

An aerial photograph of a winter landscape. The foreground and middle ground are dominated by a large, snow-covered area, possibly a frozen lake or a wide river, with visible tracks and patterns in the snow. To the left, there is a dense forest of evergreen trees, some of which are covered in snow. In the background, there are rolling hills and more forested areas. The sky is a clear, pale blue.

# Calista Energy Management Assistance Initiative - CEMAI

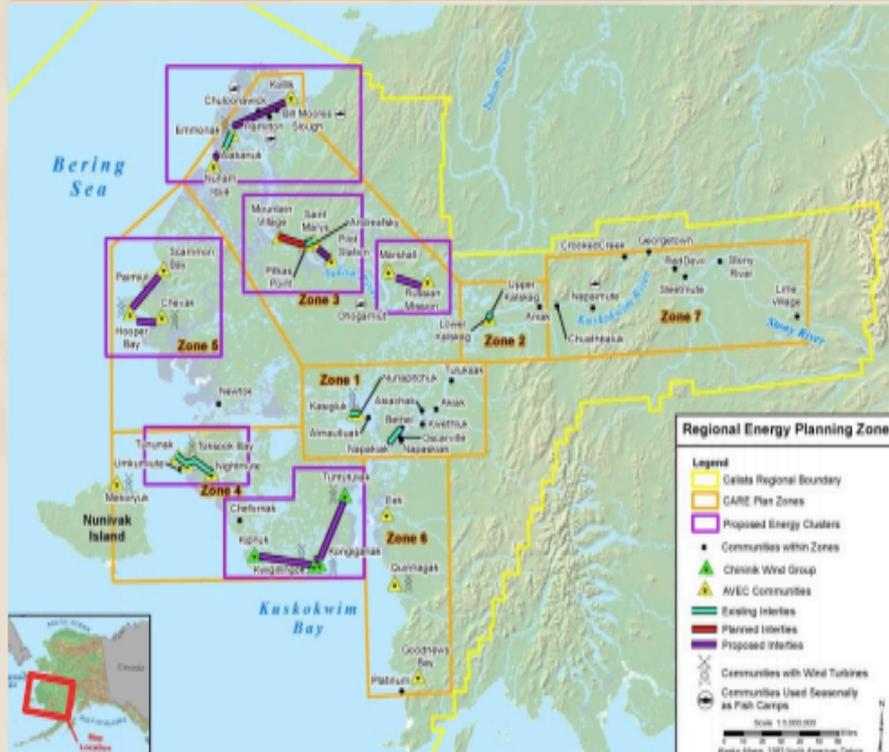
DOE – Indian Energy Program  
Review  
November 16, 2017  
Denver, CO

Calista Corporation Technical  
Team

# Calista – DOE TA Award

## Budget and Timeline

Federal funds: \$967,498 Cost-share: \$109,584 Total: \$ 1,077,082



We are a growing partnership led by Calista Corporation focused on saving energy and money for shareholders, businesses, and residents of the Calista region.

## Key Milestones & Deliverables

Year 1:	Data collection; formatting database; benchmarking; workshop
Year 2:	Trainings/workshops; village plan templates; technology review
Year 3:	Village action plans; regional plan; roadmap/coordination

## Project Outcomes

- Improved understanding of the cost of operating existing utilities
- Rate-setting tools to increase financial viability
- Key Performance Indicators and record keeping to identify and track progress in maintenance
- Energy-training, and planning
- Enhanced human capacity resulting in improved operational efficiency, lower costs
- Create Job opportunities.

# Calista Region Description

- 56 Tribal Villages (Yu'pik, Cu'pik, Athabascan)
- Islanded microgrids...(no connected roads) Expensive energy!
- ~57,000 sq mi = size of New York State; 75% federal lands; 3 sub-regions
- Highest poverty and unemployment rates in AK (and among highest in US)
- High Subsistence use
- Most Fluent Speakers in AK
- Severe Coastal and Riverbank Erosion (Climate Change)



# Whole Community Solutions

Help us create a 3 year plan!

## 2017 Program Alignment

Better Homes  
Better Utilities  
Better Communities

## 2018

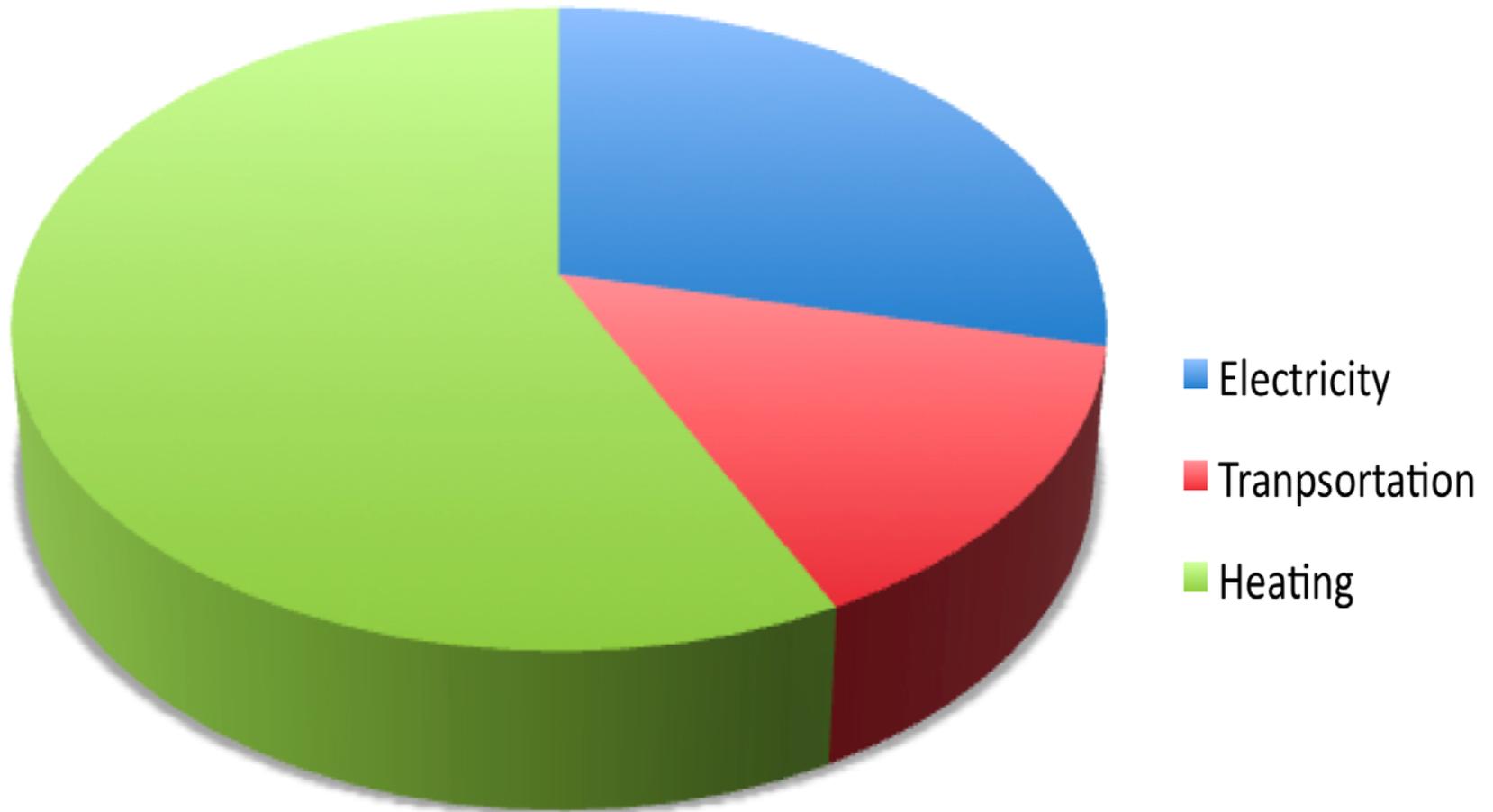
Customized Program  
Specialized Training  
Support:  
Profiles,  
Scorecards,  
Baselines  
Dashboards,  
Workplans

## 2018-9 Full deployment

Workplan  
Activities  
Collaboration



# Annual Average Village Fuel Usage



# Focus: Whole Community & Regional Energy Progress

- Increase Awareness
- Analyze Opportunities
- Customized programs
- Align resources
- Build Capacity

- Increase Data & Analysis  
Improve financial performance  
Program manager
- Household reports
  - Community reports/plans
  - Regional plans

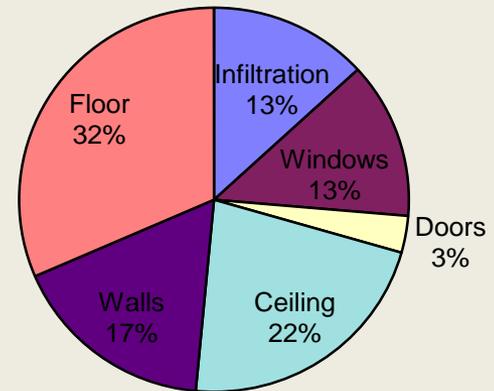
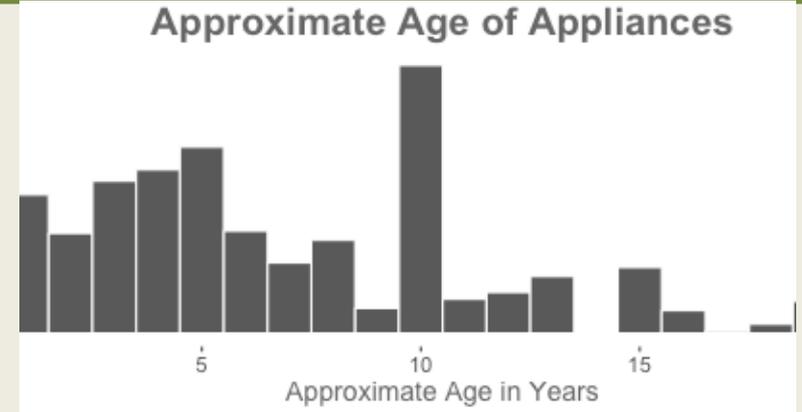
- Program Collaboration
- Define resources
- Funding/equipment/experts
- Coordinate implementation
- Assist with training
- Assist with business development

# Tools and Interfaces



- Community Profile
- Scorecard
- Home Survey
- Utility Inventory
- Utility Log
- Utility Dashboard
- Community Report

# Better Homes: Lighting, Appliances, Weatherization





# Your Energy Audit

In cooperation with:



CALISTA CORPORATION  
www.calistacorp.com

Home Information:  
123 Seawall  
Kongiginak  
Alaska

Data Collection  
Information:  
Collected Apr 5, 2017.

This data collection is  
under the supervision of:

**Intelligent Energy  
Systems**  
110 W 15<sup>th</sup> Ave.  
Anchorage, AK  
99501

Contacts:  
Dennis Meiners:  
dennis@iesconnect.net

Ian Knapp:  
ian@iesconnect.net



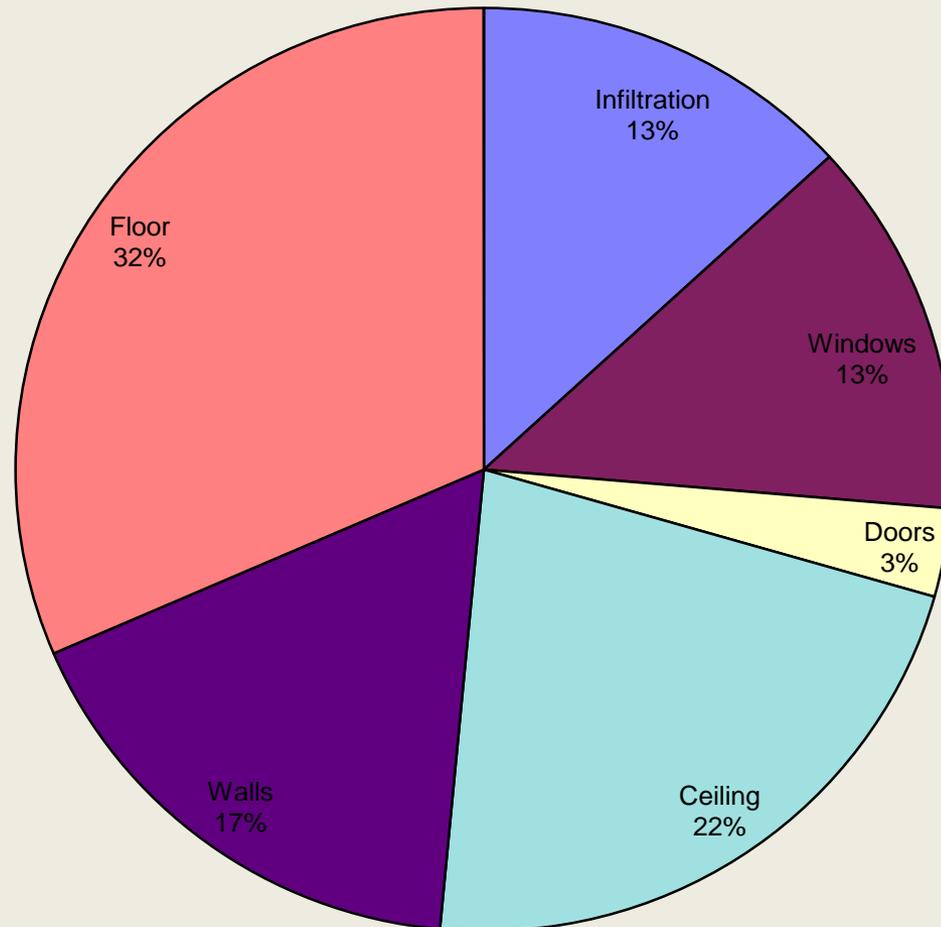
This report is part of your community's efforts to improve the availability and efficiency of your energy utilities. As part of that effort, we are producing reports about how your home uses energy. This report will give you some information about how you can improve how your home uses fuel and electricity. It includes sections on the following:

- Insulation
- Heating
- Appliances
- Weatherproofing
- Sealing Windows

Furthermore, in addition to helping you understand opportunities for your home, similar reports will help your village utility understand the needs of the community.

# Heat Loss Summary

## Average Home



# Better Utilities

## Diesels

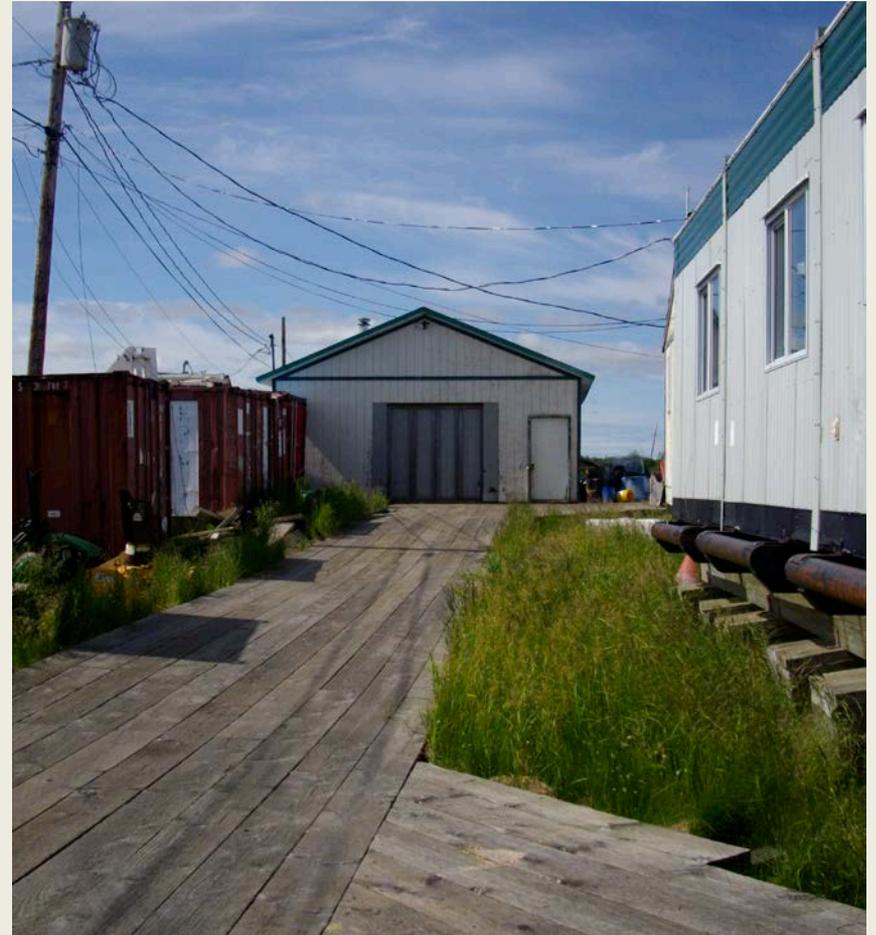


## Distribution



# Utility Management

- Trend Analysis
- 2,5,10 year plan
- Engineering
- OMM&R
- Revenue
- Rate Setting
- Financing



# Scorecards, Baselines, KPI's

## Better Utilities



Information Support



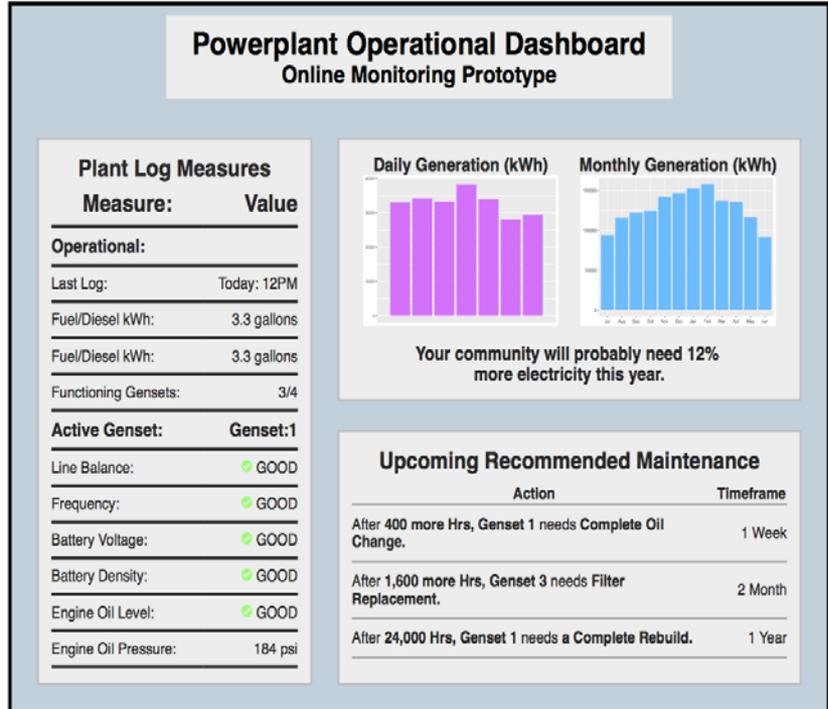
Operational Support: OMM& R plan



Management Support: Financial Planning, KPI, Coordination



Decision Support: Technology/Markets/ Resources



### Electricity Consumption

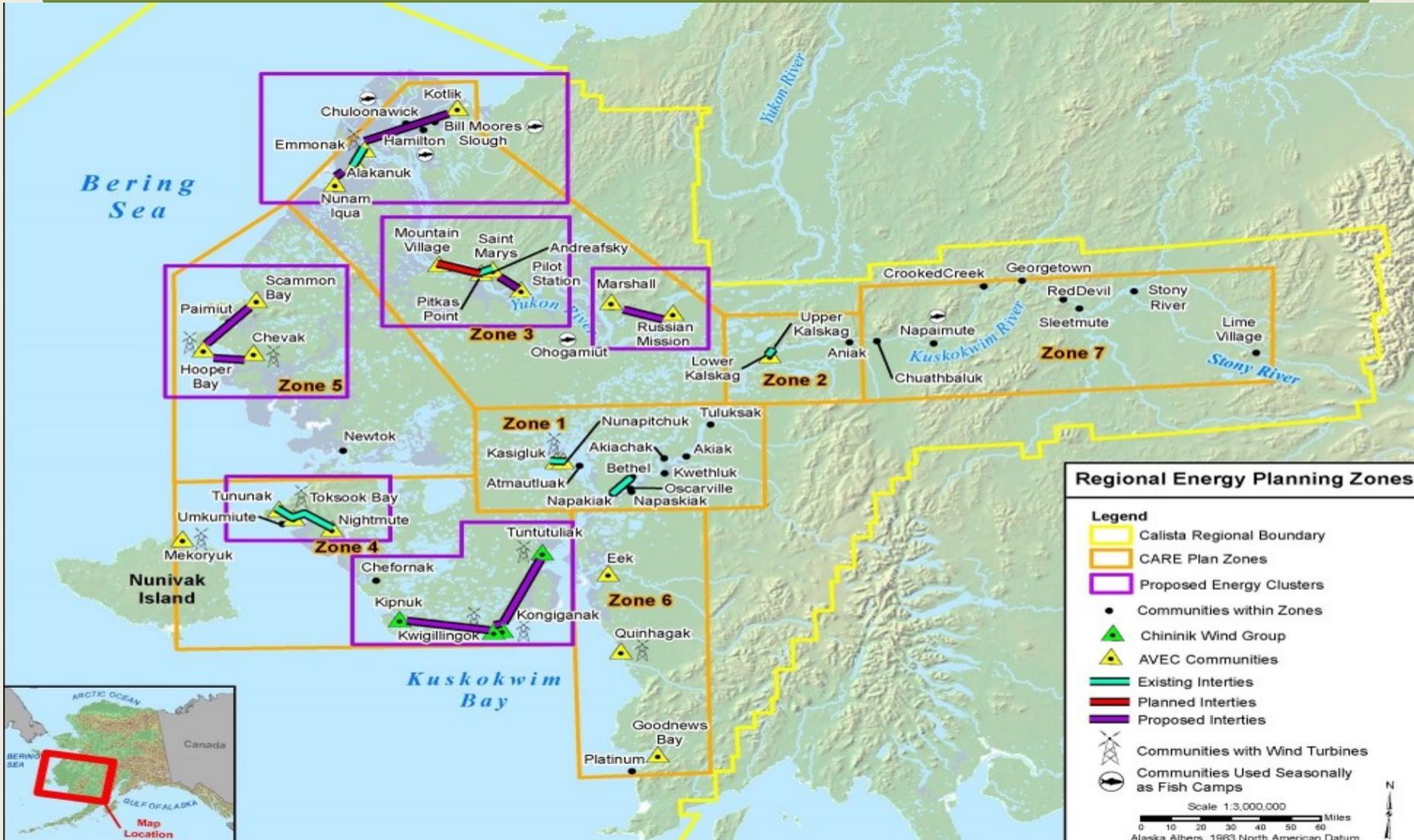
Electrical demand growth (7 years).	Community: 40%	Avg.: 40%	2/3
What percent of the electricity sales are residential?	Community: 65%	Avg.: 49%	2/3
Annual residential load per customer.	Community: 3000 kWh	Avg.: 4000 kWh	3/3
Houses without retrofits.	Community: 72%	Avg.: 50%	1/3
How much more electricity does community use in the winter?	Community: 30%	Avg.: 50%	

Total: 13/18

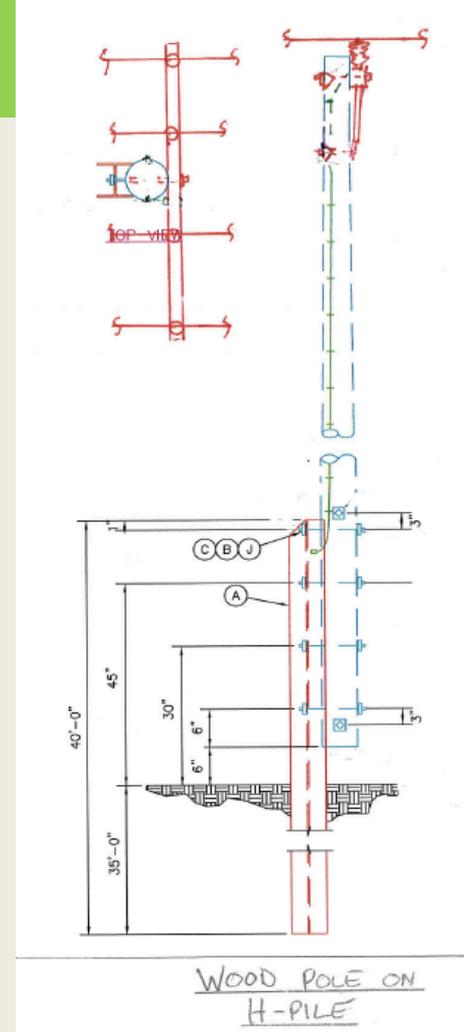
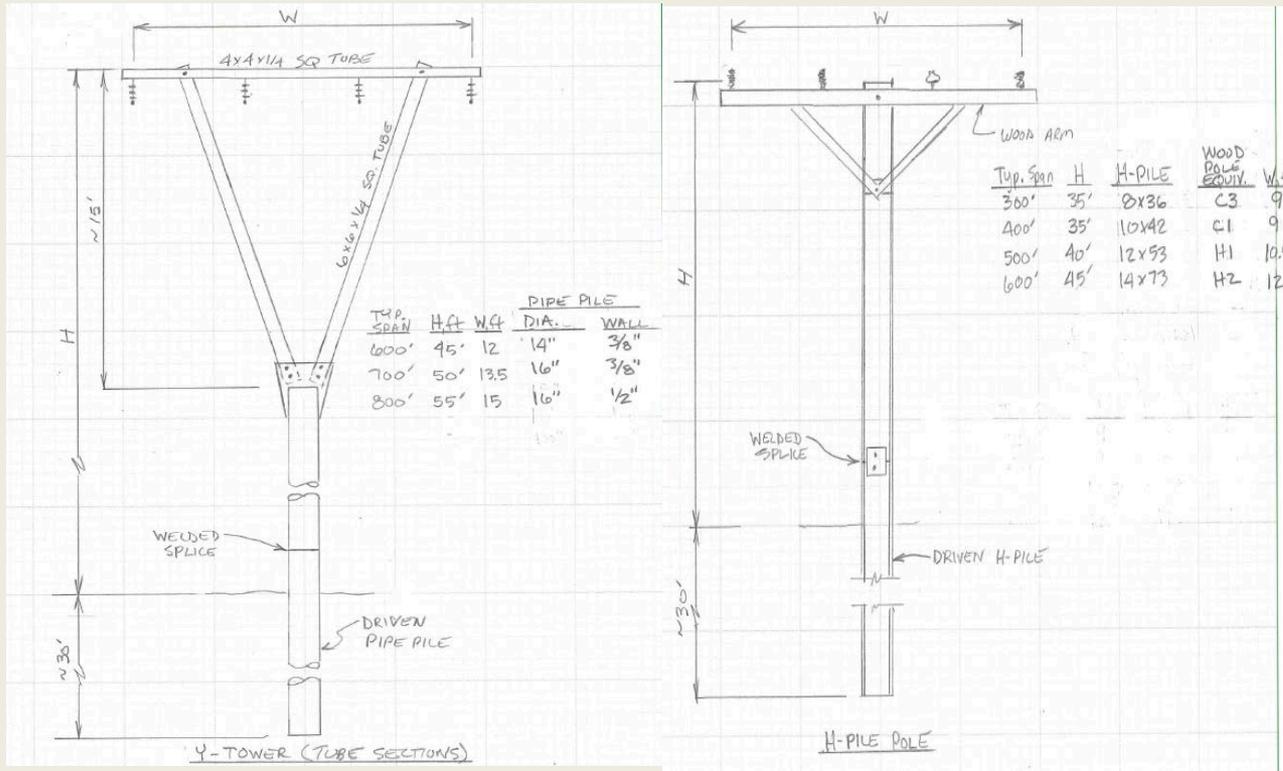
### Electricity Production

What percent of electricity gets sold?	Community: 65%	Avg.: 49%	2/3
Non-fuel costs.	Community: 40%	Avg.: 40%	2/3
Fuel / diesel kWh.	Community: 3000 kWh	Avg.: 4000 kWh	3/3
Percent of Electricity from Diesel.	Community: 72%	Avg.: 50%	1/3
Functioning Generators.	Community: 3	Avg.: 4	2/3
kWh / Genset / Month	Community: 30000 kWh	Avg.: 20000 kWh	1/3

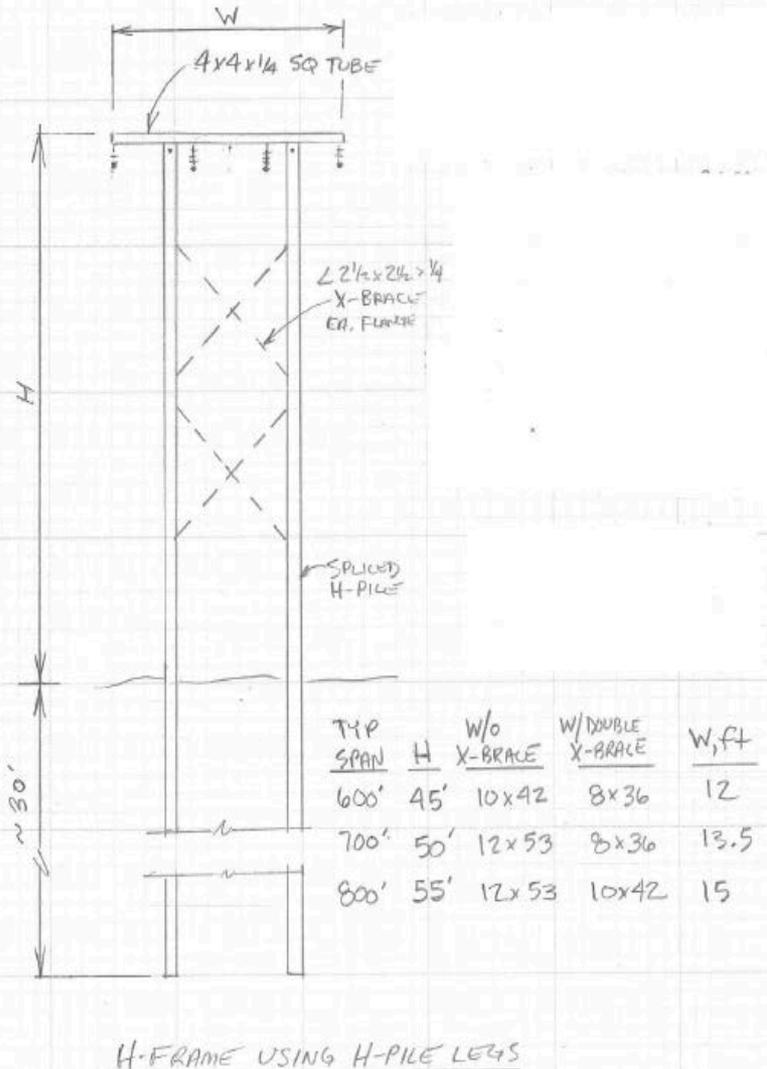
# Sub-Regional Intertie Opportunities



# InterTie Study

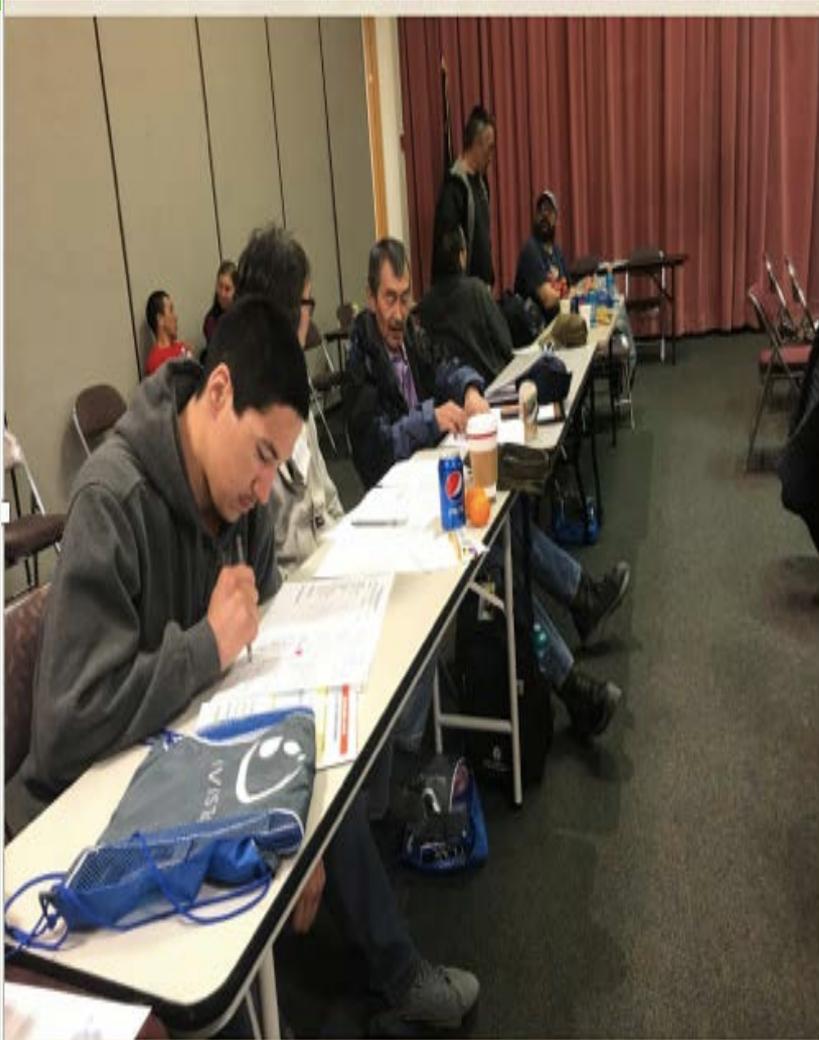


# Driving Down Costs for Interties (\$/Mile)



Option: Unbraced H-frame using H-piles							
Typical Span Length:	600 ft		Typical Str. Ht:	45 ft			
Line Length:	10 miles	Guys/str.	Anchors/str.				
Qty of heavy angle deadends:	4	6	4			Conductor 111 kcmil 12/7 ACSR r: "Minorca"	
Qty of medium angle strucs.	4	2	1			Max. Sag:	18.0 ft
Qty of light angle strucs.	8	1	1			NESC Tension:	4,350 lbs
Qty of tangent strucs.	72					Deadend Guy Load, 4 wires:	45,113 lbs
	Qty	Wt. ea.	Material Cost, Seattle	Freight to W. AK	Labor Cost	Total Unit Cost	Extended Cost
H-piles, 10x42x40'	176	1,680 lbs	\$1,050	\$840		\$1,890	\$332,640
H-piles, 10x42x40'	176	1,680 lbs	\$1,050	\$840		\$1,890	\$332,640
Conductor, reels	18.95	3,175 lbs	\$5,080	\$1,588		\$6,668	\$126,349
Guy wire, 3/8" EHSS	2,700 ft	0.30 lbs	\$0.60	\$0.15		\$0.75	\$2,025
Anchor, 10x42x40' H-pile	28	1,680 lbs	\$1,050	\$840		\$1,890	\$52,920
Guy hardware	40	20 lbs	\$50	\$10		\$60	\$2,400
Steel Arms, 4"x4"x1/4"x13'	92	160 lbs	\$250	\$80		\$330	\$30,360
Insulators, pin	16	1 lbs	\$15	\$1		\$16	\$249
Insulators, comp, susp, w/fittings	116	6 lbs	\$40	\$3		\$43	\$4,988
Grounding wire, rod, hardware	88	5 lbs	\$10	\$3		\$13	\$1,100
Wire wraps, deadends	88	10 lbs	\$60	\$5		\$65	\$5,720
Bolts and hardware	88	20 lbs	\$30	\$10		\$40	\$3,520
		718,690 lbs	\$535,566	\$359,345	\$0	\$894,911	\$894,911
		cost/mile =	\$53,557	\$35,934	\$0	\$89,491	

# Community Workshop, Bethel – April 2017



Morgan Fitka – Ohogamiut Tribe

- ~ 25 Villages represented, other parts of AK, Canada, federal and state agencies, University of AK, others
- Each participant community created a “readiness scorecard” to direct next steps and fuel savings
- Replicate workshop in sub-regional hubs & individual communities
- Goal: Collect more data to create EE & RE development plans for homes, community & commercial buildings and electric utilities

# Partnering & Job Creation

## Capacity Building and Training

### NEW JOB RECRUITMENT: ENERGY COORDINATOR

Collaborative effort between Nuvista and CEMAI  
Will work with community leadership & technical team to design and implement energy projects and system improvement activities:

- Management of community outreach activities, data collection, and reporting
- Organization of workshops and trainings
- Assist in program design
- Stakeholder outreach and public communication
- Project evaluation
- Program administration

Position is Funded by the US DOE CEMAI Grant and Nuvista

RECEIVED NUMEROUS APPLICATIONS – SELECTION IN DECEMBER 2017



# Quyana - Thank You!

## Working for Future Generations

[www.cemai.calistacorp.com](http://www.cemai.calistacorp.com)

