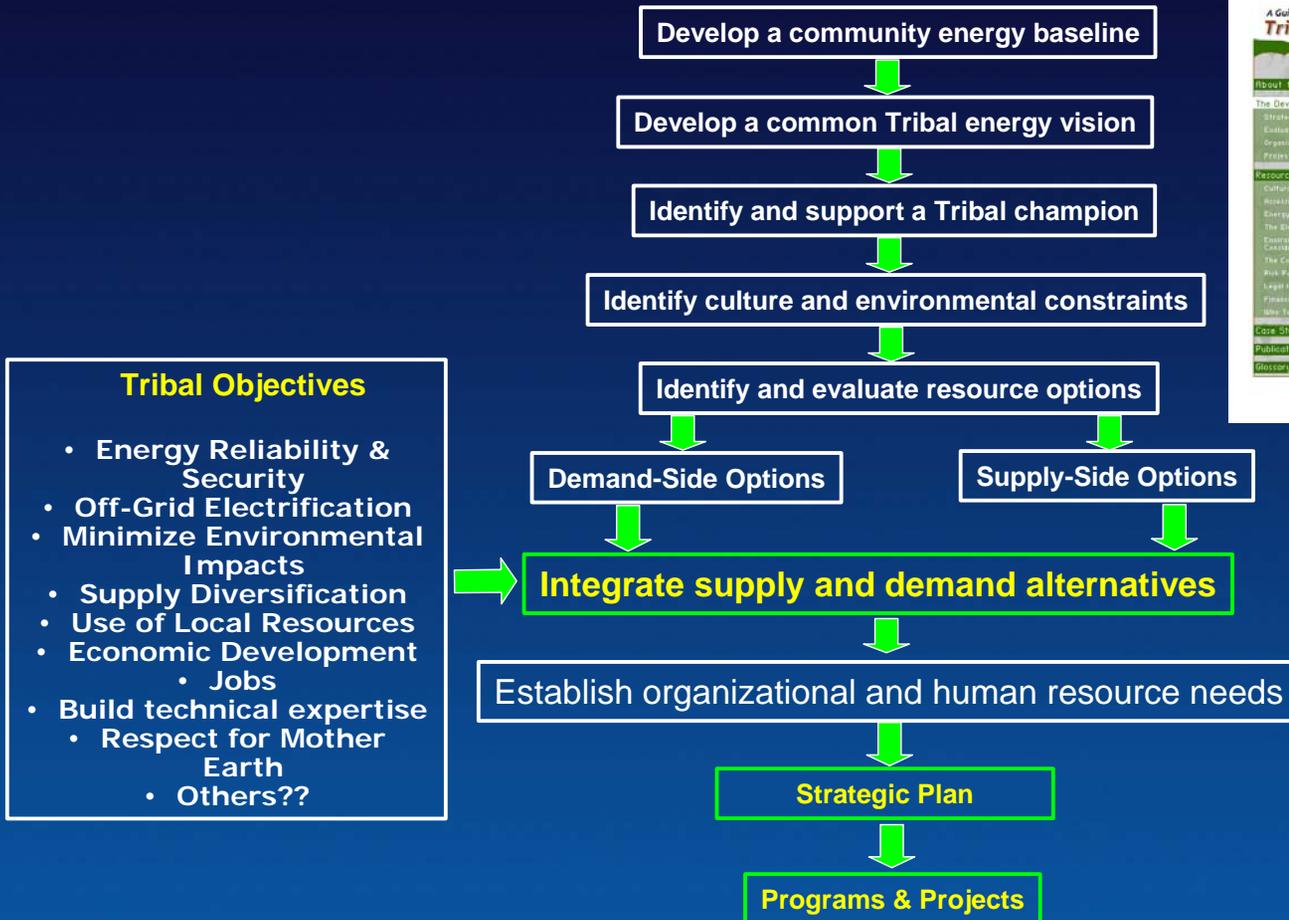
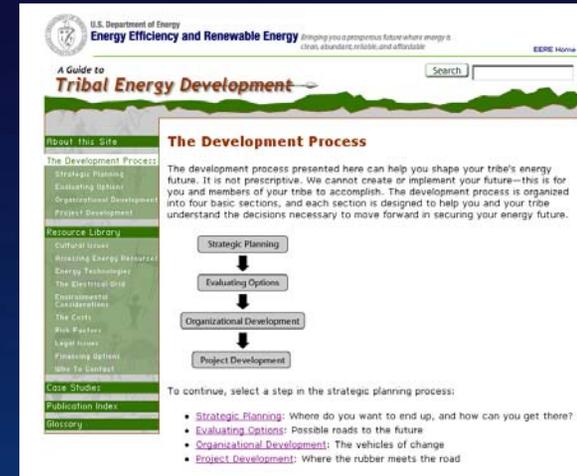


Innovation for Our Energy Future

Tribal Energy Development – Process & “Guide”

<http://www.eere.energy.gov/tribalenergy/guide>



Strategic Energy Planning

*Defining where you are,
Where you want to go, and
Developing a plan to get there.*



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Strategic Planning

Where do you want to end up, and how can you get there?

The first step in understanding your energy journey is to envision your destination. Where is it you want to go? What does that place look like? At the same time, take stock of where you are now, to better understand the resources you will need to get to your destination. The difference between these two points, where you are, and where you want to be, defines the work that needs to be done. Energy strategic planning can be a relatively straightforward process, as demonstrated below. However, the work needed to complete a plan may be considerable.

To continue, select a step in the strategic planning process or [print the complete process](#):

- [Vision Statement](#): Where do you want to end up?
- [Champion](#): Who's going to lead the charge?
- [Energy Needs and Forecasts](#): Defining the problem
- [Resource Options](#): Energy supplies available from on and off the reservation
- [Preliminary Options](#): Choosing your tribe's best options
- [Bounding the Problem](#): Identifying your tribe's priorities
- [Strategic Plan](#): Putting it all together

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Any form of energy planning—whether it be for an individual building, a tribe, or a country—necessarily starts with understanding the building's, tribe's or country's energy needs. What is the load? What are the services that are being provided or need to be provided? How much is being provided today? By what energy sources? And finally, how are these energy needs expected to grow in the future, as population expands and as local economic activities develop?

As the strategic plan begins to take shape and the focus on specific options narrows, more detailed load assessments may need to be done. At this stage, the objective is to understand the big picture, and be able to answer the following basic questions. Developing answers to these questions will help the tribe understand the present "as-is" situation, or energy baseline. The gap between the energy baseline and the vision needs to be filled through the action of the strategic plan. Every journey has a beginning and an end. Answering these questions helps define the beginning, the energy baseline.

- Who are your current energy service providers?
- How are energy supplies presently distributed to the tribe?
- Are both gas and electricity available?
- How much of each is used on a monthly basis (monthly load profiles for tribe as a whole or for major individual loads).
- What is the per-unit cost of various energy supplies? What is the electricity tariff structure? How is the tribe's energy use being metered?
- How do you expect the tribal load or major loads of concern to increase in the future? Will there be a concentration of new load or will it be dispersed throughout the tribe?
- What are the economic development interests of the tribe that would impact the need for additional energy supplies?

Developing the answers to these questions builds the foundation upon which new energy planning takes place. It is a truism in today's energy economy that it is often cheaper to save energy than to build new generation capacity to meet increasing needs. Establishing an awareness of where and how major energy costs are impacting the tribe is the first step. That step will also help the tribe to define the energy efficiency opportunities that should be integrated into the strategic energy plan.

- **Energy Reliability & Security**
- **Off-Grid Electrification**
- **Minimize Environmental Impacts**
- **Supply Diversification**
- **Use of Local Resources**
- **Economic Development**
 - **Jobs**
- **Build technical expertise**
 - **Respect for Mother Earth**
 - **Others??**



Develop a community energy baseline



Community Energy Audit

- All individual energy flows, in detail
- Buildings, Transportation, Agriculture, Water

Forecast of New Loads

- Markets, Coops, Housing, Lodging, Casino, Warehouse

Details of current Service Providers

- Who, where, how much, tariffs, level of cooperation
- Electric, Gas, Propane, Wood
- Load profiles, in detail

Local Energy Supply Options

- RE and fossil fuel inventory

Add it all up, categorize by load type, quantify load growth

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Vision Statement

Developing a strategic plan should start with a vision, or goal, in mind. Where is it you want to get to? Developing a tribal energy vision should go hand-in-hand with other tribal objectives, like economic development, job creation, and cultural values.

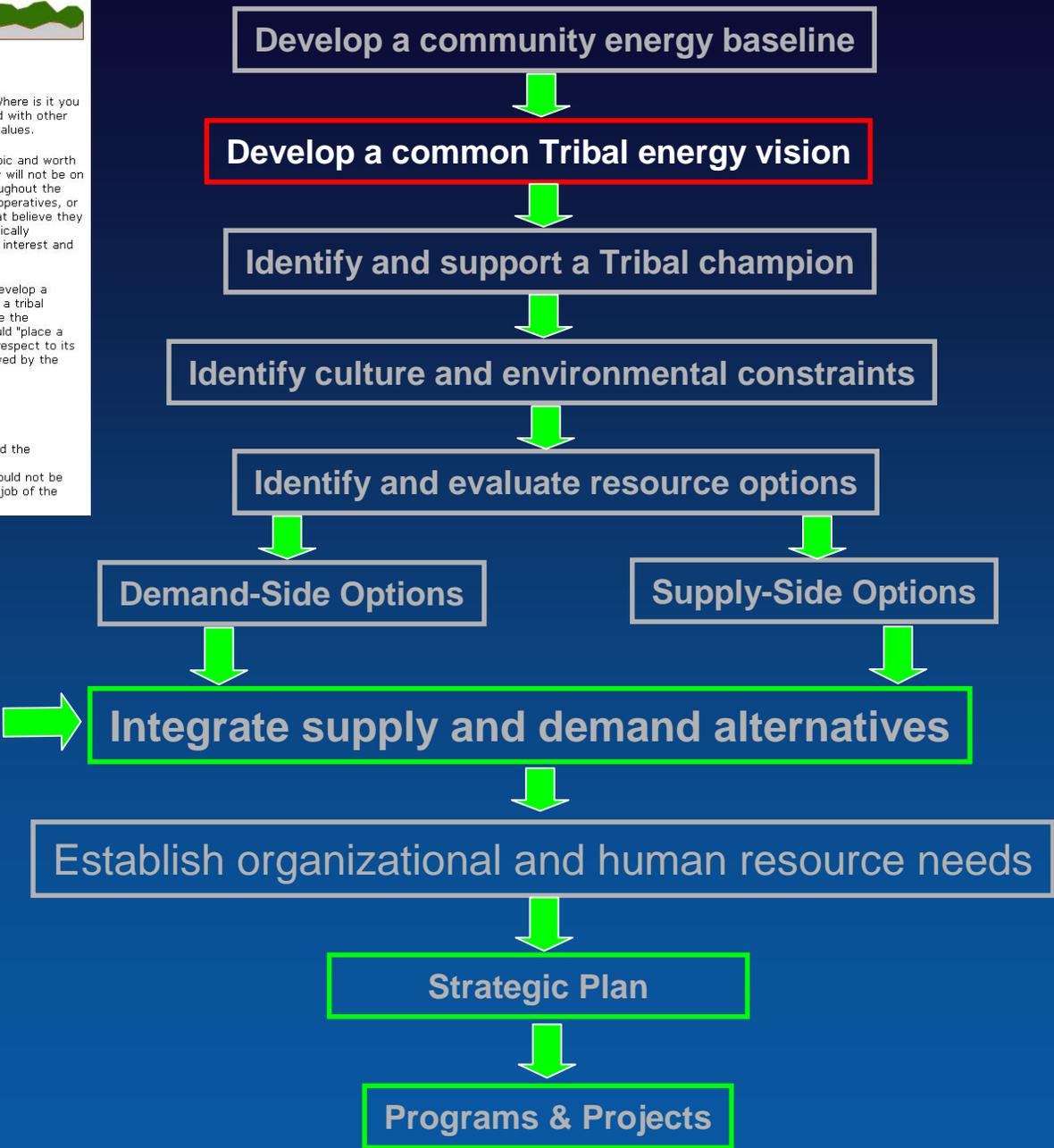
The first step is to agree within the tribe that energy is an important topic and worth including in the top items requiring the attention of tribal leaders. Energy will not be on the priority list for many tribes, and that is okay. In several regions throughout the United States, intertribal energy collaboration, the formation of tribal cooperatives, or other business relationships may make the most sense. But for tribes that believe they are overly dependent on energy imports from outside, that have economically developable local energy resources (renewable and fossil), and have the interest and commitment to change their energy future, the opportunities are many.

For tribes committed to securing their energy future, it is important to develop a common tribal vision. There is no prescription for the process to develop a tribal energy vision. The vision does not need to be static over time, but unlike the strategic plan itself (which is often an iterative process), the vision should "place a marker" on where the tribe wants to be, in say 5, 10, or 20 years, with respect to its energy situation. The vision should be a statement, or resolution, approved by the Tribal Council following active input from the broader tribal community.

Several things must emerge from this process.

- The vision should set the policy direction for tribal action
- A tribal champion should emerge, empowered and supported to lead the strategic energy planning process forward.
- The vision should be specific enough to set clear direction, but should not be prescriptive in the methods used to achieve the vision (this is the job of the strategic plan itself).

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Develop a common Tribal energy vision

- Place a “marker” on where the tribe wants to be – in 5, 10, or 20 years
- A statement, or resolution, approved by the Tribal Council following input from broader tribal community
- The vision sets clear direction, but is not too prescriptive

Examples of possible tribal energy vision statements might include:

- Establish tribal energy independence, self-sufficiency, and security through development of indigenous resources, capabilities, and institutions within the next generation.
- From the [Navajo Tribal Utility Authority](#):
"To provide electric, natural gas, water, wastewater treatment and related services at competitive prices, while contributing to the economy of the Navajo Nation, consistent with the improvement of the health and wealth of the residents of the Navajo Nation, and the employment of the Navajo people."
- From the Hopi *Hopit Poptskwaniat* — Energy Related Goals:
"To provide affordable and environmentally safe energy for local residents and businesses for the purpose of economic self-sufficiency."
- From the Cow Creek Band of Umpqua Tribe of Indians, Tribal Legal Code, Title 300 ([PDF 239 KB](#)) [Download Acrobat Reader](#).:
"The purpose for which the Utility is organized is to provide an entity through which the Tribe may exercise all natural gas utility, electrical utility, other energy utility, water and sewer utility, telecommunications utility, and mineral use and development functions for the benefit of the Tribe, and to regulate all such utility matters of third parties on the Reservation."
- From the charter of the Aha Macav Power System (AMPS), the tribal utility for the Fort Mojave Indian Tribe:
"The Fort Mojave Tribal Council hereby finds and declares that the creation of AMPS is necessary and desirable in order to promote the development of the Tribe's resources, to promote the prudent economic vitality of the Reservation and surrounding communities, to protect the health and welfare of tribal members and to provide employment and training opportunities for tribal members."

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Champion

The importance of identifying a tribal energy champion cannot be understated. As the number of opportunities and challenges in Indian country expand, any progress that will be made in initially developing, then later implementing, a tribal energy plan requires the dedicated leadership and continuity provided by the tribal energy champion (or champions, as the case may be).

Energy planning and implementation is a long-term, multi-year process. Continuity over time is absolutely required for success, whether the focus is on cost reduction through the use of efficiency measures or electricity independence through new generation. The seeds of energy decisions often take many years to bear fruit. The steady, patient, yet persistent hand of a tribal energy champion is indispensable.

Like all true champions, tribal energy champions are not often appointed, but emerge through their innate interest and hence commitment to leadership. Only you can identify your tribal energy champion. Look for the interest, the commitment to follow-through, and the leadership, and then surround this person with expertise and support.

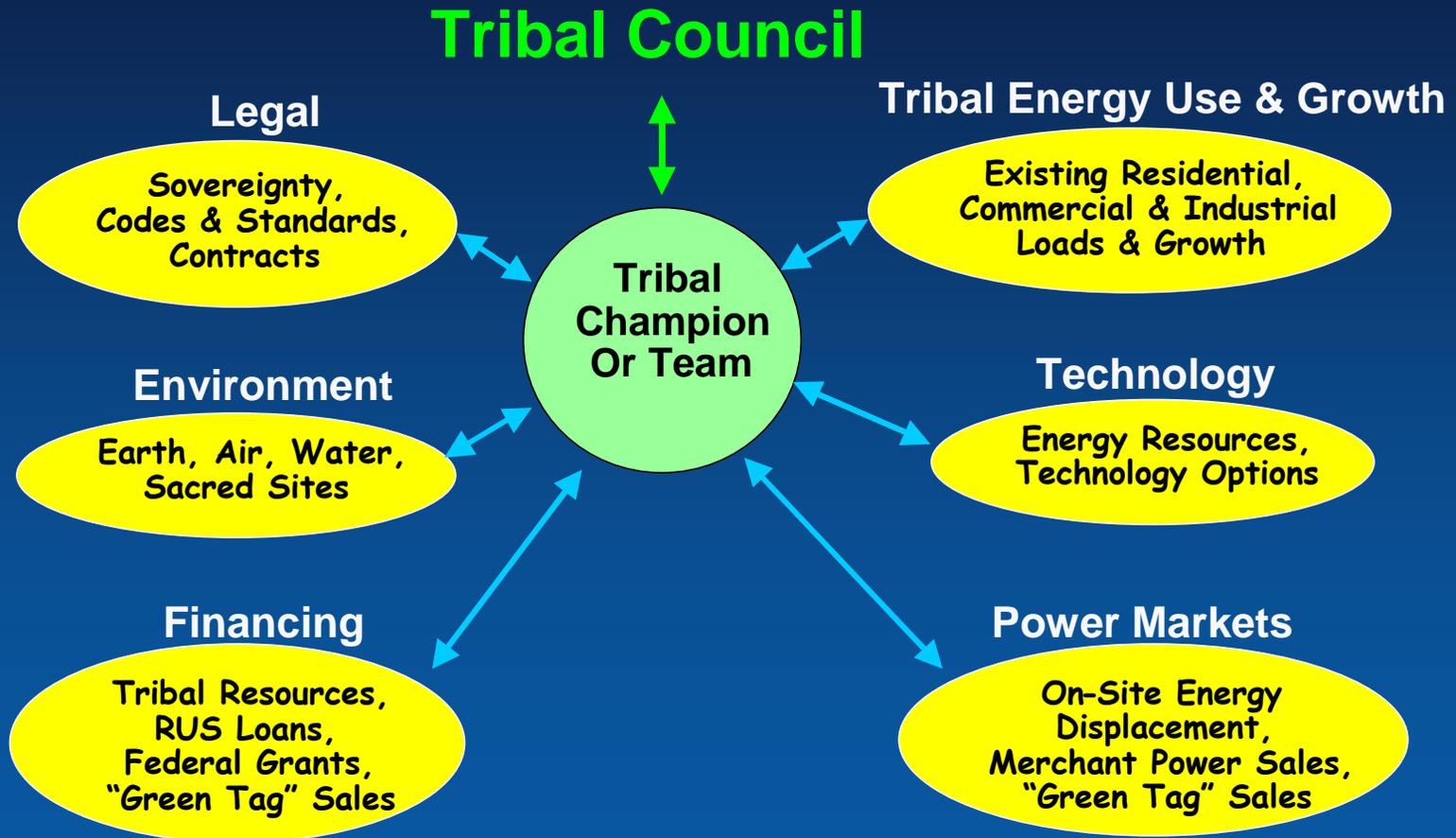
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- ### Tribal Objectives
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Identify and support a Tribal champion

A tribal champion (or team) is key - empowered to lead the strategic energy planning process forward



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Cultural Issues

As the population on tribal lands grows and the pressing need for economic development and an improved quality of life on the reservation continues, tribes are increasingly faced with the challenge of meeting their energy needs. For tribes, part of that challenge is to meet their energy needs while maintaining their cultural identity and values.

Energy development on tribal lands is a balancing act. Energy development can provide local jobs, tribal income, and the satisfaction of energy self-sufficiency, while also providing important contributions to the broader energy-hungry U.S. economy. At the same time, energy development can damage the earth, streams, air, and even tribal culture if not carried out in an environmentally and culturally respectful manner. Thus is the challenge.

Some key questions for tribes include:

- How to change with the times in a way that works for the entire community?
- How can this be accomplished in a manner that respects tribal needs and values?
- What are the tradeoffs in between quality of life, economic development, and the environment?

To paraphrase the challenge: *"Western development looks at things as resources. We look at them as relatives."*

When considering energy alternatives, consider renewable energy. There is an inherent compatibility between renewable energy and traditional values that respect the earth, air, and water. Renewable power plants provide power without exhausting the resource and without polluting the environment. They are sustainable—the resource will be there for generations to come. They fit well within the web of nature.

This handbook is intended to provide useful information to help make the best energy decisions for your tribe. The following are some aspects of the balancing act between energy development and tribal cultural values that you may wish to consider:

[The Impacts of an Energy Project](#)
[Sovereignty and Energy Decisions](#)
[Working with Outside Organizations and Companies](#)

Impacts

- Supply Diversification
- Use of Local Resources
- Economic Development
 - Jobs
- Build technical expertise
 - Respect for Mother Earth
 - Others??



Identify culture and environmental constraints

- Natural Resource Valuation
 - Water and Air
 - Wildlife Habitat
 - Forests, rangelands, wetlands, other
- Technology Effects
 - Emissions, Aesthetics, Noise
- Economic Development Trade-offs
- Cultural Impacts – (Sacred Sites, Plants, Burial Grounds)
- Tribal Impact – Community & Government
- Other Considerations

- Holistic Approach to development

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Assessing Energy Resources

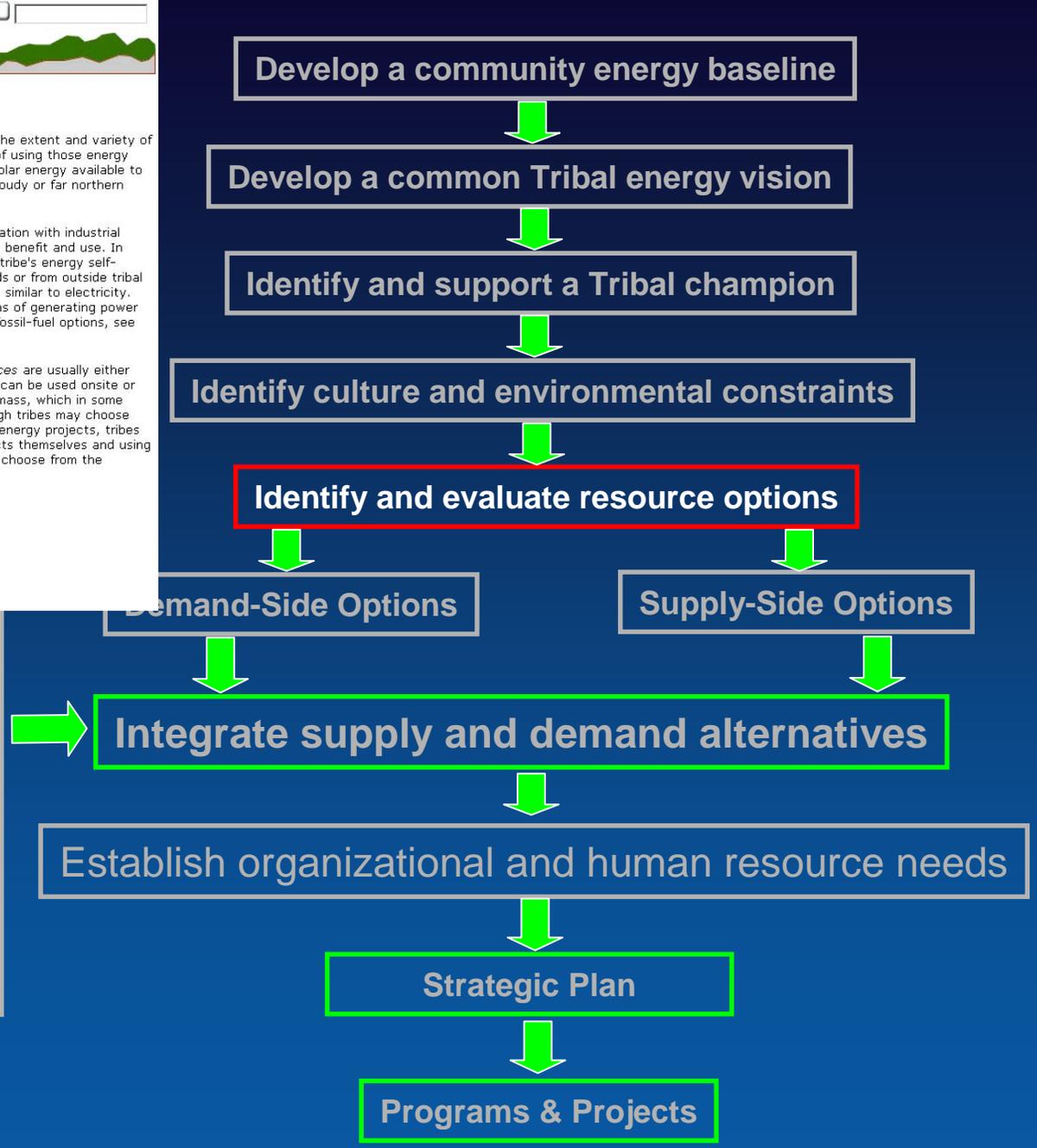
All tribal lands have some usable energy resources, although the extent and variety of available energy sources varies widely, as do the economics of using those energy resources. For instance, even the smallest tribal lands have solar energy available to them, and solar electricity is feasible for some uses even in cloudy or far northern climates.

Most fossil-fuel resources on tribal lands are tapped in cooperation with industrial partners and provide a royalty stream back to the tribe for its benefit and use. In most cases, these projects contribute little or nothing to the tribe's energy self-sufficiency. But if natural gas is available—either on tribal lands or from outside tribal lands via a pipeline—it can serve as an energy source in ways similar to electricity. Natural gas can be used as both a heating source and a means of generating power on both small and large scales. For more information on your fossil-fuel options, see [Fossil-Fuel Resources](#).

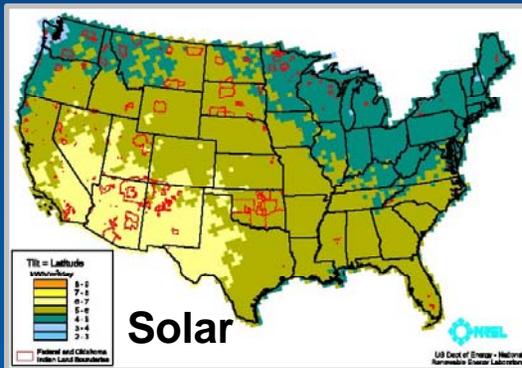
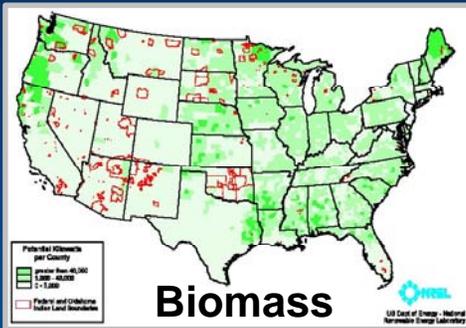
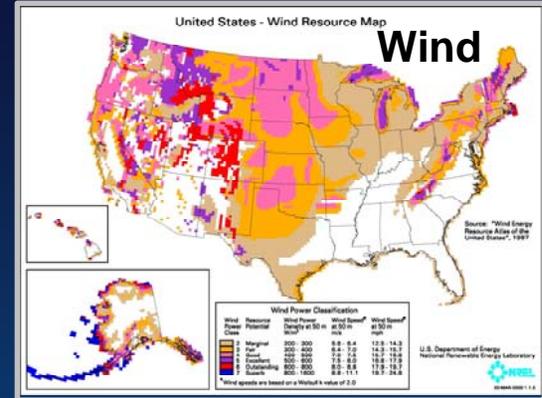
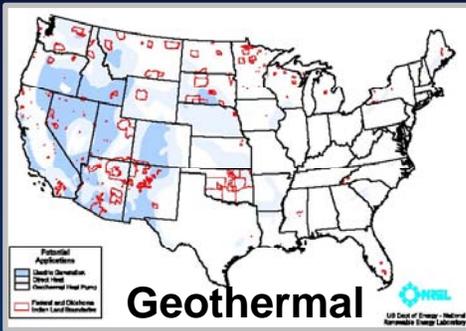
In contrast to fossil-fuel resources, renewable energy resources are usually either used at their location or are converted into electricity, which can be used onsite or fed into the power grid. The sole exception to that rule is biomass, which in some forms (such as wood) can be shipped short distances. Although tribes may choose royalty-stream arrangements for some large-scale renewable energy projects, tribes would likely accrue benefits more rapidly by owning the projects themselves and using their energy production as they see fit. For more information, choose from the renewable energy sources listed below:

- [Biomass](#)
- [Geothermal](#)
- [Hydropower](#)
- [Solar](#)
- [Wind](#)

- Off-Grid Electrification
- Minimize Environmental Impacts
- Supply Diversification
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- Build technical expertise
 - Respect for Mother Earth
 - Others??



Identify and evaluate resource options



Develop a community energy baseline

Develop a common Tribal energy vision

Identify and support a Tribal champion

Identify culture and environmental constraints

Identify and evaluate resource options

Demand-Side Options

Supply-Side Options

Integrate supply and demand alternatives

Establish organizational and human resource needs

Strategic Plan

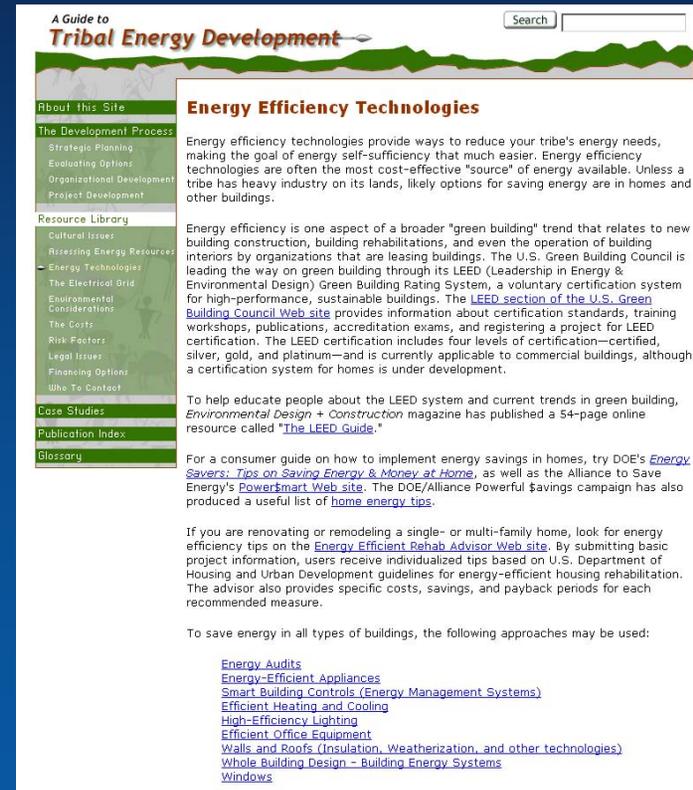
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Demand-Side Options

- Fuel Switching (electricity, gas, propane, wood)
- Weatherization
- Efficiency
 - Appliances
 - Lighting
 - Heating & Cooling Systems
 - Commercial & Industrial Loads
- Demand Response and Load Shifting
- Direct Load Control
- Considerations
 - Quantifying available resource
 - Measuring effects of actions



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Energy Efficiency Technologies

Energy efficiency technologies provide ways to reduce your tribe's energy needs, making the goal of energy self-sufficiency that much easier. Energy efficiency technologies are often the most cost-effective "source" of energy available. Unless a tribe has heavy industry on its lands, likely options for saving energy are in homes and other buildings.

Energy efficiency is one aspect of a broader "green building" trend that relates to new building construction, building rehabilitations, and even the operation of building interiors by organizations that are leasing buildings. The U.S. Green Building Council is leading the way on green building through its LEED (Leadership in Energy & Environmental Design) Green Building Rating System, a voluntary certification system for high-performance, sustainable buildings. The [LEED section of the U.S. Green Building Council Web site](#) provides information about certification standards, training workshops, publications, accreditation exams, and registering a project for LEED certification. The LEED certification includes four levels of certification—certified, silver, gold, and platinum—and is currently applicable to commercial buildings, although a certification system for homes is under development.

To help educate people about the LEED system and current trends in green building, *Environmental Design + Construction* magazine has published a 54-page online resource called "[The LEED Guide](#)."

For a consumer guide on how to implement energy savings in homes, try DOE's [Energy Savers: Tips on Saving Energy & Money at Home](#), as well as the Alliance to Save Energy's [PowerSmart Web site](#). The DOE/Alliance Powerful Savings campaign has also produced a useful list of [home energy tips](#).

If you are renovating or remodeling a single- or multi-family home, look for energy efficiency tips on the [Energy Efficient Rehab Advisor Web site](#). By submitting basic project information, users receive individualized tips based on U.S. Department of Housing and Urban Development guidelines for energy-efficient housing rehabilitation. The advisor also provides specific costs, savings, and payback periods for each recommended measure.

To save energy in all types of buildings, the following approaches may be used:

- [Energy Audits](#)
- [Energy-Efficient Appliances](#)
- [Smart Building Controls \(Energy Management Systems\)](#)
- [Efficient Heating and Cooling](#)
- [High-Efficiency Lighting](#)
- [Efficient Office Equipment](#)
- [Walls and Roofs \(Insulation, Weatherization, and other technologies\)](#)
- [Whole Building Design - Building Energy Systems](#)
- [Windows](#)

Supply-Side Options

- Conventional Technologies
- Cogeneration
- Renewable Technologies
- Attributes to Consider
 - Plant Capacity
 - Fuel Type
 - Efficiency
 - Reliability
 - Capital, Operating & Lifecycles Costs
 - Lifetime & Decommissioning
 - Environmental Impacts

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Renewable Energy Technologies

A wide range of renewable energy technologies have been developed, allowing each renewable energy resource to serve at least two applications, and often more. The primary renewable energy technologies that are commercially available today include:

- [Wind Turbines](#)
- [Hydroelectric Power](#)
- [Geothermal Energy Systems](#)
- [Photovoltaic Solar Power Systems](#)
- [Concentrating Solar Power Systems](#)

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Supply-Side Options

Integrate supply and demand alternatives

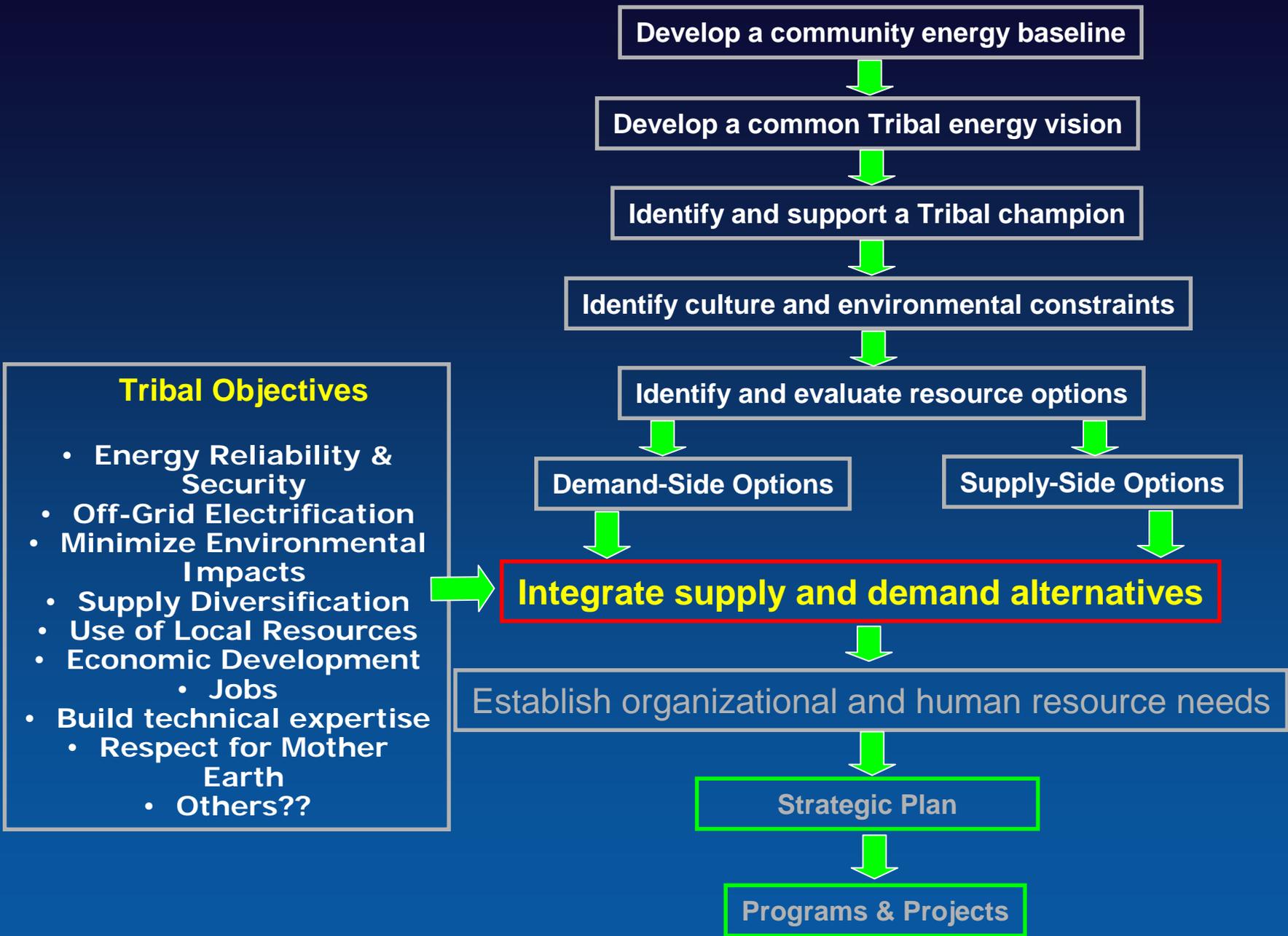
Establish organizational and human resource needs

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Demand-Side Options

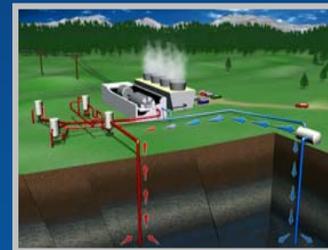
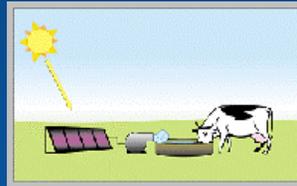
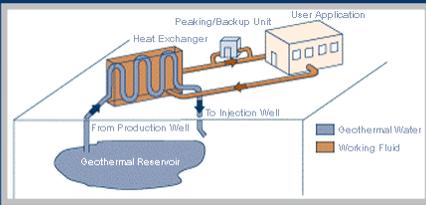
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Tribal Objectives

Integrate supply and demand alternatives

Demand-Side Actions

Supply-Side Actions



Community Activities

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Organizational Development

It may be necessary to develop new organizations or institutions to effectively implement your tribal energy plans and projects. In some cases, it may be possible to expand the responsibilities of an existing tribal entity to take on the responsibility of energy implementation, but sometimes a whole new entity, such as a tribal utility, is needed. Sometimes, joint ventures with outside partners may make the most sense, although true tribal economic development cannot be achieved by simply contracting out the opportunity.

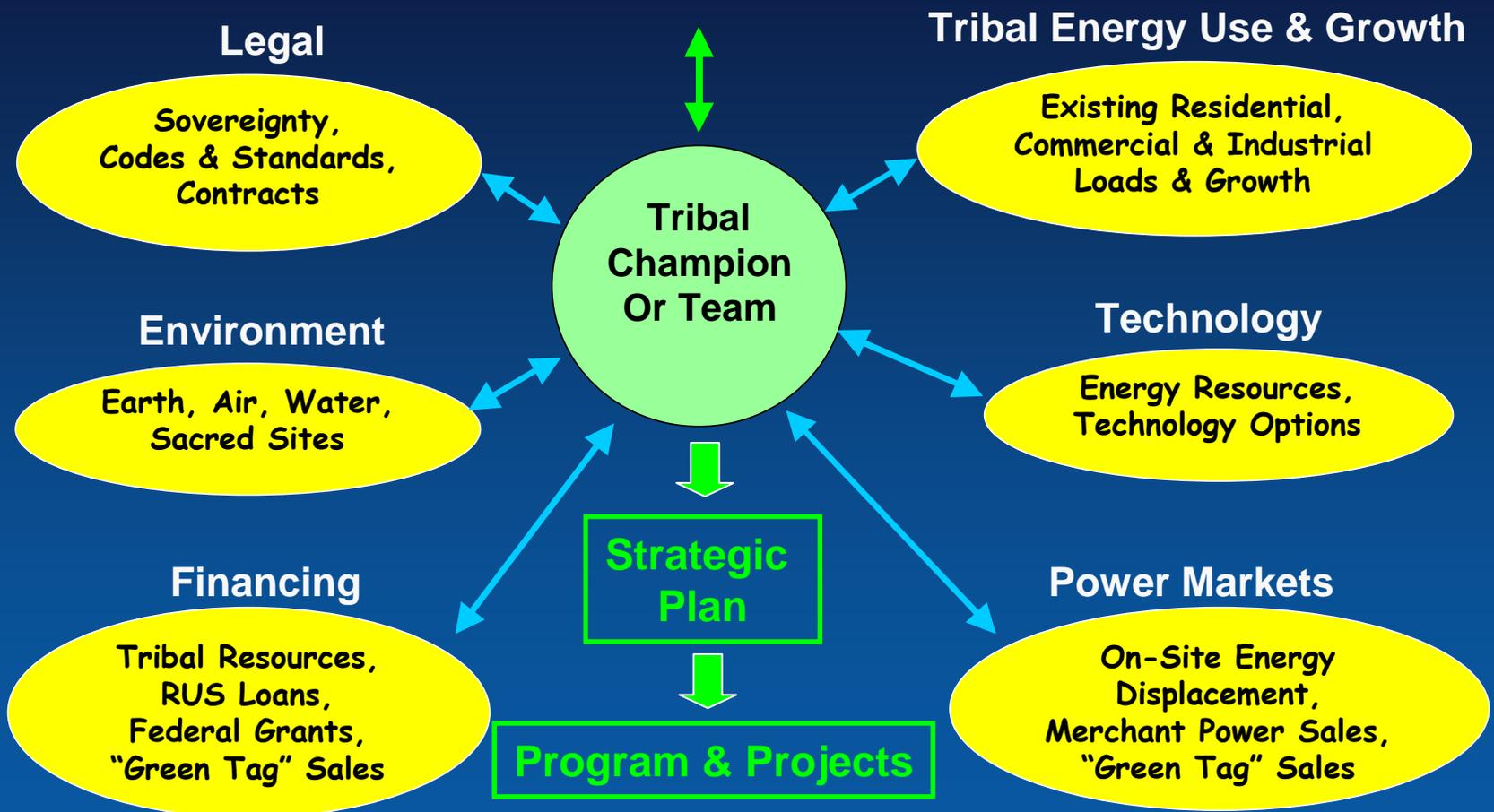
The foundation of organizational development is human capacity. Effective strategic energy planning requires addressing a host of issues including legal, environmental, finance, energy end-use, technology, and market elements. The section on [Human Capacity Development](#) describes these elements. Ideally a tribe would have all this expertise in-house, but very seldom does, relying instead on consultants and other outside experts. While this is often necessary to begin with, tribes should be working to build this internal capacity. Going through the strategic planning process will help build this capacity, but the more a tribe can build this internal capacity, the more sovereign it becomes, and the faster it can make effective decisions to promote economic development opportunities, in energy and elsewhere.

There are many organizational options. The "organization," in this context, refers to the legal business structure that is set up to implement energy projects. Energy projects are usually long-term (10-, 20-, 50-year) commitments and require a stable professional business-like structure to sustain the project performance (operations and maintenance, revenue collection, and debt payment) after construction. Energy efficiency projects can be accomplished without a formal organization, but they are more effective, more comprehensive, and can reach more tribal homes and commercial buildings if they are well organized. The following sections describe four of the most common options.



- Minimize Environmental Impacts
 - Supply Diversification
 - Use of Local Resources
 - Economic Development
 - Jobs
 - Build technical expertise
 - Respect for Mother Earth
 - Others??

TRIBAL ENERGY



Program & Projects

Characteristics of a Solution

- Rapid
- Technically & Institutionally Sustainable
- Maximize Coordination
- Politically Feasible
- Attracts Financing, Capital, Sweat Equity
- Reinforces tribal enterprises

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Project Development

With a Strategic Plan in hand, knowing your tribe's viable energy options, and having chosen your preferred institutional arrangements, it is then possible to formulate an action plan, raise funding, and move forward with specific projects that contribute to your tribal energy sufficiency goals.

Before actually committing to construction, most energy projects benefit from a more detailed [feasibility assessment](#). The initial screening that takes place during strategic plan development should identify a number of interesting options while generating lots of unanswered questions. For the preferred options, conducting a good feasibility assessment will reduce the list of interesting options down to the possible options, which can be further ranked by criteria important to the tribe. The winners can then move into the project development process.

As part of the feasibility assessment, the tribe should begin discussions with the local electric utility about an interconnection agreement. The [interconnection process](#) should proceed in parallel with the project development process, which is mapped out below. Each step will provide you with much, if not all, of the information and documentation needed to move your individual projects forward. To continue, select a step in the process.

```
graph TD; MD[The Management Decision] --> CO[Contract Out]; MD --> TD[Tribal Development]; TD --> ED[Engineering Design]; TD --> PA[Power Agreement]; ED --> PL[Permitting and Licensing]; PA --> PL; PL --> PF[Project Financing]; PF --> HD[Hardware Development]; HD --> CT[Construction & Training]; CT --> COM[Commissioning]; COM --> OM[Operations & Maintenance];
```

Opportunities & Strategies

- Tribal utility formation
- Strategic industry partnerships
- Tribal cooperatives
- Energy service companies
- Small businesses
- Education (link Tribal Community Colleges with Tribal needs)

Barriers Identification

- Financing
- Human Capacity Development
- Organizational Development
- Tribal Laws and Regulations
- Clear Decision Making Process
- Stable Leadership

Congratulations!

Those of you that make it through this process will be well on your way to tribal energy sovereignty.

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