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# Reducing Energy Costs for Water Systems in Rural Alaska

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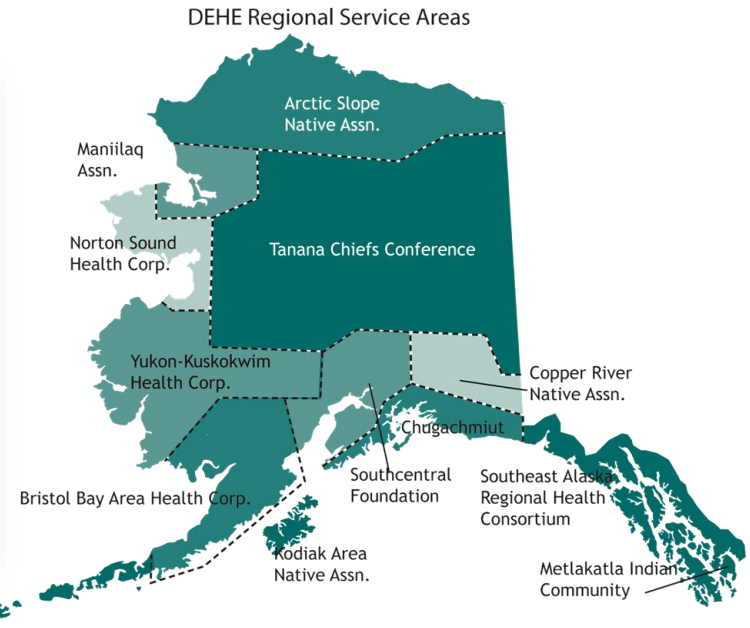


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# Alaska Native Tribal Health Consortium



Aleutian / Pribilof Islands Assn.



In 1998, the Alaska Native Tribal Health Consortium (ANTHC) signed a contract to assume responsibility for many of the Indian Health Service's Alaska Area office programs. Later that year, ANTHC also became a Title III Self-Governance entity by signing the Alaska Tribal Health Compact through the Alaska Tribal Health System (ATHS).



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# Division of Environmental Health and Engineering (DEHE)



Sanitation



Health Facilities and Clinics



Operations and Maintenance (O&M) and Training



Alaska Rural Utility Collaborative (ARUC)

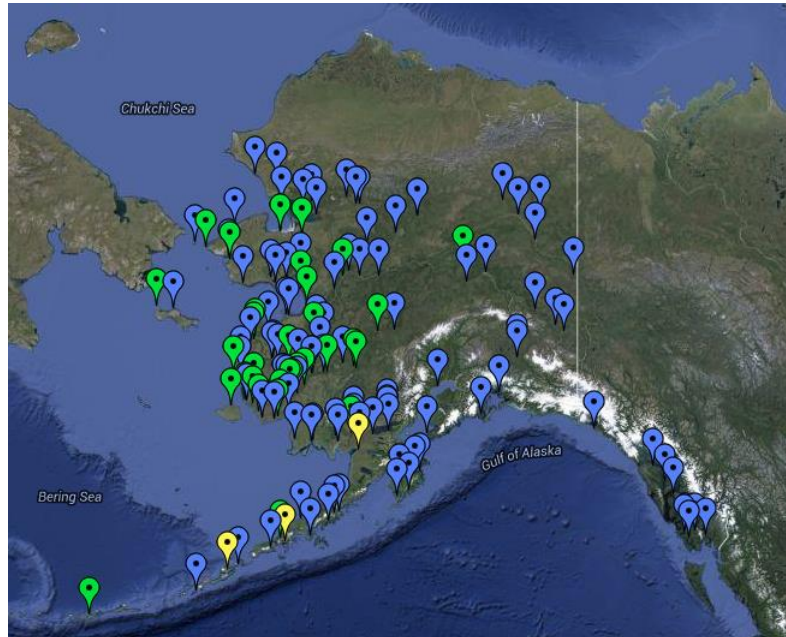


Environmental Health



Energy

# ANTHC Active Projects



## Active Projects in Water & Sewer by Lead



Alaska Native Tribal Health Consortium



State of Alaska Village Safe Water



Municipal Grants and Loans



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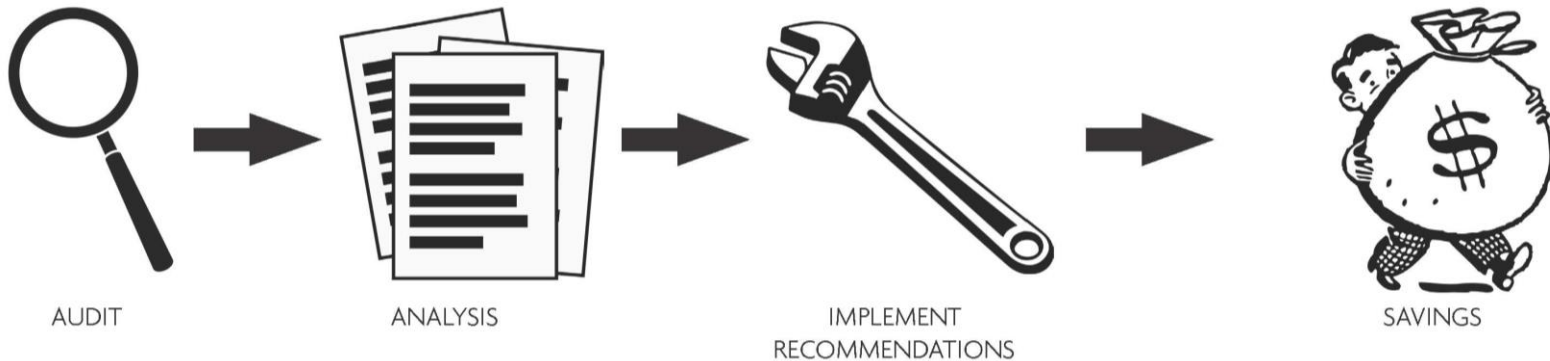
# What is the Rural Energy Initiative?

Recognizing the importance of energy and its high cost to Alaskans living in rural communities, in 2010 the Alaska Native Tribal Health Consortium started a Rural Energy Initiative to implement innovative energy projects that help lower costs and keep money otherwise spent on fuel in the local economy.



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# Steps to Energy Efficiency



Planning & Research  
Contact Community  
Equipment Preparation

*Field Setup  
Facility Modeling/  
Retrofit Evaluation  
Field Closeout*

*Energy Modeling  
Report Writing  
Distribution*

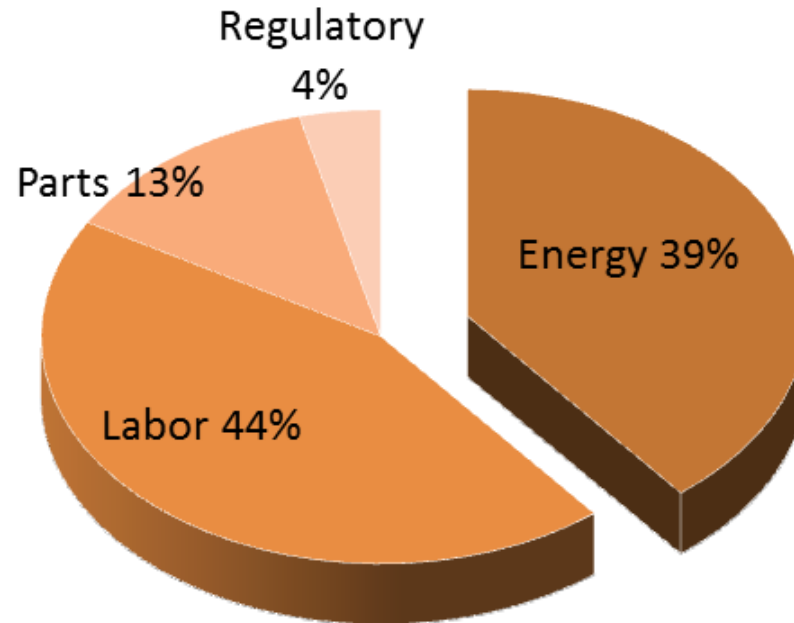
*Data Comparison  
Produce Detailing  
Funding Proposals &  
Funding Requests*



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# What does Energy have to do with Water and Sewer?

Breakdown of operating costs of an average water/sewer plant in rural Alaska:



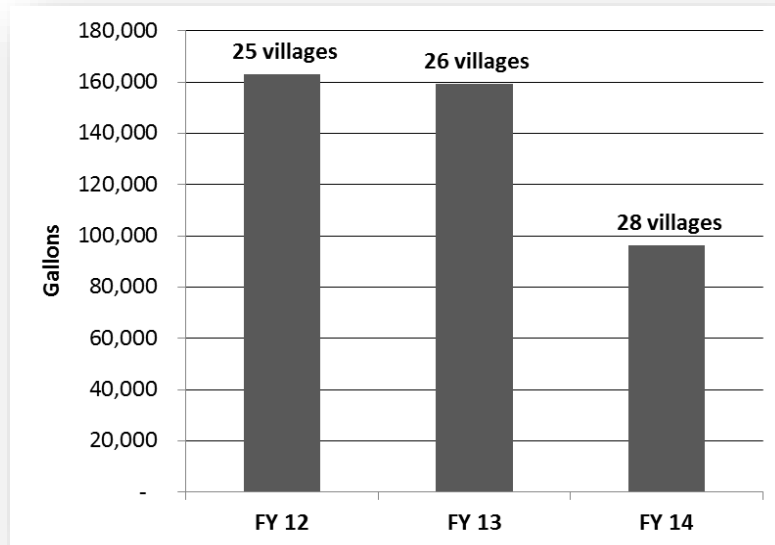
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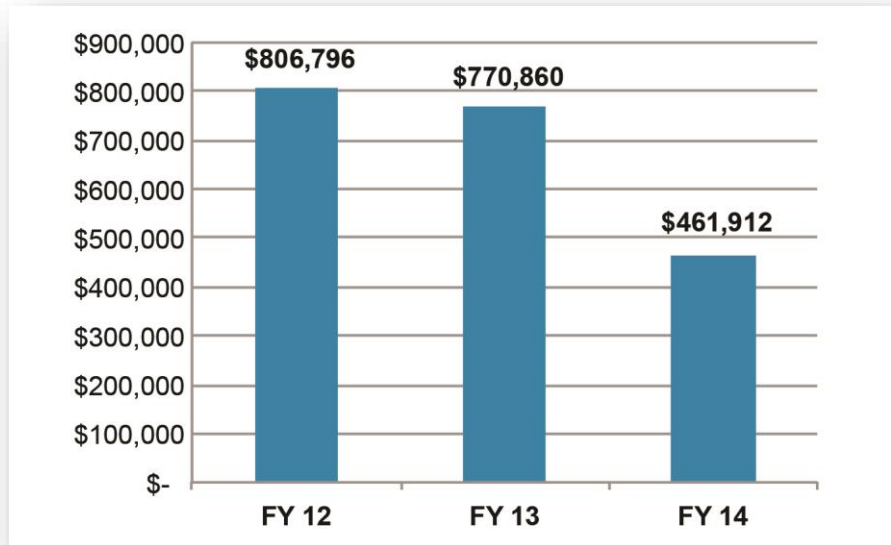
ARUC  
Alaska Rural Utilities Cooperative

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# Value of Energy Efficiency in Water and Sewer Systems



ARUC Fuel Purchases



Cost of Fuel Purchased by Fiscal Year

\*data based off ARUC financial information



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# How Can We Save Energy Costs

## ANTHC's Approach:

### Renewable Energy Projects

- Biomass
- Heat Recovery
- Wind to Heat

### Energy Efficiency Projects

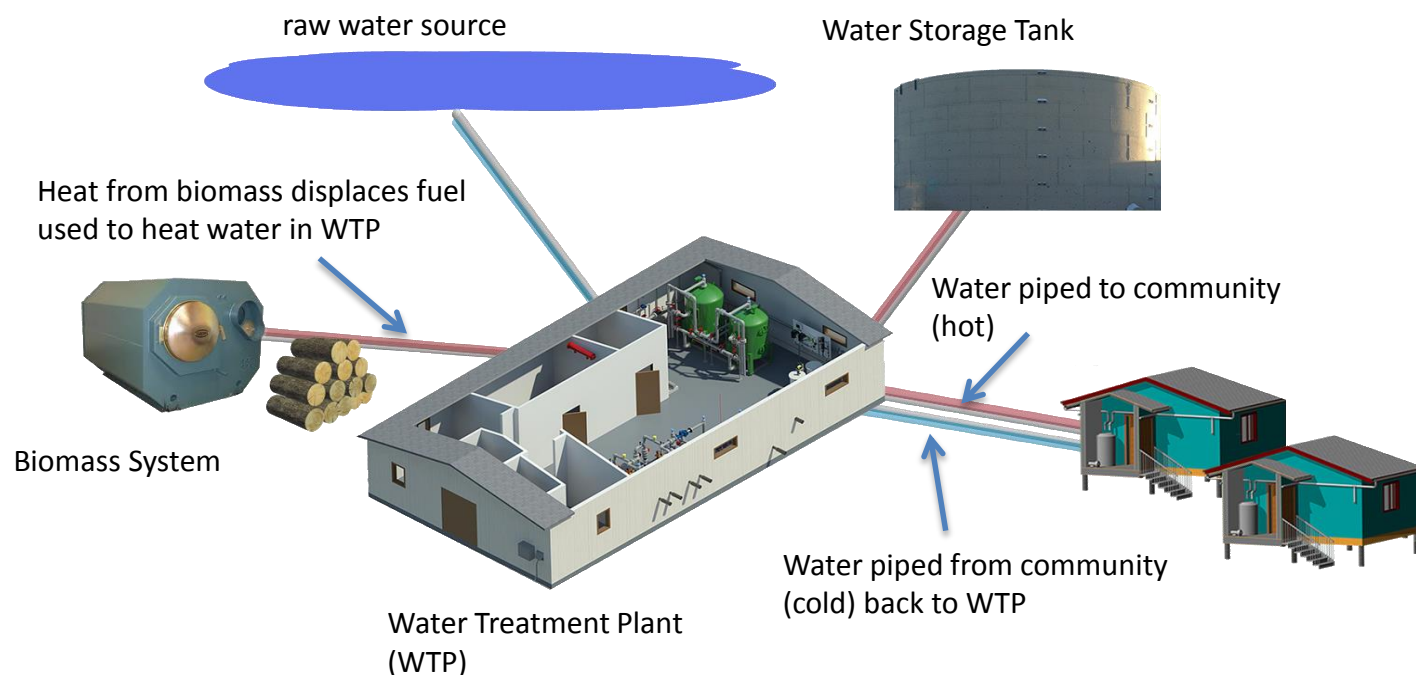
- Retrofit
- Remote Monitoring
- Training



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# Renewable Energy: Biomass

Locally sourced cord wood is used to create heat and is then redistributed to heat water in the water treatment plant.



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# Elim Biomass

Elim has reduced its imported fuel oil demand by 5,000 gallons annually\*. The resulting savings has lowered utility bills by \$9,000, while paying local wood cutters \$15,000.

\*In 2013 fuel pricing, equivalent to \$24,000

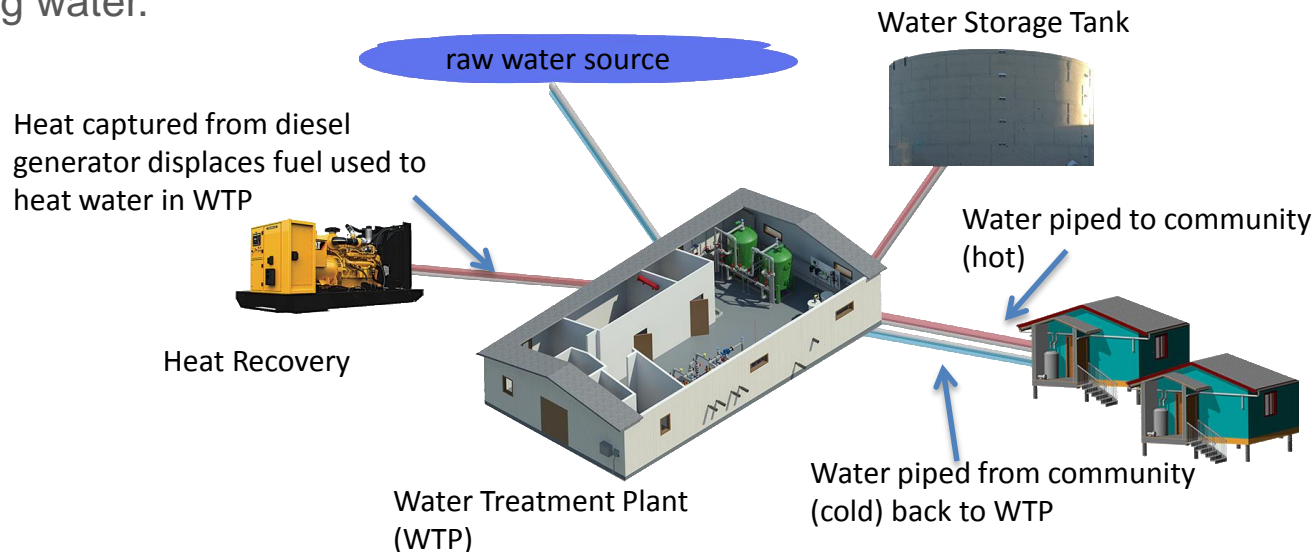


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# Renewable Energy: Heat Recovery

Diesel generators expel up to 70% of the energy from fuel inputs as heat. Only 30% goes towards creating electricity.

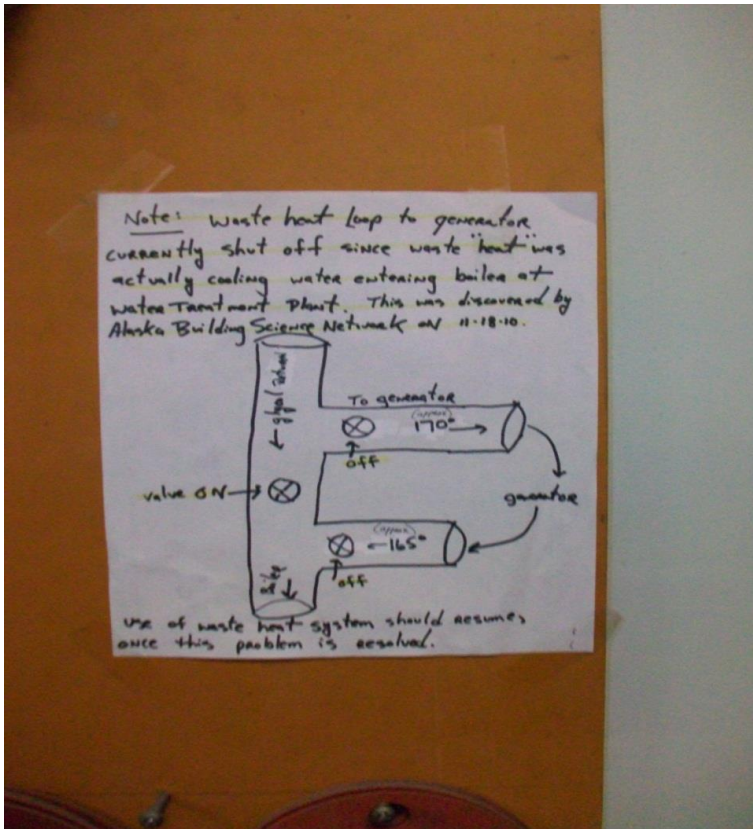
ANTHC has partnered with the Alaska Village Electric Cooperative and local power companies to recover the “waste heat” and redistribute it for heating water.



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# Deering Heat Recovery



ARUC rebuilt the recovered heat system in the winter of 2013 and **reduced fuel costs by \$48,934.86.**

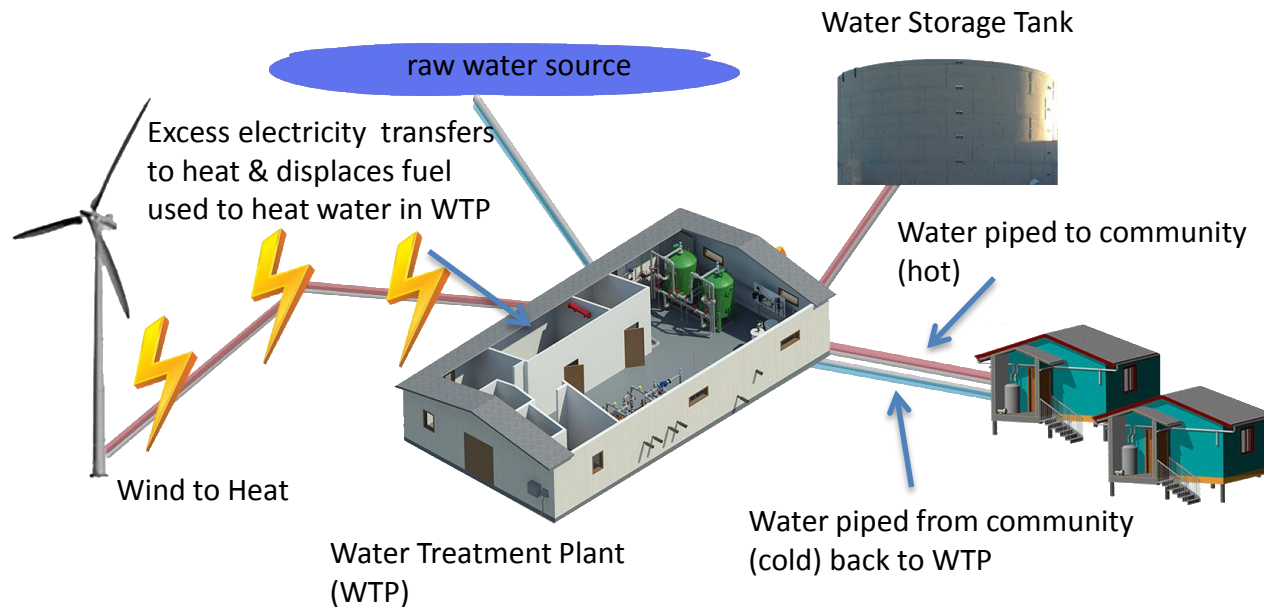
**Each household was able to save \$150/month due to the reduced fuel use.**



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# Renewable Energy: Wind to Heat

Wind to Heat systems use the surplus electricity generated from wind turbines during peak wind events to heat water for use in arctic sanitation systems.



# Mekoryuk Wind to Heat



- Potential fuel savings of \$40,000 annually
- Cost of \$0.05 per KWH equivalent to fuel oil at \$1.46 per gallon
- Stabilizes village power grid
- Completed December 2014.
- Three similar systems in construction for: Gambell, Shaktoolik, and Chevak.



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# Energy Efficiency

- **Retrofit:** Anything as large as a new boiler to as small as a light bulb can be upgraded based on findings from energy audits.
- **Remote Monitoring:** Small wireless devices collect and transmit water plant operations information. Potential problems can be identified, corrected and emergencies can be prevented before they become a larger and more costly repair.
- **Training:** Water/sewer operators receive training so that the systems are maintained and operated correctly, efficiently and safely.



# Selawik Energy Improvements



Obsolete and inefficient pumps, controls, lighting, boilers, glycol systems and associated plumbing were replaced.

State funding was used to attract \$702,427 in US Department of Energy funding and \$50,000 in US Environmental Protection Agency funding to improve the recovered heat system and install more efficient boilers.

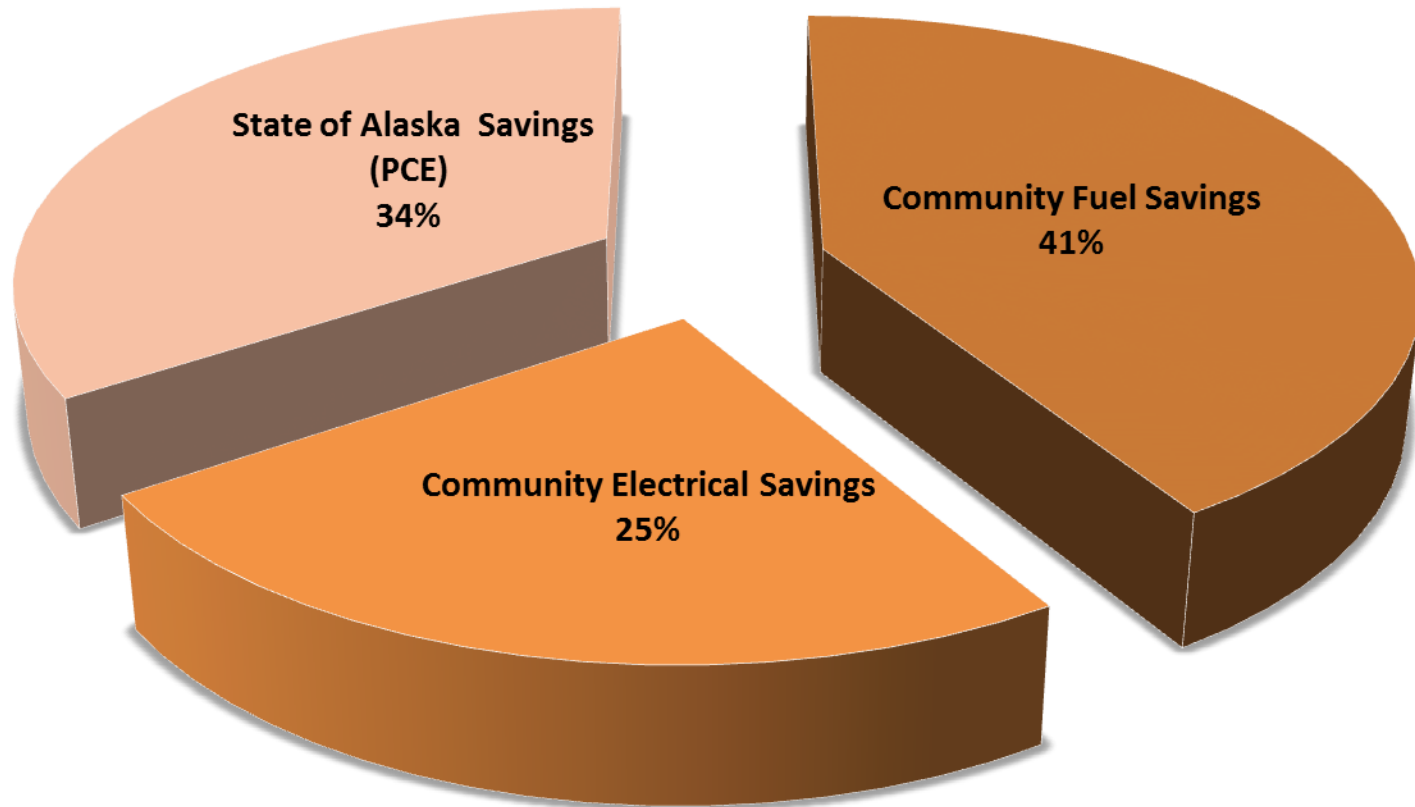
## Selawik Water System Energy Improvements

	% Saved	Annual Savings, \$
Electricity Savings	68%	\$146,719
Fuel Oil Savings	50%	\$40,352
Labor Savings	15%	\$30,156
Total O&M Savings	32%	\$217,227



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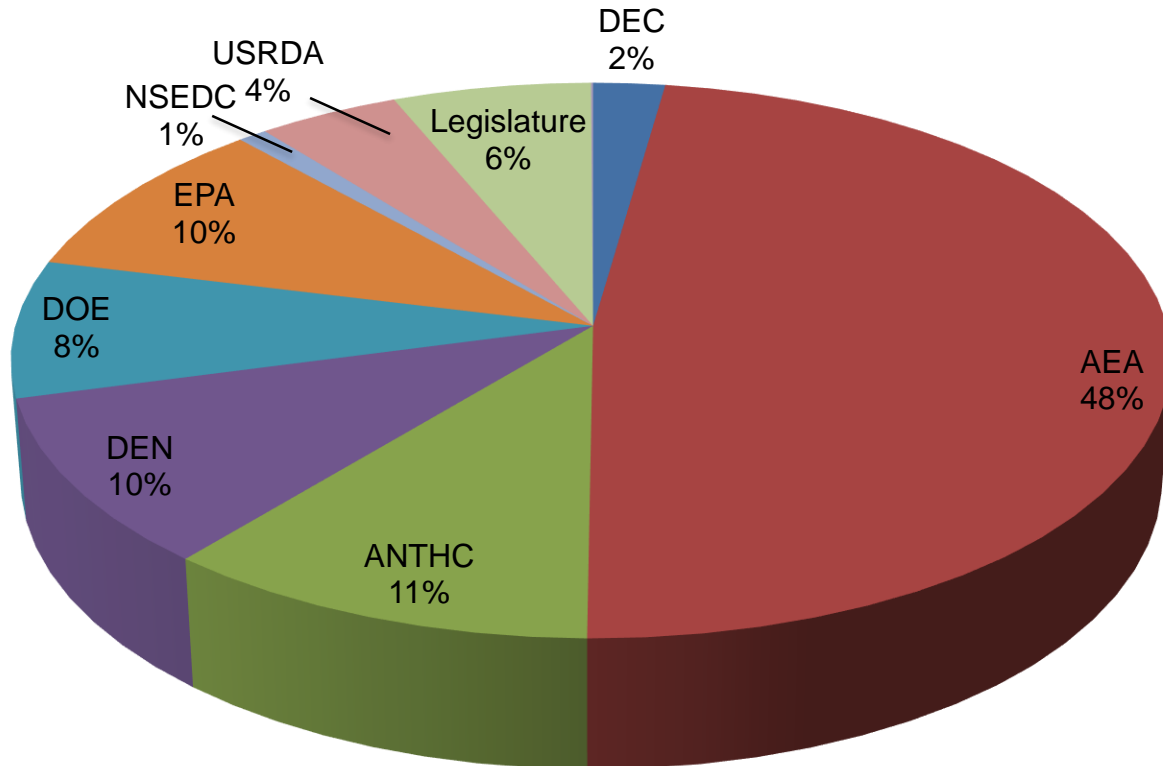
# Who Benefits From Energy Efficiency Projects





# ANTHC Collaborative Efforts

## Energy Program Funding Sources



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# How Are We Moving Forward?

- **Expand ANTHC's Energy Efficiency Program:** Gaining support from funding partners specifically for audits, energy retrofits and training
- **Audits and retrofits** in more than 40 additional communities
- **Work with villages and regional partners** to apply for grants and loans to implement long term recommendations – including renewable energy
- **Monitor results** to capture data and develop “Best Practices”
- **Coordinate with the Alaska Remote Maintenance Worker (RMW) Program** as upgrades are made to enhance long-term regional-level support
- **Provide back-up to local capacity** with Alaska Rural Utility Collaborative (ARUC)
- **Build local capacity** with on-site and AVTEC training



## Alaska Native Tribal Health Consortium

Rural Energy Initiative

Community Project List



	Completed Project	Active Design/Construction	Project Funded					
RHO	Community	Energy Audits	Sanitation Energy Efficiency	Health Clinic Energy Efficiency	Heat Recovery	Biomass	Wind to Heat	Feasibility Study
YKHC	Akiachak							
YKHC	Akiak							
YKHC	Alakanuk							
TCC	Alatna							
TCC	Allakaket							
Maniilaq	Ambler							
YKHC	Aniak							
TCC	Anvik							
YKHC	Atmautluak							
NSHC	Brevig Mission							
Maniilaq	Buckland							
YKHC	Chefornak							
YKHC	Chevak							
YKHC	Chuathbaluk							
YKHC	Eek							
BBAHC	Ekwok							
NSHC	Elim							
YKHC	Emmonak							
TCC	Fort Yukon							
TCC	Galena							
NSHC	Gambell							
NSHC	Golovin							
BBAHC	Goodnews Bay							
YKHC	Grayling							
CRNA	Gulkana							
YKHC	Holy Cross							
YKHC	Hooper Bay							

RHO	Community	Energy Audits	Sanitation Energy Efficiency	Health Clinic Energy Efficiency	Heat Recovery	Biomass	Wind to Heat	Feasibility Study
TCC	Hughes							
TCC	Huslia							
BBAHC	Igiugig							
TCC	Kaltag							
YKHC	Kasigluk							
Maniilaq	Kiana							
YKHC	Kipnuk							
Maniilaq	Kobuk							
BBAHC	Koliganek							
YKHC	Kongiginak							
YKHC	Kotlik							
NSHC	Koyuk							
TCC	Koyukuk							
YKHC	Kwigillingok							
YKHC	Lower Kalskag							
BBAHC	Manokotak							
YKHC	Marshall							
TCC	McGrath							
YKHC	Mekoryuk							
AISU	Metlakatla							
TCC	Minto							
YKHC	Mountain Village							
YKHC	Napaskiak							
TCC	Nenana							
BBAHC	New Stuyahok							
YKHC	Newtok							
YKHC	Nightmute							
TCC	Nikolai							
Maniilaq	Noatak							
BBAHC	Nondalton							
Maniilaq	Noorvik							
TCC	Nulato							
YKHC	Nunam Iqua							
YKHC	Nunapitchuk							
YKHC	Oscarville							
KANA	Ouzinkie							

RHO	Community	Energy Audits	Sanitation Energy Efficiency	Health Clinic Energy Efficiency	Heat Recovery	Biomass	Wind to Heat	Feasibility Study
YKHC	Pilot Station							
YKHC	Pitkas Point							
BBAHC	Platinum							
YKHC	Quinhagak							
TCC	Rampart							
YKHC	Russian Mission							
YKHC	Saint Mary's							
NSHC	Savoonga							
YKHC	Scammon Bay							
Maniilaq	Selawik							
NSHC	Shaktoolik							
NSHC	Shishmaref							
Maniilaq	Shungnak							
YKHC	Sleetmute							
NSHC	St. Michael							
NSHC	Stebbins							
TCC	Tanacross							
TCC	Tanana							
NSHC	Teller							
BBAHC	Togiak							
YKHC	Toksook Bay							
YKHC	Tuluksak							
YKHC	Tuntutuliak							
YKHC	Tununak							
BBAHC	Twin Hills							
NSHC	Unalakleet							
TCC	Venetie							
NSHC	White Mountain							

# Thank you

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For more information, please visit:  
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## **OUR VISION:**

Alaska Native people are the  
healthiest people in the world.



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