EPA KEY CONTACTS FORM

OMB Number: 2030-0020
Expiration Date: 06/30/2024

Authorized Representative: *Original awards and amendments will be sent to this individual for review and acceptance, unless otherwise indicated.*

Name: Prefix: Mr. First Name: Curtis Middle Name:
Last Name: Thayer Suffix:

Title: Executive Director

Complete Address:

Street1: 813 W. Northern Lights Blvd.
Street2:
City: Anchorage State: AK: Alaska
Zip / Postal Code: 99503-2407 Country: USA: UNITED STATES

Phone Number: 907-771-3000 **Fax Number:** 907-771-3044

E-mail Address: cthayer@akenergyauthority.org

Payee: *Individual authorized to accept payments.*

Name: Prefix: Ms. First Name: Pamela Middle Name:
Last Name: Ellis Suffix:

Title: Controller

Complete Address:

Street1: 813 W. Northern Lights Blvd.
Street2:
City: Anchorage State: AK: Alaska
Zip / Postal Code: 99503-2407 Country: USA: UNITED STATES

Phone Number: 907-771-3981 **Fax Number:** 907-771-3044

E-mail Address: pellis@akanergyauthority.org

Administrative Contact: *Individual from Sponsored Programs Office to contact concerning administrative matters (i.e., indirect cost rate computation, rebudgeting requests etc).*

Name: Prefix: Ms. First Name: Pamela Middle Name:
Last Name: Ellis Suffix:

Title: Controller

Complete Address:

Street1: 813 W. Northern Lights Blvd.
Street2:
City: Anchorage State: AK: Alaska
Zip / Postal Code: 99503-2407 Country: USA: UNITED STATES

Phone Number: 907-771-3981 **Fax Number:** 907-771-3044

E-mail Address: pellis@akenergyauthority

EPA KEY CONTACTS FORM

Project Manager: *Individual responsible for the technical completion of the proposed work.*

Name: **Prefix:** Mr. **First Name:** Ryan **Middle Name:**

Last Name: McLaughlin **Suffix:**

Title: Infrastructure Engineer

Complete Address:

Street1: 813 W. Northern Lights Blvd.

Street2:

City: Anchorage **State:** AK: Alaska

Zip / Postal Code: 99503-2407 **Country:** USA: UNITED STATES

Phone Number: 907-771-3012 **Fax Number:** 907-771-3044

E-mail Address: rmclaughlin@akenergyauthority

Tracking Number:GRANT14107584 Funding Opportunity Number:EPA-R-OAR-CPRGI-23-07 Received Date:Mar 29, 2024 06:12:49 PM EDT

OMB Number: 2030-0020
Expiration Date: 06/30/2024

Preaward Compliance Review Report for All Applicants and Recipients Requesting EPA Financial Assistance

Note: Read Instructions before completing form.

I. A. Applicant/Recipient (Name, Address, City, State, Zip Code)

Name: Alaska Energy Authority

Address: 813 W. Northern Lights Blvd.

City: Anchorage

State: AK: Alaska Zip Code: 99503-2407

B. Unique Entity Identifier (UEI): F3N8ZSHJXUH8

C. Applicant/Recipient Point of Contact

Name: Curtis Thayer

Phone: 907-771-3000

Email: cthayer@akenergyauthority.org

Title: Executive Director

II. Is the applicant currently receiving EPA Assistance? ☒ Yes ☐ No

III. List all pending civil rights lawsuits and administrative complaints filed under federal law against the applicant/recipient that allege discrimination based on race, color, national origin, sex, age, or disability. (Do not include employment complaints not covered by 40 C.F.R. Parts 5 and 7.)

None

IV. List all civil rights lawsuits and administrative complaints decided against the applicant/recipient within the last year that alleged discrimination based on race, color, national origin, sex, age, or disability and enclose a copy of all decisions. Please describe all corrective actions taken. (Do not include employment complaints not covered by 40 C.F.R. Parts 5 and 7.)

None

V. List all civil rights compliance reviews of the applicant/recipient conducted under federal nondiscrimination laws by any federal agency within the last two years and enclose a copy of the review and any decisions, orders, or agreements based on the review. Please describe any corrective action taken. (40 C.F.R. § 7.80(c)(3))

None

VI. Is the applicant requesting EPA assistance for new construction? If no, proceed to VII; if yes, answer (a) and/or (b) below.

☒ Yes ☐ No

a. If the grant is for new construction, will all new facilities or alterations to existing facilities be designed and constructed to be readily accessible to and usable by persons with disabilities? If yes, proceed to VII; if no, proceed to VI(b).

☐ Yes ☒ No

b. If the grant is for new construction and the new facilities or alterations to existing facilities will not be readily accessible to and usable by persons with disabilities, explain how a regulatory exception (40 C.F.R. 7.70) applies.

Grant will fund construction of the Dixon Diversion Project. The Project will impact mechanical rooms and other spaces that, because of their intended use, will not require accessibility to the public or beneficiaries and therefore fall under the regulatory exception laid out in 40 C.F.R. 7.70 (b) (2).

VII. Does the applicant/recipient provide initial and continuing notice that it does not discriminate on the basis of race, color, national origin, sex, age, or disability in its program or activities? (40 C.F.R 5.140 and 7.95) ☒ Yes ☐ No

a. Do the methods of notice accommodate those with impaired vision or hearing? ☒ Yes ☐ No

b. Is the notice posted in a prominent place in the applicant's/recipient's website, in the offices or facilities or, for education programs and activities, in appropriate periodicals and other written communications? ☒ Yes ☐ No

c. Does the notice identify a designated civil rights coordinator? ☒ Yes ☐ No

VIII. Does the applicant/recipient maintain demographic data on the race, color, national origin, sex, age, or disability status of the population it serves? (40 C.F.R. 7.85(a)) ☒ Yes ☐ No

IX. Does the applicant/recipient have a policy/procedure for providing meaningful access to services for persons with limited English proficiency? (Title VI, 40 C.F.R. Part 7, *Lau v Nichols* 414 U.S. (1974)) ☒ Yes ☐ No

X. If the applicant is an education program or activity, or has 15 or more employees, has it designated an employee to coordinate its compliance with 40 C.F.R. Parts 5 and 7? Provide the name, title, position, mailing address, e-mail address, fax number, and telephone number of the designated coordinator.

Karen Turner, Human Resources Director, 813 W. Northern Lights Blvd. Anchorage, AK 99503. KTurner@aidea.org, 907-771-3000 phone, 907-771-3946 fax.

XI. If the applicant is an education program or activity, or has 15 or more employees, has it adopted grievance procedures that assure the prompt and fair resolution of complaints that allege a violation of 40 C.F.R. Parts 5 and 7? Provide a legal citation or applicant's/ recipient's website address for, or a copy of, the procedures.

https://humanrights.alaska.gov

For the Applicant/Recipient

I certify that the statements I have made on this form and all attachments thereto are true, accurate and complete. I acknowledge that any knowingly false or misleading statement may be punishable by fine or imprisonment or both under applicable law. I assure that I will fully comply with all applicable civil rights statutes and EPA regulations.

A. Signature of Authorized Official	B. Title of Authorized Official	C. Date
Wendy Sturdivant	Executive Director	03/29/2024

For the U.S. Environmental Protection Agency

I have reviewed the information provided by the applicant/recipient and hereby certify that the applicant/recipient has submitted all preaward compliance information required by 40 C.F.R. Parts 5 and 7; that based on the information submitted, this application satisfies the preaward provisions of 40 C.F.R. Parts 5 and 7; and that the applicant has given assurance that it will fully comply with all applicable civil rights statures and EPA regulations.

A. *Signature of Authorized EPA Official	B. Title of Authorized Official	C. Date

Instructions for EPA FORM 4700-4 (Rev. 04/2021)

General. Recipients of Federal financial assistance from the U.S. Environmental Protection Agency must comply with the following statutes and regulations.
Title VI of the Civil Rights Acts of 1964 provides that no person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. The Act goes on to explain that the statute shall not be construed to authorize action with respect to any employment practice of any employer, employment agency, or labor organization (except where the primary objective of the Federal financial assistance is to provide employment). Section 13 of the 1972 Amendments to the Federal Water Pollution Control Act provides that no person in the United States shall on the ground of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under the Federal Water Pollution Control Act, as amended. Employment discrimination on the basis of sex is prohibited in all such programs or activities. Section 504 of the Rehabilitation Act of 1973 provides that no otherwise qualified individual with a disability in the United States shall solely by reason of disability be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. Employment discrimination on the basis of disability is prohibited in all such programs or activities. The Age Discrimination Act of 1975 provides that no person on the basis of age shall be excluded from participation under any program or activity receiving Federal financial assistance. Employment discrimination is not covered. Age discrimination in employment is prohibited by the Age Discrimination in Employment Act administered by the Equal Employment Opportunity Commission. Title IX of the Education Amendments of 1972 provides that no person in the United States on the basis of sex shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance. Employment discrimination on the basis of sex is prohibited in all such education programs or activities. Note: an education program or activity is not limited to only those conducted by a formal institution. 40 C.F.R. Part 5 implements Title IX of the Education Amendments of 1972. 40 C.F.R. Part 7 implements Title VI of the Civil Rights Act of 1964, Section 13 of the 1972 Amendments to the Federal Water Pollution Control Act, and Section 504 of The Rehabilitation Act of 1973.

Items "Applicant" means any entity that files an application or unsolicited proposal or otherwise requests EPA assistance. 40 C.F.R. §§ 5.105, 7.25. "Recipient" means any State or its political subdivision, any instrumentality of a State or its political subdivision, any public or private agency, institution, organizations, or other entity, or any person to which Federal financial assistance is extended directly or through another recipient, including any successor, assignee, or transferee of a recipient, but excluding the ultimate beneficiary of the assistance. 40 C.F.R. §§ 5.105, 7.25. "Civil rights lawsuits and administrative complaints" means any lawsuit or administrative complaint alleging discrimination on the basis of race, color, national origin, sex, age, or disability pending or decided against the applicant and/or entity which actually benefits from the grant, but excluding employment complaints not covered by 40 C.F.R. Parts 5 and 7. For example, if a city is the named applicant but the grant will actually benefit the Department of Sewage, civil rights lawsuits involving both the city and the Department of Sewage should be listed. "Civil rights compliance review" means: any federal agency-initiated investigation of a particular aspect of the applicant's and/or recipient's programs or activities to determine compliance with the federal non-discrimination laws. Submit this form with the original and required copies of applications, requests for extensions, requests for increase of funds, etc. Updates of information are all that are required after the initial application submission. If any item is not relevant to the project for which assistance is requested, write "NA" for "Not Applicable." In the event applicant is uncertain about how to answer any questions, EPA program officials should be contacted for clarification.

CERTIFICATION REGARDING LOBBYING

Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

Statement for Loan Guarantees and Loan Insurance

The undersigned states, to the best of his or her knowledge and belief, that:

If any funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this commitment providing for the United States to insure or guarantee a loan, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in accordance with its instructions. Submission of this statement is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required statement shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

* APPLICANT'S ORGANIZATION

Alaska Energy Authority

* PRINTED NAME AND TITLE OF AUTHORIZED REPRESENTATIVE

Prefix: Mr. * First Name: Curtis Middle Name:

* Last Name: Thayer Suffix:

* Title: Executive Director

* SIGNATURE: Wendy Sturdivant * DATE: 03/29/2024

Other Attachment File(s)

*** Mandatory Other Attachment Filename:** 1234-AKPrioritySustainableEnergyPlan_AEAIndividual

Add Mandatory Other Attachment | Delete Mandatory Other Attachment | View Mandatory Other Attachment

To add more "Other Attachment" attachments, please use the attachment buttons below.

Add Optional Other Attachment | Delete Optional Other Attachment | View Optional Other Attachment

Project Narrative File(s)

*** Mandatory Project Narrative File Filename:** 1239-Workplan_AEAIndividual.pdf

Add Mandatory Project Narrative File | Delete Mandatory Project Narrative File | View Mandatory Project Narrative File

To add more Project Narrative File attachments, please use the attachment buttons below.

Add Optional Project Narrative File | Delete Optional Project Narrative File | View Optional Project Narrative File

OMB Number: 4040-0004
Expiration Date: 11/30/2025

Application for Federal Assistance SF-424

* 1. Type of Submission:
- [ ] Preapplication
- [x] Application
- [ ] Changed/Corrected Application

* 2. Type of Application:
- [x] New
- [ ] Continuation
- [ ] Revision

* If Revision, select appropriate letter(s):

* Other (Specify):

* 3. Date Received: 03/29/2024

4. Applicant Identifier:

5a. Federal Entity Identifier:

5b. Federal Award Identifier:

State Use Only:

6. Date Received by State:

7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name: Alaska Energy Authority

* b. Employer/Taxpayer Identification Number (EIN/TIN): 92-6001185

* c. UEI: F3N8ZSHJXUH8

d. Address:

* Street1: 813 W. Northern Lights Blvd.
Street2:
* City: Anchorage
County/Parish:
* State: AK: Alaska
Province:
* Country: USA: UNITED STATES
* Zip / Postal Code: 99503-2407

e. Organizational Unit:

Department Name:

Division Name:

f. Name and contact information of person to be contacted on matters involving this application:

Prefix: Mr.
* First Name: Ryan
Middle Name:
* Last Name: McLaughlin
Suffix:

Title: Infrastructure Engineer

Organizational Affiliation:

* Telephone Number: 907-771-3012
Fax Number:

* Email: rmclaughlin@akenergyauthority.org

Application for Federal Assistance SF-424

*** 9. Type of Applicant 1: Select Applicant Type:**

A: State Government

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

Environmental Protection Agency

11. Catalog of Federal Domestic Assistance Number:

66.046

CFDA Title:

Climate Pollution Reduction Grants

*** 12. Funding Opportunity Number:**

EPA-R-OAR-CPRGI-23-07

* Title:

Climate Pollution Reduction Grants Program: Implementation Grants (General Competition)

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Add Attachment | Delete Attachment | View Attachment

*** 15. Descriptive Title of Applicant's Project:**

Climate Pollution Reduction Grant – Dixon Diversion

Attach supporting documents as specified in agency instructions.

Add Attachments | Delete Attachments | View Attachments

Application for Federal Assistance SF-424

16. Congressional Districts Of:

* a. Applicant: AK-001 * b. Program/Project: AK-001

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment | Delete Attachment | View Attachment

17. Proposed Project:

* a. Start Date: 10/01/2024 * b. End Date: 09/30/2029

18. Estimated Funding ($):

* a. Federal	348,415,151.00
* b. Applicant	0.00
* c. State	0.00
* d. Local	0.00
* e. Other	0.00
* f. Program Income	0.00
* g. TOTAL	348,415,151.00

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

☐ a. This application was made available to the State under the Executive Order 12372 Process for review on .

☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.

☒ c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**

☐ Yes ☒ No

If "Yes", provide explanation and attach

Add Attachment | Delete Attachment | View Attachment

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 18, Section 1001)**

☒ ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix: Mr. * First Name: Curtis

Middle Name:

* Last Name: Thayer

Suffix:

* Title: Executive Director

* Telephone Number: 907-771-3000 Fax Number:

* Email: cthayer@akenergyauthority.org

* Signature of Authorized Representative: Wendy Sturdivant * Date Signed: 03/29/2024

BUDGET INFORMATION - Non-Construction Programs

OMB Number: 4040-0006
Expiration Date: 02/28/2025

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. Climate Pollution Reduction Grant	66.046	$	$	$ 348,415,151.00	$	$ 348,415,151.00
2.						
3.						
4.						
5. Totals		$	$	$ 348,415,151.00	$	$ 348,415,151.00

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SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY (1) Climate Pollution Reduction Grant	(2)	(3)	(4)	Total (5)
a. Personnel	$ 3,010,185.00	$	$	$	$ 3,010,185.00
b. Fringe Benefits	1,492,121.00				1,492,121.00
c. Travel	245,360.00				245,360.00
d. Equipment	80,000.00				80,000.00
e. Supplies	200,000.00				200,000.00
f. Contractual	304,920,588.00				304,920,588.00
g. Construction					
h. Other	36,890,571.00				36,890,571.00
i. Total Direct Charges (sum of 6a-6h)	346,838,825.00				$ 346,838,825.00
j. Indirect Charges	1,576,326.00				$ 1,576,326.00
k. TOTALS (sum of 6i and 6j)	$ 348,415,151.00	$	$	$	$ 348,415,151.00
7. Program Income	$	$	$	$	$

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SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e)TOTALS
8. Climate Pollution Reduction Grant	$	$	$	$
9.				
10.				
11.				
12. TOTAL (sum of lines 8-11)	$	$	$	$

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	$ 12,377,338.00	$ 1,902,105.00	$ 4,326,544.00	$ 4,326,544.00	$ 1,822,145.00
14. Non-Federal	$				
15. TOTAL (sum of lines 13 and 14)	$ 12,377,338.00	$ 1,902,105.00	$ 4,326,544.00	$ 4,326,544.00	$ 1,822,145.00

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (YEARS)			
	(b)First	(c) Second	(d) Third	(e) Fourth
16. Climate Pollution Reduction Grant	$ 14,841,181.00	$ 111,916,104.00	$ 152,585,037.00	$ 56,695,491.00
17.				
18.				
19.				
20. TOTAL (sum of lines 16 - 19)	$ 14,841,181.00	$ 111,916,104.00	$ 152,585,037.00	$ 56,695,491.00

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges: $346,838,825

22. Indirect Charges: $1,576,326

23. Remarks: AEA negotiating NICRA for FY24, provisional indirect rate of 31.86%

DISCLOSURE OF LOBBYING ACTIVITIES

Complete this form to disclose lobbying activities pursuant to 31 U.S.C.1352

OMB Number: 4040-0013
Expiration Date: 02/28/2025

1. * Type of Federal Action:
- [ ] a. contract
- [x] b. grant
- [ ] c. cooperative agreement
- [ ] d. loan
- [ ] e. loan guarantee
- [ ] f. loan insurance

2. * Status of Federal Action:
- [ ] a. bid/offer/application
- [x] b. initial award
- [ ] c. post-award

3. * Report Type:
- [x] a. initial filing
- [ ] b. material change

4. Name and Address of Reporting Entity:

[x] Prime [ ] SubAwardee

** Name:* Alaska Energy Authority

** Street 1:* 813 W. Northern Lights Blvd. *Street 2:*

** City:* Anchorage *State:* AK: Alaska *Zip:* 99503

Congressional District, if known: AK-001

5. If Reporting Entity in No.4 is Subawardee, Enter Name and Address of Prime:

6. * Federal Department/Agency:
Environmental Protection Agency

7. * Federal Program Name/Description:
Climate Pollution Reduction Grants

CFDA Number, *if applicable:* 66.046

8. Federal Action Number, *if known:*
EPA-R-OAR-CPRGI-23-07

9. Award Amount, *if known:*
$

10. a. Name and Address of Lobbying Registrant:

Prefix: ** First Name:* N/A *Middle Name:*

** Last Name:* *Suffix:*

** Street 1:* *Street 2:*

** City:* *State:* *Zip:*

b. Individual Performing Services (including address if different from No. 10a)

Prefix: ** First Name:* N/A *Middle Name:*

** Last Name:* *Suffix:*

** Street 1:* *Street 2:*

** City:* *State:* *Zip:*

11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when the transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

*** Signature:** Wendy Sturdivant

***Name:** *Prefix:* Mr. ** First Name:* Curtis *Middle Name:*

** Last Name:* Thayer *Suffix:*

Title: Executive Director **Telephone No.:** 907-771-3000 **Date:** 03/29/2024

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State of Alaska
Priority Sustainable Energy Action Plan

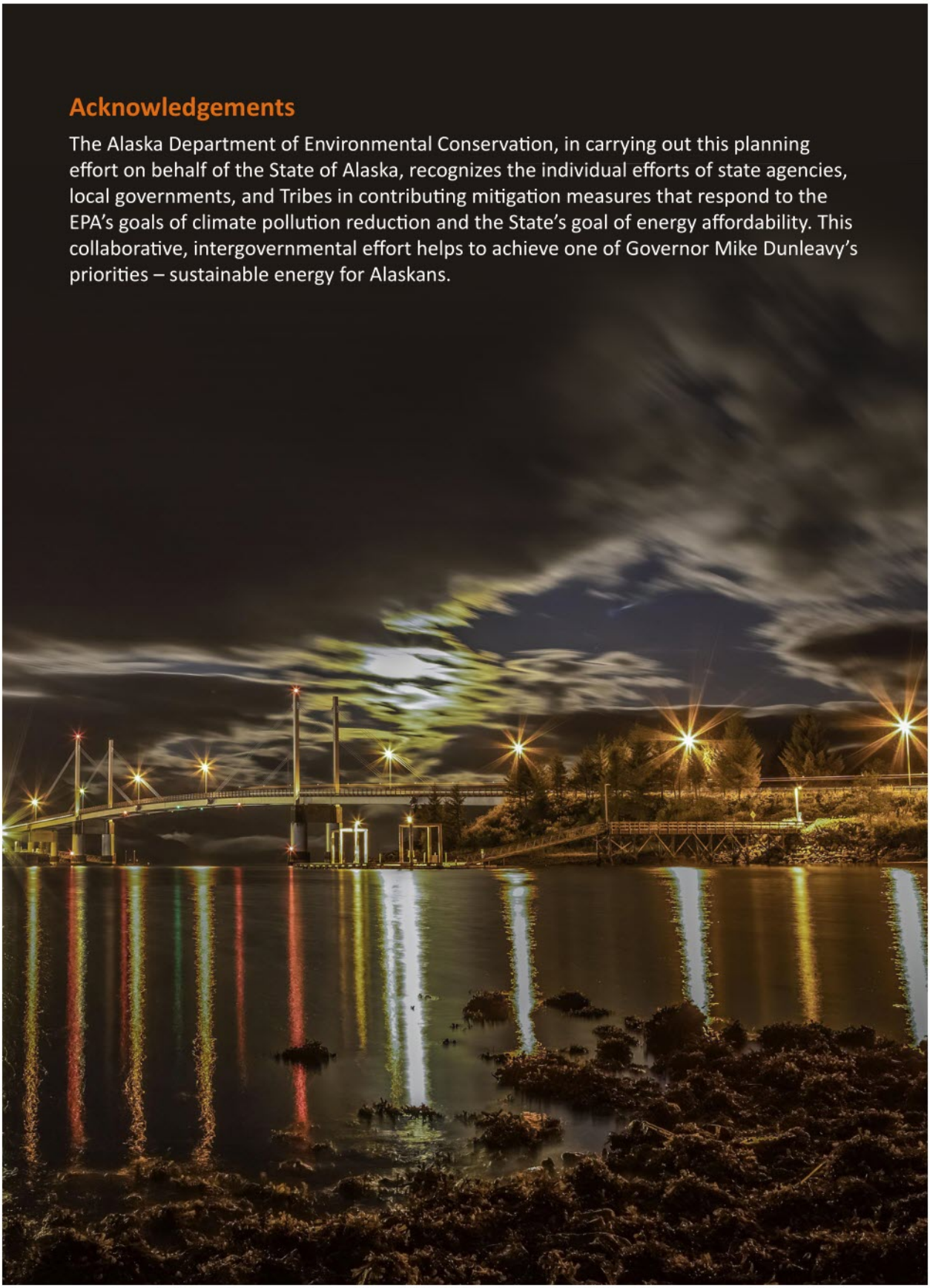
Meeting the requirements of the Priority Climate Action Plan for EPA's Climate Pollution Reduction Grant Program

Prepared by the Alaska Municipal League
for the Alaska Department of Environmental Conservation

Submitted March 1, 2024

Acknowledgements

The Alaska Department of Environmental Conservation, in carrying out this planning effort on behalf of the State of Alaska, recognizes the individual efforts of state agencies, local governments, and Tribes in contributing mitigation measures that respond to the EPA's goals of climate pollution reduction and the State's goal of energy affordability. This collaborative, intergovernmental effort helps to achieve one of Governor Mike Dunleavy's priorities – sustainable energy for Alaskans.



Contents

Definitions, Geography, and Acronyms

Definitions

Borough	The county-level equivalent regional government for Alaska.
Municipal government	The 164 city and borough governments incorporated under state law, as well as the Metlakatla Indian Community incorporated under federal law.
Retro-commissioning	A process of analyzing and optimizing building systems so that it operates more closely to original designed energy usage parameters.
Tribal government	Sovereign, self-governing, and distinct political entities within the geographic bounds of the United States – for the purposes of CPRG, the 228 federally-recognized tribes in Alaska.

Geography

As the largest state in the country, there are many ways that regions can be defined, and the specific definitions often depend on the context. The three main ways that Alaska is subdivided are:

- ***ANCSA region*** – Defined by the Alaska Native Claims Act of 1971, these regions follow the boundaries of twelve the regional Alaska Native Corporations. These regions tend to correspond with Alaska Native cultures and languages.
- ***Borough/Census Area*** – Where county-level governments, aka boroughs, have formed these statistical areas correspond to their boundaries; otherwise, they follow Census Bureau defined regional statistical areas known as Census Areas.
- ***Economic regions*** – The following table defines some of the broader geographic regions that are used in general discussions of Alaska's regions.

Interior Alaska	A geographic and economic region of Alaska bounded by the Alaska Range to the south and the Brooks Range to the north.
Northern Alaska	A geographic and economic region of Alaska generally referring to areas on, or close to, the Arctic Ocean including the North Slope Borough, Northwest Arctic Borough and the Nome Census Area.
Railbelt	The region of Alaska defined by the Alaska Railroad, stretching from Seward, through Anchorage, to Fairbanks. This region shares an electric grid and other infrastructure and acts as an economic center of the state.
Southcentral Alaska	A geographic and economic region of Alaska that includes Anchorage, the Mat Su Valley, and the Kenai Peninsula.
Southeast Alaska	A geographic and economic region of Alaska that generally is considered to stretch from Yakutat to Ketchikan.
Southwest Alaska	A geographic and economic region of Alaska that includes the Alaska Peninsula, as well as the Aleutian and Pribilof Islands.

For this report, it is also relevant to name the regions where tribal planning processes are taking place for CPRG. The Alaska Native Tribal Health Consortium (ANTHC), with its statewide service, has the largest coverage for producing tribal PCAPs, with much Southwest and Southeast Alaska included in their scope of work. Working through their Rural Energy program, they are collaborating closely with Nuvista and Kodiak Alaska Native Association (KANA), as well as other tribal organizations.

Other tribal consortia engaged in CPRG directly are Tanana Chiefs Conference covering their Interior region, Bristol Bay Native Association, and Kawerak in the Bering Strait region. Tribal partnerships advance work with the Village of Solomon, King Island Native Community, Native Village of Council, and Nome Eskimo Community in Nome; as well as the Chugach Regional Resources Commission and the Native Village of Eyak in Cordova. Chickaloon, Metlakatla, Unalakleet, and the Village are all working independently on tribal PCAPs.

Acronyms

ACS	Census Bureau American Community Survey
AEA	Alaska Energy Authority
AELP	Alaska Electric Light & Power
AHFC	Alaska Housing and Finance Corporation
AHS	Alaska Heat Smart
AML	Alaska Municipal League
ANCSA	Alaska Native Claims Settlement Act
ANTHC	Alaska Native Tribal Health Consortium
ARDOR	Alaska Regional Development Organization
ARIS	Alaska Retrofit Information System
AWIB	Alaska Workforce Investment Board
AWP	Alaska Workforce Partnership
BBNA	Bristol Bay Native Association
BTU	British Thermal Unit
CAP	Climate Action Plan
CBJ	City and Borough of Juneau
CCS	Carbon Capture and storage
CCUS	Carbon capture, utilization, and storage
CEJST	Climate and Economic Justice Screening Tool
CO2e	Carbon Dioxide Equivalent
CPRG	Climate Pollution Reduction Grant
CSEAP	Comprehensive Sustainable Energy Action Plan
DCRA	Division of Community and Regional Affas
DEC	Alaska Department of Environmental Conservation
DEED	Alaska Department of Education and Early Development
DERA	Diesel Emissions Reduction Act
DNR	Alaska Department of Natural Resources
DOE	U.S. Department of Energy
DOL&WD	Alaska Department of Labor and Workforce Development
DOT&PF	Alaska Department of Transportation and Public Facilities
ECI	Energy Cost Index
EIA	U.S. Energy Information Administration
EJScreen	EPA Environmental Justice Screening and Mapping Tool
EPA	Environmental Protection Agency
EVSE	Electric Vehicle Supply Equipment
GHG	Greenhouse Gases

GPC	GHG Protocol for Cities – ICLEI framework for conducting GHG inventories
GWh	Gigawatt hour
GWP	Global warming potential
ICLEI	International Council for Local Environmental Initiatives
IPCC	Intergovernmental Panel on Climate Change
IPP	Independent Power Producer
IRA	Inflation Reduction Act
KPB	Kenai Peninsula Borough
LIDAC	Low Income / Disadvantaged Communities
LIHEAP	Low Income Housing Energy Assistance Program
MMBTU	Million BTU
MSW	Municipal Solid Waste
MT	Metric Ton
MWh	Megawatt hour
NOFO	Notice of Funding Opportunity
PCAP	Priority Climate Action Plan
POW	Prince of Wales Island
PSEAP	Priority Sustainable Energy Action Plan
QAPP	Quality Assurance Project Plan
REAA	Regional Education Attainment Area
REF	Renewable Energy Fund
SBDC	Small Business Development Center
SEC	Southeast Conference
TCC	Tanana Chiefs Conference
UA	University of Alaska
USDA	U.S. Department of Agriculture
VEEP	Village Energy Efficiency Program

Tables and Figures

Tables

Figures

Executive Summary

Purpose and Scope

The State of Alaska has produced its Priority Sustainable Energy Action Plan (PSEAP) in accordance with the guidance of the Climate Pollution Reduction Grant (CPRG) program, and which satisfies the requirements of a Priority Climate Action Plan (PCAP). The State's purpose in producing this plan is to enable participation by State agencies and political subdivisions in submitting applications to the EPA's CPRG Implementation Grant program.

The scope for the PSEAP is focused on mitigation measures that are consistent with guidelines of the CPRG implementation NOFO, to ensure as broad an opportunity as possible to deliver benefits to Alaska communities. The State recognizes that a more substantial undertaking is ahead, in producing the Comprehensive Climate Action Plan (CCAP) over the coming year, and that this effort will require more detailed analysis and thorough review of opportunities climate pollution reduction.

Ultimately, the State of Alaska has placed an emphasis on including in this initial round of planning mitigation measures that are readily available for implementation and which capacity of eligible entities is identified and ready to submit for the grant program. This effort has the most potential to result in real, tangible improvements for Alaska communities in the shortest amount of time possible.

Plan Overview

The PSEAP is organized into chapters that align with CPRG PCAP guidance. It includes external sources of information, including and especially as it relates to Alaska's Greenhouse Gas (GHG) Emissions Inventory. The PSEAP also includes a Low Income / Disadvantaged Communities (LIDAC) analysis as a standalone worksheet that evaluates equity and environmental justice by census tract, and using available tools provided by the EPA.

This initial planning effort included literature review, data analysis, and active stakeholder engagement. This plan includes chapters required by EPA, as well as initial versions of optional chapters that help to describe the context experienced by Alaska communities. These are summarized below.

Responsible Agency

The Governor designated the Alaska Department of Environmental Conservation (DEC) to lead the CPRG planning effort, and the DEC Division of Air Quality has been responsible for the development of the PSEAP. DEC contracted with the Alaska Municipal League (AML) as the sub-awardee to conduct the greenhouse gas emissions inventory (produced by Constellation Energy), collaborate with Tribal governments conducting their parallel planning efforts, facilitate stakeholder engagement, and produce the PSEAP and CSEAP.

State-specific Considerations for Plan

DEC has adopted by reference any mitigation measure contained within:

- Alaska DOT&PF's Carbon Reduction Strategy, which includes multiple lines of effort that support transportation-related emission reduction strategies.
- Municipal Climate Action Plans, including those of Juneau, Anchorage, Homer; and where relevant findings from Sitka and Fairbanks' CAP development processes.

DEC recognizes the opportunity to collaborate with Tribal governments through this process and its comprehensive planning will advance ways in which complementary, non-duplicative efforts can achieve mutually beneficial goals. Tribal mitigation measures that also advance the State's goals of affordability and energy security will be prioritized, and the potential for multi-jurisdictional implementation will be leveraged to the greatest extent possible.

Review of Existing Local Climate Action Plans (CAPs)

Since Homer completed the state's first CAP in 2007[1], five other Alaska communities have worked to produce CAPs and their associated emissions inventories. As a planning document, a local CAP must be developed by the local or tribal government, reviewed by the public in a stakeholder engagement process, and finally adopted by the entity's governing body. Only three Alaska communities have completed this process, with three others in progress.

Most communities who engaged in a CAP process produced some version of an emissions inventory. Both Anchorage and Homer used the ICLEI ClearPath Tool following ICLEI U.S. Community Protocol standards. Anchorage modeled their Emissions Inventory after the *Ann Arbor 2019 Community-Wide Greenhouse Gas Inventory Report.* Emissions inventory documentation often focuses primarily on a municipal scope rather than a community scope, such as in Homer and Sitka.

Likely because of the relatively labor-intense process behind developing an emissions inventory, additional inventories have been challenging. Juneau, which has inventories for 2007, 2010, and 2021, is the only community with more than two years of inventories on record.

Beyond the plans discussed above, relevant planning efforts in Alaska have largely focused on either 1) affordable, sustainable solutions for rural microgrids or 2) adaptation efforts to respond to the impacts of greenhouse gases. All Alaska municipalities with planning commissions are required to submit comprehensive plans under Alaska statute as a "compilation of policy statements, goals, standards, and maps for guiding the physical, social, and economic development, both private and public, of a community… [including] statements of policies, goals, and standards; a land use plan; a community facilities plan; a transportation plan; and recommendations for implementation of the comprehensive plan."[2] As the primary document guiding the actions of municipal officials, comprehensive plans have many implications for emissions reduction efforts.

A review of borough-level comprehensive plans found many recommended actions with emissions reduction potential. The projects in Juneau's 2011 Climate Action Plan were adapted into the Sustainability section of the 2013 Comprehensive Plan, which now serves as the foundation for more relevant planning efforts such as the 2018 Juneau Renewable Energy Strategy. Comprehensive plans provide the authority for municipal officials to pursue emissions reduction projects. For example, the Kodiak Island Borough Plan[3] put alternative energy solutions for rural communities in the borough as high priority actions. In the Energy chapter of the North Slope Borough's Comprehensive Plan[4], energy efficiency technologies like weatherization, waste heat recovery, and innovative housing technology are included. The Northwest Arctic Borough Comprehensive Plan[5] establishes the goal to "invest in renewable energy, promote energy efficiency, and reduce reliance on imported fuels," which is furthered via proposed actions and community-level data review via their regional energy plan[6].

Hazard mitigation planning, which is often a FEMA-funding requirement for many localities, may lead communities to consider some similar efforts as climate adaptation planning. While these do not pertain directly to GHG reduction measures, there may be overlap between proposed adaptation measures and CPRG projects – e.g., projects that increase micro-grid resilience and reduce emissions in these communities. A review of Alaska adaptation plans revealed lack of funding as a major implementation issue and climate action projects may help alleviate this.

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1 https://www.cityofhomer-ak.gov/citycouncil/climate-action-plan
2 AS 29.40.030 via https://touchngo.com/lglcntr/akstats/Statutes/Title29/Chapter40/Section030.htm
3 https://www.kodiakak.us/DocumentCenter/View/1507/2008-Comprehensive-Plan-Updatepdf
4 https://www.north-slope.org/wp-content/uploads/2022/02/10_Energy_-_NSB_Comprehensive_Plan.pdf
5 https://nwab2030.org/
6 http://www.nwabor.org/wp-content/uploads/NWAB-Regional-Energy-Plan-Update-Final-Reduced.pdf

Working with the Office of Indian Energy, many communities around Alaska have created Strategic Energy Plans[7] that set renewable generation goals. These plans are confidential, proprietary information belonging to the entity (primarily tribal governments and native corporations) that have completed them, so they are unfortunately not available via any public repository. Those completing CPRG planning for Alaska's tribal governments might benefit from requesting and reviewing them.

Summary of Priority Plan Engagement

The development of this plan included substantial engagement with state agencies, local governments, and Tribes (including tribal consortia). Stakeholder meetings were held separately with state agencies and municipal governments to discuss ways in which to maximize the potential benefits to Alaska through large-scale, broad mitigation measures. These facilitated discussions were followed up on with individual communication to further develop proposed measures, including to contemplate implementation grant applications.

The hallmark of the State's approach has been collaboration with Tribes and tribal consortia. The State's development of its GHG emissions inventory includes sharing with all tribal planning and applicants. This data-sharing includes the ability for each Tribe or consortia to utilize the mitigation measures evaluation available through this online tool. AML facilitates bi-weekly calls with the state's CPRG Working Group that includes all planning partners.

Further details on engagement for the development of this plan are given in section I, with plans for future engagement detailed in section VII.

Plan Elements and Key Takeaways

The PSEAP is a preliminary analysis of the potential for climate pollution reduction in Alaska, and corresponding mitigation measures. DEC expects a more thorough review as part of the comprehensive planning process, including a robust stakeholder engagement and public consultation.

This plan includes all of the components required by EPA and has included many of the optional elements to introduce appropriate context for relevant issues.

Key Takeaways include:

- The ability of the State to build the infrastructure for a statewide GHG emissions assessment available to all communities is an important feature of the PSEAP.
- The State's collaboration with tribes and tribal consortia will be critical to successful implementation.
- This initial assessment was limited by available project time before PCAP deadline.
- There is concern voiced by many eligible entities and stakeholders that the tie and timing between the PSEAP and the tribal PCAPs and the implementation grants limits the extent to which disadvantaged communities may receive the most benefit.
- Community need exceeds available resources, and EPA must take an equitable distribution of resources into account.

2022 Greenhouse Gas Inventory

Section II of this plan contains a summary of the statewide GHG inventory completed for calendar year 2022. This inventory work will also result in community-level reports, resulting in opportunities to evaluate GHG reduction measures broadly at the local, regional, and statewide levels. The emissions inventory and community reports include:

- Stationary Combustion by fuel type, and percentages by sector.
- Transportation by fuel type, and percentages by road and non-road activity.

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7 https://www.energy.gov/indianenergy/articles/alaska-strategic-energy-plan-and-planning-handbook

- Purchased Electricity by energy type, with percentages contributed.
- Industrial Processes will be addressed during comprehensive planning.
- Methodology, consistent with the approved QAPP.

The methodology used in the inventory involved the collection or modeling of energy, fuel, and vehicle data, and the calculation of GHG emissions based on fuel types and uses from different sources and sectors. The inventory uses EPA's standard GHG emissions factors and GPC framework to determine metric tons of carbon dioxide equivalent (MTC02e) for three greenhouse gases: carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O).

CO2e is an abbreviation for carbon dioxide equivalent, the internationally recognized measure of greenhouse gas emissions. Converting emissions of non-CO2 gases to units of CO2e allows greenhouse gases (GHGs) to be compared on a common basis: the ability of each GHG to trap heat in the atmosphere. In this report, non-CO2 gases have been converted to CO2e using internationally recognized Global Warming Potential (GWP) factors from Intergovernmental Panel on Climate Change (IPCC) assessment reports.

The IPCC developed GWPs to represent the heat-trapping ability of each GHG relative to that of CO2. For example, the GWP of methane is 25[8] because one metric ton of methane has 25 times more ability to trap heat in the atmosphere than one metric ton of carbon dioxide. The GWP of nitrous oxide is 298. The CO2e measure is used worldwide to report the equivalent weight of carbon dioxide in metric tons (MTCO2e) (1,000 kilograms or 2,205 pounds). The global warming potential from each greenhouse gas is based on the amount of carbon dioxide that would have the same global warming potential measured over a specified time period.

Emissions Reduction Strategies & Measures

The State has identified more than $700 million in potential mitigation measures that could be advanced by state agencies, the university, and local governments. This could easily be expanded in the development of the comprehensive planning process, and at a more micro level. The State's PSEAP has focused on broadly applicable measures that have maximized the impact of federal investment. GHG reduction measures include the following, organized by category.

Residential Weatherization & Energy Efficiency
- Alaska Housing Finance Corporation – Weatherization Assistance and Energy Rebate Programs
- Southeast Conference – Residential Beneficial Electrification

Non-Residential Weatherization & Energy Efficiency
- Juneau Wastewater Treatment Plant Boiler Upgrades
- UAA Anchorage Campus Efficiency/Electrification
- UAF Efficiency, Weatherization, and Heating
- DOT&PF Facilities Energy Improvement Program
- Other Public Facilities & Assets

Solid Waste
- Central Peninsula Landfill Methane Reduction
- Tlingit & Haida Composting Program

Transportation
- Green Corridor – Juneau Port Electrification
- AEA EV Charging Infrastructure

8 https://www.epa.gov/system/files/documents/2023-03/ghg_emission_factors_hub.pdf

Electric Generation
- Dixon Diversion
- Community Generation & Transmission Projects
- DERA, VEEP, & Rural Alaska Distribution
- Solar for All
- Renewable Energy Fund

Other measures
- DNR Carbon Capture and Utilization Sequestration Program

Benefits Analysis

The following figure – produced using EPA's IRA Disadvantaged Communities tools – indicates that almost the entirety of Alaska qualifies under federal criteria, which combines Climate and Economic Justice Screening Tool (CEJST) and EPA Environmental Justice Screening and Mapping Tool (EJScreen) datasets.

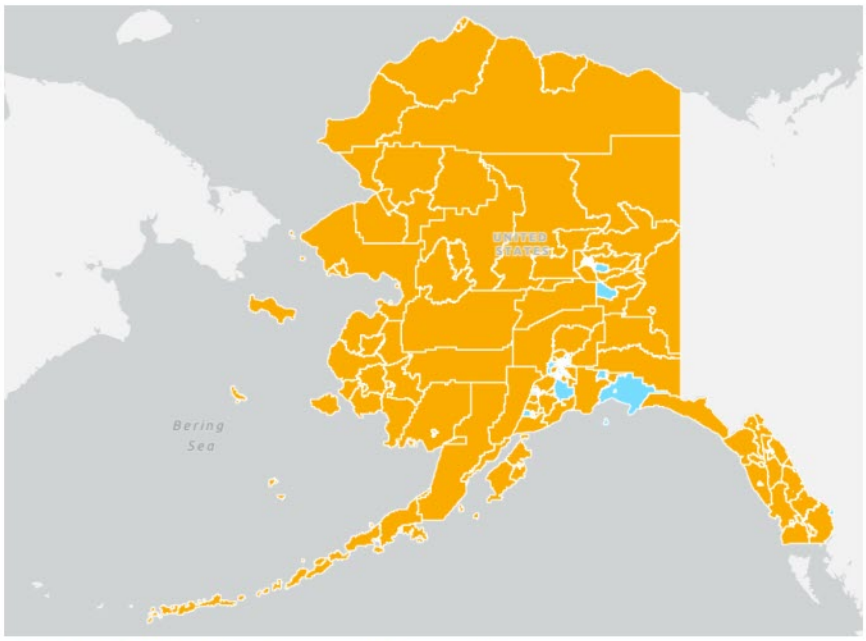

FIGURE 1: EPA IRA Disadvantaged Communities

The State of Alaska's PSEAP recognizes the incredible impact GHG reduction measures will have on LIDACs in the state. Measures included in the PSEAP are responsive to CPRG's requirement that at least 40% of project benefits accrue to disadvantaged communities.

DEC has included this preliminary analysis of benefits for LIDACs anticipated to result from the GHG reduction measure(s) in their PSEAP and recognizes that EPA anticipates requiring an accounting of such benefits as part of any future CPRG implementation grant application. DEC has used the CEJST along with EPA's EJScreen as a supplement to CEJST.

Low Income / Disadvantaged Communities (LIDAC) Benefits Analysis for PSEAP and Mitigation Measures

This is included in the Appendix as a spreadsheet with multiple tabs that indicate LIDAC analysis broadly for the PSEAP, and individually for mitigation measures.

Review of Authority to Implement

All reduction measures have been evaluated for the proponent's authority to implement, which falls into three categories. Measures have been submitted by State agencies, the University of Alaska, or local governments (political subdivisions). All have the necessary authority to implement GHG reduction measures proposed in the PSEAP, and a detailed review of authority is included as Chapter VI.

The following describes organizational authority in brief:
- Alaska Housing Finance Corporation – quasi-independent State housing authority

- Alaska Energy Authority – State energy agency
- University of Alaska – State political subdivision
- Alaska DOT&PF – State transportation agency
- Alaska DEED – State education agency
- City and Borough of Juneau – political subdivision, consolidated municipal government
- Kenai Peninsula Borough – political subdivision, county-equivalent
- Southeast Conference – Alaska regional development organization and council of governments

While priority measures are described relative to specific organizational sponsors, the State's PSEAP is crafted such that any entity with similar or relevant authority to implement may do so. Thus, all categories of measures are available to all political subdivisions of the State.

At the same time, DEC recognizes the authority of tribal governmental planning and implementation and adopts by reference the reduction measures identified by Tribes, to the extent they do not come into conflict with State authority to implement or otherwise manage its resources, lands, and activities. Cross-walking of measures will be conducted during the comprehensive planning process.

Intersection with Other Funding Availability

In addition to particular mention in section III, the PSEAP acknowledges the intersection of the Climate Pollution Reduction Grant program with other federal investments, including:

- EPA's Solar for All
- DOE's Grid Resilience and Innovation Partnership
- DOE's Training for Residential Energy Efficiency Contractors (TREC)
- DOE's Home Energy Rebate Program
- DOE's Renew America's Nonprofits Program
- DOE's Weatherization Assistance Program
- FHWA's Carbon Reduction Strategy allocation
- Investment Tax Credit (ITC) and related IRA incentives

Ultimately, nearly every currently available federal grant opportunity includes reference to the need for projects to advance carbon reduction. The State will evaluate individual opportunities alongside CPRG investments to leverage to the greatest extent possible.

Initial Workforce Planning Analysis

While continued assessment of workforce needs for these measures will occur, this plan contains an initial workforce planning analysis in section IV. The State's strategy to strengthen and cultivate a workforce capable of implementing the array of GHG reduction measures outlined within the PSEAP follows an important structure:

1. Establish and cultivate increased coordinative capacity within and between the workforce and relevant sectors. This implementation strategy will support career pathways through a diverse network of training providers.
2. Expand outreach efforts to underserved and disadvantaged areas with high unemployment and underemployment. This implementation strategy will provide funding for statewide and targeted outreach efforts.
3. Increase capacity of existing place-based training programs for upskilling and reskilling Alaskans for employment in high-demand industries, implemented by prioritized region. Alaska has numerous existing training programs and facilities that have the potential to meet the training needs of Alaskans but currently lack the capacity to meet the demand.
4. Identify and deliver new or improved rural place-based training to underserved areas for upskilling and reskilling Alaskans for employment in high-demand industries, implemented by prioritized

region and sector. This implementation strategy will focus on adding new place-based training and support systems to prioritized regions, including delivering remote training as necessary.

5. Provide wraparound support services. Implementation efforts should provide support for workers entering into training programs, including housing and childcare, travel, and supplies that alleviate the challenges identified by worker voices.
6. Strengthen economic development and the contractor ecosystem. This implementation strategy will include maintaining and cultivating partnerships with Alaska SBDC and regional development organizations (ARDORs).

Implementing projects that contribute to reducing GHG emissions will take into account Good Jobs Principles. Alaska is committed to fostering safe, healthy, and inclusive workplaces with equal opportunity, free from harassment and discrimination. State agencies and local governments will provide multiple pathways for creating high-quality, middle-class jobs in the residential-serving distributed solar energy industry based on principles outlined below. In addition, eligible entities have considered ways to invest in training, education, and skill development and support the corresponding mobility of workers to advance in their careers. Agencies will assess collective bargaining agreements as identified throughout the life of the project.

I. Overview

A. Introduction

i. CPRG Overview

From the Inflation Reduction Act, the EPA released a number of formula planning grants to states, municipalities, and tribes under the CPRG program. These grants fund the creation of three types of planning documents through 2025 – a Priority Climate Action Plan (PCAP), a Comprehensive Climate Action Plan (CCAP), and a Status Report.

In Alaska, several tribes and tribal consortia are creating plans at the community level, while the state is producing its plans – starting with a Priority Sustainable Energy Action Plan (PSEAP) to meet the requirements of the PCAP – via collaboration between the Department of Environmental Conservation and the Alaska Municipal League. Major partners in this collaboration include The Alaska Native Tribal Health Consortium's Rural Energy Program, Tanana Chiefs Conference, Kawerak, and the Bristol Bay Native Association.

ii Scope of Plan

This plan contains a list of quantified GHG reduction measures that could be implemented by state agencies, municipalities, tribal consortia, and councils of government. In line with EPA guidance for this document, measures do not have to address all sectors nor meet a specific target for reductions. Measures for this plan are required to be "near-term, high-priority, implementation ready measures."

These measures generally focus on a statewide and regional scope that complements the community-level planning effort being conducted by grantees under CPRG tribal planning. Some of these measures are explained in greater detail, given greater availability of information and greater likelihood of agency applications to implement.

Given the impetus to identify high impact measures that are ready to implement, this plan looks at existing programs or projects that can be boosted or completed with CPRG funding to deliver significant, long-lasting emissions reductions are ideal for the priority CPRG plan since they may be able to more easily complete a quality CPRG implementation grant application and receive funding.

iii Alaska Context

Alaska's greenhouse gas (GHG) emissions profile is distinct due to its unique geographical, environmental, and economic conditions. In 2020, Alaska's total CO2 emissions were reported at 33.4 million metric tons (MMT), an increase from previous years but still lower than the peak of 45.4 MMT in

2005[9] Alaska spends dramatically for energy on a per capita basis. In 2021, Alaska ranked first with a per capita energy expenditure of $8,711, amounting to nearly 11.15% of its GDP[10]. This ranking has remained consistent since 2015. The EIA attributes this to factors such as Alaska's Arctic environment, which results in long and harsh winters, and the presence of a large and developed oil and natural gas industry.

In 2021, Alaska ranked 39th out of all states in terms of energy-related CO2 emissions. In comparison, states with larger populations and economies, such as Texas and California, recorded 2021 emissions of 663.5 MMT and 324 MMT[11], respectively. On a broader scale, Alaska's GHG emissions for 2020 constituted approximately 0.66% of the total nationwide GHG emissions. When considering global anthropogenic GHG emissions, which account for 36.44 billion tons[12] per year (TPY), Alaska contributes a mere 0.000092672% of CO2e to these global emissions.

Despite Alaska's relatively minor role in overall national and global greenhouse gas emissions, the state stands out for its high per capita emissions, ranking third out of state in 2021 with 53 MT per capita energy-related CO2 emissions[13]. This contrast is deeply rooted in Alaska's distinctive context. On one hand, its small population size typically leads to a lower total emissions output. However, Alaska's vast and rugged Arctic environment significantly elevates per capita energy and fuel needs, especially during prolonged, harsh winters. Furthermore, the state has a well-developed and mature oil and natural gas industry in both the North Slope and Cook Inlet which provides fossil fuel energy resources for interior markets and is exported to the contiguous United States. Thus, Alaska's unique combination of a low population, an energy-intensive climate, and a major energy industry culminates in its high per capita emissions despite its smaller overall emissions contribution.

On a national scale, the U.S. transportation sector is the largest contributor to greenhouse gas emissions[14], primarily driven by road vehicles like cars and trucks. However, Alaska's transportation emissions profile is distinct due to its heavy reliance on aviation and marine transportation. While road vehicles dominate the transportation emissions in the contiguous U.S., Alaska's vast landscapes and limited road networks necessitate a more diverse transportation mix. While Alaska's transportation emissions trends reflect its unique geographical and infrastructural challenges, its contribution to the nation's overall transportation emissions is relatively small.

Alaska's emissions trajectory over the past thirty years presents a complex interplay of variables, influenced by infrastructure, technology, and resource utilization. The electrical generation sector reveals patterns of fuel combustion efficiency and technology adaptation, with coal combustion emissions indicating potential areas for technological intervention since 2013. The oil and gas sector's emissions data, juxtaposed with production metrics, offers insights into extraction and refining efficiencies. In transportation, the consistency of gasoline highway vehicle emissions, contrasted with the rise in diesel emissions, points to vehicular technology trends and fuel consumption patterns. The residential sector's data, particularly the spike in natural gas use, suggests infrastructural developments and shifts in energy consumption methodologies. Meanwhile, the agriculture and waste sectors underscore the engineering challenges and opportunities in waste management and sustainable farming practices. The role of emission sinks, from an engineering lens, emphasizes the importance of ecological infrastructure in carbon sequestration. Collectively, this analysis underscores the need for innovative engineering solutions to optimize resource utilization, enhance efficiency, and mitigate environmental impacts in Alaska's future.

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9 (Alaska Department of Environmental Conservation, Division of Air Quality, 2023)
10 https://www.eia.gov/state/seds/data.php?incfile=/state/seds/sep_sum/html/rank_pr.html&sid=US
11 https://www.eia.gov/environment/emissions/state/excel/table1.xlsx
12 (Alaska Department of Environmental Conservation, Division of Air Quality, 2023)
13 https://www.eia.gov/environment/emissions/state/excel/table4.xlsx
14 https://www.epa.gov/greenvehicles/fast-facts-transportation-greenhouse-gas-emissions

Electrical Generation. In the realm of electrical generation, there has been a noticeable plateauing and slow decline in emissions from three of the four fuel combustion types since 1990[15]. However, coal combustion emissions have seen an uptick since 2013. On the other hand, emissions from petroleum distillate (diesel) have slightly tapered off in the last two years of the reporting period, and natural gas emissions have consistently declined since their peak in 2012.

Oil and Gas. The oil and gas sector has witnessed a decrease in emissions between 1990 and 2020, primarily attributed to a decrease in crude oil production and refining. Specifically, CH4 emissions from oil production have declined by 0.325 MMT in the last five years. In contrast, natural gas production emissions saw a minor increase between 2017 and 2019 before decreasing by 0.134 MMT.[16]

Transportation. Transportation emissions have shown varied trends. Gasoline highway vehicles emissions have remained consistent over the past three decades, with a slight uptick to over two million TPY of CO2e by 2018. Diesel highway vehicles have seen a steady increase in emissions since 1990, culminating just below 800,000 TPY of CO2e by the end of the analysis period. Off-road vehicle emissions, which include aviation and marine sources, peaked in the mid to late 2000s but have experienced a slight decline in recent years. When examining on-road vehicle emissions trends from 1990 to 2018, emissions from gasoline highway vehicles have remained relatively consistent, with a slight increase to over two million tons per year (TPY) of CO2e by 2018. Passenger vehicle emissions have also seen an increase, reaching over 1.33 million TPY since 1990.[17]

Residential and Commercial. The residential sector has shown interesting trends. Statewide residential emissions have largely remained stable since 2013. However, there was a significant increase in residential natural gas use between 2019 and 2020, leading to a rise in emissions of 430,000 tons of CO2e since 1990. This increase is noteworthy, especially considering the state's population grew by 181,000 during the same period.[18]

Agriculture and Waste. Agriculture and waste sectors also contribute to the state's emissions. Agriculture produces GHGs through mechanisms like fertilizer converting to nitrous oxide and decomposition from agricultural waste that produces methane. These were estimated to account for just 109,000 tons CO2e in 2020[19], less than 0.5% of total state emissions. Waste decomposition, especially anaerobic decomposition of waste food, can release methane.

Emission Sinks. Lastly, emission sinks or reservoirs play a crucial role in the state's emissions profile. These are areas where carbon is removed from the atmosphere and sequestered. While wildfires produce CO2, N2O, and CH4, the gases from wildfires are often absorbed by more productive recolonized vegetation.[20]

Summary. Understanding Alaska's emissions trends over the past three decades is pivotal for shaping future policies and strategies. These trends reflect the state's evolving economic activities, technological advancements, and policy measures. While some sectors have seen increases in emissions, others have witnessed declines, emphasizing the need for a comprehensive approach to achieve broader environmental and sustainability goals.

15 (Alaska Department of Environmental Conservation, Division of Air Quality, 2023, p. 19)
16 (Ibid. p. 21)
17 (Ibid. p. 31)
18 (Ibid. p. 40)
19 (Ibid. p. 43-44)
20 (McGuire, Genet, He, et al., 2016)

Alaska's Grid Conditions

There are two distinct grid categories in the State of Alaska: Railbelt and remote. The majority of the state's population (~70%)[21] resides in urban areas of what's known as the Railbelt. This relatively small interconnected electrical system is home to significant Department of Defense assets, tribal governments, highly diverse populations, and a remarkable variety of carbon and non-carbon energy resources.

Alaska's Railbelt is serviced by five electric utilities (four cooperatives and one municipal utility) and is an interconnected grid that loosely follows the route of the Alaska Railroad. The State of Alaska, through the Alaska Energy Authority (AEA), owns significant transmission and generation infrastructure on the Railbelt system. The residents and businesses along the Railbelt consume approximately 75%[22] of the state's electricity across a service area similar to the distance from West Virginia to Maine. On an annual basis, the Railbelt generates approximately 5000 GWh[23]. Interconnection between regions is by single transmission lines, which limits economic transfers and negatively affects system resiliency. The opportunity for residential solar is high in this market.

The remaining ~30% of the state's population resides in over 200 rural and tribal communities and rely on local and regional power generation. These remote, islanded grids are owned and operated by approximately 100 utility operators, including cooperatives, tribal, and municipal entities. Most of these rural Alaska communities are only accessible by plane or marine vessel, with over half classified by the Denali Commission as distressed communities.

Except where these utilities have legacy hydroelectric generation, such as in large portions of Southeast Alaska, these communities[24] are generally supported on the Power Cost Equalization (PCE) program that subsidizes electric rates for rural consumers to bring them in line with those paid by consumers in Anchorage, Fairbanks, and Juneau. Since 1985 when it was implemented to spread the benefit of subsidized energy projects in urban Alaska to rural Alaska, PCE has been a critical feature of Alaska's energy landscape that has helped soften the energy burden faced by rural communities.

To move towards a resilient economy, characterized by less reliance on fossil fuels for energy, the State must embrace local, clean energy that can power value-added economic development. Diversification in this way will strengthen the State's economy overall and increase opportunities for local residents. Private sector innovation is increasingly driving economic development in the state. This trend can be supported within priority industries, with incentives in places where clean energy is used. Supporting centers of innovation such as business accelerators and incubators that assist start-ups focused on value-added activities is critical to creating private sector innovation and fomenting entrepreneurship.

B. Vision, Goals & Objectives

i Vision Statement

Alaska's vision is for a sustainable energy action plan that results in improved economic development, community resilience, public health, and affordability for residents while delivering transformative and beneficial emissions reductions.

ii Goals

This vision can be met with goals that are realistic and consistent with Alaska's current conditions and aspirational future. The State of Alaska's goals are to:

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21 https://live.laborstats.alaska.gov/data-pages/alaska-population-estimates
22 https://www.epa.gov/system/files/documents/2024-01/egrid2022_summary_tables.pdf
23 Ibid.
24 https://gis.data.alaska.gov/datasets/DCCED::power-cost-equalization-pce-program/about

1. Leverage available federal funding to achieve a widespread and impactful transformation at the residential, commercial, and public sector levels, and across sectors.
2. Deliver equitable benefits such that disadvantaged communities have access to resources that decrease their vulnerability and improve resilience.
3. Align activities with beneficial economic impacts that include improving job quality, increasing workforce opportunity, and strengthening business development.
4. Achieve corresponding environmental and public health benefits, including improving air quality.
5. Significantly diversify power generation with an emphasis on local, reliable, and affordable energy.

In aiming to reduce its carbon footprint, the state is focusing on key sectors like transportation and energy production that contribute significantly to emissions. Recognizing the complexities in managing emissions, the state highlights the following aspirations, which are indicative rather than time-bound goals . Further development, and refinement of these targets to sector-level, quantified metrics, will be completed in coordination with relevant stakeholders as part of the comprehensive planning process.

- Emissions reductions of 15%: This milestone reflects the potential impact of reducing GHG emissions from 2022 levels by 15%. This would entail targeting high-emission sectors with immediate measures to reduce emissions.
- Emissions reductions of 30%: This milestone represents the challenging goal of cutting GHG emissions by 30% from 2022 levels. Achieving this would likely require a comprehensive transformation of the state's energy infrastructure, adopting sustainable practices across all sectors, and harnessing Alaska's natural resources for carbon sequestration.

iii Objectives

- Support and incentivize energy efficiency, renewable energy, decarbonization, and beneficial electrification across all sectors.
- Sustainably increase value-added economic activities (e.g., fisheries, transportation, agriculture, mariculture and marine biotechnology, and petrochemicals) that leverage clean energy and maximize in-place opportunity for residents.
- Develop new carbon-neutral models of community economic development that support diversification, leverage local investment, and strengthen the clean energy economy.
- Support diversification, investment, and established business expertise within sectors addressing carbon reduction.
- Promote and export technological and process innovation related to carbon emission reduction and sequestration.
- Increase and promote growth opportunities in careers that contribute to addressing carbon reduction, including engineering, architecture and design, business, and entrepreneurship.
- Increase the financing opportunities available for affordable and low-carbon clean energy and energy efficiency activities.
- Consider mechanisms to ensure that oil and gas development is conducted more efficiently and with decreased emissions, and with continued private investment.
- Identify ways to reduce fugitive emissions and increase carbon capture, use, storage, and sequestration.
- Set a target of renewable energy that should be included in new oil, gas, mining, and industrial projects.
- Establish programs to finance and support energy efficiency retrofits for residential, commercial, and public buildings.
- Improve electric generation efficiency in the Railbelt through a regionwide system operator and economic dispatch.
- Improve electric generation efficiency in rural Alaska through optimized power generation

maintenance, improved renewable integration strategies, and reduced line loss.
- Increase the efficiency of and reduce carbon emissions in air, rail, road, and marine operations and transportation, and promote the use of more efficient and lower-emitting fuels.
- Prepare for and promote a rapid transition to electric vehicles (EV) and lower-carbon fuels for transportation; this includes providing the requisite EV charging infrastructure, as well as shared bulk purchasing of EVs.
- Establish a Green Bank to develop long-term, state-led financing of clean energy and energy efficiency.
- Explore the state's ability to access or leverage venture capital funds, reinsurance programs, and other innovative opportunities for funding.

C. Planning Process & Methodology

The development of this plan occurred primarily between August 2023 and February 2024. The follow table describes some major milestones:

Planning Timeline

- August Literature Review
- September GHG baseline emissions identification
- October GHG baseline emissions review
- November Measures identification
- December Peak outreach and education
- January Draft planning documents
- February Finalizing planning documents
- March Release PSEAP as PCAP deliverable to EPA

Community Engagement

CPRG Working Group. Given the short timeline and need to avoid duplication of effort, AML and DEC have focused on coordinating their outreach and engagement efforts with the CPRG Working Group, which includes all Tribal planning awardees and consortia. Regular participants in this group include those working on tribal planning grants for ANTHC, TCC, Kawerak, and BBNA.

State Agencies. The development of the PSEAP has required intensive engagement with state agencies that had not previously been engaged in or prioritized carbon reduction activities, and which required new effort to understand and respond to this opportunity, such as DEED. Scoping of this plan is also informed by recent state energy planning efforts for agencies like the Alaska Energy Security Task Force Report.

Political Subdivisions. Much of the communication about this program, and soliciting potential measures, has been completed with city and borough governments, who regularly engage with AML's infrastructure programming. Outreach has also been conducted with school districts, tribes, and other public entities. These anchor institutions will have the greatest ability to implement wide-ranging and impactful emission reduction measures.

Public Awareness. Several public presentations about CPRG and the development of this plan have been given by AML staff and in coordination with ANTHC's planning team at major events like the Infrastructure Symposium and Alaska Local Government Conference. There have also been several smaller virtual and in-person presentations to groups including the Alaska Municipal Climate Network and the Alaska Environmental Health Association.

DEC anticipates an increased amount of public outreach and community engagement as part of the development of a comprehensive sustainable energy action plan. Additional information on this is detailed in section VII of this plan.

II. State of Alaska GHG Inventory 2022

This report summarizes the GHG emissions from the State of Alaska for the calendar year 2022. The methodology used in the inventory involved the collection or modeling of energy, fuel, and vehicle data, and the calculation of GHG emissions based on fuel types and uses from different sources and sectors at the community, borough, census area and state-level. The inventory determines metric tons of carbon dioxide equivalent (MTC02e) for three greenhouse gases: carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O).

This inventory's methodology utilizes activity data and emission factors to calculate emissions.

Emissions (CO2) = Activity Data (MMBTU) x Emission Factor (CO2 per MMBTU)

Activity data represents the relevant measurement of energy use, such as fuel consumption by fuel type (propane, heating oil, diesel, gasoline, jet fuel, etc.) and metered electricity use, and is collected from a variety of sources, listed below. To translate energy use data, factors from the EPA's 2022 GHG Emissions Factors Hub[25] were used.

Table 1 provides an overview of data on energy use total emissions by sector and source (fuel type) as a result of the emissions inventory process. MMBtu represents one million British thermal units and is a unit of energy used to compare across different fuel quantities, like diesel vs. electricity - all units of fuels, electricity, and wood have been converted to MMBtu for purposes of comparison.

CO2e is an abbreviation for carbon dioxide equivalent, the internationally recognized measure of greenhouse gas emissions. Converting emissions of non-CO2 gases to units of CO2e allows greenhouse gases (GHGs) to be compared on a common basis: the ability of each GHG to trap heat in the atmosphere. In this report, non-CO2 gases have been converted to CO2e using internationally recognized Global Warming Potential (GWP) factors from Intergovernmental Panel on Climate Change (IPCC) assessment reports per EPA[26]. The IPCC developed GWPs to represent the heat-trapping ability of each GHG relative to that of CO2.

This report used the 2022 calendar year for the reporting year: A standardized emissions inventory report comprises all GHG emissions occurring during a calendar year. Among others, the United Nations Framework Convention on Climate Change, the Kyoto Protocol, the European Union, The Climate Registry, and the California Climate Action Registry all require GHG inventories to be tracked and reported on a calendar year basis.

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25 https://www.epa.gov/system/files/documents/2023-03/ghg_emission_factors_hub.pdf
26 Ibid.

In calculating emissions from stationary combustion using fuel use activity data and emission factors by fuel type involves the following steps. First, the inventory process determined the total annual consumption of each fuel combusted at community-level sectors, as well as facilities and assets whenever available. Then, we determined the appropriate CO2, CH4 and N2O emission factors for each fuel using EPA's factors[27]. Finally, we calculated each fuel's CO2, CH4 and N2O emission contributions, and lastly convert CH4 and N2O emissions to MTCO2 equivalent to determine total emissions. Then based on community membership the data was aggregated at the borough-level and then at the state-level.

Residential and commercial electricity and fuel consumption were estimated for Alaska communities using a similar spatial refinement methodology previously performed by the National Renewable Energy Laboratory (NREL) from the DOE Leading through Energy Analysis and Planning (Cities-LEAP)[28] project.

This methodology represents a revised model using newly available data sets to estimate community-level data for the 2022 calendar year. Modeling was conducted at the U.S. Census tract level and then aggregated accordingly to the community level. For stationary combustion, a number of datasets were used to conduct the analysis, principally the Residential Energy Consumption Survey, and Energy Information Administration's Commercial Buildings Energy Consumption Survey (RECS and CBECS); although data from ARIS, PCE, and other localized datasets was used as well. The estimates also uses EIA's SEDS totals, which itself is based off of regionally aggregated energy consumption surveys, such as for surveys of energy consumption by residential households from the Residential Energy Consumption Survey (RECS, Form EIA-457) and by commercial buildings from the CBECS (Form EIA-871) provide detailed information about the energy end users, their size, their assumed stock of energy-consuming equipment and appliances, and their total energy consumption and expenditures. Although MECS (Form EIA-846) collects consumption by type of use and fuel switching capability from manufacturing establishments grouped by manufacturing classification, usually 3-digit NAICS codes, the FLIGHT database of the GHGRP was used instead at the reporting facility level.

Transportation emissions were modeled using EPA's MOtor Vehicle Emission Simulator (MOVES) model for on-road (passenger vehicles, motorcycles, trucks, buses, etc.) and non-road (equipment, recreational or other crafts) assets at the borough-level and downscaled using ACS and NAICS factors. MOVES models had specific fuel-types per vehicle type. Most electricity generation emissions came from Power Cost Equalization Program (PCE) for rural energy generation and consumption, whereas utility territory specific details from EIA form 861 and downscaled by communities within the territories. Only source and sector emissions were covered with grid-losses assumed to be the difference between upstream generation and downstream consumption.

The end-use sectors in the table follow's US EIA's sector classification for inclusion. For instance, the residential sector classification adopted here follows EIA's definition of an energy-consuming sector that consists of living quarters for private households. Common uses of energy associated with this sector include space heating, water heating, air conditioning, lighting, refrigeration, cooking, and running a variety of other appliances. The residential sector excludes institutional living quarters, which instead appears in the commercial section. Commercial sector is an energy-consuming sector that consists of service-providing facilities and equipment of businesses; federal, state, and local governments; and other private and public organizations, such as religious, social and other such groups. Common end-uses uses of energy associated with this sector include space heating, water heating, air conditioning, lighting, refrigeration, cooking, and running a wide variety of other equipment, such as generators that produce electricity and/or useful thermal output primarily to support commercial activities.

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27 Ibid.

28 https://www.nrel.gov/news/program/2019/data-to-decisions-nrels-latest-cities-leap-work-provides-unique-solutions-to-local-governments.html

Table 1: Statewide GHG emissions (MT CO2e) by source and sector for calendar year 2022

Sector	Fuel type	Energy in Billion BTU	MT CO2e
Residential	Distillate fuel oil	7,955	582,704
	Propane	419	25,752
	Electricity consumption	7,110	670,260
	Natural gas	21,054	1,117,125
	Wood energy	6,080	570,304
Commercial	Distillate fuel oil	8,604	630,243
	Motor gasoline	536	37,638
	Propane	816	50,151
	Electricity consumption	8,730	822,977
	Natural gas	16,439	872,253
	Waste energy	397	36,008
	Wood energy	1,091	102,336
	Coal	7,367	687,194
Industrial	Still gas (industrial)	13,930	1,313,181
	Unfinished oils	463	43,647
	Asphalt and road oil	13,425	1,011,708
	Lubricants	904	67,140
	Distillate fuel oil	15,171	1,111,276
	Propane	126	7,744
	Motor gasoline	524	36,795
	Electricity consumption	4,527	426,760
	Natural gas	321,064	7,035,656
	Wood and waste	71	6,660
	Coal	22	2,052
Transportation	Aviation gasoline	1,037	71,812
	Propane	6	369
	Distillate fuel oil	29,651	2,171,936
	Jet fuel	126,719	9,151,646
	Lubricants	417	30,971
	Motor gasoline	30,930	2,171,905
	Natural gas	484	25,681
	Biodiesel	865	63,872
Total emissions			**40,955,755**

TABLE 1: 2022 Statewide GHG Emissions (MT CO2e) by source and sector for calendar year 2022

Industrial sector is the energy-consuming sector that consists of all facilities and equipment used for producing, processing, or assembling goods. The industrial sector encompasses manufacturing (NAICS codes 31-33); agriculture, forestry, fishing, and hunting (NAICS code 11); mining, including oil and gas extraction (NAICS code 21); and construction (NAICS code 23). Unlike residential and commercial end-uses, the overall energy use in this sector is largely for process heat and cooling and powering machinery, with lesser amounts used for facility heating, air conditioning, and lighting. Non-energy use of fossil fuels is also used as raw material inputs to manufactured products. Like the commercial sector, this sector includes generators that produce electricity and/or useful thermal output primarily to support industrial or manufacturing activities and large facilities are captured in EPA disclosures by the facilities. A related, but separate sector, is the power sector, which is the energy-consuming and process sector that consists of electricity-only and combined-heat-and-power plants within the NAICS 22 category whose primary business is to sell electricity, or electricity and heat, to the public, and thus includes electric utilities and independent power producers. In the state summary table, electricity consumption is separated out based on the in-state sectors consuming that electricity, such as residential, commercial, industrial and transportation end uses.

EIA's transportation classification has also been adopted, which identifies it as the energy-consuming sector that consists of all vehicles whose primary purpose is transporting people and/or goods from one physical location to another, including automobiles; trucks; buses; motorcycles; trains, subways, and other rail vehicles; aircraft; and ships, barges, and other waterborne vehicles. Vehicles whose primary purpose is not transportation (e.g., construction cranes and bulldozers, farming vehicles, and warehouse tractors and forklifts) are classified in this sector by EIA due to their primary use, which is handled within MOVES model's non-road modules.

Di rect GHG emissions from stationary (non-transport) combustion of fossil fuels at a facility, such as combustion within boilers, turbines, process heating, but also end-uses like space or water heating, and appliances. These come from residential, commercial, community and industrial buildings and facilities. For each modeled fuel type from sources above Emission factors are calculated ratios relating GHG emissions to a proxy measure of activity at an emissions source. Whenever emissions values were directly provided, we consulted the source, U.S. EPA or the emitters, directly to understand data quality.

In 2022, residential emissions amounted to 2,966,144 MT CO2e or accounted around 7% of total statewide emissions in 2022. Commercial emissions on the other hand, amounted to 3,238,800 MT CO2e or around 8% of total statewide emissions. Industrial emissions, which include emissions from municipal solid waste landfills, petroleum and natural gas systems, refineries, and other general stationary fuel combustion sources, amounted to 21,062,619 MT CO2e or around 51% of total statewide emissions. These emissions include some offshore usage of fuels, not attributed to a specific region or industrial facility. Power generation and distribution is not counted here, but as end-use consumption in respective end-use sectors, such as residential and commercial and non-process industrial stationary combustion. Transportation emissions, which includes both on-road and off-road sources, amount to 13,688,191 MT CO2e or around 33% of total statewide emissions. These emissions are direct GHG emissions associated with fuel combustion in mobile sources, such as on- road vehicles (passenger vehicles, commercial trucks, government fleets) and off-road vehicles (planes, ships) or equipment (air support, construction, agricultural, etc.)

Emissions are broken down into Scope 1, 2, and 3. Scope 1 emissions refer to boundary emissions, such as combustion of fuels for use within the community like heating a home or workplace and driving, when the operational boundary is the entire state, all emissions can be considered Scope 1. At more community levels and boundaries, Scope 2 emissions typically refers to grid supplied energy, such as electricity, heat or steam, either combusted within the boundary and then delivered (in which case it would be Scope 1 in the community) or combusted outside the community boundary. All industrial emissions data came from EPA's GHGRP system at the facility level. All residential and commercial emissions were estimated based on records at the zip code level on NAICS code-based entities for commercial, and American Community Survey (ACS) for residential. Scope 3 refers to indirect emissions, such as material and energy inputs from outside of Alaska, or goods and services sold and processed outside of Alaska.

III. Emissions Reduction Strategies

A. Residential

AHFC Weatherization Assistance Program & Energy Rebate Program

Summary

Weatherization has been a housing policy priority throughout Alaska for many years, due to its ability address multiple community challenges, such as poor quality housing and high energy costs, in one fell swoop. Residential energy use accounts for 7.6% of Alaska's energy use[29], and can be a major household expense, with Alaska's average household spending $4,186 which is over 1.8 times the national average; however, there is significant variation between regions, with rural and northern communities often facing higher costs. Approximately 14,600 housing units in Alaska are considered very inefficient, which is most pronounced in rural communities. Many rural communities in Alaska rely primarily on diesel fueled electric generators for power, Alaska ranks second only to Hawaii in the total share of electricity 14% in 2022 generated from petroleum[30]. On a per capita basis, Alaska ranks third in the nation in emissions due to it's small population, and harsh winters.

The Alaska Housing Finance Corporation (AHFC) has operated Alaska's Weatherization Assistance Program since the early 90's, which provides direct assistance to low-income Alaskans to make their homes more energy efficient, reducing energy consumption and energy costs while increasing comfort and durability of the home. This program was greatly expanded in 2008, when the state invested $200 million into the program. From 2008 through 2018, the program invested $402.1 million to retrofit 20,917 homes[31] across the state, creating 5,460 jobs in the process. Investment in Alaska residential energy projects has shown a substantial socioeconomic benefit[32] over the past 15 years, and renewed investment can continue to provide these benefits.

New programs supported by the Inflation Reduction Act are beginning to emerge, such as the Department of Energy's (DOE) Home Energy Rebate Program which AHFC will administer Alongside weatherization, this new program will help create a deeper transformation of residential energy landscape in Alaska that reduces emissions and provides more affordable, livable housing.

AHFC administered a state funded Home Energy Efficient Rebate program from 2008-2018 which funded energy efficiency retrofits in 26,587 homes across the state. Homes that participated in the state rebate

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29 https://www.eia.gov/state/?sid=AK#tabs-2
30 https://www.eia.gov/state/print.php?sid=AK
31 https://www.ahfc.us/application/files/5516/2576/4404/2019_Weatherization_Program_Impacts_Report.pdf
32 (McKinley Research Group, 2021)

program saw an average annual energy savings of 34%, with their Carbon Dioxide emissions being reduced from 41,090 lbs/year to 28,910, a reduction of 30%. A lifecycle analysis of the State's Home Energy Rebate program showed a savings to investment ration of 1.8, meaning energy cost saving experienced by the homeowner will earn nearly double the money back spent on installing the measures.

Alaska also benefits from agencies like the Alaska Cold Climate Housing Research Center and the National Renewable Energy Laboratories Fairbanks campus who innovate new solutions to make weatherization and energy efficiency in Alaska communities more affordable and effective.

Proposed Measure

The Weatherization Assistance Program is implemented primarily through regional entities like housing authorities, and non-profits including Interior Weatherization, Inc., RurALCAP, and the Alaska Community Development Corporation. The described priority measure would boost funding for this program to allow an additional 700 homes to be weatherized. The participation of regional housing authorities has been essential to completing weatherization work in the more than 200 communities not on the road system that often face lack of local financial firms, contractors, and affordable materials.

The Alaska Housing Finance Corporation has a range of programs that have served homeowners and renters around Alaska for decades – the Home Energy Rebate Program will join this portfolio in coming months, adding the potential to bring transformative home energy savings and emissions reductions for thousands of residences around the state. The described measure would add to planned Home Retrofit Rebates allowing for additional scope of rebates so that 3,650 households can receive deeper energy retrofits. It would also subsidize household energy assessments, which are required to access portions of the Rebate Program, enabling an additional 1,800 households to receive ratings. Additionally, the program would provide extra funding for households in Alaska's rural and remote communities to perform energy efficiency retrofits under the upcoming Department of Energy Energy Rebate Programs. This will allow households with incomes above the weatherization threshold but would still struggle to pay for their own retrofits to access the benefits and infrastructure provided under that program. We anticipate offering 1,800 expanded energy retrofit rebates.

If funded, allocation for the Weatherization Assistance Program will need to be increased gradually and annually over the five years of the project. Weatherization providers are currently staffed to provide services at the rate required by current annual funding. Increasing that funding will need to happen gradually and predictably, so they can increase their workforce to meet it. The Alaska Housing Finance Corporation and other statewide organizations are working to support this anticipated workforce growth via emerging workforce development programs, which are described in Section IV: Initial Workforce Planning Analysis.

To enable the additional retrofits that deliver emissions reductions, this program will provide funding for 1,800 additional household energy assessments and provide extended retrofits for 1,800 homes, allowing homeowners that would struggle to fund their improvements to make deeper and more efficient retrofits.

Similar Initiatives

More intensive weatherization may be completed on a regional level by housing authorities and other community organizations. This plan supports these local efforts.

Funding Landscape

Alaska's Weatherization Assistance Program is currently funded by DOE, LIHEAP and State Funds. Funding has been steady but limited for some time now, only allowing between 200-300 homes to be weatherized annually. Over the 2008-2018 period, over 96% of the programs funding came from state investment.

The Alaska Housing Finance Corporation is in the process of developing a Home Energy Rebate Program with funding made available under the Inflation Reduction Act; the proposed action in this section would expand upon that emerging program, allowing more Alaskans to participate.

Household Energy Assessment Subsidies to support Home Retrofit Rebates	Home Retrofit Rebates – increased incentives	Additional home weatherization assistance
$1,500,000	$7,200,000	$91,200,000

TABLE 2: AHFC Measure Budget

Transformative Impacts

Based on the historical performance of the Weatherization Assistance Program, households that go through weatherization experience an average reduction of energy consumption of an equivalent of 6,740 lbs of carbon dioxide a year, a 21 percent reduction. A reduction of 61.7 million BTU's or 453 gallons of fuel oil per year representing an average of 29% energy cost savings per household.

The Weatherization Assistance Program has historically delivered substantial benefits to low-income and disadvantaged communities.

Median household income	$28,263
Households in rural Alaska communities	42%
Alaska Native households	38%
Households with elderly members	34%
Households with children under 6	24%

TABLE 3: Alaska Weatherization Assistance Program Statistics

A life-cycle cost analysis of the program shows a Savings to investment ratio of 1.5, so energy cost savings from Alaska's weatherization program will earn back the money spend plus 50 percent over the course of the improvement's life. During the 2008-2018 period when the weatherization program had a state surplus of funds to work with, the program created an estimated 5,460 annual jobs.

These savings are especially significant in rural Alaska, where in Winter 2023 heating fuel in 92 unsubsidized communities had an average cost of $6.72 per gallon[33] in contrast to the national average of $4.60 during the same period. In Alaska's Western region, which has some of the lowest average household incomes in the country, the 2023 average heating fuel price rises to $7.50. While diesel use for electricity is supported by Power Cost Equalization (PCE) funds, this is not the case for household heating fuel. Given these statistics, it's evident why reducing the residential fuel needs in rural Alaska has such a disproportionate impact in reducing the economic burden of energy on individual households.

An important function of properly-done residential weatherization is making homes more livable and comfortable for its residents. Residential weatherization can help prevent moisture management issues that, left untreated, can lead to mold growth, poor indoor air quality, and worse health outcomes.

Less fuel consumption also means that fuel deliveries do not have to happen as regularly, resulting in greater resilience to freight disruption by weather and disaster that might delay fuel shipments. Over the long-term reduced residential dependence on diesel may mean that bulk fuel systems in some rural Alaska communities will not need to maintain as much capacity.

33 https://storymaps.arcgis.com/stories/b7c2c672432e456a8e1f9f6e52206d1d

Estimated Emissions Reduction

Action	CO2e Reduction (Annual Metric Ton, by 2030)	CO2e Reduction (Through 2030, cumulative metric tons)	CO2e Reduction (Through 2050, cumulative metric tons)
1,800 Households receive subsidized Energy assessments supporting Energy Efficiency Retrofit Rebates	21,640	81,751	514,551
3,650 additional homes are weatherized	44,740	158,122	1,052,922

TABLE 4: AHFC Measure Estimated Emissions Reduction

Southeast Conference Residential Beneficial Electrification Program

Summary

Thanks to factors like the moderate climate, high cost of fuel, and substantial legacy hydroelectric generation, Southeast, as well as much of Alaska's gulf coast, is well-positioned for beneficial electrification of the buildings emissions sector.

As a designated Economic Develop District (EDD) and Alaska Regional Development Organization (ARDOR), Southeast Conference serves as the state and federally designated regional economic development organization for Southeast Alaska. Their membership includes most municipalities and tribes in the region, serving as a common resource and a shared voice for these governments. In this role, Southeast Conference plans to work with the Juneau-based nonprofit Alaska Heat Smart to further priority objective #4 of the Southeast Alaska 2025 Economic Plan, which calls for the promotion of beneficial electrification.

Alaska Heat Smart has four years of experience in developing and operating energy efficiency and beneficial electrification programs, and has served over 1000 households and businesses in Juneau with operating funding from the City and Borough of Juneau. It currently manages four beneficial electrification programs with an annual budget of $1.5 million. It has recently expanded a suite of these services to Sitka. The DOE-funded NORTHH program as part of the "Renewing America's Nonprofits" funding opportunity, will begin in late spring of 2024 and take AHS services statewide, increasing the annual AHS budget to just over $3 million.

Proposed Measure

The proposed program would seek to accelerate beneficial electrification, primarily via air source heat pumps, throughout Southeast Alaska via three complimentary areas of action. It would also seek to expand their established work to begin to serve Southcentral Alaska communities. The target for installations in 2025 would be 525 buildings, growing to 650 buildings by 2030 – this project would establish resources and a program which, along with other factors, could set a path to beneficially electrify all oil-heated homes in the region using heat pump systems.

1. Expand the full suite of one-stop home energy and heat pump educational and advisory services of AHS throughout Southeast Alaska's 'hydro' communities.

Southeast's "hydro communities" are ripe for rapid acceleration of heat pump adoption for residential space heating due to availability of lower-cost 100% emissions-free electricity. When replacing or supplementing oil-based heating systems, homeowners can quickly realize a greater than 50% reduction

in heating costs and a substantial reduction of their GHG emissions. In many cases, residential emissions can be completely eliminated with the addition of an air source heat pump to a home's heating infrastructure.

2. Expand an appropriate suite of home energy and heat pump educational and advisory services of AHS throughout Southeast Alaska's 'partial hydro' communities.

Partial hydro communities face higher electrical rates than their 100% hydro-powered counterparts. Households in these Southeast towns may require additional reasoning besides cost savings to adopt an air source heat pump. Often, improvements in weatherization and a home's thermal envelope can enable heat pump savings. Education and advisory services in these communities must include a diversity of improvement options as well as guidance on tax credits and financial incentives.

3. Scale up AHS's home energy and heat pump educational and advisory services to serve Southcentral Alaska's coastal communities.

Strong interest in the AHS program model has been expressed by various southcentral communities, contractors, and utilities. The southcentral HVAC landscape is faced with unique challenges. Natural gas is a prevalent heating fuel for many homeowners along the southern Railbelt, contractor availability is extremely thin, and small communities are dispersed over great distances. Such communities may see greater programmatic success through the incorporation of a neighborhood-centric model such as the 2021-2022 AHS Thermalize Juneau campaign. The promise of a significant project tied to efficiencies of scale, along with streamlined product offerings, may entice greater contractor engagement.

4. Replicate the developing DOE-funded $5M AHS NORTHH (NOnprofit Retrofits for Health and Housing) program in order to serve up to 25 nonprofit organizations across Southeast Alaska with building retrofit services.

AHS has been named one of nine "prime selectees" to receive $4M in DOE funding for the Renewing America's Nonprofits grant. AHS will lead this program, along with partners the National Renewable Energy Laboratory - Alaska Campus, and Information Insights, to provide energy efficiency retrofits to up to 25 nonprofit organization buildings across the state of Alaska. Projected energy savings of up to 40% and GHG emissions reductions of up to 35% are targeted per building.

The Renewing America's Nonprofits program is a rare opportunity for the nonprofit sector and will allow these organizations to direct savings toward mission critical work. Southeast Alaska will only realize a fraction of the NORTHH program benefits. AHS will develop a "NORTHH – Southeast" program in order to deliver this uncommon opportunity to additional 501c3's operating between Yakutat and Saxman, Alaska.

Similar Initiatives

Municipalities, tribes, and other related entities may consider advancing regional and community-wide incentive programs that support weatherization and beneficial electrification using heat pump systems like proposed for Southeast Alaska. These efforts could follow the model set[34] in communities like Juneau to quickly support beneficial heat pump installations in their jurisdiction.

While systems designed for cold weather are still advancing towards wide commercial availability in Alaska and the electric grid is not substantially decarbonized in many communities, there are comparable examples of widespread air and ground source heat pump adoption in Arctic climates – namely in Norway[35] and Finland.

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34 https://storymaps.arcgis.com/stories/82810913c65e49549753ac1c14c67165

35 (Sadeghi, Ijaz, & Singh, 2022)

Funding Landscape

The current funding for AHS is derived from grants made by the City and Borough Juneau, grants from the Departments of Energy and the Department of Housing and Urban Development, and corporate and private donations made to the Alaska Carbon Reduction Fund, which to date has focused primarily on providing services in Juneau. With additional funding from federal programs like the Climate Pollution Reduction Grant program, AHS programs will be able to expand to serve a greater geographic range, and more deeply accelerate a regional energy transformation. The NORTHH program component would expand the benefit from the Renewing America's Nonprofits.

Transformative Impacts

The services provided by this program seek to reduce the cost of living and increase the use of clean energy in households by removing barriers to the adoption of energy efficiency measures and technologies. This proposal and its programs will provide energy efficiency and home retrofit education, as well as home energy assessment services, with a minimum 50% of program benefits directed to Justice40 communities.

Benefits flowing to disadvantaged communities will be realized via:

- a decrease in energy burden and utility costs with community dependent reductions in home heating of up to 75%
- increase in access to low-cost capital through both energy savings and financial assistance programs
- decrease in environmental exposure due to less use and storage of diesel or heating fuel and improvements in indoor air quality
- increase in high-quality jobs through disadvantaged and local hire and workforce development training, and equipment operations and maintenance in each community
- increased access to clean energy and home retrofit technologies such as high-quality heat pumps, ventilation, insulation
- Nonprofit energy burden reductions allowing an increase in mission-based expenditures

In communities with nearly 100% hydroelectricity such as Juneau, Sitka, Wrangell, Petersburg, Ketchikan, and some POW communities, replacement of oil heat with heat pumps can often result in almost complete elimination of carbon emissions for heating. AHS analysis of home energy data for Juneau homes indicates:

- Average household oil space heating annual cost: $3,048
- Average household electric resistance heating annual cost: $2,100
- Projected average annual savings from oil heat to heat pump: $1,802
- Projected average annual savings from resistance to heat pump: $1,226
- Average annual heating fuel elimination from installation of a single head heat pump - 500 gallons
- (NOTE: These costs/savings values were calculated assuming oil cost of $3.58/gallon. Today's oil costs (Jan '24) average $4.79/gallon so savings would actually be even larger.)

Estimated Emissions Reduction

Action	CO2e Reduction (Annual metric tons)	CO2e Reduction (Through 2030, cumulative metric tons)	CO2e Reduction (Through 2050, cumulative metric tons)
2833 Southeast households retrofitted with heat pumps	9,428	37,160	225,720

TABLE 5: SEC Measure Estimated Emissions Reduction

B. Non-Residential

Public Building and Asset Weatherization, Energy Efficiency, and Beneficial Electrification

Summary

Weatherization, energy efficiency measures, and beneficial electrification of Alaska's public, non-residential facilities like schools, universities, and state and city/tribal office buildings has great potential to provide emissions reduction and broader community benefits through money saved on energy expenses. Importantly, these measures are among the short list of efforts that can be undertaken with expedience and expertise by resource-limited governmental entities. In Alaska, government is one of the largest economic sectors. This is reflected in many small communities where public facilities, such as schools, are critical to human infrastructure, serving a changing role as lodging for out-of-town guests, emergency shelter, and community gathering space. AHFC's 2014 Energy Efficiency in Public Buildings Analysis[36], among other evidence, points clearly to the economic and environmental benefits

These facilities are also a major driver of costs for governments that are already fiscally distressed or lack access to sufficient revenue to meet growing costs, especially when the buildings are not energy efficient and use expensive heating oil, which in some communities is priced as high as $13/gallon.[37]

Proposed Measures

The proposed actions support programs by public entities that promote greater energy efficiency through weatherization, energy efficiency measures, and beneficial electrification in public facilities across Alaska. Other public assets, like vehicle and equipment fleets, may be considered as part of this measure as well. They would be implemented by the University of Alaska, Department of Transportation & Public Facilities, Department of Education and Early Development, municipal school districts, and other public entities like municipal and tribal governments.

University of Alaska

The University of Alaska was established in Fairbanks in 1917. Now the University of Alaska System includes three universities and 13 community campuses and extended learning centers located across the state. With more than 20,700 students, UA is essential to preparing the state's workforce. The proposed UA projects would address deferred maintenance, energy efficiency, and alternative energy projects (including some related to circulation, pedestrian improvements, and vehicle fleets) with the greatest potential for emissions reductions in the immediate future. UA's measures are well positioned to be implemented within 1-3 years.

Department of Transportation & Public Facilities

The Alaska Department of Transportation and Public Facilities (DOT&PF) designs, constructs, operates and maintains the state's transportation infrastructure systems, buildings, and other facilities used by Alaskans and visitors. The proposed measure would conduct energy audits, condition assessments and implement feasible energy efficiency upgrades at major State of Alaska facilities. It would also mean implementing already identified energy savings opportunities from other public assets, such as adjusting using LED streetlights on a portion of the state-owned Glenn Highway between Anchorage and the Mat-Su Borough. The majority of DOT&PF actions, in particular those that don't require energy audits, can be completed by the end of 2026.

Department of Education and Early Development

The Alaska Department of Education and Early Development manages state and federal funding for Alaska's schools to ensure an excellent education for every student every day. The proposed measure

36 (Wiltse, Madden, & Valentine, 2014)
37 https://storymaps.arcgis.com/stories/b7c2c672432e456a8e1f9f6e52206d1d

would fund major maintenance projects with substantial emissions reduction potential that have been identified through the department's Capital Improvement Project (CIP) program.

Projects on the CIP major maintenance list represent the most important capital projects for schools across the state. Of particular priority are projects in the Rural Education Attainments Areas (REAAs) of the unorganized borough, where the State of Alaska assumes the responsibility for providing K-12 education that would normally be shared with local governments. These REAA school districts operate with their own administration and school boards. The logistical ability to implement these measures varies by location, but they all ought to be implementable within a five-year window. Importantly, most of the projects that districts would consider for this program have been identified, scoped, and even partially designed/engineering as part of their submission to the state's CIP process.

Agencies, Tribes, Municipalities, and School Districts

Alaska's other state agencies, tribes, municipalities, and school districts provide essential services and maintain the critical infrastructure that support even Alaska's smallest communities. The proposed measure would support these entities in advancing basic energy efficiency retrofits and retro-commissioning of public buildings to reduce emissions via improvements in HVAC systems, insulation, beneficial electrification of space and water heating, rooftop solar systems, and other emissions-reducing modifications. The timeline for implementation of these measures varies based on the entity, but generally these retrofits can generally be made within a five-year window.

With respect to school districts, retro-commissioning should be considered as a cost-effective initial effort for energy conservation. AHFC's analysis found that "[s]ince every school district except Anchorage has an average ECI of greater than $2 per square foot and some schools have issues with deferred maintenance, retro-commissioning is likely to be very cost effective." This report includes data on ECI, a number of other recommendations that are still relevant to Alaska's public facility managers.

Measures that would be considered by these entities are substantially similar to what has been described for other entities in this section.

Funding Landscape

The cost of materials and labor for major maintenance can be prohibitively expensive in Alaska, especially in rural communities. In addition to these economic drivers, access to funding for major maintenance has been exacerbated by the ongoing state fiscal crisis which has exacerbated the maintenance condition of both state and municipal facilities.

Even when federal and state grants allow facility managers to consider implementing energy efficiency upgrades, finding non-federal match funds can be a major barrier to these projects. While some home rule municipalities may issue bonds, generally revenue conditions are not sufficient to pay back this debt in a reasonable period.

Action	Estimated Cost
UA - Campus Energy Projects	$50,000,000
DOT&PF - State Facilities Retrofits	$50,000,000
DEED - CIP Program Support	$66,296,653

Table 6: Non-residential budget estimates

Transformative Impacts
For state facilities, reduced energy usage means deeper savings that reduce expenses give state agencies more fiscal flexibility that allows more complete funding o public services. For the University of Alaska, these projects provide a direct benefit to students, faculty, and staff while also producing savings that support other services and offset the need for revenue such as increased tuition. Actions that produce reduced fuel combustion in Fairbanks helps reduce criteria pollutants which could help address that community's status as a PM2.5 nonattainment area.

Reduced fuel consumption can mean big differences for rural communities in Alaska. First of all, revenue for municipal governments in rural Alaska can be quite limited as communities can have a very restricted tax base; by reducing a reliably costly expense like heating oil, these essential governments may have greater fiscal resilience to economic shock and they may have more flexibility to invest in other needed areas. Reduced fuel use also may mean that fuel deliveries do not need to happen as regularly, resulting in greater resilience to freight disruption by weather and disaster that might delay fuel shipments. Over the long-term reduced residential dependence on diesel may mean that bulk fuel systems in some rural Alaska communities will not need to maintain as much capacity. This reduced reliance on importation of fossil fuels can make a huge difference for the most remote communities in Alaska.

Estimated Emissions Reduction
There is varying degree of certainty regarding emissions reduction, depending on whether the energy project is already scoped or if it needs to be identified with an energy assessment or similar tool.

To capture the potential emissions reduction from significant investment in non-residential energy efficiency that these measures represent, quantification was completed by modeling the impact of energy efficiency upgrades for 1050 geo-coded public buildings around the state, representing roughly 25% of all public buildings across the state.

CO2e Reduction (Annual Metric Tons by 2030)	CO2e Reduction (Through 2030, cumulative metric tons)	CO2e Reduction (Through 2050, cumulative metric tons)
60,761	243,044	1,458,264

TABLE 7: Non-residential Estimated Emissions Reductions

Mendenhall Wastewater Treatment Plant

Summary
The Mendenhall Wastewater Treatment Plant stands out as the largest and most energy-inefficient municipal facility within the City and Borough of Juneau (CBJ). A crucial hub for the community's waste management, this facility has been a stalwart but increasingly inefficient in its energy consumption. Its two fuel oil boilers, now in their 38th year of service, have been the primary workhorses behind the plant's operations, requiring 214,000 gallons of oil annually to power the municipally owned utility.

The passage of time has taken its toll on these boilers, which have reached the end of their 35-year service life and are in need of replacement. Recognizing the imperative for a sustainable energy shift, this measure calls for the replacement of one of the two aging boilers with an electric boiler. This transformation is projected to yield substantial savings, estimated at approximately 80,000 gallons of oil each year over the electric boiler's 35-year life cycle, amounting to an impressive 2.8 million gallons saved. While the replacement of a single boiler might initially appear as a modest endeavor, its impact is anything but insignificant.

In fact, this conversion to clean and renewable hydro-powered electricity carries profound implications, extending beyond the walls of the Mendenhall Plant. In its inaugural year of operation, this transition

promises to reduce the collective carbon dioxide (CO2) emissions from all CBJ-managed facilities—excluding schools and hospital buildings—by 11%. This significant reduction underscores the project's significance in both environmental and community terms, marking a pivotal step toward greener and more sustainable municipal operations.

CBJ, with its proven track record and systematic approach to energy efficiency enhancements, stands well-prepared to implement this transformative measure. It is part of a broader strategy that aligns seamlessly with CBJ's Juneau Renewable Energy Strategy[38] (JRES). As a cornerstone of JRES, this project contributes to the overarching goal of increasing renewable energy usage to a remarkable 80% of the total community energy consumption by the year 2045. Thus, it not only addresses the immediate energy efficiency needs of the Mendenhall Plant but also reflects CBJ's steadfast commitment to a more sustainable and eco-friendly future for Juneau and its residents.

Estimated Emissions Reduction

Metric	Emissions Reduction
Fuel Oil Savings	80,000 gallons per year
CO2e Reduction	711 metric tons per year
Percentage of Total CBJ Emissions	Over 11% of CBJ facility emissions (2021, excluding schools and hospital buildings)
Overall CBJ Emissions Reduction	More than 5% reduction in CO2 emissions (2021 GHG Emissions Inventory Update) when considering all operational emissions (buildings, equipment, fleet, etc.)

TABLE 8: CBJ Estimated Emissions Reduction

Community Benefits

Community benefits stemming from this project encompass both tangible and long-lasting advantages for the residents of Juneau. One of the primary benefits lies in the reduction of energy costs, a factor that directly impacts the economic well-being of the community residents. By mitigating the potential for long-term fuel cost increases, this project holds the promise of curbing the necessity for future rate hikes by the water utility. This is particularly significant for lower-income residents, it should be noted that this initiative extends its reach to benefit those residing in the federally designated disadvantaged community of Lemon Creek, represented by Census tract 4.

The City & Bureau of Juneau has already conducted an evaluation of replacement options for the Mendenhall Plant's outdated boilers. This evaluation estimates that with an electric boiler there would be a projected energy use cost savings of $5 million over the 35-year life cycle of this sustainable infrastructure. Replacement of the current boiler with an electric boiler also offers significant potential for emissions reduction, aligning with environmental goals and promoting cleaner air for the entire community. It is crucial to acknowledge that the initial capital costs for bringing an electric boiler online amounts to nearly $10 million, a financial commitment that surpassed CBJ's fiscal capacity without substantial grant funding assistance.

In the absence of support from programs like the CPRG (Community and Project Renewable Generation) or equivalent grant funding, CBJ would be compelled to proceed with the installation of two new fuel oil boilers. This scenario is driven by the fiscal realities faced by the community, and it underscores the challenges of funding such crucial projects independently, especially within the constraints of a municipality like Juneau. The reliance on external grant funding becomes not just an option but a vital

38 https://renewablejuneau.org/policies-for-renewables/cbj-renewable-energy-strategy/#:~:text=This%20ambitious%20energy%20strategy%20brings,hydroelectricity%20%E2%80%93%20for%20roughly%20100%20years.

lifeline for realizing both the economic and environmental benefits that this project promises to deliver to the community for generations to come.

Timeline
The timeline of this project is dependent on the procurement equipment lead times. Installment of electric boilers could be completed by 2026 if funded.

Project Budget Estimate

Item	Cost
Electric Boiler (equipment, parts, construction, etc)	$5.5 million
Escalation, Contingencies, Design, CBJ Admin, etc	$1.6 million
CBJ-side Electrical Upgrades	$2.5 million
AELP-side Electrical Upgrades	$150,000
Total Budget	**$9,750,000**

TABLE 9: CBJ Budget Estimate

Other Funding Sources
CBJ is committed to funding both the purchase and construction/installation expenses associated with the secondary fuel oil boiler, which will serve as a crucial backup to the electric boiler. This proactive measure not only enhances the facility's resilience but also aligns with sustainability goals by introducing a significantly more efficient alternative to the aging fuel oil boilers. The addition of this new boiler is anticipated to yield even greater reductions in greenhouse gas (GHG) emissions. The estimated cost for the acquisition and implementation of the new fuel boiler is projected at $3 million, reflecting CBJ's commitment to investing in cleaner and more energy-efficient solutions for its municipal facilities.

C. Solid Waste

Central Peninsula Landfill Methane Capture Project

Summary
The Central Peninsula Landfill (CPL) has been actively receiving Municipal Solid Waste (MSW) in its lined landfill cells since 2006. Presently, there are three open cells, with Cell 3 currently in active use. Given the landfill's size, the Kenai Peninsula Borough has not been obligated to actively collect landfill gas from these cells. Instead, passive horizontal gas vents have been installed throughout the cells to release any landfill gas into the atmosphere. An ongoing project is in progress to install a new leachate concentrator at CPL, which will have the capability to utilize landfill gas, resulting in significant savings on natural gas consumption. Furthermore, our local electrical energy cooperative is exploring the feasibility of installing a landfill gas-powered generator. This generator not only holds the potential to provide sustainable energy to the Borough but also to capture waste heat from its operation for use in the concentrator.

The Central Peninsula Landfill is the MSW landfill serving the Kenai Peninsula that is accessible by road. The Central Peninsula Landfill processes waste from a range of communities, spanning from Homer to Hope and Seward. Currently, the methane produced from the waste degradation process is passively released into the atmosphere. However, it's well-established in the industry that collecting and burning methane through a flare is a standard practice that mitigates methane emissions and harnesses its potential.

Beyond the environmental benefits of reducing methane emissions, CPL recognizes the opportunity to put this valuable resource to practical use within our facility. KPB has initiated a project to introduce a new leachate concentrator at CPL, specifically designed to handle the leachate generated within

the landfill cells. This concentrator will be equipped with a flare capable of burning both natural gas and landfill gas to power its equipment processes. Additionally, it can utilize waste heat to drive its operations. Once this state-of-the-art concentrator is installed, anticipated in the summer of 2024, we will be equipped to directly utilize landfill gas to power the evaporator, thereby significantly reducing our reliance on purchased natural gas. This, in turn, will lead to substantial utility cost reductions for both the landfill and the Borough.

The regional electric cooperative, Homer Electric Association, is actively exploring the feasibility of introducing a landfill gas-powered generator at the CPL site. There is potential to provide a renewable energy source for the Peninsula, further contributing to the emissions reduction potential of this project. Additionally, the waste heat generated by this generator could be captured and channeled into the leachate concentrator, further reducing waste and diminishing the need for gas consumption in the concentrator's operations. Although this project is currently in the design phase, it presents a promising avenue for a mutually beneficial partnership that aligns with our commitment to environmental stewardship and resource efficiency.

Community Benefits

The first notable benefit of this project is its capacity to significantly reduce the release of methane into the atmosphere within the Kenai Peninsula Borough. Historically, the landfill has been a substantial source of greenhouse gas emissions. By mitigating methane venting, this project would actively address localized environmental concerns and contribute to sustainable waste management for the Kenai Peninsula Borough.

In tandem with the reduction in methane emissions, another crucial advantage lies in the decreased reliance on natural gas at the landfill site. The new leachate concentrator is rated to use 18,000 CFH of natural gas. Any offset of this usage is a benefit in reducing emissions, saving taxpayer funds and reduction in usage of natural gas that is projected to be in short supply in coming years[39]. By optimizing the Central Peninsula Landfill's energy usage and minimizing the consumption of natural gas, this project embraces both fiscal responsibility and proactively responds to the challenges posed by an evolving energy landscape.

Estimated Emissions Reduction

Landfill gas, a byproduct of the decomposition of organic waste, comprises a complex mixture of gases. It typically contains approximately 50-55% methane, 45-50% carbon dioxide, and less than 1% of non-methane organic compounds, along with trace amounts of inorganic compounds. Methane, a predominant component of landfill gas, is a particularly potent greenhouse gas, possessing the ability to trap heat in the atmosphere 28 to 36 times more effectively than carbon dioxide over a 100-year period. Understanding the composition of landfill gas and the environmental implications of its emissions is critical in developing strategies to mitigate its impact.

Gas to energy initiatives, such as this proposed project, are designed to capture a substantial portion of the methane generated by landfills, with capture rates typically ranging from 60% to 90%, contingent on the efficiency and effectiveness of the system in place. The captured methane can then be repurposed, typically by burning it to produce electricity or heat, converting it into water and carbon dioxide in the process. This not only mitigates the release of methane, a potent greenhouse gas, into the atmosphere but also harnesses it as a valuable energy resource.

In the context of the Central Peninsula Landfill, the significance of landfill gas management becomes apparent when examining the emissions data. In 2022, the existing leachate concentrator was

39 https://alaskapublic.org/2023/06/02/alaskas-natural-gas-shortage-how-did-we-get-here-and-what-comes-next/

responsible for producing 2,255.3 metric tons of carbon dioxide (CO2) through the combustion of natural gas. With the introduction of the new unit, it is anticipated that this figure will surge by approximately 250%, resulting in the generation of 5,638.3 metric tons of CO2. Concurrently, the landfill itself was estimated to emit 2,125.96 metric tons of methane in 2022, a value that is expected to increase annually as waste continues to be deposited in the landfill. Implementing a landfill gas capture system with a capture rate of 60-90% could have averted the release of 1,275.6 to 1,913.4 metric tons of methane into the atmosphere while reducing natural gas usage for necessary operation of the leachate concentrator, a significant reduction with important environmental implications.

The following total CO2e reduction was calculated using the LFG Benefits Calculator, pulling from EPA's Landfill Methane Outreach Program (LMOP) database.

CO2e Reduction (Annual metric tons)	CO2e Reduction (Through 2030, cumulative metric tons)	CO2e Reduction (Through 2050, cumulative metric tons)
49,067	196,268	1,177,607

TABLE 10: CPL Estimated Emissions Reduction

Implementation Schedule

Project Phase	Duration
Grant acceptance and pre-planning	1 month
Design procurement	3 months
Design of project	6 months
Construction procurement	2 months
Construction, installation, and startup	12 months
Project Close out	1 month
Total project duration	**25 months**

TABLE 11: CPL Implementation Schedule

This table outlines the estimated duration for each phase of the project, as well as the total project duration, which ranges from 24 to 30 months based on project scheduling variability.

Proposed Metrics

The proposed project encompasses a multifaceted approach to maximize the efficient utilization of landfill gas at the Central Peninsula Landfill (CPL). Central to this initiative is the installation of gas meters strategically placed along the gas lines. Complementing the installation of gas meters, the project also includes the implementation of a Supervisory Control and Data Acquisition (SCADA) system. By monitoring gas flow rates, pressures, and other critical parameters, the SCADA system will track the usage and gas volumes over the lifetime of the project.

Funding Landscape

The total construction cost of this project is estimated to be $4,160,000.

There are currently no funds appropriated for this stand alone project. The Homer Electric Association is actively searching for funds for construction of the proposed combined heat and power project mentioned in the above measure narrative.

Southeast Alaska Composting Program

Summary

Southeast Alaska tribal communities face an urgent solid waste management crisis, with most tribal communities relying on environmentally risky Class III landfills or shouldering the economic burden of shipping waste to the lower 48 states. The pressing need for immediate action arises to reduce greenhouse gas emissions, protect local resources, mitigate and alleviate the economic strain on these underserved and overburdened communities. Additionally, recognizing the significance of composting emerges as a crucial aspect in this comprehensive, region-specific emission reduction measure. Composting not only reduces greenhouse gas (GHG) emissions, but also reduces the volume of waste sent to landfills, enriches the soil, and contributes to the preservation of local ecosystems while promoting sustainable agricultural practices. Implementation of composting initiatives alongside other waste management strategies becomes imperative in addressing the urgent challenges faced by Southeast Alaska tribal communities, ensuring the protection of our local drinking water sources, subsistence resources, and overall health of our tribal communities.

The Central Council of The Tlingit and Haida Indian Tribes of Alaska (Tlingit & Haida) is proposing a measure to design and construct composting facilities tailored specifically for four tribal communities (Wrangell, Hoonah, Petersburg, Yakutat) and one urban city (Juneau) in the Southeast Alaska region. The proposed measure to establish composting facilities within tribal communities under the stewardship of Tlingit & Haida presents a robust and sustainable solution to mitigate greenhouse gas emissions while fostering environmental stewardship and community resilience. By strategically partnering with tribal communities, this measure aims to address solid waste management challenges while simultaneously reducing greenhouse gas emissions through composting organic waste.

Tlingit & Haida's expertise in collaborative stewardship projects and its established government-to-government relationship uniquely positions the organization to spearhead this initiative effectively. Led by Director Desiree Duncan and supported by a dedicated team with decades of combined experience in grant management, program implementation, and environmental stewardship, Tlingit & Haida brings a wealth of knowledge and expertise to the table. The organization's Environmental Managerand Environmental Coordinatorpossess extensive experience in managing environmental grants and solid waste programs. Their leadership ensures the smooth execution of the proposed measure, from establishing partnership agreements with tribal communities to developing comprehensive scope of work reports and service agreements with contractors.

Additionally, Tlingit & Haida's recent success in securing the EPA Solid Waste Infrastructure for Recycling (SWIFR) grant underscores its capacity to leverage funding opportunities and implement large-scale environmental initiatives. With the support of the Regional Greenhouse Coordinator, and Environmental Specialist , the organization is well-equipped to navigate the complexities of composting infrastructure development and optimization.

By integrating composting facilities into tribal communities and providing training on proper composting techniques, Tlingit & Haida not only facilitates substantial reductions in greenhouse gas emissions but also fosters community empowerment and capacity building. The proposed measure aligns with the organization's commitment to enhancing and protecting land, environment, and culture while promoting sustainable development and resilience within tribal communities. Through collaborative efforts and strategic partnerships, Tlingit & Haida aims to establish a model for sustainable waste management that can be replicated and scaled across regions, ultimately contributing to significant, long-term emissions reductions and environmental stewardship.

Community Benefits

The Central Council of the Tlingit & Haida Indian Tribes of Alaska is a federally recognized tribal government representing 37,000 tribal citizens in 18 villages and communities in Southeast Alaska – most of which are not connected to a road system and are only accessible by boat or plane. Being remote and often isolated, Southeast Alaska Native Villages and the areas of Wrangell, Prince of Wales, and Metlakatla are underserved and identified as being disadvantaged according to the EPA Climate and Economic Justice Screening Tool. These tribal communities in Southeast Alaska often have inadequate and unsustainable management of organic resources.

The proposed measure goes beyond immediate environmental concerns and GHGs emission reduction; this measure is geared towards fostering collaboration, capacity building, and information exchange throughout the region. By establishing a network for cooperation among tribes, government entities, non-profits, and other groups, the measure seeks to strengthen the collective ability of tribal communities in Southeast Alaska to implement and sustain effective organics recycling programs. Additionally, the proposed measure emphasizes the cultural and economic significance of the region's lands, waters, and wildlife, aiming to connect and restore these vital elements that form the foundation of the communities' cultural existence and economic welfare. Overall, this measure represents an inclusive approach, aligning with Tlingit & Haida mission, and positioning the tribal government as a regional coordinator for collaborative stewardship projects that address the unique challenges of organic resource management in Southeast Alaska.

Communities shipping waste to out-of-state landfills can attain cost savings by locally diverting heavy food waste and producing compost on-site, thereby reducing dependence on expensive soil amendments. Composting programs can be scaled up more quickly and are less expensive than landfills or incinerators. These incentives encourage active engagement in this effort, fueled by the potential for localized waste management solutions and economic benefits tied to compost production.

The benefits of this measure will extend to the entire Southeast Alaska region, including tribal communities, municipalities, residents, businesses, and the environment. Community gardens, food producers, gardeners, school gardens, and the entire region can benefit from locally sourced compost for local agriculture, food security, and food sovereignty. The local economy will benefit through revenue generation, job creation and cost savings through organics recycling. This regional measure will help to safeguard drinking water sources, protect subsistence resources, enhance community aesthetics, and promote the overall well-being and sustainability of our region.

Estimated Emissions Reduction

CO2e Reduction (Annual metric tons)	CO2e Reduction (Through 2030, cumulative metric tons)	CO2e Reduction (Through 2050, cumulative metric tons)
48,206	144618.15	293719462.7

TABLE 12: CCTHA Estimated Emissions Reduction

This quantification is based on a Waste Reduction Model (WARM)[40] using data from the following reports: Wrangell Integrated Solid Waste Management Plan Updated December 2021, Yakutat Tribe Environmental Department Soil Security Stewardship (Compost) Data January 20,2021, Municipality of Skagway Solid Waste and Recycling Management Plan February 28, 2013. Additionally estimates for Juneau were based on the Juneau Commission on Sustainability (JCOS) Juneau Solid Waste Factsheet dated March 12, 2021. The tonnage of compostable items for each community was calculated using

40 https://www.epa.gov/warm

the percentages of food, yard trimmings, paper, and cardboard identified in the waste characterization studies and the annual total tonnage disposed of in the landfills or shipped to the lower 48 states. The calculated total CO2E reduction value represents the maximum potential for 100% diversion of all compostable items for 5 communities in Southeast Alaska.

Implementation Schedule

Phase 1: Planning and Design (01/2025 - 06/2026 1.5yrs)
Milestone 1. Establishing partnership agreements with tribal communities (MOAs/MOUs) - Outline roles and responsibilities for collaboration.

Milestone 2. Developing Scope of Work Report - Conduct site assessment and feasibility studies to evaluate potential locations for composting facilities.

Milestone 3. Service Agreements with Contractors - Identify qualified contractors with experience in composting facility design, construction, and operation.

Milestone 4. Developing Initial Composting Infrastructure Design Options - Site layout, equipment specifications, waste handling process. Present design to tribal communities for review and feedback.

Phase 2: Implementation (07/2026 - 11/2028 2.5yrs)
Milestone 5. Procurement - Issue Request for Proposals (RFPs) for composting equipment, infrastructure, and solid waste management consulting.

Milestone 6. Installation of Composting Infrastructure - Begin construction of composting facilities based on approved designs, site inspections to verify design specifications and timelines.

Milestone 7. Develop comprehensive Standard Operating Procedures (SOPs) detailing the protocols for operating and managing the composting facilities. These SOPs will outline guidelines for waste segregation, composting processes, equipment maintenance, safety procedures, and quality control measures.

Milestone 8. Equipment Testing and Optimization - testing of composting processes, train staff and community members on proper composting techniques.

Milestone 9. Reporting and Documentation - Compile data on composting performance, including waste diversion rates, greenhouse gas emissions reduction, and compost quality.

Phase 3: Data Collection and Sustainability (12/2028 - 12/2029 1yr)
Milestone 10. Long-term Monitoring and Evaluation - Collect data on key indicators such as waste diversion rates, greenhouse gas emissions reductions, and community engagement levels.

Milestone 11. Sustainability Planning and Capacity Building -Identify funding sources and opportunities for revenue generation. Build capacity within tribal communities to independently manage and operate composting facilities. Roadblocks: Regulatory compliance, community engagement, funding constraints.

Proposed Metrics
The proposed measure for establishing composting facilities within tribal communities in Southeast Alaska under the stewardship of the Central Council of The Tlingit and Haida Indian Tribes of Alaska (Tlingit & Haida) will be tracked using various metrics to gauge progress and effectiveness. These metrics include:

- Type of equipment installed for each community: This metric will track the actual implementation of composting infrastructure within tribal communities and urban areas, including Wrangell, Hoonah, Petersburg, Yakutat, and Juneau.

- Volume of organic waste diverted from landfills: Tracking the amount of organic waste diverted from Class III landfills or shipments to the lower 48 states will indicate the effectiveness of the composting facilities in reducing the burden on existing waste management systems.
- Reduction in greenhouse gas emissions: Quantifying the reduction in greenhouse gas emissions resulting from the implementation of composting initiatives will provide insight into the environmental impact of the measure. This could include metrics such as tons of CO2 equivalent emissions avoided through composting.
- Number of community members trained in composting techniques: Monitoring the number of community members trained in proper composting techniques will demonstrate the level of engagement and capacity building achieved within tribal communities.
- Investment in composting infrastructure: Tracking the investment made in designing, constructing, and optimizing composting facilities will provide insight into the financial commitment and resource allocation towards waste management solutions.
- Job creation and workforce development: Assessing the number of jobs created and workforce development opportunities generated through the implementation of composting initiatives will demonstrate the economic benefits and community empowerment achieved.

By tracking these metrics, Tlingit & Haida can effectively monitor progress, identify areas for improvement, and demonstrate the tangible benefits of the proposed measure in addressing solid waste management challenges, reducing greenhouse gas emissions, and fostering environmental stewardship within Southeast Alaska tribal communities.

Funding Landscape
The estimated cost for this program is just under $15M.

Tlingit & Haida has been awarded the following grants for work related to solid waste:
- EPA Solid Waste Infrastructure for Recycling (SWIFR) grant - currently in awarding process for $1,499,999 to establish a regional recycling hub and expand Tlingit & Haida's current composting program which will help bolster this measure.
- USDA Composting Food Waste Reduction (CFWR) grant - awarded in 2023 for $375,000 for composting infrastructure including an in-vessel composting and storage building.

Current funding being considered:
- Denali Commission Regional Solid Waste Management Planning funding for $500,000 to develop detailed community Organics Recycling Plans (ORPs) tailor to community specific needs and establish a composting network between tribes and municipalities in Southeast Alaska.
- Alaska Native Tribal Health Consortium (ANTHC) funding for $50,000 to develop detailed community planning for recycling and composting on a smaller scale while also establishing a community network for recycling and composting in Southeast Alaska.

D. Transportation

Green Corridor – Juneau Port Electrification

Summary
The cruise industry is a major economic feature along the southern coast of Alaska. In 2001, the world's first shore power facility for cruise ships was installed at one of the two private cruise ship docks serving Juneau's visiting cruise ships with success, continuing to serve ships over twenty years later. Communities like Juneau receive as many as seven ocean-class cruise ships daily.

Juneau is one of three communities in Alaska to have an approved climate action plan addressing emissions reduction measures, with a goal of reducing emissions 25% by 2032. There is greater public ownership of shoreside infrastructure in Juneau than some other communities, as two of the four cruise ship berths in Juneau are municipally owned.

The development of shore power in Juneau serves as just a portion of the Green Corridor project[41] being lead in collaboration with the Port of Seattle and other partners. The Port of Seattle says that "A green corridor is a shipping route where zero greenhouse gas solutions are considered, demonstrated and supported. Green corridors—through collaboration across sectors—establish the technological, economic, and regulatory feasibility needed to accelerate implementation of low and ultimately zero GHG emission vessels."

As a "first mover" of the Green Corridor project, Juneau serves as an example for infrastructure being developed in other "first mover" communities in Southeast Alaska, like Sitka, Haines, and Skagway as well as other communities who are exploring cruise terminal shore power like Ketchikan and Whittier.

Proposed Measure

City & Borough of Juneau

The City and Borough of Juneau's objective is seeking to install equipment at their two cruise docks to provide shore power to the ships moored there, thus substantially reducing the emissions produced by the on-board generators during the "hoteling" that occurs while the ship is at port. This electrification would greatly reduce criteria pollutant emissions in one of the densest areas of Juneau, while also greatly reducing greenhouse gas emissions by shifting energy use to the Alaska Electric, Light, & Power (AEL&P) grid which has 100% of its firm electrical needs supported by hydroelectric power.

Other Alaska communities and ports along the green corridor could develop projects to a similar scope and scale of what has been proposed in Juneau.

Timeline

The engineering effort for Juneau's project will require a 12-month period to complete, which will also be used to apply for additional funding. With the completion of design and development of construction documents, as well as the final acquisition of funding, the project will be bid. The project may be segregated into two phases, allowing one shore power facility to be constructed before full acquisition of funds needed to complete the second facility. The bid period is anticipated to require a 2-month period. After award of a construction contract is received, the acquisition of transformers, high-voltage switchgear, stationary or floating support structure at the dock, and shore power deployment equipment will take 12 to 24 months. Construction can be completed within 12 months.

Design and Construction Documents	12 Months
Grant Applications (concurrent with design)	18 Months
Bidding	2 Months
Procurement	12 to 24 Months
Construction	12 Months

TABLE 13: Green Corridor - Juneau Implementation Timeline

Similar projects in other communities may have longer timelines than Juneau due to additional time needed for feasibility and other initial scoping.

41 https://www.portseattle.org/projects/exploring-green-corridor-cruise-pacific-northwest-alaska

Funding Landscape
An application seeking $1,500,000 in funding for this project via the 2022-2023 Diesel Emissions Reduction Act (DERA) National Grants was submitted.

In 2022, the City and Borough of Juneau committed $4,900,000 to this project and additional funding will be contributed using local funds generated by cruise industry fees and additional grants.

Transformative Impacts
The proposed cruise ship dock electrification will reduce exposure to criteria pollutants in the downtown business district and nearby residential neighborhoods. The reduced air emissions and health impacts will further benefit Juneau's efforts to provide EJ to the elderly, under-served, and children residing in the downtown Juneau port area. Juneau was a PM-10 nonattainment area in 1987 and a redesignated maintenance area in 2013.

Juneau is also home to two federally recognized tribes and is thus considered partially disadvantaged according to the EJScreen tool. The Douglas Indian Association includes over 700 tribal members, with its historic townsite located across the water from the cruise docks. The Central Council of Tlingit & Haida Indian Tribes of Alaska, which is headquartered in downtown Juneau, has 24,000 active enrolled citizens with a portion of this population residing in the community. Juneau's population is 19% Alaska Native, with a substantial younger population representing 25% of all Juneau youth.

The broader Green Corridor project could help address environmental justice and economic opportunity needs along the entire corridor proposed.

Estimated Emissions Reduction
The electrification of both the north and south berth of the Juneau project would likely produce the following emissions reduction.

CO2e Reduction (Annual metric tons)	CO2e Reduction (Through 2030, cumulative metric tons)	CO2e Reduction (Through 2050, cumulative metric tons)
7,795	31,180	187,080

TABLE 14: Green Corridor Estimated Emissions Reduction

Electric Vehicle Supply Equipment Installation Program

Measure Summary
The proactive installation of Electric Vehicle Supply Equipment (EVSE) in both urban and rural Alaska communities will serves as a vital step in bridging the existing funding gaps between private and public programs, with a primary objective of alleviating range anxiety among electric vehicle (EV) drivers and promoting EV adoption throughout Alaska. This project aligns seamlessly with the state's comprehensive NEVI strategic plan, which through thorough evaluation sited both Level 2 and Level 3 charging stations at key locations. Level 2 chargers cater to urban areas, providing convenient daily charging solutions, while Level 3 chargers are more conducive to locations along major long-distance routes, facilitating quick recharges during extended journeys.

In a collaborative effort alongside the Department of Transportation and Public Facilities (DOT&PF), the Alaska Energy Authority (AEA) actively spearheads the implementation of Alaska's share of the National Electric Vehicle Infrastructure (NEVI) funding. This joint endeavor is driven by the shared goal of maximizing resources and efficiently developing a comprehensive and robust EV charging network that is designed to meet the unique needs and challenges of Alaska's diverse landscape.

The significance of this infrastructure development cannot be overstated, as it directly addresses the critical funding gaps that have hindered the expansion of EV infrastructure. By strategically placing charging stations, this measure aims to reduce range anxiety, thus creating a market environment conducive to increased EV adoption. In essence, this initiative plays a pivotal role in fostering seamless charging experiences and removing existing barriers to EV adoption, ultimately contributing to a cleaner and more sustainable transportation sector in Alaska. Furthermore, an infusion of funding into this endeavor follows a similar model to the NEVI funding program, ensuring a streamlined and efficient allocation of resources to further accelerate the growth of EVs across the state.

Community Benefits

The program aims to achieve several key objectives including enhancing clean transportation access and addressing environmental concerns. One of its primary goals is to enhance clean transportation access by strategically siting charging stations and increasing the number of EV charging stations located in Justice40 areas. This effort is designed to alleviate the burden of transportation energy costs by providing reliable access to affordable charging, and lowering the burden of EV ownership for all.

Additionally, the program seeks to bolster the clean energy job pipeline, offering job training and establishing job-creating enterprises within disadvantaged communities. This initiative aims to generate new clean energy jobs and related opportunities, thus contributing to economic growth in these areas. Simultaneously, the program intends to reduce environmental exposures to transportation-sector emissions, benefiting the health and well-being of those communities where stations are directly sited, and those communities along impacted roadways.

Moreover, there are positive economic impacts anticipated for business owners through increased retail and site sales owing to visitation by patrons charging their electric vehicles. The program emphasizes knowledge sharing and program awareness, encouraging community engagement and fostering opportunities for dialogue. Lastly, it underscores the direct air quality improvements brought about by the deployment of charging ports, particularly in Justice40 communities. Cleaner air benefits everyone, and the transition to electric vehicles showcases these advantages, particularly in urban areas like Fairbanks, of which a portion is classified as a PM2.5 nonattainment area, where reduced vehicle emissions can substantially improve air generally poor air quality, especially during winter months where temperature inversions trap airborne pollutants near the ground. This program represents a multifaceted approach to creating a more sustainable and healthier transportation ecosystem for all Alaskans.

Estimated Emissions Reduction

Based on the International Council on Clean Transportation's (ICCT's) Global Comparison of the Life-Cycle Greenhouse Gas Emissions of Passenger Cars[42], an estimated amount of carbon emissions was determined for Internal Combustion Engine (ICE) vehicles and Electric Vehicles (EVs). The ICCT report identified life-cycle emissions per mile driven and also categorized the emissions into Passenger Cars (PCs) and Sport Utility Vehicles (SUVs). A comparison was made between the two fuels for PCs and SUVs, and it was determined that electric PCs have an annual benefit of 13.4 g CO2 / mile reduction and electric SUVs have an annual benefit of 15.2 g CO2 / mile reduction.

Alaska's vehicular fleet is comprised of 76% trucks and SUVs and 24% PCs and minivans, so a blended rate was compiled. Since Alaskan's drive an average of 11,111 miles per year[43], the result is each EV conversion results in a reduction of 166,665 g CO2, or 455 tons CO2 per year. The National Renewable Energy Lab estimates that by 2030 there will be a need for 28 million charging ports to support the

42 https://theicct.org/wp-content/uploads/2021/07/Global-Vehicle-LCA-White-Paper-A4-revised-v2.pdf
43 https://www.policygenius.com/auto-insurance/average-miles-driven-by-state/

estimated 33 million EVs on the road[44]. This conclusion results in the need for 0.848 ports per EV. Therefore, each port can be concluded to reduce emissions by 536 tons CO2 per year.

This measure can be applied to each port deployed and scaled as the program expands. Further, Alaska will measure the adoption rates as it relates to the increase in the number of ports to determine if further correlation exists. The measure will also be compared with port usage to ensure that the station and ports are receiving usage to support the carbon reduction claims.

Each site will follow requirements and standards set in Title 23 for the National Electric Vehicle Infrastructure (NEVI) program in that four ports will be deployed at each site. Each site will provide a benefit of reducing CO2 emissions by 2,144 tons per year.

Implementation Schedule
This measure has an anticipated project timeline of three years. Major project tasks will include: community outreach in targeted communities, administration of requests for applications in said targeted communities to select charger site hosts, a competitive selection process, and installation and commissioning of related EVSE.

Proposed Metrics
At the highest level, the metric for the success of this measure will be the number of EV charging stations installed. Each site will follow the requirements and standards set in Title 23 for the National Electric Vehicle Infrastructure (NEVI) program with four ports deployed at each site. It is estimated that each site will provide a reduction of CO2 emissions up to 2,144 tons annually. Post installation the utilization of these ports can be monitored to document use and track the actualized emissions reduction on an annual basis.

Cost Estimate

Budget Component	Estimated Cost (Per Site)	Number of Sites	Total Estimated Cost
Level 3 Charging	$600,000	15	$9,000,000
Level 2 Charging	$15,000	40	$600,000
Total Project Budget			**$10,000,000**

TABLE 15: EVSE Cost Estimate

Funding Landscape
While no other funding for this measure has been committed to date, potential funding to leverage in support of this project includes; the National Electric Vehicle Infrastructure (NEVI) Program, the Charging and Fueling Infrastructure (CFI) Program, and the potential of a site host/ community match from those communities targeted in this effort.

E. Electric Generation

Dixon Diversion Project

Summary
The Dixon Diversion project is a significant expansion of the Alaska Energy Authority (AEA)-owned Bradley Lake Hydroelectric project. This project aims to divert water from the Dixon Glacier through a diversion dam and a five-mile underground tunnel into Bradley Lake. From there, the water will flow into an existing hydroelectric power plant connected to the main Railbelt electric grid. The Railbelt is the

44 https://www.nrel.gov/docs/fy23osti/85654.pdf

electrical system serving 75% of the state's population stretching from Homer to Fairbanks. This project also includes modifications to the Bradley Lake Dam, increasing its full pool height by up to 28 feet.

The Dixon Diversion project will harness renewable energy with minimal localized environmental impact, making it a promising step towards a more sustainable energy future for Alaska. The addition of this project is a key assumption shared across all feasible scenarios in long-term Railbelt grid energy planning completed by NREL (National Renewable Energy Laboratory) and ACEP (Alaska Center for Energy & Power) that was conducted in 2022 and 2024 respectively.

Emissions Reduction

The Dixon Diversion project will convey water from the Dixon Glacier Basin into Bradley Lake, resulting in an estimated increase of 190,000 MWh per year in energy production resulting from the additional inflows to the lake and from higher head pressures associated with the dam raise. This remarkable surge in energy equates to a 50% boost to the Bradley Lake hydroelectric project, which currently supplies about 10% of the Railbelt's electric demand. The increased capacity of hydro generated electricity for the Railbelt can be achieved with a limited environmental footprint. This project includes the construction of only one mile of new road, utilization of less than five acres for the diversion dam, an underground tunnel, and the inundation of up to 400 acres due to a higher lake level. Importantly, Bradley Lake is an alpine lake that is not an existing fish habitat, minimizing ecological impact.

AEA has a proven record of accomplishment in managing projects of similar scope. In 2020, the AEA successfully completed the Battle Creek Diversion project, a similar expansion to the Bradley Lake project. With its experience and expertise, the AEA is well-positioned to implement the Dixon Diversion project.

Proposed Implementation Schedule

Year	Project Activity
2024	Geotechnical investigations near the entrance and exit of the Dixon Tunnel
2024 -2026	Comprehensive study activities
2027-2030	Construction

TABLE 16: Dixon Diversion Implementation Schedule

Community Benefits

The benefits of this project will positively impact all Alaskans. Dixon Diversion stands as one of the largest renewable projects ever undertaken in the state, promising cheaper and more reliable hydroelectric power that will lower electricity costs for Railbelt consumers. This, in turn, will indirectly reduce energy costs for Power Cost Equalization (PCE) ratepayers throughout Alaska. The project's storage component offers a significant advantage over other renewable resources like solar and wind, allowing Railbelt utilities to reliably dispatch renewable power throughout the year – with the additional water storage capacity, utilities will be able to regulate non-firm energy generators more easily on the grid, indirectly fostering additional non-firm generation development.

The project would offset 190,000 MWh/year of natural gas-generated electricity on Alaska's Railbelt electric grid, resulting in substantial CO2e emissions and a more resilient grid. This does not account for the potential emission reductions as a result of intermittent renewable generation projects that are newly dispatchable by utilities thanks to the project's increased energy storage component. Additionally, the Dixon Diversion project is expected to displace at least 1.5 billion cubic feet of natural gas annually, offsetting a portion of anticipated Cook Inlet natural gas supply shortages in the coming decade.

CO2e Reduction (Annual metric tons)	CO2e Reduction (Through 2030, cumulative metric tons)	CO2e Reduction (Through 2050, cumulative metric tons)
131,094	262,188	2,884,068

TABLE 17: Dixon Diversion Estimated Emissions Reduction

Funding Sources

The current total project budget for completion of the project stands at $342,000,000, which includes a contingency fund. The following funding has already been committed:

Funding Source	Amount
State of Alaska (FY24 Funds)	$5,000,000.00
Renewable Energy Fund Grant	$1,000,000.00
Utility Contributions	$1,360,000.00

TABLE 18: Dixon Diversion Budget Estimate

Community Electric Generation and Transmission Projects

Summary

Railbelt Electric Grid

Alaska's Railbelt grid is the largest electric grid in Alaska, supplying power to approximately 70% of Alaska's population. This system stretches from Homer to Fairbanks and consists of a number of intertied, member-owned utility cooperatives. In recent years, two detailed studies[45][46] have been conducted to assess the feasibility and impacts of decarbonizing the Railbelt grid over the next 25 years. These reports have presented and analyzed potential scenarios and timelines, but generally consider it feasible to achieve 80 percent generation within the Railbelt by 2040. This measure supports generation projects that work towards that goal.

Remote, Islanded Electric Grids

Through tribal CPRG planning and other previous energy planning work, there are a significant number of emissions reducing projects across rural Alaska which have conducted and completed feasibility, conceptual design, and advanced-stage design work. Often, the high cost of logistics to bring these projects to completion results in these planned and designed projects languishing in limbo at the expense of the respective community's residents. These projects should not be expected to deliver complete replacement of diesel generation, but rather they can reduce reliance on aging diesel equipment and gradually increase renewable electric generation. This measure would seek to support these remote, islanded electric grid projects that aren't otherwise captured in a tribal PCAP.

Proposed Measure

Alaska's tribes and municipalities provide essential services in the maintenance of the critical energy infrastructure that support Alaska's communities; their role is especially important in the state's most geographically remote communities. Even in communities where they do not operate the utility, they will often work closely with the utility as a major customer and landowner.

This measure would support projects delivered by a municipality, tribe, or related entities (including state agencies) directly as well as in partnership with electric cooperatives or Independent Power Producer (IPP) which delivers renewable generation that offset fossil fuel generation. These projects

45 (Cicilio & et al., 2023)
46 (Denholm, Schwarz, DeGeorge, Stout, & Wiltse, 2022)

include (but are not limited to) wind, solar, hydroelectric, hydrokinetic, nuclear, and geothermal and must be able to be integrate and interconnect into the local electric grid both effectively and beneficially.

The electric utility landscape in Alaska is diverse and at is generally operated and maintained by entities within the local community. To incorporate new, clean generation in an effective manner, upgrades relating to existing diesel generation, transmission, and distribution may be as important to emissions reduction as the generation themselves. Components of these projects may include diesel power plant improvements, such as switch-gear upgrades, that are necessary for the successful integration other generation types but are severely limited in their eligibility for other sources of funding. Transmission and distribution projects that enable greater access and deployment of affordable, reliable, and emissions-reducing generation are also considered as part of this measure.

Per EPA guidance, a project must be ready-to-implement. For the sake of this plan, we consider this to be a project coming online by 2029 at the latest; although projects that are partially designed may be require an even shorter time to completion. In addition to lasting GHG reduction, critical metrics that project sponsors should keep track of include improved grid resilience and reliability, decreased community energy burden, decreased hazardous air pollutants, and increased generation capacity that enables the future beneficial electrification of other community sectors.

Funding Landscape

Many federal and state programs provide funding for eligible electric generation projects, including the Renewable Energy Fund, as mentioned later in this plan. Unfortunately, national competitive funding opportunities are frequently difficult to access for Alaska projects, especially for remote, islanded grid communities. Beyond the limited nature of funding, there are a combination of factors that make federal funding for Alaska rural energy projects difficult to access. These include logistical hurdles – which increase costs and timelines – and administrative burdens – which decrease the ability of short-staffed utilities to respond. Additionally, with inability to fully-substitute diesel fueled electric generation with renewable generation owing to considerations for life and safety, with many potential renewable generation types characterized as intermittent in their ability to deliver power when it is needed, many of the critical projects regarding operational and efficiency upgrades to diesel-generation related infrastructure are found to be ineligible for such national, competitive opportunities and otherwise.

Transformative Impacts

Railbelt Electric Grid

In response to a natural gas shortage that is the result of declining production and availability of known supply in the Cook Inlet, in January 2024[47] a coalition of eleven mayors throughout the Railbelt region began convening together to assess their respective communities' energy needs and begin to chart a path forward through this crisis which threatens high cost burdens associated with higher input costs for Railbelt electric utilities including more costly utility bills, reducing both the discretionary income of both residents and businesses alike, with potential deleterious effects including a reduction in local consumption and consequently, overall decreased available capital for business reinvestment. With electric utility costs being a primary cost input regarding cost-of-living expenses, there also remains additional risk that such cost escalations may result in further out-migration from Alaska to elsewhere in the nation. Large-scale renewable energy projects that seek to offset the predominantly natural-gas-fueled Railbelt generation may help delay this crisis coming to a head, support greater adoption of beneficial electrification in the buildings and transportation sector, and ultimately make Alaska's energy system more resilient in the face of global economic disruptions that would add to the already volatile markets for carbon-based fuels.

47 https://alaskapublic.org/2023/12/13/southcentral-alaska-mayors-form-coalition-to-address-looming-natural-gas-shortfall/

Remote, Islanded Electric Grids

The characteristics of remote, islanded electric grids in Alaska can differ substantially depending on factors such as community size, the utility owner and/operator, and geographic location. While benefits are best inferred for specific projects, it can be generally said that reduced diesel generation can improve air quality, strengthen community resilience, and reduce operating costs associated with the power plant. While most scenarios don't allow communities to entirely substitute all diesel generation, projects that allow significant reductions in plant runtime can have a substantial impact on all of these factors. When projects are implemented by IPPs, there are proven mechanisms whereby PCE subsidies can be maintained in such a way that utilities can remain financially solvent as they are faced with the added expenses related to the renewable energy infrastructure.

Less fuel consumption also means that fuel deliveries do not have to occur as regularly, resulting in greater resilience to disruptive events concerning fuel conveyance such as freight disruption by weather and disaster that may materially delay fuel shipments. Over the long-term, reduced dependence on diesel may mean that bulk fuel systems in some rural Alaska communities will not need to maintain such high levels of available fuel, reducing a community's exposure to risks regarding spills such as surface water contamination, fire, and/or personal injuries.

Greater resilience and community energy independence are critical needs that can be met by electric generation and transmission projects for remote grids in Alaska.

Measure Quantification

Railbelt Grid

For the sake of quantifying potential emissions reduction for the off-set of fossil fuel consumption, we presumed a 1000 GWh/year reduction of fossil fuel generation (primarily natural gas) across Railbelt communities. This quantification also presumes that this generation is replaced by zero-emission generation, such as (but not limited to) wind, solar, hydroelectric, hydrokinetic, and geothermal. This quantification also presumes a gradual ramp-up of generation capacity towards a 10% reduction between 2025 and 2030.

Remote, Islanded Electric Grids

For the sake of quantifying potential emissions reduction for the off-set fossil fuel usage, we presumed a 10% GWh reduction of fossil fuel generation (primarily Diesel #1) across non-Railbelt communities. This quantification also presumes that this generation is replaced by zero-emission generation, such as (but not limited to) wind, solar, hydroelectric, hydrokinetic, and geothermal. This quantification also presumes a gradual ramp-up of generation capacity towards a 10% reduction between 2025 and 2030.

Measure	CO2e Reduction (Annual Metric Tons by 2030)	CO2e Reduction (Through 2030, cumulative metric tons)	CO2e Reduction (Through 2050, cumulative metric tons)
Railbelt	555,601	798,645	11,910,665
Non-Railbelt	31,248	829,893	1,454,853

TABLE 19: Community Generation & Transmission Estimated Emissions Reduction

These measure quantifications are hypothetical. Many communities may look to reduce their diesel usage and increase their energy resilience by integrating renewable energy generation, while retaining generators as a safety measure in case of disasters. The State of Alaska views renewable energy options as an opportunity to grow strength and capacity within our isolated communities.

AEA DERA, VEEP, and Rural Distribution Programs

Summary

The Alaska Energy Authority (AEA) is spearheading a comprehensive measure proposal aimed at addressing critical energy challenges faced by rural communities in Alaska. This proposal encompasses three key components: Diesel Emissions Reduction Act (DERA) Program Expansion, Distribution System Upgrades, and the Village Energy Efficiency Program (VEEP). AEA is committed to making substantial, long-term emissions reductions while simultaneously delivering numerous benefits to these remote communities.

The State DERA program, in which the Alaska Energy Authority (AEA) participates, relies on annual funding from Congress, with states applying for DERA funds based on population. Additionally, EPA oversees a competitive tribal DERA program that awards funds nationwide.

DERA encompasses a variety of project types, ranging from replacing school buses to upgrading railroad engines. AEA, on behalf of the State of Alaska, exclusively utilizes DERA funds to replace prime power diesel engines in rural Alaska. These engines typically operate 24/7 and have a substantial impact on air quality in rural communities.

In most rural Alaskan communities, the absence of a larger electric grid requires them to generate electricity locally. Small diesel power plants are used for this purpose, creating isolated grids. These diesel engines emit pollutants and are inefficient, which results in both increased fuel consumption and higher power costs. Installing newer, certified, and more efficient engines helps reduce emissions per unit of fuel and improves electricity generation efficiency. AEA's existing annual DERA work plan includes specific estimates for each community.

The Alaska Legislature established the Village Energy Efficiency Program (VEEP) in 2010 as an Alaska Energy Authority (AEA) grant program aimed at reducing per capita consumption through energy efficiency. VEEP's objective is to actively implement energy and cost-saving efficiency measures in buildings and facilities within small, high-energy-cost Alaska communities.

Proposed Measure

AEA will issue sub-award grants to replace diesel engines in rural Alaska communities, expanding the scope of the EPA's DERA program. These communities rely on small diesel power plants to generate their electricity, and many of these plants use older, high-emission engines. AEA's program aims to replace non-certified and lower-tier diesel engines with cleaner Tier 2 and 3 marine engines and low particulate matter (PM) emitting nonroad engines. These upgrades enhance performance and reduce emissions.

AEA compiles a priority list for engine replacements within communities, highlighting eligible ones.

AEA will issue sub-award grants to upgrade distribution systems in rural Alaska communities, enhancing efficiency and sustainability. These microgrids, predominantly diesel-generated, are over 50 years old and in need of modernization.

The upgrades will reduce line losses, diesel fuel usage, and ensure readiness for renewable energy integration.

AEA will work in coalition with tribal consortia, including Tanana Chiefs Conference, to advance qualified high-energy cost communities for energy-efficient upgrades to public buildings and infrastructure. AEA will also issue sub-award grants through an RFA for Alaska communities not part of the coalition effort.

Measure Activities

DERA

The replacement of older engines with certified marine engines is expected to result in immediate fuel savings and emissions reductions. Over the long term, DERA engines are estimated to provide fuel savings, emission reductions, and health benefits for many years.

Distribution

Upgrades are anticipated to significantly reduce line losses, improving energy efficiency and environmental impact. Reduced reliance on diesel generators will lead to lower emissions, better air quality, and lower costs.

VEEP

Over past VEEP solicitations, 56 communities have offset a total of 1,189,463 kWh/year, demonstrating the effectiveness of energy efficiency in reducing diesel consumption. The program not only saves costs but also enhances community safety through improved community/street lighting.

Capacity to Implement

AEA has a strong track record in rural energy infrastructure development, with projects spanning power generation, bulk fuel facilities, distribution systems, renewable energy integration, and maintenance. Recent powerhouse upgrade projects and VEEP solicitations illustrate AEA's commitment to rural energy solutions.

Estimated Emissions Reductions & Community Benefits

Program	Emissions Reductions	Community Benefits
DERA	Replacement engines in Akiachak have demonstrated the following reductions: • 23% NOx reduction, • 93% PM2.5 reduction • 75% HC reduction • 46% CO reduction • 7% CO2 reduction • Over a 10-year lifespan, substantial emissions reductions.	• Improved air quality in communities • Reduced fuel costs for residents due to increased engine efficiency
Distribution	Reduced line losses through distribution upgrades	• Cost savings for residents and businesses through energy efficiency upgrades • Environmental benefits, including reduced emissions, promoting sustainability and improved health
VEEP	Collectively offset a substantial amount of kWh annually, leading to long-term emissions reductions.	• Economic benefit to communities through cost savings from energy efficiency improvements • Enhanced safety in public areas with improved lighting

TABLE 20: DERA/VEEP/Distribution Estimated Emissions Reduction & Benefits

Implementation Schedule

Program	Duration	Justification
DERA	Approximately 2 years	Project span includes complexities, construction season, and supply chain challenges
Distribution	Approximately 2 years	First year focused on planning, design, permitting, and procurement
VEEP	5 years	Administering $10 million over five years for VEEP projects

TABLE 21: DERA/VEEP/Rural Distribution Implementation Schedule

Proposed Budget

Program	Cost Estimation	Description
DERA	$10 million	Engine replacements in over 150 communities
Distribution	$10 million	Distribution upgrades in communities in need
VEEP	$10 million	VEEP programs over five years

TABLE 22: DERA/VEEP/Rural Distribution Budget

Funding
This measure would leverage existing funding sources and partnerships including State of Alaska matching funds, the Denali Commission, BIA and EPA grants, community matching funds, and DOE programs.

Expanding the DERA program, upgrading distribution systems, and enhancing energy efficiency through VEEP will address rural Alaska's energy challenges in a multi-prong effort. These activities promise long-term emissions reductions, economic benefits, and improved quality of life for rural communities while leveraging multiple funding sources to achieve these benefits.

AEA Solar for All Program

Summary
Solar for All (SFA) is an impactful measure proposed by the Alaska Energy Authority (AEA), in collaboration with the Alaska Housing Finance Corporation (AHFC), aimed at bringing solar-centric renewable energy solutions to the forefront of Alaska's energy landscape. The primary objective of this program is to facilitate the widespread deployment of solar photovoltaic (PV) infrastructure across the state of Alaska, with a targeted focus on PV development for low-income and disadvantaged households.

Comprising two components, SFA encompasses an AEA-managed initiative that funds community solar and battery projects, primarily in those rural and/or remote areas of Alaska. Concurrently, AHFC will oversee a residential rooftop solar installation program, catering to eligible low-income and disadvantaged households. By bridging this divide, the program strives to make renewable energy accessible to many Alaskans who would otherwise be financially challenged and unable to utilize solar PV technology. The successful execution of SFA promises substantial reductions in carbon dioxide emissions by mitigating the reliance on natural gas-generated electricity.

In terms of its timeline and scalability, the Solar for All program is slated for completion within a span of five years. However, it is worth noting that the program remains fully adaptable to absorb additional funding should it become available. Furthermore, SFA dedicates resources to bolster the initiative through workforce development, technical support, rooftop upgrades, and community outreach, ensuring that the benefits extend beyond energy generation and encompass various facets of Alaskan society.

AEA's approach draws upon the lessons and framework established by the Renewable Energy Fund, while AHFC's experience in implementing its successful Weatherization Program is directly complementary to its management of the residential rooftop solar component. With solar PV systems known for their long useful life and minimal maintenance requirements, these installations promise to provide sustainable electricity production for over three decades. Moreover, community-scale solar PV integration with Battery Energy Storage Systems will fortify electrical distribution in select rural Alaska communities, delivering both resilience and reliability for the foreseeable future, further solidifying SFA's position as a transformative program, diversifying Alaska's energy landscape.

Estimated Emissions Reductions
If fully funded this measure is estimated to reduce emission equivalent to 11,202 tons of CO2 annually, or 336,060 tons of CO2 over a 30-year project life cycle.

Community Benefits
A distinguishing feature of this initiative is its unwavering commitment to directly benefit low-income and disadvantaged households. With no financial burden imposed on participants, the program becomes readily accessible to such low-income and disadvantaged households, granting access to the transformative potential of renewable energy to those who might otherwise never have the opportunity. For an average participating household, the program is projected to yield approximately a 40% reduction in their annual electricity bills, making it a compelling proposition for those seeking economic relief from rising energy costs.

Beyond the immediate cost savings, the Community Solar PV and Battery projects play a pivotal role in bolstering the reliability and resilience of aging and isolated microgrids scattered throughout the state of Alaska. The risk of damage to associated community infrastructure for microgrid-communities face significantly increases when blackouts occur, especially during the harsh winter months when rapid freeze-ups can damage the fragile above-ground water and sewer systems. Integration of Solar PV and Battery systems into the existing diesel grid will be a game-changer, significantly diminishing the frequency, duration, and impacts of these disruptive events. In essence, this program serves as a lifeline for communities in dire need of enhanced energy stability.

Furthermore, the Solar for All program is set to cultivate a local Alaskan-grown solar workforce. This endeavor is provided for by substantial investment in workforce development programs and a surge in demand for solar installations. This dual approach not only promises to expand and augment the expertise and capacity of the domestic Alaskan solar industry but also paves the way for future solar development opportunities that extend beyond the scope of the program. It is an endeavor that not only promises immediate benefits but also lays the foundation for future sustainable growth and innovation in Alaska's energy sector.

Implementation Schedule
AEA envisions a five-year implementation period of this project. Year one will be dedicated to planning activities, including project partner engagement, community outreach, and multi-agency collaboration for workforce development.

Measure Metrics
The proposed metrics to track the progress and impact of this project include the number of households impacted, and the electric bill savings of said households. Other metrics that apply to this project are featured in the following table:

Metric	Unit
Solar Capacity Deployed	14.3 MW
Battery Storage Capacity Deployed	5.7 MWh
Average Rooftop Solar Array Size	6 kW
Annual Emissions Reduction	11,446 mtCO2e

TABLE 23: Solar for All Metrics

Funding Landscape
In October 2023, the Alaska Energy Authority (AEA) submitted a grant application to the Environmental Protection Agency (EPA) as part of the Solar for All program with a proposed budget of $100 million. This

initiative was part of a broader, nationally competitive program with a $7 billion budget allocated for renewable energy projects.

AEA's application was one of two submissions from Alaska for this program. The Tanana Chiefs Conference (TCC) partnered with the Alaska Native Tribal Health Consortium (ANTHC) to submit a separate proposal, reflecting the collective effort within the state to harness the potential of solar energy. AEA anticipates notice on the status of this application in March of 2024.

Cost Estimate

Item	Cost Estimate
AEA Community-Owned Solar + Battery	$41.3MM
AEA Administration, Travel, Overhead	$5.1MM
AHFC Residential & Multi-family	$40MM
AHFC Enabling Rooftop Upgrades	$3.5MM
AHFC Program Administration & Overhead	$3MM
Workforce Development, Technical Assistance, Community Outreach	$7.1MM
Total Program Budget	**$100MM**

TABLE 24: Solar for All Cost Estimate

AEA Renewable Energy Fund

The Alaska Energy Authority (AEA) is looking to augment its Renewable Energy Fund Grant Program[48] (REF). The REF is a proven grant program which provides critical financial assistance in support of the feasibility, design, construction, and integration of renewable energy projects throughout the state. The REF provides financial support and incentive for sustainable renewable energy development in Alaska enabling the harnessing of Alaska's vast potential of renewable energy potential. Under AEA leadership and administration, this measure will continue to deliver substantial, long-term reductions in emissions, bolster the capacity to scale renewable projects, and provide immense benefits to Alaskan communities statewide.

Summary

The Renewable Energy Fund was established in 2008, has been a beacon of success in the journey towards renewable energy adoption. With over $317 million in state-appropriated grants, it has achieved remarkable results. An independent impact analysis revealed that the REF offset approximately 85 million gallons of diesel fuel, equivalent to 5% of all petroleum consumed in Alaska in 2021. It also reduced 2.2 million cubic feet of natural gas and mitigated 1,063,500 net metric tons of carbon dioxide emissions.

This initiative has not only saved an estimated $53 million in net energy costs but has also had a significant impact on employment, generating an estimated 2,931 additional jobs across the state. Beyond direct state investment, the REF has leveraged over $300 million in external funding, supporting federal opportunities, local contributions, and additional capital for projects. Moreover, the REF program was renewed indefinitely in May 2023, showcasing its importance to Alaska's energy landscape.

Administered by AEA, the REF boasts a dedicated team with experience in managing grant awards. A 9-member advisory committee has successfully overseen the program since its inception, ensuring its continued effectiveness.

48 https://www.akenergyauthority.org/What-We-Do/Grants-Loans/Renewable-Energy-Fund

Estimated Emissions Reduction
The REF's has a proven track record in reducing electric generation and transmission-related emissions. Through its awarded projects, the REF has helped to offset millions of gallons of diesel fuel, natural gas, and carbon dioxide emissions. For Round 16, AEA evaluated 28 applications, with 24 passing economic and technical feasibility evaluations. These projects are estimated to reduce emissions by 1,186,857 tons of CO2 annually, or a total 24,278,625 tons of CO2 over their lifespan. Even with conservative estimates, the emissions reduction potential is significant.

Community Benefits
The REF focuses on LIDAC communities, with 80% of past awards granted outside the Railbelt region. It delivers numerous advantages, including reducing reliance on carbon-based fuels, thereby stabilizing energy costs, improving air quality by offsetting diesel generation, enhancing energy security, and creating new jobs in the renewable energy sector. It is an inclusive initiative that benefits those diverse communities across Alaska.

Proposed Timeline

Activity	Time Period
Allocation of $100 million	Ongoing
Solicitation for projects	Summer 2024 (occurs annually)
Recommendations to Alaska State Legislature	January 2025 (occurs annually)
Grant awards for funded projects	Beginning July 2025 (ongoing)
Procurement, installation, construction	Beginning Fall 2025 (ongoing)
Allocation of $100 million	Ongoing

TABLE 25: REF Proposed Timeline

Metrics
To assess measure progress, AEA will employ various metrics, including program expenditures, renewable capacity deployed, battery storage capacity, renewable power produced, CO2 emissions avoided, and diesel fuel reduction.

Proposed Budget

Program	Proposed Budget	Implementation Period
Renewable Energy Fund	$100 million	Five-year period

TABLE 26: REF Proposed Budget

This table outlines the proposed budget of $100 million for the Renewable Energy Fund and the intended implementation period of five years for CPRG measures.

Funding Sources
The REF is primarily funded through state appropriations by the Legislature, with no statutory obligation to fund the program. Historically, funding availability has been linked to the state's fiscal health, resulting in years where the program went unfunded owing to budgetary constraints. Despite these challenges, the REF has persevered and remains a vital tool in Alaska's renewable energy development toolkit.

The Alaska Energy Authority's Renewable Energy Fund has a proven track record of reducing emissions, creating jobs, and advancing renewable energy development in Alaska. With dedicated leadership, community benefits, and a substantial capitalization, the REF remains poised to continue making significant strides in building a sustainable energy future for Alaska.

F. Carbon Capture, Use, and Sequestration

Carbon Capture & Storage and Carbon Offset Program

Summary

The State of Alaska is preparing to harness its abundant subsurface resources for the purpose of carbon capture and storage (CCS). Spearheaded by the State of Alaska's Department of Natural Resources (DNR), this initiative aims to make these state-owned resources accessible for CCS projects, thereby contributing to global efforts to combat climate change. To realize this vision, Governor Mike Dunleavy has put forth legislative proposals that would establish a comprehensive carbon storage program. This program's administration would fall under the oversight of the Division of Oil and Gas within DNR. With this framework in place, a range of activities would be facilitated, including in-depth research and characterization of subsurface resources, negotiations for commercial access terms, and the permitting and approval of projects situated on state-owned land. Collaboration with other state agencies, the University of Alaska system, and regulators would be pivotal in ensuring the seamless execution of these endeavors.

In addition to the CCS-focused program, DNR has already been actively involved in tackling greenhouse gas emissions through its Carbon Offset Program. This existing initiative focuses on a multifaceted approach that includes both nature- and technology-based solutions. To support the development of projects aimed at reducing greenhouse gas emissions, the program has identified key infrastructure enhancements. Among these are the improvement of roads and bridges providing access to forested state lands. Such enhancements would enable more active forest management, the implementation of carbon-boosting silviculture practices, reforestation efforts in areas impacted by beetle infestations and wildfires, and terrestrial storage of biomass, thereby preventing its release into the atmosphere through combustion or natural decomposition.

DNR's strategic investments encompass the acquisition of portable biochar equipment. This technology allows for the conversion of biomass, including timber residues and beetle-killed trees, into a stable carbon product, bolstering carbon sequestration efforts. Additionally, the construction of additional electric vehicle charging stations aligns with the Alaska Energy Authority's (AEA) ongoing EV Infrastructure Plan, facilitating the growth of electric vehicles, which contribute to greenhouse gas reduction efforts. By engaging staff from various divisions within DNR, such as Forestry & Fire Protection, Mining, Land, & Water, and the Office of Project Management & Permitting, and by leveraging the capacity to collaborate with project developers and secure additional state funding when necessary, DNR is well-equipped to implement these initiatives efficiently.

Community Benefits

Carbon sequestration and carbon removal projects in Alaska present employment opportunities, improved air and water quality, improved fish and wildlife habitat, improved access for recreation, hunting, fishing, and other subsistence uses, and other associated environmental and cultural benefits.

Implementation Schedule

The Carbon Offset Program was authorized by the Alaska Legislature in May of 2023. Efforts are currently underway to hire staff, enact a regulatory framework, establish contracting procedures, and identify suitable carbon removal projects. Regulations are anticipated to be enacted by May of 2024, with the goal of beginning the registration process for carbon removal projects in August of 2024.

The Administration is proposing the Legislature enact the carbon capture and storage (CCS) program this (2024) legislative session. The Department of Natural Resources will then proceed with regulation development and implementation as necessary.

Measure Metrics
The most direct metric for the Carbon Offset Program will be the number of in-development and accredited carbon removal projects on state lands. Secondary metrics would include the number of miles of forested roads and bridges constructed that improve access to carbon removal project areas, the purchase and deployment of biochar equipment, and the construction of electric vehicle charging stations.

For the carbon capture and storage (CCS) program, while there may be many other intervening measures of success (resource assessment data gathered, etc.) the establishment of carbon capture facilities that intend to sequester carbon dioxide in State-owned subsurface resources is the most direct metric.

Funding Landscape
State funds may be allocated to CCS efforts. The University of Alaska may pursue characterizations efforts as well, along with federal agencies, such as the U.S. Geological Survey, and/or private industry entities.

For the Carbon Offset Program, $649,000 in ongoing operating funding is appropriated annually for program-related staff and $425,000 in capital funding was appropriated in FY24 for carbon removal project development over the next five years.

Cost Estimate
This project is in a preliminary stage. Assessments to confirm subsurface resources are available for sequestration are scalable to any cost level, and would result in more expansive and/or definitive information about potential to sequester carbon dioxide.

For infrastructure improvements that would support carbon and other greenhouse gas removal projects under the Carbon Offset Program, costs would be dependent upon additional assessments of the number of road miles and bridges that would need to be constructed to access the areas with the highest potential for carbon and GHG removal projects, the number of biochar equipment needed to address the most critical and prospective carbon-reducing areas of the 2+ million acres of beetle-killed and fire-affected state forestlands.

IV. Initial Workforce Planning Analysis

Employment Data

Looking first at the more traditional measure of unemployment, Alaska's unemployment rate remains near the historic low of 3.6% in May 2023[49]. While the unemployment rate is even lower in urban areas, unemployment remains high in most rural areas. For example, December 2023 unemployment (not seasonally adjusted) sat at 9.8% in the Bethel Census Area and 7.4% in the Nome Census Area, while Anchorage and the Mat-Su sat at 4% for the same period[50]. The prime-age employment gap data confirms that parts of the state are doing relatively well by that measure, other parts of the state have gaps of as much as 39 percentage points and all of the state's economic development regions have pockets with high gaps.

Based on projections by the Alaska DOL&WD[51], from 2020 to 2030 there will be about 1600 vacancies per year for positions that require postsecondary training or education. The 2022 excess unfilled job vacancies included approximately 3000 positions for which employers typically require or prefer postsecondary education. Alaska lags U.S. averages, however, ranking 46th in November 2023[52] seasonally adjusted unemployment rate. In 2021 and 2022 the Alaska job opening rate increased and ranged between about 8 and 14% (seasonally adjusted). The highest rates correspond to a ratio of only 0.4 unemployed person per job opening. The job opening rates are the highest since the survey began in 2012 and higher and more variable than those for the national 6.5% annual average.

Both national and state numbers show job openings are much higher than before the pandemic[53]. Three factors have been cited to explain this worker shortage: retirements and early retirements of the large "Baby Boom" cohort; difficulty in obtaining child care; and in Alaska, outmigration of working-age adults. In September-October 2022, Alaska labor force participation rate was 65.6% and the labor force was 62.7% of the population, the highest values since 2017 and 2015, respectively. Both slightly exceeded the 2019 percentages. In the last 50 years the peak labor force participation was 75.3% and the peak labor force percentage of the population was 69.8%, both in 1989, and there has been a slow, steady decline since then. This is attributable to an aging population. Alaska's participation rate is unlikely to improve further without support.

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49 https://www.bls.gov/web/laus/lauhsthl.htm
50 https://live.laborstats.alaska.gov/data-pages/labor-force-home
51 https://live.laborstats.alaska.gov/occfcst/occupations
52 https://live.laborstats.alaska.gov/trends-magazine/2024/January/outlook-for-alaska-jobs-in-2024
53 https://labor.alaska.gov/trends/aug22.pdf#page=12

In addition to the aging population, the Alaska worker shortage is exacerbated by outmigration. Net outmigration of young adults developed after 2015, and outmigration of all working age groups has increased. Given the normal labor participation rates in 2022, outmigration appears to be an important reason for the continuing worker shortages. From 2015 to 2020 Alaska lost an annual average of 5070 residents aged 15 to 64. The cumulative 6-year loss is 8.5% of the average labor force during that period. In 2020, there were about 110,000 jobs in Alaska that required postsecondary education, about 30% of total jobs. The total projected job openings for the period 2021-2030 are 11% or 12,000 per year. However, most of those will be transfers to other positions in Alaska, often within the same career or industry.

The following describes potential careers for clean energy, including many careers that do not currently exist or marginally so in Alaska: environmental technician, wind turbine technician, planner, solar installer, air quality engineer, energy auditor, energy manager, utility operator, energy engineer, health and safety officer, siting assessment and permitting, feedstock development, wholesale market administration, contract management, lifecycle analyst, asset management, distribution grid developer, economist, appliance distributor, financing, contracting, and procurement. For example, Alaska's Solar for All program will focus on the applicability of these careers to solar, specifically, but also look to leverage the interconnections across the clean energy industry. This recognizes the interoperability necessary and the reskilling that may occur over the course of any workforce development program.

Workforce Challenges

Attracting, training, and placing hundreds of new workers in trade jobs in every region of the state has many challenges. Other industries will be competing for the limited supply of new workers. Another challenge is having enough qualified instructors to train the new workforce. Alaska has a shortage of trade instructors; it is a challenge to recruit instructors due to the competitive wages they can earn in their industry sector; and new instructors need to be trained in classroom management, safety, and methods for teaching technical skills. An even larger obstacle is providing training and employment for persons living in rural Alaska, where occupational training opportunities are limited and compounded by transportation, climate, and technology barriers. High school graduates and job seekers who live in rural Alaska need an assort¬ment of support services so they can attend training and transition to work. Providing support requires having experienced case managers who can assist individuals and access resources from multiple partners on behalf of the client.

Alaska's workforce training landscape is shaped by a combination of strengths and challenges rooted in its unique geography, economy, and culture. On the positive side, the state benefits from rich natural resource industries like oil, gas, fisheries, mining, and timber, which create opportunities for specialized workforce training programs and offer job stability with competitive wages. The presence of Alaska Native corporations also plays a significant role in supporting workforce development, particularly in sectors such as construction, transportation, and tourism. Alaska boasts a network of vocational and technical education institutions, including the University of Alaska system that also serves a community college mission, regional training centers, and trade schools, which provide tailored training programs aligned with the state's workforce needs. Additionally, Alaska receives federal funding for workforce development, further bolstering training initiatives and skill-building opportunities.

However, Alaska also faces several challenges in its workforce training efforts. The state's vast size and remote communities present geographic isolation challenges, making it difficult for individuals to access training centers and educational resources. Extreme weather conditions, particularly during the harsh winter months, can disrupt transportation and training schedules, hindering residents' ability to participate in programs. The high cost of living in Alaska poses financial challenges for individuals trying to balance education and training expenses with basic living costs. The limited economic diversity, primarily reliant on resource industries, can leave the workforce vulnerable to commodity price fluctuations and affect opportunities for training in other sectors.

Seasonal employment in industries like tourism and fishing leads to periods of unemployment and reduced access to training during off-seasons. Cultural diversity, including a significant Indigenous population, necessitates culturally sensitive and accessible training programs. Additionally, addressing healthcare workforce shortages, substance abuse, and mental health issues are vital aspects of Alaska's workforce development agenda. To mitigate these challenges and leverage its strengths, Alaska's workforce development initiatives must involve multi-sector collaborations, financial assistance programs, online and distance learning options, and a commitment to addressing the unique needs of rural and Indigenous communities.

State Energy Workforce Strategy Outline

The State's strategy to strengthen and cultivate a workforce capable of implementing the array of GHG reduction measures outlined within this plan, and to be expanded upon in the comprehensive plan, include the following:

1. Establish and cultivate increased coordinative capacity within and between the workforce and relevant sectors. This implementation strategy will support career pathways through a diverse network of training providers.
2. Expand outreach efforts to underserved and disadvantaged areas with high unemployment and underemployment. This implementation strategy will provide funding for statewide and targeted outreach efforts.
3. Increase capacity of existing place-based training programs for upskilling and reskilling Alaskans for employment in high-demand industries, implemented by prioritized region. Alaska has numerous existing training programs and facilities that have the potential to meet the training needs of Alaskans but lack the capacity to meet the demand.
4. Identify and deliver new or improved rural place-based training to underserved areas for upskilling and reskilling Alaskans for employment in high-demand industries, implemented by prioritized region and sector. This implementation strategy will focus on adding new place-based training and support systems to prioritized regions, including delivering remote training as necessary.
5. Provide wraparound support services. Implementation efforts should provide support for workers entering into training programs, including housing and childcare, travel, and supplies that alleviate the challenges identified by worker voices.
6. Strengthen economic development and the contractor ecosystem. This implementation strategy will include maintaining and cultivating partnerships with Alaska SBDC and regional development organizations (ARDORs).

Implementing projects that contribute to reducing GHG emissions will take into account Good Jobs Principles[54]. Alaska is committed to fostering safe, healthy, and inclusive workplaces with equal opportunity, free from harassment and discrimination. State agencies and local governments will provide multiple pathways for creating high-quality, middle-class jobs in the residential-serving distributed solar energy industry based on principles outlined below. In addition, eligible entities have considered ways to invest in training, education, and skill development and support the corresponding mobility of workers to advance in their careers. Agencies will assess collective bargaining agreements as identified throughout the life of the project.

Ideally, implementing entities will take an approach to quality jobs that means that project staff will have (1) fair, transparent, and equitable pay that exceeds the local average wage for an industry, while delivering; (2) basic benefits (e.g., paid leave, health insurance, retirement/savings plan); (3) providing workers with an environment in which to have a collective voice; and (4) helps the employee develop

54 https://www.dol.gov/general/good-jobs/principles

the skills and experiences necessary to advance along a career path. In addition, the partners will offer good jobs that provide (5) predictable schedules and a safe, healthy, and accessible workplace devoid of hostility and harassment. With good jobs, (6) employees are properly classified with the limited use of independent contractors and temporary workers. Workers have a (7) statutorily protected right to a free and fair choice to join a union under the National Labor Relations Act (NLRA).

Implmenting entities will ideally encourage project staff to participate in training programs and encourage contractors to offer paid time for employees to participate in skills training. This will include the provision of personalized, modularized, and flexible skill development opportunities, such as on-demand and self-directed virtual training. This will be included as part of the cohort support system established through the project. These programs will identify and provide continuing education programs for employees to earn credentials and degrees relevant to their career pathways.

State Leadership - Alaska Workforce Investment Board

The Alaska Workforce Investment Board (AWIB) is the Governor of Alaska's appointed, lead planning and coordinating entity for Alaska's public workforce and development system. The Board provides policy oversight of state and federally funded job training and vocational education programs. Board members--who represent a variety of sectors in Alaska including business, industry, education, organized labor, and state government--examine employment trends and emerging occupations to ensure training efforts are aligned and that Alaskans are trained and ready for the jobs that pay well and are in demand.

The Board is tasked with reviewing plans and providing recommendations to the State of Alaska to further train and prepare Alaskans for the workforce - and help grow Alaska's economy. To meet the workforce needs of this plan's measures, AWIB will partner with employers to design training that includes apprenticeships as part of an implementation effort to increase the number of workers employed in emerging renewable energy and related industries. Collaborations with community-based organizations and leaders are vital to AWIB's mission of engaging with underserved communities, ensuring that our programs are inclusive and accessible.

The rapid growth of occupations in the renewable energy industry has led to many companies struggling to fill workforce shortages. Wind Turbine Technicians and Solar Photovoltaic Installers[55] are two of the fastest growing occupations in the U.S. Training is often on-the-job and can lead to long-term employment in the community being served. Employers also provide flexible training schedules that accommodate seasonal employment patterns and offer training during off-peak seasons. This includes ensuring that training programs are culturally sensitive and inclusive, respecting the diverse backgrounds and languages of participants, particularly in Indigenous communities.

Alaska has unique workforce challenges. To help track those challenges, Alaska's Occupational Database[56] was designed to help measure success and inform policy-making. AWIB will utilize collected data to accurately track training investment and jobs outcomes. This will include tracking what percentage of participants are employed after training, their average wages by occupation, and whether they are employed in Alaska one year after training. AWIB will utilize its existing workforce investment grants to support wrap-around services for workforce development and training. These fund sources include, but are not limited to the following programs: Statewide Training Employment Program[57], Alaska Workforce

55 https://www.bls.gov/opub/btn/volume-10/pdf/solar-and-wind-generation-occupations-a-look-at-the-next-decade.pdf
56 https://live.laborstats.alaska.gov/occfcst/usemeth.html
57 https://awib.alaska.gov/training-programs/step.htm

Infusion Grant[58], Training and Vocational Education Grant[59], Workforce Investment and Opportunity Act funding[60], and the Alaska Construction Academy[61].

Recent Workforce Developments

TREC and Solar for All are two recent program opportunities highlight the State's approach:

TREC – Home Energy Efficiency Training

Alaska's Training for Residential Energy Contractors (TREC) program funded by DOE envisions a residential home energy efficiency training program that is focused on certifying an incumbent and new workforce, utilizing intermediary training providers like AWP, ABC Alaska pre-apprenticeship programs, and apprenticeships facilitated by the AFL-CIO, AVTEC, and UA to deliver medium and high wage occupation opportunities to disadvantaged communities. DOL&WD's Alaska Job Centers are well-positioned to assist supporting unemployed and underemployed residents work through an intake and navigation process that leads to training partnerships, including apprenticeships and pre-apprenticeships. There is widespread support for expanding apprenticeship in Alaska, particularly due to federal support through previous USDOL apprenticeship expansion grants and progress made since the 2015 American Apprenticeship Initiative, which continues today with two active State Apprentice Expansion grants. While apprenticeships are less common in residential activities, project partners will review and identify key opportunities to make pathways available to program beneficiaries.

Construction trade skills take years of training and work experience to master the occupation. AHFC acknowledges that research indicates the most effective way to learn these skills is through a Registered Apprenticeship. In 2018, the AWIB adopted the Alaska Apprenticeship Plan[62], or AAP, with strategies to expand and diversify apprenticeships. The plan has action steps to increase the number of employers that train apprentices, increase the number of industries using the apprentice model, and increase the number of women and persons of color who become apprentices. The plan calls for coordinated efforts among employers, unions, apprentice sponsors, educators, and the public workforce system. Comparing 2017 data (pre-AAP) to 2021, women apprentices increased from 10-18% and persons of color from 30-36%.

The project will engage with the DOL&WD Job Center Employment Services Center Technicians who have the ability to assess and identify current occupational needs, organize career fairs, and assess the impacts of existing workforce training. Employment Services Technicians work with university campuses, training providers, and employers to bring synergy and cohesion of activities among both campuses and statewide industry partners. The Employment Services Technicians are responsible for keeping up to date with industry needs and opportunities in the engineering and technology sectors and connecting industry partners with trainings. The tasks of the Employment Services Technicians include overseeing job placement, internships, job shadowing opportunities for students, career fairs, mentorship opportunities, interviewing/resume/skills workshops, and industry interaction with student clubs.

The National Association of State Energy Officials (NASEO) estimates that 418 jobs will be required in Alaska based on calculations[63] from funding for the Home Energy Rebates program. NASEO also provides state-specific wage information[64] related to occupations and wages, including for: electricians, insulation workers, plumbers, pipefitters, and steamfitters, construction and building inspectors, and heating, air conditioning, and refrigeration mechanics.

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58 https://aws.state.ak.us/OnlinePublicNotices/Notices/View.aspx?id=210714
59 https://awib.alaska.gov/training-programs/tvep.htm
60 https://awib.alaska.gov/wioa.htm
61 https://awib.alaska.gov/training-programs/aca.htm
62 https://awib.alaska.gov/Alaska_Apprenticeship_Plan-10-2018.pdf
63 https://www.naseo.org/Data/Sites/1/documents/tk-news/naseo_trec-workforce-needs-assessment_1a-final.pdf
64 https://www.naseo.org/Data/Sites/1/documents/tk-news/naseo_trec-workforce-needs-assessment_1d-final.pdf

The project partners have outreach, pre-apprenticeship, and direct entry agreements with Alaska's Joint Apprenticeship Training Committees (JATC)[65], too. The JATCs have 16 fully equipped trade schools in Alaska and offer training for 21 construction trade occupations. Each JATC supports Career and Technical Education (CTE) pathways from Alaska's secondary schools to trade apprenticeship and employment and career advancement.

Solar for All

Alaska's utilities are experienced operators of power systems that experience challenging conditions. The local and regional workforce is skilled, and regularly provides training opportunities. In partnership with the Alaska Vocational and Technical school (AVTEC), AEA offers the Power Plant Operator training program that includes engine maintenance, troubleshooting and theory, electrical systems and generators, introduction to electrical distribution systems, diesel electric set operation, control panels, paralleling generator sets, load management, fuel management, waste heat recovery, plant management, and power plant safety. As part of this program, AEA will update course curriculum to be responsive to new and innovative solar system designs, and work with partners to deliver the course for participants.

At the same time, AEA's Circuit Rider Program provides eligible utilities with technical assistance to improve the efficiency, safety, and reliability of their energy infrastructure. Circuit Riders provide skilled labor to address, diagnose, and repair rural powerhouses, including to provide training for local communities to create skilled power plant labor. This program helps to reduce the risk and severity of emergency conditions. The Circuit Rider program develops strong ties with the remote Alaskan communities. The power system operator ecosystem in Alaska is interdependent, with strong collaboration between the state and utilities in ensuring system operability and community health and safety. As part of its Solar for All program, AEA will ensure that the Circuit Riders have the tools and training to increase support for community and residential solar and continues to support and train local communities in the use of improved power systems.

This project envisions a workforce ladder, utilizing intermediary training providers like AWP, apprenticeships facilitated by Alaska's labor organizations, and the university to deliver medium and high wage occupation opportunities to disadvantaged communities. Unemployed and underemployed residents will work through an intake and navigation process to ensure appropriate engagement in tracks and guidance, including support services. There is widespread support for expanding apprenticeship in Alaska, particularly due to federal support through previous USDOL apprenticeship expansion grants and progress made since the 2015 American Apprenticeship Initiative and continues today with two active State Apprentice Expansion grants. All partners will be involved in the ladder through a collaborative process.

Trades Track – As a coalition partner, Alaska Works Partnership (AWP) will offer pre-employment and pre-apprenticeship training through the existing Alaska Construction Academies, Women in the Trades, and Helmets to Hardhats programs. Alaska Safety Alliance (ASA) will offer pre-employment and occupational certificate training required for work on solar energy projects. Residential training centers, school districts, and apprentice sponsors will be activated to join in project activities and engage in cross-industry employment and training activities. In the past 5 years, AWP has served more than 3,500 individuals, and 75% of those served were placed in industry jobs. Of these, more than 700 entered registered apprenticeship. AWP specializes in helping underserved and underrepresented populations enter and retain employment in industry jobs that pay above prevailing wages. AWP has established relationships with industry associations, employers, unions, apprentice sponsors, Alaska Native Organizations, educational institutions, and workforce agencies, and manages $3 million in federal, state, and local workforce grants.

65 https://aatca.org/

University Track - AEA will work during the first year's planning process to work with the University of Alaska system, which has the potential to help meet workforce needs for solar energy by expanding key certificate programs and increasing industry access to trained workers. UA is not considered a named subrecipient within the program coalition. UA could expand the number of relevant certificates offered as well as promote the engineering degree programs that serve the solar sector. AEA will engage with UA during the program planning year to assess and identify current occupational needs, organize career fairs, and assess the impacts of existing workforce training. AEA can communicate to UA industry needs and opportunities in the engineering and technology sectors and help connect industry partners with students, faculty, and staff. UA may consider supporting job placement, internships, job shadow opportunities for students, career fairs, mentorship opportunities, interviewing/resume/skills workshops, and industry interaction with student clubs. AEA will encourage UA to assess current UA efforts and partnerships to evaluate the extent that current training programs are effectively meeting the needs of industry and make recommendations to strategically invest program funding to increase capacity, graduates, and the number of graduates becoming employed in these targeted sectors. UA will contribute to the project's information campaigns - data presented in the University of Alaska Workforce Reports shows that new graduates earn good salaries in most fields and their earnings increase substantially over five years following graduation. The university will consider continued expansion of online programs, informed by discussions with partners during the planning period, with a focus on adding more of the most needed workforce programs. If hands-on instruction is needed, it will be provided with intensive face-to-face components or, in some cases, internships or other on-the-job training, including through AWP. Dual enrollment opportunities are especially important for first-generation and economically disadvantaged students to increase their college graduation rates substantially.

V. Benefits Analysis

LIDAC Benefits Analysis

Alaska's GHG reduction measures would have a hard time impacting a community other than one considered LIDAC. The following map – produced using EPA's IRA Disadvantaged Communities tools – indicates that almost the entirety of Alaska qualifies under federal criteria, which combines CEJST and EPA EJScreen datasets – where gold indicates disadvantaged status.

The State of Alaska's PSEAP recognizes the incredible impact GHG reduction measures will have on LIDACs in the state. Measures included in this plan are responsive to CPRG's requirement that at least 40% of project benefits accrue to disadvantaged communities.

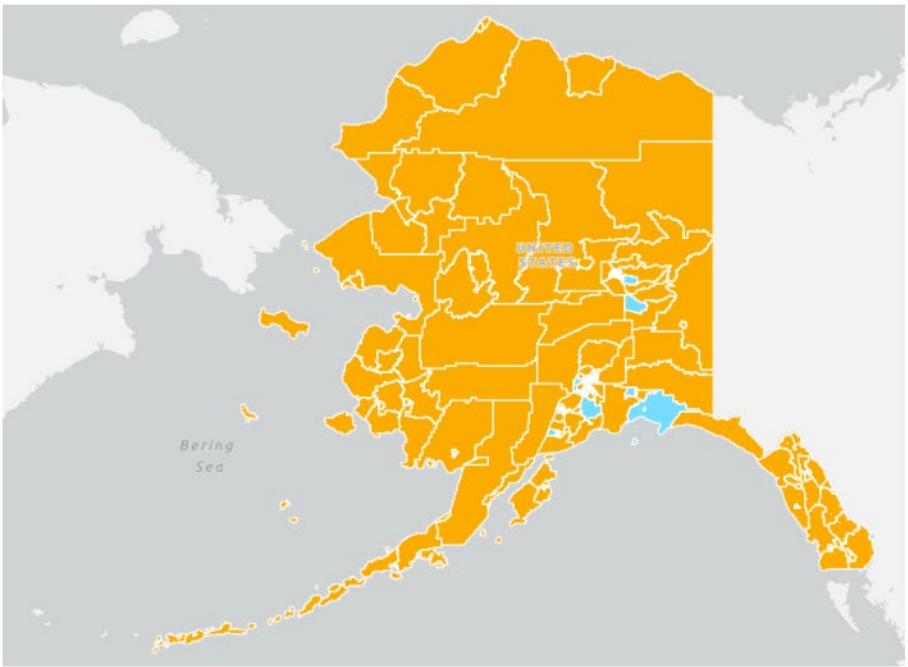

FIGURE 1: EPA IRA Disadvantaged Communities

DEC has included this preliminary analysis of benefits for LIDACs anticipated to result from the GHG reduction measure(s) in their PSEAP and recognizes that EPA anticipates requiring an accounting of such benefits as part of any future CPRG implementation grant application. DEC has used the Climate and Economic Justice Screening Tool (CEJST) along with EPA's Environmental Justice Screening and Mapping Tool (EJScreen) as a supplement to CEJST.

Alaska's analysis of CEJST (August 2023) produced the following concerns or questions, which are worth considering in relation to the state's LIDAC analysis – and that of EPA.

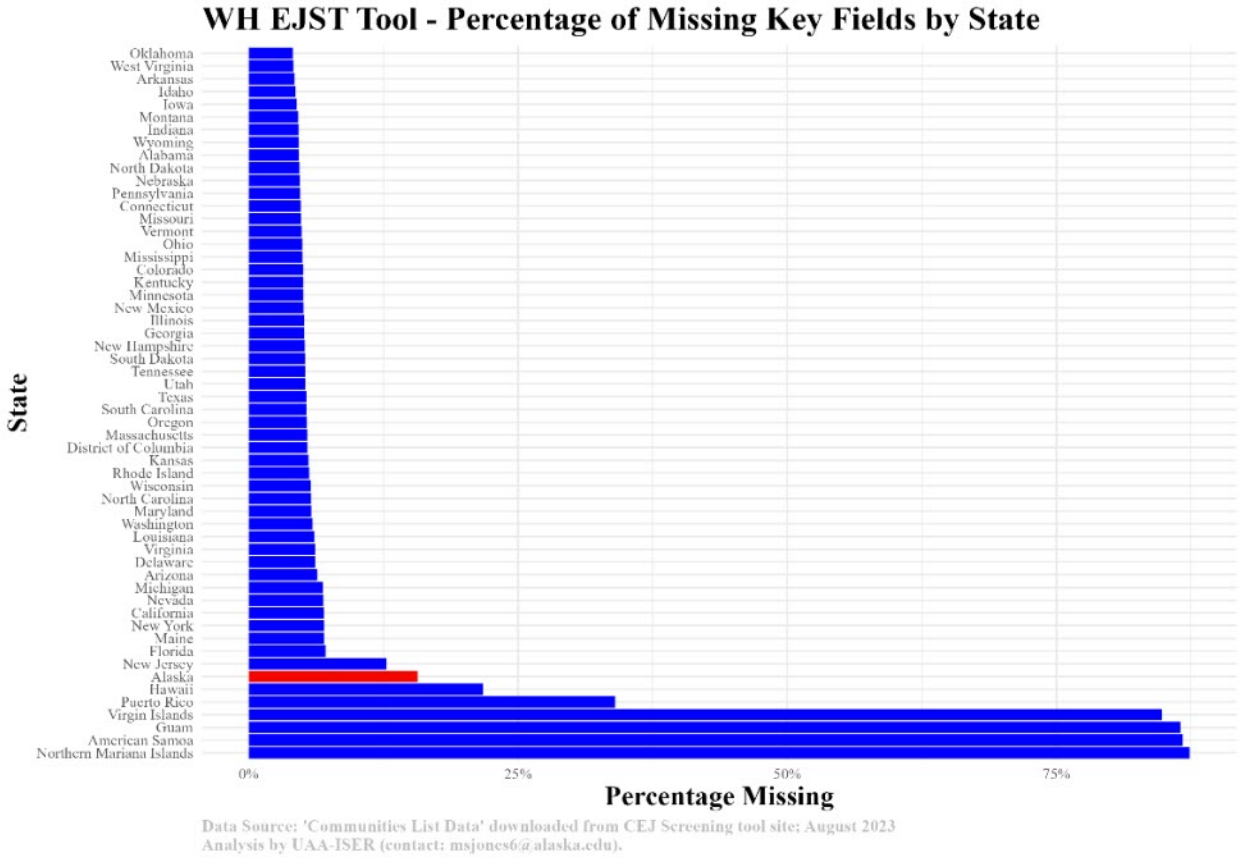

FIGURE 2: Percentage of Missing Key Fields in CEJST by State

The guiding feature of the screening tool is what makes a tract 'disadvantaged' (following the CEJST technical notes[66]): *"Under the current methodology, communities will be considered disadvantaged:*

- *If they are in census tracts that meet the thresholds for at least one of the tool's categories of burden, or*
- *If they are on land within the boundaries of Federally Recognized Tribes.*
- *Census tracts that are surrounded by tracts that are identified as disadvantaged and meet an adjusted low income threshold are also considered disadvantaged."*

Alaska has the second highest rate of missing core fields of the 50 states, behind Hawaii.

While US territories have the most missing fields, their census tracts are much more likely to be classified disadvantaged. The percentage of AK census tracts classified as disadvantaged is slightly lower than NJ or PA.

The percentage disadvantaged by borough/census area varies considerably, and CEJST has mislabeled Kusilvak as its old name "Wade Hampton Census Area". There is essentially no data for this tract, probably because nothing matches onto the name. This is egregious because it is one of the poorer parts of the state, and it's just a data entry error by using an old list of 'county' names. The website calls this tract "partially disadvantaged" simply due to surrounding tracts being disadvantaged, but the missing income field excludes it from meeting full criteria.

66 https://static-data-screeningtool.geoplatform.gov/data-versions/1.0/data/score/downloadable/1.0-communities-list.pdf

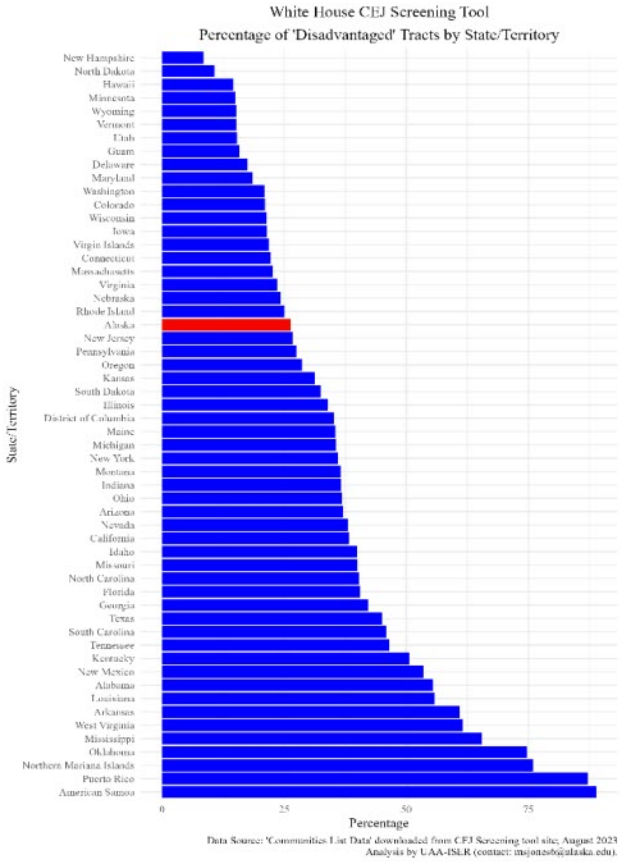

FIGURE 3: Percentage of Disadvantaged Tracts by State

Given the "Adj. % of Indiv. <200% Fed. Pov. Line" threshold is crucial to pair with every one of the categories, [Kusilvak] is negatively impacted from gaining "disadvantaged" status by most missing fields in their core categories [aside from tribal areas concerns, listed below]. Each of their categories have been included along with the missing variable fields in Appendix A, LIDAC Benefits Analysis.

The CEJST technical notes claim that more variables are used in the disadvantaged calculation than the map tool shows (those extra variables are also present in the dataset download, but it's unclear how/ if they are used). For example, 'historical underinvestment' is claimed to be in the housing category, but the map dropdown menu shows no such variable directly included. To the consideration of DEC, EJScreen also tends to underestimate LIDAC status for Alaska communities.

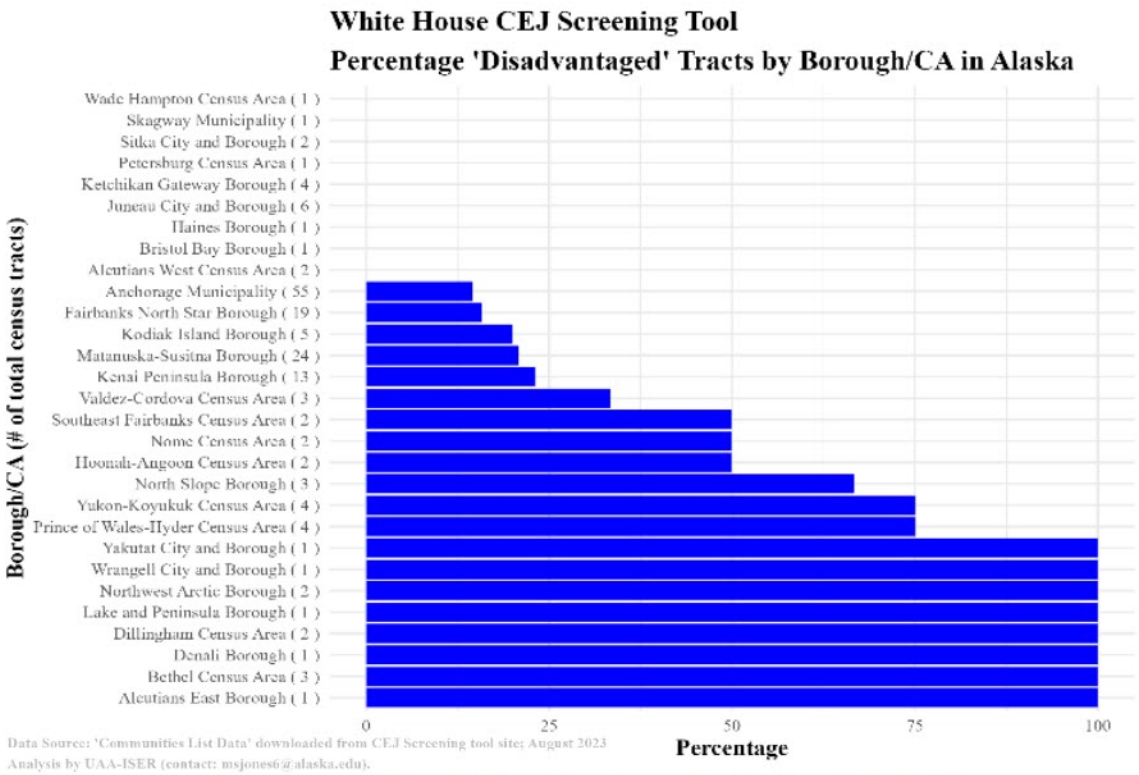

FIGURE 4: Percentage of Disadvantaged Tracts by Borough or Census Area in Alaska from CEJST

Tribal Lands:
It is not clear how or if CEJST is considering 'Number of Tribal areas within Census tract for Alaska' in their calculation. There are many missing observations. The data source is listed as: "Bureau of Indian Affairs' Land Area Representation (LAR) dataset from 2018", but that doesn't explain the amount of missing observations. The tribal area map is here.

1. No Alaskan census tract is "Identified as disadvantaged due to tribal overlap". CEJST has a variable called "Percent of Census tract that is within Tribal area", but only Annette Island has a value in that field (at 94%).
2. CEJST does have 230 'tribal areas' noted within the '# of tribal areas' field. But 22 census tracts are not considered 'disadvantaged' despite tribal presence. Some of these census tracts that are also a tribal area of the Native Village of Eklutna which includes higher income Anchorage neighborhoods. However, Kusilvak Census area (shown as 'Wade Hampton CA' in CEJST) with 19 tribal areas still doesn't make the cut. We can only surmise the field is omitted, which unfairly prejudices against Alaskan communities.
3. While CEJST does have 230 tribal areas, it is not clear if CEJST has incorporated the Alaska Native Village Statistical Areas in recognizing and representing Alaska Native communities. These areas encompass both permanent and seasonal residences of Alaska Natives who either hold membership in, or receive vital governmental services from, the defining Alaska Native village (ANV). Importantly, ANVSAs extend their geographical boundaries to encompass the region and vicinity of the ANV's historic and traditional location, ensuring that the unique cultural and historical significance of these areas is duly acknowledged and preserved.

LIDAC Benefits Analysis
Public entities in Alaska are accustomed to engaging with communities and Tribes through permitting and regulatory processes for clean energy and energy efficiency projects. These efforts urge early dialogue with local governments and Tribes, as well as community-based organizations, labor, and other stakeholders. These conversations should begin sufficiently early in order to inform project development in response to local communities' needs and concerns. Community stakeholders are uniquely situated to help identify the most effective actions the projects can take toward partnerships that advance workforce issues; diversity, equity, inclusion, and accessibility; and the flow of project benefits to disadvantaged communities.

An NREL study on distributed renewables for Arctic energy[67], found that community buy-in and ownership is essential, as this extract demonstrates and the project anticipates and responds to. DEC knows that projects must be community-driven and supported, with community members understanding and participating in the value proposition of moving to a stronger reliance on renewable energy. It is critical to include and receive buy-in from key stakeholders like utility managers, operators, project champions, and local government officials. Beyond project development, community engagement must be ongoing, and continue after the project is deployed to maintain community support and ownership. Long-term engagement is an essential element of sustainability. For example, a strong community focus enabled a successful project in Kongiganak: the community trained and retained a local workforce, built community trust through presentations in village meetings, and received community leader and tribal council support. In Galena, hiring and training an all-local workforce provided enhanced job satisfaction, increased local capacity, and strengthened the community overall.

Alaska anticipates that carbon reduction measures should be commensurate with the training, education, and availability of the local workforce, through the on-going relationship with State training

67 (Anderson, Jordan, & Baring-Gould, 2023)

providers like the Alaska Vocational Technical Center (AVTEC)[68] and the appropriate labor unions. The state knows that the use of community-appropriate technology reduces system failures and the community's dependence on long-term, expensive, external assistance. Local capacity will determine how simple or complex the system should be, and what assets it can include. Robust operations and maintenance plans must be considered from the start, and technical assistance provided to complete and maintain these. Communities have found that small, easy-to-maintain pilot systems with solar photovoltaics (PV), batteries, and/or wind can be a good stepping-stone to larger, more complex systems with higher contributions of renewable energy. Community-based technical capacity may be increased over time through community education and expanded experience from operating power systems. Many communities have been successful in engaging local youth, with energy providers gaining traction by speaking through credible, community-based educators. In Kotzebue, installing small wind turbines provided the technical capacity for subsequent installations of much larger wind turbines, batteries, and solar PV systems. In Galena, a focus on community education and training allowed the community to perform increasing portions of system maintenance locally and has enabled it to set its sights on future solar projects.

The State of Alaska knows that having a regional or statewide pool of support resources increases the likelihood of success, which its cohort and technical assistance approach will support. Having a network of knowledgeable people actively engaged in operating projects, such as an energy cooperative, that can provide targeted education or technical knowledge, increases the likelihood of project success, and can allow communities to install systems that they may not be able to support on their own. Allowing a process for communities to access this network will streamline the renewable energy development process including planning, financing, installation, and operations. Such a network is especially helpful for small communities with limited human capital. A face-to-face knowledge sharing network would increase the number and success rate of community projects.

DEC anticipates needing to identify and support competent, practical project managers that are required to ensure the project's success. The technical, financial, managerial, and community engagement components of a renewable energy project must be overseen by experienced personnel to help ensure effective delivery of projects. Managers must be able to validate project proposals from engineers and external entities, compare those proposals to community needs, and decline when necessary. Some communities also face rapid turnover of bookkeeping and managerial staff, reducing their financial and managerial capacity for projects. Such seemingly minor problems can have long-term impacts. In Kodiak, early renewable projects failed due to insufficient engineering and project management. Since then, a renewed focus on these components has enabled successful projects.

Engaging with labor unions, local governments, and Tribal entities.

Public entities have established, long-term, and mutually valued relationships with the organized labor community in Alaska. Larger development often occurs within collective bargaining agreements of the International Brotherhood of Electrical Workers (IBEW) Local 1547[69] and the various trade unions, depending on location. While this is very much about scale, the Alaska approach will be to engage its labor partners early to initiate discussions toward labor agreements and overall benefits of the project. Project sponsors will coordinate with organized labor the need for local and targeted hiring goals, card-check neutrality, and possible provisions advancing programs to attract, train and retain new workers.

The project anticipates that community engagement will be initiated early and conducted often to inform project development and implementation. Local and Tribal governments are uniquely situated to help identify the most effective actions the projects can take toward partnerships that advance

68 https://avtec.edu/
69 https://www.ibew1547.org/

workforce issues; diversity, equity, inclusion, and accessibility; and the flow of project benefits to disadvantaged communities.

Workforce and Community Agreements

DEC anticipates that there will be opportunities for workforce or community strategies to be established as a direct result of the project. This will include planning for environmental justice, carbon reduction, workforce development, shared procurement, local hire, and asset management, including maintenance and operations planning and technical assistance. Ideally, implementing agencies will reference DOE's Community Benefit Agreement Toolkit[70], recognizing that it doesn't apply the same to federal projects as private, its intended purpose. The outcome of the CBA will be CBAs 40% percent of benefits should be allocated to communities of color, Indigenous peoples, low-income communities, and other marginalized groups. Each project will evaluate the opportunity for workforce agreements, as well, which will help ensure equity for women, people of color, and other historically disadvantaged or underrepresented groups in the project's implementation. Project sponsors will work through a facilitated community stakeholder process to identify ways in which workforce goals will be met. Goals include local hire, family-supporting jobs (wage parity), health insurance, diverse workforce, diverse workforce participation, and resources for continuing education and certification that result in a highly skilled workforce. Contractor solicitation should reference these goals as part of criteria for an award.

Approach to apprenticeships and local hiring goals

Ideally, implementing agencies may maintain a local workforce availability and hire tracking system throughout the life of the project, enabling local hire goals to be met and cross-promoting hire between projects that might occur within a region. This system will also track municipal and tribal workforce in-kind contributions, staff time that is applied to the project planning and implementation.

The project team will work with the University of Alaska (UA), AVTEC, and Alaska Works Partnership to identify ways in which training, apprenticeships and local hiring can benefit from microgrid implementation, and other proposed projects. In addition, the project will reference the Alaska Workforce Investment Board's strategies for workforce development, found in its Combined Plan for Workforce Innovation and Opportunity[71].

The UA is an important mechanism for workforce development, including for apprenticeships. 20 years ago, the University of Alaska Anchorage (UAA) created the Associate of Applied Science in Apprenticeship Technologies. The University of Alaska System, the UAA Community and Technical College, and several joint apprenticeship training programs have joined the United States Department of Labor (USDOL) Registered Apprenticeship-College Consortium, which simplifies the process for an apprentice to earn college credit.

Investing in the American Workforce

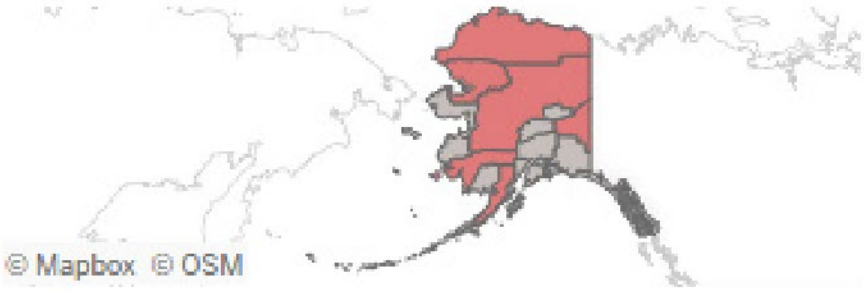

FIGURE 5: USDA's Economic Risk Assessment Dashboard showing Alaska's distressed communities by borough – red indicates distressed borough/census area where red indicates top 10% highest risk nationally. Note: incomplete data in census areas like Kusilvak prevent these from being marked.

70 https://www.energy.gov/diversity/community-benefit-agreement-cba-toolkit
71 https://awib.alaska.gov/pdf/WIOA_plan_2022-2023.pdf

GHG reduction measures in Alaska have the ability to result in increased investment in the workforce in Alaska's LIDAC communities. Measures could result in job creation and business development, and sponsors may work individually and together to identify ways in which this can be maximized, not just in project development and delivery, but in the long-term. USDA's Economic Risk Assessment Dashboard tracks COVID, Community Distress, Unemployment, and Social Equity and is a good example of where economic benefits might accrue. It produces a dashboard for Alaska that identifies fully half the state by geography as distressed, more than any other state in the nation.

Advancing Diversity, Equity, Inclusion, and Accessibility

DEC recognizes the value of a meaningful and targeted approach to advancing diversity, equity, inclusion, and accessibility. The following is a description of the methodology the team will implement in project design and implementation.

Equity: Implementing agencies should have shared commitments to 1) build a diverse workforce, supported by equitable operations and policies, and establish an informed culture that delivers authentic inclusivity; 2) promote economic opportunity for Alaskans through transportation investments, including working with BIPOC and woman-owned businesses as well as businesses owned by others who have been historically and/or are currently marginalized; 3) utilize the viewpoints of those who reside in the communities and who are likely to be affected by the outcomes of the project; and 4) invest in the protection of marginalized communities from environmental hazards.

Diversity: Implementing agencies should have shared commitments to 1) a workforce that is talented, diverse, and committed to fostering a safe, fair, and inclusive workplace; 2) ensure all voices, regardless of social identity or social demographics, are heard and their views influence project decisions; 3) work with stakeholder groups to aid in communication with the community and project personnel.

Inclusion: Implementing agencies should have shared commitments to 1) include the diverse perspectives within this project's scope and deployment; 2) leveraging investments and increasing pathways to opportunity for minority-owned and disadvantaged business enterprises, and for individuals who face systemic barriers; 3) meaningful engagement with communities that are diverse and underrepresented in the creation and implementation of the programs and projects that impact the daily lives of their communities by creating more transparent, inclusive, and on-going consultation and collaboration process; 4) ensure the project includes practices based on community engagement to avoid harm to frontline and vulnerable; and 5) provide training to staff to promote inclusion internally and externally.

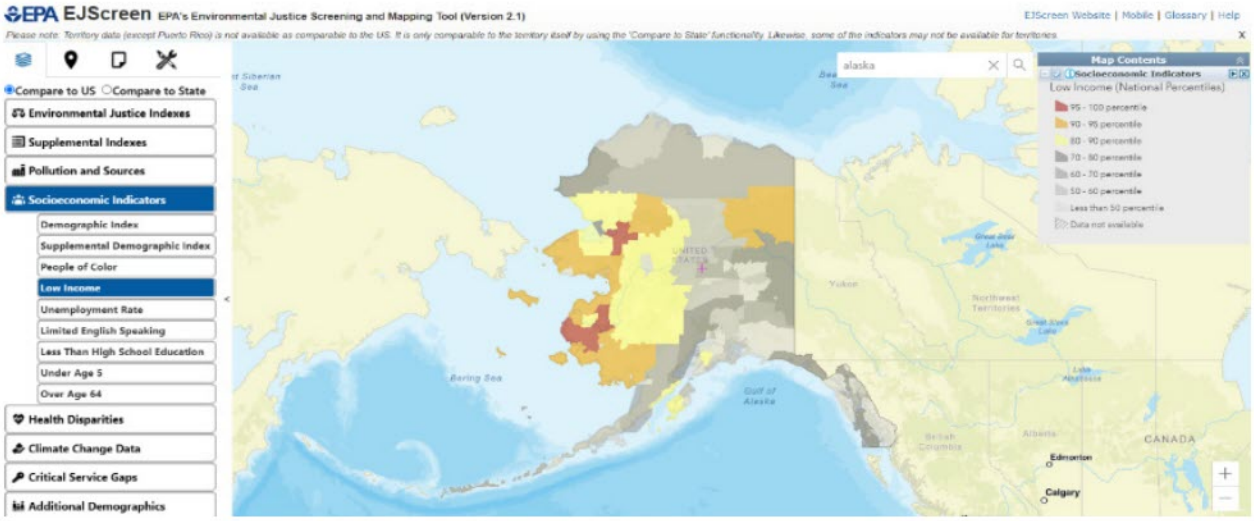

FIGURE 6: Low-Income Alaska communities on EPA's EJScreen

Accessibility: Implementing agencies should have share commitments to 1) strengthen accountability policies and procedures, create a more accessible and disability-inclusive workplace, and foster a greater respect for religious diversity; 2) ensure that reasonable accommodations are handled with tact and care to provide community members as well as employees the opportunity to fully participate in project activities; 3) develop and implement a process to increase awareness of accessibility tools and disability inclusion; 4) review and evaluate disability inclusion policies and practices in crisis and emergency management including, but not limited to, planning and response for pandemics, disasters, and evacuations in the domestic context; 5) examine options to enhance technological accessibility; and 6) increase awareness of religious accommodations.

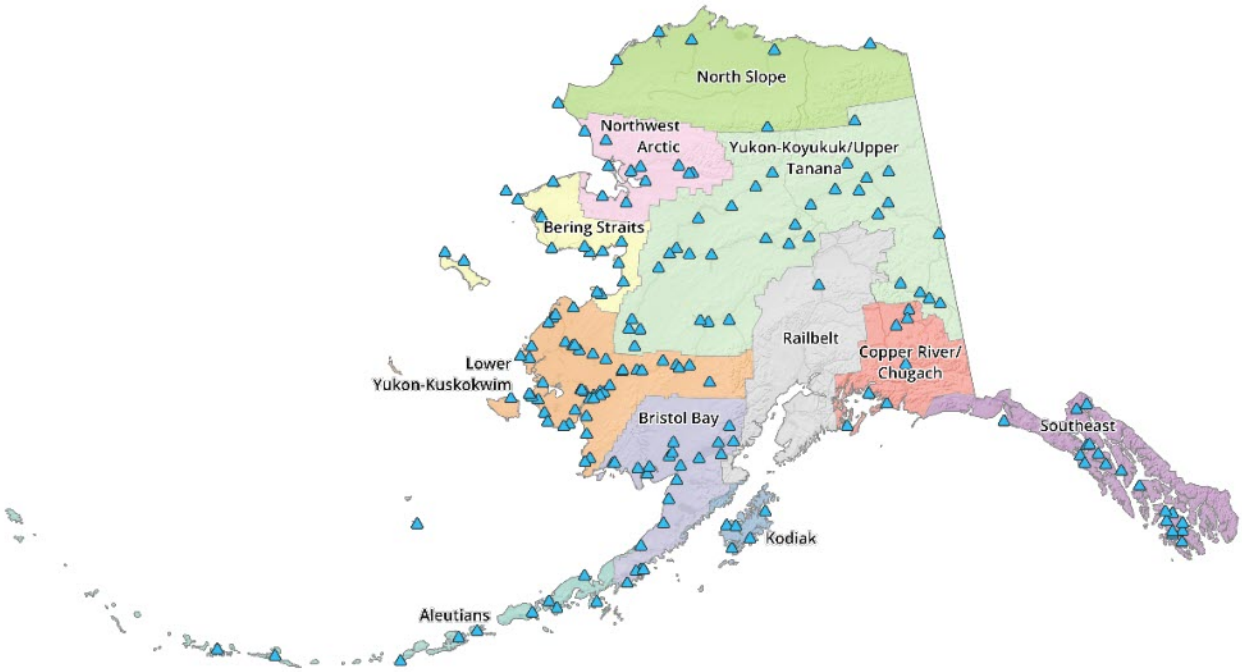

FIGURE 7: AEA's Power Cost Equalization communities

EPA's EJScreen identifies areas of the state experiencing low income, for instance. While DEC has concerns about the underrepresentation of communities in EJScreen, these areas are generally consistent with where Power Cost Equalization (PCE) communities fall in AEA's 10 rural energy regions, where high cost is relative to an average of three urban communities. GHG reducing projects will result in at least 40% of benefits accruing to rural communities that are considered disadvantaged or Tribal.

The table below demonstrates for relevant census areas and boroughs (county equivalent), their FIPS identification for reference[72], population[73], Rural status according to the Office of Management and Budget (OMB)[74], their social vulnerability index according to the Centers for Disease Control and Prevention (CDC)[75], whether they are Areas of Persistent Poverty according to United State Department of Transportation (USDOT)[76], whether they are difficult to develop according to Department of Housing and Urban Development (HUD)[77], and whether the Denali Commission considers communities within Distressed. [78]

72 https://www.census.gov/library/reference/code-lists/ansi.html
73 https://live.laborstats.alaska.gov/data-pages/alaska-population-estimates
74 https://www.census.gov/content/dam/Census/library/publications/2020/acs/acs_rural_handbook_2020_ch01.pdf
75 https://www.atsdr.cdc.gov/placeandhealth/svi/index.html
76 https://www.transit.dot.gov/grant-programs/areas-persistent-poverty-program
77 https://www.huduser.gov/portal/sadda/sadda_qct.html
78 https://www.denali.gov/wp-content/uploads/2020/08/2020DistressedCommunitiesReport.pdf

City/Borough	FIPS*	Pop.	Rural (OMB)	National SVI* Ranking (CDC)	APP* (DOT)	DDA* (HUD)	Distressed Communities
Aleutians East Borough	2013	3,515	Yes	Moderate to High	No	Yes	No
Aleutians West Census Area	2016	5,723	Yes	Low to Moderate	No	Yes	No
Bethel Census Area	2050	18,216	Yes	High	Yes	Yes	Yes
Bristol Bay Borough	2060	877	Yes	Low to Moderate	No	No	Yes
Valdez- Cordova Census Area	2063	9,202	No	Low to Moderate	No	No	Yes
Denali Borough	2068	2,059	Yes	Low	No	Yes	Yes
Dillingham Census Area	2070	5,000	Yes	High	No	Yes	Yes
Haines Borough	2100	2,474	Yes	Low	No	No	Yes
Hoonah- Angoon Census Area	2105	2,151	Yes	Low to Moderate	No	No	Yes
Ketchikan Gateway Borough	2130	13,918	Yes	Moderate to High	No	Yes	Yes
Kodiak Island Borough	2150	13,345	Yes	Moderate to High	No	Yes	Yes
Kusilvak Census Area	2158	8,049	Yes	High	Yes	No	Yes
Lake and Peninsula Borough	2164	1,587	Yes	High	No	No	Yes
Nome Census Area	2180	10,008	Yes	High	No	Yes	Yes
North Slope Borough	2185	9,872	Yes	Moderate to High	No	Yes	Yes
Northwest Arctic Borough	2188	7,671	Yes	High	No	Yes	Yes
Wrangell- Petersburg Census Area	2195	5,910	Yes	Moderate to High	No	Yes	Yes
Prince of Wales – Hyder Census Area	2198	6,422	Yes	High	No	No	Yes
Sitka	2220	8,458	Yes	Low to Moderate	No	No	No
Skagway	2230	1,240	Yes	Low	No	Yes	No
Southeast Fairbanks Census Area	2240	6,918	Yes	Moderate to High	No	Yes	Yes
Wrangell	2275	2,127	Yes	Moderate to High	No	No	Yes
Yakutat	2282	662	Yes	Moderate to High	No	Yes	No
Yukon- Koyukuk Census Area	2290	5,327	Yes	High	Yes	No	Yes

TABLE 27: Indices of vulnerability of Alaskan boroughs and census areas

An equity assessment will be encouraged as part of project development and implementation. This will include review of available datasets to ensure distribution of project benefits to 40% disadvantaged communities, and to structure ways in which project sponsors and contractors can implement strategies that maximize equitable benefits.

Identification of applicable benefits that are quantifiable, measurable, and trackable.

DEC will track project benefits that are quantifiable and measurable. Baseline measures will be secured prior to project implementation, and measured at the conclusion of each project for a pre- and post-project assessment.

Benefits	Quantifiable	Measure	Tracking
Decrease in Energy Burden	T btu (trillion British thermal unit)/ Million $	Site Energy Savings Energy Costs Savings	2009 Baseline – annual and cumulative
Decrease in environmental exposure	MT CO2e Reduction	CO2 Reduction	2009 Baseline – annual and cumulative
Increase in access to low-cost capital	Million $	Capital availability	AAHA report on access to capital
Increase in job creation and training	Job #s	Jobs and training opportunities	ASHBA report/DOL&WD
Increase in clean energy jobs and enterprise creation	Business #s	Business development	ASHBA report/AKSBDC
Increase in community ownership	Municipal code	Adoption or revision	Community reporting/AML
Increased parity in clean energy technology access and adoption	Municipal code	Energy technology reference	Community reporting/AML

TABLE 28: How to quantify and track project benefits

Anticipated Negative and Cumulative Environmental Impacts on disadvantaged communities.
While EPA's EJScreen does not include sufficient data to assess the potential impact of projects to disadvantaged communities, the project team recognizes the research that exists to describe the value and impact of renewable energy development generally.

According to the Fifth National Climate Assessment, Alaska is warming two to three times the global average[79]. The consequence of this difference is a greater impact of socioeconomic and ecological changes driven by climate change, especially for Alaska's most remote communities. The report found that Alaska is facing compounding stressors from climate change, growing built environment costs, and economic consequences of ecological disruption (for example, within fisheries). Alaska's people, and especially its disadvantaged communities, are likely to face a greater impact of climate in the near term than other states and thus a proportionately larger amount of federal funds should be allocated to address the needs for adaptation in Alaska.

The recent 200-page report by ANTHC and DCRA, "Unmet Needs of Alaska's Environmentally Threatened Alaska Native Villages" makes a number of recommendations with relevance to state and federal policymakers. There are many particular findings, including agency programmatic and legislative barriers such as required match, that are currently preventing needed investment for climate adaptation.[80]

Fuel transportation to remote Alaska communities is becoming more susceptible to weather-related disruptions. In these communities, fuel is typically delivered by barge, which for inland communities is only available during the summer when the rivers are free of ice. Changes in river paths, low water levels, increasing sediments, or unexpected storms can put shipments at risk, leaving a community without the energy stores needed to meet high heating loads during the long winter. Alternative methods of delivery, such as ice roads and winter-based overland routes, are becoming less secure. The emergency alternative—flying diesel in on small planes or even by helicopter—increases costs exponentially, with some communities paying over $16/gallon[81]. Burning diesel also releases greenhouse

79 (Huntington, et al., 2023)
80 (Alaska Native Tribal Health Consortium, Division of Community and Regional Affairs, 2024)
81 https://www.adn.com/alaska-news/rural-alaska/2022/05/18/fuel-in-the-alaska-village-of-noatak-was-16-a-gallon-the-costs-are-more-than-just-money/

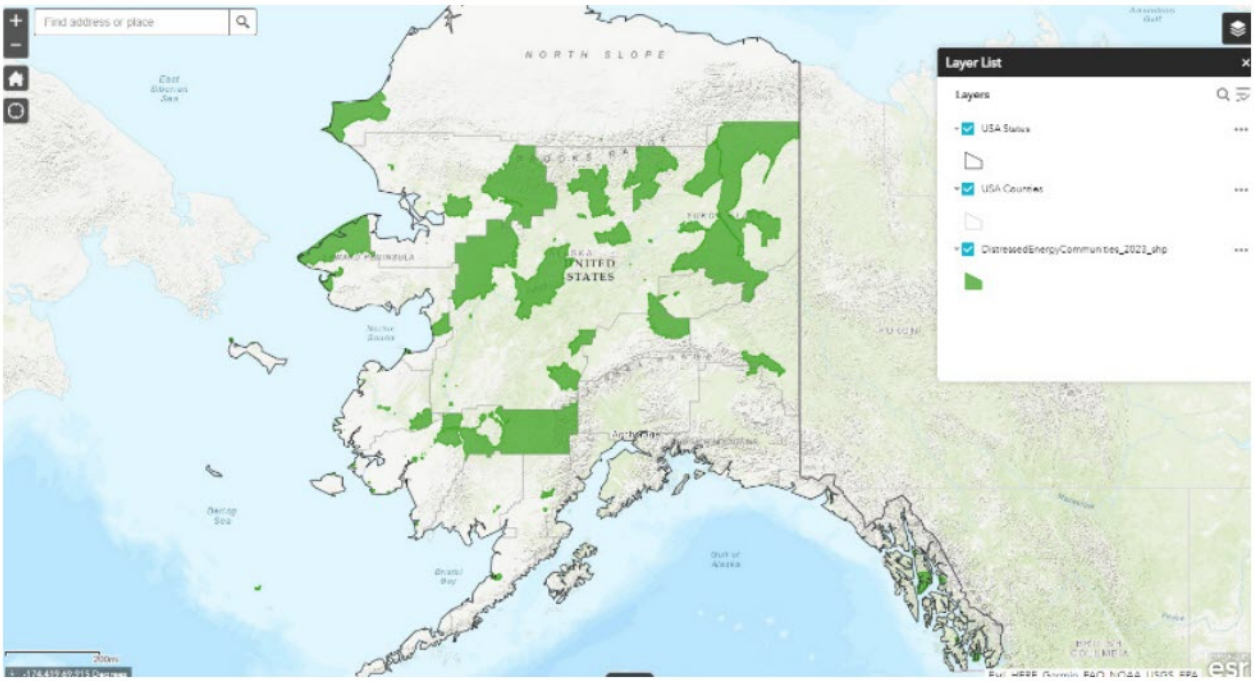

FIGURE 8: USDA Rural Development Distressed Energy Communities in Alaska

gases and other pollutants, reducing local air quality. The effects of severe weather are being experienced acutely in Arctic regions like Alaska, as melting permafrost further reduces transportation options and puts building foundations at risk.

Remote Alaska communities have and will continue to lead in community-based renewable energy development, serving as an example for similar communities throughout the world. Many communities have excellent wind, solar, hydropower or biomass resources waiting to be utilized. Sixty-nine Alaskan communities have so far integrated some form of renewable energy, and between 2014 and 2018, 5,210 households[82] in rural Alaska received building energy efficiency improvements to reduce overall energy demand. A variety of funding sources and programs are available to support communities in the complex transition to renewable energy Remote locations may be rich in renewable energy sources, but the intermittent nature makes their integration into the power grid a challenge.

Energy planning can offer enhanced protection against the threats of natural disasters and terrorism to make our communities more resilient, sustainable and livable for generations to come, which lowers the price of mitigation for building owners. The many challenges to public health and safety and environmental sustainability in our increasingly complex global society call for a holistic approach to public policy development and business models, including how we construct buildings. Thoughtful consideration of "performance goals" prior to taking action is important for budget planning and for establishing priorities, such as: public health and safety; protection of ecosystems and the important functions they serve; accessibility and mobility for all citizens; affordable housing; and economic sustainability. Implementation of new policies and practices should start by identifying the intersections and synergies that will achieve the performance goals (which may change) in the most responsible and cost-effective way possible.

82 https://www.nrel.gov/docs/fy23osti/84391.pdf

USDA Rural Development has data identifying Distressed Energy Communities[83], which covers a large swath of Alaska. These are regions that will benefit most from locally sourced renewable energy projects. This will be part of the project review process for evaluation of eligibility and competitiveness.

Benefits to Disadvantaged Communities.

Disadvantaged communities will directly and indirectly benefit from the outcomes of the PSEAP activities. By inclusive engagement in project development, scoping, and implementation, disadvantaged communities will be exposed to learning opportunities that will enable them to improve current practices and policies. Upon completion, the projects will provide public health and safety benefits to communities disadvantaged by equity and environmental justice factors.

83 https://ruraldevelopment.maps.arcgis.com/apps/webappviewer/index.html?id=86027863e066487ca1b33dc9217a70d1

VI. Review of Authority to Implement

A. Alaska Housing Finance Corporation

AHFC is a quasi-state entity that makes mortgages accessible to Alaskans and provides affordable housing and energy efficiency programs. AHFC's mission is to provide Alaskans access to safe, quality, affordable housing. AHFC delivers a variety of programs to meet this mission, including building code development. AHFC has administered several code process and programs since 1992 making the organization uniquely qualified to perform this project's tasks. AHFC established the Building Energy Efficiency Standards (BEES)[84] to promote the construction of energy efficient buildings. AHFC facilitates training and education for Energy Raters and Home Inspectors to become certified to sign off on BEES compliance. As an enforcement tool, AHFC has created a process for state inspectors to perform inspections during construction of a new home with AHFC financing. Internal auditing and quality control policies and procedures have been developed and followed to ensure compliance.

AHFC's authority to implement the Weatherization Assistance Program, along other energy efficiency programs, comes for Alaska Statute 18.56.850, which is part of Alaska Housing Finance Corporation's larger enabling legislation – AS Chapter 18.56.

AHFC is Alaska's agency implementing the Department of Energy's two Home Energy Rebate programs, including the Electrification and Appliance rebate program that includes point of sale rebates for electrification improvements to help households prepare for a successful solar installation. The program includes up to $4,000 for a load center/service panel upgrade and up to $2,500 for household wiring upgrades. AHFC works with an established network of professional energy raters and building inspectors to administer its Home Energy Rating System and its Building Energy Efficiency Standards on any home financed by AHFC (such as those through its tax-exempt first-time homebuyer and veterans' loans for income-qualified households). AHFC anticipates being able to leverage its weatherization program such that solar installation could occur alongside broader residential improvements.

At the same time, AHFC has a variety of program experience that has established its methodology for customer acquisition. AHFC developed and administered the U.S. Treasury's COVID-19 Emergency Rental Assistance and Homeowner Assistance Fund Programs whereby AHFC provided the critical infrastructure for all Alaskans to check their eligibility apply through a single portal. The process pooled resources from Anchorage, Alaska's largest city, and tribal entities resulting in an efficient application process for Alaskans and allowed AHFC and its partners to quickly evaluate applications and issue payments. This

84 https://www.ahfc.us/pros/builders/building-energy-efficiency-standard

effort led to a national award in 2022 for management innovation by National Council of State Housing Agencies, and first place communications awards in the categories of community relations and special electronic and printed promotional materials by Alaska's Public Relations Society of America.

B. Alaska Energy Authority

The Alaska Energy Authority (AEA) is an independent and public corporation of the State of Alaska, est. 1976 and is governed by a board of directors with the mission to "reduce the cost of energy in Alaska." AEA is the State Energy Office and lead agency for statewide energy policy and program development. AEA's core programs work to diversify Alaska's energy portfolio, lead energy planning and policy, invest in Alaska's energy infrastructure, and provide rural Alaska with technical and community assistance. AEA's enabling legislation, which includes authority to implement the programs described in this plan, come from Alaska Statutes, chapter 44.83.

The impact of AEA's programs extend to the construction of rural power generation and bulk fuel facilities, distribution systems and transmission lines, renewable energy asset construction and integration, and ad-hoc maintenance and improvement of aging infrastructure. Rural Electric Utility Workers, under AEA's circuit rider program, continuously travel to rural communities to administer itinerant training to rural utility operators, and diligently maintain an inventory and assessment record for nearly every rural powerhouse in the state by conducting comprehensive on-site assessments. This record informs the powerhouse construction schedule and ensures alignment with community needs.

AEA is committed to advancing and sustaining rural power systems across rural Alaska, including the construction of powerhouses for rural and tribal communities, efforts which has been ongoing since its inception in 1976. Over its existence, AEA has come to have touched the power generation systems, and worked with stakeholders from nearly every community in the state to provide supply and demand energy services. Over the past two years, AEA has overseen ten rural powerhouse upgrade projects at different stages of development in the communities of Akhiok, Napaskiak, Nikolai, Venetie, Rampart, Nelson Lagoon, Manokotak, Circle, Akiachak (DERA) and Arctic Village (DERA). AEA maintains a strong commitment to follow through on delivering energy improvements for communities and often seeks additional project funding beyond what is provided by the Denali Commission and the State. Recently, AEA sought funding on behalf of the communities of Napaskiak and Manokotak through the USDA High Cost of Energy program and the Aleutian Pribilof Island Community Development Association's Infrastructure fund to support rural powerhouse construction projects. AEA was awarded over $3 million through these efforts. Relationships and partnerships are in place with all Alaska energy stakeholders, including small rural non-profits and utilities, large regional and village Alaska Native Corporations and tribal governments, conservation organizations, municipal governments, and technology- or solution-oriented working groups. Many organizations contribute to the development and support of infrastructure in rural Alaska, such as DOT&PF, responsible for airport infrastructure, ANTHC, focused on water and sanitation, local school districts, who support K-12 public school facilities, among others. However, when it comes to rural energy infrastructure, AEA serves as the leading organization.

As current industry trends move increasingly towards a clean energy future, AEA's efforts have adapted accordingly. Rural utilities and powerhouses that were once exclusively powered by diesel are now seeking to transition to solar energy solutions. This shift demands careful consideration. Diesel generators in rural communities are sensitive to load fluctuations, as they can impact the efficiency of the gensets (i.e. the practice of wet-stacking), and excessive fluctuations can result in damage to the diesel generators, which serve as the backbone of the rural microgrid. Integrating renewables into diesel microgrids is a complex undertaking that requires the expertise of qualified and responsible entities with a track record like AEA's of reliable energy infrastructure deployment across the state.

Between 2008 and 2023 the state legislature appropriated $317 million for Renewable Energy Fund (REF) grants, which AEA has managed. Those state monies leveraged over $300 million in private and federal funds to complete project funding. The REF is managed by AEA in coordination with a nine-member REF Advisory Committee, as established under Alaska Statute 42.45.045 and AS 44.83.080(15). The program provides grant funding for the development of qualifying and competitively selected renewable energy projects. Since its inception 289 REF grants have been awarded and funded via legislative appropriations totaling $317 million. These funds have been matched by local and private contributions that have leveraged AEA's investment. Over 100 operating projects have been built with REF contributions, collectively saving more than 85 million gallons of diesel and 2.2 million cubic feet of natural gas since the REF's inception. These investments have resulted in the reduction of 1,110,424 gross metric tons of carbon dioxide since 2008. AEA has identified nearly a dozen projects that have the engineering and planning already in place to move quickly into construction, if funded. AEA is an active participant in many of the projects, including as project manager. The completed studies have shown that many of the projects are viable and ready for implementation. Disadvantaged communities will directly and indirectly benefit from the outcomes of such project activities. Via inclusive engagement in project development, scoping, and implementation, disadvantaged communities will be exposed to learning opportunities that will enable them to improve current practices and policies. Upon completion, the projects will provide public health and safety benefits to communities. AEA is engaged in all levels of consumer energy from project and resource identification, appropriate design, to financing and operations and maintenance. With decades of experience in developing energy projects in Alaska, AEA has continuously improved its processes, and applications of technology, and delivery of services. AEA integrates modern energy technology and advanced grid services into all program areas both on the supply- and demand-side.

Diesel Engine Replacement/Rural Power System Upgrades/Distribution Upgrades

Agency efforts supporting these goals include the administering a variety of statewide programs which include the Rural Power System Upgrade program (RPSU)[85], the Bulk Fuel Upgrade program (BFU)[86] and the Renewable Energy Fund (REF)[87] which integrates renewable energy in generation facilities. AEA also administers end use efficiency grants, educational programs and technical assistance programs which train local operators to monitor their local diesel-based power plants and maintain efficient operations. Per AEA's bylaws, included in Supplemental Materials, and Alaska Statute 44.83.080 subsection 10, AEA has the legal authority to receive funds and grant them to sub-recipient utilities.

Under 3 AAC 108.100 – 130 the Alaska Energy Authority's Rural Power Systems Upgrade (RPSU) program may provide financial assistance and technical assistance including construction management and training to eligible recipients.

AEA consults with the Alaska Department of Environmental Conservation (ADEC) Division of Air Quality to ensure compliance with applicable emissions regulations. ADEC requested AEA take over as the lead granting authority to administer Alaska's State Clean Diesel Program per the letter from State Commissioner Larry Hartig to Gina McCarthy dated April 15, 2016. EPA approved this request by letter dated May 11, 2016.

Village Energy Efficiency Program (VEEP)

Regulations for this program can be found under Title 3 of the Alaska Administrative Code, 3 AAC 108.400 – 3 AAC 108.499.

85 https://www.akenergyauthority.org/What-We-Do/Rural-Energy/Rural-Power-System-Upgrade-Program
86 https://www.akenergyauthority.org/What-We-Do/Rural-Energy/Bulk-Fuel-Upgrade-Program
87 https://www.akenergyauthority.org/What-We-Do/Grants-Loans/Renewable-Energy-Fund

Electric Vehicles

In 2018, Alaska became a beneficiary of the Volkswagen (VW) Environmental Mitigation Trust (Trust), and the Authority was designated by the Governor's Office as the State's lead agency for EV planning and implementation. At that time, AEA adopted a secondary mission to reduce barriers to EV adoption. AEA has taken the leading role in developing and implementing the NEVI program.

Since the designation of AEA as the State's lead agency for EVs by the Governor's Office, AEA has conducted public outreach and education and has worked towards reducing range anxiety by strategically installing EV chargers. In 2020, AEA facilitated the development of the Alaska Electric Vehicle Working Group (AKEVWG), comprised of representatives of utilities, state and local government, researchers, EV owners, and stakeholder industries. AEA's experience administering the VW Settlement grants for DCFC in Alaska provides the agency with the background and experience needed to implement the NEVI program.

AEA developed the State of Alaska Electric Vehicle Infrastructure Implementation Plan along with Alaska DOT&PF.

C. Department of Early Education & Development

The Department of Early Education & Development maintains a number of programs relating to the financing of school construction and maintenance, both for the REAA school districts established by AS 14.08.031(a) which receive most of their revenue from the department, and for municipal schools districts. The major maintenance program referenced in this plan was established by AS Chapter 14.11.

D. Other State Agencies

This plan names priority measures relating to energy efficiency improvement of facilities under the purview of for the University of Alaska and the Department of Transportation & Public Facilities. These agencies receive their authority from various areas of Alaska Statute. These agencies would implement their measures as a part of their regular facilities and operations obligations and authority.

E. Southeast Conference

The mission of Southeast Conference (SEC) is to undertake and support activities that promote strong economies, healthy communities, and a quality environment in Southeast Alaska.

As the state and federally designated regional economic development organization for Southeast Alaska, SEC is responsible for developing the five-year regional Comprehensive Economic Development Strategy (CEDS). The sections of the CEDS are developed by subject area committees, which also advise and suggest advocacy through SEC's other working, giving SEC a grass roots structure. The most recent Strategy names beneficial electrification, including the use of residential heat pumps, as a priority measure. SEC works alongside its members to implement these measures, acting as the primary regional organization advancing economic development.

As a membership organization representing more than 185 organizations from communities across the region, SEC is governed by a Board of Directors that provide direction SEC staff on implementing the organization's work plan, which is tied closely to the CEDS. This board is composed of five tribal or municipal government representative members, five private sector members, and three members-at-large; this board is elected by membership at SEC's Annual Meeting.

F. Alaska Municipalities and Tribes

Most microgrids in Alaska are operated by local utilities, with over 100 certificated utilities active in the state, each serving a relatively small population. This stands in contrast to the continental U.S., where

most microgrids are deployed by third parties serving critical facilities (such as military bases) and commercial and industrial customers. While nearly two dozen electric utilities in Alaska are municipal owned, cooperative utilities are the predominant model in Alaska, again a feature which aligns with much of the world's utility structures that lean toward non-profit and government entities.

Many rural communities have Strategic Energy Plans which set renewable generation goals. The Office of Indian Energy promulgated standard guidance[88] and provides technical assistance in the creation of these plans; however, access to them is conditional and on a case-by-case basis as they are confidential, proprietary information belonging to the entity (primarily tribal governments and native corporations) completing them.

Developing a climate action plan in a small community is an unwieldy undertaking that is limited greatly by available expertise in a community. The three adopted climate action plans all have long lists of contributing technical & planning organizations which enabled them to complete their work successfully. Emissions inventories are one of the more time-consuming, technical requirements which has slowed the process in communities like Sitka.

Ultimately, specific authority varies for each municipality – though for the measures relating to local governments described in this plan, authority stems clearly from existing powers and obligations.

G. Federally-recognized Tribes and Other Tribal Entities

Many of the tribal governments in Alaska received CPRG planning grants, with most of the work being completed via consortia. As an example of the approaches being taken in these plans, ANTHC's CPRG work plan names three priority sectors – 1) Electric generation 2) Residential energy efficiency 3) Non-residential energy efficiency. These priorities informed by ANTHC's close work in communities have been reflected in this plan's approach and development.

While PCAPs are being completed by ANTHC and other grantees for approximately 157 tribal governments, there are some small gaps in this coverage, especially in more urban communities. As it does with municipalities not explicitly named, this plan includes measures that may be implemented by interested tribal governments who are not covered under another PCAP. Tribal government authority varies, though the measures described fall under their general obligations and powers.

Current Statutory and Regulatory Conditions

Alaska's State Energy Policy has a goal of 80% utilization of renewables for power production by 2040 and the state has been limited in its ability to meet this goal due to limited available funding at the State level. Leveraging federal funding will significantly overcome this hurdle, and lead to transformation that moves Alaska communities closer to this goal than otherwise possible.

Power Cost Equalization

Given the geographically dispersed locations of Alaska's rural communities, electric rates are frequently three to five times greater than those incurred by customers residing in urban areas of the state. AEA, along with the Regulatory Commission of Alaska (RCA), administers the Power Cost Equalization (PCE) program to provide economic assistance and reduce the effective electric rates for rural consumers to be comparable to in urban areas of the state. The PCE program serves 82,000 Alaskans in 193 communities that are largely reliant on diesel fuel for power generation, providing payments to households in high-cost energy communities to effectively lower residential energy costs, up to 750 kWh per month.

Adoption of clean energy projects in Alaska on a substantial scale faces multiple market barriers both

88 https://www.energy.gov/indianenergy/articles/alaska-strategic-energy-plan-and-planning-handbook

common to the rest of the nation, and specific to the state. Barriers such as net metering, third party ownership (TPO), obscure interconnection processes, and renewable portfolio standards (RPSs) all exist here as they do across the country. Additionally, the substantial variance in seasonal generation and the astronomic cost of installation for remote communities pose geography specific problems.

Net Metering

The prevailing net metering legislation established by the Regulatory Commission of Alaska (RCA) dictates that all utilities under their economic jurisdiction must provide net metering options to their customers, provided that the total nameplate capacity of all net metering participants does not exceed 1.5% of the previous year's average retail demand. Utilities with annual retail power sales below 5,000 MWh or those generating electricity entirely from approved renewable sources are exempt from this requirement.

Several leading utilities in the Railbelt region, notably Chugach Electric Association (CEA) and Golden Valley Electric Association (GVEA), offer net metering limits exceeding the RCA's cap, extending up to 5% of average retail demand. Homer Electric Association (HEA) goes even further, allowing up to 7%. Meanwhile, Matanuska Electric Association (MEA) has not set a specific limit on net metered capacity but currently operates at approximately 3% of retail demand, with no recent refusal of new net metered capacity applications according to the latest RCA filing. Payment for net metering occurs monthly through bill credits, determined by each utility's non-firm avoided cost rate registered quarterly with the RCA. These credits have no expiration date and can be applied to subsequent monthly bills. Individual net metered systems must have a nominal capacity between 400 W and 25 kW. Utilities are prohibited from imposing additional fees, such as standby, interconnection, or capacity charges, unless approved by the RCA.

Utilities can limit net metering amount if it causes stability or operational issue. In case of a decrease in retail sales, resulting in the net metering amount exceeding the limit of 1.5%, utilities are not allowed to disconnect the metering of a member. The utilities can require net metering customers to have insurance with the condition that it is attainable and priced reasonably.

The RCA has not instituted statewide mandates regarding the implementation of virtual net metering or other aggregative/alternative net metering policies. In 2019, the RCA rejected a utility-sponsored proposal for a community solar project, citing specific plan details regarding subscription policies. However, they expressed support for innovative renewable energy programs and emphasized that this decision did not set a precedent for community solar. CEA and GVEA have shown interest in revisiting community solar projects, addressing the issues raised in 2019. Various public interest groups are actively engaging with the legislature and drafting legislation to encourage and facilitate community solar initiatives. In Senate Bill 152, the state legislature codified the ability of the RCA to make rulings on community energy producers, strengthening the language that existed regarding small power producers.

Third Party Ownership

No explicit rulings regarding third party ownership (TPO) have been made by the RCA. Insofar as small power production facilities are concerned (as would be the case for a community solar installation) the Alaska Administrative Code (AAC) utilizes the definitions for a qualifying facility laid out in 18 C.F.R. 292.101(b) and has protections and guarantees that they must be offered interconnection by the RCA regulated utilities. Specifically, for any electric utility subject to RCA regulation interconnection must be offered to a qualifying facility so long as it doesn't cause the utility to become subject to federal regulation under the Federal Power Act (interstate operation) and so long as the qualifying facility complies with safety and reliability standards prescribed in 3 AAC 52.485. This regulation also provides for financing options with regard to interconnection fees laid out in 3 AAC 50.760 d/e. The utility can charge interconnection fees, including: the reasonable cost of connection, switching, metering,

transmission, distribution, safety provisions, administration, and other costs related to the installation and maintenance of the physical facilities necessary to permit interconnected operations, to the extent that these costs are in excess of the costs that the utility would have incurred if it had not engaged in interconnection. Additionally, the utility must offer the option to pay these fees over a reasonable period of time, with an interest rate described in their tariff or in a special contract between the qualifying facility and the utility with RCA approval.

In sum, there are protections for third party ownership, at least of community scale renewable generators. TPO, as it pertains to rooftop residential solar, would likely be considered individual net metered capacity, with the ownership of the panels and power a separate issue to be defined by those respective parties and thus outside RCA's purview. While the regulatory framework doesn't provide explicit support for installations of either type, it at the least protects their right to connect and sell power to the grid. As demonstrated by the recent opening of the 8.5 MW solar farm in the Mat Su Borough by a third party, there is interest from the Railbelt utilities and general support from the RCA and legislative framework to add renewable generators. Multiple successful implementations of rural solar IPP systems indicate their viability from regulatory and utility perspectives.

Interconnection processes are not regulated on a statewide basis. Streamlining this is a significant opportunity to reduce the barriers for residential rooftop applications. All four Railbelt Co-ops offer applications and supplementary information via their websites with varying degrees of complexity. CEA has a clause in their application allowing for combination of some required system drawings and streamlining of approval procedures for "type-tested" or previously approved and installed system designs, and implementation of similar language by the other Railbelt utilities will be sought by project partners. For the residential portion of the program, AHFC would provide a standardized system design for households and leverage said language to expedite the approval process and substantially enhance approval and installation rates. As it relates to the rural portion of the program, interconnection will be protected by the RCA rulings related to small power producing facilities. Grid stability is of significant concern in those scenarios, and early communication and involvement with the local utilities will facilitate successful solar integration.

Renewable Portfolio Standard

While there is currently no binding statewide renewable portfolio standard (RPS) in Alaska, there is pending legislation looking at Renewable Portfolios Standards or Clean Energy Standards for Alaska. These bills propose renewable generation targets of 25% by 2027, 55% by 2035, and 80% by 2040 for Railbelt utilities, which currently operate at approximately 15% renewable generation. The state's overall renewable portfolio is bolstered to around 25% by various small-scale hydro-power projects in southeast Alaska. Notably, any net metered capacity is presently included in the utilities' generation statistics, potentially incentivizing utility collaboration and investment in distributed solar projects.

Statewide Building Code

Currently, Alaska is one of eight states that do not have a statewide building code. Local jurisdictions are responsible for selecting, setting, and enforcing building and energy codes, if any, within their boundaries. Not all jurisdictions have adopted energy codes and those that have, none are more current than the 2018 International Energy Conservation Code. This diversity presents a set of unique challenges.

Electric Vehicles

In 2017, AEA was appointed by Alaska's governor to administer the state's share of the Volkswagen (VW) Settlement Environmental Mitigation Trust. Through a public process, AEA created a beneficiary mitigation plan, which provided money for the electrification of certain vehicles and $1,250,000 for the installation of EV charging stations, comprising the primary source of matching funds for this project.

AEA included EVs as a market title for federal State Energy Program (SEP) funds in 2018. Associated work includes EV outreach and education, installation of level 2 charging stations in coordination with the Department of Transportation and Public Facilities (DOTPF), and ongoing assessment of the barriers to adoption. AEA has hired a contractor to facilitate a formal Alaska Electric Vehicle Working Group (AKEVWG) that pulls together industry stakeholders including utilities, municipalities, tribal entities, advocacy groups, businesses, researchers, car dealerships, and consumers to coordinate action that supports EV adoption throughout the state. The contractor also facilitates technical subcommittee meetings to discuss and address technical market and regulatory barriers. The AKEVWG serves as the collaborative forum for the pursuit of funding opportunities.

AEA is designated as the lead agency for developing and implementing the NEVI program. The NEVI program focuses on the Alternative Fuel Corridor, marine highway system, and connected road system, while the proposed project is specifically targeting rural communities not covered through the NEVI program. The project will expand on the NEVI program to increase investment in underserved Alaskan communities.

Alaska has one of the most undeveloped EV markets in the United States and has some of the highest transportation-related costs. Its expansive geography, isolated small population, and cold environment amplify the traditional challenges for EV adoption. Most Alaskans do not have reasonable access to EV charging infrastructure to help increase market adoption. Currently, there are only 47 Level 2 and 11 DCFC charging stations in the state. As of June 2022, there are over 1,400 registered full EVs in the state3. As of August 2022, Alaska's average rural electricity rate was 60 cents/kWh, six times higher than the national average, and second highest in the country, according to the U.S. Energy Information Administration. The transportation sector accounts for approximately 26.8 percent of the state's energy use, and the costs associated with transportation and energy vary significantly across urban and rural Alaska.

Community-Based Clean Energy Projects

Alaska has the potential for some of the most significant transformations from diesel power generation to renewables in the nation, and already has communities that have taken these steps. While overall adoption is high and the EIA identifies 33% of Alaska's electricity generation comes from renewable sources, the isolated nature of its microgrids makes transformation a community-by-community effort. Funded projects under this award will use technology that has been deployed with success in Alaska, with proven innovation that is adapted to remote, isolated systems that face challenging weather and operational extremes. The following section describes renewables that are applicable to and proven for rural microgrids, battery systems that complement their use, and integration expertise that has been demonstrated by project partners.

Hydroelectric - Between 2010 and 2020, hydroelectric projects represented nearly half of renewable energy project investment in Alaska. Hydroelectric projects such as Blue Lake in Sitka, Allison Creek in Valdez, and expansion of AEA-owned Bradley Lake in Homer were among the largest projects in Alaska in terms of construction cost and generation capacity. The state also saw projects that used "lake tap" infrastructure requiring no dam and "run-of-river" hydro.

Wind - Over the past decade, wind projects represented 35% of investment in renewables. Large wind projects developed between 2010 and 2020 include Eva Creek in Healy, Fire Island in Anchorage, Phase II of Kodiak's Pillar Mountain development, and the Snake River project in Nome. Many wind projects developed over the past decade contributed to Alaska's role as a leader in implementing wind-diesel hybrid systems. Investments in wind-diesel hybrid systems in rural communities included efforts such as Chaninik Wind Group's project, which incorporated thermal stoves for residential heating using excess wind generation. Enhancements in energy storage provided opportunity for further investment.

Solar - Solar projects accounted for 2% of investment in Alaska in renewable energy between 2010 and 2020, including the state's first utility-scale solar farms constructed in Healy and Willow. Solar generation in the spring and fall is often impressive in northern latitudes where clear skies, cool temperatures, dry air and bright, reflective snow all support solar generation. Solar photovoltaic systems can actually exceed their rated output during these times of year. The Native Village of Hughes recently installed a 120 kW solar photovoltaic system. The project is being developed to help advance the community's renewable energy goal of 50 percent by 2025. When the project is completed, it will be the largest solar project in a small rural community in the state.

Battery Storage - Residents need a reliable supply of electricity because many residents live in remote areas and winter temperatures can fall as low as minus 50 °F. Backup power therefore has to be available in the event of an outage. Utilities such as Golden Valley Electric and Homer Electric have chosen a battery backup solution as a cost-effective and reduced carbon emission solution, and implemented design and controls engineering for the whole system. In Fairbanks, the prime function of the Battery Energy Storage System (BESS) is to provide spinning reserve. At the end of the spinning reserve sequence, the BESS will automatically re-establish the operation mode, which was active prior to the event. In Homer, the new battery energy storage system will be used to balance system demands with its greater ability to deliver or receive energy. This also allows base-loaded thermal units to be run more efficiently while allowing for increased integration of utility scale non-dispatchable renewable energy sources (i.e., wind & solar).

The rural application is demonstrated, as well. Private companies have successfully deployed a hybrid solar + storage microgrid2 to support the residents of Shungnak, a remote community above the Arctic Circle in Alaska. Funded by the United States Department of Agriculture (USDA) and Northwest Arctic Borough (NWAB) the microgrid was designed to address the numerous challenges of operating in extreme conditions and break the community's dependence on its expensive and polluting diesel generator power plant. The microgrid's 225-kW solar array is able to offset much of Shungnak's energy needs, while battery systems each store excess energy for later use. Uniquely designed to enable a "diesels off" operation, the system automatically coordinates between solar and energy storage to ensure lowest cost power and communicates with the utility's power plant about the best times to turn diesel generation off. The microgrid is expected to save 25,000 gallons of fuel per year and an estimated $200,000 per year on fuel costs, based on $7 to $8 per gallon calculations.

System Integration - The Alaska Village Electric Cooperative (AVEC) provides electricity to over 50 remote communities in Alaska, including several with wind or solar power. In 2018, AVEC installed a 900-kW wind turbine in St. Mary's. They connected the two villages with an intertie in 2019, enabling them to share power. Combined, their peak electric load is 1000kW, allowing the 900-kW wind turbine to produce power greater than their electric load. This would enable diesels-off operation if there was another source of regulation and spinning reserves. AVEC identified this need and came up with the concept of a Grid Bridging System (GBS) that would provide regulation and spinning reserves. AVEC worked with ACEP to identify technical specifications for the GBS as well as ideal energy storage technologies that would fit the need. The GBS requires a high-power capacity, the ability to supply a lot of power, but for a short period of time, a minimum of around 10 minutes. Therefore, a high-power and low-energy capacity system is needed. The team came up with three systems: 1) Ultracapacitor energy storage systems, 2) Lithium Titanium Oxide (LTO) batteries, and 3) Lithium Iron Phosphate (LFP) batteries.

VII. Conclusion

A. Benefits of Priority Sustainable Energy Action Plan

Funding

This plan creates a pathway for dozens of implementation projects to be eligible for federal funds through the CPRG implementation opportunity. With needs identified of more than $700 million, and a national competition with available funds of only $4 billion, Alaska recognizes that it will need to focus on applications that result in the greatest contributions to improving conditions in disadvantaged communities and reducing greenhouse gas emissions. The State's approach will be to align these priorities with increasing energy affordability, which would greatly assist with the high costs that Alaskans experience.

At the same time, this plan will result in the ability of every community in Alaska to be able to apply for federal competitive grants that require a climate action plan, as the State's investment includes a mechanism for communities to have access to GHG emissions data and the ability to prioritize different measures that contribute to reducing emissions. This enabling of community opportunity is critical to fully realize the benefits of the CPRG and State PSEAP.

Collaboration / Knowledge Sharing

This plan has resulted in robust inter-departmental knowledge sharing and cooperation, even as the State has facilitated the active engagement of political subdivisions.

Most importantly, the State has hosted a CPRG Working Group that includes all eligible planning funding recipients, including all Tribes and tribal consortia. This has been an effective way to collaborate, avoid duplication, and share information.

Project Identification, Bundling

To the greatest extent possible given the limited timeline, the State has not only identified projects that would be eligible and ready for implementation relative to the implementation grant deadlines, but worked with agencies and political subdivisions to bundle projects into relevant categories for submission.

At the same time, it is worth noting that the distinct measures identified in the PSEAP are available to other eligible entities to apply for, to the extent that they are consistent with the measures presented.

Again, the State's goal in project identification and bundling is focused on eligibility and competitiveness of applications to the CPRG implementation program, and maximizing the efficacy of delivery across Alaska's disadvantaged communities.

B. Next Steps

The State of Alaska anticipates moving quickly from the PSEAP to the CSEAP, recognizing that the comprehensive planning process will provide an opportunity to move toward more granularity of GHG emissions and corresponding mitigation measures.

The State encourages federal action to make additional implementation funds available at the conclusion of the CCAP process.

CSEAP Strategic Planning Meetings
At the Infrastructure Development Symposium in April 2024, a half or full-day discussion will review the PSEAP and discuss the comprehensive planning process to get stakeholder buy-in and help inform the process going forward. The audience will at a minimum include representative state, municipal, and tribal government leaders. Following this and as early as late 2024, there will be regular stakeholder check-in meetings to review progress on the CSEAP with these leaders.

CSEAP Emissions Sector Workshops
From August 2024 to May 2025, AML, DEC, and relevant partners will organize charette style workshops that bring together interested stakeholders to produce workshop reports that will form the basis of the CSEAP. Informed by map tool resources produced as a continuation of GHG Inventory work with Constellation, and with technical expertise from partners, these workshops will look more deeply at potential for emissions reduction in each sector.

Current plans call for sector workshops addressing emissions reduction and co-benefits in the following emissions sectors: residential, non-residential, agriculture/land management, solid waste, wastewater, rural energy, Railbelt energy, industrial, land & air transportation, maritime, and carbon capture, use, and sequestration.

As an outcome of the workshops, the planning team will identify interested participants for sector-level working groups that include relevant stakeholders and will help inform further development of the CSEAP. Throughout sector workshops, there will be complimentary work with workforce contractors to support the workforce planning analysis. Outputs from this effort that will contribute to the draft CSEAP include establishing sector greenhouse gas emissions reduction targets and the identification of additional and refined greenhouse gas reduction measures.

CSEAP Required Components
DEC will include in its comprehensive planning the components required by EPA. Alaska's CSEAP will touch on all significant GHG sources/sinks and sectors present in a state or metropolitan area, establish near-term and long-term GHG emission reduction goals, and provide strategies and identify measures to achieve those goals. The State's CSEAP will mirror a CCAP, and include:

- A GHG inventory – to include additional data at reduced scale.
- GHG emissions projections – to include additional measures.
- GHG reduction targets – initiated within PSEAP and finalized within CSEAP.
- Quantified GHG reduction measures – continued work within CSEAP.
- A benefits analysis for the full geographic scope and population covered by the plan – additional work to be completed for CSEAP.
- A low-income and disadvantaged communities benefits analysis – initiated within the PSEAP.
- A review of authority to implement – this will be expanded to include all relevant authorities identified in the comprehensive planning process.
- A plan to leverage other federal funding – after implementation grants are awarded the State will be in a better position to identify opportunities to leverage other federal funding within the CSEAP.
- A workforce planning analysis – initiated within the PSEAP.

DEC will consider recent changes in technologies and market forces, potential leveraging of other funding opportunities (e.g., under the Inflation Reduction Act, Bipartisan Infrastructure Law, or other sources), new program areas and opportunities for regional collaboration, and inclusion of analyses to estimate benefits including those flowing to low income and disadvantaged communities.

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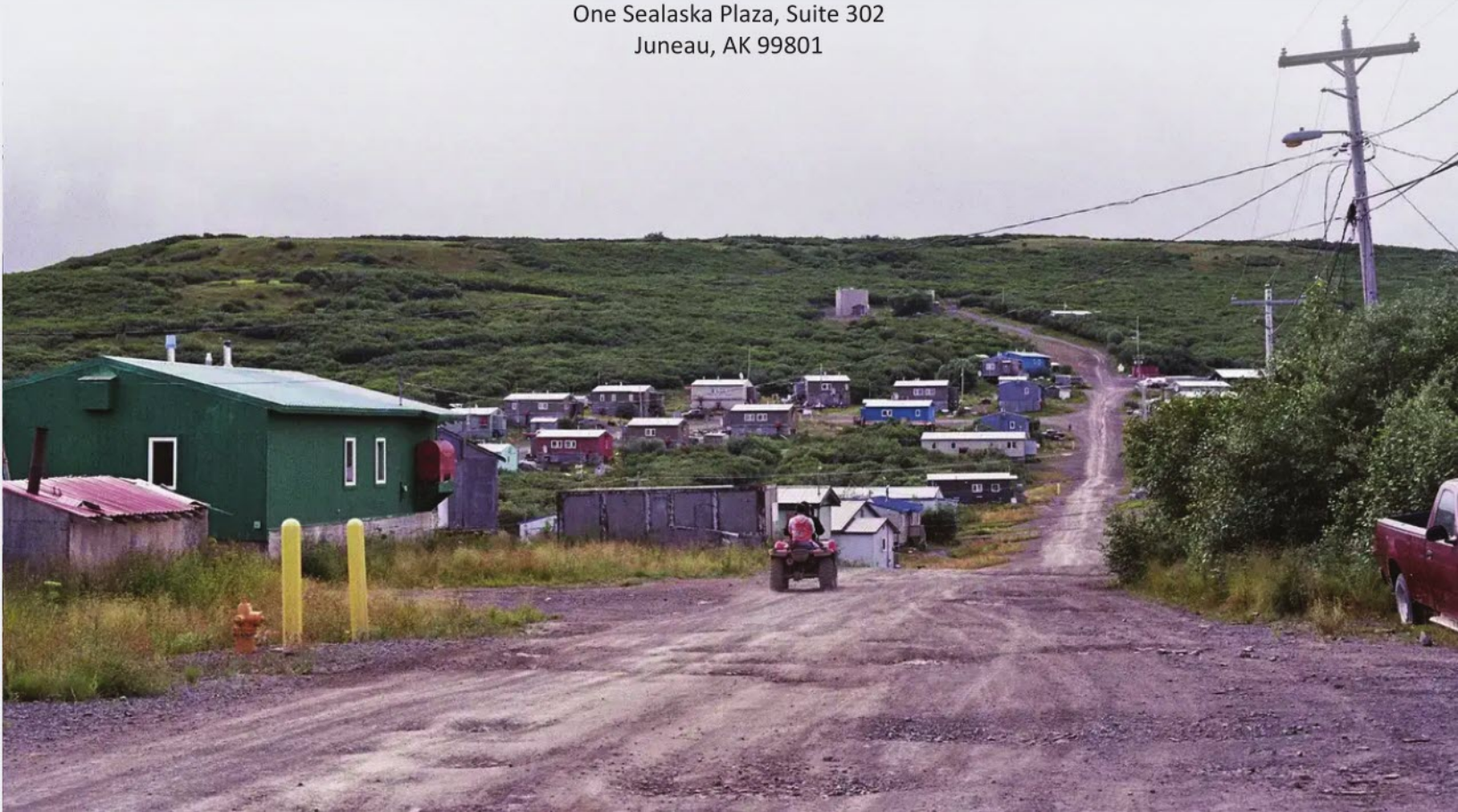
AKFederalFunding.org/CPRG

State of Alaska Department
of Environmental Conservation
555 Cordova Street
Anchorage, AK 99501

ALASKA
MUNICIPAL
LEAGUE

Alaska Municipal League
One Sealaska Plaza, Suite 302
Juneau, AK 99801



EJ Screen Supplemental Indexes

	CEJST Census Tract Number (2010 Census)	CEJST Disadvantaged	EJ Screen Census Tract Number (2020 Census)	Percentile for Particulate Matter 2.5 Supplemental Index	Percentile for Ozone Supplemental Index	Percentile for Diesel particulate matter Supplemental Index	Percentile for Air toxics cancer risk Supplemental Index	Percentile for Air toxics respiratory HI Supplemental Index	Percentile for Toxic Releases to Air Supplemental Index	Percentile for Traffic proximity Supplemental Index	Percentile for Lead paint Supplemental Index	Percentile for Superfund proximity Supplemental Index	Percentile for RMP Facility Proximity Supplemental Index	Percentile for Hazardous waste proximity Supplemental Index	Percentile for Underground storage tanks Supplemental Index	Percentile for Wastewater discharge Supplemental Index
Dixon Diversion																
Nenana	2290000200	No	2290000200			8	47	61	30	15	83	47	17	52	24	
Delta Junction	2240000400	No	2240000400			11	41	69	59	11	61	42	16	49	23	
Municipality of Anchorage																
Anchorage - Peters Creek/Eklutna	2020000101	No	2020000101			18	31	35	21	40	0	35	22	30	47	
Anchorage - Chugiak	2020000102	No	2020000102			49	69	54	28	55	61	55	39	47	50	
Anchorage - Downtown Eagle River	2020000201	No	2020000201			61	71	56	31	73	36	70	48	58	69	
Anchorage - Eagle River	2020000202	No	2020000202			35	36	36	19	34	27	38	26	30	38	
	2020000203	No														
Anchorage - Upper Eagle River Valley	2020000204	No	2020000204			26	28	31	18	22	0	40	30	31	13	
Anchorage - Lower Eagle River Valley South	2020000300	No	2020000205			36	42	39	21	29	13	40	28	34	30	
Anchorage - Lower Eagle River Valley North	2020000400	No	2020000206			38	37	37	16	26	19	34	25	25	22	
Anchorage - Government Hill	2020000500	No	2020000500			96	97	96	97	85	97	96	85	96	96	
Anchorage - West Mountain View/Ship Creek	2020000600	Yes	2020000601			100	100	100	97	97	96	100	98	100	100	
Anchorage - East Mountain View	2020000600	Yes	2020000602			98	98	98	94	98	98	99	99	98	97	
Anchorage - Ptarmigan Area	2020000701	No	2020000701			92	87	88	83	92	76	94	90	93	90	
Anchorage - Northwest Muldoon	2020000702	No	2020000702			94	89	92	82	96	80	97	96	94	96	
Anchorage - Northeast Muldoon	2020000703	Yes	2020000703			84	84	84	67	88	49	92	93	87	91	
Anchorage - Wonder Park	2020000801	Yes	2020000801			88	91	89	85	91	67	93	84	92	88	
Anchorage - Russian Jack	2020000802	Yes	2020000802			90	93	90	90	90	66	93	82	92	90	
Anchorage - Merrill Field Vicinity	2020000901	Yes	2020000901			98	98	99	98	100	100	98	98	99	99	
Anchorage - Chester Creek	2020000902	No	2020000902			86	85	86	89	88	77	88	73	89	89	
Anchorage - West Fairview	2020001000	Yes	2020001000			93	93	92	93	94	92	92	84	94	94	
Anchorage - Downtown Anchorage Core	2020001100	Yes	2020001100			97	97	97	98	96	95	96	90	96	97	
Anchorage - Bootleggers Cove/Westchester	2020001200	No	2020001200			59	63	60	64	62	59	60	50	63	64	
Anchorage - Turnagain	2020001300	No	2020001300			46	46	51	47	45	42	42	43	42	43	
Anchorage - South Fireweed	2020001400	No	2020001401			77	77	78	73	78	64	73	71	75	82	
Anchorage - North Fireweed	2020001400	No	2020001402			95	94	94	94	93	89	91	93	93	93	
Anchorage - Rogers Park/Tudor Area	2020001500	No	2020001500			75	80	76	61	76	62	69	65	73	70	
Anchorage - Airport Heights	2020001601	No	2020001601			80	81	80	71	80	85	84	63	82	78	
Anchorage - University Area	2020001602	No	2020001602			75	76	70	56	71	32	75	55	70	75	
Anchorage - Baxter	2020001701	No	2020001701			65	65	65	54	65	10	76	56	69	71	
Anchorage - Cheney Lake	2020001702	No	2020001702			66	66	66	55	67	67	78	61	72	63	
Anchorage - Muldoon	2020001731	No	2020001731			81	82	82	65	84	45	89	78	83	82	
Anchorage - Scenic Foothills	2020001732	No	2020001732			48	34	44	41	57	7	63	52	56	0	
Anchorage - Campbell Park West	2020001801	No	2020001801			85	86	85	74	86	64	82	81	78	85	
Anchorage - Campbell Park East	2020001802	No	2020001802			94	95	95	90	90	58	88	90	92	92	
Anchorage - Midtown	2020001900	No	2020001900			97	96	96	93	95	52	90	96	91	94	
Anchorage - Spenard	2020002000	Yes	2020002000			99	99	98	96	99	98	95	100	95	98	
Anchorage - Woodland Park/Spenard	2020002100	No	2020002100			91	92	93	92	89	93	86	92	86	92	
Anchorage - Lake Spenard	2020002201	No	2020002201			80	82	82	75	59	12	76	75	73	42	
Anchorage - East Turnagain/Fish Creek	2020002202	No	2020002202			89	90	91	92	83	84	85	88	85	69	
Anchorage - Airport/Kincaid	2020002301	No	2020002301			56	73	72	46	44	7	41	57	44	48	
Anchorage - Commos Lake	2020002302	No	2020002302			82	83	85	65	70	56	67	77	67	68	
Anchorage - Jewel Lake/Birch Lake	2020002303	No	2020002304			86	86	86	70	70	34	68	83	71	83	
Anchorage - Dimond/Northwood	2020002303	No	2020002305			90	89	90	80	80	0	81	91	76	85	
Anchorage - Northwood	2020002400	No	2020002400			83	84	84	71	77	44	72	80	73	76	
Anchorage - Arctic	2020002501	No	2020002501			79	81	81	61	72	11	60	75	64	67	
Anchorage - Taku/Campbell	2020002502	No	2020002502			92	92	93	81	87	47	84	92	80	88	
Anchorage - Abbott Loop West	2020002601	No	2020002601			84	85	83	63	78	20	72	77	69	76	
Anchorage - Abbott Loop North	2020002602	No	2020002602			72	76	74	50	56	15	59	64	57	58	
Anchorage - Abbott Loop	2020002603	No	2020002603			78	80	80	53	58	0	62	66	63	50	
Anchorage - Campbell Lake/Bayshore	2020002711	No	2020002711			52	61	63	32	35	17	34	51	35	47	
Anchorage - Dimond/Southport	2020002712	No	2020002712			88	88	88	69	84	31	71	86	74	86	
Anchorage - Oceanview	2020002792	No	2020002713			72	79	76	45	67	11	49	62	55	61	
Anchorage - Klatt	2020002702	No	2020002714			68	77	71	48	47	14	46	60	48	57	
Anchorage - Independence Park	2020002811	No	2020002811			89	90	87	69	82	0	80	86	76	80	
Anchorage - Lower Hillside	2020002812	No	2020002812			64	67	64	39	44	18	45	54	48	51	
Anchorage - Hillside East	2020002813	No	2020002813			28	23	22	23	13	8	28	27	26	0	
Anchorage - Huffman	2020002821	No	2020002821			55	61	57	31	42	13	37	49	38	46	
Anchorage - Rabbit Creek	2020002822	No	2020002822			55	58	47	39	36	42	44	50	43	17	
Anchorage - Rabbit Creek/Bear Valley	2020002823	No	2020002823			32	29	31	27	18	21	33	36	32	0	
Anchorage - Girdwood/Turnagain Arm	2020002900	No	2020002900			10	7	3	14	10	9	18	9	14	12	
Anchorage - Science Center/Bicentennial Park	2020003000	No	2020980000			0	0	0	0	0	0	0	0	0	0	
Elmendorf AFB	2020000203	No	2020980100			50	59	55	43	60	40	65	46	62	35	
Fort Richardson	2020000203	No	2020980200			73	73	72	48	50	39	85	72	77	31	
Mat-Su Borough																
Petersville	2170000101	Yes	2170000101			19	50	35	25	6	76	43	23	28	21	
Skwentna	2170000101	Yes	2170000101			19	50	35	25	6	76	43	23	28	21	
Susitna	2170000101	Yes	2170000101			19	50	35	25	6	76	43	23	28	21	
Trapper Creek	2170000101	Yes	2170000101			19	50	35	25	6	76	43	23	28	21	
Chase	2170000102	No	2170000102			25	39	25	17	8	30	38	21	24	37	
Susitna North	2170000102	No	2170000102			25	39	25	17	8	30	38	21	24	37	
Talkeetna	2170000102	No	2170000102			25	39	25	17	8	30	38	21	24	37	
Chickaloon	2170000200	Yes	2170000200			16	28	30	30	20	72	51	46	34	36	
Eureka Roadhouse	2170000200	Yes	2170000200			16	28	30	30	20	72	51	46	34	36	
Glacier View	2170000200	Yes	2170000200			16	28	30	30	20	72	51	46	34	36	
Sutton-Alpine	2170000200	Yes	2170000200			16	28	30	30	20	72	51	46	34	36	
Matsu - Fishhook	2170000300	No	2170000300			40	52	41	40	16	23	39	55	32	36	
Houston	2170000401	Yes	2170000401			63	55	68	56	48	43	78	44	68	0	
Willow	2170000402	Yes	2170000402			33	44	29	35	27	25	53	27	42	32	
Big Lake	2170000501	Yes	2170000501			59	69	59	55	24	50	74	38	66	60	
MatSu - West Lakes	2170000502	No	2170000502			68	64	53	52	17	55	68	31	59	56	
MatSu - Fairview	2170000601	No	2170000601			71	46	55	32	41	0	50	43	40	42	
MatSu - Foothills	2170000603	No	2170000603			63	54	64	36	46	22	57	35	53	43	
MatSu - Knik Arm	2170000604	No	2170000604			61	68	77	60	38	0	71	47	67	55	
MatSu - West Meadow Lakes	2170000701	No	2170000701			53	57	47	37	42	39	56	34	53	62	
MatSu - East Meadow Lakes	2170000703	No	2170000703			57	60	51	36	52	24	58	44	53	65	
Seldon	2170000705	No	2170000705			56	56	46	38	43	14	54	53	47	51	
Tanaina	2170000706	No	2170000706			44	38	50	34	28	16	53	56	45	40	
MatSu - North Wasilla	2170000800	No	2170000800			81	74	65	58	81	48	69	68	64	74	
MatSu - South Wasilla	2170000900	No	2170000900			82	63	71	51	76	46	64	60	55	71	
MatSu - Wasilla-Fishhook	2170001001	No	2170001001			76	68	56	57	58	33	59	70	52	53	
MatSu - Bogard	2170001003	No	2170001003			67	55	46	47	55	26	52	59	43	52	
MatSu - South Lakes	2170001004	No	2170001004			69	52	63	46	54	30	50	57	40	61	
MatSu - Gateway	2170001100	No	2170001100			51	34	43	34	37	23	32	47	25	32	
Palmer	2170001201	No	2170001201			69	62	53	84	63	75	55	85	41	77	
MatSu - Greater Palmer	2170001202	No	2170001202			71	57	48	76	64	67	51	80	38	72	
Butte	2170001300	No	2170001300			36	30	20	44	12	55	36	53	27	34	
Denali Borough																
Anderson	2068000100	Yes	2068000100			7	14	21	17	9	40	26	6	50	14	
Cantwell	2068000100	Yes	2068000100			7	14	21	17	9	40	26	6	50	14	
Denali Park	2068000100	Yes	2068000100			7	14	21	17	9	40	26	6	50	14	
Ferry	2068000100	Yes	2068000100			7	14	21	17	9	40	26	6	50	14	
Healy	2068000100	Yes	2068000100			7	14	21	17	9	40	26	6	50	14	
Fairbanks North Star Borough																
Fairbanks - Downtown	2090000100	Yes	2090000100			96	96	97	99	98	99	98	76	98	98	
Fairbanks - Airport Way Central	2090000200	No	2090000200			73	75	75	86	72	80	83	42	86	84	
Fairbanks - South Fairbanks	2090000300	Yes	2090000300			93	94	94	96	92	92	97	73	97	95	
Fairbanks - Hamilton Acres	2090000400	No	2090000400			54	67	67	75	60	68	81	36	78	73	
Fairbanks - Johanson/Railroad	2090000500	Yes	2090000500			87	88	89	95	94	96	94	67	97	93	
Fairbanks - College/Aurora	2090000600	No	2090000600			62	72	69	78	60	73	77	33	81	75	
Fairbanks - Airport Way West	2090000700	No	2090000700			67	70	77	76	62	44	77	34	80	79	
Fairbanks - Geist/University West	2090000800	No	2090000800			77	78	78	84	74	28	79	35	88	84	
Chena Ridge	2090000900	No	2090000900			41	40	49	63	22	0	47	22	60	44	
Fairbanks - FAI/Van Horn	2090001000	No	2090001000			70	75	79	82	49	51	82	39	84	78	
Fairbanks - Steese Highway	2090001200	No	2090001200			42	35	45	68	32	17	65	31	65	31	
Fairbanks - UAF/Farmers Loop	2090001300	No	2090001300			50	51	62	79	39	15	73	30	79	57	
Fairbanks - Badger West/Pensinger	2090001400	No	2090001401			60	42	50	67	33	35	75	45	65	40	
Fairbanks - Badger West/Bradway	2090001400	No	2090001402			51	56	67	88	50	50	86	61	77	59	
Fairbanks - Badger East/Moose Creek Dam	2090001500	No	2090001501			31	43	52	64	20	21	61	52	56	45	
Fairbanks - Badger East/Plack	2090001500	No	2090001502			38	48	58	80	36	0	63	69	55	56	
Greater North Pole	2090001600	No	2090001600			43	51	73	88	52	48	67	72	57	68	
Salcha	2090001700	No	2090001700			7	16	23	25	4	28	31	19	26	0	
Fairbanks - Goldstream/Murphy Dome	2090001800	No	2090001901			12	35	38	57	14	0	43	20	54	26	
Chena Ridge	2090001900	No	2090000900			41	40	49	63	22	0	47	22	60	44	
Chena River Valley	2090001900	No	2090001902			13	36	39	68	7	26	48	29	44	16	
Fort Wainwright	2090001300	No	2090980000			64	78	81	77	54	19	87	51	89	28	
Eielson AFB	2090001800	No	2090980100			42	59	68	60	13	22	89	58	88	0	
Kenai Peninsula Borough																
Beluga	2122000100	Yes	2122000100			14	60	38	43	missing	75	64	40	67	15	
Tyonek	2122000100	Yes	2122000100			14	60	38	43	missing	75	64	40	67	15	
Nikiski	2122000200	No	2122000200			47	71	60	91	33	18	46	78	90	33	
Kenai - Kenai River	2122000400	No	2122000400			31	53	44	29	31	29	35	37	51	48	
Soldotna	2122000500	No	2122000500			52	65	73	53	64	57	39	41	61	67	
Kasilof	2122000700	No	2122000701			37	49	59	44	26	25	27	26	46	25	
Kalifornsky	2122000700	No	2122000702			27	39	48	42	27	31	22	32	39	41	
Anchor Point	2122000800	No	2122000800			43	43	28	19	25	38	34	21	33	38	
Ninilchik	2122000800	No	2122000800			43	43	28	19	25	38	34	21	31	38	
Diamond Ridge	2122000900	No	2122000900			38	27	18	0	16	27	19	10	15	28	
Homer	2122001000	No	2122001000			74	45	57	0	51	65	51	18	27	81	
Kenai - East End Road	2122001100	No	2122001100			28	25	26	0	6	52	29	19	23	0	
Halibut Cove	2122001200	Yes	2122001200			39	10	17	0	2	59	23	7	19	0	
Nanwalek	2122001200	Yes	2122001200			39	10	17	0	2	59	23	7	19	0	
Port Graham	2122001200	Yes	2122001200			39	10	17	0	2	59	23	7	19	0	
Seldovia	2122001200	Yes	2122001200			39	10	17	0	2	59	23	7	19	0	
Seward	2122001300	Yes	2122001300			22	14	14	0	46	73	27	14	17	44	
PCE Communities																
Adak	2016000100	Partially	2016000100			20	0	0	72	missing	81	88	89	0	0	
Akhiok	2150000100	Yes	2150000100			13	9	6	22	3	43	10	42	59	17	
Akiachak	2050000100	Yes	2050000100			21	7	7	49	missing	82	9	13	7	39	
Akiak	2050000100	Yes	2050000100			21	7	7	49	missing	82	9	13	7	39	
Akutan	2013000100	Yes	2013000100			15	0	0	62	missing	85	0	94	2	22	
Alakanuk	2270000100	Yes	2158000100			6	8	7	0	missing	71	5	5	5	0	
Alatna	2290000300	Yes	2290000300			0	64	75	0	missing	38	21	3	11	14	
Aleknagik	2070000100	Yes	2070000100			23	17	24	52	missing	86	14	63	11	0	
Allakaket	2290000300	Yes	2290000300			0	64	75	0	missing	38	21	3	11	14	
Ambler	2188000100	Yes	2188000100			3	19	15	100	missing	53	12	2	10	0	
Anaktuvuk Pass	2185000200	Yes	2185000200			2	26	40	77	10	84	8	13	33	20	
Angoon	2105000300	Yes	2105000300			44	31	32	40	2	88	25	40	36	25	
Aniak	2050000300	Yes	2050000300			0	53	43	0	missing	72	18	7	10	23	
Anvik	2290000400	Yes	2290000400			5	44	40	0	missing	65	22	5	12	29	
Arctic Village	2290000100	Yes	2290000100			3	52	42	59	missing	97	56	18	39	39	
Atka	2016000100	Yes	2016000100			20	0	0	72	missing	81	88	89	0	0	
Atmautluak	2050000100	Yes	2050000100			21	7	7	49	missing	82	9	13	7	39	
Atqasuk	2185000200	Yes	2185000200			2	26	40	77	10	84	8	13	33	20	
Beaver	2290000100	Yes	2290000100			3	52	42	59	missing	97	56	18	39	39	
Bethel	2050000200	Yes	2050000200			18	10	11	86	missing	9	6	6	4	63	
Bettles	2290000200	No	2290000200			8	47	61	30	15	83	47	17	52	24	
Birch Creek	2290000100	Yes	2290000100			3	52	42	59	missing	97	56	18	39	39	
Brevig Mission	2180000100	Yes	2180000100			14	5	5	0	0	94	3	2	3	34	
Buckland	2188000100	Yes	2188000100			3	19	15	100	missing	53	12	2	10	0	
Central	2290000100	Yes	2290000100			3	52	42	59	missing	97	56	18	39	39	

Chalkyitsik	2290000100	Yes	2290000100	3	52	42	59	missing	97	56	18	39	39
Chefornak	2050000100	Yes	2050000100	21	7	7	49	missing	82	9	13	7	39
Chenega	2261000200	Yes	2063000300	15	0	5	66	23	63	20	69	63	30
Chevak	2270000100	Yes	2158000100	6	8	7	0	missing	71	5	5	5	0
Chignik	2164000100	Yes	2164000100	4	13	18	42	missing	88	25	17	22	18
Chignik Lagoon	2164000100	Yes	2164000100	4	13	18	42	missing	88	25	17	22	18
Chignik Lake	2164000100	Yes	2164000100	4	13	18	42	missing	88	25	17	22	18
Chistochina	2261000100	Yes	2066000100	9	11	8	26	8	74	24	12	23	15
Chitina	2261000100	Yes	2066000100	9	11	8	26	8	74	24	12	23	15
Chuathbaluk	2050000300	Yes	2050000300	0	53	43	0	missing	72	18	7	10	23
Circle	2290000100	Yes	2290000100	3	52	42	59	missing	97	56	18	39	39
Clark's Point	2070000100	Yes	2070000100	23	17	24	52	missing	86	14	63	11	0
Coffman Cove	2198000100	Yes	2198000100	35	48	33	15	missing	69	80	32	22	0
Cold Bay	2013000100	Yes	2013000100	15	0	0	62	missing	85	0	94	2	22
Cordova	2261000200	Partially	2063000200	5	5	4	15	missing	54	13	73	18	19
Covenant Life	2100000100	No	2100000100	30	15	14	89	19	69	11	23	36	52
Craig	2198000200	Yes	2198000200	19	27	27	0	missing	53	66	79	16	49
Crooked Creek	2050000300	Yes	2050000300	0	53	43	0	missing	72	18	7	10	23
Deering	2188000100	Yes	2188000100	3	19	15	100	missing	53	12	2	10	0
Dillingham	2070000200	Yes	2070000200	27	18	25	0	missing	63	9	74	6	35
Diomede	2180000100	Yes	2180000100	14	5	5	0	0	94	3	2	3	34
Dot Lake	2240000100	Yes	2240000100	6	22	26	24	10	82	32	8	28	54
Dot Lake Village	2240000100	Yes	2240000100	6	22	26	24	10	82	32	8	28	54
Eagle	2240000100	Yes	2240000100	6	22	26	24	10	82	32	8	28	54
Eagle Village	2240000100	Yes	2240000100	6	22	26	24	10	82	32	8	28	54
Eek	2050000100	Yes	2050000100	21	7	7	49	missing	82	9	13	7	39
Egegik	2164000100	Yes	2164000100	4	13	18	42	missing	88	25	17	22	18
Elfin Cove	2070000200	Yes	2070000100	23	17	24	52	missing	86	14	63	11	0
Elim	2105000300	No	2105000400	68	31	32	40	2	88	25	40	36	25
Emmonak	2180000100	Yes	2180000100	14	5	5	0	0	94	3	2	3	34
Evansville	2270000100	Yes	2158000100	6	8	7	0	missing	71	5	5	5	0
False Pass	2290000200	No	2290000200	8	47	61	30	15	83	47	17	52	24
Fort Yukon	2013000100	Yes	2013000100	15	0	0	62	missing	85	0	94	2	22
Fort Yukon	2290000100	Yes	2290000100	3	52	42	59	missing	97	56	18	39	39
Galena	2290000300	Yes	2290000300	0	64	75	0	missing	38	21	3	11	14
Gambell	2180000100	Yes	2180000100	14	5	5	0	0	94	3	2	3	34
Golovin	2180000100	Yes	2180000100	14	5	5	0	0	94	3	2	3	34
Goodnews Bay	2050000100	Yes	2050000100	21	7	7	49	missing	82	9	13	7	39
Grayling	2290000400	Yes	2290000400	5	44	40	0	missing	65	22	5	12	29
Gustavus	2105000300	No	2105000400	44	31	32	40	2	88	25	40	36	25
Haines	2100000100	Partially	2100000100	30	15	14	89	19	69	11	23	36	52
Healy Lake	2240000400	Yes	2240000400	11	41	69	59	11	61	42	16	49	23
Hollis	2198000100	Yes	2198000100	35	48	33	15	missing	69	80	32	22	0
Holy Cross	2290000400	Yes	2290000400	5	44	40	0	missing	65	22	5	12	29
Hoonah	2105000300	Yes	2105000400	44	31	32	40	2	88	25	40	36	25
Hooper Bay	2270000100	Yes	2158000100	6	8	7	0	missing	71	5	5	5	0
Hughes	2290000300	Yes	2290000300	0	64	75	0	missing	38	21	3	11	14
Huslia	2290000300	Yes	2290000300	0	64	75	0	missing	38	21	3	11	14
Hydaburg	2198000100	Yes	2198000100	35	48	33	15	missing	69	80	32	22	0
Igiugig	2164000100	Yes	2164000100	4	13	18	42	missing	88	25	17	22	18
Iliamna	2164000100	Yes	2164000100	4	13	18	42	missing	88	25	17	22	18
Ekke	2198000100	Yes	2198000100	35	48	33	15	missing	69	80	32	22	0
Kaktovik	2185000200	Yes	2185000200	2	26	40	77	30	84	8	13	33	20
Kalskag	2290000300	Yes	2290000300	0	64	75	0	missing	38	21	3	11	14
Karluk	2150000100	Yes	2150000100	13	9	6	22	3	43	10	42	59	17
Kasaan	2198000100	Yes	2198000100	35	48	33	15	missing	69	80	32	22	0
Kasigluk	2050000100	Yes	2050000100	21	7	7	49	missing	82	9	13	7	39
Kiana	2188000100	Yes	2188000100	3	19	15	100	missing	53	12	2	10	0
King Cove	2013000100	Yes	2013000100	15	0	0	62	missing	85	0	94	2	22
King Salmon	2060000100	No	2060000100	21	12	11	50	missing	51	7	67	9	26
Kipnuk	2050000100	Yes	2050000100	21	7	7	49	missing	82	9	13	7	39
Kivalina	2188000100	Yes	2188000100	3	19	15	100	missing	53	12	2	10	0
Klawock	2198000200	Yes	2198000200	19	27	27	0	missing	53	66	79	16	49
Klukwan	2100000100	Yes	2100000100	30	15	14	89	19	69	11	23	36	52
Kobuk	2188000100	Yes	2188000100	3	19	15	100	missing	53	12	2	10	0
Kokhanok	2164000100	Yes	2164000100	4	13	18	42	missing	88	25	17	22	18
Koliganek	2070000100	Yes	2070000100	23	17	24	52	missing	86	14	63	11	0
Kongiganak	2050000100	Yes	2050000100	21	7	7	49	missing	82	9	13	7	39
Kotlik	2270000100	Yes	2158000100	6	8	7	0	missing	71	5	5	5	0
Kotzebue	2188000200	Yes	2188000200	29	17	19	87	missing	70	3	0	3	86
Koyuk	2180000100	Yes	2180000100	14	5	5	0	0	94	3	2	3	34
Koyukuk	2290000300	Yes	2290000300	0	64	75	0	missing	38	21	3	11	14
Kwethluk	2050000100	Yes	2050000100	21	7	7	49	missing	82	9	13	7	39
Kwigillingok	2050000100	Yes	2050000100	21	7	7	49	missing	82	9	13	7	39
Larsen Bay	2150000100	Yes	2150000100	13	9	6	22	3	43	10	42	59	17
Levelock	2164000100	Yes	2164000100	4	13	18	42	missing	88	25	17	22	18
Lime Village	2050000300	Yes	2050000300	0	53	43	0	missing	72	18	7	10	23
Lower Kalskag	2050000300	Yes	2050000300	0	53	43	0	missing	72	18	7	10	23
Manley Hot Springs	2290000200	No	2290000200	8	47	61	30	15	83	47	17	52	24
Manokotak	2070000100	Yes	2070000100	23	17	24	52	missing	86	14	63	11	0
Marshall	2270000100	Yes	2158000100	6	8	7	0	missing	71	5	5	5	0
McGrath	2290000400	Yes	2290000400	5	44	40	0	missing	65	22	5	12	29
Mekoryuk	2050000100	Yes	2050000100	21	7	7	49	missing	82	9	13	7	39
Mentasta Lake	2261000100	Yes	2066000100	9	11	8	26	8	74	24	12	23	15
Minto	2290000200	Yes	2290000200	8	47	61	30	15	83	47	17	52	24
Mountain Village	2270000100	Yes	2158000100	6	8	7	0	missing	71	5	5	5	0
Naknek	2090000100	Yes	2090000100	21	12	11	50	missing	51	7	67	9	26
Napakiak	2050000100	Yes	2050000100	21	7	7	49	missing	82	9	13	7	39
Napaskiak	2050000100	Yes	2050000100	21	7	7	49	missing	82	9	13	7	39
Nauiuti Bay	2198000100	Yes	2198000100	35	48	33	15	missing	69	80	32	22	0
Nelson Lagoon	2013000100	Yes	2013000100	15	0	0	62	missing	85	0	94	2	22
New Stuyahok	2070000100	Yes	2070000100	23	17	24	52	missing	86	14	63	11	0
Newhalen	2164000100	Yes	2164000100	4	13	18	42	missing	88	25	17	22	18
Newtok	2050000100	Yes	2050000100	21	7	7	49	missing	82	9	13	7	39
Nightmute	2050000100	Yes	2050000100	21	7	7	49	missing	82	9	13	7	39
Nikolai	2290000400	Yes	2290000400	5	44	40	0	missing	65	22	5	12	29
Nikolski	2016000100	Yes	2016000100	20	0	0	72	missing	81	88	89	0	0
Noatak	2188000100	Yes	2188000100	3	19	15	100	missing	53	12	2	10	0
Nome	2180000200	Partially	2180000200	14	3	3	0	missing	78	0	0	2	66
Nondalton	2164000100	Yes	2164000100	4	13	18	42	missing	88	25	17	22	18
Noorvik	2188000100	Yes	2188000100	3	19	15	100	missing	53	12	2	10	0
Northway	2240000100	Yes	2240000100	6	22	26	24	10	82	32	8	28	54
Northway Junction	2240000100	Yes	2240000100	6	22	26	24	10	82	32	8	28	54
Northway Village	2240000100	Yes	2240000100	6	22	26	24	10	82	32	8	28	54
Nuiqsut	2185000200	Yes	2185000200	2	26	40	77	30	84	8	13	33	20
Nulato	2290000300	Yes	2290000300	0	64	75	0	missing	38	21	3	11	14
Nunam Iqua	2270000100	Yes	2158000100	6	8	7	0	missing	71	5	5	5	0
Nunapitchuk	2050000100	Yes	2050000100	21	7	7	49	missing	82	9	13	7	39
Old Harbor	2150000100	Yes	2150000100	13	9	6	22	3	43	10	42	59	17
Oscarville	2050000100	Yes	2050000100	21	7	7	49	missing	82	9	13	7	39
Ouzinkie	2150000100	Yes	2150000100	13	9	6	22	3	43	10	42	59	17
Pedro Bay	2164000100	Yes	2164000100	4	13	18	42	missing	88	25	17	22	18
Perryville	2164000100	Yes	2164000100	4	13	18	42	missing	88	25	17	22	18
Pilot Point	2164000100	Yes	2164000100	4	13	18	42	missing	88	25	17	22	18
Pilot Station	2270000100	Yes	2158000100	6	8	7	0	missing	71	5	5	5	0
Pitkas Point	2270000100	Yes	2158000100	6	8	7	0	missing	71	5	5	5	0
Point Hope	2185000200	Yes	2185000200	2	26	40	77	30	84	8	13	33	20
Point Lay	2185000200	Yes	2185000200	2	26	40	77	30	84	8	13	33	20
Port Alsworth	2164000100	Yes	2164000100	4	13	18	42	missing	88	25	17	22	18
Port Heiden	2164000100	Yes	2164000100	4	13	18	42	missing	88	25	17	22	18
Quinhagak	2050000100	Yes	2050000100	21	7	7	49	missing	82	9	13	7	39
Red Devil	2050000300	Yes	2050000300	0	53	43	0	missing	72	18	7	10	23
Ruby	2290000300	Yes	2290000300	0	64	75	0	missing	38	21	3	11	14
Russian Mission	2270000100	Yes	2158000100	6	8	7	0	missing	71	5	5	5	0
Saint George	2016000100	Yes	2016000100	20	0	0	72	missing	81	88	89	0	0
Saint Mary's	2270000100	Yes	2158000100	6	8	7	0	missing	71	5	5	5	0
Saint Michael	2180000100	Yes	2180000100	14	5	5	0	0	94	3	2	3	34
Saint Paul	2016000100	Yes	2016000100	20	0	0	72	missing	81	88	89	0	0
Sand Point	2013000100	Yes	2013000100	15	0	0	62	missing	85	0	94	2	22
Savoonga	2180000100	Yes	2180000100	14	5	5	0	0	94	3	2	3	34
Scammon Bay	2270000100	Yes	2158000100	6	8	7	0	missing	71	5	5	5	0
Selawik	2188000100	Yes	2188000100	3	19	15	100	missing	53	12	2	10	0
Shaktoolik	2290000400	Yes	2290000400	5	44	40	0	missing	65	22	5	12	29
Shaktoolik	2180000100	Yes	2180000100	14	5	5	0	0	94	3	2	3	34
Shishmaref	2180000100	Yes	2180000100	14	5	5	0	0	94	3	2	3	34
Shungnak	2188000100	Yes	2188000100	3	19	15	100	missing	53	12	2	10	0
Skagway	2230000100	Partially	2230000100	32	9	16	33	53	81	10	11	29	19
Slana	2261000300	Yes	2066000100	9	11	8	26	8	74	24	12	23	15
Sleetmute	2050000300	Yes	2050000300	0	53	43	0	missing	72	18	7	10	23
South Naknek	2090000100	Yes	2090000100	21	12	11	50	missing	51	7	67	9	26
Stebbins	2180000100	Yes	2180000100	14	5	5	0	0	94	3	2	3	34
Stony River	2050000300	Yes	2050000300	0	53	43	0	missing	72	18	7	10	23
Takotna	2290000400	Yes	2290000400	5	44	40	0	missing	65	22	5	12	29
Tanacross	2240000100	Yes	2240000100	6	22	26	24	10	82	32	8	28	54
Tanana	2290000200	Yes	2290000200	8	47	61	30	15	83	47	17	52	24
Tatitlek	2261000300	Yes	2063000300	15	0	5	66	23	63	20	69	63	30
Teller	2180000100	Yes	2180000100	14	5	5	0	0	94	3	2	3	34
Tenakee Springs	2105000300	Partially	2105000400	44	31	32	40	2	88	25	40	36	25
Tetlin	2240000100	Yes	2240000100	6	22	26	24	10	82	32	8	28	54
Thorne Bay	2198000100	Yes	2198000100	35	48	33	15	missing	69	80	32	22	0
Togiak	2070000100	Yes	2070000100	23	17	24	52	missing	86	14	63	11	0
Tok	2050000100	Yes	2050000100	21	7	7	49	missing	82	9	13	7	39
Toksook Bay	2050000100	Yes	2050000100	21	7	7	49	missing	82	9	13	7	39
Tuluksak	2050000100	Yes	2050000100	21	7	7	49	missing	82	9	13	7	39
Tuntutuliak	2050000100	Yes	2050000100	21	7	7	49	missing	82	9	13	7	39
Tununak	2050000100	Yes	2050000100	21	7	7	49	missing	82	9	13	7	39
Twin Hills	2070000100	Yes	2070000100	23	17	24	52	missing	86	14	63	11	0
Unalakleet	2180000100	Yes	2180000100	14	5	5	0	0	94	3	2	3	34
Unalaska	2016000200	Partially	2016000200	57	3	6	0	missing	73	4	82	0	18
Upper Kalskag	2050000300	Yes	2050000300	0	53	43	0	missing	72	18	7	10	23
Venetie	2290000100	Yes	2290000100	3	52	42	59	missing	97	56	18	39	39
Wainwright	2185000200	Yes	2185000200	2	26	40	77	30	84	8	13	33	20
Wales	2180000100	Yes	2180000100	14	5	5	0	0	94	3	2	3	34
Whale Pass	2198000100	Yes	2198000100	35	48	33	15	missing	69	80	32	22	0
White Mountain	2180000100	Yes	2180000100	14	5	5	0	0	94	3	2	3	34
Yakutat	2282000100	Yes	2282000100	24	21	21	0	missing	65	6	4	85	11

March 18, 2024

Alaska Energy Authority
813 W. Northern Lights Blvd
Anchorage, AK 99503

RE: EPA-R-OAR-CPRGI-23-07: Alaska Energy Authority, Individual Application – Dixon Diversion Project

Administrator Regan,

The Bradley Lake Management Committee (BPMC) is writing in support of an application submitted by the Alaska Energy Authority (AEA) for funding the Climate Pollution Reduction Grants (CPRG) Implementation General Competition for the Dixon Diversion Project (the "Project"). The Project is a significant and transformative expansion of the existing Bradley Lake Hydroelectric Project (Bradley Lake), a 120-megawatt facility owned by AEA and managed by the BPMC that generates about 10 percent of the total annual power used by Railbelt electric utilities serving 550,000 Alaskans at some of the lowest cost energy in Alaska. The BPMC is comprised of representatives from AEA and the five electric utilities that serve the Railbelt and purchase power from Bradley Lake through an established Power Sales Agreement.

By utilizing existing energy infrastructure, the Project allows for a significant renewable resource to be developed on an extremely small footprint and represents the largest renewable energy project in Alaska in the last 30 years. The Project would leverage the existing assets at Bradley Lake to generate an additional 190,800 megawatt-hours per year, increasing Bradley Lake's annual average energy output by almost 50%, and offsetting approximately 106,668 MTCO2e of emissions annually. This additional hydroelectric generation would displace 1.5 billion cubic feet of Cook Inlet natural gas, or approximately 7.5% of the unmet natural gas demand for Alaska's Railbelt region in 2030. Cook Inlet natural gas supply shortages are anticipated to occur within the next three years, placing upward supply-side pressure on natural gas prices, widening the gap between low-cost hydroelectric and natural-gas fired generation.

The Project directly benefits the 75 percent of the state's population connected to the grid and indirectly benefits Alaskans in 188 rural communities that are geographically isolated from the Railbelt but are eligible for Alaska's rural electric subsidy Power Cost Equalization program.

AEA has a proven record of accomplishment in managing projects of similar scope; AEA successfully completed the Battle Creek Diversion project, a similar expansion to Bradley Lake, in 2020. With its experience and expertise, the AEA is well-positioned to implement the Dixon Diversion project.

The BPMC is committed to the success of the Dixon Diversion Project. With funding from the U.S. Environmental Protection Action, our ratepayers will benefit from more affordable energy and Alaskans will benefit from reduced greenhouse gas emissions.

Respectfully,

Bradley P. Janorschke
BPMC Chair

ALASKA MUNICIPAL LEAGUE

ONE SEALASKA PLAZA, SUITE 200 • JUNEAU, ALASKA 99801
TEL (907) 586-1325 • FAX (907) 463-5480 • WWW.AKML.ORG
Member of the National League of Cities and the National Association of Counties

Alaska Energy Authority
813 W. Northern Lights Blvd
Anchorage, AK 99503

March 26, 2024

Re: Climate Pollution Reduction Implementation Grant (CPRG) - Letter of Commitment for the Dixon Diversion project

Executive Director Thayer,

On behalf of the Alaska Municipal League, please accept this letter of commitment for an implementation grant application to the Environmental Protection Agency's Climate Pollution Reduction Grant program by the Alaska Energy Association (AEA) for the transformative expansion of the existing AEA-owned Bradley Lake Hydroelectric project on the Kenai Peninsula of Alaska. This expansion would provide more than 190,800 MWh/year worth of low-cost hydropower to the Railbelt system that powers 70% of Alaska's population. In drafting the state plan, we saw the role of the AEA as a key transformative partner in Alaska's Priority CPRG Plan.

Alaska Municipal League (AML) is excited to be a part of a potential generational opportunity for transformative impacts on the energy systems of disadvantaged, rural communities in Alaska. AML represents and works to support Alaska's 165 municipal governments in addressing their challenges. In line with our Infrastructure program and long-term work with DEC on the State of Alaska's CPRG PCAP, we intend to support AEA with planning support, community outreach, progress tracking, and energy data needs. AML will support the application with workforce development infrastructure which will consist of aiding applicants with recruitment, skill development, and career navigation.

AML will work with the Alaska Department of Environmental Conservation (DEC) to establish a statewide tracking and reporting system for CPRG awardees to combine data in a singular database. The system will supplement sub-awardees with technical assistance provided by partners to encourage timely reporting, with methodology consistent with the State's GHG emissions inventory. Lastly, AML will lead a statewide cohort of awardees to participate in CPRG planning and creation of a sustainability plan.

We look forward to this program and AML strongly supports the AEA proposal. Should it be selected, we will partner to initiate long-term emission reduction, greater resiliency to disruptive events, and economic and environmental benefits in Alaska.

Sincerely,

Nils Andreassen
Executive Director
Alaska Municipal League

CURTIS W. THAYER

Experience and Achievements

Alaska Energy Authority **2019-Present**

The Alaska Energy Authority (AEA) is a public corporation of the State of Alaska governed by a board of directors with the mission to "reduce the cost of energy in Alaska." AEA is the state's energy office and lead agency for statewide energy policy and program development.

Position: **Executive Director**

- The Executive Director serves as the Chief Executive Officer of the Authority, responsible for all business and operations. I work closely with the Board as it sets Authority policies, goals, and objectives, and is responsible for the execution of Board directives. I have developed a close relationship with the Governor, Commissioners of principal State departments, the Legislature, business community, and the public to advance the mission of the Authority.

Achievements: Increased the profile and developed a strategic action plan to advance the goal and objectives of the Authority

- Worked with the Board to establish long-range vision, strategies, goals, policies, and plans; including leading the strategic planning process and working with the Board and Legislature to implement the strategy to achieve that vision.
- Strengthening the working relationship with the five utilities is like shuttle diplomacy. A few of the key issues during the three years have included purchase of develop a strategy and bonding package for a $170 million upgrade for the transmission lines from Homer to Anchorage (closes 11/30/22), purchase SS/Q line ($17 million), Battle Creek diversion and construction delays and construction claims, ligation on the SQ line, and Governor's goal of reducing the cost of power. Managing expectations of the Board, Governor's Office, Legislature and our five utility partners has proved to be challenging (and rewarding).
- Oversight responsibility of the Authority's rural energy programs, including energy system upgrades, loan programs, alternative/renewable energy, energy efficiency, and the Power Cost Equalization program.
- Reviewed and analyzed legislation, laws, regulations, and other public policies that may affect the Authority's mission and programs and recommends changes when appropriate.
- Developing and maintaining professional/cooperative relationships with local, state, and federal agencies, and Authority business partners.
- Working with legislative or other government agencies regarding policies, programs, and budgets.

Alaska State Chamber of Commerce **2015-2019**

The Alaska Chamber is a non-profit, membership funded advocacy organization founded in 1953. The Chamber membership is comprised of companies, associations, and individuals from every business sector in Alaska. The Chamber's core mission is to make Alaska the best place to do business through its advocacy for and defense of sound business policies based on the principles of free enterprise, personal responsibility, and limited government.

Position: **President and CEO**

- As the President & Chief Executive Officer, I serve as the top administrative officer, principal spokesman, chief advocate in Juneau and Washington DC, chief finance officer and team leader.

Achievements: Raised the profile of the Alaska Chamber

- Coordinated and guided the work of staff, lobbyists, counsel, committee, and volunteers in marshaling and expressing the Chamber's business perspective on public policy issues which has increased the profile of the Alaska Chamber statewide through outreach and tackling tough legislative positions that benefit and promote business.
- Lead efforts to develop and manage coalitions involving other business associations, advocacy groups local chambers and the US Chamber to achieve Chamber goals.
- Grew Chamber membership for the last three straight years.
- Developed and implemented a financial plan that has increased Chamber reserves by 15 percent within three years.

State of Alaska, Department of Administration **2012 – 2014**

With 1,100 employees and an annual budget of $350 million, DoA facilitates state government operations by providing policy leadership and management services in essential areas, including finance/accounting, payroll, human resources/retirement benefits, information technology, labor negotiations, legal services, procurement/facilities, and risk management.

Positions: Commissioner & Deputy Commissioner

- Served as the chief executive officer of DoA and as a member of Governor Sean Parnell's cabinet. Unanimously confirmed by the Alaska State Legislature.
- Advised Governor on IT, pensions, healthcare, and labor relations with the Legislature and business community.
- Responsible for development and implementation of all DOA policies and programs. Hired and managed two deputy commissioners and ten division directors.

Achievements: Reducing the Cost of Government

- Reformed PERS/TERS (state/local government pension programs) to reduce annual state contribution and ensure long-term solvency. Annual savings are more than $300 million.
- Restructured AlaskaCare (state healthcare program) to reduce state contribution without reducing core benefits. Annual savings are more than $60 million.
- Negotiated with the state's eleven public employee's unions to limit automatic merit increases, reduce leave accruals, and cap benefit cash-outs, all without work stoppages. Annual savings are more than $20 million.
- Worked with Legislature to revamp state procurement statutes to increase transparency and competition. Applied new statutes and best practices to major telecom procurement, which reduced annual state expenses by 50%.

Previous Experience

- **2009-2012:** Deputy Commissioner, State of Alaska, Department of Commerce, Community, and Economic Development
- **2004-2009:** Director, Corporate and External Affairs, ENSTAR Natural Gas Company
- **2002-2004:** President & CEO, Thayer & Associates (political and corporate communications consulting)
- **2001-2002:** External Affairs Advisor, Alaska Gas Producers Pipeline Team (BP, Phillips, Exxon)
- **1997-2000:** Special Assistant, U.S Congressman Don Young (R-Alaska)
- **1993-1996:** Professional Staff, U.S House Committee on Natural Resources
- **1991-1992:** Management Specialist, Federal Bureau of Investigation (FBI)

Education

- **University of Alaska Fairbanks, Fairbanks, AK.** Bachelor of Arts in Political Science and Business/Justice
- **National Renewable Energy Lab (NREL), Golden CO,** Executive Energy Leadership Academy
- **University of Wisconsin,** Institute of Organizational Management, U.S. Chamber
- **State of Alaska,** Real Estate License

Community Activities

CURRENT

- Alaska Board of Marine Pilots, Chair
- Don Young Institute for Alaska, Chair
- Alaska Leaders Archives, Treasurer

PAST

- Alaska Gas Line Development Corporation, Director
- Alaska Housing Finance Corporation, Director
- Alaska Retirement Management Board, Trustee
- Alaska Royalty Oil and Gas Development Advisory Board, Director
- Abused Women Aid in Crisis (AWAIC), Director and Treasurer
- Committee of 100 Top Chamber Executives, U.S. Chamber
- Council of State Chamber Executives
- Selected as "Top 40 under 40" community leader

CLAY CHRISTIAN MBA, MS, CPA, CIA

clay.christian@gmail.com • Cell: 301-706-1061 • LinkedIn Profile

• Chief Financial Officer •

Chief financial officer with a long career of leadership for organizations undergoing major transitions. Creative and sound decision-making through changes in strategic direction, mergers and acquisitions, fundraising, debt and equity financing, performance improvement, financial audit restatements, and information systems. Focus areas include capital programs, investment, restructuring and alignment, asset management, procurement, real estate and construction, contract management, optimization, compliance, team building, and continuous training and process improvement.

Deep experience with public and private partnerships, government sponsored entities, not-for-profit companies, investment tax credit, and qualified opportunity zone business development programs. Certified Public Accountant, Certified Internal Auditor, and Big 4 public auditor.

• CORE COMPETENCIES •

Chief Financial Officer • Strategic Planning • Risk Management • Capital Development • Not-for-Profit
Mergers and Acquisitions • Financial and Management Reporting • Change Management • Optimization
Excellent Written & Verbal Communication Skills • Leadership • Team Building and People Development
Information Systems • Internal Controls • Training • Continuous Process Improvement

• KEY ACHIEVEMENTS •

- Chief Financial Officer for Alaska Infrastructure Development and Export Authority (AIDEA) and Alaska Energy Authority (AEA)
- Vice President, Finance for 130-year-old company, Crowley Fuels, Alaska
- Interim-Controller for start-up $3 billion Water Street Tampa real estate development
- Independent consultant through Cross Services LLC for numerous companies undergoing substantial change (Fannie Mae, Muni Mae, Capital Petroleum Group, and above Water Street Tampa)
- Worked remotely through pandemic and delivered outstanding results
- Strong engagement with public auditors through new audits, consolidations, and financial restatements
- Frequent meetings with boards, executives, general counsel, and operational leaders
- Strategic and financial transformations

• PROFESSIONAL AND CONSULTING EXPERIENCE •

Chief Financial Officer: Alaska Infrastructure Development and Export Authority (AIDEA) and **Alaska Energy Authority** (AEA) – Anchorage, Alaska 2023 – Present
Leading team of more than 22 professionals for both entities who manage more than $3 billion in investment, federal, and state programs.

Vice President, Finance: Crowley Fuels – Anchorage, Alaska 2021 – 2023
Lead for more than 20 professionals; equity raise of $120m; capital improvements of $20m; budgeting, forecasting, optimization, financial and compliance audits, investor presentations.

Private Equity Investment Firm (Cross Services LLC) – Remote to Tampa, Florida 2019 – 2021
Privately held $3B real estate investment, backed by wealthy individuals.

- Interim controller; overseeing financial reporting, compliance, and leading accounting transformation on behalf of RSM and Deloitte, global public accounting firms.

Capitol Petroleum Group (Cross Services LLC) – Washington, DC Metro Area 2011 – 2018
Privately held $1B firm focused on wholesale and retail motor fuel sales in East Coast markets.

- Led first-ever comprehensive audits of companies, developed compliance program and financial reporting system. Worked closely with mezzanine investors and bankers through budgeting, forecasting, financial restatements, and consolidations.
- Designed and developed systems using SQL programs, created executive dashboards, trained accounting department, and implemented cloud-based applications to replace legacy systems.

Miscellaneous Clients (Cross Services LLC) – Washington, DC Metro Area 2009 – 2011
My private consulting firm, focusing on investment and capital raises for several non-public clients.

Municipal Mortgage & Equity LLC (Cross Services LLC) – Baltimore, Maryland 2007 – 2009
Real estate management company with portfolio of municipal and mortgage revenue bonds.

- Led team of 40 examining accounting and reporting of more than 20 business units subject to consolidation as variable interest entities. Designed and conducted cash flow modeling, valuation, and consolidation for 2,200 not-for-profit entities in affordable housing program.

Fannie Mae (Cross Services LLC) – Washington, DC Metro Area 2005 – 2006
Largest government sponsored entity providing mortgage capital to lenders, making housing more accessible and affordable.

- Led team to review accounting policies and information systems for mortgage-backed securities programs and investments in not-for-profit affordable housing organizations.
- Designed and developed SQL database to monitor and report operating performance.

• EARLIER EXPERIENCE •

Freddie Mac – Washington, DC Metro Area
➢ **Senior Director, Sarbanes-Oxley Compliance**

CohnReznick – Washington, DC Metro Area (lead CPA firm to low-income housing tax credit industry)
➢ **Senior Manager, Consulting and Audit**

Sodexo – Washington, DC Metro Area (global leader in food and facilities management services)
➢ **Senior Director, Strategic Information Analysis**
➢ **Director, Internal Audit**

Ernst & Young – Boston, Massachusetts (global leader in public accounting)
➢ **Manager, Consulting and Audit**

• EDUCATION AND CERTIFICATIONS •

MBA and MS, Accounting – Northeastern University, Boston, Massachusetts
MS, Economics and BA, Geography – West Virginia University, Morgantown, West Virginia

Certified Public Accountant – CPA (Massachusetts License No. 16762)
Certified Internal Auditor – CIA (Certificate No. 25966)

Pamela J. Ellis

Phone: (907) 771-3981 | Email: PEllis@akenergyauthority.org

EDUCATION

- Master Class for Data Warehouse and Business Intelligence
  University of Alaska Anchorage (Fall Semester 2015)
- *Bachelor of Arts*, Major in Accounting / Minor in Management
  College of Saint Benedict – Saint Joseph, Minnesota (1987-1989)
  University of San Diego – San Diego, California (1985-1986)

EXPERIENCE

Alaska Energy Authority - Anchorage, Alaska
Controller | December 19, 2022 to Present
Supervisor: Curtis Thayer

- Duties include supervision of the daily accounting functions, finance staff; Develop, design and implement policies, procedures, internal controls and work processes; oversees the Finance section for the Alaska Energy Authority (AEA); Direct supervision of a Project Controller and Assistant Controller; conducts and oversees research and implementation of new accounting standards; controls budget and expenditures for both the AEA operations and capital budgets with restrictions by funding source; Manages federal receipts by reviewing federal grant applications for sufficient federal budget authorization and funding for match requirements; manages federal grant applications and ensures that finance components of the federal financial assistance award applications are properly completed; Manages the financial transactions of awarded federal grants and assures compliance with all federal financial reporting requirements; Reviews and assists with the publication and audit, by external auditors, of the AEA annual Single Audit; Manages the receipt and expenditure of all other funding sources of AEA. Including state funds and community grants that are managed by AEA on behalf of communities; reviews all AEA sub-recipient grants for initial or amendment. Reviews and approves all sub-recipient awards close outs; and responsible for the annual financial statements for AEA. Oversees the annual financial audit with external auditors.

Municipality of Anchorage - Anchorage, Alaska
Assistant Controller (Acting Controller 2011 & 2019) | February 2008 to Present December 16, 2022
Supervisors (Controllers/CFOs (when Acting for over 6 months)): Teresa Peterson, David Ryan, Lucinda Mahoney (CFO 2011), Nanette Spear, Tom Fink, Tammy Clayton, Alex Slivka (CFO 2019), and Mollie Morrison.

- Supervision of up to seven staff accountants and up to four Contractors (Supervisory backfill during SAP implementation) as Assistant Controller and up to twenty-three staff accountants and four supervisors as Acting Controller for the Controller Division;
- Duties of the Assistant Controller include review and creation of year-end workpapers, Detail Statements, capital asset schedules, footnotes, required supplementary schedules (RSI's), and statistical tables for the Annual Comprehensive Financial Report (ACFR). Coordination with internal and external auditors including audit field work and audit of the detailed statements and ACFR. As Acting Controller created the Letter of Transmittal and MD&A for the ACFR. Created audit finding recommended corrective action plans. Creation of the GASB 34 conversion entries and all required documentation. Recording of all debt financing activities at the governmental fund level and processing the conversion to the government-wide level for government-wide financial statement presentation.
- Create and post in the General Ledger (GL) all required GL transactions required for G.O. debt refunding's. Review all new G.O. debt GL postings for MOA's Governmental Funds. Offer consultation with the Public Finance Division in regard to capitalization of capital assets for upcoming G.O. Bond issues.
- Incorporation of three discretely presented component units and one trust fund in the form of four separate stand-alone audited financial statements into the government-wide financial statements for MOA.
- Creation of a full set of stand-alone financial statements for CIVICVentures LLC (a blended component unit), including the MD&A, financial statements (in the full accrual and modified accrual presentation) with a two-year comparison and footnotes. Maintenance of inventory documentation and capital asset schedules. Participation in the annual audit.
- Oversight of all daily accounting functions of Governmental Funds (to include the General Fund), Enterprise Funds, Internal Service Funds, Fiduciary Funds, and Suspense Funds (such as the Cash Pool Fund and the Employee Pay and Benefits Fund). Oversight of the MOA's capital asset and construction work in progress (CWIP) daily accounting activities. The Assistant Controller supervises the Fixed Asset Accountant and Infrastructure Accountant for MOA. Daily review and approval of journal entries, fund certifications of Municipal Assembly documents, and reconciliations. Creation and management of month and year-end processing schedules. Responsible for period close coordination with other Finance Directors. Hold weekly meetings as required. Process the year-end split payroll postings and perform extensive reconciliations before posting.
- Subject matter expert (SME) of the General Ledger (GL), Controlling Module (CO), Asset Management Module (AM), and the Projects Module of SAP.

- Assist with implementation of all new GASB pronouncements. Review and update of Finance policy and procedures. Creation of internal control documentation and oversight of internal controls regarding the GL and creation of the ACFR per GAAP. Acting Controller as required.

Fund / Reconciliation Accounting Supervisor | February 2005 to January 2008
Budget Coordinator Finance & CFO Departments
Supervisors: Teresa Peterson, Wanda Tankersley, Michelle Drew, and David Richards

- Supervised five Senior Staff Accountants. Two reconciliation accountants and three fund accountants. Oversight of the MOA's daily accounting activities of the General Funds, Enterprise Funds, Special Revenue Funds, Debt Service Funds, Internal Service Funds and Trust Funds (Fiduciaries). To include review of all fund certifications created for the CFO for pending assembly legislation. Oversight of MOA's capital asset module and creation of MOA's capital asset footnote for the ACFR. Creation of various footnotes, RSI's, and statistic tables of the ACFR. Review of MOA's bank reconciliations, investment reconciliations, subledger to general ledger reconciliations and unclaimed property filings. Assist four Finance Divisions of the Finance Department and the CFO Department with review and creation of their annual operating budgets. Assist with review and updates to the intergovernmental cost allocation plans (IGCs) and methodologies for the Finance and CFO Departments. Acting Controller as required.

General Fund Accountant | April 2004 to January 2005:
Supervisor: Guy Baily

- Create workpapers, detail statements, RSI's, and statistical tables for all of MOA's General Funds. Review and MOA wide department generated journal entries and creation of journal entries for all of MOA's General Funds. Create fund balance worksheets for the General Funds of MOA. Reconcile all balance sheet accounts of the MOA General Funds and create year-end workpapers.

Grant Fund Accountant | October 2001 to March 2004
Supervisor: Catherine Gettler-Amyott

- Create monthly and quarterly grant reports for state, state pass thru federal, and federal grants awarded to MOA. Reconcile the GL to grant reports and make correcting entries in the GL as required. Receipt all grant proceeds and create year-end accrual / deferral entries. Create workpapers for the generation of the Single Audit. This was for MOA's Capital Project Funds, Enterprise Funds and Special Revenue Funds. Assist in audit requests when being audited by external or internal auditors.

Reconciliation Accountant | April 2001 to September 2001
Supervisor: David Richards

- Reconciled the Accounts Payable subledger and Accounts Receivable subledger to the General Ledger. Reconciled the revenue postings to all Governmental Capital Project Funds and created corrective entries.

PROFESSIONAL BOARDS AND PROFESSIONAL CERTIFICATES

- Governmental Finance Officers Association – Member
- Municipal Audit Committee – Member (when serving as the Acting Controller)
- Lost Lake Run Board Member
- GFOA certificate for Excellence in Financial Accounting and Reporting (2019 and 2020).

COMPUTER SKILLS

- Microsoft Word
- Microsoft Excel
- Microsoft PowerPoint
- Microsoft Outlook
- PeopleSoft Financial Systems
- Corel WordPerfect
- Corel Quattro Pro
- IBM Lotus
- Yardi Property Management Software
- Microsoft Dynamics NAV 365 Business Central
- Intuit Turbo Tax
- Intuit QuickBooks Pro
- SAP (to include completion of 1 semester SAP course at UAA on Hana, BW, and NetWeaver)
- Kronos and NEOGOV
- Libra Accounting Software
- Skyline Software Systems
- Onsite Manager
- Various Web Based Reporting Systems

BRANDY M. DIXON

13429 Karen Street
Anchorage, AK 99515

(907) 764-3928
bmdinak@gmail.com

SUMMARY OF QUALIFICATIONS

Creative, forward thinking, resourceful Communications Professional with 15+ years experience in all facets of marketing, advertising, and public relations. Successfully promote diverse activities and events. Conduct public information, social marketing, and education campaigns. Strengths include:

- Written and Oral Communication
- Managing and Mentoring
- Planning and Organizing
- Researching and Evaluating

Detail, results and goal oriented. Productive team member with dedication to quality and professionalism. Proven track record of putting ideas into motion and creating engaging, targeted marketing campaigns.

SELECTED ACCOMPLISHMENTS

Written and Oral Communication

- Executed mail and email broadcast campaigns, public relations, conferences shows, media advertisements, promotions, customer communications, and other marketing plans to inform the public.
- Designed, scripted, edited and arranged production of internal/external newsletters, brochures, annual reports, corporate profiles and submissions, and internal/external communications.
- Served as spokesperson for the Alaska Native Medical Center (ANMC). Responded in timely matter to media inquiries, arranged interviews, distributed press releases and media advisories to provide accurate information. Encouraged positive and discreet communication on controversial, sensitive and proprietary topics. Protected patients' privacy and confidentiality according to the Health Insurance Portability and Accountability Act guidelines.
- Ensured cross-system coordination between ANMC and its Tribal Health Organization partners throughout the state and interactions with media regarding personnel, programs, services and policies.
- Managed interposition of vendors and contractors to successfully complete projects on time and on budget.

Managing and Mentoring

- Supervised team of five. Oversaw time and attendance, discipline, training, coaching, performance evaluations and ongoing development opportunities. Facilitated staff meetings.
- Delegated responsibilities and assignments among staff and monitored timely completion of projects.
- Identified and coordinated specific training opportunities for employees in alignment with their employee development plans.
- Monitored and coached 25+ scholarship and internship participants throughout the course of the Alaska Native Tribal Health Consortium's (ANTHC) 9-week internship. Arranged travel, housing, onboarding, interviewed department heads for intern placement matching at ANMC and conducted periodic evaluations.
- Managed database of 125+ scholarship and internship program participants via Microsoft Access to monitor program success.
- Developed and presented information to executives on department activities and goals to sustain budget funding.

Planning and Organizing

- In collaboration with leadership, developed short and long-term strategic communication plans for ANMC to fulfill Board of Directors' goals and objectives.
- Planned and coordinated numerous company events for 2,000+ employees including Joint Commission celebration, employee picnic, employee appreciation celebrations and United Way campaigns. Provided key organization functions as a member of planning team for Annual Meeting for four years with 100+ attendees.
- Successfully led marketing activities to promote the Healthy Alaska Natives Foundations' annual fundraising ball for three years with an average attendance of 450+ attendees and celebrity guests.
- Organized 20-30 employee forums over a two-year period with an average attendance of 30-40 people, which resulted in improved communication between hospital administration and staff.

Researching and Evaluating

- Conducted focus groups in partnership with external contractor to gain insight on needs of target audience. Developed communications plan based on results.
- Initiated strategic planning and implementation on a variety of communication and marketing plans.
- Reviewed ANTHC Scholarship and Internship applications, interviewed candidates and observed disciplinary procedures for program and departmental positions. Researched, developed and conducted trainings. Monitored and analyzed budgetary position for program.

EMPLOYMENT HISTORY

Communications Director	Alaska Energy Authority, AK	9/19 – Current
Communications and Events Director	Alaska Chamber, AK	12/13 – 9-19
Client Insights	Solstice Advertising, AK	9/13 – 12/13
Special Assistant to the CEO	Alaska Native Tribal Health Consortium, AK	01/12 – 9/13
Marketing Manager	Alaska Native Tribal Health Consortium, AK	09/09 – 01/12
Public Relations Manager	Alaska Native Tribal Health Consortium, AK	04/08 – 09/09
Manager of Public Relations	Southcentral Foundation, AK	07/07 – 04/08
Senior Office Specialist	Alaska Native Tribal Health Consortium, AK	04/06 – 07/07
Program Assistant	Alaska Native Tribal Health Consortium, AK	05/05 – 04/06
Senior Office Assistant	Alaska Native Tribal Health Consortium, AK	11/04 – 05/05
Office Manager	Rizzo & Company, AK	04/04 – 10/04
Marketing Coordinator	Microcom, AK	06/03 – 04/04

TECHNICAL SKILLS

Microsoft Office Suite:

- Access
- Excel
- Outlook
- PowerPoint
- Publisher
- Visio
- Word

Adobe Software:

- Acrobat
- Bridge
- InDesign
- Illustrator
- Photoshop

PROFESSIONAL ORGANIZATIONS

- American Marketing Association Alaska Chapter
- Public Relations Society of America Alaska Chapter
- Alaska Design Forum
- Cook Inlet Regional Incorporation Shareholder

EDUCATION

- Bachelor of Art, Art, University of Alaska Anchorage, AK
- Diploma, Robert Service High School, Anchorage, AK

Bryan E. Carey, P.E.

13041 Ridgewood Road
Anchorage, Alaska 99516
(907) 382-0949 E-mail B3Alaska@Outlook.com

Summary of Qualifications

Professional Engineer with over 30 years project experience at remote Alaskan sites. Experience in project management and working with varied teams of contractors and clients. Experience in design and construction at locations with challenging logistics. Strong verbal and written communication skills.

Education and Professional Certifications

Professional Engineer registration in Alaska CE - 10810
M.A., Business Administration, University of Alaska, Anchorage
B.S., Petroleum Engineering, University of Alaska, Fairbanks

Experience and Qualifications

Director of Owned Assets, Project Manager, Alaska Energy Authority AEA), Anchorage, Alaska, 2001 to Present

Project Manager at the two largest state owned but utility operated hydroelectric projects in the State (Bradley Lake and Snettisham). Responsibilities include insuring projects remain in compliance with Federal Energy Regulatory Commission (FERC) license and state permits, work with diverse group of utilities managers and professionals on project upgrades, insurance and legal agreements, and insure the State ownership interest is not impaired. Have recommended, worked with agencies and other stakeholders, and overseen multiple project license amendments through FERC to reduce land fees and flow releases.

Oversee AEA owned Statewide transmission projects. Oversee planning and operation of AEA owned and utility operated & maintained projects. Ensure insurance and permits current and in compliance.

Board Member Railbelt Reliability Council (RRC) which is the certificated electric reliability organization for the Railbelt region of Alaska. The goal of the RRC is to ensure grid resilience and reduce long-term costs by developing and enforcing technically sound reliability standards, conduction grid-wide integration resource planning, and designing consistent interconnection protocols for grid users.

Reviewed Renewable Energy Fund (REF) proposals and managed grantee's.

Proposed new West Fork Upper Battle Creek Diversion Project for Bradley Lake hydroelectric Project to utilities. Oversaw all environmental and engineering studies. Filed FERC documents, and acquired license amendment. Managed acquiring funding, bidding, and oversaw construction of diversion project. Project completed on schedule and within budget of $47 million. Project increases annual energy of the largest hydroelectric project in Alaska by 10%.

Project Manager for feasibility and conceptual engineering studies for the Susitna Hydropower Project. Oversaw engineering contractors to come up with conceptual designs

and costs to fit within the Railbelt Integrated Resource Plan (Utilities future electrical demand and generation). Deliver presentations and question & answer at legislative committees and public organizations. Oversaw all engineering and environmental work for filing the Preliminary Application Document with FERC.

Managed contractors to design, acquire site control, project funding, and construct energy projects at remote Alaskan communities. Projects required meeting with local community leaders and design engineers to develop a project design. Site control was then obtained and a Business Operating Plan developed and accepted by the project participants. Projects were built using contract construction managers or competitive bid. Negotiation of scope and changes occur at all phases with project participants and contractors.

Bulk fuel, power plant, and small hydroelectric projects were completed at approximately 20 remote rural communities. Many of the projects had multiple energy projects completed. Remote work involved limited air or barge logistics. Steep terrain required several projects to be completed with extensive use of helicopters to move equipment

William J. Price

25050 Cates Ave
Eagle River Ak, 99577

freedomsprice@live.com
907-903-3377

SUMMARY

- 20 years of experience as an Engineer and Project Manager.
- Received Bachelor's in Mechanical Engineering from Utah State University in 2002.
- Professional Mechanical Engineer, State of Alaska License #129742.

WORK EXPERIENCE

Senior Infrastructure Engineer *August 2019 – Present* Alaska Energy Authority Anchorage AK

- Maintain transmission & generation infrastructure owned by the Alaska Energy Authority. This includes the Alaska Intertie, Bradley Lake Hydro, and other related transmission infrastructure. Maintenance and operations managed through Committees consisting of utility engineers and executives.
- Represent AEA on Railbelt Reliability Council, and participate in creation of the State Energy Security Plan.
- Responsible for project planning. This includes collecting and analyzing energy and community data, identifying present and future needs, conceptualizing engineering solutions, and developing, reviewing, and analyzing plans and proposals in order to determine the feasibility and appropriate technology for a prospective project. Conduct site visits, including public meetings in order to discuss prospective projects with local entities and residents.
- Direct design professionals and business consultants in the development of conceptual design reports, design documents, business plans and cost estimates appropriate to the scope of the project.
- Perform project construction management functions including overseeing the preparation of construction budgets, schedules, work plans, quality control, oversight and on-site inspections during construction.
- Administer technical services contracts including issuing invitation for bids, reviewing and evaluation bids, selecting contractors, preparing documents, negotiating and awarding contracts, monitoring and supervising contractors, preparing change orders, overseeing contract accounting, and evaluating contractor's work.
- Analyze data, research new technology, and propose solutions to technical problems. Develop comprehensive reports and technical analysis to propose solutions and effective actions to solve technical problems.
- Coordinate with agency staff, rural community entities, federal and state agencies and the public on project and program-related topics.

Mechanical Project Engineer *March 2017 – August 2019* RSA Engineering Anchorage AK

- Responsibilities included working with the clients to develop concept designs, calculations, equipment selections, mechanical design drawings, specifications and supporting documents. Work collaboratively with architects, structural, civil engineers and in house electrical engineers to complete projects on time and on budget. Significant projects summarized below:
- Renovation of existing power plants in Kaktovik and Anaktuvuk Pass in the North Slope Borough. Project includes new radiators, heat exchangers, pumps, waste heat recovery loops, day tank, and related systems.
- Replaced boilers and renovated mechanical rooms in multiple properties owned by the Municipality of Anchorage and the National Park Service. Replacement included site investigation, drawings, boiler selection and supporting equipment and piping design.
- Developed plans and bidding documents for replacement of all domestic water piping in Valdez hospital.
- Designed water and waste connections for North Slope Borough commercial and residential buildings. Installations included holding tanks, below and above grade sewer connections.

Mechanical Project Engineer *Jan 2011 – Jan 2017* Gray Stassel Engineering Anchorage AK

- Designed or assisted in the design of 13 rural power systems for Alaskan villages. Communities included Atmautluak, Emmonak, Stebbins, Nunam Iqua, Teller, Togiak, Fort Yukon, Perryville, Kake and Heat Recovery renovations in Buckland and King Cove.
- Project Engineer for Kvichak River RISEC (River In Stream Energy Conversion) Project. Deployed two hydrokinetic devices in the Kvichak River near Igiugig Alaska, which is home to one of the largest Salmon returns in the world (Bristol Bay). Both devices were connected to the Igiugig electric grid during testing.
- Developed and maintained, budgetary estimates, project schedules, permit requirements, and stakeholder meetings.
- Designed new power plant with a biomass and district heating system in Fort Yukon Alaska. System includes 4 diesel generators which provide prime power for the community of Fort Yukon. The district heating system will provide heat for 13 community buildings through nearly 9000 feet of arctic pipe and will offset approximately 50,000 gallons of heating oil annually in the community.
- Assessed 7 rural Alaskan villages for new or updated heat recovery systems, resulting in construction of heat recovery systems in King Cove, Buckland and Atmautluak, which offset nearly 62,000 gallons of heating fuel annually.

Director of Operations Support *May 2009 – December 2010* 212 Resources Salt Lake City UT

- Operations Support for treatment of water produced during Natural Gas production in Wyoming and Colorado. Support included mechanical, process, and electrical engineering, IT, logistics, procurement, and corporate reporting.
- Project Engineer for new produced water recycling facility in Colorado. Project vaporized produced water from nearby natural gas production. Super concentrated brine was stored for disposal, condensate (primarily methanol) was collected and clean water was discharged into a nearby tributary of the Colorado River.
- Continued to serve as Field Engineer for both Colorado, and Wyoming sites. Supervised and assisted in installation of new equipment, engineering support and technical problem solving. Primary contact for vendors, contractors, consultants, manufacturers, and industry experts to solve problems and maintain field operations.
- Developed and implemented a root cause analysis and corrective action program. Created documents and reporting systems to track failure events and corrective actions. Trained operations staff in data collection, and root cause investigation.

Field Engineer *Aug 2008 – May 2009* 212 Resources Grand Junction CO

- Provided technical support, stress analysis, vibration analysis, PLC trouble shooting, and general problem solving for 24 hr field operations. The remote facility, circulated, vaporized and concentrated produced and 'frac' water from natural gas production. The super condensed waste water, condensate and clean water were stored for the client use or disposal.
- Monitored process efficiency through data collection and trend analysis, process improvements and preventative maintenance.
- Supervise installation, repair or replacement of equipment, and manage corrective actions.
- Support main office engineering staff through data collection, design engineering, testing and evaluation, field inspections utilizing AutoDesk Inventor and AutoCAD.
- Support construction efforts and new site preparation.
- Work with clients to determine operation requirements and design solutions.
- Visit vendors and contractors to inspect equipment and construction to verify specifications were met.

Ryan McLaughlin

ryan.mclaughlin25@gmail.com
907.444.7886

Work Experience

Alaska Energy Authority - Anchorage, Alaska (05/2023-present)

Infrastructure Engineer (05/2023-present)

- Assisted in engineering studies, field investigations, and development of engineering design for the Alaska Energy Authority's owned assets.

Alaska Native Tribal Health Consortium - Anchorage, Alaska (01/2022-present)

Engineering Project Manager (01/2022-present)

- Managed water, sanitation, and solid waste infrastructure projects for 7 Alaska Native communities in the Maniilaq and Norton Sound Regions of Alaska
- Developed strong relationships with key tribal and city members to help identify and progress projects that were high priority community needs
- Secured project funding through numerous sources and ensured engineering and construction was managed in compliance of funding requirements
- Negotiated and administered engineering and construction contracts, tracked and adjusted consultant progress and ensured adherence to project scope, schedule, and budget

Alaska Solar - Anchorage, Alaska (06/2021-10/2021)

Solar Technician (06/2021-10/2021)

- Worked on a small team to install ~700KW of residential solar in Southcentral Alaska
- Interfaced with customers and provided easily digestible information on how the systems would operate and produce

ConocoPhillips - Anchorage, Alaska (06/2015-03/2021)

DataOps Engineer (05/2020-03/2021)

- Collaborated with Amazon Web Services to develop a machine learning model that optimized wiper trips for the Coiled Tubing Drilling Program
- Helped develop real-time and big data processing pipelines to support the Alaska Data Science team in an effort to move Company data from on-prem to the cloud
- Acquired proficiency in multiple programming languages (SQL, Python) through on-the-job training and DataCamp curriculum

Coiled Tubing Drilling Engineer (09/2018-05/2020)

- Responsible for developing drilling programs and providing 24/7 engineering support

during execution phases of Coiled Tubing Drilling projects
- Delivered ~15 multi-million dollar projects on time and budget by working closely with multi-disciplinary teams and overseeing projects from start to finish
- Managed all long-lead material and inventory needs for the Alaska CTD program
- Developed new and innovative technologies with 3rd party vendors
- Ensured strict compliance with government regulations and maintained close communication with the Alaska Oil and Gas Association throughout all activities

Wells Supervisor (10/2016-09/2018)

- Responsible for the on-site execution, supervision, and safety for a wide range of well intervention jobs including slickline, e-line, service coil, and frac work
- Managed up to 6 crews at a time and ensured all crews had procedures, permits, and equipment necessary for daily activities
- Collaborated with engineers and contractors to come up with quick decisions for issues that arose during Well Intervention operations

Performance Engineer (06/2015-10/2016)

- Created and provided near real-time performance reports and KPIs for Drilling Operations
- Early adopter of Spotfire for data visualization and helped save over $1MM through small efficiencies gained on highly repeatable tasks on the drilling rigs

Education

B.S. Petroleum Engineering, *University of Alaska Fairbanks, 2015*

- President - Tau Beta Pi, Engineering Honor Society (2014-2015)
- Chancellor's List (3.95 GPA)
- Minor, Music Performance
- Fairbanks Symphony Orchestra (2013-2015)
- Member of AADE and SPE (2011-2015)

Extracurriculars

American Association of Drilling Engineers, Alaska Chapter

- Board Member, University Liaison (10/2019-03/2021)

Ski Summit of Mount Denali (Self-Guided, 2019)

- Employed complex trip planning and risk management skills in a remote environment

Wilderness First Responder (2021)

- 80 hr WFR certification to effectively identify and manage medical emergencies in the outdoors

Bear 100 (2021)

- 100 mile mountain trail race in Utah, requiring a year of structured training, planning, and discipline

Rebecca Garrett, PMP

AEA Rural Programs Manager
rgarrett@akenergyauthority.org

Professional Work Experience

State of Alaska, Alaska Energy Authority, Rural Energy Group
Rural Programs Manager September 2022 - Present
Oversee the Rural Programs Projects Managers and Grants section. Manage Rural Power System Upgrade (RPSU) Program. Manage Bulk Fuel Upgrade (BFU) Program. Manage rural power system construction projects. Collaborate with other agency staff, rural community entities, and federal agencies to coordinate diverse interests in rural power system projects. Seek out and apply for funding for agency and partner energy projects.

State of Alaska, Alaska Energy Authority, Rural Energy Group
Project Manager/Program Manager February 2018 – September 2022
Manager Rural Power System Upgrade (RPSU) Program. Manage rural power system construction projects. Manage the active construction of 3 heat recovery systems around the state of Alaska. Manage State Clean Diesel (DERA) program for Alaska Energy Authority. Manage the DERA rural powerhouse engine replacement projects. Offer technical assistance to communities that need efficiency upgrades and/or are experiencing problems with the power system. Assist rural communities with funding opportunities and questions to expand the reach of energy projects and programs.

State of Alaska, Alaska Energy Authority, Rural Energy Group
Assistant Project Manager June 2014 – January 2018
Manage end use (conservation) projects. Manage rural power system construction. Manage the construction of heat recovery systems around the state of Alaska. Manage State Clean Diesel (DERA) program for Alaska Energy Authority. Offer technical assistance to communities that need efficiency upgrades and/or are experiencing problems with the power system. Assist rural communities with funding opportunities and questions to expand the reach of energy conservation. Coordinate the Rural Energy Conference every 18 months (2002-2016).

State of Alaska, Alaska Energy Authority, Rural Energy Group
Project Development/Project Manager January 2009 - June 2014
Manage end use efficiency (conservation) projects. Develop and present regional energy fairs around the state with a focus on energy efficiency. Assist rural communities with funding opportunities and questions to expand the reach of energy conservation. Coordinate the Rural Energy Conference every 18 months (2002-2016). Monitor section needs and lobby for additional support when necessary.

State of Alaska, Alaska Energy Authority, Alternative Energy and Energy Efficiency Section
Program/Project Manager September 1999 – January 2009
Manage end use efficiency (conservation) program. Develop and present regional energy fairs around the state with a focus on energy conservation. Assist rural communities with funding opportunities and questions to expand the reach of energy efficiency. Authorize and release the Energy Cost Reduction RFP. Administer each project that results from the Cost Reduction RFP analysis. Facilitate bi-weekly section meetings, and collaborate with Accounting and Procurement. Oversee 20 projects with budgets totaling over $20 million all over the state of Alaska. Coordinate the Rural Energy Conference every 18 months (2002-2016).

Work History

State of Alaska - Alaska Energy Authority, Rural Programs Manager September 2022 - Present
State of Alaska - Alaska Energy Authority, Project/Program Manager February 2018 – September 2022
State of Alaska - Alaska Energy Authority, Assistant Project Manager June 2014 – January 2018
State of Alaska - Alaska Energy Authority, Project Development January 2009 – June 2014
State of Alaska - Alaska Energy Authority, Energy Efficiency Program May 2001 – May 2009
State of Alaska - Alaska Energy Authority, Training Program Manager May 1997 – May 2001
State of Alaska – Division of Energy, Administrative Clerk III March 1997 – May 1997
Avis Rent-a-Car, Assistant Manager – Rental Counter September 1992 – December 1997

Certifications

Project Management Professional (PMP) May 2018
Project Management Institute September 2015
Meeting Professionals International March 2007
Notary Public May 1997 – present
E-Writing, Business and Technical Writing March 2006

Post Baccalaureate Course Work

University of Alaska, Fairbanks May 2021
Sustainable Energy Occupational Endorsement
University of Alaska, Anchorage September 2006 – May 2007
Organizational Behavior (BA 300), Technical Writing (ENGL 212)
University of Alaska, Fairbanks March 1998
Cultural Awareness

Education

BA History, University of Alaska, Anchorage May 1996
Dimond High School, Anchorage Alaska June 1991

Volunteer Experience

State of Alaska, Polling Place Worker, Anchorage AK August 2020 -Seasonal
Primary and Election day worker at local polling station
Gladys Wood Elementary School, Volunteer, Anchorage AK September 2006 – 2013
Parent working in the classroom and Parent-Teacher Organization

Project Workplan – Dixon Diversion

1. **Overall Project Summary and Approach (45 points)**
    a. **Description of GHG Reduction Measures (20 points)**

The Alaska Energy Authority (AEA) proposes the Dixon Diversion project as a Greenhouse Gas Reduction Measure under the Alaska Priority Sustainable Energy Action Plan (PSEAP). The Dixon Diversion project is a significant and transformative expansion of the existing AEA-owned Bradley Lake Hydroelectric project on the Kenai Peninsula of Alaska. The objective of this project is to divert water coming off the Dixon Glacier into Bradley Lake which will increase the capacity of the hydroelectric project by 190,800 MWh/year, as well as offset 106,668 MTCO2e of emissions and displace at least 1.5 billion cubic feet of natural gas annually. The Dixon Diversion project will accomplish this objective through the following project elements: a diversion dam and intake structure at the toe of the Dixon Glacier, a 4.7-mile long 14-foot diameter underground tunnel to convey water from the Martin River to the existing Bradley Lake reservoir, modifications to the existing dam to raise the reservoir elevation by 14 feet, and 1 mile of new access road. By utilizing existing energy infrastructure, this project allows for a significant renewable resource to be developed on an extremely small footprint and represents the largest renewable energy project in Alaska in the last 30 years.

The original Bradley Lake hydroelectric project, commissioned in 1991, has been a steadfast source of low-cost renewable power in Alaska. Located 27 air miles northeast of Homer, Alaska, it boasts 120 MW of installed capacity, featuring a 125-foot-high concrete-faced, rock-filled dam structure, a 3.5-mile-long power tunnel and vertical shaft, generating plant, interior substation, 20 miles of transmission line, and substation. This project generates approximately 400,000 MWh of renewable electricity annually, representing 10% of the total annual power consumed by Railbelt electric utilities. Bradley power stands out as one of the most cost-effective energy sources on the Railbelt.

Alaska's interconnected transmission system, colloquially referred to as the Railbelt, serves 75% of Alaska's population. It spans nearly 700 miles from the Bradley Lake Project in the south to Delta Junction in the north and is operated by four member owned cooperatives, one city owned utility, and AEA. Power generated from the Bradley Lake hydroelectric project has consistently served all consumers along the entire Railbelt.

The Dixon Diversion would not be the first major expansion to the Bradley Lake project. As recently as 2020, AEA completed the West Fork Upper Battle Creek Diversion project. This project constructed a concrete diversion dam, three miles of new road, and a 5-foot diameter pipeline buried alongside the road to convey water from the diversion dam at the headwaters of Battle Creek into Bradley Lake. The additional water flowing into Bradley Lake increased the energy coming out of the project by about 40,000 MWh, or a 10% increase in power generation. The Battle Creek Diversion Project was completed on schedule and within the original budget. The existing and proposed components of the Bradley Lake, Battle Creek, and Dixon Diversion project are shown below.

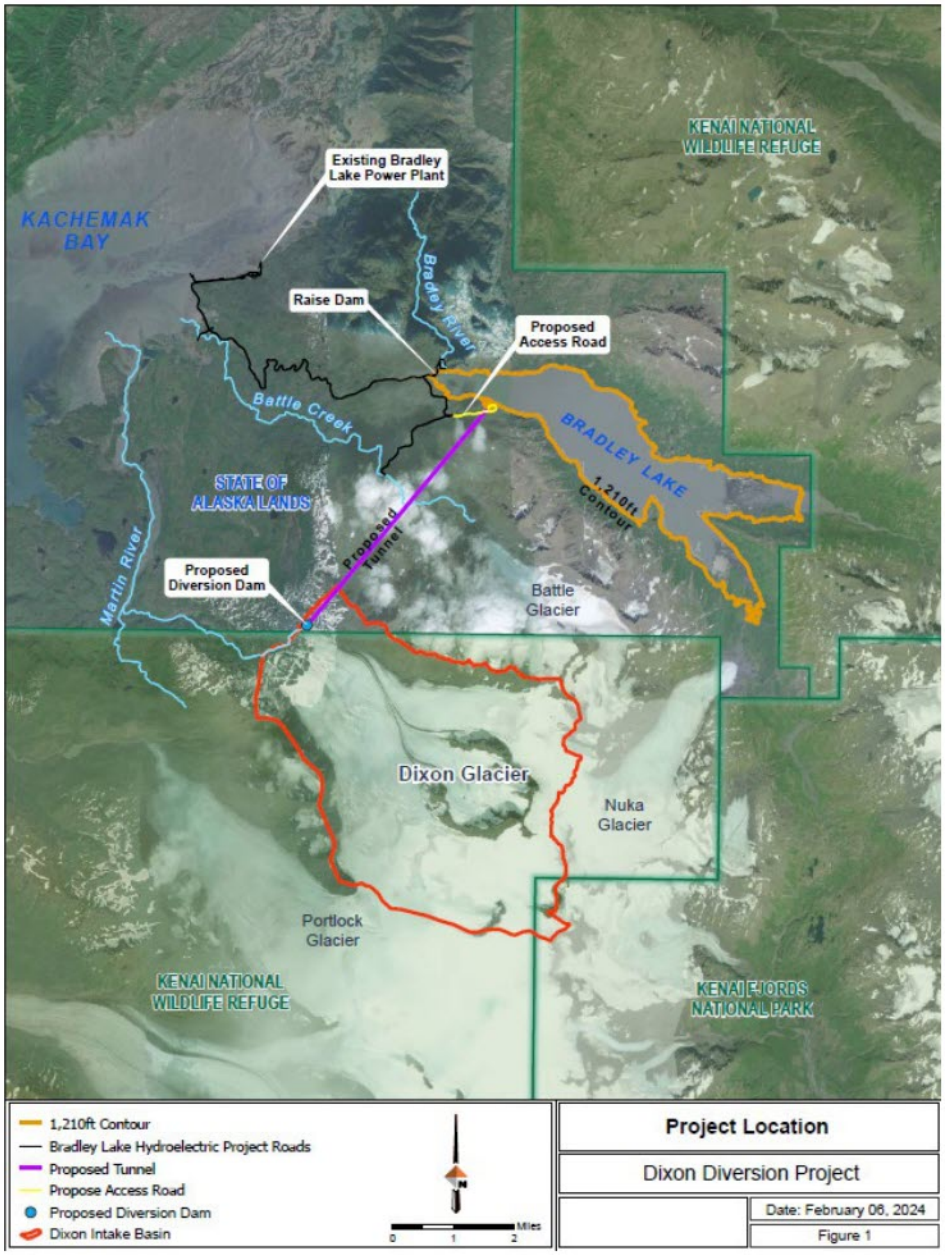


Figure 1: Dixon Diversion Project Map

AEA has identified the Dixon Diversion project as an economic and beneficial expansion of the already successful Bradley Lake Hydroelectric project. This project would increase the energy generated from Bradley by an impressive 50%, meeting 5% of the total demand of the entire Railbelt.

The Dixon Diversion project will use CPRG funds to complete the relicensing process and construct the expansion. This process entails amending the existing Federal Energy Regulatory Commission (FERC) license, an endeavor necessitating several years of comprehensive studies, which AEA has already initiated. Notably, in 2022, AEA filed the Notice of Amendment and Initial Consultation Document, subsequently accepted by FERC. Progressing through the process, preliminary studies were conducted in the summer of 2022, followed by soliciting input from the public and resource agencies on the Draft

Study Plan document in November 2022. Further preliminary studies were undertaken in 2023, focusing on hydrology, stream gauging, and video monitoring to assess fish habitat and usage in the Martin River, the river that comes off the Dixon Glacier.

A Final Study Plan will be submitted in April 2024 which will outline the remaining two years of study plans. This plan will be developed and accepted with input and concurrence from applicable resource agencies to ensure the project's potential effects are well known. Some of the major studies that will occur in the 2024 and 2025 field seasons include but are not limited to: geotechnical drilling and investigation at the tunnel inlet and outlet, continued hydrology and stream gaging, water quality monitoring, geomorphology, aquatic habitat characterization and fish use, and cultural resource studies.

Pre-engineering and design work will occur concurrently with the environmental studies, and following the 2025 field season, a Draft Amendment Application (DAA) will be submitted for comment and review to the public, stakeholders, resource agencies, and FERC. The DAA will go through an extensive review process and a Final Amendment Application will be submitted to FERC in 2026. After FERC approval and completion of the National Environmental Protection Act (NEPA) process, the project will go out to bid for construction.

Construction of the Dixon Diversion project will be completed through two primary phases: Dam Raise & Powerline Construction, and Diversion Dam & Tunnel Construction. The dam raise and powerline construction may be bid separately and completed first. The primary reasons for this are that as soon as the dam raise is complete, Bradley Lake will have additional storage capacity that can be utilized.

The lake level will be raised by at least 14 feet through modifications to the dam, including the addition of a gate to the spillway crest and raising the existing dam crest and parapet wall accordingly. The byproduct of additional storage capacity and higher head pressures at the powerplant will result in more efficient energy production from all Bradley water representing an additional 8000 MWh of energy production annually. There were multiple different levels of dam raise investigated as part of this project, and 14 feet likely strikes the right balance in gaining additional reservoir capacity, without altering the dam's structural integrity. The 14-foot raise will be accomplished through minimal intervention. Bradley Lake is surrounded by steep rocky faces along its perimeter, and inflows from a glacial outwash plain to the east. Acreage in the flat outwash plain will become inundated as the reservoir level increases, but total inundation will remain small as most of the lake is surrounded by steep rocky cliffs. AEA has modeled a range of reservoir raise scenarios and an increase up to 28 feet is possible within the project's current areal constraints.

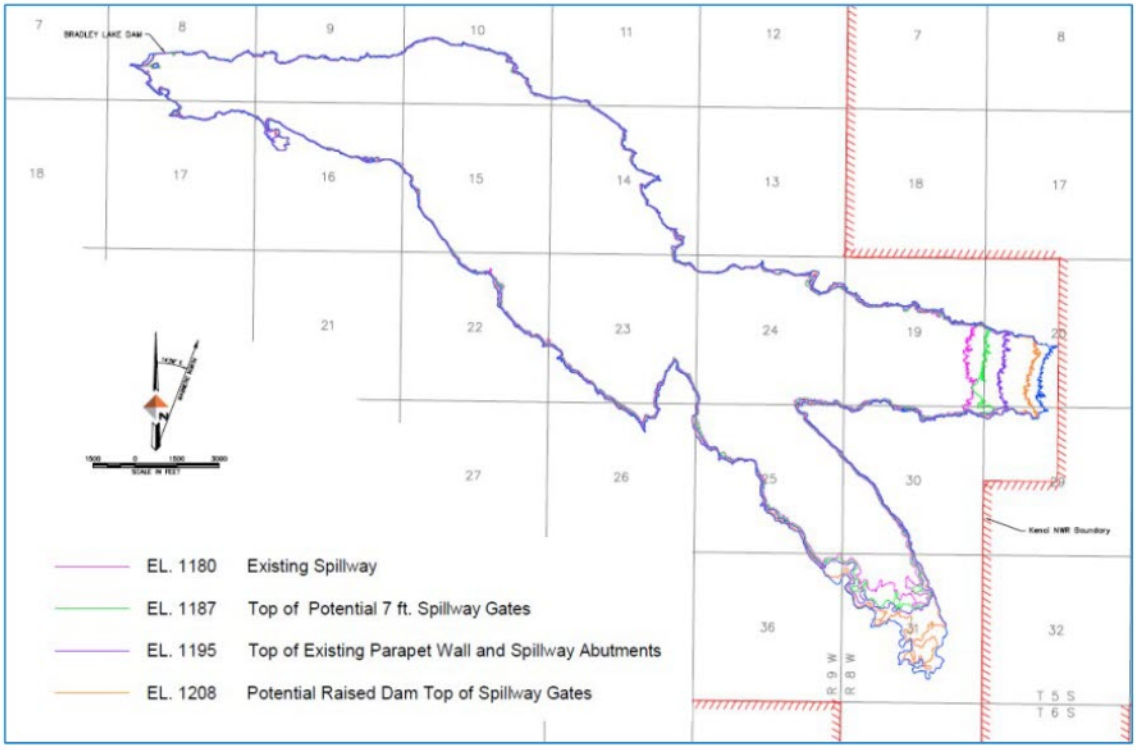


Figure 2: Inundation map of Bradley Lake for a range of dam raise scenarios

Simultaneous to the dam raise, crews would work on installing infrastructure to run three-phase power from the Bradley Lake Powerhouse to the Bradley Dam. This power will run beneath the existing road up to the dam, improving its operability and acting as a power supply for the Tunnel Boring Machine (TBM) used to drill the Dixon Diversion Tunnel, providing clean hydroelectric power in lieu of the alternative diesel-generator-powered TBM operation.

Following installation of 3-phase power and modifications to the Bradley Dam, operations to begin constructing the diversion dam, intake structure, and tunnel can begin. The diversion dam will be constructed near the toe of the Dixon Glacier on State land. This area is accessible only by helicopter, so crews and equipment will be flown in to initiate work on the diversion dam while the tunnel is being constructed. Crews will work out of a man-camp at the project site which will eventually be converted into a permanent maintenance equipment building. The diversion dam will be either constructed as a rock fill dam or rubber dam, with a gated sluiceway for sediment transport and minimum instream flows down the Martin River. Construction of the intake structure and diversion dam is expected to last approximately 1 season.

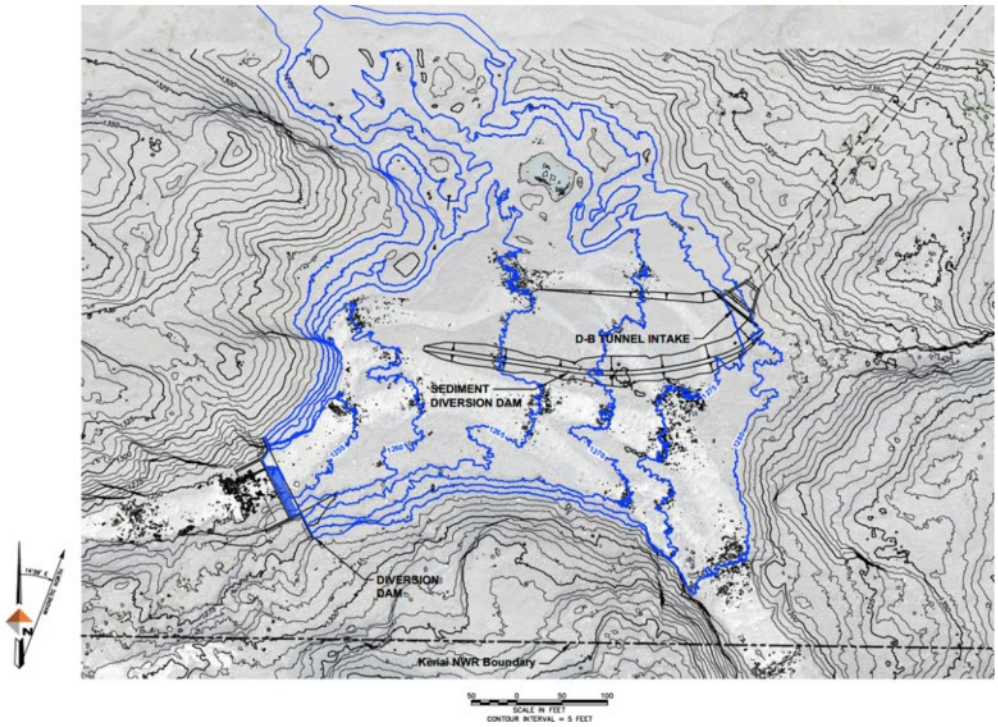


Figure 3: Conceptual design of diversion dam and tunnel intake (plan view)

Figure 4: Toe of Dixon Glacier, location of future diversion dam and tunnel intake

The tunnel construction will be the most expensive and involved aspect of this project. The tunnel will be 4.7 miles long, underground from Bradley Lake to the Dixon diversion dam. The tunnel diameter will be 14 feet, and AEA has determined that there are enough TBMs currently in operation worldwide to source for boring a tunnel of that size. TBM was compared to a drill and blast method of tunnel construction and was found to drill at much faster rates of penetration to justify the mobilization costs of the equipment. The TBM has additional benefits including reduced friction inside the tunnel due to smoother walls from TBM construction compared to drill and blast. Following construction of 300 feet of starter tunnel using drill and blast methods, the TBM will drill uphill towards the diversion dam and TBM operations will take approximately a year to complete. Due to the underground nature of this phase of the project, operations can continue through the winter season.

Upon completion of the tunnel, equipment and power can be run to the diversion dam via the newly drilled tunnel. This will allow enhanced remote operability of equipment at the diversion dam as well as provide an alternative means to mob and demob equipment from the diversion dam. Upon commissioning of the project, the tunnel should be able to convey up to 1400 cubic feet per second (cfs) of water into Bradley Lake. Several times each summer, flood events along the Martin River will exceed the diversion tunnel's capacity and excess water will flow downriver past the diversion dam creating channel maintenance events on the lower Martin River.

The Dixon Diversion project is expected to come online by early 2030, prior to the start of the 2030 water year, and will immediately provide benefits to the entire Railbelt upon commissioning. With a hydroelectric facility and powerplant already in place, all water that is diverted from Dixon Glacier into Bradley Lake will generate electricity that will directly offset natural gas generated energy in Alaska and provide greenhouse gas reduction benefits to the entire state of Alaska.

b. Demonstration of Funding Need (10 points)

The Total Project Cost for the Dixon Diversion, using a class 4/5 Engineer's Estimate is $342 million. This includes preliminary study and engineering costs, relicensing efforts, and construction costs. This does not include AEA costs.

AEA is not aware of any Federal funding opportunities that currently exist for the development of new state-owned hydroelectric projects of this magnitude. There is a substantial amount of work that has been completed and ongoing to submit the FERC license amendment necessary for the project. This includes preliminary engineering and geotech work for the diversion dam construction and tunnel boring efforts, hydrology and stream gaging to determine energy potential and minimum instream flow requirements for salmon, and permitting and license preparation. AEA has funded work to-date through a $1 million grant from AEA's Renewable Energy Fund, $1.36 million total contribution from local electric utilities, and $5 million in FY24 State of Alaska funds appropriated through the legislature. AEA has put in a request for an additional $7 million from the State of Alaska's FY25 budget to complete preliminary environmental and engineering work in the 2025 season.

Some of project costs may be eligible for the Clean Electricity Investment Tax Credit (48E) or the Clean Electricity Production Tax Credit (45Y), which are expected to be in place until at least 2032, authorized

through the Inflation Reduction Act (IRA) and the state may be eligible to receive those credits through the elective pay provisions provided by the IRA. The amount of that credit will vary based on several factors and would be reduced if AEA uses tax exempt bonds or receives grants to fund the project. Any proceeds from tax credits would be received after the commissioning and would not provide the cash flow needed for construction.

The Dixon Diversion Project appears to be economical and cost competitive with current and future natural gas prices. A Climate Pollution Reduction Grant would ensure this beneficial and transformational project can be completed on time, reducing greenhouse gas emissions in Alaska and reducing Alaska's dependence on rapidly dwindling natural gas supplies. If AEA were not to receive a grant under this program, funding would most likely be secured through utility revenue bonds. The project's cost would fall on customers of the five Railbelt utility co-ops. Alaska's small population and harsh winters are attributed, in part, to the high energy burden experienced by its residents. A Climate Pollution Reduction Grant would relieve the upward pressure on rates that are incurred owing to debt service costs resulting from needed investment for utility-scale energy projects.

c. Transformative Impact (15 points)

75% of Alaska's population is served by the Railbelt for their electric needs. The Railbelt electric transmission (Railbelt) is an electric transmission system comprised of interconnected transmission infrastructure assets owned by four independent member-owned electric cooperatives; one municipal electric utility; and the State-owned Alaska Interties and Bradley Lake Hydroelectric Project transmission assets. This transmission system spans over 700 miles from Bradley Lake at its southernmost point, to Delta Junction in interior Alaska at its northernmost point. The Railbelt also serves multiple major centers of economic activity, and critical assets along its lines, including but not limited to, military installations, hospital / critical care facilities, fire/police/EMS facilities, major ports of entry, and key access points for natural resource extraction and processing all of which rely on power delivered via the Railbelt for their daily operation.

In 2022, the Railbelt generated 4698 GWH of electricity primarily through carbon intensive means. Natural gas fired generators account for approximately 64% of the generation along the Railbelt, with coal and fuel oil accounting for another ~20%. The Railbelt is highly reliant on natural gas and other fossil fuels for its electricity and heating needs, and any increase in renewable generation via hydropower development would directly offset such costly carbon-based energy generation assets.

The Dixon Diversion project is expected to meet ~5% of the Railbelt's electricity demand and would be the largest renewable energy project in Alaska in 30 years. The Bradley Lake hydroelectric project provides firm, year-round power which utilities can dispatch at times of peak demand. In Alaska peak demand occurs in the winter when temperatures are coldest and daylight hours are shortest. Peak generation plants are inefficient compared to baseload plants. Using storage hydropower to meet these peak demands reduce the frequency whereby inefficient and high-carbon emitting generation facilities are turned on to accommodate such peaks in energy demand.

An additional concern in Alaska, and reason to accelerate this project, is the impending natural gas shortage in Southcentral Alaska. Natural gas is the primary energy generation fuel source in Southcentral Alaska, and all such gas is extracted from Cook Inlet gas fields. Cook Inlet is Alaska's oldest producing oil and gas basin and has been producing hydrocarbons since the 1950's. This pool has been in decline for decades, but in a few years the gas produced from Cook Inlet will not be sufficient to meet the energy demands for the Railbelt. A 2023 report commissioned by Enstar, the local natural gas utility in Southcentral Alaska, found that natural gas demand from Cook Inlet will likely exceed supply by 2027-2028. There have been more recent estimates that predict that shortage happening even sooner. Currently, there are no cost-effective alternatives to offset the oncoming shortage. The most likely scenario is that utilities will have to import liquefied natural gas (LNG) to meet the natural gas shortage in the coming years. Southcentral Alaska does not have an LNG import terminal, which would need to be built, and LNG will come with even higher emissions than locally sourced natural gas due to overseas shipping-related emissions. Importing LNG also would represent a significant increase in the cost of energy for all Alaskans. Alaska already faces some of the highest energy costs in the nation, importing LNG would increase the price of natural gas deliveries by at least 50%. The energy produced from the Dixon Diversion project will offset 1.5-1.6 billion cubic feet (bcf) annually. This energy represents 7.5% of the projected unmet natural gas demand in 2030, a significant step in addressing the energy needs for the Railbelt.

The Dixon Diversion is a significant expansion of the Bradley Lake Hydroelectric project and is a firm, reliable energy source that helps regulate energy needs along the Railbelt. Storage hydro has many benefits compared to other types of renewable sources, especially in Alaska, because it is dispatchable year-round. The coldest and darkest winter months correspond to the highest energy demands, and storage hydro remains available to draw from during those times of high demand. Solar and wind are both great renewable resources in Alaska, but their energy output is unpredictable and can destabilize the grid. Increasing firm renewable resources, such as storage hydro, allows utilities to regulate energy and integrate more non-firm energy sources.

A recent cold weather event in January 2023 illustrated the need for storage hydro. Anchorage had been experiencing temperatures below –20 F, breaking daily low-temperature records and the frigid temperatures had been persistent for weeks. The Cook Inlet Natural Gas Storage Facility, an underground gas storage reservoir, had experienced failures on two of five wells. Utilities were all directed to maximize their hydroelectric production to alleviate the pressure on the gas delivery system. Wind and solar resources in Alaska were not able to contribute during this critical period, highlighting the fact that a MW from a storage hydro project like the Dixon Diversion project is far more valuable to Alaska than a MW of energy from wind or solar.

2. **Impact of GHG Reduction Measures (60 points)**
    a. **Magnitude of GHG Reductions from 2025-2030 (20 points)**

The Dixon Diversion project is scheduled to be completed and commissioned by early 2030. This will capture a full water year in 2030 and associated greenhouse gas reductions from that water. In these systems water typically starts flowing in late April / early May. A minimum instream flow (MIF) will be

established through the FERC licensing process, and once flows exceed the MIF, excess water will be diverted through the Dison Diversion tunnel into Bradley Lake. The water year typically ends in late October / early November once temperatures consistently drop below freezing and there is not enough flow to divert water anymore. The project is expected to be commissioned before spring break-up so the magnitude of greenhouse gas reductions from 2025-2030 would be equivalent to the energy produced from a full water year.

Based on synthetic flows of the Martin River averaged over the previous decade, accounting for expected minimum instream flow requirements and the capacity of the 14-foot diameter diversion tunnel, the Dixon Diversion project will produce 190,800 MWh of electricity annually.

EPA's 2022 eGRID conversion factor for the Alaska Railbelt (AKGD – ASCC Alaska Grid subregion) nonbaseload rates gives an accurate estimation of CO2e reductions for projects that displace electricity generation. For the Railbelt the eGRID subregion annual CO2e non-baseload output emission rate is 1,232.508 lb/MWh.

$$190{,}800\ MWh \times 1{,}232.508\ \frac{lb\ CO2e}{MWh} \times\ \frac{1\ MT}{2204.62\ lb} = 106{,}668\ MT\ CO2e$$

Magnitude of GHG Reductions from 2025-2030 = 106,668 MTCO2e

b. Magnitude of GHG Reductions from 2025-2050 (10 points)

To estimate the magnitude of GHG Reductions from 2025-2050, the same annual energy output from Dixon will be used over a 25-year period. It is likely that the energy numbers over this period could be even higher, due to an observable trend of higher flows in recent years due to warmer summers melting the source glaciers at a faster rate.

$$106{,}668\ MTCO2e\ \times 25\ years\ =\ 2{,}666{,}701\ MTCO2e$$

Magnitude of GHG Reductions from 2025-2050 = 2,666,701 MTCO2e

c. Cost effectiveness of GHG Reduction (15 points)

$343,659,601/ 106,668MTCO2e = **$3,222/MTCO2e**

The Dixon Diversion project boasts a remarkable level of cost-effectiveness that is not captured in the scoring. Due to the extensive and involved FERC licensing process, realization of project benefits are delayed until both licensing and construction are finished. Even through all project funds will be utilized within five years, the advantages of greenhouse gas reduction won't commence until the fifth year. Nevertheless, upon completion, this project is poised to deliver year-round benefits to Alaska for approximately a century. When considering the lifecycle of a typical hydroelectric project, the cost-effectiveness is notably high, with hydroelectric projects consistently producing the most economical energy along the Railbelt.

d. Documentation of GHG Reduction Assumptions (15 points)

Annual greenhouse gas reductions resulting from the Dixon Diversion project are calculated from offsets of expected energy production from the hydroelectric project. To develop estimations of energy produced from the Dixon Diversion project, it is critical to accurately measure the discharge of the Martin River. The Martin River, which comes off the Dixon Glacier, is a fast moving, cold, and highly turbid river. Upon exiting the glacier, the Martin River quickly enters a canyon characterized by a series of waterfalls and deep canyon walls. Upon exiting the canyon, the river becomes highly braided and remains that way until the reaching tidewater.

Due to its remote nature, highly mobile bed load, and lack of defined channel, the Martin River is a challenge to accurately measure. In the summer of 2023, there was a large field effort to characterize the Martin River. The United States Geological Survey (USGS) installed and operates a stage gage on the Martin River around where it first exits the canyon (USGS 15238951). AEA hired a contractor to install additional stream gages on the Martin River, with the primary gage located at the "Constriction". The contractor performed 10 site visits between April and September to gather discharge measurements. These measurements were used to build a stage-discharge relationship for both gage locations, and from there the daily flow could be estimated over the summer.

A hydrograph was created for the summer 2023 season using a combination of the two established gage sites on the Martin River.

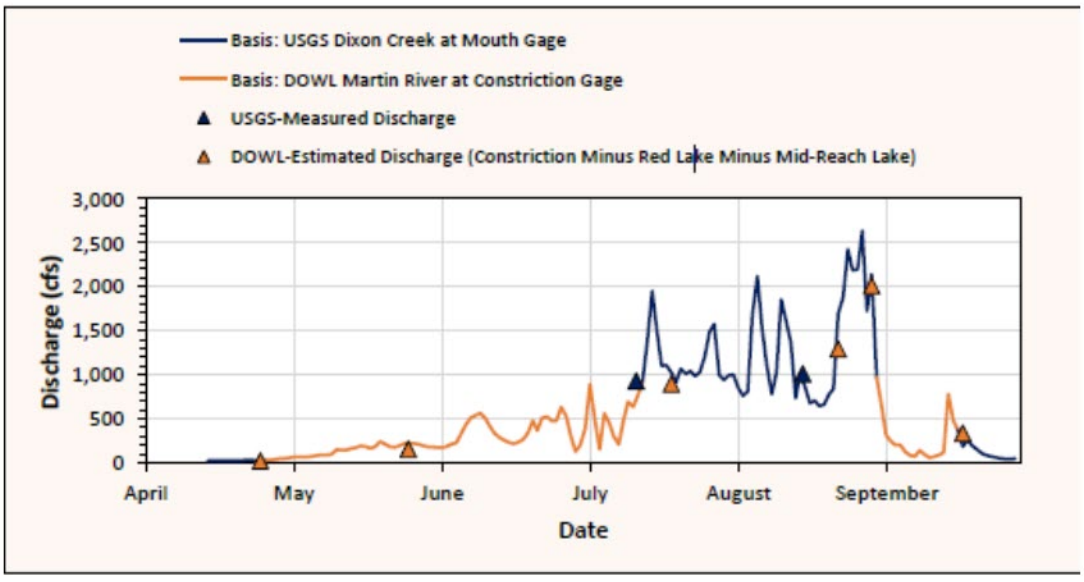


Figure 5: Hydrograph of discharge on Martin River, 2023 Water Year

Although the gage records on Martin River only go back 1 year, a synthetic flow was created by establishing a relationship between stage heights on the Martin River and the Upper Bradley River near Nuka Glacier. The Upper Bradley River at Nuka Glacier USGS gage has a 40-year record, and the Nuka and Dixon glaciers are adjacent and at similar elevations, which allows a fair comparison of discharge in the two basins.

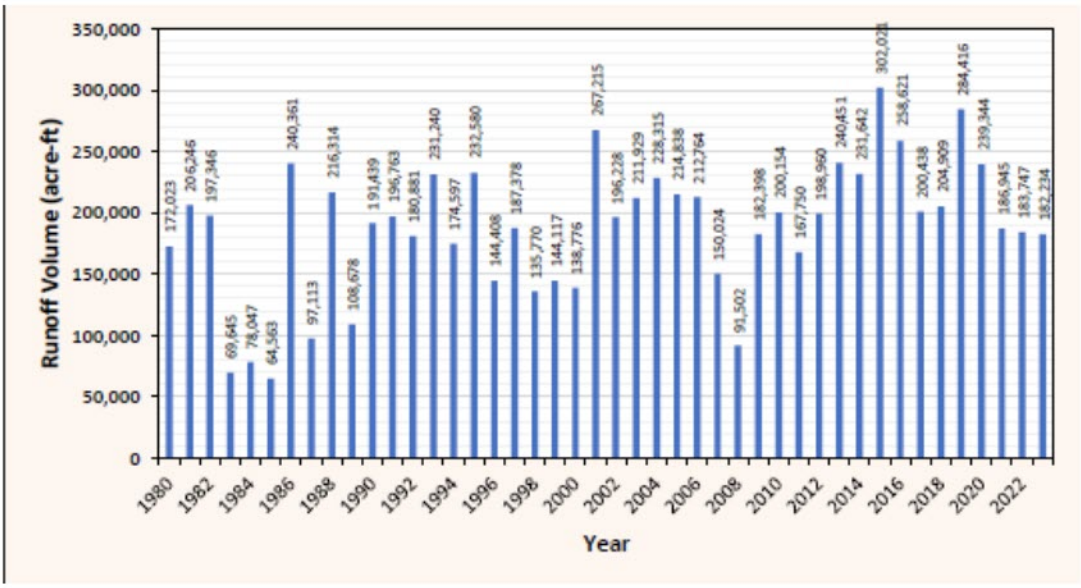


Figure 6: Synthetic 40 year annual runoff volume (acre-ft) from Dixon Glacier

A 10 year average of synthetic flow was used to estimate discharge from the Dixon glacier. This was done to capture the increase in flows from recent years due to higher summer temperatures resulting in an increased contribution of flow from ice melt. It was also assumed that the first 100 cfs of flow would always go downstream to account for future minimum instream flow stipulations. The Dixon Diversion Tunnel will be 14 feet in diameter and has a modeled capacity of 1,400 cfs, so any flood flows in excess of 1,400 cfs were assumed to go downstream on the Martin River rather than divert to Bradley Lake and would not contribute to the energy numbers for the project. Using the 10-year synthetic flow record, 238,500 acre-ft of runoff is predicted annually from the Martin River from rainfall, snow melt, and glacier melt. A majority of this flow will occur in July and August. The minimum instream flow (MIF) will account for 32,100 acre-ft, or 13% of the total runoff. Flood flows will account for 22,200 acre-ft or 10% of the total runoff, leaving 182,800 acre-ft diverted to Bradley Lake. At the Bradley Lake hydroelectric project, the efficiency of the generators gives a conversion of acre-ft to MWh of almost exactly 1:1 (ranges from 0.95-1.05). For modeling purposes, it is assumed a 1:1 ratio and 182,800 acre-ft of diverted water will account for an additional 182,800 MWh of renewable energy generation.

The proposed 14-foot dam raise would increase the capacity of Bradley Lake and raise lake levels which would in turn raise head pressure at the Bradley Lake hydroelectric plant. The increased head pressure will increase efficiency of the two 60 MW generators and account for ~8,000 MWh of electric generation annually. Combining the values of 10-year average annual diverted water with the increased head pressure from a higher reservoir gives an average annual increase in energy from the Dixon Diversion project of 190,800 MWh.

EPA's 2022 eGRID data was used to estimate the greenhouse gas reductions that will result from the Dixon Diversion project. Generation data from the Alaska Railbelt is represented by the AKGD – ASCC Alaska Grid Subregion. As mentioned earlier, electricity produced on the Railbelt is primarily through natural gas fired generators. The eGRID nonbaseload rates will give an accurate representation of CO2e

reductions for projects that displace electricity generation. The eGRID factors consider the differences in baseload generation vs peaking generation, and for the Railbelt eGRID subregion the annual CO2e non-baseload output emission rate is 1,232.508 lb/MWh. Multiplying the AKGD non-baseload output emission rate with the expected energy production from Dixon and converting to metric tons produces a result of 106,668 MTCO2e annual reduction in greenhouse gas produced in Alaska.

3. Environmental Results – Outputs, Outcomes, Performance Measures (30 points)

a. Expected Outputs and Outcomes (10 points)

The Dixon Diversion is a significant expansion of the existing Bradley Lake hydroelectric project. Building off existing renewable energy infrastructure, AEA will achieve significant greenhouse gas reductions from a relatively small footprint. Specific outputs from the Dixon Diversion project include: Diversion dam and intake structure near the toe of Dixon Glacier, 4.7 mile long 14 foot diameter tunnel to convey water from the Dixon Glacier into Bradley Lake, 1 mile of new access road leading to the tunnel outlet, modifications to the existing Bradley Lake dam to raise reservoir level by 14 feet, and new 3-phase power and conduit running from the existing hydroelectric generating facility to the new diversion dam.

The expected outcomes of the Dixon Diversion project are:

1. 190,800 MWh of annual renewable energy generation,
2. A reduction in annual CO2e emissions of 106,668 MTCO2e, and
3. An offset of 1.5 billion cubic feet of natural gas used for electric generation by Railbelt utilities.

This project is the largest renewable energy project in Alaska in over 40 years. Not only will Dixon offset a significant amount of greenhouse gas emissions, it will provide electric utilities operational flexibility since storage hydro can be used at any time during the year. Additionally, Dixon helps the State of Alaska in addressing its impending natural gas supply shortage. All the clean electricity produced by this project will directly offset significantly more expensive electricity that will be produced using imported LNG in the coming years.

b. Performance Measures and Plan (10 points)

The Bradley Lake hydroelectric project is governed by the Bradley Lake Project Management Committee (BPMC) which oversees the planning, execution, and monitoring of the Bradley Lake Project. This committee meets monthly and is responsible for coordinating, budgeting, scheduling, resource allocation, risk management, and stakeholder communication. The BPMC was established following commissioning of the original hydroelectric project in 1982 and consists of AEA and the five Railbelt utilities that purchase power from Bradley Lake. The five utilities are Chugach Electric Association, Golden Valley Electric Association, Homer Electric Association, Matanuska Electric Association, and the City of Seward.

The Bradley Lake Power Sales Agreement (PSA) defines the terms and conditions in which power generated from Bradley is sold and allocated. The PSA outlines in specific terms that AEA sells, and utilities subsequently purchase their percentage share of the project capacity. Each utility submits a Water Year energy budget of expected monthly usage (MWh). Predicted vs Actual inflows to the

reservoir are closely monitored and the Bradley Lake operations committee, containing representatives from each utility, are frequently adjusting energy usage from the project to reflect present-day reservoir conditions.

The coordination of five electric utilities utilizing Bradley Lake for power necessitates the accurate and reliable tracking of lake inflows and power generation. Additional power produced from the Dixon Diversion project would be assumed to be allocated according to the current ownership breakdown. This system is fair and reliable and has produced an equitable distribution of energy offtake for over 40 years.

Future performance measuring and tracking for the Dixon Diversion project would be an AEA responsibility carried out by the BPMC through the Bradley Lake Water Tracking Spreadsheet. Gauges will be installed at the Dixon diversion dam to accurately measure the exact contribution of inflows into Bradley Lake from the Dixon Glacier. Additional energy contributions resulting from the dam raise and higher head pressures can easily be calculated by increased generator efficiency calculations.

In addition to accurate water tracking, the energy produced by the two 60MW turbines at the Bradley Lake hydroelectric plant is closely metered. The Bradley Lake project monitors and tracks all power distributed from the plant and that data is reported to the BPMC.

Total energy output from the Dixon Diversion project will be converted into avoided CO2e emissions offset through EPA's 2022 eGRID conversion factors for the AKGD subregion non-baseload generation. AEA will use the most recent version of this dataset in future years as that data becomes available.

c. Authorities, Implementation Timeline, and Milestones (10 points)

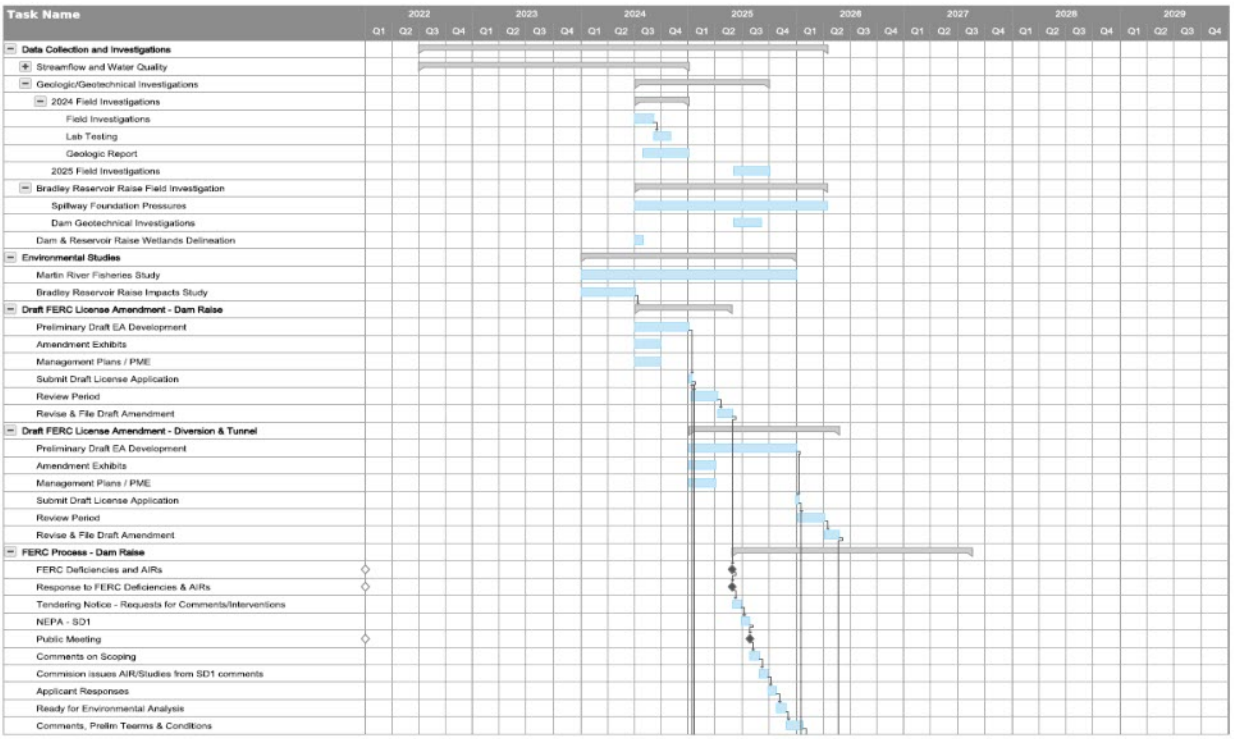
AEA owns the existing Bradley Lake hydroelectric project and will be wholly responsible for managing the Dixon Diversion project and all required reporting to the DOE. AEA will coordinate closely with the members of the BPMC as well as the operations team at Bradley in order for all current and future stakeholders to be well informed of project activities and progress.

AEA is under contract with an engineering firm and an environmental firm to complete preliminary engineering and design work and perform the required environmental studies in preparation for a FERC license amendment. AEA is also closely working and consulting with state and federal resource agencies such as Alaska Department of Fish and Game, United States Fish and Wildlife Service, and the Kenai National Wildlife Refuge to gather feedback and input into AEA's study plans. This ensures that the baseline environmental conditions of the project are fully understood as the project progresses.

AEA will contract with an engineering firm to complete the final design but is also evaluating alternative contract procurement options to expedite project completion such as: Early Contractor Involvement (ECI), Construction Manager at Risk (CMAR), Construction Manager General Contractor (CMGC), or Progressive Design Build (PDB).

A conceptual project schedule is provided below for FERC licensing, engineering, and construction of the Dixon Diversion. Use of alternative contract procurement could expedite the schedule. The conceptual project schedule considered which project components would need to be completed during the spring,

summer, and fall season. Some components, such as procurement and tunneling could be completed year-round.



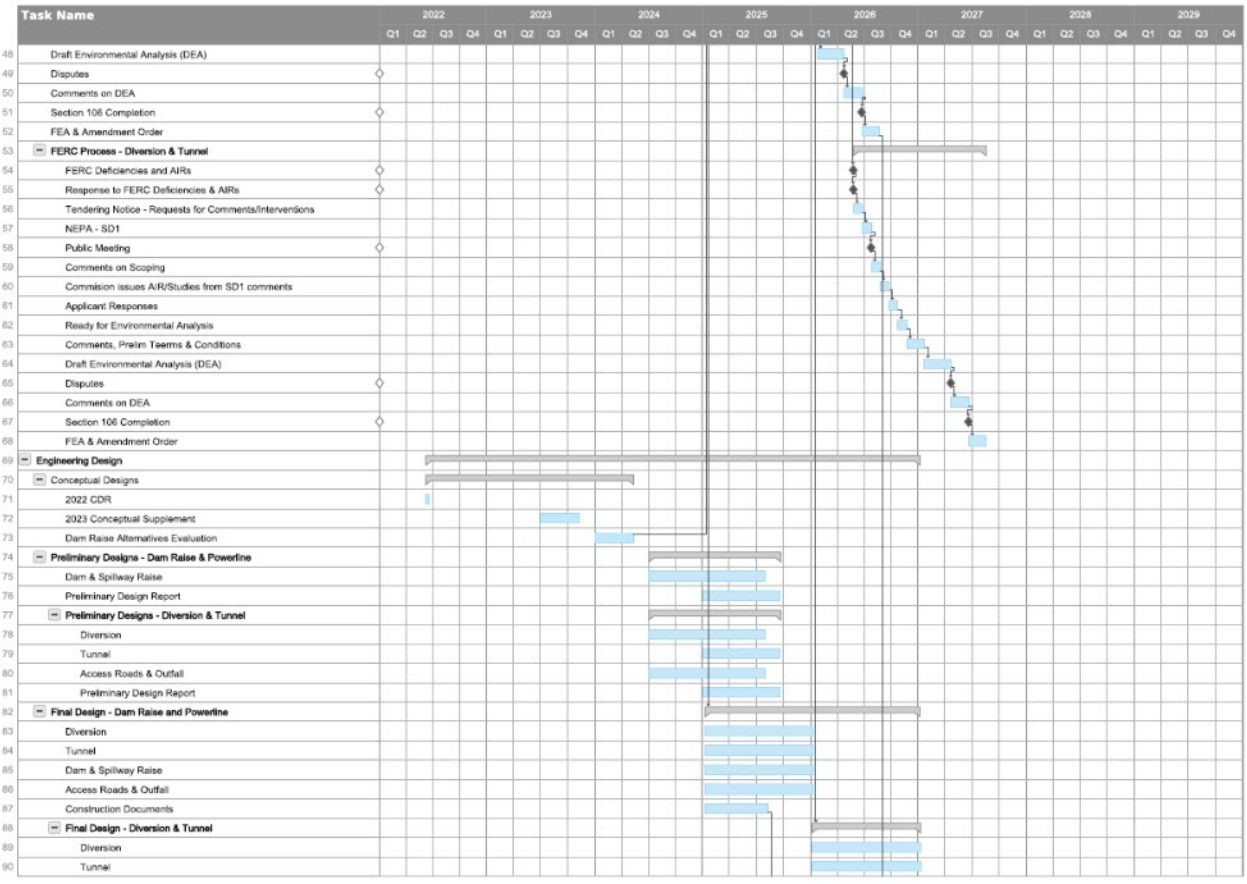


Figure 7: Conceptual Project Schedule

The above schedule outlines major project milestones and tasks along with estimated durations and completion dates. Construction is anticipated to last about 3 seasons, with additional context provided below:

Season 1:

- Project procurement and Notice to Proceed would occur in prior fall season, allowing contractor the winter season to plan, as well as full first season of construction
- Procurement of long lead time components, such as Tunnel Boring Machine (TBM), electrical equipment for the high-voltage system, dam spillway gates, and intake gates at Dixon
- First season of construction would concentrate on installation of the electrical conduits from Bradley Station to Bradley Lake, as well as the access to the downstream portal and portal development. There would be bidding and schedule efficiencies gained if the powerline could be completed in advance of season 1.
- Development and commissioning of workforce housing.
- Initial construction of the Dixon diversion dam and the upstream portal could be developed in the first season but could be delayed until the second season without any delay to the commissioning to the project as it is not a critical path milestone. Access to the upstream portal and diversion dam would be by helicopter until tunnel boring operations are complete.
- Improvements associated with raising Bradley Dam could occur during any of the summer seasons and is not a critical path item; however, the project will see immediate gains in reservoir capacity once this milestone is achieved.

Season 2:

- Development of the downstream started tunnel would take place early in the second year of construction.
- TBM tunneling operations would begin in Season 2 and are foreseen as running through the winter season, operating from the three-phase line power installed in the first season.

Season 3:

- Completion of the TBM operation, dismantling and removal of the TBM, and steel lining of fault sections within tunnel.
- Once the tunnel is completed through the upstream portal, the inlet structure and associated mechanical work can be completed. At this point, it may be possible for diversion access to be through the completed tunnel and eliminate the need for helicopter access. The contractor

would need to consider how the timing of these activities might delay the commissioning of the project.

- Electrical work within the tunnel to bring power and communication to the diversion structure.
- Completion, testing, and commissioning of the project.

4. Low-income and Disadvantaged Communities (35 points)

a. Community Benefit (25 points)

In 2021, Alaska ranked first among U.S states with a per capita energy expenditure of $8,711, amounting to nearly 11.15% of its GDP. This ranking has remained consistent since 2015[1]. The Dixon Diversion project will result in lower energy costs over the long-term and provide resiliency benefits to all customers of the Railbelt – a 700-mile-long stretch of Alaska that serves as the State's economic backbone and is home to approximately three quarters of the state's population. With anticipated increases in natural gas prices of >50% within the next 10 years, the addition of low-cost, reliable, year-round power from storage hydro projects such as Dixon becomes even more critical. The Dixon Diversion project enhances Alaska's energy security by increasing renewable penetration and grid stability, improving resilience to fuel price fluctuations and supply side disruptions, and providing stored energy to regulate other intermittent renewable energy resources. The Railbelt region includes 20 census tracts that are considered disadvantaged with a population of 62,348 and 17 Alaska Native Village Statistical Areas (ANVSA) with a combined population of 160,082 resulting in a total disadvantaged population of 22.430, or 39.6% of the population on the Railbelt[2]. These communities will receive direct benefits from the Dixon Diversion project via lower cost energy generation and improved public health benefits from reduced carbon emissions. Alaska has the third highest per capita energy-related CO2 emissions in the United States[3].

Importantly, the benefits of federal investment in the Railbelt are not limited to those directly connected to the Railbelt grid. AEA manages the Power Cost Equalization (PCE) program, which extends the financial benefits of lower Railbelt electric rates to positively impact over 81,000 residents in 188 remote communities statewide[4]; these rural communities not connected to the Railbelt's electric network will directly benefit from reduced Railbelt rates resulting from utility scale renewable projects such as Dixon. Almost all these remote communities are disadvantaged with extremely high electricity costs; PCE reduces costs in these communities based on a statutory formula tied to Railbelt rates. Using the statutory PCE credit formula, a one-cent reduction in residential electric rates on the Railbelt results in an increased credit to PCE communities estimated to be $1.4 million based on historical usage. This innovative, built-in transfer mechanism demonstrates Alaska's prioritization of equitable benefits sharing

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1 https://www.eia.gov/state/seds/data.php?incfile=/state/seds/sep_sum/html/rank_pr.html&sid=US

2 https://live.laborstats.alaska.gov/data-pages/alaska-population-estimates

3 https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.eia.gov%2Fenvironment%2Femissions%2Fstate%2Fexcel%2Ftable4.xlsx&wdOrigin=BROWSELINK

4 https://www.akenergyauthority.org/Portals/0/Power%20Cost%20Equalization/2024.02.26%20FY23%20PCE%20Statistical%20Report%20by%20Community%20(Final%20Optimzed).pdf?ver=om4p4ZK_A-xwHiFPOHfvDQ%3d%3d

and provides a time-tested means to ensure benefits realized by Railbelt consumers extend to Justice40 communities statewide.

Over 40% of the benefits of this project will impact low-income and disadvantaged communities by lowering the cost of energy, improving health outcomes, and increasing energy resiliency. In addition, with the project expected to lower energy costs over the long-term, the potential for creating induced jobs exists but is not measurable now.

AEA does not anticipate negative effects on these communities from this project; it uses a small footprint that is remotely located, away-from almost all communities and is not expected to adversely impact fish habitat. AEA will solicit feedback from communities to identify any other potential negative impacts.

b. Community Engagement (10 points)

AEA's mission is to reduce the cost of energy in Alaska; and, the Dixon Diversion project delivers on that mission, as well as provides positive environmental and public health benefits. AEA has already conducted several public outreach meetings in accordance with FERC relicensing processes related to the Dixon Diversion project and plans to implement a broader community outreach and engagement program to increase knowledge about the benefits of the project and provide additional opportunities for public input. AEA will partner with local and Tribal governments, community organizations, and utilities to foster meaningful public involvement and provide public outreach.

AEA hosted Joint Agency and public meetings to review the Dixon Diversion project and Proposed Study Plans on May 27, 2022, March 5, 2024, and March 19, 2024. These meetings were posted on AEA's public facing website, listed on the State of Alaska's public meeting notice board, and distributed to the project's email distribution list which includes Tribal Entities, state resource agencies, and various other project stakeholders. AEA plans to conduct additional joint public and agency meetings as the project progresses and develops. These include a 2024 Field season debrief meeting in December 2024, a 2025 pre-Field Season meeting in April 2025, a 2025 Field Season Debrief Meeting in December 2025, and 2-3 public meetings to solicit comments on the Draft Amendment Application submitted to FERC in 2026.

Communication with the public will flow both ways, and outreach will occur at recurring events and in stand-alone community meetings. The community outreach and engagement program will include: public meetings, both in person and virtual; social media posts; updates on AEA's website; participation by AEA in recurring events, such as, Alaska Municipal League Office Hours, Tribal Council meetings, City Council meetings, and Chamber of Commerce lunches; and, participation in more informal settings, such as the Alaska Federation of Natives Convention, Alaska Black Caucus Sunday night Zoom meetings, Alaska State Fair, Alaska Federation of Filipino Americans programming, and energy and environmental conferences held throughout the state. During 2023, AEA staff members participated in dozens of different events throughout the state providing information at exhibitor booths, participating in panel discussion, and presenting on AEA's ongoing projects.

Furthermore, the Dixon Diversion project and its benefits align with another AEA project, the Railbelt Innovation Resiliency Project, which was awarded a grant through the Department of Energy's Grid Resilience and Innovative Partnership Program. Assuming the Dixon Diversion project is funded, similar timelines for these two projects create a synergistic opportunity for community engagement.

5. Job Quality (5 points)

AEA expects new jobs to be created during the project's construction, which will be bid out. AEA is committed to fostering safe, healthy, and inclusive workplaces with equal opportunity, free from harassment and discrimination. Implementing projects that contribute to reducing GHG emissions will consider Good Jobs Principles. Work performed with this funding will be done in compliance with Alaska public contracting law, which contains provisions for local hire, apprenticeship training, prevailing wages and other forward-looking policies. Bidding and contract documents include specific provisions to implement equity-focused policies related to all phases of contracting and construction. The contract provisions address nondiscrimination, equal employment opportunity, reasonable accommodations for employees with disabilities, and non-segregation of facilities.

6. Programmatic Capability and Past Performance (30 points)

a. Past Performance (10 points)

AEA has mature staff and management systems in place to administer awards. AEA has a full suite of qualified individuals and a system of checks and balances. AEA's Finance and Accounting departments manage the fiscal compliance and reporting requirements for grants and sub-awards. Additionally, AEA staffs a grants department that includes a grants manager and a grant coordinator. Internal control procedures are in place for compliance reviews, budgetary controls, invoice approvals, periodic project status and financial reporting. AEA hires an independent audit firm to report on compliance for each major federal program, report on internal control over compliance, and report on the Schedule of Expenditures of Federal Awards required by the Uniform Guidance. AEA's FY2023 Single Audit Report found that the Alaska Energy Authority complied, in all material respects, with the compliance requirements referred to above that could have a direct and material effect on each of its major federal programs for the year ended June 30, 2023. AEA policies and procedures are published on our website, including for Procurement, Governance, Annual Reports, and Audits.

The wide array of current and past programs, and grant management experience, ensures that AEA is appropriately prepared to manage this project, including through a subaward and project delivery and assessment process the following is a small sample of the many awards AEA manages from federal agencies:

Department of Energy (DOE)

Project Title: Preventing Outages and Enhancing the Resilience of the Electric Grid Formula Grant to States
Assistance Agreement No.: DE-GD0000002
CFDA: 81.254

Description: This project is in direct support of Section 40101(d) of the Infrastructure Investment and Jobs Act (i.e., Bipartisan Infrastructure Law (BIL)). The objective of this project is to improve the resilience of the electric grid against disruptive events. Per BIL Section 40101(a)(1), a disruptive event is an event in which operations of the electric grid are disrupted, preventively shut off, or cannot operate safely due to extreme weather, wildfire, or a natural disaster.
Contact: Lucas Greza, Lucas.Greza@netl.doe.gov, (304)285-4663

Denali Commission (DC)

Project Title: 2019 Nikolai Rural Power System Upgrades
Assistance Agreement No.: 01574-00
CFDA No.: 90.100
Description: Design a new power plant in Nikolai, Alaska.
Contact: Katie Conway, kconway@denali.gov (907) 341-9617

United States Department of Agriculture (USDA)

Project Title: Sustainable Wood Energy Systems
Assistance Agreement No.: 19 DG –11100106-811
CFDA: 10.674
Description: Technical assistance aimed at helping communities displace fossil fuels and reduce heating costs through assessing, developing, and maintaining biomass heating and biomass combined heat and power projects in Alaska.
Contact: Priscilla Morris, Priscilla.morris@usda.gov (907) 743-9467

U.S. Department of Defense (DOD)

Project Title: 2022 Black Rapids Training Center Line Extension
Assistance Agreement No.: DOD-HQ00052210045
CFDA: 12.600 (contract 31201)
Description: A 34-mile electrical power line extension to connect the Black Rapids military installation to supply safe, reliable, and efficient grid power.
Contact: Tim Robert timothy.b.robert.civ@mail.mil, (916) 557-7315

Environmental Protection Agency (EPA)

Project Title: 2016-2022 State Clean Diesel Emission Reduction Act
Assistance Agreement No.: DS-01J63901
CFDA: 66.040
Description: Partially fund the replacement of up to twenty-five non-certified and lower tier diesel engines with Tier 2 and 3 marine engines and low PM emitting nonroad engines based on a community prioritization list.
Contact: Lucita Valiere, valiere.lucita@epa.gov (206) 553-8087

In addition to the sample of Federal awards listed above, AEA completed the West Fork Upper Battle Creek Diversion Project in 2020. This project was very similar in nature to the proposed Dixon Diversion project, as it was an expansion of the existing Bradley Lake Hydroelectric Project to divert water from an adjacent glacial basin into the Bradley Lake Reservoir. AEA successfully worked with state resource agencies pre and post project to quantify fish use and habitat in Battle Creek and develop minimum instream flows that have so far proven to increase fish use in Lower Battle Creek. AEA has a track record

from the Battle Creek project of efficiently working with FERC throughout the license amendment process, as well as managing construction contractors in a remote location to complete a large-scale project on time and on budget.

b. Reporting Requirements (10 points)

Department of Energy (DOE) - Project Title: Preventing Outages and Enhancing the Resilience of the Electric Grid Formula Grant to States
DOE requires submission of a project management plan within 90 days of award date and quarterly progress reports during the period of performance. DOE also requires that all projects under this grant adhere to BABA and Davis-Bacon requirements. AEA has met all required outcomes to date.

Denali Commission (DC) - Project Title: 2019 Nikolai RPSU
All progress and financial reporting requirements for this project have been met. The final close out report will be submitted in June 2024.

United States Department of Agriculture (USDA) - Project Title: Sustainable Wood Energy Systems
AEA submitted quarterly progress and financial reports throughout the duration of this grant.

U.S. Department of Defense (DOD) - Project Title: 2022 Black Rapids Training Center Line Extension
AEA has worked cooperatively with the owner agency, Office of Liaison Defense Community Cooperation (OLDCC), and Golden Valley Electric Association (GVEA) to review the conflicts and keep the agency appraised of the revised schedule. AEA submits progress and financial reports through the OLDCC project portal.

Environmental Protection Agency (EPA) - Project Title: 2016-2022 State Clean Diesel Emission Reduction Act
In 2015 AEA received the DERA funds via Reimbursable Services Agreement from Department of Environmental Conservation (DEC) and reported through DEC. Starting in 2016, AEA's relationship was directly with the EPA. AEA's quarterly reporting, both financial and progress reports have always been on time. AEA conducted several site monitors, which have resulted in no findings. For this program, AEA submits a final technical report at the end of each award.

c. Staff Expertise (10 points)

AEA is an independent and public corporation of the State of Alaska, est. 1976. AEA is governed by a board of directors with the mission to "reduce the cost of energy in Alaska." AEA is the State Energy Office and lead agency for statewide energy policy and program development. Whether building modern and code-compliant bulk fuel tank farms, upgrading to high- efficiency generators in rural powerhouse systems or integrating renewable energy projects, AEA emphasizes community-based project management. AEA's core programs work to diversify Alaska's energy portfolio, lead energy planning and policy, invest in Alaska's energy infrastructure and provide rural Alaska with technical and community assistance.

AEA has over 25 professionals on staff, including engineers, planners, project developers, project managers, accountants and finance officers, and policy analysts. As the state's designated energy office, AEA has managed hundreds of millions of dollars in federal, state, and private funds to plan and build infrastructure in urban and rural Alaska. AEA's building is located conveniently in Anchorage with adequate technology, spacing, and facilitation equipment. AEA has capabilities for video conferencing, hosting meetings, and a team for procuring services and materials.

Collectively, AEA staff have worked with nearly every community in the state to deliver critical supply and demand energy services. Likewise, AEA staff are networked to the vast array of Alaska energy stakeholders from small rural non-profits and utilities to large regional Alaska Native Corporations and tribal organizations, and from conservation organizations to technology- or solution-oriented working groups. AEA's capacity to conceptualize, implement, and successfully complete supply and demand energy projects through an outcomes-focused process positions the agency well to lead a coordinated joint team that will overcome barriers to implement the Whitter Shore Power project.

AEA has the experience, expertise, equipment, and staff ready to achieve the project objectives set out in this application. AEA has a whole team of staff specifically designated for grants, compliance, procurement, contracting, and finance. Each of these teams has adequate resources to ensure the project is on budget and on schedule.

AEA is engaged in all levels of consumer energy including project and resource identification, design and permitting, and financing and construction. Over decades of experience developing energy projects in Alaska, AEA has continuously improved on process, application of technology and delivery of service. AEA integrates energy technology and advances in grid services into all program areas both on the supply- and demand-side.

AEA, as owner of significant generation and transmission assets in the Railbelt region of Alaska, and in furtherance of its mission to reduce the cost of energy in the State, plays an important role in ensuring that sound public policy and energy planning initiatives within the region maximize the potential benefits to the broadest group of stakeholders. Without a specific certificated area, and as owners of assets which cross multiple jurisdictional boundaries, AEA is uniquely positioned to facilitate discussions amongst stakeholder groups and find solutions for the region in its entirety. AEA does so through its leadership role on the management committees associated with its assets.

AEA also manages the Renewable Energy Fund, the Emerging Energy Technology Fund, the Power Cost Equalization Program and various Energy Efficiency and Conservation Programs.

AEA provides grants and loans for qualified energy infrastructure projects and owns energy infrastructure for the benefit of Alaskans. AEA has the legal authority to enter into a financial assistance relationship with U.S. Department of Energy as discussed in this application. Additionally, as a state agency, AEA produces an annual report to the Governor, yearly federal single audit, and financial statements.

The Alaska Energy Authority (AEA) has mature staff and management systems in place to administer this award. Per the organizational chart, we have a full suite of highly qualified individuals and a system of

checks and balances in place. AEA's financial and project management capabilities are demonstrated in our yearly audit and financial report, located on our website. https://www.akenergyauthority.org/Who-We-Are/Newsroom/Publications-and-Resources

AEA has successfully managed, completed and closed well over 300 grants in the last decade from many different agencies as well as private funds from the Volkswagen Settlement and Wells Fargo.

7. Budget (45 points)

Total funding request for the Dixon Diversion project is $348,415,151. Detailed Budget Narrative and Budget Spreadsheet are included as an attachment to this application.

Budget Attachments:

- Budget_AlaskaEnergyAuthority.pdf
- Budgetcalcs_AlaskaEnergyAuthority.xlsx

NOTE: USE OF THIS EXAMPLE COVER PAGE IS OPTIONAL. IF THIS INFORMATION IS PROVIDED IN A DIFFERENT FORMAT, EPA WILL NOT REVIEW AN APPLICATION UNFAVORABLY.

CPRG IMPLEMENTATION GRANTS COMPETITION
COVER PAGE FOR APPLICATION

APPLICANT INFORMATION

Organization	Alaska Energy Authority
Primary Contact Name	Curtis Thayer
Phone Number	(907)771-3009
Email Address	cthayer@akenergyauthority.org

TYPE OF APPLICATION ☑ Individual Applicant ☐ Lead Applicant for a Coalition

If lead applicant for a coalition, provide a list of the coalition members below.

FUNDING REQUESTED: *Provide total EPA CPRG Implementation Grant funding requested.*

$ 348,415,151

APPLICATION TITLE: *Provide the title of your proposed project.*

Dixon Diversion Project

BRIEF DESCRIPTION OF GHG MEASURES: *Describe each GHG reduction measure contained in the application (1-2 sentences each).*

The Dixon Diversion Project is a significant expansion of the Alaska Energy Authority (AEA)-owned Bradley Lake Hydroelectric Project. This project will divert water from the Dixon Glacier through a diversion dam and 4.7-mile tunnel into the existing Bradley Lake Reservoir; increasing energy output from the hydroelectric facility by 190,800 MWh/year, displacing 1.6 bcf/year of natural gas, and reducing greenhouse gas emissions by 106,668 MTCO2e annually.

SECTORS: *Identify the sector(s) associated with the GHG reduction measures included in the application.*

- [ ] Industry
- [x] Electricity Generation
- [ ] Transportation
- [ ] Other (please describe)
- [ ] Commercial and Residential Buildings
- [ ] Agriculture/Natural and Working Lands
- [ ] Waste and Materials Management

EXPECTED TOTAL CUMULATIVE GHG EMISSION REDUCTIONS

For all proposed measures combined, provide the estimated cumulative GHG reductions:

Estimated cumulative GHG reductions for 2025-2030 (in metric tons)

106,668

Estimated cumulative GHG reductions from 2025-2050 (in metric tons)

2,666,701

LOCATIONS: *List the primary location(s) where the proposed measures will be implemented*

City 27 miles Northwest of Homer, Alaska

State; Territory; Federally recognized Tribe Alaska

APPLICABLE PRIORITY CLIMATE ACTION PLAN(S) (PCAP) ON WHICH MEASURES ARE BASED

PCAP Lead Organization(s): Alaska Department of Environmetal Conservation

PCAP Title(s): State of Alaska Priority Sustainable Energy Action Plan

PCAP Website link(s) (if applicable): https://akfederalfunding.org/cprg

List of GHG reduction measures and PCAP page reference for each measure:

E. Electric Generation - Dixon Diversion Project - Page 42-44

7. Budget (45 points)

a. Budget Detail (20 points)

The Dixon Diversion project budget is grounded in a class 4/5 Opinion of Probable Construction Cost (OPCC) developed by a certified cost and constructability consultant, using Association for the Advancement of Cost Engineering (AACE) guidelines. The OPCC contains all project elements including the Intake and Diversion at Dixon Glacier, a 14-foot diameter / 4.7-mile-long tunnel, a ~1-mile-long new access road to the downstream portal, and high-voltage 3-phase electrical service from Bradley Hydro Station to the downstream access portal. Project funds will be expended within the 5-year period of performance, and a year-by-year breakdown can be found in the attached Budget Notebook. Subtotals and descriptions for individual budget categories are as follows.

Personnel - $3,010,185

Direct personnel costs include all AEA staff time associated with managing and supporting this project over the 5-year period of performance. The AEA Infrastructure Engineer will be the primary project manager with a direct rate of $67.37/hr, yearly salary of $115,186, and fully dedicated to the project at 1950 hours per year or 1 Full Time Equivalent (FTE). This position will be supported by an additional Infrastructure Engineer at 0.5FTE and directly supervised by AEA Owned Assets Director ($114.33/hr, $182,656/yr, 0.5FTE)

This project will require extensive support from AEA's Procurement Department, and AEA has budgeted for 2 Contracting Officers each at 585 hrs/year, $54.09/hr and $91,280 yearly salary. AEA anticipates extensive communication with stakeholders, the public, Alaska Native Villages, and low-income and disadvantaged communities and as such has budgeted time for AEA's Communication Director to develop presentation materials and conduct outreach. This has been estimated at 585hrs/year at $75.13/hr or $126,789 yearly salary.

Additional AEA positions that will be involved with this project in supporting roles include AEA's Executive Director ($127.84/hr, $209,966 salary, .2FTE), Director of Planning ($73.74/hr, $124,449 salary, .25FTE), Legal Counsel ($111.97/hr, $183,922 salary, 0.2FTE), and a Geographic Information System (GIS) Program Manager ($53.96/hr, $91,062 salary, 0.1FTE).

All the above rates are from AEA's 2023 employee rate table with an annual escalation of 4% applied to account for cost-of-living increases and inflation.

Fringe Benefits - $1,492,121

Fringe rates were provided by AEA's HR department and are calculated on a position-by-position basis. These fringe rates are specified on the attached Budget Table and range from 43.61% - 56.93% for the AEA positions that will be directly involved with this project and listed above. Benefits include Health Insurance (10%), Public Employees Retirement System (25.1%), Supplemental Benefits System (6.13%),

Medicare (1.45%), Workers Compensation (0.68%), and Unemployment (0.40%). The benefits including sick leave and vacation vary by position type and tier under which the staff person was hired.

Travel - $245,360

Travel is budgeted under this category for AEA personnel to the jobsite during project development and construction. Travel will be conducted primarily by AEA Infrastructure Engineer / PM and support staff. Roundtrip flights to Homer are budgeted for $600 and chartered flights from Anchorage to Bradley are budgeted for $6000. AEA expects to perform site visits every ~6 weeks, adjusted seasonally with more flights occurring during summer months.

Equipment - $80,000

AEA has budgeted $80,000 for office setup costs necessary for additional staff to be brought on for this project.

Supplies - $200,000

AEA has budgeted $40,000/year for miscellaneous supplies and equipment, based off historical and previous experience.

Contractual - $304,920,587

A majority of total direct project costs will be competitively bid contractual awards. These contracts may be awarded to a single entity, or multiple entities depending on the procurement method selected. Contract activities are estimated and described based off the following categories.

Mobilization - $18,046,901 – Includes mobilization and demobilization costs at the remote Bradley Lake site for 3 construction seasons. Access to the jobsite is only by small aircraft or barge. Barges are only available to land during very high tides. Costs also include surveying and staking, contractor housing and temporary facilities.

Site Development and Access - $1,639,477 – Includes improvements to existing roadways and airstrip at the Bradley Lake Project to handle the increase in traffic due to year-round construction operations. Cost category also includes clearing, grubbing, and establishing equipment staging areas.

Electrical Upgrades - $18,892,488 – Electrical upgrades associated with this project include running 3 phase power from the Bradley Lake Plant to the Bradley dam and entrance to the tunnel. The conduit will be underground and adjacent to the existing roadway. The tunnel boring machine can be powered from clean energy generated at Bradley or from diesel; however, it was determined that the environmental risks associated with transporting and storing those quantities of diesel were unacceptable. The 3 phase power will follow the TBM as it bores uphill from the tunnel exit to the diversion dam and intake structure. A new electrical conduit and conductor will be installed in the tunnel crown and be available to remotely operate gates at the diversion. This cost category also includes modification to the Bradley Lake substation to handle the increased power that will be generated at the facility.

Tunnel Construction - $128,307,072 – Tunnel construction is the largest contractual cost for this project. The tunnel will be constructed with a 14-foot diameter Tunnel boring Machine (TBM) and will be 4.7 miles long. Selected contractor will purchase a refurbished TBM, ship to Alaska, and reassemble onsite. Before tunneling can occur, a ~1 mile spur road will be constructed from the Battle Creek access road to the tunnel outlet portal. A starter tunnel will be constructed using drill and blast methods for 300feet, and then the TBM will enter the tunnel and drill uphill to the location of the diversion dam and intake. Tunneling rates of penetration have been estimated based on previous tunneling operations in 1991 during the original Bradley Project construction and averaged 104 feet/day. Based on surface geology, similar rock types are expected in this region. Geologic investigative drilling will take place in the summer of 2024 to further refine the understanding of the geology along the proposed tunnel route.

Diversion Dam and Intake Structure - $12,159,728 – The Diversion Dam and intake structure will be designed similarly to the Battle Creek diversion dam completed in 2020. The diversion dam location is extremely remote and only accessible by helicopter, driving up transportation costs. Upon completion, access to the diversion will also be available through the tunnel. Costs include site improvements at the toe of the Dixon Glacier, temporary diversion of the Martin River during construction, tunnel intake gates and water control, tunnel intake concrete, diversion dam gates and water control, diversion dam concrete, trash racks, and a support building at the diversion dam for project construction and long-term equipment storage.

Bradley Dam Raise - $26,901,055 – A 14-foot dam raise is proposed through modifications to the existing Bradley Lake Dam. To accomplish this dam raise the existing crest and parapet wall will be demolished, additional rock fill will be added to the downstream shell, a new concrete face will be provided upstream of the raised embankment that will be structurally connected to the existing face, and a new concrete parapet wall and access road will be constructed across the crest similar to the existing arrangement. An Obermeyer gate will be added to the spillway crest to provide additional storage and operational flexibility. This will allow the reservoir full pool to raise 14 feet while still providing hydraulic control down to the fixed crest of the spillway. Concrete costs will be the main driver for the dam raise and have been estimated at $3,062.50/CY to account for sourcing, transporting, and storing at a remote Alaskan jobsite.

SCADA and Instrumentation - $359,720 – This category includes all the instrumentation, electrical, and controls for the diversion dam and new Obermeyer gate at the Bardley Lake dam.

Site Restoration - $244,338 – Revegetation of staging and construction areas, post project completion.

Unlisted Items - $14,458,555 – Unlisted items have been estimated at 7% of developed contractor Direct Costs, in accordance with the AACE Class 4/5 Engineer's Estimate Guidelines.

Bonds and Insurance - $9,088,234 – Bonds and Insurance have been estimated at 4.1% of developed contractor Direct Costs.

Escalation - $13,838,902 – Escalation from 2024 dollars to midpoint of construction.

Contingency - $60,984,117 – A design and post-award contingency of 25% has been included in the OPCC

Other - $36,890,571

Other costs include $7.5MM for FERC licensing, $5MM for geologic and hydrologic studies, $12.2MM for Feasibility and Final Design, and $12.2MM for Construction Administration.

Total Direct Costs - $346,838,825

Indirect Costs - $1,576,326

AEA is currently in negotiations with the Department of Interior to develop a FY2024 Negotiated Indirect Cost Rate Agreement (NICRA) in accordance with 2 CFR, Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards. AEA will seek approval of the NICRA from AEA's cognizant agency and intends to utilize the FY2024 NICRA for all federal awards received in the current fiscal year. AEA's provisional NICRA is 31.86%. Indirect costs were determined using an indirect rate of 31.86% applied to AEA direct personnel costs, fringe costs, supplies, and travel. If the rate has not been finalized at the time of award, AEA will use the 10% de Minimis rile allowed under 2 Code of Federal Regulation (CFR) 200.41(f) until the NICRA has been finalized.

Total Funding - $348,415,151

b. Expenditure of Awarded Funds (15 points)

AEA has developed a project budget and schedule that is reasonable and achievable within a 5-year period of performance. This plan is grounded in previous AEA and contractor experience through FERC license amendments processes, industry standard cost and schedule development, high quality preliminary engineering and design, and extensive site visits to characterize the project.

Most project funds will be spent through contracted work including environmental studies, engineering and design, tunnel construction, diversion dam construction, and the Bradley Dam raise. AEA has extensive experience in issuing and managing contracts to complete this type of work and successfully managed the Battle Creek Diversion project. AEA's procurement team will issue contracts that include specific deliverables with expenditures linked to milestones and associated completion dates. AEA will reimburse based on completion of specific deliverables and contracts will be written to ensure compliance with the CPRG objectives and timelines. AEA will regularly assess the contractor's performance against the timeline and milestones and adjust the plan accordingly to ensure timely completion.

AEA uses a financial management system that allows for tracking of expenditures and comparison to budgets and will meet regularly with the project team to assess progress. AEA has a lead accountant on staff responsible for the Bradley Lake project.

All contracts associated with this project will be competitively bid on and awarded to contractors that will deliver expected results within the schedule and budget proposed.

c. Reasonableness of Costs (10 points)

The Dixon Diversion Opinion of Probably Construction Cost (OPCC) estimate was developed by a certified Cost and Constructability consultant. The OPCC was developed using the project's current preliminary design for the Dixon Diversion to validate total project construction costs. The cost basis includes Alaska prevailing wage rates and equipment rates developed by the US Army Corps of Engineers and adjusted for site conditions, including rock engagement and current fuel cost. Construction quantities were developed by AEA's engineering contractor.

This OPCC is intended to predict cost within the range of probable bids for construction, A contractor's Indirect Costs of 15%, markup of 15%, and bond and insurance cost of 4.1% were added to developed contractor Direct Costs. A design and post-award construction contingency of 25% has been included in the OPCC. The developed expected construction cost includes the cost of FERC licensing, geologic and hydrologic studies, feasibility design, final design, and construction administration.

The cost estimate has been developed using the Association for the Advancement of Cost Engineering (AACE) Guidelines, Class 4/5 Cost Estimate, as is appropriate for a preliminary design. The cost estimate includes production detail or "bottom up" costing approach where sufficient detail is provided, while other costs are derived from bid results of the recent analog Battle Creek project that was completed in 2020 and adjusted for inflation.

This cost estimate reflects the preliminary design by AEA's engineering contractor. Costs are based on 2023 costs with escalation from NTP to the midpoint of construction.

Labor rates used in this cost estimate were based on prevailing wage rates for this region as currently established by the US Department of Labor. Additionally, a travel allowance was applied to each category to account for the remote nature of the work. While it is recognized that camp facilities will be provided for craft labor; the travel allowance would be an incentive for qualified workers and contractor's key individuals to work at this remote site and remain on the project throughout the season. Work hours and overtime factors reflect a 60-hour, 6-day workweek.

Equipment rates were derived from the established US Army Corps of Engineers hourly rates with an upwards adjustment to accommodate for rock (high wear) conditions for some machinery on this project, as well as increased fuel and maintenance costs associated with the remote location.

Contractor's site management and overhead expenses were calculated at 15% of other direct costs. A Contractor's general overhead and profit rate of 15% was used, as well as 4.1% for bonds and insurance. An allowance of 7% of construction costs was included for unlisted items to reflect project components that are not yet developed at this level of design.

The cost presented in this analysis anticipates all work being completed under a single construction contract. However, AEA has not ruled out awarding the various components under multiple contracts to attract more bidders and increase competition.

Introduction:

This Excel Spreadsheet is provided to aid Climate Pollution Reduction Grant implementation grant applicants in developing the required budget table(s) within the budget narrative. Applicants may submit a budget spreadsheet (no page limit) with their application.

The individual worksheets are formatted for 1 page width of 8.5" x 11" landscape orientation.

Instructions:

The template contains 5 tabs (titled "Measure 1 Budget" through "Measure 5 Budget") where applicants can create budgets for up to 5 discrete GHG measures contained in their application. Applicants should leave excess tabs blank (ie, if an application is for a single GHG measure, only Tab 1 should contain any numerical entries.) The Consolidated Budget tab will automatically sum budget totals across all GHG measure Tabs. If an application includes more than 5 GHG measures, users may add duplicate tabs, but will need to manually update the formulas contained on the Consolidated Budget tab.

Measure Tab Instructions:

Below is a description of the steps an applicant should complete to finish each measure tab of the template.

- **In column C,** provide itemized costs descriptions in each cost category. Insert or delete rows as needed.

- **In columns D through H,** fill in the cost for the line item per year - personnel, fringe benefits, travel, equipment, installation, or labor supplies, contractual costs, and other direct costs (i.e., subawards, participant support costs), and indirect costs for each applicable year. Subtotals will calculate automatically.

- **Column J** will automatically calculate the total cost for the line item for the entire measure, including subtotals for each budget category - personnel, fringe benefits, travel, equipment, installation, or labor supplies, contractual costs, and other direct costs (i.e., subawards, participant support costs), and indirect costs.

Please check all formulas and calculations before finalizing your budget tables.

Consolidated Budget Instructions:

This table will update automatically based on the budget detail entered in the tabs for measures 1-5. If your application includes more than 5 individual measures, you will need to add additional tabs, update the formulas below, and add additional lines to the "Budget by Project" table to include the additional measures.

Consolidated Budget Table

This table will update automatically based on the budget detail entered in the tabs for measures 1-5. If your application includes more than 5 individual measures, you will need to add additional tabs, update the formulas below, and add additional lines to the "Budget by Project" table to

BUDGET BY YEAR								
COST-TYPE	**CATEGORY**	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**		**TOTAL**
Direct Costs	TOTAL PERSONNEL	#REF!	#REF!	#REF!	#REF!	#REF!		#REF!
	TOTAL FRINGE BENEFITS	#REF!	#REF!	#REF!	#REF!	#REF!		#REF!
	TOTAL TRAVEL	#REF!	#REF!	#REF!	#REF!	#REF!		#REF!
	TOTAL EQUIPMENT	#REF!	#REF!	#REF!	#REF!	#REF!		#REF!
	TOTAL SUPPLIES	#REF!	#REF!	#REF!	#REF!	#REF!		#REF!
	TOTAL CONTRACTUAL	#REF!	#REF!	#REF!	#REF!	#REF!		#REF!
	TOTAL OTHER	#REF!	#REF!	#REF!	#REF!	#REF!		#REF!
	TOTAL DIRECT	#REF!	#REF!	#REF!	#REF!	#REF!		#REF!
	TOTAL INDIRECT	#REF!	#REF!	#REF!	#REF!	#REF!		#REF!
TOTAL FUNDING		**#REF!**	**#REF!**	**#REF!**	**#REF!**	**#REF!**		**#REF!**

BUDGET BY PROJECT			
Project Number	**Project Name**	**Total Cost**	**% of Total**
1	*Name 1*	*$348,415,151*	*#REF!*
2	*Name 2*	*#REF!*	*#REF!*
3	*Name 3*	*#REF!*	*#REF!*
4	*Name 4*	*#REF!*	*#REF!*
5	*Name 5*	*$0*	*#REF!*
Total		*#REF!*	*#REF!*

Detailed Budget Table

This Excel Workbook is provided to aid applicants in developing the required budget table(s) within the budget narrative.

BUDGET BY YEAR								
COST-TYPE	**CATEGORY**	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**		**TOTAL**
Direct Costs	**Personnel**							
	Contracting Officer @585hrs/yr	*$31,643*	*$32,908*	*$34,225*	*$35,594*	*$37,017*		*$171,387*
	Contracting Officer @585 hrs/yr	*$31,643*	*$32,908*	*$34,225*	*$35,594*	*$37,017*		*$171,387*
	Executive Director @390hrs/yr	*$49,858*	*$51,852*	*$53,926*	*$56,083*	*$58,326*		*$270,045*
	Communications Director @585hrs/yr	*$43,951*	*$45,709*	*$47,537*	*$49,439*	*$51,417*		*$238,053*
	Owned Assets Director @975hrs/yr	*$111,472*	*$115,931*	*$120,568*	*$125,391*	*$130,406*		*$603,767*
	Infrastructure Engineer @1950hrs/yr	*$131,372*	*$136,626*	*$142,091*	*$147,775*	*$153,686*		*$711,550*
	Infrastructure Engineer @975hrs/yr	*$65,686*	*$68,313*	*$71,046*	*$73,888*	*$76,843*		*$355,775*
	Director of Planning @487.5hrs/yr	*$35,948*	*$37,386*	*$38,882*	*$40,437*	*$42,054*		*$194,707*
	General Counsel @390 hrs/yr	*$43,668*	*$45,415*	*$47,232*	*$49,121*	*$51,086*		*$236,522*
	GIS Program Manager @195 hrs/yr	*$10,522*	*$10,943*	*$11,381*	*$11,836*	*$12,309*		*$56,992*
	TOTAL PERSONNEL	*$555,762*	*$577,992*	*$601,112*	*$625,156*	*$650,163*		*$3,010,185*
	Fringe Benefits							
	Contracting Officer @56.93%	*$18,014*	*$18,735*	*$19,484*	*$20,263*	*$21,074*		*$97,571*
	Contracting Officer @56.93%	*$18,014*	*$18,735*	*$19,484*	*$20,263*	*$21,074*		*$97,571*
	Executive Director @43.61%	*$21,743*	*$22,613*	*$23,517*	*$24,458*	*$25,436*		*$117,767*
	Communications Director @50.33%	*$22,121*	*$23,005*	*$23,926*	*$24,883*	*$25,878*		*$119,812*
	Owned Assets Director @45.14%	*$50,318*	*$52,331*	*$54,424*	*$56,601*	*$58,865*		*$272,540*
	Infrastructure Engineer @52.04%	*$68,366*	*$71,100*	*$73,944*	*$76,902*	*$79,978*		*$370,291*
	Infrastructure Engineer @52.04%	*$34,183*	*$35,550*	*$36,972*	*$38,451*	*$39,989*		*$185,145*
	Director of Planning @50.65%	*$18,208*	*$18,936*	*$19,694*	*$20,481*	*$21,301*		*$98,619*
	General Counsel @43.61%	*$19,044*	*$19,805*	*$20,598*	*$21,422*	*$22,278*		*$103,147*
	GIS Specialist @52.04	*$5,476*	*$5,695*	*$5,923*	*$6,159*	*$6,406*		*$29,658*
	TOTAL FRINGE BENEFITS	*$275,486*	*$286,505*	*$297,966*	*$309,884*	*$322,280*	0	*$1,492,121*
	Travel							
	AEA Project Manager RT site visits to Homer and chartered flights to Bradley from ANC	*$39,160*	*$39,160*	*$55,680*	*$55,680*	*$55,680*		*$245,360*
	TOTAL TRAVEL	*$39,160*	*$39,160*	*$55,680*	*$55,680*	*$55,680*		*$245,360*
	Equipment							
	New Staff Office Setup	*$80,000*	*$0*	*$0*	*$0*	*$0*		*$80,000*

	TOTAL EQUIPMENT	$80,000	$0	$0	$0	$0	$80,000
	Supplies						
	Misc. Supplies	$40,000	$40,000	$40,000	$40,000	$40,000	$200,000
	TOTAL SUPPLIES	$40,000	$40,000	$40,000	$40,000	$40,000	$200,000
	Contractual						
	Mobilization (3 construction seasons, temporary housing)			$13,190,679	$2,428,111	$2,428,111	$18,046,901
	Site Development and Access (clearing and grubbing, airstrip improvements)			$1,639,477			$1,639,477
	Electrical Upgrades (3 phase power install to run Tunnel Boring Machine (TBM))			$18,892,488			$18,892,488
	Tunnel Construction (Access road, TBM mob and setup, 4.7 mile/14ft tunnel drill)			$2,222,715	$94,563,268	$31,521,089	$128,307,072
	Diversion Dam and Intake Structure			$9,194,501	$1,507,891	$1,457,336	$12,159,728
	Bradley Dam Raise (14 feet)			$26,901,055			$26,901,055
	SCADA and Instrumentation					$359,720	$359,720
	Site Restoration					$244,338	$244,338
	Unlisted Items @7%	$0	$0	$5,042,864	$6,894,949	$2,520,742	$14,458,555
	Bonds and Insurance @4.4%	$0	$0	$3,169,800	$4,333,968	$1,584,466	$9,088,234
	Escalation to construction midpoint @6%	$0	$0	$4,826,741	$6,599,451	$2,412,710	$13,838,902
	Contingengy @25%	$0	$0	$21,270,080	$29,081,909	$10,632,128	$60,984,117
	TOTAL CONTRACTUAL	$0	$0	$106,350,401	$145,409,547	$53,160,639	$304,920,587
	OTHER						
	FERC Licensing		$7,500,000				$7,500,000
	Geologic and Hydrology Studies	$5,000,000					$5,000,000
	Feasibility Design	$6,096,874					$6,096,874
	Final Design		$6,096,874				$6,096,874
	Construction Administration	$0	$0	$4,254,016	$5,816,382	$2,126,426	$12,196,823
	TOTAL OTHER	$11,096,874	$13,596,874	$4,254,016	$5,816,382	$2,126,426	$36,890,571
	TOTAL DIRECT	$12,087,282	$14,540,532	$111,599,174	$152,256,650	$56,355,187	$346,838,825
Indirect Costs	**Indirect Costs**						

	Indirect Rate of 31.86% (calculated in direct personell, fringe, travel, and supplies)	*$290,055.90*	*$300,649.32*	*$316,929.75*	*$328,387.59*	*$340,303.75*	*$1,576,326*
							$0
	TOTAL INDIRECT	*$290,056*	*$300,649*	*$316,930*	*$328,388*	*$340,304*	*$1,576,326*
TOTAL FUNDING		***$12,377,338***	***$14,841,181***	***$111,916,104***	***$152,585,037***	***$56,695,491***	***$348,415,151***

a. Magnitude of GHG Reductions from 2025-2030 (20 points)

The Dixon Diversion project is scheduled to be completed and commissioned by early 2030. This will capture a full water year in 2030 and associated greenhouse gas reductions from that water. In these systems water typically starts flowing in late April / early May. A minimum instream flow (MIF) will be established through the FERC licensing process, and once flows exceed the MIF, excess water will be diverted through the Dison Diversion tunnel into Bradley Lake. The water year typically ends in late October / early November once temperatures consistently drop below freezing and there is not enough flow to divert water anymore. The project is expected to be commissioned before spring break-up so the magnitude of greenhouse gas reductions from 2025-2030 would be equivalent to the energy produced from a full water year.

Based on synthetic flows of the Martin River averaged over the previous decade, accounting for expected minimum instream flow requirements and the capacity of the 14-foot diameter diversion tunnel, the Dixon Diversion project will produce 190,800 MWh of electricity annually.

EPA's 2022 eGRID conversion factor for the Alaska Railbelt (AKGD – ASCC Alaska Grid subregion) nonbaseload rates gives an accurate estimation of CO2e reductions for projects that displace electricity generation. For the Railbelt the eGRID subregion annual CO2e non-baseload output emission rate is 1,232.508 lb/MWh.

$$190{,}800\ MWh \times 1{,}232.508\ \frac{lb\ CO2e}{MWh} \times\ \frac{1\ MT}{2204.62\ lb} = 106{,}668\ MT\ CO2e$$

Magnitude of GHG Reductions from 2025-2030 = 106,668 MTCO2e

b. Magnitude of GHG Reductions from 2025-2050 (10 points)

To estimate the magnitude of GHG Reductions from 2025-2050, the same annual energy output from Dixon will be used over a 25-year period. It is likely that the energy numbers over this period could be even higher, due to an observable trend of higher flows in recent years due to warmer summers melting the source glaciers at a faster rate.

$$106{,}668\ MTCO2e\ \times 25\ years\ =\ 2{,}666{,}701\ MTCO2e$$

c. Documentation of GHG Reduction Assumptions (15 points)

Annual greenhouse gas reductions resulting from the Dixon Diversion project are calculated from offsets of expected energy production from the hydroelectric project. To develop estimations of energy produced from the Dixon Diversion project, it is critical to accurately measure the discharge of the Martin River. The Martin River, which comes off the Dixon Glacier, is a fast moving, cold, and highly turbid river. Upon exiting the glacier, the Martin River quickly enters a canyon characterized by a series of waterfalls and deep canyon walls. Upon exiting the canyon, the river becomes highly braided and remains that way until the reaching tidewater.

Due to its remote nature, highly mobile bed load, and lack of defined channel, the Martin River is a challenge to accurately measure. In the summer of 2023, there was a large field effort to characterize the Martin River. The United States Geological Survey (USGS) installed and operates a stage gage on the Martin River around where it first exits the canyon (USGS 15238951). AEA hired a contractor to install additional stream gages on the Martin River, with the primary gage located at the "Constriction". The contractor performed 10 site visits between April and September to gather discharge measurements. These measurements were used to build a stage-discharge relationship for both gage locations, and from there the daily flow could be estimated over the summer.

A hydrograph was created for the summer 2023 season using a combination of the two established gage sites on the Martin River.

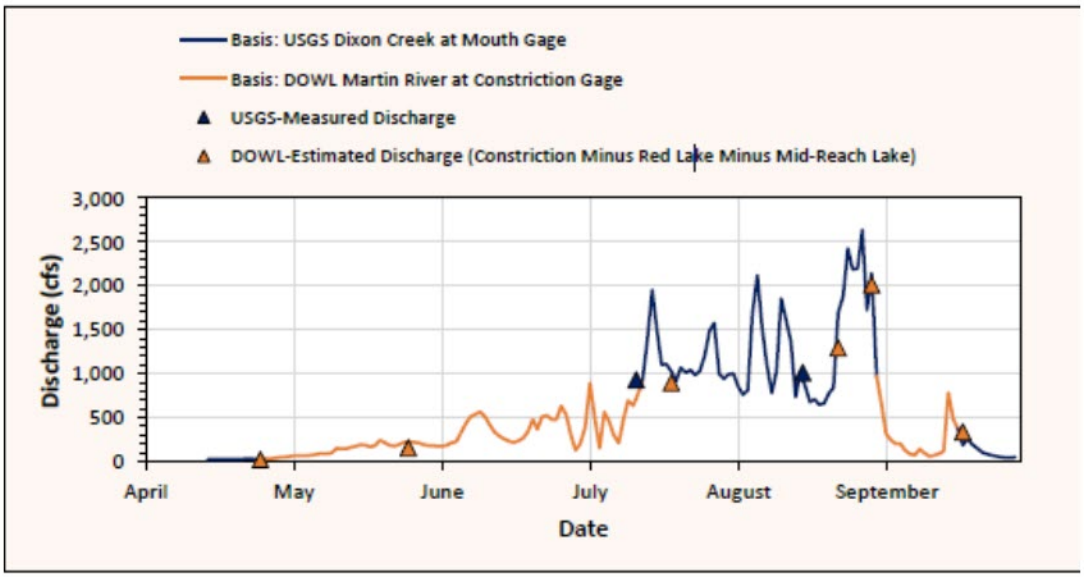

Figure 5: Hydrograph of discharge on Martin River, 2023 Water Year

Although the gage records on Martin River only go back 1 year, a synthetic flow was created by establishing a relationship between stage heights on the Martin River and the Upper Bradley River near Nuka Glacier. The Upper Bradley River at Nuka Glacier USGS gage has a 40-year record, and the Nuka and Dixon glaciers are adjacent and at similar elevations, which allows a fair comparison of discharge in the two basins.

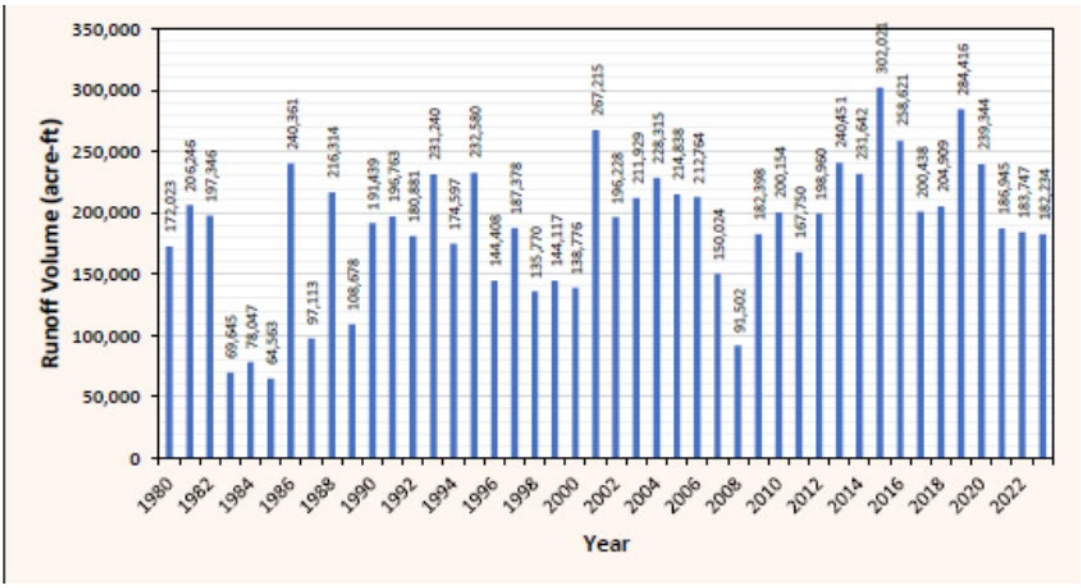

Figure 6: Synthetic 40 year annual runoff volume (acre-ft) from Dixon Glacier

A 10 year average of synthetic flow was used to estimate discharge from the Dixon glacier. This was done to capture the increase in flows from recent years due to higher summer temperatures resulting in an increased contribution of flow from ice melt. It was also assumed that the first 100 cfs of flow would always go downstream to account for future minimum instream flow stipulations. The Dixon Diversion Tunnel will be 14 feet in diameter and has a modeled capacity of 1,400 cfs, so any flood flows in excess of 1,400 cfs were assumed to go downstream on the Martin River rather than divert to Bradley Lake and would not contribute to the energy numbers for the project. Using the 10-year synthetic flow record, 238,500 acre-ft of runoff is predicted annually from the Martin River from rainfall, snow melt, and glacier melt. A majority of this flow will occur in July and August. The minimum instream flow (MIF) will account for 32,100 acre-ft, or 13% of the total runoff. Flood flows will account for 22,200 acre-ft or 10% of the total runoff, leaving 182,800 acre-ft diverted to Bradley Lake. At the Bradley Lake hydroelectric project, the efficiency of the generators gives a conversion of acre-ft to MWh of almost exactly 1:1 (ranges from 0.95-1.05). For modeling purposes, it is assumed a 1:1 ratio and 182,800 acre-ft of diverted water will account for an additional 182,800 MWh of renewable energy generation.

The proposed 14-foot dam raise would increase the capacity of Bradley Lake and raise lake levels which would in turn raise head pressure at the Bradley Lake hydroelectric plant. The increased head pressure will increase efficiency of the two 60 MW generators and account for ~8,000 MWh of electric generation annually. Combining the values of 10-year average annual diverted water with the increased head pressure from a higher reservoir gives an average annual increase in energy from the Dixon Diversion project of 190,800 MWh.

EPA's 2022 eGRID data was used to estimate the greenhouse gas reductions that will result from the Dixon Diversion project. Generation data from the Alaska Railbelt is represented by the AKGD – ASCC Alaska Grid Subregion. As mentioned earlier, electricity produced on the Railbelt is primarily through natural gas fired generators. The eGRID nonbaseload rates will give an accurate representation of CO2e

reductions for projects that displace electricity generation. The eGRID factors consider the differences in baseload generation vs peaking generation, and for the Railbelt eGRID subregion the annual CO2e non-baseload output emission rate is 1,232.508 lb/MWh. Multiplying the AKGD non-baseload output emission rate with the expected energy production from Dixon and converting to metric tons produces a result of 106,668 MTCO2e annual reduction in greenhouse gas produced in Alaska.