Alaska Native Tribal Health Consortium:

Technical Assistance For Rural Alaska Tribal Energy Solutions

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ANTHC Rural Energy Initiative

ALASKA NATIVE TRIBAL HEALTH CONSORTIUM

Alaska Native Tribal Health Consortium

Vision:

Alaska Natives are the Healthiest People in the world

Formed in 1998

Consortium of the Alaska Tribal Health System (ATHS)

Environmental Health & Engineering

- Sanitation
- Health Facilities & Clinics
- Operations & Maintenance and Training
- Alaska Rural Utility Collaborative (ARUC)

Rural Energy Initiative

We believe basic sanitation should be efficient, sustainable and affordable

ALASKA NATIVE TRIBAL HEALTH CONSORTIUM

ANTHC Rural Energy Initiative

Our Purpose

The Alaska Native Tribal Health Consortium's (ANTHC) Rural Energy Initiative works with communities to implement innovative energy efficiency and renewable energy solutions to make public sanitation affordable for the people we serve across Alaska.

We believe basic sanitation should be efficient, sustainable and affordable

ALASKA NATIVE TRIBAL HEALTH CONSORTIUM

Our Path: A Comprehensive and Collaborative Approach

Onsite Assessment

Collect Data

Evaluate Operating Practices

Assess Facility Energy Use

Develop Energy Model

Identify Potential Improvements

Identify Cost to Implement

Develop Training Plan

Purchase Materials

Implement Efficiency Retrofits

Provide Operator Training

Construct Renewable Energy Systems

Monitor Energy Usage

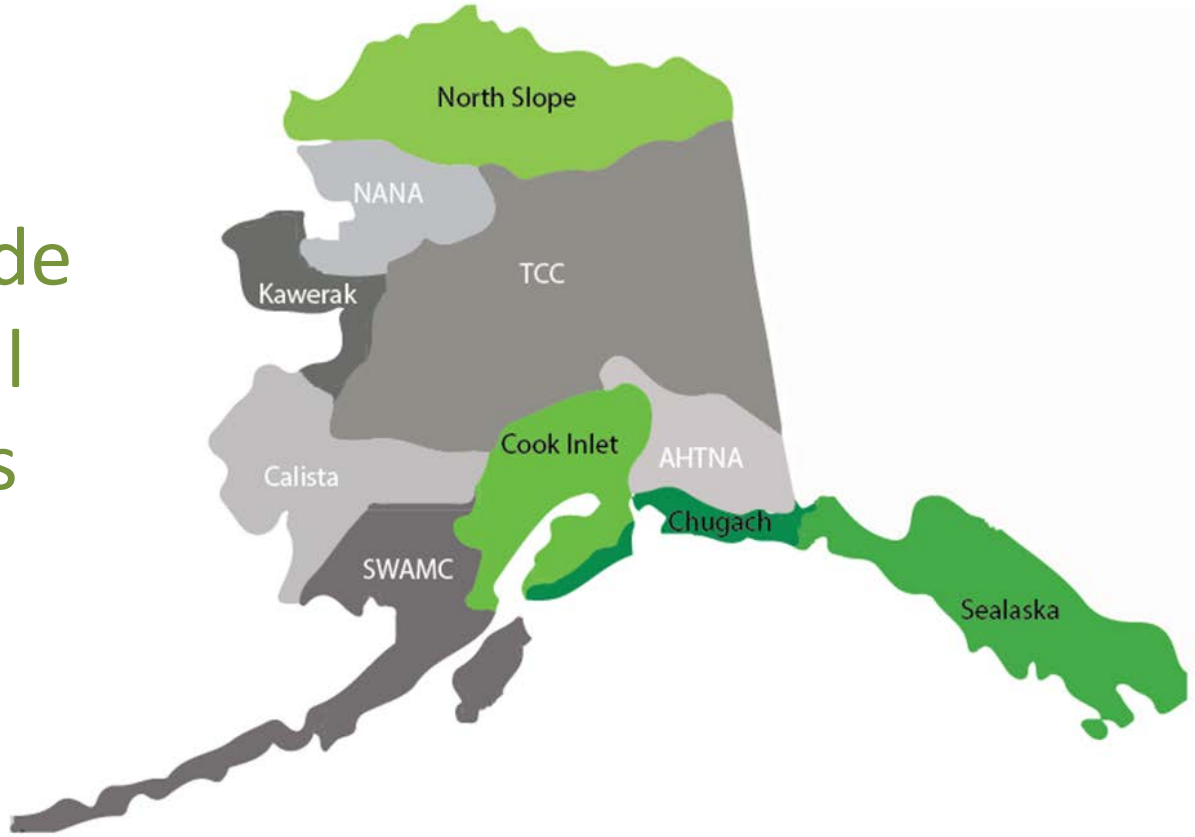
Evaluate Retrofit Effectiveness

DOE Intertribal TA Providers Network: ANTHC Statewide Intertribal Energy TA - Summary

- Provide TA coverage for all regions of Alaska
- Partner with other Intertribal TA recipients and non-recipient regions to steer priorities
- Primary goal is to develop reliable engineering documents and appropriate financial assessments to give Tribes the tools they need to develop energy projects
- ANTHC's TA will focus on improving energy performance of public infrastructure, including sanitation systems, while extending our expertise to other public community buildings

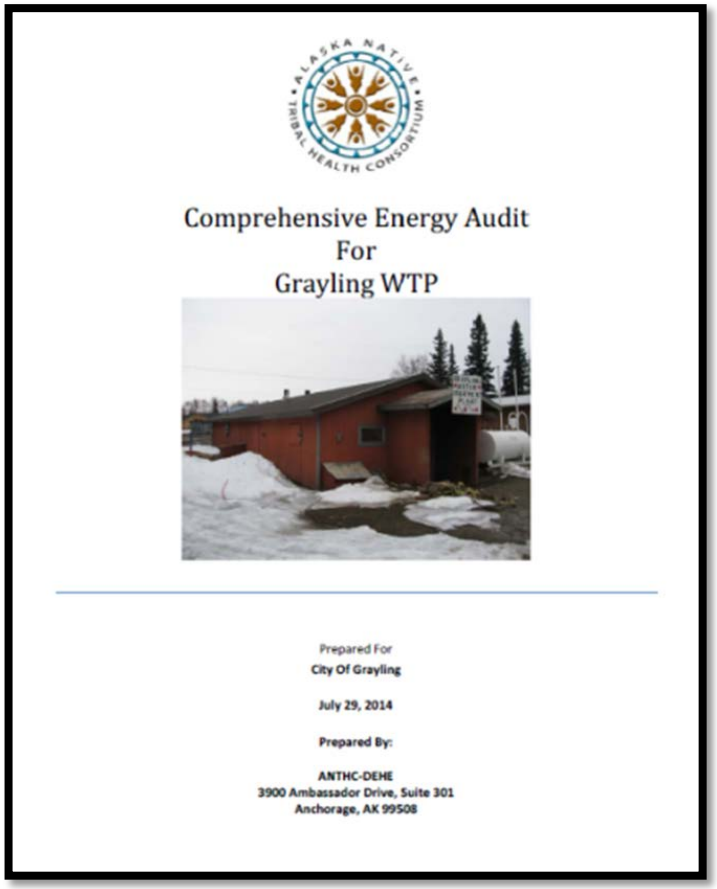
DOE Intertribal TA Providers Network: ANTHC Statewide Energy TA for Rural Tribal Communities

Alaska Statewide Regional Partners



DOE Intertribal TA Providers Network: ANTHC's 3-Year Intertribal TA - Deliverables

- 15 Level Three Energy Audits
- 15 Energy Efficiency Retrofit Installation and Training Plans
- 15 Feasibility Studies for Energy Capital Projects
- 15 Engineering Reviews of Tribal Energy Project Designs / Proposals
- 15 Instances of Assistance with Project Financing Identification


Comprehensive Energy Audit
For
Grayling WTP

Prepared For
City Of Grayling

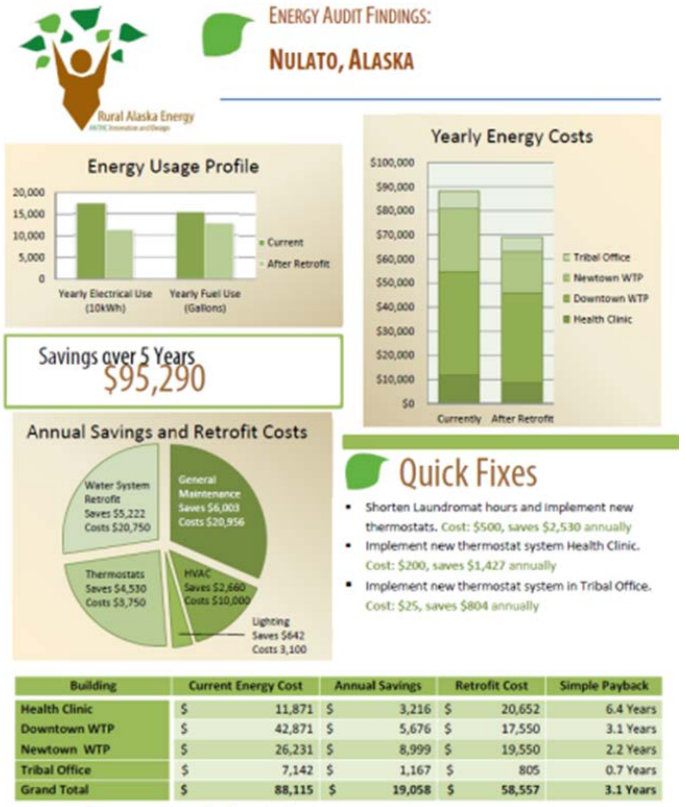
July 29, 2014

Prepared By:

ANTHC-DEHE
3900 Ambassador Drive, Suite 301
Anchorage, AK 99508

DOE Intertribal TA Providers Network: ANTHC Intertribal Energy TA - Program Outcomes

- Successfully acquire funding (Grant/Loan) for implementation of 50% of Projects identified by TA
- Expand the network of energy TA resources across rural Alaska and increase collaboration towards Tribal community energy goals
- Provide Tribal communities the project and financing acquisition knowledge they need to develop more energy projects in the future



Building	Current Energy Cost	Annual Savings	Retrofit Cost	Simple Payback
Health Clinic	$ 11,871	$ 3,216	$ 20,652	6.4 Years
Downtown WTP	$ 42,871	$ 5,676	$ 17,550	3.1 Years
Newtown WTP	$ 26,231	$ 8,999	$ 19,550	2.2 Years
Tribal Office	$ 7,142	$ 1,167	$ 805	0.7 Years
Grand Total	$ 88,115	$ 19,058	$ 58,557	3.1 Years

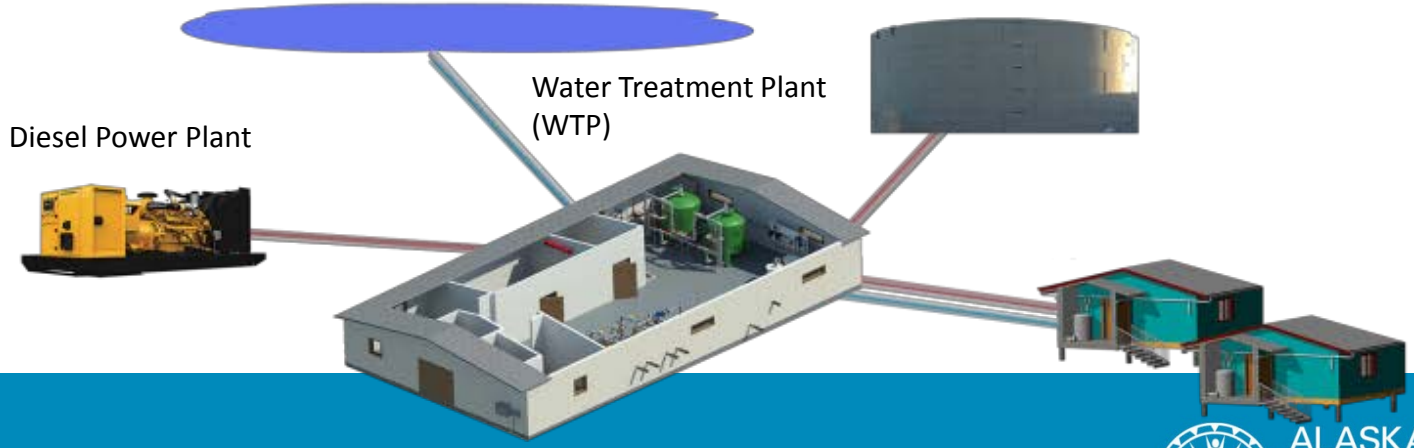
DOE Intertribal TA Providers Network: Evaluating Effectiveness of TA Provided

- Track and analyze results of completed TA – Audits and Feasibility Studies
- Publish metrics of energy improvement potential identified though Intertribal TA program
- Document projects successfully funded and implemented after TA
- Submit a proposal (in year 3) to the ANTHC Board to maintain energy TA funding following the DOE grant

DOE Intertribal TA Providers Network: Selection of Community Energy TA Opportunities

- ANTHC will be advertising the TA Opportunity via:
  - Existing Alaska sanitation project manager network
  - Collaboration with Alaska regional partners
  - TA Request Form available on the ANTHC Energy webpage
- ANTHC will provide added outreach to solicit requests from the following Alaska Regions:
  - Arctic Slope Borough (North Slope)
  - Cook Inlet (Southcentral)
  - Chugach (Southcentral)
  - Sealaska (Southeast)

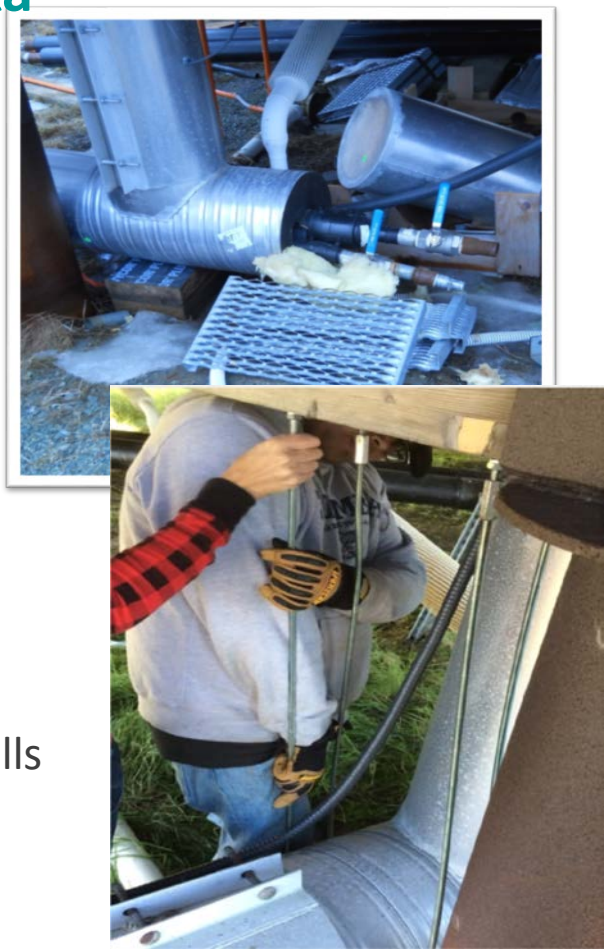
Energy Efficiency & Alternative Energy Solutions



Energy Efficiency:
Energy Efficiency Retrofits – Kwigillingok, Alaska

In 2016, ANTHC completed energy efficiency work on the Washeteria and Water Treatment Plant in Kwigillingok

- Heating fuel use reduced by 21%
- Overall Energy Use reduced by 50%
- Annual Energy Savings = $40,000



Added Benefits:

- Reduced mold risk
- More time efficient and effective clothes drying
- Increased operators' technical capacity and job skills
- Increased safety by reduction in fire risk and improved lighting

Alternative Energy:
Power Plant Heat Recovery – Savoonga, Alaska

Utilize excess heat from diesel power plant to heat the community sanitation system.

- Reduces water plant heating fuel usage by **90%** (8,800 gallons) annually
- Annual savings of almost **$40,000** per year

Alternative Energy: Biomass Heating – Kobuk, Alaska

Replace diesel with locally harvested cord wood to heat community water system.

- Reduces heating fuel usage by **3,000** gallons annually
- Annual savings of almost **$24,000** per year
- Creates local jobs for woodcutters and operators

Alternative Energy: Wind-to-Heat – Mekoryuk, Alaska

Utilize dispatchable wind electricity to provide heat to the sanitation system.

- Cost of **$0.05** per kWh equivalent to fuel oil at **$1.46** per gallon
- Projected annual savings of almost **$40,000**

Alternative Energy:
Community Water Source and Hydroelectric– Ouzinkie, Alaska

Provides clean water and electrical generation to this remote community

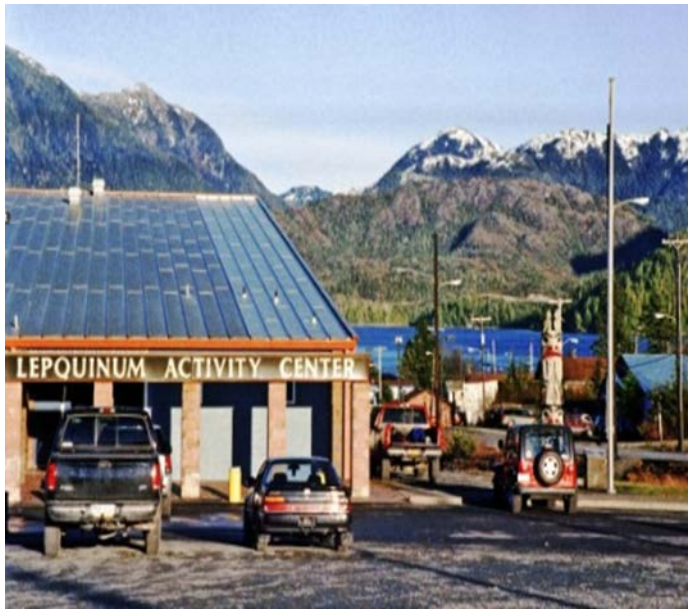
- Concrete faced rock-fill dam built to withstand 8.8 magnitude quake
- Community produces 30%of their electricity from hydroelectric, or 300,000 kwh/year, and off-setting 22,900 gallons of diesel

Alternative Energy: Solar

- Solar PV for electricity
- Solar Thermal for Water Heating
- Production occurs for nearly 10 months of the year
- 8.2 KW solar PV system at Ambler Water Plant installed by Northwest Arctic Borough in March 2013
- The solar panels produce approx. $6500 of electricity annually
- Carries “base load” of facility

Alternative Energy:
Ground Source Heat Pump – Metlakatla, Alaska

- Provides heating for the Lepquinum Pool & Wellness Center
- Estimated to displace 47,200 gal of heating fuel & save $203,000 annually
- 70 x 6” boreholes at 350’ deep
- 1” HDPE geothermal loop, w/ 1,194 MBH Heat Pump
- Building heating system upgrades include:
  - Thermal storage tank
  - Covert heating system from 180 deg to 115 deg
  - New heating coils in air handling units

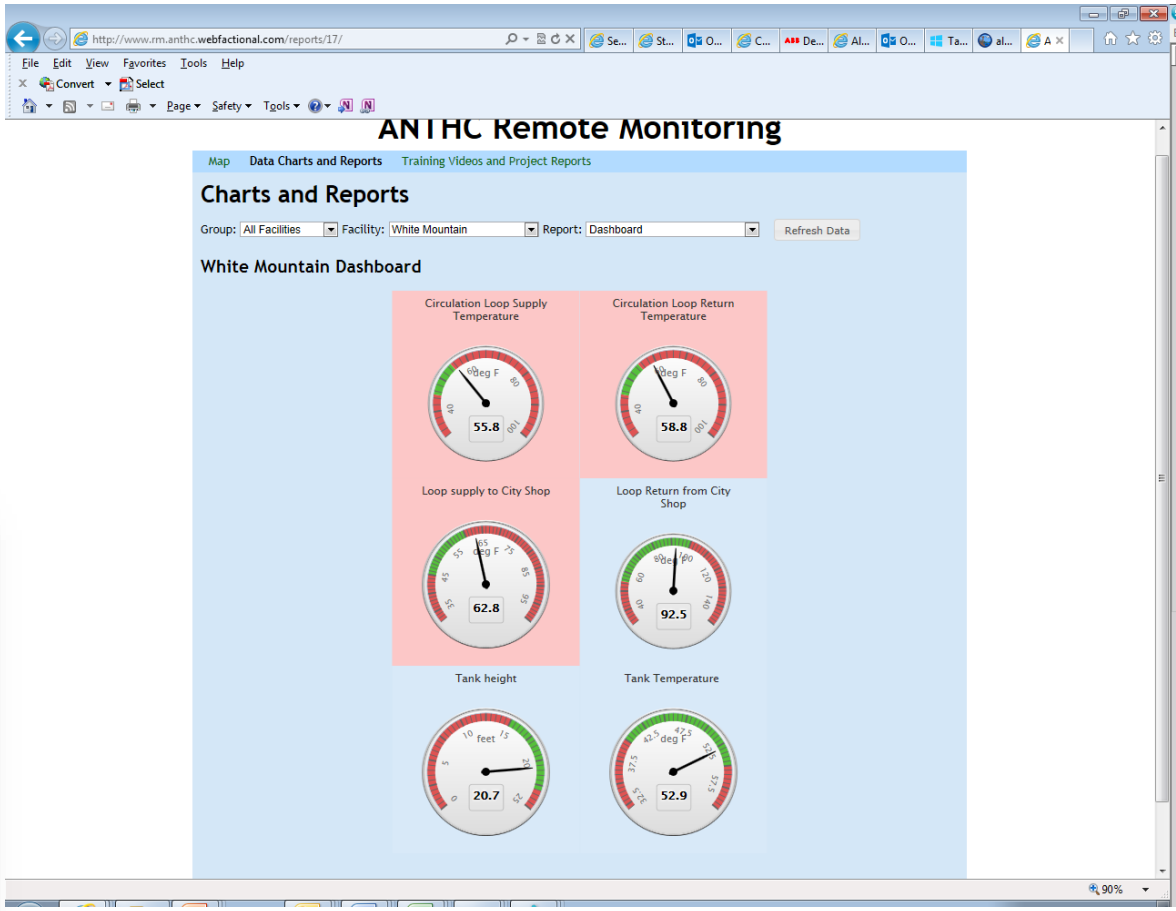


Alternative Energy:
Combined Heat and Power (CHP) Micro-turbines

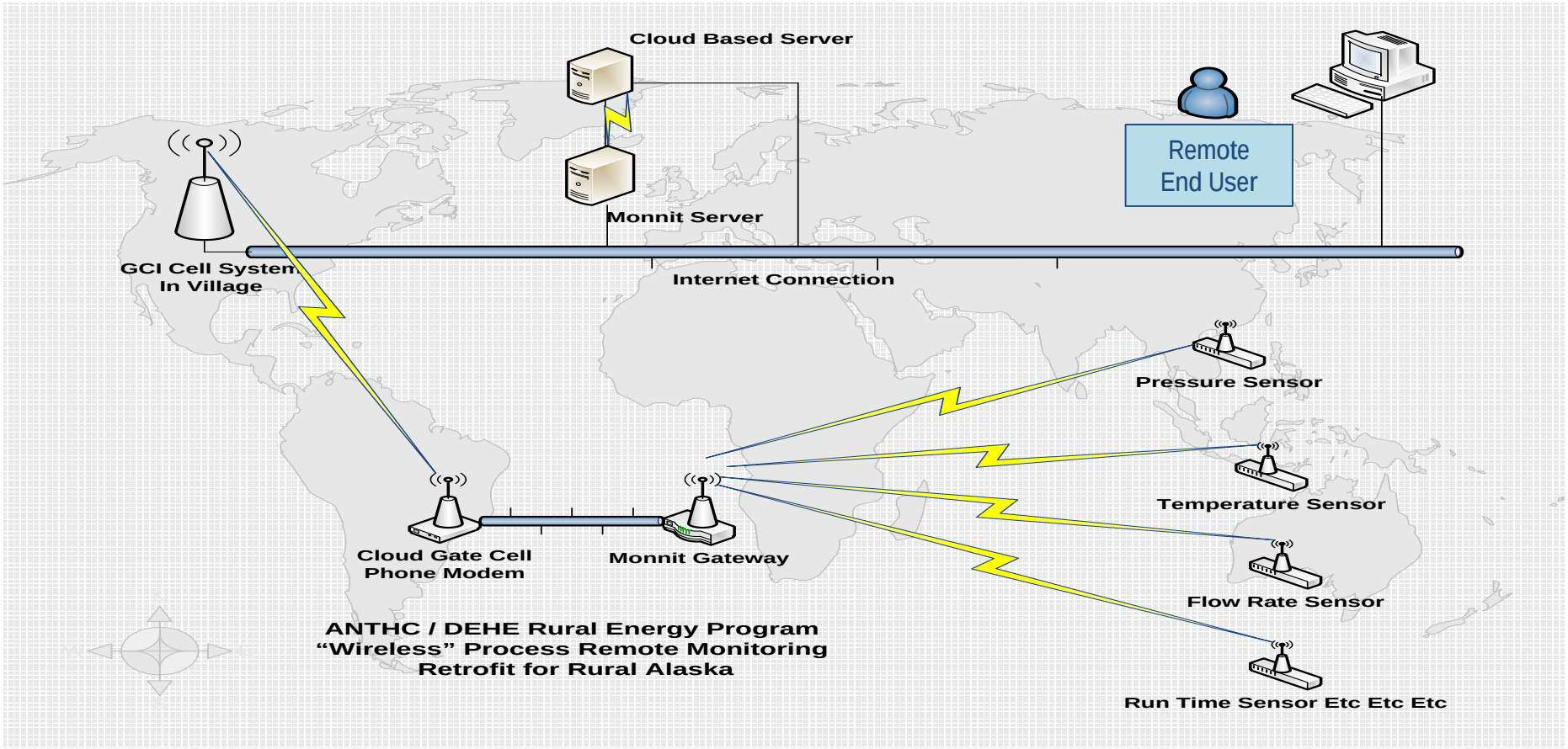
- Yukon-Kuskokwim Health Corporation (YKHC) proposed CHP
- Install 3x 65kW micro-turbines to provide electricity and heat to YKHC hospital in Bethel, AK
- Fueled by diesel
- Estimated to save 65,100 gal in fuel annually
- Annual savings: $339,420
- Project cost: $1,642,000 (4.8 year payback)

Remote Monitoring

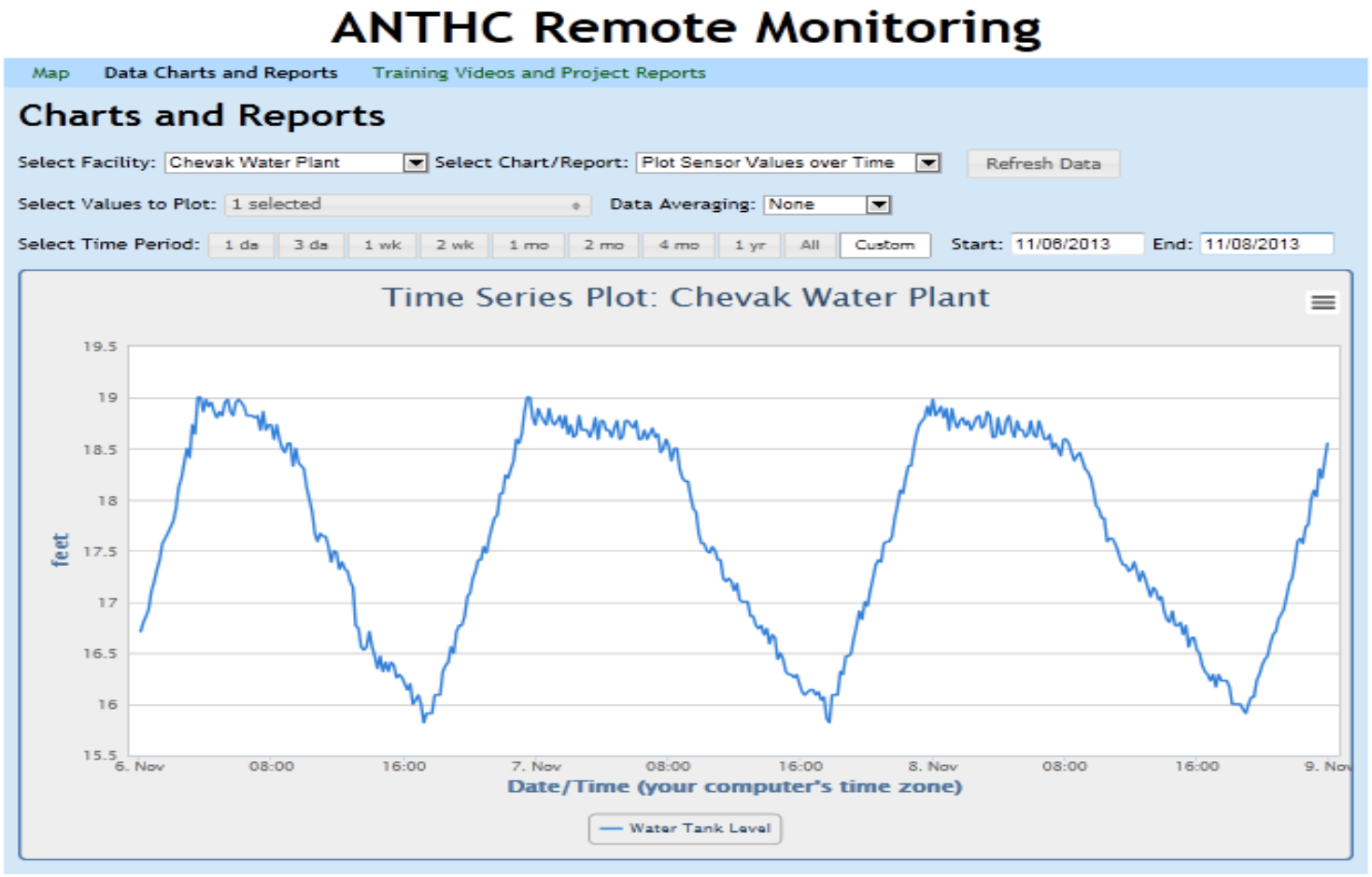
- http://rm.anthc.webfactional.com/reports/
- Records Results
- Allow for check ins and low cost technical assistance
- Greater access to information for regional partners



Remote Monitoring: System Infrastructure



Remote Monitoring: Data Analysis



ANTHC Rural Energy Initiative

Current and Identified Projects Through 2018

Current Energy Efficiency Projects

- 44 communities

Identified Energy Efficiency Projects

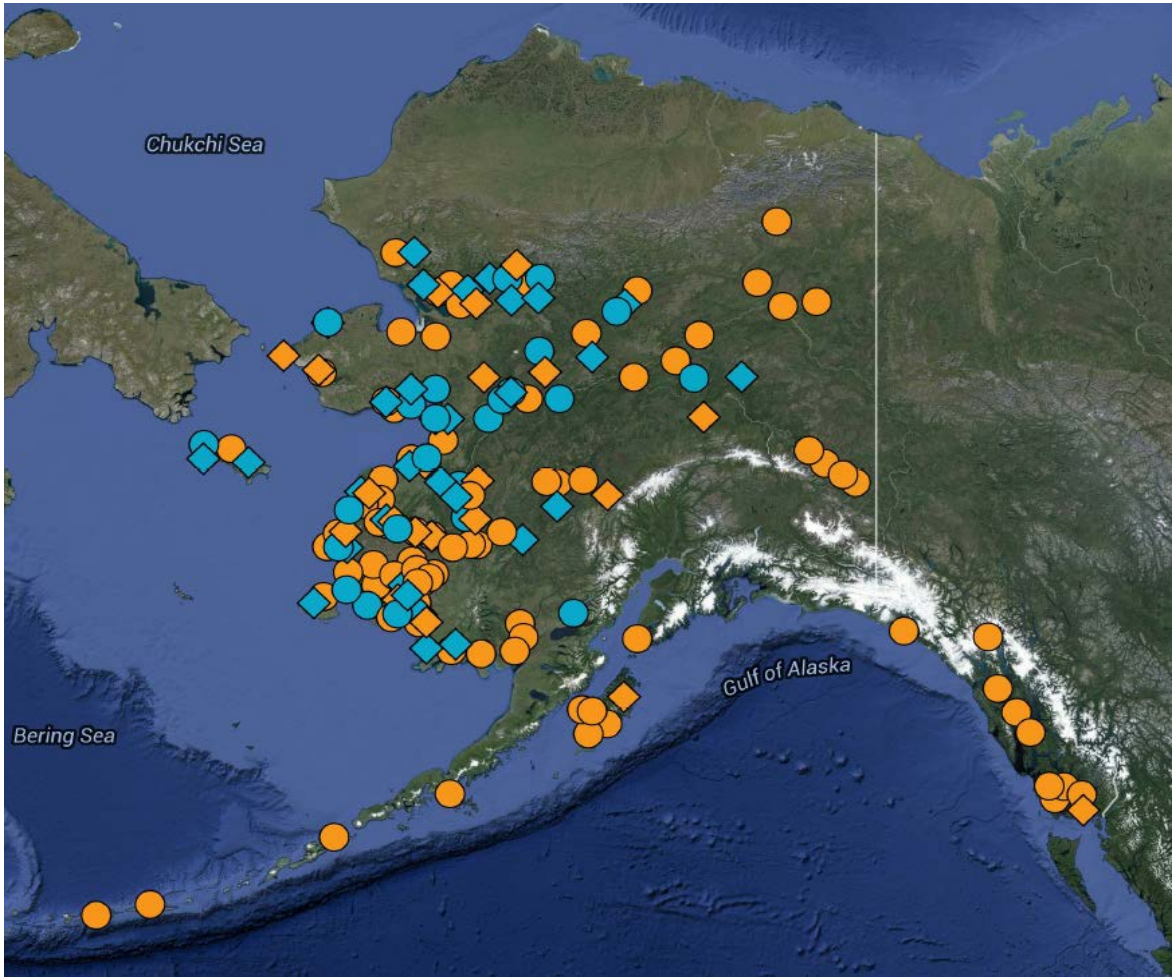
- 82 communities

Current Renewable Energy Projects

- 25 Heat Recovery Projects | 5 Biomass Projects | 4 Wind-to-Heat Projects

Identified Renewable Energy Projects

- 16 heat recovery projects | 5 Biomass Projects | 1 Ground Source Heat Pump Project | 1 Hydroelectric Project



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Thank You

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For more information, please visit:
http://anthc.org/what-we-do/rural-energy/