

CITY AND BOROUGH OF SITKA

SUSTAINABILITY

COMMISSION

2024-2025 WORK PLAN



APPROVED BY THE CBS ASSEMBLY ON MARCH 26th, 2024
ITEM 24-039

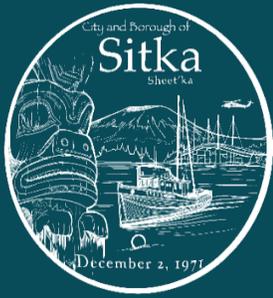


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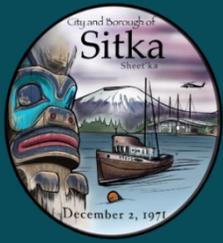
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CITY AND BOROUGH OF SITKA

SUSTAINABILITY COMMISSION

EXECUTIVE SUMMARY

The Sustainability Commission acts as an advisory body to the Assembly with the purpose of catalyzing and developing municipal and community-focused approaches that support the social, environmental, and economic sustainability of the City (SGC 2.31.010).

2023-2024 COMMISSION REQUESTS & ACTIONS

- RECOMMENDED THE ASSEMBLY FUND A SITKA-BASED HEAT PUMP ASSESSOR VIA ALASKA HEAT SMART
- PROVIDED A LETTER OF SUPPORT FOR THE SITKA COMMUNITY GARDEN CONCEPT
- MADE A RECOMMENDATION FOR THE SUSTAINABILITY SEAT ON THE TOURISM TASK FORCE

2024-2025 GOALS

1. CONTINUE THE DEVELOPMENT OF THE SITKA COMMUNITY RENEWABLE ENERGY STRATEGY (SCRES)

CBS was successfully selected as one of nine communities for the third cohort of the U.S. Department of Energy's Energy Transition Initiative Partnership Project (ETIPP) to support the development of the Sitka Community Renewable Energy Strategy (SCRES). The SCRES aims to establish a shared vision of Sitka's energy future to guide energy-related community decisions by shaping a roadmap for community and policy actions that advance the shared energy vision. The scope of the SCRES includes a community-wide greenhouse gas emissions inventory, public energy education, the development of future energy scenarios, and a compilation of community actions and policy recommendations based on continuous community engagement throughout the project. **Updates on the SCRES can be found on the project's website: cityofsitka.com/SCRES**

2. COLLABORATE WITH CITY STAFF ON STRATEGIC MANAGEMENT OF MUNICIPAL SOLID WASTE

While the original 2023-2024 goal intended to identify policy levers and actions to increase waste diversion, new leadership within the Public Works Department requested an alternative approach first be considered: use the strategic management process the City utilizes for asset management approach municipal solid waste (MSW). It was suggested that rather than just staff participating in the process, Sustainability Commissioners also be included. **In January 2024, a small group of City staff and Commissioners convened for an initial meeting to discuss the proposed approach. All were willing to commit to the novel approach and anticipate creating an MSW policy as the first step.**

3. SUPPORT THE ELECTRIFICATION OF THE MUNICIPAL FLEET

The Assembly passed Resolution 22-18: Decarbonize City Operations by 2030. To achieve this directive, this goal has been revised to encompass changes in perspective gained through discussions with the Public Works Department that indicated a formalized plan was unnecessary. This goal now focuses on answering questions and supporting implementation to incorporate the direction given by the Assembly. **Funds available through the Energy Efficiency and Conservation Block Grant Program may be considered to support the accomplishment of this goal.**



THE SUSTAINABILITY COMMISSION

PURPOSE SGC 2.31.010

It is the intent of the Sustainability Commission to work towards catalyzing a healthy community now and in the future by proposing solutions to environmental, social, and economic concerns of the City and Borough of Sitka, its partners, and community members.

DUTIES AND RESPONSIBILITIES SGC 2.31.060 B

The commission will act as an advisory body to the Assembly with the purpose of catalyzing and developing municipal and community-focused approaches that support the social, environmental, and economic sustainability of the city. The commission will accomplish this by working towards the following actions described below:

1. Fossil energy use reduction and development of local, renewable energy sources.
2. Responsible use of natural resources.
3. Diminution of Sitka's supply-chain fragility.
4. Food security enhancement.
5. Sustainable transportation options that leverage Sitka's locally generated, renewable energy sources.
6. Solid waste consumption, reduction, composting, recycling, and re-use.
7. Robust and healthy local ecosystems and natural communities.
8. Other matters as the Assembly or commission may deem beneficial for the city.



REPORTING SGC 2.31.060 B

Annually, the commission will develop, identify, and present goals to the assembly for approval. The approved goals shall be the Commission's primary focus for the following year. Concurrently with presenting goals to the Assembly, the commission will submit a report to the Assembly on progress towards the previous year's goals and other activities which were approved and directed by the Assembly.



MEMBERSHIP

SGC 2.31.010

The commission is composed of seven members appointed by the assembly and, to the extent deemed advisable by the assembly and possible from the applicants, include at least one individual with background or training as a sustainability professional and at least one individual of Alaska Native heritage with understanding and appreciation of the historical importance of sustainability on Tlingit Aaní. All voting members of the commission shall be at-large members and representative of a diverse cross-section of the community.

MEMBERS

Name	About	TERM	
		Apt.	Exp.
Katie Riley <i>Chair</i>	Born and raised in Sitka and graduated from MEHS in 2011, Katie works in policy and community development at the Sitka Conservation Society, fishes Bristol Bay in the summer, serves on the Planning Commission, and was on the Climate Action Task Force.	10/11/22	10/11/24
Auora Taylor <i>Vice Chair</i>	Born and raised in Eagle River on Dena'ina Etnena, Aurora moved to Sitka in 2019 after getting her B.S. in Environmental Science. She works as a fishery biologist and enjoys feeding salmon scraps to her cat, Tundra.	10/11/22	10/11/25
Erik de Jong <i>Secretary</i>	Originally from the Netherlands, Erik permanently moved to Sitka in 2015. He runs a boat charter business that brings scientists and filmmakers to the Arctic and other remote places. Educated as a marine engineer, he has always worked on making ships more efficient.	10/25/23	10/25/26
Elizabeth Bagley	Elizabeth works remotely for Project Drawdown, a climate solutions nonprofit. She uses her experience in education and science to work with community members to find win-win solutions that improve life for Sitkans and generations to come.	10/25/23 10/11/22	10/25/26 10/11/23
Lilli Garza	Lilli is passionate about equity and education and applies that in her job at Sitka Trail Works. Experienced in low-income energy programs, her priority is to ensure all Sitkans are included in the clean energy transition. She loves fishing, hunting, and hiking with family and friends.	11/15/23	11/15/26
<i>Vacant</i>			10/11/24
<i>Vacant</i>			10/11/25

PREVIOUS MEMBERS

Angie Bowers, Kent Barkhau, Carol Voisin, Fernanda Zermoglio
Thank you!

ASSEMBLY LIAISONS

Kevin Mosher
Assembly Liaison

Thor Christianson
Alternate Assembly Liaison

STAFF LIAISON

Bri Gabel
Sustainability Coordinator

bri.gabel@cityofsitka.org
(907) 747-1856



ONGOING COMMISSION RESPONSIBILITIES

In addition to the prioritized goals, the Sustainability Commission has ongoing responsibilities that it will continue to enact throughout the year.

CITY AND BOROUGH OF SITKA SUSTAINABILITY SUPPORT

- Serve as a resource for city staff, other commissions, boards, committees, and task forces.
- As needed, review sustainability proposals and make recommendations during Sustainability Commission meetings.

COMMUNITY ENGAGEMENT

- Engage with community and serve as a liaison for issues, ideas, and proposals, and provide appropriate feedback.
- Cultivate relationships with residents, community groups, businesses, institutions of higher learning, faith-based organizations, non-governmental organizations, etc. to provide insight on current and future projects.

COMMISSION REQUESTS & ACTIONS

RECOMMENDED THE ASSEMBLY FUND A SITKA-BASED HEAT PUMP ASSESSOR VIA ALASKA HEAT SMART (AHS)

In April 2023, AHS requested a \$10,000 contribution from CBS to fund the Sitka-based home energy assessor position to support roughly 50 assessments for Sitka homeowners. **The Sustainability Commission unanimously supported the request and recommended the Assembly contribute \$10,000 to support the AHS Sitka Home Assessor position. Currently, the recommendation awaits two Assemblymember sponsors to take the recommended request to Assembly for full consideration.**

AHS has shifted \$100,000 of its \$500,000 Clean Heat Incentive Program (CHIP), funded by DOE, to Sitka to provide between \$1,500 and \$2,500 cash incentives to lower-to-modest income families to support heat pump conversions. \$21,000 in incentives have been paid out with \$14,000 in incentive payments awaiting agreements.

Prior to receiving an incentive, prospective recipients must receive an AHS home energy assessment to determine home readiness. A typical assessment costs \$250 but are currently free to those who qualify. AHS has facilitated this in Sitka by hiring a local resident as a 'home energy assessor', funded via private foundation money and a match from the Sitka Conservation Society. Approximately 30 energy assessments have been conducted over the past eight months. Assessor funding is anticipated to run out by fall of 2024.

PROVIDED A LETTER OF SUPPORT FOR THE SITKA COMMUNITY GARDEN CONCEPT

In April 2023, the Commission drafted a letter of support for the development of a community garden requested by the Sitka Local Foods Network and Transition Sitka. Citing that a community garden aligned with the duties and responsibilities of the Sustainability Commission, including 3) diminution of Sitka's supply-chain fragility, 4) food security enhancement, 6) solid waste consumption reduction, composting, recycling, and reuse; and 7) robust and healthy local ecosystems and natural communities (SGS 2.15.060), as well as the city's five-year strategic plan and the comprehensive plan, **the Commission drafted and unanimously approved a letter of support for the community garden concept.**



MADE A RECOMMENDATION FOR THE SUSTAINABILITY SEAT ON THE TOURISM TASK FORCE

With the establishment of the Tourism Task Force in March 2023, Resolution 2023-11 stated that Sustainability shall recommend a member for appointment. **The Sustainability Commission unanimously recommended the Assembly appoint Barb Bigham to the Tourism Task Force.**

2023-2024 GOALS

On March 28th, 2023, Chair Riley presented the 2023-2024 Work Plan to the City Assembly and summarized the evolution of municipal climate and sustainability initiatives over time, steps involved in prioritizing actions, and the goals the Commission aims to achieve. Assemblymembers and members of the public voiced their support, expressed that the goals were attainable and appreciated the ranked approach to the goals. It was noted by Chair Riley that these goals would likely take multiple years to accomplish. The City Assembly unanimously approved the goals outlined in the Sustainability Commission's 2023-2024 Work Plan (Item 23-046). **The goals set forth by the Commission included:**

1. DEVELOP A COMMUNITY RENEWABLE ENERGY STRATEGY

A Community Renewable Energy Strategy will establish a shared vision of Sitka's energy future. Components of the strategy could include but are not limited to refreshing the existing baseline assessment of community emissions; forecasting energy demands and identifying priority actions; recommending feasible renewable energy options for the city to pursue, and municipal policies for consideration to increase efficiency, such as electrifying heating and land/marine transportation.

2. ANALYZE OPPORTUNITIES FOR DIVERSION OF MUNICIPAL SOLID WASTE

The current waste management contract is slated to be renewed in 2032. In order to ensure that Sitkans' waste is managed sustainably, with lower costs and fewer resulting greenhouse gas emissions, this project will identify policy levers and actions to increase waste diversion and support the long-term sustainability of Sitka. Aligned with the 2014 Interim Solid Waste Management Report, this project seeks to conduct a baseline assessment of the composition of municipal solid waste.

3. CREATE A MUNICIPAL FLEET TRANSITION & EV INFRASTRUCTURE PLAN

The City of Sitka has vowed to decarbonize city operations, which includes integrating electric and hybrid vehicles into the municipal purchasing and procurement schedule as gas/diesel-powered vehicles reach their maximum mileage or age. This plan will also help address questions, concerns, and logistics related to transitioning municipal vehicles and strengthen Sitka's ability to apply for federal EV charging infrastructure funds.

UPDATING THE GOALS FOR 2024-2025

The goals for the upcoming year support the same objectives as the 2023-2024 goals but have been reworked to reflect the updates within CBS and the evolution of the operational and feasibility landscape around each goal in the past year. Similarly, the goals will be approached sequentially with the Commission's full effort into the highest prioritized goal until there is a lull. **The Sustainability Commission unanimously approved the following updated goals at their March 4th, 2024, regular meeting.**



1. CONTINUE THE DEVELOPMENT OF THE SITKA COMMUNITY RENEWABLE ENERGY STRATEGY

SUPPORTS:



Fossil energy use reduction and development of local, renewable energy sources.



Responsible use of natural resources



Robust and healthy local ecosystems and natural communities.

SUMMARY: CBS was successfully selected as one of nine communities for the third cohort of the U.S. Department of Energy's Energy (DOE) Transition Initiative Partnership Project (ETIPP) to support the development of the Sitka Community Renewable Energy Strategy (SCRES). The SCRES aims to establish a shared vision of Sitka's energy future to guide energy-related community decisions by shaping a roadmap for community and policy actions that advance the shared energy vision. This City-led project, heavily supported by the Sustainability Commission, works in collaboration with energy experts at the National Renewable Energy Lab (NREL), Pacific Northwest National Lab (PNNL) and the Renewable Energy Alaska Project (REAP). The SCRES is funded through the ETIPP program and the Sustainability Coordinator's time.

INVOLVED DEPARTMENTS: Planning & Community Development, Electric

MILESTONES & ACCOMPLISHMENTS:

Recommended Approval of Resolution 23-18: Authorize the Municipal Administrator to Apply for the National Renewable Energy Laboratory's (NREL) Energy Transitions Initiative Partnership Project (ETIPP)

As part of the 2023-2024 Work Plan, the Commission recommended the City pursue a second round of technical assistance through the ETIPP project. The Assembly unanimously approved the resolution. This resolution also acted as the Assembly's support for the application. The Sustainability Coordinator prepared the application materials for submittal.

Assisted with Additional Stakeholder ETIPP Application Support

As required by application for the ETIPP program, additional stakeholders were required to be identified and letters of support submitted. Per the recommendation of the regional partner, supporting stakeholders for CBS's application were limited to the Sitka Tribe of Alaska (STA), CBS Electric Department, the Sustainability Commission, and the Assembly (via Resolution 23-18).

The Sustainability Coordinator and Chair Riley presented the project to STA's Natural Resource Projection Committee, who recommended approval. The Tribal Council subsequently approved.

Gathered Community Input for the Scope of Work

To help refine the scope of work, a survey was conducted that introduced participants to SCRES and help the technical team answer the following guiding questions:

- 1a.** What are the gaps in the community's understanding of Sitka's energy landscape?
- 1b.** What are gaps in the community's energy knowledge that inhibit informed decision making?
 - 2.** What are the best ways to increase understanding and share energy knowledge with the community?
 - 3.** What values does the community want to guide the development of SCRES?

The survey ran from November 28, 2023, to February 29, 2024, and gathered 152 responses. The executive summary of the results is in Appendix A.



Hosted a Technical Team Kickoff Meeting & Introduced Them to Sitka

In December, the ETIPP Technical Team visited Sitka to attend to meet the Sustainability Commission, attend their regular meeting, initialized community outreach, and familiarized them with Sitka.



Photo: As an icebreaker for SCRES, the Sustainability Commission hosted the Ginger-Build: an energy education event and competition to build energy-efficient gingerbread houses. Commissioners, their families, the technical team, and the public casually learned and enjoyed energy in its most delicious form: sugar.

Recommended Approval of Scope of Work for the SCRES

The scope of the SCRES was recommended to include a community-wide greenhouse gas emissions inventory, public energy education, the development of future energy scenarios, and a compilation of community actions and policy recommendations based on continuous community engagement throughout the project (Appendix B). The scope was approved by CBS in February 2024.

NEXT STEPS:

With the scope of work finalized, the SCRES has transitioned into the execution phase, anticipated to take place over the next 18 months. The Sustainability Commission forms ad hoc working groups to support specific requests and/or topics the technical team requires to begin planning and executing the full project. The technical team works closely with the Sustainability Coordinator to ensure that critical materials and questions are brought before the Commission at their regular meetings to provide their input, ensure alignment with the needs of the Sitka, and make recommendations to ensure the project remains community focused.

Updates on the SCRES can be found on the project's website: cityofsitka.com/SCRES



2. COLLABORATE WITH CITY STAFF ON STRATEGIC MANAGEMENT OF MUNICIPAL SOLID WASTE

SUPPORTS:



Solid waste consumption, reduction, composting, recycling, and re-use.



Responsible use of natural resources



Robust and healthy local ecosystems and natural communities.

SUMMARY: Off to a slow start due to lack of consolidated data and new City staff, goal 2 has only recently made significant progress. While the original goal intended to identify policy levers and actions to increase waste diversion, new leadership within the Public Works Department requested an alternative approach first be considered. Using the asset management program the City utilizes to strategically approach municipal solid waste (MSW), it was suggested that rather than just staff participating in the process, Sustainability Commissioners also be included. In January 2024, a small group of City staff and Commissioners convened for an initial meeting to discuss the proposed approach.

INVOLVED DEPARTMENTS: Planning & Community Development, Public Works

MILESTONES & ACCOMPLISHMENTS:

Convened for a Municipal Solid Waste Strategic Management Kickoff

In January 2024, the Public Works Director, Maintenance and Operations Superintendent, Sustainability Coordinator and the Sustainability Commission's Municipal Solid Waste Working Group convened to discuss the approach proposed by Public Works and to answer questions about the process as the endeavor was a new approach neither CBS nor the Commission had attempted before. However, with emphasis on the need for flexibility, understanding, and reflection throughout the collaboration, all were willing to commit to the novel approach.

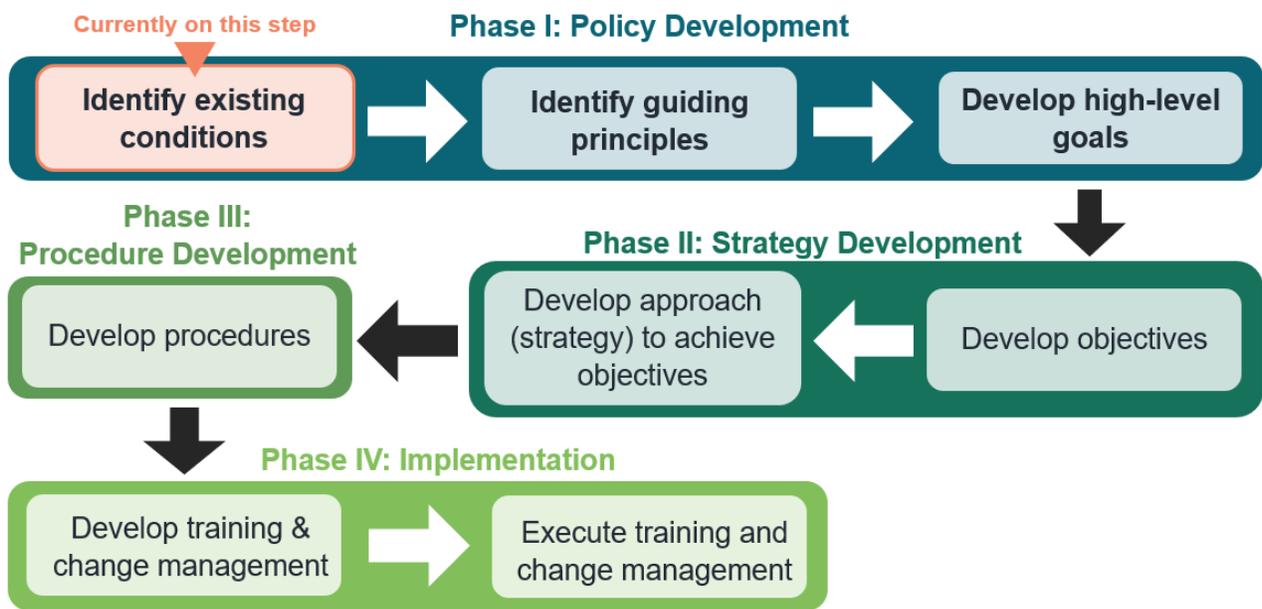


Figure 1: An outline of the strategic management steps. The team will collaborate through Phase I and create a policy that will inform Phase II: Strategy Development



NEXT STEPS:

Collaboratively Develop a Municipal Solid Waste Management Policy

The group will follow the steps outlined in Phase I of strategic management development (Fig. 1). City staff and the working group will split into parallel workstreams to delineate CBS and public perspective before coming back together to form a draft policy deliverable (Fig 2). Commissioners will inform staff when and where the full Sustainability Commission's and public's input should be sought.

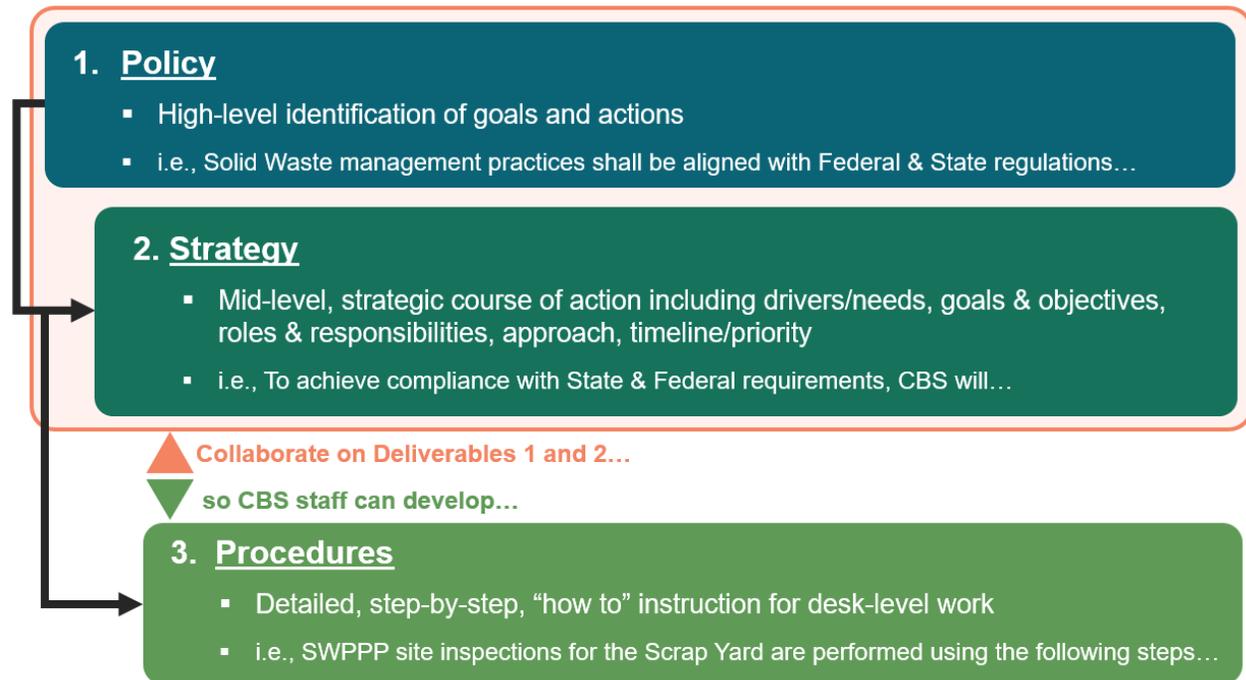


Fig 2: Deliverables of each phase of the strategic management process and how each informs more specific actions. The proposed approach is to collaborate on creating deliverables from Phases I and II to CBS staff can then create procedures for specific aspects of MSW.

Evaluate the Collaborative Policy Development Process

After completing the MSW policy deliverable, the group will review the process and determine if and how it should be continued or modified, and where Commission involvement is ideally leveraged and how CBS can apply the lessons learned elsewhere. If determined to be beneficial, they will continue onto Phase II and develop a strategy (Fig. 1 & 2).

Consolidate Data

A major inhibitor to progress during the first year of this goal was the disaggregation of data and the inherent complexity of the system that currently handles solid waste. The Sustainability Coordinator and the Maintenance and Operations Superintendent will work together to develop a system that will allow for comprehensive tracking weights collected, ships, composition, and associated costs. This will allow for information about solid waste to be communicated and utilized further into the asset management process.

Learn From Other Municipalities About Potential Solid Waste Management Strategies

As an islanded community, Sitka's MSW is currently shipped to Washington State where it is landfilled. Other communities, often equally if not more isolated, manage their MSW similarly along with some other approaches. Similarly, looking at municipalities with robust solid waste management systems may provide helpful insight into what might be possible in how CBS manages MSW. Understanding these in more detail to determine applicability to Sitka will further determine potential options for Sitka's MSW when its current contract expires in 2032.



3. SUPPORT THE ELECTRIFICATION OF THE MUNICIPAL FLEET

SUPPORTS:



Sustainable transportation options that leverage Sitka's locally generated, renewable energy sources.



Fossil energy use reduction and development of local, renewable energy sources.



Robust and healthy local ecosystems and natural communities.

SUMMARY: The Assembly passed Resolution 22-18: Decarbonize City Operations by 2030. Integrating electric and hybrid vehicles into the municipal purchasing and procurement schedule as gas/diesel-powered vehicles reach their maximum mileage or age is a required step to achieve this directive. Over the past year, the Sustainability Coordinator collected questions, conducted research, and addressed concerns from City staff regarding this transition. This goal has been revised to encompass changes in perspective gained through discussions with the Public Works Department, which indicated a formalized vehicle transition and infrastructure plan was unnecessary. The goal now focuses on answering department questions, identifying funding resources, and supporting the implementation of the direction given by the Assembly.

INVOLVED DEPARTMENTS: Planning & Community Development, Electric, Public Works

MILESTONES & ACCOMPLISHMENTS:

Purchased the First Municipal Electric Vehicle

CBS purchased an Electric Transit van in 2023 for janitorial use. While a small step, the purchase allows City staff to familiarize themselves with EVs and test their use in a low-risk task while gathering valuable data that can inform future conversion and use scenarios.

Prepared a Cost-Benefit Analysis for the Ford F150 and F150 Lightning

When a Ford F150 in the Harbors Department was approaching the end of its useful life, the Sustainability Coordinator approached staff that depended on the truck to gather questions and concerns about potentially switching to an electric truck. These questions were answered and compiled and the lifetime cost per mile was calculated (Fig 1, Appendix C) The results of the analysis showed that F150 Lightning could replace an internal combustion engine (ICE) F150 during typical use with minimal disruptions to operations. Despite a larger upfront investment, because the electric utility is owned by CBS, benefits were amplified as not only is electricity cheaper than gasoline, it also is functionally cost neutral to the municipality.

Although the Harbors truck was not replaced with an EV, it was not replaced with an ICE either. Instead, a low use vehicle was reassigned to the dept. This reduced the overall size of the CBS fleet by best utilizing its current assets and will allow for more strategizing before purchasing more EVs.

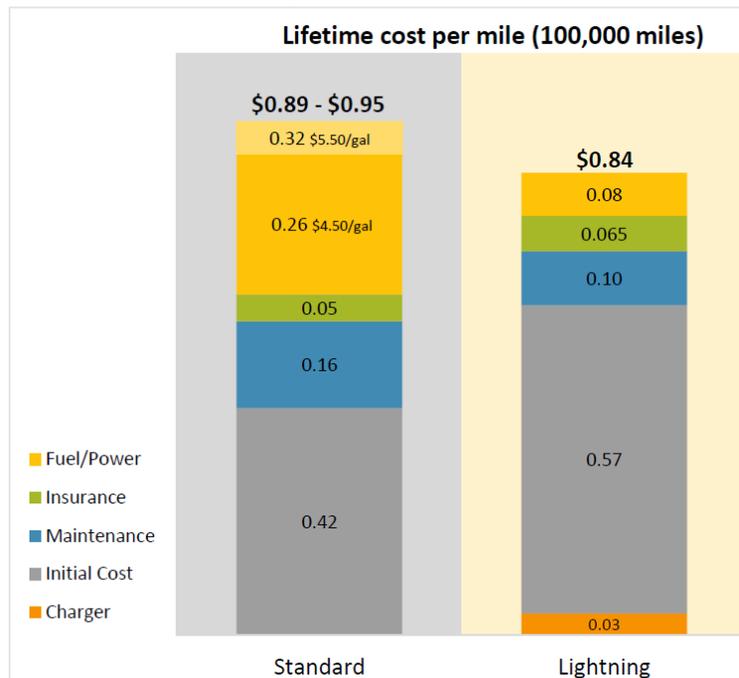


Fig 1: Lifetime Cost per Mile of a Standard (ICE) F150 and F150 Lightning for CBS. Full comparison report can be found in Appendix C.



NEXT STEPS:

Gather Feedback on E-Transit Van

With staff usage of the aforementioned E-Transit van, gathering feedback from those that have used the vehicle the most will be useful in forming recommendations for fleet conversion. While initial Cost Benefit Analysis for the F150 Lightning was informed only by questions posed by the Harbor Department, understanding real-world use of an EV for CBS use will likely uncover more concerns and questions to be answered to build confidence in the technology and the ability to transition.

Identify Conversion Candidates Within the Current Municipal Fleet

The makeup of CBS's municipal fleet ranges from light duty commuter vehicles to heavy duty snowplows and fire trucks. Depending on each use case scenario, available EVs, and scheduled replacement of the vehicle, upcoming replacements may be suitable candidates for conversion. However, no formal recommendation based on these criteria has yet to be adopted. Understanding the composition of the fleet and its use in more detail will be critical for the Sustainability to make these recommendations to CBS for fleet vehicle replacement.

Continue to Watch the EV Landscape and Identify Potential Challenges to Conversion

With the development and rapid adoption of electric vehicles across the country, supply chain issues and changes in regulations in response to Lithium-Ion batteries have developed equally rapidly. To understand the full cost of conversions and how regulations and availability may influence the pace at which CBS transitions will be critical to avoid anticipated costs or unforeseen challenges from acquisition to disposal. The Sustainability Commission along with the Sustainability Coordinator will work to keep careful watch of the developing EV landscape as they prepare formalized transition recommendations.

Recommend Use for the Energy Efficiency and Conservation Block Grant Program Award

As part of the Energy Efficiency and Conservation Block Grant (EECBG) Program, a formula-based allocation of \$75,300 is available to CBS to assist the implementation of strategies that:

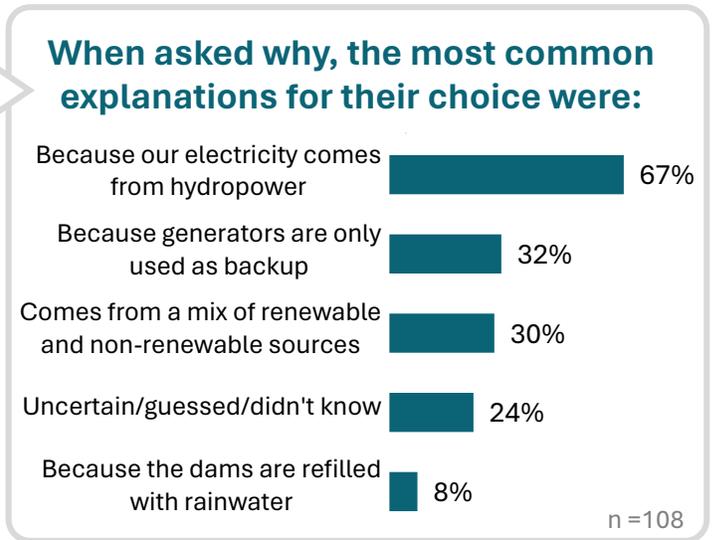
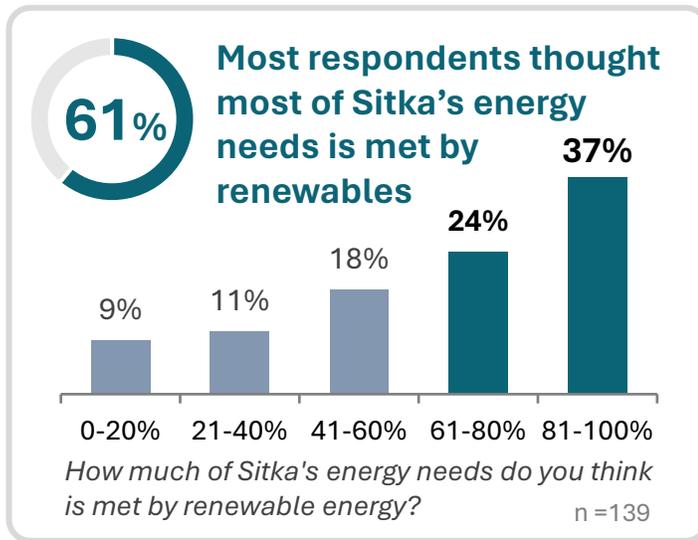
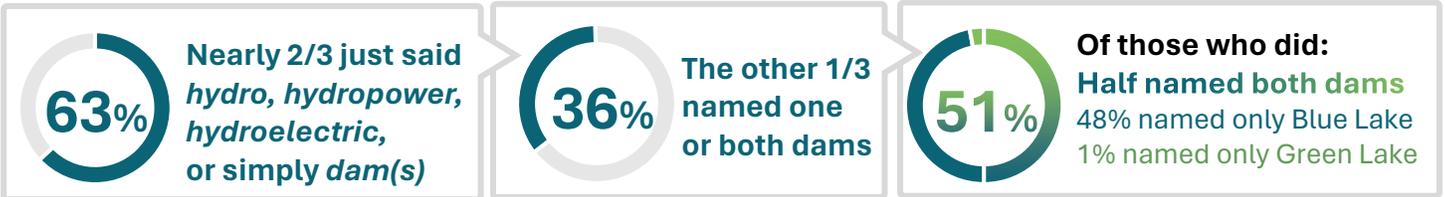
- Reduce fossil fuel emissions in a manner that is environmentally sustainable and, to the maximum extent practicable, maximizes benefits for local and regional communities;
- Reduce the total energy use of the municipality;
- Improve energy efficiency in the transportation sector, the building sector, and other appropriate sectors;
- Build a clean and equitable energy economy that prioritizes disadvantaged communities and promotes equity and inclusion in workforce opportunities and deployment activities, consistent with the Justice40 Initiative.

The use of these funds is broad and can support a variety of initiatives. As such, the Sustainability Coordinator is developing a list of potential uses that align with the CBS strategic goals, current staff capacity and needs, and that are feasible with the allotted funding. This list will be reviewed by the Sustainability Commission and a recommendation made for the use of the EECBG funds before it is taken to Assembly for approval and submittal by staff. The deadline for the EECBG application is April 30, 2024; once approved by DOE, the EECBG funds must be used within two years.

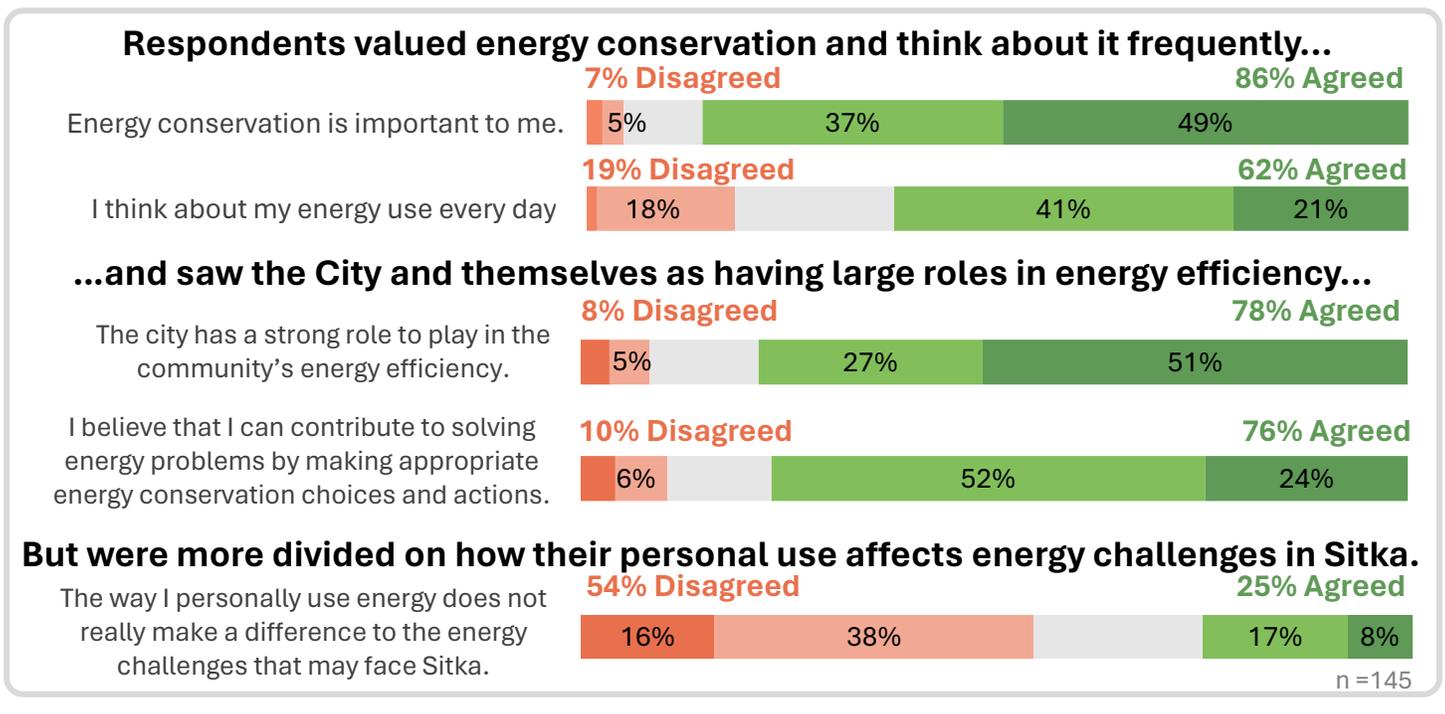


Sitka Community Renewable Energy Strategy Community Scoping Survey Report EXECUTIVE SUMMARY

When asked to describe where Sitka's electricity comes from in one sentence...



Most questions asked were about the operations and infrastructure of Sitka's electric grid (50%).



Common themes from open-ended comments were:

Affordability | Reliability | Self Sufficiency & Independence | Energy Efficiency
| Transparency | Environmental Responsibility

ETIPP Technical Assistance Project Scope

Community: Sitka, AK

Project Title

Sitka Community Renewable Energy Strategy (SCRES)

Points of Contact

Below are the individuals who can be contacted to obtain information about any aspect of the project. If the people below do not have an answer, they can ask the people who do.

- **Community Representative:** Bri Gabel, Sustainability Coordinator, City and Borough of Sitka, bri.gabel@cityofsitka.org
- **Regional Partner:** Haleigh Reed, Microgrid Project Manager, Renewable Energy Alaska Project, hreed@realaska.org
- **Technical Lead:** Molly Grear, Environmental Engineer, Pacific Northwest National Laboratory, molly.grear@pnnl.gov

Background

Community

The City and Borough of Sitka (CBS) is a remote community off the southwest coast of Alaska, accessible only by boat or plane. As a self-sustaining grid, Sitka relies almost entirely on local hydropower generated at the Green and Blue Lake dams and uses diesel as needed.

ETIPP Project Summary

The ETIPP program is a multi-organizational collaboration to provide technical assistance to Sitka for energy assessments, greenhouse gas inventories, and assist in public outreach and energy education. These projects aim to provide critical expertise in engineering, grid resilience, and energy use to understand current use, future needs, and options for meeting those needs. Sitka was part of the ETIPP Cohort 1 in 2021 which focused on renewable energy assessments in the area and is now participating in cohort 3, a more directed effort to expand public awareness around their energy use, gather public input on strategic vision, and explore opportunities for expanding and strengthening their power generation profile long-term.

Goals & Anticipated Impacts

- Establish a shared vision of Sitka's energy future to guide energy-related community decisions.
- Shape a roadmap for community and policy actions that advance the shared energy vision.

Other Key Community Contacts

Name	Title	Email
City and Borough of Sitka (CBS)		
Amy Ainslie	Planning & Community Development Director	amy.ainslie@cityofsitka.org
Melissa Henshaw	Public & Government Relations Director	melissa.henshaw@cityofsitka.org
Mike Schmetzer	Interim Electric Utility Director	mike.schmetzer@cityofsitka.org
John Leach	Municipal Administrator	john.leach@cityofsitka.org
CBS Sustainability Commission		
Katie Riley	Chair	katie.really@gmail.com
Sitka Tribe of Alaska		
Gerry Hope	Transportation Director	gerry.hope@sitkatriben-sn.gov

Implementation: Activities and Deliverables

Activity 1: Community Engagement

Pacific Northwest National Laboratory (PNNL) will assist the City and Borough of Sitka (CBS) in the development and implementation of a multifaceted approach for public engagement in Sitka while reviewing energy status, needs, energy potential, and scoping of future energy goals as they are developing the Sitka Community Renewable Energy Strategy (SCRES). This effort aims to utilize surveys, in-person events, and educational outreach materials to increase energy literacy in the community and engage as many perspectives as possible to inform a community vision for renewable energy. Community engagement will include development of scenarios to be analyzed in Activity 4.

The precise nature of what events, methods, and objectives in this process will be determined alongside the community throughout the project. As this process progresses, PNNL will provide analysis of the community’s energy portfolio or potential opportunities to inform community visioning and decision making, as well as support in facilitation and community engagement.

Deliverables:

- 3-4 site visits, including workshops, events, and working meetings
- Analysis to support data driven decision making for the community

Activity 2: Energy Education

PNNL will partner with REAP and CBS to provide materials and events to increase the energy literacy of the community. At least 4 topic areas of focus will be developed around energy education and grid resilience. These may include but are not limited to: renewable energy basics, Sitka energy grid 101, rate demystification, and a history of hydropower in Sitka. PNNL will provide analysis to support energy education on these topics, as well as instruction or trainings in collaboration with REAP and CBS. Energy education topics will be aimed at multiple demographics, including school age and the public, throughout the project.

Deliverables:

- Learning material posted to SCRES website
- On site education events

Activity 3: Greenhouse Gas Emission Inventory

PNNL will develop an updateable Greenhouse Gas Inventory. The inventory will include sources of emissions shown in the following table.

Proposed GHG Included Sectors		
SCOPE 1		
Sector	Details	Potential Data Source*
Electricity Consumption	Utility owned by the municipality	Total electricity generated from the utility annually, with percentage of diesel generation.
Heating Oil Combustion	Fuel is imported to Sitka	Total heating oil imported annually to Sitka from gas station data, with assumption on % that goes to heating.
Land Transportation	Include cars, trucks, buses, snow mobiles	Total gasoline and diesel sold annually at gas station with assumption on % to land transportation. Alternatively, utilizing NEI data.
Water Transportation	Ferries, boats that leave and return to Sitka	Total gasoline and diesel sold annually at gas station with assumption on % to water transportation. Use database of registered vessels and their approximate uses.
Wastewater	Wastewater treatment plant is owned by the municipality	Total gallons of wastewater treated annually.

Sitka, AK ETIPP Technical Assistance Project Scope

SCOPE 3		
Sector	Details	Potential Data Source*
Waste	Exported through shipping to Washington	Total tons of waste shipped to WA. Estimated break down on waste type by percentages
Air Travel	Flights to and from Sitka	# of flights in/out of Sitka, with estimates of fuel consumption on trip
Marine Travel	Included shipping materials such as heating oil, food, and consumer products to Sitka, as well as tourism passenger vessels	# of barges in/out of Sitka with estimates of fuel consumption on trip

**Potential data sources may change after discussion and availability of data.*

Geographic boundaries of each sector will be further defined during the implementation of the inventory.

PNNL will also develop a case study to dive deeper into specific industry or industries and to understand the seasonality of GHG emissions.

Deliverables:

- Report detailing GHG Inventory Assumptions and methods
- Excel spreadsheet that can be updated for future year's inventory

Activity 4: Development of Community Renewable Energy Strategy

PNNL will assist in the development of the final SCRES document outlining the vision for the community's energy future. PNNL may provide inputs on the document, such as background data analysis about the community's energy portfolio, baseline GHG inventory, results of community engagement work, and modeling potential future energy scenarios for Sitka.

In the process of scenario and strategy development, PNNL will provide policy actions and recommendations to CBS.

PNNL will co-produce the strategy document, contributing significantly to the writing of the strategy, but CBS is ultimately responsible for the publication of the final strategy document. PNNL will continue engagement with the city and the strategy process through the publication of the document.

Deliverables:

- 3-4 future energy scenarios and energy generation mix

Sitka, AK ETIPP Technical Assistance Project Scope

Schedule:

The Period of Performance for this effort is 18 months

Activity	Description	2023			2024			2025	
		Q4	Q1	Q2	Q3	Q4	Q1	Q2	
0	Scoping								
1	Community Engagement								
1.1	Survey & Analysis								
1.2	Site Visits								
1.2	Analysis to support community engagement								
2	Energy education								
2.1	Development of education material								
2.2	On site events								
3	GHG inventory								
3.1	Data Collection								
3.2	Creating inventory of								
3.3	Community training on reusable spreadsheet								
4	Community Energy Strategy								
4.1	Scenario Planning								
4.2	Strategy Document								

Sitka, AK ETIPP Technical Assistance Project Scope

Signatures:



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Gabel
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2/6/24

Community Lead, CBS

Date

John M.
Leach

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M. Leach
Date: 2024.02.08
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2/8/24

Municipal Administrator, CBS

Date

Haleigh
Reed

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Haleigh Reed
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2/13/24

Regional Partner

Date

Molly E
Grear

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Technical Lead

Date

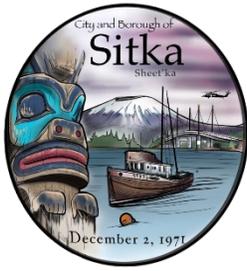
David
Martinez Biro

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ETIPP Regional Lead

Date



Ford F150 vs. F150 Lightning Lifetime Cost-Benefit Comparison for the City and Borough of Sitka

Prepared By: Bri Gabel, Sustainability Coordinator | August 2023

Executive Summary:

The City and Borough of Sitka (CBS) is committed to thoroughly investigating electric alternatives to strategically transition its municipal fleet from carbon-based fuels by 2030 as outlined in Resolution 2022-18. With an unprecedented amount of funding available through the federal government, the vehicle landscape will rapidly evolve over the next decade to include higher performing electric and alternative fuel vehicles. As such, it is in CBS’s best interest to comprehensively evaluate each option as vehicles are scheduled to be replaced in the coming years. While EVs have become significantly more affordable, they still require significant upfront costs, and the performance comparison and total lifetime cost is not immediately clear. This report examines the replacement of CBS truck #437, a 2014 Ford 150, with either an internal combustion engine (ICE) F150, a F150 Lightning Standard Pro, or F150 Lightning XLT Extended Range. Although this report uses specific driving data from truck #437, the CBS municipal fleet includes twenty F150s, or 15% of its vehicles, and many comparisons can likely be applied to other F150s in use.

Conversion Stipulations and Questions:	Yes	No
Does it have the same or better specifications than an ICE?	✓	
Does it save money over its entire life?	✓	
Are the range and charging requirements compatible with the expected workload?	✓	
In case of a catastrophic battery failure, is replacement covered?	✓*	
Can it be used in cold weather?	✓	
Is a hybrid F150 an option?		✗
Should CBS upgrade to the extended range?		✗

Total Cost of Ownership:

Ford F150 ICE XL 3.3L V6	Ford F150 Lightning Standard Pro	Ford F150 Lightning XLT Extended Range
\$89,000-\$95,000	\$76,000	\$86,000
\$25-27,000 on gas	↓13-18%	↓4-9%
More than 1/3 is the cost of fuel	Less than an ICE	Less than an ICE

Both the F150 Lightning Standard and Extended Range cost less over their lifetime than an ICE F150.

Conclusion:

Over the lifetime of the vehicle, the F150 Lightning does offer substantial savings between 4-18%. The largest contributing factor to this is the price of gasoline. With minor adjustments to workflow, the Ford F150 Lightning Standard Range should be a comparable replacement for truck #437 while reducing overall lifetime cost for CBS.

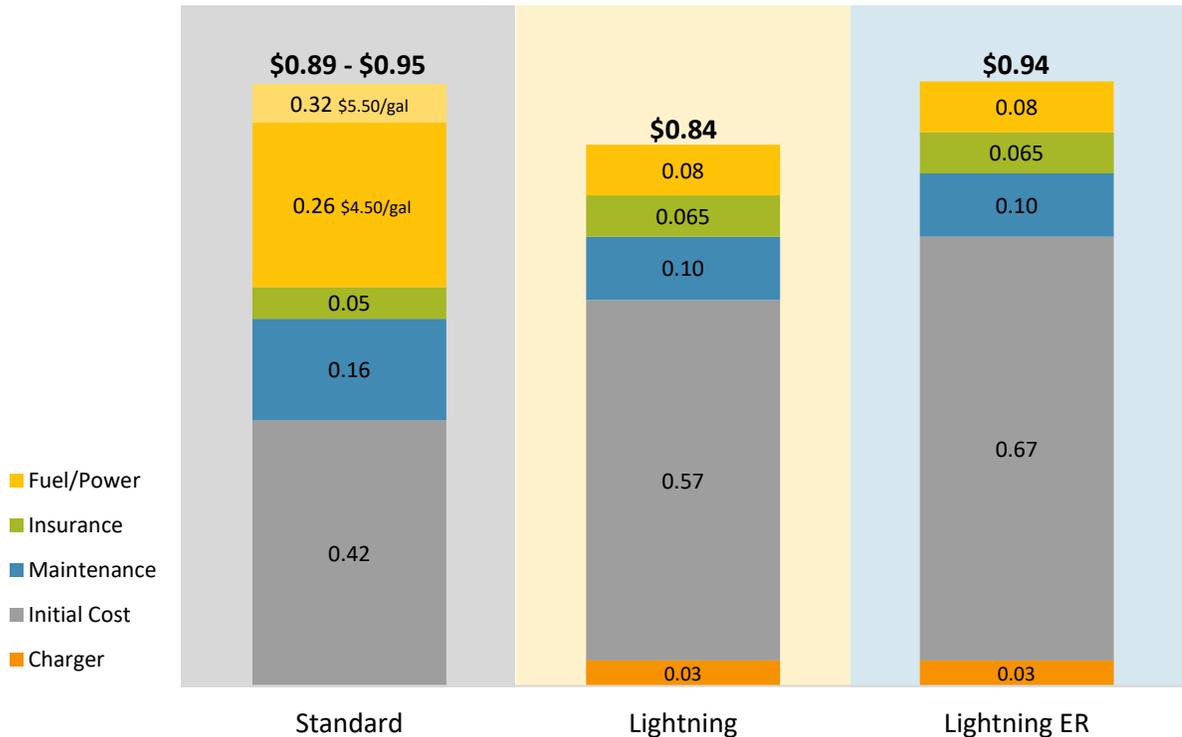
*See page 4

Truck Replacement Options

Model	Ford F150	Ford F150 Lightning	Ford F150 Lightning
	ICE XL 3.3L V6	Standard Pro	XL Extended Range
Specifications			
Drive Train	4x4	4x4	4x4
Fuel Economy	City 18/Hwy 24	City 76/Hwy 61	City 78/Hwy 63
Range	494-592 miles	240 miles	320 miles
Seating	6	5	5
Tow Rating	7,600 lbs	5,000/ 7,700 lbs (max tow package)	7,700/ 10,000 lbs (max tow package)
Horsepower	290 @ 5500 RPM	462 HP	580 HP
Torque	400 @ 5500 RPM	775 lb-ft	775 lb-ft
Battery		98 kWh	131 kWh
Chargers and Time		From 15% to 100% 8 hrs	From 15% to 100% 8 hrs
48A		19 mi/hr	20 mi/hr
80A		19 mi/hr	30 mi/hr
Price Comparison*			
Starting Price	\$43,000	\$62,000	\$72,000
Max Tow Package		\$,1,100	\$1,100
Charger (48A/80A)		\$1,400 / \$2,000	\$1,400 / \$2,000
Shipping			
Federal Tax Credit		-\$7,500	-\$7,500
Total Cost	\$43,000	\$55,900-\$57,600	\$65,900-67,600

*Based on research data, not quoted from a dealer.

Lifetime cost per mile (100,000 miles)



Assumptions and Metrics:

All Calculations were based on the 10 year or 100,000-mile replacement schedule that CBS unofficially follows and for simplicity, 10,000 annual miles was used as the baseline number for future vehicle use. Additionally, this baseline is the most commonly used within studies and allows for simple carryover.

Fuel Consumption for the internal combustion engine (ICE) F150 was only calculated at the city estimate of 19 mpg as there are no substantial highways in Sitka that would allow for the vehicle to consistently reach its 24 mpg highway efficiency rating¹. The Ford F150 Lightning has the efficiency of 49 kWh/100 miles¹.

Gasoline Price for CBS averaged at \$4.47 per gallon in FY23. For simplification, \$4.50 was set as the lowest gas price. To account for volatility in oil prices, \$5.50 per gallon was also included to provide a top end of the range. Likely, these estimates will prove to be too conservative over a ten-year span.

The Electrical Rate was set at 18.5¢/kWh which is the average seasonal rates for FY23 which are 13.4¢/kWh November-April and 21.5¢/kWh May-October.

Maintenance Costs were \$0.16 for the conventional ICE F150 and \$0.10 for the Lightning battery electric vehicle (BEV) based on new 2023 data². On average, EVs cost 40% less to maintain.

It should be noted that these do not necessarily reflect the actual cost of maintenance to CBS or any price increases due to its remote location. However, since CBS vehicles are used less than their contiguous U.S. counterparts, it is likely safe to assume that frequency these repairs in which maintenance needs to be conducted is also less, offsetting the increased initial cost with the time interval in

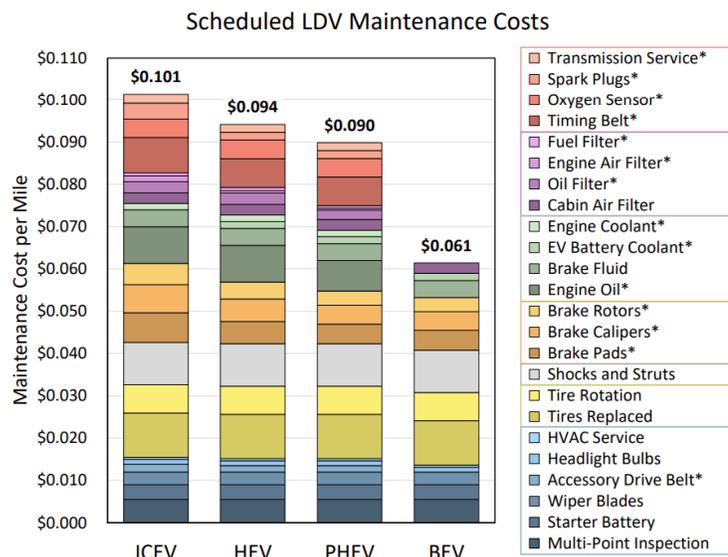


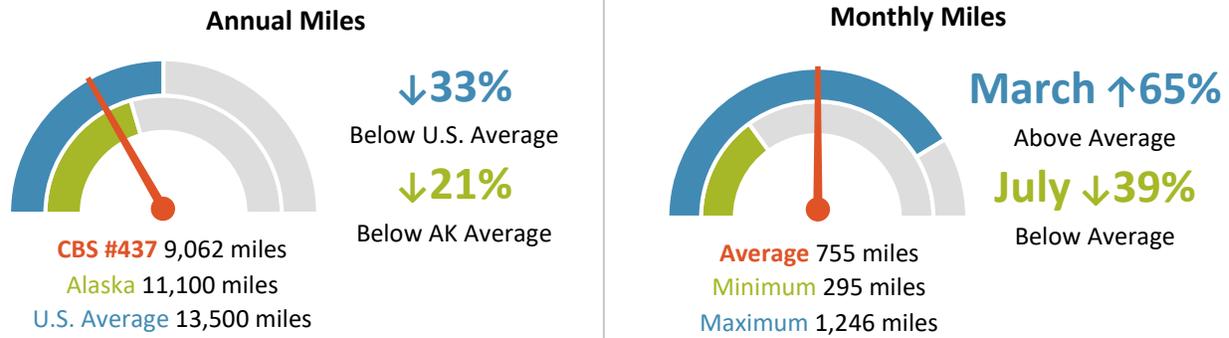
Figure 1: 2021 Per-mile maintenance costs by powertrain³. 2023 numbers are higher but EVs are still approximately 40% lower than ICEs. (*Service intervals that vary by powertrain)

between. Any adjustments made in cost would likely scale with both powertrain types, therefore not significantly changing the overall outcome of the total cost of ownership by comparison.

Annual Insurance Rate was set at \$500 per year for ICE and \$650 for the Lightning based on estimates given by Alaska Public Entity Insurance, the insurer for CBS. Rates reflect the premium for a new vehicle and do not account for adjustments for vehicle depreciation over time.

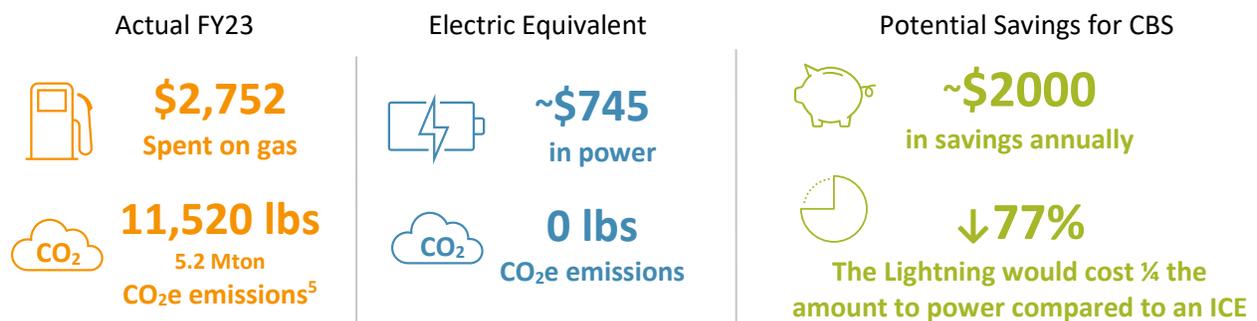
Charging Infrastructure was based on the based on the FordPro AC Charging Station 80A specifications which are \$1,999 for the base unit, approximately \$500 for installation, and a suggested \$25 annual maintenance fee for a total of approximately \$3,000 over the lifetime of the vehicle. It should be noted that every EV does not require its own charging infrastructure with a standard ratio of 3-5 vehicles depending on use per charging station. As the fleet is converted, charging infrastructure will cost less per vehicle.

CBS # 437 Driving Statistics:



Based on fuel purchase data, #437 was estimated to have driven 9,062 miles in FY23. This 33% below the national average of 13,500 miles per year and 21% below the average of 11,100 miles per year in Alaska⁴. On average, #437 was driven 755 miles per month with the maximum driving month in March with 1,246 miles and minimum in July with 295 miles. This puts the average daily use at about 25 miles per day with its maximum estimated use at 41 miles per day and its minimum use at 10 miles per day.

Fuel Savings Comparison between F150 ICE and F150 Lightning



In FY23, \$2,752 was spent on fuel for CBS # 437. The average cost of fuel was \$4.47 per gallon, and CBS # 437 created 11,520 lbs or 5.2 metric tons of CO₂ emissions equivalent. The electric power equivalent at 18.5¢/kWh would have cost approximately \$745; 77% less than conventional gasoline with no emissions as CBS operates on 100% hydroelectric power. **Since CBS owns and operates the electric utility, all money spent on electric power by CBS represents a net-zero transaction, essentially making electricity “free” and the savings in actuality 100% from the standpoint of the organization overall.**

Charging requirements:

Fuel invoices indicate that #437 refueled between one and four times per month. CBS policy is to refuel at the ½ mark of the fuel gauge which puts makes the applicable range for #437 271 miles rather than the average range of 543 miles. In consultation with CBS Harbormasters, they indicated that the truck must be readily available from 8 AM to 11 PM seven days per week year-round.

Usage Level	Low	Average	High
Daily Miles	10	25	41
Days between charges (15-100%)	24	10	6
Days between charges ER (15-100%)	32	13	8
Days between refills (½ tank)	27	11	7

This puts the charging requirements for the F150 Lightning similar to that of the conventional ICE F150. However, charging the battery from empty (15%) to full takes 8 hours, unlike refueling which takes only a few minutes. Therefore, it is in the best interest of the users to attempt to keep the car fully charged and/or charging when not in use. While there is still plenty of room to forget charging occasionally, it should be the operating standard to keep the vehicle charged/charging when not in use.

Battery Concerns:

A major concern that has been expressed is that of the lifetime of the battery and the cost of a catastrophic failure. At current prices and technology level, a replacement battery from Ford is \$28,556 for the standard range and \$35,960 for the extended range battery. This does not include installation costs or shipping costs. However, Ford states in their user manual that “the battery is covered for 8 years or 100,000 miles, whichever comes first, retaining a minimum of 70% of its original capacity over that period.” This can be compared to Ford’s warranty for ICE engines which have a powertrain warranty with 5 years or 60,000 miles.

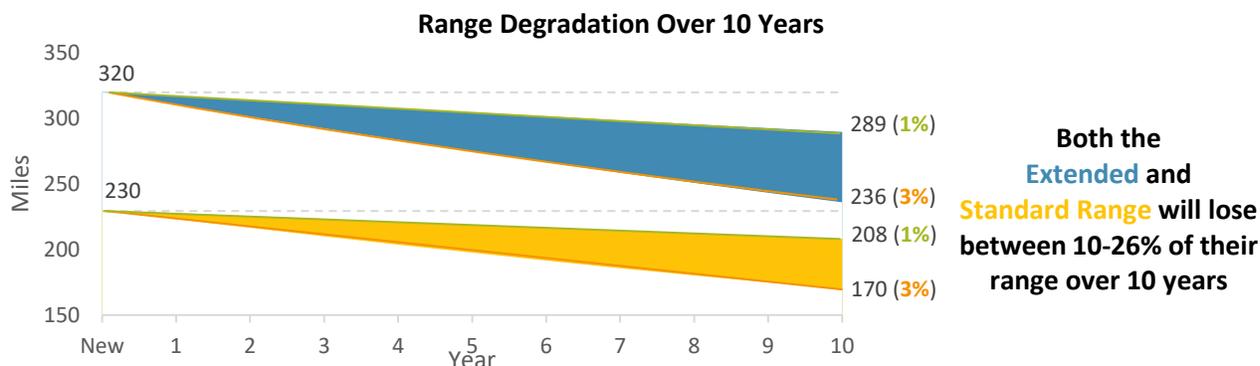
It should also be noted that Lightning batteries are modular which can be replaced at \$4,400 per module.

Comparison Between Battery and Engine Replacement

	Ford F150 ICE XL 3.3L V6	Ford F150 Lightning Standard Pro	Ford F150 Lightning XLT Extended Range
Full Battery		\$28,556	\$35,960
Battery Module		\$4,400	\$4,400
Engine	\$10,218		
Est. Replacement Time	15 hours	5 hours	5 hours
Replacement Cost (at \$135/hour)	\$2,025	\$675	\$675
Warranty	5 years/60,000 miles	8 years/100,000	8 years/100,000 miles

These numbers are at current 2023 prices which are likely exaggerated by high inflation and supply chain issues. It is anticipated that as technology becomes more advanced and EVs are more readily adopted that prices should become more competitive as time goes on.

Another concern is battery degradation over time. Estimates indicate that with extreme wear on the battery through consistent, complete battery drainage, long stretches of highway, and fast charging can degrade the battery up to 3% year-over-year. Fortunately, with the conditions in Sitka, many of these factors are inconsequential, and a more realistic degradation is likely between 1-2% annually.

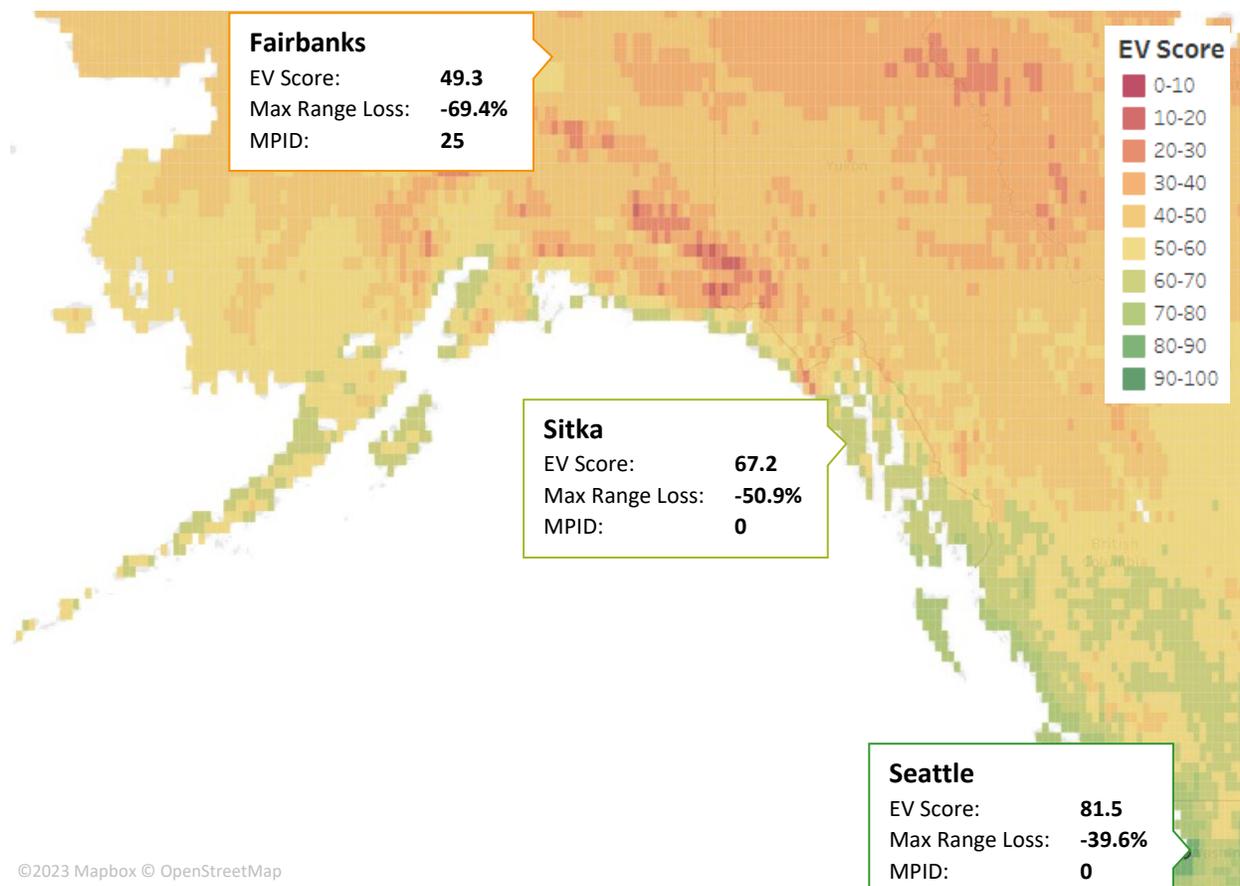


Winter Performance:

In cold weather, more power is needed to keep occupants and the battery warm for comfort, driving, and charging, thus reducing its overall range. In extreme low temperatures, this can require the vehicle to use up to 2.5 times as much energy than in an “ideal” temperature of 70° F.

In response to concerns about EV performance in cold weather, the Alaska Center for Energy and Power (ACEP) constructed a map outlining the effects of temperature on battery performance⁶. The **EV Score** is a 0-100 scale that indicates relative temperature-related range reductions. The Expected **Max Range Loss** is the maximum range loss expected for an EV based on the lowest average daily temperature from the last 10 years. The **Must-Plug-In Days (MPID)** are the number of consecutive days a location may experience temperatures lower than -4° F. This temperature is the threshold that is most cited at which permanent damage to the battery can occur if left unheated. A battery management system can keep the battery warm enough to avoid damage but only if it is connected to a source of power.

Alaska Center for Energy and Power (ACEP) EV Map



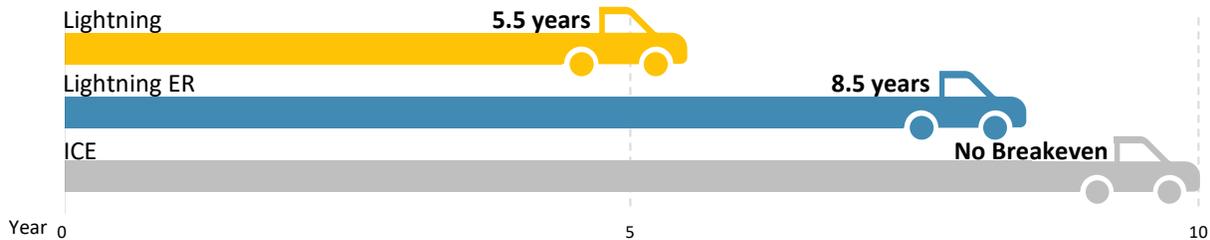
Sitka’s EV Score:

Based on the ACEP EV Score Map above, Sitka’s EV Score is 67.2 with a max range loss of 50.9% and an MPID of 0, similar to that of Oslo, Norway. Although less than ideal, Oslo has one of the highest rates of EV adoption in the world and lessons from their experience may be applicable in Sitka. During the peak of winter, more frequent charging and diligence to ensure an EV is plugged in to avoid battery damage may be occasionally required. However, compared to the rest of Alaska, this should be minimal disruption to daily operations.

Total Cost of Ownership

Ford F150 ICE XL 3.3L V6	Ford F150 Lightning Standard Pro	Ford F150 Lightning XLT Extended Range
\$89,000-\$95,000	\$76,000	\$86,000
\$25-27,000 on gas	↓13-18%	↓4-9%
More than 1/3 is the cost of fuel	Less than an ICE	Less than an ICE

Breakeven Periods



Assuming gas is \$5.00/gallon, the standard range lightning will breakeven with the ICE truck 5.5 years and the extended range at 8.5 years. This breakeven point will occur sooner if gas prices rise and later if gas prices drop. \$5.00/gallon is a very conservative estimate, so these timeframes are likely sooner.

Is the F150 Hybrid an Option?

Available only with the SuperCrew, the hybrid version of the F-150, called the PowerBoost, combines a 3.5 L EcoBoost V6 with a 35 kW hybrid motor/generator between the engine and transmission. A 1.5 kWh lithium-ion battery pack is located under the bed. The net gain is 47 HP and 70 lb-ft of torque, and 20% fuel economy increase. The hybrid option is an additional \$2,500 to the base price of a conventional F150. Its lifetime cost per mile is \$0.81 at \$4.50/gal, only 2¢ lower than the conventional F150. Considering that it only lowers the cost per mile by 2.5% at best and doesn't move CBS towards its goal of decarbonizing its operations by 2030 as set out in Resolution 22-18, and the F150 Lightning is highly comparable in performance to both the hybrid and non-hybrid F150 models, the F150 PowerBoost is not a strong alternative.

Standard or Extended Range?

Unfortunately, much of the \$10,000 cost difference between the Standard and Extended Range can be attributed to the fact that the ER is only available with the XLT trim. Many of the differences between the Pro and XLT trims beyond the extended battery are aesthetic. As such, whether or not the increased price is worth the additional cost is not entirely clear. It should be noted that many of the aesthetic changes would likely make the vehicle more prone to wear and tear in Harbor's use. For example, cloth seats and mats are not ideal for constant exposure to saltwater.

A more indicative parameter to decide on which trim to purchase is the breakeven point. Because this would be the first EV version for a vehicle of this type, it is inherently higher risk. With the breakeven point for the standard range at only 5.5 years vs 8.5 years for the extended range, CBS would breakeven three years sooner. If the Lightning fails to perform as anticipated, a smaller investment with a sooner breakeven point frame is less financially risky and therefore more favorable.

Conclusion:

The F150 Lightning with the max tow package meets or exceeds all the specifications of the ICE F150. Over the lifetime of the vehicle, a Lightning does offer substantial savings between 13-18%. The largest contributing factor to this is the price of gasoline. In this report, gas prices were assumed to be between \$4.50-\$5.50, however, it is not unusual for gas prices to rise above this range. This would only increase the savings if purchasing an EV as the largest factor contributing to the savings is fuel cost. With minor adjustments to workflow, the Ford F150 Lightning Standard Range should be a comparable replacement for truck #437 while reducing overall lifetime cost for CBS.

Conversion Stipulations and Questions:

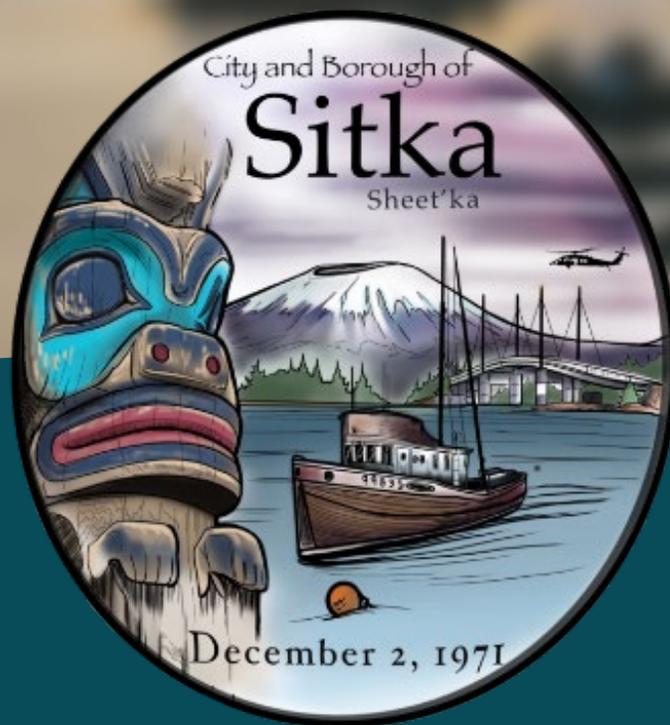
	Yes	No
Does it have the same or better specifications than an ICE?	✓	
Does it save money over its entire life?	✓	
Are the range and charging requirements compatible with the expected workload?	✓	
In case of a catastrophic battery failure, is replacement covered?	✓*	
Can it be used in cold weather?	✓	
Is a hybrid F150 an option?		✗
Should CBS upgrade to the extended range?		✗



2023 F150 Lightning, Photo from Ford

References:

- ¹2023 F150 Fuel Economy, Department of Energy
- ²2023 AFLEET Tool, Argonne National Lab
- ³2021 Comprehensive Total Cost of Ownership Quantification for Vehicles with Different Size Classes and Powertrains, Argonne National Lab
- ⁴2019 Highway Statistics, Federal Highway Administration
- ⁵2023 Greenhouse Gas Equivalencies Calculator, United States Environmental Protection Agency
- ⁶2020 ACEP EV Map, Alaska Center for Energy and Power



MISSION:

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