

Workplan - Middle Village Microgrid Project

Section 1. Overall Project Summary and Approach

The Menominee Indian Tribe of Wisconsin (MITW) is pursuing the goal of energy sovereignty by adopting a comprehensive renewable energy program. For the Menominee people, sustainability has been a way of life for generations. Moving away from fossil fuels is a way to honor ancestral traditions and practices, while also reducing climate pollution through decreased carbon use, lowering energy costs, enhancing resilience against power outages, creating quality jobs for Tribal members, and promoting economic development for the Tribe.

The Menominee Tribal lands are home to its 8,551 enrolled members and comprises 235,523 acres. It encompasses more than 407 miles of roads, 187 rivers and streams, 53 lakes, and five main communities: Keshena, Neopit, Middle Village, Zoar, and South Branch. The Tribal vision of energy sovereignty begins with Middle Village and expands throughout the other villages and enterprises located on the Tribal lands. Middle Village is a community of 73 households of about 300 residents and 12 commercial buildings, which include a home for elders called the Wolf River Community Based Residential Facility (CBRF), a fire station, and mental health and social service facilities, among others. At Middle Village, the Tribe will **prepare for energy resilience** by developing a clean energy microgrid facility with battery and solar storage and **implement renewable energy sources** by installing photovoltaic solar panels (PV) on commercial facilities and single-family homes.

Goals for the Middle Village Microgrid project include:

- Maximizing the use of renewable energy sources to reduce carbon and greenhouse gas emissions;
- Lowering the annual cost of electricity by leveraging local generation;
- Creating permanent jobs for Tribal members;
- Accommodating a planned expansion for Middle Village; and
- Enhancing its emergency response capability.

Key elements are already in place to begin construction of a microgrid system at Middle Village as soon as funding is available. These elements include:

- Tribally-governed utility department (Menominee Tribal Utility Department, established in 1997);
- Tribal ownership of the electrical power substation that serves the community of Middle Village (built in 1995, with equipment recently updated);
- Tribal management of all aspects of utility and customer services including purchase of wholesale energy from a large regional utility company; and
- Available open land needed to build a 10,000-panel solar array and battery back-up system adjoining the substation.

a. Description of GHG Reduction Measures

GHG Reduction Measure 1: Develop a clean energy microgrid

A modeling and simulation process conducted in 2023 identified eight potential design options for a Middle Village Microgrid, including single facility microgrids, a cluster microgrid, and a range of centralized microgrids. The study showed that a centralized microgrid serving the entirety of Middle Village has the greatest potential to reduce the most greenhouse gas emissions and energy costs, while circumventing costly upgrades that would be required for a single-facility or cluster microgrid.

The Middle Village Microgrid would consist of a 4 MW (DC) utility-scale solar power plant and 16 MW-hour capacity utility-scale battery storage. In this centralized, net-metered, 100% renewable model, the solar panels, batteries, and generator would be located at the existing Middle Village substation. The Tribe fully owns the substation, which is serviced by a 34.5kV transmission system that receives wholesale energy purchases from Alliant Energy, a large regional utility serving Wisconsin and Iowa. The power from the 4 MW plant and associated battery storage will be operated by the Menominee Tribal Utility Department for use in the local distribution system. Excess power will be sold to Alliant under a wholesale net metering program.

The Middle Village Microgrid will leverage several existing strengths:

- The Tribe's ownership and control of the distribution system;
- The large potential solar resource at the substation, including a large, flat area for a 10,000 panel solar array;
- A microgrid isolation point and interconnection right at the top of the substation feeder, which allows the generation, controls, and primary utility interconnection to be in the same space; and
- Existing diesel or propane back-up generators at all Middle Village commercial facilities, which can remain in place in the near-term, and potentially indefinitely, to back-up the microgrid.

Tasks

- 1) **Engineering drawings:** Develop preliminary engineering design approved by Tribe. Develop engineering drawings iteratively. Submit interconnection application. Secure engineering design approval from project stakeholders and the utility company, as well as interconnection approval.
- 2) **Procurement:** Develop request for proposal. Issue RFPs and administer requests for information. Receive and review bids. Lead descope meetings and develop recommended shortlist. Lead contract negotiations with selected contractor.
- 3) **Project initiation, planning, and execution:** Perform project monitoring and control and manage contractor on behalf of Tribe. Oversee project closeout and smooth transition to operational period. Ensure scheduled and unscheduled maintenance items are taken care of as agreed.

Milestones

June 1, 2025: Begin construction of 4MW Solar and BESS at Middle Village Substation

July 1, 2026: Complete construction of 4MW Solar and BESS at Middle Village Substation

Assumptions & Risks

The presence of large single-phase loads on the distribution circuit could create phase balancing issues that destabilize an islanded microgrid. For budgeting purposes, it was assumed that upgrades to commercial facilities would not be required in order to build out the centralized microgrid. This assumption will need to be confirmed as part of the detailed engineering study prior to construction.

Priority Alignment

This GHG reduction measure aligns with the priority to **increase energy resilience** by developing clean energy microgrids, outlined in the PCAP completed in 2024 by the Midwest Tribal Energy Resource Association (MTERA) on behalf of all 35 tribes in EPA Region 5.¹ It meets the CPRG program goal to **achieve substantial benefits for disadvantaged communities** by enabling the Tribe to dramatically increase the use of renewable energy on Menominee homelands. According to the Climate and Economic Justice Screening tool, the census tract covering Tribal lands is at the 90th percentile nationwide for households where income is at or below the Federal poverty level, making this project eligible for investment under the Justice40 initiative.²

GHG Reduction Measure 2: Install building-level solar and storage systems

This reduction measure encompasses the installation of commercial building individual energy + battery storage systems, capacity 50 kilowatts each, on four (4) Tribally-owned facilities at Middle Village. These facilities, which provide essential services to Tribal members, are:

- Wolf River Community Based Residential Facility (CBRF), a residential care facility for elders
- Maehnowesekiyah Wellness Center, a comprehensive alcohol, drug, and mental health treatment center
- Residential Treatment House
- Domestic Violence (DV) Center

This measure would add 200 kW (DC) of photovoltaic capacity producing 272,000 kilowatt-hours (AC) per year, with a likely range of 261,000 to 284,000 kilowatt-hours (AC) of usable electricity annually. The battery storage capacity is estimated at 50 kW (DC) x 4 hours, or 200 kilowatt-hours.

Tasks

- 1) **Procurement:** Develop request for proposal. Issue RFPs and administer requests for information. Receive and review bids. Lead descope meetings and develop recommended shortlist. Lead contract negotiations with selected contractor.
- 2) **Project initiation, planning, and execution:** Perform project monitoring and control and manage contractor on behalf of Tribe. Oversee project closeout and smooth transition to operational period. Ensure scheduled and unscheduled maintenance items are taken care of as agreed.

¹ Priority Climate Action Plan (PCAP), Midwest Tribal Energy Resource Association, February 2024
<https://www.epa.gov/system/files/documents/2024-03/mtera-pcap.pdf>

² Climate and Economic Justice Screening Tool, U.S. Council on Environmental Quality
<https://screeningtool.geoplatform.gov/en/>; Justice40 Initiative, The White House
<https://www.whitehouse.gov/environmentaljustice/justice40/>

Milestones

October 1, 2026: Begin installation of 50kW solar and BESS at Middle Village facilities

July 1, 2027: Complete installation of 50kW solar and BESS at Middle Village facilities

Priority Alignment

This GHG reduction measure aligns with the priority to **reduce energy generation emissions** by installing commercial facility-scale solar renewable energy systems, outlined in the PCAP completed in 2024 by MTERA.³ It addresses the CPRG objective to **achieve significant cumulative GHG reductions** by 2030 and beyond.

GHG Reduction Measure 3: Install residential (single-family) solar PV

In this stage of the project, the Tribe will install solar photovoltaic systems, capacity 10 kilowatts each, and associated battery storage systems on all 73 of the single-family residences in Middle Village.

Tasks

- 1) **Procurement:** Develop request for proposal. Issue RFPs and administer requests for information. Receive and review bids. Lead descope meetings and develop recommended shortlist. Lead contract negotiations with selected contractor.
- 2) **Project initiation, planning, and execution:** Perform project monitoring and control and manage contractor on behalf of Tribe. Oversee project closeout and smooth transition to operational period. Ensure scheduled and unscheduled maintenance items are taken care of as agreed.

Milestones

October 1, 2027: Begin installation of 10kw solar and BESS at Middle Village residences

August 1, 2028: Complete installation of 10kw solar and BESS at Middle Village residences

Priority Alignment

This GHG reduction measure aligns with the priority to **reduce energy generation emissions** by installing single-family solar renewable energy systems, outlined in the PCAP completed in 2024 by MTERA.⁴ It addresses the CPRG objective to **achieve significant cumulative GHG reductions** by 2030 and beyond.

b. Demonstration of Funding Need

The Menominee Indian Tribe of Wisconsin has strategically leveraged federal and non-federal funding sources to achieve important foundational steps towards the goal of energy sovereignty. To ensure the continuation of energy distribution at the substation at Middle Village, the Tribe used 2021 CARES funding to upgrade aging equipment. ARPA funds were used to successfully pilot a small residential solar program for four elder households; this program does not qualify for available tax credits or rebates because of the funding source. A combination of federal and non-federal funds supported

³ MTERA PCAP, p. 9

⁴ MTERA PCAP, p. 9

recent feasibility studies for widespread renewable energy implementation. The table below outlines all recent awarded and pending grants related to this initiative.

A major federal grant is now needed in order to advance this groundwork into full implementation. The availability of substantial local capital for transformative investments in renewable energy systems, e.g. from corporate partners or philanthropic donors, is extremely limited in our low-income, high-poverty rural area. This also means that grant opportunities with a significant match or cost-sharing requirement are typically out of reach. Tribal spending prioritizes the provision of direct services to community members who are impacted by poverty, historical trauma, and adverse childhood experiences. Our location does not meet the requirements for federal Energy Community status.

Table 1 - Funding Sources Pursued and Awarded by the Community Development Department, Renewable Energy Division, 2021-2024

Grant	Funding source	Amount	Project	Status
CARES (2021)	Federal	\$700,000	Substation upgrades	Awarded
ARPA (2022)	Federal	\$260,000	Elder residential solar program	Awarded
Tribal Energy Development Capacity (TEDC) (2023)	Federal (Department of the Interior, Division of Energy and Mineral Development)	\$100,000	Feasibility studies	Awarded
BIL Grid Resilience Formula Grant (2023)	Federal (Department of Energy, Grid Deployment Office)	\$182,000	Feasibility studies	Awarded
Energy Efficiency and Conservation Block Grant (EECBG) (2020)	Federal (Department of Energy)	\$10,000	Advanced metering for Middle Village	Awarded
Tribal Solar Accelerator Fund	Non-federal (GRID Accelerator)	\$150,000	Teaching solar array at College of Menominee Nation	Awarded to CMN
Midwest Tribal Energy Resource Association	Non-federal	\$10,000	Energy attorney	Awarded
Tribal Electrification Program	Federal (Department of the Interior, BIA)	\$680,000		Allocated/Not yet Received

Energy Infrastructure Deployment on Tribal Lands	Federal (Department of Energy)	\$720,000		Applied, not funded
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c. Transformative Impact

The Menominee Indian tribe of Wisconsin is committed to achieving energy sovereignty by 2035. The proposed Middle Village Microgrid is the first and largest implementation project which will lead the way for widespread adoption of renewable energy across Tribal lands, communities, and enterprises in the region. The Tribe has already completed a feasibility study and developed a plan of action for rolling out replicable renewable energy microgrid systems throughout the Menominee Nation, deploying the latest technology in solar energy and battery backup systems.

As the Tribe moves towards the full adoption of renewable energy, they will provide career education and job training from middle school to high school and college through our own College of Menominee Nation. These training opportunities will build Tribal capacity and expertise and provide a long-term pipeline to many stable, well-paying jobs in the clean energy industry for Tribal members.

As a sovereign Tribal Nation, MITW and other federally-recognized Tribal Nations have unique aspects that allow for the adoption of renewable energy systems more quickly than other communities which may be more constrained by local and state laws. This means that moving away from fossil fuel sourcing provided by a major utility company to full implementation of self-sufficient and resilient renewable energy systems can be accomplished in a short timeline of just a few years. MITW will play a significant role in advancing renewable energy as part of a consortium of Tribes interested in energy sovereignty and resiliency, guiding other Tribal Nations to replicate the MITW model and adopt renewable energy systems of their own.

Section 2: Impact of GHG Reduction Measures

a. Magnitude of GHG Reductions from 2025 through 2030

The table below summarizes the overall impact of the project's proposed GHG reduction measures from 2025 through 2030, including both direct combustion emissions and some pre-combustion emissions. A more detailed estimate and calculations are shown on the attached spreadsheet. Direct reductions over this five-year period are estimated to total a cumulative 11 million metric tons of carbon dioxide. Including estimated pre-combustion emissions of methane and nitrous oxide would increase reductions to 17 million metric tons of carbon dioxide equivalent.

Table 2. Emission Reductions 2025-2030
(Thousand Metric Tons of Carbon Dioxide and Carbon Dioxide Equivalent)

GHG Reduction Measure	Magnitude of Reductions 2025-2030
4 MW Solar Array	4,793
PV Via Battery Storage	413
SUBTOTAL Measure 1	9,442
4 x 50 kW PV Commercial Solar	326
PV Via Battery Storage	42
SUBTOTAL Measure 2	368
73 x 10 kW PV Residential Solar	927
SUBTOTAL Measure 3	927
Total Combustion CO2 Reductions	11,038
Combustion Methane & N2O	9
Total Direct Reductions	11,048
Pre-Combustion CH4 & N2O	6,245
All Emission Reductions	17,293

To convert electricity production estimates derived from PVWatts, the Menominee Indian Tribe of Wisconsin used short-run marginal greenhouse gas emissions factors derived from NREL's Cambium 2022 dataset,⁵ using their "Mid Case Scenario." NREL includes data tables from multiple scenarios for various subsections of the United States, and includes both estimates of marginal direct emissions of carbon dioxide and "pre-combustion" emissions.

Short-run marginal emissions estimates for 2026, 2028, 2030, 2035, and 2040 were drawn from a Cambium-based table provided as part of AVERT modeling output, which modifies Cambium results to show marginal emissions of fossil generation relevant to the specific region being modeled.⁶ Marginal emissions between these dates were interpolated. Post-2040 marginal emissions rates were estimated by calculating the rate of decline in marginal short-run emissions rates for 2040, 2045, and 2050 from Cambium's 2022 dataset, and applying them to the 2040 datum from AVERT.

The general trend for the future in the Mid-Case Scenario is continuing decline in marginal emissions rates, as coal-fired power plants are retired, production of renewable energy grows, and remaining fossil plants have higher efficiency. Fossil emission rates per kilowatt-hour in the Central region halve by the 2040s, reducing unit emission reductions in this estimate.

a. Magnitude of GHG Reductions from 2025 through 2050

The table below summarizes the overall impact of the project's proposed GHG reduction measures from 2025 through 2050, including both direct combustion emissions and some pre-combustion emissions. A more detailed estimate and calculations are shown on the attached spreadsheet. Direct reductions over

⁵ National Renewable Energy Laboratory. *Energy Analysis: Cambium* <https://www.nrel.gov/analysis/cambium.html>

⁶ "Reference: Modeled Marginal Emission Rates Over Time" output table in AVERT 4.2.

the life of the project are estimated to total a cumulative 49 million metric tons of carbon dioxide. Including estimated pre-combustion emissions of methane and nitrous oxide would increase reductions to 67 million metric tons of carbon dioxide equivalent.

Table 3. Emission Reductions 2025-2050
(Thousand Metric Tons of Carbon Dioxide and Carbon Dioxide Equivalent)

GHG Reduction Measure	Magnitude of GHG Reductions 2025-2050
4 MW Solar Array	29,558
PV Via Battery Storage	10,526
SUBTOTAL Measure 1	40,084
4 x 50 kW PV Commercial Solar	1,831
PV Via Battery Storage	104
SUBTOTAL Measure 2	1,935
73 x 10 kW Residential Solar	7,001
SUBTOTAL Measure 3	7,001
Total Combustion CO2 Reductions	49,020
Combustion Methane & N2O	36
Total Direct Reductions	49,057
Pre-Combustion CH4 & N2O	18,715
All Emission Reductions	67,771

b. Cost Effectiveness of GHG Reductions

For the first five years of the project (2025-2030), the cost effectiveness of GHG reductions is estimated to be \$1,360 per metric ton CO2e.

c. Documentation of Reduction Assumptions

See Technical Appendix.

Section 3: Environmental Results – Outputs, Outcomes, and Performance Measures

a. Expected Outputs and Outcomes

The Tribal vision of energy sovereignty begins with Middle Village and will then be adopted throughout the other villages and enterprises located on Tribal lands. At Middle Village, the Tribe will **prepare for energy resilience** by developing a clean energy microgrid facility with battery and solar storage and **implement renewable energy sources** by installing photovoltaic solar panels (PV) on commercial facilities and single-family homes. Key elements are already in place to begin construction of a microgrid system at Middle Village as soon as funding is available. Based on the feasibility study conducted, the following proposed GHG reduction measures will result in the largest reduction of greenhouse gas emissions, reduce energy costs, and enable energy resilience. The proposed measures along with the expected outputs and outcomes are as follows:

1. GHG Reduction Measure # 1: Develop a Clean Energy Microgrid

In this reduction measure, a centralized microgrid serving the entirety of Middle Village will be installed to reduce the most greenhouse gas emissions and energy costs. The Middle Village Microgrid would consist of a 4 MW (DC) utility-scale solar power plant and 16 MW-hour capacity utility-scale battery storage. In this centralized, net-metered, 100% renewable model, the solar panels, batteries, and generator would be located at the existing Middle Village substation. The Tribe fully owns the substation, which is serviced by a 34.5kV transmission system that receives wholesale energy purchases from Alliant Energy, a large regional utility serving Wisconsin and Iowa. The power from the 4 MW plant and associated battery storage will be operated by the Menominee Tribal Utility Department for use in the local distribution system. Excess power will be sold to Alliant under a wholesale net metering program.

Table 4. Expected Outputs and Outcomes for GHG Reduction Measure # 1

<u>Inputs/Resources</u>	<u>Project Activities</u>	<u>Outputs</u>	<u>Outcomes</u>	
			<u>Short-Term</u> 2025-2030	<u>Long-Term</u> 2025-2050
<ul style="list-style-type: none"> - 1 contractor - 3 project staff - The Tribe's ownership and control of the distribution system; - The large potential solar resource at the substation, including a large, flat area for a 10,000 panel solar array; - A microgrid isolation point and interconnection right at the top of the substation feeder, which allows the generation, controls, and primary utility interconnection to be in the same space; - Existing diesel or propane back-up generators at all 	<ul style="list-style-type: none"> - Engineering drawings - RFPs published - Bids reviewed and finalized - Contractor selected - Project implementation will include construction beginning and construction ending - Project monitoring - Project transition to operations upon completion 	<ul style="list-style-type: none"> - 4 MW (DC) utility-scale solar power plant - 16 MW-hour capacity utility-scale battery storage 	<ul style="list-style-type: none"> - Reduction of 4,793 from 4 MW solar array - Reduction of 413 from PV Via Battery Storage - Total magnitude reductions of 9,442 	<ul style="list-style-type: none"> - Reduction of 29,558 from 4 MW solar array - Reduction of 10,526 from PV Via Battery Storage - Total magnitude reductions of 40,084 - Increase energy resilience - Achieve substantial benefits for disadvantaged communities - cost effectiveness of GHG reductions estimated to be

Middle Village commercial facilities, which can remain in place in the near-term, and potentially indefinitely, to back-up the microgrid.				\$1,360 per metric ton CO ₂ e
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2. **GHG Reduction Measure # 2: Install Building-Level Solar and Storage Systems**

This reduction measure encompasses the installation of commercial building individual energy + battery storage systems, capacity 50 kilowatts each, on four (4) Tribally-owned facilities at Middle Village. These facilities, which provide essential services to Tribal members, are:

- Wolf River Community Based Residential Facility (CBRF), a residential care facility for elders
- Maehnowesekiyah Wellness Center, a comprehensive alcohol, drug, and mental health treatment center
- Residential Treatment House
- Domestic Violence (DV) Center

Table 5. Expected Outputs and Outcomes for GHG Reduction Measure #2

<u>Inputs/Resources</u>	<u>Project Activities</u>	<u>Outputs</u>	<u>Outcomes</u>	
			<u>Short-Term</u> 2025-2030	<u>Long-Term</u> 2025-2050
<ul style="list-style-type: none"> - 1 contractor - 3 project staff - Tribally-governed utility department (Menominee Tribal Utility Department, established in 1997); - Tribal ownership of the electrical power substation that serves the community of Middle Village (built in 1995, with equipment 	<ul style="list-style-type: none"> - RFPs developed and published - Bids reviewed and finalized - Descope meetings and develop recommended shortlist - Contractor selected through negotiations - Project implementation will include construction beginning and construction ending - Project monitoring 	<ul style="list-style-type: none"> - 50kW solar and BESS - Add 200 kW (DC) of photovoltaic capacity producing 272,000 kilowatt-hours (AC) per year - Range of 261,000 to 284,000 kilowatt-hours (AC) of usable electricity annually - Battery storage capacity at 50 kW (DC) x 4 hours, or 200 kilowatt-hours 	<ul style="list-style-type: none"> - Reduction of 326 from 4 x 50 kW PV Commercial Solar - Reduction of 42 from PV Via Battery Storage - Total magnitude reductions of 368 	<ul style="list-style-type: none"> - Reduction of 1,831 from 4 x 50 kW PV Commercial Solar - Reduction of 104 from PV Via Battery Storage - Total magnitude reductions of 1,935

3. **GHG Reduction Measure # 3: Install residential solar PV**

In this reduction measure, the Tribe will install solar photovoltaic systems, capacity 10 kilowatts each, and associated battery storage systems on all 73 of the single-family residences in Middle Village.

Table 6. Expected Outputs and Outcomes for GHG Reduction Measure # 3

<u>Inputs/Resources</u>	<u>Project Activities</u>	<u>Outputs</u>	<u>Outcomes</u>	
			<u>Short-Term</u> <i>2025-2030</i>	<u>Long-Term</u> <i>2025-2050</i>
<ul style="list-style-type: none"> - 1 contractor - 3 project staff - Tribally-governed utility department (Menominee Tribal Utility Department, established in 1997); - Tribal ownership of the electrical power substation 	<ul style="list-style-type: none"> - RFPs developed and published - Bids reviewed and finalized - Descope meetings and develop recommended shortlist - Contractor selected through negotiations - Project implementation will 	<ul style="list-style-type: none"> - 10kw solar - 73 battery storage systems on all 73 single-family residences in Middle Village 	<ul style="list-style-type: none"> - Total magnitude reduction of 927 from 73 x 10kW PV residential solar 	<ul style="list-style-type: none"> - Total magnitude reduction of 7,001 from 73 x 10kW PV residential solar - cost effectiveness of GHG reductions

<p>that serves the community of Middle Village (built in 1995, with equipment recently updated);</p> <ul style="list-style-type: none"> - Tribal management of all aspects of utility and customer services including purchase of wholesale energy from a large regional utility company; - The available open land needed to build a 10,000-panel solar array and battery back-up system adjoining the substation. 	<p>include construction beginning and construction ending</p> <ul style="list-style-type: none"> - Project monitoring - Project transition to operations upon completion 			<p>estimated to be \$1,360 per metric ton CO₂e</p> <ul style="list-style-type: none"> - Achieve significant cumulative GHG reductions - Reduce energy generation emissions
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The project's proposed GHG reduction measures from **2025 through 2030**, including both direct combustion emissions and some pre-combustion emissions calculated as direct reductions over the five-year period, are estimated to total a cumulative **11 million metric tons** of carbon dioxide. Including estimated pre-combustion emissions of methane and nitrous oxide would increase reductions to 17 million metric tons of carbon dioxide equivalent.

The proposed GHG reduction measures from **2025 through 2050**, including both direct combustion emissions and some pre-combustion emissions calculated as direct reductions over the life of the project are estimated to total a cumulative **49 million metric tons** of carbon dioxide. Including estimated pre-combustion emissions of methane and nitrous oxide would increase reductions to 67 million metric tons of carbon dioxide equivalent.

b. Performance Measures and Plan

The established outputs and outcomes in Section 3.a of the workplan will be overseen and tracked by the project team outlined in Section 6.c consisting of a project director, project manager, and project staff. As part of the implementation, the Tribe will secure an engineer to lead the technical elements of the proposed project. The project team will work closely with the engineer to ensure that each of the proposed GHG reduction measures are implemented efficiently and assessed for functionality.

The Advanced Metering Infrastructure (AMI) will be utilized to gather data from each proposed GHG reduction measure at the completion of implementation. The data will then be evaluated by comparing it to the projected reductions outlined in Section 2.a, short-term estimates for 2025-2040, which were drawn from a Cambium-based table provided as part of AVERT modeling output, which modifies Cambium results to show marginal emissions of fossil generation relevant to the specific region being modeled.⁷ Marginal emissions

⁷ "Reference: Modeled Marginal Emission Rates Over Time" output table in AVERT 4.2.

between these dates were interpolated. Post-2040 marginal emissions rates were estimated by calculating the rate of decline in marginal short-run emissions rates for 2040, 2045, and 2050 from Cambium’s 2022 dataset, and applying them to the 2040 datum from AVERT. Additionally, the projected reduction measures outlined in Section 2.b are estimates from 2025 through 2050 which include both direct combustion and emissions and some pre-combustion emissions, will be compared to the reductions measured in the long-term. Utilizing AMI will provide comprehensive data on energy usage in the proposed Tribal facilities, microgrid, and the residential area, which will allow Menominee Tribal Utility Department (MTUD) to negotiate energy rates as well as the ability to sell excess power back to Alliant.

The resulting reductions will be shared with EPA through the reporting requirements in place. The project team will utilize the following performance measurement plan to track each task is being completed as planned, and assess the deliverables:

Table 7. Client Performance Management Plan

NAME		Client Performance Management Plan		CONTRACTOR			
START DATE		October 1, 2024		END DATE		August 1, 2028	
Item No	Task	Actual Start Date	Tentative Start Date	Impact on Completion	Target Completion Date & Status	Deliverables	Lead
	GHG Reduction Measure # 1- Develop a clean energy microgrid		October 2024	Increase energy resilience			
1.1	Engineer						
1.1.1	Write RFP for Engineer		October 2024				
1.1.2	Out to bid engineer						
1.1.3	Review bids and select engineer		November 2024				
1.1.4	Finalize contract with engineer		December 2024			Contract with engineer	
1.2	Engineering Drawings		January 2025				
1.2.1	Develop preliminary engineering design approved by Tribe.						

1.2.2	Develop engineering drawings iteratively.					Engineering drawings	
1.2.3	Submit interconnection application.						
1.2.4	Secure engineering design approval and interconnection approval from project stakeholders and utility company.						
1.3	Procurement		March 2025				
1.3.1	Develop request for proposal					RFPs	
1.3.2	Issue RFPs and administer requests for information.		April 2025				
1.3.3	Receive and review bids.		May 2025				
1.3.4	Lead descope meetings and develop recommended shortlist.						
1.3.5	Lead contract negotiations with selected contractor.						
1.4	Project initiation, planning, and execution.		June 2025			Construction begins	
1.4.1	Perform project monitoring and control, and manage contractor.						
1.4.2	Oversee project closeout and smooth transition to operational period.		June 2026			Construction completed	
1.4.3	Ensure scheduled and unscheduled maintenance items as agreed upon are taken care of.						
1.4.4	Measure the GHG reductions using existing AMI		July 2026			Measurement of reductions	
	GHG Reduction Measure # 2- Install building-level		July 2026	Reduce energy			

	solar and storage systems			generation emissions			
2.1	<i>Procurement</i>						
2.1.1	Develop request for proposal.					RFPs	
2.1.2	Issue RFPs and administer requests for information.		July 2026				
2.1.3	Receive and review bids.		August 2026				
2.1.4	Lead descope meetings and develop recommended shortlist.						
2.1.5	Lead contract negotiations with selected contractor.						
2.2	<i>Project initiation, planning, and execution</i>		October 2026			Construction begins	
2.2.1	Perform project monitoring and control, and manage contractor.						
2.2.2	Oversee project closeout and smooth transition to operational period.		July 2027			Construction ends	
2.2.3	Ensure scheduled and unscheduled maintenance items are taken care of as agreed.						
2.2.4	Measure the GHG reductions using existing AMI		August 2027			Measurement of reductions	
	<u>GHG Reduction Measure # 3- Install residential solar PV</u>		June 2027	Reduce energy generation emissions			
3.1	<i>Procurement</i>						
3.1.1	Develop request for proposal.		June 2027			RFPs	
3.1.2	Issue RFPs and administer requests for information.						

3.1.3	Receive and review bids.		August 2027				
3.1.4	Lead descope meetings and develop recommended shortlist.						
3.1.5	Lead contract negotiations with selected contractor.						
3.2	<i>Project initiation, planning, and execution</i>		October 2027			Construction begins	
3.2.1	Perform project monitoring and control, and manage contractor.						
3.2.2	Oversee project closeout and smooth transition to operational period.		July 2028			Construction ends	
3.2.3	Ensure scheduled and unscheduled maintenance items are taken care of as agreed.		August 2028			Measurement of reductions	

c. Authorities, Implementation Timeline, and Milestones

The Tribal Authority is an important entity whose approval allows for initiating any project for the Menominee Indian Tribe of Wisconsin. The Tribal Authority's approval was the first step in exploring renewable energy opportunities and the benefits it would bring to the tribe. The Renewable Energy Work Group established by the Tribe, collaborates with key entities to advance renewable energy objectives and foster meaningful progress, comprising professionals and experts from various relevant departments within MTL, as well as external partners such as industry experts, researchers, and government representatives.

The identified project team outlined in Section 6.c housed under the Community Development Department will lead the project efforts under the supervision of the Tribal government, and will be responsible for implementing each GHG reduction measure. Collaborative measures, such as tribal town halls, Community Engagement Workshops, 90-day work plans, Pow Wow meetings, and outreach to local community partners will help continue facilitating data collection from the community at the ground level, ensuring that everyone participates in the decision-making process. Additionally, communication and coordination with the utility company will be key to timely project implementation.

The following detailed implementation timeline to track milestones and tasks for each GHG reduction measure will be utilized by the project team to support the semi-annual and final reporting requirements. Details on contractors, project engineer and construction contractors, are part of the project timeline and will be shared as they are finalized through communication and required reporting:

Table 8. Implementation Timeline

IMPLEMENTATION ACTIVITIES	2024				2025			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<i>Milestone 1- Grant Awarded</i>								
Write RFP for Engineer				X				
Submit RFP to bid engineer				X				
Review bids and select one				X				
Confirm contract with the selected engineering firm				X	X			
GHG Reduction Measure # 1								
Write RFP for construction-4MW Solar					X	X		
Submit RFP to bid 4MW Solar						X		
Review bids and select one for 4MW Solar						X		
<i>Milestone 2- Construction 4MW Solar & BESS at Middle Village Station</i>								
Start construction of Middle Village 4MW Solar & BESS						X	X	X

IMPLEMENTATION ACTIVITIES	2026				2027			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Start construction of Middle Village 4MW Solar & BESS	X	X	X					

<i>Milestone 3- Complete Construction 4MW Solar & BESS at Middle Village Substation</i>								
GHG Reduction Measure # 2								
Submit RFP for Middle Village Facilities 50KW x 4 Solar			X					
Review bids and accept MV facilities 50KW x 4 Solar			X					
<i>Milestone 4- Construction 50KW Solar & BESS at Middle Village Facilities</i>								
Start construction MV Facilities 50KW x 4 Solar				X	X	X	X	
Write RFP MV residential 10KW x 73 Solar						X	X	
<i>Milestone 5- Complete Construction 50KW Solar & BESS at Middle Village Facilities</i>								
GHG Reduction Measure # 3								
Review bids for MV Residential 10KW x 73 Solar							X	
Start construction of MV Residential 10KW x 73 Solar								X

IMPLEMENTATION ACTIVITIES	2028			
	Q1	Q2	Q3	Q4
Start construction of MV Residential 10KW x 73 Solar	X	X	X	
<i>Milestone 6- Complete Construction of (73) 10KW Middle Village Residential Solar</i>				

Section 4. Low-Income and Disadvantaged Communities

a. Community Benefits

The Menominee Indian Reservation, the largest Indian reservation east of the Mississippi, is home to over 4,197 residents. Numerous challenges, including limited employment opportunities, insufficient housing options, and an aging infrastructure incapable of meeting current demands, have resulted in fewer than half of the Tribe's 8,700 members residing on the Reservation. Socio-economically, the community experiences higher than average poverty, with 22% of residents living below the poverty rate, while the average for the State of Wisconsin is 10%. Menominee County ranks last of the state's 72 counties in health outcomes, with 27% percent of the county population experiencing poor or fair

health.⁸ Unemployment in Menominee County is 8.6% compared to Wisconsin at 3.8% per 100,000 people. Adding to these dire statistics, 17% of households in Menominee County experienced at least one of the following housing problems: overcrowding, high housing costs, lack of kitchen facilities or lack of plumbing facilities. A marked lack of pathways to economic stability and job creation contributes to and exacerbates these challenges.

The proposed GHG reduction measures, which include the development of a clean energy microgrid and the installation of building-level solar and storage systems, offer significant potential to benefit the low-income and disadvantaged communities of the Menominee Nation. Adopting a renewable energy microgrid program will not only provide direct benefit to the residents of the Middle Village community, as the project location, but it will also present the collateral benefits for the Reservation community. These benefits include: cost savings and economic resiliency; training opportunities; increased resilience to climate change; improved public health; and enhanced cultural traditions.

Cost Savings and Economic Resiliency Adopting a renewable energy microgrid program will not only provide direct benefit to the residents of the Middle Village community, as the project location, but it will also present the collateral benefits for the Reservation community. Part of the tribe's comprehensive renewable energy program includes the installation of photovoltaic solar panels on single-family homes, beginning with low-income and elderly households. The anticipated energy cost savings will have a positive impact on family and senior budgets. Utility programs that promote cost savings are particularly critical for disadvantaged communities due to the steady rise in electricity prices across Wisconsin over the past 18 years, with further increases anticipated in 2024.

The Menominee Tribe is developing and implementing a Comprehensive Three Year Economic Diversification Strategic Growth Plan to guide the Tribe in creating economic resiliency. Renewable energy is a major part of this project. Through rigorous analysis, a budget-neutral implementation of the solar grid has been projected within four years, with a return on investment expected by year twelve.⁹ The overarching aim is to reduce reliance on environmentally unfriendly options like gas or diesel-powered electricity and heating systems by installing building-level solar and storage systems.

⁸ County Health Rankings & Roadmaps. (2022). Menominee County, Wisconsin - Health Data. Retrieved from <https://www.countyhealthrankings.org/health-data/wisconsin/menominee?year=2022>

⁹ ProtoGen Energy. (2023, December 13). Tribal Utility Authority and Microgrid Feasibility. Prepared for: Menominee Indian Tribe of Wisconsin. Quakertown, PA.

With solar energy emerging as the more cost-effective option in the United States, investing in renewable energy infrastructure allows the Tribe to move toward energy sovereignty. Through the proposed program, the shift away from fossil fuel provided by a major utility company to full implementation of self-sufficient and resilient renewable energy systems can be accomplished in a relatively short time frame. Over the first five years, the Tribe will establish and optimize its expanded business operations to ensure solvency and grow operating reserves. The tribe also will pursue additional funding opportunities and tax credits, such as investment under the Justice40 initiative and the Investment Tax Credit, further alleviating the financial burden of startup costs.

Training Opportunities The Menominee Tribe chartered the College of Menominee Nation, as a Tribal College, in 1993. The college has a variety of bachelor degree programs, associate degree programs, and technical diplomas. It also has a Sustainable Development Institute which is inextricably bound to principles of sustainability and Menominee values. Prompted by Menominee's long tradition of sustainable forestry practices, tribal leaders created the Sustainable Development Institute to encourage, promote, and build upon the Menominee approach to sustainable development. A collaboration with the College of Menominee Nation on workforce development for renewable energy is underway and will expand as the workforce needs grow to meet the demand for high quality jobs.

Increased Resilience to Climate Change A primary goal of this project is to increase the use of renewable energy sources to lower greenhouse gas emissions, ultimately mitigating the impacts of climate change on the Reservation. A wildfire would devastate the Menominee. The Menominee Forest, the centerpiece of the 235,000-acre Menominee Reservation in northeastern Wisconsin, is one of the most historically significant working forests in the world. For more than 160 years, the Menominee have pioneered forestry practices that have preserved an ecosystem with numerous species and varied habitats. The result is a forest that is not only economically profitable, but also ecologically healthy.

The Menominee practice a sustained-yield approach to forestry; that is, they manage the forest to ensure that trees are harvested in amounts that will ensure a steady supply of timber far into the future. The Menominee approach is unique, blending modern forestry science with traditional beliefs embedded deep in their culture. The Menominee have been recognized by the United Nations and the Environmental Protection Agency for their leadership and achievements in responsible forest management. The overall reduction of greenhouse gas emissions positively benefits not only the Menominee Forest, but all adjacent forest land as well.

Improved Public Health The population of Menominee County ranks last in the State of Wisconsin for health outcomes: life expectancy in Menominee County is age 69.5 (Wisconsin age 78.9); diabetes prevalence in Menominee County is 15% (Wisconsin 8%); and access to Exercise Opportunities in Menominee County is 11% (Wisconsin 84%). In Menominee County, 67% of the motor vehicle crash deaths involved alcohol (Wisconsin 36%) and 20% of people did not have a reliable source of food (Wisconsin 7%).

The reduction in air pollution associated with this project helps mitigate the disproportionate impacts of climate change on vulnerable populations. This is especially crucial for elders, who, despite being among the lowest earners in the tribe, are high utilizers of hospitals and clinics due to chronic conditions.¹⁰

¹⁰ Menominee Indian Tribe of Wisconsin. MITW 2023 Comparative Survey Data - Demographics [PDF document]. Retrieved from

Enhanced Cultural Traditions Traditionally, the Menominee were premiere agroforesters who created regenerative forest gardens that still dot the landscape today. To make the most of their liminal ecological zone, the long-standing archaic period traditions of hunting, fishing, and foraging remain a critical part of the Menominee experience. These cultural elements have come together to form the modern Menominee identity. This project embodies more than just an infrastructure or investment endeavor; it signifies a deep spiritual reverence for the land. By embracing renewable energy solutions, the Menominee Tribe will reclaim some of their tribal identity. Sustainability is not a modern concept for the Menominee Tribe, rather it is woven into the very fabric of their traditions.

b. Community Engagement

In 2023, a MITW Strategic Plan was developed to create beneficial outcomes for the tribal government and its community. The plan identified specific goals, objectives, and actions to guide the Tribe for a four-year interval. The plan's purpose is to improve the tribal community by effectively making planned decisions that align community and department needs with the budgeting process.

Community engagement has been crucial to the success of this project, leveraging input at every stage. To gauge and track community feedback effectively, the Tribe has established the Renewable Energy Work Group. This dedicated team includes representatives from many departments within the Tribe who collaborate with key entities to advance renewable energy objectives and foster meaningful progress. External partners include: renewable energy industry experts and researchers; government representatives, such as the Rural Partners Network (RPN); and scholars and professors from Lawrence University located in Appleton, Wisconsin.

The Tribe has conducted a comprehensive Comparative Survey annually from 2005 to 2023, utilizing the data to guide project prioritization and strategic planning. Additional collaborative measures, such as tribal town halls, Community Engagement Workshops, 90-day work plans, Pow Wow meetings, and outreach to local community partners facilitate data collection from the community at the ground level, ensuring that everyone participates in the decision-making process. Publicly posted community events will also bridge the gap between local organizations and community partners and members, creating opportunities to continually define, assess, and revise the plan as conditions, circumstances, or needs change. This collaborative and inclusive approach ensures that the Tribe can manage the project effectively on all levels, leverage diverse perspectives and insights, and ensure every voice is heard.

Section 5. Job Quality

This project aims to provide employees with meaningful work experience, resulting in the development of stackable and transferable skills in the green and construction industries. The Menominee Indian Tribe of Wisconsin (MITW) has established partnerships with tribal leaders and Indigenous-owned and Indigenous-serving institutions to provide employees with insights into career opportunities.

To ensure that MITW adheres to Good Jobs Principles, potential employees will be assessed and selected based on their commitment to fair wages (per Davis-Bacon determinations), workplace safety, and opportunities for skill development and advancement. When recruiting new employees, MITW is

<https://www.menominee-nsn.gov/GovernmentPages/Initiatives/6-MITW%202023%20Comparative%20Survey%20Data%20-Demogr.pdf>

governed by the Menominee Indian Tribe Personnel Policies and Procedures Manual. Once employees are selected, MITW has an established protocol for employee onboarding and orientation.

The Menominee Indian Tribe is dedicated to providing its community members with opportunities to engage in the development and sustainability of this project. These opportunities include job training, employment, and contracts, all of which are governed by MITW's Accounting Policy manual. Empowering the MITW Community to develop and sustain this project will foster local development, economic improvement, and self-sufficiency.

Section 6: Programmatic Capability and Past Performance

a. Past Performance

The Tribal Administration department provides support and technical assistance to the various tribal departments. While each department individually applies for grants/agreements, and individually manages the funds for the grants awarded, the Tribe's established program oversees the monitoring/grant management component, where master files of contracts and grant correspondence are maintained. For each award, the relevant department appoints a project implementation team that is responsible for all compliance tasks as well as timely reporting requirements. The following are some examples of federally funded and non-federally funded assistance agreements within other departments and divisions that convey the Tribe's ability for successful grant performance:

- 1) **Project:** 2022 Tribal Energy Development Capacity Program (TEDC)
Grant Number: A23AP00031
Agency: Division of Energy and Mineral Development (DEMD) at Bureau of Indian Affairs
Performance Period: February, 2023 - July, 15, 2024
Contact: Jo Ann Metcalfe (Grant Officer); jo.metcalfe@bia.gov
Description: The Tribe was awarded the grant to conduct a feasibility study on energy development to examine the technical and financial feasibility of energy systems upgrades for two of the largest consuming facilities on the Menominee Nation Reservation.
- 2) **Project:** GRID RES Grant
CDFA Number: 81.254; **Grant Number:** DE-GD0000274 / 0000
Agency: Grid Deployment Office (GD) at U.S. Department of Energy
- 3) **Performance Period:** November 30, 2023 - April 30, 2028
Contact: Alexander Salter; alexander.salter@netl.doe.gov
Description: The Tribe was awarded this grant for their project to conduct a feasibility study that provides a work plan that generates the largest community benefit in improving the resilience of the electric grid against disruptive events.
- 4) **Project:** Menominee Clean Water Act Section 106
CDFA Number: 66.419; **ACH#:** 50226
Agency: Environmental Protection Agency (EPA) **Performance Period:** April 2020 - April 2022
Description: The Tribe was awarded for the Menominee Clean Water Act Section 106. The Tribe

successfully submitted performance reports on a semi-annual basis, with one final performance report submission.

- 5) **Project:** CARES Act Recovery Assistance Grant
CDFA Number: 11.300 and 11.307; **Funding Opportunity Number:** PWEAA2020
EDA Award/Grant Number: 06-69-06324
Agency: the Economic Development Administration (EDA) **Award Date:** June 2021
Description: In June 2021, the Tribe received funding through the CARES Act Recovery Assistance grant for economic recovery efforts. The funding has been utilized to provide economic relief for the loss incurred due to COVID impact.
- 6) **Project:** Feasibility Study of Renewable Energy on the Menominee Indian Reservation
CDFA Number: 15.148; **Grant Award Number:** A23AP00031-00
Agency: U.S. Department of the Interior's Division of Energy and Mineral Development
Award Date: March 6, 2023
Description: The Tribe was awarded funds under the Menominee Tribal Energy Development Capacity Grant to hold a feasibility study of renewable energy on the Menominee Indian Reservation. The feasibility study produced from the grant funding has supported several renewable energy initiatives.
- 7) **Project:** Menominee Vocational Rehabilitation Program
CDFA Number: 84.250M; **Grant Award Number:** H250M190003
Agency: U.S. Department of Education **Award Date:** October 9th, 2019
Description: The Tribe was awarded this grant to support a program at College of Menominee Nation that provides services to Native Americans with disabilities in order to obtain or retain employment.
- 8) **Project:** Aid to Tribal Government
FY 2024 - 2026 Contract Number: A24AV00142
Agency: Bureau of Indian Affairs (BIA) **Award Date:** Annual
Description: Annually, the Tribe renews its contract for the Aid to Tribal Government with the Bureau of Indian Affairs (BIA). This contract includes a yearly budget application using the BIA's base allocations, along with an annual report.

b. Reporting Requirements

The Tribe has proven successful programmatic capability and past performance on federally funded and non-federally funded assistance agreements. For each award, the relevant department appoints a project implementation team that is tasked with compliance tasks as well as timely reporting requirements. The reporting requirement for each aforementioned award is as follows:

1. Project: 2022 Tribal Energy Development Capacity Program (TEDC)

The grant award requires a semi-annual report on the status of the project which has been submitted on time. The Tribe requested an extension on the period of performance for the grant. The extension was

requested to accommodate additional time needed to translate the results of the tribal utility feasibility study and present to the tribal leadership.

2. Project: GRID RES Grant

The Tribe is required to submit financial reports, a project management plan (PMP), and a special status report. Additional reporting requirements include quarterly progress reports (QPR), Annual Program Metrics and Impact Report, Annual Allocation Request, and Award Management Report.

3. Project: Menominee Clean Water Act Section 106

The Tribe successfully submitted performance reports on a semi-annual basis, with one final performance report submission.

4. Project: CARES Act Recovery Assistance Grant

Since receiving the EDA award, the Tribe provides timely financial, evaluation, and progress reports to EDA each quarter of the grant period.

5. Project: Feasibility Study of Renewable Energy on the Menominee Indian Reservation

The Tribe has worked diligently to complete timely semi-annual programmatic and financial reporting.

6. Project: Menominee Vocational Rehabilitation Program

As a recipient of these funds, the Tribe submits an annual grant performance report with performance and financial information at the beginning of each new budget period.

7. Project: Aid to Tribal Government

As a recipient of the aid, the Tribe is required to submit an annual report.

c. Staff Expertise

The Menominee Indian Tribe of Wisconsin has 44 departments responsible for administering land management, tribal school, transportation, housing, emergency management, and more. The proposed project will be administered by the Department of Community Development under the Renewable Energy Initiative. The project will be managed by three staff members with extensive subject matter expertise in sustainable development. The team will consist of:

1. Natasha Chevalier - *Project Director* (Resume Attached)

Natasha Chevalier will serve as the ***Project Director***. She is a dedicated professional serving as the Director of Community Development for the Menominee Indian Tribe of Wisconsin. With over a decade of experience in project management, Natasha excels in overseeing programs and services focused on infrastructure development, tribal construction projects, solid waste disposal, and renewable energy initiatives. Her role is instrumental in providing essential services such as sewer, water, and electrical services to the community. Natasha holds a Master of Science degree in Management Organizational Behavior with an emphasis in Training & Development, as well as a Bachelor of Science in Business Administration. Her educational background, coupled with her professional qualifications, equips her with the strategic planning and implementation skills needed to drive impactful change within the community.

2. Darryl Pyawasay - *Project Manager* (Resume Attached)

Darryl Pyawasay will serve as ***Project Manager***. He is a seasoned professional with 33 years of experience in industrial and utility operation, management, safety, and regulatory compliance. Currently serving as the Renewable Energy Manager for the Menominee Tribe, Darryl also holds the position of Plant Operator for the Menominee Tribal Utilities. As the Renewable Energy Manager, he spearheads projects and programs geared towards long-term energy planning, micro-grid feasibility, solar development, and energy workforce development. Through his leadership and strategic vision, Darryl is instrumental in advancing the tribe's goals of environmental stewardship and energy independence.

3. Bruce Windorski - *Project Staff* (Resume Attached)

Bruce Windorski will serve as ***Project Staff***. He currently serves as the Renewable Energy Technician for the Menominee Indian Tribe. Bruce is also a Journeyman Lineman, and has government utility experience overseas as a High Voltage Journeyman Lineman and Diesel Generation Electrician for Raytheon in Antarctica. Additionally, he has worked with various municipal Utility Electric Departments in Missouri, Iowa, and Minnesota. In addition to his field experience, Bruce is an instructor for the Electrical Program at the College of Menominee Nation. Bruce relocated to the Menominee Indian Reservation in 2003 and has been serving the Menominee people.

4. Kathy Kaquatosh - *Project Fiscal Officer*

Kathy Kaquatosh will serve as ***Project Fiscal Officer***. She will be responsible for monitoring and auditing the grant award for the proposed project. She currently serves as the Tribe's Interim Finance Director for their Finance Department. The department provides accounting services for at least 350 contracts and grants, inclusive of federal, state, and tribal funds. Additionally, the department provides the following services: purchase orders, accounts payable, accounts receivable, general ledger, budget, financial reports and fiscal monitoring. There are certified accounting systems in place that allow the Tribe to obtain funding from any Federal, State or Private Agency.