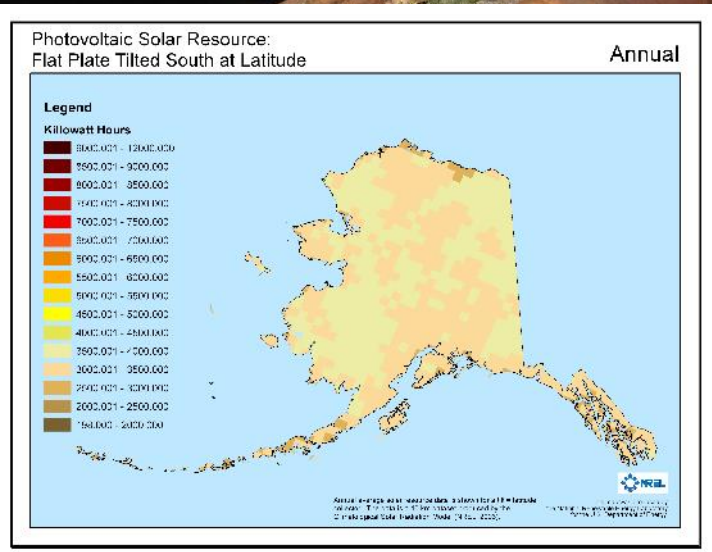

Solar Energy in Alaska

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Alaska Energy Authority: Mission

“To Reduce the Cost of Energy in Alaska”

- AEA is an independent and public corporation of the State of Alaska
- Created by the Alaska Legislature in 1976
- 44.83.070: “ The purpose of the Authority is to promote, develop, and advance the general prosperity and economic welfare of the people of the state by providing a means of financing and operating power projects and facilities that recover and use waste energy and by carrying out the powers and duties assigned to it under AS 42.45.”

Presentation Outline

- AEA-funded Solar Energy Case Studies
  - Denali Education Center Solar Thermal Project
  - Kaltag Solar PV Project
  - Eagle Solar PV Project
- Solar Codes and Standards
- Utility Interconnection Issues for Distributed Generation
- Power Cost Equalization (PCE) Implications of Solar PV
- Things to consider
- Opportunities for Solar in Alaska

Denali Educ. Center Solar Thermal Project

- Developed by Golden Valley Electric Association with REF grant funding
- Installed in Aug. 2009
- Funded as a demonstration project
- Open May-Sept only
- Previously had electric water heating
- 30’ x 50’ array
- 3k gal. water tank
- $210,879 cost
- $7,000 annual savings
- 30 year simple payback

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Kaltag AVEC Solar PV Project

- Deveoped by AK Village Electric Coop with REF grant funds
- 80kW average load
- 9.6 kW solar system built in 2012 for $100k
- Container used for transport and for mounting structure
- Inverter replaced at startup under warranty, otherwise operating as planned
- Solar system is small enough to act as a negative load, so no integration issues
- FY14 solar production was 7,937 kWh
- Saved $2,070 in fuel costs in FY14
- 50 year simple payback

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Eagle Solar PV Project

- Developed by AP&T with REF grant funds
- Installed in July 2015
- Initial PV capacity of 39kW reduced to 24kW of PV due to integration concerns
- 80kW average load
- $260k cost
- $7.5k annual savings
- 35 year simple payback

AK Solar Codes and Standards
(Not comprehensive)

- UL 1741/IEEE 1547: Grid disconnection from inverter if the AC line voltage or frequency goes above or below prescribed limits.
- AS 34.15.140: Sec. 34.15.145. Solar easement.
- Fire Marshal Plan Review: required for solar PV installations on non-residential buildings
- 2011 National Electrical Code
- 2012 National Electrical Safety Code
- Solar thermal systems: the AK Fire Marshal has adopted the 2009 Uniform Solar Energy Code
- The AK Fire Marshal is in the process of adopting new regulations!

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Utility Interconnection Issues

Critically important! Get a written agreement with the electric utility that addresses:

- rates
- net metering
- safety- disconnects, placarding, firefighter training
- Any required upgrades to meters, the service entrance, transformers, phase extensions, or other utility electrical equipment

Note: The RCA has a net metering policy that applies to only some of Alaska utilities. AVEC has its own policy, which may be useful as an example.

Power Cost Equalization Implications

- PCE kWh are 29% of total kWh sold in PCE communities
- Residential and community buildings are eligible
- Utility solar PV projects that reduce power generation costs may reduce PCE reimbursement rates
- Solar PV systems installed on PCE-eligible residences or community buildings may primarily benefit the PCE program
- Distributed generation solar PV systems reduce the number of utility kWh's sold, so increase the utility's non-fuel cost per kWh. This may adversely impact other utility customers in the community.

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Things to Consider

- Shading
  - Solar Pathfinder, Suneye, etc.
  - Consider growth rate and land ownership of vegetation
- Panel degradation rates (first year = 1%+, 0.5-0.8%/year)
- Inverter replacement at 12-15 years
- If roof-mounted, roof repairs or replacement during the 20-30 year life of the solar project
- Tilt angle can be adjusted seasonally to improve performance
- Tracking systems may be less economic than purchasing additional panels in most Alaska applications

Opportunities for Solar Energy in Alaska

- Grant-funded projects
- Ecotourism
- Marketing
- Aesthetics
  - quiet compared to a generator
  - Environmental benefits (should be compared to alternatives)

AKEnergyAuthority.org