

Hoopa Valley Tribe

Strategic Energy Plan

To combine historical values with modern technology by striving towards renewable energy and new infrastructure development that benefits the people, our lands, and our traditional cultures.

NOTICE

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Comment [SE1]: Insert the names and titles of the individuals that will comprise the energy leadership team

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Bureau of Indian Affairs
College of the Redwoods
Frontier Communications
Hoopa Airport
Hoopa Economic Development Agency
Hoopa Fire Department
Hoopa Forest Industries
Hoopa Mini-Mart Gas Station
Hoopa Modular Building Enterprise
Hoopa Valley Aggregates and Ready Mix Enterprises
Hoopa Valley Elementary
Hoopa Valley High School
Hoopa Valley Indian Housing Authority
Hoopa Valley Public Utilities District
Indian Health Service
Jack Jarnaghan Rodeo Grounds
KIDE FM
Lucky Bear Casino
McKeever Energy and Electric
Pacific Gas and Electric
Park Pumphouse
Redwood Coast Energy Authority
Redwood Community Action Agency
Southern California Telephone Company
Tribal Administration Buildings
Tsewenaldin Inn Motel
U.S. Department of Agriculture
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Comment [SE2]: Review for accuracy

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Comment [SE3]: Updated TOC

Background

The Hoopa Valley Reservation is located on 144 square miles in northern California. The reservation was established by treaty with the United States government in 1864. The reservation is located just south of the connection of the Klamath and Trinity Rivers in northeastern Humboldt County and abuts on three of its sides to the Six Rivers National Forest.

The tribe is governed by a tribal council that consists of seven elected council people and one elected chairperson. Of the seven council people, one is elected by the council to represent them as the vice-chairperson. The seven elected council people are representatives of the seven districts that correspond to traditional village sites within the Hoopa Valley. Government departments are categorized as administration, emergency services, natural resources, or other tribal entities.

Technical Potential

A technical potential analysis estimates the resources that can be used for large, commercial-scale renewable energy generation based on commercially available technologies, developable land, and system performance. It may not reflect the developable potential because it does not incorporate technology costs, competing land uses, transmission and infrastructure availability, or the policy, investor, or energy competitiveness environments. Lastly, as technical potential considers commercial-scale projects only, a site-specific assessment for distributed applications, such as residential solar photovoltaics (PV) and micro wind, is needed to adequately evaluate the potential for small-scale renewable energy development on tribal land. More detailed information on the methodology used to calculate technical potential is available at <http://www.nrel.gov/docs/fy13osti/56641.pdf>.

Table 1. Technical Potential of Various Renewable Energy Resources on Hoopa Valley Tribal land

Resource	Availability
Bio power from Solid Residues	55,748 MWh
Hydropower Generation Potential	38,550 MWh
Enhanced Geothermal Systems Potential Installed Capacity	315 MWh
Enhanced Geothermal Systems Potential Annual Generation	2,483,000 MWh
Concentrating Solar Power (CSP) Potential Installed Capacity	N/A*
Wind Potential Installed Capacity at 80m and GCF>=30%	N/A*
Urban Utility PV Power Potential Annual Generation	N/A*
Rural Utility PV Power Potential Annual Generation	121058.3517

**Insufficient data to determine resource availability. Please refer to the resource maps in Appendix A to determine technical potential.*

Resource Assessment

Table 1 and Appendix A illustrate the technical potential of renewable energy resources on the Hoopa Valley Tribal land. The land has potential for renewable energy generation from a few resources. There

is great technical potential to develop biopower and rural PV power. Additionally, there is a viable amount of technical potential to develop geothermal, but in relation to biopower and rural PV, this technical potential is not great. The Hoopa Valley Tribal land has inadequate resources to develop wind power. Please note, categories listed as “N/A” do not reflect a lack of technical potential and are only the result of unavailable data at the time that the resource assessment was conducted. Additional investigation into all of the viable resources could prove worthwhile and informative in resource planning. For more information on the basics of renewable energy technology and links to further resources, see www.eere.energy.gov/tribalenergy/guide/renewable_energy_basics.html.

The Hoopa Valley Tribe’s utility provider is Pacific Gas and Electric (PG&E). PG&E helps interconnect solar, wind, fuel cells, batteries or multiple technology-generating systems to the PG&E grid. PG&E also help applying energy credits produced by the different systems installed. PG&E has put together essential resources to assist contractors who are applying for interconnection for the larger self-generation programs. These resources include key information about the qualifications, documents needed for application, interconnection requirements, costs and other considerations. These different programs can be found at the following address to see if qualifications are met <http://www.pge.com/en/b2b/interconnections/largeselfgen/index.page>.

For large, commercial-scale renewable energy projects on tribal land, the Tribe must locate points of interconnection, assess the available capacity of nearby transmission lines, and identify prospective off-takers in the service area. The figures in Appendix A provide illustrations of resource availability and existing transmission lines on Hoopa Valley Tribal land. Further information on transmission and the interconnection process is available in Grid 101, a free on-demand webinar located on the National Training & Education Resource (NTER) website (www.nterlearning.org/).

Energy Efficiency

Energy efficiency is using less energy to provide the same level of performance comfort and convenience. It decreases the amount of wasted energy through transmission, heat loss and inefficient technology which costs American families and business money, and leading to increased carbon pollution. Improving energy efficiency is not only an effective way to combat global climate change and decrease pollutants in the air it can also reduce energy costs for consumers. PG&E provides several ways for residential and business consumers to increase their energy efficiency and receive incentives for doing so.

PG&E created an Energy Savings Assistance Program to save money and improve energy efficiency. It provides qualified customers with energy-saving improvements at no charge. Participants must first go through an approval process which follows the same income guidelines as the California Alternatives rates for Energy Program (CARE). These guidelines list the number of persons in a household and a cap on total gross annual household income. Additionally, there is an online application which must be first approved before an at home assessment can be coordinated. Once there is a final approval after the at home assessment, energy-saving measures can be implemented through the Energy Savings Assistance Program. These can include repairing or replacing appliances, weatherproofing and adding energy efficient light-bulbs, showerheads, etc. These energy-saving measures will help improve energy efficiency in the home.

(<http://www.pge.com/en/myhome/saveenergymoney/financialassistance/energysavingsassistanceprogram/index.page>)

Tribal Resiliency

Climate change increasingly impacts tribal homes, food, and overall lifestyle of American Indians. Climate change threatens traditional ways of life. Current and future impacts from climate change threaten native communities' access to traditional food such as fish, game, wild and cultivated crops which have an impact on cultural, economic, and community health life. Additionally, climate change challenges the integrity and stability of ecosystems on which native people live by changing ecosystem processes and biodiversity. Decreases in water quality and quantity affect Indian drinking water supplies, food cultures, ceremonies and traditional ways of life. Climate change affects native populations in various and impactful ways which threaten traditional ways of life.

To combat climate change in within native populations, native traditional knowledges have emerged. Traditional knowledge involves a "cumulative body of knowledge, practice, and belief, evolving by adaptive process and handed down throughout generations by cultural transmission, about the relationship of living beings with one another and with their environment" (CTKW, 2014). Traditional knowledge strives to create a symbiotic relationship between native people and their environment. Therefore, as climate change increasingly threatens Tribal Nations, cultural characteristics, and practices, documenting the impacts on traditional lifestyles may strengthen adaptive strategies.

Specifically, in the Hoopa Valley Tribal land and reservation, observations and vulnerability assessments have been noted in the U.S. Climate Action Report. The U.S. Climate Action Report puts an emphasis on climate change observation, assessment, impact, and adaption measures specific to U.S. regions. The Hoopa Valley Tribal land is near a coastal zone and these western coastal zones are vulnerable to climate change impacts effecting water supply lines and energy infrastructure. Additionally, rising sea level is a concern for much of the western coast. A rise in sea level can cause flooding which affects power generation facility, water utilities, and health and critical facilities such as hospitals, fire stations, police stations, etcetera. Specific tools to help resiliency planning and analysis can be found using the U.S. Climate Resilience Toolkit: https://toolkit.climate.gov/tools?f%5B0%5D=field_parent_topic%3A113.

Energy Vision

The energy planning team identified the following energy vision for the Hoopa Valley Tribe:

To combine historical values with modern technology by striving towards renewable energy and new infrastructure development that benefits the people, our lands, and our traditional cultures.

Energy Goals and Projects

The energy planning team identified the following goals for sustainable energy development, summarized in this section and Table 2 below.

Goal 1: Develop an energy education program by the end of 2017

Having an educated community and leadership that are aligned with and supportive of any energy initiatives is important to an energy program's success. The first goal identified by the energy planning team is to develop and begin implementing an energy education program envisioned to facilitate this consensus. This program needs to reach community members as well as the tribal leadership and staff, and so it will likely need to be multi-faceted in its messages and approach. Ideas for some aspects of this educational program include the following:

- Educate residents in the Schodst Housing units about energy consumption and savings.
- Include workforce development in energy efficiency and renewable energy skills in the education program.
- Add training about installing and maintaining solar energy systems in the curriculum of the Tribal Civilian Community Corps.

Goal 2: Create specific and detailed infrastructure development plans by the end of 2017

A crucial first step in developing any infrastructure project is to create a detailed plan outlining the project concept, funding source(s), development timeline, contingencies, and any other needed concerns. In order for energy considerations to be a priority in such projects, it will be important to ensure these plans contemplate the energy needs, impacts, and opportunities that all new development projects entail. This is why the next goal identified by the energy planning team is to undertake a deliberative and well-coordinated planning effort for the various infrastructure projects that the tribe is interested in pursuing or has already begun developing. For this effort to be successful, the energy planning team identified that it should consist of two distinct efforts described below as subcomponents of this goal.

Goal 2a: Hold meetings with the stakeholders of each proposed project in development to create specific plans

When planning infrastructure projects, it is vital to include all relevant stakeholders for each given project in the planning process so that efforts can be effectively coordinated and any potential hurdles are identified early so that they may be dealt with efficiently. This goal to conduct meetings over the coming year with appropriate stakeholders for all the infrastructure projects currently in development addresses these important facets of effective planning. Some of the projects identified as needing this deliberative planning effort are listed below, categorized as Near-Term (1-2 years), Mid-Term (3-5 years), or Long -Term (5-10 years):

Near-Term

- Broadband
- New Gas Station
- New Store
- Retrofit Old Shopping Center
- Cultural Center and Museum
- New Street Lighting
- Outdoor Lighting for Recreational Facilities

Mid-Term

- Adding Additional Retail Space
- New Administration Building
- Remodel Hotel
- Retrofit Factory
- Airport for Tribal Offices
- New Energy Efficient Housing
- Electric Vehicle Fleet

Long-Term

- Jet Fuel System at Airfield
- Solar Array on Brownfield Sites
- Convert from Propane to Natural Gas

Goal 2b: Identify sources of funding for each project and begin applying

One of the most important components of any infrastructure project is its funding. This can be a complicated aspect for tribal projects, which may be funded from one or a combination of a variety of different sources (such as a tribe's own capital investment or operating budgets, grants from a variety of government sources, and private investment). The energy planning team recognizes that identifying the most appropriate combination of these funding sources and the subsequent pursuit of them is a key part of a project's development plan.

Goal 3: Implement the plans developed from Goal 2 to construct near and mid-term projects by 2021

This goal addresses several of the tribe's pressing and important infrastructure needs over the next five years. Having effectively planned for these projects with Goal 2, the next step is naturally to pursue the development of these important projects. The energy planning team also notes that an important outcome from the process described in Goal 2 is that all the project-specific development plans will include energy as a key consideration. Therefore, all new infrastructure should be constructed in a sustainable and mindful way that considers its impact on the tribe's energy needs and supplies, and the environment. All new buildings should incorporate energy efficiency and sustainable design features and include renewable energy where possible or at a minimum be "renewable ready" (that is be designed and constructed in such a way that renewables can be easily added later).

Goal 4: Reduce energy and water consumption across tribal facilities by 2026

Besides planning smartly for future development, another great opportunity to reduce the tribe's impact on the environment is to reduce the energy and water consumption of its existing facilities. The energy planning team set the final goal in this category with an intelligent, phased approach described in the two sub-goals below.

Goal 4a: Determine feasible energy and water conservation measures for each tribal facility by 2021

Rather than setting an uninformed and arbitrary energy or water consumption reduction threshold which the tribe may later find is impossible to reach or should have been more challenging, the energy planning team decided it best to begin this effort with the goal of first establishing a baseline to decide how much can be saved in each building. This goal will require considerable work to first determine the current energy and water use in each of the tribe's facilities, second to research available reduction practices and technologies, and then finally evaluate the efficacy of the appropriate conservation measures in each application and within each facility. This extensive effort combined with the other energy planning and educational efforts that the tribe intends to pursue may require the hiring of a dedicated "energy coordinator" on the tribal staff. This is why the energy planning team is providing five years in which to complete this goal. The outcome of this effort may be a prioritized list of retrofit, weatherization, or renewable energy projects to be applied to specific facilities. Some ideas that the energy planning team has already identified that should be researched further for feasibility include:

- Roof-top Solar Power for Tribal Buildings

- Efficiency Retrofits for the Pool
- Retrofitting Existing Public Housing
- Photovoltaic-covered Carports for Tribal Offices
- Exploring the Opportunity for Biomass and Hydroelectric Projects
- Investigating Alternative Water Pumping Options
- Creating a Program that Helps Homeowners Install Solar Panels

Goal 4b: Implement identified energy and water conservation measures by 2026

Once the tribe has discovered how much energy and water can realistically and practically be conserved, the next step is to implement the selected conservation measures. To successfully implement the identified opportunities will require an integrated and holistic planning process like that described in Goal 2. The energy planning team feels that these identified savings can become reality within an additional five years after the initial five-year evaluation period, or by the year 2026.

Table 2. Hoopa Valley Tribe Energy Goals and Projects Timeline

	Year 1	Years 2-5	Years 5-10
Goal 1: Energy education program			
Goal 2a: Stakeholder meetings			
Goal 2b: Identify funding			
Goal 3: Construct projects			
Goal 4a: Identify feasible savings			
Goal 4b: Implement reduction projects			

Federal Incentives

Federal incentives play an important role in the commercialization and adoption of renewable energy technologies by providing consistent financial support for growth, including the construction of manufacturing plants and the extended project development and construction time typically required for renewable energy projects. For the commercial, industrial, utility, and agricultural sectors, the U.S. government currently supports renewable energy deployment through the Investment Tax Credit (ITC) and New Markets Tax Credit (NMTC), which encourage private investment by reducing taxes owed by a project owner. While the NMTC is available beginning in the year in which the investment is made, the ITC is available to the taxpayer in the year the energy project is put into service. In addition to these tax credits, the government provides depreciation benefits through the Modified Accelerated Cost Recovery System (MACRS), which enables certain investments in wind, geothermal, and solar technologies to be recovered over a 5-year schedule in lieu of the standard life of the asset. MACRS improves the economic viability of a project by reducing tax liability in the initial years of production.

Investment Tax Credit – Section 48 of the Internal Revenue Code provides an investment tax credit for certain types of energy projects, which reduces a company's tax liability by a percentage of qualified capital expenditures. The ITC was extended by *The Consolidated Appropriations Act* in December, 2015. The most significant changes to the extension involve a gradual step down of credits for solar technologies beginning in 2019 through 2022 and for 'large wind' – a step down beginning in 2016 through 2019. The credit is allotted in the year in which the project begins commercial operations and vests linearly over a 5-year period (i.e., 20% of the 10% geothermal credit vests each year over a 5-year period). If the project owner sells the project before the end of the 5-year period, the unvested portion of the credit will be recaptured by the Internal Revenue Service. More information on the ITC and eligible technologies is available at <http://programs.dsireusa.org/system/program/detail/658>.

New Markets Tax Credit (NMTC) – The NMTC was enacted by Congress as part of the Community Renewal Tax Relief Act of 2000 to create jobs and improve the lives of residents in low-income communities and target populations. It allows individual and corporate taxpayers to receive a federal income tax credit for making Qualified Equity Investments (QEIs) in qualified Community Development Entities (CDEs). CDEs must be designated by the Community Development Financial Institutions (CDFI) Fund, which is a division of the U.S. Department of the Treasury. The NMTC equals 39% of the investment and is claimed over a 7-year period. Through 2011, the CDFI Fund made 664 awards worth a total of \$33 billion. For more information on the NMTC, see <https://www.cdfifund.gov/programs-training/Programs/new-markets-tax-credit/Pages/default.aspx>.

California Policies and Incentives

California employs a suite of regulatory policies and financial incentives related to renewable energy and energy efficiency. The California Energy Commission was placed in charge of a Renewable Energy Program to help increase total renewable electricity production statewide making California a recognized leader in the renewable energy field. In 2002, California established its renewables Portfolio Standard (RPS) Program, with the goal of increasing the percentage of renewable energy in the state's electricity mix to 20 percent of retail sales by 2017. Additionally, Executive Order S-14-08 was passed in 2008 requiring that all retail sellers of elect city will serve 33% of their load with renewable energy by 2020. To enhance the previously stated Executive Order, the new RPS indicated that 25 percent of all retail sales have to come from renewables by the end of 2020 there will be a 33 percent requirement by the end of 2020. Finally, Senate Bill 350 was signed in 2015 which requires 50 percent by 2030 as determined by the newest RPS.

There are a variety of financial incentives available to those interested in developing renewable energy and energy efficiency projects in California. Among these incentives are tax credits, loans, grants, property-assessed clean energy (PACE) financing, corporate tax credits, and rebate programs. More detailed information on financial incentives is available on the California Energy Commission website (<http://www.energy.ca.gov/renewables/>), as well as within the Database of State Incentives for Renewables & Energy Efficiency (www.dsireusa.org).

Utility Provider and Incentives

For large, commercial-scale renewable energy projects on tribal land, the Tribe must locate points of interconnection, assess the available capacity of nearby transmission lines, and identify prospective off-

takers in the service area. The figures in Appendix A provide illustrations of resource availability and existing transmission lines on Hoopa Valley Tribal land. Further information on transmission and the interconnection process is available in Grid 101, a free on-demand webinar located on the National Training & Education Resource (NTER) website (www.nterlearning.org/).

The Hoopa Valley Tribe's utility provider is Pacific Gas and Electric (PG&E). PG&E helps interconnect solar, wind, fuel cells, batteries or multiple technology-generating systems to the PG&E grid. PG&E also help applying energy credits produced by the different systems installed. PG&E has put together essential resources to assist contractors who are applying for interconnection for the larger self-generation programs. These resources include key information about the qualifications, documents needed for application, interconnection requirements, costs and other considerations. These different programs can be found at the address below to see if qualifications are met.
<http://www.pge.com/en/b2b/interconnections/largeselfgen/index.page>

Resources

Several programs offer financial programs, technical assistance, and procurement support to help tribal communities achieve their energy goals. The programs below represent various assistance programs that may be leveraged to complete the Nation's energy related projects.

- ❖ Grants:
 - Programs that offer grants relevant to the above listed energy programs and projects include:
 - US Department of Energy
 - Energy Efficiency and Renewable Energy
 - <http://www.energy.gov/indianenergy/office-indian-energy-policy-and-programs>
 - US Department of Agriculture
 - Energy Efficiency and Community Upgrades
 - Rural Utility Service (electrical and communications)
 - <http://www.usda.gov/wps/portal/usda/usdahome?navid=otr>
 - Housing and Urban Development
 - Energy Efficiency and Housing Weatherization
 - <http://portal.hud.gov/hudportal/HUD?src=/topics/grants>
 - Bureau of Indian Affairs
 - Renewable Energy and Energy Offices
 - <http://www.bia.gov/WhoWeAre/AS-IA/IEED/DEMD/TT/TF/index.htm>
 - Technical Assistance
 - Programs that offer technical assistance relevant to the above listed energy programs and projects include:
 - US Department of Energy:
 - Energy Efficiency and Renewable Energy (all technologies)
 - Strategic planning
 - Financing
 - <http://www.energy.gov/indianenergy/office-indian-energy-policy-and-programs>
 - Housing and Urban Development
 - Energy Efficiency, Weatherization

- <http://portal.hud.gov/hudportal/HUD?src=/topics/grants>
 - Bureau of Indian Affairs
 - Renewable Energy
 - <http://www.bia.gov/WhoWeAre/AS-IA/IEED/DEMD/TT/TF/index.htm>
- ❖ Procurement
 - The following entities offer procurement assistance:
 - GSA
 - Comprehensive
 - <https://www.gsaglobalsupply.gsa.gov/>

Appendices

Appendix A. Resource Assessment Maps

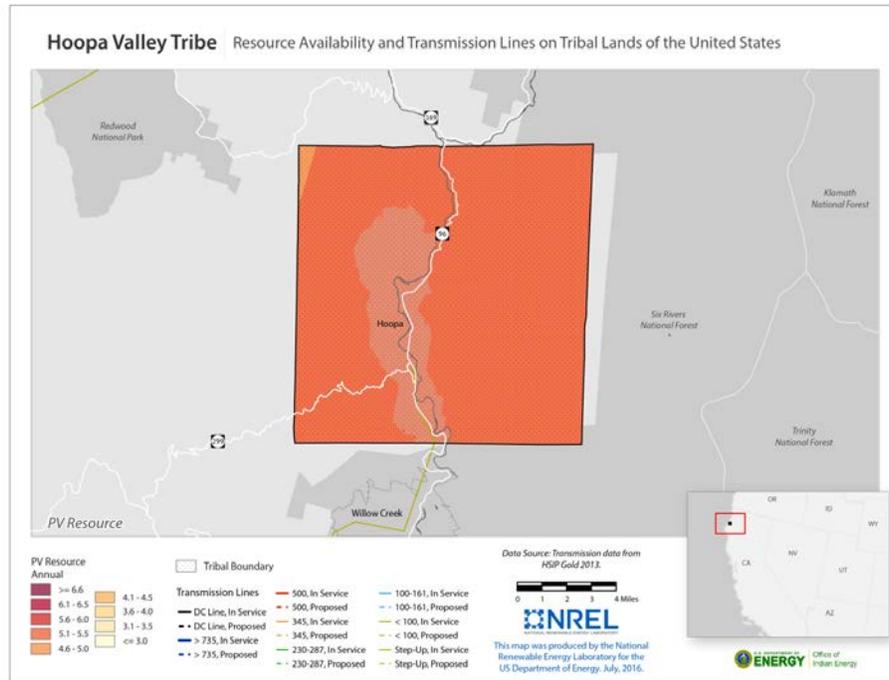


Figure 1. PV Resource availability and transmission lines on Hoopa Valley Tribal Land

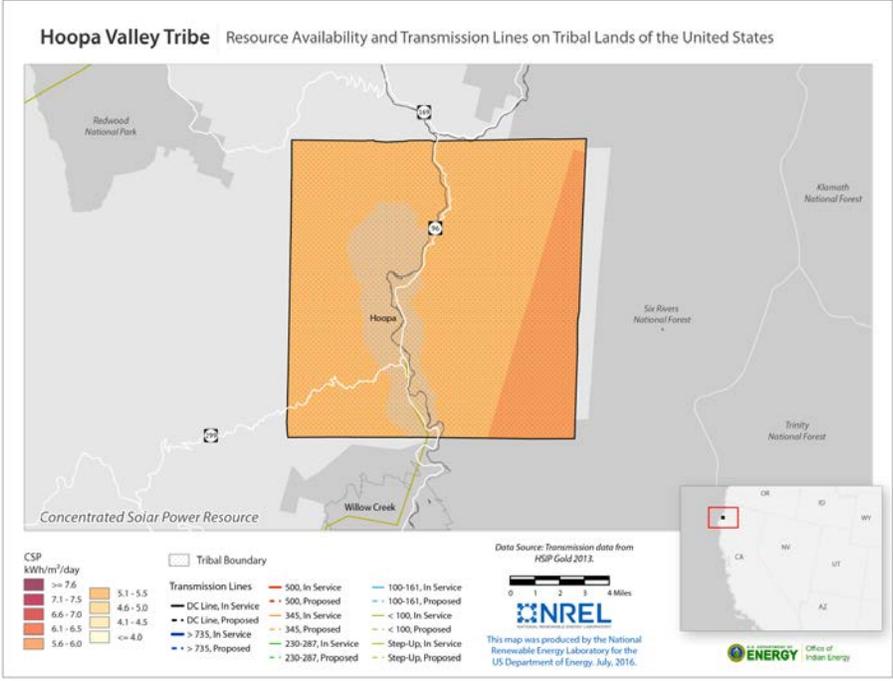


Figure 2. CSP Resource availability and transmission lines on Hoopa Valley Tribal Land

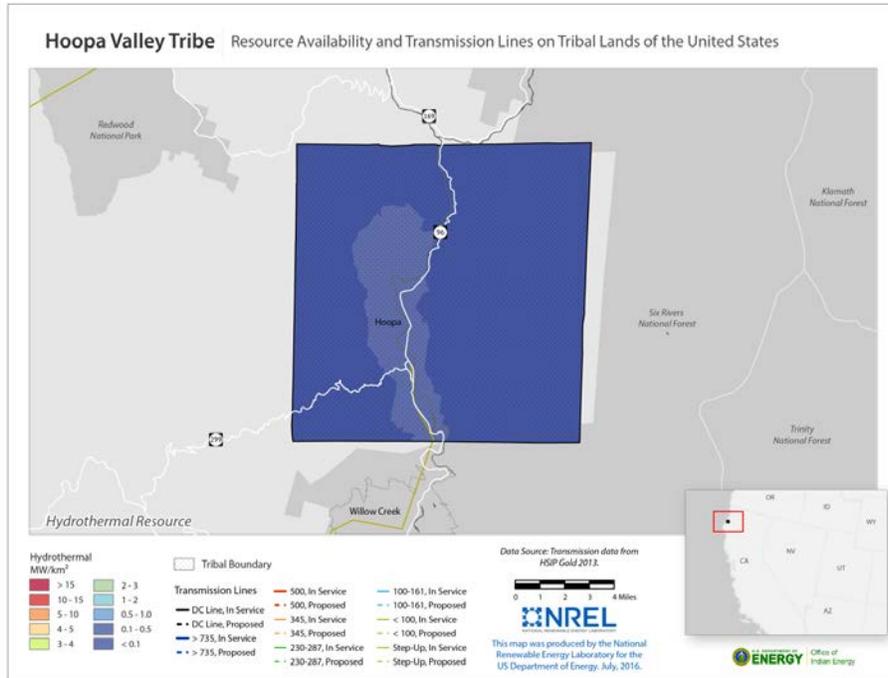


Figure 3. Hydrothermal Resource availability and transmission lines on Hoopa Valley Tribal Land

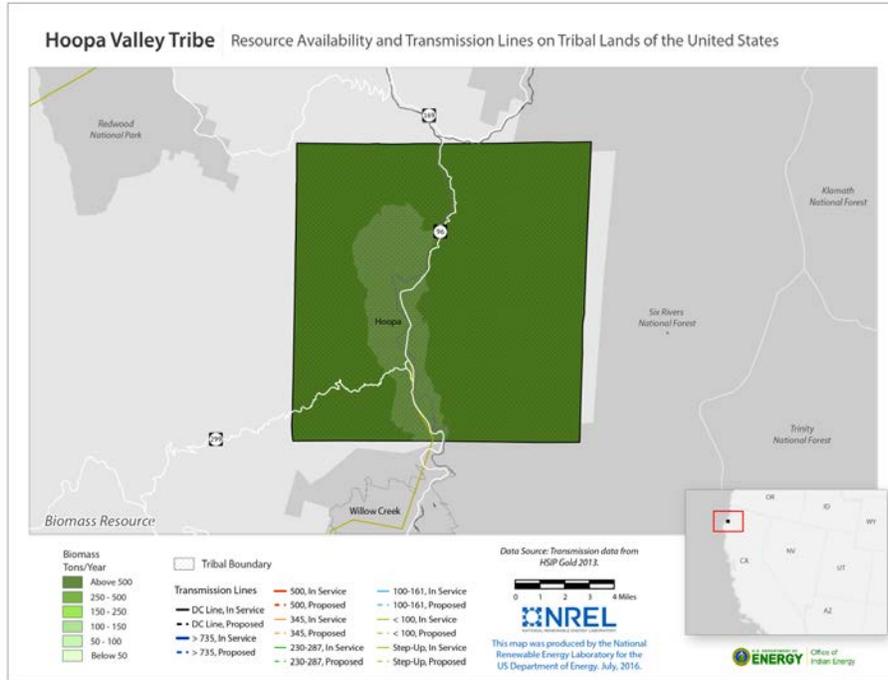


Figure 4. Biomass Resource availability and transmission lines on Hoopa Valley Tribal Land

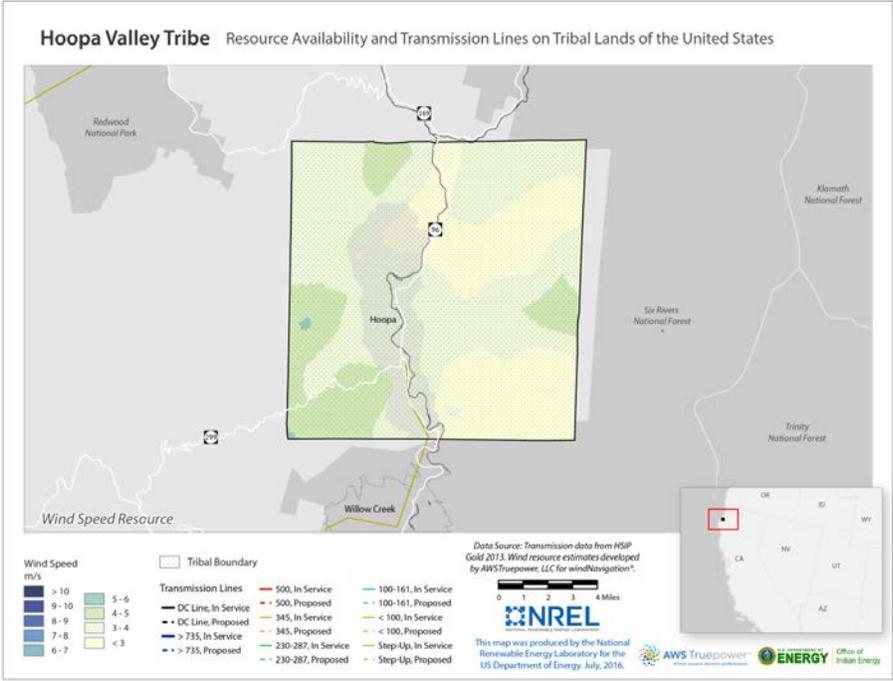


Figure 5. Wind Resource availability and transmission lines on Hoopa Valley Tribal Land

Appendix B. Glossary of Terms

Base Load

The minimum amount of energy that must be generated constantly by a utility in order to meet minimum customer demand.

Commercial-Scale Project

A stand-alone project with a primary purpose of generating revenue resulting in financial self-sufficiency.

Community Development Entity (CDE)

Required participant in New Market Tax Credit (NMTC) transactions.

Community Development Financial Institutions (CDFI) Fund

Created for the purpose of promoting economic revitalization and community development through investment in and assistance to CDFIs. The CDFI Fund was established by the Riegle Community Development and Regulatory Improvement Act of 1994.

Cooperative Utility (Co-op)

A government-regulated not-for-profit utility that is owned by its customers. Net revenue is either reinvested in the utility or distributed to its shareholders (customers).

Distributed Generation

A term used to describe an energy system in which electricity generation occurs in dispersed geographical locations that are in close proximity to energy demand. It is an alternative to a traditional grid system, in which electricity is produced at a centrally located plant and then transmitted to customers over long distances.

Investment Tax Credit (ITC)

Reduces federal income taxes for qualified tax-paying owners based on capital investment in renewable energy projects and is earned when equipment is placed in service.

Investor Owned Utility (IOU)

A government-regulated private-sector firm seeking profit by providing a utility service, such as water or electricity.

Modified Accelerated Cost Recovery System (MACRS)

A mechanism for computing tax depreciation on property placed in service after 1986 using accelerated methods of cost recovery over statutory recovery periods. An MACRS deduction is determined by applying a declining-balance percentage for a statutory recovery to the cost of the property. The cost of eligible property is recovered over 3-year, 5-year, 10-year, 15-year, or 20-year periods, depending on the type of property. For renewables, most expenditures are on a 5-year schedule.

New Market Tax Credit (NMTC)

The NMTC was enacted by Congress as part of the Community Renewal Tax Relief Act of 2000 to create jobs and improve the lives of residents in low-income communities and target populations.

Net Metering

Billing system that provides customers with credit for electricity generated from distributed resources (such as PV energy); host often receives the full retail value for the excess electricity generated by the system that is fed back to the utility grid.

Off-taker

Purchaser of the electricity from a renewable energy system. For a facility-scale project, it is often the building location where the system is located. For a community-scale project, it is often the community supporting the development. For a commercial-scale project, it can be any party purchasing the electricity, typically a utility.

Public Regulatory Commission

A governing body that regulates the rates and services of a public utility provider.

Reference List

Database of State Incentives for Renewables & Efficiency. 2014. *Programs, California*.
<http://programs.dsireusa.org/system/program?state=CA>

U.S. Energy Information Administration. 2015. *Average Retail Price of Electricity to Ultimate Customers by End-Use Sector, by State June 2015 and 2014 (Cents per Kilowatt Hour)*. www.eia.gov/electricity/monthly