Pro-Atlin Community Energy Plan

Local energy as a path to energy self-sufficiency, economic opportunity, and community climate leadership

June 2026

Community Energy Association

The Power beneath the flow

From mountain peak to Ocean wide,
The river runs, it will not hide.
A force unseen, yet ever near,
a song of light the world can here.

It turns the weel, it lights the night,
A dancer born of rain and height.
No smoke, no flame, no ash, no scar—
Just current drawn stream and star.

Through dam and turbine, clean the grand,
It gifts us power from water's hand.
A pulse of Earth, both old and new—
Hydro, the heart that pulses through.

This Page and on the Cover

This poem – The Power Beneath the Flow – was written by Hannah Netro, a 12-year-old TRTFN citizen and student in the Atlin School, as part of a class assignment on how students currently use energy in their homes and community, and how energy in Atlin could look in the future. The artwork on the cover was drawn by Bogomil for the same assignment.

These contributions from local students followed a tour of the Atlin community hydro system that was conducted in September 2025, as part of community engagement related to the development of this Atlin community energy plan.

See page 13 for more information about how community input, including the involvement of students at the Atlin School, shaped the priorities and suggested actions outlined in this community energy plan.

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CEA would like to acknowledge the contributions off all staff and residents who supported the development of this Community Energy Plan, including:

Project Team

Stuart Simpson, Tlingit Homeland Energy Limited Partnership (THELP) and Xeitl LP

Tina St Cyr, Tlingit Homeland Energy Limited Partnership (THELP)

Interviewees, Data Providers, & Supporters

Alicia Pinkson, BC Hydro

Andy Carlick, Taku River Tlingit First Nation

Ben Campbell, Northern Development Initiative Trust

Erin Monaghan, BC Hydro

Erv Krumins, Taku River Tlingit First Nation

Felicia Magee, Northern Development Initiative Trust

Innes Hood, Williams Engineering Canada

Lars Johansson, Atlin Tlingit Economic LP

Katya McClintock, New Relationship Trust

Mike Strange, Atlin resident

Richard Burgess, Atlin Tlingit Economic LP

Robin Urquhart, Atlin resident

Rosa Brown, Atlin resident and Pembina Institute

Sarah Powell, New Relationship Trust

Scott Odian, BC Hydro Diesel Generator Operator

Sinead Earley, University of Northern British Columbia

Stephen Lancaster, Owner, Atlin Inn

CEA would like to acknowledge the local residents who participated in a community dinner on September 16, 2025, and shared their priorities and perspectives on energy in Atlin.

Executive Summary

Introduction

A Community Energy Plan (CEP) identifies current energy use in a community, projected energy needs in the future, and a roadmap for how local and renewable energy will be provided and consumed over the next decade. The last CEP for Atlin, published more than 20 years ago, led to the construction of the Atlin community hydro system – among the first examples in Canada of a renewable energy system wholly owned by a First Nation.

Building from this local asset and recent advances in technology, this CEP takes a "Pro-Atlin" approach: prioritizing locally produced electricity for transportation and buildings to strengthen energy security, support the local economy, and minimize greenhouse gas emissions. Taking a "Pro-Atlin" view is also consistent with the aspirations and priorities identified by the community during various resident, stakeholder, and youth engagement activities that accompanied the development of this CEP.

This is a special and unique opportunity for Atlin; this level of energy self-sufficiency has never been identified in any of CEA's 100+ community energy and emission plans that have been produced over the past 25 years.

Current State of Energy in Atlin

Atlin's reliable, low-carbon electricity system is primarily powered by hydroelectric generation, with diesel serving as a secondary source. When the hydro system came online, average diesel consumption decreased by approximately 95% and Atlin realized many economic and environmental benefits.

Other fuel consumption in Atlin includes gasoline, diesel, propane, heating oil, and wood. In 2024, Atlin's inventory consisted of the following estimated values:

- Energy consumption: 93,540 GJ
- Greenhouse gas emissions: 4,882 tCO_2e
- Energy expenditures: $3,985,380

Figure 1 illustrates the proportion of energy, emissions, and expenditures among various sectors in Atlin. 24% of energy expenditures were spent on local sources of energy (electricity and wood), while the other 76% (approximately $3 million) were spent on trucked-in fuels (gasoline, diesel, heating oil, and propane).

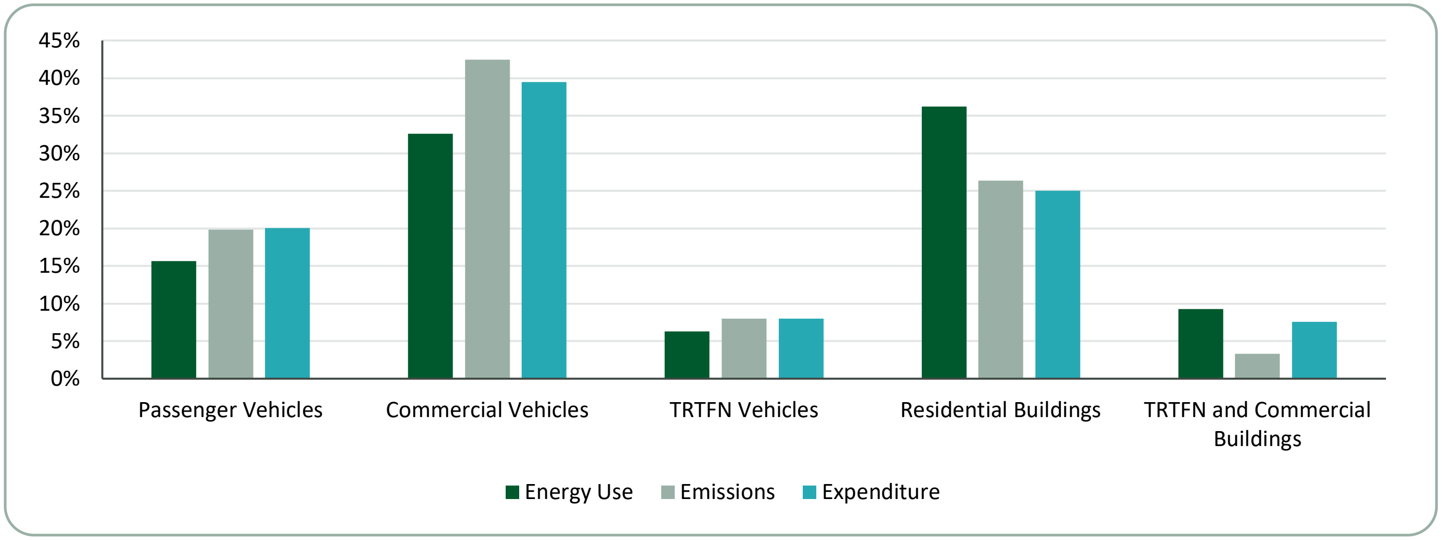


Figure 1. Proportion of Energy Use, Emissions, and Expenditures in Atlin, 2024

Electricity demand in Atlin reaches its annual peak during the coldest days of the year, driven primarily by increased space-heating needs. The town's load typically peaks twice each day, first in the morning and again in the early evening, with the greatest peaks occurring during the winter months. Figure 2 shows daily peak electricity demand from 2018 to 2020, highlighting the recurring annual pattern in which peak loads occur during the coldest periods.

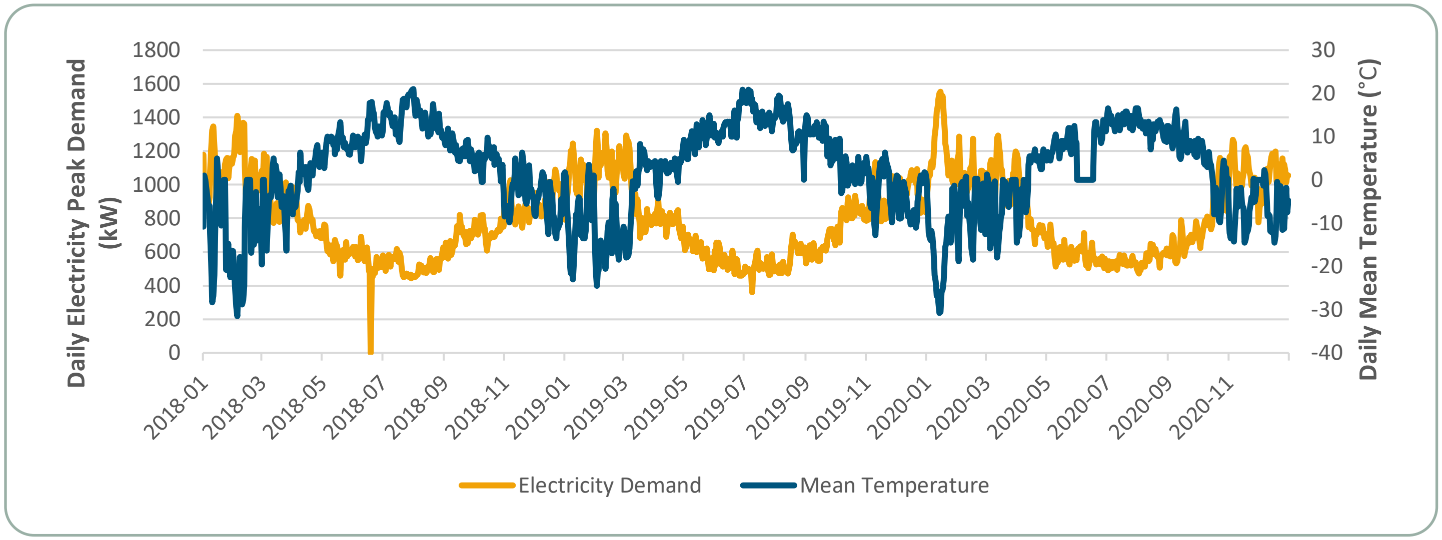


Figure 2. Daily Electricity Peak Demand in Relation to Average Temperature, 2018-2020

In regard to electricity in Atlin, there are three primary concerns and opportunities to consider:

1. Throughout much of the year, the local hydroelectric system has the capacity to produce more electricity than the community currently consumes.
2. During the coldest days of the year, the hydro system cannot meet the electricity demands of the community. Currently, this requires the operation of the diesel power-generating station to supplement power-generation.
3. Peak electricity demand and overall electricity consumption are expected to grow significantly by 2045.

Taking Action

There are ten actions within three focus areas for Atlin and the TRTFN to implement, as outlined below in Table 1.

These actions were developed to address the three considerations outlined above, to increase the consumption of locally produced energy, and to decrease diesel-generated electricity.

Table 1. Summary of CEP Actions

1. Energy Efficient and Locally Energized Buildings	2. Energy Efficient and Locally Energized Transportation	3. Local Electricity Management, Generation, and Storage
1.1 Complete energy audits and retrofits on homes and commercial buildings to improve energy efficiency and reduce emissions 1.2 Ensure new homes and buildings are built to Energy Step Code Step 4 and Zero Carbon Step Code Emissions Level 3, or higher 1.3 Explore opportunities for geoexchange / lake loop systems	2.1 Install public electric vehicle (EV) chargers near local businesses 2.2 Replace vehicles and equipment with electric options, such as EVs, e-bikes, and electric boats 2.3 Support local businesses to reduce the need for trips to nearby communities for necessities 2.4 Expand the TRTFN shuttle service	3.1 Implement battery energy storage system alongside existing hydro system 3.2 Implement demand response measures in homes and buildings 3.3 Explore opportunities to expand the existing hydro system

Impact of CEP Actions

Compared to the Business-As-Usual projections, which assume that Atlin takes no action, overall energy consumption is projected to decrease by 8% by 2050. Despite the modest energy reductions, emissions are projected to decrease by 22%. In addition to energy and emissions reductions, implementation of the CEP has many community benefits, including increased energy independence and security, reduced imported energy, increased economic and job opportunities, reduced energy costs, improved air and water quality, and increased electricity revenue for the TRTFN.

Implementation

The absence of a local government in Atlin creates a unique context for implementing this plan, requiring strong collaboration and coordination among multiple organizations. Increasing community awareness, along with actions focused on governance, public education, and workforce and youth engagement, will support effective implementation. Additionally, funding opportunities can support implementation and reduce upfront costs.

Now is the time to take collective action and build a self-sufficient energy future.

Introduction

Introduction

When the first and most-recent Community Energy Plan for Atlin was published more than 20 years ago, it presented a vision for local electricity production that would reduce the community's dependence on trucked-in diesel. What came next was the construction of a hydroelectric system on Pine Creek that takes advantage of the natural elevation difference between Surprise Lake and Atlin Lake and provides more than 95% of the community's annual electricity needs. It was a remarkable achievement, one of the first examples of a fully Indigenous-owned renewable energy system in Canada.

After 17 years of operation, it is clear that Atlin's local hydroelectric capacity is foundational to significant opportunities related to local economic development, energy security, and action to reduce greenhouse gas emissions. So why this plan and why now? The experiences in delivering energy to the residents of Atlin have revealed two main circumstances:

1. Throughout much of the year, the local hydroelectric system has the potential to produce more electricity than the community currently consumes. Additional electricity consumption during those periods of time would provide more benefits to the community and reduce the reliance on expensive trucked-in fuels that are also high in greenhouse gas emissions intensity.

2. During particularly cold times of the year, the hydro system cannot meet the electricity demands of the community. Currently, this requires the operation of the diesel power-generating station to supplement power-generation from the hydro system. Without intervention, this shortfall is expected to grow in the years ahead.

It is these circumstances that led to the commissioning of this community energy plan and they are reflected in the actions outlined in this plan. The actions also recognize the significant advances in technology that have occurred since Atlin's last community energy plan. It is now possible, for example, that the community can responsibly choose electrical options for transportation, heating, and cooling that can further support local energy, the local economy, and discourage the use of fossil fuels coming from outside of the community.

This plan takes a "Pro-Atlin" approach, recognizing that prioritizing local energy will have the knock-on effect of reducing greenhouse gas emissions, supporting energy security, boosting the local economy, and providing jobs.

This is a special and unique opportunity for the community; this level of energy self-sufficiency has never been identified in any of CEA's 100+ community energy and emission plans that have been produced over the past 25 years.

Community Energy Planning

Community Energy Planning

A CEP identifies current energy use in a community, projected energy needs in the future, and a roadmap for how energy will be provided and consumed over the next decade. The CEP considers how Atlin uses energy – to get around, heat and cool homes, and power appliances – and the sources of that energy. A CEP is critical for making sure that Atlin can continue to provide safe, reliable, affordable, and clean energy that's produced locally – and reduce reliance on diesel and other trucked-in fossil fuels.

The process of creating Atlin's CEP included the following key activities:

I. Research & Engagement
   a. Complete research and interviews to understand Atlin and TRTFN's existing plans, strategies, initiatives, and organizational structure
   b. Host community, stakeholder, and youth engagement
II. Data Collection and Analysis
   a. Develop the energy and emissions inventory to create an understanding of energy use in the community
   b. Review expected growth in electricity consumption and demand, as provided in the BC Hydro load forecast
III. Plan Writing
   a. Compile findings from previous activities to create draft CEP strategies
   b. Gather feedback from TRTFN staff and project team on the draft CEP strategies
   c. Integrate feedback and finalize the CEP

Engagement Summary

Community engagement for the Atlin Community Energy Plan (CEP) involved a variety of activities that gathered local input from diverse audiences. This included a survey, interviews, and in-person activities in September 2025 that collected feedback on how residents currently use energy and their energy priorities for the future. Information about the CEP and the engagement activities was shared through social media posts, the Whisper, mailout flyers to each home, and the Atlin CEP website.

Online Survey

An online survey was shared with the community to gather information about their energy consumption, energy upgrades they had completed or were interested in, and their travel habits. The survey was open for two months (July 2025- September 2025) and received 23 residential responses and 1 commercial response.

Community Engagement: Open House and Dialogue

A community open house was held to introduce the CEP process and provide an overview of Atlin's energy system and how it relates to community priorities like economic development, affordability, and energy security.

The event included a dialogue hosted by the University of Northern British Columbia (UNBC) that focused on understanding community members' interests, needs, and opportunities for renewable energy transitions.

Stakeholder Engagement: Interviews and Workshop

In-depth Interviews were conducted with key stakeholders to understand the social, economic and environmental barriers and priorities for Atlin's energy system.

A cross-sectoral workshop brought together key stakeholders (e.g., TRTFN, industry, local business community, service organizations, BC Hydro) for a dialogue on Atlin's energy challenges, opportunities, areas of governance and authority, and potential partnerships.

Youth Engagement: Student Tour and Workbook

Atlin school students attended a tour of the hydro system to learn about the creation of renewable energy in their community. The tour was combined with workbook assignments to help the students reflect on what they learned on the tour and the use of energy in their home and community.

Above and next page: Atlin School students participated in a tour of the hydro system, from Surprise Lake to the powerhouse. The group was led by Stuart Simpson and Tom Esquiro. Drawing by Darina.

ATLIN SCHOOL – HOMEWORK TASK #3

We toured the Atlin Hydro system!

What did you learn today? **Draw** or use **words** to describe your experience.

What We Heard

Community engagement demonstrated strong interest in a clean, resilient, and locally driven energy future. Community and stakeholder input highlighted local pride in Atlin's renewable energy leadership and interest in opportunities for energy efficiency, electrification, and economic development. Participants emphasized the need to consider local context and barriers like cost of living, remote location, and workforce capacity. In addition, the lack of a clear governance structure in the region was noted as a significant challenge with participants highlighting the importance of strong partnerships between the Taku River Tlingit First Nation, Atlin Community Improvement District, the Atlin District Board of Trade, BC Hydro, local groups, and residents.

Community Aspirations for Atlin's Energy Future

Community members and stakeholders see the Community Energy Plan as an opportunity to focus on Atlin's identity, values, and local leadership. At a high-level Atlin's CEP should aim to:

- Position Atlin as a northern leader and a model for clean, renewable energy-powered communities
- Contribute to energy sovereignty, greater self-reliance, and reduced diesel dependence
- Strengthen effective partnerships, Indigenous leadership, local ownership, and community building

Opportunities & Priorities

Local Ownership and Energy Sovereignty

Community input showed strong interest in clean energy systems that are locally owned and managed so that economic benefits remain within the community. Participants see clean energy as an opportunity to increase Atlin's resilience and self-reliance, potentially reducing vulnerability to disruptions such as supply chain issues, fuel shortages, or transmission outages.

Economic Development

Participants viewed energy planning as an opportunity to support long-term economic development by building local supply chains, training opportunities, and clean energy businesses. Expanding renewable energy and electrification projects could help position Atlin as a resilient and attractive community for investment and remote workers.

Hydropower and Electrification

Input reflected a desire to build on Atlin's history as a hydro-powered community to support a renewable energy future. Participants also expressed interest in household energy efficiency, solar energy and low carbon transportation, but emphasized that it must be affordable and supported by adequate infrastructure and generation capacity.

Energy Storage and Demand Management

Energy storage and demand management were discussed as ways to improve system reliability and reduce diesel use. Participants also noted that education, incentives, and smart energy management systems could help residents shift electricity use to off-peak times and improve overall system efficiency.

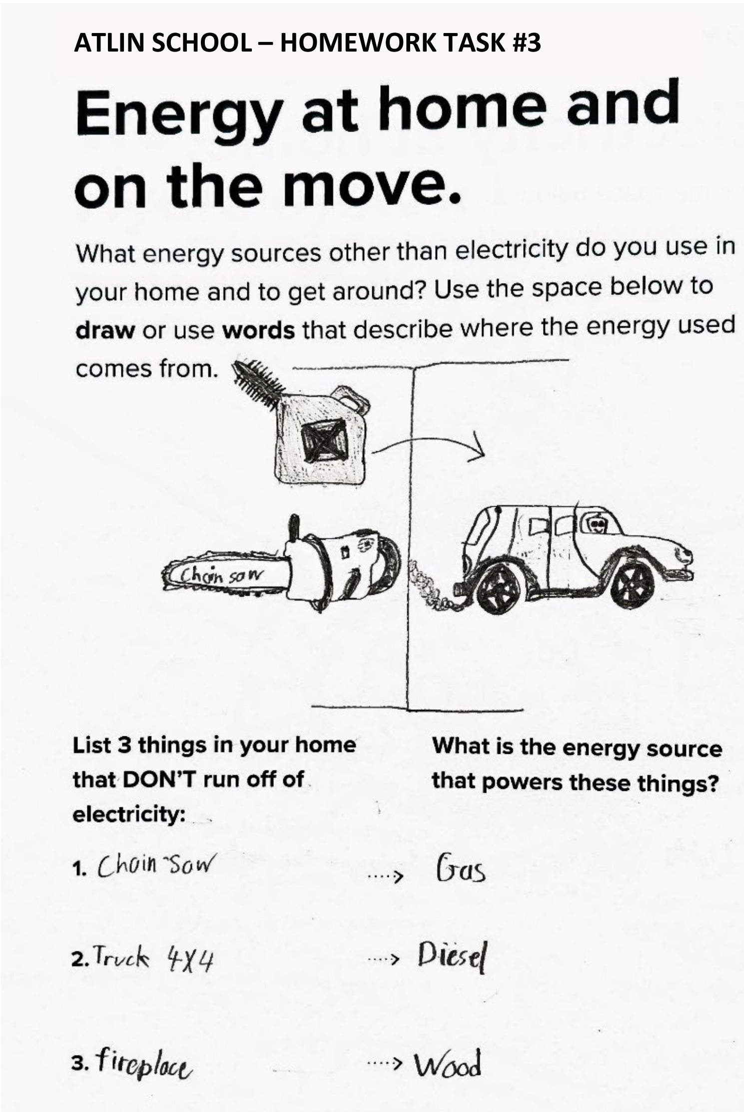
An Equitable Approach

Participants emphasized the importance of equity and affordability in Atlin's energy transition. Energy planning should consider the needs of vulnerable residents, including seniors and lower-income households who may face greater barriers to adopting new technologies or upgrading their homes. Participants expressed interest in programs that ensure the benefits of clean energy transition are accessible to all residents, including targeted financial supports, community education, and equitable program design.

A complete engagement summary is in Appendix E and UNBC's summary of the community dialogue is in Appendix F.

Energy Use in Atlin

Energy Use in Atlin


ATLIN SCHOOL – HOMEWORK TASK #3

Energy at home and on the move.

What energy sources other than electricity do you use in your home and to get around? Use the space below to **draw** or use **words** that describe where the energy used comes from.

List 3 things in your home that DON'T run off of electricity:	What is the energy source that powers these things?
1. Chain Saw	Gas
2. Truck 4X4	Diesel
3. fireplace	Wood

Overview of Existing Hydro Electricity System

Atlin's electricity system consists of hydroelectric and diesel generation. The primary source of electricity is a modified run-of-river 2.1 MW hydroelectric system with storage at Surprise Lake, which began operating in April 2009. The system is owned and operated by the Xeitl Limited Partnership (XLP) under the Taku Land Corporation, which is owned by TRTFN. XLP has a 25-year energy purchase agreement with BC Hydro.

The secondary source of electricity, used when the hydro system is not operating or is not able to meet the local electricity demand on its own, is the diesel generation station. The 2.8 MW station was built in 1978, and was the main source of electricity prior to the hydro system. The main limitation of the hydro system is the ability to meet the winter peak demand (see Figure 5 for monthly peak demand). Slush or frazil ice can accumulate in the head pond and limit hydroelectric production, furthering the difficulty to meet winter peaks.

Figure 3 shows the electricity generated by the hydroelectric system and diesel generators alongside the overall emissions factor from 2018-2024. Emission factors in 2022 and 2024 were the greatest due to the increased diesel generation. Atlin's average emissions factor is 0.008 tCO_2e/GJ; for comparison, BC's average integrated grid factor over the same period was 0.005 tCO_2e/GJ[1] and Yukon's was 0.025 tCO_2e/GJ.[2] Overall generation has increased by 4,313 GJ (22%) since 2018; this consistent growth is shown by the total generation trendline in Figure 3.

[1] https://www2.gov.bc.ca/gov/content/environment/climate-change/data/electricity
[2] Environmental and Climate Change Canada. 2025. National Inventory Report 1990 –2023.

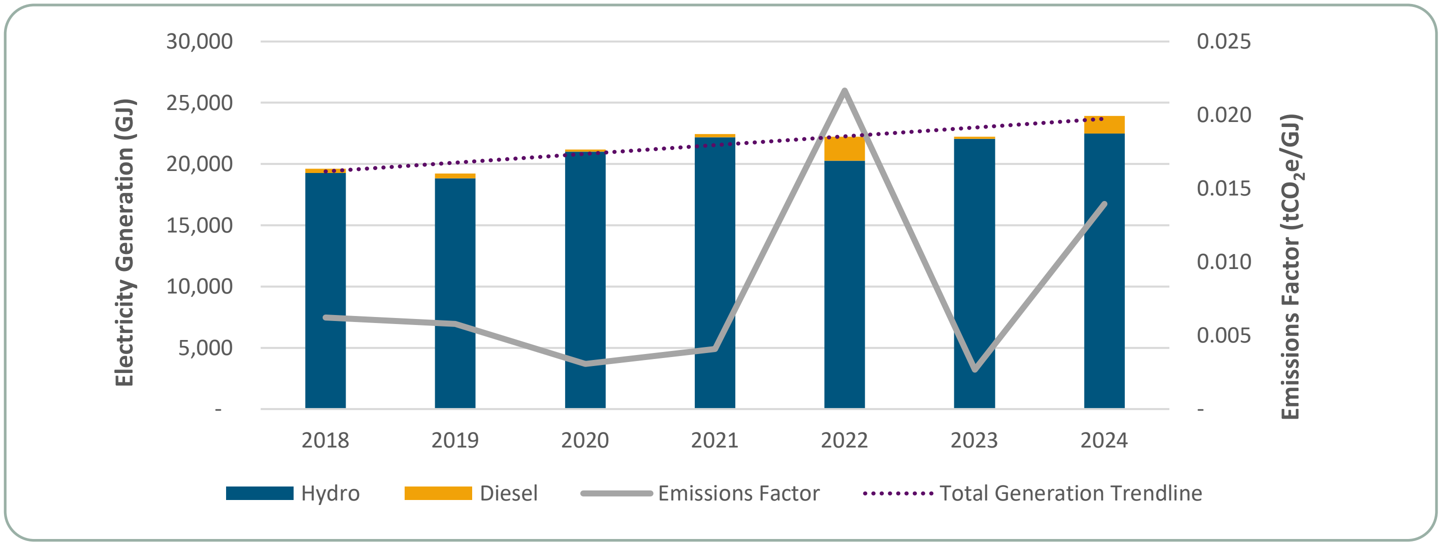


Figure 3. Electricity Generation by Fuel Type and Overall Electricity Emissions Factor, 2018-2024

Note: all fuels, including electricity, were converted to gigajoules (GJ) to allow for comparison between fuels. 1 GJ is equal to 277.78 kilowatt-hours (kWh).

Figure 4 shows the diesel consumption in litres and kilowatt-hours from 2018-2024, given that one litre of diesel contains about 11 kWh of energy. The figure also shows the diesel generation, highlighting the inefficiencies of diesel generated electricity. On average, the diesel generation is only about 23% of the diesel consumption.

Prior to the hydroelectric system, the diesel generators were consuming roughly 1.3 million litres of diesel per year,[3] or 28 B-trains,[4] resulting in a 95% reduction in average diesel consumption following the implementation of the hydro system. The average consumption is now closer to 1.5 B-trains, with some years (2020 and 2023) consuming as little as half of a B-train worth of diesel.

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[3] Xeitl Limited Partnership. (2019). 10th Anniversary Atlin Hydro Presentation.

[4] Assuming 46,000 L per B-train

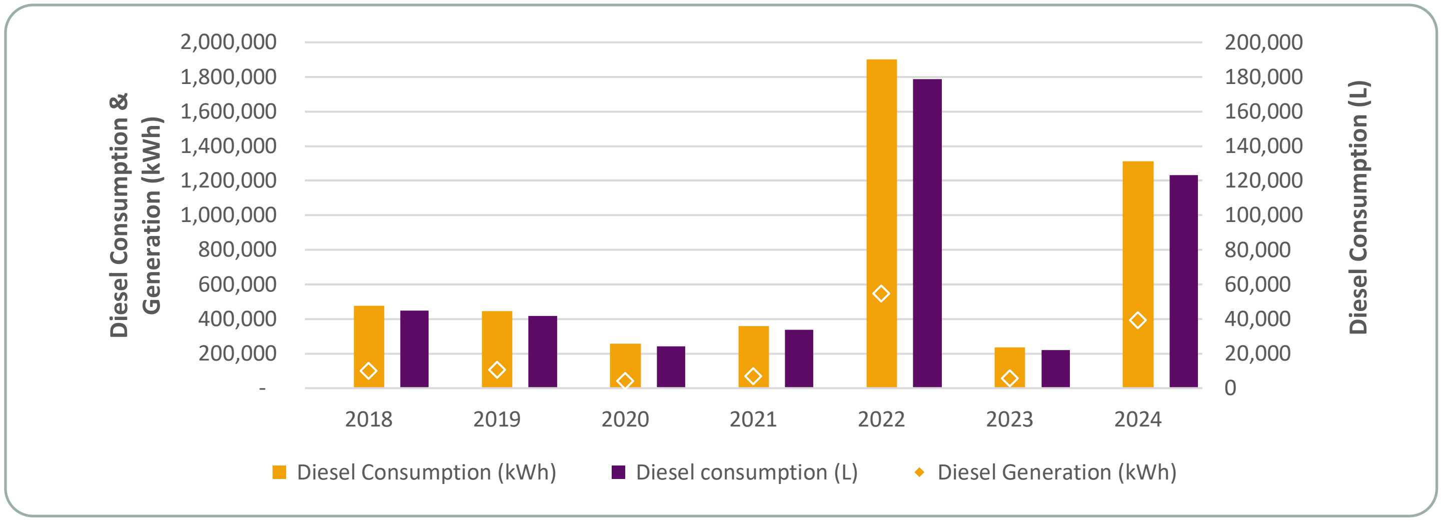

Figure 4. Diesel Consumption and Generation at the Diesel Generating Station, 2018-2024

There are numerous benefits to Atlin's hydro system, as presented in XLP's *Generation for Generations* community presentation. The project generated significant employment opportunities during construction, including 13,680 hours of work for TRT citizens, valued at $333,204, and 26,480 hours for non-TRT Atlin residents, valued at $644,973.[5] The project continues to provide economic value to the TRTFN, providing an annual average dividend of $450,000. In terms of GHG emissions, the system has resulted in significant reductions, saving over 51,000 tCO_2e between April 2009 and the end of 2024. Other key benefits include the growth of ATELP and other TRTFN corporations, social benefits, skill development and employment programs, air quality improvements, noise reduction, reinvestments of dividends into the community, community pride, and energy self-sufficiency. Over a span of five years, $80k has been invested and leveraged to create the Tlatsini fund, which reached nearly $5 million; this fund is used for environmental protection and land use management. The dividends also provided a large investment for the Atlin Hydro Expansion Project and will continue to support TRTFN priorities. Additional information on the benefits and challenges of the system are presented in The Conference Board of Canada's paper: [The Atlin Hydro Project: Making a Meaningful Contribution to Community Health and Well-Being].

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[5] 2009 dollars

Electricity Load Profile

The hourly electricity load profile, monthly variations in electricity load, and temperature impact on electricity demand can all provide insights for the development of a CEP.

Figure 5 highlights the average 15-minute kilowatt (kW) peak for each month, with November through March containing the highest peaks. The first daily peak happens around 7:45-9:30 am and peaks again in the evening (5-6:30 pm); the peaks are smaller in the summer months and larger in the winter months.

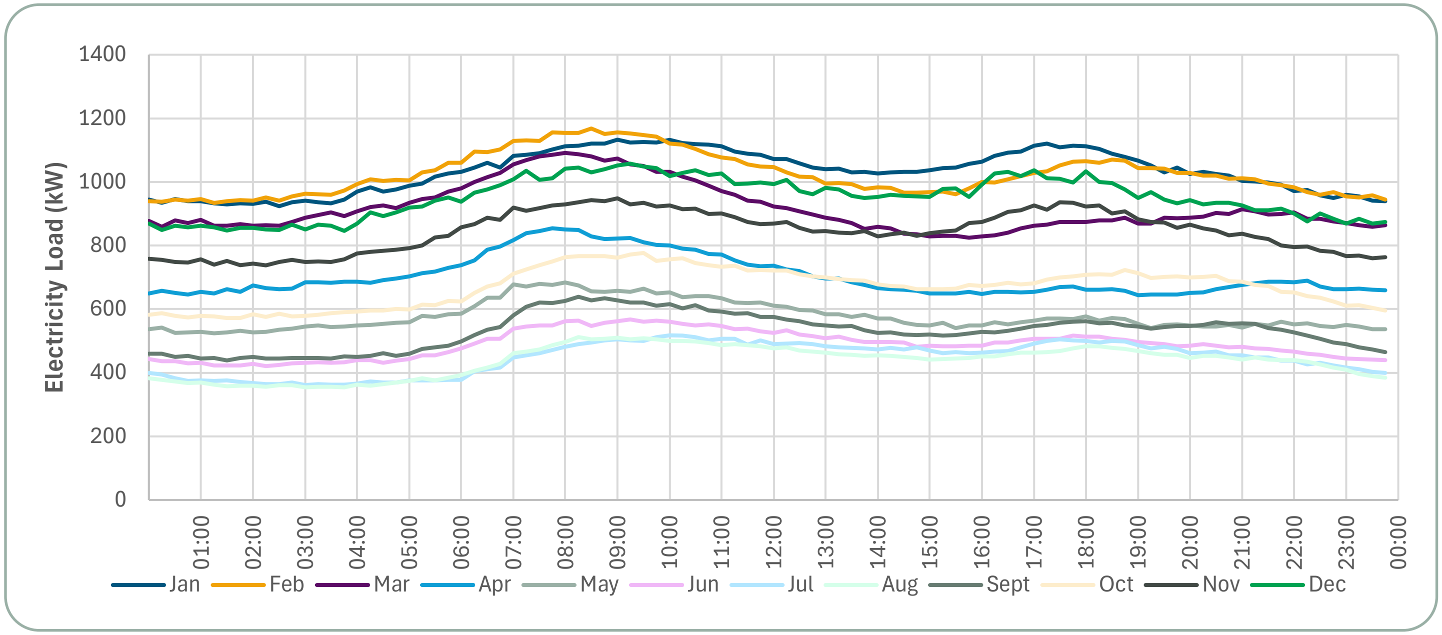

Figure 5. Average 15-Minute Peak Demand by Month, June 2022 - July 2024

Figure 6 shows three years of daily electricity peak demand compared to the mean daily temperature. As the average temperature drops, the peak demand increases, and vice versa.

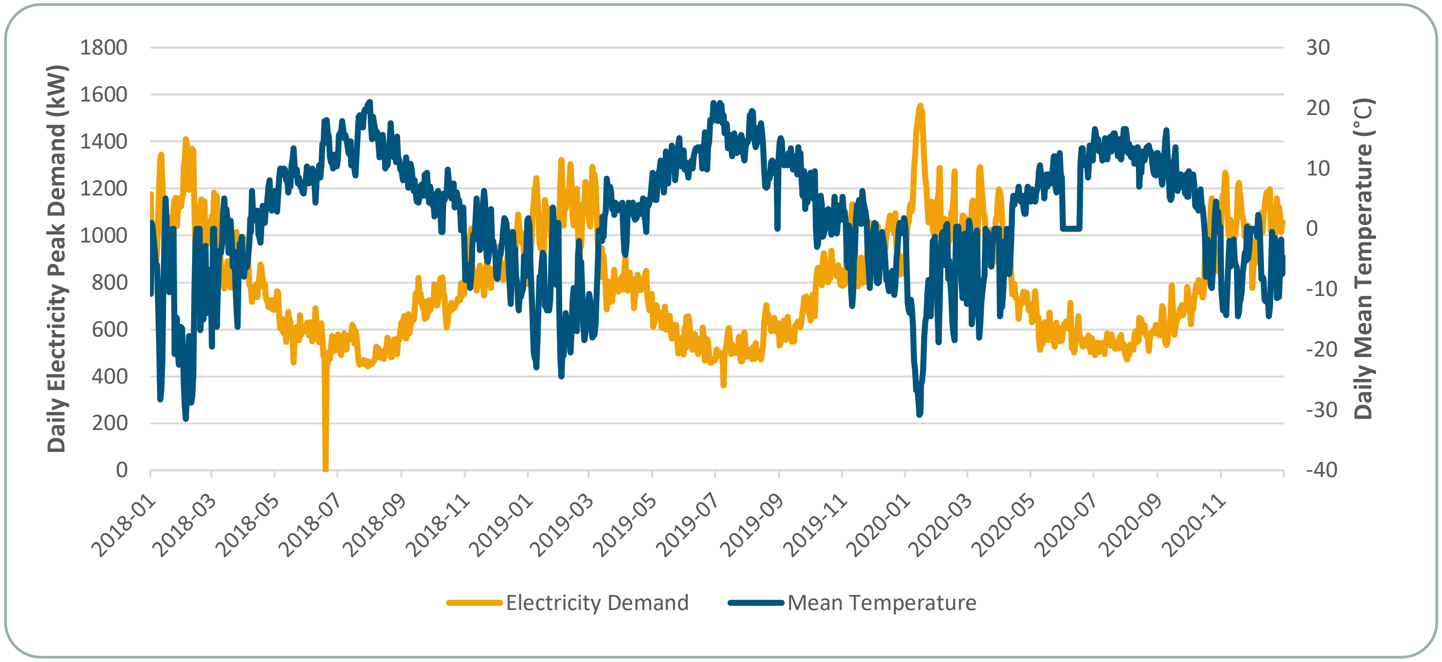

Figure 6. Daily Electricity Peak Demand in Relation to Average Temperature, 2018-2020

Current Energy, Emissions, and Expenditures

Understanding Atlin's current energy and emissions profile is the foundation for effective community energy planning. In 2024, Atlin's inventory consisted of:

- Energy consumption: 93,540 GJ
- GHG emissions: 4,882 tCO_2e
- Energy expenditures: $3,985,380

The sectors, subsectors, and types of fuel included in Atlin's inventory are explained in Table 2.

Table 2. Sectors, Subsectors, and Fuels included in Atlin's Inventory

Sector and Fuels	Subsector
Transportation: Gasoline and diesel consumed for mobility purposes.	• Passenger • Commercial [6] • TRTFN [7]
Buildings: Electricity, propane, heating oil, wood, and diesel consumed within buildings and infrastructure.	• Residential • Commercial [5] & TRTFN [6]

[6] Data for commercial buildings heating fuels was not available; only commercial electricity is included.
[7] TRTFN refers to assets owned by the TRTFN government and its development corporations

As illustrated in Figure 7, residential buildings and commercial vehicles are responsible for the greatest proportion of energy consumption, emissions, and expenditures. TRTFN vehicles and buildings are responsible for a smaller proportion of energy consumption, emissions, and expenditures; however, the TRTFN has the most influence over these assets and has the ability to impact the energy, emissions, and expenditures through the CEP actions described on page 33.

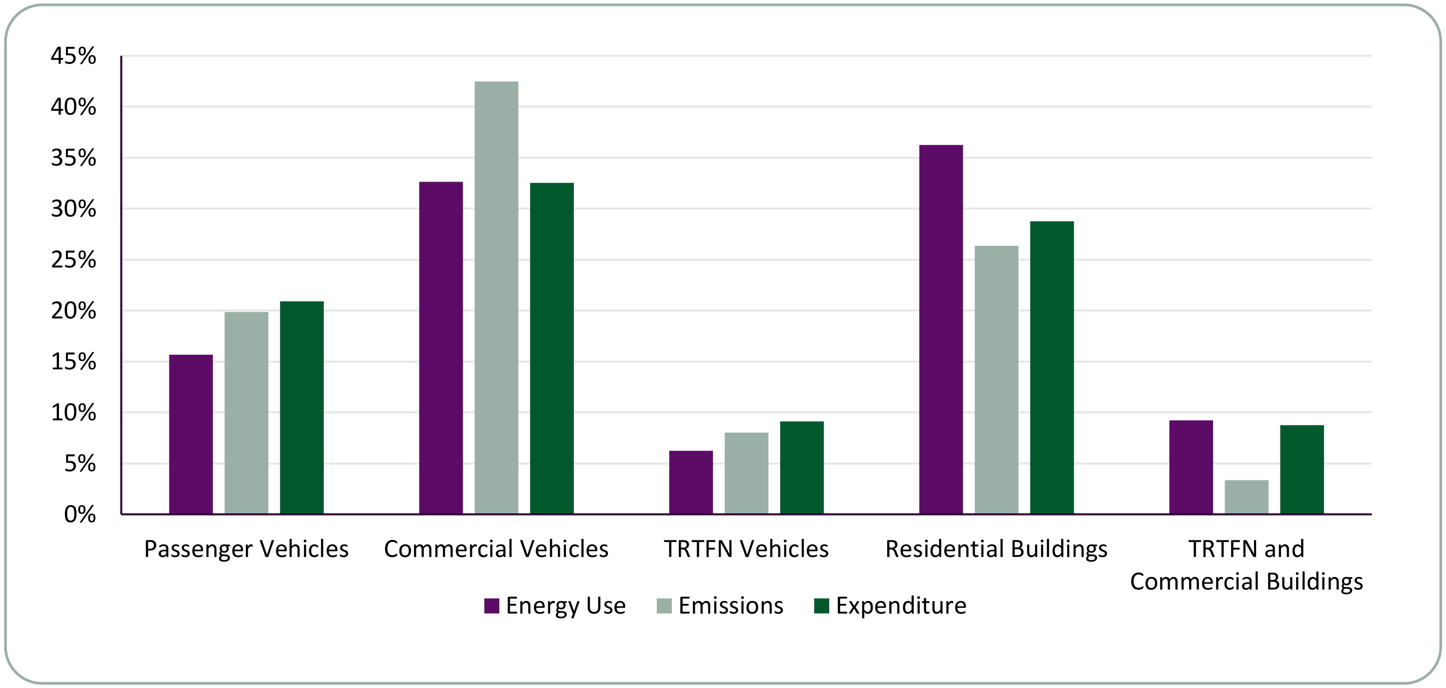

Figure 7. Proportion of Energy, Emissions, and Expenditures in Atlin, 2024

28% of energy expenditures were spent on local sources of energy (electricity and wood), while the other 72% (nearly $2.5 million) were spent on trucked-in fuels (gasoline, diesel, heating oil, and propane).

Appendix C contains the complete inventory and Appendix D contains a detailed methodology.

Business-As-Usual

What does 'Business As Usual' mean?

Business As Usual, or BAU, is a way of describing what is estimated to happen to Atlin's energy and emissions if the community takes no further action. A number of factors are taken into account to develop a BAU scenario, including the following:

- Population growth, as the number of people increase in a community, more buildings are needed and typically more vehicles are driven.
- Changing climate patterns, such as warmer winters and hotter summers, will continue to change the way that energy is consumed in buildings.
- The likely future impacts of policies already adopted by other levels of government. Notable policies include:
    - Renewable and low carbon fuel standards (Federal)
    - CleanBC's Zero-Emission Vehicle (ZEV) sales mandate requiring 75% of new light-duty vehicle sales to be ZEVs by 2035
    - Vehicle tailpipe emissions standards (Federal and Provincial)
    - Measures affecting Medium and Heavy-Duty Vehicles: MHDZEV Mandates (Federal, Provincial forthcoming)
- Electricity growth, as projected in the BC Hydro load forecast (high growth scenario)

Figure 8 presents the projected energy consumption in Atlin, beginning with the inventory year (2024) and projecting to 2050. These projections include all types of energy consumed in Atlin, including gasoline, diesel, electricity, wood, heating oil, and propane. Overall energy consumption is projected to increase by 19% by 2050; energy consumption in buildings is expected to increase significantly (80%), while transportation energy consumption is expected to decrease (-33%). As outlined in the BC Hydro load forecast (Figure 10), electricity consumption is expected to increase significantly by 2045 due to various proposed developments such as multi-unit residential buildings, an Elders' Complex, Sewer Treatment Plant upgrades, a Welcome Centre, and a 150-bed worker camp. Despite population growth and a growth in the number of vehicles, expected efficiency improvements and a shift to electric vehicles (which use about 75% less energy than internal combustion engine vehicles) lead to an overall reduction in transportation energy consumption. Additionally, even though overall energy consumption in Atlin is projected to increase, overall emissions are expected to decrease by 25% due to electrification and improved emissions standards in transportation.

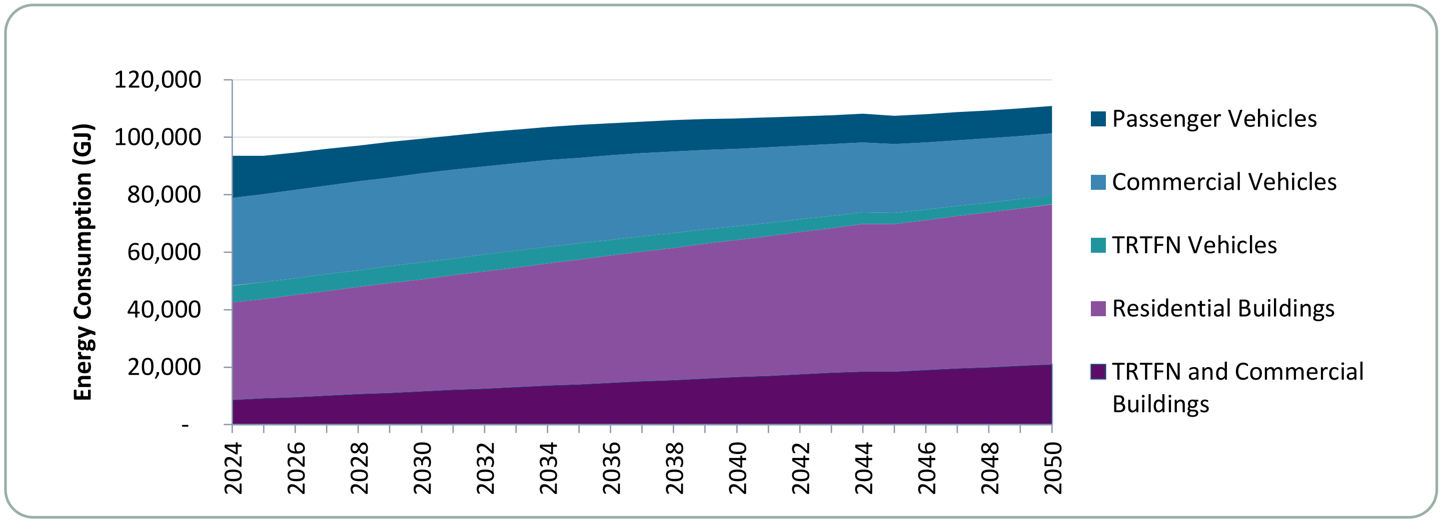

Figure 8. Atlin's Projected Business-As-Usual Energy Consumption, 2024-2050

Appendix C contains additional BAU information and Appendix D contains a detailed methodology.

Load Forecast

Figures 9 and 10 present the projected electricity growth as outlined in the BC Hydro load forecast completed for Atlin in July 2025.

Based on the forecasted electricity demand, as presented in Figure 9, Atlin's demand is projected to exceed the 2.1 MW[8] capacity of the hydro system by 2033 in the high growth scenario or by 2035 in the baseline scenario. Atlin's electricity consumption is also projected to rise significantly, as shown in Figure 10. These projections indicate the need for peak

[8] The actual remaining capacity of the system is 1.85 MW due to the 500 kW load bank, which operates at an average 230 kW load. The practical capacity is also likely reduced by lower penstock efficiency, caused by restricted flow from sediment build up.

demand management and additional electricity production capacity, which is explored in *Local Electricity Management, Generation, and Storage*, beginning on page 46.

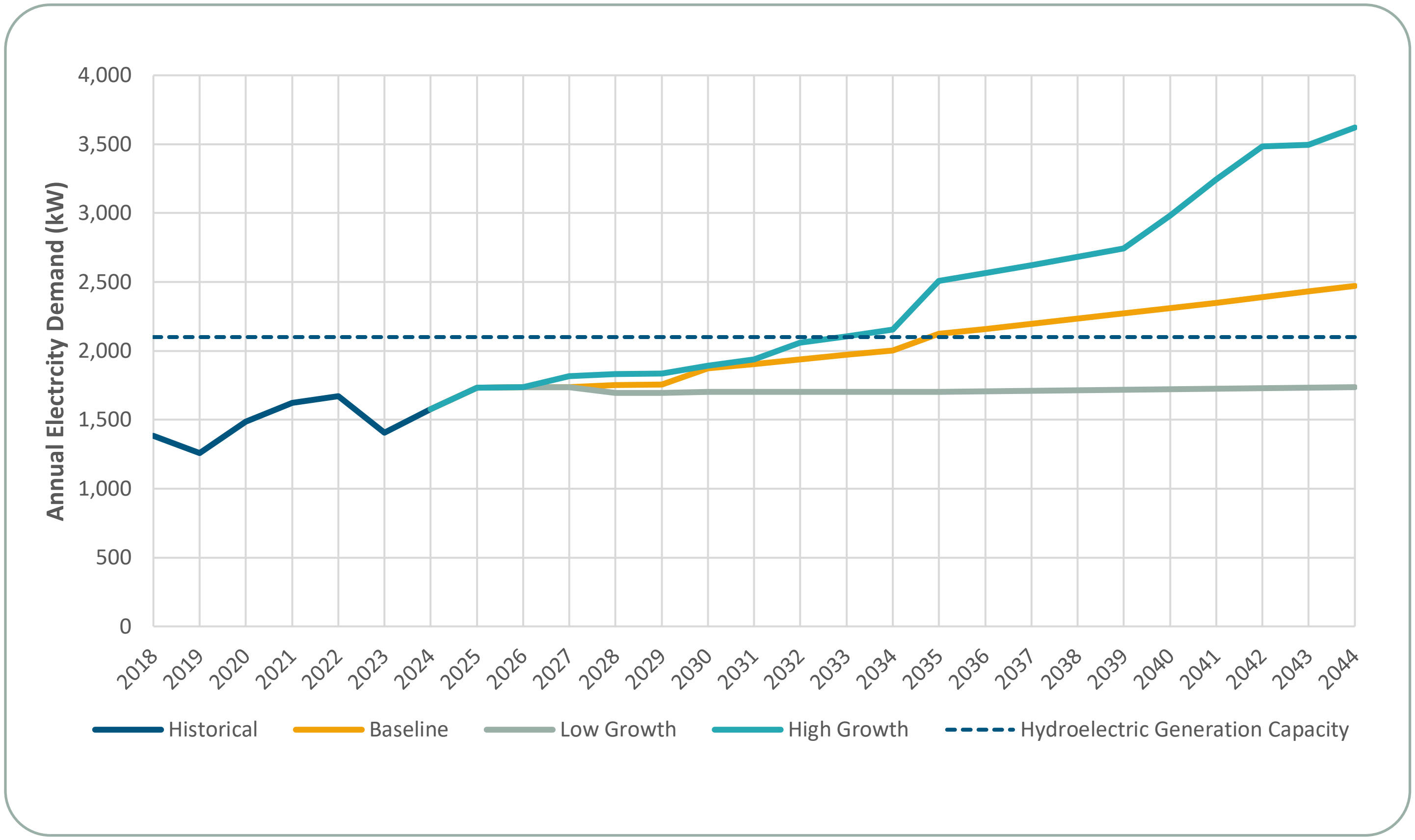

Figure 9. BC Hydro Load Forecast: Historic and Projected Electricity Demand for Atlin Compared to Current Hydroelectric Generation Capacity, 2018-2044

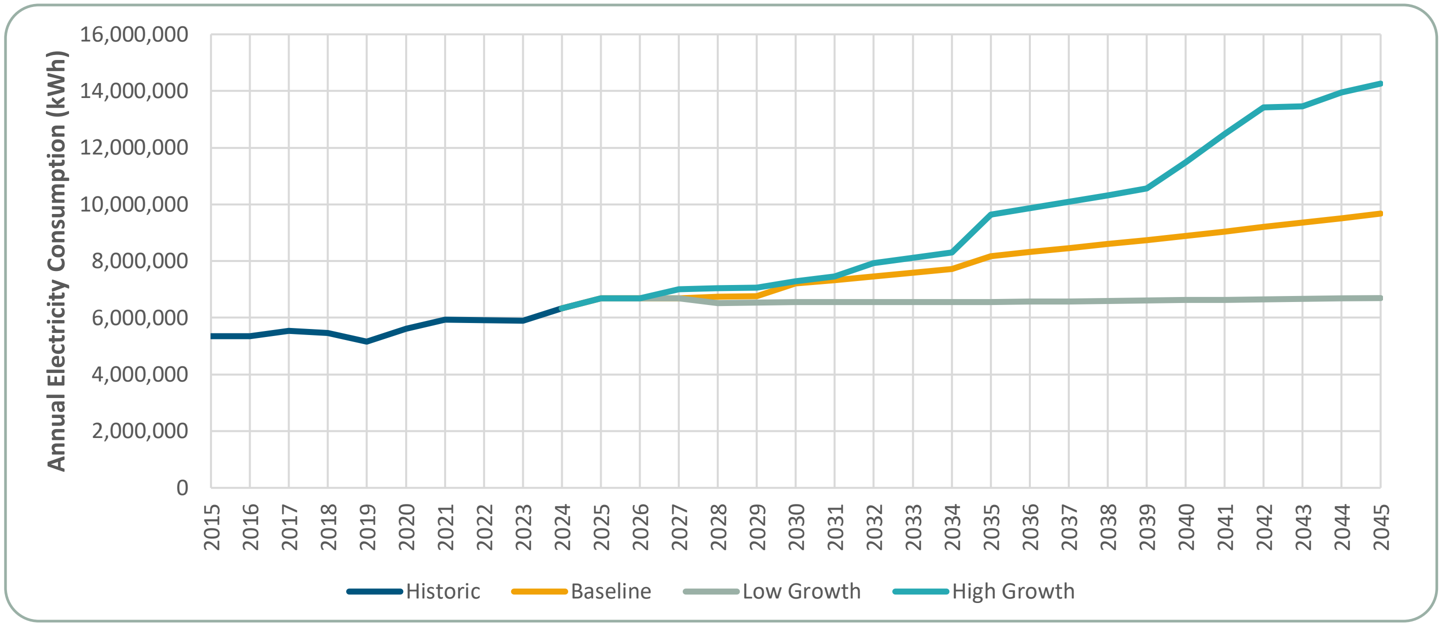

Figure 10. BC Hydro Load Forecast: Historic and Projected Electricity Consumption for Atlin, 2015-2044

CEA, based on discussions with the project team, believes that even the high load forecast may be conservative, because it has:

- Excluded new potential commercial and institutional electricity loads that are not part of the TRTFN; there may be other new loads such as mining or other commercial activity.
- Assumed limited uptake of heat pumps due to cold conditions. However, lake loop and ground source heat pumps are feasible in Atlin, as are cold climate air source heat pumps (with careful design and supplemental heat for the coldest periods). Perceptions of older heat pump technology have now been surpassed in practice, as evidenced in the Yukon, Alaska, and Northwest Territories.
- Assumed 150 temporary worker camp will come into service in 2040 and be disconnected after three years. However, based on information received by CEA, the camp will likely come into service in 2027 and will likely not be disconnected entirely (some of the camp may be kept for housing).
- Assumed a single EV charging unit in all three scenarios. However, CEA believes this is likely insufficient and has received information that the TRTFN plans to install multiple Level 2 chargers in the short-term.

Taking Action

Taking Action

There are ten actions within three focus areas for Atlin and the TRTFN to implement. These actions were developed to address the concerns and opportunities highlighted by the community and within the *Current State of Energy in Atlin*, including the following:

1. Throughout most of the year, the local hydroelectric system has the capacity to produce more electricity than the community currently consumes.
2. During the coldest days of the year, the hydro system cannot meet the electricity demands of the community. Currently, this requires the operation of the diesel power-generating station to supplement power-generation.
3. Peak electricity demand and overall electricity consumption are expected to grow significantly by 2045.

The actions were also created with the focus of prioritizing local energy consumption and decreasing diesel-generated electricity, which in turn will lead to many community benefits such as:

- Increased energy independence and security through increased consumption of local energy and reduction of imported energy.
- Increased economic and job opportunities through clean energy and energy efficiency initiatives that support local economic development and sustainability jobs (e.g. in green building, energy retrofits, and renewable energy). Keeping energy dollars local, by buying local energy such as hydroelectricity or wood and reducing purchases of fuels imported to the community, supports local jobs and affordability.
- Reduced energy costs for residents and business owners through energy efficiency improvements.
- Reduced exposure to fluctuating costs of energy sources that are tied to international markets: diesel, gasoline, heating oil, and, to a lesser extent, propane.
- Improved air and water quality through reduced use of diesel, gasoline, heating oil, and propane.
- Reduced GHG emissions through reduced consumption of fossil fuels, such as diesel, gasoline, heating oil, and propane.

Table 3 provides a summary of the CEP strategies, along with the timeline, whether it increases local energy consumption, the GHG impact, the energy cost savings, and the implementation responsibility for each action. The explanation for each category is described in the following textbox.

Timeline

- Short-term (1-2 years): high priority / current funding opportunities / highly feasible
- Medium (3-5 years): medium priority / some funding opportunities
- Long-term (5+ years): lower priority / limited or no funding opportunities / not yet feasible

Increased Local Energy Consumption: Whether the action increases local energy consumption (electricity and wood) in place of trucked-in fuels. Considerations for electrification and wood heating are explored on pages 34 and 35.

GHG and Energy Cost Impact: Emissions and cost reduction per year by 2035:

- Low: 1-10 tCO_2e, \$1,000-\$4,000
- Moderate: 11-50 tCO_2e, \$4,001-\$20,000
- High: 51+ tCO_2e, \$20,000+

Implementation Responsibility: The CEP actions are provided for the entire Atlin community. Some actions can be directly implemented by the TRTFN, such as retrofits on TRTFN-owned buildings, while other actions, such as retrofitting private homes within Atlin, cannot be directly implemented by the TRTFN. More details are provided in *Implementation*, beginning on page 56.

The chart shows whether the implementation responsibility falls under the TRTFN* or a combination of both the TRTFN and the community. For example, action 2.2 is labelled "Combined", since the TRTFN could replace their fleet vehicles with EVs and homeowners and local businesses can also complete the action.

**Including all TRTFN development corporations under the Taku Group of Companies, that currently exist or will be created.*

Table 3. Summary of CEP Actions

Action	Timeline	Increased Local Energy Consumption	GHG Impact	Energy Cost Savings	Implementation Responsibility
Energy Efficient and Locally Energized Buildings					
1.1 Complete energy audits and retrofits on homes and commercial buildings to improve energy efficiency and reduce emissions	Short	Yes	High	High	Combined
1.2 Ensure new homes and buildings are built to Energy Step Code Step 4 and Zero Carbon Step Code Emissions Level 3, or higher	Short	Yes	High	High	Combined
1.3 Explore opportunities for geoexchange / lake loop systems	Medium	Yes	Moderate	Moderate	Combined
Energy Efficient and Locally Energized Transportation					
2.1 Install public EV chargers near local businesses	Short	Yes	Moderate	Moderate	Combined
2.2 Replace vehicles and equipment with electric options, such as EVs, e-bikes, and electric boats	Short	Yes	Moderate	Moderate	Combined
2.3 Support local businesses to reduce the need for trips to nearby communities for necessities	Long	No	Low	Low	Combined
2.4 Expand the TRTFN shuttle service	Medium	No, unless EV	Low	Low	TRTFN
Local Electricity Management, Generation, and Storage					
3.1 Implement battery energy storage system alongside existing hydro system	Medium	Yes[9]	High[7]	High[10]	TRTFN
3.2 Implement demand response measures in homes and buildings	Short	Yes[7]	High[7]	High[8]	TRTFN
3.3 Explore opportunities to expand the existing hydro system	Long	Yes[7]	High[7]	High[8]	TRTFN

[9] When reducing or replacing diesel-generated electricity.
[10] Primarily increased revenue for the TRTFN rather than direct cost savings for the community.

Electrification

Many recommended actions involve the switching from fossil fuels, such as propane, heating oil, diesel, and gasoline, to electricity. There are many benefits to electrification, however, electrification requires careful planning to ensure Atlin's electricity grid can handle the growth in demand and consumption. Table 4 provides the benefits and drawbacks for electrification.

Table 4. Benefits and Drawbacks of Electrification in Atlin

Benefits	Drawbacks
Increased revenue from hydroelectricity	Increased peak demand challenges
Reduced dependencies on trucked-in fuels	Increased risk during power outages
Improved air and water quality	Increased cold climate challenges
Reduced GHG emissions	Increased upfront costs
Reduced exposure to fuels exposed to a volatile oil price: gasoline, diesel, heating oil, and, to a lesser extent, propane	

Each of these challenges can be managed, as addressed within each action (pages 35-50).

Another concern with electrification is the need for costly electrical service upgrades. The Homeowner's Guide to Electrical Load Management, created by the BC Housing Research Centre, provides tips for electrifying homes without upgrading the electrical service and other information about load management and energy efficiency.

Wood Heating

Wood heating can also have an important role in buildings, particularly homes. As a local and renewable source of energy, wood can reduce reliance on emissions-intensive and costly fossil fuels. Wood heat can also increase resilience, as wood stoves can provide heat during power outages and supplemental heat during periods of extremely cold temperatures. Compared to other heating fuels, wood can be far cheaper, especially when self-harvested. Additionally, many people enjoy warming up by a wood stove on a cold day.

However, there are important air quality concerns, as wood combustion can produce particulate matter and other pollutants that negatively affect air quality – concerns that can be partially mitigated by using modern EPA-certified low-emission wood stoves. Wood heating can also present accessibility challenges, as tasks such as chopping, carrying, and loading logs may be difficult for people with mobility limitations. Increased insurance premiums may be another drawback to wood heating.

The Canadian Lung Association provides more information on residential wood burning.

Energy Efficient and Locally Energized Buildings

In Atlin, buildings are responsible for 45% of energy consumption, 30% of GHG emissions, and 37% of fuel expenditures. There are significant opportunities to improve the energy efficiency and increase local energy consumption in new and existing buildings in Atlin. The *Energy Efficient and Locally Energized Buildings* actions will lead to many benefits such as reduced energy costs, improved comfort, increased resilience, reduced health risks, reduced GHG emissions, and increased local energy consumption and revenue.

In terms of heating sources, electric heat pumps and high efficiency, clean burning wood stoves are low-emitting, local sources of energy that should be prioritized in Atlin. Specifically cold climate air source heat pumps (CCASHP), which are designed to operate in cold climates and can maintain performance at temperatures as low as -25°C.[11] However, efficiency begins decreasing below -5°C and once temperatures drop below -10°C, supplemental sources of heat, such as electric resistance or wood, are required.

[11] Heat Pumps in Alberta. (2024). ATCO Energy Systems.

Action 1.1: Complete energy audits and retrofits on homes and commercial buildings to improve energy efficiency and reduce emissions

An energy audit is the first step in the retrofit process; it provides an overview of how a home or building uses energy and highlights opportunities for improving energy efficiency.

An energy audit for a home is called an EnerGuide assessment. Natural Resources Canada created the process and certifies Energy Advisors. There are NRCan-certified Energy Advisors in Whitehorse.

An energy audit for a commercial or institutional building is an ASHRAE energy audit[12], where ASHRAE Level 2 audits often provide the right level of detail to identify and then proceed with most energy upgrades (Level 1 being a screening or walkthrough and Level 3 for major capital work). It is likely that firms in Whitehorse could provide this service or an equivalent.

Retrofit measures for a home or building can include:

- Improving the building envelope (windows, walls, roof) by enhancing insulation, sealing gaps, and installing efficient windows and doors.
- Replacing heating, cooling, ventilation, and hot water systems with more efficient equipment.
- Switching to energy-saving controls, appliances, and lighting.

Retrofits can be implemented by individual businesses or homeowners. The TRTFN could also explore a community retrofit program which would allow multiple homes or TRTFN buildings to be retrofitted at once, improving efficiency and uptake and providing an opportunity for local jobs. Multiple First Nations in BC and the Yukon have implemented this type of project, including Nisga'a Nation, Yaqan Nukiy, Akisqnuk First Nation, and Osoyoos Indian Band:

- Nisga'a Nation: Ongoing initiative that is developing a pathway for a large-scale, multi-year Healthy Home Energy retrofits program with an emphasis on knowledge transfer to Nisga'a staff, contractors and citizens.

[12] More precisely, an ASHRAE Standard 211 commercial building energy audit.

- Yaqan Nukiy: Ongoing efforts with Ecolighten to complete deep energy retrofits on homes (envelope upgrades, windows, and mechanical upgrades including heating, hot water, and ventilation)
- Akisqnuk First Nation and Osoyoos Indian Band: Both completed community retrofit initiatives, explained further in this webinar: Retrofit Success Stories in BC First Nations Communities

A coordinated retrofit program can also help ensure that homes are retrofit with House-as-a-System (HAAS) principles; the Home Performance Stakeholder Council describes HAAS as a building science concept that defines the house as an energy system made up of four interdependent components, each of which affect the performance of each other and the entire system. The HAAS approach to home energy retrofits considers the intended or unintended effects that changing one component can have on other components, in terms of energy performance, moisture levels, air quality, occupant comfort, safety and home durability.[13]

One opportunity is to implement a demonstration energy retrofit on a building that is well-used by the community, such as the recreation centre. This building, which has high utility bills relative to its revenue,[14] could provide a great example for the rest of the community.

1.1 Key Funding Opportunities

- New Relationship Trust's Community Energy Diesel Reduction (CEDR): significant funding for residential and commercial energy efficiency improvements under the Demand Side Management stream
- Indigenous Climate Action Network (ICAN): funding for a full-time staff position (Climate Action Coordinator) that could support the coordination of a retrofit program in Atlin
- BC Hydro and CleanBC: various incentives for residential and commercial buildings, and additional funding for low-income homeowners

[13] https://www.homeperformance.ca/wp-content/uploads/2020/02/202002_HPSC_HASS_InfoSheet.pdf
[14] https://www.cbc.ca/news/canada/north/atlin-rec-centre-risk-of-closure-funding-gap-9.7087779

Action 1.2: Ensure new homes and buildings are built to Energy Step Code Step 4 and Zero Carbon Step Code Emissions Level 3, or higher

The BC Energy Step Code provides energy efficiency requirements for new buildings, with each step requiring an increasing improvement above the baseline 2018 building code. Step 4 requires buildings to be 40% better than the 2018 baseline.

The BC Zero Carbon Step Code provides emission reduction targets for new buildings, with each step requiring stronger performance. Emissions Level (EL) 3 requires decarbonization of both space heating and domestic hot water systems (such as electric resistance or heat pumps), while still allowing for secondary heating sources such as wood.

The Government of BC provides additional information on both Step Codes, including a Best Practices Guide.

At present, to meet minimum BC Building Code requirements, new homes in Atlin would generally be expected to meet BC Energy Step Code Step 3 and Zero Carbon Step Code EL-1, unless another organisation (e.g. a funder) requires a higher standard. At present, Part 3 buildings[15] would generally be expected to meet BC Energy Step Code Step 2 and Zero Carbon Step Code EL-1. Even though there isn't a municipal government in Atlin with the ability to require higher steps, the TRTFN and Atlin residents can voluntarily follow the Step Code requirements for new buildings. For example, an Atlin resident recently built their new home to Step 5.

1.2 Key Funding Opportunities

- Canada Mortgage and Housing Corporation (CMHC): funding and financing for Indigenous housing and Indigenous youth on-the-job training

[15] Part 3 buildings include large apartment and commercial buildings

Action 1.3: Explore opportunities for geoexchange / lake loop systems

Geoexchange, or ground-source heat pumps, can operate more efficiently in cold weather than air-source heat pumps because ground temperatures are warmer and more consistent. However, they are more complex to install and have a greater installation cost.

Lake loop systems have a similar advantage as geoexchange systems over air source heat pumps, as deeper lake water has a very stable year-round temperature. Lake loops should also be easier to install than geoexchange systems, however permitting may be more difficult. Lake loop systems are also limited to buildings that are close to the lake.

Lake loops are feasible in Atlin, as shown by the two TRTFN administration buildings that are already connected to a lake loop system.

1.3 Key Funding Opportunities

- BC Indigenous Clean Energy Initiative (BCICEI): funding for clean energy and energy efficiency projects

Energy Efficient and Locally Energized Transportation

In Atlin, transportation is responsible for 55% of energy consumption, 70% of GHG emissions, and 63% of fuel expenditures. Active transportation (e.g. walking and biking) and shared mobility offer lower-cost, lower-emissions, more accessible, and healthier alternatives to personal vehicle use. For trips that still require vehicles, which is often the case in smaller, remote communities like Atlin, shifting to electric options can provide many benefits including:

- **Increased electricity revenue**: Increased revenue for the TRTFN, greater profit returned to the community compared to gasoline and diesel sales. In addition, if tourists or seasonal residents use electric vehicles, the hydro system will easily cope as there is a significant amount of spare capacity outside of winter (Figure 6).
- **Improved air quality**: EVs produce no tailpipe emissions.
- **Noise reduction**: Operation of EVs is much quieter than internal combustion engine (ICE) vehicles.
- **Cost savings**: EVs have lower maintenance costs than ICE vehicles due to fewer moving parts, no oil changes, less brake wear from regenerative braking, and fewer engine and transmission components that require regular servicing or replacement. Despite a greater upfront cost, EVs are typically cheaper over the lifetime of the vehicle.[16] Additionally, electricity prices are often more stable and predictable compared to gasoline and diesel prices.
- **Efficiency**: EVs are far more energy efficient than ICE vehicles because electric motors convert most of the electricity they use into motion, while gasoline and diesel engines lose a large share of their energy as waste heat; EVs also avoid idling losses and can recover some energy through regenerative braking, which is why they often achieve around four times the useful driving efficiency of conventional vehicles.

[16] https://cleanenergycanada.org/report/the-true-cost/

Increased electricity demand is a concern during the winter, but there are opportunities to mitigate the risk, as highlighted in the Local Electricity Management, Generation, and Storage section. Some examples specific to EVs include:

- Scheduled EV charging to avoid charging during peak demand hours (see peak hours in Figure 5)
- Another opportunity is V2X, or vehicle-to-everything (V2X). This refers to technologies that allow EVs to both draw electricity from and send electricity back to homes, buildings, or the grid. Some vehicles can already provide electricity directly to appliances or even to buildings. In the near future, some vehicles should be able to provide electricity to the grid. More information is provided on page 48.

Electric vehicles are feasible in cold, remote communities. However, there are some considerations to keep in mind concerning temperatures and travel distances.

- Range: a one-way trip from Atlin to Whitehorse is 175 km. Many EVs on the market have over 400km of range, with certain models providing much greater ranges, like the Chevrolet Silverado EV (792 km). Range is continuously improving as battery technology advances.
- Idling: ICE vehicles are often left idling during extreme cold temperatures, which can be avoided with EVs. Many EV models have thermal management systems that keeps the EV at a safe temperature while parked, even while unplugged and turned off. Users of modern EVs can also use an app on their phone to pre-warm the cabin prior to entering the vehicle.
- Temperature impact: cold temperatures can significantly reduce the range and charging speed of EVs. A winter stress-test conducted by CAA found a 14 to 39% reduction in range, tested across 14 vehicles. Even with a significant reduction in range, most modern EVs should be able to travel to Whitehorse without stopping to charge.

Daylu Dena, located in Lower Post, BC, is 23 km away from all amenities. As part of their low-carbon transportation efforts, they installed EV chargers in their community. These chargers will support tourists and future EV owners in the community.

More information is provided in this video: Why Daylu Dena installed BC's northernmost EV charger

Action 2.1: Install public EV chargers near local businesses

Local EV chargers can provide an opportunity to draw EV-driving tourists to Atlin and ensure local EV drivers have access to charging.[17] Table 5, from Natural Resources Canada, explains the three levels of EV charging.

Table 5. Level 1, 2, and 3 EV Charging Details. Source: Natural Resources Canada.

	Level 1	Level 2	Level 3 (fast charger)
Input	120 V	208/240 V	480 V
Outlet type	Standard electrical outlet (for example, phone charger)	Special electrical outlet (for example, stove or dryer plug)	DC outlet (not found in homes)
Time to charge[18]	40–50+ hours[19]	4–10 hours	25–60 minutes[20]
Range (per hour of charging)	3 km to 8 km	16 km to 50 km	Up to maximum driving range of vehicle
Typical uses	Home charging and back-up situations	Home charging, charging at businesses and public spaces	Charging at dedicated stations, public spaces, and highway corridors

It is recommended to maintain a ratio of 24:1 (electric vehicles: charging ports)[21] or better. Currently, the ratio in Atlin is 6:1, with 12 hybrids and 0 EVs registered in Atlin[22] and two Level 2 charging ports.

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[17] In 2023, the Yukon had 219 EVs and 549 gasoline/electric hybrids. Source: https://yukon.ca/sites/default/files/ybs/fin-yukon-energy-facts-2023.pdf

[18] The amounts shown are estimates only and assume 80% charging level limit. Time to full charge and range per hour of charging will vary depending on the vehicle, battery, and charger, as well as fluctuating temperatures, battery state, and tire pressure.

[19] Adjusted based on additional data from the US Department of Transportation

[20] Adjusted to 60 minutes to account for 50kW fast chargers, which are the most common fast chargers in the areas surrounding Atlin. The kW of fast chargers ranges significantly; chargers up to 350kW are available in the Lower Mainland.

[21] Canada's Public Charging Infrastructure Needs

[22] ICBC Policies in Force, Atlin, 2025

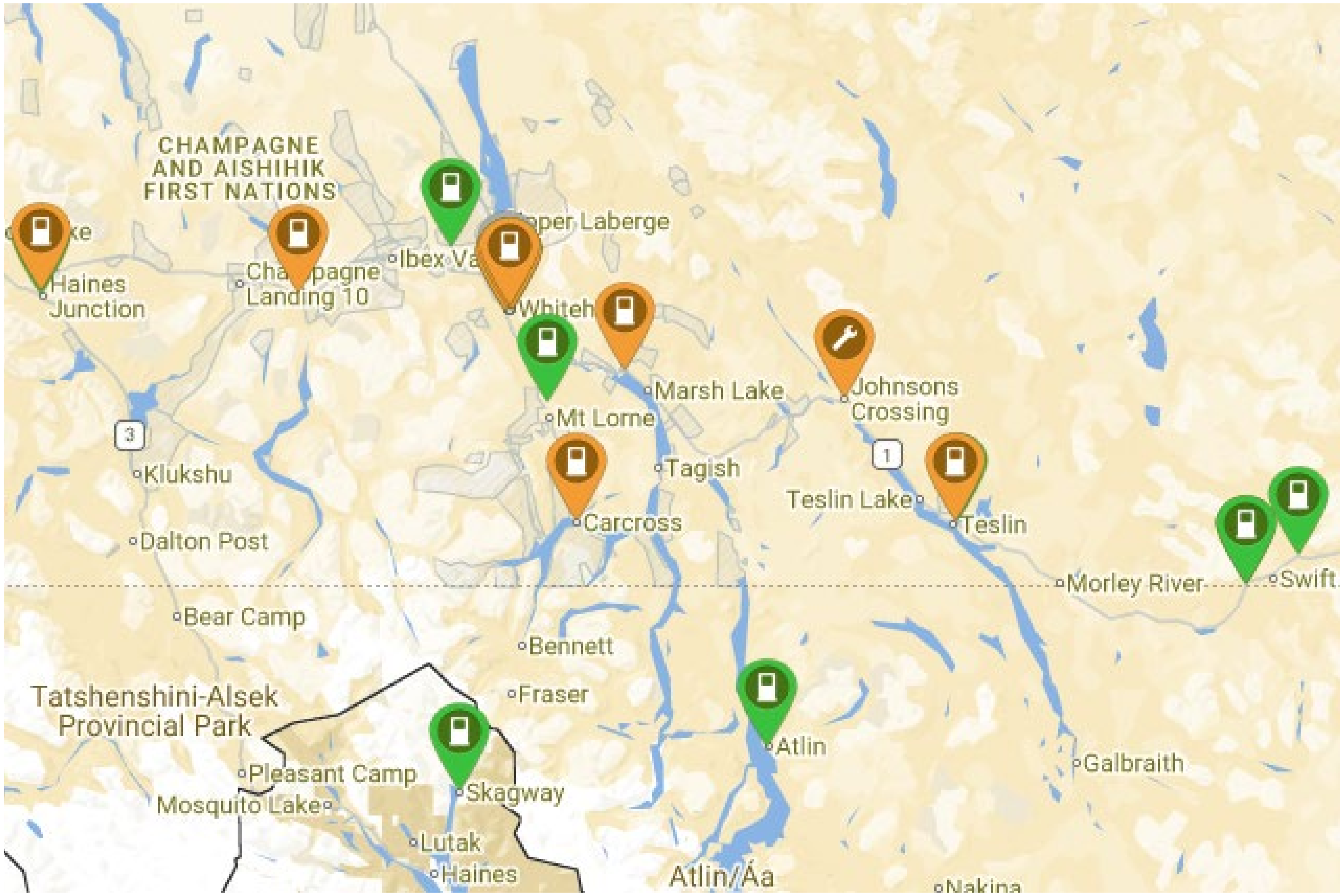


Figure 11. Map of EV Chargers Near Atlin and Whitehorse. Source: PlugShare, accessed April 2026.

Figure 11 shows the EV chargers in and surrounding Atlin. Green icons represent Level 2 chargers and orange icons represent Level 3 (also known as "fast") chargers.

TRTFN is already planning to install three Level 2 chargers near community facilities at the townsite and five mile reserves.

2.1 Key Funding Opportunities

- BC Hydro EV Charger Rebates: EV charger rebates for Indigenous individuals, organizations, businesses, and governments in B.C.

Action 2.2: Replace vehicles and equipment with electric options, such as EVs, e-bikes, and electric boats.

Atlin residents and business owners should consider electric alternatives to fossil fuel powered vehicles and equipment. For example, electric vehicles, bikes, boats, and equipment.

TRTFN has an opportunity to lead by example with its own fleet. When fleet vehicles require a replacement or upgrade, especially light duty vehicles (cars, SUVs, pickup trucks), the TRTFN should consider purchasing a plug-in hybrid electric vehicle (PHEV) or electric vehicle (EV). The TRTFN could also complete a fleet assessment to help prioritize vehicles for electrification, estimate the financial payback and emissions savings, and develop a plan for charging infrastructure.

Electric alternatives to gas-powered equipment should also be considered. As outlined in a pilot from the City of Ottawa,[23] small equipment can easily be replaced with electric options. Two key benefits found in the pilot include reduced noise levels and no exhaust, both providing healthier working conditions for the operator. There are also limitations, such as short battery life and dedicated charging infrastructure requirements.

Electric boats can provide similar benefits to EVs: quieter, lower emissions, reduced air and water quality impact, and reduced maintenance costs. Electric motors are well suited for moderate speed activities and shorter trips (5-7 hours).

E-bikes also provide similar benefits to EVs, with additional health benefits resulting from exercise. Additionally, e-bikes can provide a more accessible option compared to cars because they are less expensive and don't require a driver's license

Examples of Electric Fleet Vehicles

Whitehorse: In 2024, the City added more than half a dozen new EVs to its fleet. The new EVs are being used to shuttle transit drivers, support property management, and for staff to complete programming and services around Whitehorse.

2.2 Key Funding Opportunities

- Go Electric: funding for medium and heavy-duty commercial zero-emission vehicles
- Electric Vehicle Affordability Program (EVAP): incentives for EVs under $50,000

[23] https://council.cleanairpartnership.org/wp-content/uploads/2024/10/CAC-Presentation-Ottawa.pdf

Action 2.3: Support local businesses to reduce the need for trips to nearby communities for necessities

Providing additional services and amenities, such as food, in Atlin can reduce the amount of travel by Atlin residents to surrounding communities, in turn reducing transportation emissions and supporting the local economy.

This action can be defined further through additional community input to determine what amenities are most needed locally and the main reasons residents are travelling to Whitehorse or other nearby communities.

West Moberly First Nations is exploring a geothermal-heated greenhouse to improve local food security.

Action 2.4: Expand the TRTFN shuttle service

Currently, the TRTFN operates a shuttle for TRTFN members. The TRTFN could expand this service to include more locations and/or more frequent trips, replacing the need for TRTFN members to drive on their own. The service could also be expanded to Atlin residents outside of the TRTFN; this would require considerations for payments and may require different insurance needs.

The TRTFN could also explore options to switch to an EV when the shuttle vehicle is due for replacement, taking into consideration the trip distances, charging infrastructure, and lifecycle costs.

Local Electricity Management, Generation, and Storage

In Atlin, electricity is responsible for 22% of energy consumption, 6% of GHG emissions, and 21% of fuel expenditures. As explored on page 19, Atlin already has reliable, low emitting, renewable energy through the hydroelectricity system. This hydro system can be paired with energy storage, demand response management, and/or an expanded hydro system to meet increasing peak electricity demands and further reduce diesel consumption for electricity generation.

Reducing the peak load through energy storage and demand response management will reduce diesel consumption and delay electrical infrastructure upgrades that are triggered by increasing peak electricity demand.

While outside the timeline of this CEP, two options that could be explored for Atlin's electricity system in the longer term, particularly as electrical loads continue to increase and strain the existing hydroelectric system, include connection with the BC grid and the use of Long-Duration Energy Storage (LDES).

- Connection with the BC grid would reduce the demand and capacity constraints associated with Atlin's current off-grid system. However, this would require significant investment and planning. It is also unlikely to be completed in the next 10-15 years and would not address Atlin's near-term electricity needs.

- LDES could play an important role in Atlin by storing surplus hydroelectric energy available outside winter peak periods for later use during times of high demand. Several LDES technologies may be worth considering, with the most suitable option depending on storage duration, cost, site conditions, and local operational capacity. Hydrogen is one possible long-duration or seasonal storage option, but it is currently relatively costly, technically complex, and less energy-efficient than many alternatives. Several battery chemistries may also prove suitable as LDES options for Atlin in the longer term.

Action 3.1: Implement battery energy storage system alongside existing hydro system

The hydro system is very reliable, but it still requires backup diesel generators and a load bank.[24] A battery energy storage system (BESS) could potentially replace some or all of the load bank function, which may free up capacity for community use (up to 300 kW), depending on system design. It could also reduce diesel consumption by absorbing surplus hydro generation during lower-demand periods and discharging during times of peak demand. In addition, a suitably sized and configured battery could provide short-term backup power and system support if the hydro system suddenly goes down, helping maintain service while the diesel generators start.

TRTFN should continue to explore options and funding opportunities for BESS. TRTFN will also need to collaborate with BC Hydro to complete a technical study to understand the implications of a BESS on the microgrid and current Energy Purchase Agreement.

3.1 Key Funding Opportunities

- New Relationship Trust's Community Energy Diesel Reduction (CEDR): potential funding for batteries under the Renewable Energy Generation stream

[24] The load bank is a 500 kW (averages 230 kW when operating) electrical element that heats water. This energy is unused until it is needed in the case of a sudden increase in demand that can't be met by the hydro system.

Action 3.2: Implement demand response measures in homes and buildings

To reduce peak demand, as highlighted in Figure 5, Atlin could implement demand response measures in homes and buildings. Demand response measures help shift electricity use away from periods of high demand and toward times when more hydroelectric generation is available. They incorporate technologies such as:

- Smart thermostats
- Controlled electric hot water tanks
- Scheduled EV charging
- Batteries
- Other distributed energy resources

In a small hydro-diesel system, these measures could help reduce winter peaks, improve use of available hydroelectric generation, and lower reliance on diesel generation during high-demand periods.

A promising frontier with EVs is V2X, or vehicle-to-everything. This refers to technologies that allow EVs to both draw electricity from and send electricity back to homes, buildings, or the grid. This makes EV batteries a promising future source of flexible energy storage that helps support the electricity system – absorbing electricity when supply is abundant and discharging power back to homes or the grid during peak periods. For vehicle-to-home (V2H) and vehicle-to-building (V2B), the technology is already available today for some EV models with compatible bidirectional charging equipment and building electrical systems. Vehicle-to-grid (V2G) is further behind commercially and is still relatively early-stage in many jurisdictions, but it is advancing quickly and could become a viable option for a community like Atlin within the next few years if suitable vehicles, chargers, utility controls, and interconnection rules are in place.

There are multiple examples of demand response programs in Canada, including programs in BC and the Yukon.

BC Hydro's Peak Saver

- Peak Saver challenges – homeowners that save the targeted amount of energy earn a financial reward ($3 per event, on average).
- Smart home devices – homeowners can enrol various devices, such as smart thermostats, EV chargers, and home batteries, and earn financial rewards for allowing BC Hydro to make adjustments during peak events.

BC Hydro’s Demand Response for Business and Institutions

- Pays participating organisations on the integrated grid to reduce or shift loads during peak periods, and provides a useful model for how larger buildings in Atlin – including TRTFN government buildings and buildings owned by TRTFN development corporations – could potentially participate in a local peak management approach.

Yukon Energy Peak Smart

- During peak events, Yukon Energy makes small temperature adjustments to participating devices, including smart thermostats and water heaters.
- During the 2024/25 winter season, there were 15 peak demand events with an average load reduction of 198 kW per event. 256 homes participated in at least one event and, on average, homes with both devices reduced electricity use by 916 watts during events.[25] These results suggest that even relatively simple demand response measures can make a meaningful contribution to peak reduction in cold northern communities.

In Atlin, a local demand response program could begin with lower-cost measures such as public notifications during peak periods, voluntary conservation requests, and incentives for smart thermostats, hot water controls, and managed EV charging. The latter would have to be conducted in coordination with BC Hydro. Over time, this could evolve into a more coordinated community energy management approach in which distributed energy resources across homes and buildings are orchestrated to reduce peaks and improve reliability.

UBC is beginning a community Virtual Power Plant research initiative (funded in part by BC Hydro) and has expressed interest in Atlin as a promising off-grid case study. Participation in this initiative could help Atlin explore how a coordinated demand response or community Virtual Power Plant model might function locally.

3.2 Key Funding Opportunities

- New Relationship Trust’s Community Energy Diesel Reduction (CEDR): funding for residential and commercial energy efficiency improvements, including programmable thermostat incentives

[25] https://peaksmart.ca/media/site_documents/YEC_summary_2023-24___2024-25_program_results_fnl.pdf

Action 3.3: Explore opportunities to expand the existing hydro system

There is potential to expand the exisiting hydro system for local consumption. While the Atlin Hydro Expansion Project refers to a new hydro system solely for the purpose of exporting electricity to the Yukon, this action refers to additional electricity generation for local community consumption.

Considering the increasing electricity needs, as shown in Figure 10, Atlin will likely need additional electricity generation by 2045 or sooner. Electricity needs may increase even faster, depending on factors such as the worker's camp, the growth of Atlin's economy and population, and the uptake of electric heating and transportation technologies. Hydroelectricity is a great option for meeting this demand, considering the benefits explored on page 21 and because Atlin is already familiar with the technology; staff could apply their experience and learnings to an expansion project to serve local community needs.

TRTFN should continue to explore opportunities and funding for a hydro system expansion, for local demand only.

3.3 Key Funding Opportunities

- New Relationship Trust's Community Energy Diesel Reduction (CEDR): funding for hydro under the Renewable Energy Generation stream

Impact of CEP Actions: Energy, Emissions, and Cost Savings

Figure 12 shows the projected energy consumption in Atlin if all CEP actions were implemented. These projections include all types of energy consumed in Atlin, including gasoline, diesel, electricity, wood, heating oil, and propane. Compared to the Business-as-Usual projections, energy consumption is projected to be lower by 8% by 2050. Despite the modest energy reductions, greenhouse gas emissions are projected to decrease by 22%, mainly because high-emitting fossil fuels would be replaced by low-emitting, locally produced electricity.

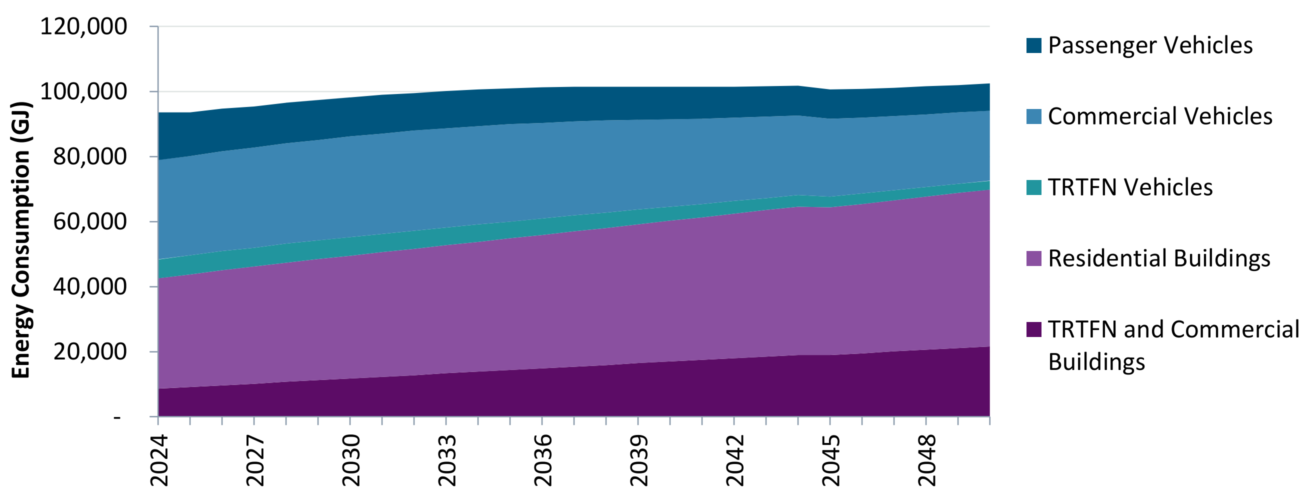


Figure 12. Projected Energy Use of CEP Implementation, 2024-2050

Figure 13 shows the projected electricity consumption in Atlin if all CEP actions were implemented compared to the three BC Hydro load forecast scenarios. The purple line illustrates the significant finding that electricity consumption from CEP implementation is projected to be greater than each of the load forecast scenarios, as a result of increased electrification of heating and transportation.

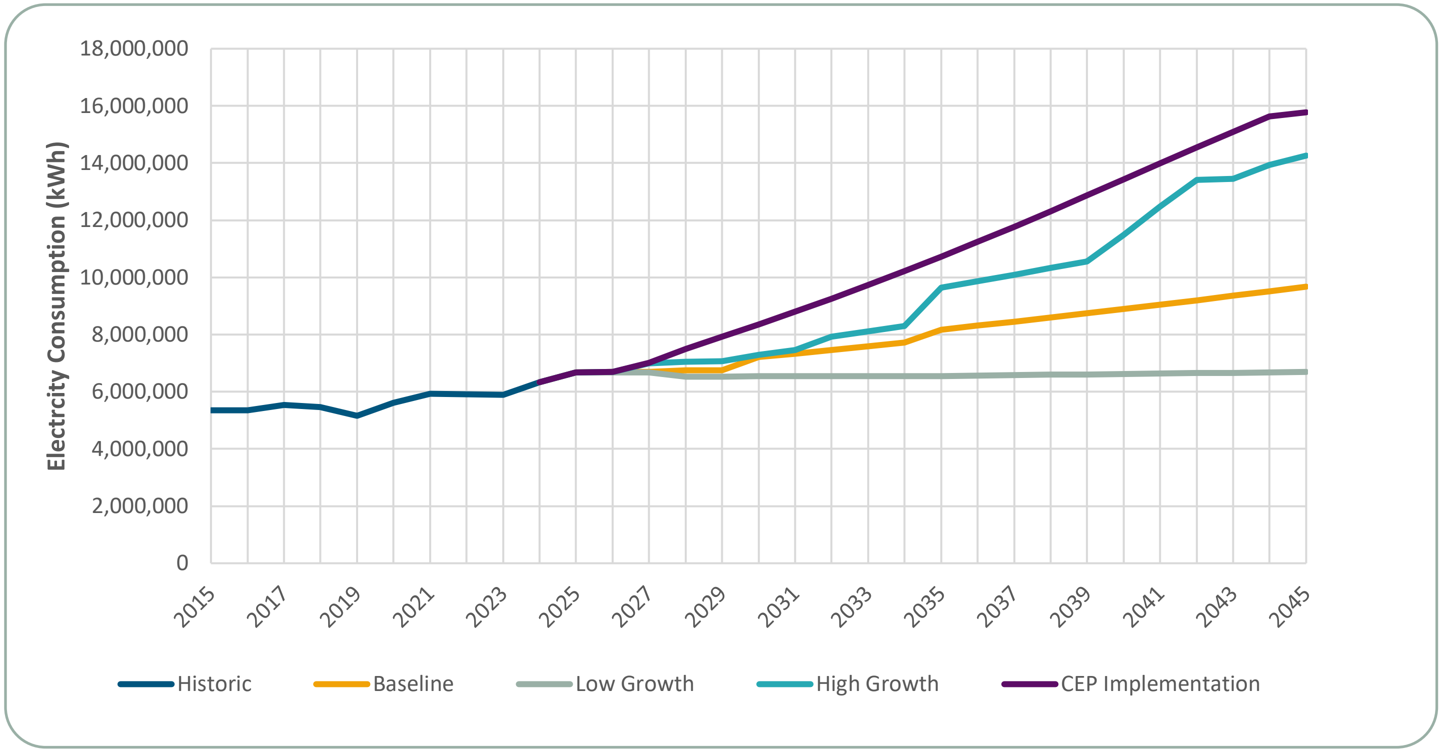


Figure 13. CEP Implementation Compared to BC Hydro Load Forecast: Historic and Projected Electricity Consumption for Atlin, 2015-2045

Figures 14 and 15 show the cost and emissions savings by focus area in 2035. *Energy Efficient and Locally Energized Buildings* are responsible for the greatest cost and emissions savings, resulting from energy efficiency improvements and switching to electric heating. The slight increase in electricity costs and emissions for both buildings and transportation are explained by the electrification of heating and transportation.

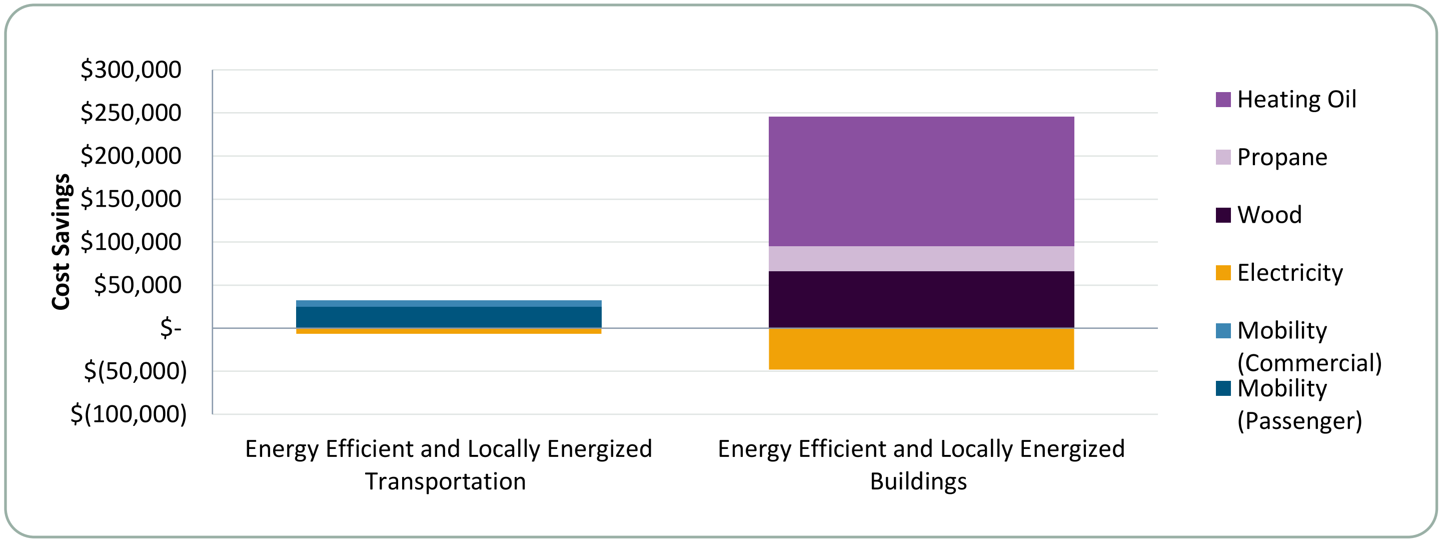


Figure 14. Cost Savings by Focus Area Compared to BAU in 2035

While *Local Renewable Energy & Demand Management* does not significantly reduce utility costs for community members,[26] as shown by the lack of cost savings in Figure 14, it will increase the revenue for the TRTFN as a greater share of electricity provided to Atlin will come from hydroelectricity instead of diesel generated electricity. This action also provides significant emissions savings due to the reduction of diesel-generated electricity.

[26] Commercial building owners could realize cost savings through demand reduction and homeowners could receive financial incentives for participating in a demand management program.

Impacts from *Energy Efficient and Locally Energized Transportation* are more modest because some EV uptake is already included within the BAU projections and further uptake is expected to be gradual due to the challenges noted on page 41.

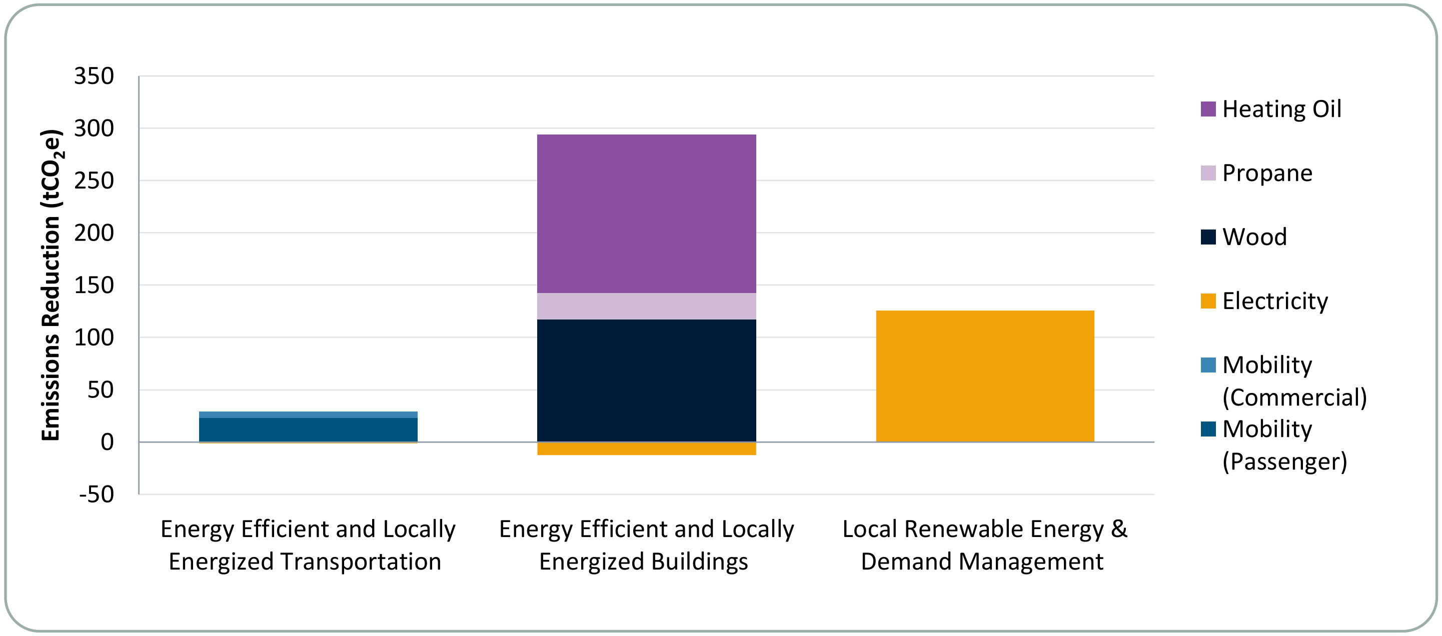


Figure 15. Emissions Reductions Compared to BAU by Focus Area in 2035

As discussed on page 31, prioritizing local energy and implementing these CEP actions will lead to many benefits for Atlin in addition to the energy, emissions, and cost savings explored in this section.

Implementation

Implementation

Governance, Public Education, and Community Engagement

The lack of a local government in Atlin presents an unusual circumstance with respect to the implementation of this community energy plan, placing greater responsibility on multiple organizations to collaborate and coordinate their energy-related commitments and investments. Even where there is a lack of clear jurisdiction, increased community awareness of local energy sources and energy-efficiency provides a runway for implementation of the energy-related initiatives in this plan.

Recommendations:

- The TRTFN schedules regular CEP meetings (e.g. biannual) with its development corporations to discuss CEP progress, energy-related initiatives, and funding opportunities.
- The TRTFN, in conjunction with the Taku Group of Companies corporations and partnerships, prepares public information summarizing this community energy plan and the benefits of prioritizing energy-efficiency and consumption of local energy sources. This would include providing publicly accessible information about the hydro system: how it works, the related benefits to the community in terms of jobs and economic impact, and the low greenhouse gas emissions compared to other energy sources used in the community.
- In the future, as TRTFN undertakes actions outlined in this plan, such as completing retrofits or purchasing electric vehicles, they share learnings with the community and leverage purchases to encourage vendors to showcase products, such as heat pumps and electric vehicles, in Atlin.
- The Atlin Community Advisory Committee (ACAC) [27] and TRTFN coordinate with other relevant community organizations to consider the social, economic, and environmental benefits of energy self-sufficiency, greater energy efficiency, and encouraging locally produced, low-carbon energy over high-carbon energy sources that are imported into the community.

[27] The ACAC is part of the Atlin Community Development Initiative, a new initiative delivered by Northern Development Initiative Trust and the Province of BC's Ministry of Housing and Municipal Affairs.

- The ACAC reviews this CEP as part of its oversight of the Atlin Capital Program, which supports community infrastructure projects that strengthen the local and regional economy.

Workforce Development and Youth Engagement

The continued operation of local energy-production systems, as well as the realisation of various co-benefits and opportunities, requires a concerted local effort to engage with youth. One example of this was demonstrated in the development of this community energy plan by the outreach to the Atlin School. It was only the second tour of the Atlin hydro system that has ever been provided to local students.

Youth engagement is critical to continue building pride in the community's energy leadership and providing a future workforce that prioritizes local residents. Workforce development must also consider succession planning, and involve mentoring staff in the early stages of their career to "grab the torch" from others who have dedicated their careers to Atlin's energy projects and enabled such remarkable community leadership.

Recommendations:

- Identify the community's capacity needs related to the opportunities outlined in this community energy plan and prepare a training plan. This would support the continued operation of the hydro system, other local energy opportunities, retrofits of existing homes and buildings, construction of new facilities, and public education.
- Connect with the administration and teachers at the Atlin School to identify opportunities for incorporating local energy knowledge and experience into the curricula at various grade levels.
- Participate in a group such as the Council of Yukon First Nations (CYFN) First Nations Energy Working Group and/or Northern BC Climate Action Network (NorthCAN) to share knowledge and learn about energy-related initiatives in other First Nations and northern communities.

Monitoring & Evaluation

Monitoring and evaluating the implementation of the Community Energy Plan is critical for its success. Key Performance Indicators (KPIs) enable communities to measure the outcomes of a plan's implementation. When KPIs are monitored regularly, communities can determine how to best allocate resources to support implementation, and what success different actions are having.

Examples of KPIs include:

1. kWh of electricity sold to BC Hydro
2. Litres of diesel consumed for electricity production
3. Dollars invested in local retrofit activity, including materials, labour, and contractors
4. Number of EV registrations and EV charging stations

See Appendix B for suggested KPIs and a template for monitoring progress on each CEP action.

Recommendation:

- Develop a mechanism for tracking KPIs that aren't yet tracked, such as KPIs #3 and #4 above.
- Complete annual monitoring on KPIs and progress on each of the CEP actions. Discuss findings at the biannual CEP meeting between the TRTFN and its development corporations, as recommended on page 56.

Funding

Energy efficiency and emissions reduction funding is available at both a community and individual level. Pursuing these funding opportunities can improve the business case of the actions recommended in this CEP.

Funding opportunities are as of March 2026; some programs listed are currently paused but will reopen later in 2026.

Community Funding

Funding sources that TRTFN and/or Altin can access to help implement CEP actions are shown in the table below.

Table 6. Internal and External Funding Sources to Support CEP Implementation

Internal Funding Sources	External Funding Sources
• Allocation from operating budget • Revolving fund: energy savings from TRTFN projects are reinvested in future projects • Revenue from hydroelectric system	• Indigenous Climate Action Network (ICAN) programs, including funding for a full-time staff position (Climate Action Coordinator) • Canada Mortgage and Housing Corporation (CMHC), various program offers for Indigenous housing • New Relationship Trust's Community Energy Diesel Reduction (CEDR) ○ This BC Gov News release provides examples of funded projects • BC Indigenous Clean Energy Initiative (BCICEI) • BC Hydro Social Housing Energy Savings Program • Clean BC programs, including Go Electric and Better Buildings • BC Hydro EV Charger Rebates • Rural Economic Diversification and Infrastructure Program (REDIP)

Individual Funding

Funding sources that residents and business owners in Atlin can access to help implement CEP actions are listed below.

- Various BC Hydro incentive programs including:
  - BC Hydro Energy Conservation Assistance Program (ECAP)
  - BC Hydro Energy Savings Kits (ESKs)
  - Solar panel and battery storage rebates
  - EV Charger rebates
- Various Clean BC incentive programs including:
  - Better Homes
  - Go Electric
  - Better Buildings
- Electric Vehicle Affordability Program (EVAP)

Conclusion

Conclusion

Atlin's last Community Energy Plan put the community on a path to to local electricity production that led to the construction of a local hydro system. Beyond demonstrating national leadership, this system significantly reduced local reliance on diesel-powered generators and led to a corresponding drop in greenhouse gas emissions. Today, it is a critical ingredient in enabling the community to pursue greater levels of energy self-sufficiency, keeping more energy dollars local, and realizing multiple other local benefits. These considerations have guided the creation of this Community Energy Plan and led to the identification of a "pro-Atlin" approach.

This approach recognizes the following:

1. Throughout much of the year, the local hydroelectric system has the potential to produce more electricity than the community currently consumes.
2. During the coldest days of the year, the hydro system cannot meet the electricity demands of the community. Currently, this requires the operation of the diesel power-generating station to supplement power-generation.
3. Peak electricity demand and overall electricity consumption are expected to grow significantly by 2045.

Implementation of the actions outlined in this CEP will help address these concerns and opportunities. They will boost local energy-efficiency, reduce reliance on imported fossil fuels, increase demand for locally produced energy, increase revenues for the TRTFN to distribute within the community, decrease diesel-generated electricity, enhance the operations of the hydro system, lower costs for residents, create and sustain jobs, improve air quality, and significantly reduce GHG emissions. These results aren't just about energy; they're about the sustainability and prosperity of the community.

Leadership from the TRTFN and its development corporations paired with well-informed and engaged youth, workforce, and community members will be essential to implementation and to ensuring that all residents benefit.

This is a special and unique opportunity for Atlin; this level of energy self-sufficiency has never been identified in any of CEA's 100+ community energy and emission plans that have been produced over the past 25 years.

Appendices

Appendix A. Glossary

Term	Definition
Atlin Community Advisory Committee (ACAC)	The ACAC is part of the Atlin Community Development Initiative, a new initiative delivered by Northern Development Initiative Trust and the Province of BC's Ministry of Housing and Municipal Affairs.
Active Transportation	Non-motorized modes of travel such as walking, cycling, rolling, and using e-bikes or mobility devices.
Business as Usual (BAU)	A projected future scenario showing expected emissions or conditions if no additional climate action is taken beyond current policies.
Community Energy Plan (CEP)	A plan that identifies current energy use in a community, projected energy needs in the future, and a roadmap for how energy will be provided and consumed.
Co-benefits	Additional positive outcomes generated by CEP actions, such as improved health, lower energy bills, or job creation.
Emissions Factor	The amount of GHG emissions produced per unit of energy or fuel consumed.
Energy Step Code (ESC)	A provincial performance-based building standard requiring increasing levels of energy efficiency in new construction.
EV (Electric Vehicle)	A vehicle powered by electricity, producing zero tailpipe emissions.
GHG (Greenhouse Gas)	Gases such as carbon dioxide, methane, and nitrous oxide that trap heat in the atmosphere and contribute to climate change.
GJ (Gigajoule)	A unit of energy commonly used to measure fuel or energy consumption.
Internal Combustion Engine (ICE) Vehicle	A conventional vehicle powered by gasoline or diesel.

Intergovernmental Panel on Climate Change (IPCC)	The UN body responsible for assessing global climate science and developing comprehensive climate reports.
Kilowatt (kW), Megawatt (MW)	Units of power commonly used to measure electric power capacity or demand.
Long-Duration Energy Storage (LDES)	An energy storage system that is capable of delivering energy for 10 hours or more.
Non-Integrated Areas (NIAs)	Communities that are not connected to the main provincial electricity grid.
Part 3 Buildings	Larger, more complex buildings over 600 m^2 and typically more than three stories in height.
Part 9 Buildings	Smaller buildings intended for residential, commercial, or low-hazard industrial activities.
Plug-in Hybrid Electric Vehicle (PHEV)	A vehicle with both a gasoline engine and an electric motor, allowing for electricity to be used for daily needs and gasoline for longer trips.
tCO_2e (tonnes of carbon dioxide equivalent)	A standard unit for comparing the emissions of various greenhouse gases based on their global warming potential.
Zero Carbon Step Code (ZCSC)	A provincial framework that sets performance levels for reducing operational GHG emissions from new buildings.

Acronyms related to the Taku River Tlingit First Nation (TRTFN) and its development corporations include:

- ATELP: Atlin Tlingit Economic Limited Partnership
- THELP: Tlingit Homeland Energy Limited Partnership
- XLP: Xeitl Limited Partnership

Appendix B. Key Performance Indicators and CEP Tracking Template

The table below provides a description of suggested key performance indicators for each focus area.

Table 1A: Key Performance Indicators

Focus Area	Indicator	Data Source
Energy Efficient and Locally Energized Buildings	Energy use, emissions and cost from community buildings	See Appendix D. Methodology and Assumptions
	Number and impact (energy, emissions, & cost) of completed retrofits	EnerGuide Assessments Direct from contractors or retrofit program data
	Federal and provincial rebate dollars accessed by residents	Program administrators (e.g. CleanBC, BC Hydro, NRCan)
	Residents' experience of health improvements from retrofits and home energy literacy	Residential surveys
	Jobs created, such as the number of local energy advisors and trained industry workers	Direct from contractors or retrofit program data
	Dollars invested in local retrofit activity, including materials, labour, and contractors	Direct from contractors or retrofit program data
Transportation	Energy use, emissions and cost from vehicles	See Appendix D. Methodology and Assumptions
	EV registration per capita	ICBC
	Number of EV charging stations installed	PlugShare
Local Electricity Management, Generation, and Storage	Diesel consumption	BC Hydro diesel generating station data
	Participation in demand response measures	Demand response program data
	Hydro electricity production (kWh and cost)	Electricity produced and sold to BC Hydro

Governance, Public Education, and Community Engagement	Participation in community educational events	TRTFN internal tracking
	Participation of the TRTFN, development corporations, and various community groups in CEP discussions and implementation projects	
Workforce Development and Youth Engagement	Participation in training & capacity building events	TRTFN internal tracking
	Participation in youth engagement events	
	Participation in working groups	

Additionally, the TRTFN can monitor a number of KPIs that are directly related to their operations.

- Energy use, emissions, and cost from TRTFN-owned buildings and fleet
- Number of TRTFN-led actions completed (e.g. retrofitting TRTFN buildings or adding EVs to the TRTFN fleet)
- Energy and emission performance level of new TRTFN-owned homes and buildings
- Charging data from TRTFN-owned EV charging stations
- Number of plans / policies with energy efficiency / emissions reduction embedded
- Dollars of contribution received from outside funding for energy efficiency / emissions reduction
- Number of dedicated staff for energy efficiency / emissions reduction

The template below can be used for tracking progress on each CEP action.

Action	Stage (not started, in-progress, or completed)	Notes (recent accomplishments, funding applications, barriers)
Energy Efficient and Locally Energized Buildings		
1.1 Complete energy audits and retrofits for homes and commercial / institutional buildings to improve energy efficiency and reduce emissions		
1.2 Ensure new homes and buildings are built to Energy Step Code Level 4 and Zero Carbon Step Code Level 3, or higher		
1.3 Explore opportunities for geoexchange / lake loop systems		
Energy Efficient and Locally Energized Transportation		
2.1 Install public EV chargers near local businesses		
2.2 Replace vehicles and equipment with electric options, such as EVs, e-bikes, and electric boats		
2.3 Support local businesses to reduce the need for trips to nearby communities for necessities		
2.4 Expand the TRTFN shuttle service		
Local Electricity Management, Generation, and Storage		
3.1 Implement demand response measures in homes and buildings		
3.2 Implement battery energy storage system alongside existing hydro system		
3.3 Explore opportunities to expand the existing hydro system		

Appendix C. Inventory and Modelling

This section provides an overview of Atlin's community energy consumption, GHG emissions, and costs for 2024, as well as Business As Usual (BAU) projections through 2050. The inventory is presented through the following sectors and subsectors, described in Table 2A.

Table 2A. Community Inventory Sectors, Fuels, and Subsectors

Sector and Fuels	Subsector
Transportation: Gasoline and diesel consumed for mobility purposes.	• Passenger • Commercial • TRTFN [28]
Buildings: Electricity, propane, heating oil, wood, and diesel consumed within buildings and infrastructure.	• Residential • Commercial & TRTFN [27]

Note: data for commercial buildings heating fuels was not available; only commercial electricity is included.

The methodology and assumptions are described in Appendix D.

Table 3A presents a snapshot of Atlin's total community energy consumption, GHG emissions, and energy expenditures for 2024. Table 4A provides a detailed breakdown.

Table 3A. Total Community Energy Consumption, GHG Emissions, and Energy Expenditures, 2024

Total Energy Consumption	Total GHG Emissions	Total Energy Expenditures
93,540 GJ	4,882 tCO_2e	$3,985,380

[28] TRTFN refers to assets owned by the TRTFN government and its development corporations

Table 4A. Summary of Community Energy Consumption, GHG Emissions, and Energy Expenditures, 2024

	Energy Consumption (GJ)	GHG Emissions (tCO_2e)	Energy Expenditures
Passenger Vehicles	**14,641**	**969**	**$797,620**
Gasoline	12,643	832	$697,127
Diesel	1,997	137	$100,493
Commercial Vehicles	**30,514**	**2,074**	**$1,572,010**
Gasoline	7,601	511	$419,109
Diesel	22,913	1,563	$1,152,901
TRTFN Vehicles	**5,861**	**391**	**$317,790**
Gasoline	3,723	245	$213,055
Diesel	2,138	146	$104,735
Residential Buildings	**33,885**	**1,286**	**$996,536**
Electricity	13,067	182	$443,189
Propane	850	52	$38,044
Heating Oil	4,356	298	$245,461
Wood	15,383	738	$258,270
Diesel	230	15	$11,573
Commercial & TRTFN Buildings	**8,639**	**163**	**$301,424**
Electricity	7,861	110	$266,606
Heating Oil	778	53	$34,818

Community Energy Consumption

In 2024, Atlin consumed over 90,000 GJ of energy. The community energy consumption is shown by fuel type in Figure 1A and sector in Figure 2A.

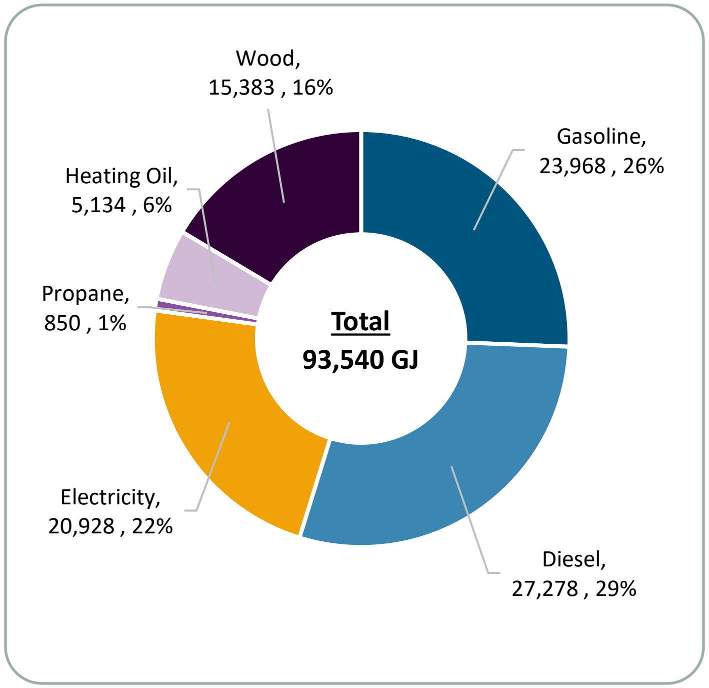


Figure 1A. Energy Consumption (GJ) by Fuel Type, 2024

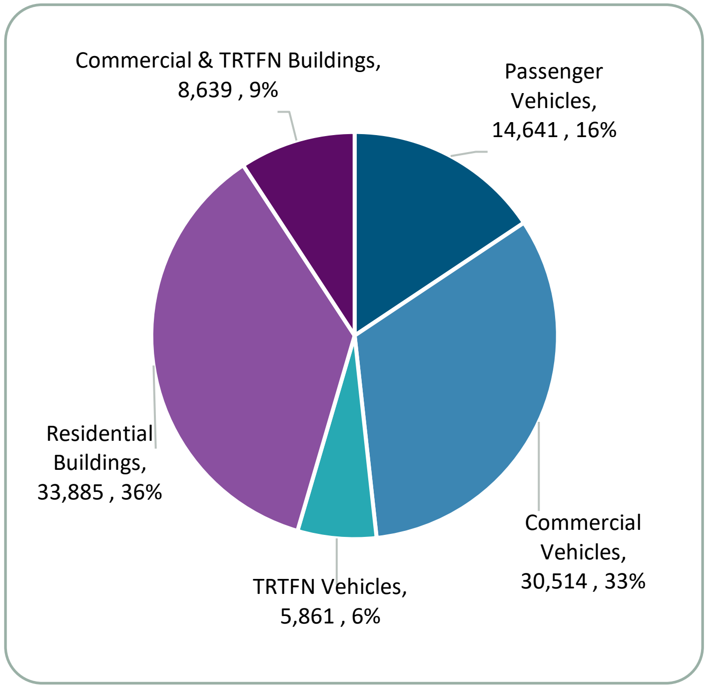


Figure 2A. Energy Consumption (GJ) by Sector, 2024

More than half of energy use is from transportation (55%), largely contributed by commercial vehicles (33%). Electricity and wood are primary sources of energy consumption in buildings, accounting for 22% and 16% respectively, while heating oil and propane contribute to 6% of total energy consumption.

Community GHG Emissions

GHG emissions in Atlin are shown by fuel type in Figure 3A and sector in Figure 4A. In 2024, Atlin's community energy use produced nearly 4,900 tonnes of CO_2 equivalent (tCO_2e). Emissions from diesel burned for electricity production are included within the electricity emissions, rather than the diesel emissions.

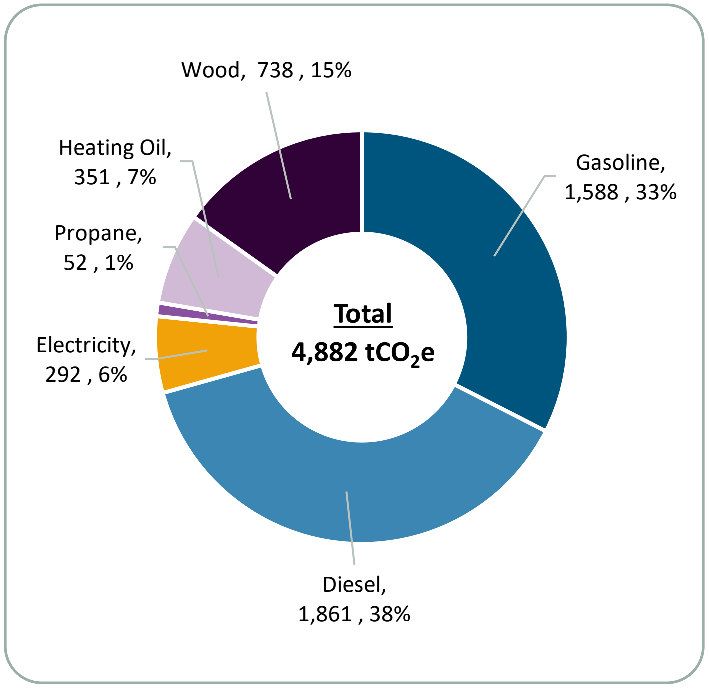


Figure 3A. GHG Emissions (tCO_2e) by Fuel Type, 2024

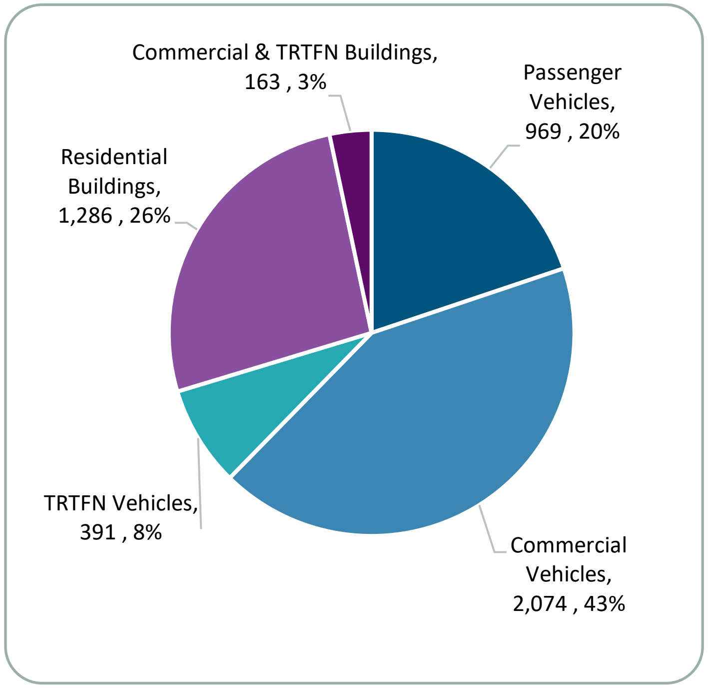


Figure 4A. GHG Emissions (tCO_2e) by Sector, 2024

Transportation accounted for 70% of total community GHG emissions, despite representing about half of energy consumption. On the other hand, buildings contributed significantly less emissions relative to their energy use. This is due to the difference in emissions intensity of the predominant fuel type from each sector in Atlin – emissions factors of gasoline and diesel are 0.066 tCO_2e/GJ and 0.068 tCO_2e/GJ respectively, while emissions factors of electricity and wood are 0.014 tCO_2e/GJ and 0.061 tCO_2e/GJ respectively. See Appendix D for more information regarding emissions factors.

Community Energy Expenditures

The cost of energy use in Atlin in 2024 was nearly $4 million. The distribution of costs by fuel type are shown in Figure 5A and by sector in Figure 6A.

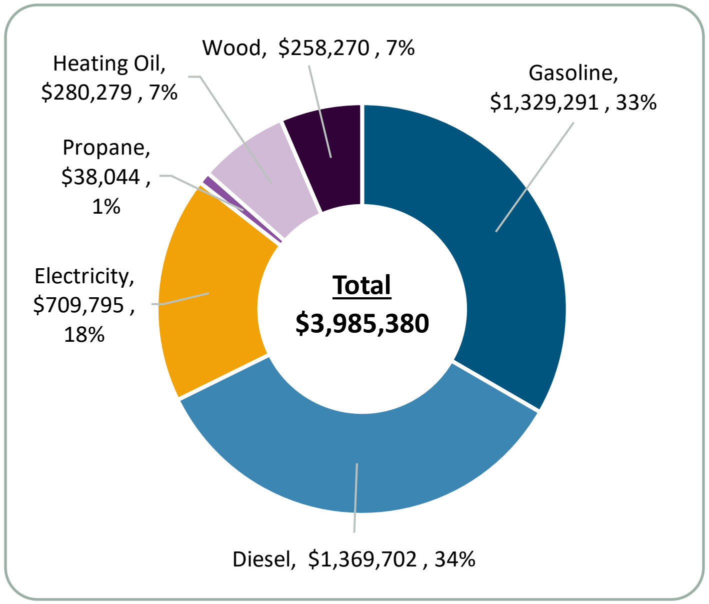


Figure 5A. Energy Expenditures by Fuel Type, 2024

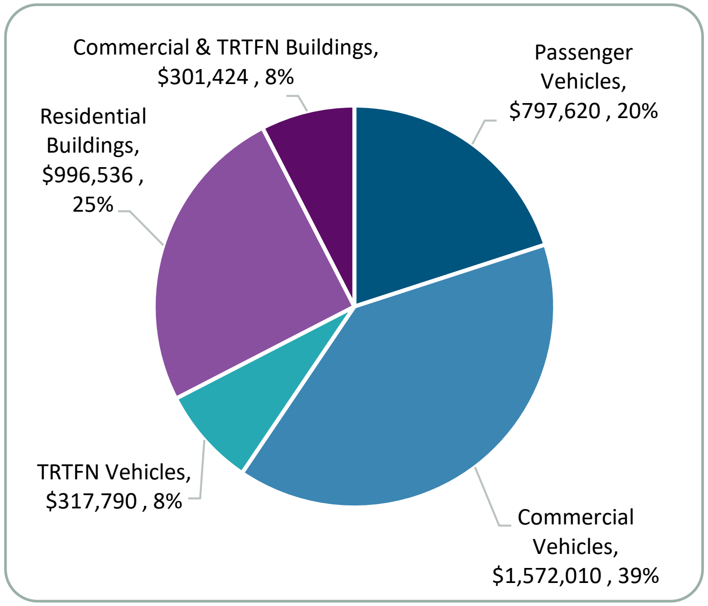


Figure 6A. Energy Expenditures by Sector, 2024

Commercial vehicles was the most expensive sector, costing nearly $1.6 million, equivalent to an average of $8,544 per commercial vehicle.[29] The second most expensive sector was residential buildings ($997k), equivalent to an average of $4,152 per household.[30] Passenger vehicle costs were approximately $800k, equating to an average of $3,762 per passenger vehicle.[12] Most money spent on transportation fuels ($2.7 million combined) leaves the community.

[29] Based on the number of vehicles registered with ICBC

[30] Based on census and TRTFN data (240 homes)

Fuel Type Comparison

Figure 7A provides a comparison of fuels consumed in Atlin in terms of cost and emissions intensity. Heating oil, gasoline, and propane are the most expensive fuels, while each of the fossil fuels (heating oil, propane, diesel, and gasoline) are the most emissions intensive. Wood is the cheapest fuel, and electricity is the least emissions intensive.

Another consideration is the volatility of fuel prices. As shown by the dark green diamonds, gasoline and diesel prices have increased significantly from 2024 to 2026, primarily because of the closure of the Strait of Hormuz.

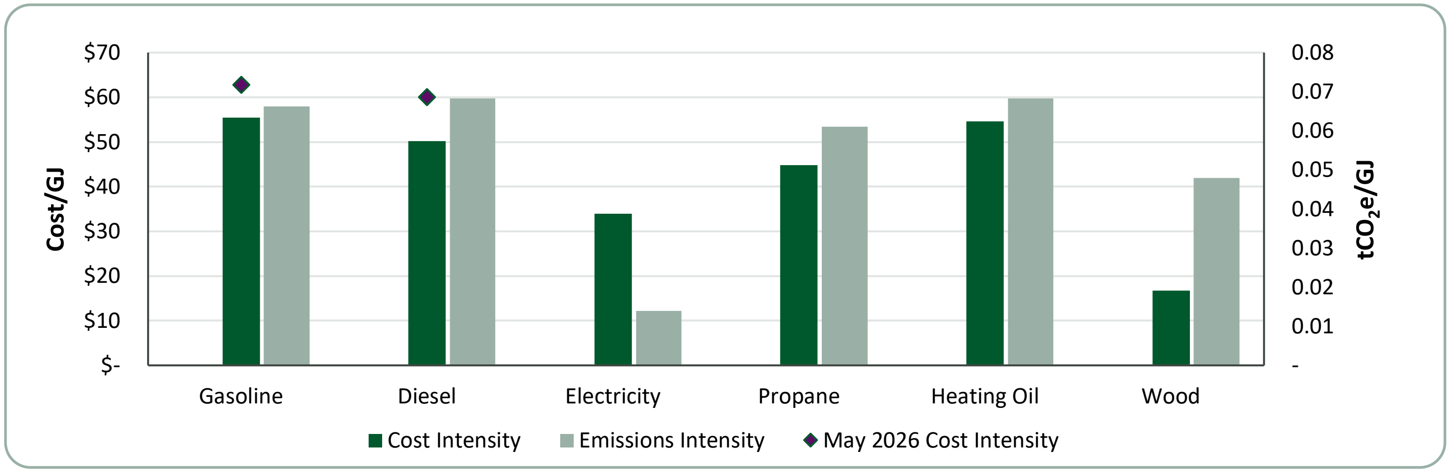


Figure 7A. Cost and Emissions Intensity by Fuel Type, 2024

Another way to compare the fuels is to compare them to a cord of wood. A cord of wood, which is equal to 28.2 GJ, cost about $475 in 2024. An equal amount of energy (28.2 GJ) in other heating fuels would cost:

- Electricity: $956
- Propane: $1,262
- Heating Oil: $1,589

However, this cost comparison does not capture the full picture because different heating systems - such as wood stoves, propane/heating oil furnaces, or electric heat pumps - have significantly different efficiencies.

TRTFN Top Vehicles & Buildings

The two charts below present the top five emissions and costs from TRTFN assets. Figure 8A presents top five vehicle emissions and costs while Figure 9A presents top five building emissions and costs, specifically for heating oil.

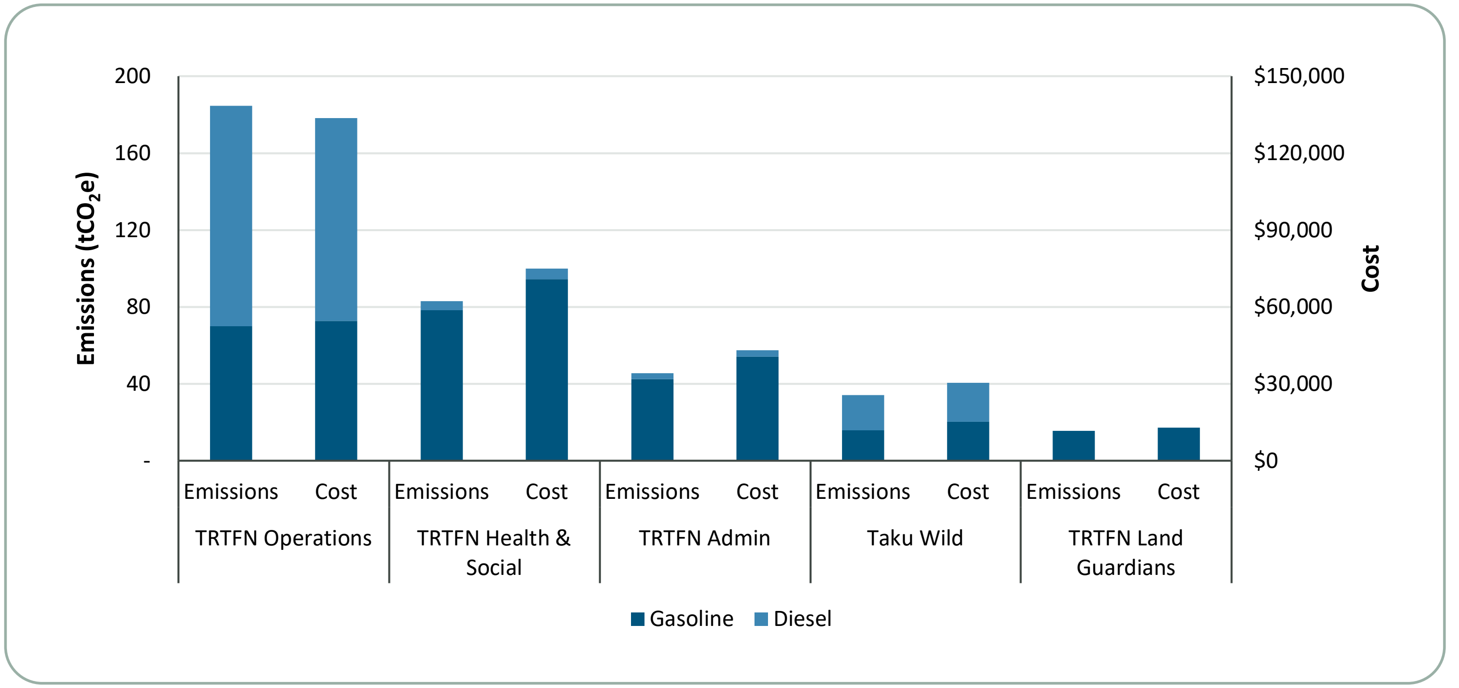


Figure 8A. Top Five TRTFN Vehicle Emissions and Costs, 2024

TRTFN Operations is responsible for the largest source of emissions (184 tCO_2e) and expenditures ($133,665), followed by TRTFN Health & Social and TRTFN Admin.

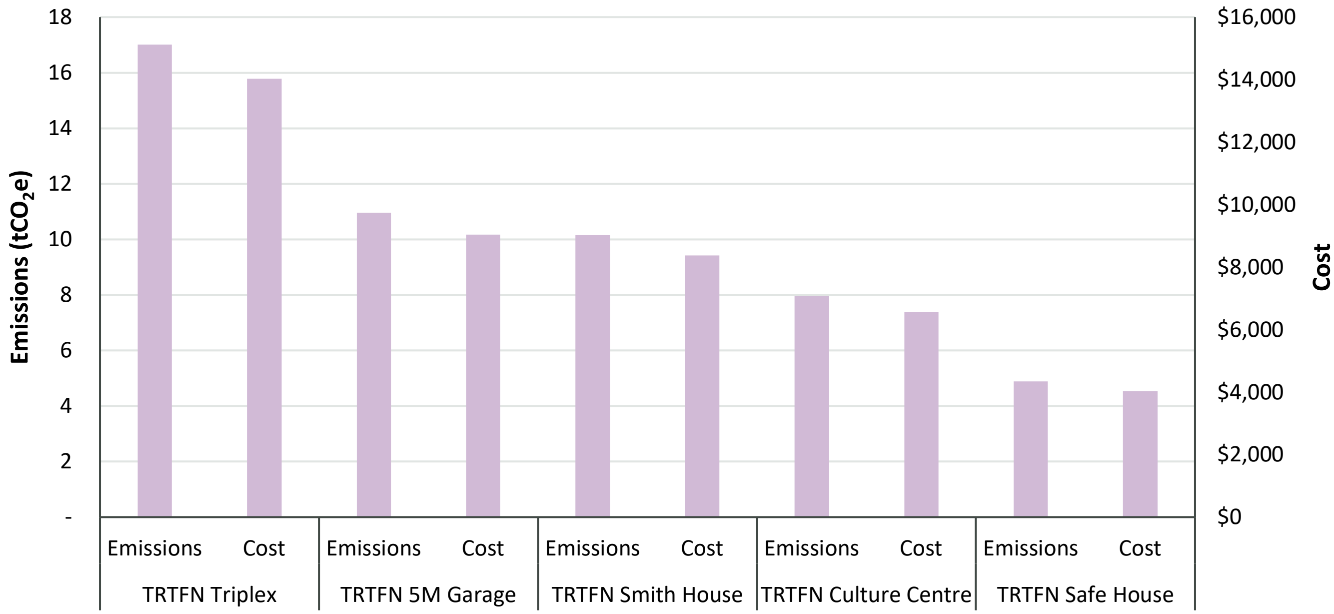


Figure 9A. Top Five TRTFN Heating Oil Emissions and Costs, 2024

TRFN Triplex has the highest emissions (17 tCO_2e) and expenditures ($14,028) from heating oil use in buildings.

Business As Usual Forecast

Figure 10A presents the projected emissions in Atlin, beginning with the inventory year (2024) and projecting to 2050. Overall emissions are expected to decrease by 25% due to electrification and improved emissions standards in transportation. Building emissions are expected to increase due to a projected increase in electricity consumption (Figure 10, page 29) and due to a growing population.

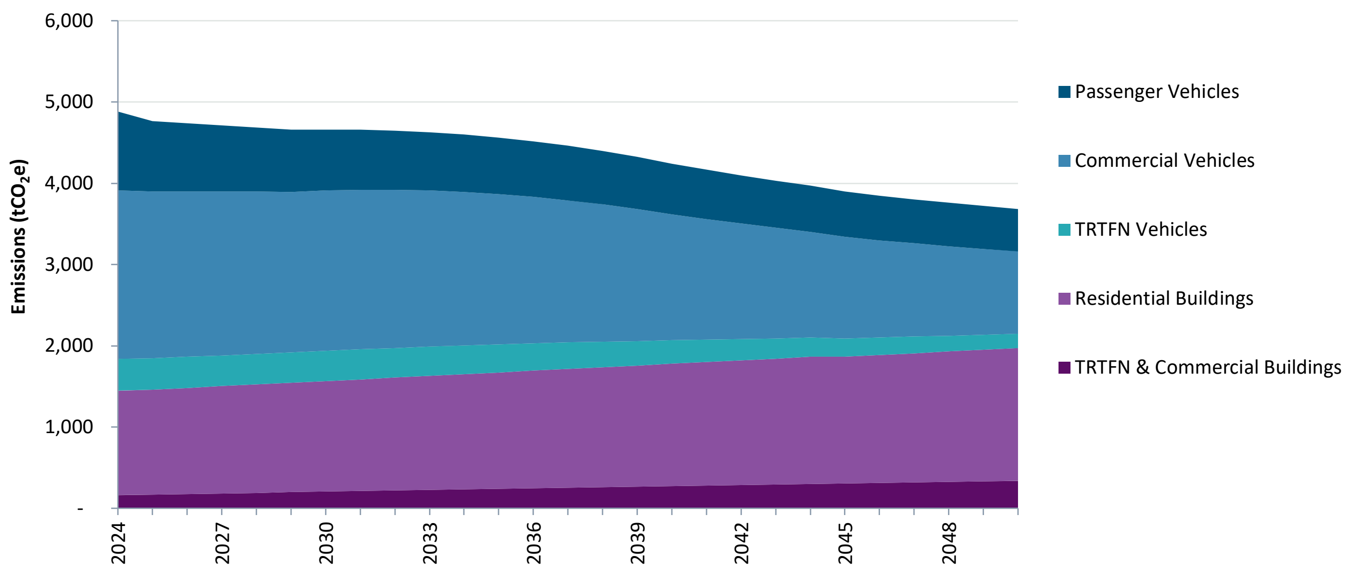


Figure 10A. Atlin's Projected Business-As-Usual Emissions, 2024-2050

Appendix D. Methodology and Assumptions

This appendix outlines methodology and assumptions used to prepare the inventory and BAU.

Transportation Data Sources

TRTFN provided monthly fuel sales reports for 2024, which were aggregated to summarize total fuel consumption (in litres) and associated fuel costs. The data are categorized by fuel type and by user group.

Due to limited data availability for passenger and commercial vehicles, average fuel consumption (in litres) per gasoline- and diesel-powered vehicle was estimated using vehicle data from Government of Yukon's 2023 energy report. These averages were then applied to the number of registered vehicle in Atlin in 2024, as reported by ICBC. For commercial vehicles, the analysis subtracts TRTFN vehicles from the number of registered vehicles. Average gasoline and diesel costs per litre from the TRTFN 2024 fleet data were used to estimate fuel costs.

More specifically, the Government of Yukon provided the following information:

- Gasoline and diesel consumption for on-road use (in litres) in 2022
- Registered motor vehicles by fuel type (e.g., gasoline, diesel) as a percentage in 2022
- Registered vehicles by vehicle type (e.g. trucks, passenger cars) in 2023

The number of registered gasoline and diesel vehicles were estimated by first distinguishing on-road and off-road vehicles from the registration list. Registered vehicles by vehicle type were reclassified assuming that trucks, passenger cars, motorcycles, and buses were on-road vehicles, while off-road vehicles and snowmobiles were categorized as off-road. Subsequently, the percentage of registered gasoline and diesel vehicles were applied to the total number of registered on-road vehicles.

Additional assumptions:

- Yukon and Atlin are assumed to have similar vehicle energy use characteristics

- Average fuel consumption per gasoline and diesel vehicle, calculated using 2022 fuel consumption and 2023 vehicle registration data, is assumed to be representative of 2024 conditions.

Buildings Data Sources

Monthly building electricity consumption (in kWh) by residential and commercial use in 2023 as well as billing details from October 2024 were provided by BC Hydro.

Residential wood and diesel consumption were estimated using the residential heating survey conducted in December 2025 by determining the average primary and secondary energy consumption per home for each source, multiplied by the proportion of homes using that heating source. Residential oil and propane consumption were calculated using available EnerGuide data for communities in the same Climate Zone as Atlin (Climate Zone 7a) to determine the average consumption per home for primary and secondary heating, then multiplied by the proportion of homes using that heating source per residential survey data.

The TRTFN 2024 fuel sales reports also provided data on heating oil consumption (in litres).

Heating oil prices refer to household heating fuel costs reported by Statistics Canada and propane prices refer to data from the Government of Canada. Average diesel costs per litre from the TRTFN 2024 fleet data is used for diesel use in buildings as well.

Additional notes and assumptions:

- Residential and commercial electricity consumption in 2023 is assumed to be representative of 2024 conditions.
- Electricity billing details from October 2024 is assumed to be representative of annual electricity costing in 2024.
- Residential propane, wood, heating oil, and diesel consumption estimated from the 2025 residential heating survey is assumed to be representative of 2024 conditions.
- Residential and commercial buildings are assumed to have the same electricity and heating oil rates.
- Heating oil consumption under 'Commercial & TRTFN buildings' is likely underestimated, as it reflects only fuel sales recorded in the TRTFN monthly fuel sales reports.

Conversion Factors

Most conversion factors, including emissions factors, were sourced from Emissions Factor Catalogue for 2024 Reporting Year by the BC Ministry of Energy and Climate solutions. The electricity emissions factor was calculated based on the amount of diesel consumed for electricity production and the total electricity produced (both hydro and diesel generated), as provided by BC Hydro. See Table 5A for a summary of factors. Additional energy use conversion factors for wood were sourced from the Canadian Wood Council and What's Up Yukon for local masses of wood per cord.

Table 5A. Summary of Conversion Factors Used

Fuel Type	Energy Conversion Factor		Emissions Factor (tCO_2e/GJ)
Gasoline	0.0334	GJ/L	Light-duty vehicles: 0.066
			Heavy-duty vehicles: 0.069
Diesel	0.0384	GJ/L	Light-duty vehicles: 0.066
			Heavy-duty vehicles: 0.069
			Residential buildings: 0.067
Electricity	0.0036	GJ/kWh	0.014
Heating oil	0.0388	GJ/L	0.068
Propane	0.0253	GJ/L	0.061
Wood	28.2	GJ/cord	0.048

Additional assumptions

- Wood stoves and wood pellets are assumed to have the same emissions factor
- Wood energy conversion based off 4,050 lb/cord (1,841 kg/cord) for seasoned wood at 15% moisture content, and 18 GJ/oven-dry-tonne

Business As Usual Projections Assumptions

For the BAU projection modelling, the assumption is that energy consumption and emissions will increase proportionally with increases to population. The impact of policies from higher levels of government that have already been adopted and that will have quantifiable impacts are also incorporated. Assumptions included are:

- Likely future impacts of policies already adopted by other orders of government, such as:
    - Renewable and low carbon fuel standards
    - Vehicle tailpipe emissions standards
    - CleanBC's Zero-Emission Vehicle (ZEV) sales mandate requiring 75% of new light-duty vehicle sales to be ZEVs by 2035
    - Federal medium- and heavy-duty zero emission vehicle (MHDZEV) sales mandates requiring 35% of MHD vehicle sales being ZEVs by 2030, and 100% by 2040
- Changing climate patterns: as warmer winters and hotter summers occur, they will continue to change the way that energy is consumed in buildings i.e. more cooling in the summer and less heating in the winter.

The final assumption had the following methodology:

- Climate change data for the region obtained from ClimateData.ca.
- Projected global emissions to 2030 currently places the world in the range for the IPCC's Fifth Assessment Report's Representative Concentration Pathway (RCP) 6.0 scenario.
- RCP 6.0 scenario not available on ClimateData.ca, therefore RCP 4.5 (median impact scenario) used as a (conservative) proxy.
- Decreases in residential heating oil and propane consumption assumed to be proportional to projected decreases in Heating Degree Days (HDDs).
- Decreases in residential and commercial natural gas consumption assumed to be proportional to decreases in HDDs and the proportions of natural gas consumed for space heating for each sector, and that proportion obtained from the Navigant 2017 Conservation Potential Review for FortisBC Gas.
- Decreases in residential and commercial electricity consumption assumed to be proportional to decreases in HDDs and the proportions of electricity consumed for space heating for each sector. However, proportions of electricity consumed for space cooling for each sector and how this will increase proportional to projected

increases to Cooling Degree Days (CDDs) also included. These proportions obtained from the Navigant 2016 Conservation Potential Review for BC Hydro.

Although CEA's model assumes that projections will be linear, there will be annual variability due to factors such as economic conditions (on mobility fuels and building energy consumption) and climatic variations (particularly on building energy consumption). These variations mean that it may often be necessary to collect several years of data to see the impact of an action implemented.

Actions Modelling

The model estimates the impacts of each Focus Area compared to the BAU trajectory. The key assumptions, based on research conducted by CEA and tailored for Atlin, include:

Transportation:

- 25% of passenger vehicle sales are EV by 2035, and 50% by 2040
- 1% of TRTFN vehicles are converted to EVs each year, to a maximum of 20% over 20 years

Buildings:

- 1.9% of buildings are retrofit per year
- 1.5% of buildings switch to air source or ground source heat pumps per year
- All new homes to use electricity for space and water heating

Electricity:

- 77% electricity emissions factor improvement by 2029 as a result of the diesel reduction realized through implementation of *Local Electricity Management, Generation, and Storage* actions

While the CEP is directed to Atlin as a whole, the modelled impact of the actions is primarily focused on TRTFN-owned assets and on-reserve homes, as those are the sectors upon which TRTFN has the greatest influence.

Appendix E. Summary of Engagement

Overview

The Atlin-Taku River Community Energy Plan (CEP) was guided by a commitment to engage with a range of stakeholders, agencies and community members. The engagement process gathered input on the opportunities and barriers for safe, reliable, affordable, and clean energy in the region.

Objectives

The following key objectives guided the project's engagement approach:

- Build awareness of the CEP planning process, including the goals and role of community members and stakeholders.
- Gather public and stakeholder input on community priorities and concerns.
- Engage stakeholders to develop a deeper understanding of key opportunities, barriers, areas of authority, potential partnerships, and next steps for implementation.

Engagement Activities

Public Engagement

- **Surveys:** Residential and commercial surveys were circulated to gather input on community energy use and emissions, including questions on household energy usage, fuel types, and costs. (July - September 2025)
- **Community Dialogue:** An open house for community members provided an overview of the CEP planning process and energy use in Atlin and featured a Northern Regional Energy Dialogue hosted by UNBC. The event invited participants to join the project team for a buffet dinner, presentations, and interactive dialogues.

Stakeholders

- **Interviews:** The project team conducted interviews with key community stakeholders to gather early insights into local barriers and opportunities for climate and energy action, build shared understanding of the planning process, and strengthen strategic relationships to support the process. (July – September 2025)

- **Stakeholder Dialogue:** Local stakeholders attended a stakeholder dinner for a dialogue on the barriers and opportunities for developing a practical roadmap for Atlin's energy future. (September 2025)

Youth Engagement

- **School Student Tour & Workbook:** Atlin school students attended a tour of the hydro system to learn about the creation of renewable energy in their community. The tour was combined with workbook assignments to help the students reflect on what they learned on the tour and the use of energy in their home and community.

What We Heard | Stakeholder Input

Throughout the planning process, we engaged stakeholders to build awareness about the CEP and to gather their insights on barriers and opportunities for climate and energy action. Strengthening strategic relationships with key community leaders and partners will be essential for collaboration and long-term implementation of the Plan.

A Broad Vision for Atlin's Energy Future

Across interviews, stakeholders described their vision for Atlin as:

- A northern leader and model for clean, renewable energy-powered communities

- A place where energy planning strengthens Indigenous leadership and culture, community cohesion, and economic opportunity

- A community with energy sovereignty, modern infrastructure, and reduced diesel dependence

1. **Key Themes – Atlin's Current Energy Context**

Stakeholders provided insights on the strengths and weaknesses of Atlin's energy context.

STRENGTHS	
Nearly 100% renewable hydro supply	• The hydro system provides most of Atlin's energy • Among the cleanest NIA (Non-Integrated Area - community not connected to BC Hydro's main provincial electricity grid) • Strong community pride in clean energy identity
Strong system reliability and resilience	• Microgrid independence avoids transmission-line outages (especially with risks long transmission lines risks in remote areas) • High performing delivery of electricity (feeder performance consistently in BC Hydro's "green zone")
Indigenous-led energy leadership	• TRTFN's system (IPP) is a national model for First Nations energy sovereignty • The Nation has long-term experience with clean energy operations
Favourable conditions for further electrification	• Lower heating degree days improve heat pump performance (Atlin Lake moderates local climate - better heat pump efficiency and lower operating cost) • EV chargers already in place • Community-wide shift toward electric heating
CHALLENGES	
Remote location and weather	• Single-phase power service to Como Lake Reserve limits industrial opportunities (fish processing, cold storage, FN business development), EV fast charging, and commercial expansion • Limited access to approved contractors for BC Hydro rebates

Affordability barriers	• High upfront costs for retrofits don't work for lower-income residents in a small town • Resident concerns around expensive electricity bills, especially after switching to electric heating • Older housing stock requiring major upgrades

2. Opportunities & Risks: Key Considerations

Stakeholders provided insights on some of the biggest opportunities and potential risks that should be considered in development of the plan.

Opportunities	

Battery Storage	• Broad agreement that a battery is one of the highest-impact opportunities
	• Potential benefits:
	  ○ Replacing most of the load bank's 200–300 kW requirement
	  ○ Shaving peak loads that currently trigger diesel
	  ○ Improving power quality
	  ○ Supporting EVs as mobile batteries during outages or peaks (future opportunity)
	• Preliminary estimate: $1.5–2M, potentially up to $4M eligible via CEDR
	• Requires a system impact study and EPA amendment; ownership model (TRTFN vs BC Hydro) remains unresolved

Demand-Side Management & Energy Efficiency	• Strong interest in energy efficiency:
	  ○ Heat pumps
	  ○ Building retrofits
	  ○ Air sealing and insulation

	○ Smart thermostats (similar to Yukon's Peak Smart model) • TRTFN could support bulk procurement or community-led retrofit groups to: ○ Lower costs ○ Build local skills ○ Attract workshops or installers ○ Better support vulnerable residents • Opportunity to coordinate Community Energy Diesel Reduction Program (CEDR nation-led) with Hydro programs (individual household incentives) to cover more residents • Ensure opt-in programs do not exclude vulnerable households is a key equity concern
Electrification of Boats and Recreation	• Local fishing/trolling boats are noisy and pollutive—seen as an excellent electrification opportunity • A community-led pilot (marine electrification) could reduce emissions and noise on the lake
Renewables & Storage	• Interest in renewable energy options: ○ Solar (limited winter contribution but cost-saving potential for homeowners) ○ Wind (potentially viable based on local geography) ○ Geothermal expansion • Any renewable projects would need to be paired with storage to avoid grid instability
Efficiency & Program Opportunities	• BC Hydro: Energy Savings Kit, Energy Conservation Assistance Program, heat pump rebates, solar/battery incentives • New Relationship Trust: Community Energy Diesel Reduction remains the best pathway for large-scale First Nation-led demand-side management projects • Inquiry about whether Atlin could generate carbon credits by reducing diesel reliance (needs further analysis, including baseline diesel use and methodology)

Community Infrastructure as Priority	• Recreation Centre (Rec Centre) identified as a priority facility for electrification upgrades, efficiency improvements, and resilience hub planning • Courthouse and other community buildings also mentioned as important infrastructure for community wellbeing and emergency services
Tensions & Risks	
Funding	• Funding is a top issue for NIA communities; complex multi-year projects require significant stacking of grants
Affordability & Social Equity	• "Opt-in" retrofit and efficiency programs often excluding those who need them most • Residents cannot afford upfront costs even when long-term savings exist • Need a "just transition" where clean energy improves quality of life for all Atlin residents
Technical & Location Concerns	• Batteries require careful design to integrate with microgrid hydro systems • Cold climate affects battery chemistry and product options • Lack of local contractors complicates participation in BC-wide rebate programs
Governance & Alignment	• Misinformation, polarization in the community • Political unpredictability – changes in administrative and political leadership • Communication & information flow and coordination needed between community members and all parties (e.g. TRTFN, the group of companies, BC Hydro, new economic partners (mining, tourism) • Disconnect between community priorities and top-down design of programs (e.g., contractor requirements, rigid program eligibility)

3. Priorities & Outcomes for Atlin's CEP

Stakeholders provided their thoughts on what they wanted to see included within the plan, as well as some ideal outcomes from resulting from the plan's implementation.

Community Focus

The CEP should reflect Atlin's identity, values, and long-term hopes for community and cultural well-being and culture

- Community building and strengthened local connections
- Amplifying northern voices and Atlin's leadership in clean energy
- Supporting TRTFN efforts to welcome members back to Atlin following historic displacement
- Using energy planning as a tool to advance economic and social opportunities
- A CEP that is simple, achievable, and grounded in local needs
- Increased community awareness and excitement about clean energy
- Stories of local leadership and success shared broadly, positioning Atlin as a model for other NIAs
- Clean energy leadership contributing to energy sovereignty and greater self-reliance

Technical Pathways

Interest in practical technology improvements that can improve system reliability, reduce diesel use, and prepare for future load growth

- A detailed feasibility and system-impact assessment for community battery storage
- Battery storage used for peak shaving, load bank reduction, and resilience
- Exploration of geothermal and seasonal energy storage opportunities
- Strategies to:
  - Manage load growth
  - Reduce peak diesel use

    - Shift from electric resistance heating to heat pumps
    - Prepare for long-term system expansion and major projects
- Infrastructure upgrades (e.g., three-phase expansion in priority corridors)
- EV fast charger to support tourism, mobility, and future electrification

Governance & Community Alignment

A CEP that strengthens relationships and ensures energy planning aligns with local development, culture, and long-term vision.

- Stronger coordination between TRTFN, BC Hydro, other partners, and local businesses
- Clear guidance on using remaining NIA program funding and understanding eligible costs
- Alignment of energy planning with community growth and cultural revitalization
- Exploration of non-traditional or blended funding models (e.g., public–private partnerships)

Economic Development

Energy planning as a central driver of Atlin's future economic health.

- Support for local supply chains: heat pump installers, solar vendors, retrofit contractors, and energy service providers
- Leveraging energy assets to foster business growth, training, and long-term jobs
- Atlin positioned as a clean, resilient, attractive community for remote workers
- Expanding economic development opportunities tied to electrification, renewable energy expansion, and system upgrades
- Recognition that long-term energy projects can catalyze community-wide benefits

Resilience Planning

The CEP should address Atlin's unique vulnerability as a remote community.

- Localized emergency hubs that support community resilience when transportation routes are disrupted
- Electrified and modernized critical infrastructure (rec centre, courthouse, community buildings)

- Reduced reliance on trucking through local water and wastewater independence
- Integrating clean energy solutions into emergency preparation

Energy Efficiency, Renewables & Low-Carbon Transportation

Updates to the CEP support residents, businesses, and the broader community to transition to low carbon energy.

- Home retrofits (insulation, doors, windows) that lower bills and improve comfort
- Adoption of renewable energy technologies suited to Atlin (wind, solar, geothermal)
- Battery storage paired with renewables and the hydro system
- Expanded low-carbon transportation options for both passenger and commercial movement
- Increased confidence and capacity within the community to adopt new technologies
- Pathways for Atlin to become a net-zero or near net-zero community over time
- Enabling electrified mobility, including EVs and marine EVs where feasible

What We Heard | Public Input

Community member input was collected through an open house featuring presentations and a Northern Regional Energy Dialogue with UNBC. These sessions helped build awareness of Atlin's energy system, the goals of the CEP, and how energy connects to everyday community values like health, affordability, and economic development. Residents shared their aspirations, concerns, and ideas to guide the plan's recommendations.

Appendix F provides the summary report of the session.

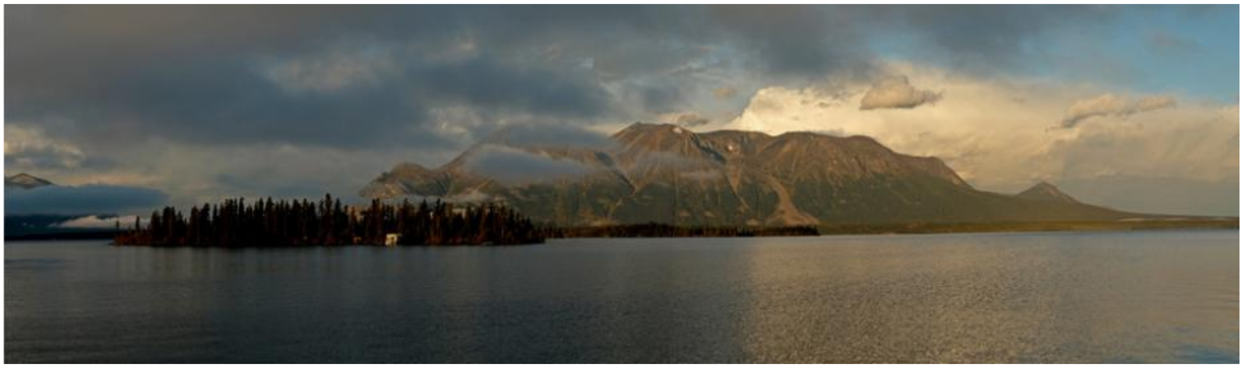
Appendix F. UNBC Community Energy Dialogue Report

The full report is provided on the following pages.

Community Report

Atlin

This report summarizes the Community Energy Dialogue held on September 16, 2025, in Atlin / Taku River Tlingit. The conversation involved eleven community members and was facilitated by Sinead Earley. The event was planned alongside several other community engagements coordinated by the Community Energy Association and Xeitl Limited Partnership, in preparation for an updated Community Energy Plan (CEP). Quotes here are from the community dialogue and have been reported anonymously.



Northern Regional Energy Dialogues is an Accelerating Community Energy Transformation (ACET) project led by Sinead Earley, Tamara Krawchenko and Kara Shaw in partnership with the University of Victoria, University of Northern British Columbia, and through support from the Community Energy Association and the Northern British Columbia Climate Action Network (North CAN).

We are working with communities and First Nations across Northern British Columbia to help them identify their interests, needs, and opportunities in support of renewable energy transitions. The current phase of the project is focused on convening community based and regional energy dialogues. Future phases will support targeted and community- identified capacity building initiatives and help formalize them with enduring peer networks.

UNIVERSITY OF VICTORIA ACET ACCELERATING COMMUNITY ENERGY TRANSFORMATION

UNBC

Report drafted by: Sinead Earley, Associate Professor, School of Planning and Sustainability, UNBC. Please send questions or comments to sinead.earley@unbc.ca

Summary

The discussion highlighted the unique energy challenges and opportunities in Atlin, as a remote, non-integrated (not connected to BC’s centralized grid), unincorporated community in northern BC. There is a strong interest in transitioning to 100% renewable energy sources, with hydroelectricity as the backbone and solar as a supplement. Affordability and reliability are critical concerns, and governance gaps were also highlighted as a challenge. Without municipal government or regional district representation, coordination across interested actors relies on informal cooperation among local bodies. Community members want energy systems that keep profits local and reduce vulnerability to external factors (e.g., fuel supply chain issues and cost increases). Local ownership is important and Atlin has experienced the community benefits associated with a locally controlled energy system in the Atlin Hydro Project (2009): a clear asset that provides most of the town’s power and is owned, designed, and operated by the Taku River Tlingit First Nation. While there is enthusiasm for electrification (homes, transportation), residents caution that current infrastructure cannot support rapid change. Diesel remains a fallback during peak demand or outages and diesel dependencies are increasing as consumption levels rise. An equity approach, community education, and smart systems were also emphasized and addressing vulnerabilities for aging populations and low-income households will be important. People see energy education as leading to efficient use and stimulating youth interest in energy-related skills and trades.





Key Recommendations

- Expand hydro, battery storage, and solar capacity to reduce diesel dependence and increase self-sufficiency.
- Develop governance or collective representation for energy planning.
- Implement demand-side management and net metering.
- Align electrification goals with infrastructure investment.
- Develop educational programs that foster an equity approach to energy system design, with specific supports for the most vulnerable residents.
- Foster connections and knowledge exchange with remote communities facing similar challenges.

Key Assets & Actors

Atlin is in the Stikine Region and is an unincorporated community, governed by the provincial government. It is unique in its remoteness, which influences the identity of those who live there. One participant stated that "we're here because we love living in Atlin, not to make a bunch of money, or because we have a bunch of money." Residents remain or are drawn to the community for a variety of reasons that go beyond economic opportunities.

"We're here because we love living in Atlin..."

The Atlin Community Improvement District is the only local service provider, established in 1967 to provide services such as fire protection, solid waste disposal, and waterworks. The District extended its boundaries in 2008 to include the Atlin Community Planning Area, through which Atlin represents its interests on land use matters to the Province. Roads, health, and policing are managed by the Province, while other services (e.g., bulk water, recreation, museum) are run by private or local societies. Guiding documents include the Atlin Official Community Plan (1981) and the Atlin Taku Land Use Plan (2011).

The Atlin Community Development Initiative, funded by the Province of BCs Ministry of Housing and Municipal Affairs and Northern Development Initiative Trust, supports planning and economic development strategies in the region. The Atlin Community Advisory Committee (ACAC; comprised of two Taku River Tlingit First Nation appointed representatives, up to three members-at-large, and one Northern Development appointed staff member) provides recommendations for capital spending within the Initiative, based on their knowledge of local circumstances and needs. The Atlin District Board of Trade is also an active governing body for the town.

In the absence of a local government, coordination on energy initiatives in Atlin relies on informal cooperation among local bodies. Taku River Tlingit First Nation (TRTFN) has led innovation in the area and is a leader in Indigenous clean energy generation. They completed a 2.1 MW hydroelectric power-generating facility in 2009, harnessing the streamflow of Pine Creek between Surprise Lake and Atlin Lake. As a 100% Indigenous-owned generating facility, it is a first of its kind in Canada. It was developed and operated by TRTFN, and all Tlingit citizens are shareholders. Xeitl Limited

Partnership (a TRTFN corporation) runs the project, powering the community through a 25-year energy purchase agreement with BC Hydro. They are currently exploring opportunities for the Atlin Hydro Expansion Project through Tlingit Homeland Energy Limited Partnership (THELP), with Yukon Energy as a potential buyer to help meet the Yukon grid's winter renewable shortfall. The project would have an installed capacity of approximately 9.3 MW and would act as own-source revenue for the Nation. Potential mining operations in the region are also possible future customers. Several TRTFN Departments (housing, education, operations and maintenance, etc.) are involved in energy conversations, such as energy retrofits or efficiency upgrades, across the community.

Atlin has a unique micro-climate; its heating degree days metric is higher than Whitehorse, which raises the prospects for cold-climate rated heat pumps. The Surprise Lake hydroelectric system is a clear asset, and the hydrology and waterways of the region are diverse; one participant referred to Atlin Lake as "a climate battery". In terms of local infrastructure, the Atlin Recreation Center is important. It is "the only building in town that the entire community can meet in" and could be "treated as a priority as an example of a net-zero building, as an example to community." Another participant also made note of the public woodlots that exist, and the role that biofuels do and could play in the local energy mix.

BC Hydro has run the diesel generating station since 1978 and is responsible for local grid system maintenance. Some of the incentive behind the forthcoming Community Energy Plan (early 2026) is to encourage more engagement from BC Hydro.

Challenges

Remoteness & Reliability

Atlin is not connected to BC's centralized electricity grid and is an unincorporated community governed by the province (i.e., no regional district). These systemic differences in energy and governance set Atlin apart as a community that must work with remoteness as a part of daily life. It means that there are vulnerabilities specific to their off-grid status, and community members are focused on increasing energy system resilience to alleviate rural uncertainties and capacity challenges.

“When there’s a power outage…they have to call for out- of-town help. They'll send a crew from Dease Lake by helicopter, or they'll send a crew from Whitehorse by truck, but it's often many hours before we can get back online again.”

As a remote community, they do not have the same access to maintenance services as other towns. For instance, “because we’re so small and don’t have a lot of capacity, we can’t support a full-time lineman. When there’s a power outage, whether it is a line strike, a branch, or a raven, we don’t have the local capacity to fix that. They have to call for out-of-town help. They'll send a crew from Dease Lake by helicopter, or they'll send a crew from Whitehorse by truck, but it's often many hours before we can get back online again.” Similarly, they also have issues finding certified professional installers when exploring new technology options.

They have the local expertise at the generating station, but they do not have the crews available to fix issues with power lines. Power outages can be long and dangerous if coinciding with Atlin’s winter temperatures. For example: “If it’s a local problem with the hydro plant or diesel generator, and not with the distribution network, we can probably fix it in half an hour. But sometimes we’re down for much longer. Last year we had an outage that lasted almost a full day because of a windstorm. It does cause hardships. We scrambled to get generators to some of the elders whose homes were getting very cold. We were worried about them. They repaired it that same day. If it had lasted two or three days, it would have been a major issue.”

“The community of Five Mile was out for five days. It became a matter of safety from keeping people warm and keeping people alive. We really paid attention to that.”

Outages and safety are real concerns: “A couple years ago we had three storms. One in November that knocked power, then December, then January. The community of Five Mile was out for five days. It became a matter of safety: keeping people warm and keeping people alive. We really pay attention to that.”

Being at the end of the road means that the community is hit hard when there are supply chain disruptions, and the costs of imported fuels are high and increasing. As stated by one participant, "the energy we use in our vehicles has to come in by truck, and we're reliant on the Alaska Highway to be open so the bulk fuel can come from Edmonton to our communities. There have been times when the highway was closed down. We certainly pay more because of the huge distances fuel has to travel." This costs more but also requires a higher level of planning on the part of residents: "Normal life in Atlin is to spend 10% more than Whitehorse for fuel, because we're remote, and we're in the province of BC with higher taxes. Some people try to get their fuel from the Yukon if they can with tidy tanks, or by filling up your vehicle when you go there. Those are some little nuances of living in such a remote northern community." The dependency that the community has on Whitehorse is seen as a weakness. For instance, there is no building supply store in Atlin; people want to figure out how to make business in a small town feasible and attract enterprises that provide basic goods.

There are also additional responsibilities and pressures that go along with being an 'operating community'. Largely powered by a local and independent power producer (IPP), the relationship between producer and consumer is far different than when working with a centralized grid and BC Hydro. Simply put, "the reality of being an operating community is, it does affect how you relate to energy." There are additional pressures and stresses placed on the service provider when the community knows the owners, operators, and employees personally, and their energy security is ensured by them.

Governance Gaps and Regional Connections

There are local governing bodies (e.g., TRTFN, the Atlin Community Improvement District, and the Atlin District Board of Trade), but in the absence of municipal or regional district government, participants describe it as, "we're disorganized, obviously. We need external help to help us plan." This is one of the major challenges for the community. When asked about how community discussions are coordinated and ideas brought together, there are some clear success stories (e.g., the Atlin Hydro Project), but many lament that there is no collective platform to easily get ideas off the ground. For instance, "Atlin is full of a whole bunch of independent sorts of all stripes. When you talk about community leaders, there isn't really such a thing. We're all just residents here. Some of us have jobs, like running the energy plant or providing a service in town, but we don't have a collective voice at a government level."

“Having a total absence of that means we don't have a planning department, we don't have policies, we don't have bylaws, we don't have forward thinking at the community level about community growth. Those of us that are concerned rely on just getting together, talking about it, and cooperating in various forms.”

This leads several community members to state that cooperation is required in the absence of government, which has taken form as joint initiatives across established bodies: “At the community scale, we've seen joint initiatives between various aspects of the community, often led by either Board of Trade initiative, or Taku River Tlingit initiative, or in some cases the Atlin Planning Commission, the Atlin Community Improvement District. But the ACID has a narrow scope mandate, and they aren’t representing us the way a mayor and council or a municipal government would. Having a total absence of that means we don't have a planning department, we don't have policies, we don't have bylaws, we don't have forward thinking at the community level about community growth. Those of us that are concerned rely on just getting together, talking about it, and cooperating in various forms.”

Collaboration in a small and remote community can be a positive thing. According to one participant, strength comes from “connecting with different small organizations, other Indigenous governments, who have a significant pull when they come together. I’m curious about the possibilities, because usually communities have shared needs, priorities, and outcomes that were looking for.” Still, coming up with agreed upon initiatives is hard and takes time; coordination across a set of organizations needs to be done carefully, “because I think that when you're trying to bring people together, it can be a really vulnerable process, and it can really take a lot more time. I think that it can be hard for folks.” From the TRTFN side, they are seeking wider community support to help move corporate proposals forward.

This also inhibits regional scale dialogue with other communities, even though there is an interest in learning from others. They are asking, “what is the catalyst in other communities?” and indicate that “it would be great to see examples of what other communities coming up with that’s innovative.” Still, they are at a loss with how to engage because they do not have the formal government structures to facilitate nation-to-nation or municipal-to-municipal relationships. Furthermore, it is important to note that planning within TRTFN and on reserve is different than in Atlin and among dispersed rural residents.

Capacity for energy system innovation or efficiency programs is highly varied. There is an impression that shared opportunities between TRTFN and the wider Atlin community exist, but from the perspective of someone who has worked with the TRTFN government, "I have little understanding of the implications of not being in a municipality. I'm aware of it, but I don't fully understand it." There is work to be done to determine if "there's a way to bring together a collective, representing a more significant population, that can allow us to seek some of those benefits of being a municipality, if any are missing." There is still some resistance to new structures of government, given Atlin's history as a destination for those seeking independent and isolated lifestyles, but "there's a small population of people that are looking for that, and there might be a collective that could come together. It doesn't mean giving up rights or benefits of being unincorporated. It doesn't mean making massive sacrifices." There is still a lot of work to be done to facilitate cooperation between Indigenous and non-Indigenous members of the community. In this regard, the Community Energy Plan is described by one participant as an opportunity for cohesion on an issue-based (i.e., energy) topic.

Opportunities & Priorities

Local Ownership

In a community where most energy is provided by an IPP, people are interested in innovative ownership models. Participants stressed the importance of energy systems that are "locally owned, so the profits come home to Atlin and we don't have money leaking out of the community for basic services that we have to buy." They want profits and community benefits to come to Atlin. They are interested in "having control over our own energy in the community. We can't have it cut off due to outside situations, like roads being down and you can't get fuel here, or the fiber optic cable gets cut, or transmission lines between here and Yukon goes down." They are seeking greater control over the energy system so that they are not as vulnerable to the external factors (macro-economic, supply chain disruptions) described earlier in the conversation.

Energy systems that are "locally owned, so the profits come home to Atlin, and we don't have money leaking out of the community for basic services that we have to buy."

Hydropower & Electrification

Atlin has a deep history as a hydro-powered community, with early run-of-river/turbine technology powering the community in the 1920s until the diesel generating station was built in 1978. There is interest in a fully renewable energy powered future, with hydropower at its center and solar power as supplementary, but "the economic side has to be affordable." They also want to see innovative incentive or subsidy models – a pilot program that might provide people with access to product lists, certified installers, and is supported through equity-based financial mechanisms.

"I'd like to see it all being renewable, electricity rather than thermal fuels like diesel. But it has to be affordable."

As stated by one participant: "I'd like to see it all being renewable electricity rather than thermal fuels like diesel. But it has to be affordable...This is something that the community energy plan can help deal with. Is it really cheaper to heat with electricity than diesel today? Ten years ago, maybe not, but today? Today we're paying up to 20 cents a kilowatt hour. 15 years ago, it was 9.5 cents. And diesel has gone up too. I'd love to see it all electric—every home heated with electricity." The phrase "100% renewable" came up several times, and the expectation is that the updated Community Energy Plan will help with making cost comparisons across different energy sources.

They have proven hydropower, but Atlin is seeing demand rise and heightened reliance on the diesel generating station. For one participant, "battery storage is the most exciting thing for me...because it relates to the issue of burning diesel in the north." Moreso, the pace of change in the system is an issue: "What we have now with the IPP is a great system. It's an awesome system. But we are just growing faster than expected on winter load. So, how are we going to power homes? What do we want to see? We'd all like to see renewable energy, but it doesn't happen overnight. That's why people bring in diesel generators. We have to be careful how fast the system grows, because renewable resources take time to develop, whereas a diesel can be brought in within a week if needed, and we'd be relying on diesel again."

“We have to be careful how fast the system grows, because renewable resources take time to develop, whereas a diesel can be brought in within a week if needed, and we’d be relying on diesel again.”

Growth must be managed carefully, while remaining focused on the vision for local ownership: “If we want it to be local, then we have to be careful about the how. How fast do we want to grow this power? Because a big company might come in and throw up three or four windmills and they'll sell to BC Hydro. At this point, BC Hydro will not go beyond what they have now. They will only purchase power from IPPs. We have to manage growth carefully.”

People see the gap between supply and demand increasing significantly in the push to electrify households and transportation. There is discord here, between the technology transitions that are embedded in many provincial policies and regulations, and the hydro expected to power those transitions. For instance, “the province is pushing for more electric heat, but the province isn’t ready to make the world all electric. That’s the problem. There are all sorts of initiatives in Canada, BC, Yukon. Rebates for heat pumps, electric cars, and going green, but we don’t have the power to support it yet. We’re putting the horse in front of the cart on this one. We don’t have the power to power those things.”

There is a push to change consumer habits and technology preferences, but the community infrastructure and supply-side is not ready yet. In the Yukon, for example, “they have all these initiatives to go green, and now they’re bringing in 15 to 20 diesel generators in per year, every year, to support communities while pushing electric initiatives…We're not ready for electric. I understand what this is trying to do—looking toward the future. But the province is pushing very hard to transition to electric, and they’re not putting the money forward.” People are dissatisfied with renewable energy promotion without the infrastructure and investment supports that they see as necessary foundations for change.

Solar is where some community members would like to see capacity expanded. The goal could be to “have enough capacity to do it all with hydro, or supplement with solar panels on roofs...There are ways to potentially divert loads. Solar panels might have been overlooked.” While thinking about how solar and geothermal can supplement the local hydropower plant, community members are excited about electrification, if managed under a long-term vision with stable sources and affordability in mind. As described by one participant, "I also want to reduce transportation energy and drive less. If we were able to have electric vehicles and they charged in a way that didn't put a strain on the system, and it was affordable, I can see that. We can basically turn it from diesel fuel to water running down the hill because of gravity."

An Equity Approach

Many of the vulnerabilities of living in a remote community hurt some members more than others, and the conversation highlighted that inequities are at play. A plan for the community must consider the barriers that different people encounter when trying to think and act differently about energy. As expressed by one participant, "I would like to see the most vulnerable people in the community benefit."

A "just transition plan" would give a social lens to energy in the town. The community wants energy planning that reflects its people's needs: "As our population ages, it's not feasible to go out and cut firewood anymore. So, they rely on electricity consumption and reliability is a primary concern. If the power goes out, those people are in crisis. Especially for elderly folks or communities with vulnerable populations. Reliability impacts different populations differently. Especially communities with different demographics." Income-based rates were suggested as a way to alleviate such vulnerabilities.

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In the absence of a smart energy system, education and use rates were suggested as strategies: "It's community education. Encourage people not to run appliances at peak times, dry their clothes or plug in their car at peak times. Do all that at night and flatten your load. In the ideal world, a smart energy system would manage this." Members referenced financial incentives, education, and target-setting as important steppingstones to embracing electrification.

Youth engagement is also important and was one of the reasons why the school tour was built into the CEA's engagement activities. One participant tells the story of a school tour in 2010, after the hydro project was completed; one of the students now runs the local diesel plant. Engagement and education on the local energy system have an impact: “A local kid goes to school here, and his involvement builds capacity.” Education here is linked to capacity development in the form of skilled workers – greater exposure to energy literacy and hands-on engagement with local projects has the potential to create jobs and retain skills in the community.

Lastly, addressing aging housing infrastructure was described as a priority issue (many homes in the township were built prior to 1970), and home retrofits and efficiencies are necessary. One participant stated that this needs to be government funded and that there needs to be an active representative whose job it is to run retrofit programs. As presented by one participant, “housing infrastructure is the root challenge to address first. Housing infrastructure and efficiency before heat.” Programs that support retrofits for all TRTFN houses, (e.g., through the Community Energy Diesel Reduction Program) and across Atlin, are considered important.