

3.5 ENERGY AND NATURAL RESOURCES

This section describes the potential impacts on the production, use and supply of energy and other natural resources resulting from the proposed Desert Claim Wind Power Project. The proposed project would require some use of energy and natural resources for construction and decommissioning. Negligible amounts of energy and natural resources would be necessary to operate the project, and most of that would be allocated to maintenance activities. The turbines themselves would require nearly no additional input of energy once they are constructed. The project would generate a substantial amount of electrical energy on a long-term basis.

3.5.1 Affected Environment

Existing energy sources in Kittitas County include natural gas for heating and cooking and electricity. Both Kittitas County Public Utility District (PUD) No. 1 and Puget Sound Energy supply electricity to retail customers in the county. Only PSE supplies natural gas. Petroleum-based fuels and other products are used to operate motor vehicles and construction equipment. These goods are not produced in Kittitas County but are available locally through a variety of wholesale and retail outlets.

The only existing electricity production facility in Kittitas County is the Wanapum Development, operated by the Grant County PUD No. 1. It consists of a dam and hydroelectric generating plant located on the Columbia River in Grant and Kittitas Counties approximately 3 miles downstream from Vantage. The Wanapum Development has been in full commercial operation since January 1965. The Wanapum Development generating plant has a rated capacity of 1,038 MW (Grant County PUD 2003). While relatively little electricity production takes place in Kittitas County, large amounts of electrical energy are transported through the county by a number of existing high-voltage transmission lines.

Current production of non-renewable natural resources in Kittitas County is primarily limited to sand, gravel and related materials mined from quarries distributed in many locations within the county. Construction activities in the local area account for most of the consumption of these resources. Metallic minerals historically supported mining in certain locations, and small-scale mineral production may continue. Some rocks and minerals found in the county are of interest to collectors.

Residential and agricultural water users in the project vicinity primarily obtain water supplies through private wells. The majority of water use in the project vicinity is for agriculture. The Kittitas Reclamation District (KRD), a local irrigation district, owns and operates the North Branch Canal, a gravity fed water supply system, which traverses the south portion of the project area. The canal supplies water for agricultural activities to areas south of the canal.

Renewable resources common in Kittitas County include wood fiber and wind. Much of the county is covered by forest land and the area has a long history of logging, timber management and wood production. Over 660,000 acres of land in Kittitas County have been designated as commercial forest land under the County's Comprehensive Plan. As discussed in **Chapter 2**, wind-energy resource maps indicate that relatively extensive areas of Kittitas County have average wind speeds that may be sufficient to support commercial production of wind energy. In general, these areas are distributed in certain locations around the margins of the Kittitas Valley.

Baseline conditions with respect to energy and natural resources for the Wild Horse and Springwood Ranch sites are similar to those described previously for the Desert Claim project area. The project area

for Alternative 1 is within the service area for the Kittitas County PUD. There are no irrigation canals or other public water supply facilities near the Wild Horse site; all water used for agricultural and residential use is obtained from private wells. Two main irrigation canals operated by the Kittitas Reclamation District (KRD) cross the northwestern portion of the Springwood Ranch, although most water users located nearby obtain their water from wells.

3.5.2 Environmental Impacts of the Proposed Action

Operation of the project would not require use of natural gas, other than as a possible source of heating for the project operations facility. Electricity needed for construction and operation of the project would likely be supplied by Kittitas County PUD, although small-scale portable diesel generators might be operated to supply electricity used in the construction process. Electrical power could be delivered to the site through the PUD transmission and distribution system (Kittitas County 1999).

Energy and natural resource impacts resulting from the modified project configuration evaluated in the Final EIS would be essentially the same as for the proposed action evaluated in the Draft EIS. Natural resource inputs required for project construction would be reduced slightly, compared to the proposed action described in the Draft EIS, because the modified project configuration includes use of wind turbines with somewhat smaller towers (213 feet in height at the rotor hub, compared to 262 feet for the turbine model addressed in the Draft EIS) and slightly shorter rotor blades (127 feet, versus 131 feet). Construction and operation impacts to energy and natural resources would remain insignificant with the modified project configuration.

3.5.2.1 Construction

The proposed wind generation facility would be constructed using materials that require energy for their production. Energy would be required to transport these materials to the project site and to operate the necessary construction equipment, such as cranes, trucks, and tools, to assemble the turbines, dig cable trenches and construct substations. Expected energy consumption during the construction phase of the proposed project would include diesel and gasoline fuel for mobile construction equipment and electricity for operation of power tools.

Energy consumption during the construction phase of the project would not require large volumes of fuel or electricity and would not significantly affect locally available energy resources. Petroleum-based fuels for construction equipment and temporary electricity would be purchased from local or remotely located commodity and material suppliers. The amount of diesel fuel, gasoline and electricity necessary for construction of the project would be small relative to the use of those resources in the County as a whole, and would represent a temporary use of such resources.

Other non-renewable natural resources used in the construction of the proposed project would include sand, gravel, steel and concrete. Gravel would be used as base and surface material in construction of the project access roads, and as an input to the concrete used for turbine and transformer pads. The sources for sand and gravel have not yet been identified, but it is anticipated that these materials would be acquired from permitted, local sources near the project area or in the community. The sand and gravel needed for the project would not represent a major new demand for material relative to the existing overall supply in the area. Steel used to construct the wind turbine towers would be purchased on the international market, fabricated in a non-local manufacturing plant and shipped to the project area.

It is likely that that the project would utilize local water resources for the construction phase of the project. The water would be used for project dust controls during construction and, in the event that an on-site concrete batch plant is utilized, some temporary water supply would be needed for concrete manufacture. The source of the temporary water for construction has not yet been determined. The amount of water required would be modest, and could be purchased from existing sources or obtained through development of an exempt well producing less than 5,000 gallons per day. The amount of water needed would not have an impact on water supply in the local area.

Construction contractors and crews would follow applicable conservation standards for fuel and water use and for waste disposal.

3.5.2.2 Operation and Maintenance

The proposed project would have a nameplate generating capacity of at least 180 MW of electricity for sale over the 30-year operating life of the project. Based on use of a 33-percent plant factor that is typically assumed for wind-energy facilities (i.e., actual wind conditions experienced are usually sufficient for energy production to average one-third of the nameplate capacity), average annual generation is expected to be approximately 60 MW. At that level, annual energy production would be approximately 525,000 megawatt-hours (MWh) per year. To achieve this output the project would consume very little additional electricity or resources. A small amount of electricity would be needed to operate the project's control and safety systems (including lights), and small amounts of petroleum products would be used in servicing the turbines and operating maintenance vehicles.

Power produced by the project would be delivered to the regional power grid and transmitted to load centers. The location(s) of those load centers would depend upon the terms of future power sales agreement(s) to be executed by Desert Claim Wind Power LLC. Possible purchasers of the project's output include public utilities and/or investor-owned utilities in the Northwest, the Bonneville Power Administration (the federal power-marketing agency serving the Northwest), and/or private-sector power-marketing entities. It is not possible to predict at this time where the output would be delivered, or how much of the electricity might be used in the local area. It is conceivable that none of the project's output would be consumed at the retail level in Kittitas County if the power output from the project were purchased by a utility that does not serve the local area. Alternatively, if one or all of the electric utilities serving Kittitas County (PSE, City of Ellensburg and the Kittitas County PUD) purchased electricity from the project, energy from the Desert Claim project would likely be blended with the respective utility's existing electric supplies and therefore would serve the local market. Therefore, it is likely the proposed project would have little or no impact on the supply and price of electricity available to local consumers.

Project operations and maintenance vehicles would need a small supply of diesel fuel and gasoline (for patrolling the site and servicing the turbines) once the project is operational. These resource demands would have no impact on the local supply or price of fuel.

During operation of the proposed project the primary renewable resource utilized to generate electricity would be wind. Project operation would use minor amounts of non-renewable resources. The project would also use efficient lighting in all of its facilities. The amount of electricity produced by the project would be far greater than the amount of energy needed to operate and maintain it, representing a large net gain in the production of electricity.

If an operations or maintenance facility is located within the project area, a new groundwater well withdrawing no more than 5,000 gallons per day might be installed to provide water supply for employees at that facility.

3.5.2.3 Decommissioning

Energy and resource utilization during decommissioning would be similar to utilization for construction. Likely resources would be fuel for construction equipment and transportation. The amount and type of fuel that would be necessary after the 30-year life of the project is not known. Water, or some other suppressor, would be required to suppress airborne dust.

Unlike the construction phase, decommissioning would not require any additional sand, gravel, or concrete. It would require additional waste disposal. Additionally, decommissioning might require soil to fill pits and trenches where the concrete bases and utility cables were removed. Soil might also be necessary for reclamation efforts on disturbed land.

The footprint of the project is small relative to the size of the project area. Decommissioning would not require great amounts of any resource, and would not have a measurable impact on energy or natural resource price or supply.

3.5.3 Impacts of the Alternatives

3.5.3.1 Alternative 1: Wild Horse Site

Impacts on energy and natural resources from construction of Alternative 1 would likely be essentially the same as those described for the proposed action in **Section 3.5.2.1**. Development of a 180-MW wind energy project at the Wild Horse site would involve the same construction activities and procedures over the same duration of time and virtually the same area as for the proposed action. Therefore, construction impacts with respect to energy consumption, use of non-renewable resources, and conservation and renewable resources would likely be indistinguishable from those of the proposed action, and would also be low. The same condition would apply to energy and natural resource impacts from decommissioning.

Operation and maintenance aspects of Alternative 1 would likely be essentially the same as those discussed in **Section 3.5.2.2** for the proposed action. Based on the respective project capacity and output characteristics presented in **Chapter 2**, average annual generation for Alternative 1 would not be expected to differ from the proposed action. Marketing and delivery of power from a wind energy project at the Wild Horse site would be as described previously.

3.5.3.2 Alternative 2: Springwood Ranch Site

Impacts on energy and natural resources from construction and operation of Alternative 2 would generally be of the same type as those described for the proposed action and Alternative 1, but they would be of lesser magnitude. Alternative 2 would involve development of approximately 40 to 45 turbines, compared to 120 turbines for the proposed action or Alternative 1. Consequently, the requirements for energy and natural resources during construction would be less than 40 percent of the corresponding requirements for a 120-turbine project. Natural resource consumption during operation would be minimal for Alternative 2. The maximum generation level for this alternative would be approximately 65 MW, and, applying the 33 percent capacity factor, the average annual generation would be in the vicinity of 22 MW.

3.5.3.3 No Action Alternative

Under the no-action alternative the Desert Claim Wind Power Project would not be developed and no energy would be consumed or generated by the project. No natural resources would be consumed or conserved in the construction or operation of the project. The consumption of electric power in the project area would likely increase if the area were further developed with single-family homes and/or if additional agricultural land were irrigated, although such an increase would not be significant on a countywide or regional basis.

The broader energy impacts of the no action alternative (beyond prospective changes in and near the Desert Claim project area) would depend on how and where alternative electricity supplies were developed. Development of alternative energy sources under this scenario might involve alternative wind energy proposals or it could entail new electricity supplies using different generation technology, such as natural gas-fired combustion turbines. A new wind energy facility comparable in size to the proposal but located elsewhere would have similar energy and natural resource impacts as described for the proposed action. Such a project would be responsive to regional energy demands in general, and to the recent requests for proposals issued in the Northwest by utilities, including PSE, Avista and PacifiCorp, for renewable energy production.

Similarly, combustion-turbine projects have been proposed for many locations in the Northwest in recent years. Regardless of location, such a power plant would require natural resource inputs for construction and would burn substantial volumes of fossil fuel in operation. As noted in **Section 2.3.3**, the no action alternative for the Desert Claim project does not include or preclude any specific action with respect to other energy generation projects that have recently been proposed or might be proposed in the future.

3.5.4 Cumulative Impacts

Cumulative impacts for all elements of the environment are addressed in **Chapter 4**.

3.5.5 Mitigation Measures

No significant adverse impacts to energy and natural resources would occur and no necessary mitigation measures have been identified.

3.5.6 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts to energy or natural resources would occur from the construction, operation or decommissioning of the project.