NATIVE AMERICAN COMMUNITY PERSPECTIVES ON RENEWABLE ENERGY TECHNOLOGY

By

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ABSTRACT

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Future generations of humans and our non-human relatives will face the environmental consequences of a human-first approach towards development. The transition from fossil fuels towards renewable energy sources represents a deviation in behavior back to the eco-centric principles practiced by our ancestors for millennia. Renewable energy technology and infrastructure development often faces barriers within communities for numerous reasons. Using Native Nation Building theory from the community development literature as a foundation, this thesis examines the perspectives of tribal affiliated individuals for initiating renewable energy development in a Michigan tribal community. The study relies on 14 semi-structured interviews with tribal citizens and employees in one Native American community that has repeatedly expressed interest in developing renewable energy infrastructure projects on tribal lands. Through thematic analysis, observations, and personal experience, I show how both required elements of Native Nation Building have not been fulfilled and barriers to development are a result of conditions witnessed during repeated site visits to conduct qualitative interviews. This research makes it clear that the barriers identified by academic literature are overshadowed by the conditions witnessed while interacting with tribal community members. In addition to participatory based action research strategies, I argue that addressing poor community conditions is necessary while attempting community development projects focused on renewable energy transitions.

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1.1 Positionality

Boozhoo, Jared Gregorini indizhinikaaz, Niigaanii Aandeg Inini indigo. Migizi indoodem, Mishiike Minisi indoonjbaa, Anishinaabe indinawemaagan Waabishkiiwed indinawemaagan. Translated from the spoken language of my ancestors, Anishinaabemowin and the appropriate introduction of my peoples means: Greetings, Jared Gregorini is my name, Leading Crow Man is who I am known as. My clan is Eagle, I am from Turtle Island, and my relatives are both original peoples and newcomers (European settlers). For the purposes of increasing transparency in this research, it is important to reflect on the positionality I bring to this project. Acknowledging that North America already had the name Turtle Island before colonization is a way to remember that the reciprocal beliefs of traditional Anishinaabe peoples existed in this place previously and can be revived to exist here again. Reciprocal beliefs include the honorable harvest recorded by Kimmerer in 2017, which entail methods of gathering food, medicines, and knowledge in a way that honor reciprocity and benefit the provider. The traditional way of life for the Anishinaabe begins with the foundational grandfather teachings which establish our connection to the land. During my research the traditional grandfather teaching that I carry with me is symbolized by the Raven (Gaagaagi); the teaching of honesty (Gwekwaadziwin). It also needs to be stated that Turtle Island belongs not to humankind. Neither the original peoples nor the newcomers own rights to the land. Mother Earth cannot be owned which makes our successes and failures a collective endeavor.

Alongside honesty, I carry the teaching of my Anishinaabe name. The significance of being named after the Crow in Ojibwe culture was explained to me during a name teaching by an Ojibwe medicine man in 2017 and I paraphrase him below:

> "All flyers of Mother Earth were given a great purpose. The Eagle (Migizi**)** is

> to be the people's messenger to the spirit world. The Hawk (Gekek) is the messenger of the peoples' needs and medicines. The Loon (Maang) is the teacher of relationships. The Crow (Aandeg) was not given purpose, or perhaps did not stay around long enough to receive one, so Crow flew around looking for purpose. Crow visited the Bear (Mukwa) to share time with and asked for the Bear to teach their ways. The Bear eventually agreed and began to teach Crow their ways, but these ways didn't fit so Crow flew off to seek new ways and with any luck, purpose. Crow learned teachings from Beaver (Amik), Wolf (Ma'iingan), Coyote (Wiisagi-Ma'iingan), Fish (Giigoonh), Birch (Wiigwaas), and all other great teachers, but still Crow gained no purpose. While flying around, Crow came across a distressed Hare (Waboose), and stopped to ask how to help. Hare was distressed because every time Fox (Waagosh) is around, there is no peace. Having learned from all great teachers, Crow knew that all members of Mother Earth were given gifts, so Crow reminded Hare of the gifts they were given, such as long legs and large ears, to avoid Fox. The Crow, having learned from many teachers, was able to share knowledge with others, helping them to renew their purpose and in doing so, found purpose. Crow reminds us, work and dedication will show the way to the purpose we seek. We will not find our purpose if we just sit on the path."

My cultural identity as an Anishinaabe newcomer is intertwined with my research because I have gathered and analyzed knowledge from the community of which I am a member. Explicitly stating my potential biases helps to demonstrate the importance of positionality and the consistent reflexivity that functions as a reminder that my perspective has the potential to influence the

research process (Bourke, 2014; Jootun and Marland, 2009). The reflexive process represents a cost–effective, practical, and theoretically sound process for managing interview data (Halcomb and Davidson, 2006). The experiences I have earned as a member of this community will provide valuable contextual insights during the analytical process.

1.2 Background

Native American communities are known to have a reverence for nature which can be loosely defined in Western language as ecocentrism or environmentalism. Native American communities have a greater dependance culturally, socially, economically, and spiritually on local species, habitats, and ecosystems (Norton-Smith, 2016). This is problematic in a landscape of environmental degradation accelerated by climate change. Climate change has necessitated the immediate transition from our predominant source of energy production to a less carbon-intensive method provided by renewable energy technologies. The destructive impacts of climate change will be experienced globally; hence, mitigation techniques will require participation from every available community. Tribal lands have the potential to generate 10 percent of the annual energy utilized in the United States; 90 percent of which could be generated by utility-scale solar installations in the conterminous 48 states (Milbrandt et al., 2018). Additionally, climate change disproportionately affects Native American communities due in part to their biocentric spatial and cultural relationships involving local flora and fauna—what western sciences refer to as natural resources (IPCC, 2007; Norton-Smith et al., 2016; Cameron, 2012; Hand, 2008; Baird, 2008; Ford 2012). Demonstrated in 2013 by Maldonado and colleagues, tribal communities in coastal regions are already experiencing climate-induced displacement. Since the 1960's, the Isle de Jean Charles Band of Biloxi Chitimacha Choctaw Indians, located in a coastal region of Louisiana have experienced over 8 inches of relative sea level rise—one of the highest recorded

rates in the world (Karl et al. 2009).

Unique opportunities to partner with Native American communities for utility-scale renewable energy development are accompanied by unique challenges. Studies have indicated that socio-cultural barriers, or those "values, norms, roles, language, symbols, customs, moral and religious beliefs, taboos, perceptions, and preferences acquired by people as members of society" (Giddens et al., 1991) can act as "obstacles hindering, delaying or preventing access to information," (Świgoń, 2011) and may impede renewable energy adoption in Native American communities. Necefer and Jones in 2015 found that renewable energy project acceptance is contingent upon perceived negative impacts on cultural resources, sacred sites, landscapes, view sheds and wildlife. Additionally, Jones in 2016 found that development projects that are consistent with biocentric values are much more likely to be successful. Native Nation Building Theory, which will be explained below, has also indicated that cultural factors are a significant aspect of effective tribal development plans (Begay Jr., et al., 2007).

Native American cultural beliefs vary by tribe, and specific cultural beliefs for Anishinaabe communities with respect to renewable energy have not been identified. Ensuring successful renewable energy projects for Native American communities requires identifying these specific cultural relationships with renewable energy technologies and the governance structures that may facilitate their development.

1.3 Motivation

The Sault Ste. Marie Tribe of Chippewa Indians identify as Chippewa, Ojibwe, and Anishinaabe. The Anishinaabe, translated to English meaning "original people," are Indigenous peoples that historically and currently occupy the lands that are referred to as the Midwestern United States. They are a group of culturally related peoples identifying as Odawa, Saulteaux,

Ojibwe, Potawatomi, Oji-cree, and Algonquin. The historical legacy of Anishinaabe ancestors in this region can be traced backwards in time for millennia (Griffin, 1951; Cleland, 1992). Anishinaabe culture is rich in biocentric relationships; plants, animals, rocks, waters, winds, and all biotic and abiotic constituents are viewed as relatives in an interconnected system of being (Gross 2016; Perez and Longboat, 2019).

The Sault Ste. Marie Tribe of Chippewa Indians (Sault Tribe) presents a unique case study to research Native Nation Building theory because they currently lack renewable energy infrastructure but have repeatedly expressed interest in developing the capacity to support it. Situated close in proximity to the St. Mary's rapids, reservations lands occupied by Sault Tribe have the availability for hydroelectric, solar, and wind power. Michigan's Upper Peninsula has not typically been thought of as an ideal location for solar panels due to both harsh winter conditions and what Sengupta et al., in 2018 found to be a lower global horizontal irradiance of about 3.5-4 kilowatt-hours/m^2/day. Despite these critiques, solar photovoltaic cells in this part of the state can generate a sufficient amount of electricity. The U.S. Energy Information Administration in 2000 shows that the solar potential for the area Sault Tribe has access to is approximately 4-5 kilowatt-hours/m^2/day. Additionally in 2000, the EIA found that the wind power density potential for the area is 200 watt/m^2 at 10 meters and 500 watt/m^2 at 50 meters.

In-state renewable energy generation for Michigan provided about 11 percent of the state's total electricity generation in 2020. The equivalent information for tribal communities is currently being compiled by the Midwest Tribal Energy Resources Association (MTERA) (Glavin, 2022). The timing of this thesis research was intended to begin the participatory community-based research process by identifying the initial perspectives of local community members. This inclusionary process will allow cultural concerns to be addressed early and throughout the development stages of future projects. Gathering data at the infancy of the tribe's potential energy

transition is key to building trust and can serve as a baseline that can be used to examine progress in the future.

Most tribes have historically faced financing problems that hinder renewable energy development. Tribes have been excluded from the main source of funding, tax reimbursement incentives, because Tribes aren't taxable entities. The United States government in 2005 recognized the disparity created by this federal policy and passed the Indian Tribal Energy Development and Self-Determination Act (ITEDSA), which allocated federal funding to assist Native American tribes with renewable energy project development on tribal lands (Bronin, 2016). Since 2005, only six of the 129 grant-supported Department of Energy projects were in Michigan and only one utility-scale project with the Saginaw-Chippewa tribe was completed.

Between 2013 and 2015, energy audits conducted by Jeffrey Holt used Department of Energy grants to inspect thirty Sault Tribe government buildings and search for potential energy improvements. The buildings audited in this study offer a myriad of critical services for the community including health services, cultural centers, court and law enforcement facilities, food distribution programs, natural resource management offices, and governmental headquarters. A synthesis of Holt's energy audits revealed the possibility to install 70 kilowatts of solar photovoltaic panels on these buildings which would financially benefit the tribe, contribute to energy sovereignty, and compliment cultural integrity.

1.4 Preliminary Study Justification

To determine the necessity of exploring perspectives of renewable energy infrastructure development in Native American communities, I conducted an informal inquiry in the summer of 2021. I began by examining the history of renewable energy projects with other tribes. In 2006, the U.S. Department of Energy funded 76 Tribal energy projects, only six of which

completed the development stage of the process. In 2017, the Eastern Band of Cherokee Indians was awarded a million-dollar grant to supplement their own 1.3-million-dollar investment designated for installing a 700-kilowatt solar photovoltaic system capable of powering a casino, a hotel, and two administrative buildings (Petersen, 2020). The Strategic Energy Plan for this development project included specific intentions to preserve the natural beauty of tribal lands and natural resources and protect cultural and economic well-being. In 2019, the Navajo nation successfully built the first utility-scale solar generation facility that is entirely owned by a tribal entity. Necefer et al. in 2015 documented that during the development of the Navajo solar installation the community considered environmental preservation important for the sustainability of future generations and for the interaction between tribal culture and stewardship of the environment. The increased investment provided by the federal government seems to have had a positive impact on the capacity of Native American communities to develop renewable energy infrastructure. A similarity among successful projects was the inclusion of cultural perspectives during the planning and development phases. An effort that started in 2008 and ended in 2021, the Saginaw-Chippewa Tribe of Indians created the first and only tribal utility authority in Michigan; this project that also had a renewable energy component involved a cultural assessment in which tribal elders were consulted to ensure cultural integrity of the proposed development locations (Smiley, 2008).

1.5. Native Nation Building Framework

The Harvard Project on American Indian Economic Development founded by professors Stephen Cornell and Joseph P. Kalt in 1987 was initiated to understand the nuances of Indigenous nation building. Native Nation Building Theory emerges from this ongoing research (David-Chavez et al., 2020; Cornell, 2015; Cornell, 2002; Jorgensen and Taylor, 2000; Cornell and Kalt,

1998; Cornell and Kalt, 1990) and provides five emergent elements that are necessary for successful economic and infrastructure development in Native Nations: Sovereignty, Capable Governing Institutions, Cultural Match, Strategic Orientation, and Public-Spirited Leadership. Each category and accompanying relevant information for the Sault Tribe is described below.

1.5.1. Sovereignty

Native Nation Building theory indicates that Native nations increase the probability of successful sustainable development outcomes when they build the capacity to establish and perform self-governing power. Achieving absolute sovereignty for Native Americans in the United States is improbable. Native nations in the United States do not have absolute sovereignty in the true meaning of the word, i.e., freedom from external control. They are instead afforded a quasi-sovereign status, still subject to state regulatory oversight. This means that for federally recognized tribes in Michigan such as the Sault Tribe, the state government usually does not have legal authority over tribal peoples given that they are inside tribal trust-land territory. However, federal laws and regulations remain enforceable. Federal acknowledgement of tribal communities is a requirement for quasi-sovereignty. This recognition allows tribal governments to exert direct jurisdiction over their peoples given that they are inside federally delineated territory. While contemporary tribal governments are a deviation from the traditional clan systems of governance, they are responsible for structuring an assortment of beneficial services for their peoples that include lawmaking, by-law interpretations, court systems, policing, health, and education services (Lopach, 2019; Haas, 1947). Tribes would be unable to expand aspects of sovereignty without social services.

Despite absolute sovereignty being a seemingly unachievable goal for Native Americans, it remains possible to expand facets of sovereignty. Energy sovereignty is the rights of the people

to make decisions about their community's source of energy, the development of that energy source, and the scale at which that energy is consumed (Schelly et al., 2020). Additionally, increasing energy sovereignty is an opportunity to support both the inherent value in the biocentric viewpoints of Native Americans and their pursuit for absolute sovereignty. Energy sovereignty as described by Schaefer et al. in 2021 denotes options for Native American communities to generate their own utility-scale renewable electrical energy infrastructure; however, challenges to increase this type of sovereignty have been carefully regulated by federal agencies. Available capital for renewable energy projects was made possible by federal tax incentives, but because Native American communities do not pay federal taxes the incentives did not apply (Sullivan, 2010). The federal investment tax credit is the predominant method to promote solar renewable energy development; however, its use requires entities to have taxable status (Schelly et al., 2020). This exclusionary process forces tribes to participate in strategic partnerships with private development companies. Private entities can use federal renewable energy incentives, which decrease their financial cost, but also requires them to add cultural considerations into development plans. Supporting the path towards energy sovereignty benefits Native Americans by endorsing their cultural practices, reducing their financial reliance on the United States government, and promoting reconciliation of strained relationships.

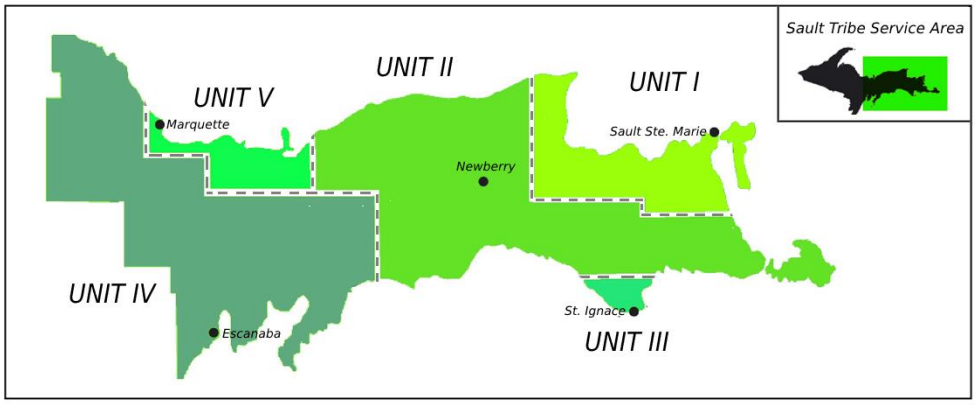
Sovereignty is a part of our identity. Without sovereignty we risk losing access to heritage sites for cultural practices and our connection to our ancestral tribal identity. The relationship that Native Americans have with the place of their origin is linked to identity and an important facet of sovereignty. Tribal identity situates people with an understanding of interconnectedness. Not only are we in our environment but our environment is also in us. Western sciences are starting to understand mechanisms associated with this relationship. Our physical identity is isotopically representative of the environment in which our lives originated

through biogeochemical elements embedded within our bodies (Hodson, 2008). Dawson in 2015 measured environmental isotopes found in hair and was able to show that the levels were a direct reflection of the water that people drink and use to bathe or shower. Cultural practices have an intimate spatial association such that flora and fauna of a particular area are honored during harvesting and ceremonies because they are viewed as relatives and a component of tribal identity. Increasing factions of sovereignty is about fulfilling our cultural obligations to relatives, identities, and futures, but most importantly our right to just be a Native American. Naturally, sovereignty has been identified as a primary element of worthwhile development on Native lands (Royster, 2008).

1.5.2. Capable Governance Structure

Native Nation Building theory indicates that sustainable development in Native Nations is facilitated by capable governments using non-politicized dispute-resolution mechanisms. The Commissioner of Indian Affairs Louis R. Bruce on September 7, 1972, granted federal recognition to the Sault Tribe by memorandum supported by the Secretary of the Interior Roger Morton. Following their federal recognition, the Sault Tribe pursued a newcomer structured organization of government under a tribal constitution implemented pursuant to section 16 of the Indian Reorganization Act, 25 U.S.C. s. 476; a constitution and bylaws of which were approved by the Acting Deputy Commissioner of Indian Affairs, Morris Thompson, on November 13, 1975. The constitution stipulates a governing body for the Sault Tribe that is comprised of 12 board members and one chairperson; all of whom are elected to office. The 12 board members are representatives of the five units of the tribe's service area (Figure 1), across 7 counties in the Eastern Upper Peninsula of Michigan.

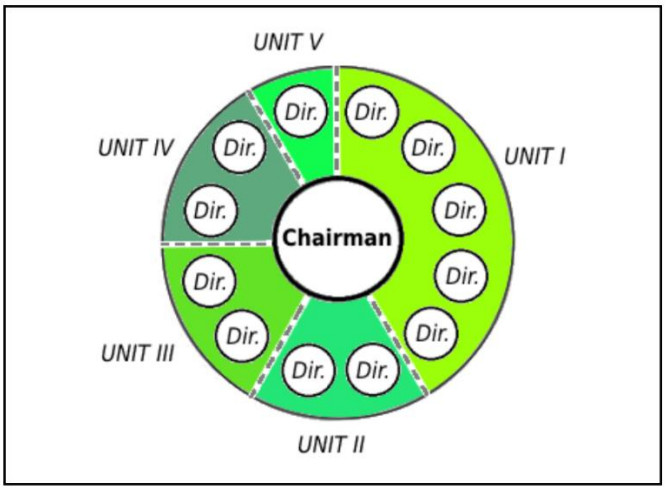
Figure 1. Delineation of Sault Tribe service units in the service area.



The map in Figure 1 shows a rough spatial separation of the Sault Tribe's governing districts (units) in the Central to Eastern portions of Michigan's Upper Peninsula.

Within these 12 board members, a vice-chairman, treasurer, and secretary are selected (Figure 2.). The board of directors organizes decision meetings twice a month with an open membership session. Membership sessions provide an opportunity for community members to discuss renewable energy plans or other dispute resolution inquires. Additionally, the tribe has a two-tiered Tribal Court system with both trial-level court and appellate court structures. Decisions made by the board are conducted subject to majority rule, and in the event of a tie the chairperson will make the final decision. Decisions concerning tribal trust lands, such as appropriate renewable energy development locations need to be approved by the Secretary of the Interior, after the tribal government vote. Tribal board meetings are typically held in-person; however, due to the quarantine safety measures necessitated by the global coronavirus pandemic, all Sault Tribe board meetings switched from in-person to being broadcast via internet-hosted live streaming on Facebook. Tribal members are able to access the meeting agendas, draft resolutions, and approved resolutions, as well as the board meeting livestream address from the tribe's main tribal resource website, www.saultribe.com/government/board-of-directors.

Figure 2. The Sault Ste. Marie Tribe of Chippewa Indians Governance Structure



The Sault Tribe has a board of directors (Dir.) with twelve elected members and the elected chairman, or 13 members in total. There are three positions that are co-opted by any director position: Vice-Chairperson, Treasurer, and Secretary, but their power is equally weighted with all other board members during governmental decisions.

1.5.3. Cultural Match

Native Nation Building theory indicates that Native Nations which use Indigenous frameworks to delineate responsibilities for development fare better than those who do not. Indigenous frameworks include cultural considerations. It isn't possible to comprehensively understand Anishinaabe culture by reading and writing, because it is a lived experience from a diversity of perspectives. Additionally, Anishinaabe culture is historically an oral tradition which isn't particularly valued in the scientific or Western traditions. Oral traditions preserve generational transfers of knowledge within Native American communities and has done so for millennia. So, it is important to examine generational influences when speaking with Native American communities. Examining traditional Anishinaabe culture can illuminate the ways

culture has an impact on decision making for tribal members.

The Anishinaabe Seven Fires Creation Story tells the history of the migration of Anishinaabe peoples from the Eastern coast of the United States to their final settlements around the Great Lakes region. Each phase of the migration along the St. Lawrence River is referred to as a "Fire" and is accompanied by a prophecy that foretells the sequences of events that the people will encounter. From the migration emerges a sacred teaching, the principle of "Mino-Bimaadiziwin." Roughly translated into the English language, it means "living the good life" and is a spiritual process of conducting oneself in a reciprocal cooperative manner as an animate member of the natural systems of Mother Earth. An important caveat pointed out by Debassige in 2010 is that the meaning of "Mino-Bimaadiziwin" is more culturally impactful than its translation. The guides for living the good life are gifted to people from a sacred teaching during each one of the seven fires. The seven sacred teachings are personified by our non-human relatives to remind the people of Earth about the necessary qualities for prolonged survival and fulfilment: humility, honesty, respect, courage, wisdom, truth, and love.

During the migration, the Anishinaabe were gifted prophecies in addition to the sacred teachings. It is within the interpretations of these prophecies that insights concerning decision-making and perspectives about modern renewable energy technologies can be illuminated. The times of the fourth and seventh fires contain information pertinent to the acceptance of modern renewable energy. And the potential apprehensions the Anishinaabe have when considering partnerships with the newcomers. During the time of the fourth fire the arrival of the light skinned race to Turtle Island is foretold by two major prophecies (Benton-Banai, 1979): the first prophecy,

> "You will know the future of our people by the face the light skinned race wears. If they come wearing the face of brotherhood, then there will come a

> time of wonderful change for generations to come. They will bring new knowledge and articles that can be joined with the knowledge of this country. In this way, two nations will join to make a mighty nation. This new nation will be joined by two more so that four will form the mightiest nation of all. You will know the face of the brotherhood if the light skinned race comes carrying no weapons, if they come bearing only their knowledge and a handshake.

and the second prophecy,

> "Beware if the light skinned race comes wearing the face of death. You must be careful because the face of brotherhood and the face of death look very much alike. If they come carrying a weapon ... beware. If they come in suffering ... They could fool you. Their hearts may be filled with greed for the riches of this land. If they are indeed your brothers, let them prove it. Do not accept them in total trust. You shall know that the face they wear is one of death if the rivers run with poison and fish become unfit to eat. You shall know them by these many things."

Gathering knowledge about the interpretations of the prophecies during the fourth fire is critical to understanding the path towards successful partnerships with the Sault Tribe. Tribal elders may be apprehensive about engaging in governmental partnerships. Having been forewarned of the changes brought by the arrival of the light skinned race, they then witnessed forced cultural assimilation. The weight of the prophecies becomes more evident as Sault Tribe members are no longer able to eat fish caught directly from the St. Mary's River due to pollution. (Burt et al., 1991).

Not only is it important to understand the process for pursuing successful partnerships with older Native Americans, but it is also equally important to understand if these cultural perspectives are held by younger tribal members. Partnerships for renewable energy development in Native American communities are complex in part due to previous interactions between settlers and Native American communities having gone poorly. Historical trauma for the Anishinaabe is deep-rooted (Grayshield et al., 2015), and current trauma is on-going. However, it cannot be overlooked that Native American tribes presently rely on the amenities brought and developed by European settlers, which may suggest a deviation from traditional cultural beliefs. Initially there was forced cultural assimilations, but that appears to have been replaced by socio-cultural evolution and the adoption of modern technologies. If relationships are to be healed, both entities need to take an active role. Western ways can be very powerful tools and useful to tribal communities.

As mentioned above, renewable energy incentives have been unavailable to Tribal communities due to their structure of access. Recent amendments to the Indian Tribal Energy Development and Self-Determination Act have introduced amendments requiring the Department of Energy to provide specific funding for Indian tribes to plan energy resource development programs (The United States of America Public Law 115-325, 2018). Not only are these amendments an opportunity to increase sovereignty, but they are also an opportunity to mend broken relationships between the newcomers and the Anishinaabe. It is necessary to understand this cultural concern and the ways it may persist in younger generations of Anishinaabe. Changes in generational attitudes have been alluded to during the seventh fire (Benton-Banai, 1979); a time believed to be now,

> "In the time of the Seventh Fire New People will emerge. They will retrace their steps to find what was left by the trail. Their steps will take them to the

> Elders who they will ask to guide them on their journey. But many of the Elders will have fallen asleep. They will awaken to this new time with nothing to offer. Some of the Elders will be silent because no one will ask anything of them. The New People will have to be careful in how they approach the Elders. The task of the New People will not be easy. If the New People will remain strong in their quest the Water Drum of the Midewiwin Lodge will again sound its voice. There will be a rebirth of the Anishinaabe Nation and a rekindling of old flames. The Sacred Fire will again be lit. It is this time that the light skinned race will be given a choice between two roads. One road will be green and lush, and very inviting. The other road will be black and charred and walking it will cut their feet. In the prophecy, the people decide to take neither road, but instead to turn back, to remember and reclaim the wisdom of those who came before them. If they choose the right road, then the Seventh Fire will light the Eighth and final Fire, an eternal fire of peace, love, brotherhood, and sisterhood. If the light skinned race makes the wrong choice of the roads, then the destruction which they brought with them in coming to this country will come back at them and cause much suffering and death to all the Earth's people."

The interpretation of seventh fire prophecy may be the most influential factor concerning renewable energy projects. It is unknown whether or not community members in the Sault Tribe consider modern renewable energy technologies, such as solar panels and wind turbines, as coinciding with the proper path spoken about in the seventh fire prophecy. For the tribal communities, traditional cultural practices mean always striving to conduct your behavior in accordance with the teachings presented in the seven fires prophecies.

Another facet of Anishinaabe culture to be mindful of is that it is understood that the people need Mother Earth (natural resources) but not vice versa. This teaching has been given by many teachers and in many stories, none more coveted than the gift of sacred tobacco (Aseema). The relationship that Native Americans have with tobacco is profound and it is understood that when used incorrectly sickness will result (Struthers and Hodge, 2004). The lesson of this teaching supersedes its individual elements. Human beings are using fossil fuels in a way that deviates from biocentric principles, and we are now suffering the consequences (Field, 2014; Pachauri et al., 2014). It has been concluded that human activity is driving a sixth mass extinction (Ceballos et al., 2015). Halting fossil fuel usage and relying on renewable energy sources may be a way for Native American communities to return to traditional biocentric beliefs and practices in a modern societal structure. There are ways in which traditional Anishinaabe culture can coincide with and even be revitalized by renewable energy development. But there are also ways such development may be a hinderance. An objective of this thesis research is to learn the best way to approach tribal communities and how to develop successful partnerships around renewable energy technologies.

1.5.4. Strategic Orientation

Native Nation Building theory indicates successful development for Native Nations needs to involve considerations of long-term impacts. The Anishinaabe Seven Fires Creation Story is the central ethical framework guiding behaviors implicit with strategic orientation. It has been passed down by oral story telling for millennia. Two teachings derived from the Seven Fires Creation Story that pertain to strategic orientation are the concept of “Mino-Bimaadiziwin” and the principle of seventh generation thinking in which decisions consider how they will impact seven generations into the future. Successful leaders in the community need to shift to proactive rather

than reactive thinking, so building the capacity for renewable energy infrastructure could strategically situate the Sault Tribe for a successful future.

Native Americans tend to approach decisions with a holistic mindset. Hain-Jamall in 2013 defines a mindset as "a culture's standard way of perceiving reality, of processing information, of approaching problems, and of interacting with others," so development is as much about building as it is about healing. Hain-Jamall noted that the holistic approach places greater value on the wellness of the tribe, rather than the individual. This holistic mindset can incorporate facets of culture, identity, and spirituality into renewable energy development plans. Culture, defined by Matsumoto's work in 1996, represents "the set of attitudes, values, beliefs, and behaviors shared by a group of people, communicated from one generation to the next;" identity, defined in Burke's work, in 2020 are "the qualities, beliefs, personality traits, appearance, and/or expressions that characterize a person or group," and spirituality, defined using Spencer's work, in 2012, is "the recognition of a feeling or sense or belief that there is something greater than oneself, something more to being human than sensory experience." Each are complexly interwoven facets of being Native American. Not only is cultural identity an integral influencing factor during decision making but it is also essential to wellness (Lowery, 1998; Gilgun, 2002)

1.5.5. Public-Spirited Leadership

Native Nation Building theory argues that successful leaders recognize the need for fundamental changes while nurturing community support. Leaders in these Nations that focus predominantly on the needs and benefits of the entire community rather than individual advantage are essential to achieving development goals. Leaders in Native Nations are not just elected officials. Leaders are spiritual advisors, grassroots activists, youth allies, and elder consultants. Regardless of their position, Native Nation leaders are required to actively engage

in an intercultural environment of non-Indigenous systems.

The Sault Tribe Board of Directors released their Strategic Plan which was approved on November 13, 2020, stating that the programs and services pursued by the board are intended to strengthen the community by sustaining the Anishinaabe way of life (Bimaadiziwin). The Board of Directors are not the only community leaders, but their strategic plan is an important document to demonstrate that community mindedness is a central focus for their decisions.

1.6 Community Based Participatory Research

Renewable energy development for the Sault Tribe is grounded in community needs. Participatory based action research has been successful for researchers working in Native American communities (Davis, 1999). The participatory process allows cultural considerations to be included at every stage of development, which is one of the components identified by the Native Nation Building framework leading to successful development. The cultural beliefs held by the Anishinaabe peoples are not only an intricate network of traditional ecological knowledge, ethical teachings, oral connections to ancestors, and tribal identity, but they are also important when approaching potential partnerships. Traditional cultural perspectives are often overlooked during feasibility assessments. There is no mention of cultural inclusivity in the Sault Tribe wind energy feasibility study by Toni Osterhout in 2005, nor an energy efficiency feasibility study conducted in 2014 by Kushman for a neighboring community of Ojibwe peoples, the Bay Mills Indian Community. Maintaining cultural integrity and strengthening sovereign powers are central tenants in tribal decisions, so the first step towards successful renewable energy infrastructure development for tribal communities should be to identify cultural perspectives. Speaking with community members about Anishinaabe culture is part of the community based participatory research process. Yet as noted by Bronin in 2016, the

specific mechanisms to integrate cultural perspectives and interests during renewable energy development projects for individual tribes are largely unknown. According to Native Nation Building theory, if a project fundamentally clashes with cultural integrity, it is unlikely to be successful. This is in response to centuries of American policies designed to assimilate Native peoples into the dominant European societal structure, culturally, politically, and economically (Champagne, 2002). Therefore, conducting participatory based community research by incorporating the biocentric cultural beliefs of the Anishinaabe is essential for energy development with Sault Tribe.

1.7 Objectives

I used Native Nation Building theory and participatory community-based action research principles to generate the objectives of this research, which guided my path of discovery and inquiry. They are as follows:

a. Investigate existing support or opposition, attitudes, perceptions, and values associated with renewable energy technologies in the Sault Tribe.
b. Identify perceived barriers to renewable energy development of the Sault Tribe.
c. Establish a working connection with Sault Tribe to coincide with participatory community-based action research.
d. Examine the five components of Cornell and Kalt's Native Nation Building theoretical framework in comparison with Sault Tribe's development potential.

1.8 Research Questions

Research questions were identified in association with the objectives described in the

previous section. Similar to the objectives, these questions provide direction for my study and are answered in chronological order in my findings. The research questions are as follows:

i. What is the current state of renewable energy development in the Sault Tribe community?

ii. How does traditional Anishinaabe culture factor into perspectives about development?

1. METHODS

2.1. Study Area & Justification

This study focused on the Sault Ste. Marie Tribe of Chippewa Indians in Chippewa County of Michigan's Upper Peninsula. The study area included people that live in the township where the main reservation lands are located. The Sault Tribe has 9 reservations/trust land sites in the service area that span 7 eastern counties of Michigan's Upper Peninsula: Chippewa, Mackinac, Luce, Alger, Schoolcraft, Marquette and Delta counties. The main reservation trust land site located in Sault Ste. Marie Michigan has a population of approximately 2,400 that is comprised of 60 percent Indian and 40 percent non-Indian (U.S. Census Bureau, 2012). I selected this community based on i) their previous interest in pursuing renewable energy development on their reservation lands, ii) their participation in an NSF funded convergence research grant project (Michigan Community Anishinaabe and Rural Energy Sovereignty (MICARES) to assist tribal communities with renewable energy development tools, iii) my experience working for the Sault Ste. Marie Tribe of Chippewa Indians' Natural Resources Department from 2016 to 2019 and the Summer of 2021, and iv) my membership in the tribe.

2.2. Data Collection

The primary method of data collection was semi-structured interviews conducted with tribal members belonging to the community and non-tribal members working for the tribe in the study area. These two groups were selected so as to identify perspectives of current and future tribal decision-makers. The semi-structured interviews were used to gather information relating to participants' perceptions towards generational opinions, modern renewable energy technologies, support for or opposition to, and opinions related to, potential renewable energy development

projects and the associated decision-making process. This study uses these terms (e.g., support, opposition, perceptions) as referenced in Rand and Hoen's 2017 and Bessette and Mills' 2021 work. Over the course of several meetings with my advisory committee, I compiled and revised a list of open-ended questions (see Appendix A), that provided direction for the conversation while allowing flexibility for the interviewees to talk about what is most important to them. To ensure accuracy, I recorded responses to interview questions using a combination of written notes and audio recordings.

The first questions I asked were designed to identify participants' initial mental associations with renewable energy through associationism (Timberlake, 1994; Horowitz, 2000; Tonneau, 2012). Word associations pointed out by Timberlake in 1994 are a way to identify relationships between two stimulus words based on the response words which gives an indication of the participants' mental models. Word concept associations are meant to record participants' mental contents prior to potentially being influenced by our discussion about renewable energy. And as Arti Prihatini demonstrated in 2020, this method is able to demonstrate a person's mental lexicon for a topic which I believe is important in understanding how to frame discussions about renewable energy with this community in the future. Word associations will also illuminate areas that need more focus.

I interviewed tribal community members that were either i) active participants in tribal voting processes, ii) current employees of the tribe, or iii) both. These groups provided perspectives of both decision-makers and citizens about the perceptions of renewable energy projects and the methods used to pursue them.

Michigan State University's Institutional Review Board approved this research, Study ID: STUDY00005315 on 07/07/2021 and Sault Ste. Marie Tribe of Chippewa Indians' Institutional Review Board gave its approval on 09/20/2021.

To connect with participants, I:

i. Examined the meeting minutes of public tribal board meetings and searched for contact information through the Sault Tribal Members website and Facebook.
ii. Visited multiple governmental offices on the main tribal reservation site to introduce my intentions and ask for interested participants.
iii. Distributed a participation request flyer at tribal housing mailboxes on the main Sault Tribe reservation.
iv. Emailed the tribal communications department to request assistance and contact information for interested participants.
v. Used snowball sampling (Goodman, 1961), a method involving asking current participants if they could recommend additional participants.

I followed up with all unresponsive individuals two weeks after the first contact attempt (by sending another e-message). In total I reached out to 83 individuals and secured interviews with 14 people resulting in a response rate of 16.9 percent. Interviews were done via zoom and in-person with a typical duration of 20 minutes. The interviews were predominantly conducted in the privacy of participants' personal offices, but some interviews were also conducted at the participants' homes. When the 14 participants were asked about their gender identity, 8 self-identified as male, and 6 self-identified as female.

2.2.1. Data Collection Revised

I conducted 4 semi-structured interviews using the initial questions developed (see Appendix A). However, during this process I observed each participant becoming uncomfortable for not being able to recall specific traditional cultural teachings. After the interviews, participants stated that they felt guilty for not knowing traditional culture, specifically that they felt like they would be responsible for this knowledge disappearing forever. This was the most uncomfortable portion

of this research for me. I am harvesting knowledge from my community. When I think about the tenants of the honorable harvest described by Robin Wall-Kimmerer in 2013, I do not believe permission was granted to harvest this knowledge in this way.

Another difficulty I experienced with the initial questions was due to a reflection of the name teaching I bring to my research. I felt as if I had learned the Western ways of the newcomers such as using restrictive timeframes and continuing questioning even when participants became uncomfortable. I believe this ended up hurting my community. Interview questions were changed with the approval of my committee to eliminate participant discomfort. And to respect the harvesting of this cultural knowledge (See Appendix B). The honorable harvest described by Kimmerer in 2017 describes an indigenous methodology of harvesting that respects reciprocity.

2.3. Data Analysis

Data was analyzed using thematic analysis which involves systematically organizing, labeling, and deriving themes to provide meaning across the data set (Braun and Clarke, 2012). The interviews were transcribed verbatim, which has been shown to be a more helpful and accurate method for managing verbal interview data (Halcomb and Davidson, 2006; Maxwell, 2002). After the transcription was complete, I read through all interviews numerous times and discussed the major emergent themes with my research advisor. This process also involved labeling information that was representative of ideas related to the research questions (Rubin & Rubin 2011).

2.3.1. Smudging Ceremony

Before reading each interview, I performed a smudging ceremony. A smudging ceremony is a traditional practice conducted by my ancestors that involves burning plant relatives with the

intention to set one's mind with a purposeful direction (McCampbell, 2011). The smoke created during the smudging ceremony is also indented to purify my space and my mind. Demonstrated in a 2017 study by Nautiyal et al., using medicinal smoke can eliminate pathogenic air bacteria within a confined space. Additionally, Mukherjee in 2012 demonstrated the neuro-linguistic programming technique of "anchoring" which uses Pavlovian conditioning to associate an internal mental state with an external trigger that can be re-accessed by repeated exposure to the same external trigger. My intention was to think about the teaching of honesty while I read through each interview and prepared for the other teachings they would reveal. The internal mental state created by thinking about the teaching of honesty was anchored and re-accessed, each time a new interview was read by the olfactory response to the external trigger of burning White Sage throughout the analysis process. The sacred medicine, White Sage (Mashkodewashk) used for these smudging ceremonies I received in a trade for a Beaver (Amik) with a Medicine Man in 2017. I placed the sacred medicine representing our Earth (Aki) relative into an abalone shell representing our Water (Nibi) relative. I lit the medicine with matches representing our Fire (Ishkode) relative and fanned it with a gifted Crow (Aandeg) feather representing our Wind (Noodinoon) relative. I first smudged the feather. I then offered smoke and thanks to all four of the cardinal directions. Lastly, I smudged my head to think honestly, my eyes to see honestly, my mouth to speak honestly, and my heart to feel honestly. I then thanked our Earth Mother for all of the gifts provided that keep me alive to be able to conduct my work.

2. RESULTS

3.1. Renewable Energy Perceptions Across Generations

My initial research objective involved examining Sault Tribe members' perceptions of renewable energy technologies. I begin here by discussing how individuals think about how different generations would respond. Generational perspectives are important to understand with this community due to their oral tradition. A younger participant stated,

> "There's probably also people that think a lot like the older generation, especially in this area, you grow up and you only hear your parents point of view. And you take their opinions. It doesn't have to be how it always was. It's ok to think different than your parents. I think a lot of people, especially in this area, don't realize that, or think that."

In the next section I discuss how individuals respond with respect to their own generation.

Both younger and older respondents mentioned that they didn't feel either generation was educated enough about the nuances of this topic. Younger participants believed that older generations were not up to date with their understanding of the current renewable energy technology and the older participants believed that the younger generations needed to know the history of previous energy technologies to respect how we got to this point. Older participants suspected that younger generations would be in favor of renewable energy technology, but they noted a general sense of naivety. As stated by an older participant,

> "I think they're very supportive of it, I think they're supportive of it to a fault at times. This idea that there's not a balance in it. To me, there's got to be a balance in it. You hear about these battery cars, it's 7 years before your carbon is offset, 7 or 8 years, and then you're still using power off of the grid. That's

> not even counting the power off the grid that you're using to make that car, they even haven't factored that in yet."

Another stated,

> "They need a wake up to know. They need to be educated in how it was in the days of yore, compared to how it brought up to this. Because with all this garbage and waste that's going on in this world right now. That to me seems to be something they should target onto, to bring into the renewable energy cycle."

Younger generations may be looking at renewable energy from the perspective of energy justice. Climate Change is prevalent on social media and younger generations may feel that the decisions of older generations are creating adverse conditions for the viability of their futures. Energy justice is a topic from the combined environmental justice and Climate Change disciplines identified in the early 2010's in work done by both Guruswamy and Yumkella. That work coincides with the ages of Generation Z individuals. An older participant,

> "Our kids today are so much more in tune to social justice issues than I ever was at 13. I feel like my kids are acutely aware of social justice issues. And clearly, it's not just my kids, its society placing a lot more emphasis on those things."

Furthermore, Goldsmith and Goldsmith in 2011 revealed that social influence theory has significant importance for environmental issues. Social influence promotes sustainable behavior, so with an increased exposure to Climate Change and social justice content online, younger generations are more focused on this issue. Boulianne and Theocharis in 2020 found a clear pattern between digital media use and engagement. As noted by a younger participant,

> "I mean it pops up on my Tik Tok all the time. You know, the new Climate

> Change, all that. It's definitely a big issue for my generation, trying to combat that somewhat. I feel like people are actually spending money on renewable energy."

Older participants identified renewable energy as being better for the environment. They had questions about the type of world that was being left behind if renewable energy technology did not achieve mass adoption. This perspective is associated with the 7th generation principle within The Anishinaabe Seven Fires Creation Story and is situated in Native Nation Building's strategic orientation component.

Young participants argued that older generations are resistant to renewable energy technology, perhaps deterred by its high cost. Younger participants also suspected that older generations are generally resistant to change. A participant noted that widespread adoption of renewable energy technology is potentially hindered by both the older generations' mindset that they will not be around to need new forms of technology and the fact that they currently make the decisions. Participants expressed additional skepticism regarding the effectiveness of renewable energy technologies in cold environments, the lifespan of renewable energy materials, and the environmental impacts of development. A younger participant discussed whether renewable energy technology would function correctly in a cold environment,

> "The technology part, I would think they're (older generations) going to be highly skeptical of. And I would find myself also a little bit skeptical because of the climate we live in. This far North. Cold and snow."

3.2. Renewable Energy Technology Perceptions Within Generations

I also asked participants to comment on the perceptions of their own generation. None of the 14 participants suspected members of their own generation would be completely against

renewable energy technologies, but they did discuss apprehension for adoption.[1] An older participant summarized the thoughts of his generation:

> "Gen X is kind of between baby boomers who don't give a shit and millennials who,…at all costs right, they believe we're in catastrophic times. So, I think my generation is still thinking there's still something in the middle there."

The youngest participants all thought that their generation would be in favor of renewable energy technology, and mitigating climate change was identified as a major motivation. One young participant stated,

> "If you don't have energy or you're using up all of your resources, it's just going to be bad until you starve to death."

Another said:

> "I feel like, my generation is a lot more open to using those (renewable energy technologies) or installing solar panels. I feel like that's definitely, I mean it pops up on my Tik Tok all the time. You know, the new climate change, all that. It's definitely a big issue for my generation."

Each younger participant stated that they had begun learning about environmental issues approximately between the ages of ten to twelve. Climate change education at such an early age may be problematic. This is because increasing awareness and engagement with Climate Change content is adversely affecting mental health (Hickman, 2021). This phenomenon is referred to as "eco-anxiety" by Panu in 2020. A study by Clayton et al., in 2021 indicated that "eco-anxiety" can

[1] Generational distinctions were made using Dimock's work in 2019 with the Pew Research Center. Generation Z born between the years 1997 and 2012; Millennial born between the years 1981 and 1996; Generation X born between the years 1965 and 1980; Baby Boomer born between the years 1946 and 1964. Four participants are in the Generation Z category, five participants are in the Millennial category, three participants are in the Generation X category, and two participants are in the Baby Boomer category

change sleep patterns, eating patterns, and reduce immune system function. Given that community well-being begins with the well-being of an individual, climate change eco-anxiety negatively impacts the Tribe's strategic orientation.

Young participants suggested that there has been an increase in exposure to renewable energy due to being raised in a technological culture. One stated,

> "I think, I just feel like we grew up with technology, and we were also taught of how fossil fuels and the burning of fossil fuels harms the environment. So, I feel like there was a push towards a more green energy, but also, we grew up with technology so it's easier to embrace the new technology."

They also may be the first generation to experience—and notice—climate change, which also motivates their appreciation for renewables:

> "Now that Climate Change is very near and very apparent that it's happening. Before a lot of people didn't believe in it and now, we're seeing the consequences, so it's become a reality instead of something in the very far future. It's not distant anymore, it's something we're all going to have to face."

Not only do younger generations engage more with Climate Change content online (Tyson and Funk, 2021), but they are also likely to be affected more by Climate Change's increasing severity over their lifespans. This problem is further compounded because, as Treen et al. found in 2020, misinformation online about Climate Change is pervasive. And Wineburg and McGrew (2016) found that younger generations are struggling to decipher credible online information. This combined with the pervasive spread of misinformation has been called one of the major threats to human society by Del Vicario et al. in 2016.

3.3. Perceived Renewable Energy Barriers

Identifying barriers to renewable development was a key objective of this work. Each one of the 14 participants believed that cost would be the greatest barrier to developing renewable energy infrastructure for the community. Participants suspected the Sault Tribe was not only lacking financial resources but also available land, technical knowledge, and capacity-building opportunities. There is evidence for these perceptions. Sault tribe has access to 1425 acres of land (Jimenez, 2022), the tribe does not have any official energy career positions (Brosemer, 2021), and the closest renewable energy technical training program in a neighboring community was terminated in 2010 without plans for renewal (Sparks, 2022). When asked about tribal renewable energy development, one of the participants stated,

> "The tribe is big on hiring their people first before anyone else. And it would open up another way. Whether it's maintenance or building these things. Is it a career path where people could go to school and learn how to do this stuff. You would think you would have some sort of knowledge about how to build a wind turbine, or how to service a wind turbine, or how you setup a solar grid… we'd have to train people."

Participants also suspected that developing renewable energy infrastructure would need to be conducted in a way that does not affect cultural activities such as hunting, fishing, and gathering medicines. Furthermore, participants suspected development decisions would also need both public majority support in addition to tribal board member support. Each of these requirements could pose a barrier towards renewable energy projects.

Cultural acceptability and trust were identified by non-tribal community members as potential barriers. Initially I suspected that traditional Anishinaabe culture would factor heavily into tribal decision making. While attending monthly Sault Tribe board meetings during my

employment for the Sault Tribe I noticed that many outspoken tribal members do not agree with the opinions of non-tribal members simply for the reason that the latter are non-tribal. There are tribal members still alive that have personally experienced physical violence for practicing Indigenous culture, so it is imperative that cultural perspectives be respected and acknowledged during interactions with the Sault Tribe. As one participant stated,

> "And I think that a big barrier is having organizations or institutions that have that technical capacity to have an understanding of Anishinaabe culture. And are actually interested in engaging and investing in the community rather than leveraging the community's resources."

Federal policy was also perceived to be a barrier towards developing renewable energy technology. Sault Tribe does not have the funding to develop utility-scale renewable energy sources, which according to the U.S. Energy Information Administration (EIA) is a power plant with a total generation capacity of at least 1 megawatt (MW) or greater without partnerships that can take advantage of federal tax incentives. Yet there are not any legal barriers in place that prevent Sault Tribe residents from developing their own residential renewable energy sources.

3.4. Renewable Energy Associations

In addition to eliciting generational perspectives and perceived barriers, I also elicited renewable energy associations for all 14 interview participants—fossil fuel associations are discussed in the next section. I told participants to think about renewable energy and asked for their initial thoughts with the purpose of understanding word associations for the topic. The participants identified 5 different types of renewable energy consistently. Wind was linked to renewable energy by all but one participant. Solar was identified by most participants.

Hydroelectric energy, biomass energy, and sustainability were themes identified least.

While most participants kept their answers concise, three of the participants expressed additional thoughts about renewable energy. One participant alluded to the fact that in discussions about renewable energy, hydroelectric power often goes unnoticed,

> "I think that hydro gets over-looked a lot nowadays. Well, it gets forgotten about, cause it's been around for thousands,…hundreds of years."

The oldest major source of noncarbon mechanical and electrical renewable energy production in the U.S. is hydroelectric power. Until 2019, hydroelectric power generation was the largest source of renewable electricity generation annually, and in 2021 as reported by the U.S. Energy Information Administration it accounted for 31.5 percent of total utility-scale renewable electricity generation. Only about half of the participants initially associated hydroelectricity with renewable energy, yet a majority of the interviews were conducted 2.5 miles from The Saint Mary's Falls Hydropower Plant; an 18-MW hydroelectric generating plant and structural landmark in Sault Ste. Marie, Michigan. The industrial use of hydroelectric power began in 1880 at a chair building factory in Grand Rapids, Michigan (Howard and Stedinger, 2012).

The prompt of renewable energy elicited thoughts about sustainability and as expressed by two participants were not necessarily straightforward. One participant was apprehensive about shifting to renewable energy technology because our society has been built around using fossil fuels. They also believed that the money accumulated by large fossil fuel companies was enough to sway political decisions. Multiple participants identified skepticism that renewable energy technologies were strictly beneficial. One participant stated,

> "…a lot of the things we call quote, "renewable energy," aren't actually, just because you can regrow a tree doesn't mean it's actually a climate smart renewable energy."

This theme was mentioned by another participant stating,

> "There's a lot of controversy, it is concerning because as much as they say renewable, a lot of the materials they use can't be recycled, so it still ends up in the garbage. And yes, we're still not using fossil fuels and putting out all the emissions but instead we're producing solid waste, which is another issue of, where does that go?"

These responses suggest that understandings of renewable energy technologies may be framed from a strictly beneficial viewpoint, ignoring their total impact. Harjanne and Korhonen pointed to this idea in their 2019 study showing how renewable energy is often framed as the main solution to climate change. Skepticism about renewable energy's promise was expressed by another participant when thinking about the implications of development,

> "But I remember hearing a fact on Tik Tok, that if you wanted enough solar energy to power the United States, you'd have to deforest the state of Texas. That's probably not the exact statistic, but it was a crazy amount of land that they would need to completely wipe clean to install solar panels."

Ong et al. found in their 2013 study that the direct land-use requirements for PV installations large enough to power the U.S. would occupy 22,000 square miles, approximately the size of the Mojave Desert. Although solar panels do not exclusively need to be built on undeveloped land, Hernandez et al. in 2014 and in 2015 found that development companies predominantly pursue utility-scale development on undeveloped lands. Additionally, Van de Ven in 2021 suggests that the potential landscape impacts driven by solar energy development remain largely unexplored.

3.5. Fossil Fuel Associations

Fossil fuel associations were included with the data collection revisions (Appendix B) so responses to these associations were recorded for only 10 of the 14 participants. A majority of the participants identified the finiteness of fossil fuels, and that continued use depletes supply. Two participants discussed emissions created by fossil fuels. One participant noted that corporations are predominantly responsible for excessive use; however, another participant indicated that this use was necessary to achieve our current societal status,

> "I mean there are good things that come from fossil fuels. It is the reason we've gotten to this point. Without that energy we would never have gotten to the point of being able to make a sustainable energy source or the machinery."

Another participant stated,

> "I think,…fossil fuels are a necessity. This idea that it's not and that we can somehow rid ourselves of them immediately is just, I feel is just crazy. It's not gonna happen. You know, I think maybe that pressure continues to make things better and cleaner. You know they have cleaner coal and maybe you can continue to progress towards making it a better way to utilize that energy. But no matter how you get your energy, we haven't found a thing yet that doesn't have a downside somewhere. Whether it's solar, wind or coal. There's always a downside somewhere."

Embedded within this statement is the idea of balance, a preserved cultural teaching within Anishinaabe culture represented by the medicine wheel. In addition to the Seven Fires Creation Story Anishinaabe peoples have sacred symbols that represent cultural teachings. The Medicine Wheel is a sacred symbol that represents an interconnected system of teachings that determine

the way Indigenous peoples pursue living a balanced life.

Although negative and positive associations were made with respect to fossil fuels, negative associations were more prevalent. When prompted to think about fossil fuels an older participant spoke about the 7th generation principle within The Anishinaabe Seven Fires Creation Story by stating,

> "A bad investment (continuing to fund the fossil fuel industry). Selling out the future of the planet for short term gains for rich people really. I always think about, we subsidize these companies to take oil out of the ground. We pay them so we can turn around and pay them for what is the public's resource in the first place."

4. DISCUSSION

4.1. Sault Tribe and Native Nation Building Theory

These interviews along with my observations suggest that the Sault Tribe may be a vulnerable population which hinders Nation Building. In addition to these interviews, I have witnessed the hardships faced by this community, hardships which represent an amalgamation of prolonged poverty, harsh seasonal winter weather conditions and traumatic remnants of colonization. Specifically, U.S. Census data in 2019 indicates that the poverty rate for Native Americans in this area is 27.83 percent, a number which is nearly triple the national average. Poverty in childhood limits people from assuming leadership roles indirectly by reducing opportunities for personal development (Barling and Weatherhead, 2016). Additionally, Sault Ste. Marie Michigan's cloudy period lasts approximately 7.2 months and has roughly 103 sunny days annually, which is lower than the national average of 205 sunny days (Ruffner, 1980). Edwards and Torcellini, in 2002 proved that natural light is beneficial for health, productivity, and safety. And Howarth and Hoffman in 1984 found that humidity, temperature, and hours of sunshine had the greatest effect on mood. That same 1984 study directly connected the most significant predictor of behavioral changes with the amount of sunshine experienced. Gendolla in 2000 confirmed that mood affects behavior and added that the mechanism is related to its informational impact on behavior-related judgments.

4.1.1. Sovereignty Constraints

Absolute sovereignty is not possible for a Nation that is economically reliant upon another Nation. Additionally, expanding energy sovereignty for the Sault Tribe is limited. Sault Tribe does not have an official energy position and the main reservation site is held in trust by the federal government. This means that tribal members cannot take out mortgages or access lines of credit

based off the land they occupy. Both of these factors obstruct individuals living in the tribal community from pursuing personal renewable energy investment and in-turn their energy sovereignty. Sault Tribe lacks funding for an energy position, which means this job would need to be grant funded. No one is dedicated to applying for energy grants to start development plans and the people that would be able to write energy grant proposals have more pertinent projects ongoing. This task would likely be meted out to employees from the Natural Resources Department and Environmental Department, who are already overworked. These factors hinder Sault Tribe's ability to expand its sovereignty, specifically energy sovereignty and effective Nation Building.

4.1.2. Controversial Governance Structure

Sault Tribe has a capable governing structure for dispute resolution, but the actions of the tribal government are usually publicized on the main tribal website https://www.saulttribe.com/. The Board of Directors on Jan. 4, 2022, held a duly called meeting that resulted in a 10-2 positive majority vote to censure the tribal Chairman for inappropriate conduct. Conduct included but was not limited to intimidating, harassing, and publicly attacking employees, committing malicious public attacks upon tribal members, violating the Medical Privacy and Procedures of individual tribal members, and releasing confidential information. The information of the censure was documented by local news outlets and was posted officially on the main Sault Tribe website.

I interviewed the participants before the censure took place. When asked about tribal board members, it was common for the younger participants to not know much information, such as the positions of the board members or political perspectives. Every participant in the older generations suspected tribal board members to be supportive of renewable energy technology. Tribal board members are perceived to be predominantly focused on Tribal finances. These tribal community members perceived that the board would be fully supportive of renewable

energy development if it did not cost a lot of money and could potentially generate additional income.

4.1.3. Fading Cultural Match

Cultural match is key for successful development. McBride in 2013 noted that this community shows signs of cultural assimilation, which includes limited Anishinaabemowin language-speakers, increasing health and mental health concerns, a decreased sense of community, and declining ethnic identity. A part of this decline may be attributed to apprehension regarding traditional methods for accessing cultural knowledge. A younger participant illuded to this,

> "For me, it's been difficult to find good literature to learn about the culture. Everyone says, oh go to the medicine man, or go to the elders. I want a book to read or something."

This represents a divergence between contemporary culture and traditional culture for younger generations. While younger tribal members want to learn about their culture using Western ways, traditional teachers and keepers of Ojibwe cultural knowledge are insistent that the sacred oral teachings not be shared in writing. To do so would disregard the synergistic relationships between teacher, learner, and non-human relatives. Without feeling comfortable seeking cultural teachings from elders, and elders not knowing many traditional teachings, younger tribal members will most likely let this traditional cultural knowledge fade away. This was illuminated during the interviews when participants became uncomfortable that they didn't know or couldn't remember traditional teachings. The Seven Fires Creation Story (Benton-Banai, 1979) addressed the potential of fading culture by stating,

> "In the time of the Seventh Fire a Osh-ki-bi-ma-di-zeeg' (New People) will

> emerge. They will retrace their steps to find what was left by the trail. Their steps will take them to the elders who they will ask to guide them on their journey. But many of the elders will have fallen asleep. They will awaken to this new time with nothing to offer. Some of the elders will be silent out of fear. Some of the elders will be silent because no one will ask anything of them."

The initial interview questions (Appendix A) had been designed to both record the experiences that Native Americans have with their culture and to identify the significance culture has during discussions about renewable energy. After interviewing 4 tribal members about the way they experienced cultural knowledge, I observed each one of the participants display discomfort for not knowing traditional Anishinaabe cultural stories. The participants told me after the interviews that they felt guilty, embarrassed, and added an accompanying statement that they felt like they should know more details. One participant stated,

> "I feel like I should know more about the culture parts tho. I don't know things (traditional practices) that are part of being Indian…"

Another participant stated,

> "I'm embarrassed about the seven prophecies,…now it's going to drive me crazy, why couldn't I remember that…"

Not only did I create the conditions for tribal members to feel guilty about their experiences with traditional culture, but I also created a circumstance to experience those feelings in myself. Fenichel in 1945 illudes to guilty feelings as "motives of defense" that alter the course of instinctual behavior. Guilt is experienced as a result of acts or failures to act, in this particular instance, not knowing traditional cultural stories for which one bears responsibility. As stated by one participant,

> "Because I'm not as well versed in a lot of the teachings, especially not as versed as I should be, or as I think I should be, I feel as a young person if I don't learn the culture and the teachings, eventually, and if more young people don't, eventually the culture is lost,…will die."

Moreover, Lewis indicated in 1971 that guilt experienced by individuals occurs during the process of negatively evaluating the self in response to the thought of having committed an irreparable injury. It is likely that despair can result from guilty feelings (Lewis, 1971). In the interviews when I asked people about traditional culture, I observed multiple physical displays clustered together that Navarro and Karlins in 2008 identified as accompanying embarrassment such as fidgeting, nervous laughter, and averting eye contact. Behrendt and Ben-Ari in 2012 were able to show that guilt is an adaptive prosocial emotion. And Schaumberg and Flynn in 2012 were able to show that people who feel guilt more frequently may be better suited to leadership positions. But neither of these studies accounted for vulnerable populations or if the participants were able to fulfill basic safety requirements of the hierarchy of needs, identified by Maslow in 1943. Fulfilling the basic requirements is necessary prior to being able to effectively problem solve (Maslow, 1981).

4.1.3.1. Traditions and Renewables

I initially suspected that tribal members who continued to follow traditional Anishinaabe practices would interpret the seven fires prophecies to mean that humanity needs to return to a world without technology, rather than pursue modern renewable energy. While there still are traditional beliefs and traditional practices adhered to amongst the Sault Tribe community, I observed a duality between traditional culture and contemporary culture. The deviation from traditional ways being necessary to exist in a modern landscape. The tribal members who were

asked about the seven fires prophecies either didn't know or weren't able to recall the specific teachings of the prophecies. Traditional Anishinaabe teachings were absent from the recollection of younger tribal members altogether, so it is not likely that these teachings would directly influence these decisions at this stage in their lives.

4.1.4. Hindered Strategic Orientation

A community that is worried about their immediate financial situation, physical safety, and emotional well-being, may not have capacity to properly evaluate the usefulness of renewable energy development projects or future concerns in general. The events that I observed, and that people told me about indicate that they are unable to satisfy the safety tier of Maslow's hierarchy of needs (Maslow, 1943; Maslow, 1981). Without the safety needs being met people are unable to effectively develop leadership skills. It's difficult for people to consider an investment in renewable energy development because they have more immediate concerns. One participant noted this point by stating,

> "So much of the tribe's resources go back into social programs for the tribal community. I feel like the stakes for the tribe to invest in [renewable energy], they gotta see returns on stuff like that to make it worthwhile. But in terms of investing the money in that [i.e., developing renewable energy infrastructure] vs. the health center, where people see real impacts to their lives, tomorrow."

In addition to acknowledging the conditions of the participants, climate change education from 1991 by Linville, Fischer, and Weber indicated that people have a limited capacity for worrying about issues—referred to by scholars as a "finite pool of worry." Renewable development may simply be outside that pool.

Community members with threats to their immediate circumstances may not have the ability to strategically orient themselves for future success. Diminished well-being prevents strategic orientation and effective leadership development. Outside of the interview questions but entirely relevant to this research were the experiences that I observed while gathering knowledge in the community. I was invited into participants' homes to ask questions about renewable energy from the perspective of a researcher, but prior to the interview questions during rapport building conversations people spoke candidly with me about the current distressing experiences of their lives. Explicit consent to document the specific details during the rapport building conversations was not given. Topics included financial insecurity, job insecurity, aggravated assault, domestic abuse, and sexual assault. A study by Kramer and Allen in 2018 found that trauma not only changes outward leadership behaviors but also wellbeing, regardless of whether a traumatic event is witnessed or experienced. Furthermore, throughout searching for potential study participants, I witnessed a sexual assault between two unidentifiable individuals. These incidents are not isolated. During my time working for the tribe, I witnessed multiple sexual assaults.

4.1.5. Public Spirited Leadership

Speaking with participants during the interviews made it clear that the Sault Tribe community has access to all the necessary tools to begin their healing journey. But they need leadership that focuses on the well-being of the community and revives traditional cultural identity. The ability to engage in productive public-spirited leadership is related to the emotional, mental, physical, and spiritual wellbeing of the leader. Shea et al. found in 2019 tribal communities show greater connection, sense of identity and belonging, well-being, academic achievement and increases in community involvement when exposed to increased tribal knowledge. In 2019, the Sault Tribe released their Strategic Master Plan which is a document that is written by the Chairman and

Board of Directors to indicate to the tribal community the indented goals for community efforts. The first focus area in the Strategic Master Plan is the revitalization of Culture and Traditional Teachings. The tribal administration knows that increasing cultural knowledge is beneficial to the community; however, the perceptions of tribal board members within the community reflect a strictly financially focused attitude. A participant stated,

> "I think unfortunately, their (tribal board members) only concerns would be money…It seems like more, the boards are looking at the tribe like a business in a way."

Another participant stated,

> "Unfortunately, our tribe, I'm only seeing transparency from the younger members. A lot of the board members don't really share much."

Community healing is a necessary step to satisfy the Native Nation Building framework and the continued development of tribal capacity in the areas of public-spirited leadership, cultural match, and strategic orientation.

4.2. Researcher and Community Power Relations

The dynamics of researcher and participant with Sault Tribe includes the historical relationship between Native Americans and disease, especially during a global pandemic. Perspectives about disease are an important caveat of Native American cultural history and may contribute to community mistrust. History and culture are woven into individual identity because traditions, values, and beliefs held by previous generations influence current worldviews. The state of the coronavirus pandemic in relation to the historical prevalence of foreign disease brought into Native American communities by newcomers may have also made

participants uncomfortable. In the past the Sault Ste. Marie Tribe had been affected by repeated smallpox epidemics in the United States having reached Sault Ste. Marie in 1702 (Houston and Houston, 2000) and again 100 years later in 1802 reported by the Office of Indian Affairs. At the time of gathering interview data, participants knew that I was vaccinated with both available Coronavirus vaccines, but correct vaccine information has been muddled with misinformation (Mian and Khan, 2020).

Additionally, Native Americans have a significant mistrust of the scientific community. A lack of trust was identified by a participant when asked about barriers to renewable development,

> "I think trust is,…(a barrier towards development). It's no different than a university researcher showing up saying, we want to study your people, hey trust us we want to do this thing, it's in your best interest, you'll make money."

In 2002, Brugge and Gobel documented an example of Native American uranium miners being excluded from pertinent scientific findings that led to many of them dying prematurely of lung cancer. In 2011, Sterling revealed mistrust when researchers gathered blood samples from Native Americans to search for a link to diabetes, but then allowed other researchers to use those blood samples to publish papers about inbreeding, alcoholism, and the tribe's origin and migration. Although I did not gather medical information, Pacheco et. al noted in 2013 that Native American communities do not generally distinguish between unethical experiences that occur in the medical profession versus the research profession; these transgressions are seen as occurring from the same people. This is a larger problem within the scientific community, but it has immediate consequences for the focal communities.

Research funding structures and opportunities may also erode community trust. The tangible

products that are required for long term funding opportunities rely on rapport building. There isn't a specific protocol for achieving rapport and building relationships; these acts do not have specific time expectations. This project was funded by a National Science Foundation grant, "GCR: Collaborative Research: Socio-Technological System Transitions: Michigan Community & Anishinaabe Renewable Energy Systems" (MICARES). Funding for the MICARES project provided by the NSF was not continued for years 3 to 5. Constrained by timing and funding, the MICARES project established the possibility of a beneficial partnership with Sault Tribe that was immediately terminated. We built up the tribe's hopes and weren't funded to follow through on those hopes. Furthermore, the Natural Resources Department is entirely grant-funded which means that including a cultural component will likely result in their request for grant funding from the federal government being denied because cultural practices are inseparable from spirituality. The biocentric Anishinaabe worldview intertwines traditional ecological knowledge, spirituality, and identity. Given that the United States Supreme Court has stated that direct government support may not be used to support "inherently religious" activities, this stance excludes Native American communities from obtaining energy grant money if they conduct cultural practices that are known to heal and build the community while also being spiritual. This is another example of how the research process may further diminish trust and cultural misunderstandings.

Interviewing participants in vulnerable populations requires different qualitative methodologies. The goal of qualitative research is to gather data without influencing the responses of participants, which can typically be achieved by behaving in a standardized manner, decreasing vocal inflection, and following scripted interview guides (Derry and Baum, 1994). These methods are easily performed in practice environments but were quite difficult during my experiences gathering data from this vulnerable population. I observed through the

process of obtaining written consent to participate and audio record the conversations for my personal transcription purposes that participants appeared to think very carefully about the personal opinions they shared. I was speaking with people who I had worked with in the past, but I noticed differences in the way they spoke during the recorded portion of the interviews. When asked about an individual's immediate thoughts about renewable energy one participant stated,

"I'm just thinking about the best way to define it for you."

This shows that the participant is shaping their answer rather than providing their uninhibited thoughts. And another participant stating,

"I don't know if that's a good answer or not."

Additionally, Woods and McNamara in 1980 studied the effects of confidentiality on interviewee behavior and found that promising confidentiality did not increase the openness of disclosures in interview settings and that interviewees displayed anxious behaviors in the presence of audio recording devices. I observed this during a conversation about the potential blind-spots researchers have when a participant began speaking uninhibited and then looked at the recording device and stated,

"I don't know if I should say that,…"

In another instance a participant shared a strong political opinion with me, but then considered that they could be identified and stated,

"Sorry, somebody else said that shit, not me."

When talking about the researcher's role during the knowledge-gathering process in vulnerable populations, Derry and Baum in 1994 noted that the realities of conditions present for participants can restrict research methodologies by introducing ethical considerations that must be weighed with experimental expectations. Qualitative data collection methods affect

participants' ideas; however, the degree to which opinions are influenced is unknown.

5. CONCLUSION

5.1. Conclusion

According to the 14 people interviewed here, renewable energy technologies would be beneficial to the community and would coincide with the traditional Anishinaabe seventh generation principle. Traditional Anishinaabe cultural references were largely absent from younger generations, which coincides with the cultural assimilation factors documented by McBride in this community in 2013. The participants did not associate traditional culture as being incompatible with renewable energy technologies; therefore, it is unlikely that traditional Anishinaabe culture will factor into decision making as younger Native Americans become prominent decision makers in the community.

Although older generations spoke of traditional Anishinaabe values, the immediate barriers impeding renewable energy development were funding and capacity. The Sault Tribe currently does not have a career position available to apply for funding to develop the tribe's capacity for transitioning to renewable energy. Successful development of renewable energy infrastructure should use a holistic approach involving traditional cultural revitalization and enhanced well-being as much as it involves physically building. A lack of funding forces tribal partnerships with entities that do not fully satisfy the required elements for successful Native Nation Building: sovereignty, cultural match, and strategic orientation. Policies set in place by the United States federal government prevent using grant funding for renewable energy development from being used for cultural revitalization due to its inseparability from spirituality. Cultural revitalization is necessary for successful Native Nation Building. Although Sault Tribe is satisfying the requirements of capable governing structures and public-spirited leadership, without the sovereignty, cultural match, and strategic orientation elements being met, renewable energy development may remain stagnant.

APPENDICES

APPENDIX A

Initial Interview Guides

Tribal Members

- What three things initially come to your mind when I say renewable energy?
- What teachings and cultural practices have you seen in the community over the years?
  - Was this on the reservation lands?
  - Are there other ways where you learned how to live with or off the land?
  - What about Fishing, Hunting, Gathering - Foods, Medicines?
- What is your earliest memory of Ojibwe teachings or practices that you have seen?
  - Can you provide more examples of teachings?
- In what ways have traditional Ojibwe teachings appeared throughout your life?
- Are you familiar with examples of renewable energy in traditional teachings?
- What changes in the land have you seen over time?
- Could you describe your familiarity with the Seven Fires Prophecies?
  - Can you think of specific examples of other traditional practices?
- What would members of your generation say about renewable energy technologies?
  - What would [younger/older] generations say about renewable energy technologies?
  - What do you think tribal board members would say about renewable energy technologies?
- Would there be anything that you could think of that might prevent the tribe from using renewable energy technologies?
- What are the ways tribal members could participate in renewable energy development?

Tribal Affiliated Members

- What three things initially come to your mind when I say renewable energy?
- What teachings and cultural practices have you seen in the community since your time here?
  - Was this on the reservation lands?
  - Can you provide more examples of Ojibwe teachings?
- In what ways have traditional Ojibwe teachings appeared throughout your life?
- Are you familiar with examples of renewable energy in traditional teachings?
- What changes in the land have you seen over time?
- Could you describe your familiarity with the Seven Fires Prophecies?
  - Can you think of specific examples of other traditional practices?
- What would members of your generation say about renewable energy technologies?
  - What would [younger/older] generations say about renewable energy technologies?
  - What do you think tribal board members would say about renewable energy technologies?
- Would there be anything that you could think of that might prevent the tribe from using renewable energy technologies?
- What are the ways tribal members could participate in renewable energy development?

APPENDIX B

Modified Interview Guides

Tribal Members

- What three things initially come to your mind when I say renewable energy?
- What comes to your mind when I say fossil fuels?
- What would members of your generation say about renewable energy technologies?
  - What would [younger/older] generations say about renewable energy technologies?
  - What do you think tribal board members would say about renewable energy technologies?
- Have you ever heard of energy being involved in cultural or traditional teachings?
- Would there be anything that you could think of that might prevent the tribe from using renewable energy technologies?
- What are the ways tribal members could participate in renewable energy development?

Tribal Affiliated Members

- What three things initially come to your mind when I say renewable energy?
- What comes to your mind when I say fossil fuels?
- What would members of your generation say about renewable energy technologies?
  - What would [younger/older] generations say about renewable energy technologies?
  - What do you think tribal board members would say about renewable energy technologies?
- During your time with the tribe, have you ever heard of energy being involved in cultural or traditional teachings?
- Would there be anything that you could think of that might prevent the tribe from using renewable energy technologies?
- What are the ways tribal members could participate in renewable energy development?

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