Rural Energy Initiative

The Alaska Native Tribal Health Consortium’s (ANTHC) Environmental Health and Engineering team provides planning, design, construction, and operations support for sanitation and health care facilities throughout Alaska. These services contribute to ANTHC’s vision that Alaska Native people are the healthiest people in the world by providing preventative health care via access to clean water, sewer and health facilities. In 2010, ANTHC created the Rural Energy Initiative to address the high cost of operating rural sanitation infrastructure. The Rural Energy Initiative works with communities to implement energy efficiency and renewable energy solutions to make public sanitation and other critical infrastructure sustainable and affordable for the people we serve across Alaska.

Importance of Energy Savings in Rural Water and Sewer

Providing clean water and sewer for remote communities with no road access in extremely cold climates presents unique challenges, including exceedingly high energy usage and high energy costs. On average, energy costs represent 39 percent of the total cost of providing public sanitation in rural Alaska, with electricity costs as high as $1/kilowatt hour, and heating fuel costs over $10 per gallon in some locations. Water and sewer bills in rural Alaska can be as high as $250 per month, and 3 to 8 percent of median household income. These factors pose a direct threat to the sustainability of public sanitation across rural Alaska.
Our Path to Rural Infrastructure Energy Savings

ANTHC’s Rural Energy Initiative works directly with rural communities to lower the operating costs of sanitation and other critical infrastructure by employing a comprehensive and multi-faceted approach. Our approach includes:

**Audit**
- Onsite Assessment
- Collect Data
- Evaluate Operating Practices
- Assess Facility Energy Use

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

**Analysis**
- Develop Energy Model
- Identify Potential Improvements
- Identify Cost to Implement

**Monitor Savings**
- Monitor Energy Usage
- Evaluate Effectiveness

**Energy Services We Provide:**

**Technical Assistance** – Developing reliable engineering documents and appropriate financial assessments to provide rural communities with the tools necessary to seek grant and loan financing to implement their energy projects. (Visit ANTHC.org/energy to apply for assistance.)

**Energy Efficiency and Training** – Implement energy efficiency retrofits and provide personalized operator training so that operators can run their sanitation facilities more efficiently and maintain energy savings for communities for years to come.

**Project Management** – Renewable energy projects such as biomass, wind to heat, heat recovery, hydroelectric, and solar can offer high impact energy solutions for rural Alaska. ANTHC assists communities in identifying renewable energy projects that are appropriate for each community, completes engineering feasibility analyses, seeks funding to implement projects, and provides project management for design and construction of energy systems.

**Remote Monitoring** – Monitoring equipment is installed to remotely monitor sanitation system’s performance and maintain information on energy usage. ANTHC’s approach is to use simple, off-the-shelf components that are easily accessible and inexpensive to install. In addition, a user-friendly online interface makes it easy to navigate monitoring data. Monitoring key water plant performance measures enables operators and statewide assistance providers to prevent catastrophic failure and ensure maximum energy efficiency.

**Our Numbers to Date**
- 111 COMMUNITIES SERVED
- 80 FACILITY ENERGY AUDITS
- 61 ENERGY PROJECT FEASIBILITY STUDIES
- 44 ENERGY EFFICIENCY RETROFIT PROJECTS
- 34 ALTERNATIVE ENERGY PROJECTS
- 28 REMOTE MONITORING SYSTEMS

**Our Impact**

**Projected annual savings for energy projects implemented through fiscal year 2016.**

$2,524,300

**Energy Program Funding Sources**

| Fiscal Year | Total Funds Awarded
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<tr>
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<tbody>
<tr>
<td>2012</td>
<td>$4,179,436</td>
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<tr>
<td>2013</td>
<td>$4,786,458</td>
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<tr>
<td>2014</td>
<td>$5,000,701</td>
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<tr>
<td>2015</td>
<td>$6,471,000</td>
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<tr>
<td>2016</td>
<td>$4,304,325</td>
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**State of Alaska 61%**

**USDA RD 7%**

**Denali Commission 10%**

**DOE 10%**

**EPA 7%**

**Other 3%**

Total project funds awarded by fiscal year.
Future Projects and Innovative Solutions

Geothermal Energy Technology

ANTHC has partnered with the Metlakatla Indian Community and the Annette Island Service Unit to design and construct a Ground Source Heat Pump (GSHP) system to serve the Lepquinn Wellness Center in Metlakatla, through funding from the Alaska Renewable Energy Fund.

GSHP systems harness the relatively constant temperature of the subsurface earth as an essentially unlimited renewable energy resource. The proposed GSHP system for the Lepquinn Wellness Center will extract heat from a geothermal loop field on the facility’s property and transfer it to the building’s hydronic heating system via a water-to-water heat pump.

Once complete, Metlakatla’s GSHP system is estimated to reduce the overall energy and operations costs for the Wellness Center by 73 percent, $203,000, in cost savings annually. The new system will displace 47,200 gallons of heating oil per year. Through the savings created by this project, dollars normally spent on heating oil can stay in the local economy and support other important public programs and services.

Solar Power for Water Treatment Plants

In 2016, the U.S. Department of Agriculture Rural Development (USDARD) announced that ANTHC’s Rural Energy Initiative will be receiving funding under the High Energy Cost Grant to provide solar photovoltaic systems to produce electricity for water treatment plants in eight rural communities (Allakaket, Beaver, Holy Cross, New Stuyahok, Newhalen, Pitkas Point, Russian Mission and Sleetmute). The solar photovoltaic systems will be comprised of 22 to 44 solar panels sized to meet the needs of the community’s water plant. In these communities, the average homeowner spends roughly 19 percent of their annual income to meet household energy needs. The project’s estimated electricity cost reduction is $61,808 annually.

Energy Education and Outreach

Moving forward, the Rural Energy Initiative would like to develop outreach and educational materials to enhance the impact of efficiency and renewable energy projects and build capacity in rural communities. Our program hopes to achieve this through:

- Increasing the availability of real-time facility energy performance information for local operators and maintenance personnel.
- Purposeful outreach and training during all energy projects to educate, both operators and local administrators, on energy monitoring and system maintenance best practices.
- Using community energy projects as opportunities to conduct K-12 energy outreach at local schools, with assistance from other ANTHC programs and external partner organizations.
- Creating workforce development training focused on energy efficiency and renewable energy systems.

Food security

Through collaboration with other ANTHC and statewide partners, the Rural Energy Initiative is looking at ways to address the food security challenges our rural communities are facing, many of which still rely on the traditional subsistence lifestyle. To overcome the barriers of imported goods and climate impacts to traditional food storage, many Alaskan communities seek local solutions to growing and preserving food, such as greenhouses and refrigerated storage. Yet, managing effective systems like these can be energy intensive and expensive to maintain. For these reasons, we are working on a variety of energy technologies that can complement local food security efforts across Alaska and help sustain our communities and their traditional values.

Waste-to-energy

Our program will explore innovative waste-to-energy technologies that could unlock additional energy resources for rural Alaskan communities. By evaluating the energy potential in local waste streams, such as landfill solid waste and municipal wastewater, and developing methods to capture and make use of this energy as heat or electricity, waste-to-energy solutions could enhance rural community sustainability.
Our Path Forward

**Deliver** – Carry out funded energy audits, efficiency retrofits, renewable projects, remote monitoring and operator training for dozens of communities through collaboration with our rural customers and statewide partners.

**Expand** – Increase the positive impact of the Rural Energy Initiative by expanding energy auditing and retrofit recommendation services to multiple public facilities in rural communities.

**Innovate** – Explore and demonstrate new technologies and approaches to addressing rural energy challenges, including micro wind turbines, combined heat and power, waste-to-energy, energy storage, and heat pump technologies.

**Diversify** – Proactively address Alaska’s funding challenges by working with rural communities to seek new grant and loan opportunities to implement energy efficiency and renewable energy projects.

**Collaborate** – Continue active engagement with local, regional and statewide partnerships to collaboratively develop solutions that address the energy challenges across rural Alaska.

**Share** – Use results of completed energy improvements to develop and share energy “best practices” that can improve energy savings and increase community sustainability across all of rural Alaska.

**Lead** – Build from ANTHC’s rural energy experience and technical capabilities to serve rural customers by orchestrating community-wide strategic energy planning.