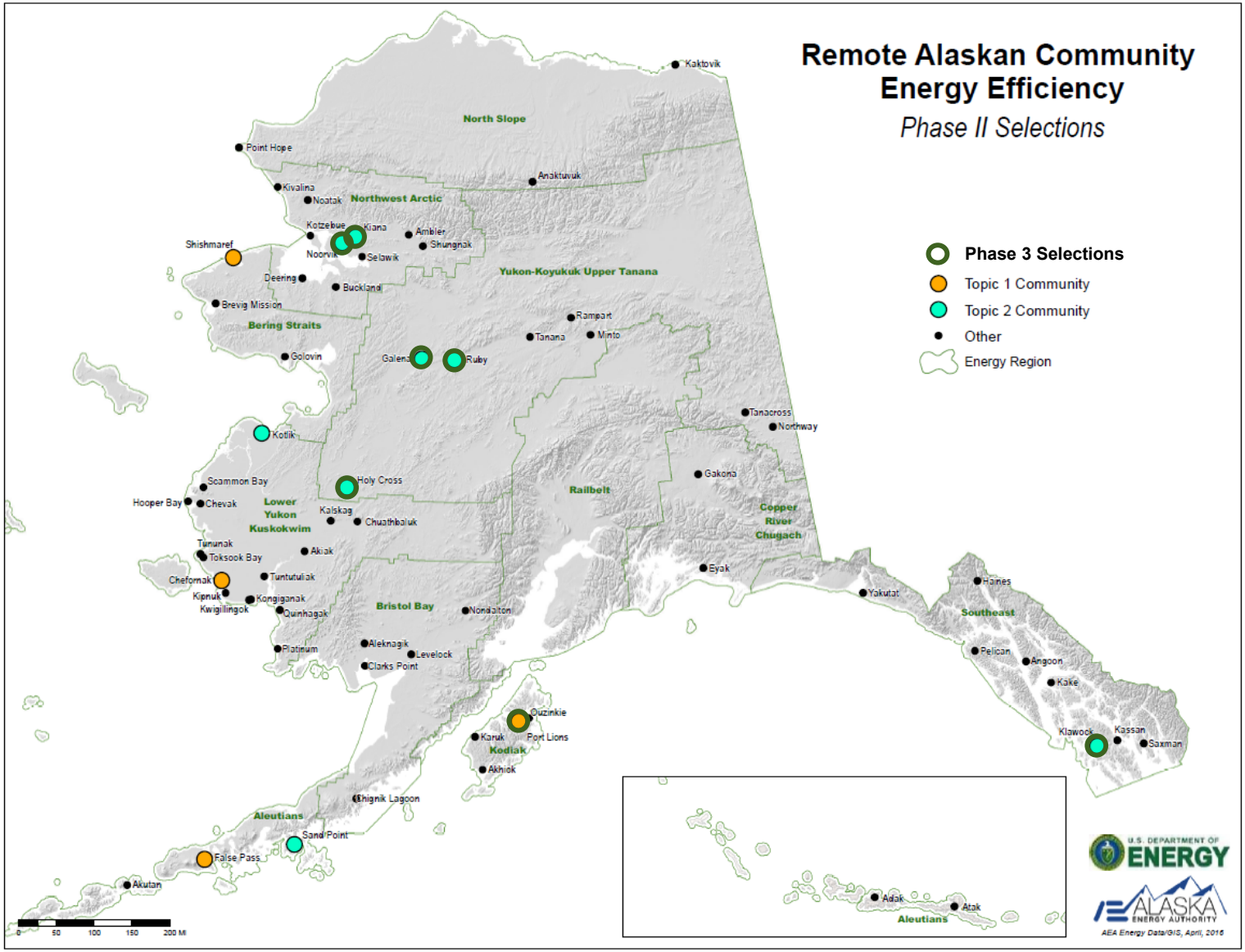
Remote Alaska Communities Energy Efficiency Peer Network

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy



Webinar Operations

- All participants have been automatically muted.
- If you have a question during the presentation, please type it into the Question panel on the right side of your computer screen. We will pose the question at the end.
- Please check the RACEE website after 6/15/17 for a link to the recording and transcription of this webinar.

http://energy.gov/eere/racee-competition-peer-exchange-network

- DOE plans to collect information for announcement on the next Peer Network call.
  - This can include useful information on funding and project ideas and opportunities
  - Email your input to Fletcher.Souba@ee.doe.gov for June's Webinar.

Welcome to the RACEE Peer Network

- The RACEE Peer Exchange Network is intended to provide a fundamental benefit to the 64 communities that pledged to reduce per capita energy usage by 15% by 2020.

- It will consist of three components:
  - RACEE website
  - Monthly technical webinars
  - In-person meetings
    - For, example, the RACEE Competition Summit at end of RACEE Phase 3

- For more details, see the RACEE Website:

http://energy.gov/eere/racee-competition-peer-exchange-network

RACEE Peer Exchange

- The goal of the network is to empower Alaskan communities and native Alaskan villages to develop effective tools to advance the use of reliable, affordable, and energy efficient solutions that are replicable throughout Alaska and other Arctic regions.

- The Department leverages the existing convening power of the AEA and other regional energy efficiency organizations to form the Peer Exchange Network to build a community of energy efficiency information sharing and action by peer exchange through webinars, and events.

Future Webinar Topics

- **Water/Sanitation Efficiency in Alaska Communities**
  - Bailey Gamble (ANTHC)
- **Biomass Heat Recovery Systems**
  - Devany Plentovich (AEA)
- **Heat Recovery Systems and Benefits**
  - Tashina Duttle (ANTHC)
- **Diesel Part 1: Efficiency**
- **Diesel Part 2: Transition from 2-Stroke to 4-Stroke Engines**
- **Line Loss Mitigation**
- **AKEnergySmart - More about Renewable Energy in Alaska**

Sustainability of Rural Water Systems: **Focus on Energy Efficiency**

RACEE Peer Network Webinar
May 31st, 2017

Bailey Gamble, Mechanical Engineer I

ALASKA NATIVE TRIBAL HEALTH CONSORTIUM

Sustainability

"Honoring those who came before us. Meeting the needs of the present generation, not compromising the future so that the coming generations are able to meet their own needs and guide our vision and renew each cycle of life."
– Thunder Valley Community Development Plan

ALASKA NATIVE TRIBAL HEALTH CONSORTIUM

Sustainability: Areas of Focus

Accessibility Connection Affordability

Rural Energy Initiative

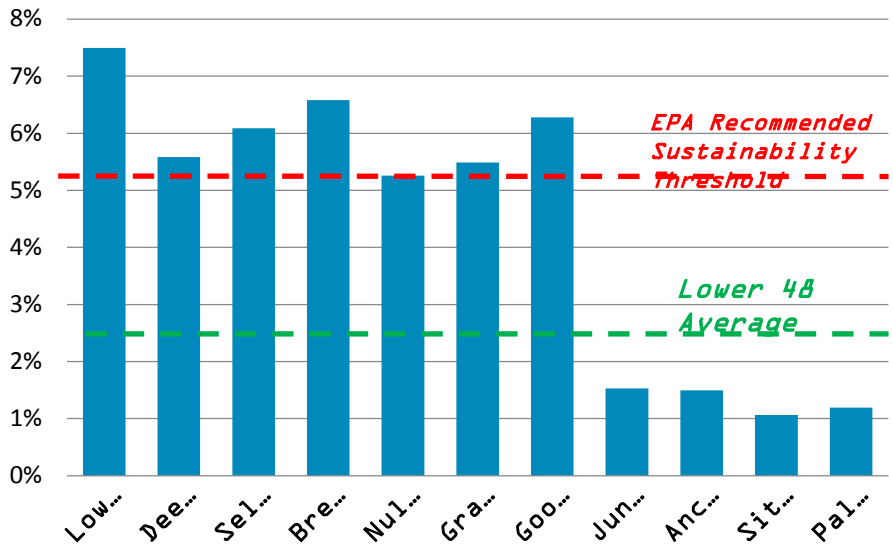
The Alaska Native Tribal Health Consortium's (ANTHC) Rural Energy Initiative works with communities to implement **innovative energy efficiency** and **renewable energy solutions** to make public sanitation affordable for the people we serve across Alaska.

Why is this important?

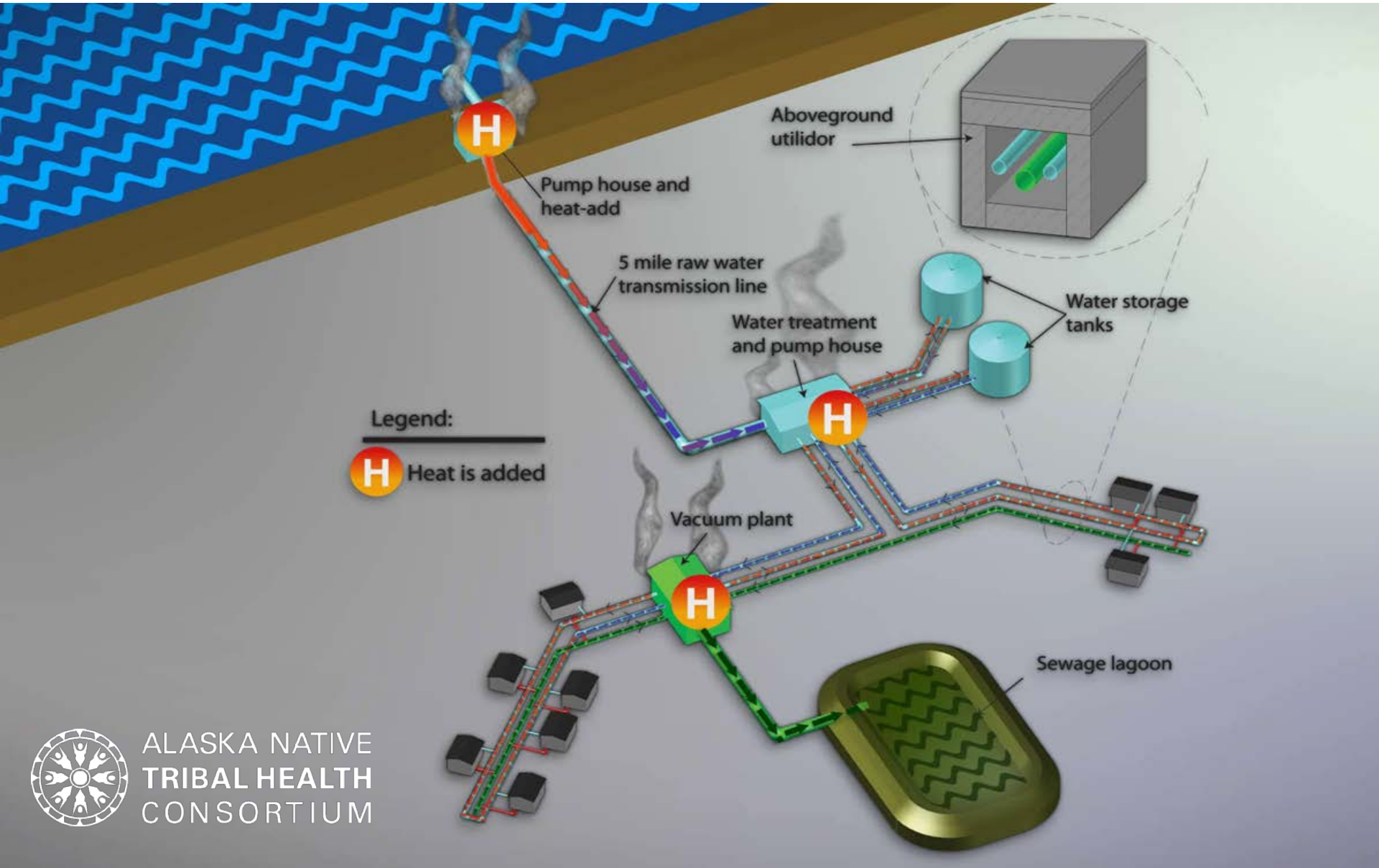
Sanitation systems can consume nearly a third of a community's energy.

High costs are passed down to community members through their monthly bill.

Water and Sewer User Fees as a Percentage of Median Household Income



Why are energy costs so high?



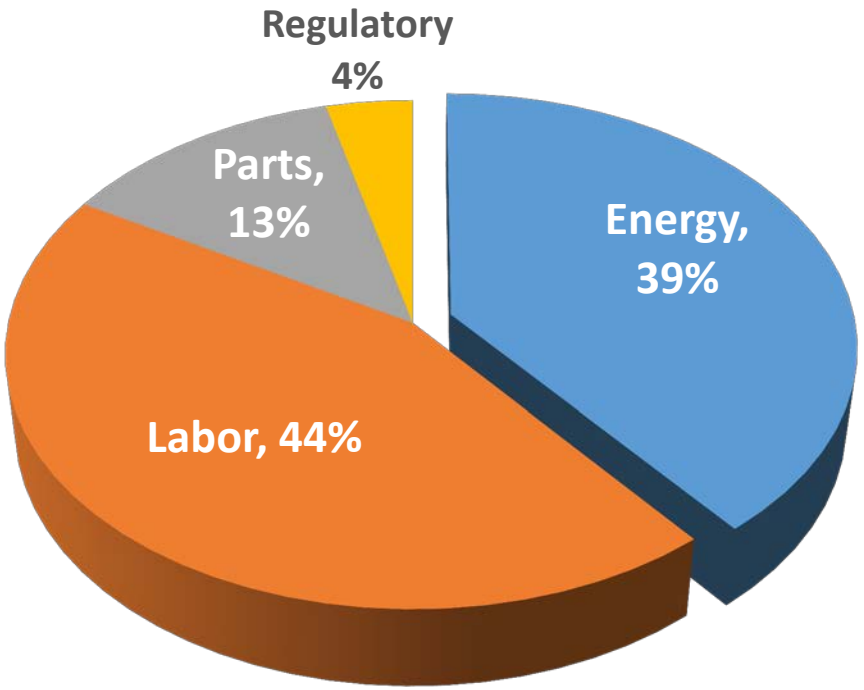
Making Water Affordable

Reducing cost to individual customers:

- Customer funded vs. subsidized or partially subsidized utilities
- Optimizing billing, ensuring that all contribute
- Offering assistance/ affordability programs for low income, disabled or elderly community members

Reducing overall operation and maintenance costs

Operations and Maintenance Costs



Breakdown of average operating costs for a water/sewer system in rural Alaska

Our Path: A Comprehensive and Collaborative Approach

Energy Audit

Onsite Assessment
Collect Data
Evaluate Operating Practices
Assess Facility Energy Use

Analysis

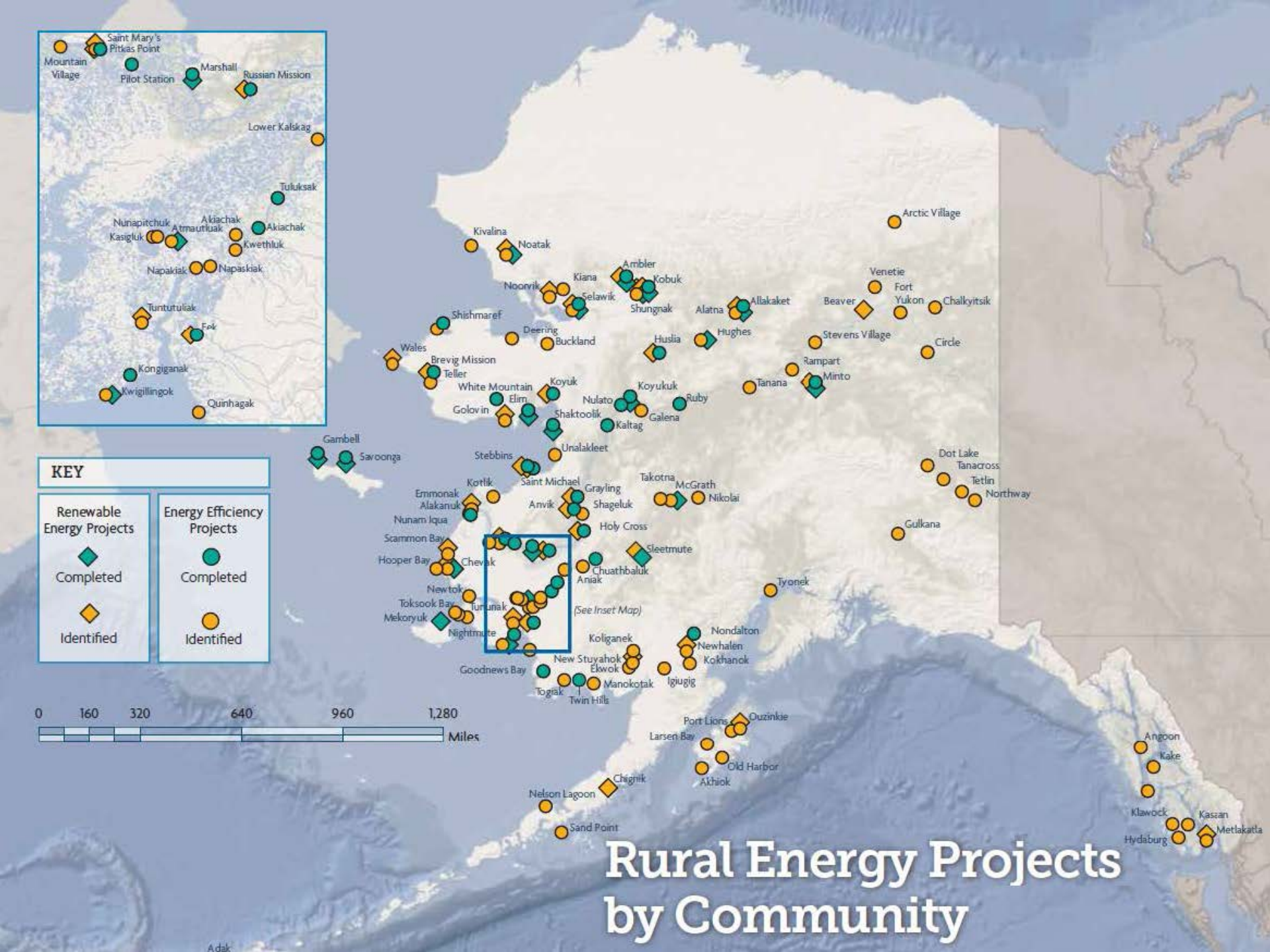
Develop Energy Model
Identify Potential Improvements
Identify Cost to Implement
Assess Financial Opportunities

Implement Recommendations

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

Savings

Monitor Energy Usage
Evaluate Retrofit Effectiveness


Saint Mary's
Pitkas Point
Mountain Village
Pilot Station
Marshall
Russian Mission
Lower Kalskag
Tuluksak
Nunapitchuk
Kasigluk
Atmautluak
Akiachak
Akiachak
Kwethluk
Napakiak
Napaskiak
Tuntutuliak
Eek
Kongiganak
Kwigillingok
Quinhagak
Kivalina
Noatak
Arctic Village
Venetie
Fort Yukon
Chalkyitsik
Beaver
Allakaket
Alatna
Ambler
Kobuk
Shungnak
Kiana
Noorvik
Selawik
Shishmaref
Deering
Buckland
Wales
Brevig Mission
Teller
Huslia
Hughes
Stevens Village
Circle
Rampart
Minto
Tanana
White Mountain
Elim
Golovin
Koyuk
Nulato
Koyukuk
Ruby
Galena
Shaktoolik
Kaltag
Unalakleet
Gambell
Savoonga
Stebbins
Saint Michael
Kotlik
Emmonak
Alakanuk
Grayling
Anvik
Shageluk
Takotna
McGrath
Nikolai
Holy Cross
Nunam Iqua
Scammon Bay
Hooper Bay
Chevak
Sleetmute
Chuathbaluk
Aniak
Dot Lake
Tanacross
Tetlin
Northway
Gulkana
Tyonek
Newtok
Toksook Bay
Tununak
Mekoryuk
Nightmute
(See Inset Map)
Koliganek
New Stuyahok
Ekwok
Goodnews Bay
Togiak
Twin Hills
Manokotak
Nondalton
Newhalen
Kokhanok
Igiugig
Port Lions
Ouzinkie
Larsen Bay
Old Harbor
Akhiok
Chignik
Nelson Lagoon
Sand Point
Angoon
Kake
Klawock
Kasaan
Metlakatla
Hydaburg
KEY
Renewable Energy Projects
Completed
Identified
Energy Efficiency Projects
Completed
Identified
0
160
320
640
960
1,280
Miles
Rural Energy Projects by Community

Kwigillingok Energy Efficiency

In 2016, ANTHC-REI worked with the Village of Kwigillingok to reduce energy consumption in the water treatment plant and washeteria. Through the energy audit, we discovered the potential for the water treatment plant to save over $40,000 annually.

Suggested Retrofits

Change how heat tapes are controlled.

Implement a heating. Setback to 60°F when Unoccupied.

Alternate circ pumps rather than run two simultaneously.

Clean dryer lint traps daily to reduce run time.

Clean and tune boilers and train operators in their troubleshooting and maintenance.

Mountain Village Energy Efficiency

In 2016, ANTHC-REI worked with the City of Mountain Village to reduce energy consumption in their water system. We found the potential to save over $20,000 annually on energy in the upper distribution loop facilities (pump house and two well houses).

Suggested Retrofits

Change boiler controls.

Change heat loop circ pump controls.

Implement a heating setback to 60°F in pump house when unoccupied.

Use heat tape only for freeze-up recovery.

Air seal doors.

Clean and tune boilers and train operators in their troubleshooting and maintenance.

Improve controls and change settings on distribution loop heat add system.

Common Quick Fixes (that can make a big diference)

- Installing programmable thermostats and implementing heating setbacks.
- Changes to heat tape operation – using for freeze-up only.
- Changes to temperature settings on heat add systems.
- Replacing fluorescent bulbs with energy efficient LEDs.
- Air sealing doors to reduce heat loss.
- Clean boilers and tune to increase heating efficiency.

Energy Focused Operator Training

AVTEC/ANTHC

- 2 Weeks @ AVTEC in Seward
- 80% Lab Work
- Focus on Heating Systems, Energy Efficiency, and Skills
- Free Travel, Tuition, Lodging, Food, Weekend Activities
- Potential Boiler Operator Certificate of Fitness 4th class certification
- 8.8 CEU's for water treatment and distribution certifications

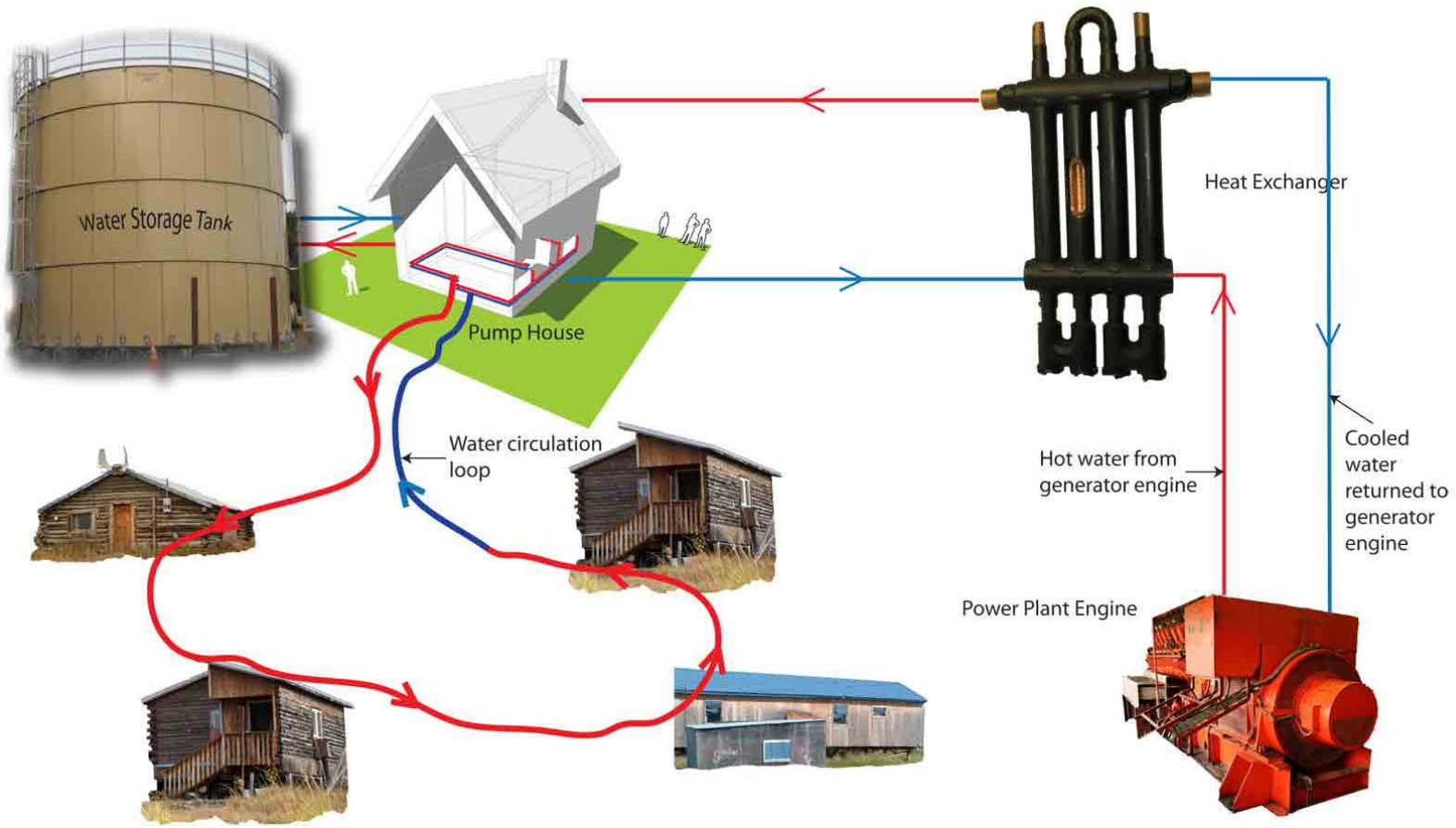
Renewable Energy Projects

Heat Recovery Projects

Woody Biomass Projects

Wind Energy Projects

Heat Recovery Projects



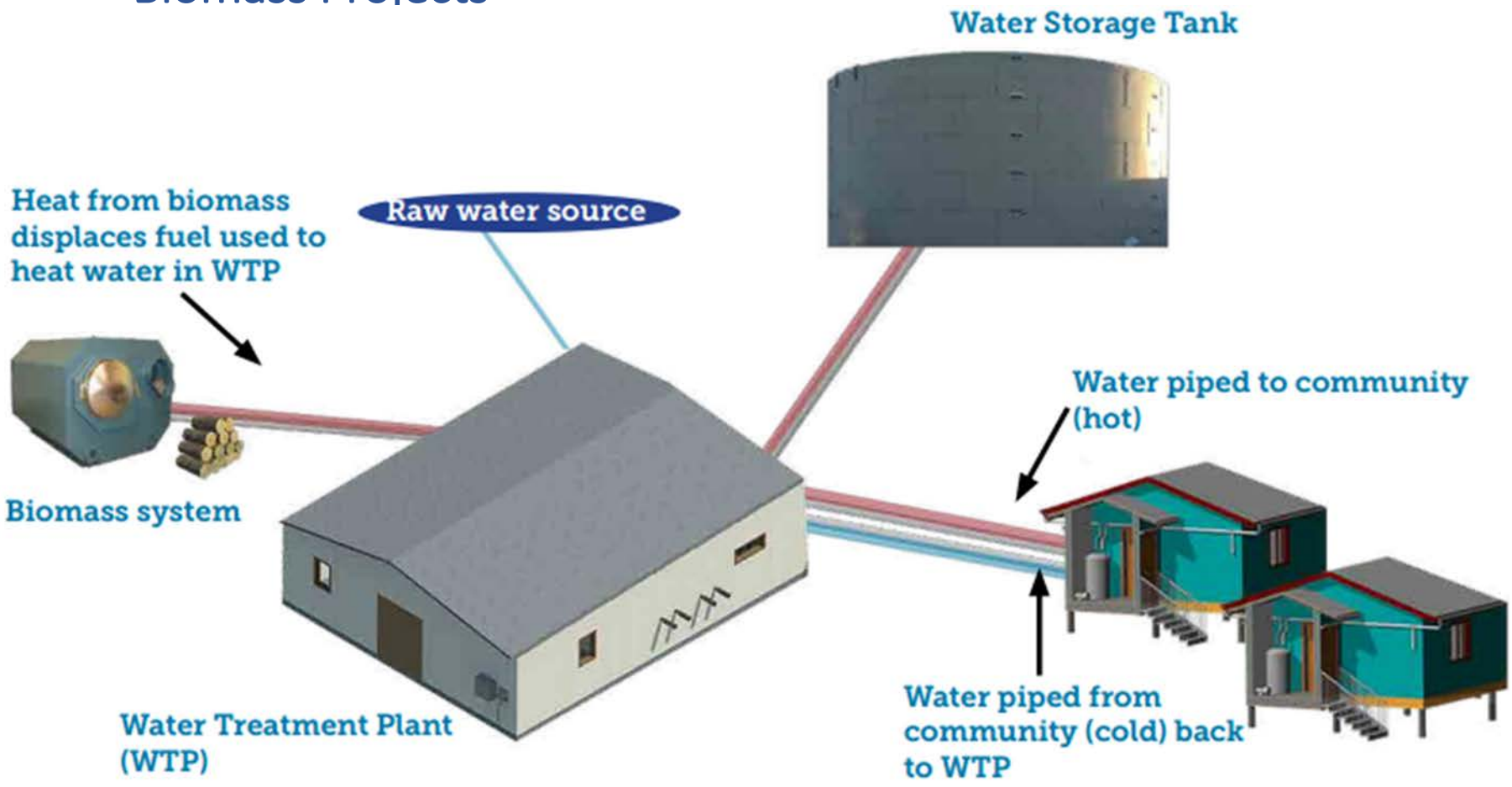
Quinhagak Heat Recovery

In partnership with AEA, AVEC and the City of Quinhagak, ANTHC constructed a Heat Recovery system that supplies the Combined Utility building and Health and Sanitation building . completed December 2016.

Annual Community Savings

Heating Fuel: 14,200 gallons
Fuel Cost Savings: $64,000
Community Savings: $45,000

Biomass Projects

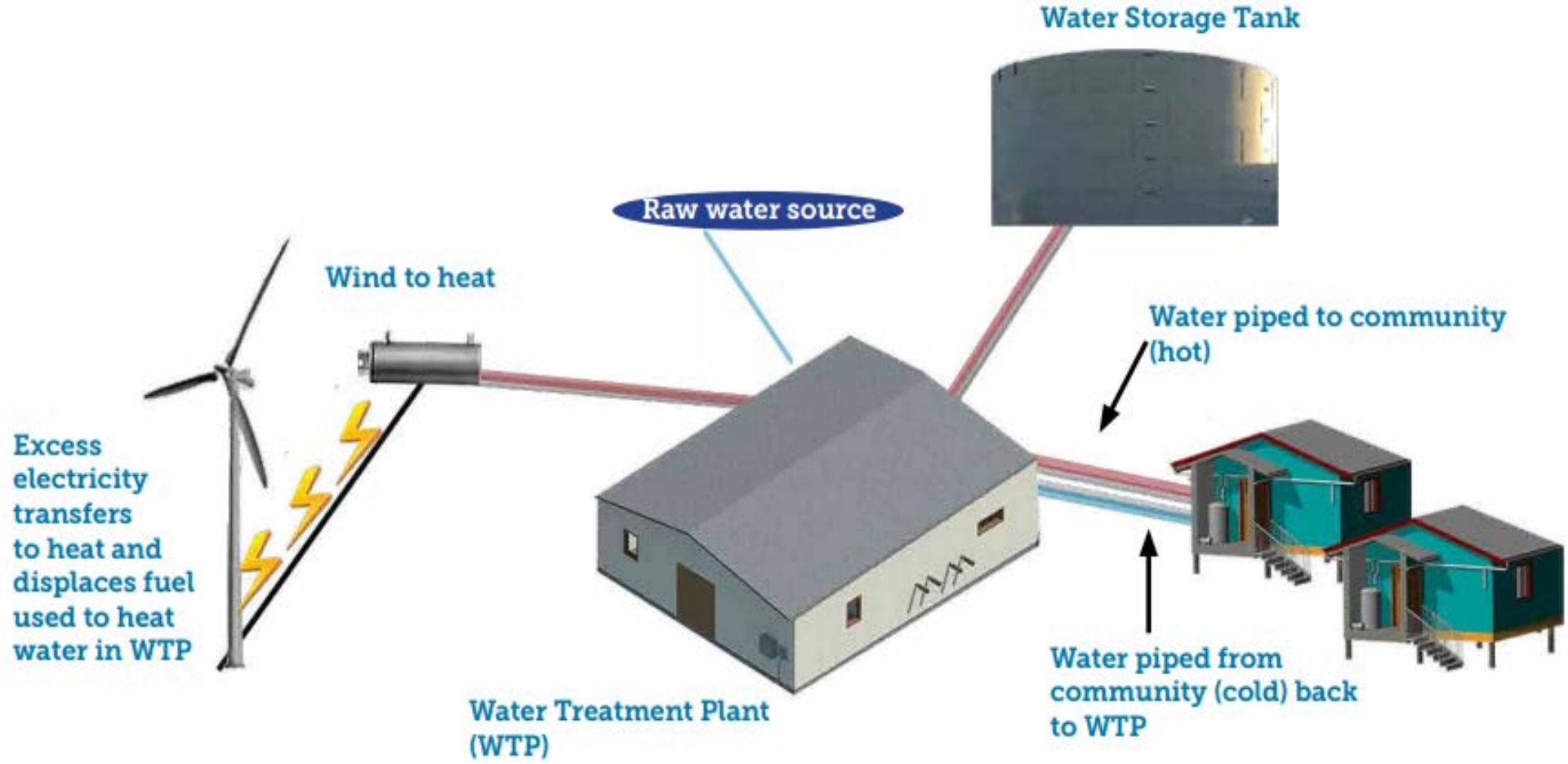


Kobuk Biomass

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

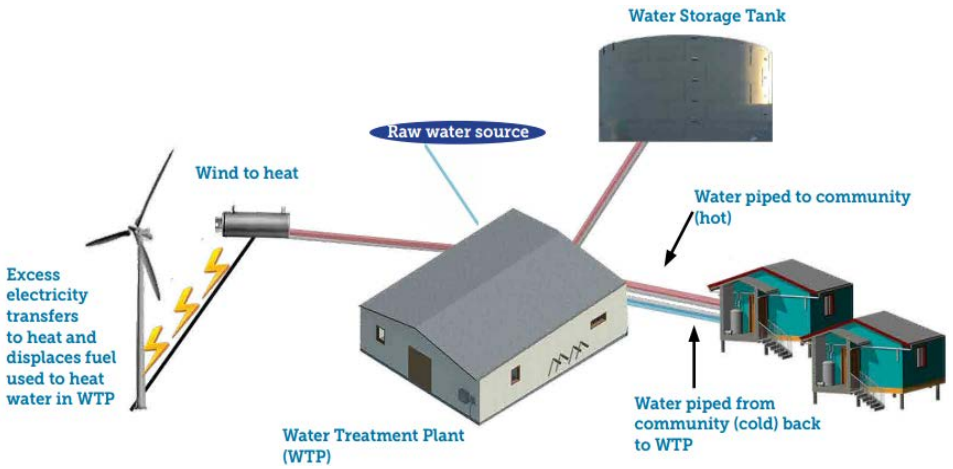
Wind To Heat Projects



Case Study: Excess Wind-to-Heat – Chevak, 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 Fuel Offset of 8,603 gallons
- Projected annual savings over $50,000

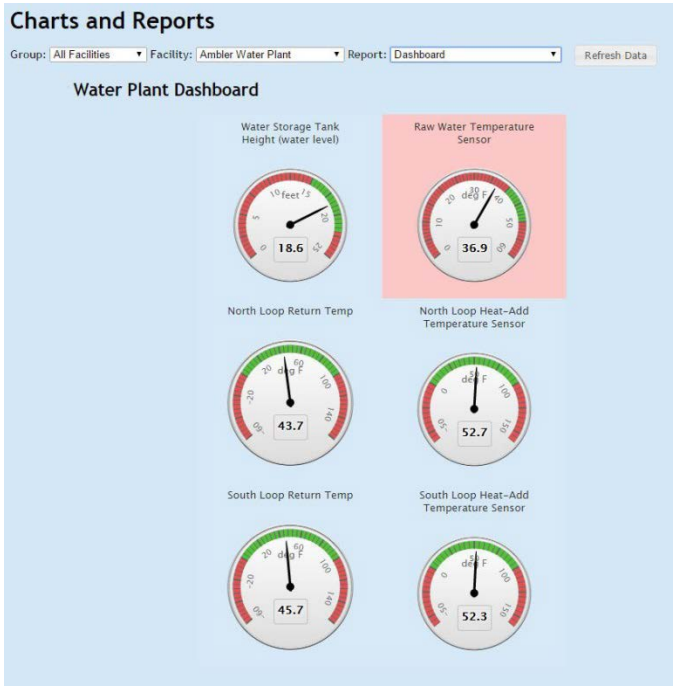


ALASKA NATIVE TRIBAL HEALTH CONSORTIUM

Remote Monitoring

Direct monitoring of a facility to prevent catastrophic failure and

Data collection for future energy audits/retrofits.

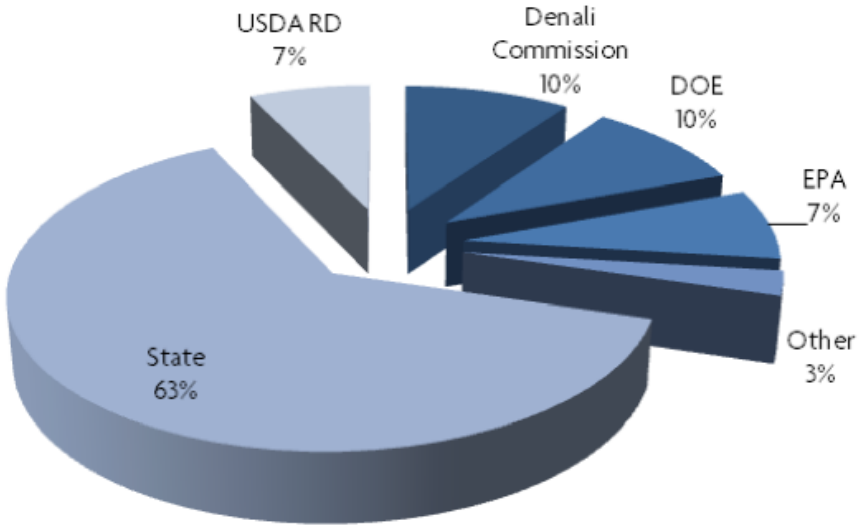


Our Finances

In 2016, our work to improve the energy efficiency of sanitation systems for communities across rural Alaska was made possible from the investments of our funders.

Thanks to funding from the Department of Energy, Denali Commission, USDA Rural Development, the State of Alaska, the Alaska Energy Authority, the EPA, local communities, regional Tribal health organizations, and the Alaska Village Electric Cooperative, this year's projects included innovative upgrades that provide notable cost savings to the rural communitities we serve.

Energy Program Funding Sources Since 2009



Total project funds awarded by fiscal year

Fiscal Year 2012	$4,179,436
Fiscal Year 2013	$4,786,458
Fiscal Year 2014	$5,000,701
Fiscal Year 2015	$6,471,000
Fiscal Year 2016	$4,304,325

Rural Energy Initiative impact

$747,300

Estimated annual project savings implemented in fiscal year 2016

$2,850,000

Estimated annual savings of projects completed from start of program through fiscal year 2016

In Closing…

We're always looking to identify new project opportunities and to partner/collaborate with communities across the state.

…Questions?

Thank You

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ANTHC Rural Energy Initiative