

# Alaska Hydropower

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# Who We Are



Created in 1976 by the Alaska Legislature, the [Alaska Energy Authority \(AEA\)](#) is a public corporation of the State of Alaska governed by a board of directors with the mission to “reduce the cost of energy in Alaska.” AEA is the state's energy office and lead agency for statewide energy policy and program development.

# What We Do



**Energy Planning** – In collaboration with local and regional partners, AEA provides critical economic and engineering analysis to plan the development of cost effective energy infrastructure.



**Grants and Loans** – AEA provides loans to local utilities, local governments, and independent power producers for the construction or upgrade of power generation and other energy facilities.



**Railbelt Energy** – AEA owns the Bradley Lake Hydroelectric Project and the Alaska Intertie. These assets benefit Railbelt consumers by reducing the cost of power.



**Renewable Energy** – AEA provides renewable energy and energy efficiency grants, analysis, and expertise to benefit Alaskans. These include hydro, biomass, wind, solar, and others.



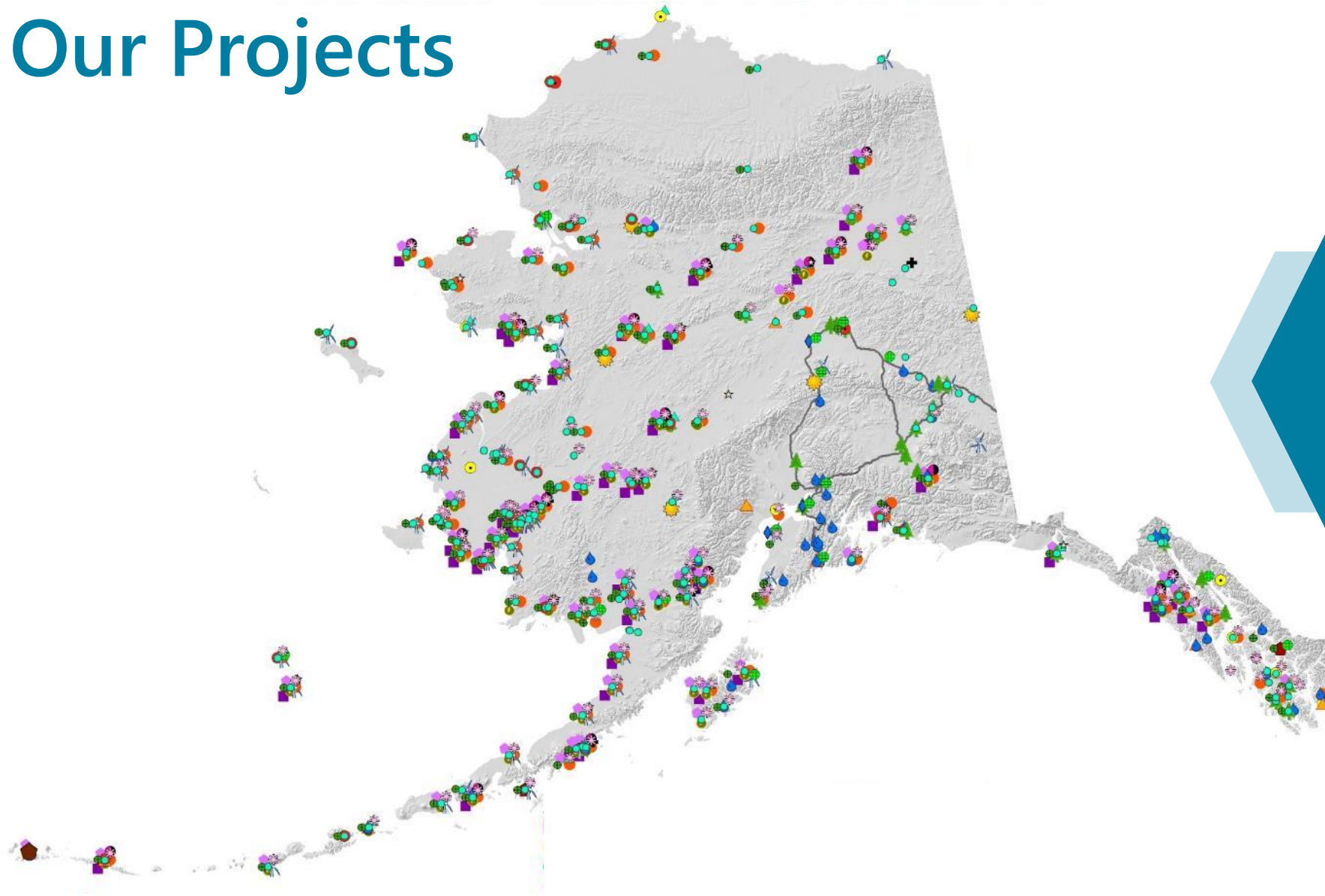
**Power Cost Equalization** – The Power Cost Equalization Program reduces the cost of electricity in rural Alaska for residential customers and community facilities.



**Rural Energy** – AEA constructs bulk fuel tank farms, diesel powerhouses, and electrical distribution grids in rural villages. AEA supports the operation of these facilities through circuit rider and emergency response programs.



# Our Projects

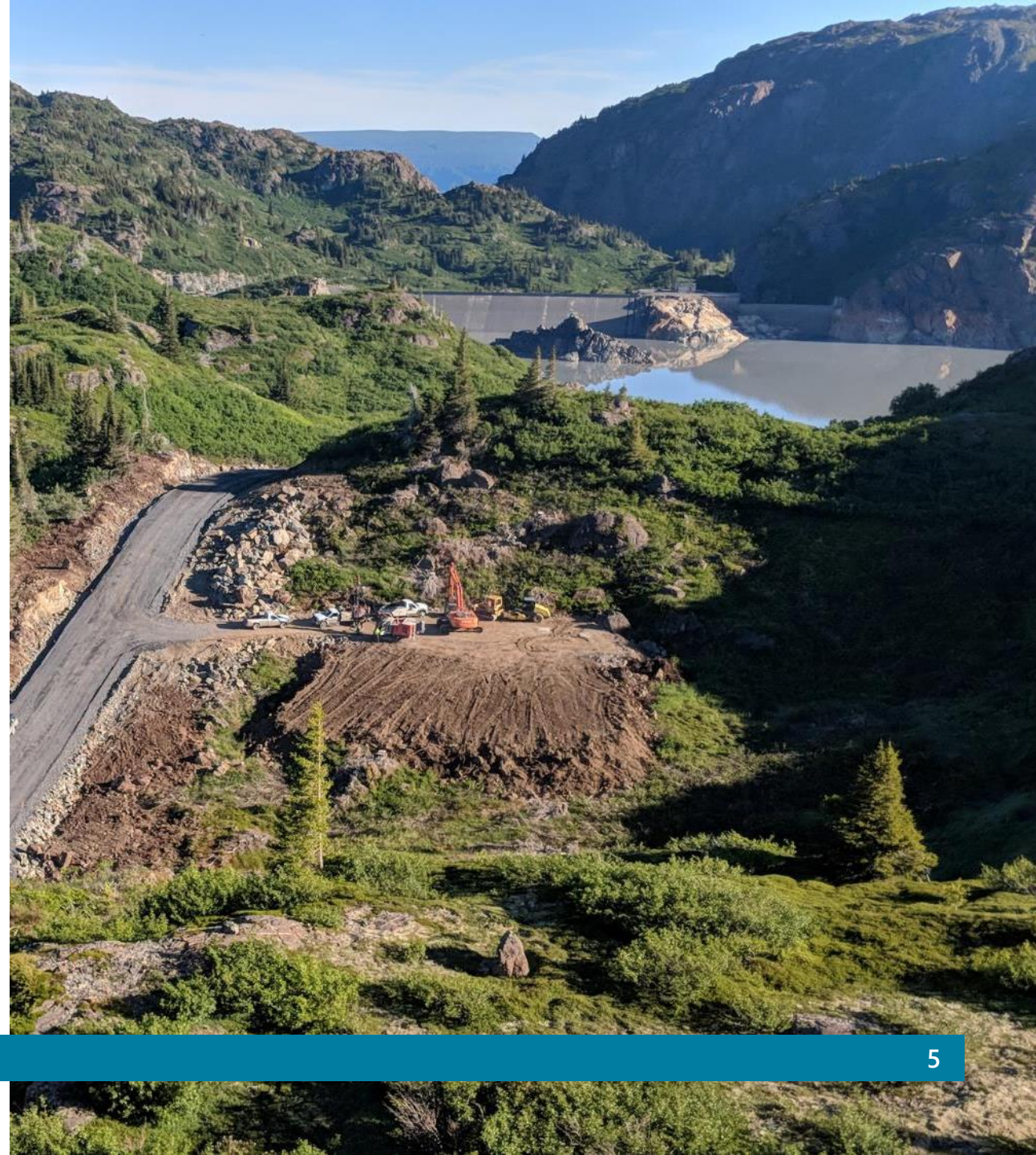


AEA works with its Alaska partners and stakeholders to provide reliable and affordable energy solutions.



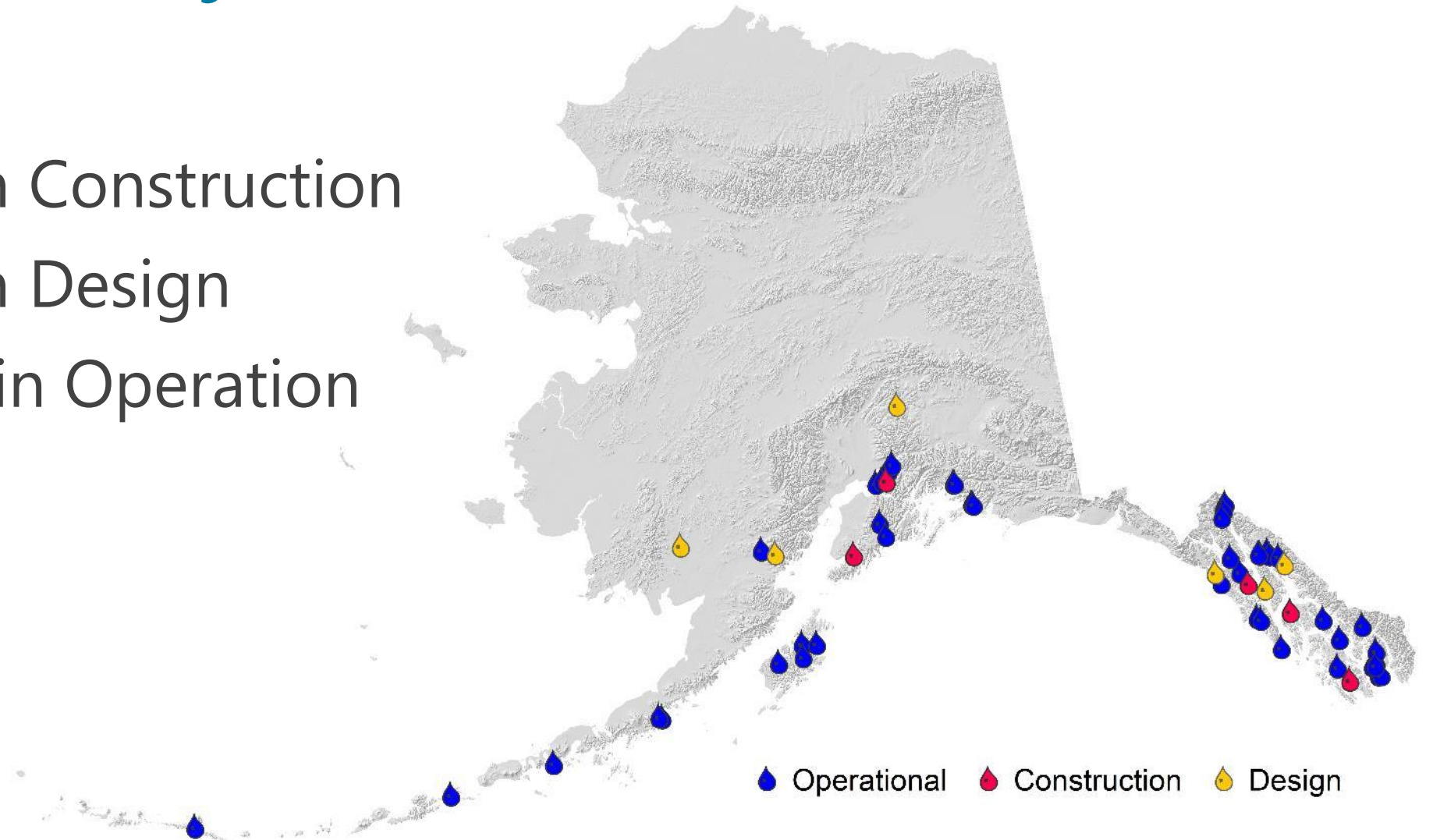
# Programs and Projects

- ▶ Bradley Lake Hydroelectric Project
- ▶ Alaska Intertie
- ▶ Bulk Fuel Upgrades
- ▶ Rural Power System Upgrades
- ▶ Rural Utility Assistance
- ▶ Power Cost Equalization
- ▶ Renewable Energy Fund Grants
- ▶ Power Project Fund Loans
- ▶ Alaska C-PACE
- ▶ Alternative Energy
- ▶ Energy Efficiency
- ▶ Energy Project Development



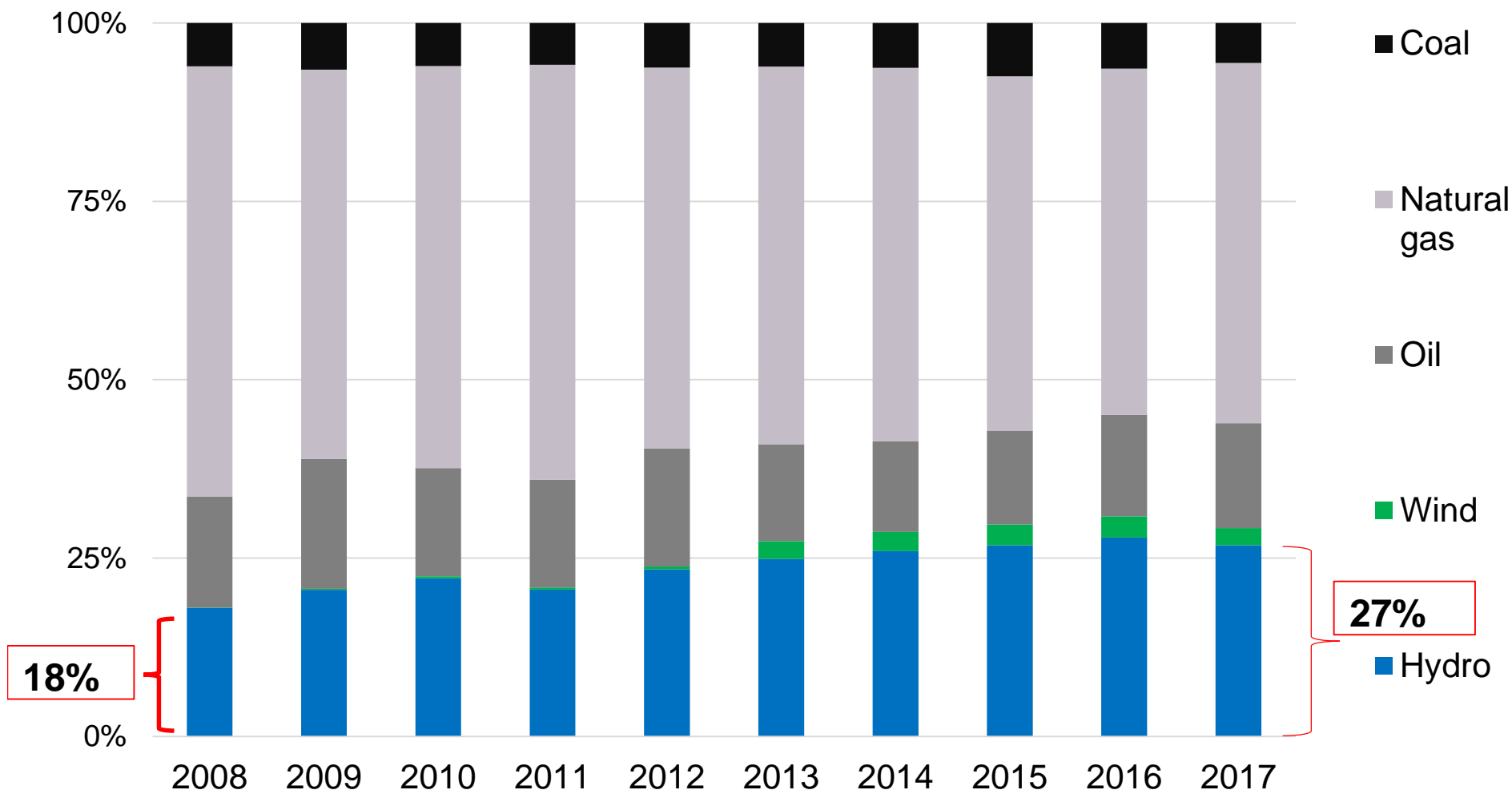
# Hydropower Projects in Alaska

- 🔴 4 Projects in Construction
- 🟡 6 Projects in Design
- 🟢 51 Projects in Operation





# Alaska Electric Energy Generation (2017)







# Alaska Hydropower Projects in Operation


- ▶ 51 operational hydropower projects in Alaska
- ▶ Three projects under construction to increase Statewide capacity by 5.5 MW to be completed in 2020
- ▶ Projects in design/funding to increase capacity by nearly 491 MW



**1 watt =**  a single LED

**1 kilowatt =**  
(1,000 watts)  a toaster

**1 megawatt =**  
(1,000,000 watts)   
1,000 houses

**1 gigawatt =**  
(1,000,000,000 watts)   
1,000,000 houses

## Important Terms

- ▶ Capacity (Engine size) is measured in megawatts (MW) or kilowatts (kW) at a single point in time.
- ▶ Project Energy is power over time. Commonly measured as Megawatt -hours (MWh) or kilowatt-hours (kWh). How far can you go?
- ▶ House on the Alaska Railbelt may use 500-600 kWh per month energy.



Lowest Cost Hydropower Are  
Improvements to Existing

# Hidden Basin

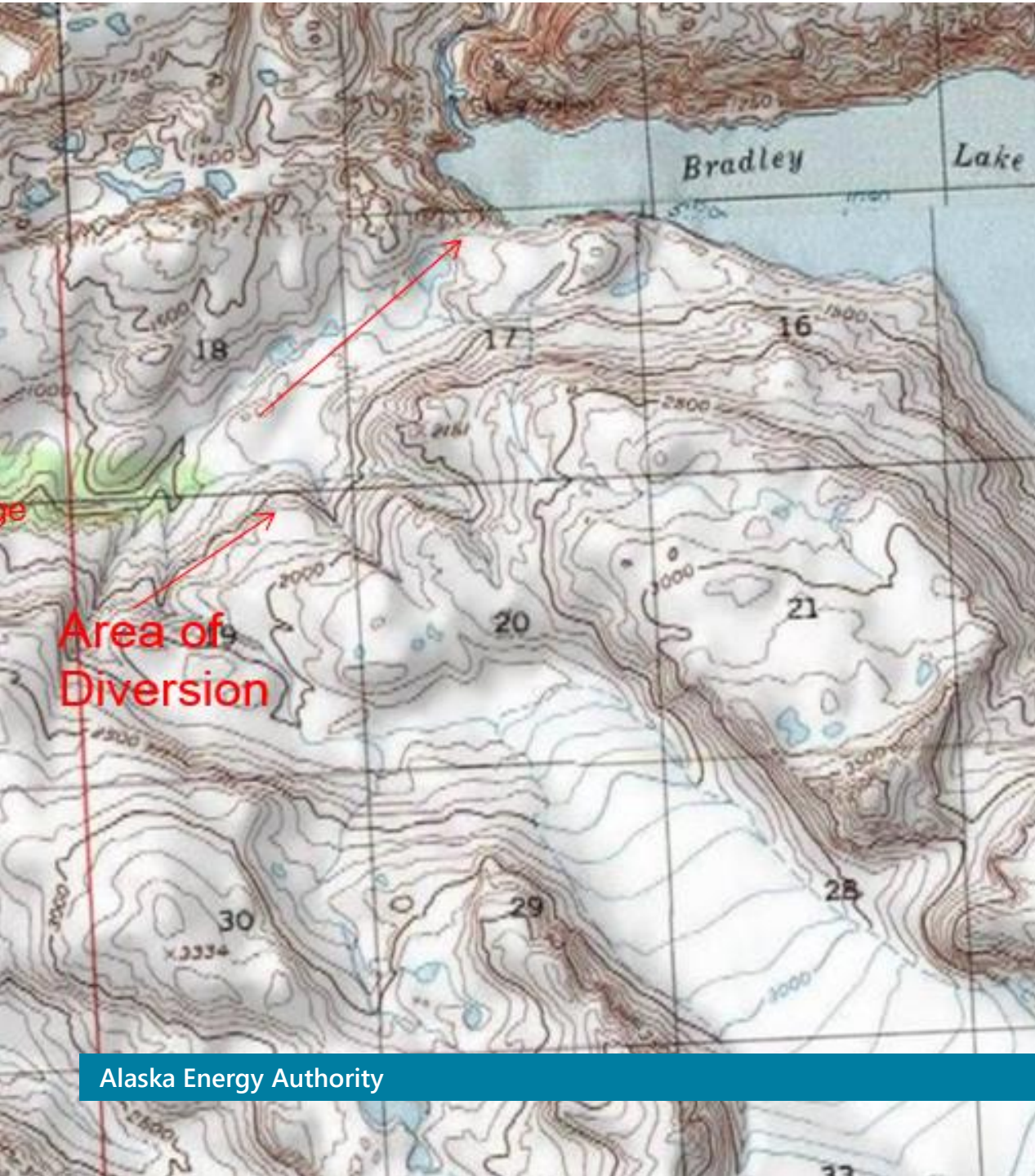
- ▶ Located 22 miles southeast of Kodiak, and serves City of Kodiak and surrounding communities
- ▶ Capacity zero
- ▶ Completed December 2019
- ▶ Financed and owned by Kodiak Electric Association





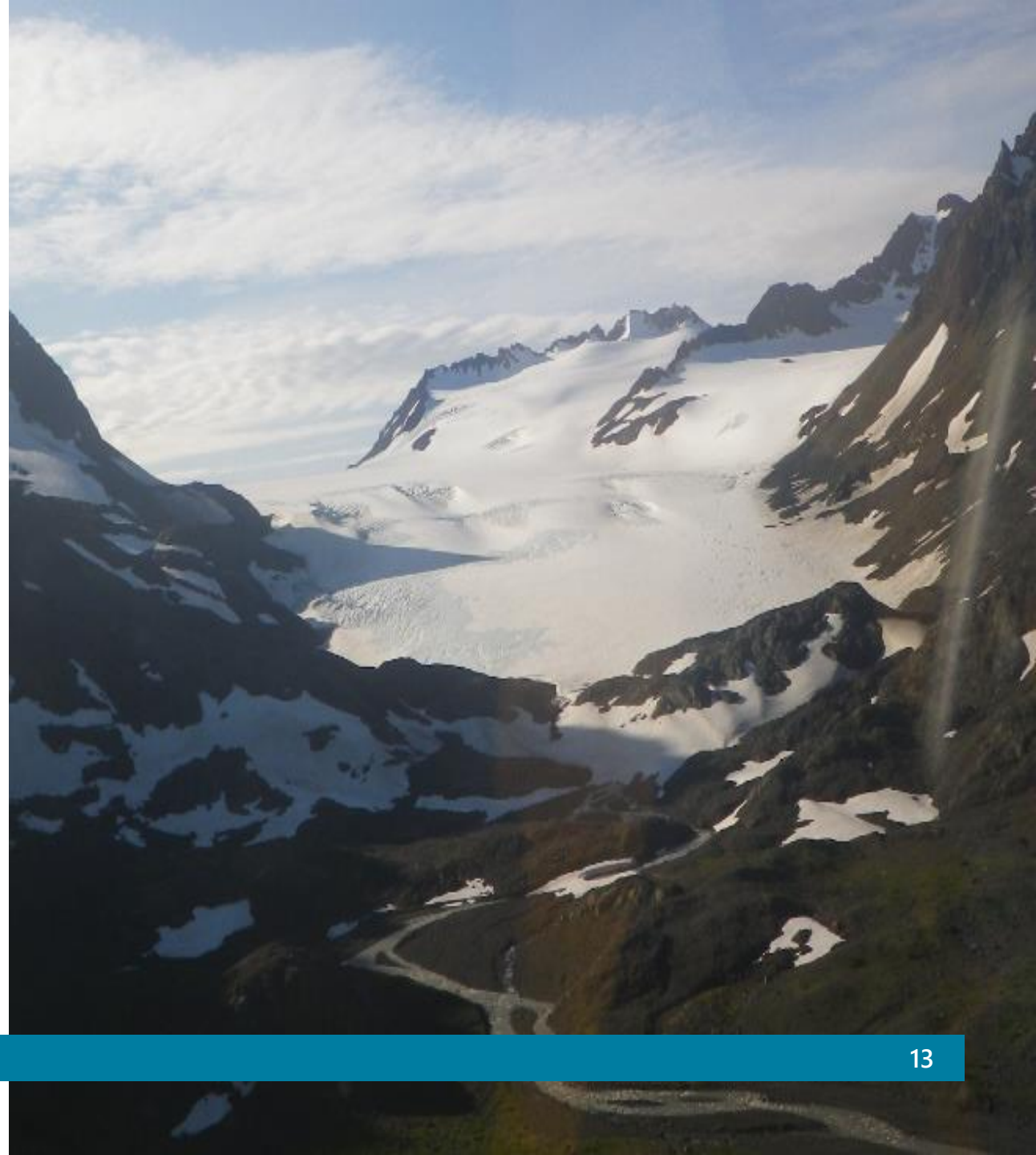
# West Fork Upper Battle Creek Diversion

- ▶ Diversion location 2 miles southwest of Bradley Lake
- ▶ Diversion 600 feet above Bradley Lake
- ▶ Convey water by pipe



# Battle Glacier Source

- ▶ Glacier is a form of energy storage
- ▶ Basin increases contribution area of Bradley Lake
- ▶ Higher elevation receives greater precipitation





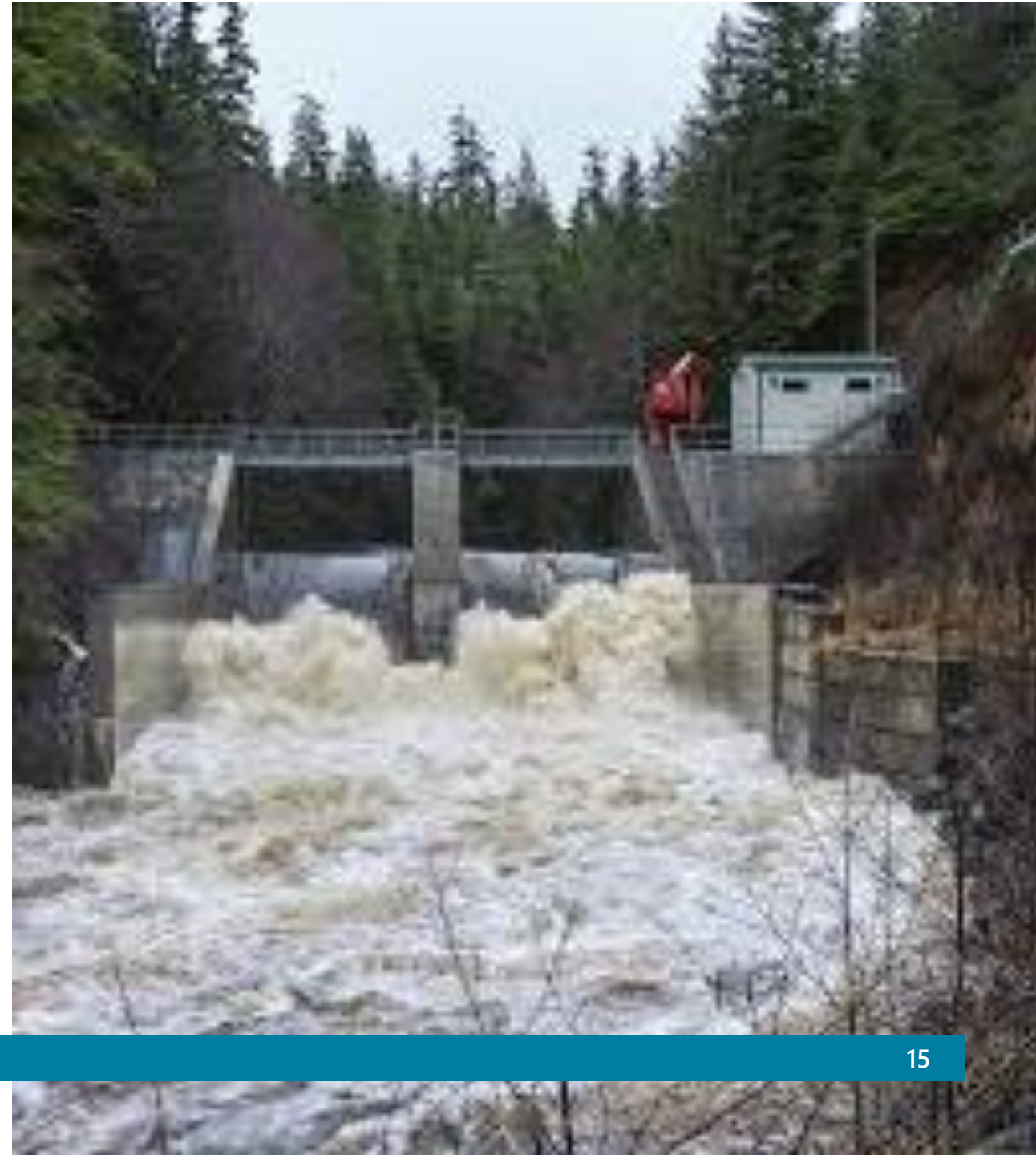
# West Fork Upper Battle Creek Diversion

- ▶ Stage 2 Diversion show under construction
- ▶ Stage 3 under construction and to be finished in the next month
- ▶ Install pipe and complete project in 2020.



# Gunnuk Creek

- ▶ Located in Kake, Alaska
- ▶ Capacity 0.5 MW
- ▶ Completion 2020
- ▶ Funded by AEA grant and Inside Passage Electric Cooperative financing
- ▶ Owned by Inside Passage Electric Coop





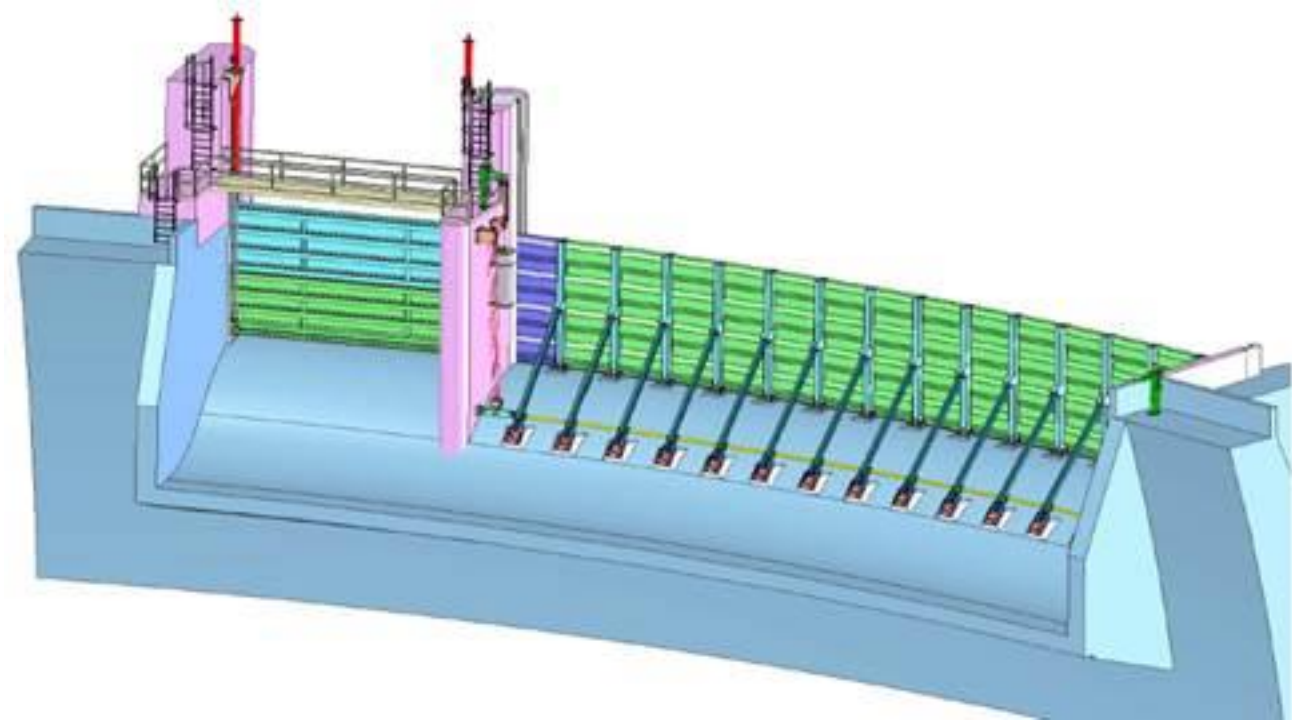
# Swan Lake

- ▶ Owned by Southeast Alaska Power Agency (SEAPA)
- ▶ Most years would spill (storage limited)

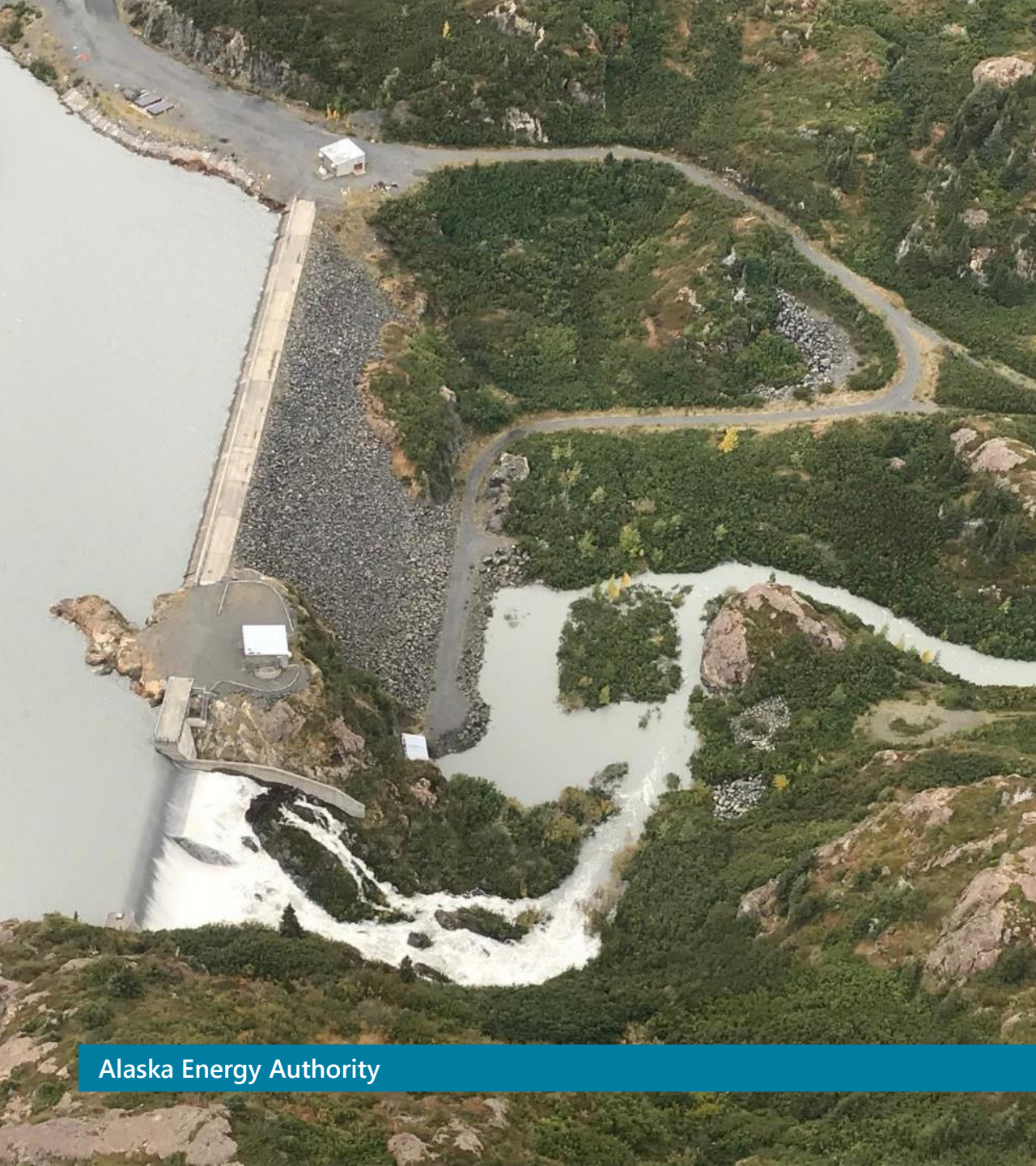


# Swan Lake Spillway Raise

- ▶ Gated spillway
- ▶ Flashboards 78 feet wide & 17 feet tall
- ▶ Increase storage by 25%
- ▶ Flashboards can be pulled during flood situation








# Bradley Lake Fish Water Release

- ▶ Salmon & point of compliance  
4 miles downstream of dam
- ▶ Historically have over released  
30%
- ▶ Install computer program and  
change valves
- ▶ Tighter control to save up to  
5,000 MWh energy





AEA provides **energy solutions** to meet the unique needs and opportunities of Alaska's rural and urban communities.



## ALASKA ENERGY AUTHORITY

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