



Alaska Native Tribal Health Consortium:

Technical Assistance For Rural Alaska Tribal Energy Solutions

Tashina Duttie, BS, MSPM

Senior Project Manager, ANTHC Rural Energy Initiative



ALASKA NATIVE
TRIBAL HEALTH
CONSORTIUM

ANTHC – What We Do

HEALTHY PEOPLE & PREVENTION

- Wellness
- Traditional Foods and Nutrition
- Behavioral Health

HEALTH RESEARCH AND DATA

- Epidemiology Center
- Clinical & Research Services

HEALTH TECHNOLOGY SERVICES

- Biomedical Engineering
- Telehealth

HEALTHY HOMES AND COMMUNITIES

- Community Environment & Health
- Clean Water & Sanitation
- Rural Energy
- Tribal Utility Support
- Construction & Engineering

HEALTH ADVOCACY

- Affordable Care Act
- Tribally-Sponsored Health Insurance Program

HEALTH TRAINING AND EDUCATION

- Alaska Dental Therapy Ed. Prog.
- Behavioral Health Aide
- Community Health Aide
- Scholarships

HEALTH AND MEDICAL SERVICES

- Patient Housing
- Alaska Native Medical Center (ANMC)
- Institutional Environmental Health
- Palliative Care



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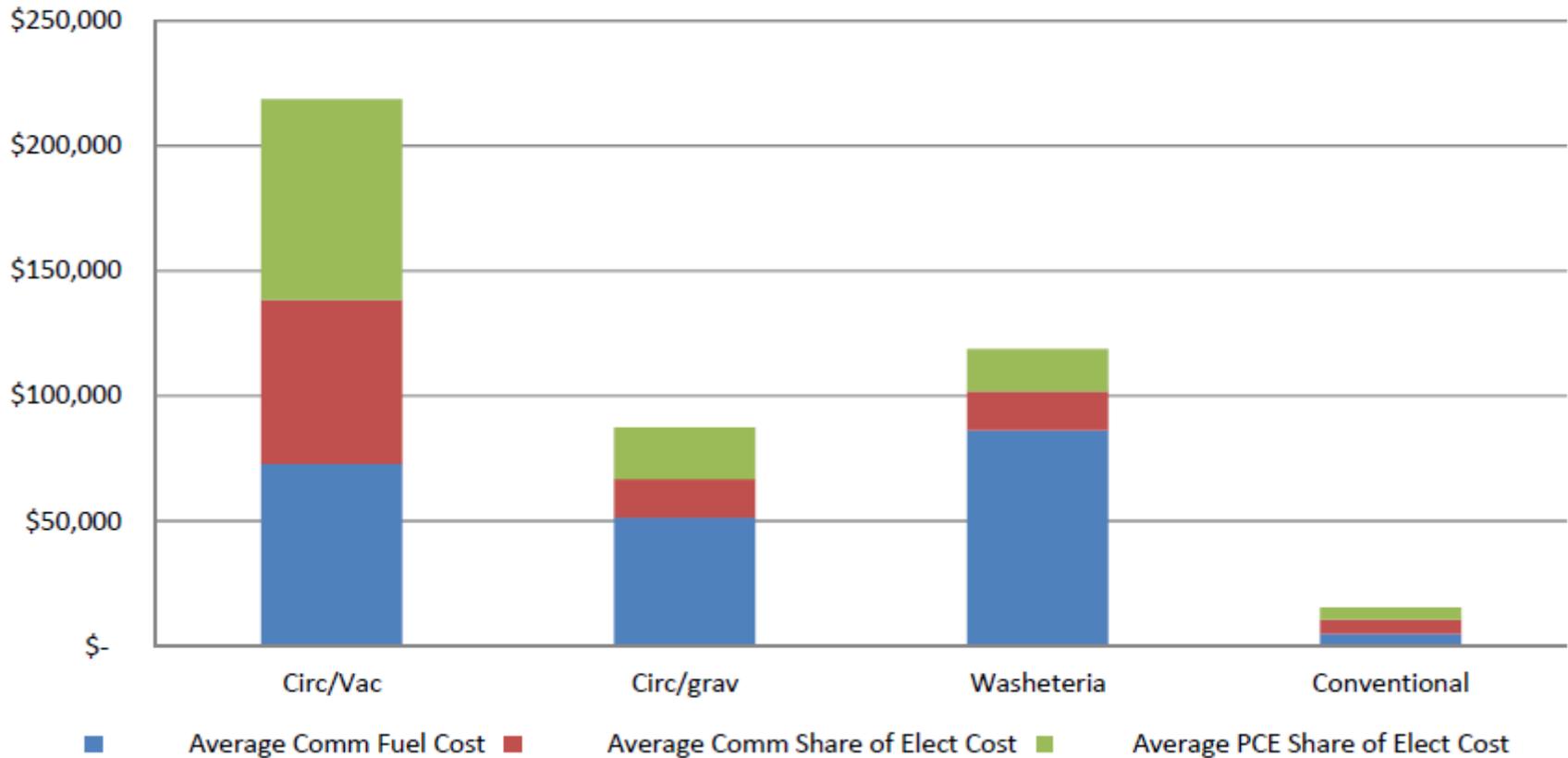
Environmental Health & Engineering



- Funding Hub
- Project Development
- Grant Writing/Management
- Project Management
- Design
- Construction
- Utility Management
- Energy
- Environmental health
- Field Support

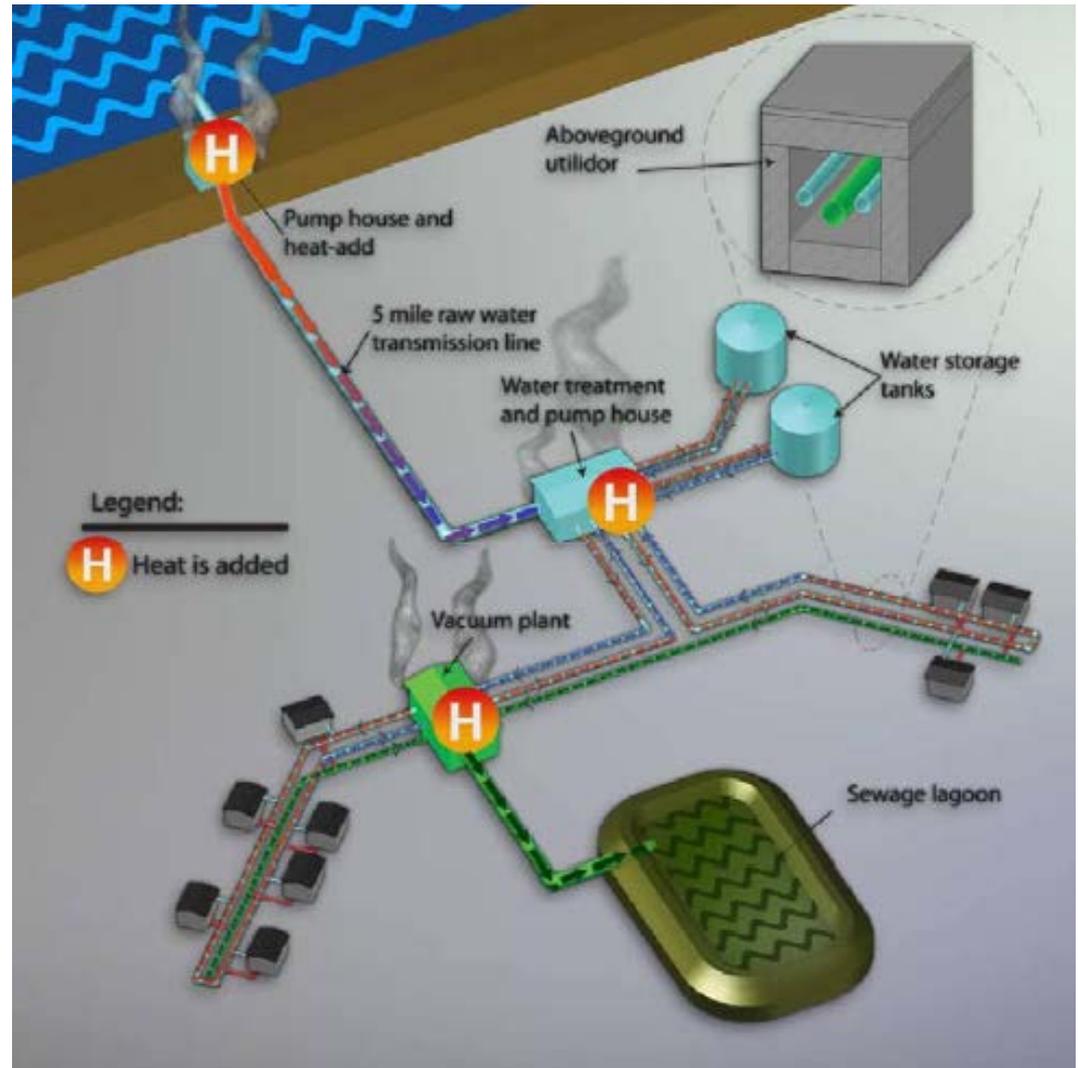
High Cost of Energy/Sanitation

Annual Energy Cost To Operate Various Water Systems



Systems require a lot of added heat.

- Fresh Water Intake
- Circulating Water
- Vacuum Plant, Wastewater to Lagoon
- From main to home service connection
- Water Storage
- Space Heating in Water/Sewer Facilities



ANTHC Rural Energy Initiative – Our Purpose

To implement 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



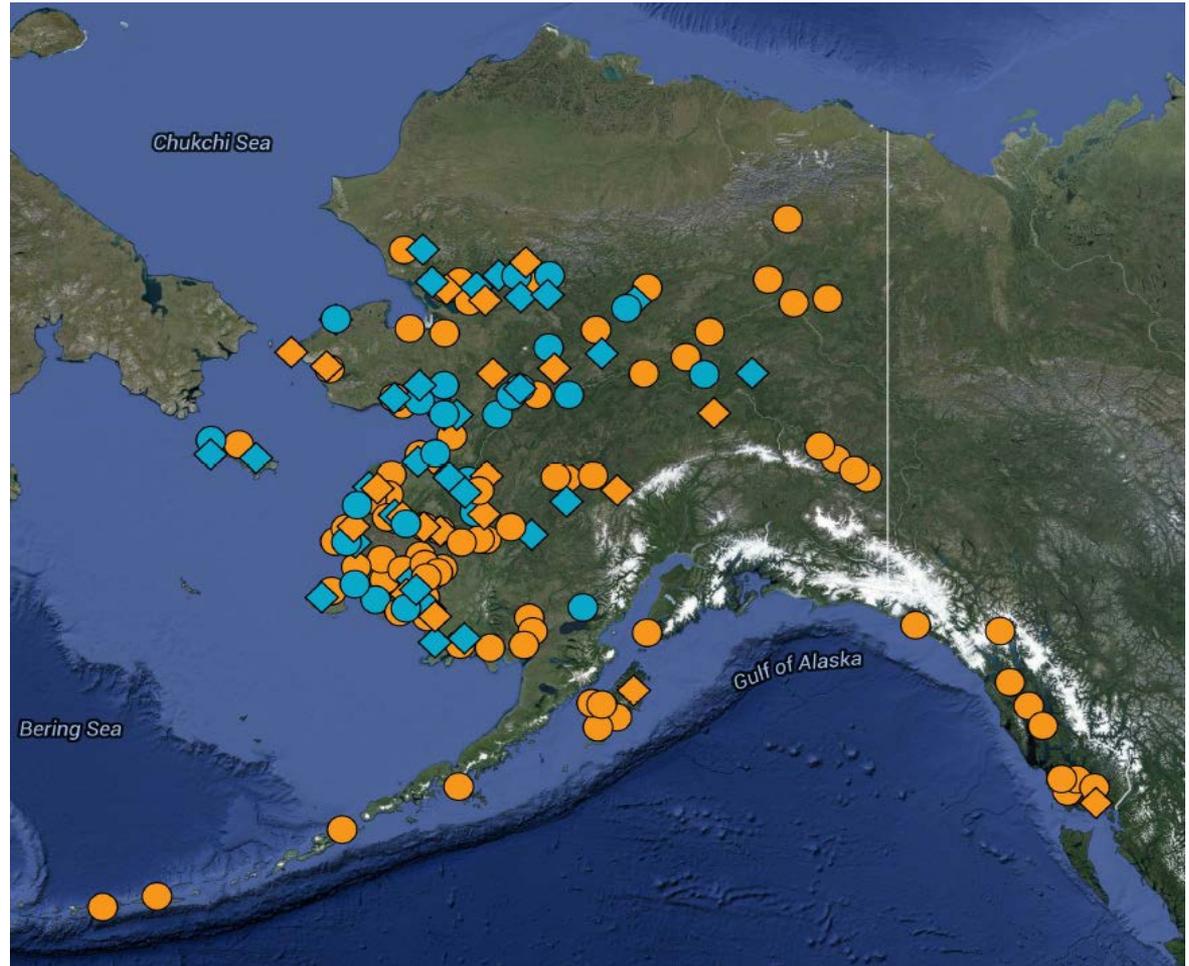
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ANTHC Rural Energy Initiative

Current and Identified Energy Projects

Active Projects = Blue

Identified Projects = Orange



We believe basic sanitation should be efficient, sustainable and affordable



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Our Path to Rural Sanitation Energy Savings



Audit

Onsite Assessment
Collect Data
Evaluate Operating Practices
Assess Facility Energy Use



Analysis

Develop Energy Model
Identify Potential Improvements
Identify Cost to Implement



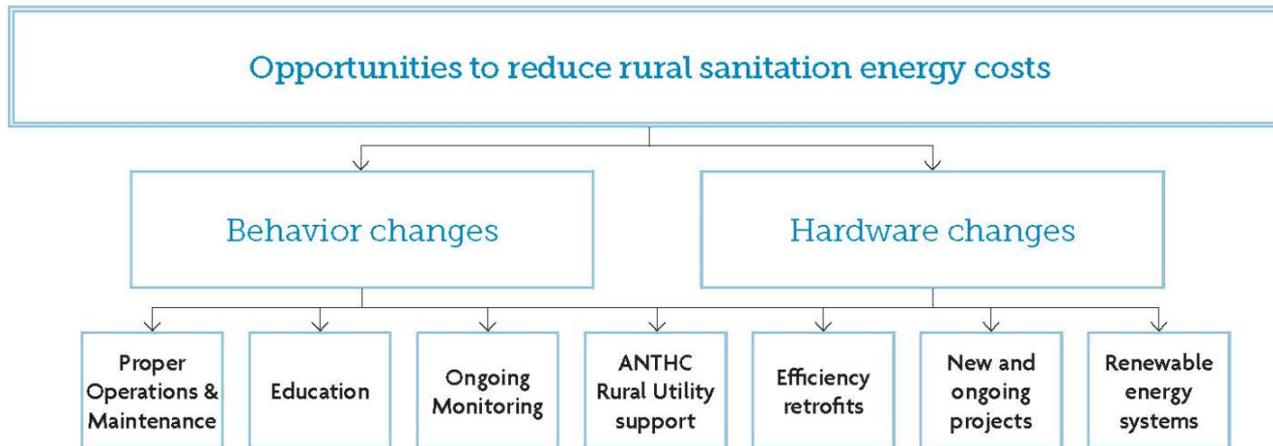
Implement Recommendations

Develop Training Plan
Purchase Materials
Implement Changes
Provide Operator Training
Construct Renewable Energy Systems



Savings

Monitor Energy Usage
Evaluate Effectiveness



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

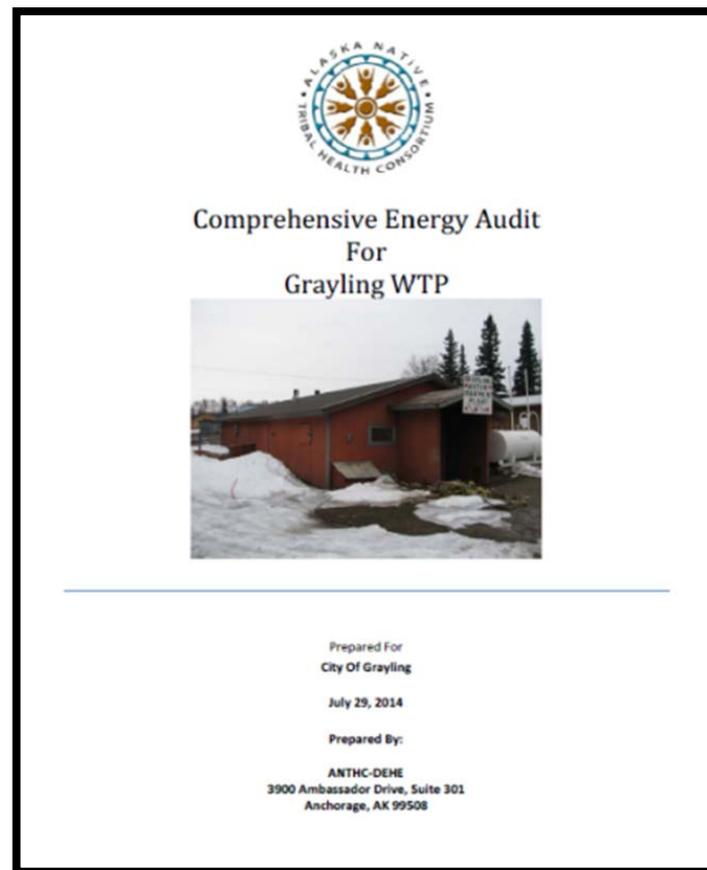


DOE Intertribal TA Providers Network: ANTHC Statewide Intertribal Energy TA - **Summary**

- Provide TA coverage for all regions of Alaska
- Partner with other Intertribal TA recipients and non-recipient regions to coordinate and prioritize projects
- **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 is focused 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's 3-Year Intertribal TA - Deliverables

- 15 Level Three Energy Audits
- 15 Material Take-Offs 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





Rural Energy

Rural Energy Reports & Audits

Rural Energy Project Case Studies

Rural Energy Initiative

Rural Energy Technical Assistance Project

Rural Energy Technical Assistance Project

Distributing assistance to the rural community



DOE Intertribal TA Providers Network:

TA Requests can be made online: anthc.org/what-we-do/rural-energy

Apply for Technical Assistance

Use this online form to request technical assistance from the Alaska Native Tribal Health Consortium for planning and implementing renewable energy and energy efficiency projects.

To help us determine whether your request fits within the program's scope and can be addressed with available resources, please provide the information below and then click on "Submit" button.

[Technical Assistance Request](#)

Rural Energy Initiative
(907) 729-3942
energy@anthc.org

DOE Intertribal Technical Assistance Provided – Year 1



Audits

1. Seldovia, AK – Multi-purpose tribal building
2. Seldovia, AK – Clinic
3. Yakutat – Water Treatment Plant
4. Tyonek – Water Treatment Plant
5. Akiachak – Multi-Community Bldg Audits



Material Take-Off / Training Plans

1. Yakutat WTP Energy Efficiency Upgrades
2. Tyonek WTP Energy Efficiency Upgrades
3. Arctic Village Solar Upgrade/Rehab – In Progress



Feasibility Studies

1. Unalakleet – Power System Optimization, wind-to-heat control optimization
2. Scammon Bay Heat Recovery
3. Togiak Heat Recovery



Design Reviews

1. Mountain Village – Water System Pump House Wind-To-Heat Design Review
2. Metlakatla – Ground Source Heat Pump Project Design Review
3. Togiak Heat Recovery - upcoming
4. Grayling Heat Recovery - upcoming
5. Huslia Biomass - upcoming



Assisting in Finance Identification

- St. Mary's Heat Recovery - loan financing



Regional Energy Coordination Meetings

- Barrow (North Slope Borough)
- Fairbanks (Tanana Chiefs Conference)
- Gulkana (Ahtna Region)
- Chugachmiut (Southcentral Alaska – 7 communities)
- SWAMC (Southwest Alaska : Aleutian/Pribilofs, Bristol Bay, and Kodiak)
- Bethel (Yukon-Kuskokwim Region)



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

- Successfully acquire implementation funding for 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 to develop more energy projects in the future



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 through 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



Energy Efficiency & Alternative Energy Solutions



Energy Efficiency:

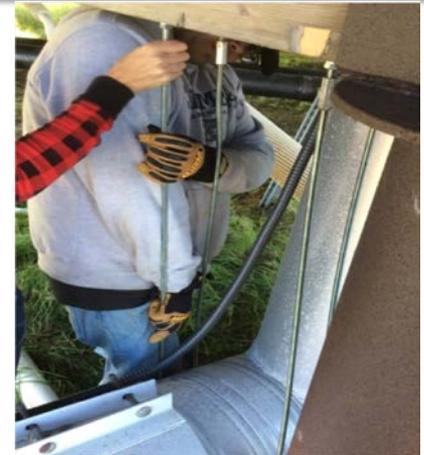
Energy Efficiency Retrofits & Training– Kwigillingok, Alaska

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:

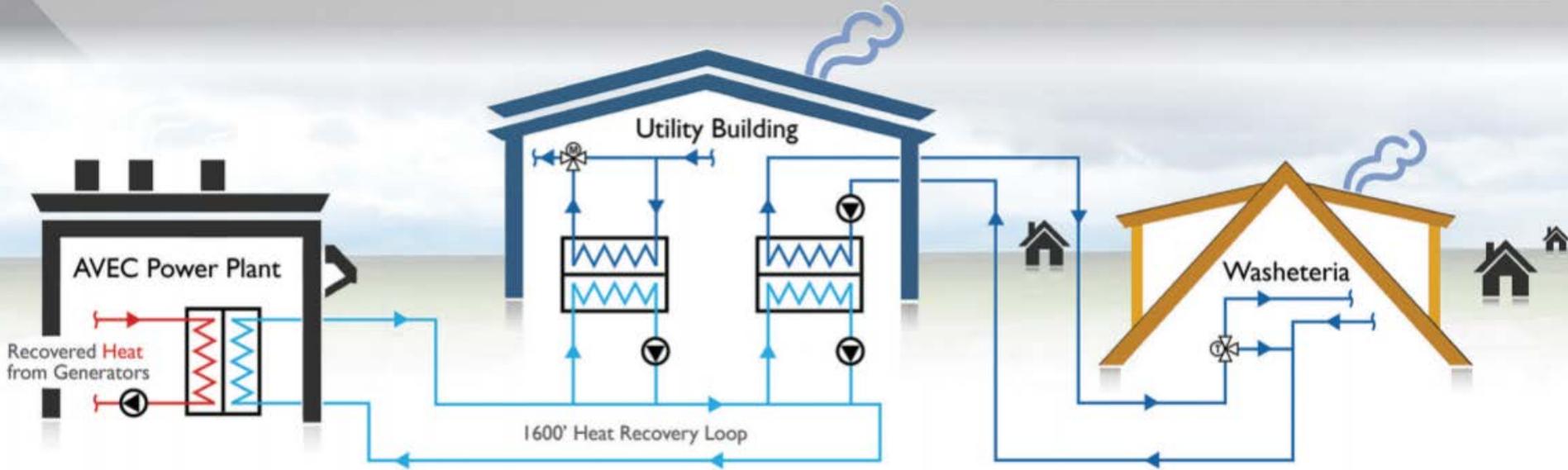
- Reduced mold risk
- More time efficient and effective clothes drying
- Increased operators' technical capacity and job skills
- Increased safety by reduction in fire risk and improved lighting



Sanitation Energy Efficiency Training



Case Study: Quinhagak Heat Recovery



In collaboration with the Alaska Energy Authority, Alaska Village Electric Cooperative (AVEC), and ANTHC's Alaska Rural Utility Collaborative program, in December 2015, the heat recovery system was brought online in Quinhagak, Alaska. This system captures waste heat from the existing AVEC power plant and uses it to heat the community's washeteria and combined utility building. Recovered heat, measured and metered in BTUs, is sold by the power utility to the community at 30 percent of the cost of fuel oil.

With the system now fully operational, it is expected that the community will reduce their annual heating fuel usage by 14,200 gallons, for a fuel savings of almost \$64,000 per year. Net savings after recovered heat sales cost is expected to be \$45,000 per year.



1 AVEC Radiator manifold and heat recovery pipelines



3 Washeteria heat recovery branchline piping

Case Study: Hughes Biomass



In 2013, Hughes received funding through the State's Alaska Energy Authority to design and construct a biomass boiler to heat the community's water system and City/Tribal office. Thanks to the combined efforts of ANTHC's Rural Energy Initiative team, the Interior Regional Housing Authority, and the City of Hughes, the biomass project was completed in summer 2015. It is anticipated that the Hughes biomass project will help the community reduce its annual energy consumption by \$38,923.

Of the overall \$38,923 annual savings, \$16,322 goes to local wood cutters for supplying cordwood and \$22,601 will be the direct savings to the operation of the Hughes Water Plant and Tribal Building.



Alternative Energy: Solar

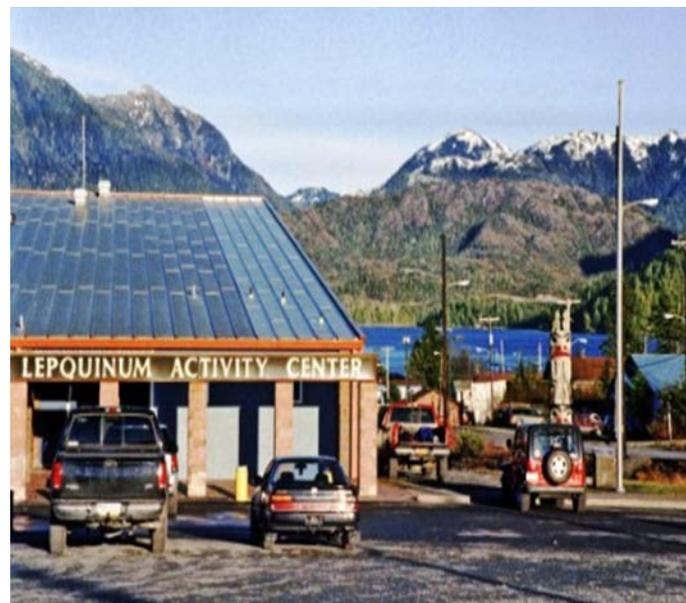
Multi-community water treatment plant solar photovoltaic system installation in Allakaket, Beaver, Holy Cross, New Stuyahok, Newhalen, Pitkas Point, Russian Mission, and Sleetmute

- The scope of this project is to provide solar photovoltaic systems to produce electricity for water treatment plants in these eight rural communities. In these communities, the average homeowner spends roughly 19 percent of their annual income to meet household energy needs. The solar photovoltaic systems will be comprised of 22 to 44 solar panels, each sized to meet the needs of the community's water plant. This project aims to reduce electricity costs for these high energy cost rural communities by an estimated \$61,808 annually.



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
 - Convert heating system from 180 deg to 115 deg
 - New heating coils in air handling units



ANTHC Remote Monitoring

Map Data Charts and Reports Custom Reports Training Videos and Project Reports System Administrator

Charts and Reports

Group: All Facilities Facility: Office DEMO Report: Current Sensor Values Refresh Data

Current Values: Office DEMO

Sensor	Value	Unit	When
Weather			
Anchorage Airport Temperature	21.92	°F	4.1 minutes ago
Heat Recovery, Emmonak			
Heat Output to City	642	kBtu/hour	8.9 minutes ago
Total Heat to City	3,322,944	kBtu	8.9 minutes ago
Flow Rate to City	67	gpm	8.9 minutes ago
Temperature Out to City	177.1	°F	8.9 minutes ago
Temperature Return from City	155.2	°F	8.9 minutes ago
Temperature Middle Return	154.3	°F	8.9 minutes ago
Miscellaneous			
Office Temperature	72.14	°F	9.0 minutes ago
Office milli-amp DEMO	0	Amps	8.2 minutes ago
Dry Contact Switch	0	1=On 0=Off	5.1 minutes ago
Vibration DEMO	0	1=On 0=Off	0.9 minutes ago

Additional Building Documentation for Office DEMO:

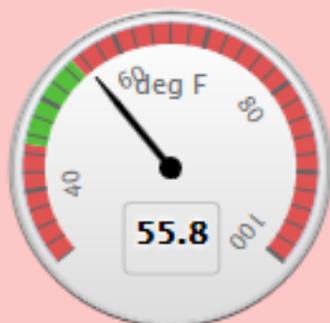
Manager: Timothy Eby P:(907)729-4007 E:tjeby@anthc.org

Charts and Reports

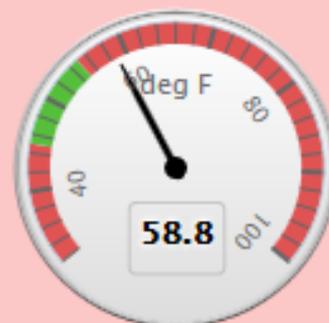
Group: Facility: Report:

White Mountain Dashboard

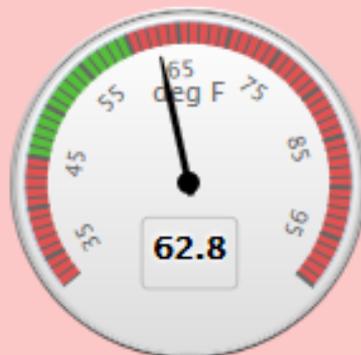
Circulation Loop Supply Temperature



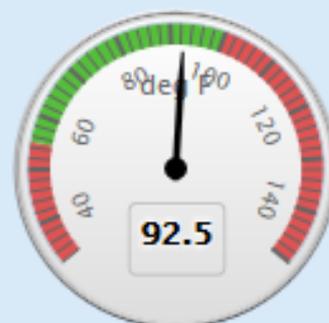
Circulation Loop Return Temperature



Loop supply to City Shop



Loop Return from City Shop



Thank You

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

