## Alaska's Railbelt Electric System: Decarboniza on Scenarios For 2050

Researchers at the Alaska Center for Energy and Power at UA8,704gfgawa (GWh), about 85% more than in 2021. Peak demand equals 1,626 megawa s (MW), more than double the 2021 level. These higher loads come from popula on growth, electric vehicles, and heat pumps.

Addi onal baseline resources include the Bernice-Beluga HVDC line, upgrading Kenai-Anchorage

transmission to 230 kilovolts (kV), the Dixon Diversion hydro project, and 30 MW of new wind at Li le Mount Susitna, plus 228 MW of residen al roo op solar. Healy unit 2 is re-red. New balleries bring total ballery capacity to 216 MW.

## Scenario descrip ons

dollars. The

& transmission cost of electricity (G&T cost) is \$119 per megawa utput and maintain reliability. The

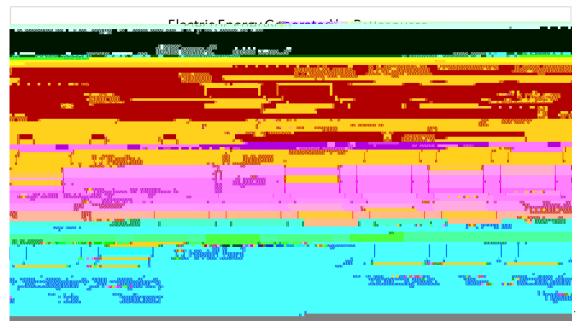
Alaska Inter e from Southcentral to Fairbanks is upgraded to 230 kV, which helps share energy. Required capital investment = \$11.8 billion; G&T cost = \$134/MWh. Wind/Solar/Tidal adds a 400 MW dal plant in Cook Inlet plus 924 MW wind and 190 MW u lity solar. Renewables generate 70% percent of required energy. 750 MW of new balleries and the Alaska Inter elugrade are added. Required capital investment = \$7.7 billion; G&T cost = \$128/MWh.

Wind/Solar/Nuclear. Small modular nuclear reactors

and 328 MW

of new u lity solar are added. Generated energy is 96% zero-carbon. 1,518 MW of new balleries and the Alaska Interleupgrade are added. Required capital investment = \$10.1 billion; G&T cost = \$128/MWh

## Results at a glance







## Takeaways

These scenarios are illustra ve. They demonstrate what is possible, not necessarily what is op mal. A low-carbon grid in 2050 with 70-95% carbon-free genera on is possible, but



