

# AKWESASNE HOUSING AUTHORITY

## Community-Scale AHA Go Solar Initiative



Presented By:  
Elizabeth M. Jacobs, Executive Director  
and  
Kayla Herne, Finance Director

# Saint Regis Mohawk Tribe

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- ▶ Contiguous Mohawk Community spanning:
  - ▶ One state (NY);
  - ▶ Two provinces (ON & PQ); and
  - ▶ Two countries (US & Canada).



# Saint Regis Mohawk Tribe

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- ▶ The Mohawks were the easternmost member of the Haudenosaunee Confederation that entered into treaties with the United States in the 18<sup>th</sup> and 19<sup>th</sup> centuries (SRMT affected by the Jay Treaty of 1794 – Indian Reorg Act).
- ▶ SRMT occupies 19.0 square miles within its ancestral homeland along the St. Lawrence River.
- ▶ 12.9% of all Tribal members are below the poverty line, and 7% of those are age 65+.
- ▶ Unemployment: 9.6% (surrounding area of Franklin County, NY is 5.4%)

# Saint Regis Mohawk Tribe

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- ▶ The Saint Regis Mohawk Tribal Council created the AHA by ordinance in 1984 for the purposes of:
  - ▶ Remedying unsafe and unsanitary housing conditions that are injurious to the public health, safety and morals;
  - ▶ Alleviating the acute shortage of decent, safe and sanitary dwellings for persons of low income; and
  - ▶ Providing employment opportunities through the construction, improvement, extension, alteration or repair and operation of low-income dwellings.
- ▶ AHA has constructed a total of 405 homes for low-income members since 1984.



## Mission

The Akwesasne Housing Authority (“AHA”) has been providing Low Income Housing Support to the Akwesasne Community since 1984.

*“The mission of the Akwesasne Housing Authority and the St Regis Mohawk Tribe is to develop a comprehensive housing program that will address the needs of all Mohawks living on and around our designated Indian area. We will seek to generate and **promote community strength and prosperity** through **safe housing, supportive ventures, economic development, and program efficiency**. In the spirit of this mission, we will strive to protect and educate our future generations.”*



# AHA Accomplishments

- ▶ Receives NAHASDA Block Grants (Years 1998 - 2020),
- ▶ Community Cooperative Projects including a 12-bed Tribal Foster Care Facility, leveraging of funds for participation in the SRMT Water Enhancement Project, and expansion of the Tribe's limited sanitary system.
- ▶ Created and managed the Akwesasne Neighborhood Networks Computer Learning Center,
- ▶ Administration of a Rental Assistance program (TAP) for low income tribal members residing on and near the SRMT Reservation,.
- ▶ Established the Akwesasne Boys & Girls Club,
- ▶ Provide construction assistance to the Partridge House, the only in-house drug and alcohol rehabilitation facility,
- ▶ leveraged funds from the SRMT, USDA for the senior citizen center in 2005, Senior Housing Complex – Sunrise Acres Phase 1 (1998) and Phase 2 (2011 - ARRA).
- ▶ Contribution of \$1.8 million to the Diabetes Center of Excellence through IHBG & fundraising.



# AHA's Rise to Go Green

- ▶ Recently, the AHA spearheaded **Sustainable Design Practices** and **Renewable Energy** for all of its projects as a matter of policy. It has also been advocating for similar policies in the broader Akwesasne Community.
- ▶ 2015-2016 - AHA realized a valuable partnership with the US Department of Energy/Indian Energy, NREL & Sandia Labs - provided excellent TA to develop the Tribe's draft Strategic Energy Plan for our community to jump start efforts.



# AHA's Rise to Go Green

## ▶ AHA's Considerations for Change

- ▶ Climate change
- ▶ Sustainability
- ▶ Economic development
- ▶ Self-sufficiency

## □ Our Start (2008/2009):

Creation of a safe and neighborhood for tribal elders

- ▶ Expansion of Existing Elderly Housing
- ▶ Convenient location (clinic, senior center, etc.)

## □ Investment

- ▶ ARRA created the opportunity for AHA to push forward a "future project" in the planning stages.
- ▶ Added points for green
- ▶ \$4 Million





## Background Regarding SRMT and AHA

- ▶ Saint Regis Mohawk Tribe (SRMT)
  - ▶ Leadership in support of AHA efforts
  - ▶ Wish to create an energy office w/in SRMT
- ▶ AHA and its energy efficiency and renewable energy initiatives
- ▶ AHA's ultimate goal of having "net zero" housing and related buildings throughout SRMT Reservation



# Project Overview

- ▶ AHA will install approximately **614.74** kW to service **159**-housing related buildings, including **80** tribal residences.
- ▶ The electrical power from the solar facilities will be utilized under National Grid's community distributed generation program.
- ▶ The project will serve **5%** of the total tribal community residential energy load and **4%** of the total electrical energy usage, including governmental and commercial buildings.



# Project Objectives

- ▶ Decrease reliance on fossil fuels and reduce AHA's, the Tribe's, and Tribal members' environmental footprints;
- ▶ Increase AHA's, the Tribe's, and Tribal members' self-sufficiency;
- ▶ Add diverse, complementary green energy systems;
- ▶ Significantly lower energy costs for Tribal members and AHA;
- ▶ Provide a model for low-income Tribal energy projects; and
- ▶ Create jobs and mentoring opportunities for Tribal members.



# “It Gets Cold up Here”

Residential Heating is one of the largest economic factors in maintaining affordable housing, especially among the elderly in the community.

## Akwasne Climate

- ▶ Zone 6
- ▶ 9,046 HDDs
- ▶ 116 CDDs
- ▶ Winter Design:  $-15^{\circ}\text{F}$
- ▶ Summer Design:  $85^{\circ}\text{F}/71^{\circ}\text{F}$  db/wb





# High Cost of Electricity for AHA and SRMT Members

## 2015 average residential monthly electricity consumption:

- ▶ U.S.: 901 kWh @ 12.65 cents per kWh = \$114.03
- ▶ AZ: 1028 kWh @ 12.13 cents per kWh = \$124.67
- ▶ CA: 557 kWh @ 16.99 cents per kWh = \$94.59
- ▶ NM: 635 kWh @ 12.47 cents per kWh = \$79.23
- ▶ **NY: 601 kWh @ 18.54 cents per kWh = \$111.32**
- ▶ WA: 964 kWh @ 9.09 cents per kWh = \$87.64
- ▶ WI: 668 kWh @ 14.11 cents per kWh = \$94.26

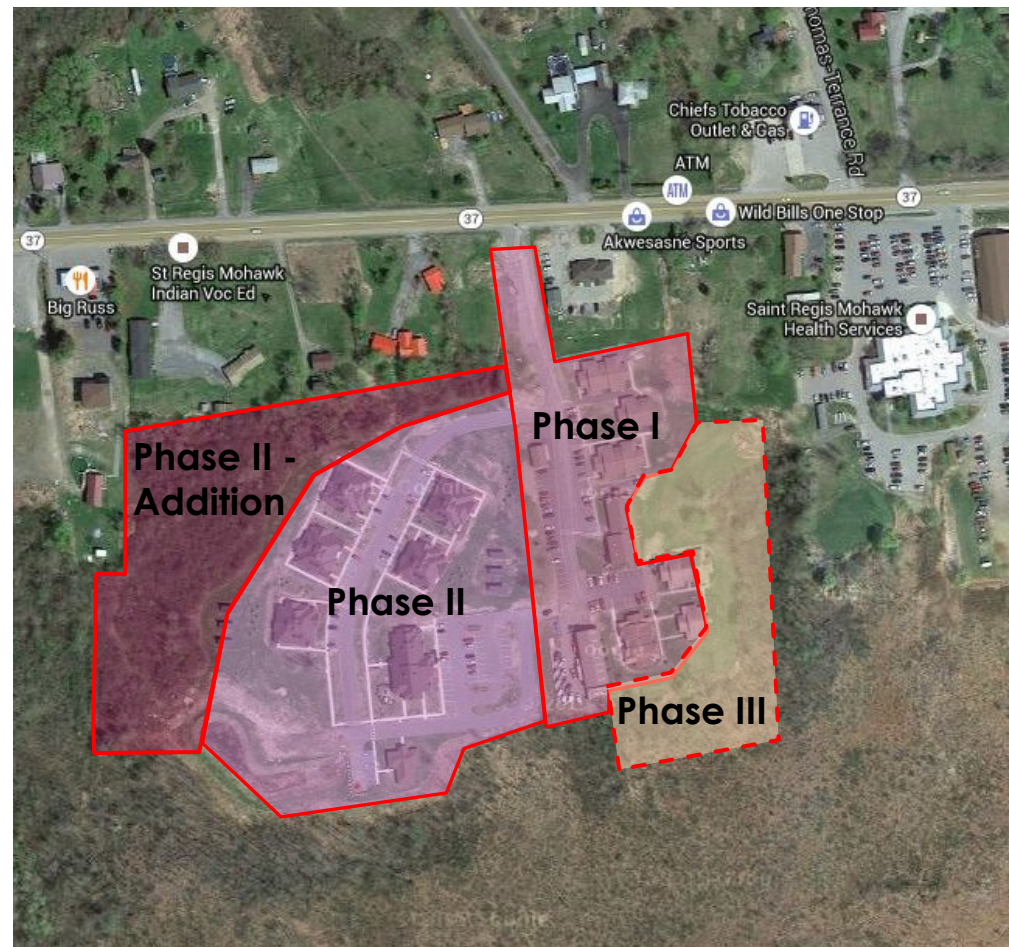
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# AHA's Sunrise Acres Senior Low-Income Housing

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- ▶ Phase I – **1998**, conventional construction
- ▶ Phase II – **2011** Sustainable Design, Solar PV
- ▶ Phase III – **2017** Sustainable Design, Remote net-metering
- ▶ Phase II – Addition & Enhancement – **2021** Solar PV





# Sunrise Acres Complex Phase 2 Expansion

**Funded by HUD's Native American  
Housing Block Grant Program**

► **Project Goals:**

- ❑ 20 Two Bedroom Apartments
- ❑ Training Space for AHA & Community Groups
- ❑ On Site management Office
- ❑ "Sustainable design strategies will be employed where agreed to be practical and cost effective."









# Sunrise Acres Complex Phase II

## Overview of Systems

- ▶ Building Envelope
- ▶ Geo-thermal System
- ▶ Photovoltaic System
- ▶ Solar Thermal System
- ▶ Energy Efficient HVAC System
- ▶ Energy Efficient Lighting
- ▶ Energy Conserving Equipment & Fixtures



# Energy Efficient Building Envelope

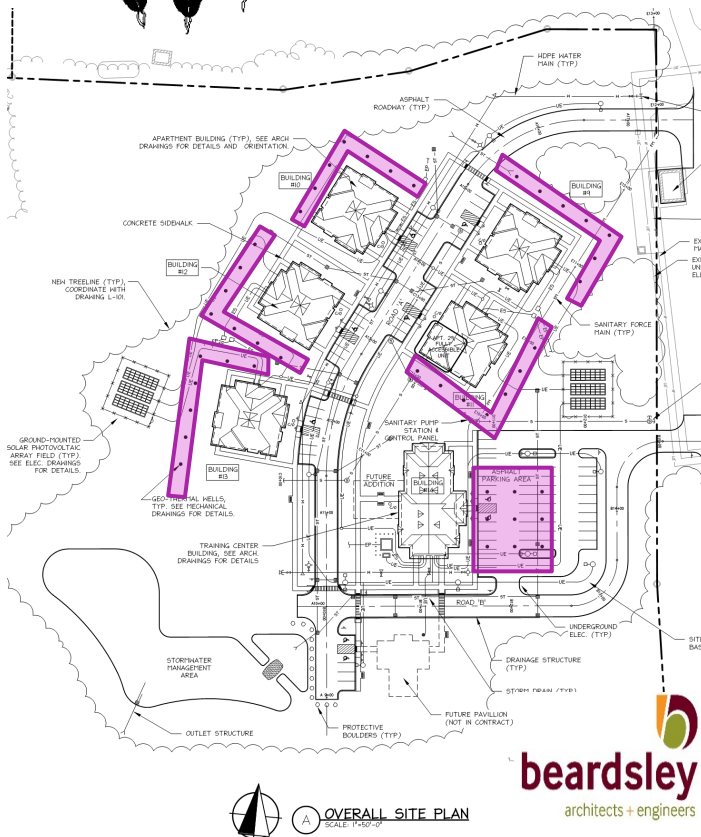
- ▶ Insulated Concrete Form (ICF) Construction for Walls & Foundation - R20
- ▶ Traditional pre-engineered wood truss roof - R40
- ▶ Fully insulated concrete slab floors – R10
- ▶ Windows – Double Hung, Anderson 400 Series, Argon gas filled Low E,  $U=0.41$



# Geothermal System



- ▶ Apartments – 7 wells, 400' each
- ▶ Training Center – 9 wells, 400' each
- ▶ 44 wells total, +/- 7 miles of tubing
- ▶ Provides both heating and cooling
- ▶ Very Efficient – EER 16-26, COP 3.2-4.1



Provides seasonal energy storage - Injects heat into the ground in the summer for use for heating in winter.

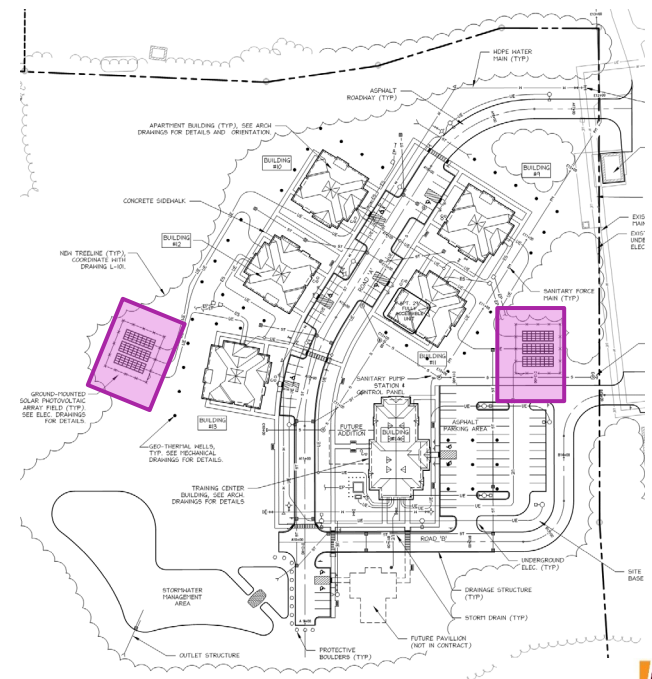
Picture: Well drillers installing geothermal wells. (AHA, 2010)



# Photovoltaic System

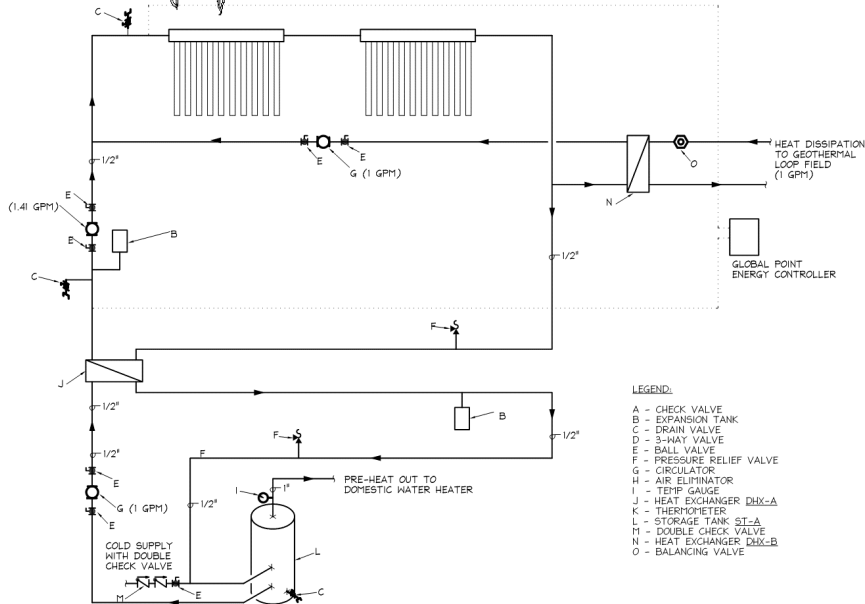


- ▶ 6 ground mounted arrays– 30 kW Total
- ▶ Training Center – 5 kW
- ▶ 5 Apartment Bldgs – 5 kW each
- ▶ Net metering
- ▶ Provides approximately 20% of electrical energy consumed by the buildings



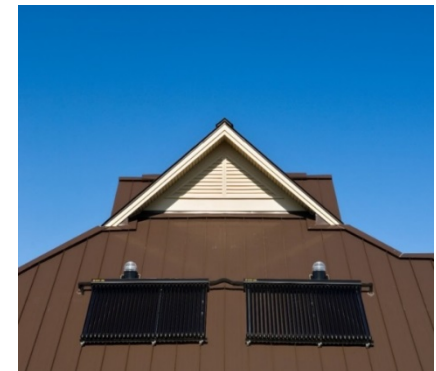
OVERALL SITE PLAN  
SCALE: 1"=20'

# Solar Thermal System



3 SOLAR WATER HEATING SYSTEM SCHEMATIC  
SCALE: NONE

- ▶ Evacuated Tube Heat-Pipe Collectors
- ▶ 2 panels per building – 45 ft<sup>2</sup> each
- ▶ Provides approximately 50% of hot water demand
- ▶ When hot water is not required, excess heat is injected into geothermal loop (stored in the ground for use in heating)





# Sunrise Acres Phase III Expansion

- ❑ Funded by:
  - ▶ Office of Temporary and Disability Assistance (OTDA) Homeless Housing and Assistance Program (HHAP), New York State Homes and Community Renewal (HCR)
- ❑ Project Outcomes:
  - ▶ Two new Buildings adjacent with (12) apartments for seniors with supportive needs and (6) veterans and homeless veterans.
  - ▶ Sustainable Design Strategies, electric heat pumps, sustainable materials and high energy efficiency building envelope.
  - ▶ Construction completed in December 2019



# Energy Efficiency Strategies

- ▶ High Efficiency Envelope – ICF construction, R30 walls, R50 Roof
- ▶ High Efficiency HVAC Systems – Air Source VRF Heatpump with Biomass (pellet Boiler) with radiant floor supplemental heat in the Seniors Building Common spaces. ERV for ventilation
- ▶ High Efficiency Lighting – CFL & LED interior lighting, LED exterior lighting, Solar Daylighting tubes
- ▶ Off-Site Solar PV array with Net metering – AHA “Go Solar Project”



# High Energy-Efficiency Initiative

- ▶ Energy efficiency and other related housing improvements for existing Tribal housing.
- ▶ Funded with Indian Community Development Block Grant (ICDBG), Indian Housing Block Grant, and New York State Energy Research and Development Authority (NYSERDA) Incentives.
- ▶ The project saved nearly \$60,000 annually in energy costs for eligible low income Tribal households.







# Work Performed Under AHA High Energy-Efficiency Initiative

- ▶ Air sealing;
- ▶ Basement wall demo;
- ▶ Duct sealing, installation, modification and balancing;
- ▶ Furnace adjustment;
- ▶ Installation of gable vents, bath fans, trap in bathroom plumbing;
- ▶ Attic insulation;
- ▶ Chimney removal;
- ▶ Basement window replacement;
- ▶ Gutter replacement;
- ▶ Rim joist upgrades;
- ▶ Smoke & CO detector installation;
- ▶ Spray Foam application above grade basement walls, floor of overhang, overhangs, rim joists;
- ▶ Venting bath fans, dryer and kitchen exhaust to exterior; and
- ▶ Water heater replacement.



# “Go Solar” Program

- ▶ Funded from ICDBG Program and DOE Tribal Energy Program.
- ▶ Tribe set aside 25 acre parcel for start up and future expansion.
- ▶ 2 components
- ▶ 50 kW on-site solar addition (Sunrise campus).
- ▶ Initial 275 kW Array for offsetting energy use at Sunrise Acres via net-metering.
- ▶ Addition 615 kW Array to offset other AHA owned or operated properties.
- ▶ Remainder of 25 Acre site to be developed as Solar Farm for net metering additional AHA buildings and Tribal residences.



# “Go Solar” Program

Two Components:

1. Onsite solar (net metering)

## **Sunrise Acres Complex**

50 kW added to the existing 30 kW solar arrays located at the Sunrise Acres Complex

2. Solar farm (Community Distributed Generation)

## **AHA Go Solar! Initiative Solar Farm**

1 MW solar farm located remotely and distributed through the local electrical provider (National Grid).

# 1. On Site Solar Sunrise Acres Complex



Existing 30 kW

New 50 kW

Pictures courtesy of AHA.



## 2. AHA Solar Farm Site

Production: Approx. 1 MW

Size: 7 acres



Pictures taken on  
September 2, 2021 courtesy  
of AHA.



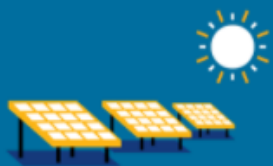
## Aggregated Net Metering (2008)

- ▶ AHA took advantage of New York's remote aggregated net metering program to service the Sunrise Acres Complex Site on site solar arrays back in 2008.
- ▶ New York's remote aggregated net metering program allows a customer to receive full retail credit on its various accounts from electric generating equipment located on property within the same utility zone.
- ▶ Net metering has been replaced by the Value Stack system governed by the New York State Public Service Commission



# How Value Stack Works!

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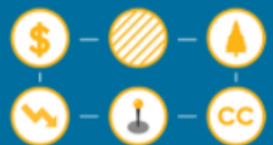
A developer develops and interconnects a DER.

2



The electricity produced by that system is injected into the grid.

3



The utility determines the value of the energy produced using the Value Stack methodology.

4



The utility allocates the monetary value of the energy produced to the offtaker's bill. For a CDG project, the developer directs the utility how to split the credits between many offtakers.

5



Offtakers pay a subscription fee to the DER developer. Steps 2-5 repeat each month.\*



# Community Distributed Generation

The New York State Public Service Commission (PSC) established the Value of Distributed Energy Resources (VDER).

## □ VDER projects:

- ▶ Located behind a non-residential host utility meter;
- ▶ Generate solar credits for electricity production in excess of the host's usage; and
- ▶ Are allocated these credits eligible low-to-moderate (LMI) income tribal households through a solar subscriptions program administered by AHA each month.





# Completed Tasks

- ❑ **Phase I – Community Distributed Generation (CDG)**
  - ▶ AHA Go Solar! 1MW solar facility was commissioned in January 2020
  - ▶ Monitoring of the solar facility began in March 2020
  - ▶ 100% of the LMI solar subscriptions have been allocated and we have a wait list.
- ▶ **Phase II – Sunrise Acres Complex onsite solar**
  - ▶ Project was completed in September 2021.
  - ▶ Commissioning of individual solar arrays are complete for the 50 kW of onsite solar at the Sunrise Acres Complex.



# LLC Operating Agreement & Power Purchase Agreement

- ▶ Will provide that AHA, as an instrumentality and subdivision of the Tribe, receives full credit for the DOE grant and full value of the investment tax credits received by investor and the NYSEERDA incentives for the solar facilities.
- ▶ Will require that once the remaining amount due to the investor has been paid, any additional money coming into the LLC will be credited to AHA as an instrumentality and subdivision of the Tribe. Will provide for energy payments to be reduced to only a very nominal amount.
- ▶ The Power Purchase Agreement and LLC Operating Agreement allow AHA to ensure the investor's exit and full AHA ownership of the facilities.

## Plans for 2022

- ▶ Provide for the maintenance of the solar farm,
- ▶ Continue monitoring of solar production,
- ▶ Closeout grant.

**Nia:wen ko:wa ta'non Sken:nen**  
**Thank You very much and**  
**peace.**



**Elizabeth M. Jacobs**  
**[ejacobs@aha-nsn.gov](mailto:ejacobs@aha-nsn.gov)**  
**518-358-9020, ext. 114**

**Kayla Herne**  
**[Kherne@aha-nsn.gov](mailto:Kherne@aha-nsn.gov)**  
**518-358-9020, ext. 127**