

Alaska Hydropower

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Community and Regional
Affairs Committee
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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.

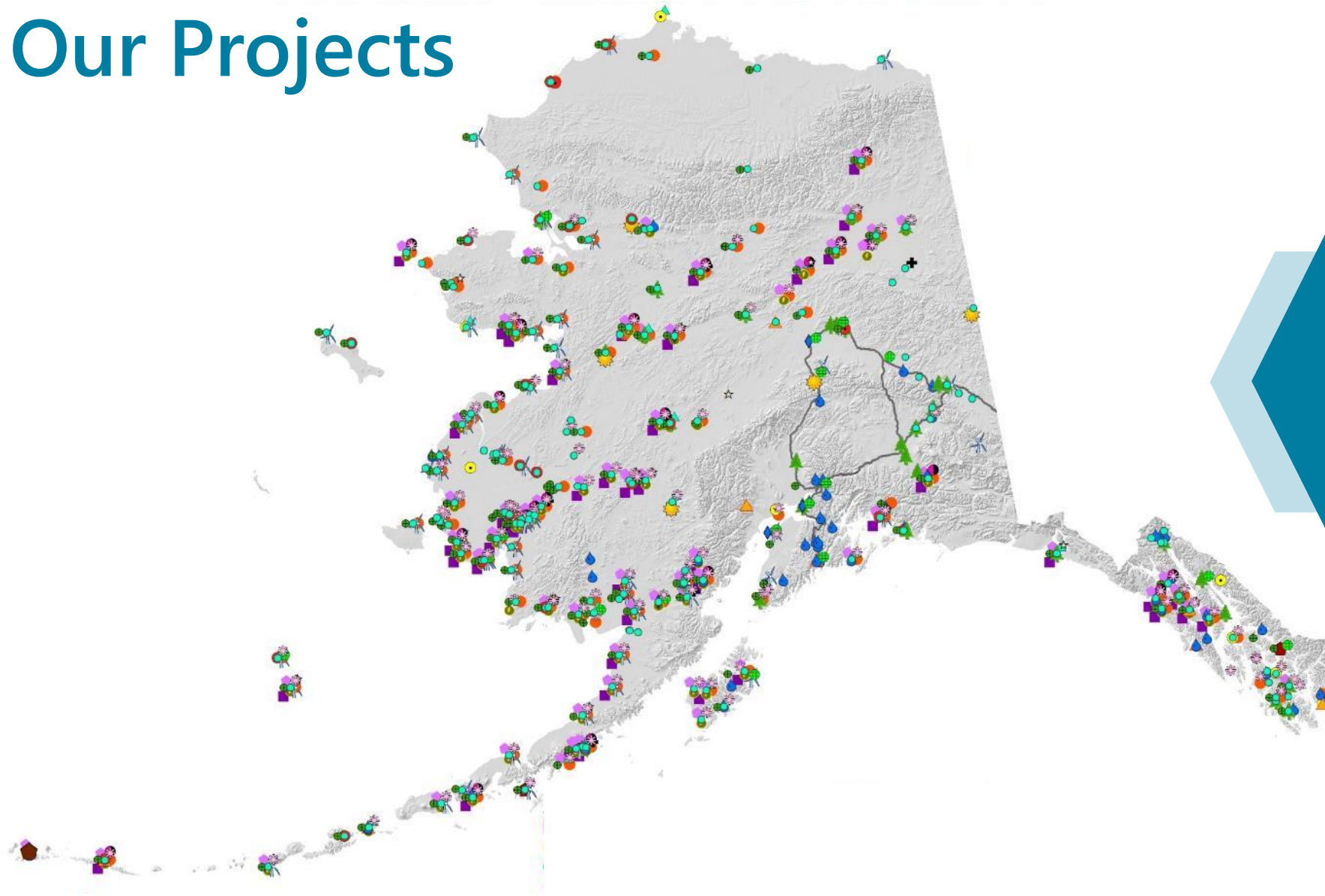


Power Cost Equalization – The Power Cost Equalization Program reduces the cost of electricity in rural Alaska for residential customers and community facilities.



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.

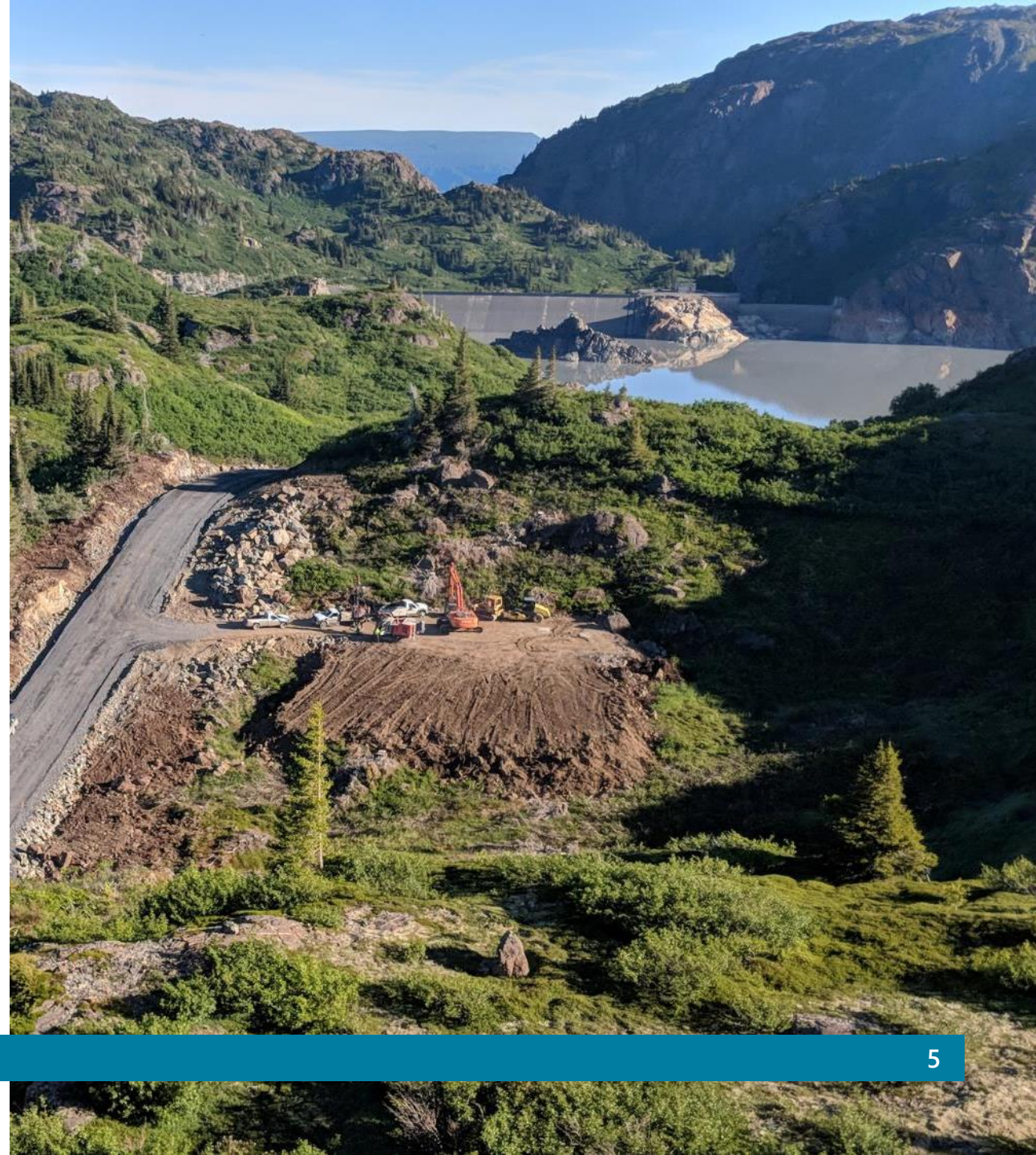
Our Projects



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

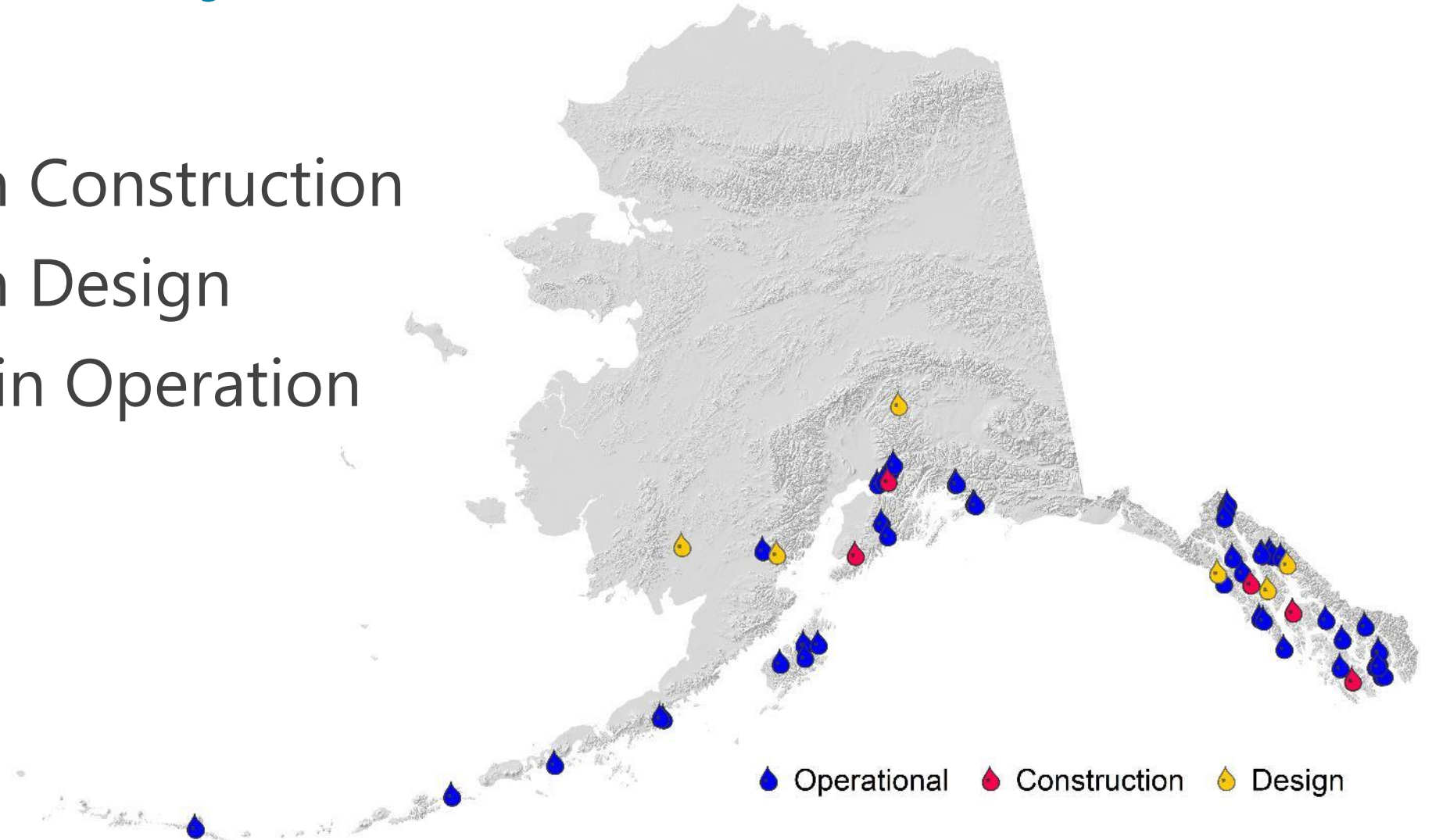
Programs and Projects

- ▶ 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

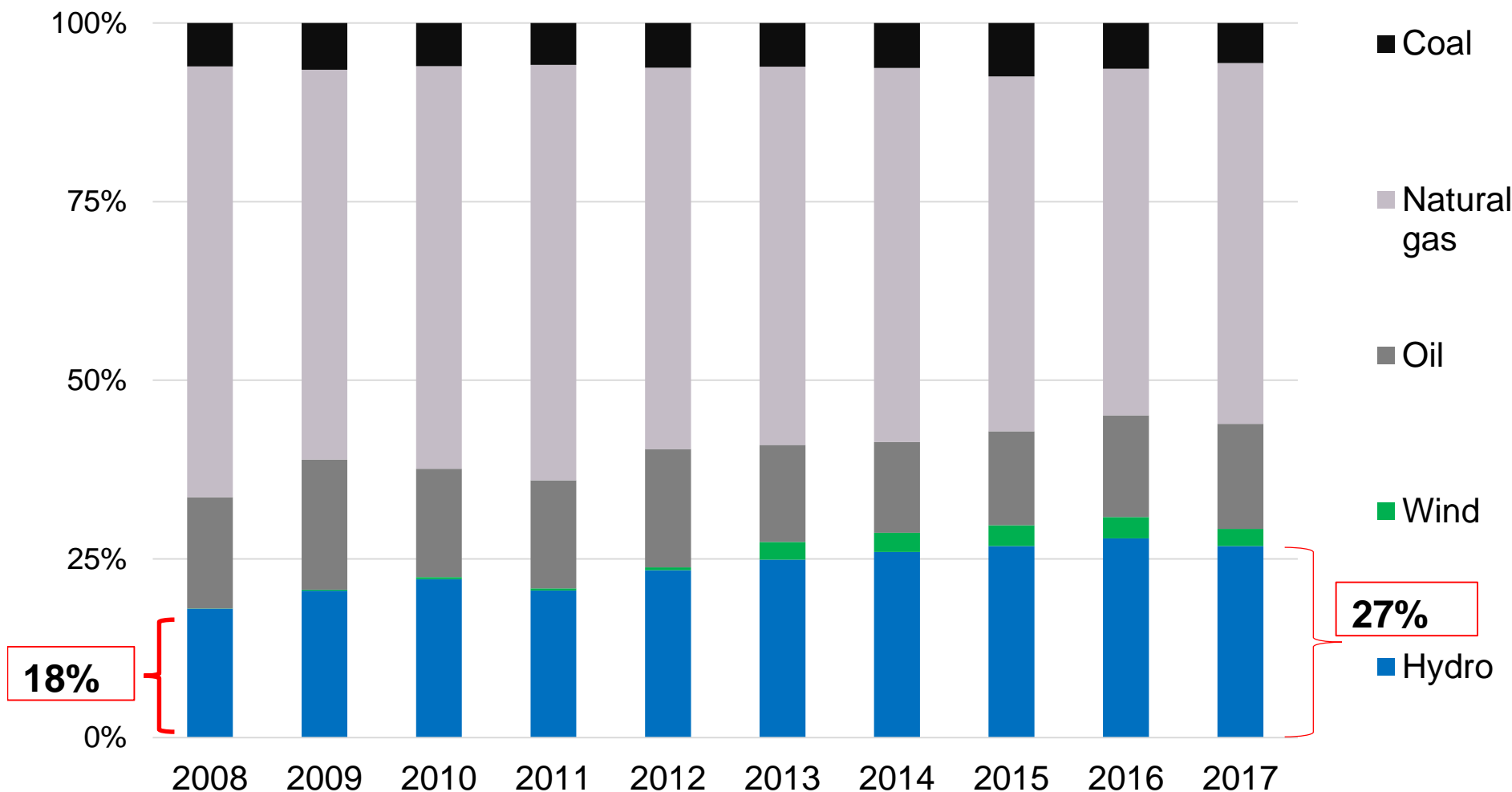


Hydropower Projects in Alaska

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

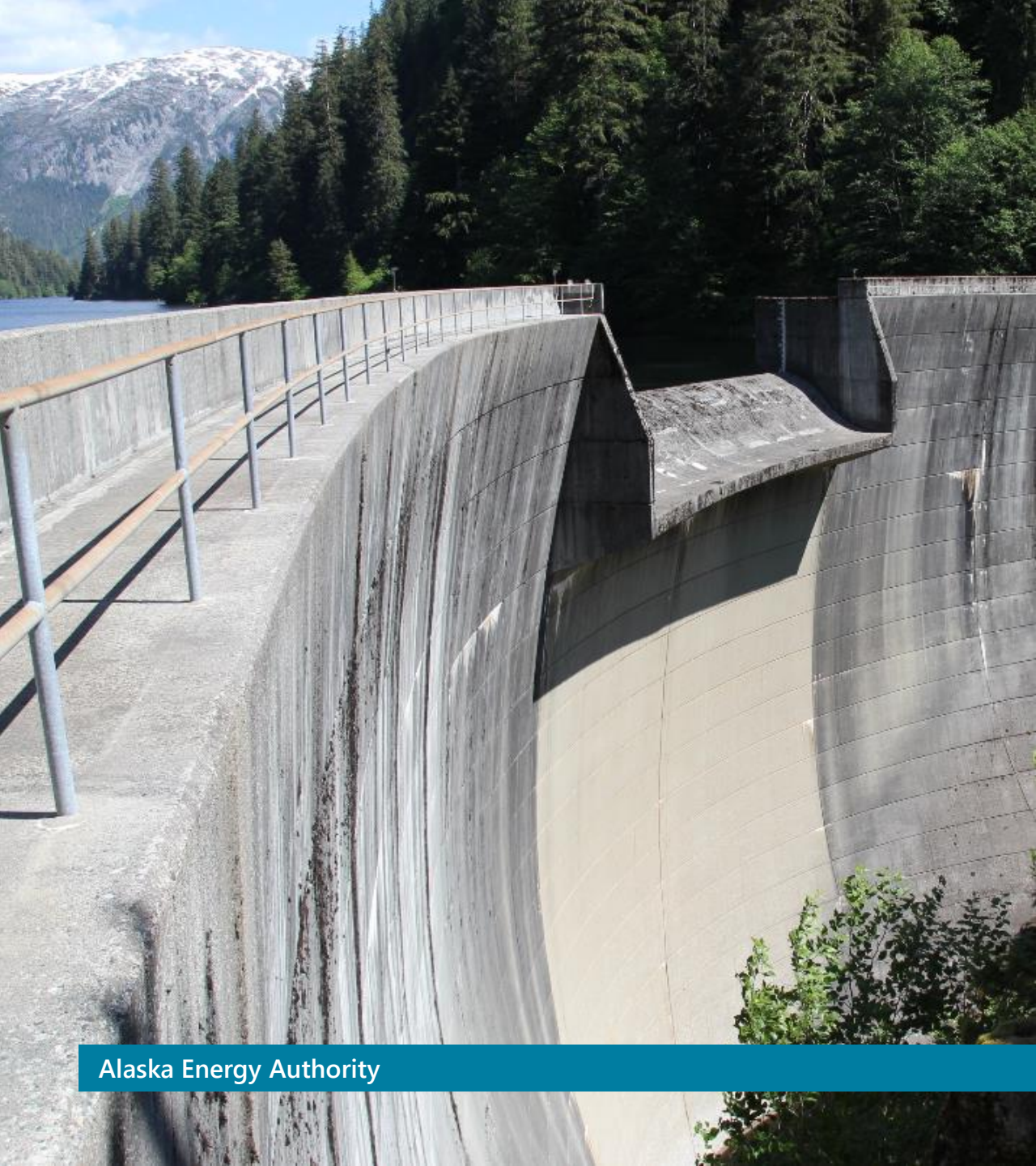


Alaska Electric Energy Generation (2017)





Two Types of Hydropower Projects

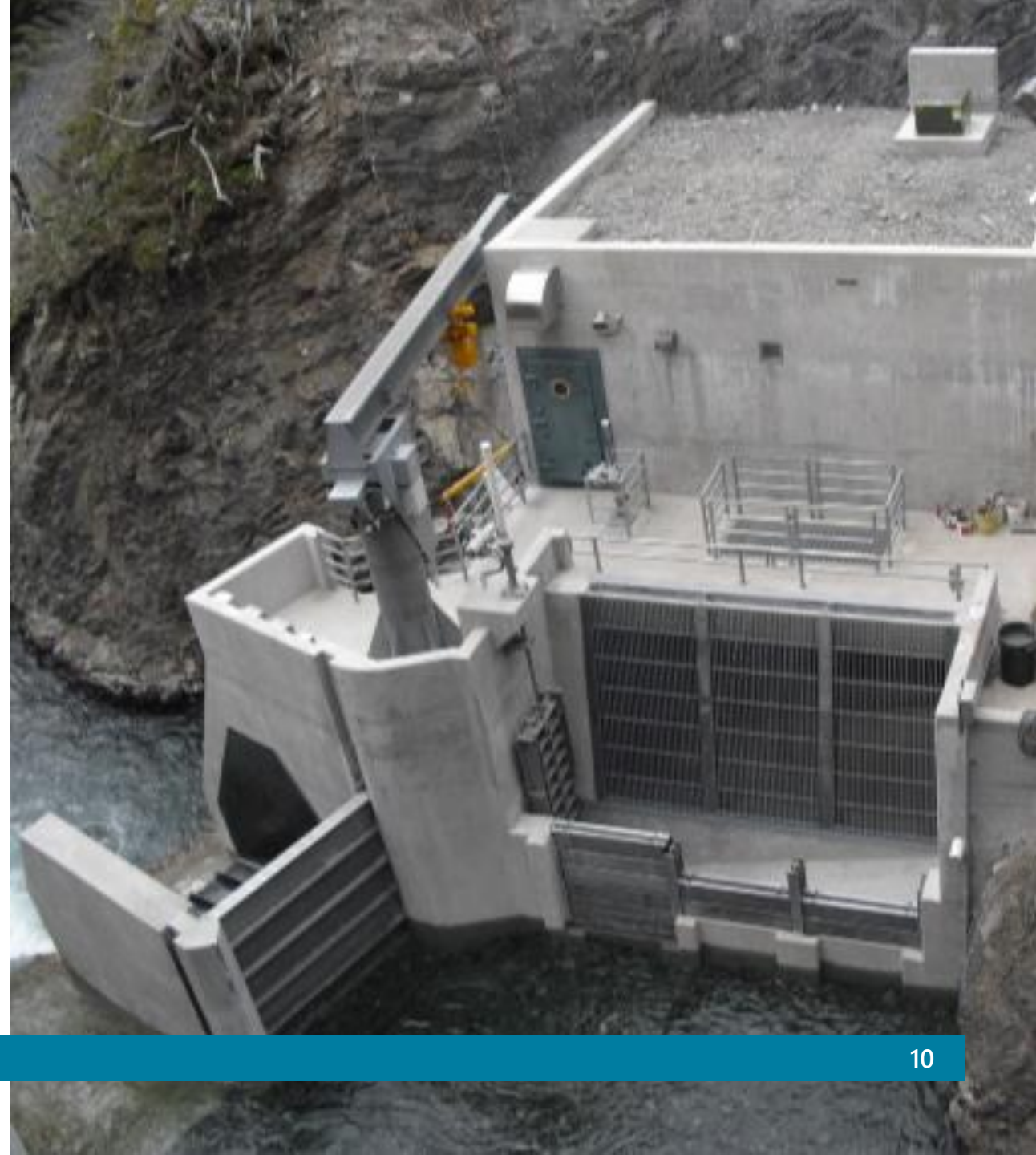


Traditional Storage

- ▶ Traditional Storage projects tend to be more expensive, require terrain chokepoints, and require more time for permitting and construction.
- ▷ Bradley Lake
- ▷ Snettisham
- ▷ Susitna-Watana
- ▷ Swan Lake
- ▷ Sweetheart Lake
- ▷ Terror Lake

Run of River

- ▶ Run of River projects are lower cost and tend to be permitted and constructed quicker.
 - ▷ Delta Creek
 - ▷ Five Mile Creek
 - ▷ Gartina Falls
 - ▷ Humpback Creek
 - ▷ Knutson Creek
 - ▷ Nuyakuk River
 - ▷ Thayer Creek



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 of a generator 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).
- ▶ House on the Alaska Railbelt may use 500-600 kWh per month energy.



Alaska Hydropower Projects in Operation

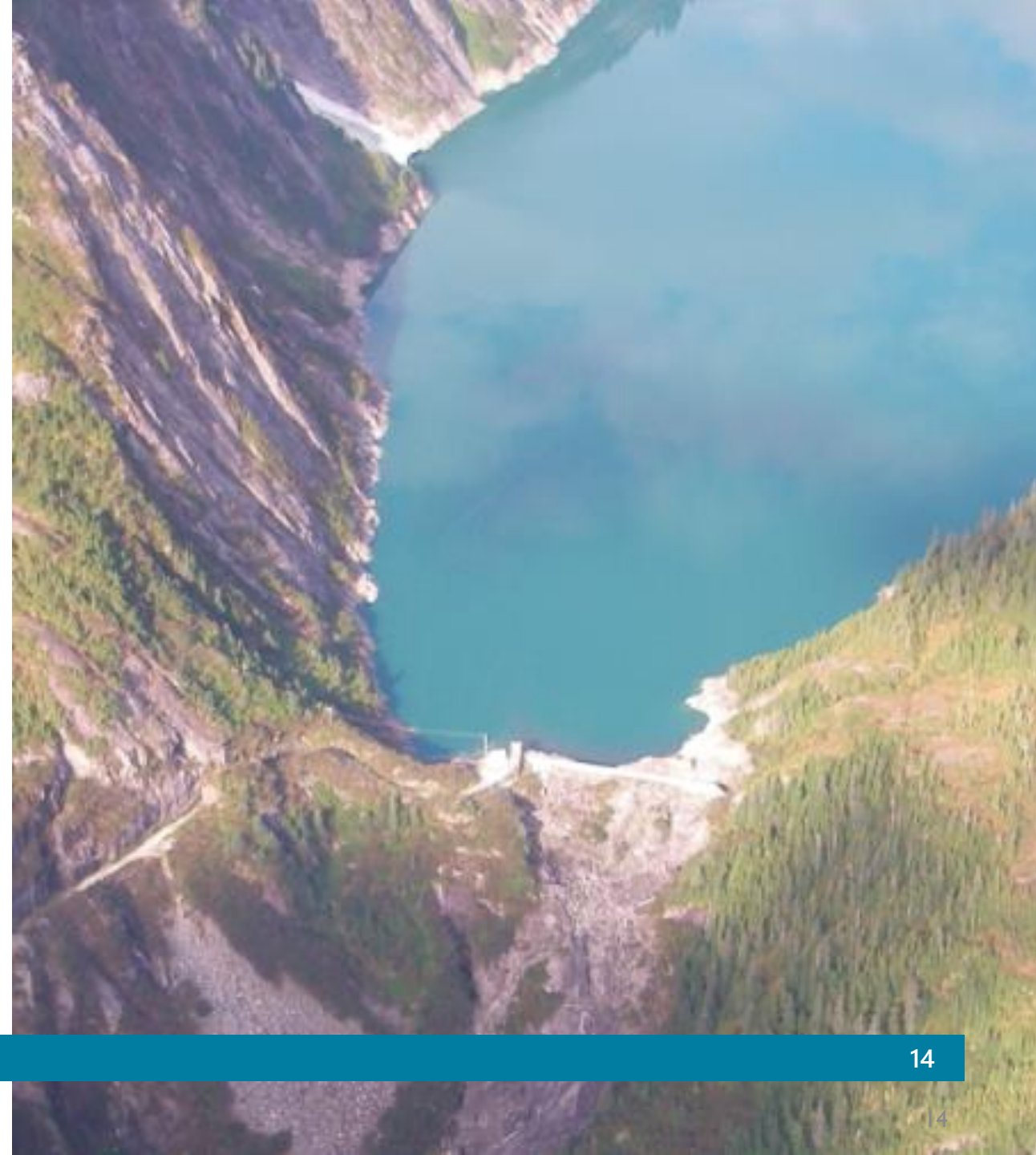
An aerial photograph showing a large concrete dam with a gravel spillway. A reservoir is formed upstream of the dam. The surrounding landscape is rugged and mountainous with some vegetation. A small building is visible on the left side of the dam.

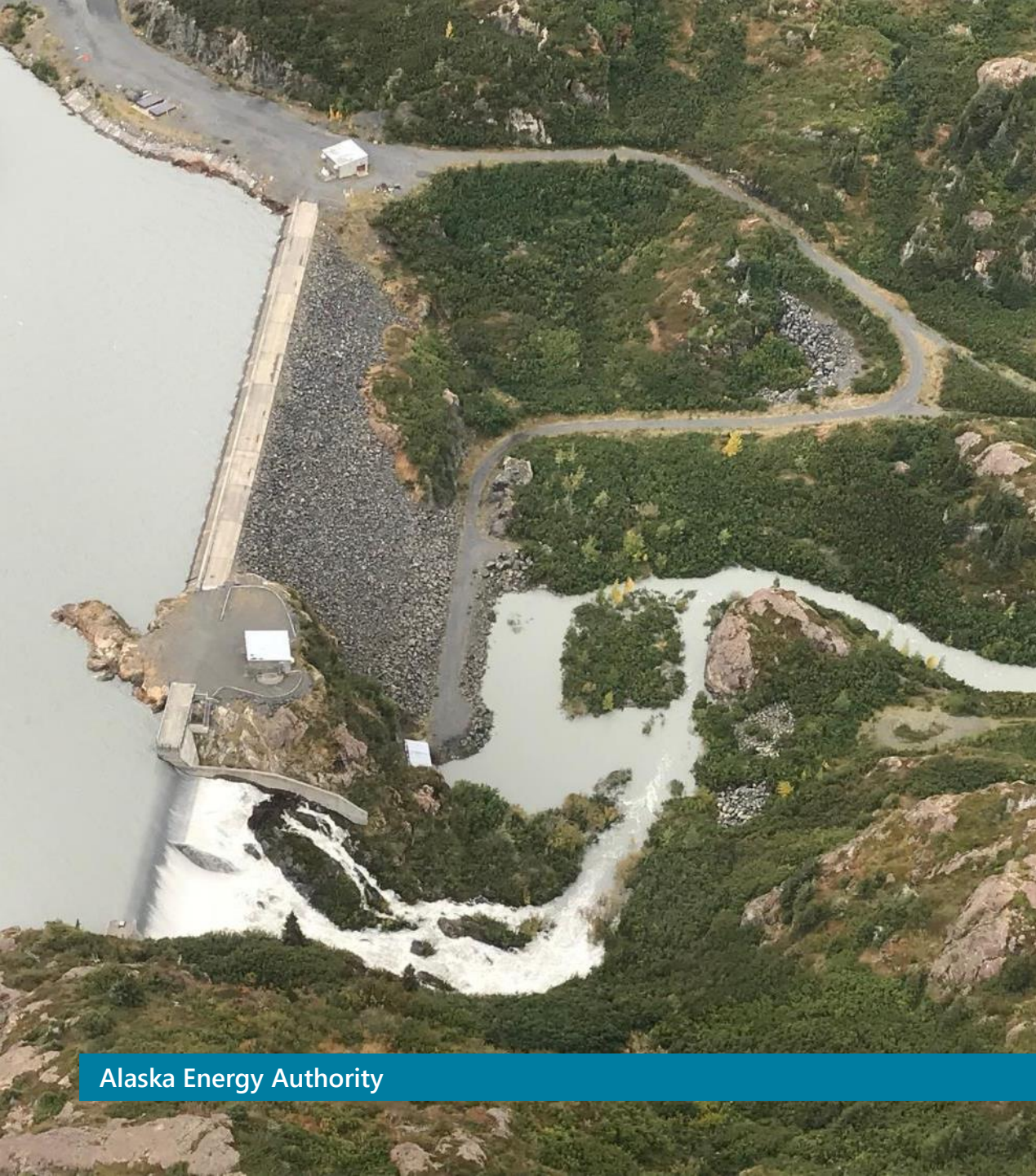
Alaska Hydropower Projects in Operation

- ▶ 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

State Involvement in Hydropower Projects

- ▶ State of Alaska owns over 40% of Statewide hydropower capacity
 - ▷ Bradley Lake (AEA)
 - ▷ Snettisham (AIDEA)
- ▶ State of Alaska through AEA/AIDEA has supported the development of more than two thirds of Statewide hydropower capacity



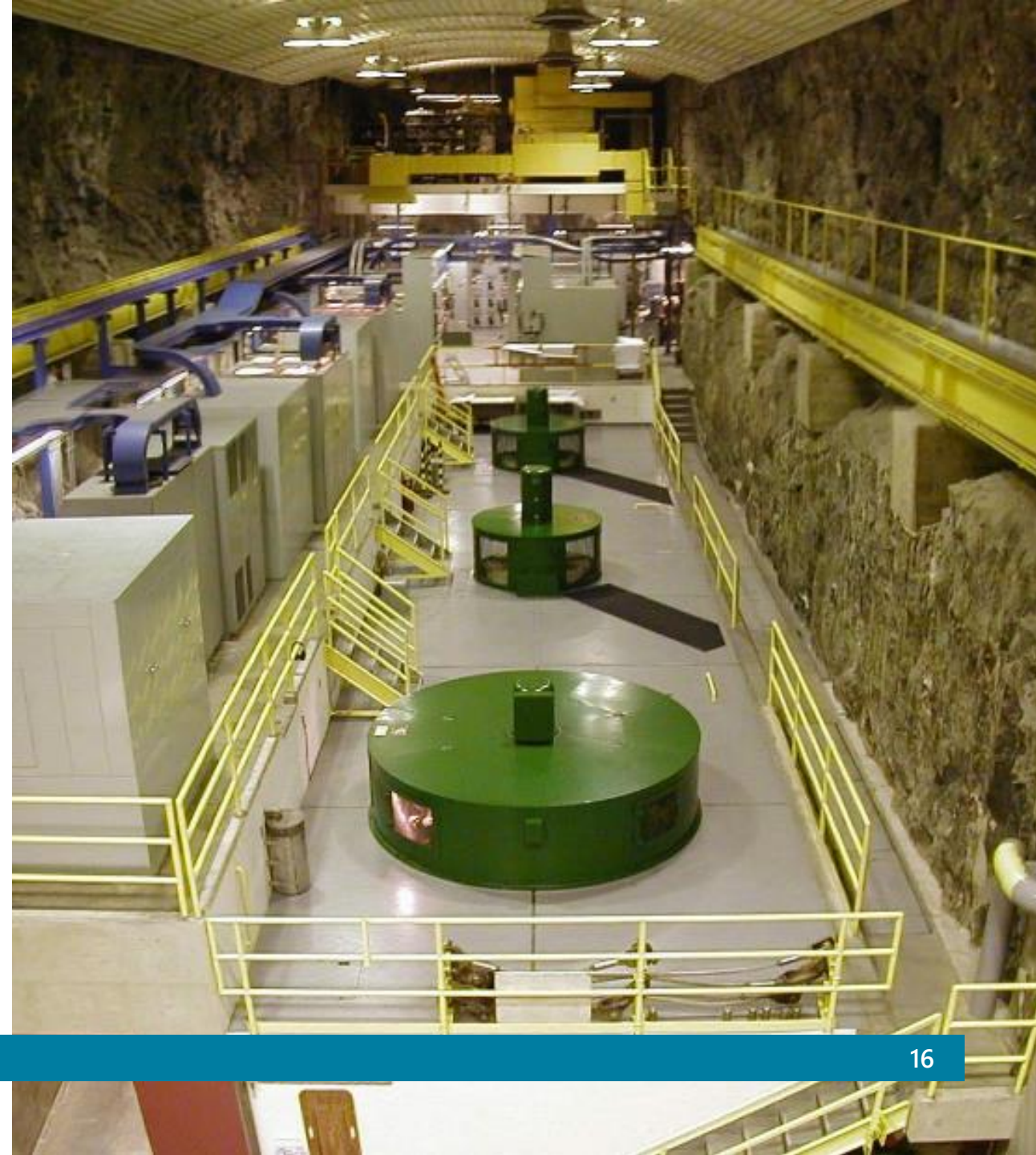


Bradley Lake

- ▶ Located 25 miles northeast of Homer and serves Railbelt
- ▶ Capacity of 120 MW
- ▶ Completed in 1991
- ▶ Funding by State of Alaska and Railbelt utilities
- ▶ Owned by AEA and managed to maximum extent by Railbelt utilities

Snettisham

- ▶ Located 30 miles southeast of Juneau and serves Juneau
- ▶ Capacity of 78 MW
- ▶ Initial completion of 1973
- ▶ Funded by Federal Government
- ▶ Owned by AIDEA, managed by AEA, and operated by Alaska Electric Light & Power





Four Dam Pool Power Authority

- ▶ AEA sold to local utilities in 2002
 - ▷ Solomon Gulch
 - ▷ Swan Lake
 - ▷ Terror Lake
 - ▷ Tyee Lake
- ▶ Proceeds helped establish Power Cost Equalization Program Endowment



Alaska Hydropower Projects in Construction



Alaska Hydropower Projects in Construction

- ▶ Four projects under construction to increase Statewide energy by 5.5 MW to be completed in 2020.
 - ▷ Gunnuk Creek
 - ▷ Hidden Basin
 - ▷ Hiilangaay
 - ▷ West Fork Upper Battle Creek

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



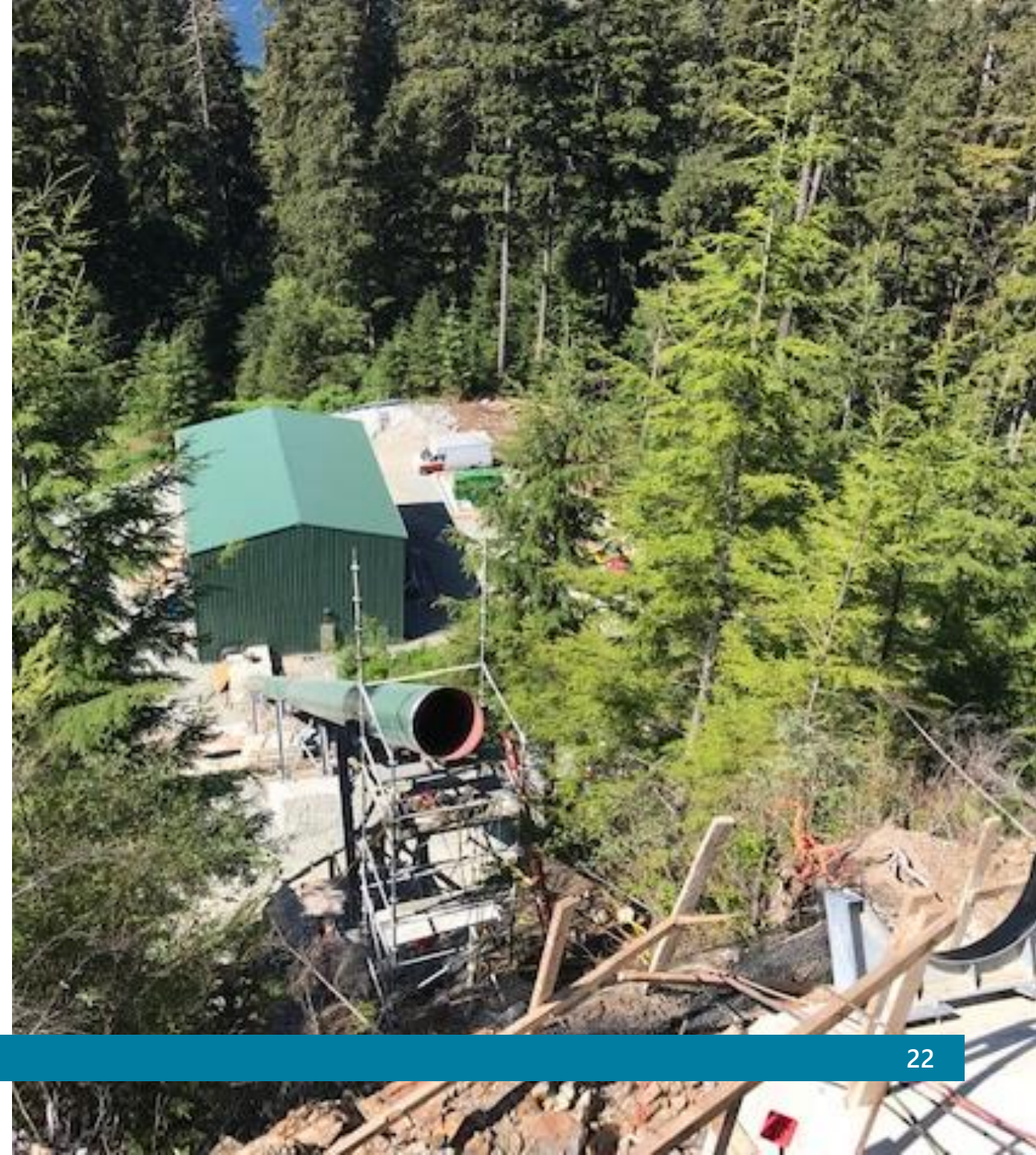


Hidden Basin

- ▶ 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

Hiilangaay

- ▶ Located 8 miles East of Hydaburg and serve Prince of Wales Island
- ▶ Capacity 5 MW
- ▶ Completion 2020
- ▶ Funded by AEA, grants, loans and Alaska Power & Telephone
- ▶ Owned by Haida Energy



West Fork Upper Battle Creek

- ▶ Located 2 miles southwest of Bradley Lake dam
- ▶ Capacity zero
- ▶ Completion 2020
- ▶ Funded by AEA grant and Railbelt utilities
- ▶ Owned by AEA



Alaska Hydropower Projects in Design

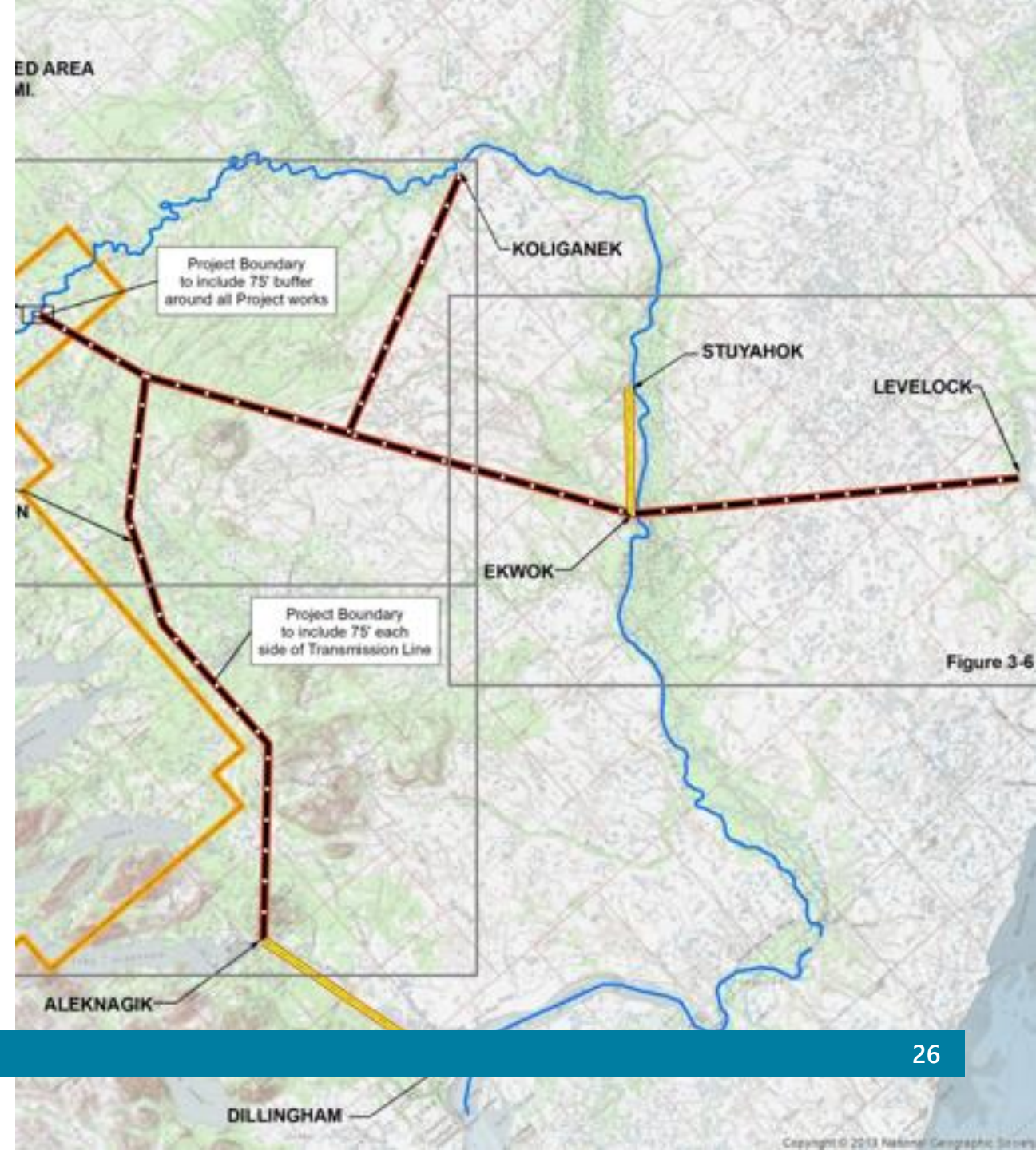


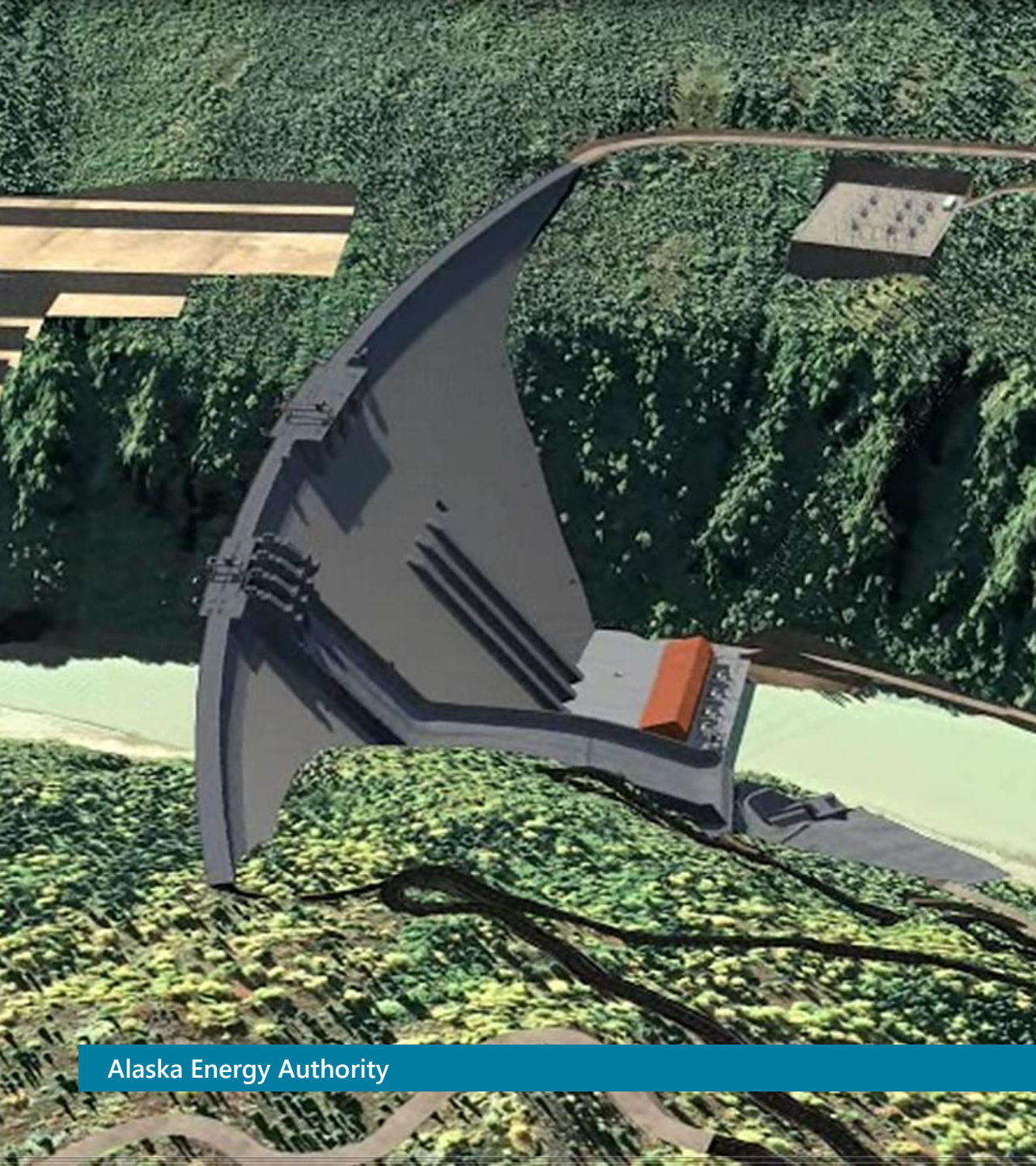
Alaska Hydropower Projects in Design

- ▶ Projects in design/funding to increase Statewide energy by greater than 491 MW hours
 - ▷ Nuyakuk River
 - ▷ Susitna-Watana
 - ▷ Sweetheart Lake
 - ▷ Thayer Creek

Nuyakuk River

- ▶ Located 50 miles north of Dillingham and would serve regional communities
- ▶ Capacity ~12 MW
- ▶ Completion date: TBD
- ▶ Funding: TBD
- ▶ Owned by Nushagak Electric & Telephone Cooperative
- ▶ 2019 Senate Bill 91 passed and allows for the development and operation of a hydro facility in the State Park



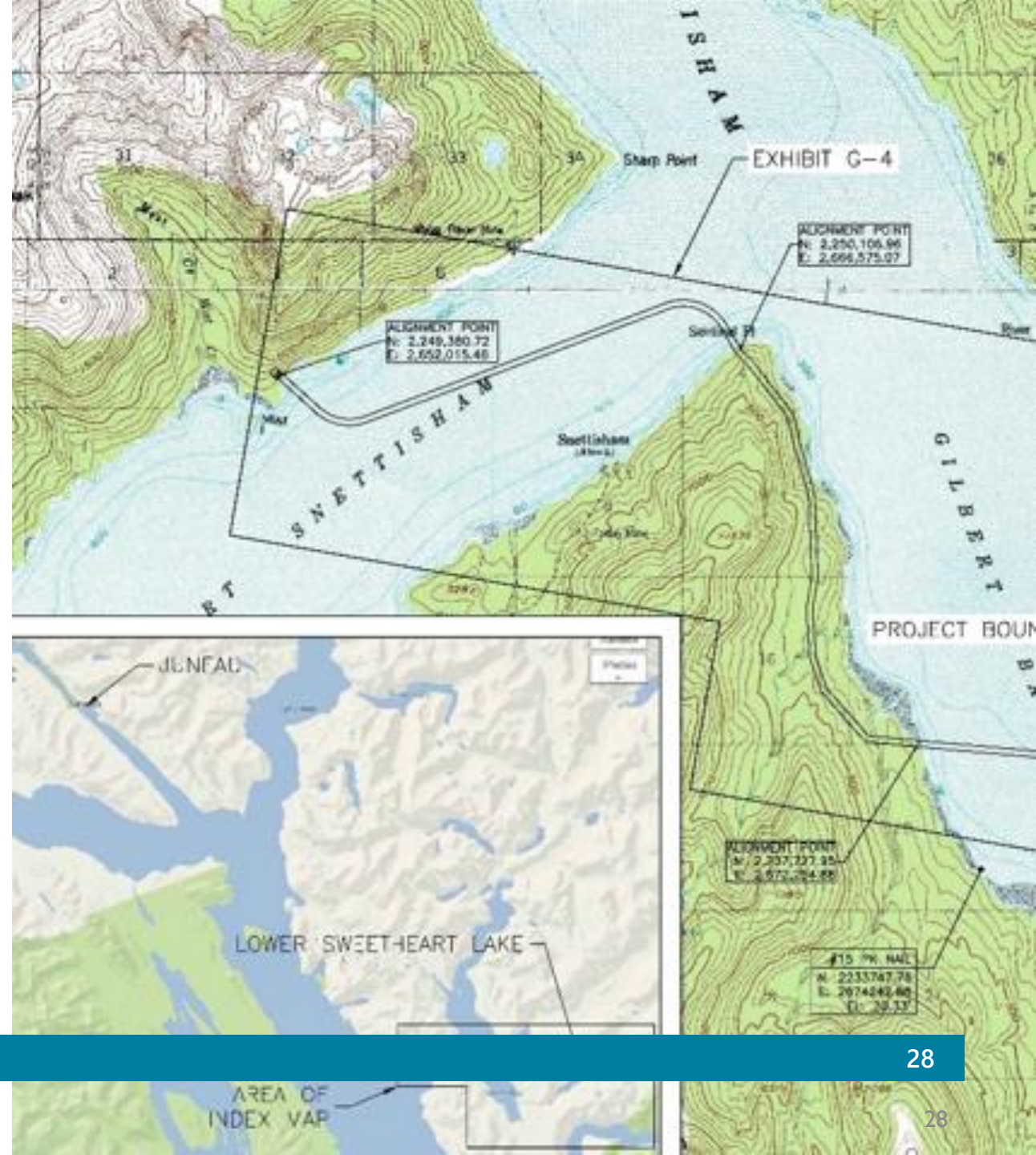


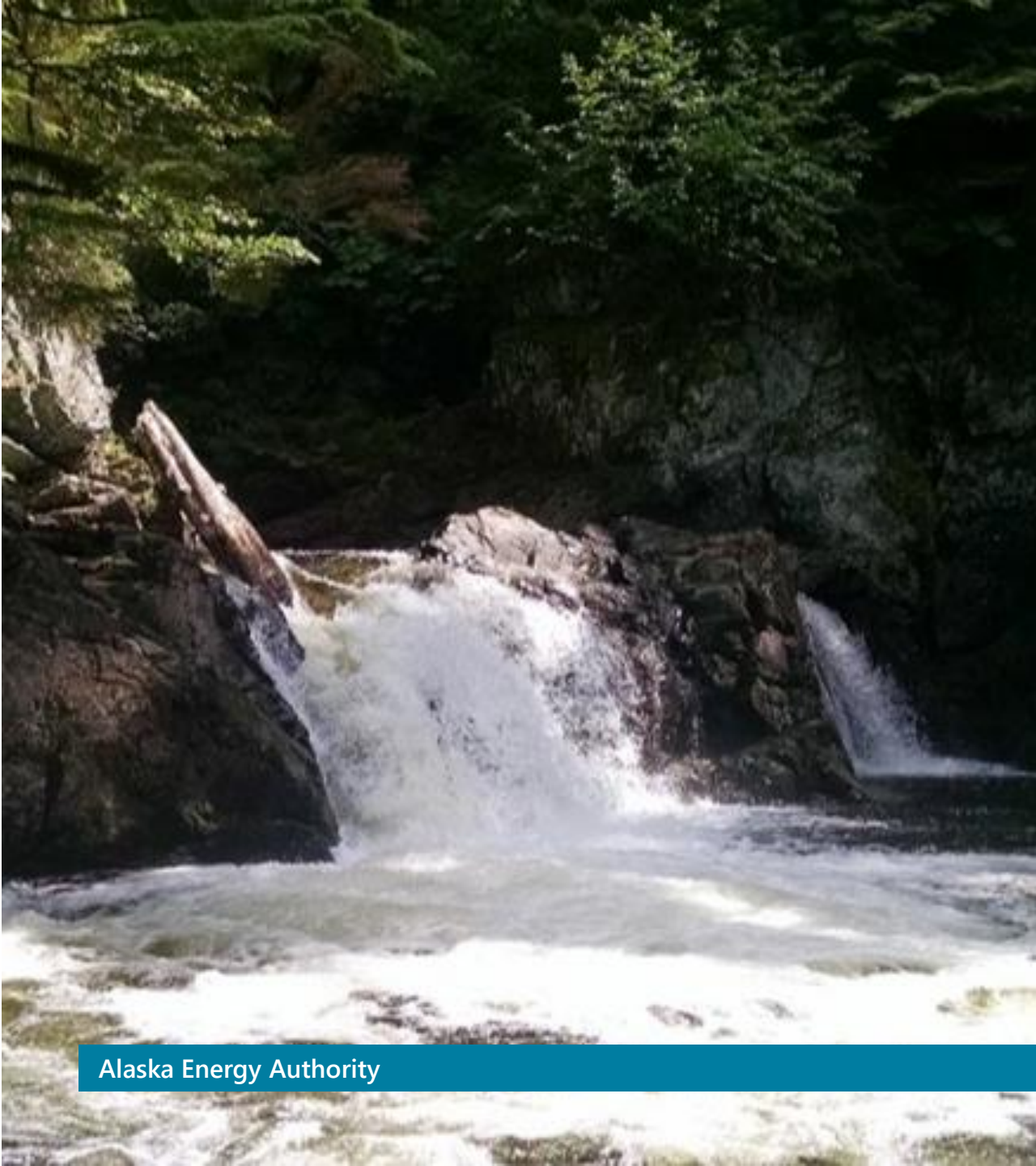
Susitna-Watana

- ▶ Located ~125 miles northeast of Anchorage and serve Railbelt
- ▶ Average capacity 459 MW
Average annual energy 2,800,000 MWh
- ▶ Completion Date: TBD
- ▶ Funding: TBD
- ▶ Owned by: TBD

Sweetheart Lake


- ▶ Located 33 miles southeast of Juneau and serve region
- ▶ Capacity 19.9 MW
- ▶ Completion Date: TBD
- ▶ Funding: TBD
- ▶ Juneau Hydropower Inc.





Thayer Creek

- ▶ Located 6 miles north of Angoon and serve Angoon
- ▶ Capacity 0.85 MW
- ▶ Completion Date: TBD
- ▶ Funding by AEA, Kootznoowoo Inc. and Inside Passage Electric Cooperative
- ▶ Owned by Kootznoowoo Inc.



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



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