



Strategic Energy Planning Resource Guide Series for California Tribes

Step 2 - Assess Current Energy Conditions, Needs
and Opportunities





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Step 2: Assess Current Energy Needs and Opportunities

Strategic energy planning is a process during which communities evaluate their current energy conditions, needs, and opportunities, co-create a vision of their desired energy future, and develop a road map for future energy projects to achieve this vision (Dane and Doris 2014, PSE, n.d.). For many Tribes, energy planning supports broader goals such as energy sovereignty, energy reliability, environmental protection, reduced energy costs, economic development, climate adaptation, and quality of life (Dane and Doris 2014; Gove et al. 2015; PSE, n.d.).

2.0 Overview of Strategic Energy Planning, the Resource Guide Series, and Step 2

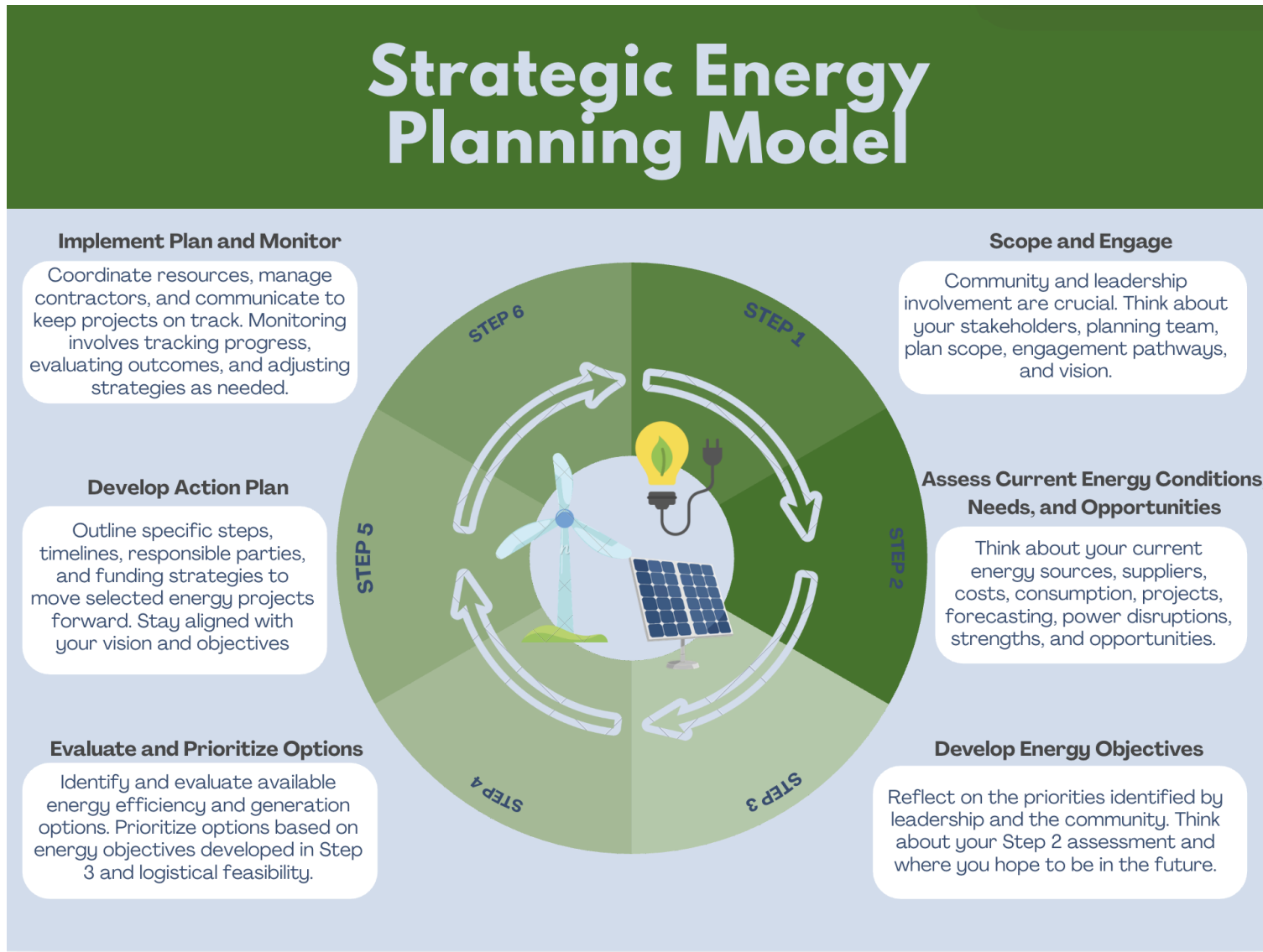
2.0.1 Strategic Energy Planning

There are different ways to go about strategic energy planning. For the *Tribal Energy Planning and Efficiency Cohort*, we are using a six-step model that has been adapted from several strategic energy planning guides (Dane and Doris 2013; Dane and Doris 2014; Gove et al. 2015; PSE, n.d.). Figure 1 below illustrates this model. In this circular process, energy planning moves through stages, including leadership and community engagement, assessing needs and opportunities, developing energy objectives, evaluating and prioritizing energy options, planning and implementing projects, and finally monitoring progress.

Values guiding this model and planning process include:

- *Community-driven*: engages with and involves community members throughout the planning process, builds relationships, and a broad base of support for actions
- *Culturally-connected*: honors Traditional knowledges, cultural values, and stewardship practices
- *Forward-looking*: Considers broader contexts, priorities, and long-term goals holistically rather than approaching energy projects in a piecemeal fashion; considers social, environmental, and economic impacts of decisions on future generations

(Gove et al. 2015; PSE, n.d.)



Figure

1:

Strategic Energy Planning Model

Although Figure 1 presents the strategic energy planning process as happening in a straightforward fashion, the process is iterative, and steps may be revisited as needed. This model provides one example for how to approach strategic energy planning and is designed to be adapted, if desired. We encourage you to also look at other strategic energy plans and strategic energy planning guides, and to choose a process that makes the most sense for your Tribe. Every strategic energy plan will look different depending on the priorities, values, and capacity of the Tribal Nation creating it. Finally, strategic energy plans are intended to be living documents that can be updated as conditions change and also in response to monitoring that evaluates whether energy projects are meeting the plan's energy objectives.

2.0.2 Resource Guide Series

This resource guide series is designed to support Tribal Nations participating in the California Tribal Energy Planning and Efficiency Cohort. Each guide focuses on one step of the strategic energy planning process and includes:

- Key questions/ prompts to consider to help Tribal staff think through different aspects of the planning process
- Worksheets and tables that Tribes can directly use as templates or adapt in strategic energy plans
- Sample language that Tribes can copy and use in their plans (we ask that you include relevant citations if, for example, the guide cites another source)
- Examples from other Tribal energy planning processes

Please note that these resource guides are works in progress, and we will continue to update them. You can find the date the guide was last updated in the footer section of the guides.

2.0.3 Overview of Step 2: Assess current energy conditions, needs, and opportunities

The purpose of Step 2 is to understand the Tribe's current energy conditions, needs, and opportunities in order to lay the foundation from which to grow the Tribe's Strategic Energy Plan and guide Steps 3 and 4 (Develop energy objectives and Evaluate and prioritize options). Key components of Step 2 include:

Step 2.1: Develop a Community Description

Describe key characteristics of your community to provide context for all the steps that follow. Align your community description with the plan scope established in Step 1.3.

Step 2.2: Identify Energy Sources and Suppliers

Inventory energy sources and suppliers to consider diversifying an energy portfolio, or establishing a Tribal Utility.

Step 2.3: Understand Energy Consumption and Costs

Understand the energy usage of your community and the associated costs to prioritize facilities and areas for renewable energy projects and energy efficiency retrofits.

Step 2.4: Understand Your Tribal Regulatory and Organizational Landscape

Inventory and familiarize yourself with your Tribe's relevant energy and climate plans, policies, and projects as a foundation upon which to build the strategic energy plan. This can help inform Step 2.7.

Step 2.5: Explore the Federal and Regional Regulatory and Organizational Landscape

Understand Federal and Regional energy policies, organizations, barriers, and financial opportunities. This can help inform Step 2.7.

Step 2.6: Assess Current and Future Energy Needs

Create a benchmark for your Tribe's energy needs to help determine which projects should be prioritized in the future.

Step 2.7: Identify Opportunities

Determining your Tribe's strengths, challenges, opportunities, and threats will be crucial for developing your energy objectives in Step 3 and identifying, evaluating, and prioritizing energy options in Step 4.

2.1 Develop a Tribal Community Description

A community description sets the stage and provides important geographic, demographic, infrastructural, climatic/environmental, cultural, and economic context for understanding all of the sections of the Strategic Energy Plan that follow, including prioritizing assisting the most vulnerable facilities and community members. The plan scope, established in Step 1.3, can help guide what is included in the community description. As mentioned in Step 1.3, you can revisit your plan scope if new ideas arise. Maps displaying location and other information can be powerful visuals.

You may be able to find and adapt community descriptions and maps included as parts of other plans such as hazard mitigation plans, economic development plans, and more. Table 1 provides examples of key components that can be included in community descriptions depending on the plan scope.

Table 1. Key Components of a Community Description

Category	Examples and Considerations	
Location	Include county/counties	
Location Map		
Community Layout Map		
List of Buildings and Facilities within Community (including critical facilities (ex., health clinics, schools, and more))		
Population	- Tribal members - On-reservation/off-reservation (if applicable) - Year-round/seasonal - Age distribution - Populations that may be vulnerable to lack of/unreliable power (ex., elderly, young)	
Communities	- Name(s) - Location(s) - Connected to the grid or off-grid	
History and Culture		
Economy	- Economic activities (e.g., agriculture, campgrounds, casino, fishing, logging, Tribal government) - Employment rate	
Values	- Are there any documents with the Tribe's guiding values?	

2.2 Inventory Energy Sources and Suppliers

Creating an inventory of existing energy sources and suppliers is essential in the next step of the strategic energy planning process – Step 2.3 Understand energy consumption and costs. Determining where your energy comes from also lays the foundation for increasing energy resilience by informing Steps 2.6 Needs assessment/ future forecasting and Step 2.7 Opportunities identification.

When inventorying energy sources and suppliers, consider your plan scope (Step 1.3) and energy uses to help determine what to include. Energy can be used in a variety of ways, including space heating, air conditioning, water heating, cooking, refrigeration, lighting, running appliances and computer equipment, transportation, etc. (EIA 2023).

Types of energy for the above uses may include electricity, natural gas, coal, solar energy, wind energy, hydropower, geothermal energy, biomass, nuclear energy, heating oil, propane, kerosene, wood (cord wood and wood pellets), gasoline, diesel, ethanol, etc. (EIA 2023).

Suppliers may include a variety of electricity and natural gas utilities, bulk fuel suppliers and retail fuel suppliers. There are different forms of entities that can be referred to as utilities. Utilities generally refer to entities that generate, transmit, and distribute electricity to consumers; however, different forms of utilities may not perform all three ([Sheppard 2024](#)) ([CEC 2026](#)). Table 2 provides examples of types of electricity suppliers. Table 3 provides an example summary table of energy sources and suppliers that could be used in a strategic energy plan.

Table 2. Examples of Electricity Suppliers

Electricity Supplier Type	Details
Tribally Owned Utilities	- Owned by the Tribe - Tribe manages how energy is sourced and delivered to customers (generally on a reservation) - Can generate or purchase power - Can determine rates for customers (Woven Energy)
Investor-Owned Utilities (IOUs)	- For-profit entities with shareholders - Can operate across multiple states - Granted licences from state commissions - Activities like generation and sales are regulated by FERC and State Commissions (Sheppard 2024). - Managed by a board-appointed team of private sector employees (Bolon, Lanckton, and Baker 2020) - The goal is to optimize return on investment for stakeholders (Bolon, Lanckton, and Baker 2020) - Serve 72% of total energy consumers in the United States (Bolon, Lanckton, and Baker 2020)
Publicly Owned Electric Load-Serving Entities	- Not-for-profit utilities - Owned by Cities or Counties - Typically regulated by the local government - Universities and military installations can own this type of utility (Sheppard 2024), (Bolon, Lanckton, and Baker 2020)
Rural Electric Cooperatives	- Not-for-profit entities - A democratically elected Board of Directors oversees operations - Generally serve rural areas without another utility (Sheppard 2024). - The goal is to optimize benefits for local customers (Bolon, Lanckton, and Baker 2020)
Community Choice Aggregators	- Allow local governments to procure power on behalf of their residents - Receive transmission and distribution service from existing utility providers. - CCAs are currently authorized in California, Illinois, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Ohio, Rhode Island, and Virginia - Individual customers must enroll in these programs - Local control of electricity generation (EPA 2025)
Electric Service Providers/Independent Providers	- Privately owned companies - Own and operate generation assets - Can supply energy to other utilities or consumers (Sheppard 2024).

Table 3. Example Summary Table of Energy Sources and Suppliers

Energy Source	Energy Provider	System Description	Examples/ Considerations
Electricity	- Tribal Utility - Public-Owned Utility - Investor-Owned Utility (IOU) - List of California Electric Companies	- Does the utility generate its own energy? - Does the utility purchase energy from other utilities?	Fuel Sources (ex. solar, wind, natural gas, nuclear, etc.)
Propane	Fuel supplier	- Can include the delivery route	
Natural Gas	Natural Gas Provider	- Can include pipeline locations	
Diesel Generators		- Generator locations - Age - Capacity - Fuel storage location(s) - Who is responsible for purchasing and keeping track of fuel?	- Are these main power sources, or backup? - Can these be replaced with renewable alternatives?
Wood pellets			
Gasoline		- Distributed at gas stations/ elsewhere?	
Local Power Generation with Storage	Owner Operator	- Age - Capacity - Maintenance done - Retrofits/Upgrades	Microgrids, solar photovoltaic, rooftop solar, biomass, etc.

2.3 Understanding Energy Consumption and Costs

Energy consumption and cost are essential data to collect, as these data can help your Tribe prioritize energy efficiency measures and provide key baseline information for renewable energy or energy efficiency projects. Some ideas for ways to utilize this information are below.

- Calculating your energy consumption will assist in estimating the needed capacity of a renewable energy project to replace grid reliance and increase energy sovereignty. This will also help you determine the scale and associated cost of a renewable energy project.
- Calculating your energy consumption can also assist in developing a renewable energy project with a large enough capacity to make a profit by selling some electricity back to the grid.
- Calculating your energy consumption and cost during particular months can help you target particular energy efficiency retrofits for different seasons, for example, better insulation and weatherization for winter months when energy costs may be highest.
- Calculating your energy consumption can identify which buildings are using the most energy. This can help target certain buildings for energy efficiency retrofits or other energy reduction measures.
- Calculating your energy cost can help your Tribe determine which renewable energy or energy efficiency option will save the Tribe the most money in the long term, particularly if the Tribe is making a decision between multiple projects.
- Utilizing your bill to determine when you're receiving the best energy rates can inform operating hours of buildings, or when to scale back energy usage to lower utility bills.

2.3.1 Using utility bills to understand energy consumption and cost

If you have utility bills from the past year, you can utilize the [corresponding spreadsheet](#) to help you understand your Tribe's energy consumption and cost. You may also include your meter readings instead, if you generate your own electricity or have an established Tribal Utility.

You may copy and add sheets to account for past years, or include it all on the same sheet and sort the data by month or year as necessary. You can continue to add accounts and meters for as many facilities as you need to track.

Looking at your utility bills, you can find the information included in the columns on the spreadsheet. If there is any data you cannot find on your bill, you can simply exclude it, or reach out for assistance from the ITEP or TECC teams in understanding your utility bills.

The spreadsheet will automatically total your energy consumption and cost based on the data you input. You can sort these totals by particular meters, locations, accounts, or billing dates.

2.3.2 Projecting energy consumption and cost

In some circumstances, you may not have utility data for a facility. In these instances, you can attempt to project the energy consumption and cost of a building or facility. While these projections can provide estimates, they will have a degree of uncertainty and should not be taken as completely accurate.

You may utilize online tools to estimate your energy consumption and cost. Your utility may have a free tool you can use that will project energy consumption and cost, and incorporate that utility's rate for a more accurate cost estimate. For example, the Los Angeles Department of Water and Power has a [free online tool](#) to calculate the estimated energy and water consumption of a residential building. See if your utility has a similar tool. This may be helpful for families to project their expected utility bills if moving to a new home or if moving back onto the Reservation. This may also be used to estimate the energy consumption of a new residential construction that hasn't accumulated actual utility data yet.

2.3.3 Considerations when reviewing energy use/cost data

When reviewing energy consumption and cost data, you may consider engaging facility managers and others to understand your data. Use the questions below as a guide to understanding all the nuances of your energy consumption and cost data.

- What information does a utility bill generally give you? For example, total cost, breakdown of cost (e.g., average daily use), billing period, comparison to other time periods.
- What additional info is needed to understand your energy usage? For example, size of the building, age of the building, how is the building used, when is the building used?
- How do you get your energy consumption and cost data and who do you need to engage with?
- How can you present this data so that it is accessible to a variety of audiences? For example, consider graphs or written explanations.

- Is the building's energy use necessary? (for example: medical facilities, refrigeration, etc.)
- How did energy consumption vary each month?
 - Which month had the highest consumption and cost? Why?
 - Which month had the lowest consumption and cost? Why?

2.4 Tribal Regulatory and Organizational Landscape

Understanding the energy-related work that your Tribe has already completed or that is currently in progress will help your Tribe lay the foundation upon which to build its energy future. This work could include energy plans, projects, ordinances, and more. In addition, familiarizing yourself with what has already been done and what is in progress will help you to avoid duplicating efforts and ensure that work is completed. Once you revisit previous energy work, you can begin to brainstorm what you'd like to see started in the future and what goals your Tribe can set for your Strategic Energy Plan. This section can help Tribes identify authority, constraints, and opportunities.

2.4.1 Find previous energy-related work

A first step in understanding your Tribal Regulatory and Organizational landscape is to locate relevant plans, project reports, ordinances and other documents. In some cases, storing documents on personal hard drives and staff turnover can make it difficult to find Tribally owned plans and documents. If you don't have access to all your Tribe's plans, these prompts may help you think about where to find them. If you have all your documents and plans on hand, skip this step and move to the next.

- Can you contact those who held your position in the past?
- Are the plans/reports publicly available online?
- Is there a printed version of the plan/report available somewhere? If it is only available in print, can you create a digital copy?
- Sometimes, plans and project reports are submitted as a deliverable to the agency/entity that funded the project. Can you contact the funder for a copy of the plan/ report?

- Consultants/contractors should have copies of the work they complete. Can you contact the consultant/contractor for a copy of the plan/report?
- Are there other departments that have done energy work (housing, transportation, etc) that may not be labeled clearly as energy work?

2.4.2 Conduct a review of previous energy-related work

Fill in Table 4 below with links to the relevant plans, projects, and Tribal ordinances/codes that will be relevant in the planning process. This will help you build off of the work that has already been completed. Fill in any notes to help remind you where to tie in for future use.

Table 4. Review of Previous-Energy Related Work

	Link to and Title of Plan	Things to Consider and Identify	Notes
Plans	Energy Plans	• Energy goals in plans • Identified energy challenges and barriers • Identified energy strengths and opportunities • Identified economic development opportunities • Identified utility projects • Identified energy needs • Projected increase or decrease in energy consumption and/or cost • Climate change impacts on energy demand	
	Community Master Plans referencing energy		
	Hazard Mitigation Plans referencing energy		
	Greenhouse gas emissions inventories		
	Priority Climate Action Plans		
	Energy Efficiency Audits		
	Comprehensive Economic Development Plans		
Projects	Renewable Energy Development Projects (ex. solar photovoltaic, biomass, wind turbines, etc.)	• Project timelines and start dates • Project costs • Are projects mentioned in the above plans? • Were projects completed? • Did project costs increase or decrease from the initial projection? Can this help you reconsider project costs for future projects?	
	Building retrofits		
	Sustainable construction design for new buildings		
	Vehicle and fleet electrification		
	Housing Surveys		
	Energy efficiency audits		
Tribal Ordinances or Codes Relating to Energy	Green building codes	• Do new Tribal constructions need to meet a certain energy efficiency standard? • Do new appliances purchased need to be Energy Star certified? • What existing Ordinances or Codes does your Tribe have regarding energy?	
	Local zoning ordinances		
	Energy efficiency standards		
	Energy benchmarking requirements		
	Renewable energy ordinances		

2.4.3 Document and store energy-related work

This section helps your Tribe assess how energy-related documents are stored, accessed, and maintained, so that critical information is easy to find, protected, and available to support ongoing and future projects.

- Does your Tribe have a shared digital filing system? If so, how do you access it? If not, can you create one? Examples of digital filing systems include Google Drive, Microsoft OneDrive, and Dropbox.
- How can new Tribal employees find documents and files? Should they be expected to review certain plans and documents as part of their onboarding process?
- Does your Tribe have a place to store physical backups of digital plans and documents? If not, where can these plans be stored? It is important to have paper copies of plans in the event a file corrupts, a hard drive is cleared, or your Tribal Administration's digital system is hacked.
- Have you shared your Tribe's energy plans and documents with all interested parties (ex. economic development programs, healthcare providers)?
- Who is responsible for maintaining and updating energy records?

2.4.4 Describe Tribe's Organizational Capacity and Staffing

Understanding your Tribe's organizational capacity and staffing will help identify the people, skills, and resources available to support energy planning, as well as any gaps that may need to be addressed to successfully implement energy projects.

- Which departments are currently involved in energy-related work?
- Is there a designated energy manager or coordinator?

- What internal capacity exists for:
 - Project development?
 - Grant writing?
 - Operations and maintenance?

- Where are the biggest capacity gaps?

2.5 Federal and Regional Regulatory and Organizational Landscape

Step 2.5 is available in a separate document on the Cohort website.

2.6 Needs Assessment and Future Forecast

Completing a comprehensive needs assessment creates a benchmark to support your Tribe in understanding and identifying what projects the Tribe may need to pursue given various future forecasts expected to impact energy availability. This step can also inform the development of energy objectives in Step 3.

2.6.1 Consider energy access and affordability

Energy access

- Are there residents, communities, and/or buildings that lack access to energy? If so, list them below.
- [Google MyMaps](#) is a free tool that allows you to create a map with pinned locations. You may use this to input the addresses of buildings that need access to energy. If you choose to use this, include a screenshot of your map.
- If there are buildings in your community that lack access to energy, why is this? Is there an overarching reason, or is each situation unique? Describe the situations.

Energy affordability

- Are there Tribal members who cannot afford electricity, but have access?
- Does your Tribe offer financial assistance with utility bills? If yes, how much does the Tribe offer? If not, is this something your community could benefit from?
- Does your utility offer reduced utility rates? Are they being utilized? How can you encourage their use?
- Have you heard from community members who are unable to afford their utility bills? If so, what are the reasons they gave for unaffordability? For example, higher or lower than average temperatures, increased utility rates, loss of income, etc.

2.6.2 Changes to population and housing

There are population projection tools available online. This [population projector](#) is one such example. These tools may not be accurate and results will vary on estimated inputs.

- What are your Tribe's' forecasted changes in population (growth, shrinkage, stagnation)? What are the primary causes of these changes? For example, lower birth rates, Tribal members moving back to the Reservation, etc.
- How is the age distribution of your Tribe's population expected to change?
- How will changes in population and age distribution affect housing and other facility demands? Will your Tribe need to construct more housing? Will your Tribe need to construct multi-family units? Will your Tribe need to construct new community buildings?

2.6.3 Consider planned and desired projects

Does your Tribe have projects in the works or projects desired in the future to benefit community members? Some examples of planned/desired projects are included in Table 5 below. You may add or delete projects or categories. Use Table 5 to consider the energy demand and supply of your projects, what opportunities may arise to complete the project, or what barriers you've run into with the project, and whether you can incorporate renewable energy or energy efficiency into them.

Table 5: Examples of Planned/Desired Projects

Project Categories	Project Details/ Examples	Project Deadline	Anticipated energy demand	Opportunities and Barriers	Funding Sources	Can/will the Project be Powered by Renewables? (Ex., solar fields, wind farms, microgrids)
Community Infrastructure	Housing					
	Schools					
	Tribal Government and Community Buildings					
	Water and sanitation					
	Other?					
Economic Growth and workforce development	Tribal enterprise					
	Commercial renewable energy project					
	Other?					
Health and Wellbeing	Health clinics					
	Cooling centers					
	Clean air centers					
	Resilience hub					
	Other?					
Broadband						

Other						
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2.6.4 Electric vehicle adoption

Electric vehicles (EVs) can provide avenues to economic opportunities such as lower fuel costs and profit from charging stations, cleaner air quality, and reductions in greenhouse gas emissions, potentially helping to achieve climate action goals. However, EVs are not always feasible modes of transit, particularly in rural areas. In addition, in order to decrease emissions, the electric grid supply energy for EVs must draw from renewable energy/zero carbon sources.

Because of their reliance on electricity, EVs can impose additional demands on the electric grid potentially straining resources. At the same time, bidirectional EV charging is on the horizon. Such chargers not only draw electricity from but can also send power back to homes or the grid. This can allow them to act as an emergency power supply during outages. In addition, as more bidirectional EV chargers come online, they have the potential to supply power to the grid during peak demand, collectively contributing to greater grid stability (US Department of Energy).

This section will help you explore different opportunities and barriers your Tribe may face when considering EV adoption. Consider how transportation plays a role in your energy vision.

- Has your Tribe considered purchasing electric vehicles to retire internal combustion engine vehicles? If your Tribe has already purchased EVs, what are the pros and cons of your transition?
- What broad barriers do you see to electric vehicle adoption?
- What broad opportunities do you see in electric vehicle adoption?

Use Table 6 to assess potential opportunities and barriers your Tribe may face with electric vehicle adoption. You may also use Table 6 to compare different EV models.

Table 6: Electric Vehicle Opportunities and Barriers

Electric Vehicle Type	Opportunities	Barriers
Electric School Buses		
Electric Vehicle Chargers		
Tribal Government Fleets		

2.6.5 Addressing power disruptions

Power disruptions can vary in causes, scale, and impacts. Some disruptions may be due to natural occurrences such as wind storms while others may be due to utilities intentionally shutting off power to protect public safety or the grid. Some disruptions may be local, others may be regional in scale. Impacts can range widely and include lost work opportunities, spoilage of food, disruptions to broadband, and critical impacts to medical facilities and equipment. Ways to lessen impacts from outages/ increase energy resilience and reliability could include short or medium-term solutions such as backup generators and increased battery storage while a longer-term solution might involve the construction of a microgrid to supply critical facilities. This section provides an opportunity to examine power outages more closely and consider ways to lessen impacts caused by disruptions and increase power reliability.

Causes of power disruptions

There are many potential causes for power disruptions in the electric grid. In some cases, outages are caused by damage to different components of the electric system. Power lines on Tribal land or personal property can be damaged by something small, such as a fallen tree branch. Such a power disruption would likely be limited to a small number of properties. Damage to distribution lines might affect a slightly larger geographic area. Damage to transmission lines that move electricity long distances can create larger scale disruptions, and, if not managed, could threaten grid stability. While damage to power generation facilities is possible, California receives power from geographically diverse areas. This means that damage to generation facilities does not often lead to power outages because power can be drawn from other parts of the grid ([CPUC 2026](#)). Utilities may also intentionally cut off electric power for maintenance or to protect public safety or the grid. **Public safety power shutoffs** (PSPS) were implemented in response to the 2017 fires in Santa Rosa, Los Angeles, and Ventura. Live utility power lines can ignite wildfires, and nearly half of the most destructive wildfires in California history have been caused by them. The PSPS program allows utilities to cut power to distribution and transmission lines during times of high fire risk (dry vegetation, high winds, etc). **Rotating power outages** occur when their electricity demand is higher than the supply, as may happen during a heatwave. The shutoffs are relatively short and prevent the grid system from larger, more catastrophic failures that might occur if the grid becomes destabilized in the event of insufficient generation ([California ISO 2023](#)).

Power disruptions may also occur to energy systems that are not part of the electric grid. For example if there is only one main road into or out of a community, an event such as a landslide can cut off the delivery of goods such as propane, gasoline, etc., that may be essential for your Tribe's energy supply.

Prompts to assess power disruption causes, impacts, and solutions

- What are the primary reasons your community currently faces power disruptions?
- How long do power disruptions last in your community? How do they end?
- What impacts does your Tribe experience as a result of power outages?
- How do you communicate power disruptions to your community? How effective is this communication?
- What are potential short, medium, and longer-term options for decreasing the impacts of power outages/increasing the Tribe's energy resilience and reliability?

Consider critical facilities in your community. Use Table 7 below to consider which critical facilities face power disruptions and why, or to predict which critical facilities may be at risk of experiencing power outages.

Table 7: Power Disruptions to Critical Facilities

Critical Facility	Common Reason(s) for Power Disruption	Impact(s) of Power Disruption	Solutions to lessen impacts; implementation

2.6.6 Potential climate change impacts on energy systems

Climate change will inevitably shape the future of energy systems across the world, and can impact both energy supply and demand. Climate changes are often framed in terms of changes in the frequency, intensity, duration, and/or increasing unpredictability of climate events (ex., drought, flooding, wildfires, snowstorms, etc.). Climate impacts vary regionally; therefore, changes to energy systems will vary.

One key finding of note from California’s Fourth Climate Change Assessment is that even though increased cooling demand during the summer may be offset by decreased heating demand in the winter, “increases in peak hourly demand during the hot months of the year could be more pronounced than changes in annual demand” (Bedsworth et al. 2018). Because electricity-generating capacity needs to match peak demand, this has critical implications for the amount of generating capacity needed.

Prompts to consider regional climate impacts

- How is climate change currently impacting your region? What changes are you seeing in weather patterns, food availability, etc.?
- How is climate change projected to impact your region in the future? What natural hazards will become more frequent and/or more intense? What new hazards might you experience?

Tools/ resources

- [CalAdapt](#) - provides interactive visualizations, downloadable datasets, the Analytics Engine and the Cal-Adapt API, helping you analyze how climate change may impact California at both state and local levels.

- [Future Climate Dashboard](#) - dashboard of projected future climate information for any location in the contiguous US. This tool is useful for evaluating how an individual climate variable is projected to change in future 30-year periods at a set location.
- [State Climate Summaries](#) - cover assessment topics directly related to NOAA's mission, specifically historical climate variations and trends, future climate model projections of climate conditions during the 21st century, and past and future conditions of sea level and coastal flooding.
- [Tribal Climate Tool](#) - designed to support tribes in the Pacific Northwest and Great Basin, U.S.A, as they prepare for the impacts of climate change, by providing information on how the climate is expected to change in the places Tribes care about. It provides maps, graphs, tables and descriptions of projected changes.

Projecting climate impacts on energy systems

Use Table 8 to brainstorm and project the impacts of climate change in your region on energy systems including both supply and demand. You can add rows for additional climate impacts or remove climate impacts that are irrelevant to your region. An example is done for you.

Table 8: Projecting Climate Impacts on Energy Systems

Climate Impact	Impacts on Energy Systems	Timeline
Increasing summer temperatures	• More energy is needed for air conditioning • Need for a Tribally owned cooling center • Energy bills increase in cost • High energy demand causes blackouts • Potential impacts of rising temperatures on solar panel efficiency	• Summer temperatures started to reach dangerous levels around 2015. Our community is experiencing an increased power demand of 20% from June-September compared to past years. This demand is forecasted to increase another 10% by 2030.
Increasing winter temperatures	• Less energy is needed for heating • Community members can rely more on alternative modes of heating, such as wood stoves, because the fuel need is lower	
Increasing wildfire frequency	• Potential increase in public safety power shutoffs • Need for cleaner air center that can operate during power outages	
Unpredictable winter storms		
Longer droughts	Less energy is produced from hydropower	
Increasing flood intensities		

Resources for determining climate impacts to energy systems:

- [California's Fourth Climate Change Assessment: Technical reports - Energy](#)
- [California's Fourth Climate Change Assessment: Key Findings - Includes impacts to energy](#)
- [California's Fourth Climate Change Assessment: Statewide Summary Report - Energy on pg 11 and starting on pg 47 for more details](#)
- [Summary Report from Tribal and Indigenous Communities in California: Energy sector starts pg 19, with recommendations pg 58](#)
- [California's Fourth Climate Change Assessment: Regional report - Have an energy section within each regional report](#)
- [Fifth National Climate Change Assessment: Energy in Chapter 5](#)

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2.7 Identify Opportunities

Identifying opportunities, strengths to lean into, and challenges to overcome related to the local energy environment is critical for strategic energy planning and will be supportive in working through Step 3, Developing Energy Objectives. Below are examples of two approaches to help with this identification: (1) strengths, weaknesses, opportunities, and threats (SWOT) analysis, and (2) strengths, opportunities, aspirations, and results (SOAR) analysis.

2.7.1 SWOT analysis

The SWOT methodology is a strategic analysis tool that can be helpful for immediate considerations and takes both internal (within the Tribe) and external (outside the Tribe) factors into consideration for determining strengths, weaknesses, opportunities, and threats related to your Tribe and the local energy landscape. One limitation to this approach is that it does not include prioritizing strategies; that is a separate step (Step 4) that will need to be taken. Below are some examples of what might be included in a SWOT analysis for strategic energy planning:

Table 1. Example SWOT Analysis

	POSITIVE	NEGATIVE
INTERNAL	<u>Strengths</u> Local Traditional Knowledges to guide energy strategies Meaningful and effective community engagement in the energy planning process Experienced Tribal personnel Energy champions Strong leadership Community mindset Tribal building codes Existing partnership and agreements with local/regional energy entities Existing energy infrastructure Existing energy efficiency measures	<u>Weaknesses</u> Staff turnover Low administrative capacity High upfront investment costs Limited energy storage capacity Existing inefficient energy use Limited grid connections
EXTERNAL	<u>Opportunities</u> Local and state energy incentives for solar and efficiency Potential partnerships to support diversifying energy supply Regional policy support for renewable energy implementation Establishing workforce development program for energy sector Training programs Bidirectional electric vehicle charging Energy efficiency	<u>Threats</u> Increasing heat-waves and warmer temperatures increase demands on energy supply More power safety shutoffs Potential land use conflicts Changes in federal renewable energy policies Cybersecurity concerns Broader geopolitical context Potential environmental or wildlife impacts of energy development

	Natural reset opportunities such as aligning development with planned infrastructure upgrades or upgrades after a natural disaster	
	Building design	

2.7.2 SOAR analysis

The SOAR methodology is a future-focused, appreciative inquiry strategic analysis tool that can be helpful for transformational or long-term energy planning. It takes both internal (within the Tribe) and external (outside the Tribe) factors as well as current and future considerations into account for determining strengths, opportunities, aspirations, and results related to your Tribe and the local energy landscape. Below are some examples of what might be included in a SOAR analysis for strategic energy planning:

Table 2. Example SOAR Analysis

	INTERNAL	EXTERNAL
CURRENT	<u>Strengths</u> <i>What strengths do we already have that we can build upon?</i> - Local Traditional Knowledges to guide energy strategies - Meaningful and effective community engagement in the energy planning process - Experienced Tribal personnel - Energy champions - Strong leadership - Community mindset - Tribal building codes - Existing partnership and agreements with local/regional energy entities - Existing energy infrastructure - Existing energy efficiency measures	<u>Opportunities</u> <i>What are the possibilities? How can we innovate?</i> - Local and state energy incentives for solar and efficiency - Potential partnerships to support diversifying energy supply - Regional policy support for renewable energy implementation - Establishing workforce development program for energy sector - Training programs - Bidirectional electric vehicle charging - Energy efficiency - Natural reset opportunities such as aligning development with planned infrastructure upgrades or upgrades after a natural disaster - Building design
FUTURE	<u>Aspirations</u> <i>What do we care deeply about? What are our dreams and wishes? How do our values drive our vision? How can this work make a difference for those it's intended to serve?</i> - Increased energy sovereignty - Robust workforce to sustain energy plan and provide jobs to Tribal members	<u>Results</u> <i>How do we know we are succeeding? What will be our measurable and meaningful outcomes? How do we define or measure success? What does it look like?</i> - Greenhouse gas emissions reductions - Lower household energy bills - Amount of energy storage capacity installed

	Net-zero carbon emissions across Tribal built infrastructure	Increased energy security during power shutoffs and natural hazard events
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