



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street
San Francisco, CA 94105-3901

FEB 28 2011

Anthony J. Como,
DOE NEPA
Document Manager, Office of Electricity
Delivery and Energy Reliability (OE-20),
U.S. Department of Energy, 1000
Independence Avenue, SW.,
Washington, DC 20585

Allen G. Kam, Esq.,
AICP, HIREP EIS Manager, State of
Hawai'i, Department of Business,
Economic Development and Tourism,
Renewable Energy Branch, State Energy
Office, P.O. Box 2359,
Honolulu, HI 96804

Subject: Notice of Intent (NOI) to prepare a Programmatic Environmental Impact Statement (PEIS) for the Hawai'i Interisland Renewable Energy Program (HIREP) Wind Project in Maui and O'ahu Counties, Hawai'i.


Dear Mr. Como and Mr. Kam:

The Environmental Protection Agency (EPA) has reviewed the December 14, 2010 Notice of Intent (NOI) to prepare a Programmatic Environmental Impact Statement (PEIS) for the Hawai'i Interisland Renewable Energy Program (HIREP) Wind Project in Maui and O'ahu Counties, Hawai'i. Our comments are provided pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act.

EPA supports increasing the development of renewable energy resources and lessening Hawai'i's dependence on oil, as recommended in the National Energy Policy Act of 2005. Using renewable energy resources such as wind power can help the state meet its energy requirements while reducing greenhouse gas emissions. To assist in the scoping process for this project, we have identified several issues for your attention in the preparation of the Draft PEIS. We are most concerned about the following issues: impacts to water resources, terrestrial and marine biological resources, habitat, and cultural resources, as well as the cumulative impacts to these resources. We recommend analysis of additional alternatives as early as possible in the environmental review process to identify and achieve solutions that minimize adverse environmental impacts, protect ecosystems and human health, and meet energy demand.

We appreciate the opportunity to review this NOI and are available to discuss our comments. Please send two hard copies of the Draft PEIS and two CD ROM copies to this office at the same time it is officially filed with our Washington D.C. Office. If you have any questions, please contact me at (415) 972-3545 or mcpherson.ann@epa.gov, or Scott Sysum at (415) 972-3742 or sysum.scott@epa.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Ann McPherson". The signature is fluid and cursive, with the first name "Ann" being particularly prominent.

Ann McPherson
Environmental Review Office
Communities and Ecosystems Division

Enclosures: EPA's Detailed Comments

US EPA DETAILED COMMENTS ON THE NOTICE OF INTENT TO PREPARE A PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT (PEIS) FOR THE HAWAI'I INTERISLAND RENEWABLE ENERGY PROGRAM (HIREP) WIND PROJECT IN MAUI AND O'AHU COUNTIES, HAWAI'I, FEBRUARY 28, 2011

Project Description

The Hawai'i Interisland Renewable Energy Program (HIREP) Wind Programmatic Environmental Impact Statement (HIREP Wind PEIS) will evaluate the environmental impacts associated with a proposed wind energy generation, transmission, and delivery program. The HIREP program would produce renewable energy through the use of wind turbine technology on one or more Hawaiian Islands and transfer the electricity generated to another island or islands by means of one or more undersea cables for subsequent transmission and distribution to energy consumers. Implementation of the proposed wind energy program would be a cooperative effort of the U.S. Department of Energy (DOE) and the State of Hawai'i, represented by the Department of Business, Economic Development and Tourism (DBEDT), to advance the objectives of the Hawai'i Clean Energy Initiative (HCEI), a partnership between the State of Hawai'i and DOE.

The HIREP project will consist of 400 megawatt (MW) of wind farms located on one or more islands in Maui County (Lāna'i and/or Moloka'i), converter/inverter stations, one or more High Voltage Direct Current (HVDC) undersea cables (70 - 200 miles in length) linking the Maui County Islands with O'ahu, and utility infrastructure upgrades on the island of O'ahu to receive and integrate the wind energy into the electric grid.

The proposed action will include approximately 100 – 200 wind turbine generators (WTG), an electrical collection system, an electrical substation, converter/inverter stations, access roads, operation and maintenance (O&M) building(s), temporary construction lay down areas, temporary concrete batch plant, harbor improvements (dredging, new piers, new/improved roads, etc), submarine cable landing sites, laying and burying one or more submarine cables on the seafloor, submarine cable laying ships and unspecified upgrades to the utility infrastructure on O'ahu.

It is estimated that approximately 1-2 acres would be needed during construction of the wind farm for each WTG with a final pad and equipment of 1/2 acre for each WTG. The proposed wind farms of up to 400 MW would require approximately 15,000 acres to allow for terrain, turbine spacing, access, etc. The WTGs are expected to range from 2-4 MW each in power, with the smaller WTGs requiring less acreage. All of the land area requirements would be subject to modification and finalization depending on regulatory and permitting requirements, the outcome of the project specific environmental impact analysis, and the final design of the facilities. The individual wind farm project life is expected to be at 20 - 25 years. The undersea power cable lifetime is expected to be 30 - 40 years

Statement of Purpose and Need

The Draft Programmatic Environmental Impact Statement (DPEIS) should clearly identify the underlying purpose and need to which DOE is responding in proposing the alternatives (40 CFR 1502.13). The *purpose* of the proposed action is typically the specific objectives of the activity, while the *need* for the proposed action may be to eliminate a broader underlying problem or take advantage of an opportunity.

Recommendation:

The purpose and need should be a clear, objective statement of the rationale for the proposed project. The DPEIS should discuss the proposed project in the context of the larger energy market that this project would serve; identify potential purchasers of the power produced; and discuss how the project will assist the state in meeting its renewable energy portfolio standards and goals.

Alternatives Analysis

The National Environmental Policy Act (NEPA) requires evaluation of reasonable alternatives, including those that may not be within the jurisdiction of the lead agency (40 CFR Section 1502.14(c)). A robust range of alternatives will include options for avoiding significant environmental impacts. The DPEIS should provide a clear discussion of the reasons for the elimination of alternatives which are not evaluated in detail. Reasonable alternatives should include, but are not necessarily limited to, alternative sites, capacities, and technologies as well as alternatives that identify environmentally sensitive areas or areas with potential use conflicts. The alternatives analysis should describe the approach used to identify environmentally sensitive areas and describe the process that was used to designate them in terms of sensitivity (low, medium, and high).

The environmental impacts of the proposal and alternatives should be presented in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decision maker and the public (40 CFR 1502.14). The potential environmental impacts of each alternative should be quantified to the greatest extent possible (e.g., acres of wetlands impacted, tons per year of emissions produced, etc.).

Utility scale wind or solar energy facilities generate a large amount of electricity that is transmitted from one location to another via a transmission system. Smaller scale systems, known as distributed generation can also be utilized. The state has abundant local renewable resources, including sun, wind, geothermal, biomass, etc. Photovoltaic (PV) solar panel prices are expected to decline 10-15% in 2011 alone after a 50% decline in the last 2 years. Distributed Generation should also be considered as a possible alternative as it would provide diversification to the mix of renewable resources. Unlike other generation resources, these types of projects can get built quickly, near the load centers, and without the need for expensive new transmission lines. And since they are built on existing structures, these projects are extremely benign from an environmental standpoint, with very little land use, water, or air emission impacts.

Recommendations:

EPA recommends that the DPEIS identify and analyze a wider range of alternatives than just the two wind projects described and transmission cable, and no action alternative. Solar energy, especially distributed generation, geothermal, biomass, nuclear, and off-shore wind are all viable technologies that should be discussed in greater detail in the alternatives analysis.

The DPEIS should describe how each alternative was developed, how it addresses each project objective, and how it would be implemented. The alternatives analysis should include a discussion of locations, including on-site alternatives that demonstrate a reduction of environmental impacts. The DPEIS should describe the benefits associated with the proposed technology.

The DPEIS should clearly describe the rationale used to determine whether impacts of an alternative are significant or not. Thresholds of significance should be determined by considering the context and intensity of an action and its effects (40 CFR 1508.27).

EPA recommends that the DPEIS identify and analyze an environmentally preferable alternative. Options such as reducing the footprint of the proposed project within the project area or relocating sections/components of the project to other areas to reduce environmental impacts should be examined.

Water Resources

Harbor Expansion and Placement of Dredged or Fill Material in Waters of the United States

If it is determined that a Clean Water Act (CWA) Section 404 Individual Permit is required, we recommend that the DOE coordinate the National Environmental Policy Act (NEPA) and CWA Section 404 permitting processes to streamline the environmental review required for the project. This coordination will ensure that the thresholds of the CWA Section 404(b)(1) Guidelines are satisfied through this environmental review process. If an individual CWA Section 404 permit will be required for dredging or fill (e.g. pier or breakwater expansion) only the Least Environmentally Damaging Practicable Alternative (LEDPA) can be permitted pursuant to the 404 (b)(1) Guidelines (40 CFR Part 230). The DPEIS should also provide enough information to demonstrate that adverse impacts to resources will be avoided and minimized to the greatest extent feasible and that any unavoidable adverse impacts from the harbor project's construction and operation are adequately mitigated.

Materials proposed for disposal in waters of the United States must satisfy the Factual Determinations of 40 CFR Part 230, specified at 40 CFR Part 230.11, using the Evaluation and Testing measures of Subpart G (40 CFR Parts 230.60 and 230.61), or demonstrating consistency with the testing exclusions of these sections. Testing guidance for assessing the quality of sediments to be discharged to waters of the United States is provided in a joint EPA/Army Corps

of Engineers' manual, Evaluation of Dredged Material Proposed for Discharge in Waters of the United States, the Inland Testing Manual (EPA-823-98). The DPEIS should recognize that dredged material proposed for disposal at federally approved disposal sites pursuant to the Marine Protection, Research, and Sanctuaries Act must be evaluated using criteria at 40 CFR Parts 220-228. Testing guidance for assessing sediment quality is found in a joint EPA/Army Corps of Engineers' Evaluation of Dredged Material Proposed for Ocean Disposal Testing Manual, the Green Book (EPA-503/8-91/001).

Recommendations:

The DPEIS should include an assessment of resources and special aquatic sites (coral reefs, wetlands, sea grass beds, mudflats) that will be directly and indirectly impacted by the Harbor alternatives. We recommend that DOE consult the National Marine Fisheries Service and U.S. Fish and Wildlife Service regarding appropriate assessment methods for coral reefs. We also recommend the use of Habitat Equivalency Analysis (HEA) for determining appropriate size of mitigation for any unavoidable impacts to coral reefs. Example HEA reports are available from Fish and Wildlife Service.

The DPEIS should identify the proposed plan for disposing of dredged material, such as unconfined aquatic disposal in inland or coastal waters, or at the Environmental Protection Agency (EPA) designated ocean dredged material disposal site. The DPEIS should also include procedures for the sediment evaluation regarding the suitability of the proposed dredged materials for disposal.

Wind Farm Clean Water Act Section 404

The project applicant should coordinate with the U.S. Army Corps of Engineers (Corps) to determine if the proposed project(s) requires a Section 404 permit under the Clean Water Act (CWA). Section 404 regulates the discharge of dredged or fill material into waters of the United States (WOUS), including wetlands and other *special aquatic sites*. The DPEIS should describe all WOUS that could be affected by the project alternatives, and include maps that clearly identify all waters within the project area. The discussion should include acreages and channel lengths, habitat types, values, and functions of these waters.

If a permit is required, EPA will review the project for compliance with *Federal Guidelines for Specification of Disposal Sites for Dredged or Fill Materials* (40 CFR 230), promulgated pursuant to Section 404(b)(1) of the CWA ("404(b)(1) Guidelines"). Pursuant to 40CFR 230, any permitted discharge into WOUS must be the least environmentally damaging practicable alternative (LEDPA) available to achieve the project purpose. The DPEIS should include an evaluation of the project alternatives in this context in order to demonstrate the project's compliance with the 404(b)(1) Guidelines. If, under the proposed project, dredged or fill material would be discharged into WOUS, the DPEIS should discuss alternatives to avoid those discharges.

The DPEIS should describe the original (natural) drainage patterns in the project locale, as well as the drainage patterns of the area during project operations, and identify whether any components of the proposed project are within a 50 or 100-year floodplain. We also recommend the DPEIS include information on the functions and locations of WOUS and their direct relationship to waters downstream.

Recommendations:

If a CWA Section 404 permit is needed, the DPEIS should demonstrate the method for the project's compliance with the CWA 404(b)(1) Guidelines.

The DPEIS should describe the geographic extent of any WOUS at the project site, as well as drainage patterns at the project location.

The DPEIS should discuss the steps taken to avoid and minimize impacts to WOUS. To the extent any aquatic features that could be affected by the project are determined not to constitute waters of the United States, EPA recommends that the DPEIS characterize the functions of such features and discuss potential mitigation.

Water Supplies

Public drinking water for the Hawaiian Islands is primarily from groundwater sources. Source water areas are delineated and mapped by the state for each federally-regulated public water system. The 1996 amendments to the Safe Drinking Water Act (SDWA) require federal agencies to protect sources of drinking water for communities. Therefore, EPA recommends that the EIS identify:

- a) source water protection areas within the project area;
- b) activities that could potentially affect source water areas;
- c) potential contaminants that may result from the proposed project; and
- d) measures that would be taken to protect the source water protection areas.

Large turbines require substantial foundations and associated structural and geotechnical engineering considerations. The substantial amount of concrete typically used in foundations for large wind turbines requires a large amount of cement, sand, aggregate, and water. A typical 1.5 MW WTG can require up to 6500 gallons of water for each turbine foundation mixture. In addition, large amounts of water are expected to be required for road maintenance and dust suppression.

Recommendations:

The DPEIS should describe the availability of a water supply for construction and operation of the proposed projects and fully evaluate the environmental impacts associated with using the selected water supply.

For the temporary concrete batch plant, the DPEIS should estimate the quantity of water required for the concrete mixture and describe likely source of this water and potential effects on other water users and natural resources in the project area.

Onshore Biological Resources, Habitat and Wildlife

During construction of the proposed wind farms, vegetation would be cleared and soils moved during the construction of roads, wind turbine foundations, substation, switchyard, converter/inverter station, submarine cable landing sites and other facilities. The DPEIS should describe the current quality and capacity of habitat and its use by wildlife in the proposed project area, especially bats and avian populations. The DPEIS should describe the critical habitat for the species; identify any impacts the proposed project will have on the species and their critical habitats; and how the proposed project will meet all requirements under the Endangered Species Act, including consultation with the U.S. Fish and Wildlife Service (FWS) and Hawaii Department of Land and Natural Resources (HDLNR).

Wind energy generation projects have the potential to disrupt important wildlife species habitat, resulting in mortality of migratory species such as birds and bats due to collisions with rotors. The DPEIS should consider whether migratory birds are likely to use the project area and avoid, if possible: 1) areas supporting a high density of wintering or migratory birds, 2) areas with high level of raptor or seabird activity, and 3) breeding, wintering or migrating populations of less abundant species which may be sensitive to increased mortality as a result of collision.

A comprehensive monitoring program should be recommended as a Best Management Practice (BMP) to evaluate impacts on bats and avian species. We suggest that the DPEIS recommend the use of the latest U.S. Fish and Wildlife Service Draft Land-Based Wind Energy Guidelines¹ when conducting pre-construction baseline surveys to evaluate the site for its importance to bats and avian species, as well as post-construction surveys to determine the extent of avian and bat fatalities and to determine the effectiveness of mitigation measures or need for research studies. The BMPs should promote the recovery of declining populations of species. Collision risk depends on a range of factors related to species, numbers and behavior, weather conditions, topography, and lighting. The DPEIS should identify and describe specific turbine types, turbine heights, and their operating characteristics and consider turbine design standards that minimize adverse impacts to wildlife, particularly birds and bats. Consideration should be given to reducing the perching and nesting opportunities, which may help reduce potential collisions.

The DPEIS should identify all petitioned and listed threatened and endangered species that might occur within the project area. The DPEIS should identify and quantify which species might be directly or indirectly affected by each alternative. All raptor and owl species are

¹ U.S Fish and Wildlife Service Draft Land-Based Wind Energy Guidelines; Recommendations on measures to avoid, minimize, and compensate for effects to fish, wildlife, and their habitats, February 2011

protected under the Migratory Bird Treaty Act (MBTA). The MBTA, however, has no provision for allowing unauthorized take.

Two avian species of concern are the Newell's shearwater (*Puffinus auricularis newelli*, 'a'o, threatened) and Hawaiian petrel (*Pterodroma sandwichensis*, ua'u, endangered). Newell's shearwaters and Hawaiian petrels are nocturnal over land. Both species nests principally on the mountains of Kaua'i, but small colonies exist on Moloka'i and Hawai'i, and possibly on O'ahu, Maui, Lāna'i, and Lehua. Adult birds leave the nesting sites and head toward the open ocean, often flying at night. During this nocturnal relocation, the birds may become blinded or disoriented by urban lights, resulting in collisions with power lines, light posts, buildings, and other structures.

Both species use traditional flight corridors for their movement to and from their nesting sites. One concern is that collision with power lines that cross these corridors or collision with WTGs in the corridors could kill both adults and fledglings. Young birds (fledglings) undergo night-time migrations from their mountain nests to the sea between the months of early October –early December. Every year several hundred fledglings are attracted to bright lights during their nocturnal migration to the sea. Upon flying closer to the attractive lights, they begin to circle around them repeatedly. Eventually they either land on the ground due to exhaustion or they collide with nearby wires, buildings, or other structures as they circle the lights. This behavior is known as fall-out. Concerns would include, but are not limited to, construction activities, lay down and staging areas, potential trenching to bury cables, and noise and light from construction activities especially if activities are conducted at night. Additionally reducing lights on cable laying or logistics ships during the seabirds' breeding season could be warranted.

Recommendations:

The DPEIS should include a BMP to design a comprehensive monitoring program to evaluate impacts on fish, wildlife (especially bats and avian species), and their habitats using the latest U.S. Fish and Wildlife Service Draft Land-Based Wind Energy Guidelines, and discuss design and management measures to minimize adverse impacts to wildlife and native and rare plants.

Commit to additional data collection/analysis to identify areas that are important to Hawaiian petrel and Newell's shearwaters (especially flight corridors) to ensure proper siting and avoid take of these species.

If alternatives cannot be developed that avoid the take of Hawaiian petrel and Newell's shearwaters, develop an operational monitoring and adaptive management plan to address this issue.

During construction and operation, if to be accomplished at night with artificial lighting, ensure that the lights are shielded to prevent upward radiation which has been shown to reduce seabird attraction if warranted to protect fledgling Newell's shearwaters and Hawaiian Petrels.

Coral Reef and Coastal Habitat Protection

Dredging of harbors and laying of the submarine cable associated with the proposed project may impact coral reefs. The purpose of Executive Order (EO) 13089 is to increase protection of U.S. coral reef ecosystems. EO 13089 requires that all Federal agencies whose actions may affect coral reef ecosystems in the United States shall: (a) identify their actions that may affect U.S. coral reef ecosystems; (b) utilize their programs and authorities to protect and enhance the conditions of such ecosystems; and (c) to the extent permitted by law, ensure that any actions they authorize, fund, or carry out will not degrade the conditions of such ecosystems. In addition, these Federal agencies shall, subject to the availability of appropriations, provide for the implementation of measures needed to research, monitor, manage, and restore affected ecosystems, including measures reducing impacts from pollution, sedimentation, and fishing.

The DPEIS should identify if the project is located within an area designated as essential fish habitat. Coordination with the National Oceanic and Atmospheric Administration should be conducted to identify avoidance or mitigation measures. Federal activities, permits and financial assistance must be consistent with the Hawaii Coastal Zone Management Act (HCZMA). The

Recommendation:

The DPEIS should address how construction of the proposed project elements will comply with EO 13089.

The DPEIS should identify how the proposed project elements will be consistent with the HCZMA and other coastal requirements.

Marine Mammals

All marine mammals are protected under the MMPA of 1972 as amended (16 U.S. Code [USC] 1431 et seq.), and some species are also protected by the Endangered Species Act (ESA) of 1973 (16 USC 1531). Marine mammals listed as threatened or endangered under the ESA are also automatically considered “depleted” under MMPA.

One species of concern is the endangered humpback whale (*Megaptera novaeangliae*), also considered depleted under the MMPA. This whale is present throughout Hawaiian waters during its winter breeding season from December through May. Humpback whales most often occur within the 985-ft depth contour of the Hawaiian Islands during winter months. The Hawaiian Islands Humpback Whale National Marine Sanctuary (HIHWNMS) comprises five marine protected areas distributed across the main Hawaiian Islands. It covers about 1,400 square miles. The largest contiguous portion of the sanctuary, about half the total sanctuary area, surrounds Maui, Lāna‘i and Moloka‘i.

Prior to 1955, several entanglements of large whales in submarine telecommunications cables were reported in the Pacific Ocean², but since the mid-1950s no whale entanglements have been documented, presumably due to advances in cable building and laying technology³.

Recommendation:

The PEIS should address how construction of the proposed project elements will comply with the requirements of MMPA and the HIIWNMS management plan.

The PEIS should include a BMP for the use of marine mammal and turtle observers on the cable laying ship to avoid potential impact with marine mammals and endangered sea turtles. Additionally a BMP could be to avoid cable laying during the humpback whale breeding season.

Undersea Power Cable

Marine power cables using Direct Current (DC) transmission are usually either monopolar, bipolar or three-phase systems. Sizes, materials, and types of modern power cables can be specifically adapted to its uses. The cable industry today offers various types of mass-impregnated (MI) cables and XLPE (cross linked polyethylene) cables, also self contained fluid filled (SCFF) or gas filled (SCGF) cables are available. Outer diameters are usually less than 8 inches. Weights vary between 10 to 80 lbs/ft.

Possible impacts of the submarine cables on the marine environment could include emission of noise, electromagnetic fields, heating due to energy losses, benthic community disturbance, and contamination due to corrosion of the cable materials. Additionally landing of the cables through the sea/shore interface can cause disturbance to coastal habitat, flora and fauna.

There are no clear indications that underwater noise caused by the installation or operation of submarine power cables poses a high risk of harming marine fauna. However, there are still significant gaps in knowledge both regarding the characteristics of sound emissions and sound perception by marine animals. Scheduling laying activities and/or performing aerial surveys for monitoring the presence of e.g. marine mammals with a subsequent suspension of activities are possible mitigation measures.

Published calculations of the temperature effects of operating cables are consistent in their predictions of significant temperature rise of the benthic sediment around the cables. There is evidence that various marine organisms react sensitively to an even minor increase of the ambient temperature but respective field studies on submarine cables under operation are almost completely lacking. To reduce temperature rise in the upper layer of the sea bottom to an

² Heezen, B.C. 1957. Whales Entangled in Deep Sea Cables. Deep-Sea Research 4: 105-115.

³ Wood, M.P., Carter, L.; Whale Entanglements With Submarine Telecommunication Cables, IEEE Journal of Oceanic Engineering, Volume: 33 Issue: 4, Feb 2009

acceptable level an appropriate burial depth should be applied. Electromagnetic fields are detected by a number of species and many of these species respond to them. Field studies on fish provided first evidence that operating cables change migration and behavior of marine animals. Emission of magnetic fields is best limited by field compensation to be achieved by an appropriate technical design (three-phase AC, bipolar DC transmission system). The directly generated electric fields can typically be controlled by shielding. A risk of contamination arising from activities causing seabed disturbance can be anticipated for heavily contaminated localities and avoidance of such areas would be an appropriate mitigation measure. Release of contaminants from the cable itself can occur if they are not removed after decommissioning, if they are damaged at any time during their lifetime or if fluid-filled cables are used. Known effects of exposure to contaminants on benthic organisms are e.g. impairment of body functions, reduction in growth and reproduction, mortality. However, there is no indication that contamination due to the use of subsea cables is of high significance.

Disturbance effects related to submarine cables are in general expected to be temporary and localized. The application of protective structures (artificial hard bottom) may lead to an introduction of non-local fauna especially in soft sediment areas. In environmentally sensitive areas physical disturbance, damage, displacement and removal of flora and fauna might turn out to be a significant impact. Avoidance of such areas would be an appropriate mitigation measure.

Recommendation:

The DPEIS should address the known impacts of submarine power cables and include appropriate mitigation measures. These could include Bipolar DC transmission, burial to an appropriate depth, avoidance of contaminated sediments, avoidance of hard bottom, etc.

The DPEIS should include a BMP for cable landing with the least environmental impact, such as Horizontal Directional Drilling. This BMP could include means to monitor drill fluids to ensure no leakage as well as spill contingency plans for drilling fluids.

Vessels engaged in installation should carry sorbent booms (floating barriers to contain and absorb oil on the surface of the water) and pads for cleanup use in the unlikely event of a fuel spill, and should adhere to Coast Guard (Clean Water Act, section 311) requirements regarding the containment, cleanup, and reporting of spills.

Invasive Species

Executive Order 13112, *Invasive Species* (February 3, 1999), mandates that federal agencies take actions to prevent the introduction of invasive species, provide for their control, and minimize the economic, ecological, and human health impacts that invasive species cause. Executive Order 13112 also calls for the restoration of native plants and tree species. If the

proposed project will entail new landscaping, the DPEIS should describe how the project will meet the requirements of Executive Order 13112.

Recommendation:

The DPEIS should include a BMP for the preparation of both terrestrial and aquatic invasive plant management plans for individual projects. The invasive plant management plan should be designed to monitor and control noxious weeds and contain selected management strategies and control options for invasive plant populations/infested areas, and uninfested areas: including prevention, early detection, control (eradication, suppression, containment), and restoration.

Indirect and Cumulative Impacts

The stated goal of the Hawai'i Clean Energy Initiative (HCEI) is to have 70 percent of Hawai'i's energy come from clean sources by 2030. The HIREP wind projects are estimated to supply approximately about 12 percent of the power on O'ahu. In order to meet the HCEI goal of 70 percent of Hawai'i's energy from clean sources, a number of other renewable energy projects will need to be built. The cumulative impacts analysis should provide the context for understanding the magnitude of the impacts of the alternatives by analyzing the impacts of other past, present, and reasonably foreseeable projects or actions and then considering those cumulative impacts in their entirety (CEQ's Forty Questions, #18). The DPEIS should clearly identify the resources that may be cumulatively impacted, the time over which impacts are going to occur, and the geographic area that will be impacted by the proposed project. The DPEIS should focus on resources of concern – those resources that are “at risk” and/or are significantly impacted by the proposed project, before mitigation. In the introduction to the *Cumulative Impacts Section*, identify which resources are analyzed, which ones are not, and why. For each resource analyzed, the DPEIS should:

- Identify the current condition of the resource as a measure of past impacts. For example, the percentage of species habitat lost to date.
- Identify the trend in the condition of the resource as a measure of present impacts. For example, the health of the resource is improving, declining, or in stasis.
- Identify all on-going, planned, and reasonably foreseeable projects in the study area that may contribute to cumulative impacts.
- Identify the future condition of the resource based on an analysis of impacts from reasonably foreseeable projects or actions added to existing conditions and current trends.
- Assess the cumulative impacts contribution of the proposed alternatives to the long-term health of the resource, and provide a specific measure for the projected impact from the proposed alternatives.
- Disclose the parties that would be responsible for avoiding, minimizing, and mitigating those adverse impacts.
- Identify opportunities to avoid and minimize impacts, including working with other entities.

As an indirect result of providing additional power, it can be anticipated that this project will allow for development and population growth to occur in those areas that receive the generated electricity.

Recommendations:

The DPEIS should describe the reasonably foreseeable future land use and associated impacts that will result from the additional power supply. The document should provide an estimate of the amount of growth, its likely location, and the biological and environmental resources at risk.

The DPEIS should consider the direct and indirect effects of the inter-connecting transmission line for the proposed project, as well as the cumulative effects associated with the transmission needs of other reasonably foreseeable projects.

Implementation of Adaptive Management Techniques for Mitigation Measures

Adaptive management is an iterative process that requires selecting and implementing management actions, monitoring, comparing results with management and project objectives, and using feedback to make future management decisions. The process recognizes the importance of continually improving management techniques through flexibility and adaptation instead of adhering rigidly to a standard set of management actions. Although adaptive management is not a new concept, it may be relatively new in its application to specific projects. The effectiveness of adaptive management monitoring depends on a variety of factors including:

- a) The ability to establish clear monitoring objectives;
- b) Agreement on the impact thresholds being monitored;
- c) The existence of a baseline or the ability to develop a baseline for the resources being monitored;
- d) The ability to see the effects within an appropriate time frame after the action is taken;
- e) The technical capabilities of the procedures and equipment used to identify and measure changes in the affected resources and the ability to analyze the changes;
- f) The resources needed to perform the monitoring and respond to the results.

Recommendation:

EPA recommends that DOE consider adopting a formal adaptive management plan to evaluate and monitor impacted resources and ensure the successful implementation of mitigation measures. EPA recommends that DOE review the specific discussion on Adaptive Management in the NEPA Task Force Report to the Council on Environmental Quality (CEQ) on *Modernizing NEPA*.

Climate Change

Scientific evidence supports the concern that continued increases in greenhouse gas emissions resulting from human activities will contribute to climate change. Global warming is caused by emissions of carbon dioxide and other heat-trapping gases. Global warming can affect weather patterns, sea level, ocean acidification, chemical reaction rates, and precipitation rates, resulting in climate change.

Recommendations:

The DPEIS should consider how climate change could potentially influence the proposed project, specifically within sensitive areas, and assess how the projected impacts could be exacerbated by climate change.

The DPEIS should consider the cumulative impacts associated with multiple alternative energy projects proposed for the Hawaiian Islands and clarify how existing and/or proposed resources will be affected by climate change.

The DPEIS should quantify and disclose the anticipated climate change *benefits* of wind energy and other alternative energy projects. We suggest quantifying greenhouse gas emissions from different types of generating facilities including solar, geothermal, natural gas, coal-burning, and nuclear and compiling and comparing these values.

Air Quality

The DPEIS should provide a detailed discussion of ambient air conditions (baseline or existing conditions), National Ambient Air Quality Standards (NAAQS), criteria pollutant nonattainment areas, and potential air quality impacts of the proposed project (including cumulative and indirect impacts). Such an evaluation is necessary to assure compliance with State and Federal air quality regulations, and to disclose the potential impacts from temporary or cumulative degradation of air quality.

The DPEIS should describe and estimate air emissions from the proposed facilities, including potential construction and maintenance activities, as well as proposed mitigation measures to minimize those emissions. EPA recommends an evaluation of the following measures to reduce emissions of criteria air pollutants and hazardous air pollutants (air toxics).

Recommendations:

- *Existing Conditions* – The DPEIS should provide a detailed discussion of ambient air conditions, NAAQS, and criteria pollutant nonattainment areas in all areas considered for wind development.
- *Quantify Emissions* – The DPEIS should estimate emissions of criteria pollutants from the proposed project and discuss the timeframe for release of these emissions

over the lifespan of the project. The DPEIS should describe and estimate emissions from potential construction activities, as well as proposed mitigation measures to minimize these emissions.

- *Specify Emission Sources* – The DPEIS should specify the emission sources by pollutant from mobile sources, stationary sources, and ground disturbance. This source specific information should be used to identify appropriate mitigation measures and areas in need of the greatest attention.
- *Equipment Emissions Mitigation Plan (EEMP)* – The DPEIS should identify the need for an EEMP. An EEMP will identify actions to reduce diesel particulate, carbon monoxide, hydrocarbons, and NO_x associated with construction activities. We recommend that the EEMP require that all construction-related engines:
 - are tuned to the engine manufacturer’s specification in accordance with an appropriate time frame;
 - do not idle for more than five minutes (unless, in the case of certain drilling engines, it is necessary for the operating scope);
 - are not tampered with in order to increase engine horsepower;
 - include particulate traps, oxidation catalysts and other suitable control devices on all construction equipment used at the project site;
 - use diesel fuel having a sulfur content of 15 parts per million or less, or other suitable alternative diesel fuel, unless such fuel cannot be reasonably procured in the market area; and
 - include control devices to reduce air emissions. The determination of which equipment is suitable for control devices should be made by an independent Licensed Mechanical Engineer. Equipment suitable for control devices may include drilling equipment, generators, compressors, graders, bulldozers, and dump trucks.
- *Fugitive Dust Control Plan* - The DPEIS should identify the need for *Fugitive Dust Control Plan*. We recommend that it include these general recommendations:
 - Stabilize open storage piles and by covering and/or applying water or chemical/organic dust palliative where appropriate. This applies to both inactive and active sites, during workdays, weekends, holidays, and windy conditions.
 - Install wind fencing and phase grading operations where appropriate, and operate water trucks for stabilization of surfaces under windy conditions; and
 - When hauling material and operating non-earthmoving equipment, prevent spillage and limit speeds to 15 miles per hour (mph). Limit speed of earth-moving equipment to 10 mph.

- The DPEIS should contain an analysis of emissions from on site concrete production, including estimated mitigated annual emissions.

Noise Impacts

The DPEIS should include an assessment of noise levels from the wind turbines. Decibel levels of the turbines should be evaluated as should the effects of noise levels on a variety of species, as well as effects on property values, residences, and recreational use.

Visual Impacts

Careful attention should be given to how a wind turbine array is set against the landscape. Steps should be taken to minimize the visual impacts and make the wind turbines less obtrusive.

Coordination with Native Hawaiian Organizations

National Historic Preservation Act

Consultation for tribal cultural resources is required under Section 106 of the National Historic Preservation Act (NHPA). Historic properties under the National Historic Preservation Act (NHPA) are properties that are included in the National Register of Historic Places (NRHP) or that meet the criteria for the National Register. Section 101(d)(6)(A) of the Act clarifies that properties of traditional religious and cultural significance to an Indian tribe or Native Hawaiian organization may be eligible for the National Register of Historic Places. Section 106 of the NHPA requires a federal agency, upon determining that activities under its control could affect historic properties, consult with the appropriate State Historic Preservation Officer (SHPO). Under NEPA, any impacts to Native Hawaiian, cultural or other treaty resources must be discussed and mitigated. Section 106 of the NHPA requires that Federal agencies consider the effects of their actions on cultural resources, following regulation in 36 CFR 800.

Recommendation:

The DPEIS should address the existence of Native Hawaiian historic and culturally significant sites in the project area. It should address Section 106 of the NHPA, and discuss how DOE will avoid adversely affecting the physical integrity of cultural significant sites, if they exist. The DPEIS should provide a summary of all coordination with Native Hawaiian Organizations and with the SHPO, including identification of NRHP eligible sites, and development of a Cultural Resource Management Plan.

Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994), directs federal agencies to identify and address disproportionately high and adverse human health or environmental effects on minority and low-income populations, allowing those populations a meaningful opportunity

to participate in the decision-making process. Given the size and scale of the wind projects and the underlying significance of the resources to Native Hawaiians, the Proposed Action would appear to constitute a cumulative and disproportionate impact to a minority population⁴.

Recommendation:

The DPEIS should include a robust and detailed analysis of impacts on the Native Hawaiians, a minority population. The DOE should conduct an Environmental Justice Screening Analysis to more clearly and thoroughly bring into focus the environmental justice impacts of the Proposed Action. (See Toolkit for Assessing Allegations of Environmental Injustice. USEPA Enforcement and Compliance Assurance, EPA 300-R-04-002, November 2004).

Hazardous Materials/Hazardous Waste/Solid Waste

The DPEIS should address potential direct, indirect and cumulative impacts of hazardous waste from construction and operation of the proposed projects. The document should identify projected hazardous waste types and volumes, and expected storage, disposal, and management plans. It should address the applicability of state and federal hazardous waste requirements. Appropriate mitigation should be evaluated, including measures to minimize the generation of hazardous waste (i.e., hazardous waste minimization). Alternate industrial processes using less toxic materials should be evaluated as mitigation. This potentially reduces the volume or toxicity of hazardous materials requiring management and disposal as hazardous waste.

Wind Turbine Production and Recycling

WTG production can address the full product life cycle, from raw material sourcing through end of life collection and reuse or recycling. Wind turbine companies can minimize their environmental impacts during raw material extraction and minimize the amount of rare materials used in the product. Collection and recycling can be facilitated through buy-back programs or collection and recycling guarantees. Some companies provide recycling programs that pay all packaging, transportation, and recycling costs.

Recommendation:

EPA recommends that the proponent strive to address the full product life cycle by sourcing wind turbine components from a company that: 1) minimizes environmental

⁴ “Disproportionately high and adverse environmental effects: When determining whether environmental effects are disproportionately high and adverse, agencies are to consider the following...factors to the extent practicable: (a) Whether there is or will be an impact on the natural or physical environment that significantly (as employed by NEPA) and adversely affects a minority population, low-income population, or Indian tribe. Such effects may include ecological, cultural, human health, economic, or social impacts on minority communities, low-income communities, or Indian tribes when those impacts are interrelated to impacts on natural or physical environment....” P. 26, Environmental Justice Guidance Under the National Environmental Policy Act, Council on Environmental Quality, 1997.

impacts during raw material extraction; 2) manufactures wind turbines in a zero waste facility; and 3) provides future disassembly for material recovery for reuse and recycling.

Project Repair, Repowering, Decommissioning and Site Restoration

On the average, the lifespan of a wind farm is 20-30 years. The life of the proposed wind projects should be taken into consideration regarding decommissioning and reclamation.

The undersea cable lifetime is expected to be 30 -40 years. The life of the cable should be considered regarding decommissioning.

Recommendation:

EPA recommends that the DPEIS identify bonding or financial assurance strategies for decommissioning and reclamation of the disturbed land for the wind farm(s).

EPA recommends that the DPEIS identify potential impacts and BMPs for minimizing impacts for repowering the wind farm(s).

EPA recommends the DPEIS identify methods and impacts of repair or decommissioning and possible retrieval of the undersea cable.

Coordination with Land Use Planning Activities

The DPEIS should discuss how the proposed action would support or conflict with the objectives of federal, state, Native Hawaiian or local land use plans, policies and controls in the project area. The term "land use plans" includes all types of formally adopted documents for land use planning, conservation, zoning and related regulatory requirements. Proposed plans not yet developed should also be addressed if they have been formally proposed by the appropriate government body in a written form (CEQ's Forty Questions, #23b).

