

Renewable Energy Alaska Project

REAP is a statewide, non-profit coalition of over 60 dues-paying member organizations with staff in Anchorage, Wasilla, Seward and Juneau.

REAP's mission is to increase the adoption of renewable energy and energy efficiency in Alaska through:

Energy education and community engagement

Training & workforce development

Policy analysis, advocacy & implementation





Reduce

- Reduce fossil fuel use and imports

Decrease

- Decrease GHG and particulate emissions

Stabilize

- Stabilize energy prices

Attract

- Attract investment

Diversify

- Diversify our economy and create jobs



Education & community engagement

REAP develops and delivers place-based energy literacy and clean energy (energy efficiency and renewable energy) education and public engagement across Alaska

- Over 5,500 students from 69 different communities (2025)
- Teacher training, curriculum development, and educational material support
- Annual statewide competitions: Power Pledge Challenge and Clean Energy Olympics
- Adult education modules focused on energy efficiency and community energy efficiency workshops
- Speaker series in spring and fall (online and IRL) and technology information and issues analysis and whitepapers
- Community energy planning and technical assistance



Training & workforce development

People in Power: connecting utility staff with trainings on governance, financial, and operations

Alaska Energy Training Working Group

Alaska Network for Energy Education & Employment (ANEEE)

Heat pump training (coming soon!)



Policy: REAP's track record (partial)



Pillar Mountain Wind Farm in Kodiak, Alaska (Photo by naql, CC BY 2.0)

2008	Renewable Energy Fund (REF)
2008-15	\$640 million to AHFC for home weatherization
2010	Emerging Energy Technology Fund & State Energy “Policy”
2017	Property Assessed Clean Energy (C-PACE)
2020:	Railbelt Grid Reform (to create regional planning)
2021-24:	State Green Bank
2024:	Railbelt Transmission Reform & IPP Tax Parity
2024:	Rate Case Intervention before the Regulatory Commission
2021-25	Renewable Portfolio Standard (RPS) for the Railbelt
2021-26	Railbelt Reliability Council (RRC) formation, governance, and IRP development
2025-26	REF and weatherization advocacy
2026	Unified economic dispatch (Railbelt)

REAP in Southeast AK

- Renewable Energy Fund Advisory Committee (statewide)
- Energy Catalyst for Southeast Sustainable Partnership
- AK Community Hydroponic Greenhouse Planning & Readiness Workbook
- K-12 STEM Education throughout region (11 communities last year)
- Dual Credit Courses in Juneau, Sitka and Angoon (Hoonah late fall 2026)
- Heat pump training (coming soon!)
- Regional partner for National Lab of the Rockies: projects in Juneau, Klukwan, Sitka, ALFA, Southeast Integrated Resource Plan



Thank You!



Renewable Energy
Alaska Project

For more information or
further questions:

Cady Lister

Executive Director

clister@realaska.org

AlaskaRenewableEnergy.org



**National Laboratory
of the Rockies**

Southeast Alaska Regional Energy Update

**Presentation to Southeast Alaska Economic
Summit and 68th Annual Meeting**

2026

Southeast Conference Project Overview

Energy Technology Innovation Partnership Project (ETIPP)

1 UNDERSTAND THE REGION

TASK 1 Regional Energy Update

- Review progress since the 2012 integrated resource plan (IRP)
- Document current conditions, projects and studies
- Identify planning priorities and data gaps

TASK 2 Load Growth & Electrification

- Develop load growth scenarios considering heat pumps, electric vehicles, ports and other emerging loads

2 MODEL PRIORITY SYSTEMS

TASK 3 Upper Lynn Canal

Value of Haines–Skagway cable; load growth, hydrology and diesel-price sensitivities

TASK 4 Southeast Alaska Power Agency (SEAPA)

Hydro operations, Metlakatla intertie, new loads, transmission utilization, storage and resource additions

TASK 5 Prince of Wales

Dispatch, seasonal reservoir management, load growth, diesel use and additional storage scenarios

3 SYNTHESIZE & REPORT

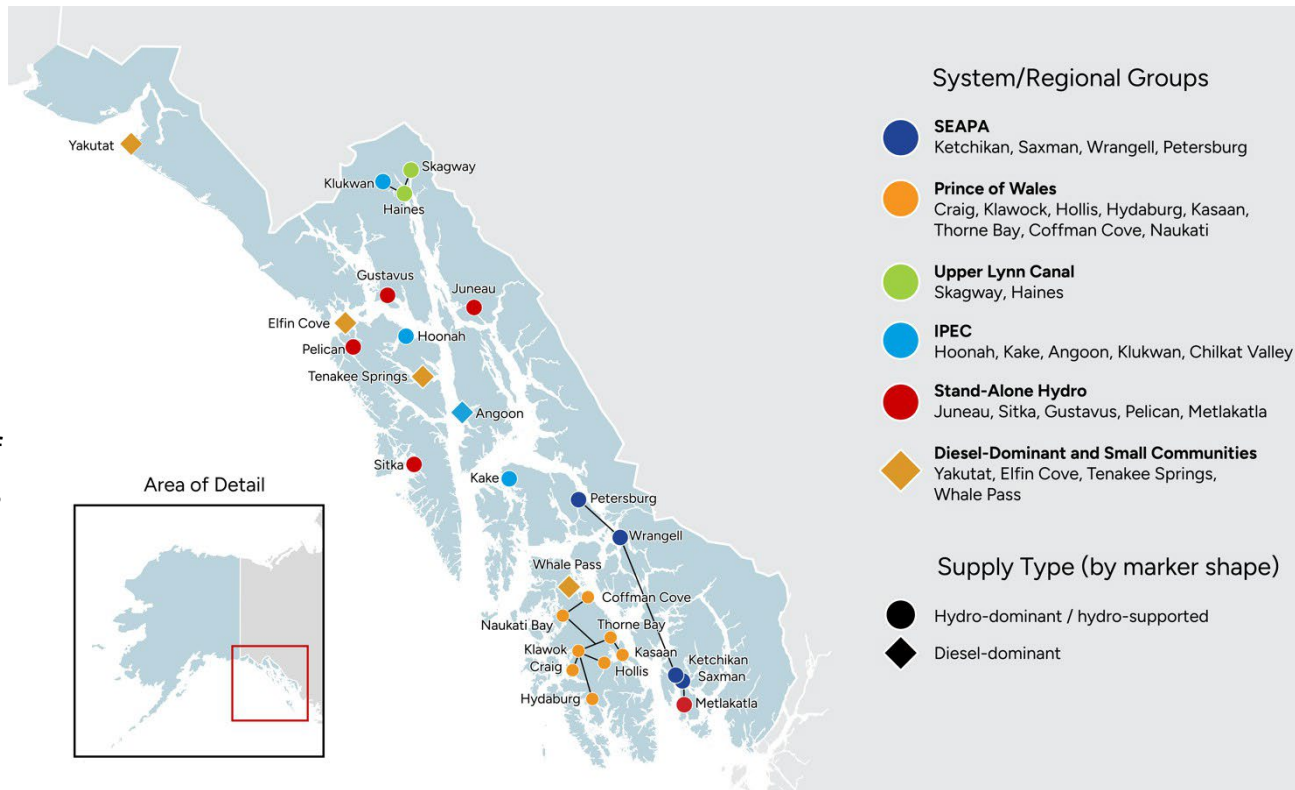
TASK 6 Regional Findings & Next Steps

- Synthesize findings across Tasks 1–5
- Identify cross-cutting trends, constraints and opportunities
- Develop planning-level recommendations
- Highlight remaining gaps and future priorities

Objective: Establish a current regional energy baseline and update key elements of the IRP for Southeast Alaska to identify planning gaps and support future energy decisions.

Southeast AK: Regional Energy Overview

- Regional population: ~70,600
- Southeast includes more than 30 coastal, island, or remote communities.
- Community size varies widely, ranging from larger cities of Juneau and Ketchikan to places with fewer than 100 residents.
- The region is served by a mix of interconnected subregional grids and isolated power systems.
- Planning needs vary significantly based on geography, access, local resources, utility structure, and community size.



Regional Electricity Supply Is Hydro-Dominated, but Local Conditions Vary Widely

Southeast Alaska had ~503 MW of installed generating capacity in 2021:

- 234 MW hydro
- 156 MW reciprocating internal combustion
- 113 MW fossil fuel turbines
- 1 MW storage.

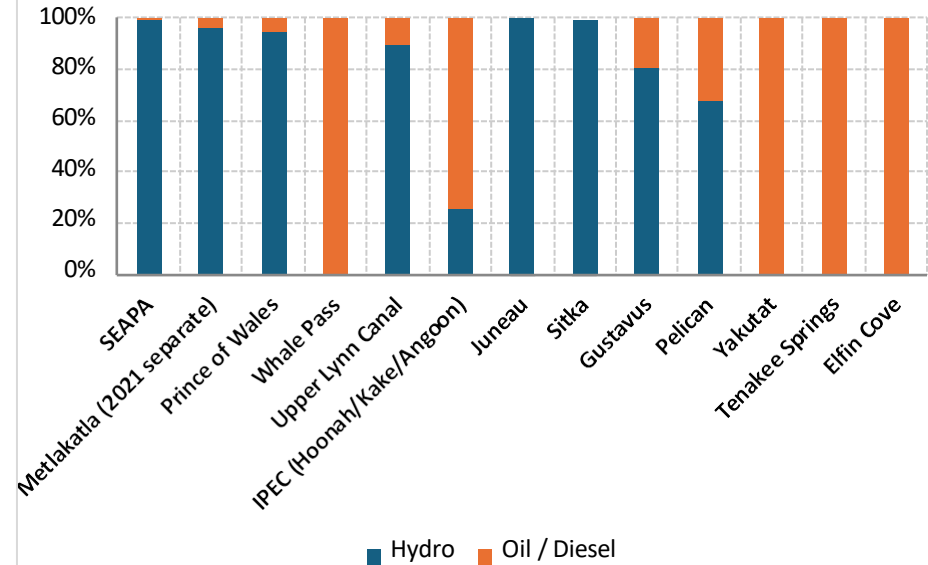
Hydropower supplied ~98% of regional electricity generation in 2021:

- Large storage hydro systems such as in Juneau, Sitka, and SEAPA generate most annual energy from hydro.
- Run-of-river hydro can be highly seasonal, with more limited production during low-water periods.
- Smaller and more remote systems rely on a mix of hydro and diesel.

Diesel generation remains important:

- Supports reliability during outages, transmission constraints, low-water periods, and major maintenance.
- Remains part of the reliability portfolio even where most annual energy is supplied by hydro.

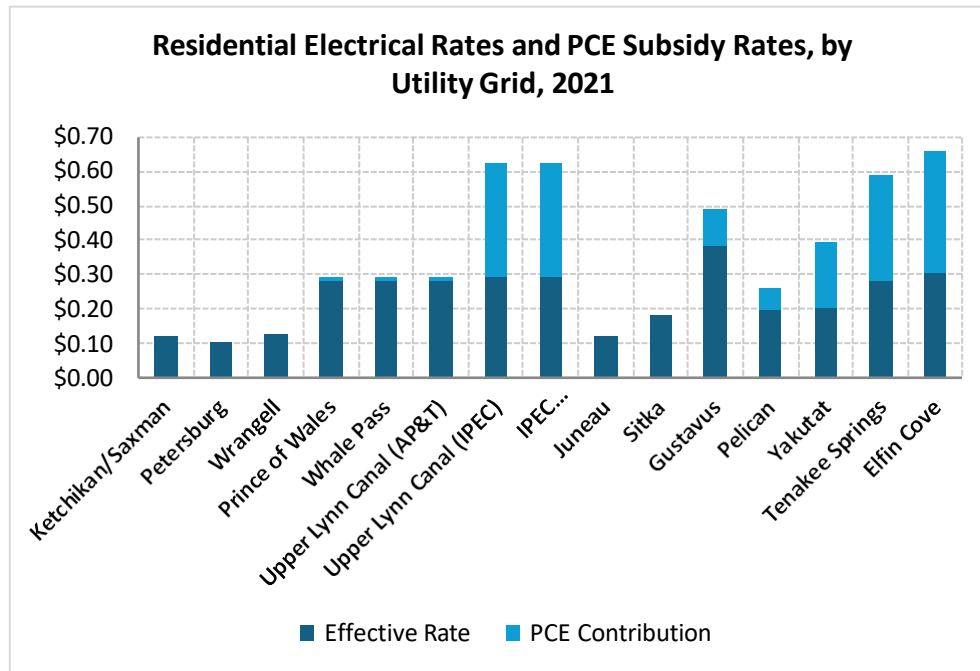
Percentage of Total Electrical Generation, by Energy Source, by Utility Grid, 2021



Source: Alaska Center for Energy and Power [2]; generation by fuel and utility/grid derived from 2021 electricity generation tables

Residential Retail Rates and Power Cost Equalization

- Southeast utilities served ~43,800 customers in 2021.
- 22 Southeast communities received Power Cost Equalization (PCE) support, reducing residential electricity costs in eligible communities. Future levels of PCE support may face pressure with rising Railbelt prices and as program demand approaches available funding limits.
- Rate structures differ by utility: some rates more directly reflect local system costs, while others spread costs across multiple communities, such as the postage-stamp rate of Inside Passage Electric Cooperative (IPEC).
- Underlying costs can vary substantially even when customer rates are similar, particularly across small, isolated systems.

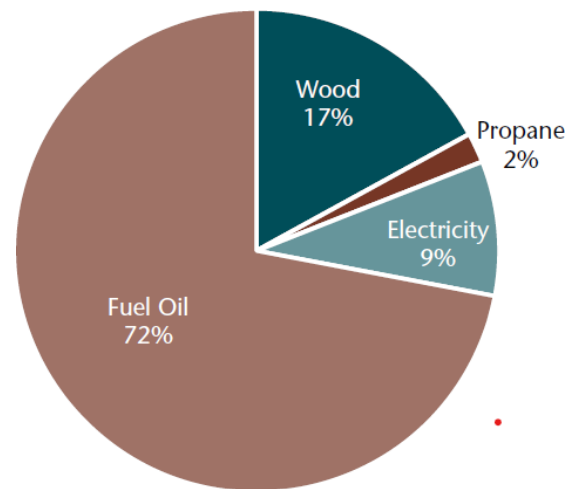


Rates shown are residential tariffs and PCE credits, not community-specific cost of service.

Source: Alaska Center for Energy and Power [2]; residential retail rates and PCE support by utility/grid.

Space Heating Remains a Major Energy Demand

- Fuel oil supplied ~72% of residential space heating energy in 2014; wood, electricity, and propane made up the balance.
- The 2012 Southeast IRP estimated ~17.4 million gallons/year of heating oil for space heating—~708 GWh of fuel energy, equivalent to ~76% of Southeast Alaska's 2021 net electricity generation (~928 GWh).
- Winter 2025 heating oil prices ranged from about \$4.49–\$6.20/gal across surveyed Southeast communities.
- Heat-pump adoption is shifting more heating demand onto the grid, increasing the importance of winter load, hydro availability, and distribution capacity.
- Current regional heating-fuel consumption data are limited; updated community- and system-level estimates are a planning need.



2014 Residential Space-Heating Energy Mix

Source: McDowell Group [3]

2012 IRP Seven Committed Resources: Status Overview

Subregion	Resource	Asset	Approx. Total Project Cost ¹	Status	Key Takeaways	Source
Sitka	Blue Lake Expansion	↑ capacity by 10 MW (~29% production)	\$150M	Operating as of 2015	Strong buy-in and integrated teams advance successfully.	[4]
Hoonah	Gartina Falls Run-of-River Hydro	450 kW	\$10M	Operating as of 2015	Shared rate structures more widely distribute benefits.	[5]
Ketchikan	Whitman Lake Storage Hydro	4.5 MW	\$28M	Operating as of 2015	Existing sales agreements impact operations and costs.	[6]
Prince of Wales	Hiilangaay Storage Hydro	5 MW	\$31M	Operating as of 2021	High construction costs may influence energy prices.	[6]
Metlakatla	Metlakatla–Ketchikan Intertie	34.5 kV transmission	\$13M	Expected operation 2026	Communication and controls are key to operations.	[7]
Angoon	Thayer Creek Run-of-River Hydro	850 kW	\$34M	In progress	High community demand can win government support.	[8]
Kake	Kake–Petersburg Intertie	69 kV transmission	\$53M	On hold	Gunnuk Creek developed as local resource.	[7]

¹Total project costs include design, engineering, procurement, and construction, when available. Costs are approximate and presented in dollars in year of project completion, not adjusted to present.

Other Supply-Side Advancements Since 2012

Subregion	Resource	Asset	Approx. Total Cost	Status	Key Takeaways	Source
Pelican	Pelican Creek Run-of-River	700 kW	\$2M	Operating 2013	Rebuilt post-storm. Now can support 100% load.	[9]
SEAPA	Swan Lake Storage Increase	Adds ~7,500 MWh per year	\$11M	Operating 2017	Revenue neutral project (no rate increase).	[10]
Kake	Gunnuk Creek Storage Hydro	500 kW	\$9M	Operating 2020	Feasibility studies support cost-effective decisions.	[11]
Gustavus	Gustavus–Glacier Bay Intertie	6.1 mi cable underground	\$6.5M	Operating 2022	Large, federal customer can offset residential cost.	[12]
SEAPA	Wrangell–Petersburg Intertie Upgrade	3.5 mi submarine cable	\$13M	Operating 2021	Designing for expansion can save on future costs.	[13]–[15]
Upper Lynn Canal	Haines–Skagway Intertie Upgrade/Replacement	~18 mi 35 kV submarine cable	\$12M	Operating 2023	Upgrading failing parts can ensure system resilience.	[16],[17]
Tenakee Springs	Indian River Run-of-River	180 kW	\$5M	In progress	Projects stall if not fully financed, with contingency.	[18]
Upper Lynn Canal	Goat Lake Storage Increase	Adds ~900 MWh per year	\$2.5M	In progress	Storage adds flexibility and production potential.	[19]
SEAPA	New hydroelectric turbine at Tye	↑ capacity by 10 MW (~50%)	\$22M	In progress	Designing for expansion helps respond to load growth.	[20]

Demand-Side Advancements Since 2012

- An era of high investment (e.g., Weatherization Program, Home Energy Rebate Program through Alaska Housing Finance Corporation) led to measured improvements through 2018 [21].
- Broad, ongoing programs for DSM/EE have been inconsistent. Local DSM programs or projects occur on a case-by-case basis, but an inventory of impact does not exist.
- Utility structure and associated regulations impact organizational ability to participate or lead local DSM/EE programs.
- Programs launched to deploy heat pumps (i.e., Thermalize Juneau, ACES [22][23]) target both electric-to-electric and conversions that replace fossil fuels as a primary heat source, demonstrating different impacts on demand.)
- Biomass systems support space heating in 10+ community facilities [22]. A new wood processing campus in Prince of Wales will demonstrate manufacturing and market feasibility.
- Alaska Wood Energy Development Task Group supports wood-for-energy through education, training, and funding. Challenges include limited infrastructure, high labor needs, complexity of fuel selection (wood chips, cordwood, pellets), availability, sizing, and handling [23].

Regional Planning Considerations Since 2012 IRP

Changing Loads

- Load growth trends vary by system and are increasingly influenced by heat pumps, electric vehicles, ports/marine electrification, and discrete commercial and industrial loads.
- Heat pump adoption has expanded substantially, with new incentives, deployment programs, utility studies, and system-specific planning underway.

Seasonal & Grid Constraints

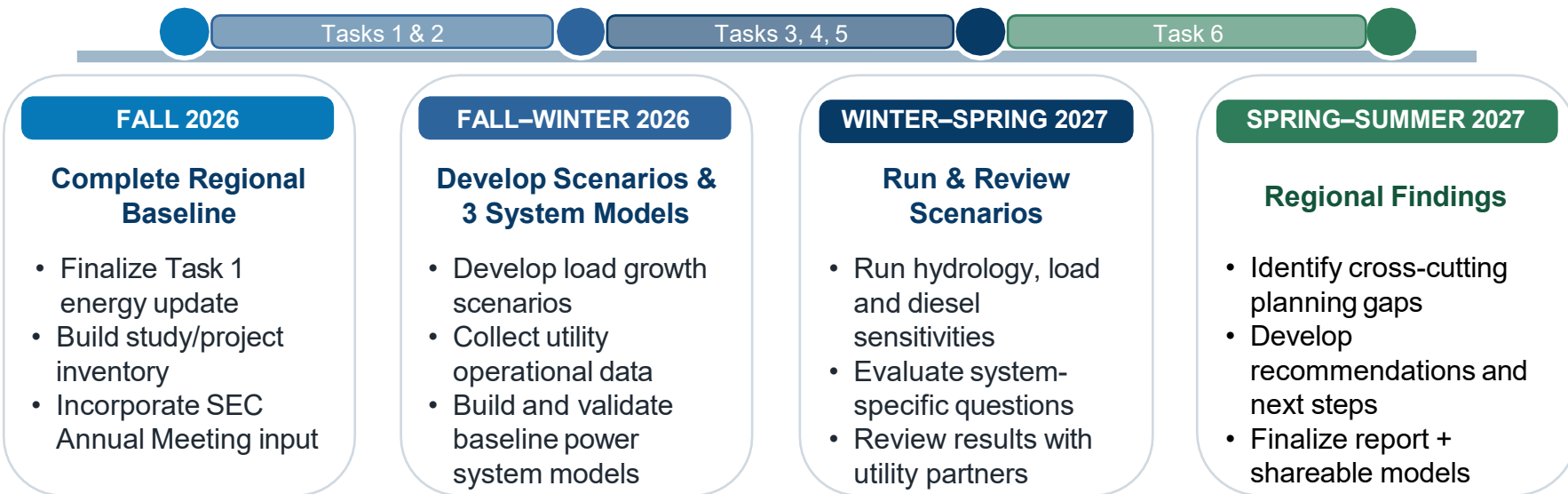
- Attention has increased on how heating electrification may increase winter electric demand during periods when some hydro systems face seasonal resource constraints.
- Growing loads can affect generation, transmission, distribution capacity, storage needs, and diesel backup.
- Hydrology, weather variability, and natural hazards add uncertainty to operations and long-term planning.

Evolving Planning Approaches

- Utilities are increasingly evaluating system-specific electrification scenarios, rate design, flexible/curtailable loads, and distribution impacts.
- Planning is shifting from annual energy generation questions toward seasonal capacity, flexibility, reliability, and resilience.

ETIPP Project Next Steps

The regional update establishes the baseline. The next phases will draw on available data, recent studies, utility and community input, and interviews with key regional partners to develop load-growth scenarios, model the three priority systems, and synthesize regional findings.



Heat Pumps

ACES: Accelerating Clean Energy Savings in Alaska's Coastal Communities

Andy Romanoff
Executive Director



Who is AK Heat Smart?

501(c)(3) incorporated in 2019

AHS' mission is to promote energy efficiency in Alaska homes and buildings by providing education and support for energy efficiency and clean energy solutions. AHS works to help Alaska residents lower heating costs, increase comfort, and reduce environmental impact through improved heating systems and building upgrades.





ACES

Accelerating Clean Energy Savings

- Major regional economic engine
- 6000 heat pump installations through 2029
- Reduce regional emissions by ~80K tonnes
- Grow contractor workforce region-wide

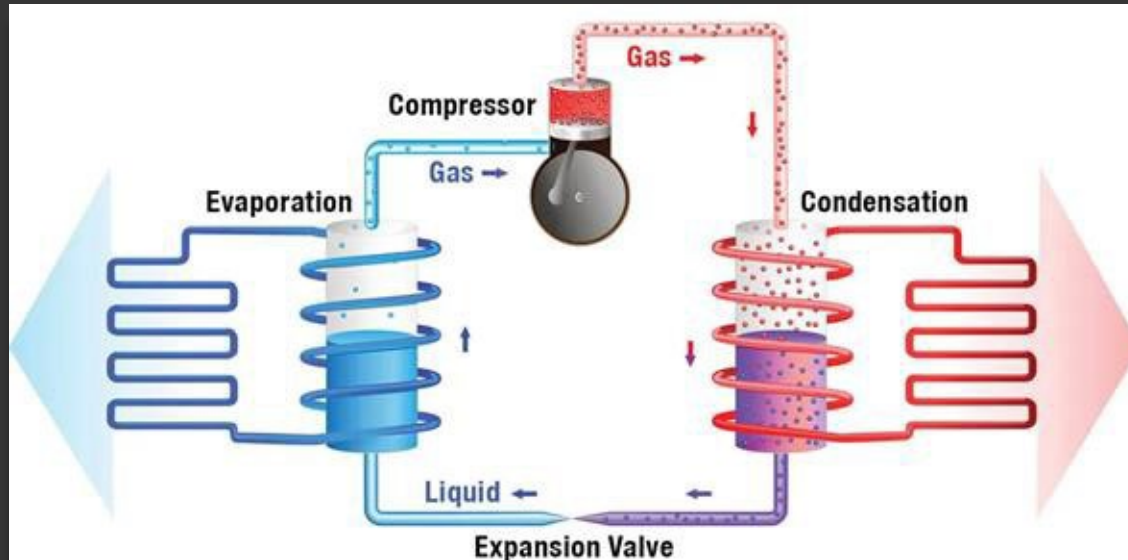


So, why heat pumps?

- Move heat, don't make it
- Can reach 300%+ efficiency
- Up to 75% bill savings
- Clean and local
- Supports community labor
- Supports local power grids

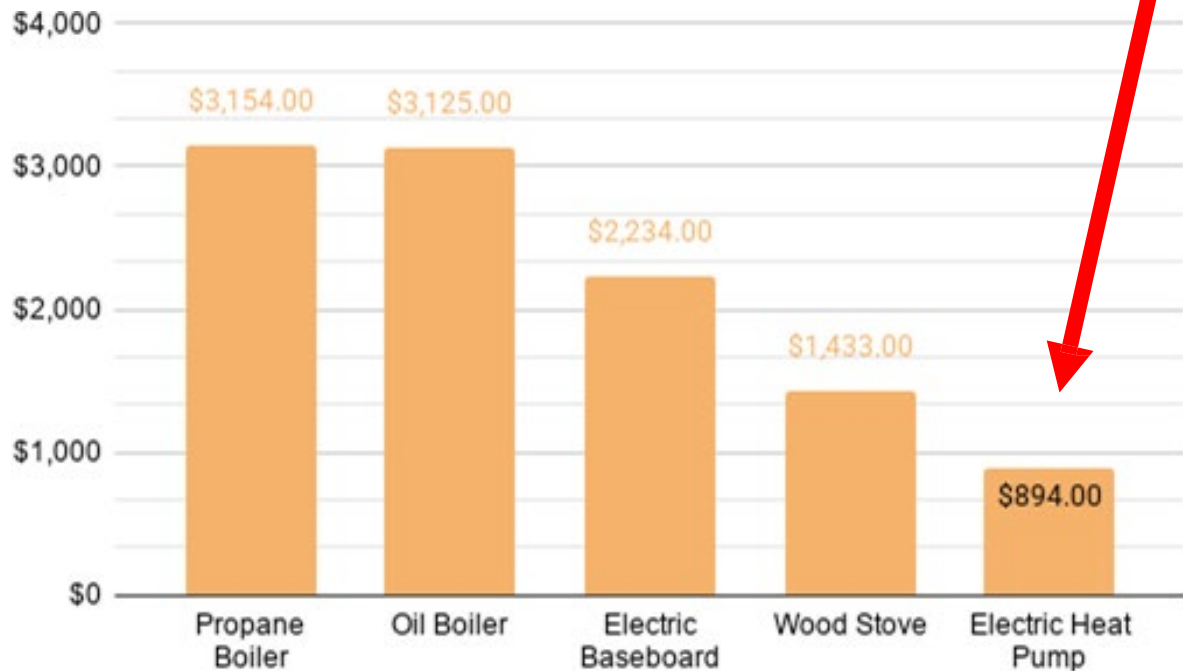


How Does A Heat Pump Work?



A heat pump simply moves heat, from outdoors to indoors, rather than making its own heat. This demands very little energy, allowing the pump to move far more energy than it consumes.

Operating Costs



Cost comparison for different home heating sources. All options provide heat equal to 500 gallons of oil for an oil boiler.

(Based on Ketchikan heating oil price as of \$6.25/gallon.)

What do I get from ACES?



No-Cost Energy Assessment

- Provide insights about your home, fuel and electricity usage, efficiency
- Energy assessor visits in-person or virtually
- Receive heat pump and energy efficiency education, recommendations, and financial savings estimates.
- ACES program requirement
- Access to low-interest TNFCU / TFCU heat pump loan (4%-6%)

\$4000, \$6000, or \$8500 rebate to help you install a heat pump

- Gross household income, household size, and community location determine rebate amount

ACES & the Regional Economy

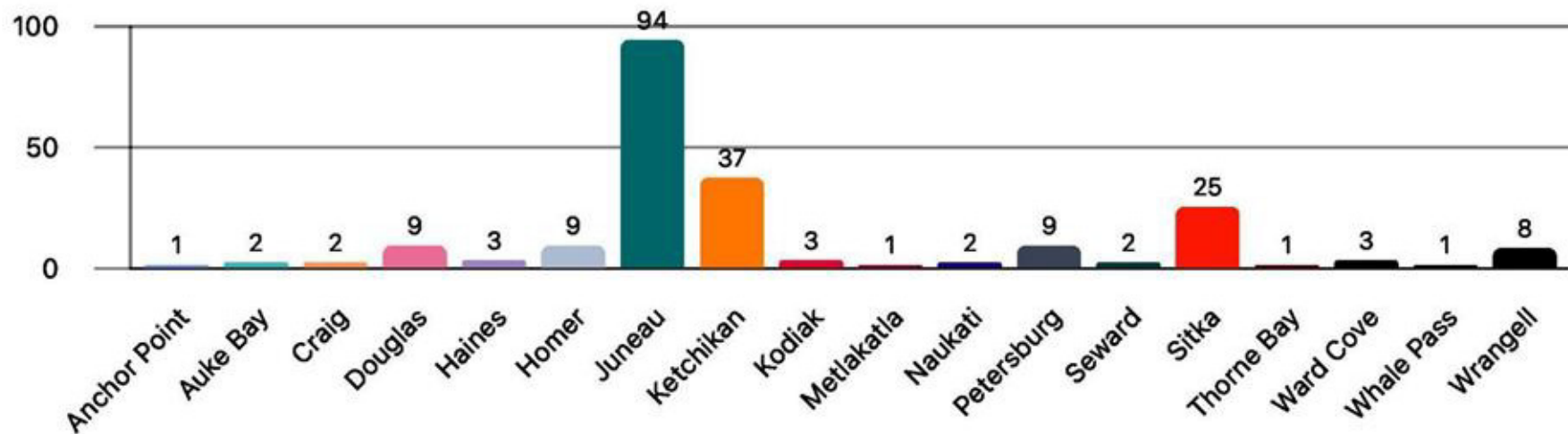


What can
ACES Bring
to
Your Town?





Heat Pump Installations by City



ACCELERATING CLEAN ENERGY SAVINGS (ACES) HEAT PUMP REBATE PROGRAM

Qualify for up to \$8,500!

1. Live in a coastal community from Metlakatla to Kodiak
2. Apply at akheatsmart.org/aces/
3. Complete income verification & energy assessment
4. Hire a heat pump and electrical contractor
5. Submit reimbursement packet

LEARN MORE OR APPLY:
AKHEATSMART.ORG/ACES/

Heat Pump Rebate Program Accelerating Clean Energy Savings (ACES)

The ACES heat pump rebate program could be you, even larger rebates for households that meet lower requirements. This program is available to household fuel-based (oil, gas, propane, and wood) heating systems in communities from Metlakatla to Kodiak!

Best: 6000 Heat pumps installed

Where: 43+ coastal Alaska communities

When: 2020-2029

Why Heat Pumps?

- Highly efficient in coastal AK's maritime climate
- Significantly reduces CO2 emissions
- 25-75% savings on annual heating costs!

Heating cost savings could be outside of this range depending on community rates and fuel prices

Scan QR code for more info! Or visit: akheatsmart.org/aces/

Accelerating Clean Energy Savings (ACES) Frequently Asked Questions

Are rebates eligible for ACES rebates?

Yes, renters can apply for an ACES rebate for their dwelling. The rebate amount will be based on the renter's household size and income, and they will receive the rebate. Both renters and property owners are required to sign an agreement with Alaska Heat Smart. Property owners are responsible for additional project costs.

What documents will I need?

You will need photos of the front and back of the heat pump, a valid driver's license or ID, along with a return. You'll also need 2 years of fuel, electric utility and income verification.

I already installed a heat pump. Can I still get a rebate?

Unfortunately rebates cannot be issued to homeowners who have an ACES heat pump installed. Unfortunately no. To ensure quality and safety, we require that all heat pumps be installed by a professional. On our contractor list, we have a list of contractors that install and wire heat pumps. We encourage you to consult with a tax advisor or CPA.

Can I install a heat pump myself?

Unfortunately no. To ensure quality and safety, we require that all heat pumps be installed by a professional. On our contractor list, we have a list of contractors that install and wire heat pumps. We encourage you to consult with a tax advisor or CPA.

Are ACES rebates subject to federal taxes?

You will receive a 1099 tax form at the end of the year you receive your rebate. We are not qualified to give any advice on federal tax implications in relation to our grant programs. We encourage you to consult with a tax advisor or CPA.

What if my rebate doesn't cover the full cost of installation?

There may be other benefits or loans that could assist you. Alaska Heat Smart has partnered with True North Federal Credit Union to offer low-interest heat pump loans throughout the ACES region. The loan can be used to cover the balance of the upfront installation costs. Reach out to aces@akheatsmart.org to learn more.

Learn more or apply at akheatsmart.org/aces/

ACCELERATING CLEAN ENERGY SAVINGS (ACES) HEAT PUMP REBATE PROGRAM

Up to \$8,500 rebate!

ACES can help you add an energy-efficient heat pump to your home's heating mix.

- For residents of coastal communities from Metlakatla to Kodiak
- Both tenants and homeowners may be eligible for the program
- Qualify for a rebate of \$4,000 to \$8,500 (income based, \$4,000 or \$8,500)

FIND OUT MORE: AKHEATSMART.ORG/ACES/

ACCELERATING CLEAN ENERGY SAVINGS (ACES) HEAT PUMP REBATE PROGRAM

APPLY NOW FOR ACES!

1. Submit ACES application
2. Complete income verification & home energy assessment
3. Hire a heat pump and electrical contractor
4. Submit reimbursement packet

\$8,500 rebate!

ACES can help you add an energy-efficient heat pump to your home's heating mix. For residents of coastal communities from Metlakatla to Kodiak, both tenants and homeowners may be eligible for the program. Qualify for a rebate of \$4,000 to \$8,500 (income based, \$4,000 or \$8,500).

Learn more or apply at akheatsmart.org/aces/

PRESS KIT

aces@akheatsmart.org

Questions?

aces@akheatsmart.org
www.akheatsmart.org

www.epa.gov/inflation-reduction-act/climate-pollution-reduction-grants

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**Apply to
ACES now!**

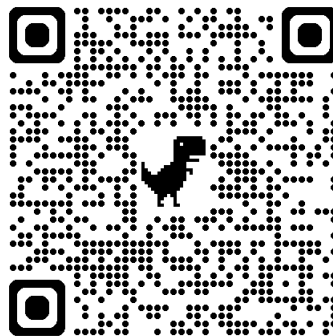
akheatsmart.org/aces



Share Your Input

- What are the most important energy-related issues facing your community today?
- What drives your energy priorities?
- Are there specific energy projects or programs you would like to see in your community?
- How would you prioritize different energy projects and initiatives in Southeast?
- What information or planning support would be most helpful?

SHARE YOUR INPUT



Scan to complete the short
survey

SURVEY CLOSES: [DATE]

*Reports, project updates, and contacts are
all helpful.*