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IDENTIFYING SUSTAINABLE DESIGN OPPORTUNITIES IN TRIBAL HOTELS AND CASINOS: MESCALERO INN OF THE MOUNTAIN GODS HOTEL AND CASINO

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Identifying Sustainable Design Opportunities in Tribal Hotels and Casinos: Mescalero Inn of the Mountain Gods Hotel and Casino

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Abstract

The Indian Gaming Regulatory Act, passed by Congress on October 17, 1988 provided tribes with the Federal statute to pursue gaming activities on tribal lands. Many Native communities contribute to larger regional economies and tourism industries. These casino facilities often include resort-style hotel amenities. Not surprisingly, they are also large consumers of energy, operating 24 hours a day and 7 days a week. Tribes with hotels and casinos can implement sustainable design features and not only receive economic gain, but also environmental and community benefits. The intention of this paper is to identify sustainable design opportunities at the Inn of the Mountain Gods Hotel and Casino. This research stems from previous work the researcher conducted and subsequently published for the Illinois Green Business Association. First, the paper reviews what sustainable design is and points of interest when considering sustainable construction. Next, the paper explores the precedents set by the Blue Lake Rancheria, Rincon Band of Luiseno Indians, and the Forest County Potawatomi Tribe. Then, the research examines areas to collect baseline information and identify opportunities in sustainable design for the Mescalero Apache Tribe, Inn of the Mountain Gods Hotel and Casino located in New Mexico. Lastly, the work explores the resources and funding options available to the tribe.

Keywords: Indian Gaming Regulatory Act, tribal hotels, tribal casinos, sustainable design, Mescalero Apache Tribe

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I am grateful that the U.S. DOE Office of Indian Energy Policy & Programs supports this internship program at Sandia National Laboratories as it has provided me with a more comprehensive understanding of the challenges, opportunities, and accomplishments in developing energy projects for Indian Country. The technical site visits to tribes across the southwest provided first-hand accounts of the impacts energy developments can have on tribal communities and regional economies.

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I would also like to extend my gratitude to Darin Sand of Goodman Reality, who took the time to speak with me about the green features in Albuquerque's Hotel Andaluz. He provided me with useful insights that tribal hotels can consider to help make their projects successful.

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Finally, I would like to thank my family for their support and encouragement as I embarked on this internship. To my loving husband and children, thank you for your endless patience while I completed this work.

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NOMENCLATURE

DOE IE	U.S. Department of Energy Office of Indian Energy
EIA	U.S. Energy Information AdministrationEPA U.S. Environmental Protection Agency
EPIC	California Energy Commission's Electric Program Investment Charge
FOA	Funding Opportunity Announcement
HVAC	Heating, ventilating, and air conditioning
ICDBG	Indian Community Development Block Grant Program
Illinois	Green Business Association (IGBA).
LED	light emitting diode
LEED	Leadership in Energy and Environmental Design
OCEC	Otero County Electric Cooperative, Inc.
SEP	Strategic Energy Plan
SEDAC	Smart Energy Design and Assistance Center
START	Program U.S. Department of Energy Office of Indian Energy's Strategic Technical Assistance Response Team ProgramUSGBC U.S. Green Building Council

1. BACKGROUND

Traditional structures built by Native Americans involved basic concepts of sustainable design. Some of these concepts included use of orientation for natural light and air, and demonstrated knowledge of place through the use of local materials and landscape features.

Figure 1-1. Site visit to Hualapai, Grand Canyon West. Example of a traditional Hopi Structure.

Today, research confirms that buildings have a crucial impact on the physical health, economic health, and well-being of the individuals, communities, and organizations that they are intended to support (Halliday & Kendall, 1997). Sustainable design concepts are becoming more of a common practice in the construction industry because of the external emphasis to conserve natural resources. Native nations also have the added benefits of integrating and supporting cultural resources using sustainable design. The sustainable design approach also offers cost savings, which tribal communities can then reinvest into other tribal enterprises and programs.

1.1. Introduction

Sustainable design seeks to reduce negative impacts on the environment and improve the health and comfort of building occupants, thereby improving building performance (Sustainable

Design, 2016). Many tribal communities invest in this approach not only as a form for self-identity, but also for economic feasibility. Roberto Nutlouis of the Indigenous Youth Coalition of Pinon stated, *"*We call for a more sustainable and culturally appropriate development that is guided by the values and teachings of our ancestors. We call for an economic base that would truly empower our people rather than the pockets of transnational corporations, western cities, tribal, state and federal government. We call for an end to the colonization of our lands for energy purposes and we demand a better government that is more accountable to the people" (Halliday & Kendall, 1997).

One foundation for the economic development of some tribes is tribal hotels and casinos. Tribes pursued this form of economic development with the passage of the Indian Gaming Regulatory Act by the U.S. Congress on October 17, 1988. Among the findings by the 100th U.S. Congress, Indian tribes had become engaged in or had licensed gaming activities on Indian lands as a means of generating tribal governmental revenue (Indian Gaming Regulation, 1988). A principal goal of Federal Indian Policy is to promote tribal economic development, tribal self-sufficiency, and strong tribal government (Indian Gaming Regulation, 1988). Indian tribes have the exclusive right to regulate gaming activity on Indian lands if the gaming activity is not specifically prohibited by Federal law and is conducted within a State which does not prohibit such gaming activity as a matter of criminal law and public policy (Indian Gaming Regulation, 1988). The act also established the National Indian Gaming Commission, which meets congressional concerns regarding gaming and protects such gaming as a means of generating tribal revenue (Indian Gaming Regulation, 1988).

> These facilities often include resort-style hotel amenities. Not surprisingly, they are also large consumers of energy, operating 24 hours

a day and 7 days a week. As the cost of energy increases, many tribal casino managers are looking toward sustainable design concepts as an alternative to improve profitability and operational efficiencies. This paper identifies sustainable design opportunities within the Mescalero Apache Tribe Inn of the Mountain Gods Hotel and Casino. This research stems from previous work the researcher conducted and subsequently published for the Illinois Green Business Association. The published work is titled, "Implementing Sustainable Business Practices in a Hotel and Expanding Green Certification Markets in the Midwestern United States", and can be found at http://www.tandfonline.com/eprint/JNYaqmttMdHmF85HUEP3/full (IGBA).

2. POINTS OF INTEREST

Utilizing sustainable design concepts encourages an integrated approach throughout the design process. The approach is intended to reduce negative impacts on the environment and the health of the occupants without compromising the bottom line (Sustainable Design, 2016). The points of interest discussed here are not an exhaustive list, but rather offer broad areas of interest to consider.

Sites

Initial planning for sustainable design should consider optimizing site potential. The location, transportation, and landscaping of a building affect local ecosystems (WBDG Sustainable Committee, 2015). Location considerations would not only address topics related to local ecology and orientation, but also culturally significant topics and/or historic areas of importance. By considering site location and development methods in relation to natural, culturally significant, and historic areas, tribes can avoid or reduce the impact on these important spaces (Tribal Green Building Toolkit, 2015). According to the toolkit, key strategies include:

- Conservation of historic and culturally important areas, lifestyle, and practices through:
    - Siting considerations, and
    - Designing for culturally important activities and traditions that require specific spaces.
- Balancing natural and built environments through:
    - Compact versus low-density development,
    - Wildlife corridors,

- Wildland interfaces, and
- Aquatic buffers.

Land development adds impervious surfaces such as cement, asphalt, and roofing. The natural cycle is disturbed, and the amount of precipitation that is infiltrated decreases, while the runoff portion increases. This changes both water quantity and quality through increased flood risk, pollutant loading, waterway scour and sedimentation (Framework, 2016). Transportation for early construction—as well as after a project is completed—should consider ways to decrease environmental impact and carbon footprint. During construction, strategies should mitigate issues such as soil erosion and water pollution. According to the Tribal Green Building Tool kit (2016), a key strategy during the construction phase is pollution control. Pollution may come from petroleum, herbicides, solvents, noise, and light. To minimize carbon emissions, developers could consider offering incentives, such as preferred parking for carpooling or electric vehicles.

Figure 2-1. Electric Vehicle Charging Station.

2.2. Water Conservation

Water sources for buildings can vary; water may come from private wells, surface water, rain water and reused water (Tribal Green Building Toolkit, 2015).

Figure 2-2. Harvesting rain water.

The U.S. Environmental Protection Agency (EPA) Water Sense program (2016) shares, "that water efficiency is the smart use of our water resources through water-saving technologies..." Droughts and population growth increase the risk of higher concentrations of natural and human pollutants. There are ample opportunities to practice water conservation for tribal hotels and casinos.

Hotel operations can consider points to minimize water loss. Opportunities may be found in guest room facilities, golf courses, pools, and laundry facilities. Darin Sand of Goodman Realty and contact for Hotel Andaluz's green features, located in Albuquerque, New Mexico, suggested installing low flow water fixtures in guest rooms, installing solar thermal systems for heating water, and recycling grey water (Telephone Interview, July 22, 2016). Installing high efficiency laundry systems will also contribute to water conservation. Key strategies found in the Tribal Green Building Toolkit (2015) for water conservation include:

- On-site water metering and sub-metering of buildings.

- Installation or creation of land contours, gutters and drains, and basins or retention areas (especially for passive systems).
- Placing development close to water sources.
- Promoting natural water filtration through strategic plantings.
- Installation of WaterSense/water-conserving appliances:
    - Faucets and showerheads with flow restrictors,
    - Low-flow or dual-flush toilets,
    - Efficient washing machines and dishwashers, and/or
    - High-efficiency cooling systems.
- Using dual-plumbed systems and other greywater plumbing and usage strategies.
- Locating containment tanks adjacent to structures, and inclusion of vents and overflows in tanks.

Optimal efficiency can be achieved by coupling water conservation ordinances with regulatory tools, educational material, and financial incentives. These types of programs promote the adoption of new technologies and practices and improve the efficiency of existing developments that are not impacted by other regulatory tools (Framework, 2016).

2.3. Energy Consumption

Central to operating hotels and casinos is access to energy. In order to decrease energy consumption in a commercial building, it is important to understand how a building uses energy. According to the U.S. Energy Information Administration (EIA), space heating accounted for

about 25% of the total energy use in commercial buildings in 2012. The most common energy sources for commercial buildings are electricity and natural gas. Furthermore, lighting is the largest single use for electricity in commercial buildings (Energy Use in Commercial Buildings, 2016).

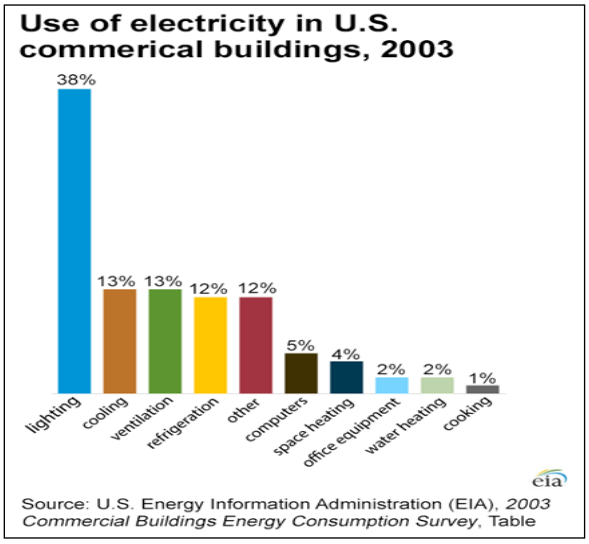

Figure 2-3. Commercial Buildings Energy Consumption Survey.

The hotel needs to meet the energy demands of their guests while also providing a comfortable atmosphere. Energy demands include the entire hotel's heating and cooling systems, from guest rooms to meeting spaces and employee office space. The casino is designed to attract and keep guests inside. From signage to slot machines, lights are intended to capture people's attention. The many onsite restaurants also consume energy. For example, the refrigeration and ventilation systems are energy demands that should be examined. Reducing heating and cooling loads through energy efficiency and passive solar design can also reduce building operating costs (TGBT, 2015).

The Tribal Green Building Toolkit offers the following key strategies for energy efficiency and optimized building performance:

- Enact and Implement the International Energy Conservation Code.
- Purchase ENERGY STAR/energy efficient appliances and technologies, such as:
    - Lighting;
    - Heating, ventilating, and air conditioning (HVAC);
    - Water heating, plumbing and pumping;
    - Kitchen appliances.
- Purchase ENERGY STAR/energy efficient windows and doors.
- Use off-grid systems.
- Conduct Energy audits and commissioning.
- Diversify energy generation and storage systems.

Utilizing on-site renewable energy generation can reduce cost by decreasing a building's susceptibility to fossil fuel price volatility (TGBT, 2015). While tribal lands comprise 2% of U.S. lands, technical potential on tribal lands comprises 4.8% of the total national U.S. technical capacity potential for renewable energy and 6% of total generation, varying by resource (TGBT,2015).

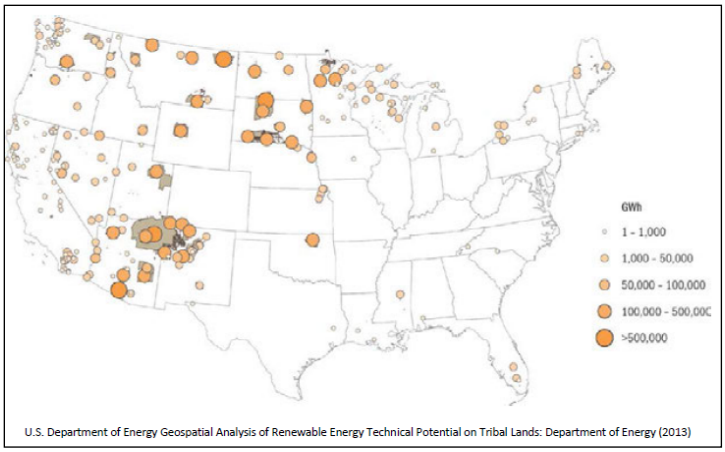

Figure 2-4. Geospatial analysis of renewable energy technical potential on tribal lands. Source: U.S Department of Energy.

2.4. Waste Management

There are many reasons to review the waste management process beyond recycling. Some concerns may include disposing of electronics or hazardous material properly, diverting construction and demolition debris from landfills, or managing food waste. Whatever the type or volume of waste a company generates, it is all the same in one respect: it costs the company money! In fact, managers are paying for it twice: once when products are purchased and the second time when it is thrown away (Why You Should Care, 2015). Efficient waste management can prevent pollution in the environment and reduce the need for virgin material. When managing waste, it may be helpful to consult with the local U.S. EPA office to adhere too federal and state regulations. Furthermore, the waste management vendor may also have programs worth pursuing.

Materials that are recycled are converted into new materials and products. However, the U.S. EPA points out that this still represents lost revenues because they are not becoming a part of the products or services (Why You Should Care, 2015). Waste management intends to develop a

culture of waste prevention similar to worker safety and customer satisfaction. One way to manage waste is to consider local options when sourcing materials. Production of locally manufactured goods and services could make a contribution to the local economy, offsetting unemployment with strategic economic and social benefits to local communities (Halliday S. P., 1997). The U.S. EPA Small Business Guides (2015) offers these steps:

- Determine what wastes are generated:
    - Examine all of the waste streams, including process wastes, hazardous wastes, nonhazardous wastes, solid waste, and office waste.
    - Characterize each waste stream and determine where the waste comes from, what processes generates it, and how much is being discarded.
- Identify waste prevention measures:
    - Evaluate all wastes for possible reduction. Determine how each waste stream can be reduced, evaluate the purchasing policies, and determine what can be reused.
    - Identify potential production changes that would improve efficiency, including process, equipment, piping, and layout changes.
    - Investigate opportunities for new products or ingredients that prevent waste generation.
    - Identify resources that can help conduct a waste reduction assessment.
- Set priorities and goals:
    - Prioritize waste prevention opportunities by considering cost, ease of implementation, payback, and other benefits, such as increased employee safety.
    - Try focusing on a few opportunities that are easy to implement, have low capital investment, and reduce large volumes of waste.

    - Set attainable goals, such as reducing office paper waste by 25% or reducing your waste hauling and disposal cost by $5,000 annually.
- Get started:
    - Teach employees how to prevent waste.
    - Promote waste prevention activities.
    - Encourage employee involvement by offering incentives.

More information is available on the U.S. EPA Pollution Prevention website: www.epa.gov/p2/why-should-you-care-about-preventing-waste-small-business-guide.

2.5. Indoor Environment

The hospitality and tourism industry always strive to provide guests with a pleasant experience. Beyond this, there should be concerns for the occupant's health and productivity. Though the indoor environment may seem like a refuge from outdoor air pollution, research has shown that air within homes and buildings can be more polluted than the outdoor air in even the largest and most industrialized cities (TGBT, 2015). Hazardous material and emissions can enter people's bodies in many ways: breathing, touching, eating or drinking (TGBT,2015). The hospitality and tourism industry should take actions to reduce exposure to chemicals from cleaning or renovations and poor ventilation.

Air quality can be compromised in casino's due to cigarette smoke and other odors. HVAC systems should be inspected to ensure the system is running at maximum efficiency appropriate for the space. HVAC systems also regulate humidity and temperature, both of which rise with the dense concentration of people, electronic gaming machines, and intense casino lighting

(Sykes & Sykes, n.d.). The Tribal Green Building Toolkit (2015) offers the following key questions:

- Are buildings designed and maintained to reduce mold and moisture impacts?
- Are building materials free of toxic substances such as lead-based paint, formaldehyde and volatile organic compounds?

The Whole Building Design Guide website has a vast amount of resources that further discuss opportunities to enhance indoor environmental quality: www.wbdg.org/design/ieq.php.

3. TRIBAL EXAMPLES

Practicing sustainable design in hotels and casinos is not a new concept. Some tribes have ventured into this area and made achievements that were suitable to their needs. The selection of tribes was based on opportunities to visit the establishment, a review of online literature, and whether the tribes were successful grant recipients from the Department of Energy – Indian Energy (DOE IE).

3.1. Blue Lake Rancheria

The Blue Lake Rancheria is home to the Wiyot, Yurok, and Hupa people and is located in Humboldt County, California. It is near the City of Blue Lake, 17 miles north of Eureka and 5 miles east of Arcata—largely rural terrain between the Northern California coastal mountains and the Pacific Ocean, bordered by the (still) great forest and the majestic California Redwood trees (Facts, 2007). The Rancheria comprises a total area of 91 acres with a population of 78 at the 2000 census and tribal enrollment of 51 (Tiller, 2000).

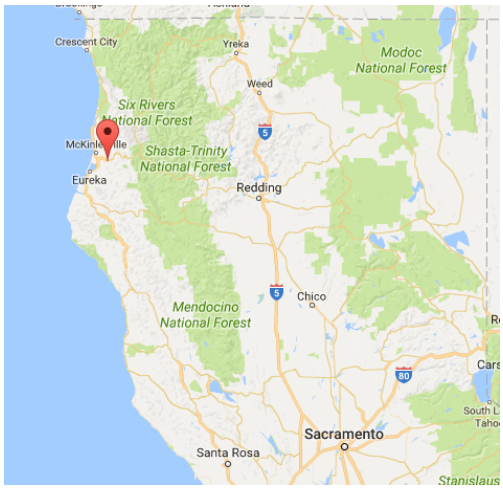

Figure 3-1. Blue Lake Rancheria location on Google maps.

The Blue Lake Casino offers 750 slot machines, 16 table games, 5 poker tables and bingo, and 3 restaurants (Tiller, 2015). The hotel offers 102 guest rooms (Tiller, 2015). The casino is designed to operate as a Disaster Relief Center and Regional External Evacuation Zone from tidal waves off the Pacific Ocean (Business Operations,2007). The required infrastructure elements to achieve this include: Diesel Generator (provides up to 5 days of self-contained power), kitchen and storage facilities, large protected interior space, fresh water, extensive shower/restroom facilities (Business Operations, 2007).

The Rancheria has taken on many projects to address their concern for climate change. They have also received recognition from the White House as Climate Action Champions. One of the most recent projects is a 500-kilowatt (kW) solar array low-carbon, community scale micro-grid with more than 950 kilowatt hours (kWh) of battery storage (Petersen, 2016). Jana Ganion, Energy Director for the tribe stated, "This project is an exemplary and successful collaboration between tribal, local, state, and federal entities, assertively working toward clean energy initiatives" (Climate Action, 2016). The micro-grid will serve the tribal offices, casino, hotel, and event center.

Figure 3-2. Blue Lake Rancheria Solar and Micro-grid ground breaking ceremony.

During our field visit to the Blue Lake Rancheria, they proudly promoted additional green initiatives at the hotel and casino. Some of this includes, energy efficiency throughout the hotel. As of 2010, the hotel achieved 35% energy reduction. By 2014, they further reduced their energy consumption by 165,000 kWh. The savings from upgrades and utilizing models of energy efficiency has been $30,000 each year (Climate Action, 2016). Their goal is to have energy generation that is 100 % renewable.

The Rancheria has also piloted a 175kW biomass co-generation system that utilizes hydrogen fuel cell technology for energy storage. They utilize biodiesel (waste oil from their commercial kitchens) for their Tribal Transit system and have adopted electric vehicles where feasible (Climate Action, 2016). The Blue Lake Rancheria is not short on green accomplishments or goals, and with this dedication, they have also received proper recognition for their efforts.

Figure 3-3. Blue Lake Rancheria Site Visit.

They have not accomplished this alone as they received grant funding for the micro-grid and solar array through the California Energy Commission's Electric Program Investment Charge (EPIC), technical assistance through the U.S. Department of Energy Office of Indian

Energy's Strategic Technical Assistance Response Team (START) Program, and other regional, national partners from industry, government, and academia (Petersen, 2016).

3.2. Rincon Band of Luiseño Indians

The Rincon Band of Luiseno Indians reside in the Northeast Corner of San Diego County California. Their tribe has 4,269.52 acres (Tiller, 2015). The 2000 U.S. census had the population at 1,495 with tribal enrollment at 639 (Tiller V. 2015). Among the environmental concerns, this is water conservation being done to ensure the longevity of their wells and primary water source Lake Henshaw. The reservation is also home to the arroyo toad which is listed as an endangered species. (Tiller, 2015).

Figure 3-4. Google map location for the Rincon Band of Luiseno Indians.

They own the Harrah's Rincon Casino and Resort, which went through a renovation in 2014 and is now known as Harrah's Resort Southern California. It offers 1,700 slot machines and 68 table games (Casino, 2016). The hotel now offers 1,065 hotel rooms, 9 restaurants, entertainment space, conference space, a gift shop, swim-up bar, and a 400 ft. Lazy River (Casino, 2016).

The Harrah's Rincon formally launched a Green Committee in 2007 to better organize and accomplish its green initiatives (Harrah's Rincon Code Green Story, 2016). Prior to the expansion and name change, they also partnered with San Diego Gas & Electric, who performed two energy audits. As a result of the energy audits, they retrofitted 10,000 lighting fixtures which contributed to savings of 3.5 million kWh and over $250,000 (SDG&E, n.d). In 2015, the newly expanded resort's sustainability efforts include: a solar plant that generated 113,986 kWh of solar energy, the equivalent of planting 450 trees or offsetting 90 tons of CO2 from burning coal, cutting the casino's usage by 25% (Ross, 2016). That same year, the resort decreased its water usage by 2.5% saving 2.3 million gallons and increased recycling by 10.5% diverting 468 tons of material (Ross, 2016). Going a step further, the committee is dedicated to employee engagement with their green efforts and wish to expand green efforts further into the tribal community to foster education and awareness.

3.3. Forest County Potawatomi Tribe of Wisconsin

The Forest County Potawatomi Tribe is located in the Nicolet National Forest of Northeastern Wisconsin and has a total area of 12,280.18 acres (Tiller, 2015). They own the Potawatomi Bingo Casino and the Northern Lights Casino (Tiller, 2015). The population at the 2000 census was 524 and tribal enrollment was 1,186 (Tiller, 2015). The environmental concerns for the Forest County Potawatomi are air and water quality. The Forest County Potawatomi Natural Resource Department also houses a solid waste and wildlife program.

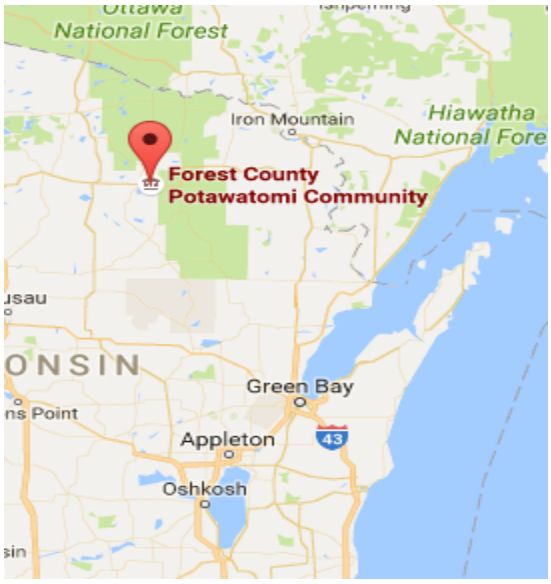

Figure 3-5. Google map for the Forest County Tribe of Wisconsin.

The Tribe started Project Greenfire in 2007, which aims to assess and reduce the Tribe's environmental impact, reduce the tribe's overall carbon footprint, and help the tribe become energy self-sufficient and provide carbon-free energy to others (Vega M., n.d.). Actions toward these goals have included quarterly Energy and Greenhouse Gas Emissions Reports. In 2010, the tribe received funding from the DOE Tribal Energy Program and upgraded the lighting in the parking structure at the Potawatomi Bingo Casino to be more energy efficient. The parking structure is six stories and is lit 24 hours a day. They replaced 1,720 205-Watt metal halide-type lights with state-of-the-art energy efficient 55-watt light emitting diode (LED) lights, resulting in a 73% reduction in the energy used for the facility (DOE IE, n.d).

Since 2007, the community has decreased its energy consumption at its major facilities by 13.88% per square foot and cost has decreased by 13.71% per square foot; the associated carbon emissions have decreased by 22.3% per square foot (Rye, Karmen, & Bayne, 2014). However, the Potawatomi Carter Casino Hotel (Formerly the Potawatomi Northern Lights

Casino) had an increase of 9.1% in energy consumption (Final Report, 2014). This prompted the community to pursue funding with the DOE Office of Indian Energy Programs and Policies with the aim to yield at least 30% in energy savings.

The Potawatomi Carter Casino Hotel offers approximately 100 guest rooms, 1,400 slot machines, 32 table games, bingo, 2 restaurants, and entertainment space (Tiller, 2015). The energy study recommended 11 energy conservation measures that would result in an energy savings of 34.66% (Rye et al., 2014). The associated capital cost was $1,136,000 but with rebates and incentives available at the time the net capital cost totaled $992,838 (Rye et al., 2014). Among the recommendations were recommendations to install a Vending Miser for vending machines, LED lights for casino slot machines (moving from 38 watt fluorescents to 17 watt LED's), replacing guest room packaged thermal air conditioning units with high efficiency packaged thermal heat pump systems and lighting fixture and control upgrades, among others (Rye et al., 2014).

4. MESCALERO PROFILE

Mescalero is in Otero County, New Mexico and is 462,769.858 acres (V. Tiller, 2015). According the U.S. 2010 Census, the population is 1,338 and approximately 4,500 tribal members (Mescalero Apache, 2011) with 1,273 identifying as American Indian and Alaska native alone, 1 as Asian alone, 6 as some other race alone, 14 as two or more races and 44 as white alone (Mescalero, NM Population, 2012). 8.82% of the tribal population is 0 to 4 years old. 24.51% of persons are 5 to 17 years old. 60.91% of the tribal population age falls between 18 to 64 years and 5.75% are 65 years and over (Mescalero, NM Population, 2012).

Figure 4-1. Google Map location for the Mescalero Apache Tribe.

The Tularosa Basin forms the western boundary (Tiller, 2015). The Sacramento Mountains and the Lincoln National Forest are to the north and south, respectively (Tiller, 2015). The natural surroundings of the Mescalero Apache Tribe contribute to the regional tourism industry and are largely the basis of the economy. The economic enterprises include The Inn of the Mountain Gods Hotel and Casino, Travel Center, Ski Apache, Tribal Store, Mescalero Big Game Hunts, among other tribal facilities (Tiller, 2015).

The tribe developed a strategic energy plan (SEP) in May of 2011 that was facilitated by Sandia National Laboratories and Kabotie Consulting. According to the plan, Mescalero is the second-largest employer in Otero County (SEP, 2011). The environmental resources include having the second-largest water reserve in New Mexico, and wood resources spanning 168K acres (SEP, 2011). At the time, the tribe was 100% dependent on the casino revenue for the tribal administration budget (SEP, 2011).

The SEP provided the tribe with the opportunity to develop a vision for itself in the year 2021. They identified both positive and negative trends, contradictions underlying progress and strategies that would assist in making progress. In 2021, the tribe envisioned, "Energy independence thru [sic] self-sustaining renewables", and being "economically independent thru [sic] diverse business development", and having "Sustainable facilities that respond to growth" (Mescalero Apache, 2011). In their first vision statement, the tribe's brainstorm data included (Mescalero Apache, 2011):

- Wind Energy integrated into schools, homes, businesses
- Wind farm
- Biomass
- Solar
- Co-generation operations
- Solar energy integrated into schools, homes, wells, business
- Sell excess electricity

The second vision statement also yielded a generous amount of brainstorm data. Among those were (Mescalero Apache, 2011):

- Recycling center: plastic, paper, and aluminum
- Energy sales strong, possibly international
- Thriving ecotourism business and opportunities
- Leased water: sell to neighbors, bottled water
- Tribal investments
- Tourism: economic/small business development
- Revenue invest in Tribal/$25 million infrastructure: electric, roads, water

The third vision statement also resulted in several potential projects, including (Mescalero Apache, 2011):

- Solar energy for 100-200 Correctional Facility,
- Retrofit green the administration building,
- energy efficient homes, and
- 400 Green Energy Homes.

As part of the planning process, the contradictions session focused on responding to the question: *what are the issues and obstacles which block progress towards our shared energy vision?*

The participants identified four underlying contradictions. These are listed from the most disruptive to the least disruptive (Mescalero Apache, 2011):

- Public is apathetic to political process and leadership.
- Communication is informal, crisis driven, and reactive.
- Workforce is unskilled and uncultivated.
- Inconsistent accountability and standards lead to inefficient productivity.

Finally, they developed strategic actions that could be taken in the next two years following the plan. These are listed with actions that would produce significant benefits and momentum first (Mescalero Apache, 2011):

- Expand ownership of the energy plan,
- Define and standardize processes of accountability,
- Build track record for success with smaller projects,
- Institutionalize information sharing, and
- Promote fair access & responsibility for tribal resources.

The SEP reflects many ideas that involve the tribe moving toward sustainable development. Pursuing sustainable design features at the Inn of the Mountain Gods Hotel and Casino would correspond to several items listed in the SEP. It would provide cost savings to Inn of the Mountain Gods Hotel and Casino that would have direct financial benefits in revenue to the Tribal Administration. It would work towards their keystone vision statements. Pursuing sustainable design would begin to dissolve some of the underlying contradictions, such as "communication is informal, crisis driven and reactive." The process of sustainable design depends on open communication and involves interdepartmental collaboration. Lastly, pursuing sustainable design features at Inn of the Mountain Gods Hotel and Casino would correspond to the strategic action items developed during the planning session. However, to begin this process, they must have a complete understanding of the hotel and casino operation.

The Inn of the Mountain Gods Hotel and Casino has 273 hotel rooms, 40,000 square feet of meeting space, an indoor pool, fitness center, and 6 restaurants. The casino is 48,000 square feet, has 1000 slot machines, and 34 table games (Jr. F., Personal Interview July 20, 2016).

Additional recreational features include 110 acres for boating and fishing. This tribal economy depends on the beauty of its surroundings to attract tourist to the area.

Figure 4-2. The Inn of the Mountain Gods Hotel and Casino.

IDENTIFYING SUSTAINABLE DESIGN OPPORTUNITIES

Collecting the Inn of the Mountain God's baseline information will be an important first step. Identifying the existing green practices and keeping accurate documentation on these activities helps everyone understand the Inn's progress and how it relates to cost savings through time. This also helps to analyze if the existing action is successful or needs improvement. Below are topic areas to consider, existing green practices, and recommendations to enhance the existing practice.

5.1. Energy Audit

The best way to collect baseline information is to identify a partner that can perform an energy audit. For example, the Mark Twain Hotel of Peoria, Illinois partnered with the Smart Energy Design and Assistance Center (SEDAC) to conduct their energy audit when they pursued green certification by the Illinois Green Business Association. The SEDAC report provided the baseline and post-certification hotel utility information and additional recommendations for the hotel to reduce consumption (Gilmore, Fuller & Jo, 2014). As shown in the previous examples, such as Forest County Potawatomi, lighting upgrades can produce a large amount of savings with relatively short payback period. Their energy study identified 11 areas of energy conservation measure's that would achieve at least 30% in energy savings. It can also act as a map to help prioritize various project options towards the tribe's goals.

An interview and tour visit with Mr. Frizzell, Chief Operating Officer, revealed that the casino is upgrading the florescent lighting to LED's in the rear employee areas of the hotel. Replacing all the light fixtures throughout the entire hotel, casino and parking structure is

recommended to achieve optimal energy efficiency. However, further research is needed to fully examine their progress toward this effort. The Inn of the Mountain Gods Hotel and Casino should address the following additional questions as they complete the project:

- What is the total cost of electricity for the hotel, casino, and parking structure?
- How many light fixtures are in the hotel, casino, and parking structure?
- What type of light fixture is in each area?
- What is the existing power rating for the fixtures?
- What is the power rating on the upgrades?
- What would the total cost be for upgrades to all the areas?
- What incentive, rebates, or grants are available to help with the cost of upgrades?
- What is the anticipated energy savings?
- What is the projected return on investment?
- What opportunities exist for renewable energy?

Figure 5-1. Inn of the Mountain Gods Hotel and Casino roof space facing east.

5.2. Water Audit

The Inn of the Mountain Gods Hotel and Casino is not connected to a public water system but is connected to wells that are located on the reservation. Therefore, the Inn of the Mountain Gods Hotel and Casino does not receive a water bill that reflects the amount of water consumed. However, the waste water is connected to the Ruidoso waste water system. Practicing water conservation is still important when the source is from wells, even though the water users do not pay for their water consumption. The incentive is to conserve the water coming from the wells and ensure recharge of the source is viable. From the Vision Brainstorm Data, the participants listed that the, "opportunity for leasing water; sell to neighbors, bottled water" was important (SEP, 2011). This can also be an incentive to increase the practice of conserving water.

The water analysis involving the Mark Twain Hotel utilized their billing statements from the Illinois American Water Company. The baseline analysis found that they consumed 32,812 liters per month. After installation of water faucet aerators and low-flow bathroom fixtures, the hotel usage decreased by 3,072 liters per month, resulting in approximately $70.00 a month in cost savings on their water bill (Gilmore et al., 2014).

The Inn of the Mountain Gods Hotel and Casino does have a few high efficiency washers in the laundry department. They plan to replace the remaining 4 washers so that they are high efficiency too.

Figure 5-2. Inn of the Mountain Gods Hotel and Casino laundry machines.

To get started and understand the potential savings, the Inn of the Mountain Gods Hotel and Casino should consider the following key questions:

- How is water heated?
- What are the functional areas that use water?
- What are the flow rates for water fixtures?
- Are there meters and sub-meters?
- Are there upgrades to fixtures that are needed?
- What rebates and incentives are available?
- What is the existing maintenance schedule?

5.3. Guest Rooms

Green practices were identified in the guest rooms. The towels are made of 40% bamboo, which is renewable and takes less time to dry (Schoen M., Personal Interview, July 20, 2016). Standard policy also includes changing the sheets and towels out every three days for long term

guests or upon request. To build upon this practice, the Inn of the Mountain Gods Hotel and Casino should consider the following:

- Purchase 100% organic sheets, pillows and mattresses,
- Purchase recycled amenities in guest rooms,
- Provide recycling bins in guest rooms, or
- Provide bulk dispensing personal care products such as shampoo & conditioner.

Guest rooms also had occupancy sensors that controlled the heating and cooling units. The censor automatically turns the unit on when a guest enters the room. There is another sensor on the balcony doors. The sensor has a time delay that won't turn on until after the balcony door shuts (Jr. F., Personal Interview, July 20, 2016). Additional considerations include:

- Motion controlled lighting,
- Motion controlled sinks,
- Energy STAR rated doors, windows and electronics.

Figure 5-3. Inn of the Mountain Gods Hotel and Casino standard guest room.

5.4. Maintenance

The Inn of the Mountain Gods Hotel and Casino has an in-house furniture restoration program. Staff are trained to reupholster any damaged furniture; such as arm chairs or sofas. According to Mr. Frizzle, this saves the hotel from needing to ship the furniture off-site for restoration. Considerations to supplement this practice include:

- Purchasing furniture and decorations from local craftsman and vendors.
- Recycling items that cannot be restored.
- Salvage/Reuse items for other projects, such as wood.
- Donating or selling gently used items to local residents. Revenue can be used to begin or support other tribal environmental programs.
- Purchase products with low volatile organic compounds.

5.5. Waste Management

Currently, the hotel and casino separate cardboard from the waste stream. They also recycle electronics twice a year. Mr. Frizzell identified this as an area they can improve on. Improvements would move them closer to the keystone vision statement, "Economically Independent thru diverse business development," in which the data includes having a "Recycling center; plastic, paper, and aluminum" (SEP,2011).

Figure 5-4. Figure 16: Inn of the Mountain Gods Hotel and Casino waste roll-off box.

According to previous research that included a guest survey, guests would have a positive opinion of a hotel that practiced recycling waste products such as paper or to-go containers. This was followed by concerns about energy efficient lighting, insulation, heating, and cooling systems; then the use of less toxic cleaning products. Last, the research suggested that guests would have a positive opinion of a hotel that practiced the use of renewable energy (Gilmore et al., 2014). Below are recommendations to enhance the Inn of the Mountain Gods Hotel and Casino waste management:

- Purchase and provide recycling bins throughout the hotel and casino.
- Recycle plastic, glass, metal, paper, office items such as inks and toners.
- Compost or donate food to local pantries.
- Educate staff on proper recycling methods.
- Perform periodic waste management audits.

6. RESOURCES

Many projects that have been a success for Tribes have been in part due to the effective partnerships they have created. Often, these partnerships assisted with funding and technical advice from subject matter experts. The discussion of resources below is not meant to be an exhaustive list but rather a sample of resources to provide information about options that are available to Mescalero. No single option is promoted, as it is more suitable for Mescalero to determine what resources best suit their unique situation. Furthermore, it is strongly encouraged that the Mescalero visit the websites to learn more about the funding opportunity discussed.

6.1. U.S. DOE Office of Indian Energy (IE)

The DOE IE can assist American Indian Tribes and Alaska Native villages with funding and implementing a variety of programmatic activities that involve energy development, capacity building, energy cost reduction and electrification for homes in Indian Country (About Us, n.d.). For example, the DOE IE intends to issue a Funding Opportunity Announcement (FOA) for First Steps Toward Developing Renewable Energy and Energy Efficiency on Tribal Lands in 2016. In support of the objectives covered by the Office of Indian Energy, applications to this FOA will include the following topic areas: 1) Conduct energy options analyses 2) Establish baseline energy use and efficiency options 3) Develop energy organizations 4) Conduct climate resiliency planning 5) Establish policy, regulations, and codes to reduce energy use or promote energy development 6) Obtain skills and training related to energy use and development (Energy, n.d.). More information about the FOA is available at: https://eere-exchange.energy.gov/#FoaIdb3acdd95-837c-4756-bb32-681b7c6f2deb

6.2. U.S. Environmental Protection Agency Energy Star Program

The Energy STAR program is a voluntary labeling energy conservation program (About ENERGY STAR, n.d.). The program identifies and promotes energy-efficient products to reduce greenhouse gas emissions. The program shares information that is intended to provide assistance with building an energy program, improve building and plant performance, earn certification, benchmark energy use, communicate, and educate (About ENERGY STAR, n.d.). More details about the program are available at: www.energystar.gov/buildings?s=mega.

6.3. New Mexico Green Zia Environmental Leadership Program

The NM Green Zia Leadership Program is administered by the NM Environmental Department's Pollution Prevention program. The leadership program is voluntary and available state-wide (Green Zia Handbook, 2015). The program's goals are to produce improvements in air quality, waste management, water and energy conservation, and pollution prevention. They offer 3 levels of membership; Bronze, Silver, and Gold. Each level offers varying degrees of environmental commitments. There are also 2 tracks available: one for small organizations and one for large organizations (Green Zia Handbook, 2015). More information about the Green Zia Leadership Program is available at: www.env.nm.gov/p2/green-zia-leadership-program/.

6.4. U.S Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED).

The USGBC was established in 1993 by Rick Fedrizz, David Gottfried and Mike Italiano with a mission to promote sustainability-focused practices in the building and construction industry (Our History, 2016). The founding meeting included 60 different representatives from firms and nonprofits. LEED was unveiled in 2000 and, since then, has become the international standard for environmentally sound buildings (Our History, 2016). LEED guides the design of buildings and communities through construction, operations, and maintenance toward sustainability. It is based on prerequisites and credits that a project meets to achieve a certification (LEED, 2016).

The LEED program is a voluntary program that provides third-party verification for green buildings at all phases of development (LEED, 2016). Depending on the number of points earned a project can receive one of four LEED rating levels including: Certified, Silver, Gold, and Platinum (LEED, 2016). More information is available at the LEED website: www.usgbc.org/leed/

6.5. Indian Community Development Block Grant Program

The U.S. Department of Housing and Urban Development offers the Indian Community Development Block Grant Program (ICDBG). The ICDBG Program provides eligible grantees with direct grants for use in developing viable Indian and Alaska Native Communities, including decent housing, a suitable living environment, and economic opportunities, primarily for low- and moderate-income persons (ICDBGP, 2016). Funding is issued under three categories, Housing, Community Facilities, and Economic Development.

The program regulations provide for two categories of grants: Imminent Threat and Single purpose. Single-purpose grants are awarded on a competition basis pursuant to the terms published in an annual Notice of Funding Availability (ICDBGP, 2016). The Secretary of HUD may set aside 5% of each year's allocation for the noncompetitive, first-come, first-served, funding of grants to eliminate or lessen problems which pose an imminent threat to public health or safety (ICDBGP, 2016). More information is available at the HUD website: http://portal.hud.gov/hudportal/HUD?src=/program_offices/public_indian_housing/ih/grants/icdbg.

6.6. Electric Cooperative Rebates

The Otero County Electric Cooperative, Inc. (OCEC) offers an Energy Efficiency Program for members. The program offers rebates to OCEC customers who have additional insulation or weatherization installed in an existing home or business (Energy Efficiency Program, 2016). In addition to weatherization, OCEC offers rebates for certain Energy Star electric appliances and high efficiency water heaters, as well as some commercial rebates (Energy Efficiency Program, 2016). The OCEC website has additional information: www.ocec-inc.com/content/energy-efficiency-program

6.7. Rural Energy for America Program Renewable Energy Systems & Energy Efficiency Improvement Loans & Grants (REAP)

The U.S. Department of Agriculture Rural Development offers this program which provides guaranteed loan financing and grant funding to agricultural producers and rural small businesses for renewable energy systems or to make energy efficiency improvements (REAP., n.d.). The funding that is available are loan guarantees on loans up to 75% of total eligible project costs. Grants for up to 25% of total eligible projects costs or combined grant and loan guarantee funding up to 75% of total eligible project costs (REAP, n.d.). More information is available at the program website: www.rd.usda.gov/programs-services/rural-energy-america-program-renewable-energy-systems-energy-efficiency

CONCLUSION

Native American tribes are finding innovative and sustainable ways to pursue economic development that responds to the unique needs of each community and that practices cultural preservation and conservation of natural resources. The Indian Gaming Act of 1988 has provided tribes with opportunities to establish casinos as an avenue for economic development. These enterprises are often the backbone of revenue for tribes to operate additional tribal programs. They consume a large amount of energy to operate and raw materials to construct. This can have negative impacts on the financial bottom line and the environment.

Just as tribes historically built structures that were in harmony with their natural surroundings, modern construction practices are allowing tribes to practice these concepts again through sustainable design. Implementing sustainable design features into tribal hotels and casinos will not only reduce negative impacts to the environment, but also provide economic and health benefits to the occupants.

Each tribe is unique and evaluates the sustainable design options that will be best accommodate their goals. As we have discussed here, seemingly small projects have provided great returns on investment in a relatively short amount of time. Contributing to these success stories are effective leaders and partnerships that have assisted with funding and technical advice. Furthermore, communicating the intentions and benefits with the tribal council, hotel and casino staff, and the community fosters support, trust, and educational opportunities.

This research identified areas at the Mescalero Apache Tribe's Inn of the Mountain Gods Hotel and Casino that will improve their energy efficiency. Pursuing sustainable design at the Inn of the Mountain Gods Hotel and Casino will correspond to many of the objectives outlined in

Mescalero's Strategic Energy Plan. The tribe has many resources available to them that will assist with funding and technical advice. Practicing sustainable design in the resort demonstrates to the guests and the community that actions are being taken to ensure the tribe's natural resources are being used wisely and will be available for future generations.

REFERENCES

About ENERGY STAR for commercial and industrial buildings. (n.d.). Retrieved from https://www.energystar.gov/buildings/about-us

About Us. (n.d.). Retrieved July, 2016, from http://www.energy.gov/indianenergy/about-us-0

Business Operations: Blue Lake Casino. (2007). Retrieved July, 2016, from http://www.bluelakerancheria-nsn.gov/boBLCasino.html

Casino. (2016). Retrieved July, 2016, from https://www.caesars.com/harrahs-socal/casino

Climate Action. (2016). Retrieved July, 2016, from http://www.bluelakecasino.com/climate-action/

Darin Sand, Hotel Andaluz Green Features Contact [Telephone interview]. (2016, July 22).

Energy Efficiency Program. (2016). Retrieved July, 2016, from http://www.ocec-inc.com/content/energy-efficiency-program

Energy Use in Commercial Buildings. (2016, February 4). Retrieved from http://www.eia.gov/energyexplained/?page=us_energy_commercial#tab2

Facts: History. (2007). Retrieved July, 2016, from http://www.bluelakerancheria-nsn.gov/factsHistory.html

First Steps Toward Developing Renewable Energy and Energy Efficiency on Tribal Lands-2016. (2016, July). Retrieved July, 2016, from https://eere-exchange.energy.gov/#FoaIdb3acdd95-837c-4756-bb32-681b7c6f2deb

Framework – Sustainable Community Development Code Beta Version 1.5. (2016). Retrieved July, 2016, from http://www.law.du.edu/index.php/rmlui/rmlui-practice/code-framework/model-code

Gilmore, E., Fuller, D., & Jo, J. (2014, March 20). Implementing sustainable business practices in a hotel and expanding green certification markets in the Midwestern United States. *International Journal of Sustainable Building Technology and Urban Development, 5*(2), 119-122. doi:10.1080/2093761X.2014.883580

Green Zia Handbook. (2015). Retrieved July, 2016, from https://www.env.nm.gov/P2/GreenZia/documents/2015GZHandbook5.1.pdf

Halliday, S., & Kendall, K. (1997, July 15). Architecture of Habitat: Design for Life. *Philosophical Transactions: Mathematical, Physical and Engineering Sciences, 355*(1728), 1389-1403. Retrieved July, 2016, from http://www.jstor.org/54757

Harrah's Rincon Code Green Story. (2016, March 25). Retrieved July, 2016, from https://www.epa.gov/statelocalclimate/harrahs-rincon-code-green-story

Indian Community Development Block Grant Program (ICDBGP). (2016, August 2). Retrieved July, 2016, from http://portal.hud.gov/hudportal/HUD?src=/program_offices/public_indian_housing/ih/grants/icdbg

Indian Gaming Regulation, National Indian Gaming Commission §§ 29-2701-2703 (1988), from http://www.nigc.gov/general-counsel/indian-gaming-regulatory-act

Jr. F., F. [Personal interview]. (2016, July 20).

Leadership in Energy and Environmental Design (LEED). (2016). Retrieved from http://www.usgbc.org/leed

Mescalero Apache. (2011). *Strategic Energy Plan* (Rep.). NM: Kabotie Consulting.

Mescalero, NM Population: Census 2010 and 2000 Interactive Map, Demographics, Statistics, and Quick Facts. (2012). Retrieved August, 2016, from http://censusviewer.com/city/NM/Mescalero

Our History. (2016). Retrieved August, 2016, from http://www.usgbc.org/about

Petersen, K. (2016, May 9). Blue Lake Rancheria Kicks Off Solar System Construction. Retrieved July, 2016, from http://www.energy.gov/indianenergy/articles/blue-lake-rancheria-kicks-solar-system-construction

Ross, D. (2016, August 9). Tribal casino's sustainability efforts make others "green" with envy, but in a good way. *Valley Road Runner*. Retrieved August, 2016, from http://www.valleycenter.com/news/2016-04-28/Tribal_News/Tribal_casinos_sustainability_efforts_make_others_.html

Rural Energy for America Program Renewable Energy Systems & Energy Efficiency Improvement Loans & Grants (REAP). (n.d.). Retrieved July, 2016, from http://www.rd.usda.gov/programs-services/rural-energy-america-program-renewable-energy-systems-energy-efficiency

Rye, T., Karman, N., & Bayne, B. (2014, March 31). *FINAL TECHNICAL/SCIENTIFIC REPORT* (United States, Department of Energy, Office of Indian Energy Policy and Programs). Retrieved August, 2016, from http://energy.gov/sites/prod/files/2015/11/f27/fcpc_final_report_de_ee0005172_2014.pdf

San Diego Gas & Electric (SDGE). (2011, June). Winning Big with Energy Efficiency. Case Study. Retrieved August 2016, from https://www.sdge.com/sites/default/files/documents/ES_Harrahs_061611_FINAL.pdf

Scheon, Michael. [Personal interview]. (2016, July 20).

START Program. (n.d.). Retrieved July, 2016, from http://energy.gov/indianenergy/resources/start-program

Sustainable Design. (2016, June 1). Retrieved from http://www.gsa.gov/portal/content/104462

Sykes, K., Gaffney, C., & Sykes, T. (n.d.). *Sustainability in Casino Design and Operation* (Tech.).

Tiller, V. (2015). *Tiller's Guide to Indian Country Economic Profiles of American Indian Reservations* (3rd ed.). Albuquerque, NM: BowArrow.

Tribal Green Building Toolkit (TGBT), 2015. (2016, June 30). Retrieved from https://www.epa.gov/green-building-tools-tribes/tribal-green-building-toolkit

Vega, M. (n.d.). *Forest County Potawatomi Community: Energy Efficiency and Renewable Energy Projects*.

WBDG Sustainable Committee. (2015, November 10). Optimize Site Potential. Retrieved from https://www.wbdg.org/design/sustainable.php

Winning Big with Energy Efficiency. (n.d.). Retrieved July, 2016, from https://www.sdge.com/sites/default/files/documents/ES_Harrahs_061611_FINAL.pdf

Why Should You Care About Preventing Waste? Small Business Guide. (2015, December 10). Retrieved July, 2016, from https://www.epa.gov/p2/why-should-you-care-about-preventing-waste-small-business-guide

Why Water Efficiency. (2016, June 21). Retrieved from https://www3.epa.gov/watersense/our_water/why_water_efficiency.html

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