



PROVIDING ELECTRICITY IN RURAL ALASKA

ALASKA ENERGY SECURITY TASK FORCE

JULY 20, 2023

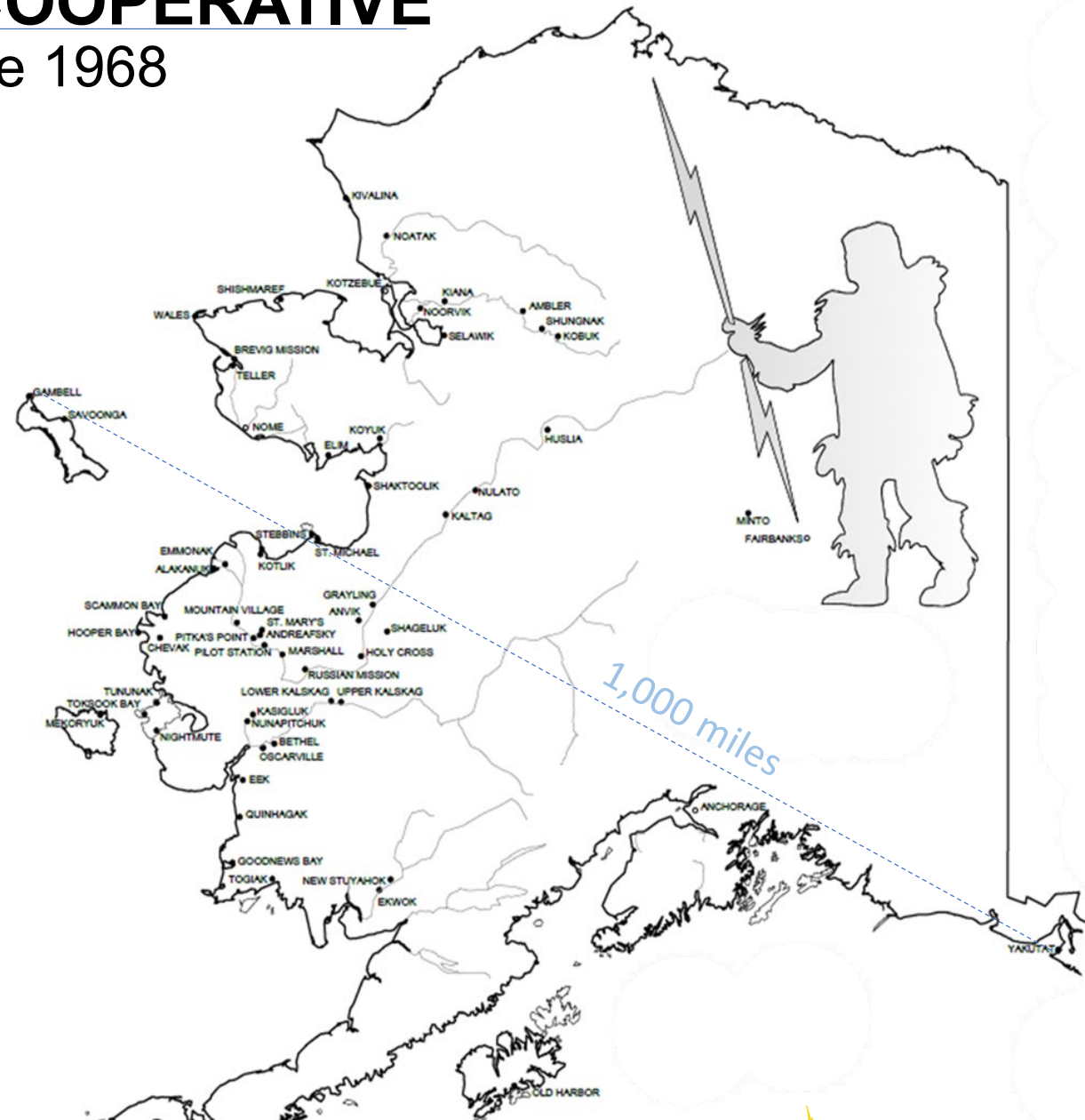
Kasigluk, AK

Alaska Village Electric Cooperative
Bill Stamm President & CEO

ALASKA VILLAGE ELECTRIC COOPERATIVE

Energizing Rural Alaska since 1968

- Nonprofit 501(c)12 -Electric Cooperative
- 8,300 Members, 11,500 Meters
- 58 Rural Communities, 31,000+ Residents
- 48 Power Plants, 160 Diesel Generators
- 9.1M Gallons of Diesel in 2022 (\$35.3M)
- 515 miles of Distribution Lines, 4,752 Poles
- 12 Wind Sites, 32 Wind Turbines, Serving 20 Communities
- \$60.7M Annual Revenue
- 2022 Total Electricity Sold 124.5 MWh

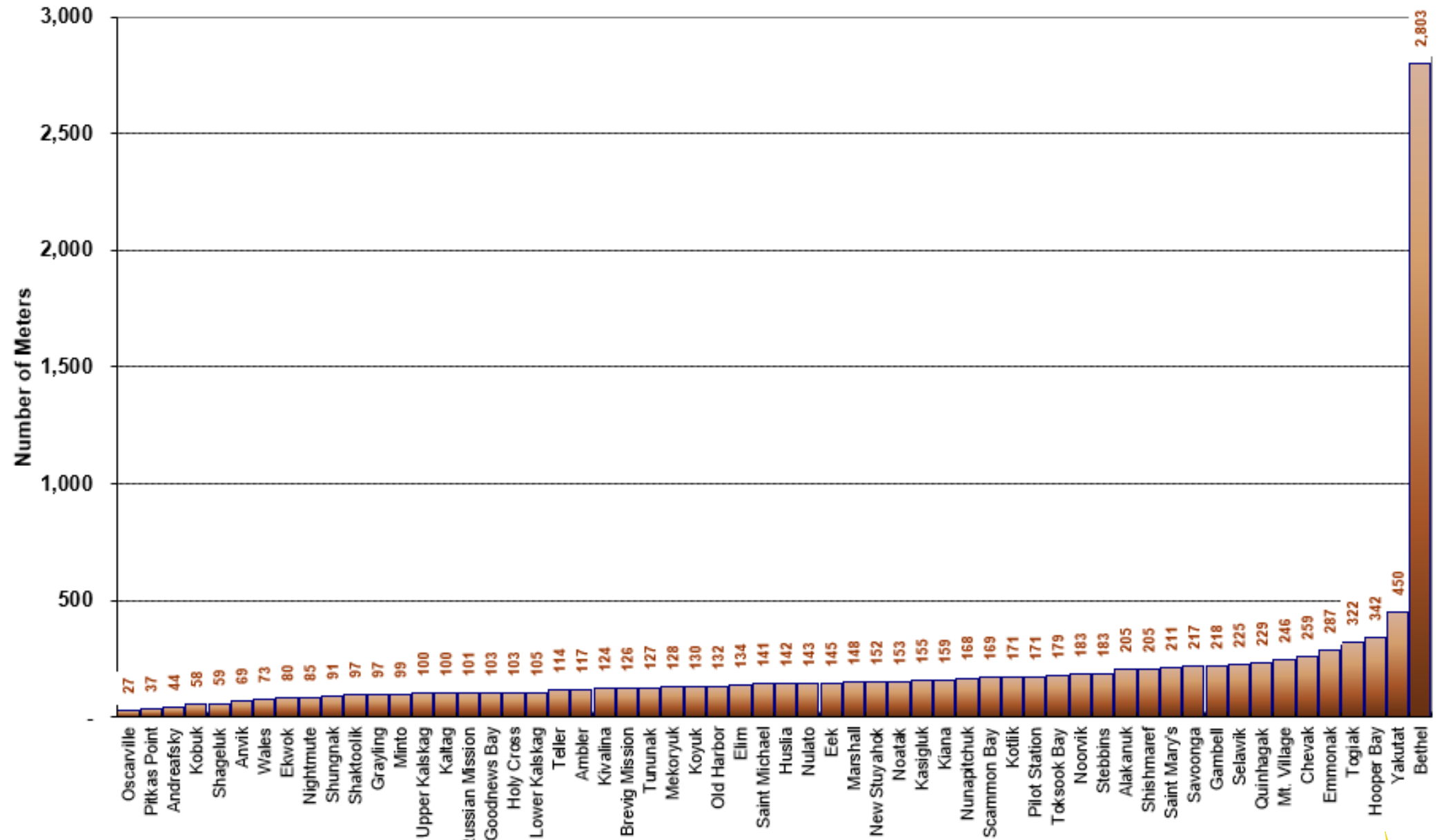




- 48 Full-time employees in Anchorage
- 24 Full-time travelling technicians
- 11 Full-time employees in Bethel
- 2 Full-time Operators in Yakutat
- 120 Part-time local Power Plant Operators



Relative “Size” of Community by Meter Count

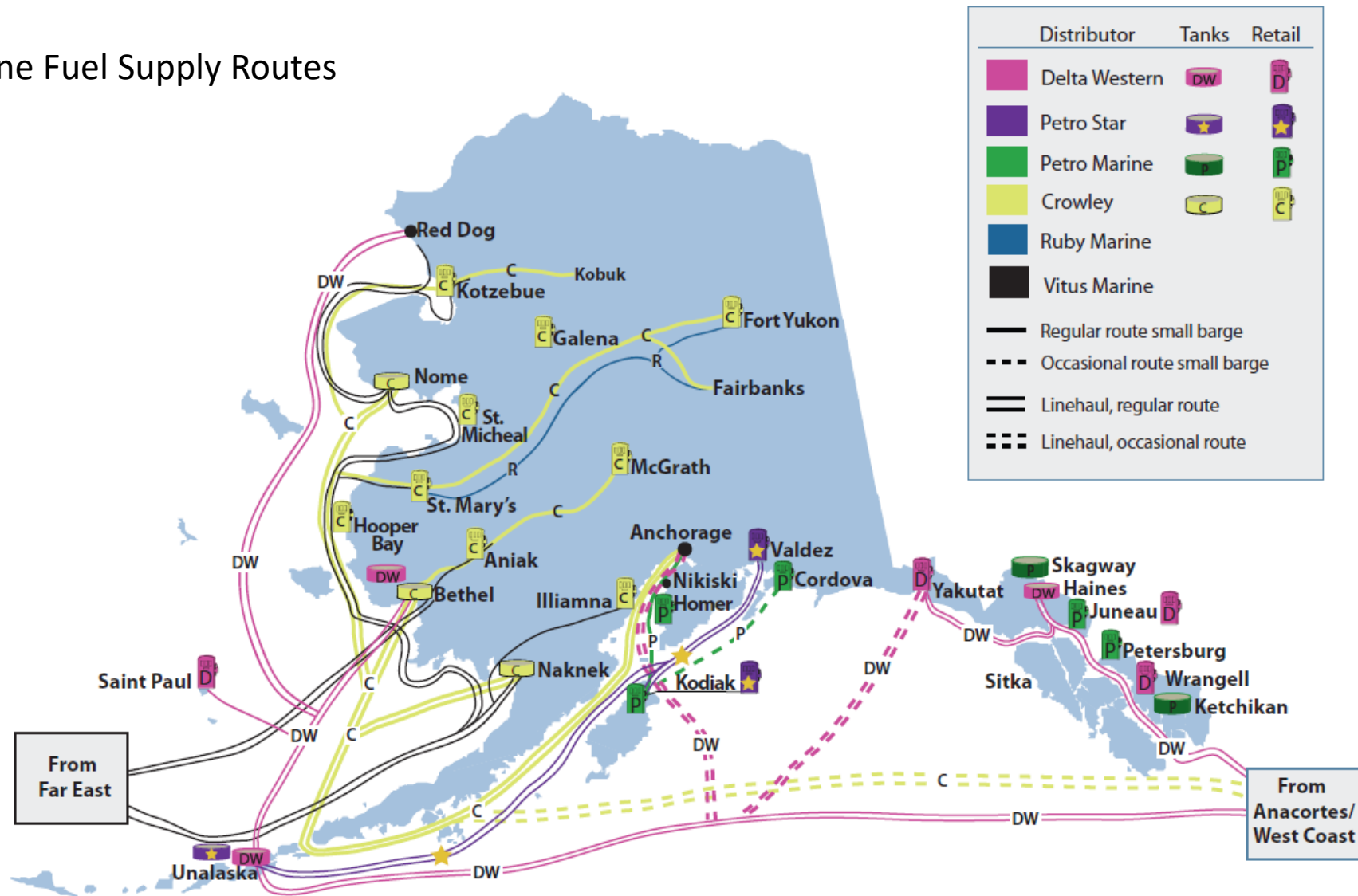




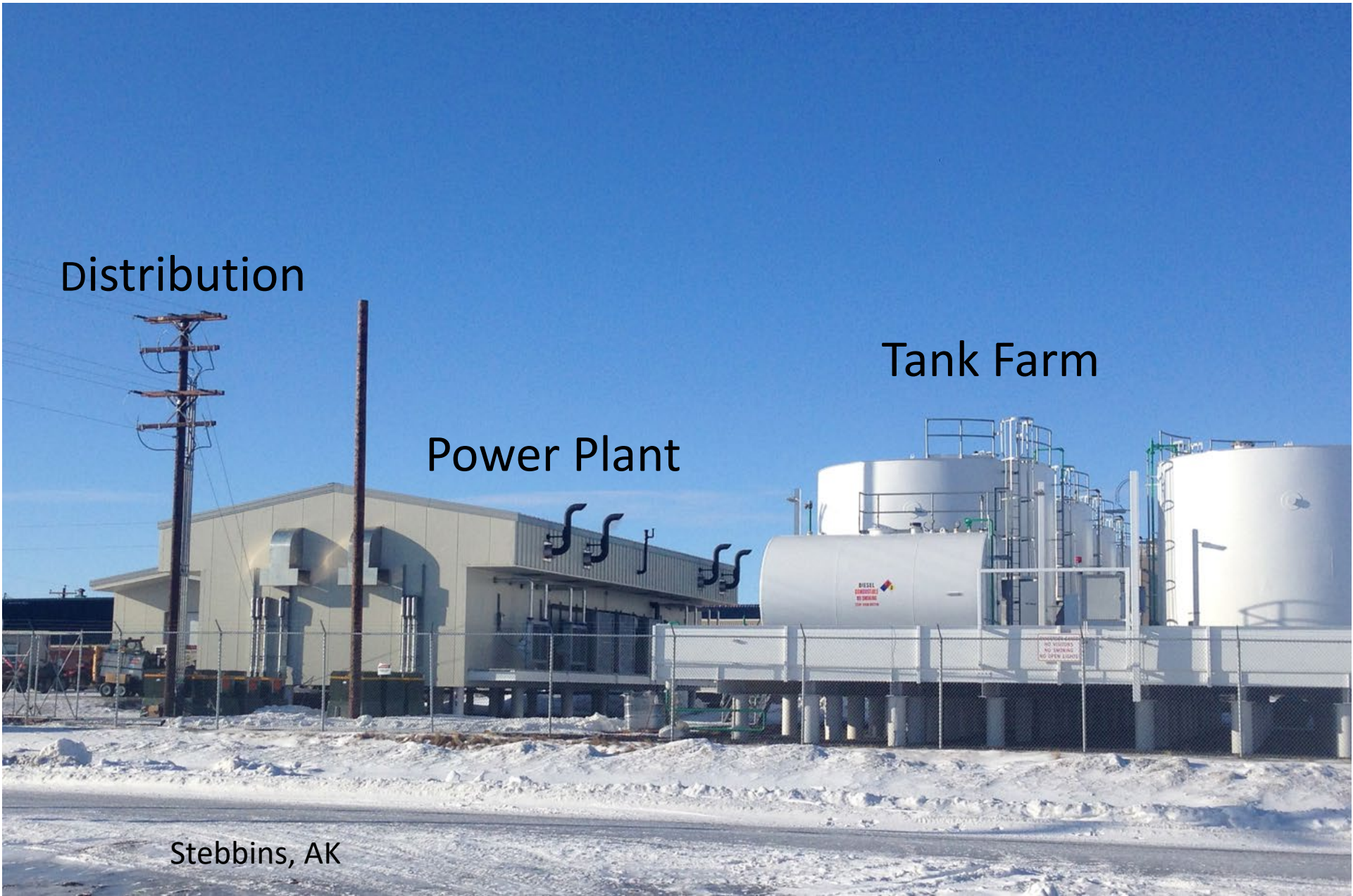


Toksook Bay, AK

Marine Fuel Supply Routes



Components of Alaska Fuel Costs: An Analysis of the Market Factors and Characteristics that Influence Non-Railbelt Fuel Prices. 2010, Szymoniak, Fay, Villalobos-Melendez, Charon and Smith.



Distribution

Tank Farm

Power Plant

Stebbins, AK



Pitka's Point/Saint Mary's

Renewable Generation System-wide 2022

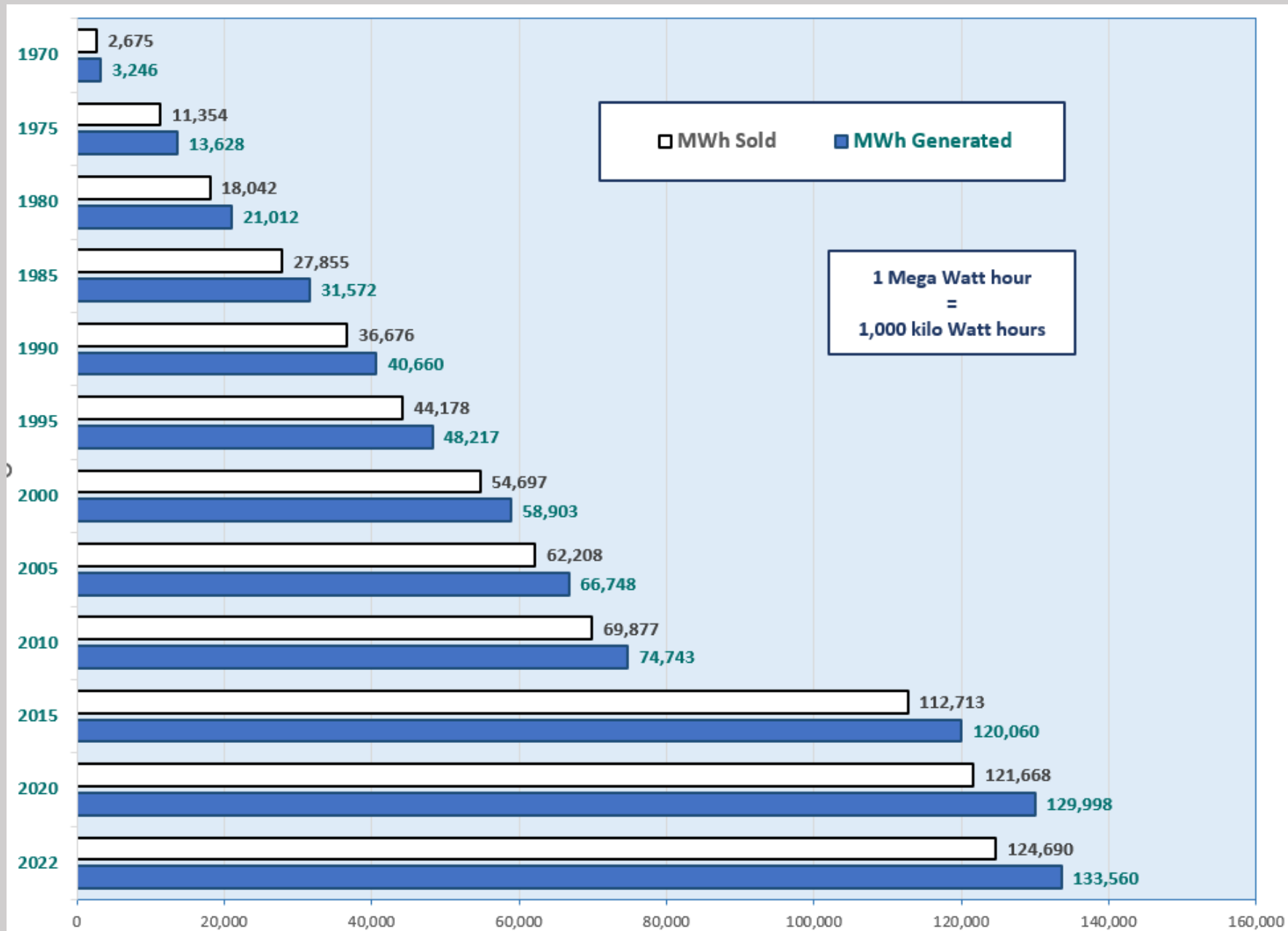
Net Wind Generation	4.5 MWh
Net Solar Generation*	<u>0.2MWh</u>
Total Renewable Gen	4.7MWh (5%)
Diesel Fuel Displaced (based on 13.7 kWh/gal)	343,000 gallons
Equivalent Cost of Diesel (based on \$3.90/gal)	\$1,338,000

* Primarily due to Shungnak-Kobuk Solar IPP

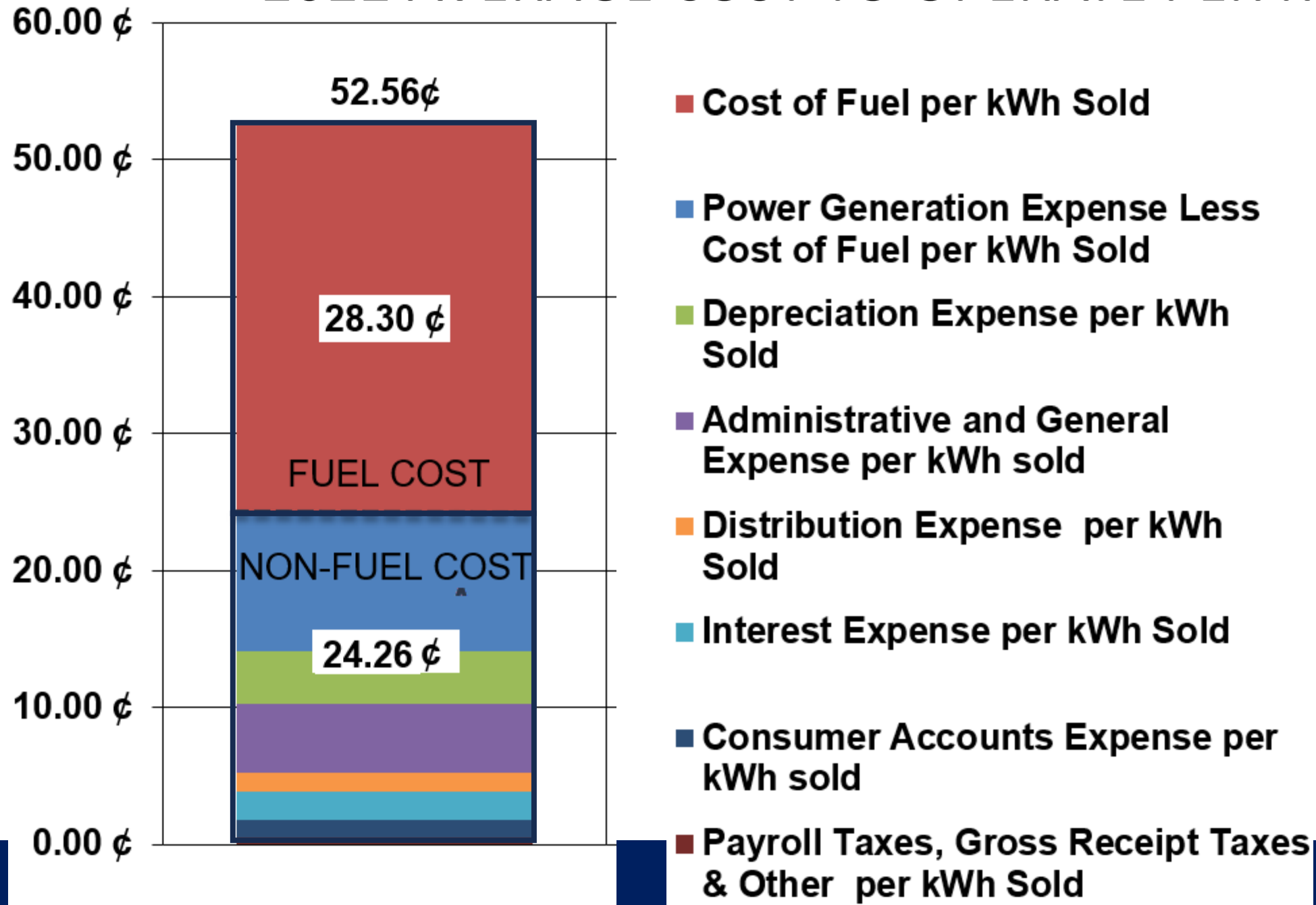
Togiak

POWER CONSUMPTION

- 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.
($< \frac{1}{2}$ of Juneau or Fairbanks)

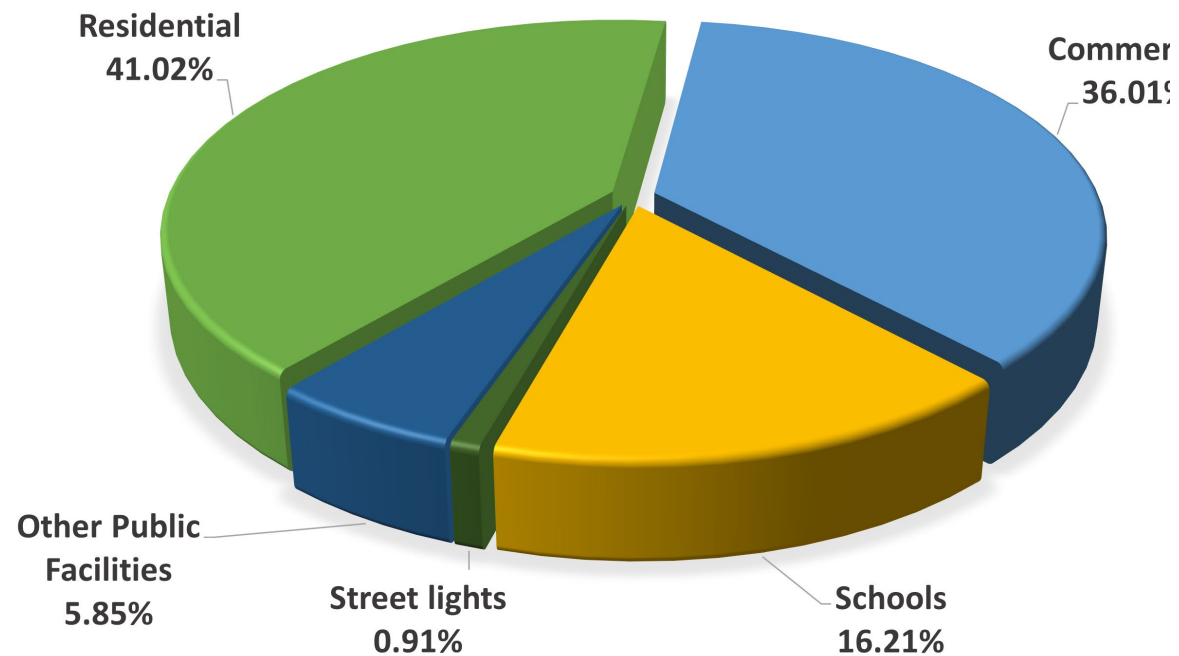


2022 AVERAGE COST TO OPERATE PER KWH SOLD

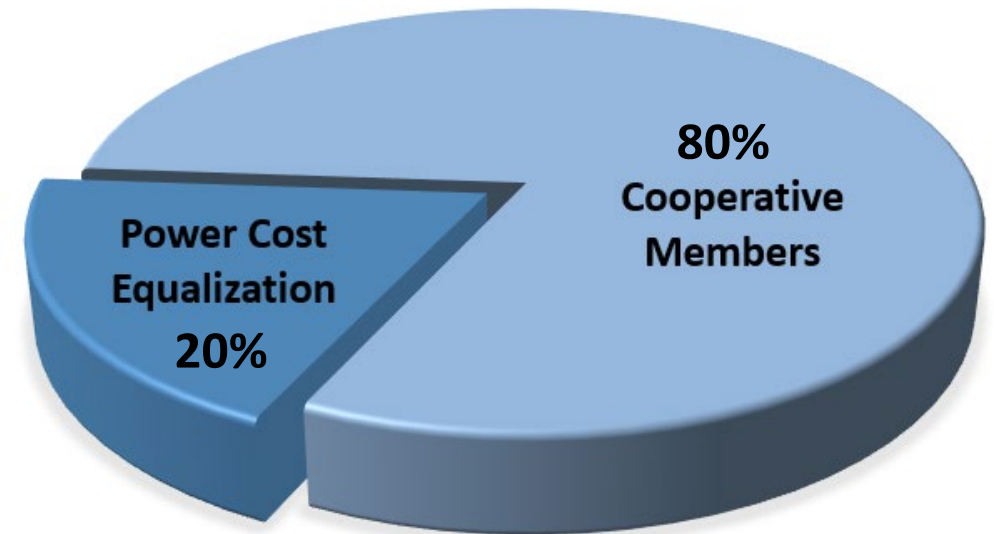


Where the Money Comes From

2021 SOURCE OF REVENUE BY CONSUMER CLASS



2021 SOURCE OF REVENUE FROM PCE



Why is electricity expensive in rural Alaska?

- Small populations – AVEC's average village is ~400 people
- Small loads – AVEC's average village load is ~160 kW
- No economies of scale, minimal commercial and industrial loads
(Expensive power = Less Development)
- Utilities are capital intensive; require lots of physical plant
- Isolated systems - reliability relies on self-redundancy
- Remote and difficult to access, limited infrastructure, equipment, resources
- Fuel is expensive – diesel delivery and storage cost often exceeds purchase cost
- Operations and maintenance is more expensive, freight, travel, lodging, it all adds up
- Availability of qualified personnel is limited, especially as complexity increases

AVEC strategies to reduce power cost

- Improve generation efficiency whenever possible
- Minimize distribution losses whenever possible
- Interconnect villages to improve economies of scale
- Welcome cost-effective new communities
- Add renewables and energy storage where economically feasible
- Capture and sell recovered heat, excess wind energy
- Promote energy education, workforce development, and economic opportunity

St. Mary's Family of Projects

- 900kW EWT Wind Turbine and Distribution Upgrades
- 20 Mile Intertie to Mt. Village
- 410,000-gallon Bulk Fuel Storage
- 3MW Power Plant
- GBS Energy Storage (2023)



Mountain Village

Yukon River

AVEC St. Mary's Power Plant

St. Mary's
St. Mary's

900kW EWT

Pitkas Point





Thank You,

