Sustaining the Seventh Generation: Strategic Energy Planning of American Indian Tribes

by

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1. Introduction

In a world of unstable energy prices, oil spills, and the harmful effects of climate change, many communities are recognizing the need for sustainable management and development of their energy resources. This has been especially true for American Indian communities where the management of both renewable and nonrenewable resources is intertwined with energy independence and tribal sovereignty. The U.S. Department of Energy (DOE) has estimated that American Indian tribal lands hold roughly ten percent of all federal onshore energy minerals while making up less than five percent of the total land area in the U.S. Tribal lands are estimated to contain three percent of the U.S.’s known oil and gas reserves, as much as 30 percent of the coal west of the Mississippi, and up to a third or more of the nation’s uranium reserves (Cohen, 2005, p. 1086, 1107). The DOE also predicted that sixty-one of the most populous tribal reservations and jurisdictional areas appear to have the potential for significant renewable energy development (though excluding transmission costs) (EIA, 2000). As technological advancements continue to make renewable and nonrenewable resources more accessible for development, tribes are increasingly looking to develop these resources in ways that help them become more energy independent and boost tribal revenues.

The purpose of this study is to analyze both the energy development and energy planning efforts of American Indian communities. The study analyzes what energy resources are currently being developed on tribal lands, who is developing these resources, what regions particular resources are being developed, and why tribes are developing these energy resources. The study also analyzes aspects of tribal energy plans in addition to energy related policies and incentives offered by tribes. The main source of information for this study comes from a survey sent to tribal leaders and to tribal employees working on energy issues and asked them to describe and classify their tribe’s energy planning and development efforts. Overall this study is intended to provide a status report on tribal energy planning and development and examine the future implications of these efforts. The main research questions include; what are the impetuses and conditions under which tribes develop some type of energy plan or energy resources, what issues are connected to the energy plans and energy development, how are the plans being used, and what are the cross tabulations and correlations between energy resource development and planning strategies.

The key findings of this study include a clear indication that tribal governments are the main institutions developing energy resources on tribal lands and that energy resource development by non-tribal entities is minimal. Tribes are primarily using federal incentives and advisory services to develop energy plans and to initiate renewable energy development and management for tribal communities. Based on energy resource maps for tribal lands, it appears tribes are not taking full advantage of the renewable energy resources best suited for development in their regions. Overall, tribes with energy plans are more likely to connect energy development with other issues facing the tribal community, such as a need for economic development, and to link energy development to the goals of the tribal community. In addition, tribes with more land area, population, and
higher levels of income are developing a wider range of resources than tribes with smaller land areas, smaller populations, and lower income levels.

The prevalence of energy resources on Native American lands, the links between energy management and tribal sovereignty, and the recent opportunities for strategic energy planning from sources like the DOE Tribal Energy Program and American Recovery and Reinvestment Act (ARRA) make tribal energy planning an interesting case study for community energy planning. This paper studies the strategic energy planning efforts, energy resource development, and energy goals and policies established by tribes within the continental US. As sovereign nations, Native American tribes are in unique positions to control and manage their own energy resources in ways that other state and local governments cannot. However, the lessons learned from tribal energy planning can provide valuable case studies for communities across the U.S.

2. Context and Literature Review

Despite the energy resources located on American Indian lands, more than 14 percent of American Indian households on reservations have no access to electricity, compared to 1.2 percent of all US households (NWF, 2010). For example, while the Navajo Nation has substantial oil, uranium, coal, and renewable energy resources within its borders, an estimated 16,000 out of about 45,000 (36%) Navajo households are without access to electricity and many more homes and families are without access to basic infrastructure, such as telephones, water, wastewater, and natural gas services (NTUA, 2012 and ACS 2006-2010 estimates). While some large tribes, like the Navajo, have their own electrical utilities, most energy utilities that serve American Indian communities are not owned and operated by tribal entities, meaning money paid to these utilities does not stay within the tribe. This disconnect between the prevalence of tribal energy resources and the use of these resources for the benefit of the tribe is a partial reflection of the complex and complicated history of tribal energy development and its relation to tribal sovereignty.

While federal policy regarding tribal mineral leases and energy resources was repeatedly reformed over the 20th century, researchers believe they all failed to fully promote economic development or increase tribal sovereignty while preserving environmental quality on tribal lands. The Harvard Project on American Indian Economic Development spent a decade identifying the key factors in successful economic development and determined that one of the key factors is increasing tribal sovereignty. Tribes have historically viewed federal mineral rights and energy resource policy as a challenge to tribal sovereignty that compromises the ability of the tribe to govern as a semi-sovereign nation in the U.S. According to the Harvard Project, tribal sovereignty has both practical and political aspects. The Harvard Project defines political sovereignty as “the extent to which a tribe has genuine control over reservation decision-making, the use of reservation resources, and relations with the outside world.” Practical sovereignty “puts the development agenda in “Indian hands” and “marries decisions and their consequences, leading to better decisions,” thus promoting more effective and sustainable development (Cornell & Kalt, 2006, p. 12). The long history of tribal self-government forms the basis for
the modern tribal political sovereignty and the exercise of tribal powers. Tribal powers of self-government within the territorial bounds of the U.S. are recognized by the U.S. Constitution, legislation, treaties, judicial decisions, and administrative practices. Neither the passage of time or assimilation of American Indians can be interpreted as diminishing a tribe’s status as a self-governing entity, and once recognized, a tribe retains its sovereignty until Congress acts to divest that sovereignty (Cohen, 2005, p. 205-206). Federally recognized tribes generally have the powers to determine the form of tribal government, determine membership, legislate and tax, administer justice, exclude persons from tribal territory, and power over nonmembers of the tribe residing within a tribal jurisdiction (Cohen, 2005, p. 201-202). Despite this legal foundation for the political sovereignty of tribes, the practical sovereignty of tribes has often been undermined, especially with the development of nonrenewable energy resources.

Tribes with nonrenewable energy resources have a troubled history with mining companies who operated on tribal lands under mining leases that ensured revenues to the tribes were only a fraction of what they were worth at market value. However, since only about 40 out of the 335 continental U.S. tribes have already experienced development of their nonrenewable resources, many tribes have not experienced this troubled history with energy development (Wilkins & Stark, 2011, p. 155). With the advent of new extraction techniques for nonrenewable resources (such as hydraulic fracturing for natural gas) and the prospect for large-scale renewable energy development on many tribal lands, many new tribes could experience energy development on their lands and accompanying federal regulations. With the tension between these federal regulations and tribal sovereignty, it will be important for tribes to understand the history behind federal tribal energy regulations and how energy plans can help tribes navigate these regulations while promoting or preserving their sovereignty.

2.1 History of Tribal Energy Development and Federal Regulations

Allotment Era
One of the first modern tribes to experience development of their non-renewable energy resources was the Navajo. Pressure and harassment from oil companies actually led to the first assembly of Navajo leaders and the formal establishment of the first Navajo Tribal government in 1923. Forming this government allowed the Navajo to negotiate with the oil companies as a formal entity (Wilkins and Stark, 2011, p. 155). The Navajo government was formed during the “allotment era” of federal policy regarding Indian mineral rights, which under the 1891 allotment statute authorized tribal councils to issue grazing and mining leases. However, application of the law varied in the degree of tribal consent that was required to negotiate mineral leases and all of the leases authorized state taxation on production during this era. Some consistent traits of the leases during this era included federal government control over decisions regarding what resources could be developed and for what period of time (Royster, 2009, p. 1072).

Reorganization Era
The 1934 Indian Reorganization Act (IRA) authorized tribes to form constitutional governments and required tribal government consent before entering into mineral leases.
While mining and oil companies were required to get consent from the tribe before extracting resources, the full details of the mineral rights leases were negotiated by the U.S. Department of the Interior (DOI). This process often led to leases that were undervalued compared to what mining companies were paying on the open market to non-Indian property owners. For example, the original lease negotiated by the DOI for the Peabody Coal Company Black Mesa coal mine on the Navajo Reservation, paid the Navajo $.17 per ton of coal during a time when standard payment was $1.50. Since there was no provision in the lease for renegotiation when the price of coal increased, the Navajo still received $.17 per ton even during energy crisis of the 1970s when coal reached $15 per ton. In addition, the Black Mesa coal mine also consumed much of the Navajo’s water resources for a coal slurry and left behind toxic waste before it was closed in 2006 (Perdue and Green, 2010, p. 106-107). DOI negotiated mineral leases also resulted in uranium mines that created significant environmental damage and toxic waste on the Navajo and Hopi reservations. These uranium leases were quickly negotiated during and shortly after WWII to supply the development of the U.S. nuclear arsenal. These abandoned uranium mines still threaten the health of tribal members and livestock raised on reservation lands, but the responsible mining companies have long-since dissolved or gone out of business (Macmillan, 2012). Both the Black Mesa and uranium mining controversies exemplify the failures in the historic policy of requiring the DOI to negotiate mineral leases on behalf of American Indian tribes. This historic policy resulted in the economic exploitation of the Navajo and severe environmental degradation on parts of the Navajo reservation.

In response to this era of exploitation of tribal energy resources, in 1974, 25 energy-resource-rich tribes organized the Council of Energy Resource Tribes (CERT). The tribe’s purpose for creating CERT was to provide a clearinghouse for providing information, financial assistance, expertise, studies, and to provide a forum to advise the federal government about Indian energy development. With now more than 50 member tribes in the organization, CERT continues to play an important role by helping members monitor and negotiate energy contracts (Wilkins and Stark, 2011, p. 156-157).

**IMDA and IERA Era**

Congress first attempted to respond to the problems with tribal mineral leases with the 1982 Indian Mineral Development Act (IMDA). Under IMDA, all tribes were authorized to enter into mineral agreements of any kind such as joint-venture production, but these agreements were still subject to the approval of the Secretary of the Interior. The IMDA allowed the tribes for the first time to directly negotiate the terms of their mineral resource production but stopped short of granting them full control over their resources. In addition, the IMDA still required an often lengthy process for DOI approval of each specific lease or agreement (Royster, 2009, p. 1074-1077). After lobbying by the Navajo Nation, Congress amended general surface leasing statute in 2000 to streamline the mineral leasing process specifically for the Navajo. Congress authorized the Navajo to issue business and agricultural leases for up to 25 years and other surface leases for 75 years if the lease is executed under tribal regulations approved by the U.S. Secretary of the Interior (Royster, 2009, p. 1079).
By 1992, little change had occurred under IMDA and the provision for tribal cooperative agreements was not widely implemented, so Congress enacted the Indian Energy Resources Act (IERA). IERA intended to promote tribal economic self-sufficiency through energy development while providing for greater tribal control of mineral development on tribal lands. Unlike the previously mentioned federal tribal energy legislation, IERA also involved the Department of Energy (DOE) and charged the Secretary of Energy to work in consultation with the Secretary of the Interior. IERA requires the DOE to establish demonstration projects to increase the development of energy resources on tribal reservations, provide technical and financial assistance for tribal energy development projects, and to consult with tribes in a manner that requires the “full participation” of tribes in developing regulations and policy initiatives (Cohen, 2005, p. 1098-1100). IERA also established the Indian Resource Commission composed of the Secretaries of Energy and the Interior along with their appointees and those from tribes in order to provide recommendations for federal tribal energy legislation. Like past federal legislative efforts, the implementation of IERA has had mixed results and the Indian Resource Commission was never formed or funded (Cohen, 2005, p. 1100). However, the funding and technical assistance mandates of IERA are being carried out by the DOE Tribal Energy Program, which has invested more than $30 million in 129 tribal energy projects across the U.S. from 2002-2010 (DOE TEP, 2011).

**ITEDSDA Era**

The Indian Tribal Energy Development and Self-Determination Act 2005 (ITEDSDA) was intended to correct historic problems with the federal government oversight over tribal energy resources by giving all tribes greater self-determination and control over their energy resources. The Act intended to do this by establishing Tribal energy resource agreements (TERAs) with the DOI. Under ITEDSDA, the Secretary of the Interior is required to approve a TERA if the proposed agreement complies with statutory requirements under which the tribe demonstrates “sufficient capacity to regulate the development of tribal resources.” Once a tribe has an approved TERA, it is authorized to enter into leases and business agreements for energy resource development and to grant rights of way for pipelines and electric transmission and distribution lines without DOI approval. Thus, unlike historic federal regulations regarding tribal energy development, ITEDSDA abolishes the need for DOI secretarial approval of specific energy resource development. ITEDSDA does not exempt tribes from the National Environmental Policy Act (NEPA) and each proposed TERA still requires an environmental impact statement (Royster, 2009, p. 1080-1081).

While ITEDSDA certainly goes much farther than past federal regulations in promoting tribal sovereignty, the cumbersome nature of technical expertise required to organize TERAs, has resulted in no documented case of a tribe actually using a TERA to develop an energy project. In addition, some tribes believe ITEDSDA has increased the risk to tribal governments of litigation for resource development on tribal lands while reducing some of the federal government’s trust responsibilities. In practice, TERAs shift significant costs of organizing resource development from the US government to the tribes and allow for more initial federal scrutiny of tribal energy affairs before the TERA is approved (Royster, 2009, p. 1082-1090). Without significant technical capacity for energy planning and legal
expertise to organize a TERA, all tribes, are currently operating under previous federal regulations. This has led to further calls for amending federal policy to increase tribal sovereignty while streamlining the energy resource development efforts of tribes. The most recent of these efforts has been the proposed bill H.R. 3973: Native American Energy Act, which seeks to “facilitate the development of energy on Indian lands by reducing Federal regulations that impede tribal development of Indian lands” (H.R. 3973, 2012).

In addition to abiding by the ever changing and sometimes unclear federal regulations that tribes are subject to, tribes are now confronted with the challenges of increasing demand for their energy resources and calls for managing their energy resources in accordance with the values of the tribe. In response, some tribes have already critically evaluated their approaches to energy resources and developed strategic energy plans and energy policies. For example, in 2012, the Navajo Nation announced the formation of a Navajo Energy Policy and a partnership with Lawrence Livermore National Laboratory to help draft this policy. While the policy is still under development, its intent is to serve as a comprehensive guide for the Navajo Nation as it expands nonrenewable and renewable energy resource development (Lucchetti, 2012). In addition, tribes with nonrenewable resources can currently enact a severance tax charged on the removal of energy resources from any lands within the tribe’s jurisdiction. For example, the Navajo already have an Oil and Gas Severance Tax (SEV) enacted on any nonrenewable energy resources exported from Navajo nation regardless of ownership of the lands (meaning regardless if an oil or gas company owns the land). The tax rate is 4% of sale price and the SEV is collected every 45 days after the end of the month. This tax provides revenue to the Navajo tribal government and helps to ensure that all Navajo share in at least some of the energy production on Navajo lands (NNDED, 2010, p. 13).

In addition to existing tribal energy policies, utilities, and taxes, with technical and financial assistance from the DOE Tribal Energy Program, over 30 tribes have already developed strategic energy plans (DOE TEP, 2011). Energy planning provides a tool for tribes to develop their energy resources in accordance with the values of the tribe, abide by or provide a framework for dealing with federal and state and local regulations, and address sustainability concerns about the environmental, economic, and social impacts of developing these resources. Energy planning could help tribes avoid the troubled past of tribal energy development while meeting other tribal economic and environmental goals.

### 2.2 History and Definition of Strategic Energy Planning

A strategic energy plan “Is a roadmap to achieving community energy goals in both the near and long term. The goals outlined in a strategic energy plan are determined by stakeholder input, so the plans are inherently local and have stakeholder buy-in” (DOE Community Greening, 2010). Strategic energy planning literature can be traced back to the late 1970s and early 1980s, when the oil shocks of the 1970s forced communities to evaluate their energy use and vulnerability to petroleum shortages and price hikes. Burchell and Listokin (1982) identified how land use planning at the time largely ignored energy consumption. In their collection from authors such as Socolow, Kaiser, Mardsen, and Burby, the two editors presented a case for maximizing the relative energy efficiency of
urban areas by incorporating goals of reducing energy consumption into land use planning. Topics included planning for solar energy generation within communities, managing energy conservation under planned growth, and the legal and institutional barriers to energy independent communities. While the collection is dated and does not cover the impacts of energy resource harvesting on communities, it is still one of the most comprehensive collections related to energy and land use.

Another post-oil shock guide to energy planning is the National Research Council (1994) Summary of an American-Bulgarian-Romanian Workshop that was intended as a guide to energy planning for countries that were in the post-Soviet era of energy consumption. The sudden transition to market economies sent drastic shocks to energy prices for Eastern European countries and strategic energy planning was seen as a way to manage these shocks. This summary also outlines an early participatory model for energy planning and how to incorporate community goals for energy conservation while also expanding the energy production capacities of the community.

The original post-oil shock discussion around using energy planning and strategies to conserve energy for a purpose unto itself has transitioned into the recent attention on “green jobs” and the economic development potential of fields in renewable energy, energy efficiency, green design, etc. Some of the more prominent recent works on this topic include The Green Collar Economy (Jones, 2008) and Hot, Flat, and Crowded (Friedman, 2008). Both works outline a plan for reviving the US economy through green technology jobs, investments in electric grid infrastructure, and creates opportunities for both highly skilled and unskilled workers. In Emerald Cities, Fitzgerald (2010) outlines how green jobs and green infrastructure upgrades can economically revive cities but requires coordination between many public and private actors and requires new job training programs to bridge the gap between traditional job skills and “green” ones. These works demonstrate that tribal energy planning is linked to a national emphasis on creating green economic opportunities for communities and they provide a theoretical justification for emphasizing energy planning as a tool for both improving local environmental quality and economic development opportunities.

The U.S. DOE now provides a template for local governments to develop strategic energy plans for their communities. This template establishes a participatory model for strategic energy planning where the goals of the plan are determined by stakeholder buy-in and input. The DOE stresses that strategic energy plans can be developed to meet multiple community goals and objectives such as energy expense/cost savings for individual community members or organizations, utility and infrastructure planning, and reduced greenhouse gas emissions from the community (DOE Community Greening, 2010). The DOE guide outlines a nine step strategic energy planning process:

1. Identify and Convene Stakeholders
2. Establish a leadership team
3. Develop a common energy vision
4. Develop community energy baseline
5. Based on the vision and baseline, develop energy goals
6. Identify and evaluate supply and demand policy and program resource options, matching these to the goals and ranking of program options
7. Find and secure funding sources
8. Compile the plan
9. Measure and evaluate-Schedule process for evaluating implementation and updating the plan (DOE Community Greening, 2010)

Additionally, DOE now has a *Solar Powering Your Community* guide which serves as a guide for local governments on how to conduct solar feasibility studies and provides examples of policies that local officials can adopt to promote residential and commercial solar power. This publication also stresses the participatory approach and stresses the need for an initial “model project” such as a solar installation on a community center or well-known landmark to generate community interest and support for solar.

In addition to these DOE resources, the American Planning Association (APA) also has published a guide for *Planning for a New Energy and Climate Future* (Shuford et al., 2010). This guide stresses the need for plans that have the goal for using energy in a way that reduces the overall carbon emissions of a community while simultaneously planning for future conditions that have been altered by climate change. This is in contrast to the DOE resources, which do not incorporate preparation and adaptation strategies for climate change to the extent found in the APA guide. The APA guide also goes into further detail on the need to consider the energy consumption form transportation when developing an energy plan, which the DOE strategic energy planning guide is also weak on. However, the overall APA approach was similar to the DOE model and stressed the need for identifying the important energy stakeholders early on in the planning process and for communities to use energy plans as a way, “To assess the potential for different energy options and to anticipate future energy needs and use” (Shuford, 2010, p. 2010).

### 2.3 Tribal Energy Planning

To differentiate tribal energy planning from other forms of energy planning requires an understanding of the unique issues with planning for tribal communities, an understanding of the power dynamics within the community, and the external institutions that exert power over the community. Zaferatos (1998), details the historic struggles of tribal communities and he frames tribal planning as strategic political action for tribes to advance their own community development. He also explains how “federal assimilation policies” and multi-jurisdictional land use regulation at the state and local levels has complicated and sometimes undermined the comprehensive planning efforts of tribal communities. These “assimilation policies” include some federal tribal energy policies, which as stated earlier have historically compromised and undermined tribal sovereignty. He suggests that tribal community planning can provide a way forward with an approach that replaces tribal isolationism with a new approach that balances tribal development goals with the consideration of nontribal interests inside the tribal lands. Hibbard et al. (2008), notes that there is only a modest literature on indigenous planning but reaches a similar conclusion as Zaferatos (1998) that indigenous planning efforts, both in the U.S. and abroad, emphasize community and local control over the goals and agendas that are pursued through
planning. The central characteristic of tribal planning efforts is that they emphasize community control to overcome the dysfunctions of externally imposed planning and policy solutions.

The tribal community based planning approach emphasized by Zafertatos and Hibbard et al. acknowledges that the planning capacity of many tribes will need to be increased through collaborative partnerships with outside institutions that do not undermine tribal sovereignty. This collaborative approach is moderately reflected in current U.S. federal financial and/or technical assistance provided to tribes for the development of certain types of plans. These plans include fire management, transportation, economic development, infrastructure, emergency response, agricultural development, and rural development plans. Some of the federal agencies providing assistance for these plans include the U.S. Bureau of Indian Affairs/Department of the Interior, Department of Transportation, Economic Development Administration, and the Department of Agriculture (White House, 2009). Some of the most commonly used resources by tribes are grants from the U.S. Economic Development Administration for developing economic development plans and feasibility studies. Between 1993 and 2002, 99 tribes received these grants and the tribes used the grants to pay staff salaries or the broad administration of the tribes’ planning departments in addition to developing specific economic development plans and environmental impact statements for economic development projects (GAO, 2004, p. 16). The reliance on federal funding and/or technical assistance for tribal planning efforts is also found with the development of tribal strategic energy plans.

The primary federal advocate for tribal strategic energy planning has been the Tribal Energy Program (TEP), under the DOE’s Office of Energy Efficiency and Renewable Energy. Established in 2002, the TEP provides tribes with financial assistance through competitive grants for renewable energy and energy efficiency projects, technical assistance through DOE laboratories, and education and training through online short courses, student internships, and workshops. The TEP also publishes a guide to tribal energy development which emphasizes writing a strategic energy plan as the first step of the development process. Recent financial incentives offered by the TEP and from the American Recovery and Reinvestment Act have provided historic opportunities for tribal strategic energy planning. In 2010, the TEP was provided a historic high of $10 million in discretionary funding (DOE TEP, 2011).

This model for energy planning found in the DOE Tribal Energy Program’s Guide to Tribal Energy Development involves a process for incorporating both expert and community stakeholder input. The Tribal Energy Program guide is similar to the DOE Community Greening guide but it is more tailored for Native American Tribes and provides many examples from Native American communities. Both guides have a similar process consisting of: vision statement, identifying energy champions, determining energy needs and forecasts, evaluating energy resource options, making preliminary resource and management choices, setting priorities, and writing the strategic energy plan. The Tribal Energy Program version also goes into detail about organizational development for creating new or modifying old institutions and organizations to implement the strategic energy plan. This includes the tribal utility authority, cooperatives, energy service
companies, joint ventures, and small businesses. Both of these resources outline a participatory model for energy planning but require some technical input from energy planners, engineers, etc. in order to help the community assess and design potential energy options.

With templates for specifically creating tribal energy plans provided by the DOE and more general templates provided by groups such as the APA, it is unknown to what extent tribes are using such templates to create their own energy plans. Analyzing the results of the survey to the tribes provides some insight into how tribes are developing their plans and how they are implementing them. In addition, with recent federal policy and funding emphasis on tribes to develop energy plans, feasibility studies, and for project implementation, analyzing the survey results can help determine if this federal government emphasis is the main reason tribes are creating these plans or if tribes are developing them independently.

3. Methods

The methodology for this study consisted of administering and analyzing results from a survey sent to tribal leaders and tribal personnel involved in energy planning and development. The sources for these contacts came from the Bureau of Indian Affairs (BIA), which keeps a directory of Tribal leaders, and from representatives of tribal governments that attended the DOE Tribal Energy Program Review in November 2011. These survey results were analyzed to determine under what conditions tribes are developing energy plans, how tribes are developing the plans, for whom are these plans developed, how these plans are used, how the plans address the impacts of energy resource development or conservation, how the opinions of the tribal community are incorporated into energy plans and policies, and the capacity of the tribes to implement the energy plans. Identifying and analyzing the characteristics of tribes that are actively involved in energy planning and development can help researchers understand why certain communities are more likely to develop energy plans and resources than others.

The survey was intended to gather data on both the energy development and energy planning efforts of American Indian tribes. The survey instrument is attached in the Appendix as Figure 8, and was submitted to the UNC Office of Human Research Ethics for Institutional Review Board (IRB approval) but was deemed as not requiring approval by the IRB since it dealt with publically available knowledge. While developing the survey instrument, I consulted the UNC Odum Institute, the UNC American Indian Center, and also solicited advice from the DOE Tribal Energy Program. By soliciting advice from these institutions I hoped to create a culturally and technically appropriate survey instrument that could be taken by members of the selected sample of tribes with minimal difficulty and investment of time.

The survey was multi-modal, consisting of: electronic surveys sent via email, hard copies sent in the standard mail, follow up phone calls and in person administration during the DOE Tribal Energy Program Review. All survey modes used the survey instrument in
Figure 8. The survey instrument was designed using the principles of the “tailored design method” formulated by Dillman (2009). This tailored design method means that questions and the format of the questionnaire were carefully constructed in such a way to maximize response rate. The survey instrument was also designed based on my literature review of recommendations for developing community and strategic energy plans that promote sustainable energy development.

With 565 US Department of the Interior recognized indigenous entities throughout the US. I chose to focus the survey on the indigenous entities in the lower 48 states, which still amounted to 335 entities. From this subset of indigenous entities, I selected a sample of all the tribes in possession or exercising control over reservations or tribal lands of 10,000 or more acres. The reasoning for selecting tribes with 10,000 or more acres was to administer the survey to tribes that have a possibility of exercising control over currently developed or potential energy resources. The sample selection was carried out using ArcGIS 10 and the “TIGER/Line Shapefile, U.S., 2010 Census American Indian/Alaska Native/Native Hawaiian Areas,” which lists the acres within tribal lands or jurisdictional areas (US Census Bureau, 2010). This amounted to 161 tribes within the continental U.S. with more than 10,000 acres. The corresponding data on the names of the tribes, location, and acreage, was then joined to the information provided in the Tribal Leaders Directory. Published by the Department of the Interior’s Bureau of Indian Affairs (BIA), the directory lists the name and contact information for the tribal chief, president, or leader of each of the 565 recognized tribes. This join required adjustment for discrepancies between the names of the tribes as recorded by the Census Bureau and those listed by the BIA. After joining and correcting the discrepancies between the acreage and tribal leader data, I had the contact info for 158 tribes. From this sample, I sent the survey to 100 of the tribal leaders via email through the Qualtrics electronic survey program. The other 58 tribes did not have emails listed so they were mailed hard copies of the survey with stamped return envelopes inside.

In addition to administering the survey via mail and email, I also distributed the survey to fellow attendees at the DOE Tribal Energy Program Review in November of 2011. This Program Review is an annual gathering of TEP employees, members of tribes who have or are seeking technical or financial assistance from the program, and other stakeholders such as energy development consultants, private industry and non-profit representatives. Using the directory of those who attended the Review, I sent the survey via email and administered some in-person during the Review. In total, 100 additional surveys were sent to attendees of the Review who directly represented and/or worked for tribal governments and agencies. The intention for sending the survey to these attendees was to gather survey responses from individuals who were likely to be affiliated with their tribe’s energy planning efforts. However, sending surveys to these Program Review attendees resulted in surveys being sent to tribes that did not meet our original standards of surveying tribes with 10,000 or more acres. In total, 10 of the responding tribes did not meet the 10,000 or more acre threshold but they did provide a useful sample of smaller tribes to compare with the energy efforts of the larger tribes.
After the initial distribution of the survey, several rounds of follow up were done via email and Qualtrics. In addition, follow up calls were conducted with tribes that had not responded to the survey. In total 185 unique tribes were contacted and I received 40 completed surveys. Adjusting for multiple responses received from two tribes and one mistakenly from an Alaskan tribe, 35 individual tribes in the continental U.S. completed a survey for a response rate of 19%.

4. Results and Analysis

After the survey was distributed and the results were collected they were summarized by total survey responses and subdivided into smaller groupings to provide additional insight and analysis. The following analysis of the survey results seeks to answer the main research questions regarding the energy planning and development efforts of the tribes, such as; what are the impetuses and conditions under which tribes develop some type of energy plan or energy resources, what issues are connected to the energy plans and energy development, how the plans are being used, and cross tabulations and correlations between energy resource development and planning strategies.

4.1 Aggregate Characteristics of Tribes Responding to Survey

4.1.1 Population and Land Characteristics of Tribes Surveyed

Figure 1 illustrates the locations of tribes responding to the survey and the boundaries of all the tribal lands in the continental U.S. including tribal reservations, trust lands, or statistical areas as defined in the 2010 U.S. Census. Grouping tribes responding to the survey by Census Region (U.S. Census, 2010) revealed that a majority of tribes responding were in the West and Midwest regions (see Table 1). This is probably a reflection of both the high concentrations of continental U.S. tribes in those regions, and the greater prevalence of potential energy resources on tribal lands in these regions (see Figures 2-7 in the Appendix).

Table 1: Responding Tribes by U.S. Census Region

<table>
<thead>
<tr>
<th>Census Region</th>
<th>Number of Tribes</th>
<th>% of Tribes Responding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midwest</td>
<td>14</td>
<td>40%</td>
</tr>
<tr>
<td>South</td>
<td>3</td>
<td>9%</td>
</tr>
<tr>
<td>West</td>
<td>18</td>
<td>51%</td>
</tr>
<tr>
<td>Total</td>
<td>35</td>
<td></td>
</tr>
</tbody>
</table>
Overall, the 35 tribes that responded to the survey represent tribal reservations and U.S. Census defined American Indian geographies with a total population of nearly 230,000 individuals (See Table 2). According to the American Community Survey 2006 to 2010 five year estimates, the mean population of the responding tribes was 6,569 while the median population was 2,748. There were also differences between the mean and median values for the area of the tribal lands, and the amount of occupied housing units. These differences between the mean and median values of our survey respondents suggest that many of the responding tribes are small both in terms of land area and in population, but that a few of the responding tribes were comparatively large; such as the Yakama Nation and Confederated Salish & Kootenai Tribes.
Table 2: Population Characteristics of Tribes Responding to Survey

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Total</th>
<th>Mean Value per tribe</th>
<th>Median Value per tribe</th>
<th>Max. Value of tribes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Population</td>
<td>229,931</td>
<td>6,569</td>
<td>2,748</td>
<td>31,692</td>
</tr>
<tr>
<td>Area (Land in sq. miles)</td>
<td>17,650.4</td>
<td>504.3</td>
<td>53.5</td>
<td>3,568</td>
</tr>
<tr>
<td>Occupied Housing Units:</td>
<td>87,752</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vacancy Rate of total Housing Stock</td>
<td>20.4%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U.S. Vacancy Rate</td>
<td>12.2%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: ACS 2006 to 2010 (5-Year Estimates); U.S. Census Bureau
*Ponca tribe has 0 land and population according to Census defined boundaries

As mentioned earlier, surveys were also sent to TEP Program Review attendees who represented tribes that did not contain the original 10,000 acre sample selection. This resulted in survey responses from 10 tribes that had less than 10,000 acres (15.6 square miles). The tribe responding with the least amount of tribal land and population, the Ponca Tribe of Nebraska, does not have a formal reservation or population according to the U.S. Census Bureau (ACS, 2010) but it does have 2,800 members according to the tribe’s website (Ponca Tribe, 2012). Despite their lack of a large land base, the Ponca tribe indicated that they did have a strategic energy plan and received an Energy Efficiency Conservation Block Grant for building retrofits.

The Ponca also exemplify the difficulty of defining “tribal lands” for some tribes because the U.S. Congress terminated the Ponca tribe in 1966 before being restored to official federal recognition in 1990. During this period of termination, the tribe lost its formally defined boundary, but now has a small trust land area and a 15 county service area where enrolled members can receive services from the tribal government. The Ponca demonstrate how historically institutions outside of the tribal community, such as the U.S. federal government, have defined the boundaries of tribal lands. The Ponca example also shows how smaller tribes and other tribes without federally recognized reservation or trust lands (such as tribes with state-recognition only) can have difficulty in taking control of the development of their energy resources, since they do not have the same land-use authority as tribes with larger federally recognized reservations or trust lands. In other words, if a tribe lacks a federally recognized reservation or some type of land base, the tribal government and members will be subject to the energy resource and land use regulations of other institutions such as municipal, county, or state governments. However, as the Ponca demonstrate, the lack of a large land base has not prevented smaller tribes from pursuing energy efficiency or some renewable energy development opportunities.
4.1.2 Economic Characteristics of Survey Respondents

Economic indicators and characteristics of responding tribes were determined using data provided by the U.S. Census Bureau American Community Survey (ACS) 2006-2010 estimates. Overall, these indicators for the responding tribes are lower than corresponding averages for the total U.S. population. The responding tribes had about a 4% higher mean unemployment rate than the U.S. average (see Table 3). The responding tribes also had a 26% lower median household income than the U.S. average and higher poverty rates for all age groups (See Table 3 and Table 12 in the appendix). However, there is a discrepancy between how the U.S. Census ACS calculates the tribal unemployment rate and DOI Bureau of Indian Affairs (BIA) estimates. In 2005, the BIA estimated that the unemployment rate for tribal reservations and nearby indigenous populations in both the continental U.S. and Alaska and Hawaii was 49% (DOI BIA, 2005). Therefore, these ACS estimates may be underestimating the actual unemployment rate, which is likely to be higher in 2012 since the 2006-2010 5-year estimates include years before the 2008 financial crisis and recession.

<table>
<thead>
<tr>
<th>Economic Characteristic</th>
<th>Responding Tribes</th>
<th>All Continental U.S. Tribes</th>
<th>U.S. Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment rate</td>
<td>11.0%</td>
<td>8.1%</td>
<td>7.9%</td>
</tr>
<tr>
<td>Median household income (In 2010)</td>
<td>$40,612</td>
<td>$41,246</td>
<td>$51,914</td>
</tr>
<tr>
<td>Inflation Adjusted Dollars</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: ACS 2006 to 2010 (5-Year Estimates); U.S. Census Bureau

4.2 Energy Development Efforts of the Tribes Surveyed

4.2.1 Types of Energy Resources Developed by the Tribes

A majority of tribes (60%) responding to the survey indicated they did have one or more energy resources currently being harvested or in the preliminary phases of development. Table 4 presents the types of energy resources and the number of tribes that indicated they are currently developing the specific resource. Out of the ten types of energy resources the survey asked if tribes were currently developing, solar was clearly the most commonly developed with 13 out of the 35 tribes indicating they were developing some type of solar energy. While the survey did not distinguish between different types of solar energy such as photovoltaic (PV) and solar thermal energy, the total number of tribes developing solar was still almost twice as much as the next most commonly developed resource, geothermal. Seven out of the 35 tribes indicated they were developing geothermal energy, which could include large scale and small scale projects such as geothermal heat pumps for individual buildings. Seven out of 35 tribes also indicated they were developing an energy resource that did not fit in any resource category identified in the survey. These “other” responses
included coal bed methane, wind turbine manufacturing, and a natural gas fueled co-generation facility. One of these respondents, the Makah Nation, indicated that they had received a Federal Energy Regulatory Commission (FERC) permit to pursue wave/tidal energy development.

Table 4: Energy Resources Currently Harvested or Pending Development

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>Responses</th>
<th>% of Tribes Responding</th>
</tr>
</thead>
<tbody>
<tr>
<td>No currently harvested energy resources</td>
<td>14</td>
<td>40%</td>
</tr>
<tr>
<td>Solar Energy</td>
<td>13</td>
<td>37%</td>
</tr>
<tr>
<td>Geothermal</td>
<td>7</td>
<td>20%</td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
<td>20%</td>
</tr>
<tr>
<td>Biomass or Biofuel Energy</td>
<td>6</td>
<td>17%</td>
</tr>
<tr>
<td>Hydroelectric power</td>
<td>5</td>
<td>14%</td>
</tr>
<tr>
<td>Wind Energy</td>
<td>5</td>
<td>14%</td>
</tr>
<tr>
<td>Oil</td>
<td>2</td>
<td>6%</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>1</td>
<td>3%</td>
</tr>
<tr>
<td>Coal</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Nuclear (including uranium mining)</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Total Tribes Responding</td>
<td>35</td>
<td></td>
</tr>
</tbody>
</table>

Out of the tribes surveyed, only two indicated they were currently developing oil, and one of these tribes, the Northern Arapaho in WY, indicated there was also natural gas and coal bed methane development on their tribal lands. The other tribe, the Kaw Nation in OK, indicated that oil could be potentially developed on their tribal lands in the next 0-5 years. As seen in Table 4, 40% of the tribes responding to the survey had no currently harvested energy resources or any pending immediate development. However, out of these 14 tribes, 12 indicated that there were potential energy resources that could be developed in the future; including oil, hydroelectric, solar, wind, geothermal, and biomass/biofuel resources (See Table 13 & Table 14 in the Appendix).

4.2.2 Where Energy Resources are Being Developed by the Tribes

Out of all of the tribes that were surveyed, some regional differences emerge regarding the types of energy resources that are developed by the tribes. As mentioned earlier, 14 of the tribes surveyed are in the Midwest region, 18 are in the West, and 3 are in the South. The two tribes that indicated they were currently developing energy resources are located in the West and South regions, where there are more prevalent natural gas resources than other regions of the country, such as the Midwest where there are very few natural gas resources (see Figure 2).

Of all of the Midwest tribes, 43% said they were developing solar resources compared to 33% of all the Western tribes. This result suggests that tribes are developing some type of solar energy resources regardless of whether they are in regionally optimal locations or not. Figure 6 shows the average daily kWhs of energy per meter squared for locations
throughout the U.S. and as demonstrated in the map, the region with the greatest solar potential is in the southwest. However, out of the four survey tribes from this region (the Santa Ynez Band of Chumash, Walker River Paiute, Morongo band of Mission Indians, and the Los Coyotes Band) only one of these tribes indicated they were developing solar energy. This pattern is found again with geothermal energy resources, where four of the seven tribes that indicated they were developing geothermal industry are located in the Midwest, which as Figure 5 indicates is not the most favorable region of the U.S. to develop geothermal resources. It is possible that these respondents are including geothermal heat pumps and other small-scale application of geothermal energy development. In addition, of the five surveyed tribes in the Midwest that are located in “favorable” or “most favorable” wind resource areas, none of them are currently developing any wind energy resources. Out of the five tribes that are developing wind resources, four are located in small areas that are very favorable for wind development, but none are in the primary wind regions of the U.S. such as the Great Plains (See Figure 7).

The implications of these results are that certain tribes are better suited geographically to develop some types of energy resources than others, but they may not be currently utilizing their comparative advantages in energy resources. Another locational factor that could be affecting tribal energy development is proximity to transmission lines. For example, even if a tribe has significant renewable energy resources such as wind or solar, without adequate transmission lines close to the resource, the need to extend new transmission lines to the area might make the project economically unviable or create unacceptable levels of environmental disturbance. Proximity to population centers may also encourage energy development by tribes in order to export energy to these areas after meeting tribal self-sufficiency and sovereignty goals.

The tribes that are not currently developing any energy resources do not cluster in a specific region and suggest that other factors might influence their lack of currently developed energy resources. Of the five surveyed tribes that indicated they had potentially developable nonrenewable energy resources, only one indicated a known time frame for oil development in the next 1-5 years and the tribe (the Kaw Nation) also indicated they were already extracting oil. According to Figure 3, the Northern Arapaho Tribe, which indicated it is currently developing oil and natural gas, also has some coal resources within its tribal lands. As seen in Figure 2, several tribes have shale and tight natural gas resources within the boundaries of their lands. As the techniques for extracting shale gas, such as hydraulic fracturing become more widespread, these tribes will have to evaluate the potential costs and benefits of harvesting these resources if they are not already doing so.

4.2.3 Who is Developing these Resources on Tribal Lands

Tribal or External Institutions Developing Resources on Tribal Lands
Table 5 describes the overall institutional actors who are developing energy resources on tribal lands. The most common institutions developing energy resources are the tribal governments themselves. Out of the tribes surveyed, private developers and even tribal corporations are playing a minimal role in developing energy resources on tribal lands. The high level of tribal government involvement in energy development may be due to the
prominence that tribal governments play in the affairs of American Indian reservations and communities and the unique semi-sovereign legal status of tribal governments (MacCourt, 2010). In addition, most of the tribes that were surveyed are fairly small communities in terms of population and land area, so it is understandable that tribal governments would be able to take such direct control of energy development, since any type of energy development in a small area is likely to be noticed by and impact the tribal community.

Table 5: Institutions Developing Energy Resources on Tribal Lands

<table>
<thead>
<tr>
<th>Institution Developing Energy Resources</th>
<th>Response</th>
<th>% of Tribes Responding</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Tribal government</td>
<td>17</td>
<td>77%</td>
</tr>
<tr>
<td>Tribal Corporation (defined as business-like unit to pursue energy development)</td>
<td>3</td>
<td>14%</td>
</tr>
<tr>
<td>Enrolled members operating a private business</td>
<td>2</td>
<td>9%</td>
</tr>
<tr>
<td>Company or Organization unaffiliated with the Tribe</td>
<td>3</td>
<td>14%</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>23%</td>
</tr>
<tr>
<td><strong>Total Tribes Responding</strong></td>
<td>22</td>
<td></td>
</tr>
</tbody>
</table>

Another influence contributing to the prevalence of tribal government involvement could be the tribal government’s ability to directly take advantage of federal financial and technical assistance for energy development. All of the 17 tribes that indicated the tribal government was developing energy resources also indicated they had received some type of federal financial or technical assistance from various agencies (See Question 15 in the Survey Instrument included in the Appendix). Even all of tribes that indicated institutions other than the tribal government were developing energy resources are still taking advantage of federal assistance to develop energy resources. In fact, all of the 21 tribes currently developing energy resources indicated they had received some type of financial or advisory assistance from a federal agency for energy planning, energy management, or energy resource development. These results indicate that the efforts of the tribal governments and the assistance of the federal government have been essential for developing energy resources, particularly renewable energy resources, on tribal lands.

Another factor contributing to the reporting of strong tribal government involvement in developing these energy resources could be the fact that the survey was sent specifically to representatives of tribal governments. However, since the survey allowed tribes to indicate if other actors were also involved or actively developing energy resources, it can be said with confidence that tribal governments are heavily involved in promoting and directly developing their energy resources. This assumption was further supported by the presentations from tribes during the DOE TEP Program Review in November, 2011, where tribes from across the country presented on the active involvement of tribal government in the development of energy resources (DOE TEP, 2011).

**Comparisons of Tribes Developing Energy Resources**
In addition to differences between the types of institutions developing energy resources on tribal lands, there are also differences between tribes in the types and the number of
different energy resources currently being developed on their lands. To begin with, differences emerge in the amount of tribes developing energy resources when comparing tribes of different population, land area, and median income levels. Dividing the surveyed tribes into quintiles based on these characteristics allows for a comparison between tribes in terms of differences in these characteristics. As seen in Table 4, 40% of all the surveyed tribes did not have any currently developed energy resources. When comparing tribes with different size land areas, three of the seven (47%) largest tribes and four of the seven (57%) smallest tribes had no currently developed resources. This difference between the largest and smallest tribes in terms of land area is smaller than expected because intuitively one would reason that a larger land area would present more opportunities for energy development. However there is a more distinct difference in the range of the types of energy resources developed by larger tribes compared to smaller tribes. The four out of the seven largest tribes that are developing energy resources are developing oil, natural gas, hydroelectric, solar, wind, geothermal, biomass, and “other” types of resources while the tribes in the smallest quintile were only developing solar and biomass energy sources. These results suggest that while the size of tribal lands does not have a significant impact on whether or not a tribe is developing at least one type of energy resource, the size of tribal lands does influence the range of energy resources tribes are able to develop.

Similar differences emerge between tribes of different population sizes. Only one out of the seven (14%) most populous tribes did not have any currently developed energy resources compared to four out of the seven (57%) least populous tribes. The seven most populous tribes are developing eight different types of energy resources while the seven least populous were only developing solar and biomass resources. These differences between population quintiles are similar to the differences between the land area quintiles because these groupings of tribes include many of the same tribes. The comparison between the seven tribes with the highest median levels of income and the seven with the lowest median income levels involves a grouping of tribes with very little overlap with the highest and lowest quintiles for population and land area. However, this comparison produces similar results with five out of the seven (71%) tribes with the lowest median income levels indicating they have no energy resources under development compared to only 2 out of the seven tribes (29%) with the highest median income levels. The range in this difference indicates that the income levels of a tribe may have more of an influence on energy development than population or land area. In addition, the tribes with higher levels of income are developing solar, geothermal, biomass, and natural gas-cogeneration while the lower income tribes are developing only solar, geothermal, and wood.

Comparing tribes by demographic groupings reveals that there is some correlation between population size, land area, and income levels with energy development and the range of energy resources developed. Overall, tribes with larger land areas, populations, and higher income levels are more likely to be developing energy resources and a wider range of resources than smaller and lower income tribes.
4.2.4 Why Tribes are Developing Energy Resources

Economic Development

As mentioned in the literature review, American Indian tribes have several different reasons for pursuing the development of their energy resources. Many of these reasons relate to sustainability goals, economic development, and increasing tribal sovereignty by becoming more energy independent (See DOE TEP, 2009 & NWF, 2010). One of the reasons that the survey examined in particular was economic development.

With lower results than the U.S. average on economic indicators (See Table 3), it is understandable that the tribes are pursuing economic development opportunities with their energy resources. Out of all the 35 tribes surveyed, 26 of them (74%) indicated that they were pursuing business and economic development opportunities with the harvesting of their energy resources or with energy efficiency opportunities. Table 6 lists the ways that these 26 tribes described their strategies for pursuing economic development opportunities with energy. A majority of the tribes that are currently pursuing energy economic development opportunities were doing so through energy efficiency or weatherization services and the development of renewable resources.

Table 6: Strategies of Tribes Pursuing Economic Development Opportunities with Energy

<table>
<thead>
<tr>
<th>Strategies of Tribes Responding “Yes” to Economic Development with Energy</th>
<th>Response</th>
<th>% of Tribes Responding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining/Extraction of non-renewable resources</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>“Green job” training program</td>
<td>10</td>
<td>38%</td>
</tr>
<tr>
<td>Energy efficiency or weatherization services</td>
<td>17</td>
<td>65%</td>
</tr>
<tr>
<td>Development of renewable resources (Hydroelectric, Solar, Wind, Geothermal, Biomass/Biofuel, etc.)</td>
<td>21</td>
<td>81%</td>
</tr>
<tr>
<td>Other (Please explain)</td>
<td>4</td>
<td>15%</td>
</tr>
</tbody>
</table>

While 21 tribes indicated that they were pursuing business and economic development opportunities with the development of renewable energy resources, only 8 answered that the tribal government or tribal members were currently receiving income from energy resource development. This discrepancy suggests that tribes are thinking about developing renewable energy resources as more of a long-term economic development strategy. This could also imply that tribes are currently having difficulty capturing the revenue or monetizing the benefits of their current energy efforts. For example, many tribes indicated that their non-profit/government status prevented them from monetizing the tax incentive benefits of renewable energy development. In addition, only 4 out of the 14 tribes not receiving income from their energy resource development did not have some type of energy plan or plan that addressed energy. This further indicates that even if a tribe is not currently receiving income from their energy resources, they are still considering the long-term implications and potential future revenues from energy development.
Out of the nine tribes that indicated they were not pursuing any energy related economic development opportunities, six of them cited lack of funding and no department assigned to energy issues as the main reasons for their inaction (See Table 7). One tribe also indicated that they were trying to get ordinances in places before pursuing energy development opportunities. This indicates that lack of funding and institutional arrangements are the more prevalent than other barriers to pursuing economic opportunities with energy.

<table>
<thead>
<tr>
<th>Table 7: Reasons Tribes are Not Pursuing Energy Related Economic Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Answer</strong></td>
</tr>
<tr>
<td>No significant energy resources</td>
</tr>
<tr>
<td>Not a priority</td>
</tr>
<tr>
<td>Lack of funding</td>
</tr>
<tr>
<td>No department or person assigned to energy issues and opportunities</td>
</tr>
<tr>
<td>Other (Please explain)</td>
</tr>
</tbody>
</table>

*Internal and External Support:*
In addition to the economic development reasons why some tribes are developing energy resources, tribal community support for renewable energy development also influences the energy development efforts of tribes. In question Q7 of the survey, tribes were asked to indicate if a majority of their tribal members supported renewable energy development for the tribe. Out of the 24 tribes that “agreed” or “strongly agreed” that tribal members were supportive of renewable energy, 29% (7 tribes) indicated they had no currently developed energy resources. Out of the ten tribes that “disagreed” or “strongly disagreed” that tribal members were supportive of renewable energy development, 40% (4 tribes) indicated they had no currently developed energy resources. This increased percentage of no currently developed energy resources indicates that tribal community support helps to promote the development of renewable energy on tribal lands.

External support for renewable energy also seems to be an important reason why tribes are developing renewable energy resources. As mentioned earlier, all of the 21 tribes currently developing energy resources indicated they had received some type of financial or advisory assistance from a federal agency for energy planning, energy management, or energy resource development. This external support seems very important especially since 29 (83%) out of all the tribes surveyed indicated lack of funding as a barrier to energy development by the tribe.

Lastly, while the survey did not measure increasing tribal sovereignty as a reason for tribes to develop their energy resources, the literature on tribal energy development and the vision statements and energy plans of many tribes cite this as a major reason for developing their energy resources (DOE TEP, 2009). Certain indicators that the survey did ask respondents about, such as economic development and job creation, do directly relate
to increasing tribal sovereignty by encouraging a stronger tribal economy. In addition, tribes that are developing their own energy resources support increased tribal sovereignty by reducing the energy imports from sources outside of the tribe.

**Barriers to Energy Development**

After identifying the energy resources being developed by tribes and some of the reasons for doing so, the survey also identified some of the barriers to developing energy experienced by the tribes. Table 8 highlights some of these barriers that have been experienced by all of the tribes responding to the survey. It is interesting to note that lack of funding, inability to capture tax incentives, internal organization or politics, and even lack of community support were listed as barriers by groups of tribes that had no noticeable demographic differences from the average for the survey sample. However, tribes with no current energy development only listed the barrier of no significant energy resources. Since this question allowed for multiple responses, these results suggest that the tribes surveyed view lack of funding, inability to capture tax incentives, and internal organization or politics as bigger barriers to developing some type of energy resource than community support and the presence of significant energy resources.

<table>
<thead>
<tr>
<th>Answer</th>
<th>Response</th>
<th>% of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of funding</td>
<td>29</td>
<td>83%</td>
</tr>
<tr>
<td>Inability to capture tax incentives</td>
<td>22</td>
<td>63%</td>
</tr>
<tr>
<td>Internal organization or politics</td>
<td>18</td>
<td>51%</td>
</tr>
<tr>
<td>Lack of community support for energy</td>
<td>4</td>
<td>11%</td>
</tr>
<tr>
<td>development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>11</td>
<td>31%</td>
</tr>
<tr>
<td>No significant energy resources</td>
<td>3</td>
<td>9%</td>
</tr>
<tr>
<td><strong>Total Tribes Responding</strong></td>
<td>35</td>
<td></td>
</tr>
</tbody>
</table>

With 34 out of the 35 surveyed tribes indicating that there are energy resources located within the boundaries or jurisdiction of the tribe that could be potentially developed in the future, this list of barriers suggest that funding and internal organization issues will need to be addressed before the tribes can develop these potential resources. Since all but one of the tribes considers themselves as potential energy developers, nearly all the tribes will need to address the barriers that are currently preventing these resources from being developed. One of the tools tribes can use to help overcome these barriers is developing a strategic energy plan. The following section demonstrates how tribes are using strategic energy plans to achieve their energy goals and goals with other issues related to energy.
4.3 Tribal Strategic Energy Planning and Policy Efforts

4.3.1 Types of Energy Plans of Surveyed Tribes

As mentioned in the “Context” section, tribes are developing strategic energy plans to help guide their current and potential energy resource and energy efficiency developments while meeting tribal community goals. These energy plans can take various forms such as:

- An energy vision document on Tribal energy goals (precursor to a more in-depth energy plan)
- An energy plan that addresses Tribal energy resources or the use of energy (example: energy management or conservation)
- A Tribal plan that addresses energy indirectly (example: addressing energy in a comprehensive plan for a community within the Tribe’s jurisdiction)
- A plan to address an energy shortage (example fuel shortage or blackouts) or other emergency situations related to energy (wellhead fires, coal slurry spill)

Out of the 35 tribes surveyed, 24 indicated that they had some type of plan related to energy with 15 tribes indicating they had a formal energy plan. Table 9 describes what types of energy plans the survey tribes have and the number of tribes with an energy plan in that category.

<table>
<thead>
<tr>
<th>Type of Energy Plan</th>
<th>Response</th>
<th>% of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Vision</td>
<td>14</td>
<td>40%</td>
</tr>
<tr>
<td>Formal Energy Plan</td>
<td>15</td>
<td>43%</td>
</tr>
<tr>
<td>Plan that addresses energy indirectly</td>
<td>5</td>
<td>14%</td>
</tr>
<tr>
<td>Plan to address an energy shortage</td>
<td>3</td>
<td>9%</td>
</tr>
<tr>
<td>Other (please explain)</td>
<td>6</td>
<td>17%</td>
</tr>
<tr>
<td>None</td>
<td>11</td>
<td>31%</td>
</tr>
<tr>
<td>Total Tribes Responding</td>
<td>35</td>
<td></td>
</tr>
</tbody>
</table>

4.3.2 Why Tribes are Creating Strategic Energy Plans

Out of the 24 tribes that have created some type of energy plan, there are no discernible patterns or correlations between development of an energy plan and the demographic characteristics of the tribe. Similarly, there are no discernible correlations between tribes without energy plans and their demographic characteristics. The means for population, land areas, and median household income of tribes with energy plans compared to those without are all very similar to each other. However, differences do emerge when comparing the energy resources and institutional arrangements for addressing energy planning issues between the two groupings of tribes.
To begin with, 33% (8 out of 24 tribes) of the tribes with some type of energy plan had no currently harvested energy resources compared to 55% (6 out of 11) of tribes with no type of energy plan. Additionally, tribes with energy plans had a higher rate of developing renewable energy resources and were developing more types of renewable energy resources than tribes without energy plans. For example, 46% (11 out of 24) of the tribes with energy plans are developing solar energy while only 18% (2 out of 11) of tribes without energy plans are. Similarly, 83% (20 out of 24) of the tribes with energy plans are pursuing economic development opportunities with the development of their energy resources and/or energy efficiency compared to only 55% (6 out of 11) tribes without energy plans. Overall, tribes with energy plans are more likely to already be developing energy resources and pursuing economic development opportunities than tribes without energy plans.

Another difference is that 96% (23 out of 24 tribes) of tribes with energy plans have one or more departments responsible for addressing energy planning and management for their tribes while 64% (7 out of 11) of tribes without energy plans have these responsible departments. In addition, only 33% (8 out of 24) of tribes with energy plans did not have a goal or policy for tribal energy use or development of energy resources while 73% (8 out of 11) tribes without energy plans did not have any energy use or development policies or goals. One of these policy differences that could be particularly important is that 21% (5 out of 24) of tribes with energy plans have a stated goal for reducing greenhouse gases while only 9% (1 out of 11) of tribes without an energy plan had such a policy. Overall these comparisons suggest that tribes with energy plans are more likely to have tribal departments or institutions with designated responsibility for energy planning and management than tribes without energy plans. Also, tribes with energy plans are more likely to have energy related policies or goals. An area for further research would be to explore if these tribal polices are linked to or were developed from the goals and objectives of the energy plans.

Tribes with energy plans could be more likely to be developing energy resources and have energy related policies and goals because of the issues that are directly or indirectly addressed in the energy plans. Table 10 describes the issues that are addressed in the energy plans in the 20 (out of the 21 surveyed tribes with energy plans) tribes that responded to the survey question about issues addressed in the energy plans. As seen in Table 10, most of the energy plans address economic development, job creation, sustainability, and energy affordability issues. However, not many of these plans are incorporating or addressing energy consumed by transportation within the tribal lands or by tribal members.
Table 10: Issues Addressed in Energy Plans

<table>
<thead>
<tr>
<th>Issue</th>
<th>Response</th>
<th>% of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased business opportunities/economic development</td>
<td>15</td>
<td>79%</td>
</tr>
<tr>
<td>Job creation</td>
<td>14</td>
<td>74%</td>
</tr>
<tr>
<td>Sustainability (meaning concern for economic, social, and environmental standards for future generations of your tribe)</td>
<td>17</td>
<td>89%</td>
</tr>
<tr>
<td>Transportation (public transit such as buses or decreasing car use for trips)</td>
<td>4</td>
<td>21%</td>
</tr>
<tr>
<td>Making energy (such as electricity or fuel) affordable for all members of the Tribe.</td>
<td>13</td>
<td>68%</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>21%</td>
</tr>
<tr>
<td>Total Tribes Responding</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Incentives for Reducing Energy Consumption**

The issues addressed in the energy plans (such as sustainability, economic development, and making energy affordable) could partially explain why 87% (21 out of 24) of tribes with energy plans provide some type of incentive(s) for tribal members to reduce their energy consumption while only 45% (5 out of 11) provide such incentives. Table 11 illustrates the differences between the incentives provided by tribes with energy plans and by tribes without energy plans. Tribes with energy plans could be providing a greater amount of and a wider range of energy conservation incentives in order to meet the sustainability and energy affordability goals that were incorporated in most of the tribal energy plans from the surveyed tribes.

Table 11: Incentives for Tribal Members to Reduce Energy Consumption

<table>
<thead>
<tr>
<th>Incentives to Reduce Energy Consumption</th>
<th>Tribes with Energy Plans</th>
<th>Tribes without Energy Plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weatherization assistance program</td>
<td>14 (58%)</td>
<td>5 (45%)</td>
</tr>
<tr>
<td>Grants or other financial incentives</td>
<td>5 (21%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Tax incentives</td>
<td>1 (4%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Advisory services (pamphlets, handouts, public education, or expert advice)</td>
<td>9 (38%)</td>
<td>3 (27%)</td>
</tr>
<tr>
<td>Incentives to encourage public transit use</td>
<td>4 (17%)</td>
<td>1 (9%)</td>
</tr>
<tr>
<td>Incentives for increasing walking and/or bicycle use</td>
<td>3 (13%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Other</td>
<td>4 (17%)</td>
<td>1 (9%)</td>
</tr>
<tr>
<td>None</td>
<td>3 (13%)</td>
<td>6 (55%)</td>
</tr>
<tr>
<td>Total Tribes Responding</td>
<td>24</td>
<td>11</td>
</tr>
</tbody>
</table>

Overall tribes with strategic energy plans are more likely than tribes without energy plans to be currently developing energy resources, developing a wider spectrum of renewable energy capacities, and providing a variety of incentives to encourage energy conservation practices.
energy resources, pursue economic development with the development of energy resources, and have incentives and policies in place related to energy management of their tribe. For a tribe to have some type of an energy plan, and especially to have a separate strategic energy plan, indicates that the tribe has probably considered its energy goals and objectives. However, without adequate planning institutions or capacities, tribes may be hard pressed to fully implement their strategic energy plans or adapt to an energy future with many uncertainties in terms of supply and cost.

The only measure in the survey that might provide insight into the planning capacity of the tribes is a question that asks about the designated tribal department or entity that has the responsibility for energy planning and management for the tribe. Out of the 24 tribes with some type of energy plan, only 10 (42%) indicated that the tribe had a planning department responsible for the energy plan. Most of the tribes with energy plans (19 out of 24) indicated that the tribal environmental/natural resources department was responsible for the energy plans. In addition, many tribes selected multiple departments as having responsibility for the energy plan. Out of the 24 tribes with energy plans that answered the question about energy plan responsibility 60 total responses were recorded about which department or entity had responsibility for the energy plan. These results could be concerning in terms of the energy planning capacity of the tribes and create uncertainty about how the tribes will implement and evaluate their progress on their energy plan without a designated process for monitoring implementation or without that responsibility assigned to a specific institution, department, or employee. As mentioned before, all of the tribes with energy plans indicated they had received financial or advisory assistance from federal agencies, especially the DOE TEP. While this assistance appears to be very important for encouraging tribes to create strategic energy plans or other types of energy plans, further research will need to be conducted to fully assess the capacity of tribes to implement these plans and to maintain a comprehensive energy strategy for the tribe.

5 Conclusions

In summary, after joining the survey results to demographic and locational data for the tribes responding to the survey, patterns emerged within the groups of tribes that were developing energy resources and plans and within the groups of tribes that were not. These patterns suggest some overall conclusions about the energy planning and development efforts of the tribes responding to this survey. To begin with, it is clear that tribal governments are the main institutions developing energy resources on tribal lands and that energy resource development by non-tribal entities is minimal. Since all but one of the tribes indicated there are potential energy resources on tribal lands that are not currently developed, it is reasonable to assume that tribal governments will continue to play an important role in spearheading energy development on tribal lands. However, as the scale and intensity of energy resource development expands on tribal lands, tribal governments will need to consider the implications of energy resource development by non-tribal entities and have the plans and policies in place to ensure that these entities develop resources in accordance to the concerns and values of the tribal community. The tribes that are already developing energy resources without a strategic energy plan in place
should consider developing a plan to help ensure that tribal energy goals and other related goals (such as economic development and sustainability) are met while developing their energy resources.

In addition, pairing the survey results to locational data and energy resource maps suggests that tribes might not be taking full advantage of the renewable energy resources best suited for development in their regions. During the energy planning and development process, tribes should consider the energy resources best suited to their regions and identify the financial, institutional, or political barriers that are preventing them from developing these resources. Tribes may also need to consider creating their own energy utilities or working with other utilities to expand transmission lines into areas with energy resource potential. Since many tribes are using federal financial and advisory services to help develop energy resources, tribes should make sure they are using these resources in ways that are best suited for their particular regions. Strategic energy plans can help guide tribes in making optimal energy investments. With most of the tribes listing lack of funding as a barrier to energy resource development, strategic energy plans can also help tribes make wise energy investment decisions with whatever funding they are able to appropriate for energy.

Many of the tribes indicated they expected federal agencies to help provide the initial funding for energy planning and development while others indicated that a long-term finance strategy must come from tribal utilities, energy development, or other funding sources from within the tribes. This feedback combined with the other results of the survey indicates that tribes are primarily using federal incentives and advisory services to develop energy plans and to initiate renewable energy development and management for tribal communities. However, it appears some tribes are realizing that in order to really increase tribal sovereignty in terms of energy, the tribes themselves must finance and implement energy development and management strategies. Tribes with energy plans are more likely than tribes without plans to already be taking these steps to increasing tribal sovereignty by providing incentives for energy conservation, have policies and departments for managing energy, and by developing renewable energy resources while pursuing economic development opportunities.

While not all of the tribes currently developing energy resources have energy plans, those that do are engaged in a more comprehensive approach to energy management and the development of energy resources for the tribe. Tribes with energy plans are more likely to connect energy development with other issues facing the tribal community, such as the need for economic development opportunities and to link energy development to the goals of the tribal community. In addition, tribes with more land area, population, and higher levels of income are developing a wider range of resources than tribes with less land area, less population, and lower income tribal members. Tribal leaders as well as federal departments that assist the tribes with energy planning and development should be mindful of this discrepancy and tailor a more specific approach to energy planning and development for the smaller and lower income tribes.
Overall, the tribal communities surveyed seem to be relying on federal financial and advisory assistance to begin their energy planning and developing efforts. Those tribes that have not yet developed any energy resources or plans do not seem to be taking advantage of these opportunities available to them. Tribes should use these initial planning and development projects to jump-start energy programs and development within their tribal lands. However, in order to truly increase their sovereignty, tribes should not develop a long-term reliance and dependency on federal resources for energy planning and development. Once federal resources are used to jump-start or initiate new tribal energy development initiatives, effective tribal energy planning can then guide tribes along a path to sustainable development of their energy resources that increases their energy self-sufficiency and tribal sovereignty.
## Appendix

Table 12: Poverty Rates for Responding Tribes and U.S. Population

<table>
<thead>
<tr>
<th>Percentage of Population Living in Poverty by Population Segment</th>
<th>Responding Tribes</th>
<th>All Continental U.S. Tribes</th>
<th>U.S. Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children under 18</td>
<td>33%</td>
<td>28%</td>
<td>19%</td>
</tr>
<tr>
<td>Age 18-64</td>
<td>20%</td>
<td>17%</td>
<td>13%</td>
</tr>
<tr>
<td>Age 65 and Above</td>
<td>11%</td>
<td>12%</td>
<td>10%</td>
</tr>
</tbody>
</table>

Source: ACS 2006 to 2010 (5-Year Estimates); U.S. Census Bureau

Table 13: Potential Energy Resources and Years to Development

<table>
<thead>
<tr>
<th>Potential Fuel Type</th>
<th>0-5 Years</th>
<th>5-10 Years</th>
<th>10-20 Years</th>
<th>More than 20 Years</th>
<th>Unknown</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Coal</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Nuclear (including uranium mining)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Hydroelectric power</td>
<td>4</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Solar Energy</td>
<td>20</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>26</td>
</tr>
<tr>
<td>Wind Energy</td>
<td>21</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>26</td>
</tr>
<tr>
<td>Geothermal</td>
<td>14</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>5</td>
<td>23</td>
</tr>
<tr>
<td>Biomass or Biofuel Energy</td>
<td>10</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>Other (Please Explain)</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>
Table 14: Potential Energy Resources of Tribes with No Current Resources in Development

<table>
<thead>
<tr>
<th>Potential Fuel Type</th>
<th>0-5 Years</th>
<th>5-10 Years</th>
<th>10-20 Years</th>
<th>More than 20 Years</th>
<th>Unknown time-frame, but could still be developed</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Coal</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Nuclear (including uranium mining)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Hydroelectric power</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Solar Energy</td>
<td>7</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>Wind Energy</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Geothermal</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Biomass or Biofuel Energy</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Other (Please Explain)</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
Figure 2: Natural Gas Resources for Tribes Responding to Survey

Source: U.S. Energy Information Administration (EIA), 2011
Figure 3: Coal Resources for Tribes Responding to Survey

Source: EIA, 2006
Figure 4: Biomass Resources for Tribes Responding to Survey

Source: U.S. DOE National Renewable Energy Laboratory (NREL), 2007
Figure 5: Geothermal Resources for Tribes Responding to Survey

Source: NREL, 2008
Figure 6: Solar Resources for Tribes Responding to Survey

Source: NREL, 2007
Figure 7: Wind Resources for Tribes Responding to Survey

Source: NREL, 2009
I. Survey Energy Planning and Development of American Indian Tribes

My name is Daniel Brookshire and I am a researcher and graduate student at the University of North Carolina at Chapel Hill (UNC). This past summer, I worked with the Eastern Band of Cherokee Indians to update their Strategic Energy Plan. This work inspired me to conduct a study on the energy planning practices of American Indian Tribes. The goal of this study is to produce a status report of energy planning and development for Tribes across the continental U.S. and to discern best practices in those efforts. Many Tribes have already begun to create energy plans and to develop energy resources within their jurisdiction and many more are expected to join these efforts in the coming decades. By developing high quality and comprehensive energy plans, Tribes will be better suited to manage their energy resources in ways that promote Tribal sovereignty, preserve the values of the community, and ensure the preservation of environmental quality during energy development.

To make sure that we get an accurate assessment of your Tribe’s energy planning efforts, please complete the following questionnaire or forward this survey to the appropriate member or employee of your Tribe who would be able to provide the most accurate assessment of your Tribe’s energy planning and energy management efforts.

The survey should only take about 15 minutes to complete. Your responses are voluntary and your personal information will not be used in the study. If you have any questions or concerns, please contact me at (919) 249-8757 or by email at dbrook@live.unc.edu. If you have questions about your rights as a research participant, you may contact the UNC Institutional Review Board at IRB_Subjects@unc.edu and mention study number 11-1943.

This survey was designed in consultation with the UNC American Indian Center, the UNC Odum Institute for Research in Social Science, and the UNC Department of City and Regional Planning. The study receives financial support from the American Planning Association Environment, Natural Resources and Energy Division and the UNC Institute for the Environment.

By taking a few minutes to inform us about your energy planning and energy development efforts, you will help us identify ways to strengthen energy planning for Tribes across the U.S. If you so choose, we will also provide you a copy of our findings once the study is completed and highlight energy planning best practices for Tribes.

I sincerely thank you for your time and effort spent on this survey and look forward to hearing from you soon.

Daniel Brookshire
UNC Department of City and Regional Planning
dbrook@live.unc.edu
(919) 249-8757
Please provide the following information so we can identify the Tribes that are covered by this survey.

1. Name of your Tribe or American Indian organization that you are representing for this study

_____________________________________________________________________________________

2. Name of Tribal reservation or lands

_____________________________________________________________________________________

3. State(s) where Tribe or organization is located_________________________________________

4. Your position and/or title _____________________________________________________________

5. Your contact email or phone number (optional) ___________________________________________

6. Please provide the following contact information so that we can send a final electronic or hard copy of the Tribal energy planning study (Optional).

   Email address________________________________________________________________________

   Name or Name of Tribal Office_________________________________________________________

   Address______________________________________________________________________________

   City__________________________ State_______ Zip Code________________________

7. Please list any website links to energy agencies within your Tribe, links to the energy plan or plans that address energy, or any other links related to energy efforts of your tribe that would be useful for this study (Optional).

_____________________________________________________________________________________

Directions: Please place an “X” or a check mark next to the responses you select.

Q1 Which of the following energy resources are currently harvested, mined, captured, or developed within the physical boundaries or jurisdiction of your Tribal lands? Please check all that apply.

_ Oil
_ Natural Gas
_ Coal
_ Nuclear (including uranium mining)
_ Hydroelectric power
_ Solar Energy
_ Wind Energy

_ Geothermal
_ Biomass or Biofuel Energy
_ Other (Please Explain)______________________________________________________________

_ No currently harvested energy resources

If selected, skip to Q2

Q1A Who is developing or harvesting these energy resources? Please check all that apply.

_ The Tribal government
_ Enrolled members operating a private business

_ Tribal Corporation (defined as business-like unit to pursue energy development)
_ Company or Organization unaffiliated with the Tribe. Please explain (optional).

_ Other (Please Explain)____________________________________________________________________
Q1.B Do these energy resources located within the boundaries of your Tribal lands currently provide any tax revenue or a source of income for your Tribe or enrolled members?
_ Yes _ No

Q1.C How much revenue per year (from both taxes and income to enrolled members) is generated from both renewable and non-renewable energy resources located within the boundaries of Tribal property or jurisdiction? (Please state your best estimate)
_ $0-$10,000 _ $500,000-$1 million
_ $10,000-$100,000 _ Greater than $1 million
_ $100,000-$500,000 _ Unknown or choose not to report

Q2 Are there any energy resources listed in Q1 that could be potentially harvested, mined, captured, or developed within the physical boundaries or jurisdiction of your Tribal lands but are not currently?
_ Yes _ No If selected, skip to Q3

Q2.A Which of the following energy resources could be potentially harvested, mined, captured, or developed within the physical boundaries or jurisdiction of your Tribal lands but are not currently? Please place check marks on all potential resources and select how many years from now development of those resources will or could potentially start.

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>0-5 Years</th>
<th>5-10 Years</th>
<th>10-20 Years</th>
<th>Greater than 20 Years</th>
<th>Unknown time-frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural Gas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuclear (uranium mining)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydroelectric power</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solar Energy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wind Energy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geothermal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biomass or Biofuel Energy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (Explain)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q3 Is your Tribe pursuing business opportunities/economic development with the development/harvesting of your energy resources or with energy efficiency?
_ Yes If selected, skip to Q3.A _ No If selected, skip to Q3.B

Q3.A If your Tribe is tying business opportunities/economic development to developing your energy resources or energy efficiency, then please check all the ways your tribe accomplishes this.
_ Mining/Extraction of non-renewable resources (Coal, Natural Gas, Petroleum/Oil, Uranium, etc.)
_ Development of renewable resources (Hydroelectric, Solar, Wind, Geothermal, Biofuel, etc.)
_ “Green job” training program _ Energy efficiency or weatherization services
_ Other (Please explain) __________________________________________________________

Q3.B If your Tribe is not pursuing business opportunities/economic development with energy development or efficiency, then why not? Please check all that apply.
_ No significant energy resources _ No department or person assigned to energy issues and opportunities
_ Not a priority _ Other (Please explain)
_ Lack of funding _
Q4 What is the Tribe doing to increase the awareness of community members about renewable energy and energy efficiency options for themselves and for the Tribe as a whole? Please check all that apply.
___ K-12 Education Outreach: Please Explain (optional)
___ Adult Education Outreach: Please Explain (optional)
___ Displaying renewable energy or energy efficiency showcase projects: Please Explain (optional)
___ Other: Please Explain
___ None

Q5 What are the current barriers, obstacles, or difficulties with developing energy for your Tribe? Please check all that apply.
___ Lack of funding
___ Inability to capture tax incentives
___ Internal organization or politics
___ Lack of community support
___ No significant energy resources
___ Other (Please explain)
___ None

Q6 Does your Tribe have an adopted (or in the process of creating) energy plan to manage energy resources? Please check all that apply.
___ An energy vision document on Tribal energy goals (precursor to a more in-depth energy plan)
___ An energy plan that addresses Tribal energy resources or the use of energy (example: energy management or conservation)
___ A Tribal plan that addresses energy indirectly (example: addressing energy in a comprehensive plan for a community within the Tribe’s jurisdiction)
___ A plan to address an energy shortage (example fuel shortage or blackouts) or other emergency situations related to energy (wellhead fires, coal slurry spill)
___ Other (please explain)
___ None If selected, skip to Q7

Q6.A Which of the following describes your energy plan? Please check all that apply if energy is addressed in multiple types of plans.
___ The energy plan is an individual document and separate from other plans.
___ The energy plan is a component of a comprehensive plan
___ The energy plan is a component of an environmental or sustainability plan
___ The energy plan is a component of a transportation plan
___ The energy plan is a component of an emergency response plan
___ The energy plan is a component of another type of plan (Please explain)

Q6.B Is your energy plan, or energy component of another plan connected to any of the following issues? Please check all that apply.
___ Increased business opportunities/economic development
___ Job creation
___ Sustainability (meaning concern for both present and future economic, social, and environmental conditions)
___ Transportation (public transit such as buses or decreasing car use for trips)
___ Making energy (such as electricity or fuel) affordable for all members of the tribe.
___ Other (Please explain)
Q7 What is the general opinion of renewable energy and energy efficiency with members of your Tribe? Please select the degree of agreement with the following statements that best reflects the attitude of the members of your Tribe.

<table>
<thead>
<tr>
<th>General Opinion</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>A majority of members are aware of renewable energy and efficiency opportunities for themselves or the Tribe</td>
<td></td>
<td></td>
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<tr>
<td>A majority of members support energy efficiency upgrades or building retrofits for the Tribe</td>
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<tr>
<td>A majority of members support renewable energy development for the Tribe</td>
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</tbody>
</table>

Q8 Has your Tribe adopted goals, policies, programs, institutions, or legislation related to Tribal energy use and/or extraction/production of energy resources? Please check all that apply.

- A stated goal for reducing greenhouse gas emissions for the Tribe
- Energy efficiency standards or “green building codes” in public buildings
- Energy efficiency standards or “green building codes” in residential homes
- Renewable energy production targets
- Public transportation system
- Public outreach or public education

Q9 Please indicate all incentives the Tribe currently provides for enrolled members to reduce their energy consumption. Please check all that apply.

- Weatherization assistance program
- Grants or other financial incentives
- Advisory services (pamphlets, handouts, public education, or expert advice)
- Incentives to encourage public transit use: Please explain ________________________________
- Incentives for increasing walking and/or bicycle use: Please explain ________________________________
- Other (Please explain) ________________________________________________________________

Q10 Do any of your energy plans, policies, or incentives try to reduce the gasoline/oil consumption of Tribal government owned vehicles? Please check all that apply.

- Incentives to encourage public transit use: Please explain (optional) ________________________________
- Fuel efficiency standards for tribal fleet vehicles: Please explain (optional) ________________________________
- Increased pedestrian and/or bicycle transit access: Please explain (optional) ________________________________
- Other: Please explain (optional) ________________________________
- None
Q11 Is the Tribe taking advantage of any incentives or grant opportunities to reduce energy consumption offered by agencies outside the Tribe? Please check all that apply.

_ State incentives: Please describe (optional)

_ Federal incentives: Please describe (optional)

_ Nonprofit incentives: Please describe (optional)

_ Other (Please explain)

_ None

Q12 Does your Tribe own or manage any of the following energy utilities that serve part or all of your enrolled members? Please check all that apply.

_ Electrical utility
_ Natural gas utility
_ Heating oil provider
_ Propane provider
_ Other (Please explain)
_ None

Q13 Which Tribal government department or other Tribal entity has the designated responsibility of addressing energy planning/management issues for your tribe? Please check all that apply.

_ Department of the Environment and/or Natural Resources
_ Department of Energy
_ Department of Commerce
_ Planning or Development Department
_ Department of Transportation
_ Tribal Corporation (business-like unit)
_ Tribally owned/operated utility
_ Department of Housing
_ Forest Service
_ Other (Please explain)
_ None

Q14 Please describe the one to two most influential Federal and State agencies, nonprofits, utilities, and private businesses that influence your tribe’s energy planning and development of resources. Also please indicate the level of involvement your tribe has with the other party (none, low, mid, or high):

<table>
<thead>
<tr>
<th>Agency (Please write in the name of the agency)</th>
<th>None</th>
<th>Low</th>
<th>Mid</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal:</td>
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<td>State or States:</td>
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<td>Nonprofit Groups:</td>
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<tr>
<td>Energy Utilities:</td>
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<tr>
<td>Private Business:</td>
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<tr>
<td>Other:</td>
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</tbody>
</table>
Q15 Which of the following Federal agencies has your Tribe received financial or advisory assistance from for energy planning, energy management, or energy resource development?

- U.S. Department of Energy Tribal Energy Program (DOE TEP)
- U.S. Department of the Interior Indian Affairs Division of Energy and Mineral Development (DOI DEMD)
- U.S. Department of Agriculture (USDA)
- U.S. Environmental Protection Agency (EPA)
- U.S. Economic Development Administration (EDA)
- U.S. Department of Housing and Urban Development Office of Native American Programs (HUD ONAP)
- Other (Please Explain) ____________________________________________________________
- None

Q16 Please use the following space to describe any recommendations for improving energy planning and development for Tribes.

_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________
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Thank you for your time spent taking this survey!

Please use the provided pre-stamped envelope to mail back survey response to:

Department of City and Regional Planning
CB# 3140 New East Building
Chapel Hill, NC 27599-3140
Attn: Daniel Brookshire
7 References


