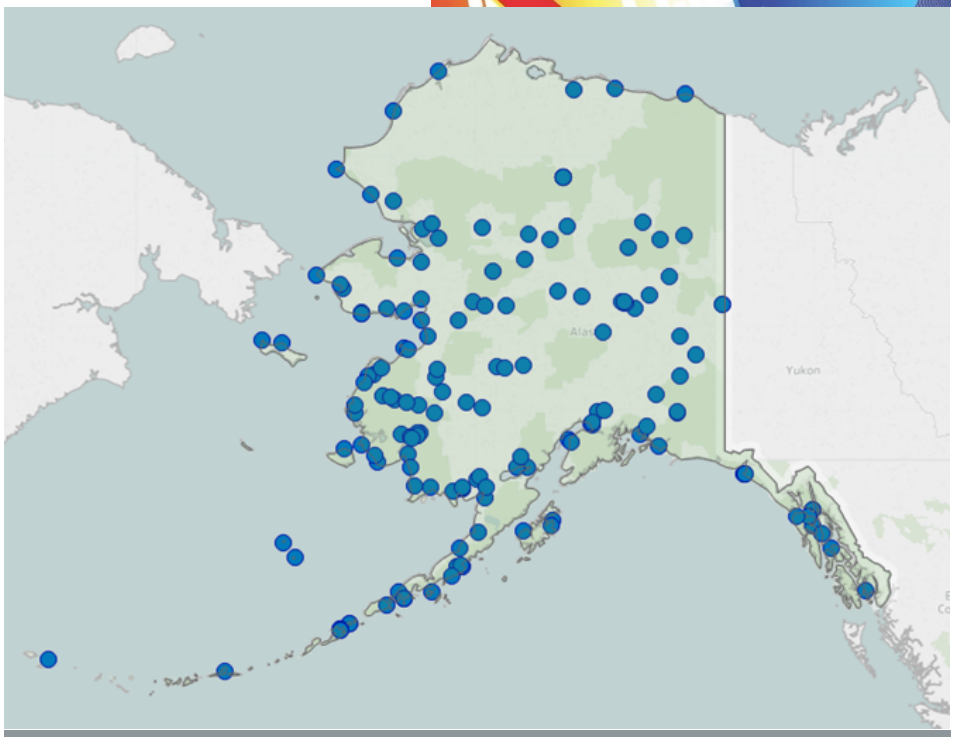
U.S. DEPARTMENT OF ENERGY

Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

The State of CHP: Alaska

Combined heat and power (CHP) – also referred to as cogeneration – is an efficient and clean approach to generating on-site electric power and useful thermal energy from a single fuel source. The information in this document provides a general overview of the state of CHP in Alaska, with data on current installations, technical potential, and economics for CHP.



Map of current CHP installations in Alaska. *Illustration from ICF.*

Alaska: Installed CHP

U.S. DOE Combined Heat and Power Installation Database

The DOE CHP Installation Database is a data collection effort sponsored by the U.S. Department of Energy. The database contains a comprehensive listing of combined heat and power installations throughout the country, including those in Alaska, and can be accessed by visiting **energy.gov/chp-installs**.

CHP Project Profiles

The Northwest CHP TAP has compiled information on certain illustrative CHP projects in Alaska. You can access these by visiting the Department of Energy's CHP Project Profiles Database at **energy.gov/chp-projects**.

Northwest CHP Technical Assistance Partnership

For assistance with questions about specific CHP opportunities in Alaska, please consult with the Northwest CHP TAP by visiting **nwchptap.org** or contacting the CHP TAP director.

Alaska Existing CHP

Sector	Sites	Capacity (MW)
Industrial	12	125
Commercial/Institutional	148	368
Other	1	0.1
Total	161	493

Northwest CHP TAP Director

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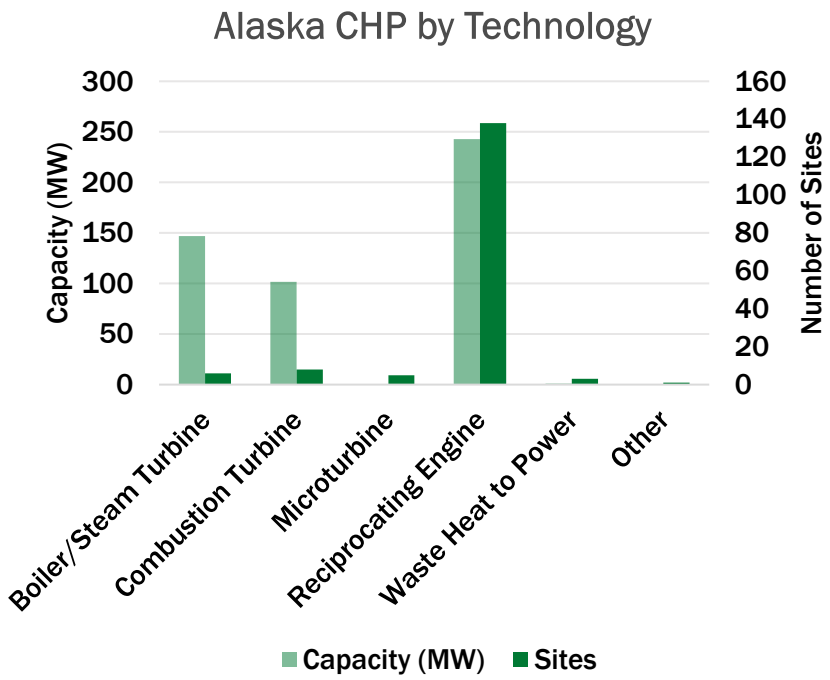
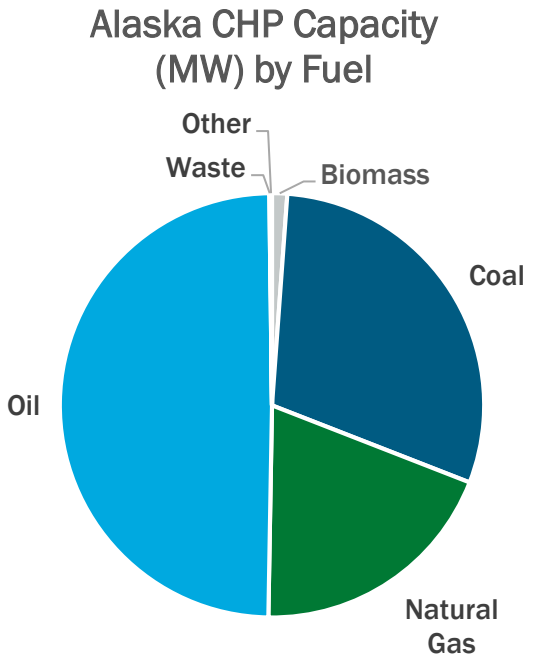
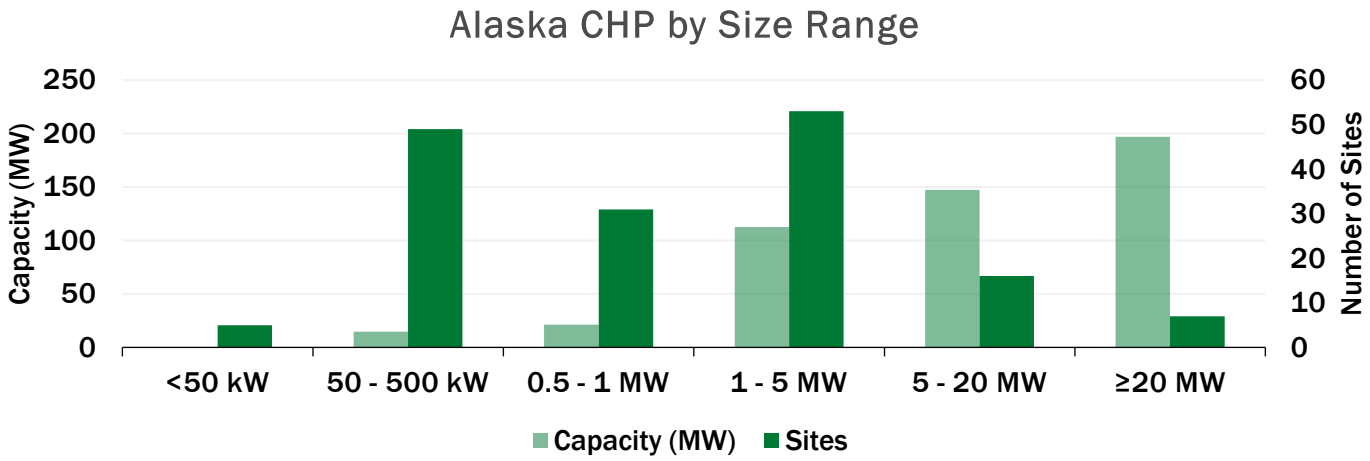
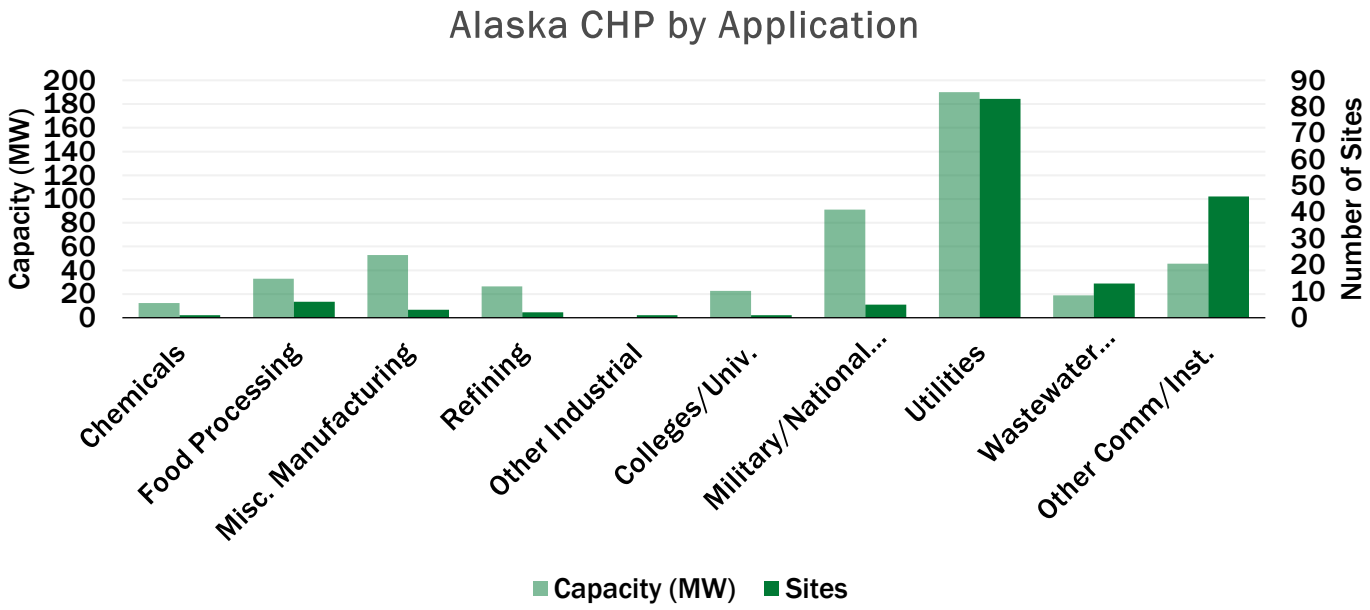
NORTHWEST CHP TECHNICAL ASSISTANCE PARTNERSHIPS


Alaska CHP by Technology
Capacity (MW)
Number of Sites
300
250
200
150
100
50
0
160
140
120
100
80
60
40
20
0
Boiler/Steam Turbine
Combustion Turbine
Microturbine
Reciprocating Engine
Waste Heat to Power
Other
Capacity (MW)
Sites


Alaska CHP Capacity (MW) by Fuel
Other
Waste
Biomass
Coal
Oil
Natural Gas


Alaska CHP by Size Range
Capacity (MW)
Number of Sites
250
200
150
100
50
0
60
50
40
30
20
10
0
<50 kW
50 - 500 kW
0.5 - 1 MW
1 - 5 MW
5 - 20 MW
≥20 MW
Capacity (MW)
Sites

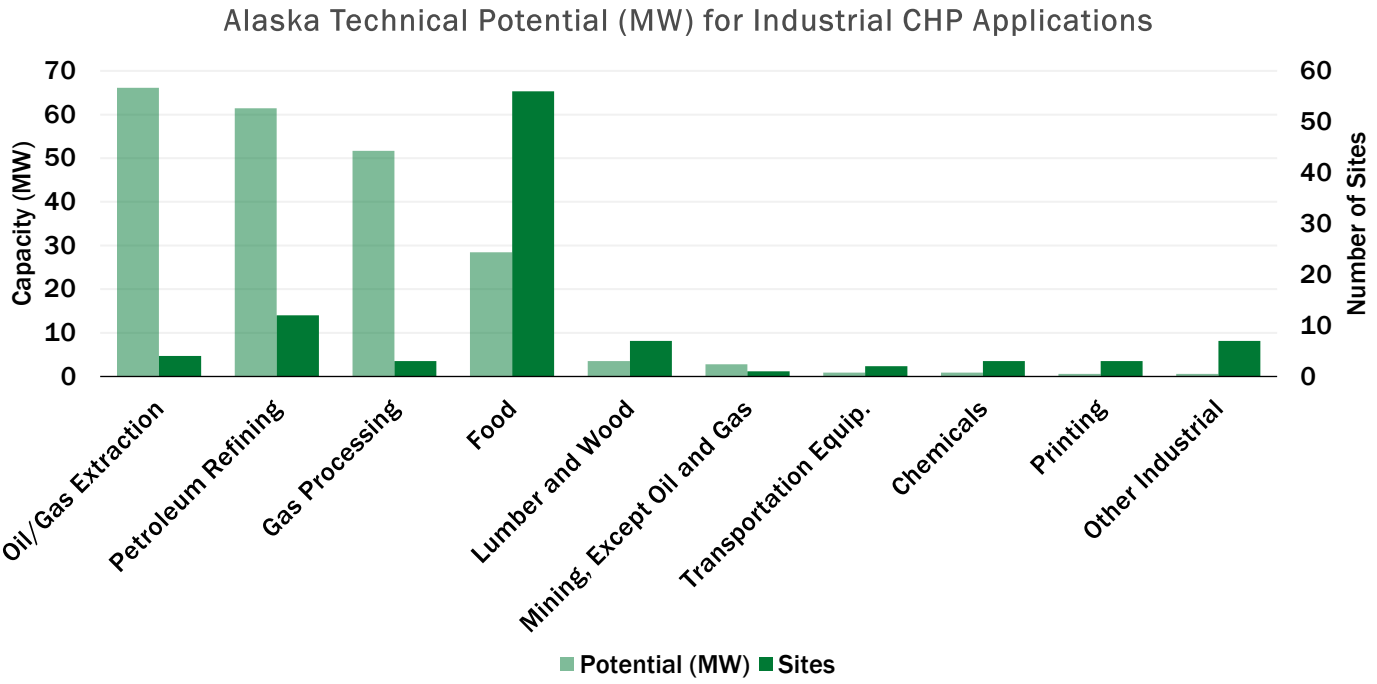

Alaska CHP by Application
Capacity (MW)
Number of Sites
200
180
160
140
120
100
80
60
40
20
0
90
80
70
60
50
40
30
20
10
0
Chemicals
Food Processing
Misc. Manufacturing
Refining
Other Industrial
Colleges/Univ.
Military/National...
Utilities
Wastewater...
Other Comm/Inst.
Capacity (MW)
Sites

Alaska: Technical Potential for New CHP Installations

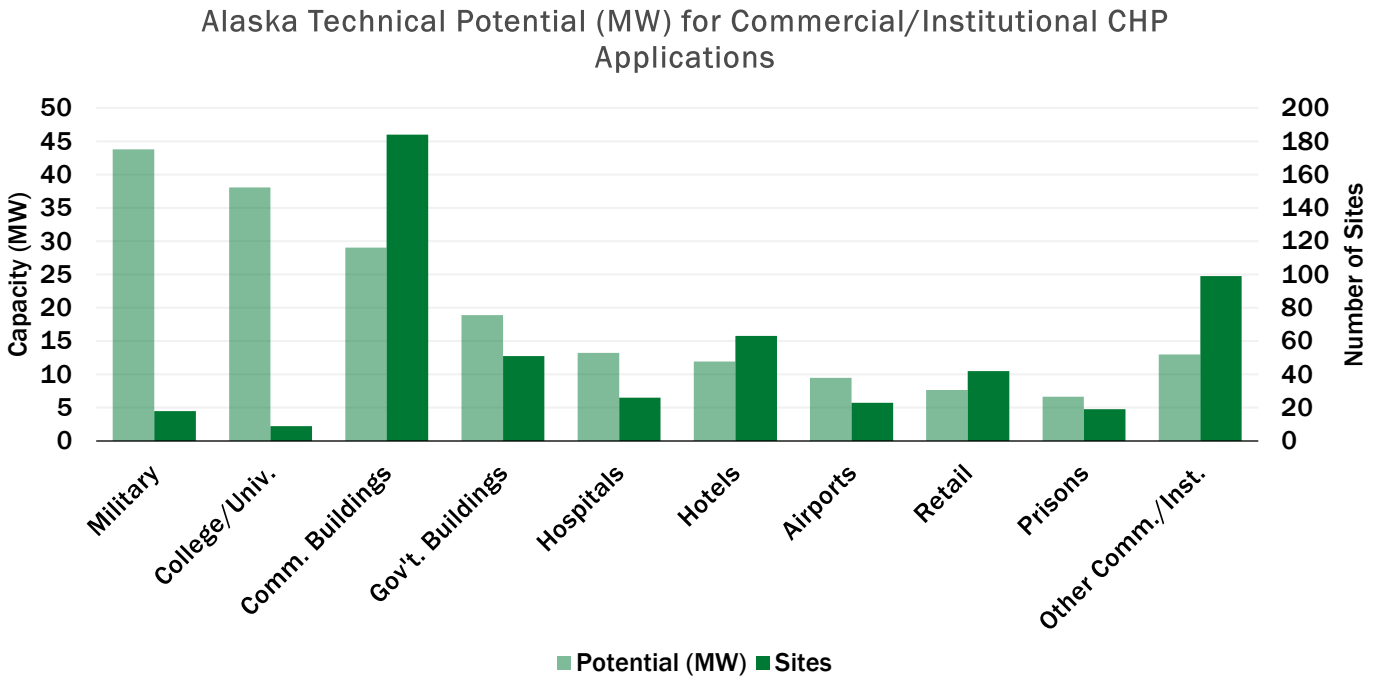
The "Combined Heat and Power (CHP) Technical Potential in the United States" market analysis report provides data on the technical potential in industrial facilities and commercial buildings for "topping cycle" CHP, waste heat to power (WHP) CHP, and district energy CHP in the U.S. This report can be accessed at **energy.gov/chp-potential**.

Alaska CHP Technical Potential

Sector	Potential Sites	Potential MW
Industrial	98	217
Commercial/Institutional	534	191
Total	632	408



	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		>20 MW		Total	
Application	Sites	MW	Sites	MW	Sites	MW	Sites	MW	Sites	MW	Total Sites	Total MW
Oil and Gas Extraction	1	0.1	0	0	2	6	0	0	1	60	4	66
Petroleum Refining	1	0	0	0	7	22	4	40	0	0	12	61
Gas Processing	0	0	0	0	2	4	0	0	1	47	3	52
Food	36	7	10	6	10	16	0	0	0	0	56	28
Lumber and Wood	5	1	1	1	1	2	0	0	0	0	7	4
Other Industrial	13	2	2	1	1	3	0	0	0	0	16	6
Total	56	9	13	8	23	52	4	40	2	107	98	217



	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		>20 MW		Total	
Application	Sites	MW	Sites	MW	Sites	MW	Sites	MW	Sites	MW	Total Sites	Total MW
Military	11	2	0	0	3	4	4	38	0	0	18	44
College/Univ.	5	1	2	1	0	0	1	7	1	29	9	38
Commercial Buildings	133	7	41	16	10	6	0	0	0	0	184	29
Government Buildings	44	6	4	3	2	3	1	8	0	0	51	19
Hospitals	19	4	3	2	4	7	0	0	0	0	26	13
Other Comm./Inst.	228	29	8	5	10	15	0	0	0	0	246	48
Total	440	48	58	27	29	35	6	53	1	29	534	191

Department of Energy CHP Accelerators

Packaged CHP Accelerator

Standardized packaged CHP systems can reduce risk for both CHP users and suppliers by reducing design errors, limiting uncertainty about performance, shortening project development time, and reducing overall costs. Accelerator partners will validate the installation, performance, and economic and resiliency benefits of packaged CHP systems, evaluate the integration of new technologies and packaged CHP, and identify R&D challenges. For more information, visit https://betterbuildingsinitiative.energy.gov/accelerators/packaged-chp

CHP for Resiliency Accelerator

The U.S. DOE collaborated with cities, states, utilities, and other stakeholders who are actively pursuing CHP as a consideration in resiliency planning for critical infrastructure in their jurisdictions. This included defining resiliency, identifying critical infrastructure, and assessing CHP opportunities. This process was documented in the DG for Resilience Planning Guide and the CHP for Resilience Screening Tool. For more information, visit https://betterbuildingsinitiative.energy.gov/accelerators/combined-heat-and-power-resiliency

Alaska: CHP Economics

The most important indicators for CHP economics are electricity and gas prices. For most potential CHP installations, natural gas and electricity rates for host facilities will fall within the range of average commercial and industrial prices. Lower energy prices may be possible for large CHP applications.

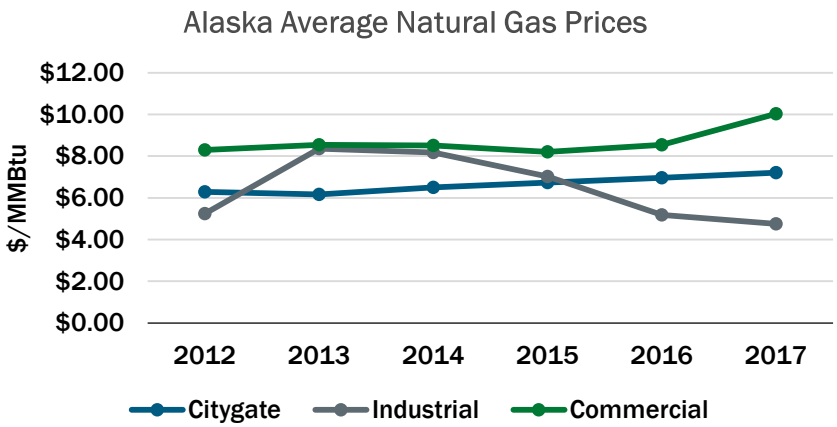
Alaska Natural Gas Prices

The EIA industrial natural gas price is a full tariff rate, and most large consumers are purchasing gas commodities from marketers at a lower rate.

Alaska Average Gas Prices ($/MMBtu) - 2017

Sector	AK Price	U.S. Price
Citygate*	7.21	4.26
Industrial	4.75	4.20
Commercial	10.03	8.08

*Citygate is a point or measuring station at which a distributing gas utility receives gas from a NG pipeline company or transmission system.

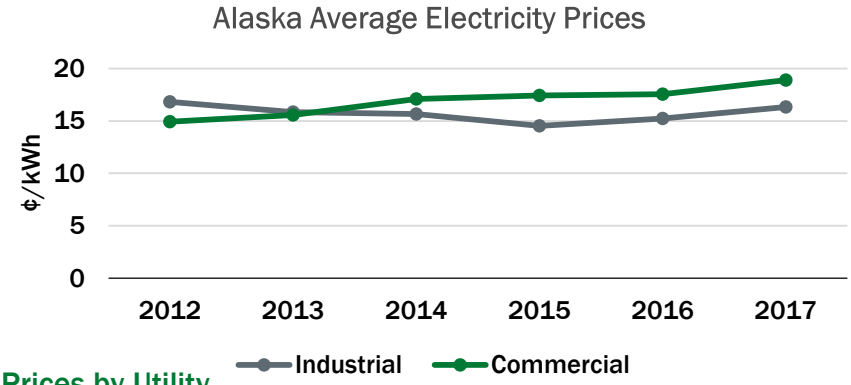


Alaska Electricity Prices

Electricity rates can vary greatly by utility and facility size range. The rates below from EIA represent general averages; individual facility rates may vary.

Alaska Average Electricity Prices (¢/kWh) - 2017

Sector	AK Price	U.S. Price
Industrial	16.34	6.88
Commercial	18.89	10.66



Alaska Average Delivered Electricity Prices by Utility

Utility	Industrial Price (¢/kWh)	Commercial Price (¢/kWh)	Average Price (¢/kWh)
Alaska Village Elec Coop	-	36.37	36.37
City of Unalaska	30.24	34.42	32.33
North Slope Power & Light	-	28.73	28.73
Alaska Power & Telephone	-	24.95	24.95
Copper Valley Elec Assn.	-	23.32	23.32
Golden Valley Elec Assn.	17.32	22.29	19.82
Matanuska Elec Assn.	-	17.77	17.77
Homer Elec Assn.	11.11	22.85	16.98
Anchorage Light & Power	-	16.75	16.75
Kodiak Elec Assn.	15.63	16.77	16.20
Chugach Elec Assn.	14.60	16.41	15.51
Barrow Util & Elec Assn.	-	11.79	11.79
Alaska Electric Light & Power	12.28	9.84	11.06