ALASKA VILLAGE ELECTRIC COOPERATIVE
A COOPERATIVE, BUT DIFFERENT

Presentation to

HOUSE ENERGY COMMITTEE

State of Alaska 34th Legislature
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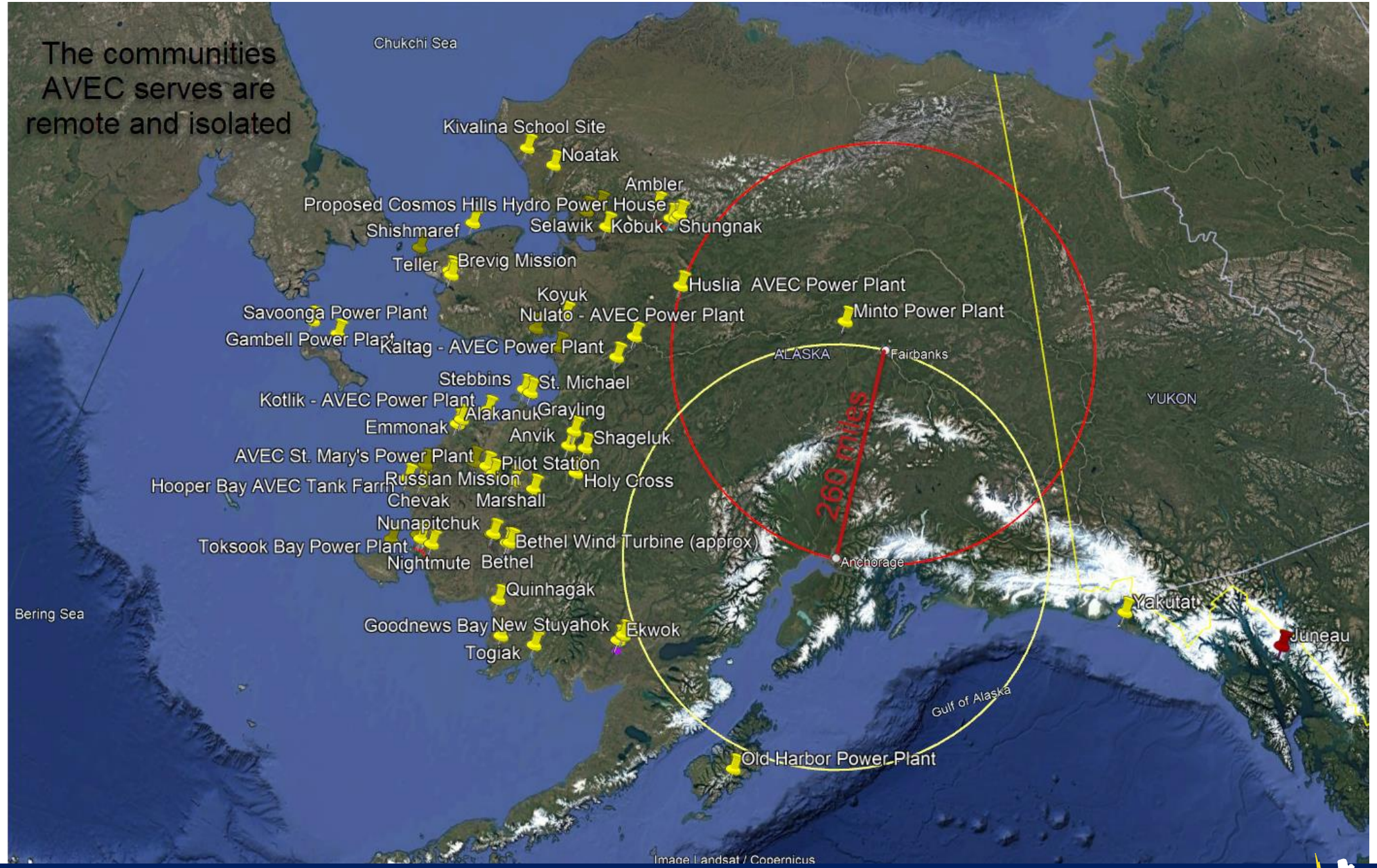
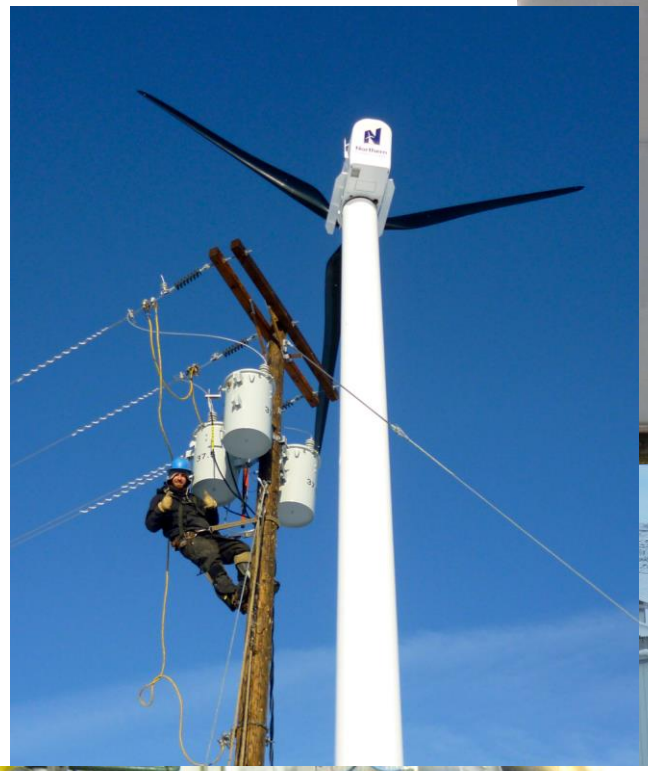
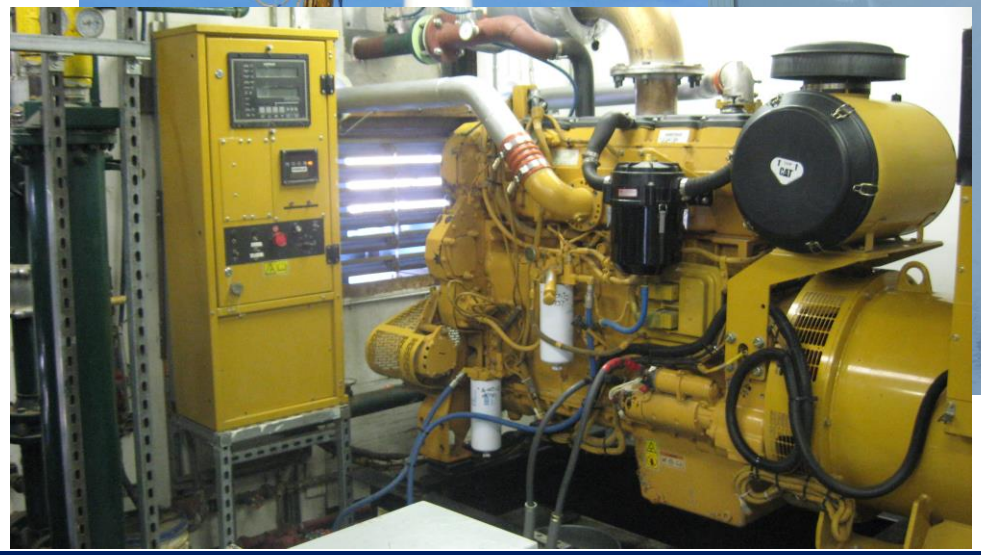
Kivalina, AK


The communities AVEC serves are remote and isolated
Chukchi Sea
Kivalina School Site
Noatak
Ambler
Proposed Cosmos Hills Hydro Power House
Selawik
Kobuk
Shungnak
Shishmaref
Teller
Brevig Mission
Huslia AVEC Power Plant
Koyuk
Minto Power Plant
Savoonga Power Plant
Nulato - AVEC Power Plant
Gambell Power Plant
Kaltag - AVEC Power Plant
ALASKA
Fairbanks
Stebbins
St. Michael
YUKON
Kotlik - AVEC Power Plant
Alakanuk
Grayling
Emmonak
Anvik
Shageluk
AVEC St. Mary's Power Plant
Pilot Station
Russian Mission
Holy Cross
Hooper Bay AVEC Tank Farm
Chevak
Marshall
Nunapitchuk
Bethel Wind Turbine (approx)
Toksook Bay Power Plant
Nightmute
Bethel
Anchorage
Quinhagak
Yakutat
Bering Sea
Goodnews Bay
New Stuyahok
Ekwok
Juneau
Togiak
Gulf of Alaska
Old Harbor Power Plant
260 miles
Image Landsat / Copernicus



2. An 8000 lb. generating unit is placed upon a sled by block-and-tackle and manpower.



Although our goals are the same, the means and methods differ.


New Stuyahok, Alaska

- High Efficiency Diesel Generators
- Combined Remote Cooling System with Heat Recovery
- Community Wide Bulk Fuel Upgrades (2011)
- Distribution Intertie to Ekwok (8 miles) (2017)
- Solar Array and BESS (2026?)

New Stuyahok, Alaska

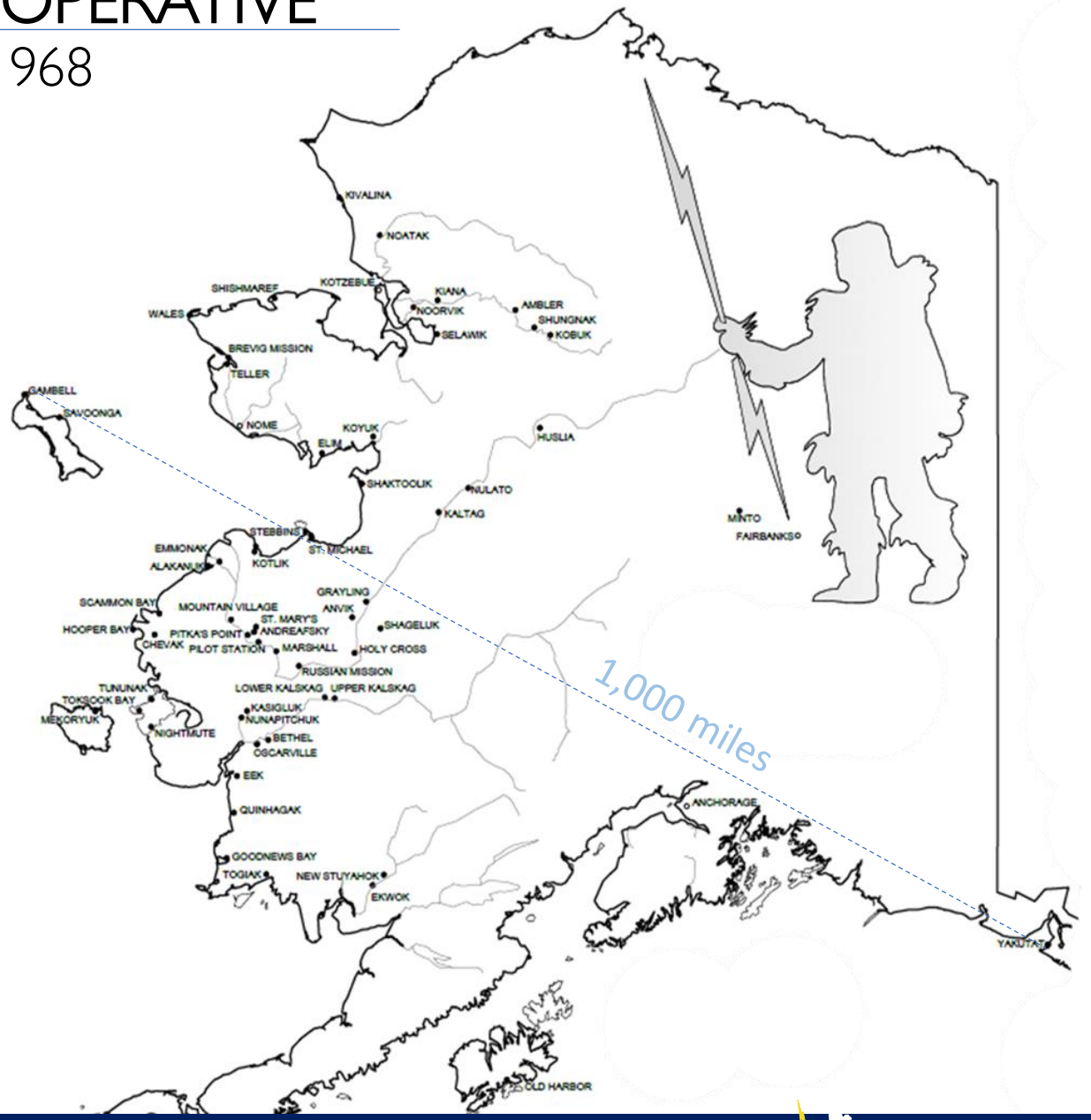

SHAKTOOLIK
NATIVE STORE
ANICA, INC.


Ravn CONNECT
N838GV

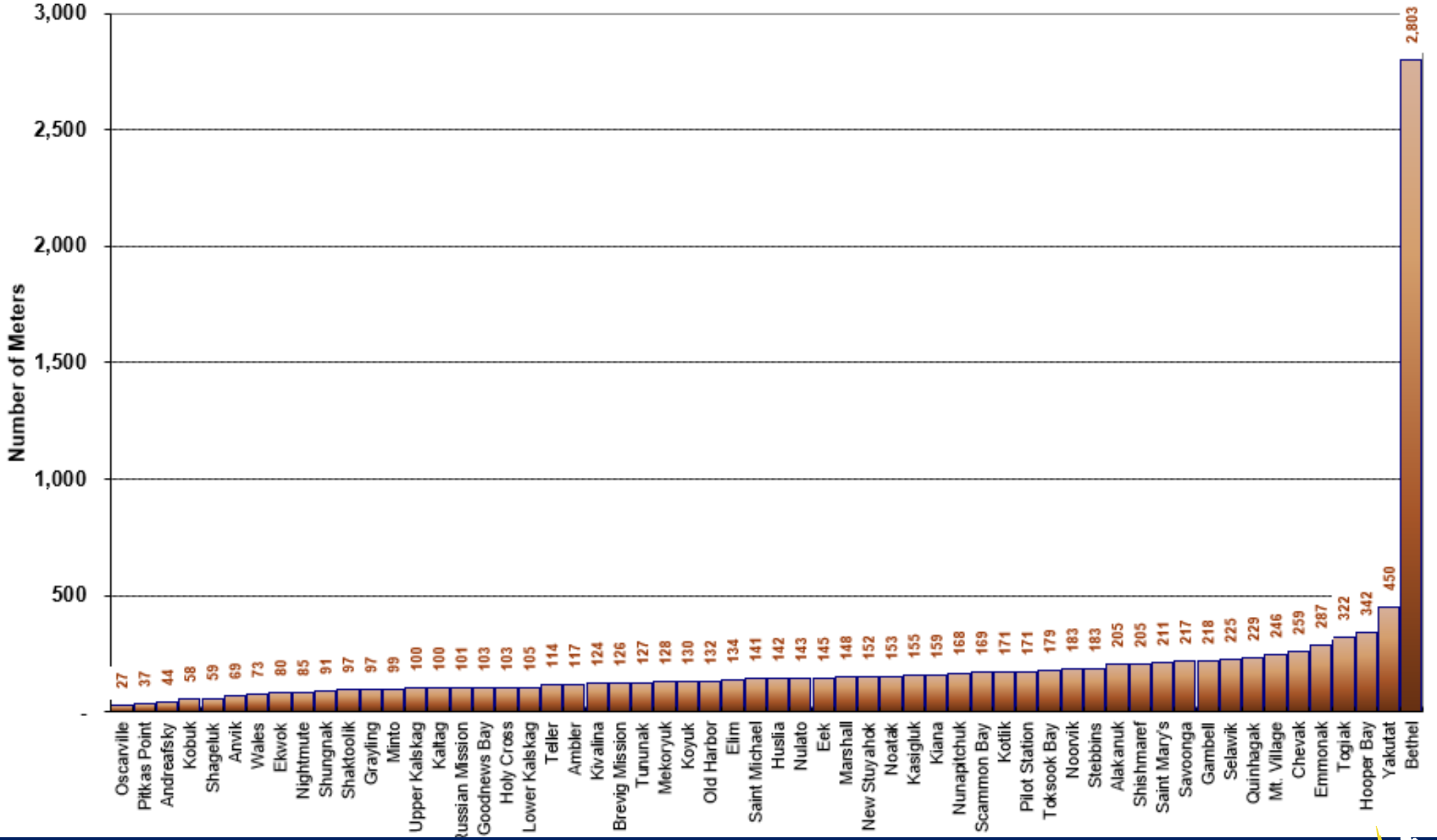
ALASKA VILLAGE ELECTRIC COOPERATIVE

Energizing Rural Alaska since 1968

- Nonprofit 501(c)12 -Electric Cooperative
- 58 Rural Communities, 31,000+ Residents
- 46 Power Plants, 160 Diesel Generators
- 9.3M Gallons of Diesel in 2023 ($43.8)
- 525 miles of Distribution Lines
- 13 Wind Sites, 33 Wind Turbines, Serving 22 Communities
- $74.0M Annual Revenue
- 2023 Total Electricity Sold 126.3 MWh

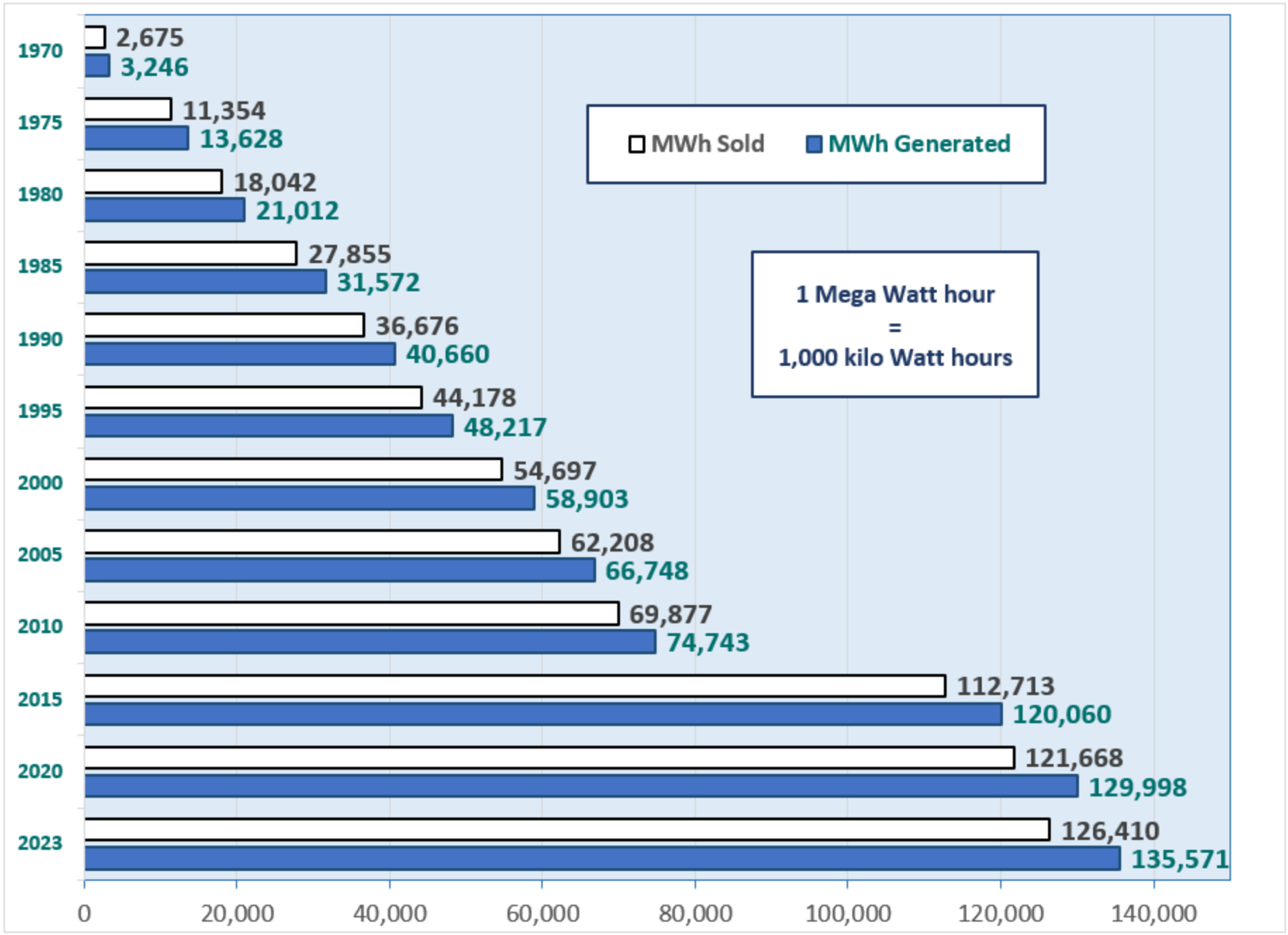


Relative “Size” of Community by Meter Count

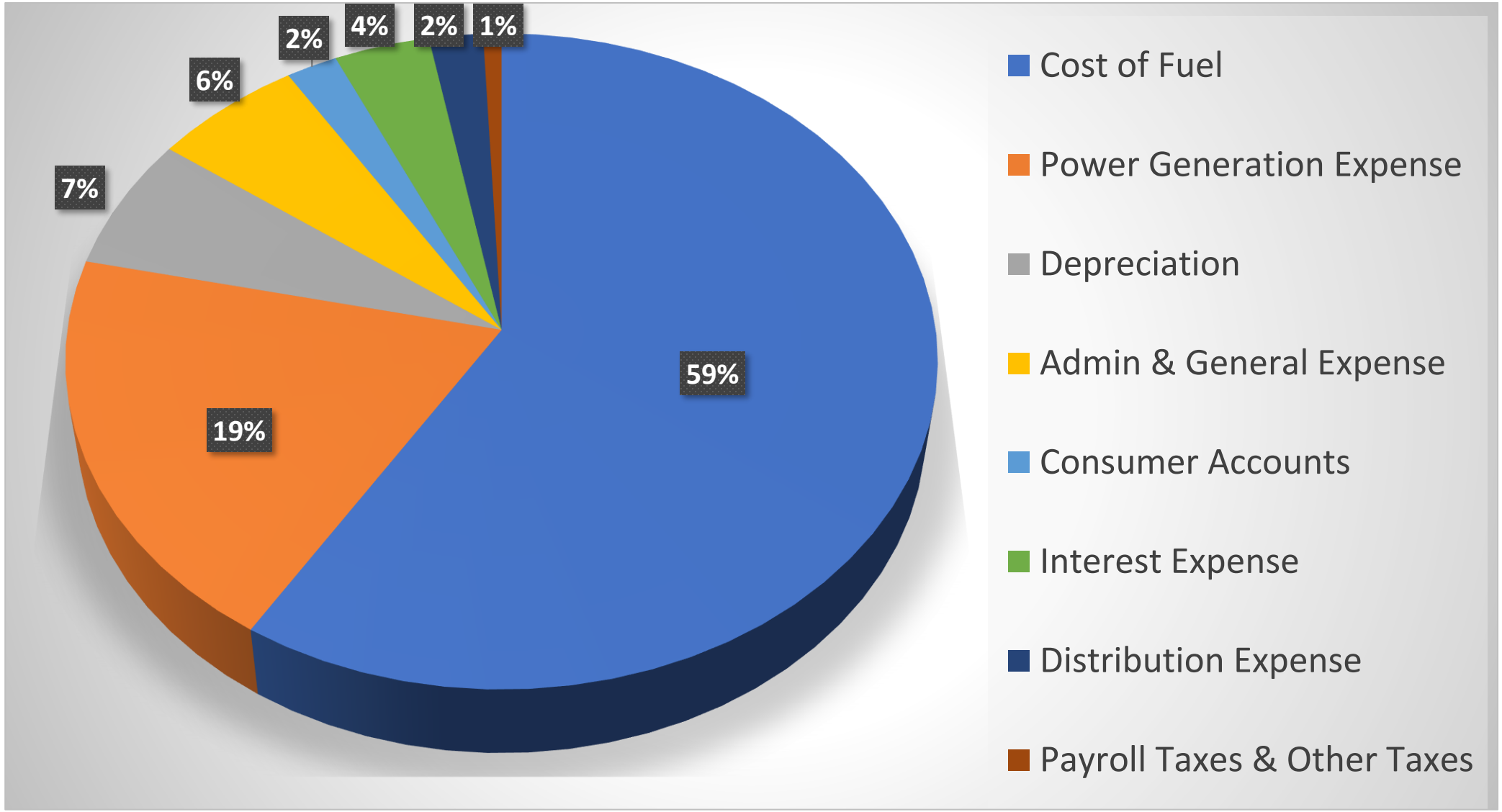


Rural Power Consumption is Relatively Low

- Steady load growth due to increased electrification and acquisitions since 1970
- Large step increase due to acquisition of Bethel in 2014
- Consistently low Line Loss, 6.6% in 2022
- Comparatively low power consumption for population size of 31,000 people. (< ½ of Juneau or Fairbanks)



Costs per Kilowatt-hour Sold



Fuel Delivery:

- Typically, May-Oct
- Lighterage Barges fill from Tankers and deliver to coastal and river communities
- Bulk Fuel Storage, strive for 14 month's supply.
- Some communities are Fly-in only

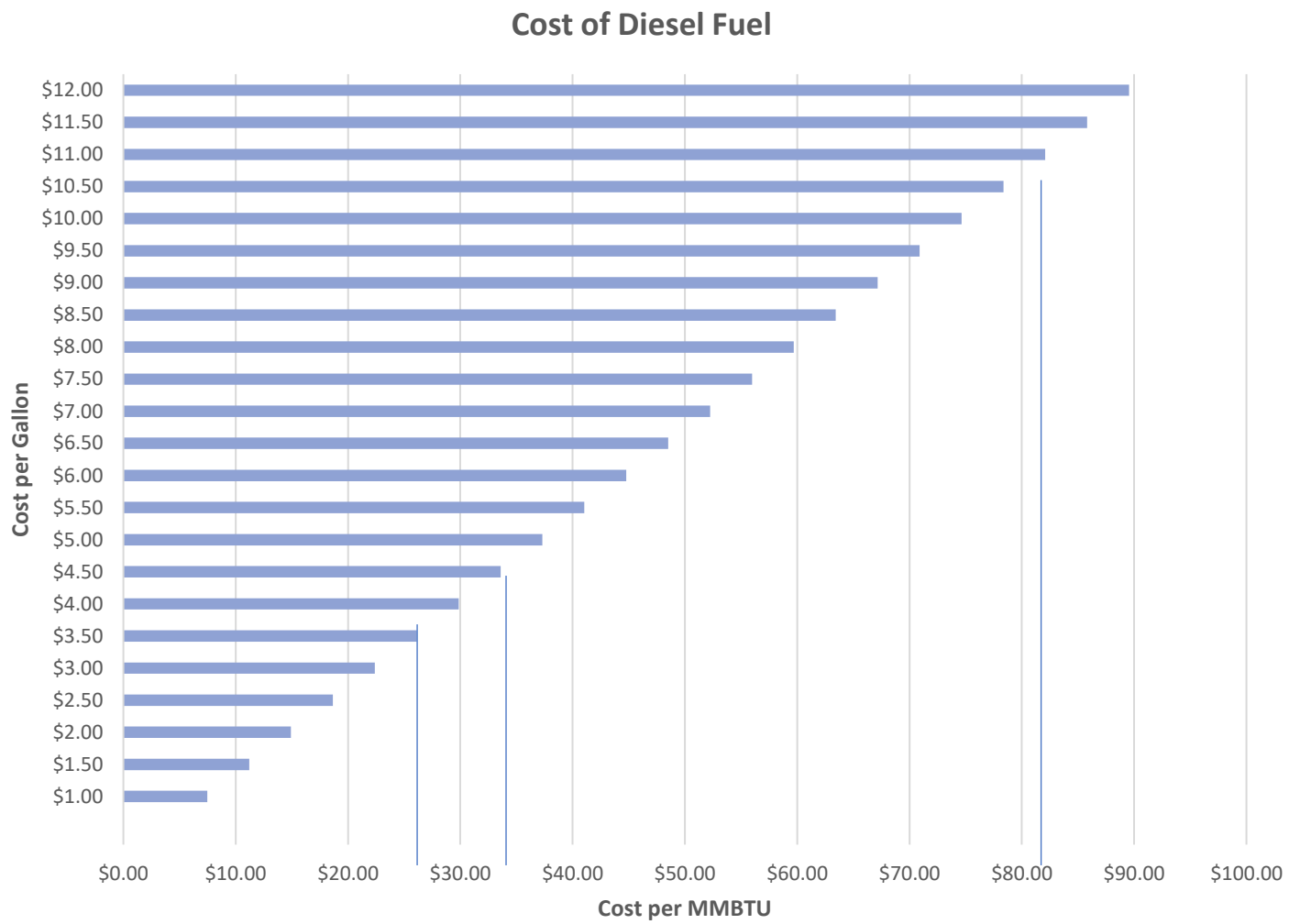
Difficulties:

- Cost
- Aging infrastructure
- Limited Suppliers
- Weather

2024 AVEC Delivered Fuel Costs:

Barge Delivery:
$3.50 to $4.50 per gallon

Air Delivery:
$10.00 to $11.00 per gallon

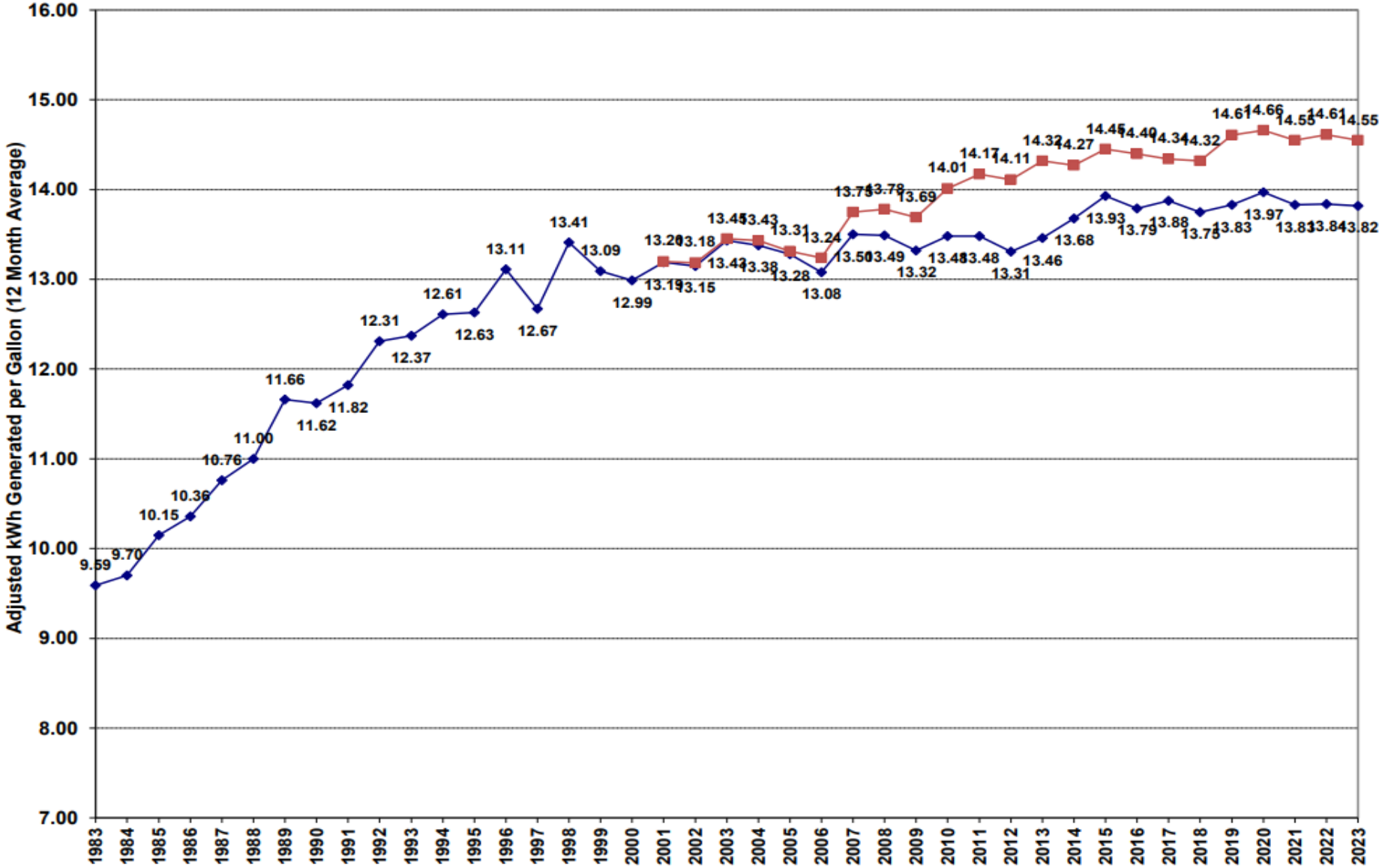


It takes roughly 7.5 gallons of diesel fuel to provide 1 MMBTU of energy

Alaska Village Electric Cooperative

Overall Adjusted Generating System Efficiency

Diesel Only vs. Diesel & Net Wind



1999 Wales with KEA 2X 65kW Wind

2006 Selawik 4X 65kW Wind

2007 Kasigluk 3X 100kW Wind

2007 Toksook Bay 3X 100kW Wind

2008 Savoonga 2X 100kW Wind

2009 Gambell 3X 100kW Wind

2009 Hooper Bay 2X 100kW Wind

2010 Chevak 4X 100kW Wind

2010 Mekoryuk 2X 100kW Wind

2010 Quinhagak 3X 100kW Wind

2010 Toksook Bay 1X 100kW Wind

2011 Emmonak 4X 100kW Wind

2012 Shaktoolik 2X 100kW Wind

2012 Kaltag 10kW Solar

2016 Noorvik with NAB 29kW Solar

2018 Bethel 1X 900kW Wind

2019 Saint Mary's 1X 900kW Wind

2021 Shungnak with NAB 225kW Solar (IPP)

2023 Noatak with NAB 275kW Solar (IPP)

2023 Stebbins 1X 900kW Wind (Pending)

AVEC'S TIMELINE OF RENEWABLE ENERGY PROJECTS 1999-2023

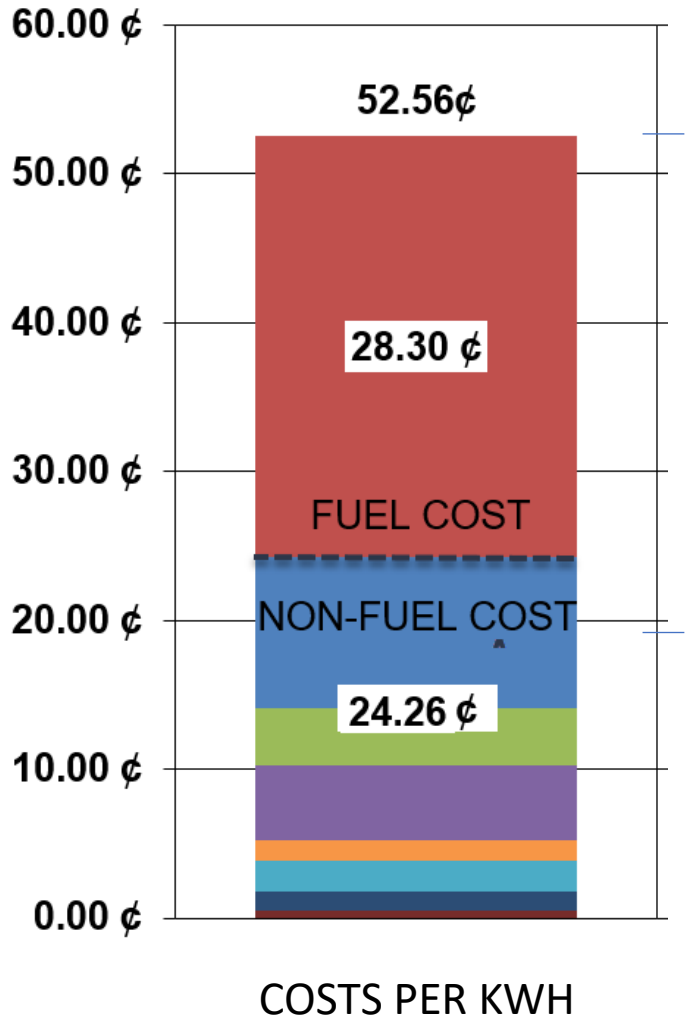
Logistics of Material Delivery

How Does PCE Work ?

PCE “FLOOR” = Average cost of power for Anchorage Fairbanks and Juneau ($0.1992 for FY 2025)

PCE pays down 95% of the Difference between rural cost of power and PCE floor.

Only for Residential and Community Facilities



Cost of Power $0.5256

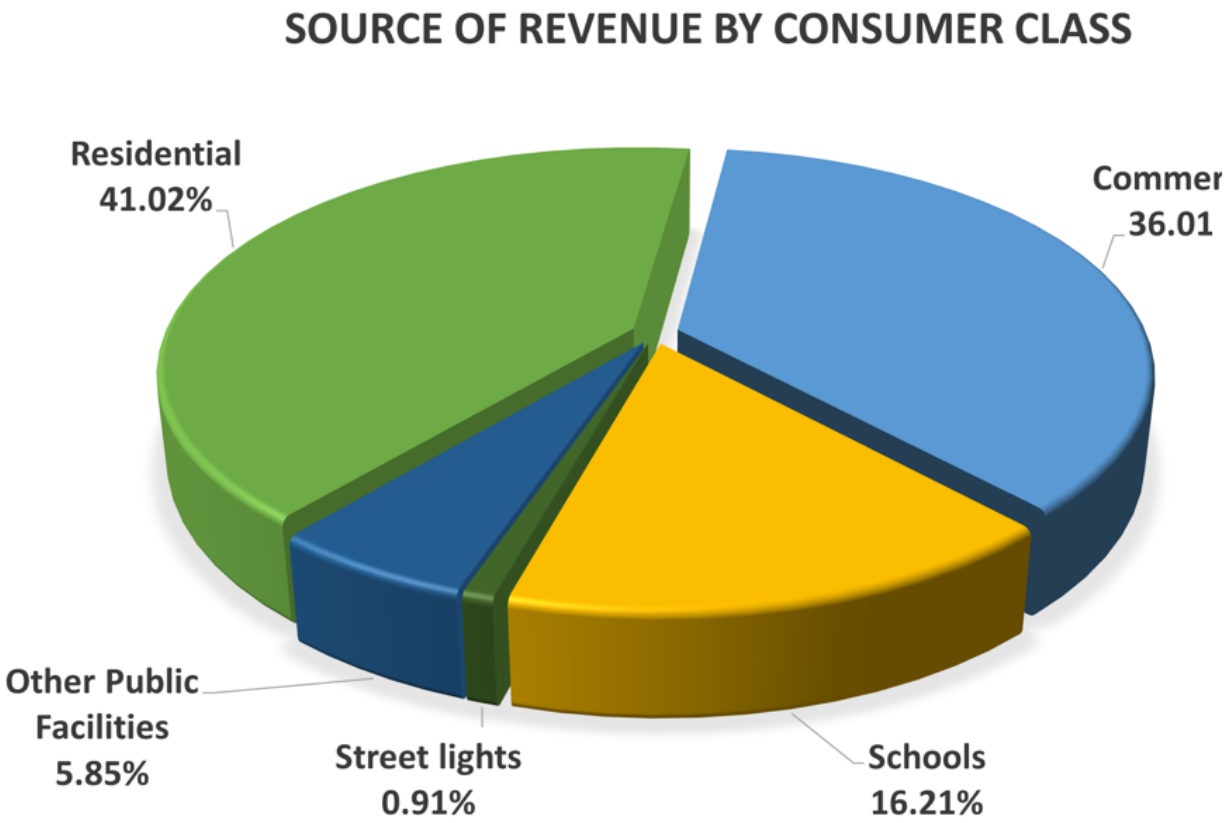
PCE pays 95% of Difference
0.95*($0.5256-$0.1992)=$0.3101

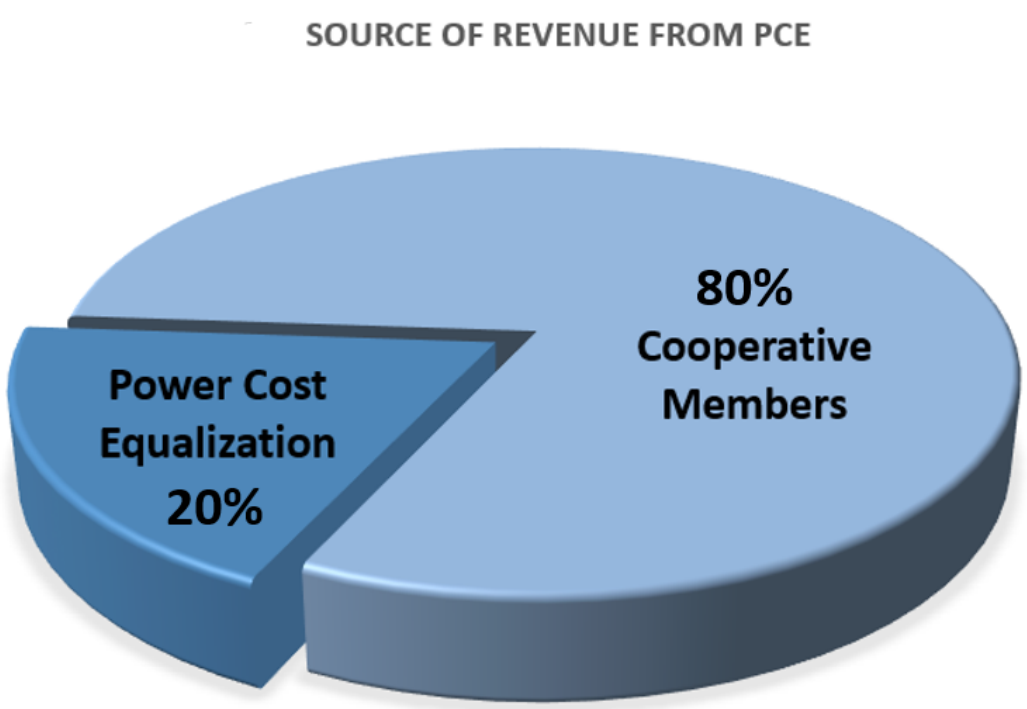
PCE Floor $0.1992

Residential customer pays $0.2155

Commercial Customer pays $0.5256

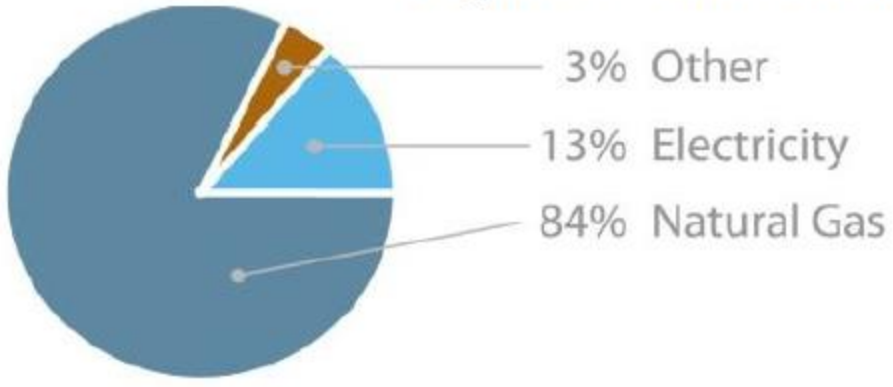
The Impact of Power Cost Equalization



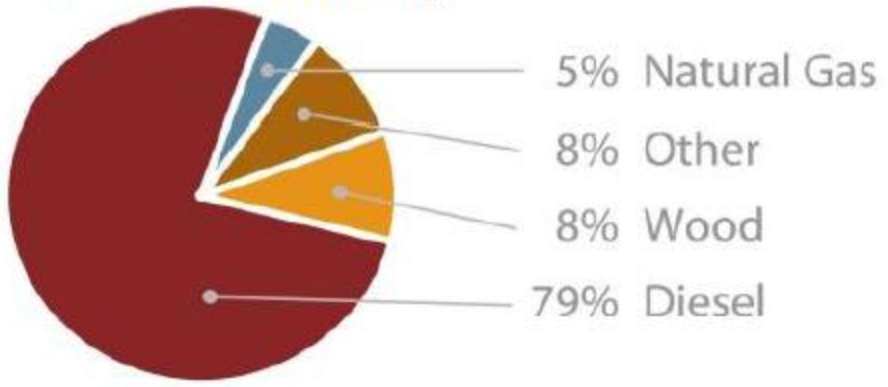


Power Cost Equalization Does Not Apply to Heating

Figure 1 – How Alaskans Heat Their Buildings[1]



Anchorage



Rural Communities

Graphic taken from: “Energy for a Sustainable Alaska, The Rural Conundrum”
A Commonwealth North Study Report, February 2012

Why is electricity expensive in rural Alaska?

- Small population – AVEC's average village is ~400 people
- Small loads – AVEC's average village load is ~160 kW
- No economies of scale, which in turn limits economic growth

  (Expensive power = Less consumption= Expensive power)
- Utilities are capital intensive, and capital is expensive
- Isolated systems - reliability relies on (self) redundancy
- Remote and difficult to access, transportation and freight is expensive
- Fuel is expensive – delivery and storage costs often exceeds diesel purchase cost
- Operations and maintenance is more expensive, freight, travel, lodging, it all adds up

AVEC strategies to reduce power cost

- Improve generation efficiency whenever possible
- Minimize distribution losses whenever possible
- Interconnect villages to improve economies of scale
- Add renewable generation and energy storage where economically feasible
- Capture and sell recovered heat and excess wind energy
- Promote energy education, workforce development
- Support economic growth in communities we serve

Thank you,

Savoonga, Alaska

Bill Stamm, President & CEO
Alaska Village Electric Cooperative