Framework seeks to establish a competitive process for these utilities to acquire or build new energy generation sources in Hawaii. However, the Framework provides several conditions or circumstances in which competitive bidding may be waived by the PUC: where more

cost-effective or better performing generation resources are more likely to be acquired more efficiently through different procurement processes or where a waiver will likely result in a lower cost supply of electricity to the utility's general body of ratepayers. Several projects have recently been granted such a waiver from the PUC.

As discussed in more detail infra, PUC approval is required for all power purchase agreements (PPAs) and off-take agreements (fuel) between any of the four Hawaii electric utilities and a third-party seller (independent power or fuel producer). PUC approval is also required for new power generation facilities proposed to be developed by the utilities themselves. This process allows for the Hawaii Consumer Advocate to weigh in on the merits of each petition, and also provides a process in which third-party entities may petition the PUC to become an Intervener on a particular docket or otherwise provide input.

In addition, the PUC has authority to conduct a public hearing whenever a Hawaii public utility plans to build a new above-ground 46 kilovolt or greater high-voltage transmission system through any residential area (HRS 269-27.5).

Potential Site Contamination

The CI Analysis may also identify historical land use and site activities that could contribute to contamination of soil, surface water, and groundwater, such as application of pesticides, Polychlorinated Biphenyl (PCBs) from transformers, leaking oil tanks, or illegal dumping. As developers refine the parcels that will comprise the project site, they may typically perform a screening-level assessment of the site for potential environmental contamination, or conduct a Phase I Environmental Site Assessment. There are over 800 Priority Sites in Hawaii (various sectors – e.g., agriculture, federal government, transportation) identified for potential or known non-emergency response cleanup actions (HDOH 2013).

Note: Typically, conducting a Phase I Environmental Site Assessment is the most efficient way of understanding the presence of environmental contamination present at a particular site, as a literature review and visual site inspection are part of this process. If warranted, a Phase II Environmental Site Assessment will need to be conducted, which involves sampling and testing to determine the extent and degree of contamination.

Community Outreach

Before substantial resources are invested in a particular site or project, community sentiment about a particular project should be well known. It is important for project developers to engage all public and private stakeholders early in the process to identify and address potential siting, construction, and operation issues. In Hawaii, word of mouth spreads quickly, so it's important to be out in front with accurate project information. Engaging the affected community early, incorporating their input, and instilling a sense of community ownership will help to spread accurate information about the project and will lead to transparency in the permitting process. Many permits require public meetings and/or hearings on the project, which impact an agency's processing of a permit

and the imposition of any conditions. Early communication with stakeholders will likely be recommended by the agencies during the preliminary regulatory consultation process.

One useful document to help incorporate local values and engage in community outreach for a project is Aloha Aina: A Framework for Biocultural Resource Management in Hawaii's Anthropogenic Ecosystems (NOAA, HIHWNMS 2012).[13] Another useful resource to identify and contact relevant, but sometimes overlooked, stakeholder groups is the Hawaii Community Stewardship Directory (2010) published by the Hawaii Office of Planning.[14]

Numerous presentations to the local community boards or associations are highly recommended, if not required by permits needed for a project. This gives the developer an early opportunity to gauge community sentiment about a project and, if necessary, modify the project to address community concerns. Project information, including visual simulations (day time and night time), plans, and other project details should be provided during these presentations. On Oahu, there are thirty-six (36) Neighborhood Boards across the island. On Maui, Kauai, Molokai, Lanai, and Hawaii Island, the closest equivalents to neighborhood boards are general plan advisory committees or community plan advisory committees (if the general plan or community plan are in review), community associations, and/or community development plan boards that may meet regularly or may be established/convened for a specific project or activity. Other advisory bodies to be consulted are identified in this Guide.

Permitting and Approval

Once a developer decides to move forward with a renewable energy project, the preliminary list of approvals and permits is generated, which will be refined as the project progresses towards final design. Casting a wide net for permits, including those which are likely not required for the project, can help ensure permits are not overlooked and can help identify outlying issues or approvals. To obtain federal, state, and county permit approvals, a more detailed assessment of potential impacts to resources are identified through conducting technical and resource studies on potential impacts that may result from construction and operation of the project. Based on these studies and land use regulations, the developer processes required land use entitlement applications, and receives approvals from the necessary agencies. As the land use entitlement permits are approved, project developers should anticipate some permits may require mitigation and compliance activities for unavoidable impacts to resources.

Construction

Construction-related permits are required before the start of construction (e.g., site grading, grubbing, building and infrastructure construction, and stormwater control). Permits required for equipment used on-site during construction are typically held by the contractor/owner of the construction equipment (e.g., diesel generators or rock-crushing equipment may need a Temporary Source permit from the Hawaii Department of Health, Clean Air Branch). These permits ensure

[13] http://hawaiihumpbackwhale.noaa.gov/council/pdfs/aloha_aina.pdf
[14] http://files.hawaii.gov/dbedt/op/czm/initiative/community_based/May2010_HawaiiCommunityStewardshipDirectory.pdf

project conformity to federal, state, and county laws, codes, and standards concerning construction and pollution control. Failure to obtain appropriate permits can result in fines, penalties, and even the removal of unauthorized construction. **Construction permits are not covered in this Guide, but are included in the Permit Briefs.** Please coordinate with the appropriate agencies to ensure compliance with all federal, state, and county requirements for construction activities. Many construction permits are under the respective county jurisdiction in Hawaii.

Operation

Upon completion of construction, project operation may require state or county operational permits and renewals, in addition to complying with permit conditions and standard best practices outlined in previously approved land use entitlement and construction permit approvals. **Operational permits are not covered in this Guide.** Please coordinate with the appropriate agencies to ensure compliance during operation with all federal, state, and county requirements. These could include ongoing monitoring for protected species, stormwater run-off, emissions, or noise.

Decommissioning

At the end of the project's useful life it will typically be decommissioned, if it is not repowered or updated to meet current standards. This means the project facilities and infrastructure are removed from the site and, to the extent feasible; efforts are made to return the site to pre-construction condition. Decommissioning has become an increasing concern raised by Hawaii communities, as well as federal, state, and county agencies during the project permitting process.

Additionally, certain permits (e.g., Conservation District Use Permit [CDUP], Special Use Permit [SUP], county zoning permits) may include decommissioning requirements as a condition of their land use entitlement and/or building permit approvals. It may also be discussed, though not necessarily required, in the power purchase or off-take agreement with the utility or in the PUC's approval of these agreements. Typically, setting aside funds for project decommissioning is a condition of land use contracts between a landowner and a project developer, and is generally required when leasing land from Hawaii public agencies. Regardless, all developers of large scale projects should have a funding mechanism in place to ensure the complete removal of the project and restoration of the site when the project is no longer in operation.

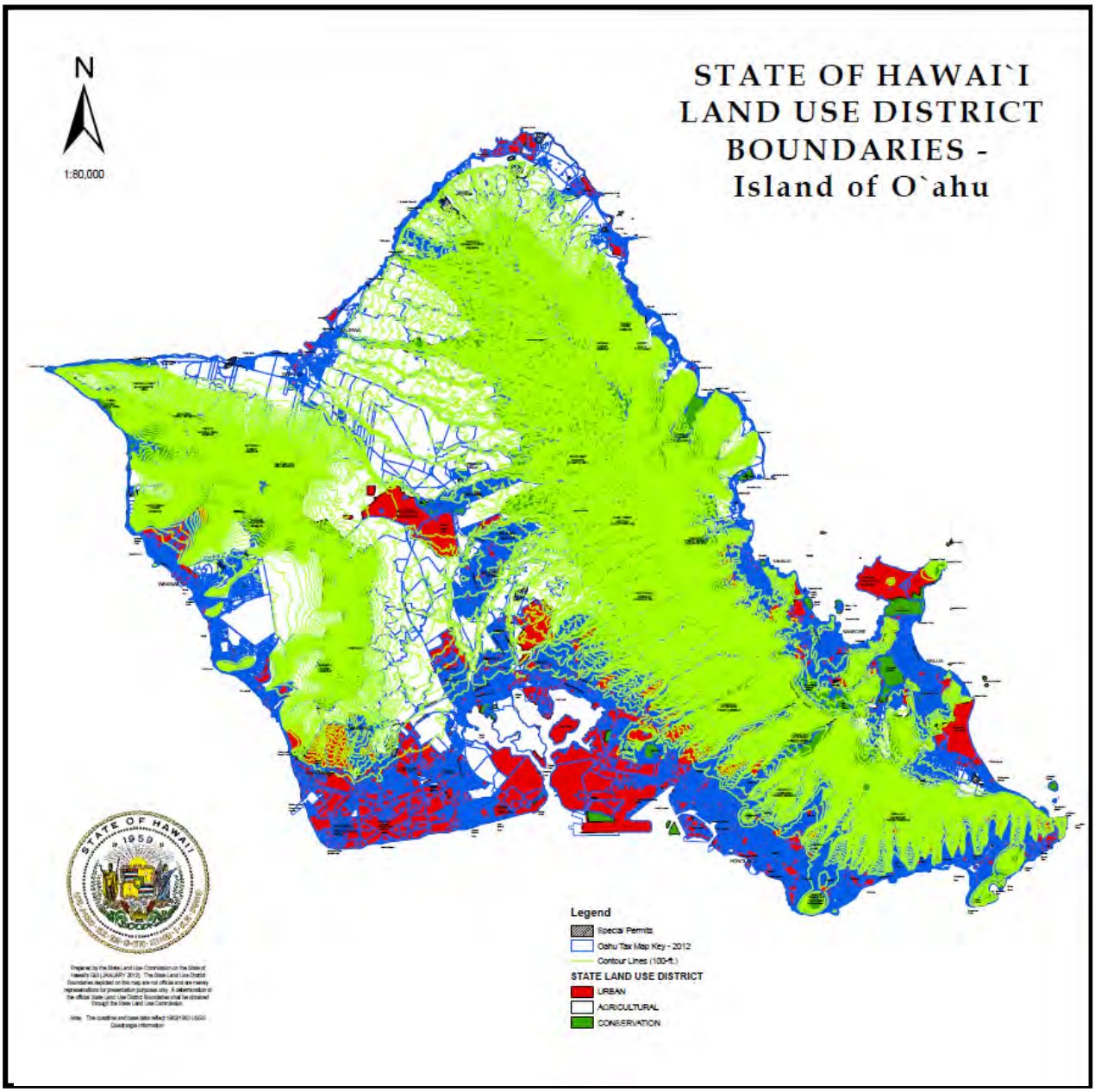
Outline of Land Use Law in Hawaii

Land use in Hawaii is highly regulated by a dual system of state and county laws. This section provides only a general outline; developers are encouraged to contact state and county agencies early in the development process and to retain the services of a knowledgeable professional permitting consultant. The following discussion illustrates the complex interaction between state and county laws that is common to all counties in the state, and provides a foundation of land use law in Hawaii.

State Land Use Classifications

All land in the State of Hawaii is classified into one of four state land use district classifications: Conservation, Agricultural, Rural, or Urban. The boundaries were initially set by the Hawaii Land Use Commission (HLUC), a body of nine members appointed by the Governor. There are processes, discussed in more detail in Chapter 2, that provide for the re-classification of a parcels' district (District Boundary Amendment) or permit facilities not expressly allowed in a given district (Special [Use] Permit, Conservation District Use Permit).

Figure 2. State Land Use District Boundaries for Oahu (2012)



http://luc.state.hi.us/maps/oahu_slud_2012.pdf

Conservation District

The Conservation District is under State of Hawaii Department of Land and Natural Resources (DLNR) jurisdiction; specifically, the Office of Conservation and Coastal Lands (OCCL). The respective counties have no zoning authority in the Conservation District. The Conservation District has five subzones: Protective, Limited, Resource, General and Special. The first four subzones are arranged in a hierarchy of environmental sensitivity, ranging from the most environmentally sensitive (Protective) to least sensitive (General). The Special subzones defines a unique land use on a specific site. Each subzone has specific identified land uses associated with it; many of these land uses require a Conservation District Use Permit (CDUP). Submerged lands within 3 miles of the coastline are also under OCCL jurisdiction and will require a CDUP for use.

The Conservation District allows only a very limited range of uses, and most of these uses require a CDUP from the Board of Land and Natural Resources (BLNR), a seven-member board appointed by the Governor with administrative responsibility over DLNR. Only the HLUC can approve DBAs for Conservation lands. For petitions to redistrict Conservation lands, the requirements of Hawaii's environmental review and disclosure law (HRS 343) must be met before the petition to reclassify Conservation land can be officially accepted as a proper filing and acted upon by HLUC.

Agricultural District

Each county administers the Agricultural District within the framework of the state land use law, with state (HLUC) oversight and approval required for projects requiring more than 15 acres of land. State law limits permitted uses in the Agricultural District mostly to uses relating to agriculture. Many types of renewable energy facilities are also permitted, provided the facility is within the limitations described in HRS 205-2 and 205-4.5; such as, wind, biofuel, solar, and geothermal energy facilities. As discussed infra, a Special (Use) Permit (SUP) can be issued for "unusual and reasonable" uses not listed as a permitted under HRS 205.

Note: As county zoning applies in the Agricultural District, a county zoning (Use) permit is likely required for those projects permitted under state law, even where a state permit may not be necessary.

Rural District

Each county administers the Rural District within the framework of the state land use law (HRS 205), with HLUC oversight for certain approval actions (SUP, DBA). State law generally limits permitted uses in the Rural District to allow for small farms mixed with very low density residential lots. The Rural District also allows for public, quasi-public, and public utility facilities, as well as geothermal development.

Urban District

The Urban District is entirely under county jurisdiction and permitted uses are governed by county zoning.

County Land Use System

Each county regulates their land use system through their General Plans. Typically, each county's General Plan includes three elements: (1) a general plan; (2) resource plans and area-specific development plans; and, (3) ordinances and rules.

General Plan

The General Plan is the overall guide to county land use policies. It provides goals, policies, standards, and courses of action. The maps show designated future land uses in the county. Permit decisions, including those related to renewable energy development, must be consistent with the goals, policies, standards, and courses of action in the applicable county's General Plan.

Resource Plans and Area-Specific Development Plans

Resource plans and area-specific development plans are intended to be more detailed and more tailored to the desires of various communities than the General Plan, and would typically include maps showing designated future land uses in the county. They are intended to guide land use approvals and capital improvement projects. For example, Oahu (City and County of Honolulu) is divided into eight planning areas each with its own development or sustainable community plan that establishes goals and policies related to future land use, infrastructure, and preservation of cultural and natural resources. See Chapter 3 for more information regarding each county's resource and area-specific development plans.

Note: Renewable energy projects will be evaluated for their conformance with the applicable development plan and corresponding community development maps.

Ordinances and Rules

Ordinances and rules, such as the zoning code, are the main county land use control. All areas on the islands, except for federal lands, areas in the Conservation District, and areas under special zoning authority (i.e., HCDA) are subject to county zoning rules. Lands owned by the Hawaii Department of Hawaiian Home Lands (DHHL) may also be exempted from certain county land use ordinances and rules. The applicable county zoning code lists the permitted uses within each zone, and also the required development standards, such as setbacks, height limits, minimum lot sizes, and other controls. Every zone will have a list of "permitted" uses that are allowed outright without further approvals. If a use is not listed, it is not allowed in that zone without a discretionary permit.

Note: Certain renewable energy facilities may be classified otherwise in the county code(s) where the county has not developed a specific classification; e.g., solar farms may be considered "utility installations." Consult the appropriate county for clarification on the type of use your project will be classified under, as this will dictate whether or not the facility will be allowed, or permitted, in the zone in which it is located.

Special Management Area

In addition to the dual land use system for the state and the applicable county, a Special Management Area (SMA) designation further protects the environmental resources of the state's coastal areas. The SMA is the area which begins at the shoreline and generally extends inland to the nearest highway. The SMA maps were enacted by the respective county planning commissions, or the city council for the City and County of Honolulu. The respective county authority may amend its county SMA boundaries as necessary provided that any contraction of the SMA boundaries shall be subject to State Office of Planning's review and determination. If a project or a portion of the project is within the SMA, an SMA Permit must be obtained from the respective county. Information to view if a project site falls within a SMA can be found through the Hawaii Office of Planning. The planning departments of the various counties are charged with assessing SMA permit applications and shoreline setbacks. Final decision-making is vested in the respective county planning commissions, or the city council for the City and County of Honolulu.[15]

Administrative Permits

Some land use permits and controls are done administratively within the county Planning Department, or other county department such as the Department of Transportation Services (more typically involved in transit service-related approvals, rather than land use controls), Department of Public Works, Department of Environmental Management/Services, and/or Department of Water Supply. The administrative permits are generally ministerial permits that do not require discretionary approvals by a board or commission; provided all necessary information for the agency to make a determination is provided in the permit application.

Note: To avoid multiple reviews and back-and-forth between agency and applicant, ensure all necessary information, in the proper format requested, is provided in the initial filing. Among the most significant administrative permits are subdivision permits, grading and grubbing permits, and building permits.

How to Use this Guide

The Guide contains sections that address specific renewable energy technologies, permitting processes that may apply to these technologies, and the applicable federal, state, and county laws and contact information. Chapter 2 provides information on federal and state laws and permits. Chapter 3 provides information on county land use laws and possible county permits. Chapter 4 provides additional permitting considerations that may be specific to a particular renewable energy technology in Hawaii.

[15] http://maps.hawaii.gov/PropertyInSMA/

Chapter 2 – Federal and State Regulatory System

While the development of renewable energy projects is critical to Hawaii meeting its clean energy goals and local laws support priority processing, these projects must comply with the same federal and state review processes as other development projects. Federal and state permits or approvals are primarily concerned with environmental protection. For most renewable energy projects in Hawaii, the environmental permits are the most onerous and lengthy approvals to obtain. A team of consultants from various disciplines with experience working in Hawaii is often required to successfully navigate the maze of environmental regulations in a timely manner. Environmental permits include permits or approvals that regulate certain types of activities that may impact environmental, ecological, archaeological, historic, and cultural resources. The various federal and state environmental permits that may be necessary for the construction and operation of a renewable energy project are described in detail in Chapter 2. The approvals, contracts, and agreements needed to sell renewable energy or fuel to an electric utility in Hawaii are also briefly discussed in Chapter 2.

Federal and State Permits/Approvals

This section is organized into six categories of permits or approvals:

1. Environmental Review
2. Protected Species
3. Water, Air, Noise, and Solid Waste
4. Archaeological and Cultural Resources
5. Contaminated Properties
6. Other Permits

Each category discusses the applicable federal and state permits or approvals that a renewable energy project may need to acquire prior to construction in Hawaii. Associated laws are identified to provide context on why a permit or approval may be necessary and also to identify where federal or state processes overlap or require close coordination.

Environmental Review

The environmental review process may take place at the federal and/or state level. Environmental review can apply to any type of proposed renewable energy project that triggers one or more of the criteria that subsequently requires environmental review. The purpose of the environmental review process is to analyze and disclose to the public the potential environmental, social, cultural, and economic impacts of a proposed project. Where project impacts are not sufficient to warrant project abandonment or relocation, disclosure of impacts is the first step in the development and implementation of mitigation measures. The federal and state processes each have their own guidelines and requirements although they may be very similar.

National Environmental Policy Act

At the federal level, environmental review takes place under the National Environmental Policy Act of 1969 ([NEPA] 42 USC 4321 et seq.). NEPA requires analysis and public disclosure of environmental impacts of a federal action, but does not require the issuance of a permit. Federal actions that trigger review under NEPA include:

- Granting rights–of-way or use of federally managed land.
- Issuance of federal permits or approvals, such as:
    - Incidental Take Permits (ITPs) under the Federal Endangered Species Act (ESA);
    - Permits from the USACE pursuant to Section 404 of the Clean Water Act for discharge of fill or dredged materials into waters of the United States; or
    - Permits under Section 10 of the Rivers and Harbors Act for work in navigable waters of the United States.
- Receipt of certain federal grant monies or other federal funds (certain grant awards are exempted from NEPA review; consult the appropriate awarding agencies for NEPA compliance requirements).

The lead agency for NEPA review is typically, though not always, the agency issuing the permit or approval that would trigger NEPA review. For example, the USACE would typically be the lead agency for the NEPA review if an individual Section 404 Permit is being pursued by a developer. Upon request of the lead agency, any other federal agency with jurisdiction by law can be a cooperating agency (40 CFR 1501.6). The NEPA process can benefit from early coordination with cooperating agencies.

The extent of the environmental analysis necessary during a NEPA review varies based on the potential significance of the impacts associated with a proposed action, such as the granting of a license or lease for a renewable energy project. For the purposes of NEPA review, federal agency decisions are divided into the three categories listed below. When performing NEPA review, the lead agency must determine which of the following categories applies:

1. ***Categorical Exclusion:*** Each agency is permitted to adopt a list of Categorical Exclusions (CX), which are types of actions that individually or cumulatively do not have significant effects on the environment. Unless extraordinary circumstances exist, an agency can proceed with an action that is a listed CX without further NEPA review. The Council on Environmental Quality has provided a guidance document for federal agencies establishing CXs under NEPA entitled Final Guidance for Federal Departments and Agencies on Establishing, Applying, and Revising Categorical Exclusions Under the National Environmental Policy Act.
2. ***Environmental Assessment*****:** The majority of federal actions require an Environmental Assessment (EA). An EA is a concise public document that provides sufficient evidence and analysis to assist the agency in determining whether to prepare an Environmental Impact

Statement (EIS) for a proposed action. If the EA results in a Finding of No Significant Impact (FONSI), no further action under NEPA is required. A FONSI is a determination that the action, including minimization and mitigation measures, would not result in significant environmental impacts. A 30-day public comment period begins when the EA is published, and although not specifically required, many agencies also conduct a formal scoping process as part of the EA. The FONSI includes the EA or a summary of the EA, and supporting evidence (40 CFR 1501.7(a)(5)).

3. ***Environmental Impact Statement:*** If the agency determines that the action is likely to have a "significant effect" on the "quality of the human environment" (42 USC 4332(C)), the agency must prepare an EIS. Agency regulations or guidelines may specify those actions that typically would require an EIS. Alternatively, an agency may prepare an EA to determine whether an EIS is necessary.

In general, other approvals or permits are not issued while the NEPA review is pending but applicants can develop project plans and undertake work that supports a permit application such as conducting meteorological, environmental, cultural, and engineering studies. Although the federal agency is responsible for preparing an EA and/or EIS, applicants often pay an environmental consultant to prepare the document and the supporting studies and documentation. The implementation of NEPA procedures must be conducted with a minimum of delay and duplication with other state and federal agencies' requirements; therefore, relevant federal, state, and local agencies are encouraged to cooperate with one another in an effort to reduce redundancy between NEPA and comparable state and local procedural requirements.

Hawaii Clean Energy Programmatic Environmental Impact Statement

For Hawaii, DOE is currently developing the Hawaii Clean Energy Programmatic Environmental Impact Statement (PEIS), which will analyze, at a programmatic level, the potential environmental impacts of clean energy activities and technologies in the following clean energy categories: (1) Energy Efficiency, (2) Distributed Renewables, (3) Utility-Scale Renewables, (4) Alternative Transportation Fuels and Modes, and (5) Electrical Transmission and Distribution. The PEIS will support decision-making concerning proposed clean energy actions and projects in Hawaii.[16]

Hawaii HRS 343 Process

Adopted in 1974 and patterned loosely after NEPA, Hawaii's environmental review law, HRS 343, (also called "Chapter 343") is administered by the Office of Environmental Quality Control (OEQC) under the Hawaii Department of Health, and requires the preparation of EAs and EISs for projects that trigger one or more criteria set forth in HRS 343. These triggers are expressly listed in HRS 343-5 and the corresponding Hawaii Administrative Rule (HAR) 11-200-6. The triggers include the following:

1. Use of state or county land or the use of state or county funds;

[16] http://hawaiicleanenergypeis.com/

2. Any use within any land classified as Conservation District by the State Land Use Commission under HRS Chapter 205;
3. Any use within a shoreline area as defined in HRS 205A-41;
4. Any use within any historic site as designated in the National Register or Hawaii Register;
5. Any use within the Waikiki area of Oahu;
6. Any amendments to existing county general plans where the amendment would result in designations other than agriculture, conservation, or preservation;
7. Any reclassification of any land classified as a Conservation District by the State Land Use Commission under HRS Chapter 205;
8. Construction of new or the expansion or modification of existing helicopter facilities within the state, that by way of their activities, may affect Conservation District lands, shoreline areas, or historic sites; and,
9. Proposal of any of the following:
    - Wastewater treatment unit, with the exception of individual wastewater systems or units serving fewer than 50 single-family dwellings, or the equivalent;
    - Waste-to-energy facility;
    - Landfill;
    - Oil refinery; or,
    - [Fossil-fueled] power-generating facility (as defined in HRS 343-2).

Note: "Oil refinery" and "waste-to-energy facility" are currently not defined under HRS 343. Projects that may fall under these classifications will be required to undergo HRS 343 review based on a determination by the appropriate accepting / processing agency. A proper and complete project description is necessary for an agency to make a determination on whether or not a facility is an "oil refinery" or "waste-to-energy" facility under Chapter 343. This description should remain consistent when consulting all appropriate permitting agencies.

Some projects can qualify as an exempt class of action under HAR 11-200-8 or as described in the Exemption List[17] maintained by the lead state or county department (see Exemption Lists By Department). OEQC published a revised Hawaii Environmental Policy Act Citizen's Guide in October 2014. The Citizen's Guide provides a summary of the environmental review process and how it works. It can be downloaded from the OEQC website.[18]

Historic and cultural resources are highly valued in Hawaii. Profitable use of Hawaii's land and renewable energy resources – sun, ocean, wind, streams, geothermal, soil – must be treated with

[17] http://oeqc.doh.hawaii.gov/Shared%20Documents/Forms/AllItems.aspx?RootFolder=%2fShared%20Documents%2fEnvironmental%5fCouncil%2fExemption%5fLists%5fBy%5fDepartment&View=%7bC0C5C897%2d3066%2d4821%2d864E%2d36FB3D77F5D5%7d

[18] http://oeqc.doh.hawaii.gov

utmost respect, which requires extensive consultation with local community members and experts in Native Hawaiian culture. As with NEPA, HRS 343 requires that government give systematic consideration to the environmental, social, cultural, and economic consequences of a proposed action prior to approving construction or operation.

Note: To emphasize the importance of preserving local culture and practices, in 2000, HRS 343 was amended to require EISs to disclose the impacts of a proposed action on the cultural practices of the community and state; often referred to as a Cultural Impacts Assessment or CIA. The law also assures the public the right to comment on projects that may affect their community, and to have those comments meaningfully addressed by the project proponent via response, project modifications, permit conditions, or other mitigation measures.

If a proposed project triggers HRS 343, environmental review typically begins with the development of a Draft EA. However, under Act 172 (2012), termed the 'Direct to EIS' law under HRS 343-5(b), a proposing agency can elect to prepare an EIS without first preparing an EA if it is anticipated that the proposed action is likely to result in a significant impact to the human and natural environment. The 'Direct to EIS' process begins with the preparation of an EIS Preparation Notice (EISPN).

An EA is a concise informational document prepared by the applicant. As with NEPA, there is a 30-day public review period in which the public and other stakeholders are invited to provide comments on the contents of the Draft EA. The Draft EA is revised to address the comments received by the public and other regulatory agencies and then the Final EA is prepared. The approving agency makes a determination of whether or not any significant environmental impacts would occur and can either request the preparation of an EIS or issue a FONSI if there is a finding of no significant impact.

An EIS addresses the project's potential significant environmental impacts, and the associated measures proposed to minimize those impacts. The EIS process commences with the publication of an EISPN in OEQC's bi-monthly bulletin called *The Environmental Notice*. There is a 30-day public comment period for the EISPN, which help to define the scope and appropriate issues for environmental review for each project. The purpose of the EISPN is to initiate the EIS scoping process under HRS 343 and to provide an opportunity for comment by reviewing agencies and the public to ensure the environmental concerns, along with economic and technical considerations, are given appropriate consideration in the decision making process.

The applicant prepares the Draft EIS, incorporating comments received during consultation periods of the Draft EA and the EISPN. The EIS must, at a minimum, describe the proposed action, identify environmental concerns, document and address public input gathered to date, evaluate alternatives, and propose mitigation measures that will minimize adverse environmental impacts (HAR 11-200-17). After the Draft EIS undergoes a 45-day review by the public and government agencies, comments are addressed and the document is issued as a Final EIS. The accepting agency

determines the acceptability of a Final EIS. Publication of the acceptance of the Final EIS in The Environmental Notice initiates a 60-day legal challenge period (HRS 343-7). Unless challenged within this period, the acceptance of the Final EIS ends the HRS 343 review and the action may proceed.

Many agencies will not accept, process, or issue permits until the EA or EIS process is completed and proof of completion may be required.

Application of Federal and State Law

It is not uncommon for both state and federal environmental reviews to be triggered. If a project triggers both NEPA and HRS 343, the two EA or EIS processes can be coordinated through preparation of a joint document that meets the requirements of both the federal and state processes and corresponding public notice and public comment periods. The processing of a joint NEPA-HRS 343 document must be closely coordinated with OEQC and the respective state and federal accepting agencies.

Note: While joining the HEPA and NEPA processes is provided for under HRS 343 and is intended to facilitate the overall review, there are important differences between the two processes that can make separate reviews more practicable and attractive from an administrative standpoint, including: content requirements, public notices and responses, terminology, timelines, and processing. See OEQC's materials for discussion on the differences between the two processes.[19]

Protected Species

Federal Endangered Species Act

The Endangered Species Act (ESA) (16 USC 1531 – 1544) establishes measures to prevent the extinction of fish, wildlife, and plant species. Developers of any type of renewable resource technology where ESA-listed species are present and could be impacted by construction or operation of a proposed project will typically need to comply with regulations promulgated by the USFWS (50 CFR Parts 13 and 17) or the National Oceanic and Atmospheric Administration (NOAA) Marine Fisheries Service (NOAA Fisheries) (50 CFR Parts 226 and 424). The USFWS is responsible for terrestrial and freshwater organisms, while NOAA Fisheries is responsible for marine organisms and anadromous fish.

The ESA has provisions for incidental take of listed species. An "incidental take" is a taking that "is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity" (ESA 10(a)(1)(B)). The Section 7 provisions (ESA 7(a)(2)) require that a federal agency authorizing, funding or carrying out any action that may affect protected species consult with the USFWS and/or NOAA Fisheries.

Note: Where renewable energy projects require a federal approval (such as a USACE individual Section 404 Permit), a Section 7 consultation will occur as part of the federal permit review

[19] http://health.hawaii.gov/oeqc/

process, in addition to the EA process under NEPA. Early consultation with the USFWS and/or NOAA Fisheries to identify potential impacts to protected species can help to minimize liability under the ESA.

The Section 7 informal and formal consultation processes have specific procedures and timelines associated with each process. If a formal consultation process is required by the USFWS and/or NOAA Fisheries, the lead federal agency will submit a Biological Assessment (BA) which is intended to determine whether or not the Federal action is likely to adversely affect a listed species. Consultation can take up to 90 days, after which time the USFWS and/or NOAA Fisheries issues a Biological Opinion regarding the potential effects of the proposed action on threatened and endangered (T&E) species and their habitat. If the agency, at the conclusion of the formal consultation, determines that development of the project is likely to result in an incidental take of a T&E species, the USFWS and/or NOAA Fisheries may issue an Incidental Take Statement (ITS) (see Figure 3 below). The action of issuing the ITS must be considered during the NEPA review required by the federal action.

Section 10 of the ESA establishes permits and exceptions to the prohibited actions listed in Section 9 of the ESA that would constitute harm or take to threatened and endangered (T&E) species. If the developer of a renewable energy project determines that a take is likely to occur and the project is not otherwise subject to Section 7 consultation (because no federal approval or action is required), the developer can apply for an Incidental Take Permit (ITP) from the USFWS and/or NOAA Fisheries, and thus shield itself from liability should a take occur. While the decision to apply for an ITP is within the developer's discretion, if a take attributable to the project occurs and the take has not been authorized by an ITP, the developer would be liable.

To apply for an ITP, the developer must submit a habitat conservation plan (HCP), including proposed requested take levels and mitigation measures (ESA 10 (a)(2)(A)), which are often determined through historical records and extensive (1-year minimum) site field surveys. Since the issuance of an ITP by the USFWS would be a federal action subject to Section 7, an intra-USFWS consultation would be conducted. Approval of the ITP would also require NEPA compliance, and thus preparation of an EA or EIS to accompany the HCP. However, if the USFWS determines that the HCP is "low-effect," the ITP approval would be considered a categorically excluded action and would not require additional review under NEPA. There is not an official timeline associated with issuing an ITP.

Hawaii Endangered Species Law

Hawaii Revised Statues (HRS) 195D-4 states that any species of aquatic life, wildlife, or land plant that has been determined to be a T&E species under the ESA shall be deemed so under this state chapter, as well as any other indigenous species designated by the DLNR as T&E by rule. Both lists must be consulted as DLNR's species list contains species not on the ESA list (e.g., indigenous T&E fauna). The "take" of any T&E species is prohibited by both the ESA and this state statute (HRS 195D-4[e]). Similar to the ESA, HRS 195D-2 defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect endangered or threatened species of aquatic life or wildlife, or

to cut, collect, uproot, destroy, injure, or possess endangered or threatened species of aquatic life or land plants, or to attempt to engage in any such conduct."

Once processed by DLNR's Division of Forestry and Wildlife (DOFAW), BLNR may issue an Incidental Take License (ITL) to permit take otherwise prohibited under subsection 195D-4(e) if the take is incidental to and not the purpose of the carrying out of an otherwise lawful activity. As part of the ITL application process, an applicant must develop, fund, and implement a BLNR-approved HCP to minimize and mitigate the effects of the incidental take. The HCP must also result in a net environmental benefit and increase the likelihood that the species will survive and recover; this requirement is different from the Federal HCP prepared under the ESA.

The Endangered Species Recovery Committee (ESRC), a Hawaii advisory committee created to review all applications and proposals for HCPs and ITLs, makes recommendations to the BLNR as to whether or not to approve, amend, or reject the HCP or ITL. The ESRC reviews the Draft HCP during the public review period and reviews the Final HCP. The ESRC typically meets quarterly or on an as-needed basis. The required components of a state HCP are listed in HRS 195D-21.

Application of both Federal and State Endangered Species Laws

If listed species are a concern for a proposed project, both federal and state laws typically apply as the Hawaii ESA includes all federally-listed species in addition to other species. If the ESA is addressed via Section 7, a BA and accompanying NEPA/HRS 343 EA or EIS is prepared for the USFWS and/or NOAA Fisheries and DOFAW. If the ESA is addressed through a Section 10 permit, a joint federal/state HCP and NEPA/HRS 343 EA or EIS is prepared in cooperation with both USFWS and/or NOAA Fisheries and DOFAW, and each agency issues its own incidental take authorization.

The Marine Mammal Protection Act of 1972 (as amended 2007)

The Marine Mammal Protection Act of 1972 ([MMPA] 16 USC 31) provides incidental take authorizations for maritime activities, provided NOAA Fisheries finds the taking would be of small numbers and have no more than a "negligible impact" on those marine mammal species not listed as depleted under the MMPA (i.e., listed under the ESA), and not having an "unmitigable adverse impact" on the availability of the species for subsistence uses. There are two types of incidental take authorizations: Incidental Harassment Authorization (IHA) and Letter of Authorization (LOA).

An IHA is applicable when the proposed action results in "harassment" only (i.e., injury or disturbance). IHAs tend to be short-term activities that might inadvertently harass marine mammals. An applicant needs to show there is no potential for serious injury or mortality; or the potential for injury or mortality can be negated through mitigation. This program allows authorizations to be issued in 120 days and IHAs are effective for up to one year.

If there is potential for serious injury and/or mortalities, and there are no mitigating measures that could be taken to prevent the "take" from occurring, then the applicant must obtain an LOA, and no incidental take is authorized until the LOA is issued. LOAs are applicable when the proposed action is planned for multiple years. LOAs can take 8-18 months to be issued.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act ([MBTA] 16 USC 703-712) is distinct from the ESA because it protects migratory bird species that are not necessarily threatened or endangered. Over 800 species of migratory birds are protected by the MBTA (50 CFR 10.13). The MBTA forbids anyone "at any time, by any means, or in any manner, to pursue, hunt take, capture, kill [or] any part, nest, or eggs of any such bird…." (16 USC 703(a)). The USFWS implements and enforces the MBTA.

Note: Several activities related to the development of renewable energy projects, including site clearing and wind turbine operation (for wind energy projects), must demonstrate compliance with the MBTA. Consultation with the USFWS regarding MBTA compliance and permitting can happen concurrently with the USFWS review of impacts on protected species under the ESA.

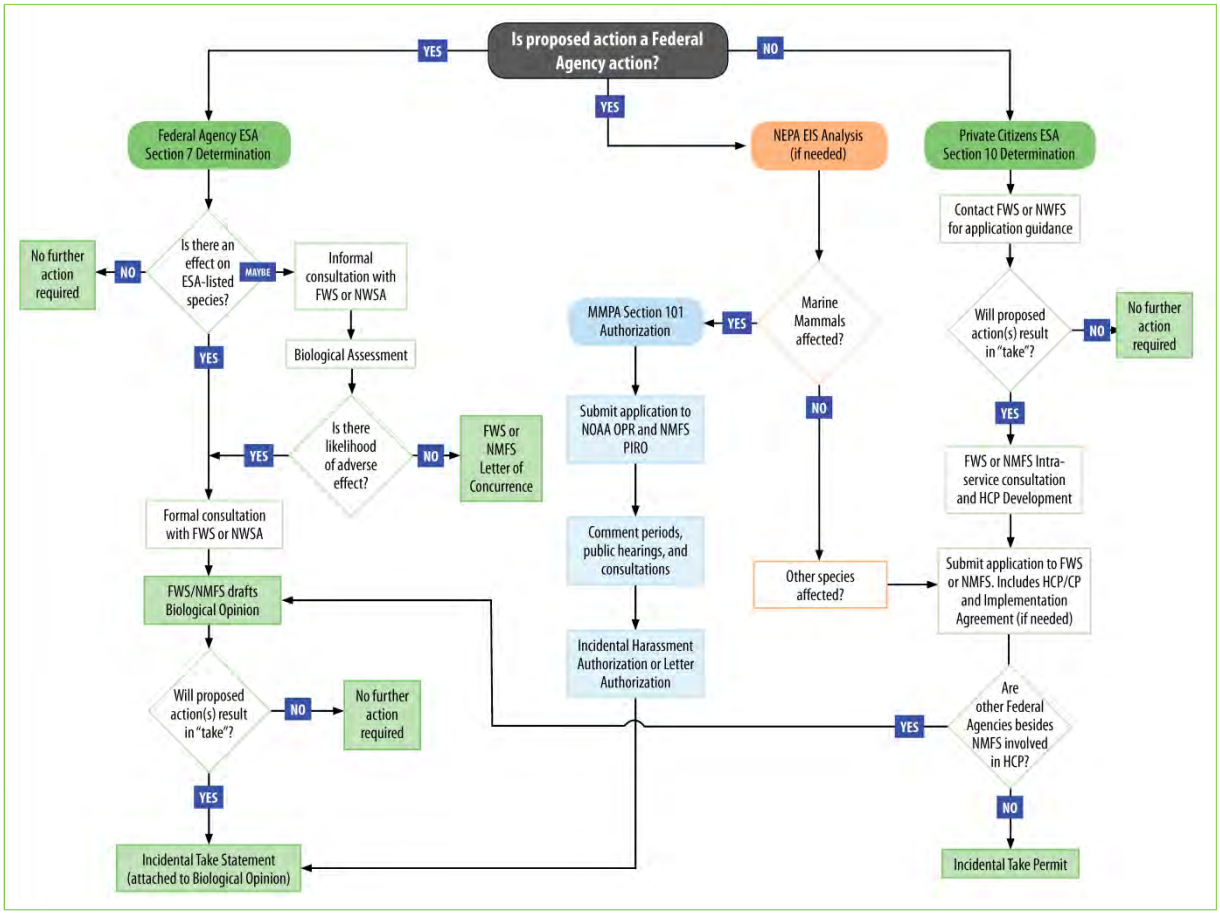
The MBTA does not provide for permits to cover incidental impacts from the construction or operation of a project, and unlike an ITP under the ESA, knowledge or intent is not required to be liable under the MBTA (16 USC 707(a)). Courts have held that even the accidental killing of a migratory bird can be a violation of this law. Proactive measures, such as involving the USFWS early in project development, would minimize the risk of mortality and avoid the potential for enforcement. Figure 3 depicts the coordination of the ESA, MMPA, and NEPA processes in order to determine the actions required by the permitting agencies.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Steven Fishery Conservation and Management Act ([MSA] 16 USC 1801-1884) provides for the conservation and management of the nation's fishery resources through the preparation and implementation of fishery management plans. The MSA also mandates that NOAA Fisheries coordinate with and provide information to federal agencies to further the conservation and enhancement of essential fish habitat (EFH). Federal agencies must consult with NOAA Fisheries on any action that might adversely affect EFH.

The Energy Policy Act of 2005 expanded the authority of the Department of Interior, who in turn appointed the Minerals Management Service (now the Bureau of Ocean Energy Management [BOEM]) to issue leases, easements and rights-of-way (ROWs) to allow for alternate use and alternative energy development on the Outer Continental Shelf (OCS). More information about BOEM is herein. In 2009, regulations governing BOEM's OCS Renewable Energy Program were finalized (30 CFR 585). These regulations include a provision (585.803) that requires conservation recommendations to avoid or minimize adverse effects on EFH that are adopted by BOEM be incorporated as terms and conditions in the commercial lease and, furthermore, must be adhered to by the applicant. BOEM may require surveys to define boundaries and avoidance distances from pinnipeds and marine mammals.

Figure 3. Coordination of ESA, MMPA, and NEPA Processes



http://www.nmfs.noaa.gov/pr/laws/more.htm

Water, Air, Noise, and Solid Waste

Water

The Clean Water Act ([CWA] 33 USC 1251-1387) and the Rivers and Harbors Act of 1899 ([RHA] 33 USC 403) are the two primary federal acts that govern water resources. The CWA has a broad goal of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. Among other things, the CWA establishes the basic structure for regulating discharges of pollutants and other materials into the waters of the United States and managing potentially polluted stormwater runoff.

Note: In particular, renewable energy projects may be subject to Water Quality Certification under Section 401 of the CWA and permit requirements under Sections 402 and 404 of the CWA.

CWA Section 404 Discharge of Dredged or Filled Material and RHA Section 10 Permit

Regulated waters of the United States under the CWA include navigable surface waters and other associated waters and wetlands. However, USACE and the US Environmental Protection Agency (EPA) have recently proposed a rule defining the scope of "waters of the United States" protected

under the CWA.[20] Section 10 of the RHA requires USACE approval prior to the accomplishment of any work in or over navigable waters of the United States, or which affects the course, location, condition or capacity of such waters. Section 404 of the CWA (33 USC 1344(a)) regulates the discharge of dredged or fill material into waters of the United States, including wetlands. The USACE manages, administers, and issues permit decisions for the regulatory program for Section 404 of the CWA (33 CFR 323) and Section 10 of the RHA (33 CFR 322).

Note: Examples of renewable energy-related activities that might require a Section 404/Section 10 Permit for the removal or fill of material or the placement of structure into waters of the United States include, but are not limited to, underwater trenching or tunneling (e.g., horizontal directional drilling), anchoring to the seafloor, clearing and grading, construction of offshore wind turbines (e.g., foundations), building project infrastructure such as offshore substation, access roads and collection systems, and performing road work, such as culvert replacements or intersection improvements.

If a project will involve construction that would directly impact waters or wetlands subject to regulation under the CWA, a Section 404 Permit would likely be required. The USACE District Office in Hawaii makes the final determination as to whether a water body or wetland is jurisdictional and whether the proposed activity requires a permit. If a permit is required, the USACE may issue either a general (national or regional) permit or an individual permit. An individual permit is required for activities that have the potential to significantly impact surface waters and wetlands or if there is no general permit that covers the proposed activity. The review process for an individual permit application can take 6 to 12 months or longer and typically triggers NEPA review and preparation of an EA or EIS.

General permits apply to discharges that have only minimal adverse impacts. The USACE issues general permits on a nationwide and regional or state basis. General permits eliminate the need for individual permits and are usually pre-certified under Section 401. There are currently 50 Nationwide Permits[21] (NWPs) that address specific types of construction activities. NWPs are reissued every 5 years and were last issued in 2012, including NWP 51 for land-based renewable energy generation facilities, NWP 12 for utility line activities, and NWP 14 for linear transportation crossings (roads). Proposed work must satisfy the NWP criteria (e.g., limits on the area of project disturbance). Under some circumstances, both NWP 12, 14 and 51 may require the applicant to submit a Preconstruction Notification to the USACE. It can take 45 to 90 days to complete the NWP process.

CWA Section 401 Water Quality Certification

Water Quality Certification under Section 401 of the CWA sets out the conditions that are necessary to ensure that a proposed project will comply with state water quality standards and other appropriate requirements of state law. This process gives individual states the authority to review

[20] *See* http://www2.epa.gov/sites/production/files/2014-06/documents/proposed_regulatory_wus_text_40cfr230_0.pdf for the proposed "Definition of 'Waters of the United States' Under the Clean Water Act" 40 CFR 230.3.
[21] USACE's list of Nationwide Permits is numbered 1 through 52; however, numbers 26 and 47 are "Reserved," and do not represent active permit categories.

projects that require federal approval (such as a permit or license) and that might result in a discharge to state waters, including wetlands. Section 401 review is a requirement of issuance of individual wetland permits under Section 404.

The EPA has primary authority under Section 401, but authority is often delegated to a state agency. In Hawaii, the Hawaii Department of Health (HDOH), Clean Water Branch is delegated with the authority to issue a Water Quality Certification and to enforce Hawaii's water quality standards contained in HAR 11-54.

In general, Section 401 review is conducted at the same time as the federal agency review of the Section 404 Permit that triggers the 401 Certification. Regardless of whether a 401 Water Quality Certification is required, the applicant must show compliance with state and federal water quality criteria and must consult with HDOH and USACE.

CWA Section 402 National Pollutant Discharge Elimination System

The National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. There are different permit programs for different stormwater sources including: construction activities, industrial activities, and other activities. EPA has delegated its authority to implement the NPDES program to HDOH Clean Water Branch (HRS Chapter 342D, HAR 11-54 and 11-55).

Stormwater Permits for Construction Activities

Pursuant to Section 402 of the CWA, a NPDES General Stormwater Permit for Construction Activities (CGP) is required for any land disturbance equal to or greater than 1 acre (including smaller sites that are part of a larger common plan of development). Hawaii CGPs incorporate, at a minimum, the requirements of the federal CGP. If the state determines that the protection offered by the CGP is inadequate, EPA or HDOH can require that a project obtain an individual Stormwater Permit for Construction Activities if the site is particularly large or located in sensitive areas.

If construction activities are eligible for coverage under a CGP, a Stormwater Pollution Prevention Plan (SWPPP) must be prepared in accordance with the CGP that provides for procedures to implement and maintain best management practices to protect water resources. SWPPPs can typically incorporate by reference plans and procedures required under other laws or regulations such as a Spill Prevention, Control, and Countermeasure Plan. The notice of intent or application must be complete and acknowledged by the EPA or the HDOH prior to discharging stormwater from construction activities. Developers should confirm the deadlines.

Stormwater Permits for Industrial Activities

Some renewable energy facilities – e.g., bioenergy, geothermal, waste-to-energy – may need a General Permit coverage for discharge of industrial stormwater to cover operations, pursuant to HAR 11-55 and 40 CFR 122. As defined in 40 CFR 122.26(b)(14), stormwater discharge associated with industrial activity includes but is not limited to runoff from industrial plant yards; on-site access roads used by carriers of raw materials, waste materials, or by-products used or created by

the facility; materials handling sites; refuse sites; sites used for application or disposal of process waste water; sites used for storage and maintenance of material handling equipment; or other areas where stormwater may pick up and convey industrial pollutants. 40 CFR 122 includes a list of categories of facilities considered to be engaging in industrial activities, for the purposes of determining permit applicability.

Note: Industrial stormwater discharges are covered under a different General Permit than construction strormwater discharges.

Other Water Discharges

If a non-stormwater-related discharge is planned, an individual NPDES Permit to cover the discharge must be obtained from EPA or HDOH. Applications for a new discharge must be filed at least 180 days in advance of the anticipated first discharge. Typically, work on such an application should begin at least 3 to 6 months before the application due date (i.e., 9 to 12 months before the first discharge).

Hawaii DLNR Commission on Water Resource Management

DLNR's Commission on Water Resource Management (CWRM) is responsible for administration of the State Water Code. CWRM's general mission is to protect and enhance the water resources of the state through wise and responsible management. The definition of "waters of the state" is broad: "any and all water on or beneath the surface of the ground, including natural or artificial watercourses, lakes, ponds, or diffused surface water and water percolating, standing, or flowing beneath the surface of the ground" (HRS 174C-3). Surface water protection is administered by the Stream Protection and Management (SPAM) Branch (HRS 174C and HAR 13-168, 13-169, 13-171), in coordination with the HDOH Clean Water Branch. See CWRM's "Application & Forms" website for guidance on the individual CWRM processes and approvals, and to obtain the application forms.[22]

The SPAM Branch issues the following permits:

Stream Channel Alteration Permit

A Stream Channel Alteration Permit (SCAP) is required for any temporary or permanent activity within the stream bed or banks that may:

- Obstruct, diminish, destroy, modify, or relocate a stream channel;
- Change the direction of the flow of water in a stream channel; or
- Remove any material or structure from a stream channel.

SCAPs are issued jointly with USACE Section 404 of the CWA permits.

Stream Diversion Works Permit

A Stream Diversion Works Permit (SDWP) is required for the removal of water from a stream into a channel, ditch, tunnel, pipeline, or other conduit for off-stream purposes including, but not limited

[22] http://dlnr.hawaii.gov/cwrm/info/forms/

to, domestic, agricultural, and industrial uses. Construction of a new stream diversion structure or alteration of an existing structure requires an SDWP.

Note: Instream Flow Standard Amendments typically go with new Stream diversion Works Applications.

Surface Water Use Permits

Any person who is making, or who proposes to make a withdrawal, diversion, impoundment, or consumptive use of surface water within a state Water Use Management Area will be required to apply for a Surface Water Use Permit from the CWRM. These permits are only required if a project site is located within a state Water Use Management Area. Currently the only state Water Use Management Area is on Maui.

Note: Water use permits for ground and surface water are subject to contested case processes, which can have indefinite timelines.

Well Construction and Pump Installation Permit

A Well Construction and Pump Installation Permit is required for drilling of new or modification of permanent monitor wells or production wells and for the installation of pumps.

Note: Board of Land and Natural Resources (BLNR) approval may be required for all of these permits.

Hawaii Department of Land and Natural Resources, Engineering Division, Dam Safety Program

The Dam Safety Program within DLNR's Engineering Division has regulatory jurisdiction of over 130 dams and reservoirs located throughout the state, over 80% of which were constructed before 1940 to support Hawaii's sugar cane industry. Because of the age of these facilities, and the waterways attached to them, dam and reservoir regulation is a key consideration for all renewable energy projects that could utilize this infrastructure; i.e., biomass and biofuel facilities, hydropower plants, pumped storage projects.

Hazard classification (dam break) studies are being conducted for all regulated dams in the State in partnership with the Pacific Disaster Center and the U.S Army Corps of Engineers. These studies use hydraulic modeling techniques to predict modes of possible dam failures due to extreme loading scenarios. The studies generate profiles of water level inundation in potentially affected downstream areas. Although they incorporate the best available data and methodologies, the results are still approximations. Final reports are submitted to the owners for their use in developing or updating Emergency Action Plans. Individual facility Emergency Action Plans are required by Hawaii State Law (§179D-30) to be prepared by the owner of each High Hazard Potential and Significant Hazard Potential dam in the state. By law, Emergency Action Plans are to be provided to the Dam Safety Program as well as the State and County emergency management agencies. The emergency management agencies can then use these Emergency Action Plans to develop emergency response plans and evacuation routes.

DLNR's online Dam Safety Inventory System enables users to obtain information on individual dams and reservoirs throughout the state.[23]

Air

Clean Air Act

The HDOH, Environmental Management Division, Clean Air Branch (CAB) is responsible for air pollution control in the state. The activities of the Clean Air Branch are authorized and directed by the federal Clean Air Act amendments and associated federal regulations; HRS 342B, Air Pollution Control; HAR 11-59, Ambient Air Quality Standards; and HAR 11-60.1, Air Pollution Control.

Pursuant to these regulations, an Air Pollution Control (APC) Permit is required prior to construction, reconstructing, modifying or operating a stationary air pollution source or air pollution control equipment.

Note: An APC Permit would be necessary for a waste-to-energy conversion plant, a geothermal energy plant, and a biofuel/biomass refinery or power plant. An APC Permit is also required for the use of a concrete batch plant, a potential need during project construction.

In the unlikely event a proposed project is located in Haleakala National Park or Hawaii Volcanoes National Park, a "Prevent Significant Deterioration of air quality" is also required in conjunction with the APC Permit. The intent of this process is to assure that high quality air is maintained in our National Parks. To meet the federal and state regulations, the National Park Service (NPS) Federal Land Manager must be consulted regarding possible sources of air pollution that may affect (generally within 300 km) HI Class I areas (Haleakala National Park and Hawaii Volcanoes National Park) or those sources that are in proximity to Class II areas. Air quality modeling analyses may be required to demonstrate park units are protected from air pollution effects.

Noise

Community Noise Control

The HDOH Noise Section of the Indoor and Radiological Health Branch (IRHB) regulates noise under HAR 11-46, Community Noise Control. This statue limits sound generated by new or expanded developments. It regulates construction activity as well as operations. The combined total of the ongoing maintenance and routine operations are subject to the sound level limits. It is not applicable to most moving sources (i.e., transportation and vehicular movements).

The land use (zoning) district in which the facility is located and the time of day determine the noise limits for stationary sources in Hawaii. HAR 11-46-3 identifies three classifications that land use districts fall within: Class A (generally includes residential and open space uses), Class B (generally includes apartment, commercial, hotel, resort uses), and Class C (generally includes agriculture and industrial uses). Class A has the lowest allowable noise limit, and Class C the highest. Different noise limits apply during daytime and nighttime for Class A and B receivers, while

[23] http://132.160.239.52/daminventory/

the limit for Class C receivers does not vary. As most renewable energy projects are located in the agricultural or industrial zoned land use districts, the Class C maximum permissible sound level of 70 decibels would apply to most project. Noise levels are measured at the property boundary of the proposed facility or activities to be permitted.

The HDOH Noise Section administers several permits related to noise impacts. A Noise Permit would allow an exceedance of the maximum allowable noise limits for construction, stationary sources, and agricultural and industrial activities. A Noise Variance would allow an exceedance of the noise limits for construction activities outside of normal permitted hours (7AM to 6PM, Monday through Friday and 9AM to 6PM, Saturday). The Variance typically triggers the need for a public hearing.

Note: HSEO recommends that a Noise Assessment be conducted for all projects with potential to generate noise near the regulated levels. This assessment is typically attached to an EA or EIS for the project, if needed, or may be attached to other permits (e.g., Conditional Use Permit). Developers of renewable energy projects should consider noise impacts and associated mitigation measures to ensure compliance with applicable noise regulations.

Hawaii counties that elect to enact noise standards more stringent than state thresholds are charged with enforcement.

Solid and Hazardous Waste

Solid and Hazardous Waste Management

The HDOH, Environmental Management Division, Solid and Hazardous Waste Branch (SHWB) oversees management of all solid and hazardous waste generated within the state through the promotion of pollution prevention and waste minimization activities, and the development of partnerships with both generators and the regulated community. There are several permits, approvals, or documentation requirements that may apply to renewable energy projects and associated feedstock facilities (i.e., landfills, processing areas).

Note: Proponents of waste-to-energy, biofuels, biomass, and other facilities requiring a Solid Waste Management Facility or other similar permit from HDOH SHWB will be required to provide specific information on the types of materials to be handled and the methods of handling, including the amount, consistency, management, and disposal of any facility residues (i.e., ash, slag, leachate). Developers who can provide information (test results, modeling) from existing operational facilities similar to that being submitted for permitting can facilitate the project review process.

Consult HDOH on the EPA's role on the processing and review of SHWB permits needed for your facility. Finally, new waste-to-energy facilities should be considered as part of the region's overall waste management system to help flush out other issues that could impact the review and approval of a proposed facility (e.g., impacts on tipping fees, existing waste management handlers and landfills, feedstock transport).

Note: For complex facilities with various types on inputs and outputs, it may be helpful early in the permitting stage to make a list of all materials going in and out of the facility, including

quantity/volume and method of materials movement (e.g., pipeline, truck, etc.). Such a list will help identify the types of permits required.

Underground Storage Tanks

The HDOH SHWB Underground Storage Tank Section regulates underground storage tanks (USTs), in cooperation with the HDOH Office of Hazard Evaluation and Emergency Response (HEER). Consult HDOH SHWB regarding UST requirements (i.e., double-walled, leak detection/monitoring, etc.).

Contaminated Properties

Comprehensive Environmental Response, Compensation and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (authorized by 42 USC 9601 to 9675) is the principal federal statute that governs liability with respect to contaminated properties. Even if a proposed site appears relatively pristine (e.g., agricultural or vegetated lands), there may be historical contamination of soil, surface water, and groundwater from prior uses such as application of pesticides, polychlorinated biphenyls (PCBs) from transformers, leaking oil tanks, or illegal dumping.

CERCLA may hold a landowner or operator of a renewable energy project liable for the costs to remediate environmental contamination, regardless of culpability. These cleanup costs can exceed the cost of the property or the value of the investment, and can attach to anyone in the chain of title (unless a liability exemption applies). Even as a lease holder, project developers could be held liable for pre-existing contamination on the property leased in certain scenarios, particularly if their construction or operation activities contribute to, or exacerbate, existing conditions.

For protection against such liability, a developer may choose to perform a screening level assessment and/or an environmental site assessment prior to acquisition of the property to identify any pre-existing environmental contamination. Also, if the project is being financed, such assessments are almost always required by the lender or investors. Lenders are particularly sensitive to liability associated with environmental contamination and typically require a minimum level of assessment prior to providing financing.

Screening level assessments and environmental site assessments are performed under the American Society of Testing and Materials standards. The screening level assessment is a questionnaire designed to establish whether there are historical uses that raise the possibility of environmental conditions existing on the property. The Phase 1 EA is a non-intrusive investigation into historic uses of a site and visible evidence of environmental conditions based on publicly available records and sources of information.

Hawaii Contaminated Properties Regulation

The primary state authority governing response to contaminated sites is the Hawaii Environmental Response Law (HERL) Chapter 128D of the HRS. It is fashioned after CERCLA. Under HERL the

HDOH HEER Office is responsible for responding to both emergency and non-emergency hazardous substance releases. The procedures by which the HEER Office responds to hazardous substance releases under the HERL are described in a set of administrative rules known as the Hawaii State Contingency Plan, HAR Title 11, Chapter 451.

Archaeological and Cultural Resources

The National Historic Preservation Act

The National Historic Preservation Act of 1969 ([NHPA] 16 USC 470) is the basis for current national policy on cultural resource issues and historic preservation. The NHPA promotes historic preservation, which includes "the protection, rehabilitation, restoration and reconstruction of districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, or culture" (16 USC 470). The NHPA created the National Register of Historic Places (NRHP) and requires federal agencies to take into account the effects of their undertakings on properties listed or eligible for listing on the NRHP. If a federal action is required for a project (e.g., permits, financial assistance, or use of federal lands), the lead federal agency must comply with Section 106 of the NHPA. The Advisory Council on Historic Preservation (ACHP) has identified procedures to be followed by federal agencies to comply with Section 106 at 36 CFR 800. If no federal permits are required, developers may nevertheless be required to comply with the state's process for addressing cultural resources issues.

Note: Whether guided by the federal or state process, a renewable energy developer will likely be required to carry out studies necessary to provide information that will allow agencies to understand if a proposed project may have an effect on historic properties. Prior to implementing studies, a project on federal or state lands may need to obtain a permit under the Archaeological Resources Protection Act of 1979 (16 USC 470aa et seq.).

Hawaii Historic Preservation Program

All projects must survey their sites for archaeological, cultural, and historic properties. It is the project developer's responsibility to ensure compliance with HRS 6E, HAR 13, and HRS 343, or risk interruptions to project construction or operation should unpermitted impacts be discovered during development or operation.

Project proponents should voluntarily consult with the State Historic Preservation Division (SHPD) within DLNR during the early due diligence period to determine HRS 6E compliance needs; this due diligence can help prevent a surprise discovery of significant artifacts or sites, which can halt a project indefinitely until resolved. HRS 6E compliance will typically start with a review of the historic documents relating to the project site, then a ground survey of the site, followed by a plan to mitigate and preserve identified sites; avoiding, them where feasible and relocating, or isolating them where avoidance is not feasible. Certain permits to regulate activities that can disturb historic sites – e.g., building, grading, grubbing permits – prompt the permitting agency to route the permit application through SHPD for review.

Each island in Hawaii has an Island Burial Council consisting of members generally recommended by the Office of Hawaiian Affairs (OHA) and appointed by the Governor for four year terms. The Island Burial Councils play a crucial role in the care of iwi kupuna (ancestral remains) found in Native Hawaiian burial sites. Burial Council members typically meet on a monthly basis on their respective island(s) to:

- Determine whether previously identified Native Hawaiian burial sites will be preserved in place or relocated.
- Assist SHPD in developing an inventory of Native Hawaiian burial sites.
- Make recommendations regarding appropriate management, treatment, and protection of Native Hawaiian burial sites, and on any other matters related to Native Hawaiian burial sites.

Note: If ancestral remains are encountered during construction, any further project construction can be halted until the remains are appropriately handled.

Projects with historic sites should work with stakeholders to preserve access, maintain cultural areas, and/or otherwise preserve identified resources. If a project site somehow blocks or disturbs frequently used access routes, notwithstanding if these access routes are illegal, project proponents should seek an amicable solution to preserve access, while mitigating landowner liabilities.

In Hawaii, there are many old military sites considered historic properties, particularly around Pearl Harbor on Oahu. As with historic Hawaiian sites, developers should work with local stakeholders to preserve and allow access to sensitive historic sites within a project area. Also as the NPS manages many of Hawaii's National Historic Landmarks, voluntary consultation with NPS, will be helpful to inform project siting and development. Any potential project should consider both direct and indirect impacts to NPS sites, including properties that are National Historic Landmarks or listed on the National Register of Historic Places.

In addition to protecting the archaeological and historic features impacted by a proposed project, developers required to undergo the HRS 343 environmental review process, must also identify and mitigate against impacts to the cultural practices of the community. As discussed earlier, Hawaii law requires OHA approval of cultural assessments included in HRS 343 environmental review documents.

Protection of Hawaii Cultural Resources

In addition to protecting the archaeological and historic features impacted by a proposed project, developers must also identify and address all impacts to Hawaii's cultural resources. Consultation with OHA (Compliance Enforcement Office), the Native Hawaiian Historic Preservation Council, and other cultural practitioners must occur early in the project siting and due diligence stages. Consultation with these entities can also help identify and address differing views that may be shared by separate cultural practitioners.

There are 43 recognized moku, or land divisions, in Hawaii. Dating back to the 9th Century and handed down through oral history and generational knowledge, the Aha Moku System was proven

to sustain the natural ecosystem and environment of Hawaii. It is a site-specific and resource based methodology that balances land and ocean resources needed to sustain healthy thriving communities; interconnecting the clouds, forests, valleys, land, streams, fishponds and sea within a designated area. Moku boundaries acknowledge the natural contours of land, the specific resources located within those areas, and the methodology necessary to sustain resources and the community. The Aha Moku System uses a foundation based on Native Hawaiian generational knowledge that ensures a community consultation process focused on the health and welfare of Hawaii's natural and cultural resources.

Through the combined efforts of elder and younger Native Hawaiian resource practitioners in each moku, the Aha Kiole Advisory Committee restored the Aha Moku System of land and ocean resource management. In 2012, the Hawaii Legislature formally recognized the Aha Moku System of land management and established the Aha Moku Advisory Committee (AMAC) within DLNR. AMAC advises the Chairperson of BLNR on issues related to land and natural resources management through the Aha Moku System, a system of best practices that is based upon the indigenous resource management practices of site-specific moku boundaries.

Note: HSEO recommends developers consult AMAC early in the siting process and seek out recognized practitioners within the moku sought for development.

Developers required to undergo the HRS 343 environmental review process, must also identify and mitigate against impacts to the cultural practices of the community. As discussed earlier, Hawaii law requires OHA approval of cultural assessments included in HRS 343 environmental review documents.

Note: It is important for all cultural impacts to be addressed in the draft stage of the HRS 343 process to ensure the Draft EA or Draft EIS thoroughly discusses the cultural impacts and proposed mitigation measures. Even where HRS 343 does not apply, project proponents should consult with OHA to identify potential cultural issues early in the project development phase and work with stakeholders to mitigate any potential impacts to cultural resources. Cultural impacts may include, but are not limited to, interference with the visual or communicative connection between multiple cultural sites, restricted access to cultural sites, destruction or relocation of cultural resources (e.g., relics, geographic structures, animals), and the use of cultural sites.

Where Both State and Federal Regulations Apply

As described above, if federal funds are involved, or if there is potential effect to a National Historic Landmark, or another federal nexus occurs, Section 106 of the NHPA may be invoked. Section 106 requires assessment and consultation on potential effects on historic resources as part of project review under NEPA. Consultation under the NHPA is a separate process than SHPD's historic preservation review process; however, the efforts involved with both may have some overlap. For example consultation may consist of phone calls, e-mails, and meetings with interested parties such as the OHA, Historic Hawaii Foundation, Native Hawaiian Legal Corporation, the applicable Island Burial Council, recognized lineal and cultural descendants of the project area, and other native

organizations. The information from these consultations is necessary for various components of both the state and federal process.

Other Permits

Federal Permits

Coastal Zone Management Act

The Coastal Zone Management Act of 1972 ([CZMA] 16 USC 1451 et seq.) provides a formal structure to address the challenges of continued growth in coastal areas. The CZMA is administered by NOAA and the goals of the CZMA are to "preserve, protect, develop, and where possible, to restore or enhance the resources of the Nation's coastal zone" (16 USC 1452(1)). The federally-approved Hawaii Coastal Zone Management Program is implemented by the Hawaii Office of Planning and is described below under the state section.

US Coast Guard Vessel and Waterways Regulation

The US Coast Guard (USCG) is responsible for regulating and coordinating the marine navigation community, including the use of Hawaii's commercial harbors and waterways, and the use of the seafloor for placing cables, pipes, anchors, etc. This includes the regulation of vessels and waterways under USCG jurisdiction, and supporting the enforcement of other federal approvals (e.g., CWA, ESA) for activities conducted within USCG jurisdiction, including discharges from marine vessels. Permits and approvals are required for both marine vessels (Certificate of Inspection) and cargo. In coordination with other federal regulatory agencies and the US Department of Defense, USCG also oversees the security of Hawaii's harbors under the Marine Transportation Security Act (MTSA) and other federal regulations.

As part of its review and approvals process, waterway analysis studies may be required by USCG, as well as assessments of a proposed action on surrounding harbor uses (i.e., setback requirements for hazardous materials, impacts to flightpaths, shipping lanes, and waterways). Depending on the cargo and vessel, USCG may also require Pollution Response Plan or a Security Response Plan. Typical harbor users coordinated by USCG include Hawaii ocean safety teams, harbors user groups, Hawaii Commodores Association, fishing vessel fleets (Western Pacific Regional Fishery Management Council), and the state Division of Boating and Ocean Recreation (DOBOR).

Note: The USCG office in Hawaii is a primary agency to consult for any projects requiring marine transport or construction.

Department of Interior's Bureau of Ocean Energy Management Regulations for Offshore Development

Outer Continental Shelf Renewable Energy Project Leases, Rights-of-Use and Easement, and Rights-of-Way

The Department of the Interior (DOI), pursuant to the Outer Continental Shelf Lands Act (OCSLA), has the authority to manage submerged lands on the outer continental shelf (OCS), an area which

includes all submerged land and the seabed beyond state waters (3 nautical miles) out to 200 nautical miles. OCSLA was amended in part by the Energy Policy Act of 2005, which expanded the DOI's authority to grant a lease, easement, or right-of-way on the OCS for the production, transportation, and transmission of renewable energy resources. The DOI delegated that authority to the former Minerals Management Service, now BOEM, who in turn, on April 22, 2009, promulgated final regulations implementing this authority at 30 CFR 585. OCS leases cannot be issued within any unit of the National Park System, National Wildlife System, National Marine Sanctuary System or National Monument.

Three types of leases are granted by BOEM for offshore renewable energy projects in federal waters: research leases, limited leases, and commercial leases. Applicants must submit a site assessment plan (SAP) for limited leases (5-year term) which allow for the use of the OCS for site assessment and technology testing activities, such as the installation of a meteorological tower or buoy, testing of new deep water turbine technology as part of a pilot project, and environmental and geophysical surveys. However, holding a limited lease does not guarantee the rights to a commercial lease at that site. Commercial leases (25-year term) provide full rights to use the OCS for energy production and generation. These leases include project easements that are necessary for transmission cables and lines associated with a project. The information obtained in the SAP during the limited lease period will inform the construction and operations plan (COP) which is necessary for submittal for a commercial lease. In the COP, applicants must describe the overall site investigation results, offshore and onshore support required for the project (e.g., ports, transportation vessels), any proposed mitigation and monitoring and lease stipulation compliance, design, fabrication, installation and operations concepts, and decommissioning and site clearance concepts. Applicants eligible for research leases include federal agencies, state agencies and universities that have legal standing of a state agency.

Additionally, BOEM may issue two types of grants: a Right-of-Way (ROW) and Right-of-Use and Easement (RUE). An ROW grant authorizes the installation of cables, pipelines, and associated facilities that involve the transportation or transmission of electricity or other energy product from renewable energy projects on the OCS. An RUE grant authorizes the construction and maintenance of facilities or other installations on the OCS that support the production, transportation, or transmission of electricity or other energy product from any renewable energy resource.

After an application for a ROW grant is submitted, BOEM will publish a public notice, describing the parameters of the project, to give affected and interested parties an opportunity to comment on the proposed ROW grant and to determine if there is a competitive interest in developing that same ROW (30 CFR 585.307). If BOEM determines that there is no competitive interest in a ROW grant, BOEM works with the applicant to establish the terms and conditions for the grant and to develop a General Activities Plan (GAP). If BOEM determines there is a competitive interest in the project, BOEM will publish a notice of each grant auction in the Federal Register describing auction procedures, allowing interested persons 30 days to comment, and conduct a competitive auction for issuing the ROW grant (30 CFR 585.308). For a ROW grant issued competitively, the GAP must be submitted within 6 months of issuance (30 CFR 585.640(b)).

The applicant must receive BOEM approval of the GAP before beginning any of the approved activities on the ROW. Similar to a COP, a GAP describes the proposed construction, activities, and conceptual decommissioning plans for all planned facilities, including testing of technology devices and onshore and support facilities that the applicant will construct and use for the project. More specifically, the GAP must demonstrate that the applicant has planned and is prepared to conduct the proposed activities in a safe manner that minimizes potential for impacts to resources. The GAP serves as the NEPA compliance document for the project.

A permit from the USCG will be necessary for offshore wind turbines where each turbine should be lit, individually marked, and maintained as Private Aids to Navigation per USCG Aids to Navigation requirements (33 CFR 66.01). Additionally, developers should submit a request to the USCG for publication of a Local Notice to Mariners prior to the start of any in-water work. Copies of all USCG communications should be provided to the BOEM and others as required.

The National Park Service may have some overlapping jurisdiction in state waters and should be consulted when seeking an undersea right-of-way.

Federal Energy Regulatory Commission

The Federal Energy Regulatory Commission (FERC) regulates the inter-state transmission of electricity, natural gas, and oil. FERC also reviews proposals to build liquefied natural gas terminals and inter-state natural gas pipelines as well as licensing hydropower and MHK projects. Among other responsibilities, FERC is responsible for:

- Regulating the transmission and wholesale sale of electricity in inter-state commerce;
- Regulating the transmission and sale of natural gas for resale in inter-state commerce;
- Approving the siting and abandonment of inter-state natural gas pipelines and storage facilities;
- Reviewing the siting application for electric transmission projects under limited circumstances; ensuring the safe operation and reliability of proposed and operating liquefied natural gas terminals;
- Licensing and inspecting private, municipal, and state hydroelectric projects under FERC jurisdiction;
- Protecting the reliability of the high voltage inter-state transmission system through mandatory reliability standards; enforcing FERC regulatory requirements through imposition of civil penalties and other means; and,
- Overseeing environmental matters related to natural gas and hydroelectricity projects and other matters.

There are a number of testing facilities underway or proposed for MHK projects in Hawaii (e.g., University of Hawaii, Hawaii Undersea Research Laboratory, School of Ocean and Earth Science and

Technology, and Natural Energy Laboratory of Hawaii Authority). A FERC pilot project license is necessary for developers to undertake such technology testing activities. Developers operating MHK projects at a commercial scale in either state waters or beyond state waters are required to obtain both a license from FERC as well as a lease from BOEM.

Note: Many hydropower projects in Hawaii do not require a FERC license as they do not meet the following criteria for FERC jurisdiction: (1) the facility is located on navigable waters of the US; (2) the facility occupies public lands; (3) the facility is located on a body of water over which Congress has Commerce Clause jurisdiction; or, (4) the facility affects the interests of inter-state or foreign commerce. See the section on Hydroelectric in Chapter 4 for more information on FERC licensing exemptions for hydroelectric projects. Hawaii has a history of authorizing and regulating hydropower projects at the state level. In Hawaii, FERC would primarily apply to liquefied natural gas (LNG) terminals and, in limited circumstances, to hydroelectric projects in navigable waters.

Federal Aviation Administration, Western-Pacific Regional Office

Objects Affecting Navigable Airspace, Determination of No Hazard, and Notice of Proposed Construction or Alteration

The Federal Aviation Administration (FAA) must be notified of any construction that may affect the National Airspace System under provisions of 49 U.S.C. 44718. Preliminary project review may be requested from the FAA (14 CFR 77). If a proposed development is more than 200 feet tall or less than 200 feet tall but near an airport, a Notice of Proposed Construction or Alteration form (FAA 7460-1) must be completed and submitted to the appropriate office at least 6 months prior to beginning construction. Following receipt of this notice, the FAA conducts a study to determine whether the project would create a hazard to navigable airspace. At the end of this process the FAA issues either a Determination of No Hazard (DNH) or a Notice of Presumed Hazard. An FAA DNH does not address all military airspace and other issues; coordination with the military command responsible for management of the training space (military operating areas) is still required. If the FAA issues a DNH the FAA will send a letter to the developer within 30 to 45 days stating that construction is approved. The FAA will also review the project's impacts on Department of Defense (DOD) flight paths and operations, which are plentiful in Hawaii due to routine DOD training flights and missions. FAA review should occur prior to consulting DOD. In addition, HSEO recommends project developers review the FAA Interim Policy, FAA Review of Solar Energy System Projects on Federally Obligated Airports (Federal Register, Vol. 78, No. 205, p. 6376, Oct. 23, 2013). Photovoltaic projects with potential to impact aviation activities will be required to submit a 'glint and glare' study.

Note: The Hawaii Department of Transportation (HDOT), Airports Division, strongly recommends developers consult their office during project siting and prior to engaging in any glint/glare assessments to ensure all potential impacts are considered. County building permits are often routed to HDOT Airports Division for review.

For projects with vertical construction (smokestacks), review the FAA Advisory Circulars 150/5190-4a, 150/5200-33B, and 150/5200-34A.

Department of Defense Review

Thorough DOD consultation requires discussion with all potentially impacted service branches, and the DOD strongly recommends all potential renewable energy projects consult the DOD Siting Clearinghouse.[24] In addition, projects sited on or near DOD installations or training areas must consult the CPLO at each installation at or near the proposed project site. A detailed plan including a description of the project location, technology, construction activities, infrastructure, and transportation should be prepared prior to consultation with the appropriate CPLO. Military airspace and transportation impacts are a critical consideration.

Note: HSEO recommends developers consult the appropriate regional Community Plans and Liaison Officers (CPLO) and the DOD Siting Clearinghouse[25] early in the project development phase to identify and address potential impacts to DOD installations and training areas in Hawaii.

State Permits

Hawaii Coastal Zone Management Program

The Hawaii Coastal Zone Management (CZM) program is led by the Hawaii Office of Planning (OP). The CZM program is a network of authorities and partnerships collectively implementing the objectives and policies of Hawaii's CZM statutes (HRS 205A). The CZM area encompasses Hawaii's entire land area, and extends seaward to the limit of the state's authority to include the territorial sea, which is 3 nautical miles from the shore. The CZM program may factor into an energy project in two ways: (1) it may require a Special Management Area (SMA) Permit; or, (2) it may require Federal Consistency review.

SMA Permits regulate land uses within the SMA to ensure that uses and activities are consistent with the CZM objectives and policies. Authority to issue SMA Permits has been delegated to the counties, as they have the responsibility to define and amend the boundaries of the SMA (see Chapter 3 for more information on SMA Permits). However, the authority to issue SMA Permits on lands controlled by HCDA rests with OP.

The Federal Consistency provision of the CZMA (16 USC 1456) provides states with authority to review federal agency actions that may affect the state's coastal uses or resources. Generally, federal consistency requires that federal actions (e.g., coastal projects lead by a federal agency, issuance of federal permits, expenditure of certain federal funds), within and outside the coastal zone, which have reasonably foreseeable effects on any coastal use (land or water) or natural resource of the coastal zone be consistent with the enforceable policies of the state's federally-approved CZM program.

Note: CZM consistency review occurs after the filing of an application for any federal permit or license, however, HSEO recommends OP is consulted before the filing of an application for any federal permit or license.

[24] http://www.acq.osd.mil/dodsc/
[25] Id.

Hawaii Land Use Commission

Hawaii Land Use Permits

As briefly discussed in Chapter 1, all land in the State of Hawaii is classified into one of four state land use district classifications: Conservation, Agricultural, Rural, and Urban. See Section Chapter 1 for a brief description of each of these land use districts or see the Hawaii Land Use Commission (HLUC) website[26] and the Hawaii Statewide Geographic Information System (GIS) Program website for more information on these districts and their boundary locations.[27]

Note: As many parcels in Hawaii are governed by two overlaying zones – the state land use district and the overlaying county zoning district – all zoning districts that apply to your parcel must be identified in order to determine all permit requirements; separate zoning permits from both the state and county may be required. There are some general exceptions, which should be confirmed on a case-by-case basis: e.g., Conservation lands, and land under control of HCDA, DHHL, or other special authority.

Developers seeking to build a renewable energy project that is not allowed in the target land use district can consider various possible pathways, including: DBA, SUP, CDUP, or other (county) approval.

District Boundary Amendments

Changes to land use district classifications can be made through a petition to the HLUC for a District Boundary Amendment (DBA). The appropriate County Council can approve DBAs for areas of 15 acres or less. For areas greater than 15 acres, OP and other stakeholders (i.e., Hawaii Department of Agriculture, counties) evaluate the petition and make recommendations to the HLUC. DBAs are generally initiated by landowner application and reviewed on the facts of the project as compared to the decision-making criteria identified in the Hawaii Land Use Commission law (HRS 205).

State Special (Use) Permits

As stated in Chapter 1, a Special (Use) Permit (SUP) can be issued for an "unusual and reasonable" use that is not listed as a permitted use in the Agricultural or Rural Districts. All SUP applications start with the respective county and must be reviewed by the Planning Commission. For areas of 15 acres or less, the respective county Planning Commission approves or denies the SUP. For projects proposing to use more than 15 acres, if the SUP is approved by the respective county Planning Commission, it will go to HLUC for review. For these projects, if the county denies the SUP, there is no HLUC review and the project may need to be revised and resubmitted for reconsideration.

The Hawaii Department of Agriculture and the Hawaii Office of Planning are required by law to have opportunity to review and comment on all SUP proceedings. HSEO recommends applicants consult these agencies early in the SUP process.

See Chapter 3 for more information on county land use laws and zoning.

[26] http://luc.State.hi.us/index.htm
[27] http://planning.hawaii.gov/gis/

Hawaii DLNR Office of Conservation and Coastal Lands

As discussed in Chapter 1, the DLNR Office of Conservation and Coastal Lands (OCCL) is responsible for overseeing approximately 2 million acres of private and public lands that lie within the Conservation District (see HRS 183C and 190D; HAR 13-5 and 13-222).

Conservation District Use Permits

Potential land uses in the Conservation District are identified in HAR 13-522 to 13-5-25. All land uses are conditional, and many require approval of a Conservation District Use Permit (CDUP) by the Board of Land and Natural Resources. There are four levels of approval that may be granted:

1. A No Objection letter is used for activities that do not require a permit (such as biological surveys) but for which the landowner would like documentation that the project has been reviewed.

2. A Site Plan Approval is issued by OCCL for identified land uses that have a minimal environmental or social impact, such as basic land management, minor alterations to existing structures, or replacement of existing permitted structures.

3. A Departmental Permit is a CDUP that must be approved by the Chair of the OCCL. The Chair has the final authority to modify, grant, or deny any Departmental Permit, or to refer it to the full BLNR.

4. A Board Permit is a CDUP that must be approved by the BLNR. The BLNR has the final authority to modify, grant, or deny any Board Permit.

Proposed energy projects within the Conservation District are likely to require issuance of either a Department Permit or Board Permit, depending on the Subzone in which the project will be located. BLNR can approve, through the CDUP, projects such as renewable energy facilities, highway maintenance and construction, and infrastructure for utilities (e.g., facilities, transmission lines). In cases where a developer is leasing public lands, or seeking another type of land entitlement (e.g., easement, rights-of-way), for Conservation lands, a CDUP is required before BLNR will issue the entitlement.

Management Plans, which can be processed alongside the CDUA, are required for many larger projects.

As work within a Conservation District is an environmental review trigger under HRS 343, CDUAs typically require an HRS 343 Environmental Assessment (EA) or Environmental Impact Statement (EIS) to be completed before the CDUA can be processed, unless OCCL has determined that the project is exempt. HSEO recommends attaching a Final EA or EIS to the CDUP Application.

For projects also requiring a Special Management Area (SMA) Permit from the respective county, approval from the County Council of the SMA is required before BLNR will issue a CDUP. An approved CDUP is also required prior to issuance of a right-of-way or easement if located within the

Conservation District. The OCCL has separate application forms for land-based projects and for marine-based projects.

Hawaii Department of Transportation (HDOT)

HDOT has the responsibility to plan, design, construct, operate, and maintain state facilities in all modes of transportation. The different transportation resources are administered through HDOT's Highways, Harbors, or Airports Divisions. HDOT has jurisdiction over many of the main roads on each of Hawaii's islands, over all state airports and aviation facilities, and 10 commercial harbors (Honolulu, Kalaeloa Barbers Point, Hilo, Kawaihae, Kahului, Hana, Kaunakakai, Kaumalapau, Nawiliwili, and Port Allen). (Note the State of Hawaii Division of Boating and Ocean Recreation (DOBOR) has jurisdiction over small boat harbors throughout the state, as well.) HDOT administers a number of permits related to transportation facilities; in terms of energy development these relate primarily to construction and transportation of equipment rather than facility siting or design.

Highways Division

A Use and Occupancy Permit from the Highways Division would be required to perform construction adjacent to and within the highway right-of-way, or to park on a restricted section of a state highway. Movement of large construction equipment (i.e., wind turbines) or project materiel (i.e., feedstock) often requires a permit to operate or transport oversize and/or overweight vehicles and loads. A Permit for Construction Upon a State Highway is required to perform work upon a state highway. The Highways Division will also be called upon if the proposed facility is required to conduct a traffic impact assessment or other analysis on the impacts of a proposed project on state roadways.

Harbors Division

In coordination with other agencies (USACE, USCG), HDOT, Harbors Division manages use of its commercial facilities; including planning for short- and long-term harbor improvements necessary to meet future demand. For more information, review the Port Hawaii Commercial Harbors System Handbook (HDOT 2004). The Harbors Division prepares master plans for each harbor and identifies recommended uses for specific areas based on best planning principles and practices. Harbor space is finite and requires significant planning to best optimize its limited resources.

The HDOT, Harbors Division, in coordination with other agencies with jurisdiction, is also involved in the management of any construction activities in the State Energy Corridors (see the Permit Brief on State Energy Corridor for more details). Concurrence from existing State Energy Corridor tenants (i.e., other utilities, refineries) is required, in addition to compliance with all other applicable permits and approvals.

Airports Division

As discussed in Chapter 2 (under FAA), the Airports Division, in coordination with the FAA and DOD, oversees commercial projects (e.g., roof or ground-mounted PV, smokestacks, wind turbines) sited at or near Hawaii's airport facilities. While FAA/DOT-Airports review processes are generally

triggered by a proposed project's proximity to airports, HSEO recommends all project proponents closely evaluate the potential impacts of the project on nearby island flightpaths (commercial, recreational, military), including consulting FAA and DOT-Airports. If a project is built without this consideration, severe mitigation – including removal – may be required if it is determined the project is a risk to aviator safety.

Hawaii Department of Agriculture (HDOA)

HDOA is charged with overseeing the well-being of Hawaii's agricultural sector. Like energy and fuel, Hawaii is actively pursuing food security and independence, as the vast majority of Hawaii's food products are not produced locally. Projects proposing to utilize good quality agricultural lands and/or displace existing farming operations should consult HDOA early in the process to assess impacts and identify potential mitigation strategies. HDOA routinely provides comments on permit applications for projects impacting agricultural lands.

HDOA's Plant Quarantine Branch, Import Program, regulates the importation of organisms to Hawaii. All agricultural items, including plants, plant parts, non-domesticated animals, microorganism cultures, microbial products, arthropods and soil require inspection upon arrival in Hawaii. These items must be checked before the shipment can be released to insure they are free of pests or will not become pests themselves. Some organisms (e.g., restricted crops for feedstock such as algae) may be required to undergo a lengthy quarantine process before the crop will be allowed in the field. In addition, the HDOA Pesticides Branch regulates the manufacture, sale, and use of pesticides in the State of Hawaii.

Utility Permits and Approvals

Hawaii Public Utilities Commission (PUC)

A utility permit or approval is required for nearly all utility construction, reconstruction, and maintenance activities, including the purchase of energy from independent power producers (IPPs). Utility approvals are issued by the PUC, which is responsible for regulating Hawaii's public utilities to ensure the provision of essential and reliable service at just and reasonable rates.

Power Purchase Agreement (PPA) or Off-Take Agreement Approval

As discussed in Chapter 1, the PUC must approve agreements between any one of Hawaii four public electric utilities and a third-party power or fuel provider, and any projects proposed to be developed by the utility itself; typically in the form of a petition submitted by the utility that creates a new PUC docket to approve the contract (Power Purchase Agreement or Fuel Off-Take Agreement) for that action/project. The timing of this approval varies significantly, depending on the project, parties to the docket, information required to make a decision, and other variables. Developers should plan well in advance for this process. All PUC dockets can be found at the PUC's Document Management System website.[28] Developers should review the dockets of other similar projects under PUC consideration to better anticipate the issues, dialogue, and PUC review and

[28] http://dms.puc.hawaii.gov/dms/

approval process. In addition, the PUC may decide to conduct public hearings on certain issues or actions.

Note: Power and fuel off-take agreements with Hawaii's utilities can include guaranteed milestones or conditions for specified county, state, or federal permits and approvals, depending on the project and permits required. Additionally, these agreements may require project developers to obtain the permits necessary to construct utility-owned infrastructure. Developers should clarify with the utility early in the siting process who will be responsible for obtaining all permits required for both utility-owned *and* developer-owned infrastructure and equipment. This includes any and all permits required for construction on or near state roadways.

Transmission Line Approval – Hearing

Whenever a public utility plans to place, construct, erect, or otherwise build a new 46 kilovolt or greater high-voltage electric transmission system above the surface of the ground through any residential area, the PUC will conduct a public hearing prior to its issuance of approval thereof (HRS 269-27.5). Notice of the hearing must be given in the manner provided in HRS 269-16 for notice of public hearings.

Note: Ancillary transmission or communications infrastructure can carry additional state and county permitting requirements. To reduce the risk of identifying requirements later in the development process, be sure to clearly define and describe the entire project when initially presenting it to the relevant permitting agencies.

Federal and State Agency Contacts

Developers are encouraged to contact all relevant permitting and consulting agencies early on in the planning process. The number of agencies involved depends on project-specific factors. Tables 1 and 2 provide a list of anticipated federal and state agencies, respective contact information, and associated permits that may be required for a renewable energy project.

Note: In addition to engaging with the permitting agencies directly, it is strongly recommended that renewable energy applicants consult with the HSEO within DBEDT prior to submitting permit applications to ensure all required permits or approvals are identified.

Table 1. Federal Agencies, Contact Information, and Associated Permits

Agency	Contact Information	Permit/Approval	Regulation
US Army Corps of Engineers (USACE) Pacific Ocean Division	USACE Honolulu District Building 230 Fort Shafter, Hawaii 96858 Phone: 808-835-4715	Clean Water Act Section 404 Permit Permit to Build-Construct on Navigable Waters	Clean Water Act Section 404 (33 USC 1344); Rivers and Harbors Act Section 10 (33 USC 403); and Marine Protection, Research and Sanctuaries Act Section 103 (16 USC 1431; 33 USC 1401) 33 CFR 320 & 325
Council on Environmental Quality (CEQ) Federal Action Agency (USACE, BOEM, FERC)	N/A	Record of Decision for Environmental Impact Statement (EIS), Finding of No Significant Impact for Environmental Assessment (EA), or Categorical Exclusion	National Environmental Policy Act (42 USC 4321, 40 CFR 1500-1508)
US Environmental Protection Agency (EPA)	EPA Region 9 Water Program 75 Hawthorne St. San Francisco, CA 94105 Phone: 415-947-8000	Underground Injection Control Permit	Safe Drinking Water Act (42 USC 300f; 40 CFR 141)
Federal Aviation Administration (FAA)	Honolulu Airports District Office P.O. Box 50244 Honolulu, HI 96850-0001 Phone: 808-541-1232	Objects Affecting Navigable Airspace; Determination of No Hazard and Notice of Proposed Construction or Alteration	49 USC 44718; 14 CFR 77;
Federal Energy Regulatory Commission (FERC) Office of Energy Projects Division of Hydropower Administration and Compliance San Francisco Regional Office	888 First Street, NE Washington, DC 20426 Phone: 202-502-6088 Toll Free: 1-866-208-3372 Phone: 415-369-3368	 Hydroelectric License Hydrokinetic Pilot Project License	 18 CFR Part 5 (Addendum 18 CFR 5) 18 CFR Part 5 (Addendum 18 CFR 5)
Department of the Interior (DOI) Bureau of Ocean Energy Management (BOEM)	Pacific OCS Region 770 Paseo Camarillo, 2nd Floor, Camarillo, CA 93010 Phone: 800-672-2627	Outer Continental Shelf Renewable Energy Project Leases, Rights-of-Use and Easement, and Rights-of-Way	30 CFR Part 585

Agency	Contact Information	Permit/Approval	Regulation
US Coast Guard (USCG)	USCG Sector Honolulu District 14 400 Sand Island Parkway Honolulu, HI 96819 Phone: 808-842-2640	Bridge Permit, Rivers and Harbors Act Section 9 Approval	33 CFR Parts 114 through 118
		Private Aid to Navigation Notice to Mariners	33 CFR 66
National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NOAA Fisheries) Office of Protected Resources	1315 East-West Hwy, 13th Floor Silver Spring, MD 20910 Phone: 301-713-2332	Incidental Take Statement Incidental Take Permit Letter of Authorization or Incidental Harassment Authorization	Endangered Species Act (ESA) Section 7 (a)(2) (16 USC 1531-1544) ESA Section 10(a)(1)(B) (16 USC 1531-1544) The Marine Mammal Protection Act of 1972 As Amended 2007 (16 USC 31) Marine Protected Species of the Hawaiian Islands, April 2008 (HRS 190)
National Park Service (NPS) Pacific Islands Office - Honolulu	300 Ala Moana Boulevard, Room 6226 Honolulu HI 96850 Phone: 808-541-2693	Consultation under NEPA and Section 106 recommended if project may impact NPS properties or historic resources.	National Historic Preservation Act (NHPA) Section 106
Air Resources Division	12795 W. Alameda Pkwy Denver, CO 80225 Phone: 303-969-2816	Prevention of Significant Deterioration if Impacting a National Park	Clean Air Act 160-169B (40 CFR 51.166)
US Fish and Wildlife Service (USFWS) Pacific Islands Fish and Wildlife Office	300 Ala Moana Boulevard, Room 3-122 Honolulu, HI 96850 Phone: 808-792-9400	Incidental Take Statement Incidental Take Permit	ESA Section 7 (a)(2) (16 USC 1531-1544) ESA Section 10(a)(1)(B) (16 USC 1531-1544)

Table 2. State Agencies, Contact Information, and Associated Permits

Agency	Contact Information	Permit/Approval	Regulation
Hawaii Department of Agriculture (HDOA) Plant Industry Division	1428 S. King Street Honolulu, HI 96814-2512	Restricted Organism Import Permit (Form PQ-7) Application for Phytosanitary Certificate (Form PQ-47A) Permit Application for Restricted Commodities into Hawaii	Hawaii Administrative Rules (HAR), Title 4, Chapter 70 and 71A HAR, Title 4, Chapter 70 and 71A HAR, Title 4, Chapter 70 and 71A
Hawaii Department of Health (HDOH) Environmental Health Service Division Indoor and Radiological Health Branch Environmental Management Division Clean Air Branch Clean Water Branch	1250 Punchbowl Street Honolulu, HI 96813 Phone: 808-586-4576 591 Ala Moana Blvd., Room 133 Honolulu, HI 96813 Phone: 808-586-4700 Phone: 808-586-4304 Phone: 808-586-4200 Phone: 808-586-4309	Community Noise Control Permit Noise Variance Air Pollution Control Permit (Covered Source Permit and Noncovered Source Permit) Section 401 Water Quality Certification Permit National Pollutant Discharge Elimination System Permit (Operation) General Permit Zone of Mixing Permit	Hawaii Revised Statutes (HRS) 342F, Noise Pollution HAR 11-46, "Community Noise Control" HAR, 11-60.1, Air Pollution Control Clean Water Act Section 401 (33 USC 1341); HAR 11-54 Clean Water Act Section 402 (33 USC 1342); HAR 11-55, Appendices B through L HAR 11-54

Agency	Contact Information	Permit/Approval	Regulation
Safe Drinking Water Branch	Phone: 808-586-4258	Underground Injection Control Permit	HAR 11-23
Solid and Hazardous Waste Branch	Phone: 808-586-4226	Underground Storage Tank Permit	HAR 11-281
		Hazardous Waste Treatment Storage and Disposal Permit	HAR 11-265 and 11-271 40 CFR Part 265, Appendix I
		Solid Waste Management	HAR 11-58.1
Wastewater Branch	919 Ala Moana Blvd., Room 309 Honolulu, HI 96813 Phone: 808-586-4294	Variance from Pollution Control	HAR 11-62
		Biosolids Treatment Works Permit – Notice of Intent	HAR 11-62
		Individual Wastewater Management Permit	HAR 11-62
Hazard Evaluation and Emergency Response Office (HEER)	919 Ala Moana Blvd., Room 206 Honolulu, HI 96813 Phone: 808-586-4249	Hawaii Emergency Planning and Community Right-to-Know-Act (HEPCRA) Chemical Inventory Reporting	EPCRA 313, HAR 11-453-31
		Superfund Amendment & Reauthorization Act (SARA) Reporting	Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, amended in 1986 by SARA (42 USC 9601 et seq.[1980])
Office of Environmental Quality Control (OEQC)	235 South Beretania Street, Suite 702, Honolulu, HI 96813. Phone: 808-586-4185	EIS/ EA	HRS 343, HAR 11-200
Department of Business, Economic Development and Tourism (DBEDT)	250 S. Hotel St. Honolulu, HI 96813		
State Energy Office	235 South Beretania Street, 5th Floor Honolulu, HI 96813 Phone: 808-587-3807	Consultation	HRS 196

Agency	Contact Information	Permit/Approval	Regulation
Hawaii Land Use Commission (HLUC)	235 South Beretania Street, Room 406 Honolulu, HI 96813 Phone: 808-587-3822	District Boundary Amendment Special Use Permit – over 15 acres	HRS 205; HAR15-15 HRS 205; HAR 15-15
Office of Planning (OP)	235 South Beretania Street, 6th Floor Honolulu, HI 96813 Phone: 808-587-2846	Coastal Zone Management Federal Consistency Review Special Management Area Use Permit	15 CRF 930 HRS 206E, HRS 205A; HAR 15-150
Hawaii Community Development Authority (HCDA)	461 Cooke St. Honolulu, HI 96813 Phone: 808-594-0300	Kakaako Development Permit Kakaako Mauka/Kalaeloa Development Permit	HRS Chapter 206E, HAR 15- 217 and 15-218
Department of Land and Natural Resources (DLNR)	Kalanimoku Building 1151 Punchbowl Street Honolulu, HI 96813 Phone: 808-587-0400		
Commission on Water Resource Management (CWRM) Ground Water Regulations Branch	Phone: 808-587-0214	Ground Water Use Permit Well Construction and Pump Installation Permit	HRS Chapter 174C, HAR 13-171 HRS Chapter 174C, HAR 13-168
Stream Protection & Management Branch		Stream Channel Alteration Permit Stream Diversion Works Permit Surface Water Use Permit	HRS Chapter 174C, HAR 13-169 HRS Chapter 174C, HAR 13-168 HRS Chapter 174C, HAR 13-171
Division of Forestry and Wildlife (DOFAW)	Phone: 808-587-0166		

Agency	Contact Information	Permit/Approval	Regulation
Forestry Section		Closed Watershed Entry Permit	HRS Chapter 183, HAR 13-105 and 13-104
		Forest Reserve Entry/ Access Permit	HRS Chapter 183, HAR 13-104
		Forest Reserve Special Use Permit	HRS Chapter 183, HAR 13-104
		Wildlife Sanctuary Entry Permit	HRS Chapter 195D, HAR 13-126
Native Ecosystems Protection & Management Section		Threatened and Endangered Plant Permit	HRS Chapter 195, HAR 13-104, 13-107, and 13-124
		T&E and Native Invertebrate Research and Collection Permits	HRS Chapter 195D, HAR 13-124
		Natural Area Reserves System SUP	HRS Chapter 195, HAR 13-209
Wildlife Section		Incidental Take License and Habitat Conservation Plan	HRS Chapter 195, HAR 13-124
		Protected Wildlife Permit for Scientific Research	HRS Chapter 183D, HAR 13-124
Engineering Division	Phone: 808-587-0230	Dam Safety Permit (Dams and Reservoirs Permit)	HRS Chapter 179D, HAR 13-190.1
		Geothermal Exploration Permit	HRS Chapter 182, HAR 13-183
		Geothermal Drilling and Well Modification Permit	HRS Chapter 182, HAR 13-183
		Geothermal Resource Mining Lease	HRS Chapter 182, HAR 13-183
Land Division	Phone: 808-587-0419	Right of Entry/Access Permit, Easement, or Land Lease for Use of State Land	HAR 13- 221-5

Agency	Contact Information	Permit/Approval	Regulation
Office of Conservation and Coastal Lands (OCCL)	Phone: 808-587-0377	Submerged Land Lease	HRS 190D
		Conservation District Use	HRS 183C & 190D; HAR 13-5 & 13-222
		Conservation District Use Permit—State Marine Waters/Ocean Waters Construction Permit	HRS 183C & 190D; HAR 13-5 & 13-222
State Historic Preservation Division (SHPD)	Phone: 808-692-8015	Historic and Archaeological Resource Protection, Section 106 Process	NHPA Section 106
		Historic Preservation Review	HRS Chapter 6E; HAR 13-275 through 13-284
Department of Transportation (HDOT)			
Highways Division	Aliiaimoku Building 869 Punchbowl Street Honolulu, HI 96813 Phone: 808-587-2220	Permit for Construction to Cross or Enter the State Energy Corridor	
		Construction Upon a State Highway	HAR 19-105
		Oversize and Overweight Vehicles	HAR 19-104
		Use and Occupancy Agreement (Lane Use Permit for Construction Work)	HAR 19-102
Harbors Division	Hale Awa Ku Moku Building 79 South Nimitz Highway Honolulu, HI 96813 Phone: 808-587-1927	Work in Ocean Waters of the State	HAR 19-42
Airports Division	HNL International Airport 400 Rodgers Blvd, Suite 700 Honolulu, HI 96819-1880	Work in Regulated Airspace	HAR 19-11 through 19-40
Office of Planning, Coastal Zone Management Program	Office of Planning State of Hawaii PO. Box 2359 Honolulu, Hawaii 96804-2359	Federal Consistency Certification	Coastal Zone Management Act of 1972 (16 USC 1456)
		Special Management Area Permits	HRS 205A

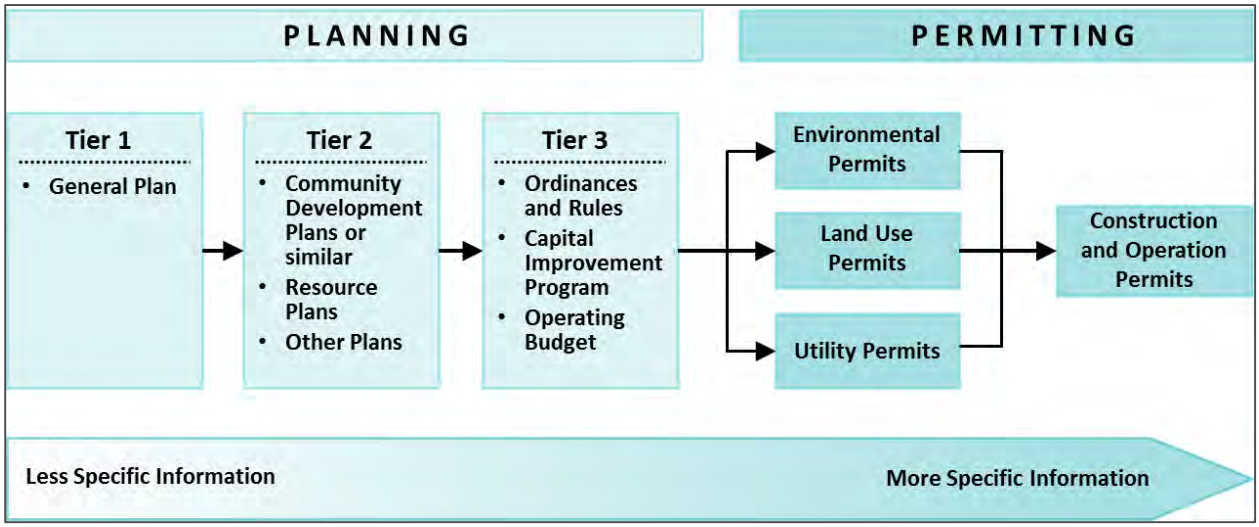
Agency	Contact Information	Permit/Approval	Regulation
Public Utilities Commission (PUC)	465 S. King Street, #103 Honolulu, HI 96813 Phone: 808-586-2020	Power Purchase Agreement Approval Transmission Line Approval	HRS 269-16 HRS 269-27.5

Chapter 3 – County Regulatory Systems

There are four primary county governments in Hawaii: City and County of Honolulu, Hawaii County, Kauai County, and Maui County.

Land use at the county level is regulated through a three-tier land use system consisting of (1) a county-wide general plan, (2) community development plans and resource plans, and (3) ordinances and rules including zoning regulations. These three land use regulation tiers drive the permitting requirements of each county and are illustrated below in Figure 4.

Figure 4. County Land Use Regulatory System



At the first tier of the county land use regulatory system, the General Plan provides the overall planning policy for the county by establishing county-wide goals, policies, standards, and courses of action. The General Plan provides the foundation for the second tier of the regulatory system which includes community development plans and resource plans. Community development plans establish goals, policies, and future land use designations specific to an area, and typically includes maps designating these future land uses for the community development plan area. Resource plans may include transportation plans, facility or capital improvement plans, energy plans, and natural hazard plans. Proposed renewable energy development should reference and demonstrate compatibility with these plans. The third tier of the land use regulatory system includes ordinances and rules that administers the various levels of land use designations, and includes zoning regulations or code. The zoning code for each county defines where certain land uses may be allowed and how land use permits are processed. The three-tier county land use system is intended to function as a unified whole, and should be consistent with the state land use designations of Agricultural, Rural, and Urban. At each county level the three tiers should be internally consistent and mutually supportive.

Note: Renewable energy developments should be consistent with the goals, policies, standards, courses of action and general land use pattern in the applicable county's General Plan.

Each county has different procedures and requirements for land use or energy project permitting. However, there are a few permit processes that apply in all counties, including:

- A Shoreline Setback Variance is required for all structures and activities in the "Shoreline Area," as generally defined in HAR 13-222-2 and more specifically defined by each county. The location of the setback line varies by county and by specific location (note that development in a shoreline area triggers HRS 343 compliance).
- A Special Management Area (SMA) Permit is required for all development proposed within the SMA, which is a buffer zone along the shoreline defined by each county pursuant to HRS 205A, the CZM program (see Chapter 2 for a description of the SMA in context to the CZM regulations). Authority to issue SMA Permits has been delegated to the counties, as they have the responsibility to define and amend the boundaries of the SMA. The SMA varies in width from about 100 yards from the shoreline to several miles inland. For CZM work within lands controlled by the Hawaii Community Development Authority – i.e., Kakaako, Kalaeloa – the Office of Planning has jurisdiction to process SMA Permit applications. There are two types of SMA Permits: Major (more thorough review) and Minor. The relevant county planning department will determine whether a Minor or Major is required.
- As discussed in Chapter 1, a Special (Use) Permit (SUP) is required in the state Agricultural or Rural Districts for "certain unusual and reasonable uses…other than those for which the district is classified," pursuant to HRS 205. SUPs for an area of land less than 15 acres are subject to approval by the county. For an area of land greater than 15 acres or for uses on land designated as important agricultural lands, approval of both the county and the HLUC are required (see Chapter 2 for a description of the SUP).
- The counties may amend the state land use district boundaries via Distract Boundary Amendment (DBA) of areas 15 acres or less in size located in the Urban, Rural, and Agricultural Districts. Reclassification of areas greater than 15 acres requires HLUC approval. The counties have no authority to amend the boundaries of the state Conservation District regardless of the size of the area.

Note: Renewable energy project developers should review each county's land use regulations and rules to ensure their project is sited appropriately and the necessary permits are identified. Certain counties have developed ordinances and processes for specific renewable energy technologies, as discussed in Chapter 4 for each technology.

The following discussion focuses on county land use permits required for commercial or utility scale renewable energy projects. Construction permits (e.g., building, electrical, or grading permits) are not discussed in detail, but are an important phase of facility permitting. See HSEO's Developer & Investor Center for more information on construction permits (Permit Briefs). Tables 3 through 6 list the land use permits that are potentially applicable to a renewable energy project. The tables describe the activity that may require a permit. HSEO has Permit Briefs available on the HSEO

website for review and download.[29] The HSEO Permit Briefs provide specific information regarding permit application requirements and permit processing. If a renewable energy developer is unsure whether a permit is required, the applicable Permit Brief should be reviewed, which should provide enough information to determine if the permit is required (if still unsure, contact the administrating agency listed in Tables 3 through 6).

Note: Each county has an Energy or Sustainability Coordinator or Commissioner within the Mayor's Office or other county department. HSEO strongly recommends contacting these figures, depending on the county, early in the project due diligence and siting phase.

[29] http://energy.hawaii.gov/renewable-energy-project-permitting-in-the-State-of-hawaii

City and County of Honolulu

Overview of the City and County of Honolulu's Regulatory System

The City and County of Honolulu (CCH) encompasses the island of Oahu (Figure 5) and is served by HECO. The three-tiered land use regulatory system that guides land use and development on the island consists of a General Plan (Tier 1), Sustainable Community Plans and Development Plans (Tier 2), and Ordinances and Rules (Tier 3). Renewable energy development must be consistent with the three-tiered land use regulatory system, which will also help through the county permitting processes. The CCH Department of Planning and Permitting (DPP) administers all permits that relate to these three tiers.

Figure 5. City and County of Honolulu

City and County of Honolulu's General Plan

The General Plan for the CCH establishes objectives and policies related to Oahu's collective vision for its future and quality of life and acts as an overall guide to future land use patterns and general development. The General Plan was first adopted in 1977 and since 1977 a number of amendments have been incorporated; however, the basic objectives and policies remain intact. Information on the General Plan can be found through the CCH website.[30]

The General Plan's objectives and policies related to energy development are found primarily in Section VI Energy; these are supported by compatible policies related to Economic Activity, the Natural Environment, Transportation and Utilities, Physical Development and Urban Design, and others. Figure 6 lists the policies and objectives set forth in the Energy section of the General Plan.

[30] www.honoluludpp.org/Planning/GeneralPlan.aspx

Figure 6. Oahu's Energy Objectives and Policies

Objective A: To maintain an adequate, dependable, and economical supply of energy for Oahu residents.

- Policy 1: Develop and maintain a comprehensive plan to guide and coordinate energy conservation and alternative energy development and utilization programs on Oahu.
- Policy 2: Establish economic incentives and regulatory measures which will reduce Oahu's dependence on petroleum as its primary source of energy.
- Policy 3: Support programs and projects which contribute to the attainment of energy self- sufficiency on Oahu.
- Policy 4: Promote and assist efforts to establish adequate petroleum reserves within Hawaii's boundaries.
- Policy 5: Give adequate consideration to environmental, public health, and safety concerns, to resource limitations, and to relative costs when making decisions concerning alternatives for conserving energy and developing natural energy resources.
- Policy 6: Work closely with the State and Federal governments in the formulation and implementation of all City and County energy-related programs.

Objective B: To conserve energy through the more efficient management of its use.

- Policy 1: Ensure that the efficient use of energy is a primary factor in the preparation and administration of land use plans and regulations.
- Policy 2: Provide incentives and, where appropriate, mandatory controls to achieve energy- efficient siting and design of new developments.
- Policy 3: Carry out public, and promote private, programs to more efficiently use energy in existing buildings and outdoor facilities.
- Policy 4: Promote the development of an energy- efficient transportation system.

Objective C: To fully utilize proven alternative sources of energy.

- Policy 1: Encourage the use of commercially available solar energy systems in public facilities, institutions, residences, and business developments.
- Policy 2: Support the increased use of operational solid waste energy recovery and other biomass energy conversion systems.

Objective D: To develop and apply new, locally available energy resources.

- Policy 1: Support and participate in research, development, demonstration, and commercialization programs aimed at producing new, economical, and environmentally sound energy supplies from:
  - solar insulation;
  - biomass energy conversion;
  - wind energy conversion;
  - geothermal energy; and
  - ocean thermal energy conversion.
- Policy 2: Secure State and Federal support of City and County efforts to develop new sources of energy.

Objective E: To establish a continuing energy information program.

- Policy 1: Supply citizens with the information they need to fully understand the potential supply, cost, and other problems associated with Oahu's dependence on imported petroleum.
- Policy 2: Foster the development of an energy conservation ethic among Oahu residents.
- Policy 3: Keep consumers informed about available alternative energy sources and their costs and benefits.
- Policy 4: Provide information concerning the impact of public and private decisions on future energy use.

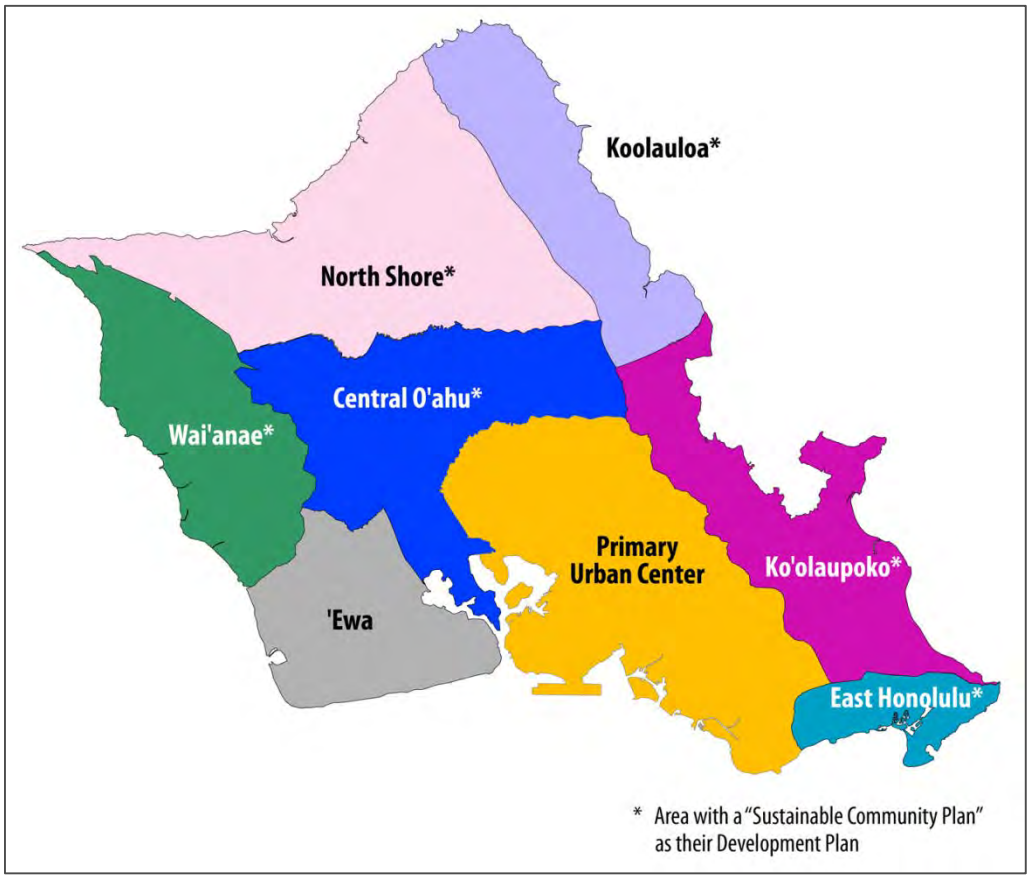
Source: www.honoluludpp.org/Planning/GeneralPlan.aspx

Development Plans and Sustainable Community Plans

Oahu is divided into eight planning areas, each of which has either a Development Plan or Sustainable Community Plans adopted by City Council ordinance and administered by the DPP. The Development Plan or Sustainable Community Plan areas are illustrated in Figure 7. Each of the eight plans are available on the DPP website (DPP 2014b).[31] Plans are reviewed every five (5) years to revalidate visions and make adjustments as needed.

As stated, renewable energy projects should be compatible with the plans applicable to the areas in which they are proposed. Conformance and compatibility with these plans should be highlighted and discussed in relevant (land use, zoning, environmental) permit applications.

Figure 7. Oahu's Eight Planning Areas



DPP 2014b

The eight Development/Sustainable Community Plans establish goals and policies and provide information related to future land use, infrastructure, and natural and cultural resources that may play a critical role in energy facility siting. These plans establish future land use designations for each area. They identify future infrastructure, land use designations, and significant natural and

[31] http://www.honoluludpp.org/Planning/DevelopmentSustainableCommunitiesPlans.aspx

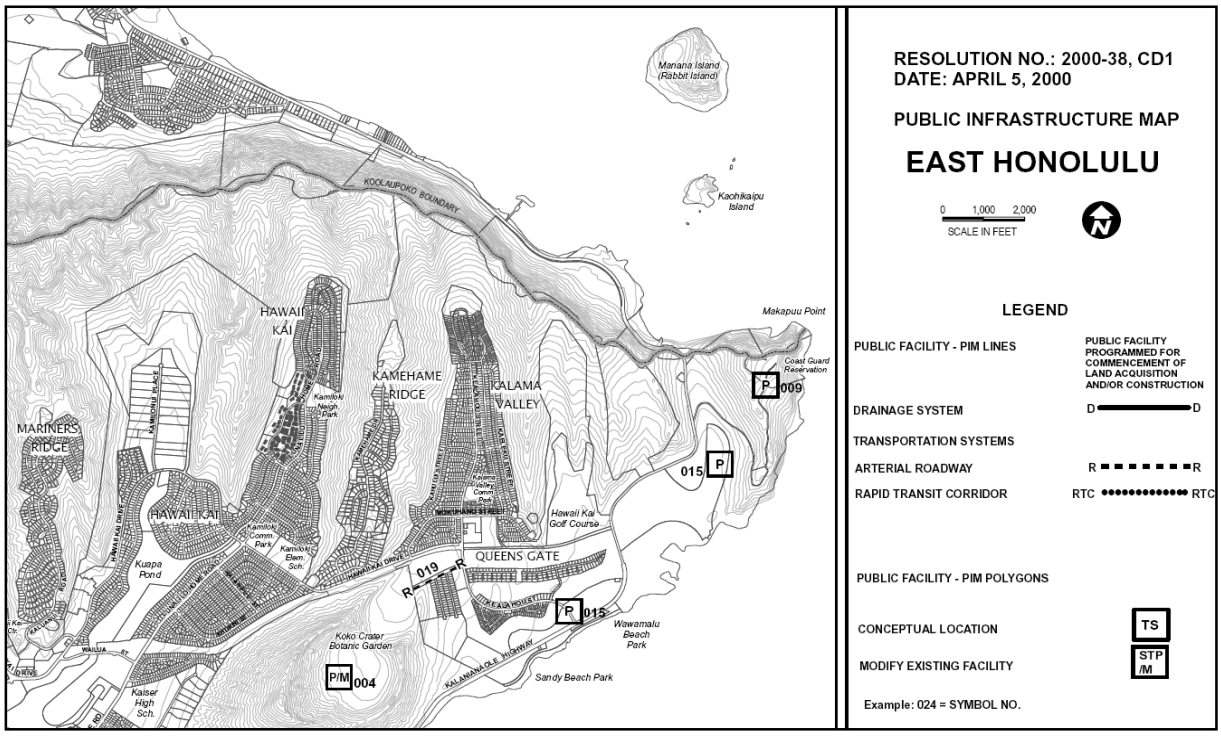
cultural resources that may indicate potential community concerns or specific opportunities for development that must be consistent with and addressed in the land use permitting process.

The Development/Sustainable Community Plans are also supplemented by special area plans and functional plans. Some of the cities and towns on Oahu have adopted special area plans to define the identity, function, organization and character of their neighborhoods. For example, Transit-Oriented Development plans have been adopted or the specific areas around Honolulu, Pearl City and Kapolei along the planned commuter rail line.

Functional Plans and Other Plans

Functional plans are essentially public infrastructure plans that inform Oahu's Capital Improvements Program. A key element of the functional plans is the Public Infrastructure Map, which identifies existing and proposed major public infrastructure facilities. The availability of public facilities and infrastructure may play a role in energy development, particularly if a proposed renewable energy development would be large enough to change the location, nature or timing of planned infrastructure improvements. Detailed Public Infrastructure Maps are available on the DPP website.[32] Figure 8 on the next page shows a portion of the East Honolulu public infrastructure map as an example of the level of detail of each map. The DPP website allows zooming in and out of these maps, which can provide greater detail.

Figure 8. Public Infrastructure Map Example (East Honolulu)



DPP 2014

[32] http://www.honoluludpp.org/Planning/PublicInfrastructureMaps(PIM).aspx

Ordinances and Rules

Ordinances are mandated by the City Charter and constitute the principal means for implementing CCH's plans. CCH follows the Revised Ordinances of Honolulu (ROH), which are available on the CCH website.[33]

The Land Use Ordinance (LUO) is the zoning code for the CCH; it comprises Chapter 21 of the ROH. The LUO establishes and applies zoning districts, and identifies allowed land uses within each zone, as well as land uses that may be conditionally allowed. The LUO also establishes permit review procedures, timelines, and approval authorities; general and specific development standards; and other development regulations. The LUO is supported by other chapters of the ROH that may also play a role in energy development, including but not limited to chapters on subdivision of land (Chapter 22); shoreline development (Chapter 23); special management area development (Chapter 25); and building, electrical, plumbing, building energy conservation, and fire codes. Development and Sustainable Community Plans are adopted as ROH Chapter 24. Table 21.3 (Master Use Table) is particularly useful to identify the permitting requirements for certain land uses in specific CCH zoning districts.

Agencies to Know in the City and County of Honolulu

Below is an overview of the CCH agencies that administers permits that may be required for a renewable energy project in CCH. It is advisable to coordinate with the county agencies that will process the relevant permits for a renewable energy development.

Department of Planning and Permitting

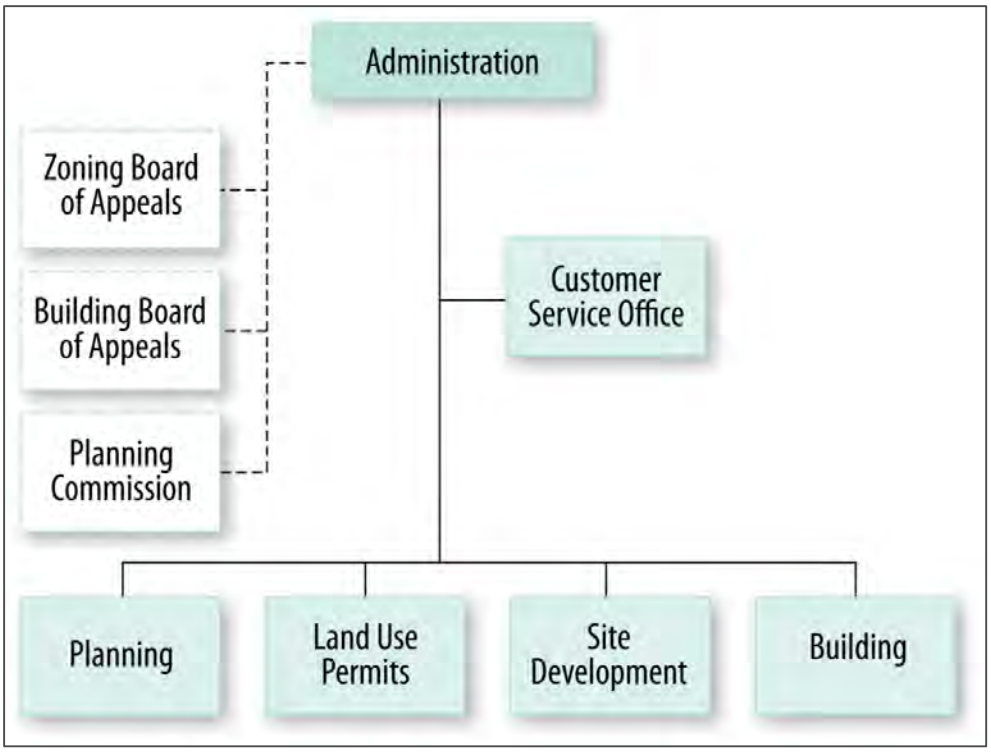
In the CCH, the DPP administers the majority of permits required for renewable energy projects on Oahu, including, land use and building permits. Figure 9 is a broad organizational chart for the DPP, which depicts the major divisions of the department. The Planning Division is responsible for developing and maintaining the General Plan and Community Plans, and processes applications for amendments to those plans, zone changes, state SUP requests, and state land use District Boundary Amendments. The Land Use Division handles most other land use permits including conditional uses, while the Site Development Division is responsible for the review and approval of infrastructure necessary to support development and subdivisions.

DPP provides technical advice to the Mayor, Planning Commission and the County Council. The Planning Commission is the approval authority for some permit applications, and provides a recommendation to the County Council on other application types.

DPP's Honolulu Internet Permit System[34] is the online method for applying for and tracking Building Permits electronically.

[33] http://www.honolulu.gov/ocs/roh.html
[34] http://dppweb.honolulu.gov/DPPWeb/default.aspx?PossePresentationId=3000

Figure 9. Department of Planning and Permitting Organizational Chart



DPP offers resources on their website[35] including information on the various types of permits, and other supporting information.

Department of Environmental Services

Other CCH departments and agencies may play a role in renewable energy development, depending on the nature and location of the proposed project. The Department of Environmental Services handles all municipal wastewater, solid waste and stormwater generated on Oahu; permits may be required for hookup to a wastewater collection and treatment system, or for stormwater management (in addition to a NPDES Permit from the HDOH, see Chapter 2). The Department of Environmental Services is the CCH entity responsible for managing the Honolulu Program of Waste Energy Recovery and other waste treatment facilities.

Department of Budget and Fiscal Services

Should an energy project be proposed on land owned or managed by the CCH, an easement or lease must be arranged through the Department of Budget and Fiscal Services (DBFS). The potential role of these and other CCH departments and agencies is determined through the application review process, led by DPP.

[35] http://www.honoluludpp.org/

Table 3 provides a quick reference and contact information and a list of permits or approvals that may be needed from to the DPP's various divisions and or Honolulu Fire other CCH Department that administers permits noted in this Guide.

Note: The Real Property Assessment Division within DBFS is responsible for assessing the real property taxes for renewable energy facilities and other projects. Certain DBFS policies and/or procedures may be in place for renewable energy projects on Oahu. Land owners and developers should contact DBFS to discuss the property tax assessment specifics for a project.

Other Resources

One of the key resources for developers is the county's online GIS mapping service, the Honolulu Land Information System (HoLIS).[36] HoLIS is a county-wide system that provides land use and zoning information as well as tax, infrastructure, and environmental data and allows for spatial query and analysis. Pre-made maps are available, or the advanced mapping system may be used online or data downloaded for offline use.

[36] http://gis.hicentral.com

Table 3. City and County of Honolulu Land Use Permits Potentially Applicable to Energy Development

Agency and Contact Information	Permit/Approval	Permitted Activity
Department of Planning and Permitting 650 South King Street Honolulu, HI 96813 Phone: 808-768-8000 Land Use Permits Division Phone: 808-768-8012	Shoreline Setback Variance	Any activity within the "Shoreline Setback Area" as defined in Chapter 23, Revised Ordinances of Honolulu.
	Special Management Area (SMA) Use Permit—Major and Minor	Development within the SMA as defined in Chapter 25, ROH.
	Conditional Use Permit (CUP) (Major and Minor) including Joint Development	Uses in which may be approved in a specific zoning district, if certain standards and conditions are met. Some uses in some zoning districts require either a Minor or a Major CUP, depending on potential adverse impacts to surrounding land uses.
	Plan Review Use	Uses of a permanent and institutional nature that provide essential community services but which could have a major adverse impact on surrounding land uses.
	Special District Permit (Major and Minor)	Development of a project in any of the special districts which has been classified by the Land Use Ordinance, Article 9 as a major or minor project. There are seven special districts on Oahu, including: the Hawaii Capital District, Diamond Head District, Punchbowl District, Chinatown District, Haleiwa District, Thomas Square/Academy of Arts District, and Waikiki District.
	Waiver Permit	Provides an exception from the strict application of the development or design standards of the Land Use Ordinance (LUO) for specified purposes and/or reasons defined in LUO Article 2, including public uses and utility installations. Waivers are not applicable to projects requiring Plan Review Use approval.
	Various Construction Permits	Building, plumbing, electrical, grading, grubbing activities will require permits.
Planning Division Phone: 808-768-8053	Development Plan Amendment	Amends the Development Plan or Sustainable Community Plan governing the area of a proposed project.
	General Plan Amendment	Amends the general plan of the City and County of Honolulu.

Agency and Contact Information	Permit/Approval	Permitted Activity
	State Special Use Permit	Allows for the development of "unusual and reasonable" land uses within agricultural and rural districts other than those for which the district is classified, pursuant to HRS 205-6. The use may be approved with "such protective restrictions as may be deemed necessary" to promote the effectiveness and objectives of the State land use classification system,
	State Land Use Boundary Amendment	Changes the boundary of a State land use district involving an area of 15 acres or less in an agricultural or urban district as the districts are defined by the state Land Use Commission.
	Zone Change	Changes the zoning in a particular area of the City and County of Honolulu. Some zone changes may also require a development plan or general plan amendment.
Site Development Division Phone: 808-768-8097	Flood Hazard District Variance	Allows for some types of development in the flood hazard district.
	Flood Determination Approval	Provides an evaluation and determination as to whether the project is located in a floodway or flood fringe area.
Department of Budget and Fiscal Services 530 South King Street, Room 208 Honolulu, Hawaii 96813 Phone: (808) 768-3901	Easement or Lease of County Property	Allows use of county property for project purposes.
Department of Environmental Services 1000 Uluohia Street, Suite 308 Kapolei, HI 96707 Phone: 808-768-3486	Construction related permits	Issues permits for a number of activities including hookups to a wastewater collection and treatment system, or for stormwater management (in addition to a National Pollutant Discharge Elimination System permit from HDOH, see Chapter 2).

Hawaii County

Overview of the Hawaii County Regulatory System

Hawaii County encompasses the island of Hawaii (aka the Big Island) as shown in Figure 10, and is served by HELCO. The three tiered planning system that guides land use and development in Hawaii County consists of the General Plan (Tier 1); Community Development Plans (Tier 2); and, Ordinances, Rules, and Permitting Requirements (Tier 3).

Figure 10. Hawaii County

Hawaii County's General Plan

Hawaii County's General Plan is the foundation for all other elements of the county's planning structure, and encompasses long-term goals, policies, strategies, courses of action for the entire county (HC 2009). The current General Plan was adopted in February 2005.[37]

The General Plan establishes objectives and policies related to the island's collective vision for its future and quality of life, and acts as an overall guide to future land use patterns and general development on the island of Hawaii. The Energy section (Chapter 3) of the General Plan

[37] http://www.cohplanningdept.com/community-planning/general-plan/

establishes goals and policies related to energy use and development; these are presented in Figure 11.

Figure 11. Hawaii County's Energy Goals and Policies

Goals

1. Strive towards energy self-sufficiency.
2. Establish the Big Island as a demonstration community for the development and use of natural energy resources.

Policies

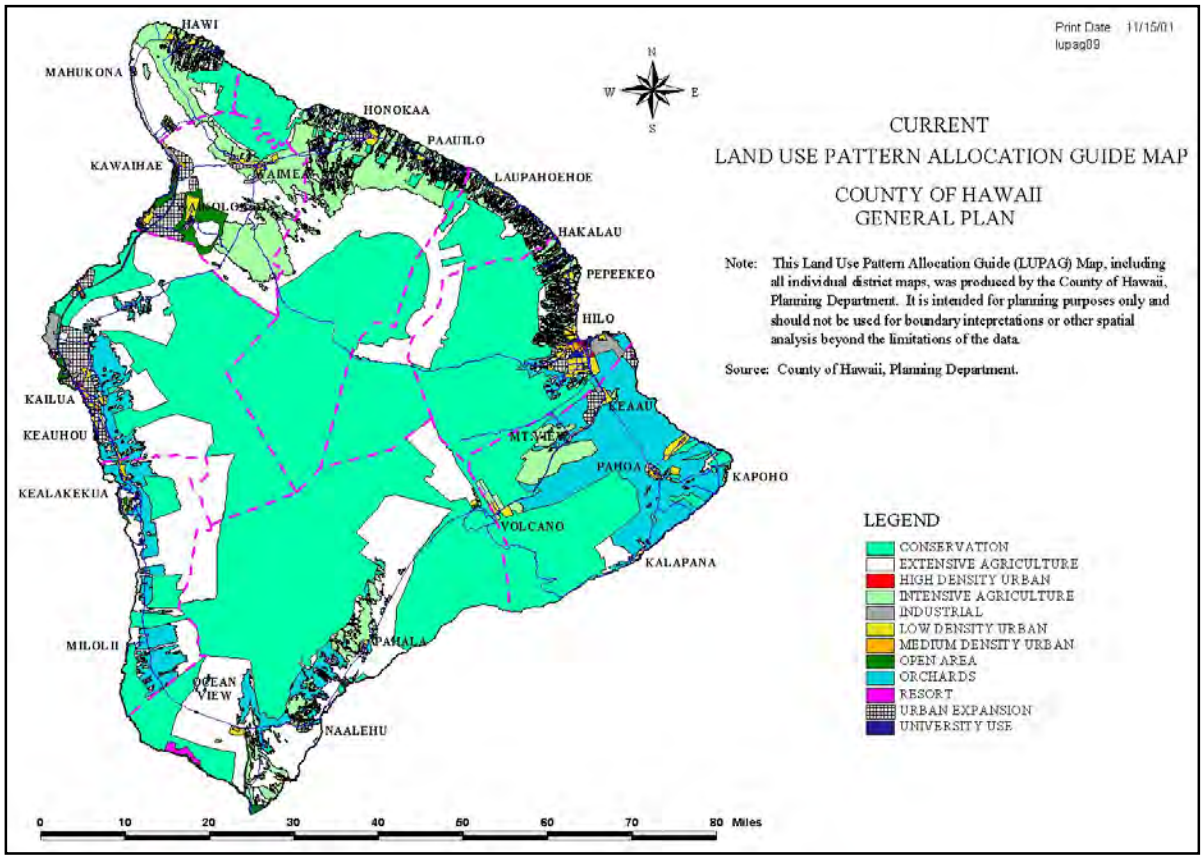
1. Encourage the development of alternate energy resources.
2. Encourage the development and use of agricultural products and by-products as sources of alternate fuel.
3. Encourage the expansion of energy research industry.
4. Strive to educate the public on new energy technologies and foster attitudes and activities conducive to energy conservation.
5. Ensure a proper balance between the development of alternative energy resources and the preservation of environmental fitness and ecologically significant areas.
6. Strive to assure a sufficient supply of energy to support present and future demands.
7. Provide incentives that will encourage the use of new energy sources and promote energy conservation.
8. Seek funding from both government and private sources for research and development of alternative energy resources.
9. Coordinate energy research and development efforts of both the government and private sectors.
10. Encourage the continuation of studies concerning the development of power that can be distributed at lower costs to consumers.
11. Strive to diversify the energy supply and minimize the environmental impacts associated with energy usage.
12. Continue to encourage the development of geothermal resources to meet the energy needs of the County of Hawaii.
13. Encourage the use of solar water heating through the continuation of State tax credit programs, through the Building Code, and in County construction.
14. Encourage energy-saving design in the construction of buildings.
15. Support net-metering and other incentives for independent power producers.

Source: Sections 3.2 & 3.3. of the Hawaii County General Plan, 2005 (HC 2009)

The General Plan includes two sets of policy maps: the Land Use Pattern Allocation Guide (LUPAG) maps and the Facilities maps. The Facilities maps, which must be obtained directly from Hawaii County, show important infrastructure, natural and cultural resources, energy generation sources, public buildings, military installations, public land ownership, and lava hazard zones. The location and nature of infrastructure, and natural and cultural resources may play a role in energy facility siting.

The LUPAG maps (see example in Figure 12) show the general location of different land use types; these are closely related to the four state land use classifications and are consistent with the HLUC designations. These are further defined in the community development plans and help to inform the zoning of the land. The General Plan divides the county along judicial district lines into nine areas (referred to variously as districts or zones); zoning has been adopted for each area separately, and some have adopted development plans as described below.

Figure 12. Land Use Pattern Allocation Guide Map of Hawaii County Land Uses



http://www.hawaii-county.com

Community Development Plans

While the General Plan applies to the entire county, Community Development Plans are intended to focus on specific towns, communities, and/or natural watersheds. These plans translate the broad General Plan goals, policies and standards into implementation actions as they apply to specific geographic areas of the island. As of October 2014, only four Community Development Plans have been adopted while others are under development, as called for by the 2005 General Plan. The adopted Community Development Plans cover the judicial districts of North and South Kona, North Kohala, South Kohala, and Puna and the Volcano Census Designated Place in the district of Kau. Information on the adopted and in-process Community Development Plans is available on the County Planning Department website;[38] however, not all of the plans are available online.

The existing Community Development Plans focus primarily on the urban areas of the county, and are largely geared toward the layout and urban design of those cities and towns. As such, they identify future land uses and infrastructure improvements necessary to implement the community

[38] http://www.hawaiiCountycdp.info

vision for those areas. These in turn inform the adoption of zoning and land use decisions by the county.

Note: The Hawaii County Planning Department recommends developers consult the available Community Development Plans in order to help identify and avoid areas and resources sensitive to development.

Other Plans

Hawaii County has embarked on a wide range of energy sustainability initiatives and programs that are part of a comprehensive approach to the environment that is unprecedented on the county level. The Hawaii County Five-Year Energy Sustainability Plan was completed in October 2007 and accepted by the County Council and Mayor in early 2008. This Plan included a broad evaluation of the county's energy supply and demand, and serves as an energy roadmap for the county's future. It provides information and recommendations related to energy costs and pricing; transmission; efficiency measures, and a variety of alternative energy sources including geothermal, solar, biofuels, waste, hydrogen and ocean energy. Contact the Hawaii County Department of Research and Development for a copy of this plan, which also updates the County of Hawaii Energy Baseline Study sponsored by The Kohala Center[39] in 2006.

Ordinances and Rules

Ordinances are mandated by the County Charter and constitute the principal means for implementing the county's plans. The Hawaii County Code is a compilation of nearly all permanent ordinances adopted by the County Council. This code is updated and released in January and July of each year. The official print version may be purchased from the Hawaii County Clerk's Office through the website. An unofficial online version is also available on the website.[40]

Chapter 25 of the Hawaii County Code is the county's zoning code. The zoning code and other code chapters establish and apply land use zoning throughout the county, and identify allowed and non-permissible uses within each zone, as well as uses that may be conditionally allowed. The Code also establishes land use permit review procedures, timelines, and approval authorities; general and specific development standards; and other development regulations.

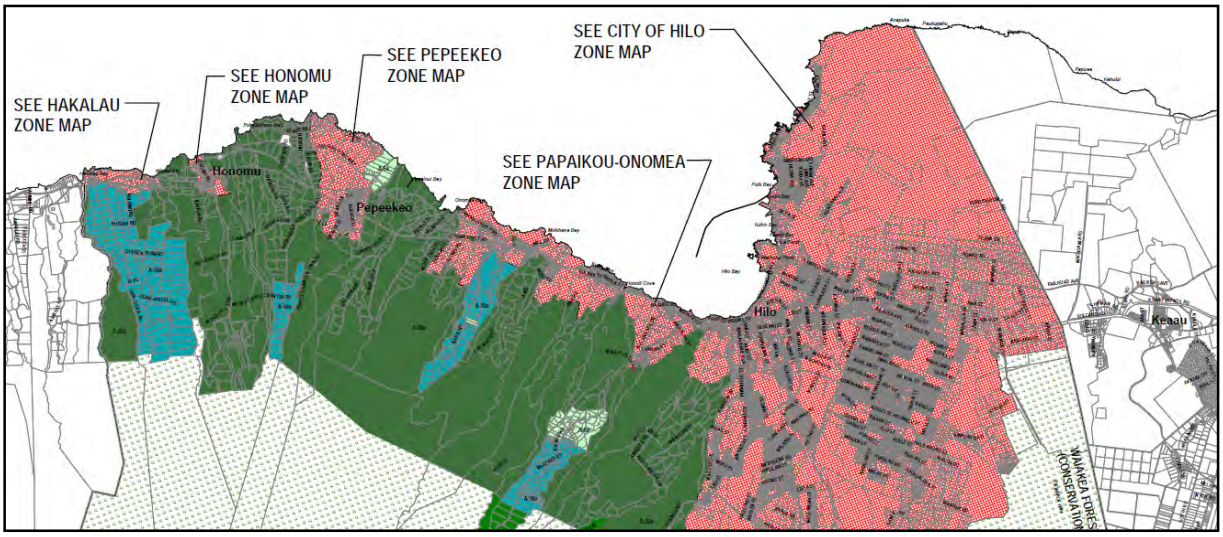
The Hawaii County Code is supplemented by two additional sets of rules: the Planning Department Rules of Practice and Procedure and the Planning Commission Rules of Practice and Procedure; both are available online from the county planning department website.[41] These two sets of rules primarily provide additional procedural guidance and detail on approval criteria, and also include a few key definitions including the boundaries of the Special Management Area and the shoreline setback line, which are not specified in the Hawaii County Code.

The land use pattern allocation of the General Plan and applicable community plans are implemented through the zoning ordinance and zoning maps. Detailed zoning maps are available

[39] http://kohalacenter.org/
[40] http://www.hawaiicounty.gov/lb-countycode/
[41] http://www.cohplanningdept.com/resources-and-references/

on the county's website.[42] Figure 13 is an example of an adopted zoning map. This is only an excerpt of Zone 2, South Hilo zoning map; the Hawaii County website allows zooming in to attain detailed zoning information.

Figure 13. Zone 2, South Hilo Map Excerpt



http://www.hawaii-County.com

Table 4 lists land use permits or approvals that may be needed for energy project development in Hawaii County.

Note: For an unofficial, quick reference on Hawaii County zoning, see the Planning Department's "Permitted Uses by Zoning District" table.

Agencies to Know in Hawaii County

Below is an overview of the county agencies cited as administrators of permits that may be required for a renewable energy project in Hawaii County. The overview is followed by a contact list for each agency.

Planning Department

The Planning Department is responsible for all county-level environmental and land use permits cited in this Guide for Hawaii County. The Planning Department provides technical advice to the Mayor, Planning Commission and County Council on all planning and land use matters. The Planning Department is also responsible for the administration of the subdivision and zoning codes.

The Planning Commission is the approval authority for many permit applications, and provides a recommendation to the County Council on other application types. There are two planning commissions; the Windward commission in Hilo, and the Leeward commission in Kona.

[42] http://www.cohplanningdept.com/zone-maps/

Department of Public Works

The Department of Public Works (DPW) is responsible for all construction and operation permits in Hawaii County. This includes all matters relating to engineering; public and private building construction and inspection; construction, inspection and maintenance of public streets, highways, bridges and drainage facilities; acquisition of public and private properties for public purposes; design, operation and maintenance of traffic signals and traffic control devices; and all other public works projects excluding wastewater and solid waste. The Hawaii County DPW has two divisions with permitting requirements that may apply to renewable energy development:

- **Building Division**: responsible for the administration and enforcement of building, electrical, and plumbing codes as well as issuance of building, plumbing, and electrical permits.
- **Engineering Division**: responsible for assisting the Planning Department with engineering related requirements for development, as well as permits associated with grading, grubbing, stockpiling, subdivisions, drainage and flood zones, and waterline installations.

Department of Research and Development

The Department of Research and Development is responsible for providing pro-active leadership, enhancing the quality of life, and improving the sustainability of the island of Hawaii communities through programs related to: agriculture, energy, tourism, economic development, community development, and film. Specific program areas include renewable energy initiatives, regulatory and legislative support, energy-related economic development projects, and energy emergency preparedness. The Department of Research and Development employs a Hawaii County Energy Coordinator.

Note: Hawaii County recommends that all renewable energy developers contact the County Coordinator early in the planning process.

Table 4. Hawaii County Land Use Permits Potentially Applicable to Energy Development

Agency	Permit/Approval	Permitted Activity
Planning Department East HI Aupuni Center 101 Pauahi Street, Suite 3 Hilo, HI 96720 Phone: 808-961-8288 West HI 74-5044 Ane Keohokalole Highway, Bldg E, Kailua-Kona, HI 96740 Phone: 808-323-4770	Shoreline Setback Variance	Any activity in the "Shoreline Setback Area" as defined in Hawaii County Planning Department Rules of Practice and Procedure, Rule 11 and Hawaii County Planning Commission Rules of Practice and Procedure, Rule 8.
	Special Management Area (SMA) Major or Minor Permit	Land development and earth-disturbing activities within the SMA as defined in the Hawaii County Planning Commission Rules of Practice and Procedure, Rule 9.
	Community Development Plan Amendment	If the Project is determined to be inconsistent with the vision, policies, principles, and guidelines of the applicable Community Development Plan, a Community Development Plan Amendment may be obtained to revise the plan.
	Use Permit	Required for certain permitted uses in zoning districts for other "unusual and reasonable uses" which are not specifically permitted in any zoning district. In particular, this permit is required for wind energy facilities in the O (Open) zoning district.
	Plan Approval	Site Plan approval is required prior to construction of transmission lines or substations in most zones, and may be required as a condition of approval for any use permit, variance, or other action relating to a specific use.
	Variance	Allows for some deviation from the strict implementation of provisions in the zoning requirements, Hawaii County Code Chapter 25 due to a site-specific hardship; provided that a variance shall not allow the introduction of a use not otherwise permitted within the district.
	State Special Use Permit	Allows for the development of "unusual and reasonable" land uses within agricultural and rural districts other than those for which the district is classified, pursuant to HRS 205-6.
	Change in Zoning	Changes the boundaries of existing zoning districts, or other provisions of the zoning code.
Department of Public Works Aupuni Center 101 Pauahi Street, Suite 3 Hilo, HI 96720 Phone: 808-961-8321	Various building and construction permits	Building Division issues building, plumbing, and electrical permits. Engineering Division issues permits associated with grading, grubbing, stockpiling, subdivisions, drainage and flood zones, and waterline installations.
Department of Research and Development	No permit or approval needed.	Coordination with the Department of Research and Development Energy Coordinator recommended early in a project's planning process.

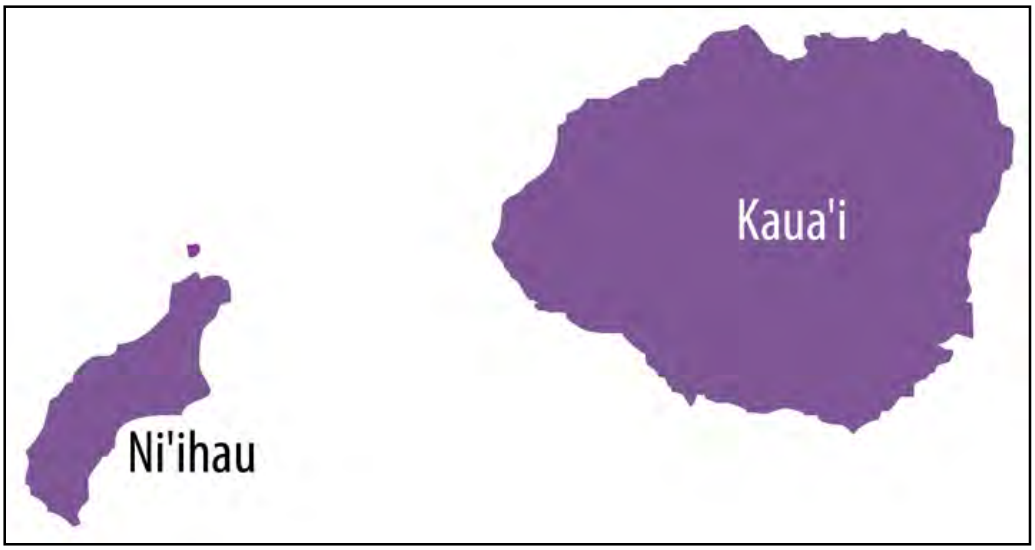
Agency	Permit/Approval	Permitted Activity
East HI 25 Aupuni Street, Suite 1301 Hilo, HI 96720 Phone: (808) 961-8366 West HI 74-5044 Ane Keohokalole Highway, Bldg C Kailua-Kona, HI 96740 Phone: (808) 323-4700		

Kauai County

Overview of the Kauai County Regulatory System

Kauai County consists of the islands of Kauai and Niihau (as shown in Figure 14) and is served by KIUC; however, this Guide is focused on Kauai only due to Niiahu's private ownership. Like other counties, Kauai County uses the three tiered planning system to guide land use and development on the island. These consist of a General Plan (Tier 1); Development Plans and Public Facility Plans (Tier 2); and, Ordinances, Rules and Permitting Requirements (Tier 3). The county's plans and land use regulations cover only the island of Kauai.

Figure 14. Kauai County



Kauai County General Plan

Kauai County's General Plan provides guidance for long-range development and conservation, land use regulations, the location and character of new developments and facilities, and planning for county and state facilities and services. The current version of the General Plan was adopted in 2000; it is available on Kauai County's Planning Department website.[43]

Section 7.7 of the General Plan addresses energy, and includes a number of policies and implementing actions related to energy development and conservation. Figure 15 provides an excerpt of the General Plan that describes the county's vision for electrical power. Other sections of the General Plan establish policies related to scenic views, historic and cultural resources, natural resources, land use, public infrastructure, and other factors in development.

[43] http://www.kauai.gov/Government/Departments/PlanningDepartment/LongRangeDivision/TheKauaiGeneralPlan/tabid/130/Default.aspx

Figure 15. Kauai County General Plan Vision for Electrical Power

Kauai's Vision for Electrical Power

(From the County of Kauai General Plan, 1999)

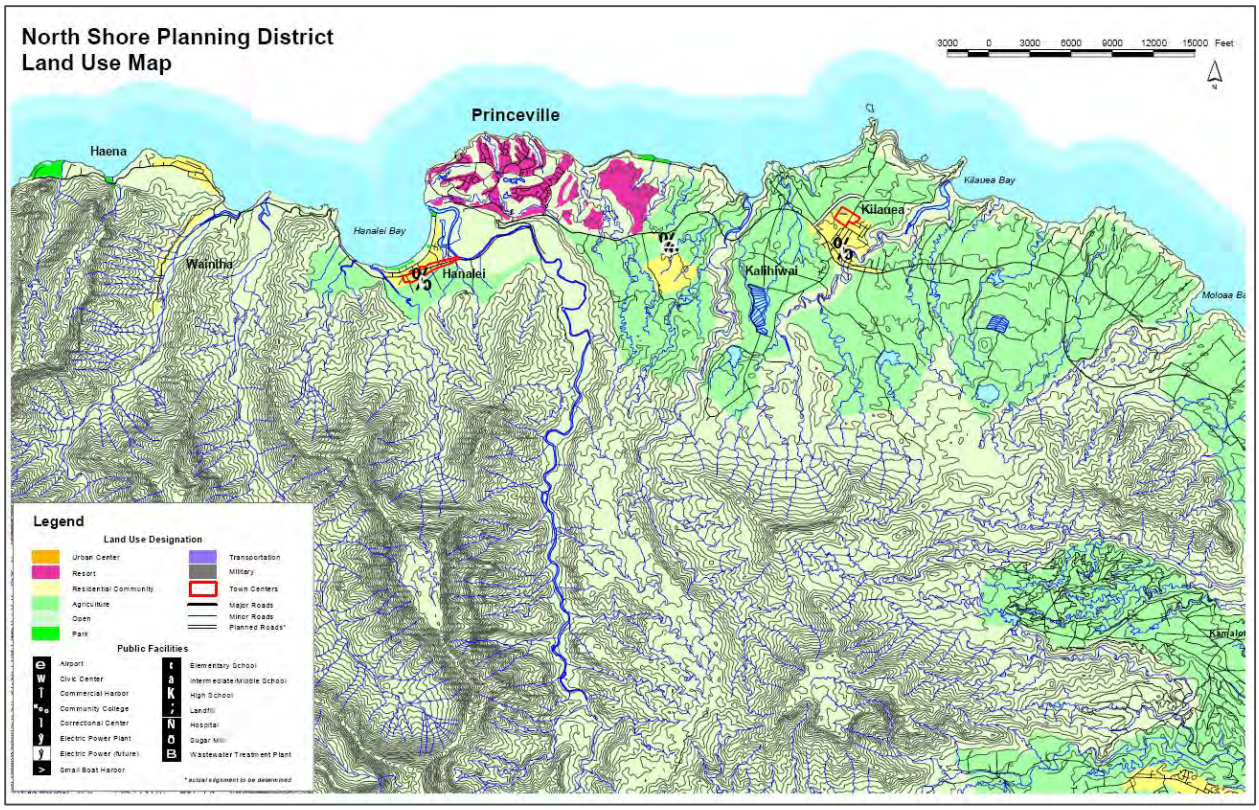
The electrical power companies serving Kauai take advantage of new technologies to offer alternative power sources that do not depend on fossil fuels. Renewable sources of energy such as solar, hydroelectric and biomass, supply a growing portion of energy needs. Fuel cells are commonly used to provide an individual power source for homes and businesses, especially in outlying areas. The power generating companies have been able to reduce power transmission facilities and costs, with savings passed onto the consumers.

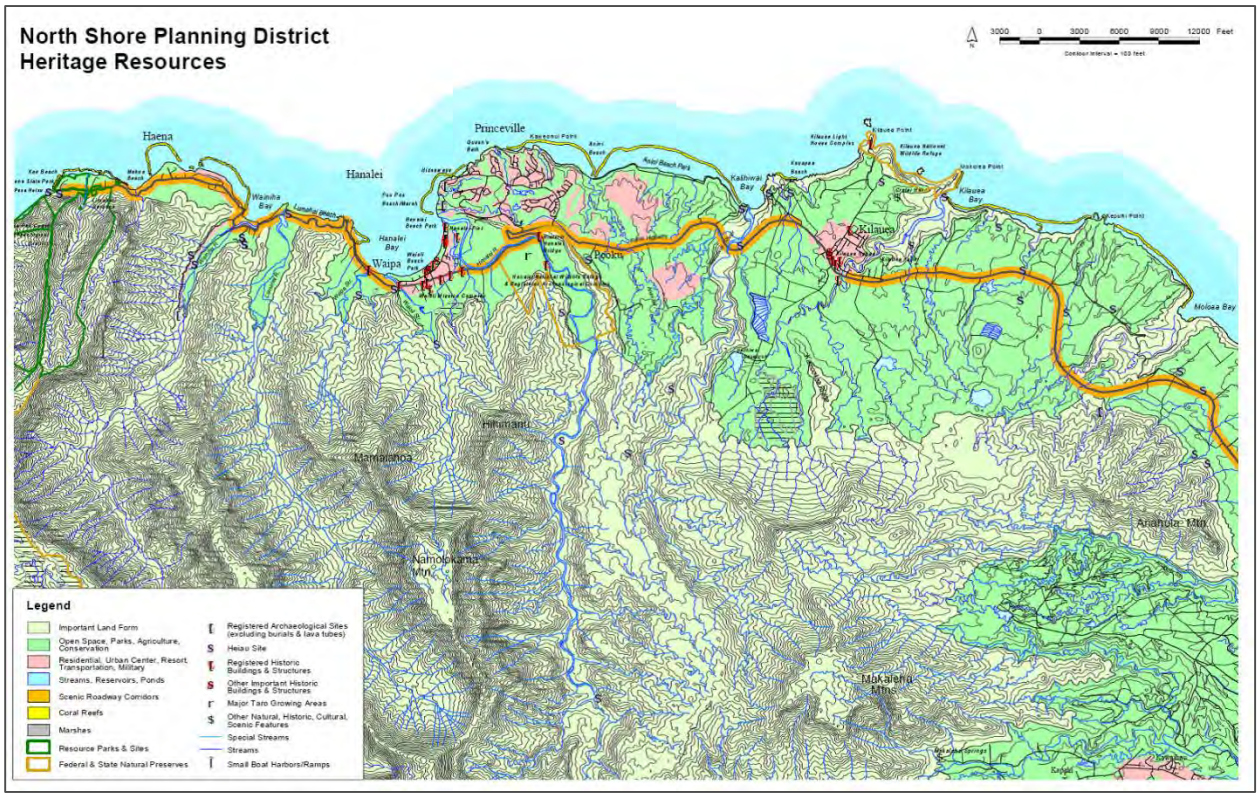
Residents of Kauai County are dedicated to the efficient use of energy and to minimizing the deleterious health, safety and aesthetic impacts of power installations. In particular, the County seeks opportunities and economic methods to render facilities (including transmission lines) inconspicuous in order to enhance a "park like" appearance throughout the island.

Source: County of Kauai General Plan, 1999 (KC 2009)

The Kauai County General Plan includes two sets of policy maps; Land Use Maps and Heritage Resource Maps, which supplement the text policies for each region (Kawaihau, Koloa, Lihue, West, and North Shore). The Land Use Maps depict the general locations of land use types and public facilities, serving as a guide for development plans and public facilities plans. The Heritage Resource Maps depict important natural, historic, cultural and scenic resources including mountains, streams and other landforms important to scenic views. All of the maps are available on the county's General Plan website. Figure 16 shows the Land Use Map (top) and Heritage Resource Map (bottom) for the North Shore of Kauai.

Figure 16. Maps Provided in the General Plan – North Shore District





http://www.kauai.gov/Portals/0/planning/flu-nshore.PDF and http://www.kauai.gov/Portals/0/planning/fhr-nshore.PDF

Development and Other County Plans

While the General Plan applies to the entire island of Kauai, development plans are intended to focus on specific towns, communities, and/or natural watersheds. To date, only one development plan has been adopted: the Lihue Town Core Urban Design Plan. Kauai County is currently working on a development plan for East Kauai. A Public Facility Plan is also under development, which will serve as long-range guidance for the provision of public services, facilities, capital improvements, and funding.

Consistent with the vision of the General Plan, there has been a recent focus on energy planning in Kauai County. Kauai's Energy Extension Service website provides information on Kauai County's Ongoing Program Areas.[44] In addition, the County of Kauai Operations Sustainability and Climate Action Plan (County of Kauai 2014)[45] documents Kauai's long-range goals, adopting principles and practices, past and ongoing efforts, and new opportunities for reducing carbon emissions and energy-related expenditures. This Plan also outlines a process for capturing information that will allow for performance measurements going forward, which can help guide development metrics.

Ordinances and Rules

Ordinances are mandated by the County Charter and constitute the principal means for implementing the county's plans. Title IV of the County Code addresses county planning and land development; the Comprehensive Zoning Ordinance (CZO; Title IV, Chapter 8) and related sections of Title IV provide regulations and standards for land development and the construction of buildings and other structures on the island. The CZO aligns with the other tiers of land use regulations, and is intended to ensure compatibility with the overall character of the island. An unofficial version of the Code is available online;[46] official hardcopy versions are available at the County Clerk's Office.

The County Code is supplemented by two additional set of regulations: the Rules of Practice and Procedure of the Kauai Planning Commission and the Special Management Area (SMA) Rules and Regulations. The Planning Commission Rules[47] primarily relate to procedural matters for planning commission hearings. Chapter 13 deals with SUPs as defined in HRS 205-6. The SMA Rules[48] govern permitting of uses within the SMA pursuant to HRS 205A.

Table 5 lists land use permits or approvals that may be needed for energy project development in Kauai County.

[44] http://www.kauai.gov/Government/Departments/EconomicDevelopment/ProgramAreas/EnergyPrograms/tabid/249/Default.aspx
[45] http://www.kauai.gov/Government/Departments/EconomicDevelopment/ProgramAreas/SustainabilityProgram/tabid/348/Default.aspx
[46] http://qcode.us/codes/kauaicounty/
[47] http://www.kauai.gov/Government/BoardsandCommissions/PlanningCommission/tabid/517/Default.aspx
[48] http://www.kauai.gov/Government/Departments/PlanningDepartment/ZoningandLandUsePermits/ResourceDocuments/tabid/627/Default.aspx

Agencies to Know in the County of Kauai

Below is an overview of the three different Kauai County agencies cited as administrators of permits that may be required for a renewable energy project in Kauai County.

Planning Department

The Planning Department administers all environmental and land use permits in Kauai, making them the main entity responsible for the administration and enforcement of Kauai's General Plan and CZO and related planning and land use development ordinances.

Note: There are four general classes of zoning permits in Kauai County – Class I, II, III, and IV. The Kauai PD determines which class is appropriate for the proposed project.

The Planning Department also provides technical advice to the Mayor, Planning Commission, and County Council on all planning and land use matters in the county. The Planning Commission is a board made up of seven members from the public that are appointed by the Mayor and confirmed by the County Council. The Planning Commission holds bi-monthly public hearings on zoning and land use permits and applications (i.e., SUPs, Shoreline Setback Variances, SMA Permits, zoning permits, and variances), and provides recommendations on the land use decisions or is the decision making entity on these matters.

Department of Public Works

The Kauai Department of Public Works (DPW) is responsible for the renewable energy-related construction and operation permits in Kauai. DPW reviews and enforces various codes and regulations pertaining to construction. Three divisions of DPW administer the construction and operation permits that may be required for energy development:

- **Building Division**: responsible for building code enforcement and building construction. The DPW website offers a Building Permits Online feature,[49] which allows applicants to track the status of submitted building permits. Also see DPW's Electronic Plan Review (ePlan) website,[50] which provides for the electronic submission of plans for Building Permits.
- **Engineering Division**: administers grading, grubbing, stockpiling, plumbing, and other ordinances. There are three subdivisions within the Engineering Division, including the Construction Management & Inspection, Design & Permitting, and Survey & Mapping.
- **Wastewater Management Division**: develops and operates the county's wastewater infrastructure, including administration of permits that allow sewer lines to be connected to the public wastewater system.

Office of Economic Development

The Office of Economic Development (OED) is responsible to provide technical and financial support, as feasible, for both large and small business establishments, or existing and emerging new industries which offer full employment for Kauai's residents. The OED works, in partnership with

[49] http://www.kauai.gov/BuildingPermits
[50] http://www.kauai.gov/Government/Departments/PublicWorks/BuildingDivision/ElectronicPlanReview/tabid/392/Default.aspx

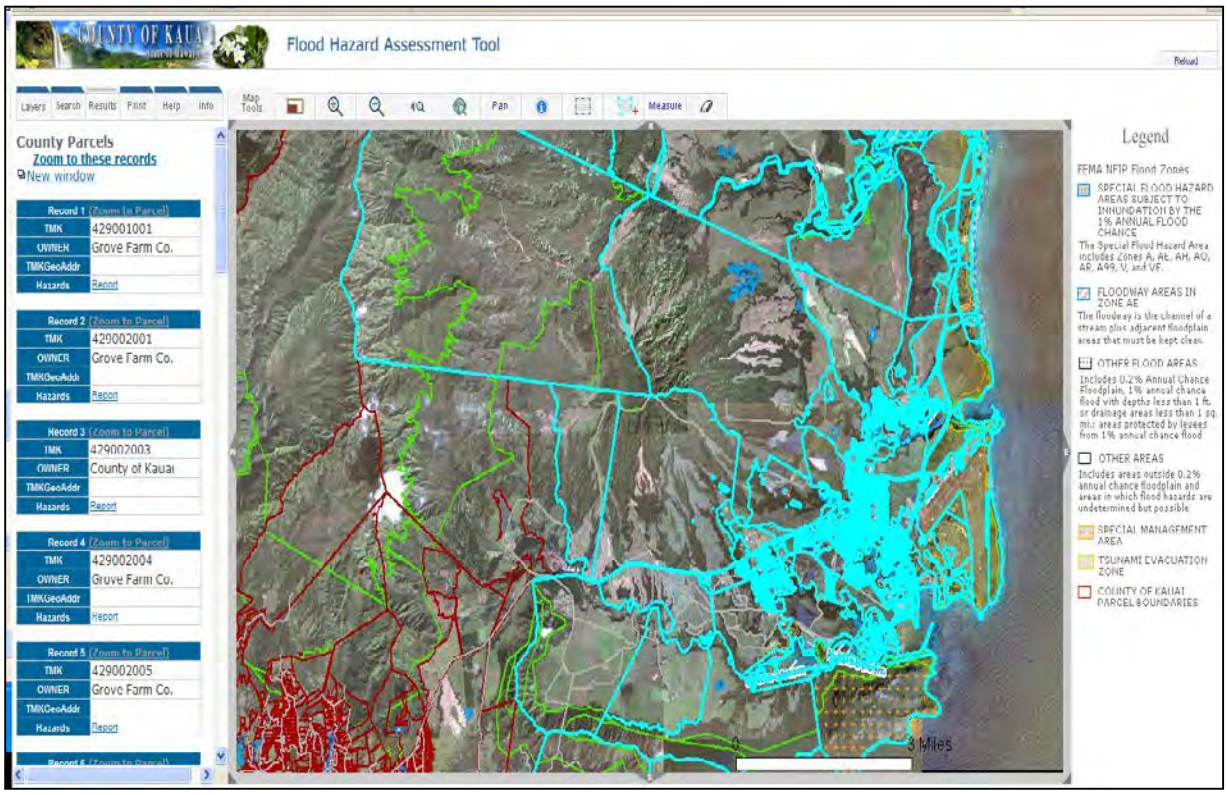
the community, to create economic opportunities towards the development of a healthy, stable and balanced economy for the residents of Kauai County. The Kauai County Energy Coordinator is located in this office and HSEO recommends that all applicants contact the Coordinator early in the planning process.

Note: Developers should also coordinate with the Kauai County Sustainability Manager in this Office.

Other Resources

An important resource for prospective developers working in Kauai is the Kauai Online Hazard Assessment (KOHA) tool that was created for Kauai County by NOAA. Figure 17 illustrates how using this tool enables anyone to view parcels of land, conservation districts, waterways, SMAs, and other helpful information. The KOHA tool can be accessed online.[51]

Figure 17. Kauai Online Hazard Assessment Tool Map Example



[51] http://www.kauai.gov/EServices/GIS/tabid/433/Default.aspx

Table 5. Kauai County Land Use Permits Potentially Applicable to Energy Development

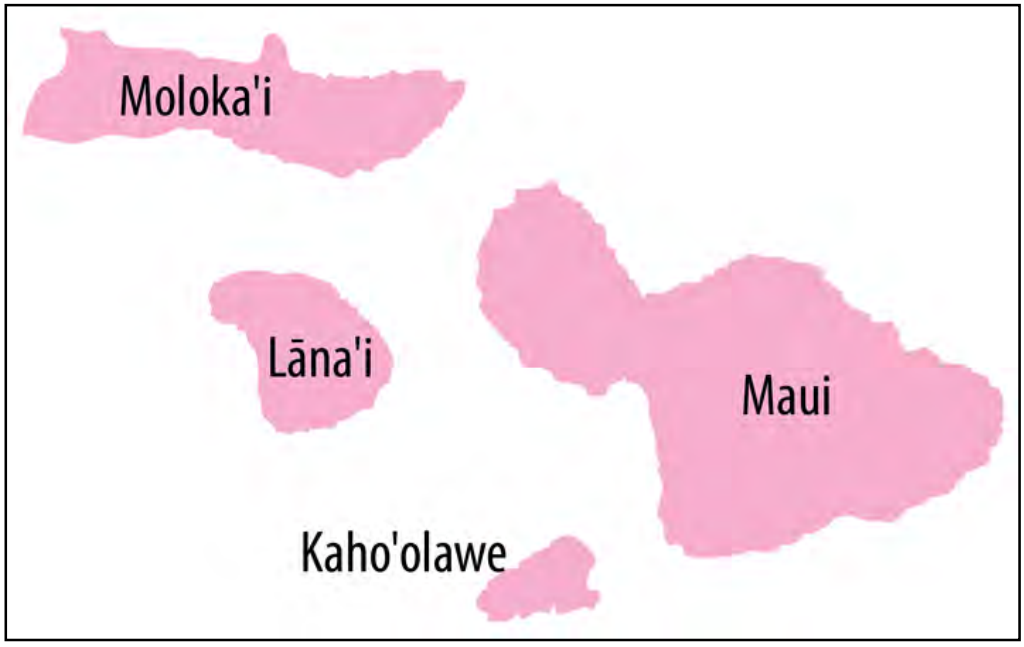
Agency	Permit/Approval	Permitted Activity
Planning Department 4444 Rice Street, Suite 473 Lihue, HI 96766 Phone: 808-241-4050	Shoreline Setback Variance	Allows for some types of structures or activities within the "Shoreline Setback Area" as defined in County Zoning Ordinance, Chapter 8, Article 27. Applies to all lands within 500 feet of the shoreline.
	Special Management Area Use Permit	Allows for development and related activities within the Special Management Area, as defined in the Special Management Area Rules and Regulations of Kauai County.
	State Special Use Permit	Allows for the development of "unusual and reasonable" land uses within agricultural and rural districts other than those uses for which the district is classified, pursuant to HRS 205-6.
	Use Permit	Required for uses, development and activities that are "generally permitted" within each zoning district, to ensure proper integration and compatibility of land uses which may be suitable only in specific locations in a district, or only under certain conditions, or only if the uses are designed, arranged or conducted in a particular manner.
	Variance Permit	Allows a variance from the strict application of county land use regulations as they are set forth in the Comprehensive Zoning Ordinance (CZO) Chapter 18, if there are site-specific circumstances that prohibit the reasonable use of the property if all regulations are applied. A variance may not be used to permit uses that would otherwise not be permitted.
	Zoning Permit	Required for nearly all construction, development, activity or use regulated by CZO, Chapter 8, Article 19, including obtaining a building permit.
Department of Public Works	Various construction level permits	Building Division issues permits for building construction. Engineering Division issues permits for grading, grubbing, stockpiling, plumbing, and other activities. Wastewater Management Division administers permits that allow sewer lines to be connected to the public wastewater system.
Office of Economic Development	No permit	The Kauai County Energy Coordinator is located in this office and HSEO recommends that all applicants contact the Coordinator early in the planning process.

Maui County

Overview of the Maui County Regulatory System

Maui County consists of four islands—Kahoolawe, Lanai, Maui, and Molokai—as shown in Figure 18, and is served by MECO. The three tiered planning system that guides development in Maui County consists of the Countywide Policy Plan and the Maui Island Plan, which together form the General Plan (Tier 1); Community Plans (Tier 2); and, Ordinances, Rules and Permitting Requirements (Tier 3).

Figure 18. Maui County



Maui County General Plan

The Maui County 2030 General Plan consists of a pair of planning documents: the Countywide Policy Plan (CWPP) and the Maui Island Plan (MIP). An updated CWPP was adopted in March 2010, as the first component of the decennial General Plan update; it is available on the Maui County Planning Department website.[52] An updated version of the MIP was adopted in December 2012.[53]

The CWPP acts as an overarching values statement, and is the umbrella policy document that provides direction for the more specific MIP and Community Plans. The CWPP includes: (1) a vision statement and core values for the county; (2) an explanation of the plan making process; (3) a description and background regarding the current state of the county; (4) guiding principles for the

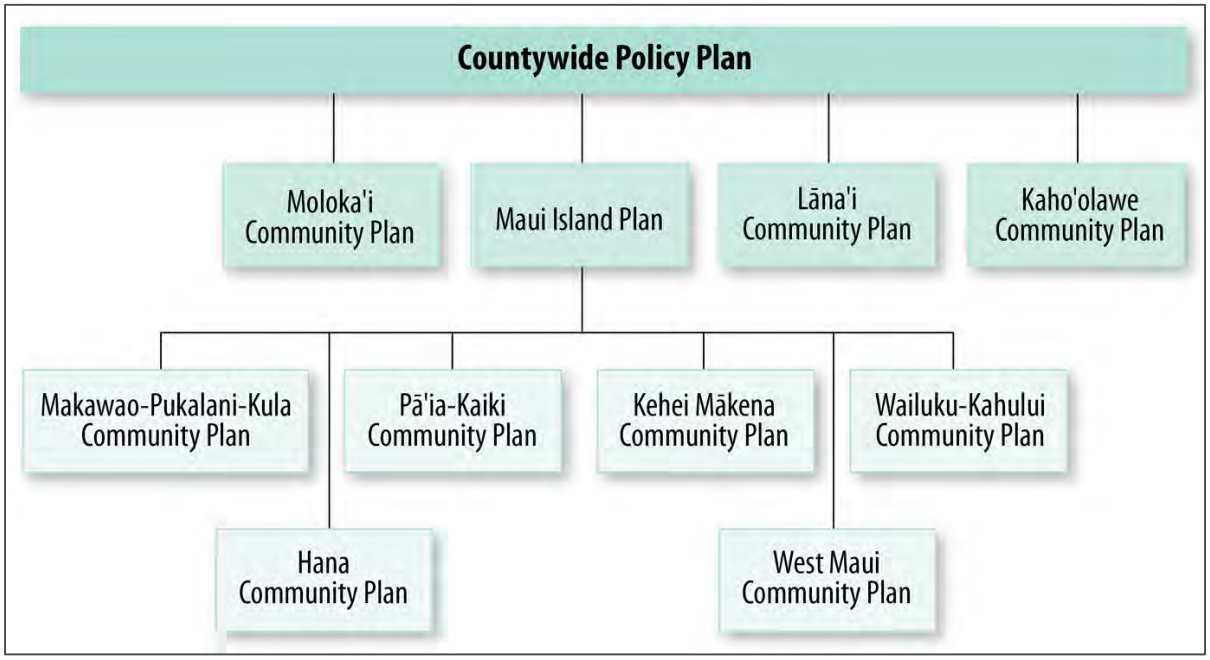
[52] http://co.maui.hi.us/index.aspx?NID=420
[53] http://co.maui.hi.us/index.aspx?NID=1120

county; and, (5) a list of countywide goals, objectives, and policies related to population, land use, the environment, the economy, housing, and other county priorities.

Note: In applications for project permits, renewable energy project proponents should demonstrate in detail how their project(s) conform with and support these plans.

The MIP builds upon the CWPP and addresses issues specific to the island of Maui, the largest of the county's islands and the home of the majority of its residents. It provides policy direction for the use and development of land, development of public infrastructure and community facilities, and protection of natural and cultural resources. The MIP also provides the foundation for zoning and other regulatory mechanisms. The MIP includes a series of maps depicting general land use classifications, which cover the more developed portions of the island and inform the adoption of zoning ordinances. The MIP also acts as a guide for each of the island's six community plans, as illustrated in Figure 19.

Figure 19. Maui County General Plan Documents



County of Maui Hawaii – Website for Planning Department (http://www.mauiCounty.gov/index.aspx?NID=423)

These plans communicate Maui County's visions and values regarding land use, open space, transportation, natural resources, and other issues pertinent to energy use and renewable energy permitting. The CWPP includes many objectives and policies related to improving sustainability, most of which are geared toward environmental stewardship and resource conservation; some, however, relate specifically to renewable energy development. Energy-related objectives and policies are presented below in Figure 20.

Figure 20. Maui County's Energy Objectives and Policies

Maui County 2030 General Plan, Countywide Policy Plan

Objective: Significantly increase the use of renewable and green technologies to promote energy efficiency and energy self-sufficiency.

Policies

a. Promote the use of locally renewable energy sources, and reward energy efficiency.
b. Consider tax incentives and credits for the development of sustainable- and renewable-energy sources.
c. Expand education about energy conservation and self-sufficiency.
d. Encourage small scale energy generation that utilizes wind, sun, water, biowaste, and other renewable sources of energy.
e. Expand renewable energy production.
f. Develop public-private partnerships to ensure the use of renewable energy and increase energy efficiency.
g. Require the incorporation of locally appropriate energy-saving and green building design concepts in all new developments by providing energy-efficient urban design guidelines and amendments to the Building Code.
h. Encourage the use of sustainable energy to power vehicles.
i. Promote the retrofitting of existing buildings and new development to incorporate energy-saving design concepts and devices.
j. Encourage green footprint practices.
k. Reduce Maui County's dependence on fossil fuels and energy imports.
l. Support green building practices such as the construction of buildings that aim to minimize carbon dioxide production, produce renewable energy, and recycle water.
m. Promote and support environmentally friendly practices in all energy sectors.

Maui Island Plan, 2012

Goal 6.10: Maui will meet its energy needs through local sources of clean, renewable energy, and through conservation.

Objective 6.10.1: Reduce fossil fuel consumption. Using the 2005 electricity consumption as a baseline, reduce by 15 percent in 2015; 20 percent by 2020; and 30 percent by 2030.

Policies:

6.10.1.a Support energy efficient systems, processes, and methods in public and private operations, buildings, and facilities.
6.10.1.b Support the Maui Solar Rooftop initiative.
6.10.1.c Support Hawai`i Energy and other Public Utility Commission (PUC) approved energy efficiency programs.

Objective 6.10.2: Increase the minimum percentage of electricity obtained from clean, renewable energy sources. By 2015, more than 15 percent of Maui's electricity will be produced from locally-produced, clean, renewable energy sources, 25 percent by 2020, and 40 percent by 2030.

Policies:

6.10.2.a Evaluate available renewable energy resource sites and applicable technologies.
6.10.2.b Encourage the installation of renewable energy systems, where appropriate.
6.10.2.c Support the establishment of new renewable energy facilities at appropriate locations provided that environmental, view plane, and cultural impacts are addressed.
6.10.2.d Encourage all new County facilities completed after January 1, 2015, to produce at least 15 percent of their projected electricity needs with onsite renewable energy.

Objective 6.10.3: Increased use of clean, renewable energy.

Policies:

6.10.3.a Support efforts in the PUC to upgrade Maui's power grid to integrate renewable energy from multiple sources and wheeling of electricity.

6.10.3.b Encourage the PUC to work with the County to implement and expedite community supported renewable energy projects.
6.10.3.c Encourage efforts to produce more renewable energy using distributed generation.
6.10.3.d Encourage import substitution by MECO and the broader community to become more self-sufficient in energy production.
6.10.3.e Educate the public on the economic and environmental benefits from the increased use of renewable energy.
6.10.3.f Encourage support from the Federal government, State, and the private sector for Maui's renewable energy objectives.
6.10.3.g Encourage incentives to support the development and use of renewable energy.

Objective 6.10.4: More efficient distribution of power throughout the island while preserving island beauty.

Source: MCPD 2010

Community Plans

The islands of Kahoolawe, Lanai, and Molokai each have a Community Plan that also acts as an Island Plan. As noted above there are six additional Community Plans covering portions of the island of Maui. The nine Community Plan documents are available online[54] or printed copies may be purchased from the Maui County Department of Planning. The Lanai and Molokai Community Plans are both in the process of being updated as of October 2014; the other plans would be updated sometime thereafter as part of a regular review cycle.

Each of these plans establish land use categories and definitions, and include maps that form the basis of future zoning in those areas. The land use categories and definitions are found within the body of each plan, while the maps are available on a separate page of the county's website.[55]

All of these Community Plans share similar or identical goals and policies related to energy development and conservation. Primary among these is to "promote energy efficiency as the energy resource of first choice." Other policies include promoting "environmentally and culturally sensitive use of renewable energy resources like biomass, solar, wind and hydroelectric energy" and requiring "proper site selection, facility construction and monitoring of power generation facilities in order to minimize adverse environmental impacts." As with the General Plan, most of the energy-related policies are geared toward energy conservation and small-scale distributed energy generation.

Ordinances and Regulations

The Maui County Code (MCC) establishes the structure and organization of the government of Maui County, establishes and applies zoning designations, and establishes permitting requirements and procedures for development. The MCC is available online.[56] The most commonly applicable sections of the MCC for permitting renewable energy projects are:

[54] http://www.mauiCounty.gov/index.aspx?NID=423
[55] http://co.maui.hi.us/index.aspx?NID=1523
[56] http://library.municode.com/index.aspx?clientId=16289

- Title 16—Buildings and Construction
- Title 19—Zoning

Title 16 provides the building code for construction standards. Title 19 identifies allowable, and special uses in each zone. Many renewable energy projects would require either a county Special Use Permit and/or a state SUP, depending on the nature and location of the project, and would require hearings before the appropriate planning commission.

Note: The permitting of associated above-ground and underground electrical infrastructure (transmission lines, poles, substations) in Maui County may depend on whether or not the infrastructure is considered "accessory" or not, and whether or not the PUC has oversight over the transmission. The issue of infrastructure permitting and regulation should be determined early in the permitting process. Providing accurate drawings and descriptions to the County permitting agencies will facilitate the permit determination and review process.

Other applicable rules include those adopted by the three planning commissions – the Maui Planning Commission, Lanai Planning Commission, and the Molokai Planning Commission – as well as those rules adopted by the Board of Variances and Appeals. Each of the Planning Commissions provide rules for additional procedural guidance, rules related to the shoreline setback, and rules related to the SMA. The boundaries of the SMA are adopted by each planning commission, and are shown on the county's online mapping system. Additional rules including design guidelines may also apply.

Table 6 lists land use permits or approvals that may be needed for renewable energy project development. These types of permits apply to all of Maui County; however, there are application forms specific to proposed projects on Lanai and Molokai that are different than the forms for Maui.

Agencies to Know in Maui County

Below is an overview of the agencies cited as administrators of permits that may be required for a renewable energy project in Maui County.

Department of Planning

Maui County's Planning Department administers many environmental reviews and permits, as well as land use permits. The Planning Department offers technical advice to the Mayor, County Council and commissions; proposes zoning legislation; drafts updates to the General Plan, Maui Island Plan, and Community Plans; presents reports & recommendations on development proposals; and oversees programs on cultural resources, census and geographic information, flood plain permits and other special projects and permits (MCPD 2010).

The Planning Department has three major divisions that carry out its mission: the Current Planning Division, the Zoning Administration and Enforcement Division, and the Long Range Planning Division. The Long Range Planning Division is responsible for overseeing the development of the General Plan and Community Plans. The Current Planning Division and Zoning Administration and

Enforcement Division administer a number of permits and approvals that a renewable energy developer may be required to acquire.

The Planning Department supports the three planning commissions—the Maui Planning Commission, Lanai Planning Commission, and the Molokai Planning Commission. Projects located on Molokai or Lanai must work with the respective island Planning Commission, while the Maui Planning Commission covers the rest of Maui County. All Commissions advise the Mayor, County Council, and Planning Director in matters concerning planning programs in their respective areas of Maui County. The Commissions are involved in the public hearing process, and transmit their findings and recommendations to the County Council for consideration and action. The CZM laws, and other land use rules, ordinances, and laws also fall under the jurisdiction of these Commissions; as noted above, the Planning Commissions define the boundaries of the Special Management Areas.

The Planning Department and other county agencies have a majority of their permits online; forms, tracking, and permit information has been organized and made available on the Maui County website.[57]

Department of Public Works

The Maui County DPW administers a number of construction permits that, depending on the renewable energy project, may be required. The DPW's three major branches—the Development Services Administration, Engineering Division, and Highways Division—all serve to protect the public health, safety, property, and environment by administering its building codes. Building permits, county highway work, electrical permits, grading and grubbing permits, subdivision approvals, and others are all administered by the DPW's Development Services Administration. DPW's Building Plans and Reviews Section website provides information on Maui County Codes applicable to renewable energy and energy conservation projects.[58]

Department of Environmental Management

The Department of Environmental Management oversees the Wastewater Reclamation and Solid Waste Management Divisions. The Wastewater Reclamation Division issues the Wastewater Discharge Permit and Wastewater Hauler Permit—both of which may be necessary for geothermal, hydroelectricity, hydrokinetic, waste-to-energy, and biofuel projects. A Wastewater Discharge Permit is necessary for discharge of industrial wastewater into the county's wastewater treatment facilities. A Wastewater Hauler Permit is required for liquid waste haulers to discharge wastewater into the county's treatment facilities; this is likely to apply during project construction, but would be required for the third-party wastewater hauler rather than for the project developer.

[57] http://www.co.maui.hi.us/index.aspx?nid=121
[58] http://www.co.maui.hi.us/index.aspx?NID=1308

Office of Economic Development (OED)

The Maui County OED is responsible to work in partnership with the community, business and government sectors to strengthen and diversify the economy by supporting existing businesses and assisting in the attraction, development and expansion of new businesses.

Note: The Maui County Energy Commissioner and Coordinator are located in this Office, and HSEO recommends that all applicants contact the Commissioner and Coordinator early in the planning process.

Other Resources

The Maui County Energy Alliance was established in 2008 to address the formulation of policies and actions that could move the county away from fossil fuel dependence. Five working groups formed under the Maui County Energy Alliance in order to gather data, site opportunities, and make recommendations in the areas of (1) Renewable Resource Development, (2) Green Workforce Development and Education, (3) Energy and Transportation Infrastructure, (4) Energy Efficiency and Conservation in County Facilities, and (5) Greenhouse Gases and Carbon Emissions. The recommendations made by these working groups will move Maui toward achieving the goal of 95 percent renewable energy and a carbon-neutral footprint by the year 2020. In the September 2009 Maui County Energy Alliance Plan, the working groups cite the opportunity to encourage investment in renewable energy technologies by fast-tracking and reducing fees for clean energy-related permits, procedures, and zoning resolutions (MCEA 2009). Collectively, the alliance, their recommendations, and the Maui County Clean Energy Program's efforts show the high priority that renewable energy has in Maui. The plan is available online.[59]

A number of other resources important for prospective energy developers are available on the Maui County website, including an online mapping system with data including land use zoning, major roads, Special Management Areas, hazard areas and other important features.[60] The county also provides the data for download. Permits may also be tracked through the mapping system.

[59] http://www.co.maui.hi.us/documents/50/54/317/MCEA%20Expo%20Long%20Version%20Final%20Sep%2009.pdf
[60] http://agis10g.co.maui.hi.us:8080/agis/map/viewer.jsp

Table 6. Maui County Land Use Permits Potentially Applicable to Energy Development

Agency	Permit/Approval	Permitted Activity
Planning Department 250 S. High Street Kalana Pakui Bldg, Suite 200 Wailuku, HI 96793 Phone: 808-270-7735 Current Planning Division 2200 Main Street One Main Plaza Bldg, Suite 619 Wailuku, HI 96793 Phone: 808-270-8205	Shoreline Setback Variance	Allows for some types of structures or activities within the "Shoreline Setback Area" as defined in the respective Shoreline Rules of the Maui, Molokai or Lanai Planning Commission.
	Special Management Area Use Permit	Allows for development and related activities within the Special Management Area, as defined in the respective Special Management Area Rules of the Maui, Molokai or Lanai Planning Commission.
	Change in Zoning Permit	Establishes a zoning district or changes established zoning designation on a parcel of land to another established use zone district.
	Conditional Use Permit	Allows for development that is similar or related to those uses permitted within the given use zone and is for a limited period of time.
	State Special Use Permit	Allows for the development of “unusual and reasonable” land uses within agricultural and rural districts other than those for which the district is classified, pursuant to HRS 205-6. The applicable planning commission may approve uses on lands up to 15 acres in size; larger projects require HLUC approval.
	State Land Use Commission District Boundary Amendment (DBA)	To amend or reclassify State Land Use District boundaries involving lands 15 acres or less presently classified in the Agricultural, Rural or Urban Districts as defined in HRS Section 205-3.1. Proposals to reclassify lands greater than 15 acres or involving Conservation lands requires HLUC approval.

Agency	Permit/Approval	Permitted Activity
Planning Department, Zoning Administration and Enforcement Division 2200 Main Street One Main Plaza Bldg, Suite 335250 S. High Street Kalana Pakui Bldg, Suite 200 Wailuku, HI 96793 Phone: 808-270-7253	County Special Use Permit	Allows for development of certain special uses within the various zoning districts as defined in MCC Title 19 Article II. Required for some types of energy facilities in some zones.
	Special Flood Hazard Area Development Permit	Allows some types of development in areas subject to flooding, as defined in MCC 19.62.
	Board of Variance and Appeals	Allows variances from the strict application of any zoning, subdivision or building ordinances. Process also used to appeal a decision or order of, or alleged error by, any department charged with the enforcement of zoning, subdivision, and building ordinances.
	Zoning and Flood Confirmation Form	Provides official verification of the County Zoning, Community Plan, State Land Use District designations, Flood Zone and other special districts for parcels of land located within Maui County.
Department of Public Works	Various construction permits	Permits issued for building construction, work in County highway, electrical construction, grading, grubbing, and other.
Department of Environmental Management	Wastewater Discharge Permit and Wastewater Hauler Permit	Wastewater Discharge Permit allows discharge of industrial wastewater into the County's wastewater treatment facilities. Wastewater Hauler Permit allows liquid waste haulers to discharge wastewater into the County's treatment facilities.
Office of Economic Development	No permit	The Maui County Energy Commissioner is located in this office and HSEO recommends that all applicants contact the Energy Commissioner early in the planning process.

Chapter 4

While the information presented in the preceding chapters applies broadly to any type of renewable energy development, this chapter highlights permitting nuances in Hawaii for the renewable energy technologies identified in Chapter 1 and listed below:

- Biofuels/Bioenergy
- Geothermal
- Hydroelectric
- Marine Hydrokinetic (MHK) or Wave Energy
- Ocean Thermal Energy Conversion (OTEC)
- Solar
- Waste-to-Energy (WTE)/Biomass Conversion
- Wind

The purpose of this chapter is to provide resource planners and developers with a description of some of the particular considerations that go into siting and permitting each of the technologies in Hawaii. This chapter also provides the consultations and permits that may be required for a specific type of renewable energy technology in Hawaii; however, it is not intended to be all inclusive as the suite of federal, state, and county approvals typically applicable to all or most types of energy development were described in Chapters 2 and 3. Refer to the applicable Permit Brief at DBEDT's Developer & Investor Center website for more detail on various federal, state, and county permit or approval processes.

Initial Assessment

As discussed in Chapter 1; prior to development, all technologies require some level of resource assessments or studies to determine if there is potential for impacts to environmental resources, and whether specific permits or approvals may be required to construct and operate a proposed project. The type of assessment undertaken by a developer may depend upon the project's location, such as whether it is on land or in a marine or aquatic environment. Typically, desktop assessments (e.g., literature reviews) are initially conducted to determine if more detailed assessments or field studies are required. Examples of literary resources available to the public include the Hawaii Biodiversity and Mapping Program database through the University of Hawaii,[61] the Hawaii Statewide GIS Program through the Office of Planning,[62] and the databases maintained by each county's GIS department, such as the City and County of Honolulu's Hawaii Land Information System (HoLIS).[63] If field studies are required, rights-of-way (ROWs) or access approvals from the appropriate agencies may be needed for access to public lands, which may be dependent upon the

[61] http://hbmpweb.pbrc.hawaii.edu/ccrt/hbmp
[62] http://planning.hawaii.gov/gis/
[63] http://gis.hicentral.com/

issuance and approval of other permits (e.g., Conservation District Use Permit). Early engagement with regulatory agencies can help clarify expectations and guide site evaluations so that resource assessments are conducted according to standard protocols.

Note: Early coordination with agencies provides an opportunity to identify federal, state, or local rules and policies that may affect the project, to confirm permits required, and to confirm a schedule for approvals. Meaningful community and stakeholder outreach should also take place early in the project scoping and design phase.

Potential Resource Considerations Applicable to Most Renewable Energy Technologies

As discussed in detail in Chapter 2, potential resource considerations applicable to most renewable energy technologies include the following:

Biological Resources

To determine if protected plant and animal species and important habitats may potentially occur within a project area or be otherwise affected by a proposed renewable energy project, a desktop assessment can be completed using publically available information (e.g., Hawaii Biodiversity and Mapping Program database). However, in general, focused survey efforts during the appropriate season are often necessary to adequately address risk of impacts. Typically a general biological site assessment is conducted to review site conditions and identify the potential for species of concern, associated important habitats, and the need for additional field surveys. These surveys may include species or species-groups specific surveys such as avian or invertebrate surveys, acoustic monitoring, botanical surveys, fish and benthic surveys, and essential fish habitat surveys. When planning biological surveys, it is important to identify the species of concern as early as possible so that targeted surveys can be conducted, if warranted, according to appropriate protocols. The duration and scope of these surveys is typically determined by industry standards and in coordination with the primary regulatory agencies: DLNR/DOFAW, USFWS and NOAA.

Water Resources

To determine if jurisdictional wetlands or waters of the US (regulated by USACE, USCG, or other federal agency) occur within a project area, a desktop assessment is initially conducted to identify whether a field assessment is warranted. Publically available National Wetlands Inventory Data and National Hydrography Data can be used to assess the potential for presence of jurisdictional waters within a project area. If there appears to be potential for wetlands or waters within a project area, limits may be field delineated to avoid or minimize impacts from the proposed project. Avoiding impacts to jurisdictional waters eliminates the need for a Section 404 Permit from USACE and Section 401 compliance. Consult the state Commission on Water Resource Management and the department/board of water supply within each county to identify watershed and waterways protected under local or state programs.

Cultural and Archaeological Resources

SHPD requires an Archaeological Inventory Survey with subsurface testing for all ground disturbing activities per HAR 13-276. As mentioned in Chapter 2, project proponents should voluntarily consult with SHPD during the early due diligence period to determine HRS 6E compliance needs and to avoid any surprise discoveries of significant artifacts which can delay issuance of permits related to authorization of site disturbance (e.g., grading permit). All components of the project facilities are subject to compliance with HRS 6E including generator-tie lines, subsea transmission cables, and access roads. If possible, renewable energy facilities should be sited to avoid any cultural and archaeological resources located within the project area. Mitigation may be viable where impacts cannot be avoided; in such cases, the project developer would be required to have in-depth consultations with affected stakeholders to find a solution to sufficiently preserve the resources impacted.

Note: Given the length of time required for proper identification and protection of archeological and cultural resources, these assessments should be a top priority, along with biological reviews, when evaluating a potential site for development. Consultation with OHA and other stakeholders early in the project development stage is also recommended. OHA's Papakilo Database is an ongoing cutting edge and comprehensive database consisting of varied collections of data pertaining to historically and culturally significant places, events, and documents in Hawaii's history.[64] Developers should also consult the SHPD and other (e.g., Bishop Museum) websites for existing reports that may cover their targeted development area(s).

For in-water projects, submerged cultural resources surveys (e.g., magnetometer survey) may be required. Further consultation with SHPD, OHA, and other recognized stakeholders or experts is required if there is potential for impacts to historic, archaeological, and/or cultural resources in the project area, including maritime heritage sites.

Visual Resources

A visual resource impact analysis may be needed to identify any potential visual impacts to nearby communities and, in some instances, historical properties. If necessary, more extensive visual analysis and visual simulations could be developed during permitting and during the public outreach and comment period.

Note: If there is ***any*** potential for day or night visual impacts, HSEO strongly recommends thorough consultation with nearby communities, including presenting day and night visuals from multiple key vantage points, which can be best identified through community consultation.

Noise

Depending upon the type of renewable energy technology, noise can be a concern to humans as well as species living within the project area, particularly marine mammals. HAR Section 11-46 as described in Chapter 2, limits noise from stationary sources and sets limits based on both the land

[64] http://www.papakilodatabase.com/main/main.php

use district the noise source is located in and the time of day. For noise associated with offshore renewable energy project construction and operation, the MMPA includes provisions for the "incidental take" of marine mammals if harmful sound-related activities have the potential to kill, injure, or harass the animals. Pursuant to the MMPA, NOAA Fisheries may require that surveys (such as seismic surveys) or construction and operation activities occur only during a particular temporal window or in a specific area, and promote sound-reducing technologies.

There are various tools available to predict sound levels from renewable energy technologies. Computer models can take into account terrain effects, wind direction effects, atmospheric absorption, background noise, and requirements of regulatory agencies. If a project anticipates exceeding the maximum permissible sound levels, a noise analysis can be conducted to determine sound levels, assess likely impacts from facility operations, and help determine appropriate mitigation measures. For projects near communities, sound level monitors are typically located at key points along the project property, where sound impacts are measured. To minimize sound impacts, projects with potential to generate noise levels in excess of state or county noise limits should be cited away from residential or conservation areas when possible.

Aviation and Airspace

FAA must be notified of any construction that may affect the National Airspace System under provisions of 14 CFR 77. FAA review includes analysis of commercial, recreational, and DOD air flight paths; however, DOD may likely require additional assessment. DOD airspace review is initiated after FAA review. Wind, solar (for reflectivity concerns), and projects with smokestacks (bioenergy, waste-to-energy) must consult FAA.

Potential Considerations Applicable to Specific Renewable Energy Technologies

The following sections identify various permits, approvals, and consultations specific to a renewable energy technology that may be needed prior to the construction and operation of a renewable energy facility in Hawaii.

Bioenergy and Biofuels

Background

While the permitting process for bioenergy systems resembles that of other industrial developments, there are some unique features. For example, intensive use of herbicides, pesticides, water, and cultivation of land create impacts different from a fossil-fuel power plant or a wind energy facility.

As mentioned in Chapter 1, the Hawaii Bioenergy Master Plan (DBEDT 2009) was released after a lengthy research and stakeholder input process. This Plan provides a discussion of bioenergy siting, permitting, and other considerations (e.g., feedstock, transport, processing).

Resource Considerations, Permits, and Approvals Specific to Bioenergy Development

Federal, State, and County Considerations

Most of the regulatory processes that involve permits or approvals specific to bioenergy development are at the state or county level. Some federal laws that apply to bioenergy development are described below; however, as described in Chapter 2, much of the authority to administer these federal laws has been delegated to state agencies. Where these laws are specifically applicable to bioenergy, they are included and described below.

Bioenergy Land Use

Biomass feedstock production does, and is expected to continue to, occur primarily on land zoned for agricultural uses. While there are approximately 136,000 acres of former plantation lands in Hawaii, the suitability of these lands for bioenergy feedstock cultivation depends on the types of crops, number of contiguous acres needed, irrigation water availability, rainfall, and other site- and crop- specific factors. The Hawaii Bioenergy Master Plan addresses land and water issues associated with feedstock production. Generally, biofuel processing facilities may not be sited in Conservation Districts, and some counties may limit larger conversion facilities to areas with designated county industrial zoning. The availability of suitable land with appropriate zoning and adequate infrastructure is therefore a key consideration for bioenergy developments.

Bioenergy Processing or Generating Facilities

Developers looking to construct a bioenergy generation or processing facility in Hawaii will encounter many of the same permitting requirements as a fossil-fuel plant or other manufacturing facility. To minimize the required permits and approvals, such industrial uses should be sited in designated county urban and industrial zones. Facilities with agriculture as the primary enterprise activity (e.g., generating and selling power to the grid is a secondary source of revenue) are allowed in state Agricultural Districts without need for a state SUP if in conformance with HRS 205-4.5 (note that county zoning permit requirements apply). Biofuel processing facilities that are considered directly accessory and secondary to the growing of the energy feedstock are also allowed in state Agricultural Districts without need for a state SUP if in conformance with HRS 205-4.5 (note that county zoning permit requirements also apply). It is important for bioenergy developers to consider HRS 343-5 compliance requirements when considering feedstock types and management methods.

Note: The project description for the facility should be consistent throughout the permit/approval process. A single facility description for all permit applications can help avoid questions or the need for facility reclassification in permit applications as the various permits (and the EA or EIS) are routed between agencies.

County Zoning Requirements

While certain bioenergy facilities may be allowed on state Agricultural lands, county zoning permits will likely be required. On Oahu, a separate land use classification for "biofuel processing facilities" has been created to guide the siting and permitting of these facilities (ROH Chapter 21, Master Use

Table 21-3). If allowed in the county zoning district, a CUP (Major or Minor) will be required, depending on the zoning of the parcel. In other counties, consultation with the relevant planning department can help identify the specific land use category of the proposed facility for permitting purposes. In the absence of a designated use category for bioenergy or biofuel facility in the county code, these facilities may be classified as a 'utility installation or facility' or 'power generating facility,' which may comparable to a fossil fuel generating station for zoning permitting purposes.

Traffic Impact Considerations

A traffic impact assessment or analysis will likely be required by HDOT Highways Division if feedstock and/or product transport is needed for the facility operations. This assessment may be triggered as part of the review of another permit (e.g., county zoning permit, SMA Permit). Common issues associated with bioenergy feedstock transport, particularly those that occur near residential areas, include, but are not limited to: safety concerns from increased vehicle traffic or from the potential for feedstock or other debris to be inadvertently released onto public roadways, air quality concerns from increased dust and vehicle emissions, and noise concerns. Developers should anticipate and address these impacts prior to agency and community engagement.

Pesticide and Herbicide Use

Pesticide and herbicide use is regulated by the Hawaii Department of Agriculture (HDOA). A list of Restricted-Use Pesticides is available on the HDOA's Pesticides Branch website.[65] Only certified Pesticide Applicators may purchase or use restricted pesticides in Hawaii.

A Pesticide Experimental Use Permit is required for trials of pesticides in the natural environment. A Category 10, Demonstration and Research Pest Control expert as certified by HDOA must be involved.

Note: Large-scale pesticide application is currently a big issue in Hawaii. Pesticide and herbicide application must be in strict conformance with any federal, state, and county laws and procedures, and should be done in consultation with surrounding communities. HSEO recommends bioenergy developers seek feedstock crops that can thrive in Hawaii with minimal chemical treatment.

Plant Quarantine Considerations

The importation of bioenergy plants and microorganisms is regulated by the Plant Quarantine Branch of HDOA. This Branch inspects materials entering the state for the inadvertent introduction of alien invasive species. To import certain restricted energy feedstocks (e.g., algae), a Permit for Restricted Commodities Into Hawaii must be obtained. Genetically modified materials are subject to further regulatory review. HSEO recommends potential bioenergy developers to use crops currently cultivated or present in Hawaii. Approval of feedstocks from the Hawaii Board of Agriculture may also be required.

[65] http://hawaii.gov/hdoa/pi/pest/list

Note: Importers should be aware that HDOA may require HRS 343 compliance for the importation of commodities considered to potentially have significant impact upon the state. HDOA should be consulted early in the planning process.

Protected Species Considerations

The large scale growth of new feedstocks may attract protected species that did not originally occur on that land. If a protected species decides to inhabit a feedstock farm, seasonal harvesting and crop management requirements may be imposed. HSEO recommends consulting with DOFAW and USFWS before planting large-scale farms in order to identify if there is potential for species of concern.

Water Use Regulations

Biofuel facilities may be water intensive and may compete with other water uses. Water rights are generally administered by CWRM within DLNR, as prescribed under the Hawaii State Water Code (HRS 174C). Per this Code, certain water users are given priority over others. For example, developers considering use of public lands (e.g., DHHL, DLNR, or HDOA), must take these priorities into consideration when assessing the viability of a water resource relied upon my multiple users. The individual counties also play a key role in water allocation and distribution, as they control the majority of the public infrastructure and municipal utilities. The HDOH and DLNR issue most water use permits. A Groundwater Use Permit may be necessary to establish new or modified uses of ground water in a designated ground water management area.

Regional water quality could be affected by pesticide and herbicide use. A CGP for pesticides or industrial stormwater discharge may be required for discharge of fluids to local waters, or to engage in an activity (such as biomass growth/pesticide use) that might affect the water supply (see Chapter 2 for more discussion on CGPs). Developers should consult with the HDOH to determine specific permit requirements for each project.

Mariculture is the production of biomass in the state's marine environment, including algae growth. Algae production may require the use of beach areas and marine waters, which are regulated in part by OCCL within DLNR. The Conservation District Use State Marine Waters Permit is administered by OCCL, and governs activities such as mariculture. A Subsurface Lease or ROW for the seafloor is also likely required from DLNR. For marine land uses, it is recommended applicants consult with DLNR's Divisions of Aquatic Resources (DAR).

Algal conversion technologies utilizing reclaimed waste water must check with HDOH for permitting requirements. A Wastewater Management Permit may be required. An NPDES Permit from Clean Water Branch (33 USC 1342; HAR 11-55, Appendices B through M) would be required for discharges to surface waters, including thermal discharges, or discharges that might affect water supplies (Appendix M includes pesticide applications).

Dam Safety

A Dams and Reservoirs Permit from DLNR's Engineering Division is needed to construct, enlarge, repair, alter, or remove a dam. For high-hazard and significant-hazard dams, an Emergency Action

Plan is required as part of the dam safety permit application. Ongoing permitting and monitoring is required for dams and reservoirs.

Clean Air Compliance

The Standard Industrial Classification (SIC) code assigned to a bioenergy facility can impact clean air permitting requirements. At print, the following SIC codes may apply:

- Biofuel Combustion—2869 (Industrial Organic Chemicals, not elsewhere classified)
- Biomass Combustion Facilities that generate electricity for sale—4911 (Electric Services)

Contact the EPA and HDOH Clean Air Branch for information on your facility SIC and clean air permitting requirements.

Note: New technologies and technologies utilizing unique or new feedstocks as fuel will be required to model and demonstrate to HDOH's satisfaction the amount and type of emissions to be expected from the facility. Developers who can use data form identical facilities elsewhere will enable this review process. Unless determined otherwise by HDOH and/or EPA, a Clean Air Permit from HDOH will be required before facility construction may begin. It is important for facilities to account for the impact the fluctuation in power output (including the facility's own load) will have on facility emissions.

Solid and Hazardous Waste

A Solid Waste Management (Facility) Permit from the HDOH SHWB will likely be needed for a biofuel processing facility or a feedstock processing facility. A Hazardous Waste Treatment, Storage and Disposal Permit from SHWB would be required to operate a facility that engages in the treatment, storage or disposal of hazardous waste as defined by HAR 11-261-3. Most bioenergy facilities in Hawaii will likely be dealing with solid waste, rather than hazardous waste; however, developers must also consider the composition and concentration of by-products to determine if hazardous waste management approvals are warranted.

All underground storage tanks will need an Underground Storage Tank Permit from SHWB. All new underground storage tanks in Hawaii must be double-walled unless otherwise directed by HDOH.

Sustainability Requirements

Increased focus on the sustainability of bioenergy operations—from feedstock crop growth to biorefining—requires bioenergy developers to evaluate their entire production chain. This is particularly important in Hawaii, where resources for food and fuel crops are limited. While voluntary, fuel off-takers may require biofuel producers to meet minimum sustainability standards. The Roundtable on Sustainable Biofuels (RSB)[66] certifies biofuel producers who meet their standards. The Hawaii Biofuels Foundation (HBF) was established in June 2010 to ensure the environmentally and socially sustainable growth of Hawaii's biofuels industry. RSB, the Natural

[66] www.rsb.org

Resources Defense Council, and HBF are currently evaluating Hawaii-specific standards, which will evaluate:

- Legality
- Planning, Monitoring and Continuous Improvement
- Greenhouse Gas Emissions
- Human and Labor Rights
- Rural and Social Development
- Local Food Security
- Conservation of Biodiversity
- Soil
- Water
- Air
- Use of Technology, Inputs and Waste Management
- Land Rights

While not yet required in Hawaii, local utilities (i.e., HECO) have requested potential biofuel providers be in line with RSB standards in prior solicitations (see Environmental Policy for Procurement of Biodiesel from Palm Oil and Locally-Grown Feedstocks).[67]

National Renewable Fuel Standard Program

The National Renewable Fuel Standard Program (RFS2) promotes the sustainable development of transportation biofuels purchased in the US by requiring that the refinement and transport of renewable fuels produce fewer greenhouse gases than the petroleum fuel replaced, as determined through a life-cycle analysis (LCA). Section 526 of the Energy Independence and Security Act of 2007 (EISA) requires Federal agencies to purchase alternative or synthetic transportation fuels that meet LCA/RFS2 threshold standards. Biofuel refiners and importers track the percentage of biofuels they handle through renewable identification numbers, which are the basic currency for obligated parties and renewable fuel exporters to demonstrate RFS2 compliance, as well as track the volumes of renewable fuels. The RFS2 also serves to establish specific annual volume standards for cellulosic biofuel, biomass-based diesel, advanced biofuel, and the total renewable fuel that must be used in U.S. transportation—36 billion gallons total by 2022. RFS2 impacts biofuel feedstock growers, biofuel producers, and biofuel consumers. Impacted parties should consult the EPA regarding EISA/RFS2 compliance.

Noise

A Noise Permit or Variance may be required from HDOH for construction and/or operation.

[67] http://www.hawaiianelectric.com/vcmcontent/StaticFiles/pdf/HECO-NRDC_Biodiesel_Policy.pdf

Geothermal

Background

While considered a potentially significant source of firm, comparatively cheaper form renewable energy in Hawaii, the geothermal industry has faced, and continues to face, challenges concerning the potential health and cultural impacts from geothermal development. In response to recent discussion, Hawaii County is conducting studies relating to the health impacts of geothermal and the impacts to Native Hawaiians.[68] The results of these studies, together with review of other industry findings, will help determine the appropriate level of regulation for geothermal in Hawaii. To minimize community concerns, geothermal developers should consider exploration and development sites away from residential areas.

Resource Considerations, Permits, and Approvals Specific to Geothermal Energy Development

Federal, State, and County Considerations

Most of the regulatory processes the involve permits or approvals specific to geothermal energy development are at the state or county level. Some federal laws that apply to geothermal energy development are described below; however, as described in Chapter 2, much of the authority to administer these federal laws has been delegated to state agencies. Where these laws are specifically applicable to geothermal energy development, they are included and described below.

The primary state agencies involved in regulating geothermal development in Hawaii are the DLNR Engineering Division, Geothermal Program, and the Hawaii Department of Health, Environmental Health Administration (various Branches). The primary county agencies are the respective county Planning and Public Works Departments.

Geothermal Exploration Permit

An Exploration Permit from BLNR is required for nearly all types of geothermal exploration on state lands, or lands in which the state has mining interests (termed "reserved lands"). Geothermal exploration activities include, but are not limited to, geophysical operations, drilling of shallow test holes, and construction of access roads and trails (see HRS 182, HAR 13-183-7). Consult the DLNR Engineering Division to determine whether or not the proposed level of exploration warrants a geothermal exploration permit. Geothermal exploration may also be subject to other permits (e.g., site access, ground clearing) and routing through other departments for review (e.g., impacts to species and archaeologic resources). Exploration permits are valid for one year but may be renewed at the discretion of BLNR. For explorative geothermal sites on public lands, a Right-of-Entry Permit from DLNR is likely to be required. Geothermal exploration requiring drilling will require HDOH oversight to regulate underground injections, noise, water, and air quality.

[68] http://www.accord3.com/docs/Report%20FINAL.pdf

County zoning approvals may also be required for exploration. The county is the primary agency charged with lighting regulation. Consult the appropriate agencies to determine the appropriate level of environmental review for exploration activities.

Note: Hawaii County has restrictions on geothermal drilling. Consult the Hawaii County Planning and Public Works Departments early in the siting / due diligence stage to determine the viability of all proposed geothermal projects.

Geothermal Development Permit Requirements

HRS 205 allows geothermal development in all state Agricultural and Rural Districts, without need for a state Special (Use) Permit. However, county zoning laws still apply for geothermal projects proposed in State Agricultural, Rural, and Urban Districts. Consultation with the appropriate county is necessary to determine what the proposed geothermal exploration, development, and operation activities would be classified as in the county's zoning laws, and what county permits may be needed prior to construction (e.g., plan approval, subdivision approval, use permit, etc.). HRS 183C allows for geothermal development in the state Conservation District, provided a CDUP must be obtained from BLNR, among other required permits and approvals. As discussed in Chapter 2, HRS 343 environmental review is a prerequisite to obtaining a CDUP.

Some of the permits that may be required for utility-scale geothermal development in Hawaii include, but are not limited to, the following:

- DLNR (BLNR) permits/approvals:
    - Geothermal well drilling permit (HRS 177, 178, and 182; HAR 13-183-8)—required prior to drilling, modifying, modifying use, or abandoning of any well, the operator of the well must receive a well drilling permit approval from the BLNR.
    - Geothermal Plan of Operations ((HRS 177, 178, and 182; HAR 13-183-55)—lessee required to submit a Plan of Operations to the BLNR and receive approval prior to commencing operations of any kind.
    - SHPD for historic preservation site review.
    - DLNR/DOFAW to determine potential impacts to protected species.
- HDOH permits/approvals:
    - Noncovered Source Permit from Clean Air Branch (HAR 11-60.1, Subchapter 4)—except as provided in HAR Section 11-60.1-62 or Section 11-60.1-82, an Air Pollution Control Permit is required prior to construction, reconstructing, modifying or operating a stationary air pollution source or air pollution control equipment.
    - Underground Injection Control Permit from Safe Drinking Water Branch (HAR 11-23) —required to construct a Class V well, the type typically required for disposal of low-temperature geothermal fluids. This method of disposal is usually preferred.
    - NPDES Permit from Clean Water Branch (33 USC 1342; HAR 11-55, Appendices B through M)—required for discharges to surface waters, including thermal discharges, or discharges that might affect water supplies.
    - Noise permit or variance for construction, drilling, and/or operations.

- HRS 343 environmental review:
    - Consult the appropriate county, OEQC, and DLNR to determine project requirements under HRS 343. An Environmental Assessment, Environmental Impact Statement, or other form of HRS 343 compliance may be required for the proposed activity.
    - The 343 review process includes an assessment of impacts to cultural resources.
- County level permits/approvals:
    - Consult with each county to identify the county level permits needed.
    - Includes zoning, construction, and ongoing operational permits.
    - Geothermal developers must also check with the county Civil Defense Agency to ensure all required emergency response and action measures are in place.

Geothermal Leasing Requirements

HAR 13-183 contains DLNR's rules on leasing and drilling of geothermal resources in the state of Hawaii. DLNR issues two types of leases pertaining to geothermal development: (1) subsurface mining/mineral rights lease (HAR 13-183); and, (2) surface lease. The subsurface mining lease grants the lessee exclusive right to develop the geothermal resource. Public auction may or may not be required, at BLNR's discretion. Processes in place recognize that entities which pursue exploration activities and find a viable resource should be afforded priority when it comes to developing that resource.

The mining lease requires royalties – presently distributed to the county, DLNR, OHA, and DHHL if the project is located on DHHL land – which BLNR determines prior to leasing the subject parcel. The surface lease may or may not require public auction as well, with lease rates determined according to fair market value and appraisal. Royalties are not required for surface land leases.

Geothermal Direct-Use Development in Hawaii

In addition to utility-scale geothermal electric projects, low temperature, direct-use projects providing space heating/cooling for buildings, swimming pools, aquaculture, crop drying, and industrial processes offset electricity and are feasible, although not currently under development. The following steps apply to direct-use geothermal use (Lyons 2004):

Step 1—Acquire the appropriate lands according to state and local regulations

Use of lands owned by the State of Hawaii or one of its counties is typically subject to competitive bidding; however, exceptions to this process may be allowed for geothermal exploration and/or development. Consult DLNR about the use of state lands.

Step 2—Gain water rights

Water rights are administered by the CWRM. The Groundwater Control Area Permit is necessary for geothermal direct use projects unless the land is located outside of a Water Management Area, or if the water is being used solely for domestic consumption.

Step 3—Obtain permits for construction of well(s)

The Well Construction and Pump Installation Permit is administered by the CWRM. The CWRM maintains a Well Index Database with data from other wells in the area. A "Well Information Release Request Form" from the CWRM website is necessary to receive this information. Data on nearby wells is helpful when planning the construction of a new well. HRS 343 review may also be required.

Step 4—Obtain permits for fluid disposal through subsurface injection or surface treatment

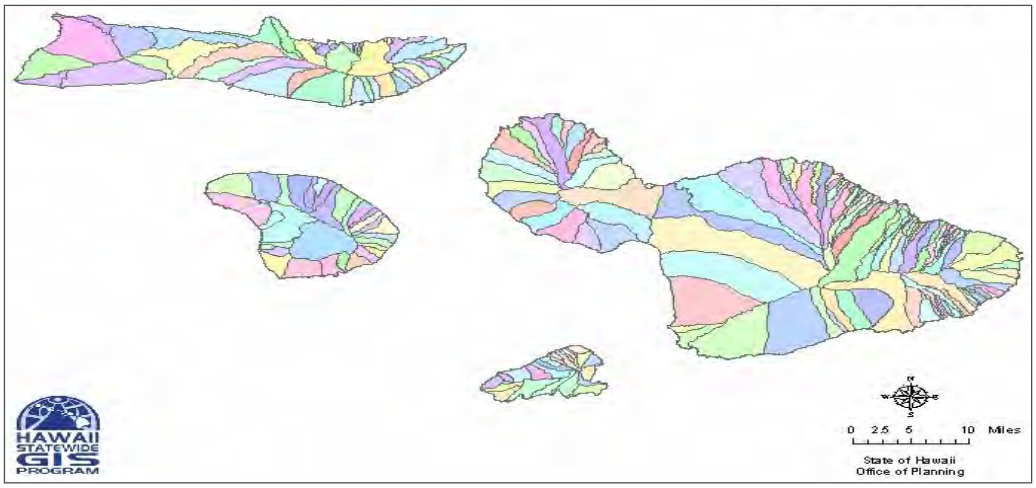
The HDOH CWB and Safe Drinking Water Branch, regulate the disposal of geothermal fluids. Different permits may be required for a direct-use geothermal project depending on the method of disposal. In some direct use applications where the resource is suitable, a downhole heat exchanger might be used. In these cases, no geothermal fluid would be extracted, avoiding the creation of a waste stream requiring treatment and disposal. An Underground Injection Control Permit and NPDES Permit may be required from HDOH. HDOH may specify the preferred disposal method based on the groundwater conditions in the area.

Hydroelectric

Background

Hawaii has a long history of hydroelectric development; dating back to the early 1900's. Today, the islands of Hawaii, Kauai, and Maui have been operating hydroelectric power plants that feed power to the electrical grid. Figure 21 is an example watershed map available for Maui County (there is one for each county), which can help determine the areas with possible groundwater reserves for hydroelectric development. Additionally, the USACE's Hydroelectric Power Assessment – State of Hawaii[69] provides a good review of the hydroelectric potential of numerous sites throughout Hawaii.

Figure 21. Watershed Map for Maui County



http://hawaii.gov/dbedt/gis/

[69] http://energy.hawaii.gov/wp-content/uploads/2011/10/HydroelectricPowerAssess.pdf

Resource Considerations, Permits and Approvals Specific to Hydroelectric Development

Federal Considerations

Under the Federal Power Act, FERC has two types of licensing jurisdictions for hydroelectricity: mandatory and permissive. Mandatory licensing is governed by section 23(b)(1); however, most Hawaii hydroelectric projects may not fall under FERC jurisdiction or may otherwise be exempted from FERC licensing requirements. A non-federal hydroelectric project is exempt from FERC licensing requirements if it can show that it is:

- Not located on navigable waters of the US;
- Does not occupy public lands or reservations of the US;
- Does not utilize surplus water or waterpower from a federal dam; or,
- Is not located on a body of water over which Congress has Commerce Clause jurisdiction and the project does not affect the interests of interstate or foreign commerce (e.g., is not connected to the interstate power grid).

As discussed in the October 20, 2011, FERC Order 137 ¶61,057,[70] many hydropower projects in Hawaii do not require a FERC license and Hawaii has a long history of authorizing and regulating hydropower projects at the state level.

If mandatory licensing is not required, FERC can license a hydroelectric project in response to a voluntary application if the project is located on a commerce clause water. Permissive licensing is authorized rather than required, and is governed by section 4(e) of the FPA. Commerce clause waters are any bodies of water over which Congress has jurisdiction under its authority to regulate commerce. Because most, if not all, of Hawaii's rivers ultimately flow into the ocean, they would be considered commerce clause streams, which are a subset of section 4(e) commerce clause waters. Therefore, hydropower projects in Hawaii that involve commerce clause waters, could seek a voluntary FERC license pursuant to section 4(e) of Order 137 FERC ¶ 61,057.[71]

If the project is within FERC jurisdiction, FERC may issue a preliminary permit to maintain the priority of an application for licensing. The preliminary permit typically covers the period during which an applicant studies the site and prepares a complete license application and can be issued for up to three years. Preliminary permits are not required to receive a license, and are typically valid for three (3) years. However, in the October FERC Order,[72] FERC concluded that although many hydroelectric projects may be eligible for voluntary FERC license they will decline to issue preliminary permits for projects in the State of Hawaii that would be subject to permissive section 4(e) licensing. This is due in large part to the existing state regulatory processes in place.

[70] *Kahawai Power 4, LLC & Kehaha Ditch Hydro, LUC*, 137 FERC ¶ 61,057 (2011). http://www.ferc.gov/whats-new/comm-meet/2011/102011/H-3.pdf
[71] http://www.ferc.gov/whats-new/comm-meet/2011/102011/H-3.pdf
[72] http://www.ferc.gov/whats-new/comm-meet/2011/102011/H-3.pdf

Developers interested in prospective hydropower sites should contact FERC to check the permitting history of that site, as prior applicants may have permitting priority.

State and County Considerations

A Dams and Reservoirs Permit from DLNR's Engineering Division is needed to construct, enlarge, repair, alter, or remove a dam. For high-hazard and significant-hazard dams, an Emergency Action Plan is required as part of the dam safety permit application. Ongoing permitting and monitoring is required for dams and reservoirs.

As discussed in the Bioenergy section, water rights in Hawaii can be highly coveted in certain areas of the state. Developers must have an in-depth understanding of those entities using the waterway targeted for development, and the potential impacts a new hydroelectric facility would have on these users. The Hawaii State Water Code identifies priority water users, as discussed herein. DLNR's CWRM will be the primary agency charged with issuing state permits and approvals to use surface waters for hydroelectric use. The following DLNR CWRM / HDOH CWB permits may apply:

- Ground Water Use Permit – to use groundwater (impacts to customary/traditional water uses must be assessed)
- Stream Channel Alteration Permit (SCAP) – to alter a stream
- Stream Diversion Works Permit – for stream diversions
- Well Construction / Pump Installation Permit – to construct a well or install a water pump
- Surface Water Use Permit – to use or divert surface waters (subject to in-stream flow standards)
    - In-Stream Flow Standards must be considered as part of any assessment in which surface waters may be diverted or affected.
- Section 401 Water Quality Certification
- NPDES
- Construction General Permit (CGP)

Note: Some of these permits are routed for review to other federal, state, and county agencies for review of the impacts: e.g., endangered/threatened species, archeological sites, cultural impacts, conformance with district, infrastructure, conservation / preservation areas.

Traditional and customary use of Hawaii's in-land waterways must be closely evaluated early in the siting process, including consultation with Native Hawaiian practitioners who may be actively using the targeted waterway. Growing taro and other indigenous agriculture, aquaculture, fishing, and use of streams for other indigenous practices are common in Hawaii.

As hydroelectric projects are not currently explicitly permitted in the state Agricultural District under HRS 205-2 or -4.5, a state Special (Use) Permit is likely required for hydropower facilities on state Agricultural lands. If located on Conservation land, a CDUP approved by BLNR will be required. If not located on Conservation land, a county (zoning) Use Permit will most likely be required for a hydropower installation on any island. For example, on Kauai, a Class IV zoning permit will likely be required for new any hydropower facility. Some counties may classify hydropower facilities as a 'utility facility or installation' or 'power generating facility' for zoning code purposes.

Marine Hydrokinetic Energy (Wave Energy)

Background

Resources derived from the motions of the oceans, such as waves, tides, and currents, are referred to as MHK resources (42 USC 17211 (2006), defining the term "marine and hydrokinetic renewable energy"). To date, MHK technologies are largely pre-commercial, with only a few MW of installed capacity; these installations are generally engineering prototype test devices or small single-unit demonstration wave and tidal projects (Thresher, et al 2012). In Hawaii, wave technology demonstrations have been made possible due, in part, to Department of the Navy and DOE efforts in support of an open-water, grid-connected wave energy test site in waters a kilometer offshore from the Marine Corps Base Hawaii at Kaneohe Bay, Oahu.

Although none yet exist here, there is potential for utility-scale wave energy projects, as Hawaii's waves are among the most powerful in the world per square meter (Hagerman 2004). By contrast, Hawaii's ocean tide and current resources are considered minor and harnessing this energy may not be well-suited for Hawaii.

Resource Considerations, Permits, and Approvals Specific to MHK Development

Federal Considerations

For MHK projects located within federal waters, both a lease from BOEM (30 CFR 585) and a license from FERC (18 CFR Parts 4 and 5) are required. BOEM shares jurisdictional responsibilities for MHK projects on the OCS with FERC with roles clarified in the agencies' memorandum of understanding, while FERC alone has jurisdiction over MHK projects in state waters. The federal government has exclusive jurisdiction over projects on the OCS, while projects in the territorial seas are regulated by both state and federal agencies. The associated subsea transmission cables of OCS projects passing through the territorial sea and making landfall are regulated by the federal agencies and, in most cases, the respective state's CZM agency.

For MHK projects located in federal waters, an unsolicited lease request to BOEM may be filed for acquisition of OCS lease blocks within the proposed project site to support the construction and operation of the proposed project. Upon receipt of the application and pursuant to 30 CFR 585.231, BOEM will issue "public notice of a request for interest" related to the proposed action and consider comments received in order "to determine if competitive interest exists." If no other developer wishes to develop within that area, BOEM would then publish a Determination of No Competitive Interest in the Federal Register, which will initiate BOEM's review of the project under NEPA. BOEM will be the lead agency for the NEPA review.

The SAP and the COP required by BOEM regulations serve as blueprints for site development, construction, operations, and decommissioning and must also provide the information necessary for BOEM to assess project impacts for the NEPA review. Initially, desktop and some field environmental assessments and associated reporting are conducted including: in-air and underwater noise modeling and assessment; electromagnetic field assessment; visual impact assessment; navigational safety assessment; marine mammal and sea turtle desktop assessment

and agency consultation (e.g., NOAA Fisheries and USFWS); fisheries assessment; air emissions analysis; and sediment dispersion modeling. These initial assessments help to inform what additional surveys may be required such as marine site characterization surveys including marine geophysical and shallow geotechnical surveys; marine cultural survey; and marine benthic survey. Other environmental surveys and reports necessary for the NEPA analysis include terrestrial archaeology surveys, historic properties surveys, and wetlands surveys.

As described in Chapter 2, the COP describes a commercial leaseholder's construction, operations, and conceptual decommissioning plans. Required contents of the COP, including the components designed to assist with NEPA compliance, are described in 30 CFR 585.626 and 585.627 and the information is collected as part of the site assessment studies described above. Close coordination between the project's environmental permitting and engineering design teams will be required during the SAP data collection activities to ensure that all the information needed for both the preparation of the COP and for the NEPA review is obtained.

BOEM and FERC would conduct a joint NEPA process to review the SAP, the Pre-Application Document, license application, and the environmental document. The FERC license takes the place of a BOEM COP for MHK projects; therefore, BOEM will not require the submission of a COP or any associated reports (e.g., the Facility Design Report and the Fabrication and Installation Report).

FERC has developed the "Integrated Licensing Process" specifically for MHK pilot projects. These procedures allow new technologies to be tested at appropriate sites, including interconnection with the electric grid, while minimizing the risk of adverse environmental effects.

Criteria and terms of a hydrokinetic pilot project license include:

- Short (5-year) duration (although some applications have been pending for up to 10 years)
- Small (less than 5 MW)
- Avoids sensitive locations
- Is modifiable or renewable
- Connection to the grid allowable
- May lead to a hydroelectric license under the Federal Power Act (FERC 2008).

Pilot project license procedures streamline the FERC process and allow transmission of electric power into the grid, and may lead to application for a standard license under the Federal Power Act if the pilot project results indicate commercial build-out is feasible and desirable. FERC guidelines indicate that an EA/FONSI should apply to most pilot projects.

When a MHK project is ready for commercial operation, a FERC hydroelectric license will be needed. Authorization to utilize the FERC Alternative Licensing Process (ALP) to obtain a FERC license for the construction and operation of a project can be requested, assuming that a noncompetitive commercial lease will be granted by BOEM. In the ALP, all interested parties should be engaged early on and a collaborative process should be established. Should further studies be conducted prior to the receipt of a license, a preliminary permit should be obtained from FERC to

maintain the priority of an application, guaranteeing position in the processing queue. A preliminary permit is typically obtained while studies are conducted and a complete license application is prepared. Preliminary permits can be issued for up to three years and are not required in order to apply for or receive a license. As described in the associated permit packet available on the HSEO website, FERC should be contacted for guidance.

In addition to BOEM and FERC, other potential cooperating and consulting federal agencies include the USACE, NOAA Fisheries, USFWS, USCG, EPA (issuance of an OCS Air Permit), and SHPD (State) for Section 106 consultation. DOD is consulted to determine if there are any potential military testing, training, or other DOD activities in the surface and subsurface operating areas of the project location that conflict with the development of the project.

Unique to offshore renewable energy projects is the likely requirement of an Incidental Take LOA/IHA to address the potential take of marine mammals (not protected under the ESA) during the construction of a project. An IHA/LOA may be pursued under two conditions: 1) there is no potential for serious injury or mortality, or 2) the potential for serious injury or mortality can be negated through mitigation requirements that could be required under the authorization. NOAA Fisheries will likely require that a MHK project proponent prepare an IHA/LOA request given that construction or operations could result in incidental harm to Federally-listed species. There exists the possibility that a marine mammal or sea turtle could be harmed as a result of an accidental collision with a project construction or maintenance vessel. An authorization letter from NOAA Fisheries typically identifies federally enforceable conservation measures.

State and County Considerations

State and county regulations that apply to the development of MHK projects will depend upon where the project is located. However, if the MHK project is located in state waters, the following permits, approvals, or licenses may apply:

- FERC license – Note that if a project is located in state waters, a BOEM lease will not be required, but a license from FERC will be required for project approval. A submerged land lease or ROW processed by DLNR's Land Division and approved by BLNR would be issued in accordance with HRS Chapter 171. Note that at the minimum, a CDUP and HRS 343 review document (EA or EIS) will be required before the Board of Land and Natural Resources will issue a lease or ROW.
- A submerged land lease or ROW from the DLNR's Land Division and approved by BLNR would be issued in accordance with HRS Chapter 171. Note that at the minimum, a CDUP and HRS 343 review document (EA or EIS) will be required before the BLNR will issue a lease or ROW.
- A CDUP approved by BLNR will be required. DLNR's OCCL has a separate application for proposed land uses in state marine waters (HRS 183C and 190D; HAR 13-5 and 13-222).
- An SMA Permit from the appropriate county will also likely be required, as well as a Shoreline Setback Variance.

- A CZM Consistency Determination from the Office of Planning/DBEDT may be required in accordance with 15 CFR 930 and the state's federally-approved CZM program.
- A water quality certification from HDOH in accordance with Section 401 of the CWA and HRS Chapter 342D.
- A NPDES Permit from HDOH, Clean Water Branch.
- If project-related activities (e.g., dredging, installation of buoys or construction) are proposed within commercial harbors and entrance channels belonging to or controlled by the state, then a Work in Ocean Waters of the State Permit would be required by the HDOT Harbors Division. However, a Work in Ocean Waters of the State Permit is not required if an applicant has completed a CDUP – State Marine Waters permit.

Consultation with state agencies includes the following:

- SHPD would lead the historic preservation site review of both on- and offshore resources potentially impacted by the facilities associated with an MHK project.
- DLNR/DOFAW would review, if warranted, whether any state-listed species and habitats would be potentially impacted by the project activities and facilities.

Note: Projects sited on federal lands are not subject to certain state and county permits and approvals, but may require coordination with state and county agencies.

Consultation with area recreational and commercial ocean users is also highly recommended early in the projects siting and design phase. See the Hawaii Community Stewardship Directory discussed herein. The State of Hawaii GIS Program also offers maps of existing submerged cables and sewer lines in Hawaii.[73]

Ocean Thermal Energy Conversion

Background

OTEC uses the natural temperature difference between deep and shallow ocean waters (thermal gradient) to spin a turbine, producing electricity. OTEC power generation involves technologies still in development; there are no commercial OTEC plants operational in the world. However, Hawaii is well suited for the deployment of OTEC technology because of its tropical location and deep ocean water depths close to shore. Consequently, ocean waters in Hawaii provide a large temperature differential in a comparatively short distance.

Since 1979, the National Energy Laboratory of Hawaii Authority (NELHA), a state-funded facility in North Kona, has hosted various OTEC test systems onshore and offshore at Keahole, as well as some near Keahole Point (HC 2009). Recently, in November 2013, the Hawaii Natural Energy Institute at the University of Hawaii (HNEI) and the Office of Naval Research have jointly funded OTEC work at NELHA, including construction of a new OTEC Heat Exchanger Test Facility and 100 kilowatt pilot

[73] http://planning.hawaii.gov/gis/download-gis-data/

generating station planned for connection to HELCO's grid. These efforts are being supported by the State of Hawaii.

Resource Considerations, Permits and Approvals Specific to OTEC Development

Federal Considerations

The 1980 OTECA gives NOAA the authority for licensing the construction and operation of commercial OTEC plants. NOAA initially established licensing regulations but rescinded them in 1996 as no applications had been received. NOAA is currently in the process of developing new licensing regulations. Under OTECA, NOAA is required to coordinate with states and the USCG as well as other federal agencies (BOEM, FERC, NOAA, DOD, etc.). A NEPA review must be conducted for each license. It is expected that the majority if not all federal, state and local requirements would be handled through the NOAA licensing process. Federal approval under the Ocean Thermal Energy Conversion Research, Development, and Demonstration Act, administered by the US Department of Energy, may also be required.

Given that the regulations for construction and operation of commercial OTEC plants has not been finalized, DBEDT has not developed a permit brief relating to OTECA.

State and County Considerations

If an OTEC project is located in state waters the following state permits, approvals, or licenses may be required (similar to MHK projects):

- OTEC License – for commercial facilities
    - OTEC Demonstration Project Determination (USDOE) – for demonstration facilities
- A submerged land lease or ROW from the DLNR's Land Division and approved by BLNR would be issued in accordance with HRS Chapter 171. Note that at the minimum, a CDUP and HRS 343 review document (EA or EIS) will be required before the BLNR will issue a lease or ROW.
- A CDUP approved by BLNR will be required. DLNR's OCCL has a separate application for proposed land uses in state marine waters (HRS 183C and 190D; HAR 13-5 and 13-222).
- An SMA Permit from the appropriate county will also likely be required, as well as a Shoreline Setback Variance.
- A CZM Consistency Determination from the Office of Planning/DBEDT may be required in accordance with 15 CFR 930 and the state's federally-approved CZM program.
- A water quality certification from HDOH in accordance with Section 401 of the CWA and HRS Chapter 342D.
- A NPDES Permit from HDOH, Clean Water Branch.
- If project-related activities (e.g., dredging, installation of buoys or construction) are proposed within commercial harbors and entrance channels belonging to or controlled by the state, then a Work in Ocean Waters of the State Permit would be required by the HDOT

Harbors Division. However, a Work in Ocean Waters of the State Permit is not required if an applicant has completed a CDUP – State Marine Waters permit.

Consultation with state agencies includes the following:

- SHPD would lead the historic preservation site review of both on- and offshore resources potentially impacted by the facilities associated with an OTEC project.
- DLNR/DOFAW would review, if warranted, whether any state-listed species and habitats would be potentially impacted by the project activities and facilities.

Note: Projects sited on federal lands are not subject to certain state and county permits and approvals, but may require coordination with state and county agencies.

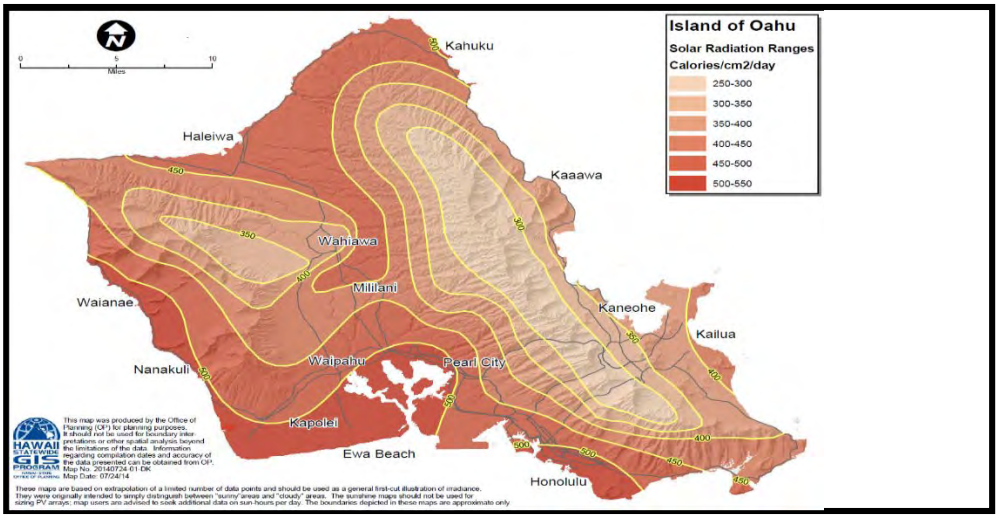
Consultation with area recreational and commercial ocean users is also highly recommended early in the projects siting and design phase. See the Hawaii Community Stewardship Directory discussed herein. The State of Hawaii GIS Program also offers maps of existing submerged cables and sewer lines in Hawaii.

Solar

Background

Publically available resources from the State of Hawaii and other sources provide solar radiance data throughout the state.[74] Figure 22 is an example of one of these resources; the state's GIS Program. The NREL In My Backyard solar estimator tool allows development of more specific estimates of solar energy production based on exact location, system size, and other variables.[75]

Figure 22. Solar Map of the Island of Oahu



http://hawaii.gov/dbedt/gis/

[74] http://energy.hawaii.gov/resources/renewable-energis-map, http://planning.hawaii.gov/gis/download-gis-data-expanded/#004, http://solar.geography.hawaii.edu/
[75] http://pvwatts.nrel.gov/

Customers interested in permitting residential or commercial roof-mounted solar installations (PV) will need building, electrical, and/or plumbing permits from the county in which they live. Contact your county Departments of Planning and/or Public Works for more information.

Resource Considerations, Permits and Approvals Specific to Solar Development

Note: Solar projects are sited on previously disturbed lands typically result in fewer or minimal impacts to environmental resources, but developers are nonetheless responsible should new impacts or resources be discovered. Lands targeted for solar development are may be well-suited for agricultural use. The displacement of existing or potential agriculture operations by solar energy will likely undergo rigorous regulatory, agricultural industry, and community scrutiny.

Federal Considerations

As mentioned in Chapter 2, HSEO recommends project developers review the FAA Interim Policy, FAA Review of Solar Energy System Projects on Federally Obligated Airports (Federal Register, Vol. 78, No. 205, p. 6376, Oct. 23, 2013). Photovoltaic projects with potential to impact aviation activities will be required to submit a 'glint and glare' study. The HDOT Airports Division strongly recommends developers consult their office during project siting and prior to engaging in any glint/glare assessments to ensure all potential impacts are considered. County building permits are often routed to HDOT, Airports Division for review.

Note: HSEO also recommends developers consult the appropriate regional Community Planning Liaison Office and the DOD Siting Clearinghouse[76] early in the project development phase to identify and address potential impacts to DOD installations and training areas in Hawaii.

Projects, such as solar, that require large areas of ground to be cleared may by subject to USFWS review for species impacts and/or the Advisory Council on Historic Preservation (ACHP) for impacts to archeological resources. These reviews may take place at the state level where there is no federal jurisdiction over a project.

Note: Use of areas on Oahu's south and western shores may also contain historical military sites protected under state and/or federal law. Consult the appropriate military historians familiar with the project area.

The construction of a large ground-mounted solar farm in Hawaii may not trigger state or federal environmental review. An assessment of the impacts to cultural resources should be included as part of other (zoning, land use, environmental) permit applications. In particular, large-scale solar arrays can inhibit access to Native Hawaiian gathering or practitioner areas. Outreach with local community members and cultural practitioners should be a priority in the early project siting stages, as solutions can be developed during the project design phase.

[76] http://www.acq.osd.mil/dodsc/

State and County Considerations

State Land Use

Solar technologies are currently permitted uses in state Agricultural Districts where soil is of lower productivity (classified "D" or "E" using the University of Hawaii Land Study Bureau's Overall Productivity Rating system). For sites classified "B" and "C" soils, solar facilities are permitted on up to 20 acres of land, or an area equal to 10% of the acreage of the subject parcel, whichever is lesser without need for a state SUP. For projects on B and C soils that occupy more than 20 acres or 10% of the parcel, a SUP can be obtained if the project also meets the following criteria (Act 55, Session Laws of Hawaii 2014):

1. The area occupied by the solar project must also be made available for compatible agricultural activities at a lease rate that is at least 50% below fair market value for comparable properties;
2. Proof of financial security to decommission the project is provided to the satisfaction of the appropriate county planning commission prior to the date of commencement of commercial generation; and,
3. The solar project must be decommissioned at the owner's expense, including the removal of all equipment related to the project within twelve (12) months of the conclusion of facility operation or useful life and the restoration of the site to substantially the same physical condition as existed prior to the development of the facility.

Solar projects are allowed, in extremely limited circumstances, on Agricultural lands with soil classification "A." To avoid potential permitting ambiguities, poorer soils (D and E) should be targeted for solar development.

Solar projects can be built on state Conservation land if a CDUP is granted from BLNR. Just as with any proposed development in Hawaii, HRS 343 would apply to a solar project if the project triggers one of the HRS 343 needs for environmental review discussed in Chapter 2.

Note: Ground and roof-mounted solar projects located within the Special Management Area should consult the respective county to determine if the project requires an SMA Permit. Certain non-structural improvements to existing structures may not need an SMA. Developers must also be aware that projects sited in flood plains or flood fringes are subject to Federal Emergency Management Agency (FEMA) review and approval. In certain cases, panels may be required to be elevated to a certain height as determined by FEMA. The Engineering Division within DLNR assists with FEMA coordination and review.

In addition to or in lieu of a state SUP, a zoning permit from the county will likely be required. Consult the appropriate county agency for more guidance if considering agricultural land for solar use. Solar and PV facilities may be classified as a 'utility installation or facility' or 'power generating facility' in the county code. As with all projects, the associated infrastructure (transmission poles and lines, substations, etc.) must be contemplated and included as requested in permit applications.

City and County of Honolulu

On Oahu, solar facilities are considered either Type A or Type B "utility installations" in the Land Use Ordinance (LUO). DPP has provided guidance on whether a particular solar installation is a

Type A or Type B, and therefore, what permits are required.[77] A CUP (Minor) is required if the facility is considered a Type B utility installation. A waiver or variance will also likely be required to allow for larger percentages of the parcel to be covered than currently allowed by code.

On Oahu, roof-mounted solar facilities require a Building Permit from DPP, which must be applied for online.[78]

County of Maui

The County of Maui has created a specific land use category for solar facilities called "solar energy facilities" in MCC Section 19.04.040. Regarding solar in Agricultural Districts, MCC Sections 19.30A.050 and 19.30A.060 set forth the permitting requirements for Maui County. In addition, Maui County issued guidance on the permitting of solar and wind facilities.[79] Consult Maui County for the most current policies. Depending on the Maui County zoning district in which a facility is proposed and the facility designation ("minor utility facility" or "major utility facility"), a solar project may need a state SUP and a Maui County Special Use Permit. Height and setback requirements also apply.

For projects considering battery storage or may have other increased potential for fire or explosion risk, the Building/Electrical Permits are routed to the county Fire Department. For zoning purposes, batteries are considered an "accessory use."

Projects that propose to use a certain amount of parcel acreage by percentage, depending on the zoning, will need a Variance from the Zoning Board of Appeals.

County of Hawaii

The County of Hawaii has passed ordinances specific to the permitting of residential solar installations, and has published Guidelines for Permitting a Residential Photovoltaic (PV) Roof Mounted System (effective January 1, 2013).[80] Hawaii County has also published directions on how to obtain permits for PV systems, wind generators, fuel generators, and communication towers (see, "How to Obtain a Building Permit for Alternate Energy & Communication Systems"). Consult Hawaii County for the most current policies.

In Hawaii County, ground-mounted solar installations may be classified as "utility substations" for zoning permit purposes. Variances for height and/or lot density (amount of acreage in % used by solar facility). Consult the Hawaii County Planning Department to determine zoning permit requirements.

County of Kauai

The County of Kauai has also passed ordinances specific to the permitting of solar projects. For example, solar energy work by an electrical utility (i.e., KIUC) or serving agency operating under a franchise or charter granted by the State of Hawaii may not be required to obtain a Building or

[77] See "Solar Farm Guidelines" and "Solar Farm Self-Certification Form" at http://www.honoluludpp.org/ApplicationsForms/ZoningandLandUsePermits.aspx
[78] http://dppweb.honolulu.gov/DPPWeb/default.asp?PossePresentation=OnlineBuildingPermit&PosseObjectDef=j_OnlineBP
[79] http://www.mauiCounty.gov/documents/20/81/83/Permit_Req_For_PhotovoltaicSystems_WindTurbines_Windmills_Dec2009.PDF
[80] http://www.hawaiicounty.gov/pw-pv-guidelines

Electrical Permit form the county for the project.[81] Consult Kauai County for the most current policies.

In Kauai County, ground-mounted solar installations may be classified as "utility facility" for zoning permit purposes. Variances for height and/or lot density (amount of acreage in % used by solar facility). Consult the Kauai County Planning Department to determine zoning permit requirements.

Waste-to-Energy (WTE) and Biomass Conversion Facilities

Background

This section covers technologies that use *waste* materials as feedstock to generate fuel or electricity. The conversion of designated organic (grown and harvested as feedstock) biomass is discussed under the Bioenergy and Biofuel section. Municipal solid waste (MSW) and construction and demolition (C&D) waste can be used to generate energy at WTE plants, biomass conversion facilities (i.e., incineration with energy recovery), and through the capture and conversion of landfill gas to energy. MSW is typically managed by the respective counties in Hawaii; however, there are also private landfills for C&D waste where waste feedstock may be available (see PVT Landfill on Oahu). Feedstock availability will likely be a focus of the critical issues analysis for any WTE project in Hawaii; with feedstock availability largely dependent upon the county/island targeted for WTE development.

Resource Considerations, Permits and Approvals Specific to Waste-to-Energy and Biomass Conversion Development

Federal, State, and County Considerations

The siting of WTE and bioconversions typically occurs in industrial areas or areas otherwise zoned for waste management activities, which is appropriate based on county planning.

Clean Air Compliance

Air emissions from WTE and biomass conversion facilities are regulated under Clean Air Act standards for municipal waste incinerators. The EPA has delegated authority to the HDOH for administering new source performance standards and national emission standards for hazardous air pollutants (EPA 2010).

The SIC code assigned to a WTE facility can impact clean air permitting requirements. A Covered Source/Prevention of Significant Deterioration Permit would likely be required. Contact the EPA and the HDOH Clean Air Branch for information on the clean air permitting requirements.

WTE facility permits will be very similar to those for other industrial operations. As an initial step in identifying project permits, project proponents must closely evaluate all of the facility inputs (waste feedstock, water, etc.) and outputs (emissions, effluent, noise, ash/waste, lighting, energy, etc.).

[81] Kauai County Code, Chap. 12-2.2, Sect. 105.1.13.

Water Use Regulations

A WTE facility may require a water source for the cooling water used in the energy conversion process. This water source may be from ground water, municipal sources, or surface waters. Depending on the source of the water permits from DLNR or the county Board/Department of Water Supply may be necessary. Well permits from the county Board/Department of Water Supply would be required prior to construction of a well. A Groundwater Use Permit may also be required from DLNR CWRM.

Developers should consult with the HDOH and DLNR to determine specific permit requirements for each project.

Solid and Hazardous Waste

A Solid Waste Management (Facility) Permit from the HDOH SHWB will likely be needed for a WTE or biomass conversion facility. A Hazardous Waste Treatment, Storage and Disposal Permit from SHWB would be required to operate a facility that engages in the treatment, storage or disposal of hazardous waste as defined by HAR 11-261-3; this may apply to a WTE or biomass conversion facility.

Effluent and Run-Off

The following permits from HDOH will likely be required:

- Underground Injection Control Permit from Safe Drinking Water Branch—required to construct a Class V injection well.
- NPDES Permit from Clean Water Branch—required for discharges to surface waters, including thermal discharges or discharges that might affect water supplies.
- A WTE facility would likely require a CGP for stormwater associated with industrial activities.

Noise Regulations

- A Noise Permit and/or Variance may be required during construction and facility operation.

County Permits/Approvals

- Consult with each county to identify the county level permits needed.
- Includes zoning, construction, and ongoing operational permits:
    - (Conditional) Use Permit – Major or Minor
    - Dewatering Permit
    - Grading / Grubbing / Stockpiling Permits
    - Building / Electrical Permits

Other Considerations

For the counties without a specified land use classification, a WTE or bioconversion facility may be classified as a 'utility installation or facility' or 'power generating facility' in the county code. Consult the appropriate county Planning Department for county zoning permit requirements. As

with all projects, the associated infrastructure (transmission poles and lines, substations, etc.) must be contemplated and included as requested in permit applications.

Note: Depending on the feedstock used and energy/fuel generated by the facility, HRS 343 review is likely to be triggered under either the "waste-to-energy" or “oil refinery” classifications. HSEO recommends that developers take this into consideration when applying for other permits, as permitting agencies may seek an HRS 343 determination. Consult OEQC and the appropriate state and county permitting agency or agencies when this potential trigger applies.

Permitting considerations of the feedstock facility are critical. Modifications to existing facility permits may be required due to new methods of feedstock (trash) management. A traffic impact assessment or analysis will likely be required by the HDOT if feedstock and/or product transport is needed for the facility operations. This assessment may be triggered as part of the review of another permit (i.e., county zoning permit, Special Management Area Permit).

Common issues associated with WTE facilities and the associated feedstock transport include, but are not limited to: safety concerns from increased vehicle traffic or from the potential for feedstock or other debris to be inadvertently released onto public roadways, air quality concerns from increased dust and vehicle emissions, and noise concerns. WTE facilities are typically sited in industrial zoned areas as they are not as reliant on geographically constrained resources (i.e., wind, geothermal, etc.) and are more compatible with industrial development.

Finally, WTE developers must closely analyze how the desired waste materials are currently being handled; from pick-up to transport to storage to ultimate disposal. Diverting waste materials from these processes may result in negative impacts to the services and businesses currently running these operations. Also consider the impacts on the associated feedstock tipping fees, which are sources of revenue or expenses to various entities.

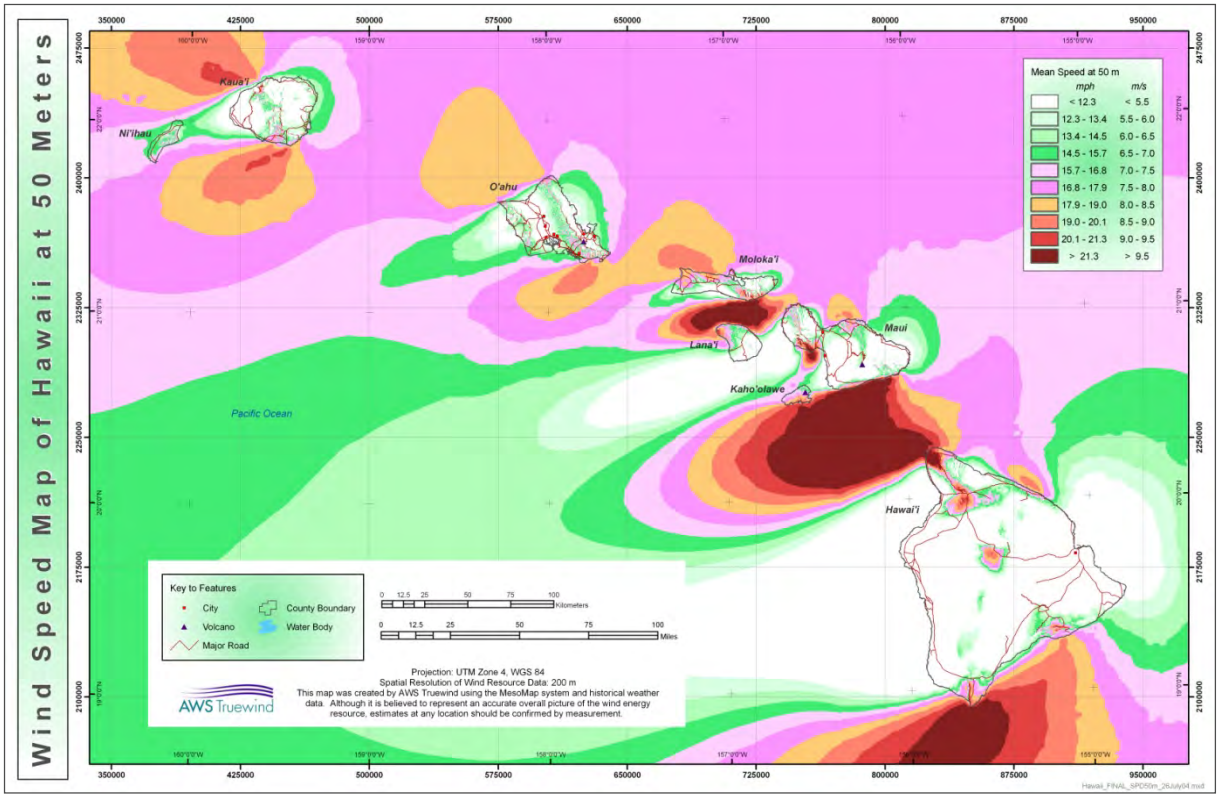
Wind

Background

Wind energy facilities are sited where there are sufficient wind resources. Wind resource maps have been prepared for the Hawaiian Islands such as the one provided in Figure 23. Because of its abundant wind resources, several onshore wind energy facilities have been constructed and are operational in Hawaii. Offshore wind energy facilities do not currently occur in Hawaii, and will face significant challenges in the form of steep bathymetry, heavy marine use (recreational, commercial, military), and impacts to marine species and ecosystems.

Wind turbines and their locations (on- or offshore) create unique impacts compared to other renewable technologies. Some counties have wind-related provisions in their ordinances associated with boundary set-back distances and zoning permissions. Given the wide variety of wind turbines on the market—from utility to residential scale—it is important to accurately describe the size, number, and type of wind turbine(s) and associated infrastructure during permitting.

Figure 23. Example of a Map of Wind Energy Resources in Hawaii



http://energy.hawaii.gov/resources/hawaii-state-energy-office-publications

Resource Considerations, Permits and Approvals Specific to Onshore Wind Development

Although the initial siting criteria for a wind energy facility is a sufficient wind resource, potential impacts to other resources must be considered when assessing the viability of a proposed location. Therefore, additional studies are typically completed to assess impacts to other resources including noise, visual, biological, archaeological, and cultural, as they are often the issues of most concern by both regulatory agencies and the public.

Federal, State, and County Considerations

The below sections discuss considerations that are specific to wind energy development.

Noise Considerations

In general, noise emissions from operating wind farms are considerably low due to advancements in technologies; however, wind turbines can be audible from a distance under certain circumstances. As each wind project is unique, applicants should expect detailed discussions involving HDOH, the surrounding community, and the turbine manufacturer to resolve potential noise issues.

Because noise emission levels are generally low, and because noise attenuates with distance, noise emitted by wind turbines is generally masked by ambient (background) sounds except perhaps at

residences closest to the wind generator. Every facility/turbine is different depending on the topography, technology used, and proximity to the property line. Facility developers and operators may use quieter turbine technology and a reliable preventive maintenance program to minimize operating noise emissions. A noise study is likely needed to determine the noise impacts of any new proposed wind farm and to characterize other noise sources in the affected area for comparison (NWCC 2002). These studies will identify the potential risks to nearby communities and guide effective mitigation strategies.

A wind energy project requires a noise permit addressing construction and operation from the HDOH.

Community Relations and Wind Energy Development

Wind energy projects have faced opposition in Hawaii primarily because of their visual impacts and location. For example, certain communities (i.e., North Shore Neighborhood Board, Oahu) have passed resolutions or other directives opposing the development of large "industrial" wind turbines. Providing early opportunities for meaningful public involvement can expedite a project's permit process. Ideally public involvement, including education and outreach, would have started prior to the mandatory public hearings that are required for some permits. As with all projects, garnering community support early in the development process significantly eases project permitting. A considerable benefit to wind is that surrounding lands may be used for other purposes, thereby generating dual revenue for landowners. For example, ranching and farming can co-exist on the same parcel with wind energy production. See the Aloha Aina Guidance Document for assistance in community and stakeholder outreach.

Visual Considerations

A visual impact assessment should be conducted early in the permitting phase of a proposed wind energy project to assess whether impacts may be significant and to assist with early community outreach. Visual simulations of the turbine locations from key observation points such as residential communities, national parks, or high use areas are typically developed to understand the visibility of turbines. In some cases, micrositing of turbines can sometimes reduce visual impacts. Visual impacts are significant in Hawaii, given the aesthetic value and widely visible view sheds typical of an island. Extensive community outreach early in the development process is required to identify visual impacts and explore mitigation strategies. Painting turbines to blend in with the surrounding environment is generally not permitted due to aviation safety regulations, which require turbines to be clearly visible and often white.

Note: Accurate visual simulations / assessments should be provided to regulatory agencies and communities as part of the initial project review process, and should be provided at each opportunity to engage the impacted community. This includes daytime and nighttime visuals (red lights).

Species of Concern

Wind energy facilities have contributed to bird and bat mortality in Hawaii. Since the Hawaiian Islands are home to a large number of federal and state threatened and endangered avian species, sufficient preconstruction technical studies should be conducted to assess the potential impact of a wind facility on threatened and endangered species, and the opportunities available for mitigation (AWEA 2005). Additionally, post-construction survey data are available from wind facilities that have been operating in Hawaii for several years on Maui and Oahu. Seabirds and the Hawaiian hoary bat are currently the primary species of concern based on the results of these fatality studies although other listed species have potential to be impacted. Given the lack of hoary bat data, in particular, extensive pre-construction field studies are likely to be required. USFWS published Land-Based Wind Energy Guidelines in March 2012. These voluntary guidelines provide a structured scientific process for addressing wildlife concerns at all phases of land-based wind energy development (USFWS 2012).

After an initial desktop assessment to identify if a proposed project is located near important wildlife areas or known occurrences of species of concern, field surveys will most likely be required such as avian radar surveys, avian point count surveys, bat acoustic monitoring, invertebrate surveys, rare plant surveys and other species-specific studies. Some of these surveys are time sensitive or need to be conducted during certain seasons of the year or for multiple seasons. For example, rare plant surveys should be completed at the time species of concern typically flower which is often during the wet season. Therefore, identifying the biological assessments that need to be conducted early-on in the due diligence and permitting stage of a proposed project can help avoid delays in the process and whether impacts would be significant. Previous biological surveys completed for a proposed project or in the vicinity may be useful in assessing potential impacts to species of concern; however, typically site-specific studies are required.

Distributed wind generation and smaller turbine technologies are also subject to threatened and endangered species protections. While some manufacturers advertise avian-friendly technologies, developers and residential installers are wise to consult the DOFAW and USFWS before investing time and resources into a proposed wind development. There may be opportunities for cooperation and coordination for smaller turbines.

As described in Chapter 2, the federal and state threatened or endangered species laws identify the coordination and permitting processes for threatened and endangered species as administered by USFWS, NMFS, and DLNR. If threatened or endangered species could be adversely affected by a proposed wind project, typically the developer seeks incidental take coverage from these agencies, as applicable. Negotiations for development of a Habitat Conservation Plan (HCP) or a Biological Assessment (BA) to obtain incidental take coverage can be complex and expensive as these processes can take a minimum of one to three years. For incidental take or impacts to species, the developer must demonstrate avoidance and minimization measures and mitigation is typically required for each species. DLNR requires that mitigation provide a net benefit in addition to offsetting proposed impacts to a species. It is important that both federal and state wildlife agencies

are consulted early in the planning stages of a proposed project. With DLNR, HCPs and ITLs require approval from the Endangered Species Recovery Committee (ESRC) and the BLNR.

Note: Kauai County's Energy Sustainability Plan (2010)[82] provides information and recommendations on several alternative energy sources, including wind energy. This Plan notes that "Regardless of the economic and technical benefits of wind, its development on Kauai has been essentially put on hold due to federal regulations regarding the endangered Newell Shearwater and other endangered bird and mammal species; some community and local opposition centering on visual impacts; and location (remoteness of the best potential sites). Kauai faces more stringent environmental restrictions due to its large populations of endangered avian species compared to the other Hawaiian Islands."

Transportation Considerations

Due to Hawaii's often narrow and winding roadways, roadway closures or traffic controls may be required during the land transport of large (oversize) wind turbines. Consult the DOT Highways Division for the necessary permits and approvals.

State and County Land Use Considerations

Wind energy facilities and appurtenances are typically identified as a permitted use in county and state rules and guidance, though county zoning permits may be required, depending on land use and zoning. For example, the production and generation of wind-generated energy are permitted on all lands within a state Agricultural District provided the facilities are compatible with agricultural uses and cause minimal adverse impact (HRS 205-4.5(a)(14)). Turbines sited on Conservation District lands are required to obtain a Conservation District Use Permit, which requires HRS 343 environmental review.

An NPDES permit will also likely be required to regulate run-off during construction and operation, if necessary.

Note: Because some wind projects may not be currently subject to 343 review where none of the 343 triggers apply, developers of these projects must make efforts to disclose and address all potential impacts through the other permitting processes.

Hawaii County, Maui County, and the City and County of Honolulu have specific land use categories for wind energy facilities to clearly identify the zoning districts in which wind is allowed, with or without a permit. Most counties currently have a property setback requirement of at least the height of the turbines proposes, though the appropriate county must be consulted.

City and County of Honolulu

A CUP (Minor) is likely required for a wind energy facility on Oahu. These permits typically include a decommissioning and site restoration provision to ensure the project is properly decommissioned after the end of its useful life. Setback and height requirements apply, and may require a variance from DPP.

[82] http://www.kauainetwork.org/programs/past-programs/

County of Maui

Maui County has issued guidance on compliance with electrical and building codes for solar and wind facilities.[83] Ultimately, the permits required for a land based wind project will depend on the location of the project. Large-scale turbines will likely be classified as a "major utility facility" for Maui County permitting purposes. A state SUP and Maui County Special Use Permit will likely be required, as well as a County Variance if the project does not meet the applicable height and setback requirements. Consult the Maui Planning Department for the most current wind turbines siting requirements.

County of Hawaii

Hawaii County permits wind energy facilities in certain zones, as determined by Chapter 25 (Zoning). Where not permitted in a particular district, a county zoning permit will be required. In certain districts, height limitations may be exempted where the turbines are setback from all property lines at least as far as the turbine is tall. Consult the Hawaii Planning Department for guidance on the permitting requirement for particular projects.

Resource Considerations, Permits and Approvals Specific to Offshore Wind Development

There are many complex considerations involved in the permitting and siting of an off-shore wind farm in Hawaii. Developers are encouraged to review the sections of this Guide addressing Wind, OTEC, and MHK developments. In addition, review through the DOD Siting Clearinghouse, and the USCG would be key initial consultations early in the siting stages.

As is mentioned in the MHK energy development section, the BOEM Renewable Energy Regulatory Framework (30 CFR 585) establishes a foundation for offshore renewable energy activities on the OCS to comply with NEPA. Offshore wind development in federal waters requires the same rigorous permitting process as does MHK development, including the desktop analyses, marine site characterization surveys, and other environmental surveys. However, unlike the MHK permitting process, FERC does not have jurisdiction over offshore wind projects. If an offshore wind project is located in state waters, BOEM does not have jurisdiction and the USACE serves as the lead NEPA agency. The same regulatory and consultative agencies identified in the MHK energy development section will participate in the issuance of permits for an offshore wind project. Furthermore, some of the same resource impact and public concern issues associated with onshore wind and MHK are typically raised for offshore wind facilities. Extensive outreach with DOD and other marine users is necessary early in the project scoping phase.

[83] http://www.mauiCounty.gov/documents/20/81/83/Permit_Req_For_PhotovoltaicSystems_WindTurbines_Windmills_Dec2009.PDF

Acronyms and Abbreviations

ALP	Alternative Licensing Process
APC	Air Pollution Control
BA	Biological Assessment
BLNR	Board of Land and Natural Resources
BOEM	Bureau of Ocean Energy Management
C&D	construction and demolition
CCH	City and County of Honolulu
CDUA	Conservation District Use Application
CDUP	Conservation District Use Permit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CGP	NPDES General Stormwater Permit for Construction Activities
CI Analysis	Critical Issues Analysis
CIA	Cultural Impacts Assessment
COP	Construction and Operations Plan
CPLO	Community Plans and Liaison Officer
CWA	Clean Water Act
CWPP	Countywide Policy Plan
CWRM	Commission on Water Resource Management
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act
DBEDT	Department of Business, Economic Development, and Tourism
DBFS	Department of Budget and Fiscal Services
DHHL	Department of Hawaiian Home Lands
DLNR	Department of Land and Natural Resources
DNH	Determination of No Hazard
DOD	Department of Defense
DOE	Department of Energy
DOBOR	Division of Boating and Ocean Recreation
DOFAW	Division of Forestry and Wildlife
DOI	Department of the Interior
DPP	CCH Department of Planning and Permitting
DPW	Department of Public Works
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act
EISPN	EIS Preparation Notice
EPA	Environmental Protection Agency
ESA	Endangered Species Act

ESRC	Endangered Species Recovery Committee
FAA	Federal Aviation Administration
FERC	Federal Energy Regulatory Commission
FONSI	Finding of No Significant Impact
GAP	General Activities Plan
GIS	geographic information system
HBF	Hawaii Biofuels Foundation
HCEI	Hawaii Clean Energy Initiative
HCP	Habitat Conservation Plan
HDOA	Hawaii Department of Agriculture
HDOH	Hawaii Department of Health
HDOT	Hawaii Department of Transportation
HECO	Hawaiian Electric Company
HEER	HDOH, Hazard Evaluation and Emergency Response
HEI	Hawaiian Electric Industries, Inc.
HELCO	Hawaii Electric Light Company
HERL	Hawaii Environmental Response Law
HLUC	Hawaii Land Use Commission
HoLIS	Honolulu Land Information System
HRS	Hawaii Revised Statutes
HSEO	Hawaii State Energy Office
IHA	Incidental Harassment Authorization
IRS	Interconnection Requirement Study
ITL	Incidental Take License
ITP	Incidental Take Permit
ITS	Incidental Take Statement
KESP	Kauai Energy Sustainability Plan
KOHA	Kauai Online Hazard Assessment
KUIC	Kauai Island Utility Cooperative
LOA	Letter of Authorization
LUO	Land Use Ordinance
LUPAG	Land Use Pattern Allocation Guide
MBTA	Migratory Bird Treaty Act
MCC	Maui County Code
MECO	Maui Electric Company
MHK	marine hydrokinetic
MIP	Maui Island Plan
MMPA	Marine Mammal Protection Act
MSA	Magnuson-Steven Fishery Conservation and Management Act
MSW	municipal solid waste
MW	megawatts

NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NOAA Fisheries	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NPS	National Parks Service
NRHP	National Register of Historic Places
NWP	Nationwide Permit
OCCL	Office of Conservation and Coastal Lands
OCS	Outer Continental Shelf
OCSLA	Outer Continental Shelf Lands Act
OED	Office of Economic Development
OEQC	Office of Environmental Quality Control
OHA	Office of Hawaiian Affairs
OTEC	ocean thermal energy conversion
OTECA	Ocean Thermal Energy Conversion Act
PCB	polychlorinated biphenyl
PEIS	Programmatic Environmental Impact Statement
PUC	Hawaii Public Utilities Commission
PV	photovoltaic
RFS2	National Renewable Fuel Standard Program
RHA	River and Harbors Act
ROH	Revised Ordinances of Honolulu
ROW	Right-of-Way
RSB	Roundtable on Sustainable Biofuels
RUE	Right-of-Use and Easement
SAP	Site Assessment Plan
SCAP	Stream Channel Alteration Permit
SDWP	Stream Diversion Works Permit
SHPD	State Historic Preservation Division
SHWB	HDOH, Environmental Management Division, Solid and Hazardous Waste Branch
SIC	Standard Industrial Classification
SMA	Special Management Area
SPAM	Stream Protection and Management
SUP	Special Use Permit
SWPPP	Stormwater Pollution Prevention Plan
T&E	Threatened and Endangered
USACE	US Army Corps of Engineers
USCG	US Coast Guard
USFWS	US Fish and Wildlife Service

WTE	waste-to-energy

References

AWEA 2005	American Wind Energy Association. 2005. Wind Power Myths vs. Facts. Retrieved on 12/22/09 from http://www.awea.org/Resources/Content.aspx?ItemNumber=873&navItemNumber=588
DBEDT 2009	Department of Business, Economic Development and Tourism. December 2009. Hawai'i Bioenergy Master Plan.
DBEDT 2012	DBEDT. 2012. Biofuels Study Final Report to the Legislature In Accordance with Act 203, Session Laws of Hawaii, 2011. December 2012. Accessed 12/28/14 at http://energy.hawaii.gov/wp-content/uploads/2011/10/BiofuelsStudy_Act203_Dec2012.pdf
DBEDT 2014	DBEDT, Hawaii State Energy Office. Hawaii Energy Facts & Figures. November 2014. Retrieved on 12/28/14 at http://energy.hawaii.gov/wp-content/uploads/2014/11/HSEO_FF_Nov2014.pdf
DPP 2014a	City and County of Honolulu, DPP. Solar Farm Guidelines. Last modified 8/28/2014. Retrieved on 12/28/14 from http://www.honoluludpp.org/Portals/0/pdfs/zoning/Solar%20Farm%20Guidelines.pdf
DPP 2014b	http://www.honoluludpp.org/Planning/DevelopmentSustainableCommunitiesPlans.aspx
EPA 2010	US Environmental Protection Agency website. Region 9: Air Standards Delegations, Agency Delegations, Hawaii State Agency. Retrieved 1/6/10 from http://yosemite.epa.gov/r9/r9nsps.nsf/ViewAgencies?ReadForm&State=HI
Erickson et al. 2014	Erickson, W.P., M. Wolfe, K. Bay, D. Johnson, J. Gehring. 2014. A Comprehensive Analysis of Small-Passerine Fatalities from Collision with Turbines at Wind Energy Facilities. PLOS ONE 9 (9) e107491.
FERC 2008	Federal Energy Regulatory Commission, Hydrokinetic Projects http://www.ferc.gov/industries/hydropower/gen-info/licensing/hydrokinetics.asp#skipnav
Fleischmann 2007	Fleischmann, D.J. (January 2007). An Assessment of Geothermal Resource Development Needs in the Western United States. Geothermal Energy Association, Washington D.C.
Hagerman 2004	G. Hagerman, R. Bedard, and M. Previsic (June, 2004). Electricity Innovation Institute EPRI Survey and Characterization of Potential Offshore Wave Energy Sites in Hawaii. Retrieved 11/18/09 from http://oceanenergy.epri.com/attachments/wave/reports/003_Hawaii_Site_Report_Rev_1.pdf
HC 2009	Hawaii County Website. Hawai'i County 2005 General Plan. Retrieved 12/16/09 from http://www.hawaii-County.com/la/gp/toc.html
HDOH 2013	HDOH. Report to the Twenty-Seventh Legislature State of Hawaii 2014. December 2013. Retrieved 12/28/14 from http://eha-web.doh.hawaii.gov/eha-cma/Leaders/HEER/annual-heer-office-legislature-report
HECO 2014	Hawaiian Electric Company (2014). 2013 Renewable Portfolio Standard Status Report. Hawaiian Electric Company, Inc., Hawaii Electric Light Company, Inc., Maui Electric Company, Limited. For the Year Ended December 31, 2013. March 31,

	2014. Available at: http://puc.hawaii.gov/wp-content/uploads/2013/07/RPS-HECO-2013.pdf Accessed December 10, 2014.
HNEI 2009	Hawaii Natural Energy Institute (2009). Bioenergy Master Plan: http://www.hnei.hawaii.edu/node/410
KC 2009	County of Kauai Website, The Kauai General Plan. Retrieved 12/16/09 from http://www.kauai.gov/Government/Departments/PlanningDepartment/TheKauaiGeneralPlan/tabid/130/Default.aspx
KIUC 2014	Kauai Island Utility Cooperative (2014). 2013 Renewable Portfolio Standard (RPS) Status Report, Year Ending December 31, 2013. June 30, 2014. Available at: http://dms.puc.hawaii.gov/dms/DocumentViewer?pid=A1001001A14G02A84813A14594 Accessed December 10, 2014.
Lyons 2004	Lyons, K., Washington State Extension Energy Program (2004). A Regulatory Guide to Geothermal Direct Use Development. http://wsldocs.sos.wa.gov/library/docs/wsu/idaho_2008_005011.pdf
MCEA 2009	Maui County Energy Alliance (September 2009). Sustainable Energy: Strategies for Implementation Recommendations from the Working Groups. Retrieved on 1/8/10 from http://www.co.maui.hi.us/documents/Mayor%27s%20Office/Office%20of%20Economic%20Development/2009%20Energy%20Expo/MCEA%20Expo%20Long%20Version%20Final%20Sep%2008.PDF
MCPD 2010	Maui County Planning Department Website. Retrieved 1/5/10 from http://www.co.maui.hi.us/index.aspx?nid=121
NWCC 2002	National Wind Coordinating Committee (NWCC) (2002). Permitting of Wind Energy Facilities: A Handbook, 2nd ed. www.nationalwind.org
Strickland et al. 2011	Strickland, M.D., E.B. Arnett, W.P. Erickson, D.H. Johnson, G.D. Johnson, M.L. Morrison, J.A. Shaffer, and W. Warren-Hicks. 2011. Comprehensive guide to studying wind energy/wildlife interactions. Prepared for the National Wind Coordinating Collaborative. Washington, D.C.
Thresher, et al. 2012	R. Thresher et al, Ocean Energy Technologies, in 2 National Renewable Energy Laboratory, Renewable Electricity Futures Study, p9-1 (2012).
USFWS 2010a	USFWS. Hawaiian Islands Animals: Updated April 13, 2010, Listed Species, as Designated Under the U.S. Endangered Species Act. Accessed at http://www.fws.gov/pacificislands/publications/listinganimals.pdf
USFWS 2010b	USFWS. Hawaiian Islands Plants: Updated April 13, 2010, Listed Species, as Designated Under the U.S. Endangered Species Act. Accessed at http://www.fws.gov/pacificislands/publications/listingplants.pdf
USFWS 2012	USFWS. Land Based Wind Energy Guidelines. March 2012. Accessed at http://www.fws.gov/cno/pdf/Energy/2012_Wind_Energy_Guidelines_final.pdf

APPENDIX II Hawai‘i Endangered Species

HAWAIIAN ISLANDS ANIMALS: Updated April 13, 2010

LISTED SPECIES, AS DESIGNATED UNDER THE U.S. ENDANGERED SPECIES ACT

Species status by island: E=endangered; **T**=threatened; **(CH)**=critical habitat designated; P=proposed.
N.W. Hawaiian Islands: Frigate; Kure; Laysan; Midway; Necker; Nihoa; PH = Pearl & Hermes

			DISTRIBUTION						
		STATUS	Hawai'i	Maui	Lāna'i	Moloka'i	O'ahu	Kaua'i	N.W. Islands, Kaho'olawe, Ni'ihau, or Oceanic
VERTEBRATES (40 Endangered + 4 Threatened = 44 taxa)									
LISTED MAMMALS (4 Endangered taxa)									
Lasiurus cinereus semotus	Bat, Hawaiian hoary; 'Ōpe'ape'a	E	x	x			x	x	
Megaptera novaeangliae	Whale, humpback; Koholā	E	x	x	x	x	x	x	O
Monachus schauinslandi **(CH)**	Hawaiian monk seal; 'Īlio-holo-i-ka-uaua	E	x	x	x	x	x	x	N.W. islands
Physeter macrocephalus	Whale, sperm; Palaoa (uncommon)	E							O
LISTED BIRDS (34 Endangered + 1 Threatened = 35 taxa)									
Acrocephalus familiaris kingi	Millerbird, Nihoa	E							Nihoa
Anas laysanensis	Duck, Laysan	E							M, L
Anas wyvilliana	Duck, Hawaiian; Koloa maoli	E	x	x			x	x	
Branta sandvicensis	Goose, Hawaiian; Nēnē	E	x	x		x		x	
Buteo solitarius	Hawk, Hawaiian; 'Io	E	x						
Chasiempis sandwichensis ibidis **(CH)**	'Elepaio, O'ahu	E					x		
Corvus hawaiiensis	Crow, Hawaiian; 'Alalā	E	x						
Fulica alai	Coot, Hawaiian; 'Alae ke'oke'o	E	x	x	x	x	x	x	
Gallinula chloropus sandvicensis	Moorhen, Common; Hawiian gallinule; 'Alae 'ula	E	x	x		x	x	x	
Hemignathus lucidus affinus	Nuku pu'u, Maui	E		x					
Hemignathus lucidus hanapepe	Nuku pu'u, Kaua'i	E						x	
Hemignathus munroi	Akia pōlā'au	E	x						
Hemignathus procerus	'Akia loa, Kaua'i	E						x	
Himantopus mexicanus knudseni	Stilt, Black-necked; Hawaiian stilt; Ae'o	E	x	x	x	x	x	x	Ni'ihau
Loxioides bailleui **(CH)**	Palila	E	x						
Loxops caeruleirostris **(CH)**	'Ākepa, Kauai; Akekee	E						x	
Loxops coccineus coccineus	'Ākepa, Hawai'i	E	x						
Loxops coccineus ochraceus	'Ākepa, Maui	E		x					

HAWAIIAN ISLANDS ANIMALS: Updated April 13, 2010

LISTED SPECIES, AS DESIGNATED UNDER THE U.S. ENDANGERED SPECIES ACT

Species status by island: E=endangered; **T**=threatened; **(CH)**=critical habitat designated; P=proposed. N.W. Hawaiian Islands: Frigate; Kure; Laysan; Midway; Necker; Nihoa; PH = Pearl & Hermes			**DISTRIBUTION**						
		STATUS	Hawai'i	Maui	Lāna'i	Moloka'i	O'ahu	Kaua'i	N.W. Islands, Kaho'olawe, Ni'ihau, or Oceanic
Melamprosops phaeosoma	Po'ouli	E		x					
Moho braccatus	Ō'ō, Kaua'i; 'Ō'ō 'ā'ā	E						x	
Myadesxes lanaiensis ruxha	Thrush, Moloka'i; Oloma'o	E				x			
Myadestes myadestinus	Thrush, Large Kaua'i; Kāma'o	E						x	
Myadestes palmeri	Thrush, Small Kaua'i; Puaiohi	E						x	
Oeromystis bairdi **(CH)**	Creeper, Kauai; Akikiki	E						x	
Oreomystis mana	Creeper, Hawai'i	E	x						
Palmeria dolei	Honeycreeper, Crested; 'Ākohekohe	E		x					
Paroreomyza flammea	Creeper, Moloka'i; Kākāwahie	E				x			
Phoebastria albatrus	Albatross, Short-tailed	E							M
Paroreomyza maculata	Creeper, O'ahu; O'ahu 'Alauahio	E					x		
Pseudonestor xanthophrys	Parrotbill, Maui	E		x					
Psittirostra psittacea	Ō'ū	E	x					x	
Pterodroma phaeopygia sandwichensis	Petrel, Dark-rumped; Hawaiian Petrel; 'Ua'u	E	x	x	x			x	
Puffinus auricularis	Shearwater, Newell's	T	x				x	x	
Telespyza cantans	Finch, Laysan	E							L
Telespyza ultima	Finch, Nihoa	E							Nihoa

LISTED REPTILES (2 Endangered + 3 Threatened = 5 taxa)

Caretta caretta	Turtle, Loggerhead sea; (incidental in Hawai'i)	T	x	x	x	x	x	x	O+all islands
Chelonia mydas	Turtle, Green sea; Honu	T	x	x	x	x	x	x	O+all islands
Dermochelys coriaceae	Turtle, Leatherback sea; (incidental in Hawai'i)	E	x	x	x	x	x	x	O+all islands
Eretmochelys imbricata	Turtle, Hawksbill; 'Ea	E	x	x	x	x	x	x	O+all islands
Lepidochelys olivacea	Turtle, Olive ridley sea; (incidental in Hawai'i)	T	x	x	x	x	x	x	O+all islands

INVERTEBRATES (56 Endangered +2 Threatened = 58 taxa; 2 proposed Endangered)

LISTED SNAILS (41 Endangered + 1 Threatened = 42 taxa)

Achatinella abbreviata	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella apexfulva	Snail, O'ahu tree; Pupu kani oe	E					x		

HAWAIIAN ISLANDS ANIMALS: Updated April 13, 2010

LISTED SPECIES, AS DESIGNATED UNDER THE U.S. ENDANGERED SPECIES ACT

Species status by island: E=endangered; **T**=threatened; **(CH)**=critical habitat designated; P=proposed. N.W. Hawaiian Islands: Frigate; Kure; Laysan; Midway; Necker; Nihoa; PH = Pearl & Hermes			**DISTRIBUTION**						
		STATUS	Hawai'i	Maui	Lāna'i	Moloka'i	O'ahu	Kaua'i	N.W. Islands, Kaho'olawe, Ni'ihau, or Oceanic
Achatinella bellula	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella buddii	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella bulimoides	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella byronii	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella caesia	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella casta	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella cestus	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella concavospira	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella curta	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella decipiens	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella decora	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella dimorpha	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella elegans	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella fulgens	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella fuscobasis	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella juddii	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella juncea	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella lehuiensis	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella leucorrhaphe	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella lila	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella livida	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella lorata	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella mustelina	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella papyracea	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella phaeozona	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella pulcherrima	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella pupukanioe	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella rosea	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella sowerbyana	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella spaldingi	Snail, O'ahu tree; Pupu kani oe	E					x		

HAWAIIAN ISLANDS ANIMALS: Updated April 13, 2010

LISTED SPECIES, AS DESIGNATED UNDER THE U.S. ENDANGERED SPECIES ACT

Species status by island: E=endangered; **T**=threatened; **(CH)**=critical habitat designated; P=proposed. N.W. Hawaiian Islands: Frigate; Kure; Laysan; Midway; Necker; Nihoa; PH = Pearl & Hermes		**STATUS**	**DISTRIBUTION**						
			Hawai'i	Maui	Lāna'i	Moloka'i	O'ahu	Kaua'i	N.W. Islands, Kaho'olawe, Ni'ihau, or Oceanic
Achatinella stewartii	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella swiftii	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella taeniolata	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella thaanumi	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella turgida	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella valida	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella viridans	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella vittata	Snail, O'ahu tree; Pupu kani oe	E					x		
Achatinella vulpina	Snail, O'ahu tree; Pupu kani oe	E					x		
Erinna newcombi **(CH)**	Snail, Newcomb's; Pupu wai lani	T						x	

LISTED ARTHROPODS (15 Endangerd + 1 Threatened = 16 taxa; 2 proposed Endangered)

Adelocosa anops **(CH)**	Wolf spider, Kaua'i cave	E						x	
Manduca blackburni **(CH)**	Moth, Blackburn's sphinx	E	x	x					Ka
Drosophila aglaia (CH)	Picture-wing fly, Oahu	E					x		
Drosophila attigua **(CH)** (syn.w/*D. sharpi*)	Picture-wing fly, Kauai	E						x	
Drosophila differens (CH)	Picture-wing fly, Molokai	E				x			
Drosophila hemipeza (CH)	Picture-wing fly, Oahu	E					x		
Drosophila heteroneura (CH)	Picture-wing fly, Hawaii	E	x						
Drosophila montgomeryi (CH)	Picture-wing fly, Oahu	E					x		
Drosophila mulli (CH)	Picture-wing fly, Hawaii	T	x						
Drosophila musaphila (CH)	Picture-wing fly, Kauai	E						x	
Drosophila neoclavisetae (CH)	Picture-wing fly, Maui	E		x					
Drosophila obatai (CH)	Picture-wing fly, Oahu	E					x		
Drosophila ochrobasis (CH)	Picture-wing fly, Hawaii	E	x						
Drosophila substenoptera (CH)	Picture-wing fly, Oahu	E					x		
Drosophila tarphytrichia (CH)	Picture-wing fly, Oahu	E					x		
Megalagrion nesiotes	Flying earwig Hawaiian damselfly	PE	x	x					
Megalagrion pacificum	Pacific Hawaiian damselfly	PE	x	x	x	x	x	x	
Spelaeorchestia koloana ***(CH)***	Amphipod, Kaua'i cave	E						x	

HAWAIIAN ISLANDS PLANTS: Updated April 13, 2010

LISTED SPECIES, AS DESIGNATED UNDER THE U.S. ENDANGERED SPECIES ACT

Species status by island: E= endangered; **T**= threatened; **P**= formally proposed as E or T;
(CH)=critical habitat designated; pCH=critical habitat proposed ;*=possibly extirpated in the wild.
‡=N.W. Hawaiian Islands: Frigate; Kure; Laysan; Midway; Necker; Nihoa; PH = Pearl & Hermes.

LISTED PLANTS (343 Endangered, 11 Threatened)

		STATUS	DISTRIBUTION						
			Hawai'i	Maui	Lāna'i	Moloka'i	O'ahu	Kaua'i	N.W. Islands‡, Kaho'olawe, and Ni'ihau
Abutilon eremitopetalum	No common name	E			✓				
Abutilon menziesii	Ko`oloa`ula	E	✓	✓	✓		✓		
Abutilon sandwicense **(CH)**	No common name	E					✓•CH		
Acaena exigua	Liliwai	E		✓*				✓*	
Achyranthes mutica **(CH)**	No common name	E	✓•CH					✓*	
Achyranthes splendens var. *rotundata*	Hinahina ewa	E			✓*	✓*	✓		
Adenophorus periens **(CH)**	No common name	E	✓CH		✓*	✓CH	✓*CH	✓CH	
Alectryon macrococcus var. *auwahiensis* **(CH)**	Mahoe	E		✓CH					
Alectryon macrococcus var. *macrococcus* **(CH)**	Mahoe	E		✓CH		✓CH	✓CH	✓CH	
Amaranthus brownii **(CH)**	No common name	E							Nihoa CH
Argyroxiphium kauense **(CH)**	`Ahinahina, Ka`u silversword	E	✓CH						
Argyroxiphium sandwicense ssp. *macrocephalum* **(CH)**	`Ahinahina, Haleakala silversword	T		✓CH					
Argyroxiphium sandwicense ssp. *sandwicense*	`Ahinahina, Mauna Kea	E	✓						
Asplenium peruvianum var. *insulare* **(CH)** (listed as Asplenium fragile var. insulare)	No common name	E	✓CH	✓CH					
Astelia waialealae **(CH)**	painiu	E						✓CH	
Bidens micrantha ssp. *kalealaha* **(CH)**	Ko`oko`olau	E		✓CH	✓CH				
Bidens wiebkei **(CH)**	Ko`oko`olau	E				✓CH			
Bonamia menziesii **(CH)**	No common name	E	✓CH	✓CH	✓	✓*	✓CH	✓CH	
Brighamia insignis **(CH)**	`Olulu	E						✓CH	Niihau*CH
Brighamia rockii **(CH)**	Pua `ala	E		✓*CH	✓*	✓CH			
Caesalpinia kavaiensis	Uhiuhi	E	✓	✓*	✓*		✓	✓*	
Canavalia molokaiensis **(CH)**	`Awikiwiki	E				✓CH			
Canavalia napaliensis **(CH)**	Awikiwiki	E						CH	
Cenchrus agrimoniodes var. *agrimonioides* **(CH)**	Kamanomano	E	✓*	✓CH	✓*		✓CH		
Cenchrus agrimonioides var. *laysanensis*	Kamanomano	E							L*, K*, M*
Centaurium sebaeoides **(CH)**	`Awiwi	E		✓CH	✓	✓CH	✓CH	✓CH	
Chamaesyce celastroides var. *kaenana* **(CH)**	`Akoko	E					✓CH		
Chamaesyce deppeana **(CH)**	`Akoko	E					✓CH		
Chamaesyce eleanoriae **(CH)**	`Akoko	E						✓CH	
Chamaesyce halemanui **(CH)**	`Akoko	E						✓CH	
Chamaesyce herbstii **(CH)**	`Akoko	E					✓CH		

HAWAIIAN ISLANDS PLANTS: Updated April 13, 2010

LISTED SPECIES, AS DESIGNATED UNDER THE U.S. ENDANGERED SPECIES ACT

Species status by island: E= endangered; **T**= threatened; **P**= formally proposed as E or T;
(CH)=critical habitat designated; pCH=critical habitat proposed ;*=possibly extirpated in the wild.
‡=N.W. Hawaiian Islands: Frigate; Kure; Laysan; Midway; Necker; Nihoa; PH = Pearl & Hermes.

		STATUS	DISTRIBUTION						
			Hawai'i	Maui	Lāna'i	Moloka'i	O'ahu	Kaua'i	N.W. Islands‡, Kaho'olawe, and Ni'ihau
Chamaesyce kuwaleana **(CH)**	`Akoko	E					✓CH		
Chamaesyce remyi var. kauaiensis **(CH)**	`Akoko	E						✓CH	
Chamaesyce remyi var. remyi **(CH)**	`Akoko	E						✓CH	
Chamaesyce rockii **(CH)**	`Akoko	E					✓CH		
Chamaesyce skottsbergii var. *kalaeloana* (listed as *Euphorbia skottsbergii* var. *kalaeloana*)	`Akoko	E					✓		
Charpentiera densiflora **(CH)**	Papala	E						✓CH	
Clermontia drepanomorpha **(CH)**	`Oha wai	E	✓CH						
Clermontia lindseyana **(CH)**	`Oha wai	E	✓CH	✓CH					
Clermontia oblongifolia ssp. *brevipes* **(CH)**	`Oha wai	E				✓CH			
Clermontia oblongifolia ssp. mauiensis **(CH)**	`Oha wai	E		✓CH	✓*				
Clermontia peleana ssp. *peleana* **(CH)**	`Oha wai	E	✓CH						
Clermontia peleana ssp. *singuliflora* **(CH)**	`Oha wai	E	✓*CH	✓*					
Clermontia pyrularia **(CH)**	`Oha wai	E	✓CH						
Clermontia samuelii ssp. *hanaensis* **(CH)**	`Oha wai	E		✓CH					
Clermontia samuellii ssp. *samuelii* **(CH)**	`Oha wai	E		✓CH					
Colubrina oppositifolia **(CH)**	Kauila	E	✓CH	✓CH			✓CH		
Ctenitis squamigera **(CH)**	Pauoa	E		✓CH	✓	✓CH	✓CH	✓*CH	
Cyanea acuminata **(CH)**	Haha	E					✓CH		
Cyanea asarifolia **(CH)**	Haha	E						✓CH	
Cyanea copelandii ssp. *copelandii*	Haha	E	✓*						
Cyanea copelandii ssp. *haleakalaensis* **(CH)**	Haha	E		✓CH					
Cyanea crispa **(CH)**	Haha	E					✓CH		
Cyanea dolichopoda **(CH)**	Haha	E						✓CH	
Cyanea dunbariae **(CH)**	Haha	E				✓CH			
Cyanea eleeleensis **(CH)**	Haha	E						✓CH	
Cyanea glabra **(CH)**	Haha	E		✓CH					
Cyanea grimesiana ssp. *grimesiana* **(CH)**	Haha	E				✓*CH	✓*CH		
Cyanea grimesiana ssp. *obatae* **(CH)**	Haha	E					✓CH		
Cyanea hamatiflora ssp. *carlsonii* **(CH)**	Haha	E	✓CH						
Cyanea hamatiflora ssp. *hamatiflora* **(CH)**	Haha	E		✓CH					
Cyanea humboldtiana **(CH)**	Haha	E					✓CH		
Cyanea kolekoleensis **(CH)**	Haha	E						✓CH	
Cyanea koolauensis **(CH)**	Haha	E					✓CH		
Cyanea kuhihewa **(CH)**	Haha	E						✓CH	
Cyanea lobata ssp. *baldwinii* (listed as *Cyanea lobata*)	Haha	E			✓				

HAWAIIAN ISLANDS PLANTS: Updated April 13, 2010

LISTED SPECIES, AS DESIGNATED UNDER THE U.S. ENDANGERED SPECIES ACT

Species status by island: E= endangered; **T**= threatened; **P**= formally proposed as E or T;
(CH)=critical habitat designated; pCH=critical habitat proposed ;*=possibly extirpated in the wild.
‡=N.W. Hawaiian Islands: Frigate; Kure; Laysan; Midway; Necker; Nihoa; PH = Pearl & Hermes.

		STATUS	DISTRIBUTION						
			Hawai'i	Maui	Lāna'i	Moloka'i	O'ahu	Kaua'i	N.W. Islands‡, Kaho'olawe, and Ni'ihau
Cyanea lobata ssp. *lobata* (listed as *Cyanea lobata*) **(CH)**	Haha	E		✓•CH					
Cyanea longiflora **(CH)**	Haha	E					✓CH		
Cyanea macrostegia ssp. gibsonii	Haha	E			✓				
Cyanea magnicalyx (listed as *Cyanea grimesiana* ssp. *grimesiana*) (**CH**)	Haha	E		✓CH					
Cyanea mannii **(CH)**	Haha	E				✓CH			
Cyanea mauiensis (listed as *Cyanea grimesiana* ssp. *grimesiana*)	Haha	E		✓*					
Cyanea mceldowney **(CH)**	Haha	E		✓CH					
Cyanea munroi (listed as *Cyanea grimesiana* ssp. *grimesiana*) (**CH**)	Haha	E			✓	✓CH			
Cyanea pinnatifida **(CH)**	Haha	E					✓CH		
Cyanea platyphylla **(CH)**	`Aku`aku	E	✓CH						
Cyanea procera **(CH)**	Haha	E				✓CH			
Cyanea recta **(CH)**	Haha	T						✓CH	
Cyanea remyi **(CH)**	Haha	E						✓CH	
Cyanea rivularis (listed as *Delissea rivularis*) **(CH)**	No common name?	E						✓CH	
Cyanea salicina (listed as *Cyanea recta*) (**CH**)	Haha	T						✓CH	
Cyanea shipmanii **(CH)**	Haha	E	✓CH						
Cyanea st.-johnii **(CH)**	Haha	E					✓CH		
Cyanea stictophylla **(CH)**	Haha	E	✓CH						
Cyanea superba ssp. *regina* **(CH)**	Haha	E					✓*CH		
Cyanea superba ssp. *superba* **(CH)**	Haha	E					✓CH		
Cyanea truncata **(CH)**	Haha	E					✓CH		
Cyanea undulata **(CH)**	Haha	E						✓CH	
Cyperus fauriei **(CH)**	No common name	E	✓CH		✓*	✓CH			
Cyperus pennatiformis ssp. *bryanii* **(CH)** (listed as Mariscus pennatiformis)	No common name	E							L CH
Cyperus pennatiformis ssp. *pennatiformis* **(CH)** (listed as Mariscus pennatiformis)	No common name	E		✓CH			✓*CH	✓*CH	
Cyperus trachysanthos **(CH)**	Pu`uka`a	E			✓*	✓*	✓CH	✓CH	Niihau *
Cyrtandra crenata	Ha`iwale	E					✓*		
Cyrtandra cyaneoides **(CH)**	Mapele	E						✓CH	
Cyrtandra dentata **(CH)**	Ha`iwale	E					✓CH		
Cyrtandra giffardii **(CH)**	Ha`iwale	E	✓CH						
Cyrtandra kealiae ssp. *kealiae* (listed as *Cyrtandra limahuliensis*)**(CH)**	Ha`iwale	T						✓CH	
Cyrtandra munroi **(CH)**	Ha`iwale	E		✓CH	✓				
Cyrtandra oenobarba **(CH)**	Ha`iwale	E						✓CH	
Cyrtandra paliku **(CH)**	Ha`iwale	E						✓CH	
Cyrtandra polyantha **(CH)**	Ha`iwale	E					✓CH		

HAWAIIAN ISLANDS PLANTS: Updated April 13, 2010

LISTED SPECIES, AS DESIGNATED UNDER THE U.S. ENDANGERED SPECIES ACT

Species status by island: E= endangered; **T**= threatened; **P**= formally proposed as E or T;
(CH)=critical habitat designated; pCH=critical habitat proposed ;*=possibly extirpated in the wild.
‡=N.W. Hawaiian Islands: Frigate; Kure; Laysan; Midway; Necker; Nihoa; PH = Pearl & Hermes.

		STATUS	DISTRIBUTION						
			Hawai'i	Maui	Lāna'i	Moloka'i	O'ahu	Kaua'i	N.W. Islands‡, Kaho'olawe, and Ni'ihau
Cyrtandra subumbellata **(CH)**	Ha`iwale	E					✓CH		
Cyrtandra tintinnabula **(CH)**	Ha`iwale	E	✓CH						
Cyrtandra viridiflora **(CH)**	Ha`iwale	E					✓CH		
Delissea argutidentata (listed as *Delissea undulata*) (**CH**)	No common name	E	✓*CH						
Delissea kauaiensis (listed as *Delissea undulata*) **(CH)**	No common name	E						✓CH	
Delissea niihauensis (listed as *Delissea undulata*)	No common name	E							Niihau*
Delissea rhytidosperma **(CH)**	No common name	E						✓CH	
Delissea subcordata **(CH)**	No common name	E					✓*CH		
Delissea takeuchii (listed as *Delissea subcordata*) **(CH)**	No common name	E					✓*CH		
Delissea undulata	No common name	E		✓*					
Delissea waianaeensis (listed as *Delissea subcordata*) **(CH)**	No common name	E					✓CH		
Diellia erecta **(CH)**	No common name	E	✓CH	✓CH	✓*	✓CH	✓CH	✓*CH	
Diellia falcata **(CH)**	No common name	E					✓CH		
Diellia mannii **(CH)**	No common name	E						✓CH	
Diellia pallida **(CH)**	No common name	E						✓CH	
Diellia unisora **(CH)**	No common name	E					✓CH		
Diplazium molokaiense **(CH)**	No common name	E		✓CH	✓*	✓*CH	✓*CH	✓*CH	
Doryopteris angelica **(CH)**	No common name	E						✓CH	
Dryopteris crinalis var. *podosorus*	Palapalai aumakua	E						✓CH	
Dubautia herbstobatae **(CH)**	Na`ena`e	E					✓CH		
Dubautia imbricata ssp. imbricata **(CH)**	Na`ena`e	E						✓CH	
Dubautia kalalauensis **(CH)**	Na`ena`e	E						✓CH	
Dubautia kenwoodii **(CH)**	Na`ena`e	E						✓CH	
Dubautia latifolia **(CH)**	Kaholapehu	E						✓CH	
Dubautia pauciflorula **(CH)**	Na`ena`e	E						✓CH	
Dubautia plantaginea ssp. *humilis* **(CH)**	Na`ena`e	E		✓CH					
Dubautia plantaginea ssp. magnifolia **(CH)**	Na`ena`e	E						✓CH	
Dubautia waialealae **(CH)**	Na`ena`e	E						✓CH	
Eragrostis fosbergii **(CH)**	No common name	E					✓*CH		
Eugenia koolauensis **(CH)**	Nioi	E				✓*CH	✓CH		
Euphorbia haeleeleana **(CH)**	No common name	E					✓CH	✓CH	
Exocarpos luteolus **(CH)**	Heau	E						✓CH	
Flueggea neowawraea **(CH)**	Mehamehame	E	✓CH	✓CH		✓*CH	✓CH	✓CH	
Gahnia lanaiensis	No common name	E			✓				
Gardenia brighamii	Nanu	E	✓*	✓*	✓	✓*	✓		

HAWAIIAN ISLANDS PLANTS: Updated April 13, 2010

LISTED SPECIES, AS DESIGNATED UNDER THE U.S. ENDANGERED SPECIES ACT

Species status by island: E= endangered; **T**= threatened; **P**= formally proposed as E or T;
(CH)=critical habitat designated; pCH=critical habitat proposed ;*=possibly extirpated in the wild.
‡=N.W. Hawaiian Islands: Frigate; Kure; Laysan; Midway; Necker; Nihoa; PH = Pearl & Hermes.

		STATUS	DISTRIBUTION						
			Hawai'i	Maui	Lāna'i	Moloka'i	O'ahu	Kaua'i	N.W. Islands‡, Kaho'olawe, and Ni'ihau
Gardenia mannii **(CH)**	Nanu	E					✓CH		
Geranium arboreum **(CH)**	Nohoanu	E		✓CH					
Geranium kauaiense **(CH)**	Nohoanu	E						✓CH	
Geranium multiflorum **(CH)**	Nohoanu	E		✓CH					
Gouania hillebrandii **(CH)**	No common name	E		✓CH	✓*	✓			K*
Gouania meyenii **(CH)**	No common name	E					✓CH	✓CH	
Gouania vitifolia **(CH)**	No common name	E	✓CH	✓*CH			✓CH		
Haplostachys haplostachya	No common name	E	✓	✓*				✓*	
Hedyotis cookiana **(CH)**	`Awiwi	E	✓*					✓CH	
Hedyotis coriacea **(CH)**	Kio`ele	E	✓CH	✓CH			✓*CH		
Hedyotis degeneri var. *coprosmifolia* **(CH)**	No common name	E					✓*CH		
Hedyotis degeneri var. *degeneri* **(CH)**	No common name	E					✓CH		
Hedyotis mannii **(CH)**	Pilo	E		✓CH	✓	✓			
Hedyotis parvula **(CH)**	No common name	E					✓CH		
Hedyotis schlechtendahliana var. *remyi*	Kopa	E			✓*				
Hedyotis st.-johnii **(CH)**	No common name	E						✓CH	
Hesperomannia arborescens **(CH)**	No common name	E		✓	✓*	✓CH	✓CH		
Hesperomannia arbuscula **(CH)**	No common name	E		✓CH			✓CH		
Hesperomannia lydgatei **(CH)**	No common name	E						✓CH	
Hibiscadelphus distans	Hau kuahiwi	E						✓	
Hibiscadelphus giffardianus **(CH)**	Hau kuahiwi	E	✓CH						
Hibiscadelphus hualalaiensis **(CH)**	Hau kuahiwi	E	✓CH						
Hibiscadelphus woodii **(CH)**	Hau kuahiwi	E						✓CH	
Hibiscus arnottianus ssp. *immaculatus* **(CH)**	Koki`o ke`oke`o	E				✓			
Hibiscus brackenridgei ssp. *brackenridgei* **(CH)**	Ma`o hau hele	E	✓CH	✓CH	✓				
Hibiscus brackenridgei ssp. *mokuleianus* **(CH)**	Ma`o hau hele	E				✓CH	✓*CH		
Hibiscus brackenridgei ssp. *molokaiana* **(CH)**	Ma`o hau hele	E				✓*CH	✓CH		
Hibiscus clayi **(CH)**	Koki`o `ula`ula	E						✓CH	
Hibiscus waimeae ssp. *hannerae* **(CH)**	Koki`o ke`oke`o	E						✓CH	
Huperzia mannii **(CH)**	Wawae`iole	E	✓*	✓				✓*	
Huperzia nutans **(CH)**	Wawae`iole	E					✓	✓*	
Ischaemum byrone **(CH)**	Hilo ischaemum	E	✓CH	✓CH		✓CH	✓	✓CH	
Isodendrion hosakae **(CH)**	Aupaka	E	✓CH						
Isodendrion laurifolium **(CH)**	Aupaka	E					✓CH	✓CH	
Isodendrion longifolium **(CH)**	Aupaka	T					✓CH	✓CH	

HAWAIIAN ISLANDS PLANTS: Updated April 13, 2010

LISTED SPECIES, AS DESIGNATED UNDER THE U.S. ENDANGERED SPECIES ACT

Species status by island: E= endangered; **T**= threatened; **P**= formally proposed as E or T;
(CH)=critical habitat designated; pCH=critical habitat proposed ;*=possibly extirpated in the wild.
‡=N.W. Hawaiian Islands: Frigate; Kure; Laysan; Midway; Necker; Nihoa; PH = Pearl & Hermes.

		STATUS	DISTRIBUTION						
			Hawai'i	Maui	Lāna'i	Moloka'i	O'ahu	Kaua'i	N.W. Islands‡, Kaho'olawe, and Ni'ihau
Isodendrion pyrifolium **(CH)**	Wahine noho kula	E	✓	✓*CH	✓*	✓*CH	✓*CH		Niihau*
Kanaloa kahoolawensis **(CH)**	Kohe malama malama o Kanaloa	E							K CH
Keysseria erici **(CH)**	No common name	E						✓CH	
Keysseria helenae **(CH)**	No common name	E						✓CH	
Kokia cookei	Koki`o	E				✓*			
Kokia drynarioides **(CH)**	Hau hele `ula; koki`o	E	✓CH						
Kokia kauaiensis **(CH)**	Koki`o	E						✓CH	
Labordia cyrtandrae **(CH)**	Kamakahala	E					✓CH		
Labordia helleri **(CH)**	Kamakahala	E						✓CH	
Labordia lydgatei **(CH)**	Kamakahala	E						✓CH	
Labordia pumila **(CH)**	Kamakahala	E						✓CH	
Labordia tinifolia var. *lanaiensis*	Kamakahala	E			✓				
Labordia tinifolia var. *wahiawaensis* **(CH)**	Kamakahala	E						✓CH	
Labordia triflora **(CH)**	Kamakahala	E				✓CH			
Lepidium arbuscula **(CH)**	`Anaunau	E					✓CH		
Lipochaeta lobata var. *leptophylla* **(CH)**	Nehe	E					✓CH		
Lobelia gaudichaudii ssp. *koolauensis* **(CH)**	No common name	E					✓CH		
Lobelia monostachya **(CH)**	No common name	E					✓CH		
Lobelia niihauensis **(CH)**	No common name	E					✓CH	✓CH	Niihau*
Lobelia oahuensis **(CH)**	No common name	E					✓CH		
Lysimachia daphnoides **(CH)**	Lehua makanoe	E						✓CH	
Lysimachia filifolia **(CH)**	No common name	E					✓CH	✓CH	
Lysimachia iniki **(CH)**	No common name	E						✓CH	
Lysimachia lydgatei **(CH)**	No common name	E		✓CH					
Lysimachia maxima **(CH)**	No common name	E				✓CH			
Lysimachia pendens **(CH)**	No common name	E						✓CH	
Lysimachia scopulensis **(CH)**	No common name	E						✓CH	
Lysimachia venosa **(CH)**	No common name	E						✓CH	
Marsilea villosa **(CH)**	`Ihi`ihi	E				✓	✓CH		Niihau
Melanthera fauriei **(CH)** (listed as *Lipochaeta fauriei*)	Nehe	E						✓CH	
Melanthera kamolensis **(CH) (**listed as ***Lipochaeta kamolensis*)**	Nehe	E		✓CH					
Melanthera micrantha ssp. *exigua* **(CH)** (listed as *Lipochaeta micrantha*)	Nehe	E						✓CH	
Melanthera micrantha ssp. *micrantha* **(CH)** (listed as *Lipochaeta micrantha*)	Nehe	E						✓CH	
Melanthera tenuifolia **(CH)** (listed as *Lipochaeta tenuifolia*)	Nehe	E					✓CH		
Melanthera venosa (listed as *Lipochaeta venosa*)	Nehe	E	✓						

HAWAIIAN ISLANDS PLANTS: Updated April 13, 2010

LISTED SPECIES, AS DESIGNATED UNDER THE U.S. ENDANGERED SPECIES ACT

Species status by island: E= endangered; **T**= threatened; **P**= formally proposed as E or T;
(CH)=critical habitat designated; pCH=critical habitat proposed ;*=possibly extirpated in the wild.
‡=N.W. Hawaiian Islands: Frigate; Kure; Laysan; Midway; Necker; Nihoa; PH = Pearl & Hermes.

		STATUS	DISTRIBUTION						
			Hawai'i	Maui	Lāna'i	Moloka'i	O'ahu	Kaua'i	N.W. Islands‡, Kaho'olawe, and Ni'ihau
Melanthera waimeaensis **(CH)** (listed as *Lipochaeta waimeaensis*)	Nehe	E					✓CH		
Melicope adscendens **(CH)**	Alani	E		✓CH					
Melicope balloui **(CH)**	Alani	E		✓CH					
Melicope degeneri **(CH)**	Alani	E						✓CH	
Melicope haupuensis **(CH)**	Alani	E						✓CH	
Melicope knudsenii **(CH)**	Alani	E		✓CH				✓CH	
Melicope lydgatei **(CH)**	Alani	E					✓CH		
Melicope mucronulata **(CH)**	Alani	E		✓*CH		✓CH			
Melicope munroi	Alani	E			✓	✓			
Melicope ovalis **(CH)**	Alani	E		✓CH					
Melicope pallida **(CH)**	Alani	E					✓*CH	✓CH	
Melicope paniculata **(CH)**	Alani	E						✓CH	
Melicope puberula **CH)**	Alani	E						✓CH	
Melicope quadrangularis	Alani	E						✓*	
Melicope reflexa **(CH)**	Alani	E				✓CH			
Melicope saint-johnii **(CH)**	Alani	E					✓CH		
Melicope zahlbruckneri **(CH)**	Alani	E	✓CH						
Munroidendron racemosum **(CH)**	No common name	E						✓CH	
Myrsine juddii **(CH)**	Kolea	E					✓CH		
Myrsine knudsenii **(CH)**	Kolea	E						✓CH	
Myrsine linearifolia **(CH)**	Kolea	T						✓CH	
Myrsine mezii **(CH)**	Kolea	E						✓CH	
Neraudia angulata var. *angulata* **(CH)**	No common name	E					✓CH		
Neraudia angulata var. *dentata* **(CH)**	No common name	E					✓CH		
Neraudia ovata **(CH)**	No common name	E	✓CH						
Neraudia sericea **(CH)**	No common name	E		✓CH	✓	✓CH			K*
Nothocestrum breviflorum **(CH)**	`Aiea	E	✓CH						
Nothocestrum peltatum **(CH)**	`Aiea	E						✓CH	
Nototrichium humile **(CH)**	Kulu`ī	E		✓*CH			✓CH		
Ochrosia kilaueaensis	Holei	E	✓*						
Panicum fauriei var. *carteri* **(CH)**	Carter's panic grass	E		✓	✓	✓	✓CH		
Panicum niihauense **(CH)**	Lau`ehu	E						✓CH	Niihau*
Peucedanum sandwicense **(CH)**	Makou	T		✓CH		✓CH	✓CH	✓CH	
Phyllostegia glabra var. *lanaiensis*	Ulihi	E			✓*				
Phyllostegia haliakalae (listed as *Phyllostegia mollis*) **(CH)**	No common name	E		✓CH		✓*	✓*CH		

HAWAIIAN ISLANDS PLANTS: Updated April 13, 2010
LISTED SPECIES, AS DESIGNATED UNDER THE U.S. ENDANGERED SPECIES ACT

Species status by island: E= endangered; **T**= threatened; **P**= formally proposed as E or T;
(CH)=critical habitat designated; pCH=critical habitat proposed ;*=possibly extirpated in the wild.
‡=N.W. Hawaiian Islands: Frigate; Kure; Laysan; Midway; Necker; Nihoa; PH = Pearl & Hermes.

		STATUS	DISTRIBUTION						
			Hawai'i	Maui	Lāna'i	Moloka'i	O'ahu	Kaua'i	N.W. Islands‡, Kaho'olawe, and Ni'ihau
Phyllostegia hirsuta **(CH)**	No common name	E					✓CH		
Phyllostegia hispida	No common name	E				✓			
Phyllostegia kaalaensis **(CH)**	No common name	E					✓CH		
Phyllostegia knudsenii **(CH)**	No common name	E						✓CH	
Phyllostegia mannii **(CH)**	No common name	E		✓*CH		✓CH			
Phyllostegia mollis	No common name	E					✓CH		
Phyllostegia parviflora var. *glabriuscula*	No common name	E	✓						
Phylostegia parviflora var. *lydgatei* **(CH)**	No common name	E					✓CH		
Phyllostegia parviflora var. *parviflora* **(CH)**	No common name	E		✓*			✓CH		
Phyllostegia pilosa (listed as *Phyllostegia mollis*)	No common name	E		✓CH		✓*CH			
Phyllostegia racemosa **(CH)**	Kiponapona	E	✓CH						
Phyllostegia renovans **(CH)**	No common name	E						✓CH	
Phyllostegia velutina **(CH)**	No common name	E	✓CH						
Phyllostegia waimeae **(CH)**	No common name	E						✓CH	
Phyllostegia warshaueri **(CH)**	No common name	E	✓CH						
Phyllostegia wawrana **(CH)**	No common name	E						✓CH	
Pittosporum napaliense **(CH)**	Hoawa	E						✓CH	
Plantago hawaiensis **(CH)**	Laukahi kuahiwi	E	✓CH						
Plantago princeps var. *anomala* **(CH)**	Laukahi kuahiwi	E						✓CH	
Plantago princeps var. *laxiflora* **(CH)**	Laukahi kuahiwi	E	✓*	✓CH		✓CH			
Plantago princeps var. longibracteata **(CH)**	Laukahi kuahiwi	E					✓CH	✓CH	
Plantago princeps var. princeps **(CH)**	Laukahi kuahiwi	E					✓CH		
Platanthera holochila **(CH)**	No common name	E		✓*CH		✓	✓*CH	✓CH	
Platydesma rostrata **(CH)**	Pilo kea lau lii	E						✓CH	
Pleomele hawaiiensis **(CH)**	Hala pepe	E	✓CH						
Poa mannii **(CH)**	No common name	E						✓CH	
Poa sandvicensis **(CH)**	No common name	E						✓CH	
Poa siphonoglossa **(CH)**	No common name	E						✓CH	
Portulaca sclerocarpa **(CH)**	Po`e	E	✓CH		✓CH				
Pritchardia affinis	Loulu	E	✓						
Pritchardia aylmer-robinsonii	Wahane	E							Niihau
Pritchardia hardyi	Loulu	E						✓CH	
Pritchardia kaalae	Loulu	E					✓		
Pritchardia munroi	Loulu	E				✓			
Pritchardia napaliensis	Loulu	E						✓	

HAWAIIAN ISLANDS PLANTS: Updated April 13, 2010
LISTED SPECIES, AS DESIGNATED UNDER THE U.S. ENDANGERED SPECIES ACT

Species status by island: E= endangered; **T**= threatened; **P**= formally proposed as E or T;
(CH)=critical habitat designated; pCH=critical habitat proposed ;*=possibly extirpated in the wild.
‡=N.W. Hawaiian Islands: Frigate; Kure; Laysan; Midway; Necker; Nihoa; PH = Pearl & Hermes.

		STATUS	DISTRIBUTION						
			Hawai'i	Maui	Lāna'i	Moloka'i	O'ahu	Kaua'i	N.W. Islands‡, Kaho'olawe, and Ni'ihau
Pritchardia remota **(CH)**	Loulu	E							Nihoa CH
Pritchardia schattaueri	Loulu	E	✓						
Pritchardia viscosa	Loulu	E						✓	
Psychotria grandiflora **(CH)**	Kopiko	E						✓CH	
Psychotria hobdyi **(CH)**	Kopiko	E						✓CH	
Pteralyxia kauaiensis **(CH)**	Kaulu	E						✓CH	
Pteris lidgatei **(CH)**	No common name	E		✓CH		✓*CH	✓CH		
Remya kauaiensis **(CH)**	No common name	E						✓CH	
Remya mauiensis **(CH)**	No common name	E		✓CH					
Remya montgomeryi **(CH)**	No common name	E						✓CH	
Sanicula mariversa **(CH)**	No common name	E					✓CH		
Sanicula purpurea **(CH)**	No common name	E		✓CH			✓CH		
Santalum freycinetianum var. *lanaiense*	`Iliahi	E		✓	✓				
Scaevola coriacea	Dwarf naupaka	E	✓*	✓	✓*	✓	✓*	✓*	Niihau*
Schiedea adamantis	No common name	E					✓		
Schiedea apokremnos **(CH)**	No common name	E						✓CH	
Schiedea attenuata **(CH)**	No common name	E						✓CH	
Schiedea haleakalensis **(CH)**	No common name	E		✓CH					
Schiedea helleri **(CH)**	No common name	E						✓CH	
Schiedea hookeri **(CH)**	No common name	E		✓*			✓CH		
Schiedea kaalae **(CH)**	No common name	E					✓CH		
Schiedea kauaiensis **(CH)**	No common name	E						✓CH	
Schiedea kealiae **(CH)**	No common name	E					✓CH		
Schiedea laui	No common name	E				✓CH			
Schiedea lychnoides (listed as *Alsinidendron lychnoides*) **(CH)**	Kuawawaenohu	E						✓CH	
Schiedea lydgatei **(CH)**	No common name	E				✓CH			
Schiedea membranacea **(CH)**	No common name	E						✓CH	
Schiedea nuttallii **(CH)**	No common name	E		✓*		✓	✓CH		
Schiedea obovata (listed as *Alsinidendron obovatum*) **(CH)**	No common name	E					✓CH		
Schiedea perlmanni (listed as *Schiedea nuttallii*) **(CH)**	No common name	E						✓CH	
Schiedea sarmentosa **(CH)**	No common name	E				✓CH			
Schiedea spergulina var. *leiopoda* (listed as *Schiedea spergulina*) **(CH)**	No common name	E						✓CH	
Schiedea spergulina var. *spergulina* (listed as *Schiedea spergulina*) **(CH)**	No common name	T						✓CH	
Schiedea stellarioides **(CH)**	Laulihilihi	E						✓CH	
Schiedea trinervis (listed as *Alsinidendron trinerve*) **(CH)**	No common name	E					✓CH		

HAWAIIAN ISLANDS PLANTS: Updated April 13, 2010

LISTED SPECIES, AS DESIGNATED UNDER THE U.S. ENDANGERED SPECIES ACT

Species status by island: E= endangered; **T**= threatened; **P**= formally proposed as E or T;
(CH)=critical habitat designated; pCH=critical habitat proposed ;*=possibly extirpated in the wild.
‡=N.W. Hawaiian Islands: Frigate; Kure; Laysan; Midway; Necker; Nihoa; PH = Pearl & Hermes.

		STATUS	DISTRIBUTION						
			Hawai'i	Maui	Lāna'i	Moloka'i	O'ahu	Kaua'i	N.W. Islands‡, Kaho'olawe, and Ni'ihau
Schiedea verticillata **(CH)**	No common name	E							Nihoa CH
Schiedea viscosa (listed as *Alsinidendron viscosum*) **(CH)**	No common name	E						✓CH	
Sesbania tomentosa **(CH)**	`Ohai	E	✓CH	✓CH	✓	✓CH	✓CH	✓CH	K, Niihau*, Ne,
Sicyos alba **(CH)**	`Anunu	E	✓CH						
Silene alexandri **(CH)**	No common name	E				✓CH			
Silene hawaiiensis **(CH)**	No common name	T	✓CH						
Silene lanceolata **(CH)**	No common name	E	✓CH		✓*	✓CH	✓CH	✓*	
Silene perlmanii **(CH)**	No common name	E					✓*CH		
Solanum incompletum **(CH)**	Popolo ku mai	E	✓CH	✓*	✓*	✓*		✓*	
Solanum sandwicense **(CH)**	Popolo `aiakeakua	E					✓*CH	✓CH	
Spermolepis hawaiiensis **(CH)**	No common name	E	✓CH	✓CH	✓	✓*CH	✓CH	✓CH	
Stenogyne angustifolia (listed as *Stenogyne angustifolia var. angustifolia*)	No common name	E	✓	✓*		✓*			
Stenogyne bifida **(CH)**	No common name	E				✓*CH			
Stenogyne campanulata **(CH)**	No common name	E						✓CH	
Stenogyne kanehoana **(CH)**	No common name	E					✓CH		
Stenogyne kealiae **(CH)**	No common name	E						✓CH	
Tetramolopium arenarium ssp. *arenarium* (listed as *Tetramolopium arenarium*)	No common name	E	✓	✓*					
Tetramolopium arenarium ssp. *laxum* (listed as *Tetramolopium arenarium*)	No common name	E		✓*					
Tetramolopium arenarium var. *arenarium* (listed as *Tetramolopium arenarium*)	No common name	E	✓	✓*					
Tetramolopium arenarium var. *confertum (listed as Tetramolopium arenarium)*	No common name	E	✓						
Tetramolopium capillare **(CH)**	No common name	E		✓*CH					
Tetramolopium filiforme var. *filiforme* (listed as *Tetramolopium filiforme*) **(CH)**	No common name	E					✓CH		
Tetramolopium filiforme var. *polyphyllum* (listed as *T. filiforme*) **(CH)**	No common name	E					✓CH		
Tetramolopium lepidotum ssp. *lepidotum* **(CH)**	No common name	E			✓*		✓CH		
Tetramolopium remyi **(CH)**	No common name	E		✓*CH	✓CH				
Tetramolopium rockii var. *calcisabulorum* (listed as *Tetramolopium rockii*) **(CH)**	No common name	T				✓CH			
Tetramolopium rockii var. *rockii* (listed as *Tetramolopium rockii*) **(CH)**	No common name	T				✓CH			
Tetraplasandra bisattenuata **(CH)**	No common name	E						✓CH	
Tetraplasandra flynnii **(CH)**	No common name	E						✓CH	
Tetraplasandra gymnocarpa **(CH)**	`Ohe`ohe	E					✓CH		
Trematolobelia singularis **(CH)**	No common name	E					✓CH		
Urera kaalae **(CH)**	Opuhe	E					✓CH		
Vicia menziesii	Hawaiian vetch	E	✓						
Vigna o-wahuensis **(CH)**	No common name	E	✓CH	✓CH	✓	✓	✓*CH		K, Niihau*
Viola chamissoniana ssp. *chamissoniana* **(CH)**	`olopu; pamakani	E					✓CH		

HAWAIIAN ISLANDS PLANTS: Updated April 13, 2010

LISTED SPECIES, AS DESIGNATED UNDER THE U.S. ENDANGERED SPECIES ACT

Species status by island: E= endangered; **T**= threatened; **P**= formally proposed as E or T;
(CH)=critical habitat designated; pCH=critical habitat proposed ;*=possibly extirpated in the wild.
‡=N.W. Hawaiian Islands: Frigate; Kure; Laysan; Midway; Necker; Nihoa; PH = Pearl & Hermes.

		STATUS	DISTRIBUTION						
			Hawai'i	Maui	Lāna'i	Moloka'i	O'ahu	Kaua'i	N.W. Islands‡, Kaho'olawe, and Ni'ihau
Viola helenae **(CH)**	No common name	E						✓CH	
Viola kauaensis var. *wahiawaensis* **(CH)**	Nani wai`ale`ale	E						✓CH	
Viola lanaiensis	No common name	E			✓				
Viola oahuensis **(CH)**	No common name	E					✓CH		
Wilkesia hobdyi **(CH)**	Iliau	E						✓CH	
Xylosma crenatum **(CH)**	No common name	E						✓CH	
Zanthoxylum dipetalum var. *tomentosum* **(CH)**	A`e	E	✓CH						
Zanthoxylum hawaiiense **(CH)**	A`e	E	✓CH	✓CH	✓*	✓CH		✓CH	