



FORT INDEPENDENCE INDIAN COMMUNITY

Priority Climate Action Plan

Abstract

The Fort Independence Indian Tribe is Laying the Groundwork for a Carbon Free Electric Future

April 1, 2024

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1 Introduction

The Fort Independence Indian Community (FIIC) has developed this Priority Climate Action Plan (PCAP) to identify local sources of greenhouse gas (GHG) emissions and to develop a strategy for reducing those emissions. The Tribe is evaluating a variety of activities that will result in decreases to its GHG emissions.

1.1 CPRG Overview

Indian Reservations may choose to participate in the U.S. Environmental Protection Agency's (EPA's) Climate Pollution Reduction Grant (CPRG) Planning Grant Program for several reasons. Among these are the ability to protect public health and the ability to reduce GHG emissions. Fort Independence is using the CPRG as a pathway to understand and then reduce its GHG emissions.

1.2 PCAP Overview

This PCAP has been prepared following the guidelines put forth in the EPA's most recent guidance document, "*DRAFT Priority Climate Action Plan Guidance: An Outline for Tribes and Territories, November 2023*". It has also followed the requirements of the previously submitted Quality Assurance Project Plan (QAPP)¹.

1.3 Approach to Developing the PCAP

The approach to developing this PCAP follows the outline for PCAP preparation as described in the Tribes QAPP. The PCAP team has implemented these requirements by following, among other things, the Project Management and Data Acquisition requirements of the QAPP. As an example of this, the PCAP team collected data from a variety of sources such as utility billing data for all Tribal owned and operated facilities, as well as emissions data from the local utility. To ensure that local operations such as water supply and water treatment, propane use, and solid waste management activities were modeled correctly, the PCAP team coordinated with and gathered operational information from the Tribes Project Manager.

Next, the PCAP team conducted the required GHG inventory using the "*EPA's Tribal GHG Inventory Tool: Community Module*". This tool is specifically designed to model community wide GHG emissions and is based on data inputs that reflect the Tribe's activities. Among other things, the GHG inventory is useful in identifying the largest on-site sources of greenhouse gas emissions. This information presented the Tribe with the opportunity to consider various abatement strategies that could be funded in the short-term and that could provide long term air-quality related health benefits.

¹ Climate Pollution Reduction Grants Program: Fort Independence Indian Reservation Quality Assurance Project Plan, Grant Number: 98T82901, United States Environmental Protection Agency, Office of Air and Radiation, Region 9, October 6, 2023

After identifying the largest GHG emission sources on-site, the Tribe evaluated several mitigation techniques and selected the alternative that was provide the most GHG reductions over time and that was consistent with the Tribes long-term development planning.

See Measure 3, Construct MW Microgrid Project, for a full discussion of this alternative and the benefits it will bring to the Tribe and the local community.

1.4 Scope of the PCAP

This PCAP and GHG Inventory is a community inventory and is based within the geographical boundaries of the Fort Independence Indian Reservation. It includes an inventory of existing GHG, CAP, and HAP emissions from stationary, mobile and off-site sources as well as an analysis of emissions of GHGs and other air pollutants that could be curtailed by implementing the measures identified in this report.

2 Tribal Organization and Considerations

The Project Manager, Sean Dahlberg, will coordinate interagency meetings between Fort Independence Indian Community administration and the Fort Independence Environmental Office as needed to identify key priorities and solicit collaborative input regarding inventory updates. He will also oversee contracted support in updating the GHG Inventory to include all GHG emissions and sinks by emission source and sink category following commonly accepted protocols for the following sectors: industry, electricity generation and/or use, transportation, commercial and residential buildings, agriculture, natural and working lands, and waste and materials management.

3 Greenhouse Gas (GHG) Inventory

3.1 Background

The Fort Independence Indian Community (FIIC) is a federally recognized tribe located in the Owens Valley, in Inyo County, eastern California. The reservation was established in 1915 and has a population of 94 as of the 2020 US Census. The tribe is comprised of the Mono and Timbisha peoples, and their ancestral languages are the Owens Valley Paiute language and the Timbisha language, respectively. Recognition as a federally recognized tribe grants the Community certain rights and privileges, including self-governance and the ability to engage in various economic and social activities.

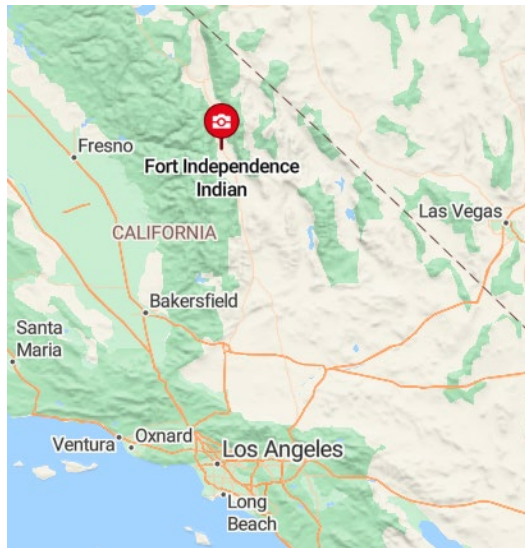


Figure 1 General location of FIIC

The tribe is located along US 395, approximately 230 miles north of Las Angeles, CA and approximately 40 miles south of Bishop, CA. The tribe has a reservation of 356 acres approximately three miles north of the town of Independence, CA.

The Community has approximately 46 residential housing units, a number that includes both single family and mobile homes.

Commercial operations on the reservation consist of a Travel Plaza constructed in 2008 that serves travelers along US 395, the Winnedumah Winns Casino, located next to the Travel Plaza, the Oak Creek Dispensary, and the Fort Independence Campground. The Travel Plaza operates 24/7 and includes a total of 12 gas and diesel pumps, a small grill, and public bathrooms.

Industrial activities at the reservation include the operations of Grinding Rock Aggregates, (GRA) a state-of-the-art sand and gravel quarry and processing facility. GRA is owned and operated by the Tribe and supplies crushed granite, gravels, aggregates, rocks, and ripraps to local construction projects. The Tribe also operates a cannabis cultivation operation located north of the Travel Plaza, which supplies product to the Oak Creek Dispensary.

Institutional/tribal operations include the Wellness Center, Public Works Facility, and Domestic Water Supply (DWS) that supplies water to the community. Other tribal operations include the Fort Independence Campground and a small meteorological tower operated by the tribe.

3.2 Project Scope

This GHG inventory has been prepared to estimate GHG emissions generated by the FIIC. We have used the “EPA’s Tribal GHG Inventory Tool: Community Module” in order to estimate community-wide emissions. This tool has been specifically developed by the EPA to help tribes understand their greenhouse gas emissions profile and the various sectors responsible for GHG emissions.

Calendar year 2022 has been selected as the Base Year for the Tribe’s GHG evaluation. This is based primarily on the availability of utility billing data for that year and the fact that all of the Tribes commercial businesses were in operation. In addition to the utility data, fuel logs and other pertinent energy data made available by the Tribe was evaluated to understand community wide GHG emission sources. The inventory was conducted per the methodologies and processes described in Climate Pollution Reduction Grants Program: Fort Independence Indian Reservation Quality Assurance Project Plan, approved by EPA December 13, 2023.

The following sectors were included in the GHG Inventory:

1. Mobile combustion
2. Stationary combustion
3. Electricity consumption
4. Solid waste
5. Agriculture & land management
6. Water use
7. Waste generation

These sectors can be further analyzed and grouped into the following Source categories as defined by the USEPA:

- 1) Scope 1 Emissions (Direct GHG emissions generated within inventory boundary)
 - a) Stationary combustion (including for commercial and residential heating)
 - b) Mobile combustion
 - c) Water supply and treatment
- 2) Scope 2 Emissions (Indirect GHG emissions from purchased electricity generated outside of inventory boundary.)
 - a) Los Angeles Department of Water and Power (LADWP) GHG emissions
- 3) Scope 3 Emissions (All other indirect GHG emissions)
 - a) Solid waste generation and disposal
 - b) Agriculture and Land Management
 - c) Any additional sources

3.3 Data Collection

Data for the various GHG sectors has been collected from a variety of sources as itemized in the following table:

GHG Sector	Primary Data Source(s)
Mobile combustion	<ul style="list-style-type: none"> • CARB (VMT estimates) • Tribe vehicle inventory • Tribe fuel logs.
Stationary combustion	<ul style="list-style-type: none"> • EIA (propane emissions from heating and cooking) • GRA fuel logs (for emissions from diesel genset)

Electricity consumption	<ul style="list-style-type: none"> • FIIC energy bills (commercial and industrial facilities) • US Census Bureau, 2020 census. • EPA e-Grid Power Profiler • LADWP specific emissions
Solid waste	<ul style="list-style-type: none"> • EPA WARM_v16 Model • FIIT communication on current SWM practices. • CalCycle, data for Inyo County unincorporated areas. • Inyo County SWMP.
Agriculture & land management	<ul style="list-style-type: none"> • UC Davis, CA Nitrogen Assessment.
Water supply	<ul style="list-style-type: none"> • FIIT communication.
Wastewater treatment	<ul style="list-style-type: none"> • FIIT communication.

3.4 GHG Emissions

3.4.1 Mobile Source Emissions

Mobile source emissions for personal and commercially owned vehicles have been calculated by applying the average vehicle miles travelled per capita per day (VMT) to the FIIC population. We have used a VMT value of 24.6 miles per day, based on CA Air Resources Board (CARB) data. On an annual basis this is equal to 844,026 miles traveled. In addition to estimating mobile source emissions for the general community, an inventory of existing vehicles and heavy machinery owned and operated by the Tribe has also been included. GHG emissions from these mobile sources were estimated based on fuel usage data provided by the Tribe’s fuel logs and is equal to 80,600 gallons of diesel. Total CO₂e emissions for this sector are equal to 826 MT per year.

3.4.2 Stationary Combustion

Stationary combustion sources at FIIC include two major point sources:

- GRA’s diesel generator(s) that is used to power their rock processing operation, and;
- Residential and commercial/industrial heating and cooking that is fueled by propane.

GRA is not connected to the existing LADPW grid and therefore must generate its own electric power. At the time of this inventory (using 2022 as the base year) GRA was operating one, 1,600 kW diesel fired generator, to power rock crushing and processing operations at the quarry. Diesel consumption and operating hours were estimated based on manufacturer specifications for a similarly sized genset and conversations with FIIC. Total CO₂e emissions from this source are estimated to be 828 MT per year.

Propane is the primary fuel used for heating and cooking throughout the reservation. Propane is delivered to both residential and commercial accounts by local suppliers and is stored in external tanks. Since it is used by both residential and commercial consumers, we have estimated propane

emissions separately for both residential and commercial/institutional sources. Data sources include 2020 US Census housing data, and industry estimates of propane consumption. Total GHG emissions from this sector are equal to 312 MT CO₂e per year, of which 238 MT CO₂e are from residential sources and 76 MT CO₂e are from commercial/institutional sources.

3.4.3 Electricity Consumption

Electricity usage at the FIIC reservation has been estimated by analyzing two distinct categories: (1) Tribal owned and/or operated buildings and (2) residential housing. Utility bills were available for all of the Tribe’s buildings so actual data has been used in estimating GHG emissions from this category. However, actual billing data was not available for the residential housing component, so electricity usage has been estimated for this category.

Based on a review of calendar year 2022 LADPW utility bills, electricity consumption has been tabulated for the following Tribal facilities:

FIIC Building	Annual kWh Consumption, 2022
273 S Willow	4,909
Admin Office	36,264
Campground	67,600
Cultivation	229,615
DWS	84,757
Gaming Commission	5,137
Garden	496
MET station	890
Public Works	796
Travel Plaza	450,880
Wellness Center	5,401
Total	886,745

Table 1 2022 FIIC Electricity Consumption - Tribal Buildings

Electricity consumption from residential sources located on the reservation have been estimated using 2020 US Census data, and industry estimates of annual kWh consumption. To account for a diverse housing stock, we have estimated the average household energy use for both single-family and mobile homes. This equals a combined estimate of 426,668 kWh per year of electricity consumption from the residential category. See Table 2 below.

Housing Type	Annual Estimated kWh Consumption
Single Family Home	336,420
Mobile Home	94,248
Total	426,668

Table 2 Estimated Electricity Consumption - Residential Housing

LADWP, for 2022, reported 0.257 MT per MWh². Using these estimations of electricity consumption, we have estimated the Location Based GHG emissions from off-site electricity generation to be equal to 338 MT CO₂e per year. Of this, 110 MT CO₂e are from residential housing and 228 MT CO₂e are from commercial and industrial sources.

3.4.4 Solid Waste

Solid waste collection services at the reservation are provided by a private contractor pursuant to the Tribes Solid Waste Management Plan. The Tribe’s contractor collects solid waste generated by both residential and commercial accounts located on the reservation. According to the Inyo County Solid Waste Management Plan, the closest landfill is the Independence Landfill, located approximately 5 miles south of the FIIC. We have assumed this landfill to be final waste disposal location for our GHG modelling.

Solid waste quantities have been estimated by applying a per capita waste disposal rate of 6.7 pounds/person/day to the Tribe’s population³. This data was then entered into the EPA’s WARM-v16 model to estimate greenhouse gas emissions resulting from solid waste collection and disposal activities.

Based on this modeling total GHG emissions from solid waste management is equal to 68 MTCO₂e annually.

3.4.5 Agriculture and Land Management

Indirect GHG emissions from agriculture have been estimated assuming that they are associated with the application of synthetic, organic, and manure fertilizers. As these fertilizers volatilize, they release N₂O, a potent GHG.

To estimate GHG emissions from this sector we have used data provided by “*The (2016) California Nitrogen Assessment*”. Among other things, this assessment included estimates of the total tons of synthetic and animal fertilizers applied to farm fields in California. These values were then used to calculate a per capita generation rate that was applied to the Tribe’s population. This approach

² <https://www.ladwp.com/who-we-are/power-system/power-content-label>

³ CalRecycle 2021 State of Disposal and Recycling Report. Dec. 2022

resulted in an estimated 1.61 tons of fertilizer applied per year with associated GHG emissions of 11.57 MT CO₂e annually.

3.4.6 Water Use

Domestic water on the reservation is provided by a community well. The GHG emissions associated with this activity have been included in 3.4.3 Electricity Consumption because the well pump is powered by grid electricity purchased from LADPW.

3.4.7 Wastewater Treatment

The Fort Independence Community is not served by a municipally operated wastewater treatment facility. Instead, individual septic systems are used by all residential and commercial/industrial sources. For the purposes of GHG modelling, we have assumed that all systems use anaerobic treatment without digester gas collection.

Based on these modelling parameters, estimated GHG emissions from wastewater treatment are equal to 63.44 MT CO₂E per year.

3.5 GHG Emissions Summary

Estimates of GHG emissions from the Fort Independence Indian Reservation are based on output derived from the *EPA's Tribal GHG Inventory Tool: Community Module*. A base year of 2022 has been selected with respect to energy purchase and all other activities.

Emission by Source data indicates Stationary Combustion is responsible for 47% of total CO₂e emissions, at 1,144.5 MT CO₂e per year. The second and third highest sources of GHG emissions come from Mobile Sources 34%, 826 MT CO₂e, and Electricity 13%, 318.9 MT CO₂e. Together these three sources are responsible for 94% of the Tribes GHG emissions.

A breakdown of Total GHG **Annual Emissions by Source** is shown below:

Emissions by Source (MT CO ₂ e)								
Source	CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Total	Percent of Total
Stationary Combustion	1,140.61	1.36	2.57	-	-	-	1,144.54	47%
Mobile Combustion	822.93	0.27	2.58	-	-	-	825.78	34%
Solid Waste	-	-	-	-	-	-	-	0%
Wastewater Treatment	-	61.06	2.38	-	-	-	63.44	3%
Electricity - Location Based	317.71	0.52	0.63	-	-	-	318.87	13%
Electricity - Market Based (for informational purposes only)	317.72	0.52	0.63	-	-	-	318.87	
Water	-	-	-	-	-	-	-	0%
Ag & Land Management	-	-	11.57	-	-	-	11.57	0%
Urban Forestry	-	-	-	-	-	-	-	0%
Waste Generation	-	68.41	-	-	-	-	68.41	3%
Total (Gross Emissions)	2,281.25	131.62	19.74	-	-	-	2,432.61	100%
Total (Net Emissions)	2,281.25	131.62	19.74	-	-	-	2,432.61	100%

Figure 2 Emissions by Source From EPA Tribal Greenhouse Gas Inventory Tool, note this tool uses a state-wide carbon intensity value for electricity (0.247 MT/MWh); in our hand calculations we used LADWP's actual number (0.257 MT/MWh)- there will be a slight difference between GHG values in this table versus our hand calculations.

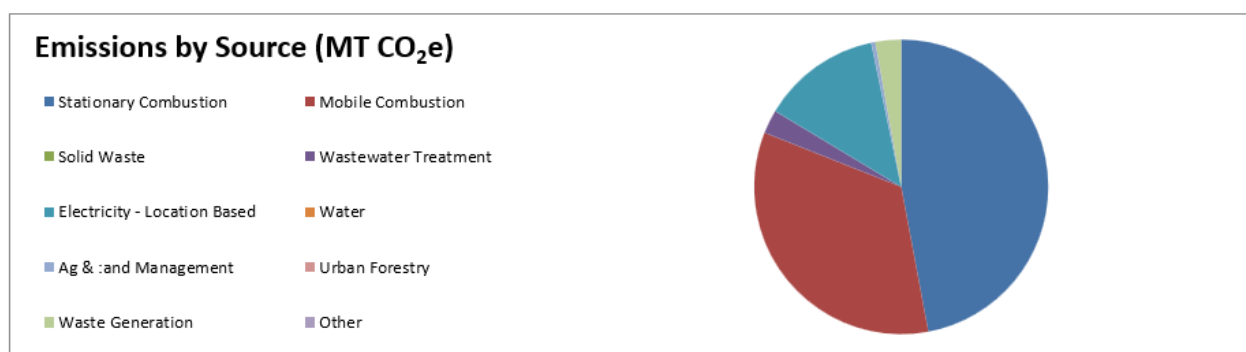


Figure 3 Graph of Emissions by Source

Emissions by Scope data indicate that Scope 1 Emissions, defined as all direct GHG emissions, are responsible for 84% of GHG emissions as shown in the table below. For FIIT, Scope 1 Emissions include those from Stationary Combustion sources (GRA diesel generator), Mobile Combustion sources (vehicles), residential and commercial emissions associated with the use of propane for heating and cooking, and emissions from the use of on-site septic systems, which are the primary means of wastewater management.

Scope 2 Emissions are those associated with off-site electricity generation. We have used the location-based method (using data from LADPW) to calculate Scope 2 emissions, consistent with EPA guidance.

Scope 3 Emissions include all other indirect GHG emissions associated with activities on the Reservation. This includes emissions associated with the use nitrogen-based fertilizers and animal manures by the agricultural sector, and methane emissions associated with the use of offsite sanitary landfills for waste disposal.

Total Emissions (MT CO ₂ e)								
	CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Total MT CO ₂ e	Percent of Total
Scope 1	1,963.54	62.69	7.53	-	-	-	2,033.76	84%
Scope 2 - Location Based	317.71	0.52	0.63	-	-	-	318.87	13%
Scope 2 - Market Based (for informational purposes only)	317.72	0.52	0.63	-	-	-	318.87	
Scope 3	-	68.41	11.57	-	-	-	79.98	3%
Total Gross Emissions	2,281.25	131.62	19.74	-	-	-	2,432.61	100%
Total Net Emissions	2,281.25	131.62	19.74	-	-	-	2,432.61	100%

Figure 4 GHG Emissions by Scope- From EPA Tribal Greenhouse Gas Inventory Tool, note this tool uses a state-wide carbon intensity value for electricity (0.247 MT/MWh); in our hand calculations we used LADWP's actual number (0.257 MT/MWh)- there will be a slight difference between GHG values in this table versus our hand calculations.

3.5.1 Emission Analysis

As previously identified, the largest source of GHG emissions associated with the Tribe are those from GRA's diesel generator(s). The operation of this generator(s) was responsible for emitting 828 MT CO₂e annually, which is equal to 72% of Stationary Source emissions, and 34% of total GHG emissions at the reservation. Replacing GRA's existing generator with power from LAPD or from on-site renewable energy would significantly reduce the Tribe's GHG Emissions profile. Considering that this emission source is directly under the control of the Tribe, it presents a great opportunity for reducing GHG emissions.

3.6 GHG Reduction Measures

As described in the emissions analysis, the use of diesel generator(s) at GRA is responsible for the overwhelming majority of the Tribe's GHG emissions.

In order to address this, the Tribe has been evaluating the feasibility of eliminating diesel-powered self-generation for the GRA operation, either through direct interconnection with LADWP, or by developing lower carbon footprint on-site self-generation capabilities. Either way, electrifying GRA's operations would significantly reduce the Tribe's GHG emissions. As the Priority Climate Action Plan, this plan identifies and quantifies priority actions that if implemented can in the short-term significantly reduce GHG and other emissions. The Comprehensive Climate Action Plan (CCAP), the companion plan to PCAP, which will be completed in 2025, will contain a more all-inclusive set of measures that further reduce FIIC's GHG and other emissions. For instance, FIIC is considering a microgrid using a variety of generation and storage assets to meet most of their power need, which will be discussed in detail in the CCAP.

3.6.1 Los Angeles Department of Water and Power (LADWP) Service Extension

Extending LADPW power to the western side of US 395 will bring grid power to the existing GRA operation and replace the existing diesel generators. This service extension could also provide power to a new Community Building as well as a planned expansion of the Tribes' Travel Plaza.

FIIT is currently in discussions with LADWP regarding the construction of this service connection.

Measure 1 Extend LADWP Service to GRA	
Implementing agency	LADPW/Fort Independence Indian Community
Implementation milestones	Consider purchase options, enter into agreement with LADPW, obtain Tribal Council approval.
Geographic location	Fort Independence Indian Reservation, north of existing Travel Plaza,
Funding sources	TBD
Metrics tracking	Periodic project updates, monthly construction management report, other reports as required per grant compliance.
Cost	\$1,100,000
Annual estimated GHG and criteria air pollutant emission reductions	Direct GHG reductions of 831 MT CO ₂ e Estimated CAP reduction of 35 tons, and estimated HAP reductions of approximately 20.6 lbs. The most recent (2022) LADWP power content label (CO ₂ /kWh) is roughly equivalent to the current diesel emissions and comprises 35.6% renewables. However, LADWP will be reducing its carbon intensity and will supply 55% renewable energy by 2025; 80% by 2036; and 100% by 2045. In the interregnum, FIIC will take advantage of LADWP's Green Power for Green L.A. Program and purchase renewable energy at the cost of an additional \$0.03/kWh such that the power supplied by LADWP has close to zero carbon intensity. FIIC will scale the amount purchased to decrease as LADWP's total power mix moves towards 100% renewables in 2045.
Implementation authority milestones	Approval by Tribal Council

Table 3- Measure 1 Details

3.6.2 On-Site Solar Array with Battery Storage System (BESS)

This project would provide solar power to the Tribes existing commercial and institutional load (not including cannabis cultivation) by developing a 350kW ground-mount solar project and BESS that would replace current LADWP grid energy. This measure will not replace the Tribes existing GRA generator(s). Any excess power generated from the solar energy/BESS project, not consumed by FIIC, would then be sold back to LADWP pursuant to current Net Metering regulations. In addition to displacing LADWP grid energy, the project would be able to realize additional revenue by participating in California's tradeable solar REC market. This measure would also provide the Tribe with the ability to own the infrastructure.

The Tribe has prepared preliminary feasibility analyses around this concept and is in the process of exploring financing and grant opportunities.

Measure 2 Construct 350 kW Solar PV and BESS	
Implementing agency	Fort Independence Indian Community
Implementation milestones	Obtain Tribe approval, submit California’s Energy Conservation Assistance Act (ECCA) Grant application.
Geographic location	Fort Independence Indian Reservation, south of existing Travel Plaza,
Funding sources	California’s Energy Conservation Assistance Act (ECAA) Low-Interest Loan Program
Metrics tracking	Periodic project updates, monthly construction management report, other reports as required per grant compliance.
Cost	\$1,250,000
Annual estimated GHG and criteria air pollutant emission reductions	The system will provide 797 MWh/yr., displacing the use of a similar amount of LADWP electricity. Based on LADWP’s carbon intensity, this results in direct GHG reductions of 205 MT CO ₂ e, plus estimated CAP reduction of 0.11 tons.
Implementation authority milestones	Approval by Tribal Council

Table 4- Measure 2 Details

3.6.3 Microgrid

The Tribe has also been evaluating the feasibility of constructing a microgrid that would be able to supply self-generated power to current and planned tribal and residential load. This microgrid would be in addition to the above-mentioned 350 kW solar plus storage measure. However, the microgrid could be configured such that if the solar plus storage measure was implemented first, it could be linked to the microgrid so that the solar plus storage measure would be controlled/managed as part of the microgrid.

Assuming the 350-kW solar plus storage system is implemented and excluding load requirements for GRA, FIIC will need the microgrid to supply 516 MWh to serve its remaining current load (tribe-owned buildings and privately owned homes on tribal land). Roughly 1/3 of this energy will be consumed at night, requiring a BESS to enable FIIC to remain independent of the grid at night. Allowing for redundancy, BESS charge/discharge efficiency, and contingency, Table 5 lays out the high-level design requirements of the microgrid.

Microgrid Asset	Capacity	Comments
Baseline Solar PV	230 kW	Baseline capacity to meet 516 MWh
Solar Capacity for Battery Charging	100 kW	Added capacity to ensure BESSs are charged to provide overnight power
BESS #1	500 kWh	Overnight load is around 500 kWh

BESS #2	500 kWh	N+1 redundancy for overnight power and general contingency
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Table 5- Measure 3 Microgrid Asset Description

With respect to impact, the microgrid will be displacing 510 MWh per year of LADWP grid power, therefore only 230 kW solar capacity should be used in the Avert tool to calculate GHG and other pollutant mitigations.

Microgrid implementation would provide self-generated power, energy storage, grid resilience, and control over electricity costs. This measure would also provide the Tribe with the ability to own both the generation and distribution assets associated with the microgrid. The measure as described herein only considers existing FIIC electricity demand. FIIC is considering adding a future community center, a new travel plaza, and EV charging stations. As FIIC moves towards potentially implementing this measure and gains more certainty about the new electric loads, they will examine revisiting the high-level design of the microgrid to serve these new loads in an environmentally sustainable manner.

Measure 3 Construct Microgrid Project	
Implementing agency	Fort Independence Indian Community/LADPW
Implementation milestones	Integrate MG planning into the Tribe's expansion plans, create Tribal Utility Authority (TUA) to assume ownership of assets, enter into agreement with LADPW, obtain Tribal Council approval.
Geographic location	Fort Independence Indian Reservation, north of existing Travel Plaza,
Funding sources	TBD
Metrics tracking	Periodic project updates, monthly construction management report, other reports as required per grant compliance.
Cost	\$3,066,000 (as currently configured to meet existing load)
Annual estimated GHG and criteria air pollutant emission reductions	Direct GHG reductions of 133 MT CO ₂ e, from avoided electric generation. Estimated CAP reduction of .09 tons.
Implementation authority milestones	Approval by Tribal Council

Table 6- Measure 3 Details

3.7 Benefits Analysis

This section provides a benefits assessment of the GHG reduction measures included in this PCAP. As required, we have also evaluated the estimated reductions of criteria air pollutants, (CAP) and air toxics, or hazardous air pollutants (HAP), for each measure identified in Section 3.6.

Each of the three measures identified in Section 3.6 will have a different impact on regional air quality if they are implemented.

Measure 1, *LADPW Service Line Extension to GRA*, will provide most of its air quality benefits by eliminating emissions from the diesel generator(s). Although this measure increases the amount of

LADPW supplied power consumed by the Tribe, it is more than offset by eliminating GRA’s diesel emissions with grid supplied power.

Measure 2, *Construct 350 kW Solar PV and BESS*, has been sized to meet FIIT’s existing power demand, not including cultivation. This measure assumes that the solar project will replace some of the LADPW supplied power with solar energy and battery storage. This measure does not replace the existing diesel generator(s) operated by GRA, but it does reduce the need for power generated by LADPW to serve the Tribe.

Measure 3, *Construct a Microgrid based on 330 kW Solar PV and 1,000 kWh BESS*, has been sized to meet FIIT’s remaining power demand not covered by Measure 2 and excluding GRA. This measure assumes that the microgrid will replace all of the LADPW supplied power with solar energy and battery storage, not replaced by Measure 2. This measure does not replace the existing diesel generator(s) operated by GRA, but it does reduce the need for power generated by LADPW to serve the Tribe.

GHG and criteria air pollutant reduction estimates have been calculated using the EPA’s Avoided Emissions and generation Tool (AVERT). The AVERT model calculates the change in emissions from electric power plants after the implementation of a specific renewable energy or energy efficiency project.

Estimated emission reductions in GHGs, CAPs, and HAPs from discontinuing use of the diesel generator(s) at GRA’s quarry are based on emission factor data from “AP-42, *Compilation of Air Pollutant Emissions Factors from Stationary Sources*.”

3.7.1 Measure 1 Extend LADPW Service to GRA

Emission reductions under this measure are solely from replacing the 1,600-kW diesel generators with grid power from LADPW. As discussed in Section 3.4.2, replacing the diesel generators would reduce annual CO₂e emissions by 828 MT.

In addition to reducing GHG emissions, this measure also will see reductions in CAP and HAP emissions as shown in Tables 3 and 4.

Pollutant	Emission Factor	Avoided Emissions	
	lb/kWh	lbs	Tons
NOx	9.70E-03	32,275	16.1
CO	4.10E-03	13,655	6.8
SOX	6.04E-03	20,085	10.0
CO2	8.65E-01	2,879,918	1,440.0
PM	5.22E-04	1,738	0.9
TOC (as CH4)	5.26E-04	1,750	0.9
Total		2,949,421	1,475

Table 3 Avoided Emissions from Replacing Diesel Generators at GRA. Source “AP-42 Large Stationary Diesel and All Stationary Dual-fuel Engines”

Hazardous Air Pollutant	Emission Factor lb/1,000 gal burned	Avoided Emissions lbs
Chrysene	1.20E-05	0.00
Ethylbenzene	3.07E-03	0.25
Fluoranthene	1.13E-04	0.01
Formaldehyde	6.63E-02	5.38
Isomers of xylene	6.84E-03	0.55
Naphthalene	1.29E-02	1.05
Benzene	1.26E-01	10.21
Toluene	3.86E-02	3.13
Total		20.58

Table 4 Avoided HAP Emissions from Replacing Diesel Generators at GRA.
Source: WebFire On-Line Database

3.7.2 Measure 2 Construct 350 kW Solar PV and BESS

Table 5 shows annual estimated reductions in criteria air pollutants following the construction of a proposed 350 kW solar array and BESS that would replace grid power generation and delivery.

Expected Reduction in CAP Emissions following Implementation of 350 kW and BESS Project	
Criteria Air Pollutant	Reductions
SO2 (lb)	-20
NOX (lb)	-150
Ozone season NOX (lb)	-90
PM2.5 (lb)	-30
VOCs (lb)	—
NH3 (lb)	-20

Table 5 Reduction in CAP Emissions from Fossil Fuel Power Plants. (Source: EPA AVERT model)

Although this measure does reduce the demand for grid generated electricity, it does not reduce GHG emissions from the GRA diesel generators.

Replacing the diesel generator will also result in reduced hazardous air pollutant emissions as shown in Table 4. Emissions reductions of HAPs have been estimated using the EPA's WebFIRE online database. WebFIRE contains emissions factors for criteria and hazardous air pollutants (HAP) for industrial and non-industrial processes.

3.7.3 Measure 3 Construct a Microgrid Project

This measure assumes that the Tribe constructs and takes ownership of the microgrid project that would provide power to all existing activities on the reservation, assuming Measure 2 is implemented and excludes the GRA diesel generators. The microgrid would replace all grid energy currently purchased from LADWP, and the microgrid would sell excess power to the grid using net-metering rules and tariffs.

Expected Reduction in CAP Emissions following Implementation of Microgrid	
Criteria Air Pollutant	Reductions
SO2 (lb)	-20
NOX (lb)	-120
Ozone season NOX (lb)	-70
PM2.5 (lb)	-20
VOCs (lb)	
NH3 (lb)	-10

Table 7 Reduction in CAP Emissions from Fossil Fuel Power Plants. (Source: EPA AVERT model)

3.7.4 Summary

GHG and CAP emission reductions are summarized in Table 7. Measure 1, Extend LADPW Service to GRA provides significant GHG, CAP, and HAP air quality benefits. GHG benefits require a combination of renewable power purchases through LADWP’s Green Power for Green L.A. Program and LADWP’s continuing progress towards its 100% renewables by 2045. It’s also worth considering that the Tribe is currently negotiating the specifics of Measure 1 with LADWP, and it could be constructed within a year of signing a final agreement with the utility. Measure 2 offers less savings for similar costs to Measure 1, but its benefits are not dependent upon LADWP. Measure 3 is of similar impact to Measure 2, but greatly improves FIIC’s resiliency and allows FIIC to have increased independence from LADWP.

In the event that the Tribe is able to implement all three measures, and if LADWP is able to meet its pledge to phase out fossil fuels by 2045, it is foreseeable that FIIT’s electrical load could be served by carbon free power in the coming decades.

Measure	GHG Reductions	CAP Reductions	HAP Reductions	Estimated Project Cost
Measure 1 Extend LADPW Service to GRA	Direct GHG reductions of 828 MT CO2e.	35 tons	20.6 lbs.	\$1.1M
Measure 2 Construct 350 kW Solar PV and BESS	Direct annual GHG reductions of 158 MT CO2e.	0.11 tons	0	\$1.2M
Measure 3 Construct a Microgrid Project	Direct GHG reductions of 133 MT CO2e, based on replacing 510 MWH of LADWP electricity with Solar PV plus BESS.	0.09 tons	0	\$3.1M

Table 8 Summary of GHG, CAP, HAP Emission reductions and Project Cost

3.1 Review of Authority to Implement

The Fort Independence Tribal Council has the authority to implement the measures identified in this report.