Photo of Blue Lake Dam by Lee House

CITY AND BOROUGH OF SITKA

2025 Electric Utility Department Annual Report

Mission of the Electric Utility

*"Provide its customers with **adequate** and **reliable** electric utility service at the **lowest cost**, consistent with **industry standards** and **sound business principles**."* **SGC 15.20.010**

Introduction from the Utility Director

As the provider of a critical service to the community, the CBS Electric Utility Department is guided by and remains steadfast to our core mission stated above. This annual report is structured to reflect these guiding principles, detailing our performance across key operational metrics and strategic initiatives, while providing insights into the electric system that powers Sitka. This report will delve into key areas of performance, such as generation output, system reliability, cost management, and adherence to industry best practices, all within the context of the demanding conditions of 2025.

2025 presented a unique set of environmental and operational conditions that tested our electric system's resilience. We began the year with a low snowpack combined with cooler temperatures that extended well into May, which impacted early season hydropower generation potential. However, our robust system design and proactive management strategies allowed us to navigate this period. Fortunately, by early July, we were pleased to see both the Blue Lake and Green Lake reservoirs had reached their normal spill periods, which provided a healthy operational margin for the remainder of the summer and fall.

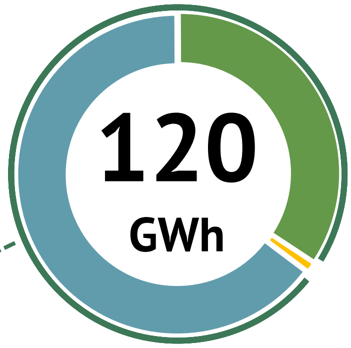
In the final months of 2025, our community experienced several weeks of weather that trended well below freezing temperatures, which pushed our transmission and distribution infrastructure to its limits. This resulted in several localized outages attributed to the freeze-thaw cycle's breakdown of aging infrastructure. Despite these challenges, our dedicated crews worked tirelessly to restore power efficiently. The year concluded with a significant milestone, a record peak load of just over 26 megawatts, underscoring the growing energy demands of our community. As such, we continue to look forward to improving ability to provide this critical service for Sitka and support a livable community for all.

Thank you,

Ron Vinson
Electric Utility Director

In 2025, Sitka's hydropower generated 120 GWh of electricity

68% from Blue Lake 32% from Green Lake 0.05% from diesel



of electricity was made

The City and Borough of Sitka owns and operates two hydropower plants called the Blue Lake and Green Lake Hydroelectric Projects, which provide 100% of Sitka's electricity 99.95% of the time. Back-up diesel generators are maintained and routinely exercised in case of an emergency; power generated is still used. Generation follows demand as the load changes depending on time and weather, with demands higher in the winter and lower in the summer.

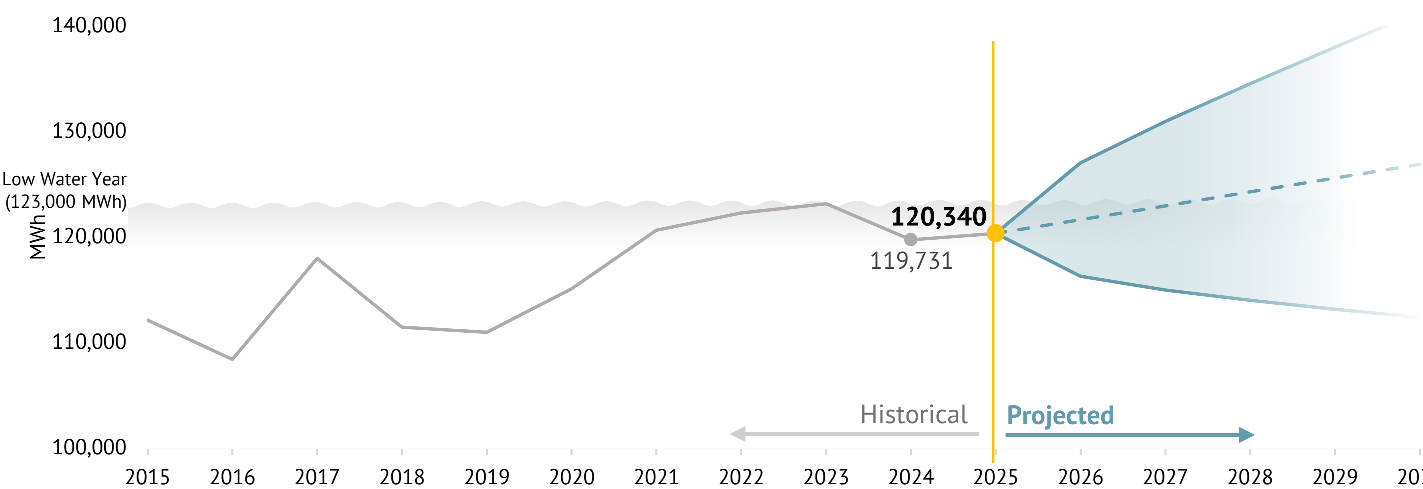
99.95% Renewable

Sitka's hydropower kept 114,945 $MTCO_2e$ Emissions out of the atmosphere

Electricity generation only produced 46 $MTCO_2e$ Emissions from 5,179 gal of diesel

Hydro saved *at least* $50 million in fuel costs* or ~11.2 million gallons of diesel

Between 2024 and 2025, Sitka's electric generation grew by 0.5%



Historical electricity generation from 2015-2025 with 5-year projection. The projection is linear and does not include the influence of external factors, such as temperature or oil prices, which impact consumption and electrification.

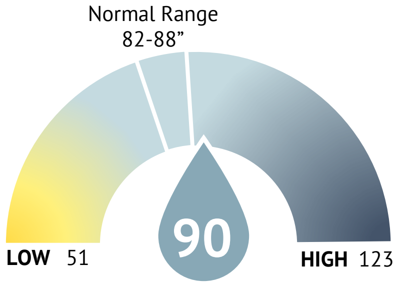
Total annual generation and consumption is showing signs of slow but stable growth

The total annual electricity generation between 2024 and 2025 increased by 609 MWh, or 0.5%. In the past 10 years, generation has steadily grown by an average 0.8% year-over-year, resulting in an 7% overall increase between 2015 and 2025. Growth in the past 5 years has increased slightly to 0.9% year-over-year compared to 0.7% year-over-year between 2015 and 2020. Assuming these trends continue, Sitka's annual generation will continue to grow to 127 GWh per year in the next 5 years, or about a 5% increase from 2025.

**Annualized, based on current CBS diesel generator efficiency and assuming diesel is $4.50/gal*
GWh and percentages have been rounded

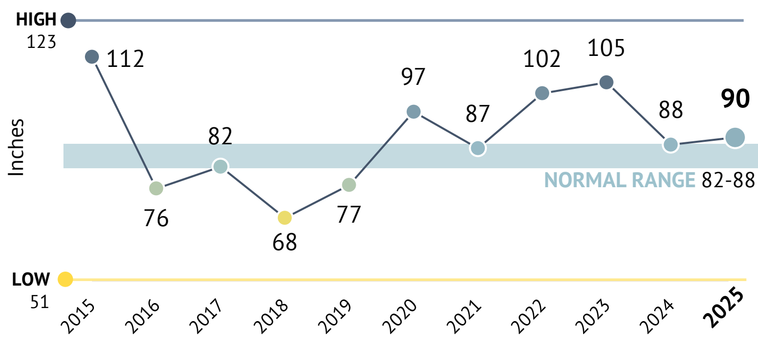
Sitka's Electricity Generation is Dependent on Rainfall

2025 Was Slightly Wetter Than Normal



Inches of Precipitation

Rainfall in Sitka Over the Past 10 Years



Since hydropower depends on the precipitation to fill the reservoirs, rainfall is monitored. Annual precipitation typically follows a pattern of 4-6 years of above the normal rainfall, followed by a 4–6-year period of below normal rainfall.

Reservoirs were normal throughout 2025

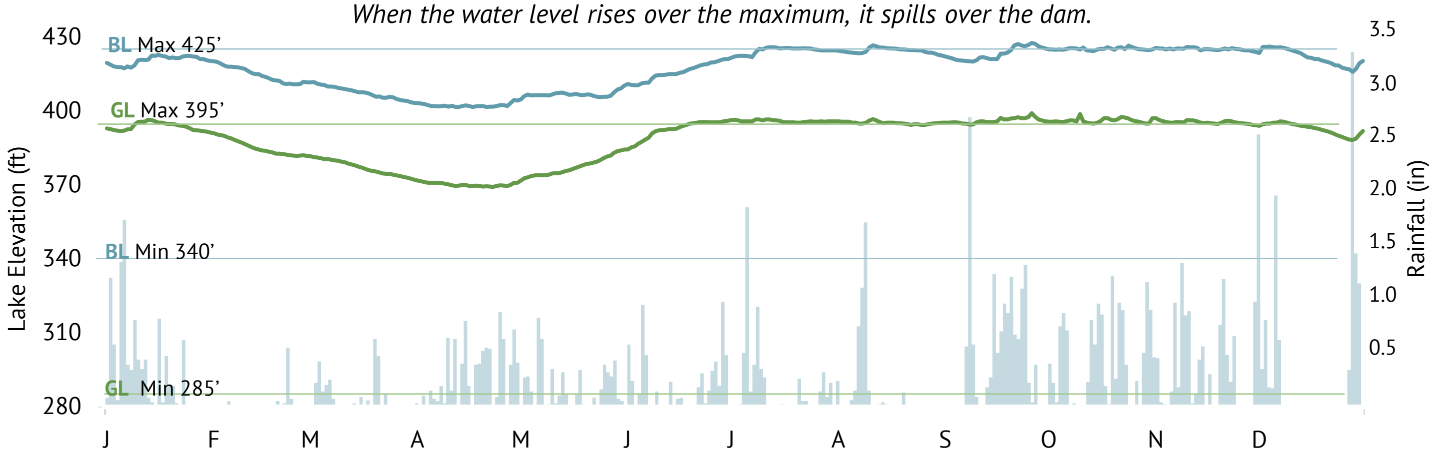
The availability and duration of Sitka's hydropower is dependent on rainfall. In 2025, electric loads, rainfall, and lake elevation closely followed historical trends, with lake elevation at its lowest in the spring and gradually rising in the summer as snow melts. Rainfall often outpaces electric demand, which leads to water spilling over the dams. **The Blue Lake reservoir did not spill 75% of the time, while the Green Lake reservoir did not spill 56% of the time.** While efforts to minimize spill are made, it is occasionally unavoidable, particularly when loads are lower in the summer and leading into fall, when it rains the most.

Regionally, the snowpack was abysmal

Snowpack observations within the watersheds of the Blue and Green Lake Hydroelectric Projects do not currently exist, with the nearest SNOwpack TELemetry Network (SNOTEL) site located at Long Lake in Juneau. Regional descriptions are published by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS). NRCS described the 24/25 winter snowpack in Southeast Alaska as *abysmal*, with water contents equivalent to 43% of normal, and the third-lowest measurement in 48 years of recording[1]. **Despite an abysmal snowpack regionally in the 24/25 winter, the Blue Lake and Green Lake reservoirs spilled as expected.**

Reservoir Elevations and Rainfall

When the water level rises over the maximum, it spills over the dam.



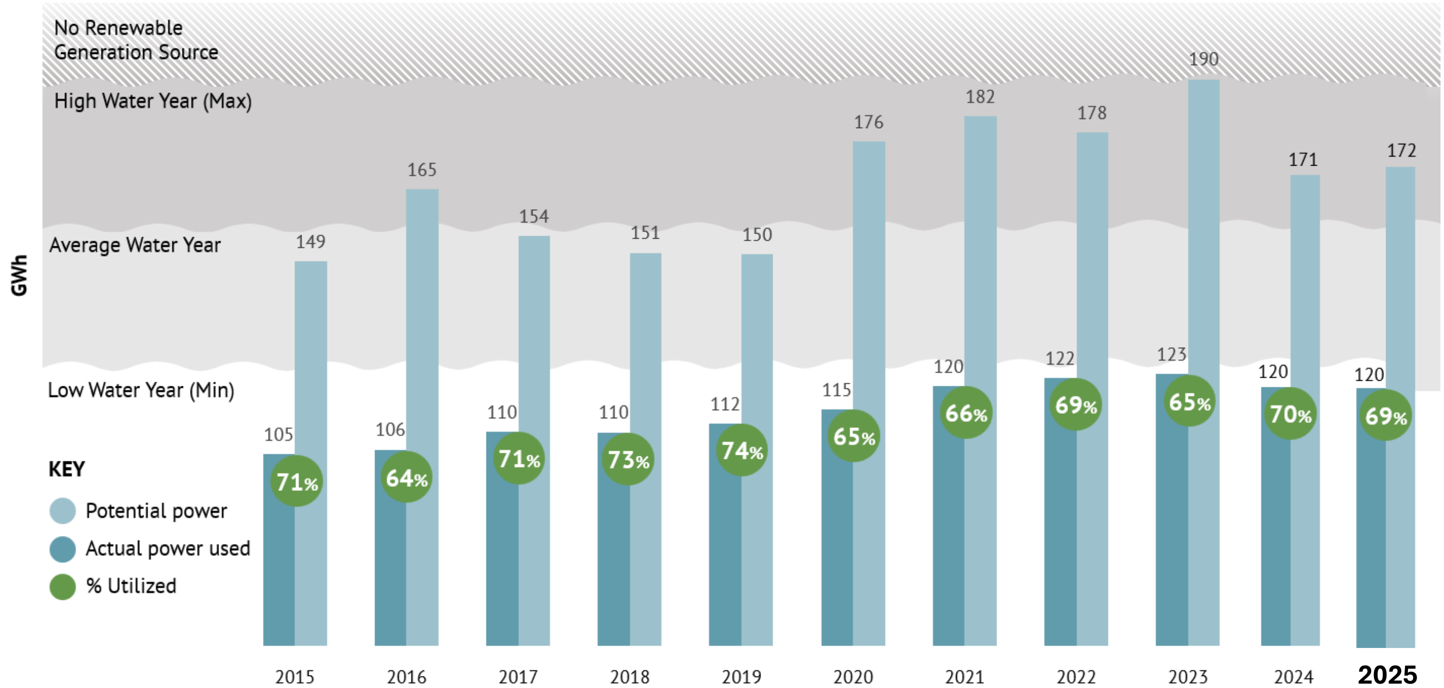
Lake elevations of Blue Lake and Green Lake, with inches of rainfall. If the level is at or above the max, water spilled over the dam.

Source: *CBS Electric Department*

Consumption and Peaks

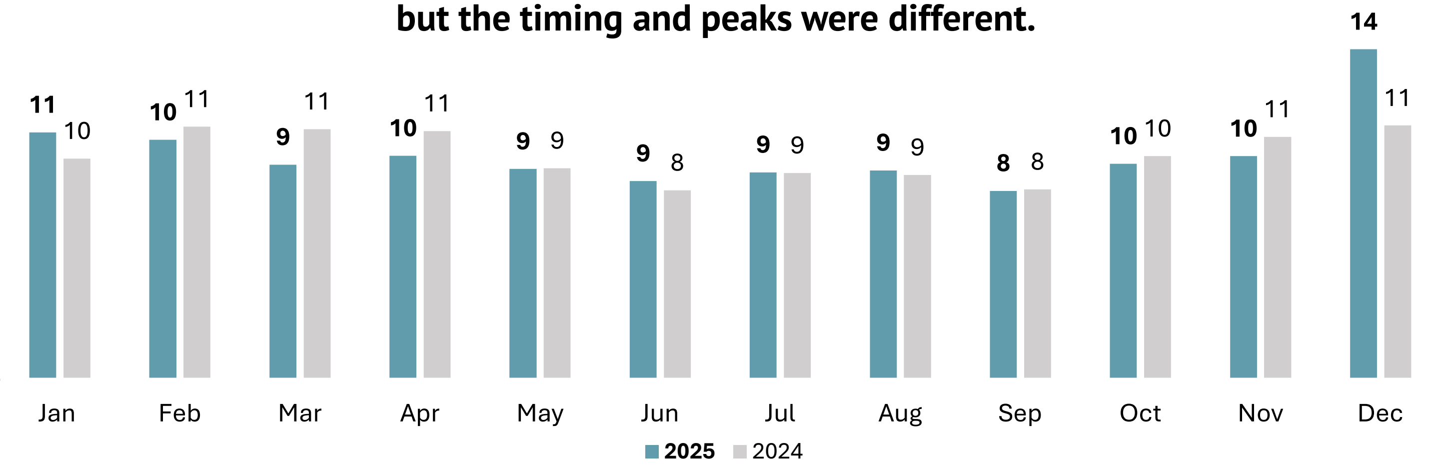
Sitka used about 69% of its potential generation

Based on 90 inches of precipitation and under unrestricted operating conditions, the Blue and Green Lake Hydroelectric Projects could have produced an annualized 172 GWh. With 120 GWh generated, about 69% of the potential power was utilized, consistent with the previous 10 years, with utilization ranging between 64-74%.



Sitka's total annual consumption of electricity typically falls between 64-74% of the potential generation; the amount theoretically generated from the total recorded inches of precipitation.

Sitka used nearly the same amount of electricity in 2024 and 2025, but the timing and peaks were different.



Electricity consumption in GWh between 2024 and 2025. In 2025, consumption peaked in December while in 2024, it stayed relatively similar throughout the winter.

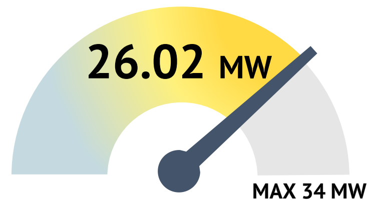
Although the annual total electricity consumption between 2024 and 2025 were nearly identical, the timing differed significantly. This is likely due to weather. The 24/25 winter season was warmer, with December 2024 being the warmest ever recorded with a daily temperature average of 42.7° F[2]. Coupled with a cooler spring, consumption was consistently 11 GWh per month. To compare, December 2025 was on average, only slightly colder than normal, with a daily average temperature of 32.8° F, with a high of 50° F and a low of 12° F.

Consumption and Peaks

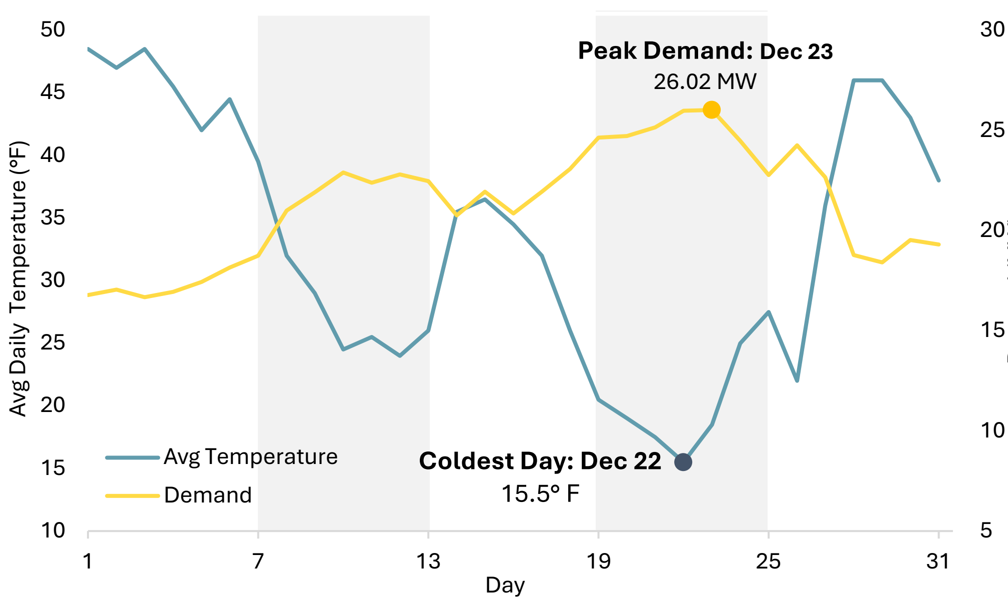
December 2025 was the highest ever consumption and demand

Although only slightly colder than average, December 2025 had a total of 12 days with highs below freezing, with 6 of those days consecutively. The most extreme was a 4-day long streak of minimum temperatures below 20° F, reaching lows of 12° F for 2-days. **This extended cold dramatically increased the electricity consumption in December to 14.4 GWh, with an instantaneous demand of 26.02 MW, the most electricity ever consumed or demanded in one month.**

December 2025 Demand



December 2025 Temperature and Demand

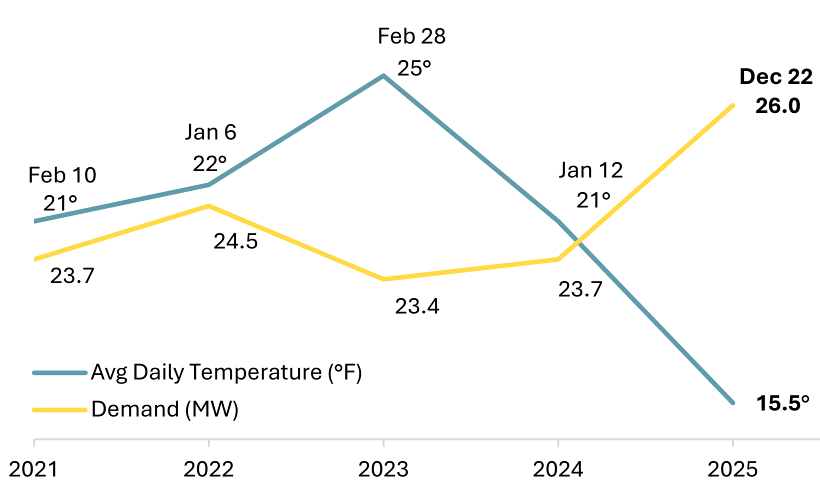


Electricity demand compared to average temperature. In general, demand follows 2-3 days if a long cold period occurs.

What about the new SEARHC Hospital?

While the new SEARHC hospital does add to the electric load, it only accounted for about 3% (0.78 MW) of the peak demand on December 23, 2025, and about 3% of the total monthly consumption.

5 Year Peak Demands, Dates, and Temperature



The previous peak demands, dates, and average daily temperature of those days. While temperature influences demand, it is not directly related. Demand is partially driven by both temperature and the number of buildings that use electricity for heating.

The duration of the cold matters more than the extreme of the cold

Although temperature influences when demand from heating peaks, it is not always the coldest day that has the highest demand. Changes in demand are less rapid than temperature, and often lag a few days. This is due to the heat retention of buildings, also called thermal capacity, which usually lasts about three days. After three days, the cold "creeps in" and building requires more energy to stay warm. Extended periods of colds drive demand more than short periods of extreme cold. December 2025 had both!

Consumption and Use

In 2025, Sitka Consumed 118 GWh

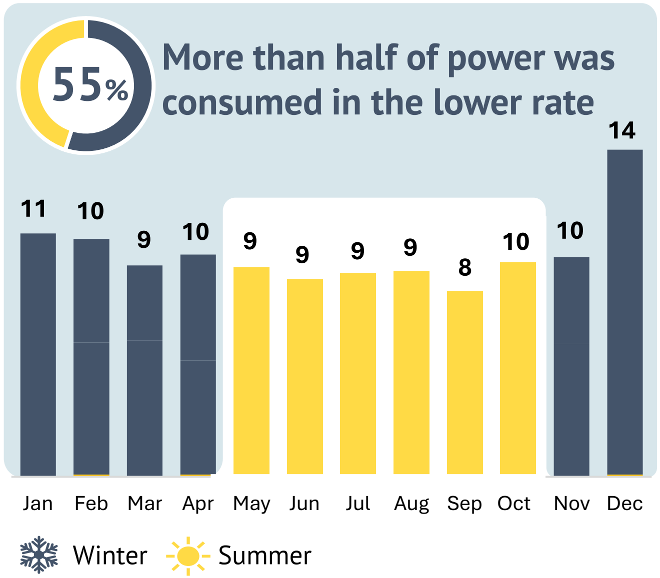
Most electricity is consumed in at the lower winter rate

Although CBS generated 120 GWh, only 118 GWh was consumed due to normal line loss of about 3%. More than half (55%) of this consumption was when lower winter rates were in effect for most customer classes.

Residents consume more in the winter, while commercial customers consume more in the summer

CBS has six customer classes that reflect broad uses of electricity, whose rates differ as does their seasonal use. 57% of residential consumption was at the winter rate and made up between 38-43% of monthly consumption in the winter. Comparatively, 55% of commercial consumption was at the summer rate, and made up between 32-44% of monthly consumption in the summer.

GWh Consumed Per Month



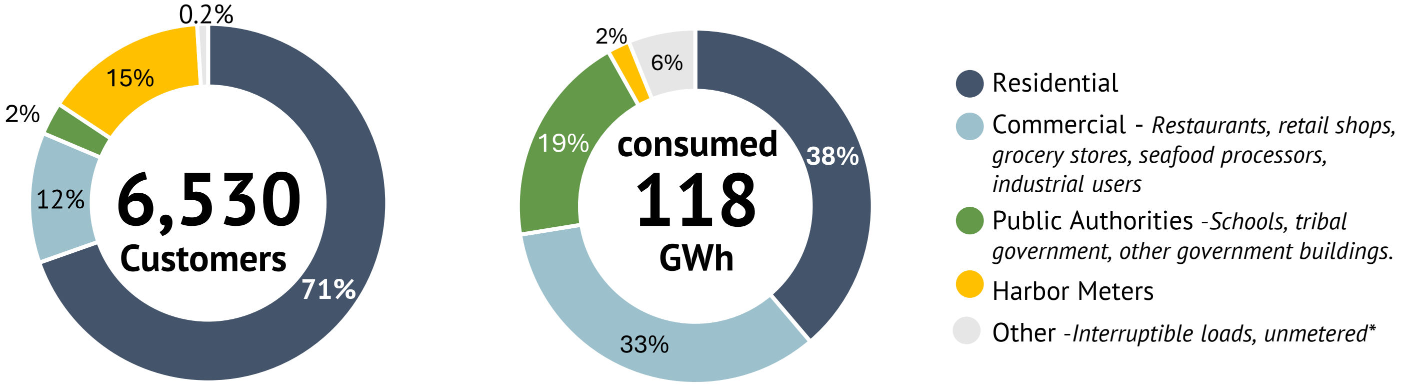
Electricity consumption by month. The most electricity was consumed in December at the winter rate.

Residents are the largest consumer customer class and consumer of electricity

Sitka's customer base composition looks similar to the U.S. customer base. CBS has approximately 6,530 customers, 71% of which are classified as residential customers. Of the estimated 160 million customers in the U.S., approximately 88% of customers are residential customers[3]. 12% of Sitka's customers are commercial customers, which is same as the rest of the U.S., with industrial customers making less than 1%. While Sitka does not have as a distinct industrial customer class, about 4% of Sitka's commercial customers meet some criteria used to distinguish industrial customers, such as additional charges for instantaneous demand.

This is reflected in Sitka's consumption per customer class. Residents consumed the most electricity in Sitka (38%) which is the same as the U.S. average. But Sitka's commercial sector consumption was 33%, about half the size of the U.S. commercial and industrial consumption of 61%[3].

CBS Customer Class Composition and Consumption



*Customer classes and how much each electricity each class consumed. *unmetered loads are things like streetlights.*

Residential Rates and Rate Comparisons

FY25 Residential Rates

13.71¢/kWh	17.24¢/kWh	21.93¢/kWh
Winter (Nov-Apr)	Weighted Residential Average	Summer (May-Oct)

Residential electric rates in Sitka are competitive with the national average residential rate

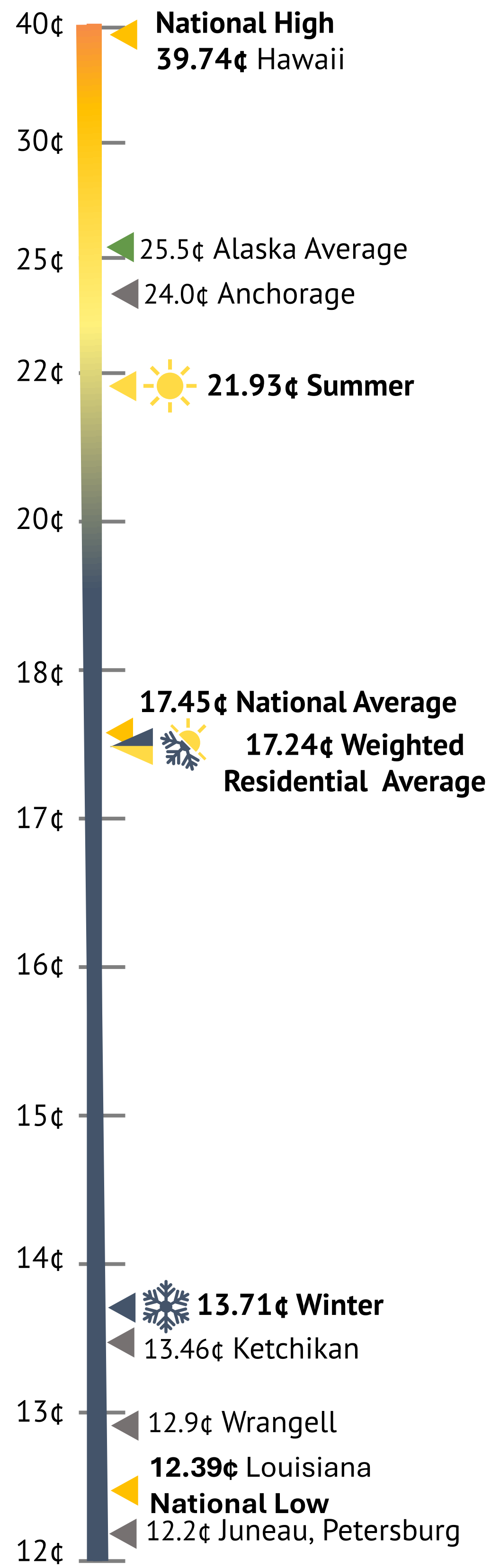
Electricity in Sitka is based on seasonal rates, with lower rates in the winter (Nov-Apr) and higher rates in the summer (May-Oct). **Residents consumed 57% of electricity in the winter months, with a weighted residential average per kWh rate of 17.24¢.** In 2025, the national residential rate was 17.45¢/kWh, making Sitka's weighted average residential rate 1.2% lower than the national average[4].

How does Sitka's monthly electricity usage and bills compare to others?

Location	Electricity Usage	Electricity Bill
Alaska	578 kWh	$147
	↑40% Sitkans much more electricity than the average Alaskan…	↑ 8% …but only paid about $11 more per month.
Sitka	808 kWh	$158 $21.90 customer charge + kWh used
	↓5% Sitkans used a little less electricity than the average American…	↑4% …but only paid about $7 more per month.
U.S. National	855 kWh	$151

How do Sitka's rates compare to others?

Many locations use variable rates based on consumption and have different customer charges.



Sources: *CBS Finance & Electric Departments*

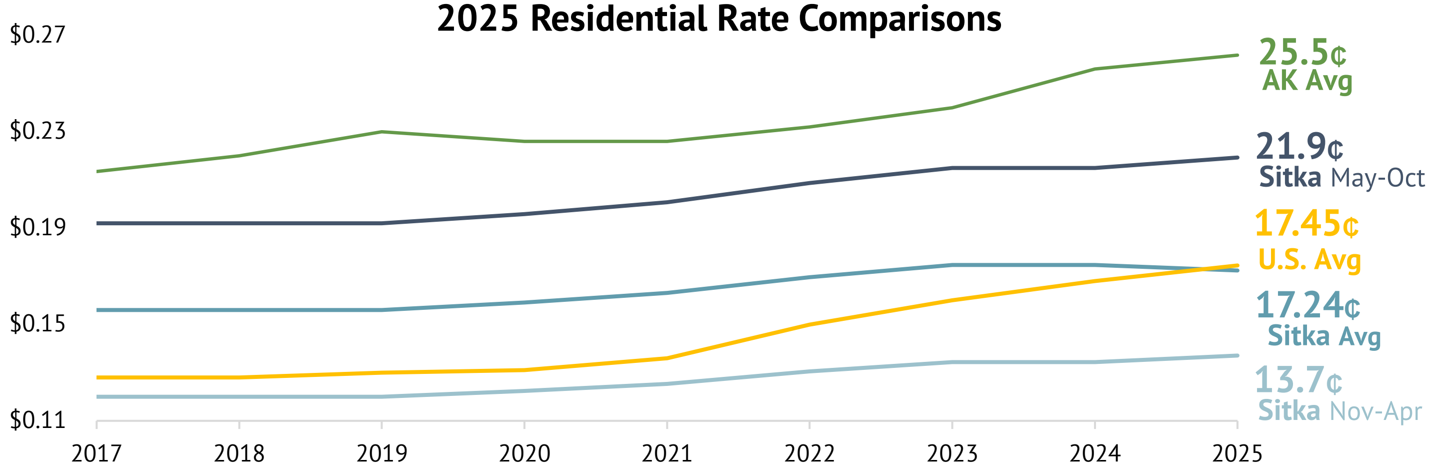
Other community rates may be calculated differently.
Reported rates may be averaged across multiple seasonal or volumetric rates.

Residential Rates and Rate Comparisons

Sitka's electric rates have risen slower than the national average rates

In 2017, CBS switched to seasonal rates. When first implemented, Sitka's average residential rate was 22% greater than the national average. **Over the past eight years, rates have risen faster nationally than in Sitka, despite annual increases in pace with inflation each year** (typically 2-3%). At the end of 2025, Sitka's weighted residential average rate was 1.2% lower than the national average. Nationally, rates are expected to continue to rise an additional 4% to 18.0¢/kWh by the end of 2026[5].

2025 Residential Rate Comparisons

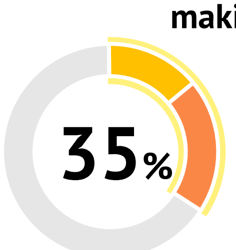


Residential electricity rate comparisons between Sitka's seasonal and averages, Alaska average, and U.S. average.

Energy Cost and Energy Burden

The U.S. Department of Energy's Low-Income Energy Affordability (LEAD) tool defines energy cost as the amount of household expenditures spent on electricity and fuels including fuel oil, natural gas, wood, etc, excluding fuels used for transportation. Energy burden is defined as the percentage of gross household income spent on energy costs. Households with an energy burden of more than 6% are considered to be highly energy burdened, with 10% or greater considered severely energy burdened. **It is estimated that the average energy cost in Sitka is $4,495, with 42% of that cost coming from electricity[6].** With a median household income (AMI) of $101,727[7], **Sitka's estimated energy burden is 4.4% with 1.7% from electricity**. However, the impact of energy burden increases in lower-income households. With approximately 3,440 households in Sitka[7], more than one in three (35%) may considered energy burdened, with 15% highly energy burdened, and 20% severely energy burdened.

If the average energy cost in Sitka is estimated to be $4,500, any household making less than $75,000 may be considered highly energy burdened



of households in Sitka may be energy burdened

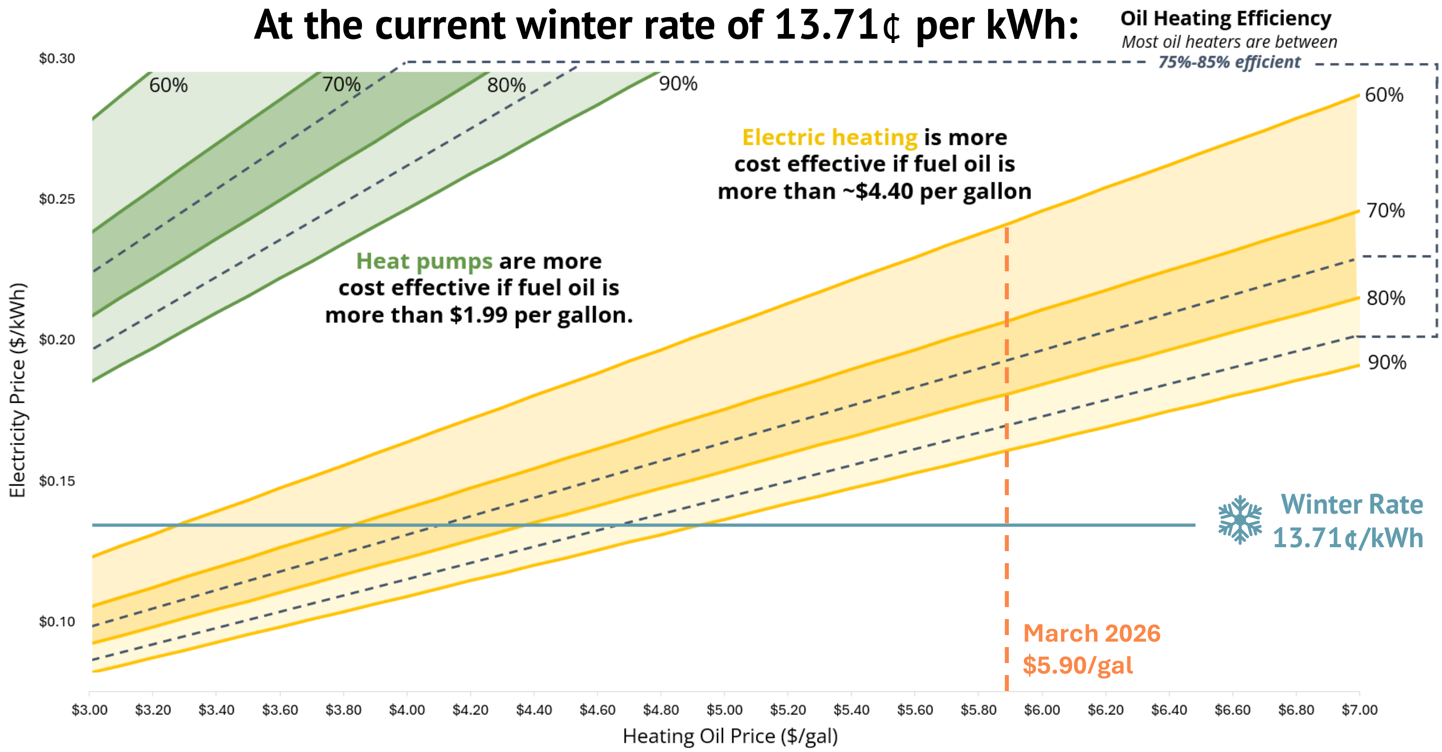
65% Not energy burdened (<6%)
15% High energy burden (6%-9.9%)
20% Severe energy burden (>10%)

	Threshold	Energy Burden
Median Household Income	**$102,000**	**4.4%**
Low Income†	$81,600	5.5%
High Energy Burden	**$75,000**	**6%**
Very Low Income†	$51,000	8%
Severe Energy Burden	**$45,000**	**10%**
Extremely Low Income†	$34,700	15%

†U.S. Department of Housing and Urban Development income definitions based on a family of 4 people: Low - 80% of AMI; Very Low - 50% of AMI; Extremely low - 60% of very low, compared and adjusted to Department of Health and Human Services guidelines.

Affordability of Electric Heating

At the current winter rate of 13.71¢ per kWh:



Whether fuel oil or electricity is more cost effective for heating depends on the efficiency of the heating system and fuel price.

Impact on heating costs†

Heat Source	Fuel Price	Fuel Price per Million Btu	Efficiency	Cost per Million Btu	Estimated Cost to Heat an Average Home in Sitka (56 Million Btu per year[8])	
Electricity						**Rank**
Boiler or baseboard	13.71¢ /kWh*	$40	99%	$41	$2,273	#3
Air-source heat pump			220%[1]	$18	$1,025	#1
Wood						
Conventional stove	$450/ cord**	$25	54%[2]	$47	$2,630	#4
EPA Certified stove			75%[2]	$34	$1,893	#2
Fuel Oil						
Older furnace or boiler	$5.90/ gal***	$43	75%[3]	$57	$3,176	#7
Newer furnace or boiler			85%[3]	$50	$2,803	#6
Toyostove			87%[3]	$49	$2,764	#5

*FY25 November-April electricity rate. **Estimated based on recent *Sitka for Sale* postings. ***as of March 26, 2026.

[1]Heating Seasonal Performance Factor (HSPF) measures the heating efficiency of air-source heat pumps, with higher numbers indicating better efficiency and lower energy consumption. This comparison uses the federal minimum HSPF of 7.5. Modern heat pumps have 8.2 to 9+, making them more cost effective than as illustrated.

[2]The heat content and efficiency of wood can vary greatly depending on species and moisture content. In general, most air-dried wood has about a 20% moisture content. EPA certified for cord wood stoves efficiencies range from 70%-88%.

[3]Annual Fuel Utilization Efficiency (AFUE) is used measure heating efficiency by measuring the amount of heat actually delivered to the space compared to the amount of fuel used in the heating system. For example, a heating system that has an 80% AFUE rating converts 80% of fuel supplied to heat. The other 20% is lost as smoke, light, etc.

† ***Disclaimer:*** *For illustrative purposes only. Estimates do not include the price of equipment, installation, maintenance, or other recurring costs.*

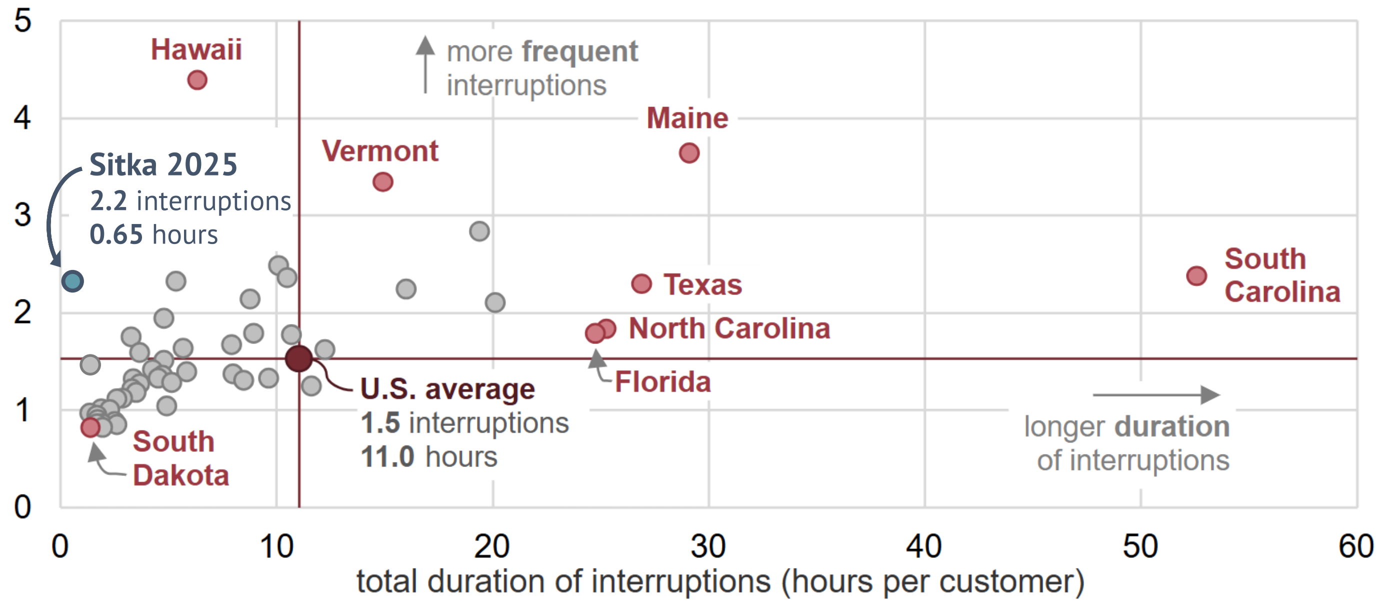
Interruptions and Outages

17
Electricity interruptions
2.2 interruptions per customer
46% more than the U.S. average

20
Hours without power
39 minutes per customer
95% less than the U.S. average

In 2025, Sitka experienced 17 sustained electricity interruptions totaling 20 hours. This does not mean that each customer experienced all the interruptions or hours without power. To understand system reliability, utilities report the number of electricity interruptions and duration per customer using metrics called System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI). **In 2025, Sitka's average customer experienced 2.2 interruptions per year (SAIFI) and about 39 minutes without power (SAIDI)**. For comparison, in 2024, U.S. electricity customers experienced an average 1.5 interruptions totaling 11 hours without power[9]. Although customers in Sitka experienced slightly more outages than the U.S. average, those outages were much shorter, with nearly half (47%) of interruptions in Sitka lasting less than one hour.

Average annual total power interruptions by state in 2024[3]



U.S. Energy Information Administration visualization of distribution system reliability by state using SAIDI and SAIFI values.

Most interruptions were caused by transmission and distribution equipment failures

Of the 17 unplanned interruptions, 11 were caused by equipment failures, with 10 (58%) caused by transmission and distribution equipment failures and 1 caused by generation equipment failure. Of the remaining interruptions 3 were caused by vegetation, 1 by severe weather, 1 by human accidents, and 1 unknown.

65% Equipment Failure

18% Vegetation Interference

6% Severe Weather

6% Human Accidents

6% Unknown

Source: *CBS Electric Department*

Reducing Risk to Advance the Mission of the Electric Utility

Over the previous five years, CBS has embraced a risk-based asset management approach for its services. This approach prioritizes addressing vulnerabilities, which drive uncertainty, to advance the utility's objectives, reduce the likelihood of unplanned interruptions, and avoid any other safety or financial impacts.

Risk:

"The effects of uncertainty on objectives"

ISO 31000 Risk Management Framework

Highlighted Work to Reduce Risk

Infrastructure and Resources

Green Lake Hydroelectric Project Rehabilitation

The Green Lake Hydroproject has operated nearly continuously for over 40 years and now carries a high amount of inherent risk due to its age. The Utility is completely overhauling its two turbines over the next two years, which will significantly extend the life of the hydroproject. After this rehabilitation, Green Lake will be capable providing the majority of the customer load throughout the year, if needed.

The Green Lake powerhouse, photo by Lee House.

Security and Technology

FERC Security Compliance

The Federal Energy Regulatory Commission (FERC) requires vulnerability assessments. Results from these assessments have informed projects for the FY27 budget that will help reduce physical security risks of the electric system.

Data and Inventory Management

Well informed decisions rely on good data, which is critical for a reliable electric system. As such, the Utility continues to push toward better data management to support its data-driven decision-making capabilities. One way is through the utilization of a computerized maintenance management system (CMMS) that manages parts and inventory data, as well as work order data.

Implementation of inventory management improvements allows the Utility to reduce risks associated with long-lead times for critical equipment and parts, disruptions from supply chain fragility. Proper inventory management improves reliability through appropriately maintaining spare parts and materials for quick deployment if needed, shortening interruptions and reducing costs.

Alignment with Best Practices

Workforce and Partnerships

CBS Plant Operators show engineers from the national labs the Supervisory Control and Data Acquisition (SCADA) system at the Blue Lake Powerhouse.

Nation Labs Partnerships

Engineers from National Lab of the Rockies (NLR) and the Pacific Northwest National Lab (PNNL) provide critical engineering support while opening additional sources of federal funding to develop tools capable of addressing Sitka-specific challenges. NLR is developing a microgrid model for electric grid simulations, while a PNNL is creating hydrological model of the Blue and Green Lake reservoirs. Both tools provide better insight into operational risk reduction opportunities across the Utility's infrastructure, natural resources, and data management requirements. Currently, the Utility is seeking ways to strengthen and continue its partnerships with the National Labs into the future.

Local Workforce Partnerships

To grow future employee locally and reduce risks and costs associated with recruiting candidates off island, the Electric Utility is partnered with the Sitka Conservation Society (SCS) to establish a working student assistant program. The program was first piloted in 2025 with one college and one high school intern, who were able to receive hands on experience at the utility and explore potential employment opportunities at the Utility.

To truly build a local workforce pipeline requires engagement early and often with students. To do this, the Sitka Sound Science Center (SSSC) is integrating Sitka-specific energy education opportunities into schools. These integrations range from simple concepts like "things that spin make electricity", elementary school field trips to the Blue Lake Hydroelectric Project, to high school physics lessons, where students create simplified energy projections using actual data provided by the Electric Utility.

Young Sitkans learning that things that spin make electricity.

References

[1]Fisher, D., DeMarco, T., Austin, L., Hart, A., Vorderbruggen, J., Krantz, K. (2025). *2025 Alaska Snow Survey Report*. U.S. Department of Agriculture's Natural Resources Conservation Service.

[2]Thoman, R. (2025). *Alaska December 2024 Climate Review*, Alaska and Arctic Climate Newsletter.

[3]U.S. Energy Information Administration. (2025). *2024 Electric Power Annual*.

[4]U.S. Energy Information Administration. (n.d.). *Electric Power Monthly,* Table 5.3. Retrieved March 20, 2026.

[5]U.S. Energy Information Administration. (2026). *Short-Term Energy Outlook, March 2026*.

[6]U.S. Department of Energy. (2022). *Low-Income Energy Affordability Data Tool, Energy Burden for 99835*. Note: LEAD tool data was downloaded corrected with known electricity consumptions and adjusted for 2025 values.

[7]U.S. Census Bureau, American Community Survey 5-year Estimates (2020-2024). *Table B19001: Household Income in the Past 12 Months for 99835 (In 2024 Inflation-adjusted Dollars)*.

[8]City and Borough of Sitka, AK. (2026). *2023 Sitka Greenhouse Gas Emissions Inventory*.

Photos of Blue Lake Dam by Josh Houston

CITY AND BOROUGH OF **SITKA**

MISSION

To provide public services for Sitka that support a livable community for all.

Service | **I**ntegrity | **T**eamwork | **K**indness | **A**ccountability

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