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Benefits of Renewable Energy for Native Nations from the Environmental and Native Perspectives

Lani Tsinnajinnie
University of New Mexico
Sandra Begay-Campbell, Technical Advisor
Sandia National Laboratories[1]
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Abstract

From a Western environmental viewpoint, renewable energy is thought to be beneficial as a clean energy source with minimal impacts on the environment. For Native peoples, renewable energy not only has environmental benefits, but social, economic, and cultural benefits as well. Both these perspectives are used to advocate for using renewable energy. The objective of this paper is to demonstrate and explain the benefits of renewable energy to tribes from both perspectives. This will be done by first explaining the Western environmental perspective of renewable energy and how benefits are attributed from using renewable energy. The second part of this paper will explain a Native perspective of using renewable energy and show how this perspective is demonstrated by the Navajo Nation. The research methodology of this report was taken using different techniques. Interviews were conducted with tribal renewable energy program coordinators either in person, by phone, or through email. Information was also acquired from scholarly articles, government reports, brochures, published books, and websites from agencies and private organizations. Personal observation during field visits, conferences, and workshops were also used for writing this report.

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Background and Context

When starting the Tribal Energy Program Internship, I came into the program thinking that everyone should use renewable energy because of its positive reputation of benefiting the environment. Because I am majoring in Environmental Science, I never thought to look at the other reasons that renewable energy is used. Throughout the summer, I have seen and learned about how renewable energy is making a difference in the lives of people and communities in more ways than one. Most importantly, I learned that renewable energy could especially benefit Native people, as individuals and as nations, by providing economic, social, cultural, and environmental benefits that lead to stronger, sovereign nations.

Environmental Perspective of Renewable Energy

From the Western environmental viewpoint, the major benefits of renewable energy are thought to be from environmental aspects. The benefits stem from the reduction of use and reliance on fossil fuel resources. Diagram 1 outlines an environmental approach to renewable energy by Western society. Two major environmental attributes that arise out of using renewable energy are the reduction of pollution and greenhouse gas emissions. Another attribute of renewable energy is that there is less reliance on foreign resources for energy. These benefits have helped the development of financial incentives, such as green tags and tax credits, for people who use or develop renewable energy. The financial incentives, in return, have played a major role in increasing the popularity of renewable energy. These three attributes of

using renewable energy all branch into environmental and societal benefits that are positive for everyone.

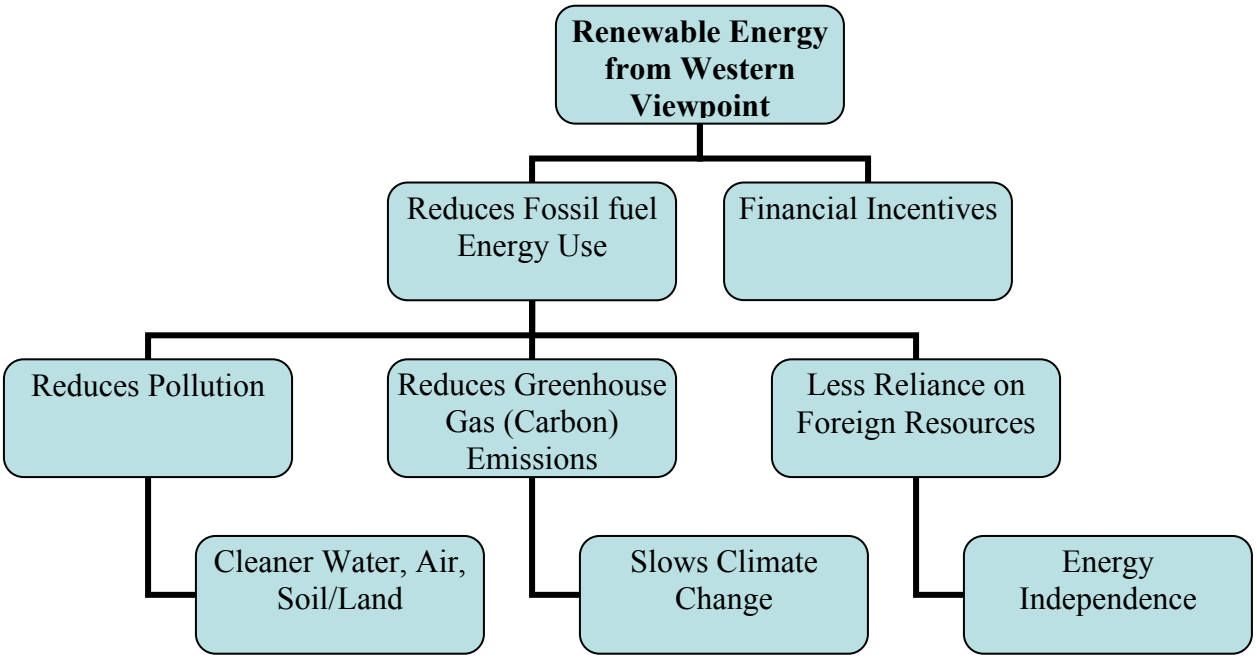

Figure 1 Outline of an Environmental Approach to Renewable Energy

The attribute of reducing fossil fuel usage by using renewable energy is the reduction in pollution which allows there to be cleaner water, cleaner air, cleaner soil, and more usable land. The Union of Concerned Scientists (UCS), an organization comprised of citizens and scientists looking for environmental solutions, composed a guide that includes the variety of pollution produced from fossil fuels.[2] Carbon monoxide, nitrogen oxides, sulfur oxides, and hydrocarbons are the main air pollutants listed by UCS. The Navajo people of the Four Corners Area are familiar with air pollution emitted by coal-fired power plants; two such plants that exist on the reservation.

[2] Union of Concerned Scientists. 2005. "The Hidden Cost of Fossil Fuels". Retrieved July 3, 2006 from the World Wide Web: http://www.ucsusa.org/clean_energy/fossil_fuels/the-hidden-cost of -fossil-fuels.html

The Navajo Generating Station and the Four Corners Power Plant have produced methyl mercury and noxious gas emissions that combine with toxic dust from coal mines to cause respiratory diseases and cancer in the reservation.[3]

In addition to air pollutants, the Union of Concerned Scientists also discusses water and land pollution. One of the ways water and land can be polluted is by oil and fuel spills, which can result in the loss of plant and animal life.

In Alaska, the Native Village of Venetie relies on diesel to run generators. Because of the remote location of Venetie Village, the process to transport and transfer the fuel is difficult which leads to the many spills that have occurred and will continue to occur with the village's reliance on fossil fuels. The Native Village of Venetie Tribal Government (NVVTG) has set up two photovoltaic systems in both the Venetie and Arctic villages as an alternative to using diesel fuel to produce electricity. Lance Whitwell, the NVVTG Energy Program Director, says that the photovoltaic systems have benefited the villages by reducing the risk of environmental contamination through oil spills and by providing a reliable, cost-effective alternative source. Community members from Venetie Village now have more confidence in their leaders because they are able to provide clean energy services to their people.[4] The Native Village of Venetie Tribal Government received a Department of Energy (DOE) Tribal Energy Program grant.

Another form of water pollution listed by the UCS is acid formed from pyrite, which is contained in coal that can pollute rivers and streams near coal mines. Coal mining can also leave the soil acidic because the matter close to the coal is acidic and can

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[3] Nowell, Brenda. 2005. "Policy debate: Power plants on Navajo land", *Indian Country Today* (June 3, 2005). Retrieved July 28, 2006 from the World Wide Web: http: //www.indiancountry.com/content.cfm.?id=1096411021

[4] Interview with Lance Whitwell, NVVTG Energy Program Director, July 19, 2006

leave the topsoil contaminated. Other major concerns with coal mining are the solid wastes created during the mining process and the waste ash that remains after the coal is burned. Strip mining on the Navajo reservation has led to contaminated aquifers, salty soils, erosion, and acid rain contamination that has killed plants, made animals sick, and endangered human lives.[5]

Several tribes have come up with their own water quality and air quality standards to regulate these types of pollution. The Navajo Nation Environmental Protection Agency has an agreement with the United States Environmental Protection to use fees to monitor emissions from power plants.[6] The Northern Cheyenne Tribe of Montana has developed water quality standards because of concern of coal bed methane polluting the Tongue River.[7] However, another way tribes can control pollution is to use renewable energy and encourage other people to use more renewable energy so that the pollution associated with fossil fuel usage will decline.

The second attribute of reducing fossil fuel usage by using renewable energy is reducing greenhouse gas emissions. Carbon dioxide, the main greenhouse gas of concern, is emitted during fossil fuel combustion. A key reason renewable energy is becoming more popular is because it has been presented several times as an option for helping to confront climate change. Renewable energy is presented as one of many currently available viable options for slowing the use of carbon-emitting technology.

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[5] Grinde, Donald A., and Johansen, Bruce E. 1995. "The Navajos and National Sacrifice" Pp. 118-143 in *Ecocide of Native America*. Santa Fe: Clearlight Publishers.
[6] Nowell, Brenda. 2005. "Policy debate: Power plants on Navajo land"
[7] Johnson, Clair. 2005. "Water talks go on: Tribe still trying to win EPA approval of quality standards" The Billings Gazette (July 11, 2005). Retrieved July 28, 2006 from the World Wide Web: http://www.indianz.com/News/2005/009216.asp

Pacala and Socolow offer the option of "stabilization wedges" (Figure 2) which are different methods that can be used to offset or reduce carbon emissions by 2054.[8] Each wedge in the stabilization triangle can offset carbon emissions and stabilize the amount of carbon emissions coming from fossil fuels.

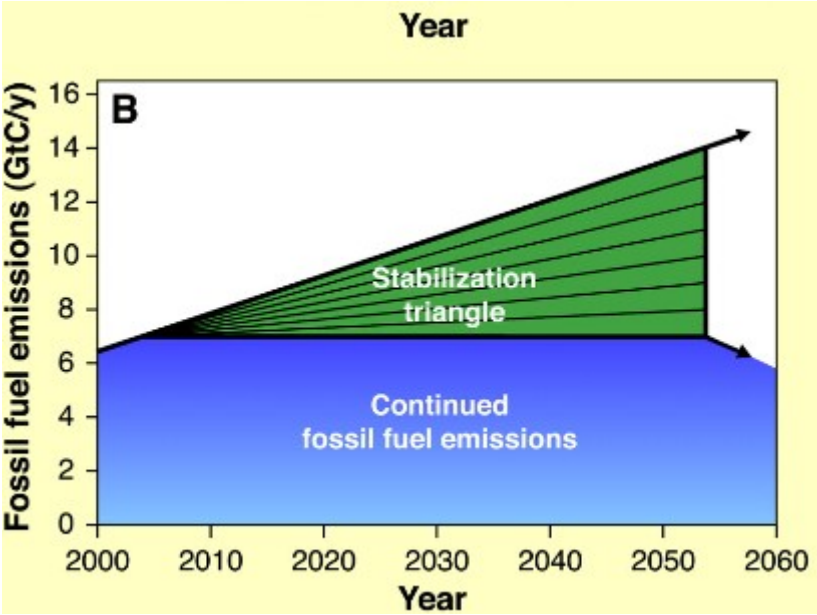

Figure 2 Pacala and Socolow "Stabilization Wedge" to off-set or reduce carbon emissions.

Pacala and Socolow suggest that if 2 million 1-MW-peak or 2000 GW-peak wind turbines are deployed to produce electricity in the place of coal-fired power plants, then 14 gigatons of carbon sent into the atmosphere will be avoided. They also calculate that electricity from 2000 GW-peak capacity of photovoltaic systems could also displace 14 gigatons per year of carbon in the atmosphere.

Climate change is a global issue and is addressed by both Native and non-Native people. The Intertribal Council on Utility Policy (Intertribal COUP) has helped several tribes in the Plains area set up wind turbine projects. One of the ways the Intertribal

[8] Pacala, S. and Socolow, R. 2004. "Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies" *Science* 305(5686): 968-972.

COUP has marketed the electricity created from their wind turbines is to spotlight the environmental benefits of their wind turbines. For example, the Rosebud Sioux wind project is expected to reduce up to 10-ton coal trucks extending 25 miles long that would have been used in a coal-fired power plant.[9] Also, the Intertribal COUP offers green tags for sale.[10] Green tags are clean energy credits that arise from the non-production of toxic pollutants and greenhouse gases. They can be sold to people who want to offset their emissions to the environment. Intertribal COUP has an alliance with different cities who want to meet Kyoto Protocol standards and buy green tags and support tribal wind projects.[11] Both Native and non-Native people are addressing the environmental issue of climate change through the use and development of renewable energy.

The third attribute of using renewable energy from the Western perspective is reducing the reliance on foreign resources. The United States has a vast supply of coal, but coal is finite and eventually will disappear. On the other hand, renewable energy resources are readily available right here in the United States. By developing renewable energy, the U.S. will decrease the need to get energy resources from other countries.

These three attributes are reasons why more financial incentives are being offered to develop renewable energy. Bonds, grants and tax credits for people developing renewable energy are attractive to energy developers. As mentioned before with the Intertribal COUP, renewable energy can also be used to make profits from green tags. These financial incentives are also benefits of renewable energy and are another big reason why the development of renewable energy technology is becoming more popular.

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[9] Interview with Patrick Spears, Intertribal COUP President, July 26, 2006.
[10] Native Wind. "Give Green Tags". Retrieved July 28, 2006 from the World Wide Web: http://www.nativewind.org/html/green_tags.html.
[11] Interview with Patrick Spears, Intertribal COUP President, July 26, 2006.

Native Perspective of Renewable Energy

As demonstrated by projects of Intertribal COUP, Native people are using and developing renewable energy for the same environmental benefits seen from the Western perspective. From the Western perspective, renewable energy can also provide economic benefits and energy security. From the Native perspective, other benefits are also taken into account. Economic, social, and cultural benefits are connected to the environmental benefits that come from using renewable energy. The environmental, social, economic, and cultural benefits all intertwine with one another to ultimately lead to strengthening the sovereignty of different tribes. Figure 3 outlines how the benefits of renewable energy from the Native perspective relate to one another.

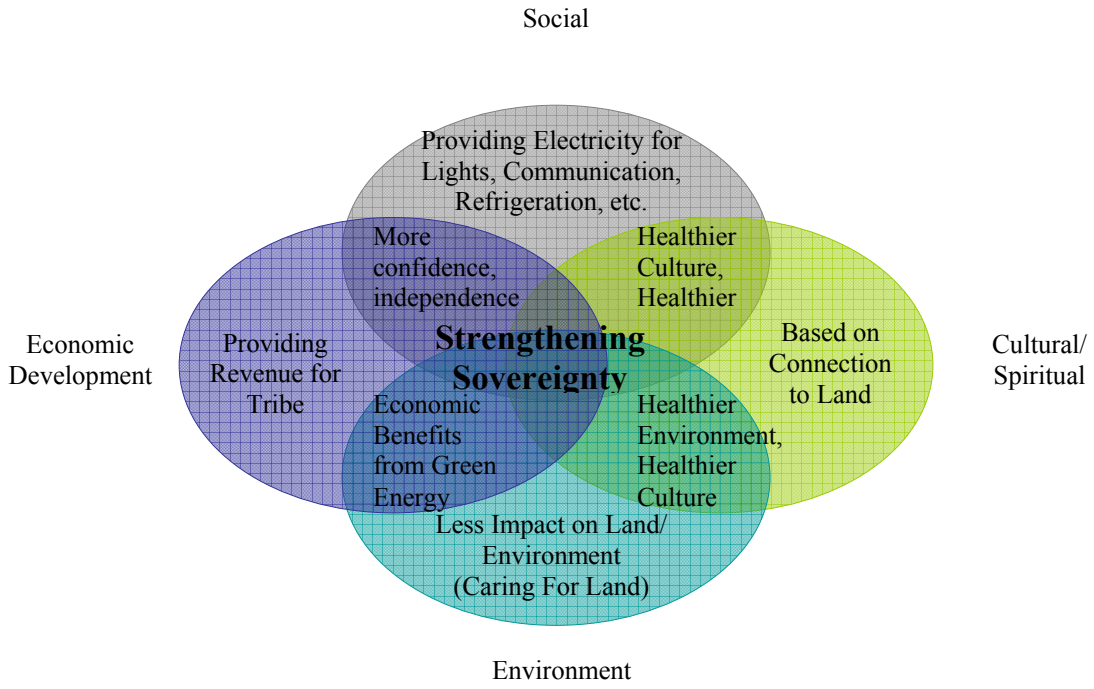

Figure 3 Renewable Energy from the Native Perspective

The most popular benefit for tribes to use or develop renewable energy has been for economic development. Plans are currently underway to build a large scale wind farm on the Navajo reservation. The tribe is conducting a feasibility study using wind resource maps and anemometers at different locations to determine where an effective wind farm can be located. The proposed 80 MW wind farm has the most promise of being located on Gray Mountain, near Cameron, Arizona, because it has a high-potential wind resource (Class 4 and 5) and because transmission lines are already located in the area to interconnect the wind farm.[12] This location has the best wind resource for large scale wind development in the state of Arizona.

The wind farm could be successful as a business in the same way that Intertribal COUP is marketing their wind farms. Cities or individual people could buy green tags from the wind farm to offset electricity they buy from carbon-emitting generating plants. Patrick Spears, who is the president of Intertribal COUP, has been promoting the development of wind energy for Native people. He explains that wind fits with the cultural and spiritual beliefs of Native people because Native people believe in the power of the wind, which was given to the people as a blessing. Spears believes that wind is a no-regrets strategy of energy development that can lead to a lot of economic restoration for tribes.[13] The wind farm would be a cost-effective way for the Navajo Nation to generate its own electricity to provide to its members and would also be one of the first sources coming from within the Navajo Nation to power homes on the reservation.

The Gray Mountain wind farm project would be a new method of energy development, which is the primary source of revenue on the reservation. The Navajo

[12] Mills, Andrew, D. 2006. "Wind Energy in Indian Country". Berkeley: Energy and Resource Group, University of California, Berkeley.
[13] Interview with Patrick Spears, Intertribal COUP President, July 26, 2006.

Nation has high unemployment and high poverty rates along with a lack of jobs for educated young people to work.[14] Using wind energy as a form of economic development would help provide jobs through construction, installation, operation, and maintenance. This wind farm will not only be one of the first of its kind because of its size and location on tribal land, it will also be one of the first commercial-scale power generating systems that does not have a large environmental impact on the reservation.

Navajo people have been traumatized in the past from other energy development ventures that have taken place on the reservation. Uranium mining has been prevalent on the Navajo reservation since the middle of the twentieth century. Many Navajo uranium miners became sick or died from being exposed to the hazardous materials at the mines. The trauma from the uranium mining experiences has passed to the families of the affected uranium miners. Kathleen Tsosie, a Navajo woman who lost her father and uncle from working in the mines, is a member of a Navajo organization that is fighting future uranium mining on the Navajo reservation.[15] By using renewable energy for economic development, the Navajo Nation can avoid having further trauma associated with energy development.

One of the major differences from the Western perspective for tribes to use renewable energy is that it is a viable technical option to get electricity. In order to provide utility services to its members, the Navajo Nation Council established the Navajo Tribal Utility Authority (NTUA) as a tribal enterprise. The services that NTUA provides include electricity, water, wastewater treatment, natural gas, and photovoltaic power.

[14] Mills, Andrew, D. 2006. "Wind Energy in Indian Country".
[15] LaDuke, Winona. 2004."Leetso Dooda" Pp. 4-6 in *Indigenous Peoples, Power and Politics: A Renewable Future for the Seventh Generation*. Minneapolis: Honor the Earth.

The number of customers provided electricity services is around 37,000. However, an estimated 18,000 homes do not have electricity on the Navajo Reservation.[16]

The 18,000 homes without electricity is a major reason why the Navajo Tribal Utility Authority established its photovoltaics program and began a partnership with the DOE Solar Program and Sandia National Laboratories. Many of the people who live in these homes are off NTUA's utility grid because they choose to live in the remote locations. The cost to extend transmission lines is very expensive at $29,000 per mile.[17] By using photovoltaics, the NTUA is able to provide electricity in a cost-effective way to rural homes that are not able to be connected to the utility grid.

Figure 4 NTUA's Larry Ahasteen and electrician inspect PV system[18]

With photovoltaic power, these homes can have modern amenities that most people take for granted such as lights, communication (television and radio), and refrigeration. By providing electricity and other needs to the Navajo people using their own resources, the Navajo people could gain more confidence in the leadership of the tribe because they were able to provide services to them.

[16] Data from paragraph taken from: Navajo Tribal Utility Authority. 2006. "About Us". Retrieved July 24, 2006 from the World Wide Web: http://www.ntua.com
[17] Interview with Larry Ahasteen, NTUA renewable energy specialist, July 10, 2006.
[18] Photo take July 16, 2006 by Deborah Tewa.

In the younger generations, many Navajo people are getting used to modern amenities like television, video games, computers, refrigeration, stereos, etc. It is important for young Navajo people to have access to modern technology like computers and the Internet in order to have the same educational opportunities as other people. This means that younger generations are consuming more and more energy. More Navajo people are getting used to consuming energy by being connected to the grid. However, to make renewable energy systems work; the users have to learn energy efficiency as well. The photovoltaic systems installed on the Navajo reservation are not able to handle loads coming from TVs, refrigerators, and stereos that are all being used at the same time. They must learn to manage their electrical loads. More young people want to be connected to the utility grid so that they can use the amount of energy that will fit their energy needs. However, it is sometimes not possible to connect people to the utility grid due to the high cost of connecting to the electrical grid. The need for electricity has to be met for those who want electricity but who also want to remain at their homes on the reservation.

By staying on their homelands, Navajo people will remain more connected to their culture. For Native peoples, their cultures and ways of life arise from the land that they are connected to. The Navajo homeland, Dine Bikeyah, is enclosed within four sacred mountains. It is within the four mountains that the language, songs, food, ceremonies, and other traditions come from. That is why caring for the land is important to the Navajo. The land must be cared for and respected because it gives life to the Navajo people. Preserving and caring for the environment are ways the Navajo are protecting their way of life so that it will be available for future generations.

By using and developing renewable energy, the Navajo Nation will receive economic, social, and cultural benefits. These benefits that will come from renewable energy have the potential to play the large and important role of strengthening the sovereignty of the Navajo Nation. Larry Ahasteen, renewable energy specialist for the NTUA, sees the attributes renewable energy and what renewable energy development can do for the Navajo Nation in the future. He believes that one day the Navajo Nation can start controlling their own destiny by providing its own clean power to their people and stop being dependent on other resources to make the Navajo Nation more secure.[19]

Renewable energy has the potential to bring much prosperity to the Navajo people. However, very few Navajo people are aware of renewable energy technology. Much of the focus of energy development on the Navajo Reservation still leans toward fossil fuels. Currently, the Navajo Nation has been working on developing a new clean coal-fired power plant on the reservation called the Desert Rock Project. The Desert Rock Project has the approval of the majority of the Navajo Nation Council and the President. The Desert Rock Project will use clean coal technology to generate electricity. With more awareness of renewable energy being spread, perhaps future projects will focus more on renewable energy.

Indigenous Peoples and Climate Change

Concerns for climate change may not be the main reason that the Navajo Nation or Native people are using or developing renewable energy, but climate change still has been on the minds of Indigenous peoples for many years. In 1993, several Indigenous

[19] Interview with Larry Ahasteen, NTUA renewable energy specialist, July 10, 2006.

leaders from around the world gathered to address the United Nations, many warning about the destruction to the environment. Thomas Banyacya, a Hopi elder, described the warnings Nature was giving us: "You see increasing floods, more damaging hurricanes, hailstorms, climate changes and earthquakes—as our prophecies said would come...If we humans do not wake up to the warnings, the Great Purification will come to destroy this world—just as the previous worlds were destroyed."[20] Climate change is perhaps the greatest environmental concern that the Indigenous peoples may worry about.

Climate change has the potential to do much more harm to the environment and to people because it is a global effect. Potential impacts of climate change are described:

> It is suggested, among other things, that forest systems would begin to decline within a few decades and a number of species of plants and animals would die out because they could not migrate north quickly enough or their paths of migration would be blocked quickly by urban sprawl. Most of the country's coastal wetlands—many of them irreplaceable wildlife refuges—would be lost to rising seas (caused by the melting of land-based polar ice and the thermal expansion of seawater). Coastal communities would have to spend large sums to protect against flooding. Agricultural output would be affected, as forecasters predict increased summer dryness in the American breadbasket and a higher frequency of droughts and heat waves (although increased levels of atmospheric carbon dioxide could at least partially offset these changes by aiding plant growth). In some parts of the country, water for drinking, irrigation, and industry would become more scarce.[21]

These impacts will without a doubt affect the ways of life for many Indigenous people who depend on the land and environment. Indigenous leaders and other leaders around the world are calling for people to take action so that humans can reduce their contribution to climate change and the risk that the destructive impacts mentioned above will not happen.

Although climate change is a global issue, that does not mean tribes or other smaller governments and organizations should leave it up to the world leaders to solve

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[20] Banyacya, Thomas. 1994. "Thomas Banyacya" Pp. 112-118 in *Voice of Indigenous Peoples*, Santa Fe: Clearlight.
[21] Brower, Michael. 1992. *Cool Energy*, p.9. Cambridge: MIT Press.

the problem. Tribes have to play their roles in confronting climate change and a major way they can do this is through their use and development of renewable energy. By using and developing renewable energy tribes can be leaders in the world and set the example for others to take action and offset carbon emissions.

Figure 5 PV-Wind hybrid system on Navajo Reservation[22]

Bob Gough, from the Intertribal Council on Utility Policy, is already helping tribes to play this leadership role. He describes that renewable energy had already been in use for thousands of years by Native people, but using renewable energy to generate electricity is still new. He believes that tribal renewable energy can produce a whole lot of change and tribes can play the leadership role. However, before they can do this, tribes need to meet their own needs and need to get bigger in scale to put projects up. When this happens, tribes can own these projects and build a renewable energy economy that can be sustainable.

[22] Photo taken July 16, 2006 by Deborah Tewa.

Conclusion

By promoting and developing renewable energy, Indigenous people can help fulfill their roles as caretakers of Mother Earth. Indigenous people can be leaders and bring all peoples of the world together to work at restoring the environment. Even though Native people have a different perspective and approach of renewable energy than Western society, common goals are shared. Both perspectives show that renewable energy can provide a solution to environmental problems such as pollution and climate change, a way to become energy independent, a way to strengthen the economy. Both perspectives show that renewable energy is a positive alternative that can benefit individual groups of people and the world as a whole. All in all, renewable energy is an important factor in making sure that life will continue for seven generations to come.

Reflections

I am very fortunate and thankful to have participated in the Tribal Energy Program Student Internship. Before coming into this internship, I had nothing but positive expectations, which were all fulfilled. I was able to attend several workshops and conferences regarding Native people and renewable energy. At the Crownpoint Institute of Technology (CIT) Small Wind Workshop, I was able to get hands-on experience assembling a small wind turbine and interact with CIT students and NTUA electricians to learn about their perspectives of wind energy. At the International Indigenous Business and Entrepreneurship Conference, I was able to meet other Indigenous people who wanted to better their communities. The Southwest Renewable Energy Conference was also a positive experience because I was able to interact with

leading professionals and advocates in the renewable energy field. The field visits to Arizona tribes provided the most valuable experience to me because I was able to see the systems first hand and observe and interact with the people who used the systems.

Overall, the internship provided many benefits to me that will help guide my educational and professional careers. In this internship I was able to interact with top professionals. Both Sandra Begay-Campbell and Deborah Tewa have been excellent mentors and role models for me. I am sincerely grateful to have worked with them. The most important benefit of this internship for me is that it has given me a peek at what I want to do professionally in the future. It has always been my goal to work with Tribes in helping strengthen Native Nations and caring for the environment as well. I definitely felt that I experienced doing some of that through this internship. I feel that I have a lot to look forward to in the future in working with Native people, especially with developing renewable energy.