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@akenergyauthority.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.org

EPA KEY CONTACTS FORM

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

Name: **Prefix:** Ms. **First Name:** Rebecca **Middle Name:**

Last Name: Garrett **Suffix:**

Title: Rural Programs Manager

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: 907-771-3042 **Fax Number:** 907-771-3044

E-mail Address: rgarrett@akenergyauthority.org

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 energy efficiency upgrades, diesel engine replacements, and electric distribution system updgrades. This work will impact mechanical rooms, power plants, and other spaces that, because of their intended use, will not require accessibility to the public or beneficiaries and therefore falls 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	AEA 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: AEA Executive Director

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

Other Attachment File(s)

*** Mandatory Other Attachment Filename:** 1239-StateofAlaskaPrioritySustainableEnergyPlan_AE

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:** 1234-Workplan_AEA_Coalition.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: Ms.
* First Name: Rebecca
Middle Name:
* Last Name: Garrett
Suffix:

Title: Rural Programs Manager

Organizational Affiliation:

* Telephone Number: 907-771-3042
Fax Number:

* Email: rgarrett@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:**

Proposal to Address Rural Alaska's Critical Energy Challenges

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	49,896,112.00
* b. Applicant	0.00
* c. State	0.00
* d. Local	0.00
* e. Other	0.00
* f. Program Income	0.00
* g. TOTAL	49,896,112.00

*** 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: AEA 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 Grants Program	66.046	$	$	$ 49,986,112.00	$	$ 49,986,112.00
2.						
3.						
4.						
5. Totals		$	$	$ 49,986,112.00	$	$ 49,986,112.00

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SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY (1)	(2)	(3)	(4)	Total (5)
	Climate Pollution Reduction Grants Program				
a. Personnel	$ 1,523,476.00	$	$	$	$ 1,523,476.00
b. Fringe Benefits	1,243,557.00				1,243,557.00
c. Travel	165,000.00				165,000.00
d. Equipment					
e. Supplies					
f. Contractual	125,785.00				125,785.00
g. Construction					
h. Other	45,746,983.00				45,746,983.00
i. Total Direct Charges (sum of 6a-6h)	48,804,801.00				$ 48,804,801.00
j. Indirect Charges	1,181,311.00				$ 1,181,311.00
k. TOTALS (sum of 6i and 6j)	$ 49,986,112.00	$	$	$	$ 49,986,112.00
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 Grants Program	$ 0.00	$ 0.00	$ 0.00	$ 0.00
9.				
10.				
11.				
12. TOTAL (sum of lines 8-11)	$ 0.00	$ 0.00	$ 0.00	$ 0.00

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	$ 3,106,726.00	$ 776,681.00	$ 776,682.00	$ 776,681.00	$ 776,682.00
14. Non-Federal	$				
15. TOTAL (sum of lines 13 and 14)	$ 3,106,726.00	$ 776,681.00	$ 776,682.00	$ 776,681.00	$ 776,682.00

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 Grants Program	$ 11,719,847.00	$ 11,719,846.00	$ 11,719,846.00	$ 11,719,847.00
17. N/A			0.00	0.00
18.				
19.				
20. TOTAL (sum of lines 16 - 19)	$ 11,719,847.00	$ 11,719,846.00	$ 11,719,846.00	$ 11,719,847.00

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges: $48,804,801

22. Indirect Charges: $1,181,311

23. Remarks:

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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:* 99503-2407

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

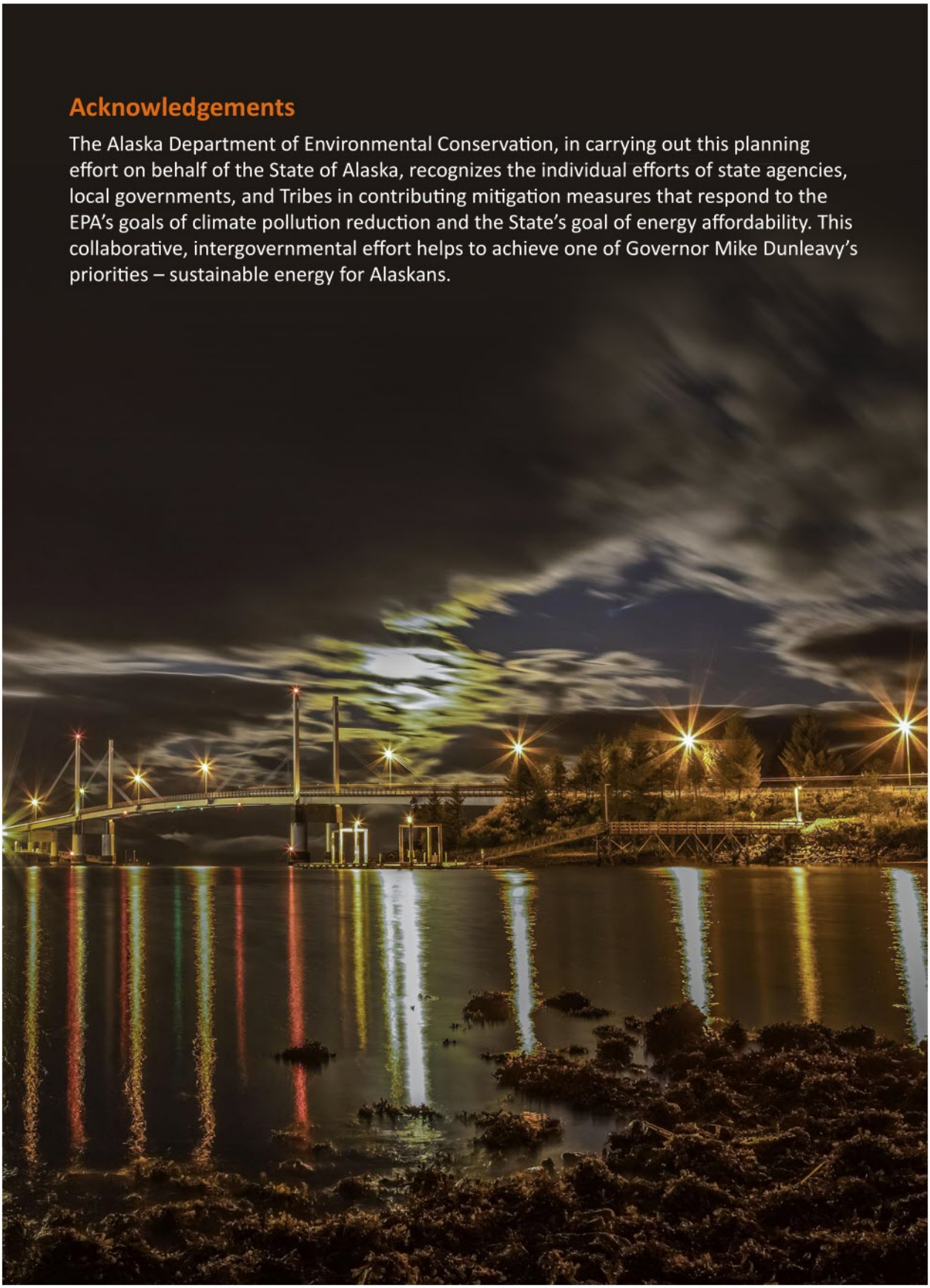
Meeting the requirements of the Priority Climate Action Plan for EPA's Climate Pollution Reduction Grant Program

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.

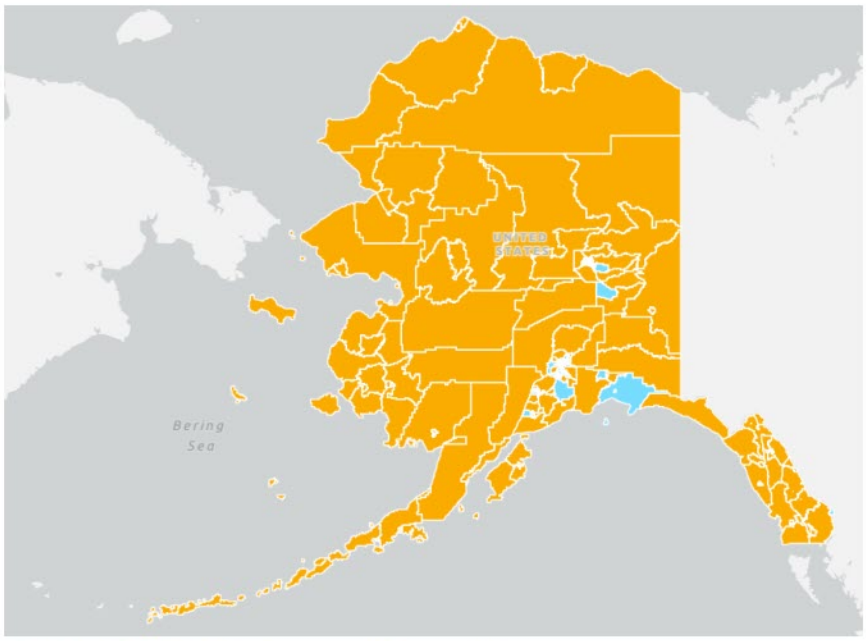

FIGURE 1: EPA IRA Disadvantaged Communities

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.

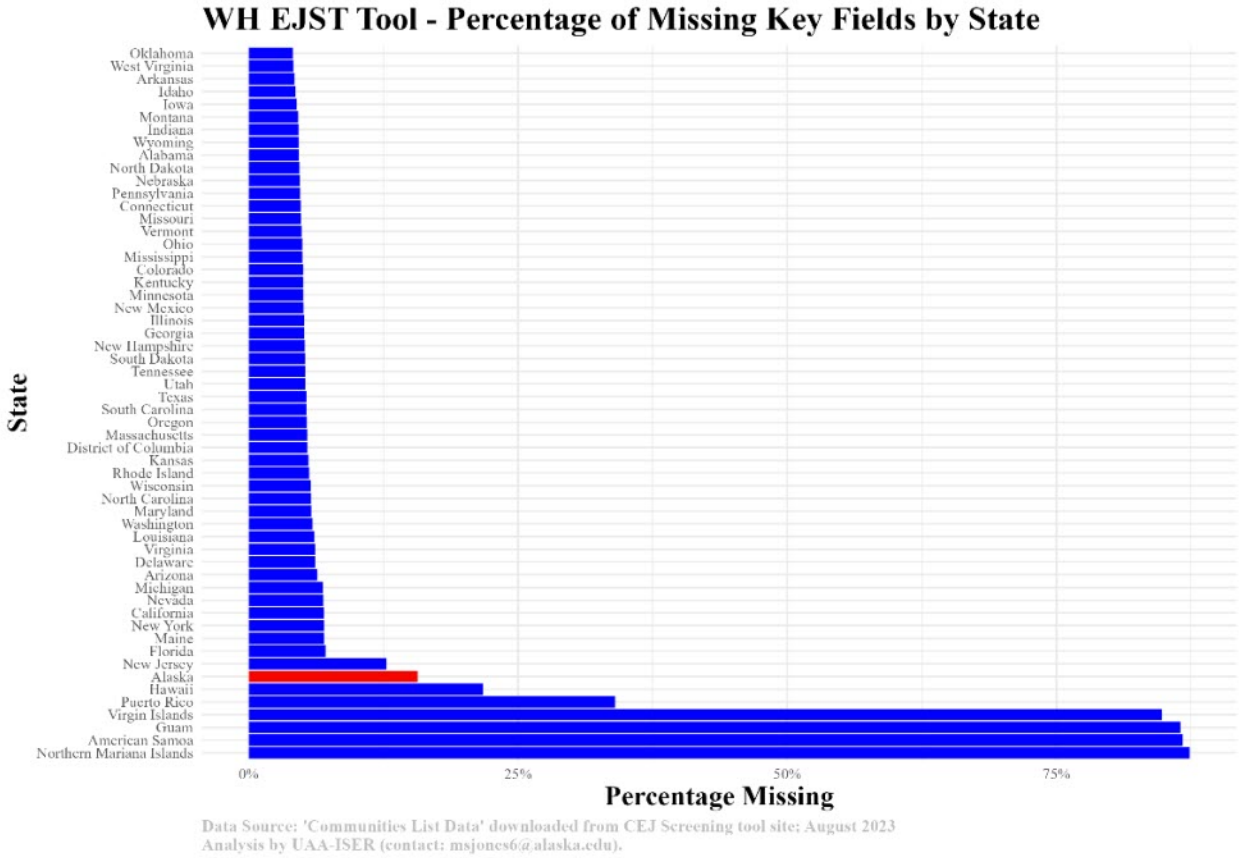

FIGURE 2: Percentage of Missing Key Fields in CEJST by State

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

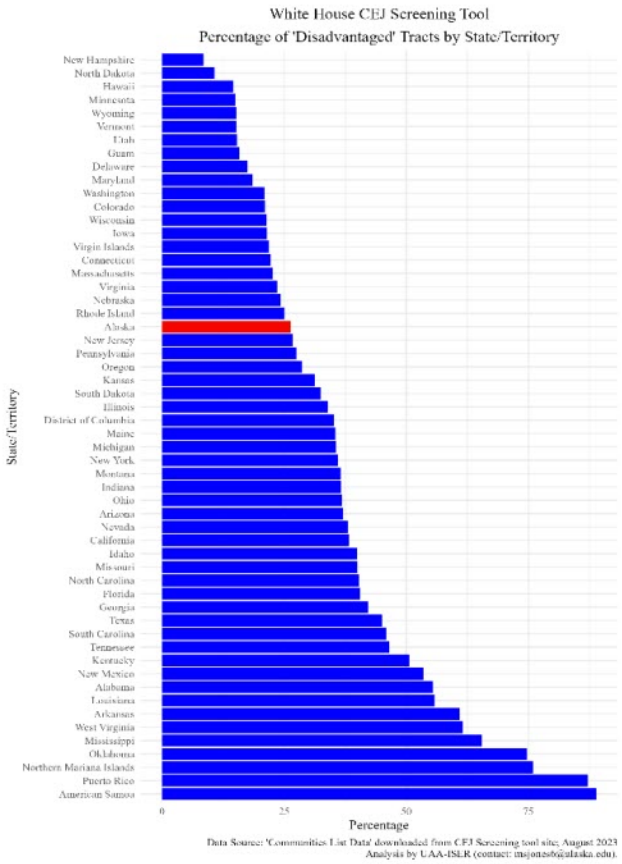

FIGURE 3: Percentage of Disadvantaged Tracts by State

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.

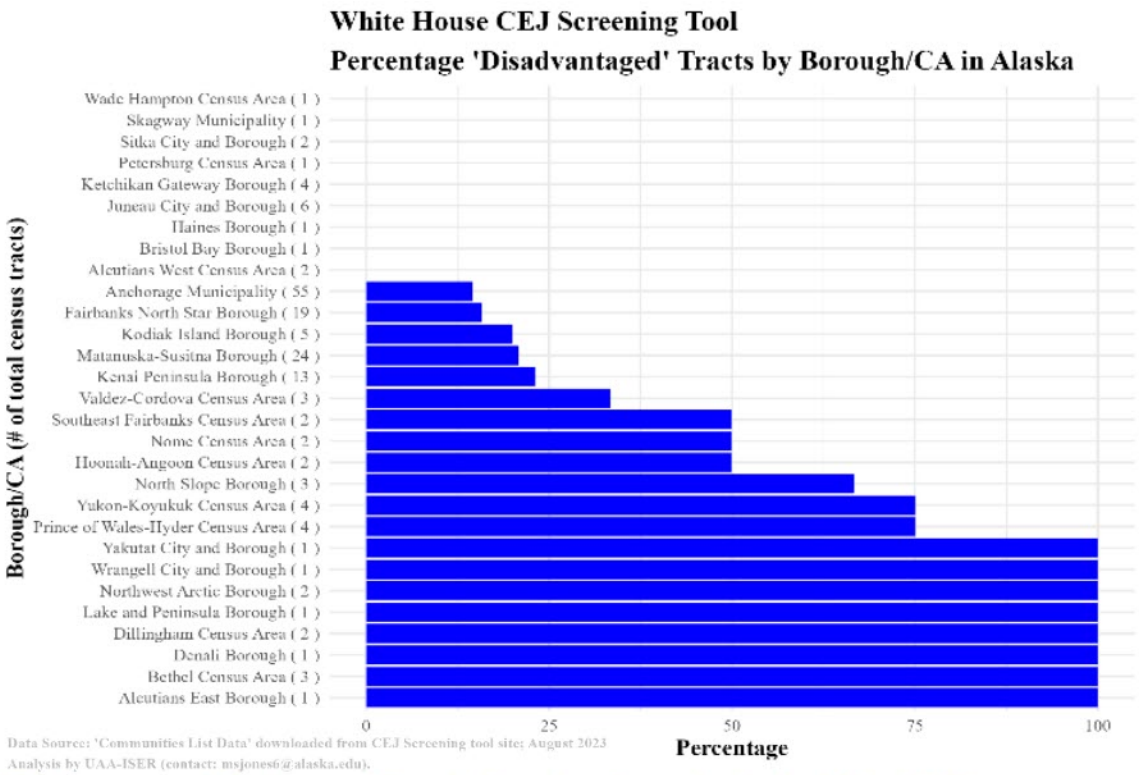

FIGURE 4: Percentage of Disadvantaged Tracts by Borough or Census Area in Alaska from CEJST

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

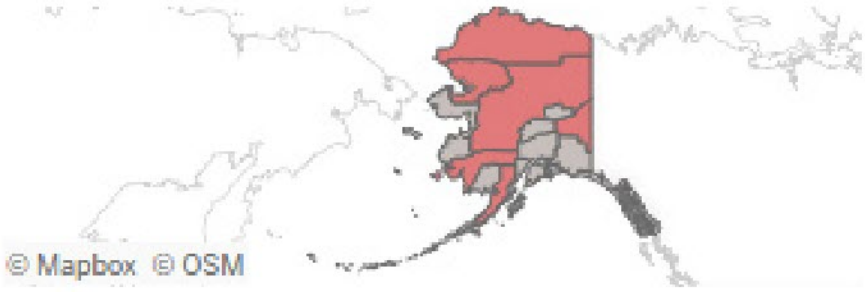

FIGURE 5: USDA's Economic Risk Assessment Dashboard showing Alaska's distressed communities by borough – red indicates distressed borough/census area where red indicates top 10% highest risk nationally. Note: incomplete data in census areas like Kusilvak prevent these from being marked.

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.

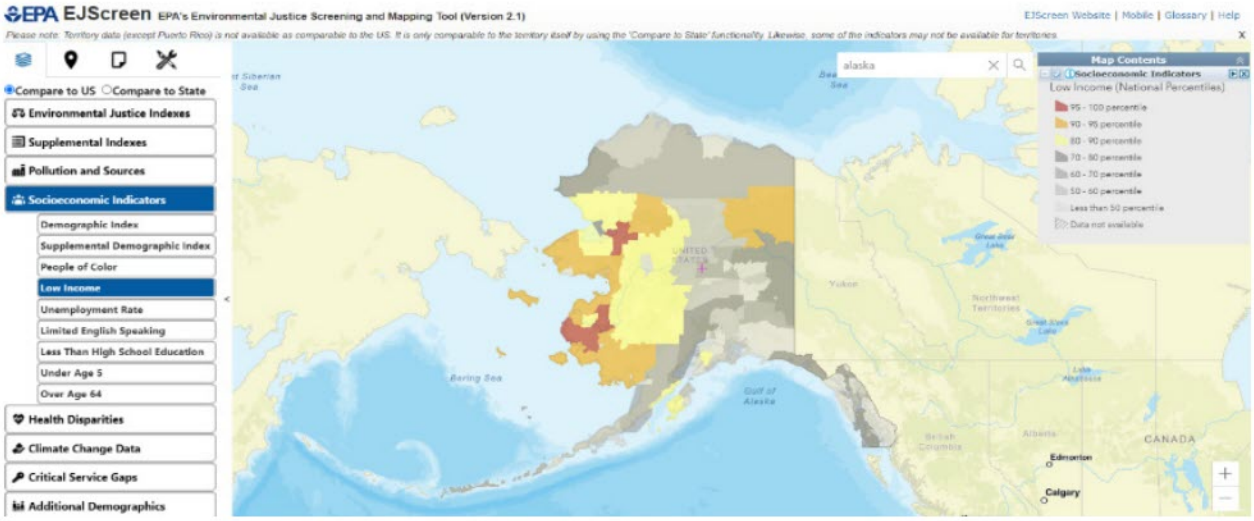

FIGURE 6: Low-Income Alaska communities on EPA's EJScreen

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.

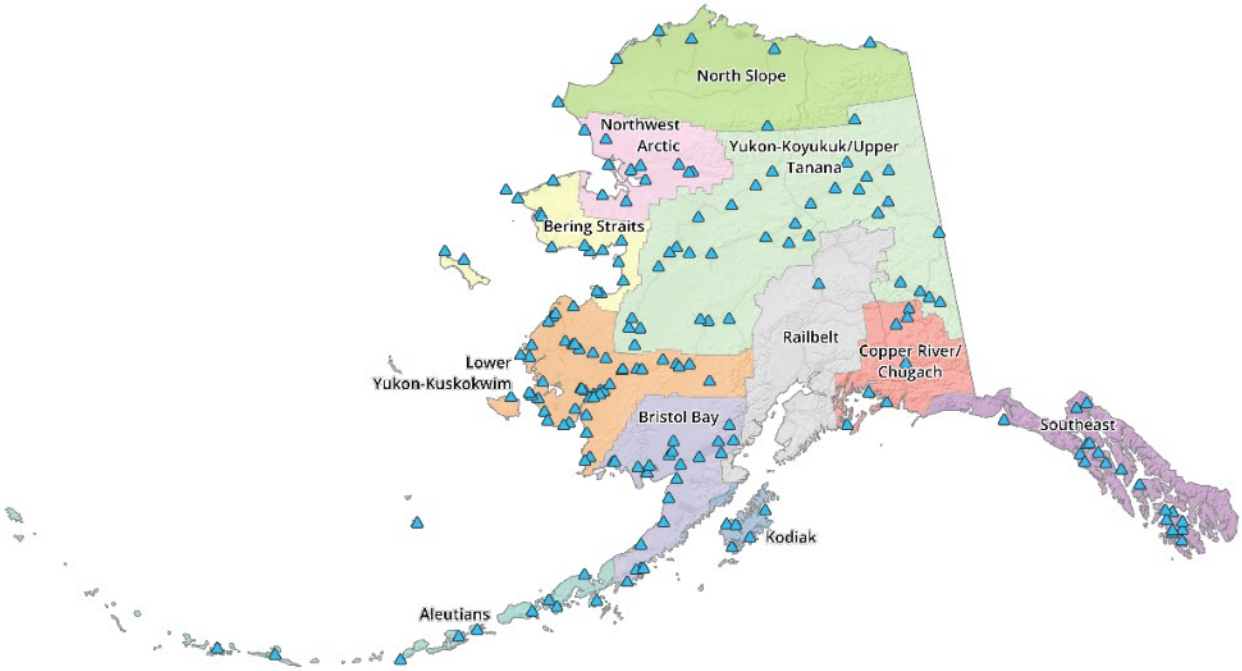

FIGURE 7: AEA's Power Cost Equalization communities

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/

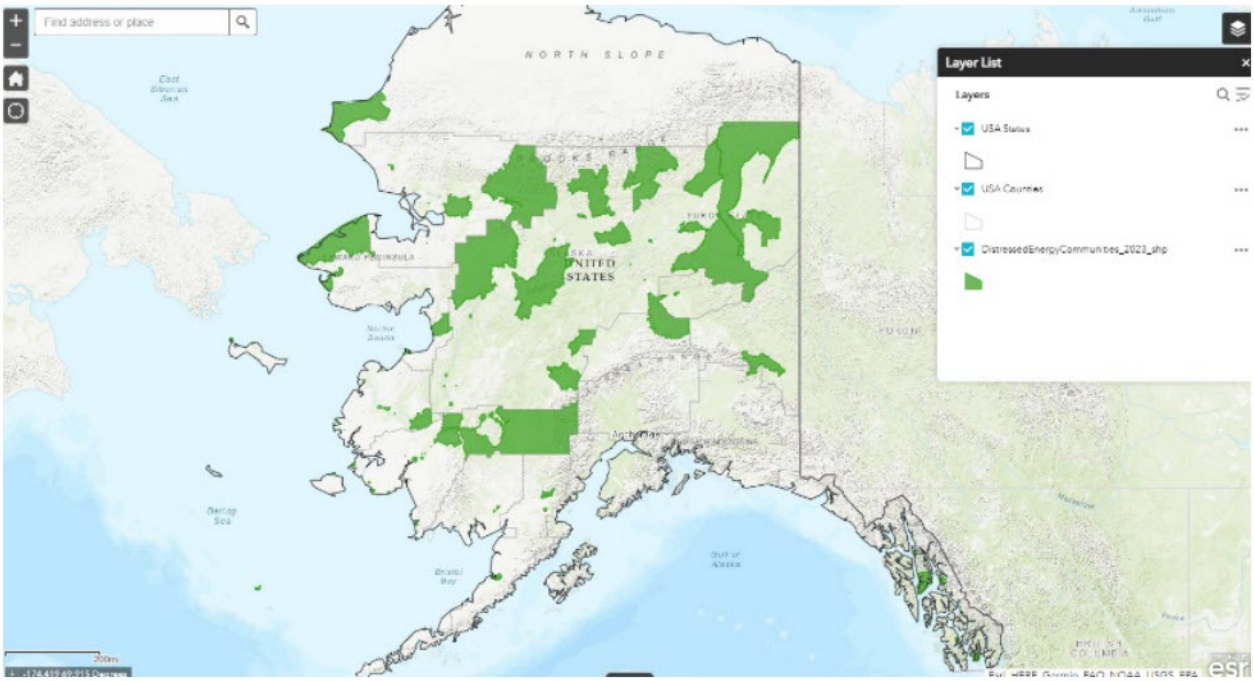

FIGURE 8: USDA Rural Development Distressed Energy Communities in Alaska

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.

VIII. Bibliography

Alaska Department of Environmental Conservation, Division of Air Quality. (2023). *Alaska Greenhouse Gas Emissions Inventory, 1990-2020.* State of Alaska.

Alaska Housing Finance Corporation. (2018). *2018 Alaska Housing Assessment.* Anchorage, AK: Alaska Housing Finance Corporation.

Anderson, B., Jordan, R., & Baring-Gould, I. (2023). *Distributed Renewables for Arctic Energy: A Case Study.* Golden, CO: National Renewable Energy Laboratory. Retrieved from https://www.nrel.gov/docs/fy23osti/84391.pdf

Cicilio, P., & et al. (2023). *Alaska's Railbelt Electric System: Decarbonization Scenarios for 2050".* Fairbanks: Alaska Cetner for Energy and Power, University of Alaska.

Denholm, P., Schwarz, M., DeGeorge, E., Stout, S., & Wiltse, N. (2022). *Renewable Portfolio Standard Assessment for Alaska's Railbelt.* Golden, CO: National Renewable Energy Laboratory. Retrieved from https://www.nrel.gov/docs/fy22osti/81698.pdf

Huntington, Strawhacker, Falke, Ward, Behnken, Curry, . . . Yoder. (2023). *Ch. 29. Alaska. In: Fifth National Climate Assessment.* Washington, DC: U.S. Global Climate Change Research Program. Retrieved from https://nca2023.globalchange.gov/chapter/29/

McGuire, D., Genet, H., He, Y., & et al. (2016). *"Chapter 9: Alaska Carbon Balance", part of Baseline and Projected Future Carbon Storage and Greenhouse-Gas Fluxes in Ecosystems of Alaska, ed. Zhiliang Zhu and A. David McGuire.* Reston, VA: U.S. Geological Survey.

McKinley Research Group. (2021). *Resilient Homes: Alaskans Building for Climate Change.* 2021: The Nature Conservancy. Retrieved from https://www.nature.org/content/dam/tnc/nature/en/documents/Resilient-Housing.pdf

Sadeghi, H., Ijaz, A., & Singh, R. M. (2022). Current status of heat pumps in Norway and analysis of their performance and payback time. *Sustainable Energy Technologies and Assessments*. Retrieved from https://www.sciencedirect.com/science/article/pii/S2213138822008773

Wiltse, N., Madden, D., & Valentine, B. (2014). *Energy Efficiency of Public Buildings in Alaska: Metrics and Analysis.* Fairbanks, AK: Alaska Housing Finance Corporation.

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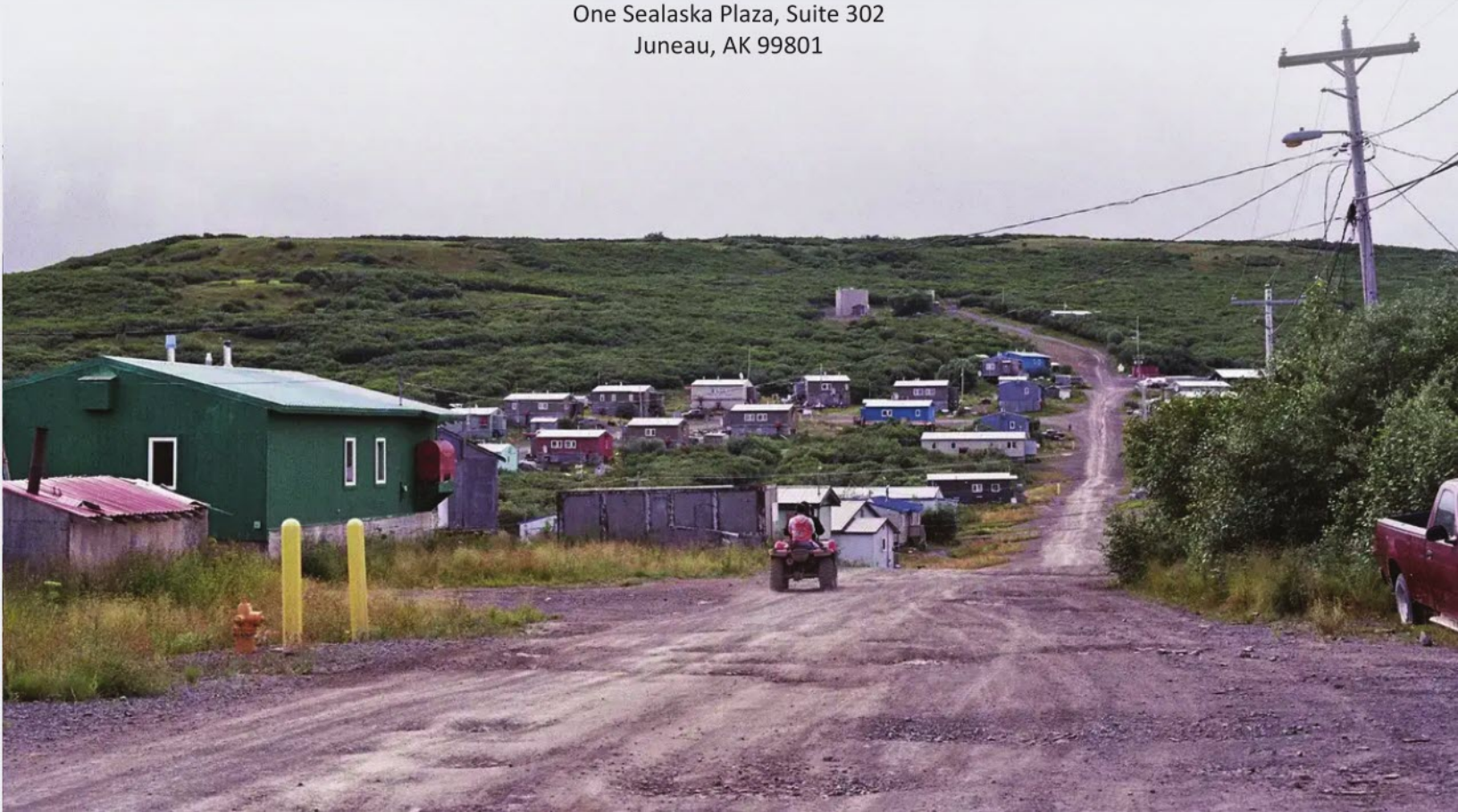


State of Alaska
Priority Sustainable Energy Action Plan

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

Appendix

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

Submitted March 1, 2024

LIDAC Measure Impact

	Measure	AHFC Wx and Energy Rebate Program	Non-Residential	Mendenhall Waste Water Boiler	Southeast Alaska Composting Program	Green Corridor	Dixon Diversion Project	Community Generation and Transmission Projects	AEA Solar for All	AEA DERA, VEEP, Rural Distribution	AEA Renewable Energy Fund
Census tract 2010 ID	**County Name**										
02013000100	Aleutians East Borough	x	x					x	x	x	x
02020000600	Anchorage Municipality	x	x				x	x	x	x	x
02020000703	Anchorage Municipality	x	x				x	x	x	x	x
02020000801	Anchorage Municipality	x	x				x	x	x	x	x
02020000802	Anchorage Municipality	x	x				x	x	x	x	x
02020000901	Anchorage Municipality	x	x				x	x	x	x	x
02020001000	Anchorage Municipality	x	x				x	x	x	x	x
02020001100	Anchorage Municipality	x	x				x	x	x	x	x
02020002000	Anchorage Municipality	x	x				x	x	x	x	x
02050000100	Bethel Census Area	x	x					x	x	x	x
02050000200	Bethel Census Area	x	x					x	x	x	x
02050000300	Bethel Census Area	x	x					x	x	x	x
02068000100	Denali Borough	x	x				x	x	x	x	x
02070000100	Dillingham Census Area	x	x					x	x	x	x
02070000200	Dillingham Census Area	x	x					x	x	x	x
02090000100	Fairbanks North Star Borough	x	x				x	x	x	x	x
02090000300	Fairbanks North Star Borough	x	x				x	x	x	x	x
02090000500	Fairbanks North Star Borough	x	x				x	x	x	x	x
02105000200	Hoonah-Angoon Census Area	x	x		x	x		x	x	x	x
02122000100	Kenai Peninsula Borough	x	x				x	x	x	x	x
02122001200	Kenai Peninsula Borough	x	x			x	x	x	x	x	x
02122001300	Kenai Peninsula Borough	x	x			x	x	x	x	x	x
02150000100	Kodiak Island Borough	x	x			x		x	x	x	x
02164000100	Lake and Peninsula Borough	x	x					x	x	x	x
02170000101	Matanuska-Susitna Borough	x	x				x	x	x	x	x
02170000200	Matanuska-Susitna Borough	x	x				x	x	x	x	x
02170000401	Matanuska-Susitna Borough	x	x				x	x	x	x	x
02170000402	Matanuska-Susitna Borough	x	x				x	x	x	x	x
02170000501	Matanuska-Susitna Borough	x	x				x	x	x	x	x
02180000100	Nome Census Area	x	x					x	x	x	x
02185000100	North Slope Borough	x	x					x	x	x	x
02185000200	North Slope Borough	x	x					x	x	x	x
02188000100	Northwest Arctic Borough	x	x					x	x	x	x
02188000200	Northwest Arctic Borough	x	x					x	x	x	x
02198000100	Prince of Wales-Hyder Census Area	x	x		x	x		x	x	x	x
02198000200	Prince of Wales-Hyder Census Area	x	x		x	x		x	x	x	x
02198940100	Prince of Wales-Hyder Census Area	x	x		x	x		x	x	x	x
02240000100	Southeast Fairbanks Census Area	x	x					x	x	x	x
02261000100	Valdez-Cordova Census Area	x	x			x		x	x	x	x
02275000300	Wrangell City and Borough	x	x		x	x		x	x	x	x
02282000100	Yakutat City and Borough	x	x		x	x		x	x	x	x
02290000100	Yukon-Koyukuk Census Area	x	x					x	x	x	x
02290000300	Yukon-Koyukuk Census Area	x	x					x	x	x	x
02290000400	Yukon-Koyukuk Census Area	x	x					x	x	x	x

Listed communities are Census tracts that are considered disadvantaged in CEJST, but do not represent impacts on communities that are disadvantaged under other standards.

These impacts are preliminary, direct impacts based on the full scope of a measure and do not necessarily represent any given project's likely final impact.

Alaska CEJST Identified Disadvantaged Census Tracts

Census tract 2010 ID	County Name	State/Territory	Percent Black or African American	Percent American Indian / Alaska	Percent Asian	Percent Native Hawaiian or Pacific	Percent two or more races	Percent White	Percent Hispanic or Latino	Percent other races	Percent age under 10	Percent age 10 to 64	Percent age over 64	Total threshold criteria exceeded	Total categories exceeded	Identified as disadvantaged	Identified as disadvantaged	Identified as disadvantaged due	Identified as disadvantaged
02013000100	Aleutians East Borough	Alaska	0.04	0.46	0.19	0.01	0.09	0.13	0.09	0.04	0.06	0.83	0.09	2	2	TRUE	FALSE	FALSE	TRUE
02020000600	Anchorage Municipality	Alaska	0.11	0.24	0.07	0.1	0.07	0.25	0.15	0.05	0.25	0.66	0.07	6	4	TRUE	FALSE		TRUE
02020000703	Anchorage Municipality	Alaska	0.05	0.18	0.12	0.13	0.07	0.36	0.12	0.01	0.15	0.71	0.13	2	1	TRUE	FALSE		TRUE
02020000801	Anchorage Municipality	Alaska	0.11	0.17	0.2	0.07	0.12	0.25	0.09	0.01	0.16	0.74	0.08	2	1	TRUE	FALSE		TRUE
02020000802	Anchorage Municipality	Alaska	0.07	0.18	0.15	0.03	0.08	0.38	0.11	0.04	0.15	0.77	0.07	2	1	TRUE	FALSE		TRUE
02020000901	Anchorage Municipality	Alaska	0.12	0.13	0.12	0.11	0.13	0.24	0.15	0.05	0.14	0.79	0.05	7	5	TRUE	FALSE		TRUE
02020001000	Anchorage Municipality	Alaska	0.04	0.21	0.06	0.01	0.08	0.48	0.09	0.07	0.05	0.81	0.12	1	1	TRUE	FALSE		TRUE
02020001100	Anchorage Municipality	Alaska	0.09	0.17	0.04	0	0.09	0.55	0.04	0.01	0.02	0.84	0.13	4	4	TRUE	FALSE	FALSE	TRUE
02020002000	Anchorage Municipality	Alaska	0.05	0.1	0.13	0	0.13	0.49	0.09	0.04	0.11	0.75	0.13	6	5	TRUE	FALSE		TRUE
02050000100	Bethel Census Area	Alaska	0	0.95	0	0	0.02	0.02	0	0	0.22	0.7	0.07	9	5	TRUE	FALSE	FALSE	TRUE
02050000200	Bethel Census Area	Alaska	0.01	0.64	0.02	0	0.05	0.2	0.06	0	0.15	0.77	0.06	0	0	FALSE	TRUE	FALSE	TRUE
02050000300	Bethel Census Area	Alaska	0	0.83	0	0	0.05	0.1	0.01	0	0.2	0.71	0.07	6	5	TRUE	FALSE	FALSE	TRUE
02068000100	Denali Borough	Alaska	0.01	0.02	0.02	0	0.09	0.84	0	0	0.04	0.86	0.09	3	3	TRUE	FALSE	FALSE	TRUE
02070000100	Dillingham Census Area	Alaska	0.01	0.82	0	0	0.05	0.09	0	0	0.18	0.71	0.09	5	4	TRUE	FALSE	FALSE	TRUE
02070000200	Dillingham Census Area	Alaska	0.01	0.59	0.01	0	0.09	0.22	0.08	0.01	0.16	0.73	0.1	0	0	FALSE	TRUE	FALSE	TRUE
02090000100	Fairbanks North Star Borough	Alaska	0.03	0.12	0.08	0	0.1	0.56	0.12	0	0.09	0.66	0.23	4	4	TRUE	FALSE	FALSE	TRUE
02090000300	Fairbanks North Star Borough	Alaska	0.09	0.25	0.06	0	0.1	0.45	0.1	0	0.13	0.78	0.08	4	4	TRUE	FALSE		TRUE
02090000500	Fairbanks North Star Borough	Alaska	0.09	0.12	0.03	0	0.09	0.56	0.08	0	0.13	0.75	0.1	1	1	TRUE	FALSE		TRUE
02105000200	Hoonah-Angoon Census Area	Alaska	0	0.58	0	0	0.31	0.09	0	0	0.06	0.66	0.26	1	1	TRUE	FALSE	FALSE	TRUE
02122000100	Kenai Peninsula Borough	Alaska	0	0.61	0	0	0.14	0.2	0.14	0	0.07	0.85	0.06	3	3	TRUE	FALSE	FALSE	TRUE
02122001200	Kenai Peninsula Borough	Alaska	0	0.37	0	0	0.11	0.47	0.02	0.01	0.08	0.71	0.2	4	4	TRUE	FALSE	FALSE	TRUE
02122001300	Kenai Peninsula Borough	Alaska	0.01	0.12	0.05	0.01	0.04	0.66	0.06	0	0.1	0.76	0.13	3	3	TRUE	FALSE		TRUE
02150000100	Kodiak Island Borough	Alaska	0	0.31	0	0	0.14	0.52	0.01	0	0.14	0.73	0.12	1	1	TRUE	FALSE	FALSE	TRUE
02164000100	Lake and Peninsula Borough	Alaska	0.01	0.69	0.01	0	0.05	0.2	0	0	0.12	0.79	0.07	5	5	TRUE	FALSE	FALSE	TRUE
02170000101	Matanuska-Susitna Borough	Alaska	0.02	0.02	0	0	0.12	0.81	0	0	0.03	0.72	0.24	6	5	TRUE	FALSE		TRUE
02170000200	Matanuska-Susitna Borough	Alaska	0	0.11	0.02	0	0.12	0.71	0.01	0	0.09	0.73	0.17	6	5	TRUE	FALSE	FALSE	TRUE
02170000401	Matanuska-Susitna Borough	Alaska	0.02	0.04	0	0	0.03	0.85	0.03	0	0.14	0.73	0.12	5	5	TRUE	FALSE		TRUE
02170000402	Matanuska-Susitna Borough	Alaska	0	0.05	0	0	0.07	0.83	0.03	0	0.17	0.66	0.16	4	4	TRUE	FALSE		TRUE
02170000501	Matanuska-Susitna Borough	Alaska	0	0.1	0	0	0.01	0.8	0.06	0	0.11	0.66	0.21	3	3	TRUE	FALSE		TRUE
02180000100	Nome Census Area	Alaska	0	0.89	0.02	0	0.02	0.05	0	0	0.21	0.71	0.07	6	5	TRUE	FALSE	FALSE	TRUE
02185000100	North Slope Borough	Alaska	0.02	0.6	0.11	0.03	0.11	0.1	0.02	0	0.21	0.7	0.07	1	1	TRUE	TRUE	FALSE	TRUE
02185000200	North Slope Borough	Alaska	0	0.8	0	0	0.07	0.11	0	0	0.23	0.69	0.07	7	6	TRUE	FALSE	FALSE	TRUE
02188000100	Northwest Arctic Borough	Alaska	0	0.91	0	0	0.01	0.05	0	0	0.23	0.68	0.07	8	5	TRUE	FALSE	FALSE	TRUE
02188000200	Northwest Arctic Borough	Alaska	0.02	0.69	0.02	0	0.07	0.17	0.02	0	0.16	0.75	0.07	0	0	FALSE	TRUE	FALSE	TRUE
02198000100	Prince of Wales-Hyder Census Area	Alaska	0	0.29	0	0.01	0.09	0.54	0.03	0	0.13	0.67	0.19	3	3	TRUE	FALSE	FALSE	TRUE
02198000200	Prince of Wales-Hyder Census Area	Alaska	0	0.24	0.01	0	0.13	0.57	0.02	0	0.12	0.72	0.14	0	0	FALSE	TRUE	FALSE	TRUE
02198940100	Prince of Wales-Hyder Census Area	Alaska	0	0.74	0.02	0	0.07	0.12	0.05	0	0.12	0.74	0.12	2	2	TRUE	FALSE	FALSE	TRUE
02240000100	Southeast Fairbanks Census Area	Alaska	0	0.36	0.04	0	0.02	0.54	0	0	0.13	0.68	0.17	1	1	TRUE	FALSE	FALSE	TRUE
02261000100	Valdez-Cordova Census Area	Alaska	0	0.35	0	0	0.07	0.54	0.02	0	0.22	0.69	0.08	5	4	TRUE	FALSE	FALSE	TRUE
02275000300	Wrangell City and Borough	Alaska	0	0.24	0	0	0.1	0.61	0.05	0.01	0.08	0.68	0.22	1	1	TRUE	FALSE	FALSE	TRUE
02282000100	Yakutat City and Borough	Alaska	0	0.38	0.04	0.01	0.08	0.43	0.07	0	0.14	0.7	0.14	3	3	TRUE	FALSE	FALSE	TRUE
02290000100	Yukon-Koyukuk Census Area	Alaska	0	0.79	0.01	0	0.05	0.12	0.01	0	0.17	0.68	0.14	9	5	TRUE	FALSE	FALSE	TRUE
02290000300	Yukon-Koyukuk Census Area	Alaska	0	0.78	0	0	0.03	0.15	0.02	0	0.17	0.69	0.12	6	5	TRUE	FALSE	FALSE	TRUE
02290000400	Yukon-Koyukuk Census Area	Alaska	0	0.68	0	0	0.11	0.15	0.05	0	0.19	0.69	0.11	7	5	TRUE	FALSE	FALSE	TRUE

Alaska CEJST Identified Disadvantaged Census Tracts

Census tract 2010 ID	County Name	Percentage of tract that is disadvant	Share of neighbors that are identified	Total population	Adjusted percent of individuals below	Adjusted percent of individuals below	Is low income?	Income data has been estimated	Greater than or equal to the 90th	Expected agricultural loss rate	Expected agricultural loss rate	Greater than or equal to the 90th	Expected building loss rate (Natural	Expected building loss rate (Natural	Greater than or equal to the 90th	Expected population loss rate (Natural	Expected population loss rate (Natural	Share of properties at risk of flood in	Share of properties at risk of flood in
02013000100	Aleutians East Borough	100	50	3385	0.67	0.32	TRUE	FALSE	FALSE		0	FALSE	1	0.0002	FALSE	55	0.0002		
02020000600	Anchorage Municipality	100	66	6955	0.92	0.56	TRUE	FALSE	FALSE		0	FALSE	9	0.001	TRUE	95	0.0015	81	17
02020000703	Anchorage Municipality	100	0	5604	0.68	0.33	TRUE	FALSE	FALSE	7	0.0004	FALSE	11	0.0012	TRUE	97	0.0021	94	38
02020000801	Anchorage Municipality	100	42	7505	0.65	0.31	TRUE	FALSE	FALSE	7	0.0004	FALSE	9	0.0009	TRUE	96	0.0016	94	40
02020000802	Anchorage Municipality	100	28	5033	0.71	0.35	TRUE	FALSE	FALSE	12	0.001	FALSE	9	0.0011	TRUE	98	0.0026	95	49
02020000901	Anchorage Municipality	100	66	5164	0.84	0.46	TRUE	FALSE	FALSE	4	0.0001	FALSE	8	0.0007	TRUE	97	0.0024	36	5
02020001000	Anchorage Municipality	100	42	3360	0.52	0.24	FALSE	FALSE	FALSE	13	0.0013	FALSE	7	0.0006	FALSE	98	0.0028	31	4
02020001100	Anchorage Municipality	100	50	895	0.74	0.37	TRUE	FALSE	FALSE		0	FALSE	7	0.0006	TRUE	99	0.0126	30	4
02020002000	Anchorage Municipality	100	0	3598	0.68	0.32	TRUE	FALSE	FALSE		0	FALSE	8	0.0007	TRUE	98	0.0031	86	21
02050000100	Bethel Census Area	100	50	10262	0.98	0.69	TRUE	FALSE	FALSE		0	FALSE	0	0.0001	FALSE	36	0.0001		
02050000200	Bethel Census Area	100	100	6472	0.6	0.28	FALSE	FALSE	FALSE		0	FALSE	52	0.0151	FALSE	62	0.0002		
02050000300	Bethel Census Area	100	85	1400	0.92	0.56	TRUE	FALSE	FALSE		0	FALSE	25	0.0046	FALSE	74	0.0004		
02068000100	Denali Borough	100	40	2246	0.65	0.31	TRUE	FALSE	FALSE		0	FALSE	0	0	TRUE	98	0.0036		
02070000100	Dillingham Census Area	100	60	2682	0.94	0.6	TRUE	FALSE	FALSE		0	FALSE	25	0.0047	FALSE	63	0.0002	23	3
02070000200	Dillingham Census Area	100	100	2279	0.54	0.24	FALSE	FALSE	FALSE		0	FALSE	0	0.0001	FALSE	52	0.0002	29	4
02090000100	Fairbanks North Star Borough	100	40	1078	0.74	0.37	TRUE	FALSE	FALSE		0	FALSE	1	0.0002	FALSE	0	0	98	96
02090000300	Fairbanks North Star Borough	100	25	4550	0.69	0.34	TRUE	FALSE	FALSE		0	FALSE	1	0.0002	FALSE	1	0	98	95
02090000500	Fairbanks North Star Borough	100	16	2864	0.47	0.21	FALSE	FALSE	FALSE	0	0	FALSE	7	0.0006	FALSE	9	0	98	88
02105000200	Hoonah-Angoon Census Area	100	0	72	0.59	0.27	FALSE	FALSE	FALSE		0	FALSE	6	0.0006	FALSE	99	0.0167		
02122000100	Kenai Peninsula Borough	100	55	526	0.76	0.38	TRUE	FALSE	FALSE	14	0.0017	FALSE	24	0.0043	TRUE	99	0.0424	67	11
02122001200	Kenai Peninsula Borough	100	28	904	0.68	0.33	TRUE	FALSE	FALSE	4	0.0001	FALSE	32	0.0061	TRUE	99	0.0164	65	10
02122001300	Kenai Peninsula Borough	100	25	4128	0.69	0.33	TRUE	FALSE	FALSE	1	0	FALSE	29	0.0056	TRUE	98	0.0033	89	25
02150000100	Kodiak Island Borough	100	33	1711	0.49	0.22	FALSE	FALSE	FALSE		0	FALSE	0	0	FALSE	14	0	61	9
02164000100	Lake and Peninsula Borough	100	83	1393	0.79	0.41	TRUE	FALSE	FALSE		0	FALSE	0	0.0001	FALSE	43	0.0001		
02170000101	Matanuska-Susitna Borough	100	63	526	0.79	0.41	TRUE	FALSE	FALSE		0	FALSE	1	0.0002	TRUE	99	0.0253	74	13
02170000200	Matanuska-Susitna Borough	100	28	1898	0.71	0.35	TRUE	FALSE	FALSE		0	FALSE	0	0.0001	TRUE	99	0.0076	53	8
02170000401	Matanuska-Susitna Borough	100	50	1977	0.71	0.35	TRUE	FALSE	FALSE		0	FALSE	8	0.0009	TRUE	99	0.0082	61	9
02170000402	Matanuska-Susitna Borough	100	28	1973	0.74	0.37	TRUE	FALSE	FALSE		0	FALSE	0	0.0002	TRUE	99	0.0074	75	14
02170000501	Matanuska-Susitna Borough	100	20	1564	0.71	0.35	TRUE	FALSE	FALSE		0	FALSE	1	0.0002	TRUE	99	0.0091	53	8
02180000100	Nome Census Area	100	60	5877	0.95	0.61	TRUE	FALSE	FALSE		0	FALSE	0	0	FALSE	60	0.0002		
02185000100	North Slope Borough	100	100	4457	0.5	0.22	FALSE	FALSE	FALSE		0	FALSE	0	0.0001	FALSE	83	0.0006		
02185000200	North Slope Borough	100	60	2540	0.67	0.32	TRUE	FALSE	FALSE		0	FALSE	0	0.0001	TRUE	94	0.0012		
02188000100	Northwest Arctic Borough	100	60	4428	0.95	0.62	TRUE	FALSE	FALSE		0	FALSE	0	0	FALSE	30	0.0001		
02188000200	Northwest Arctic Borough	100	100	3287	0.58	0.27	FALSE	FALSE	FALSE		0	FALSE	15	0.0022	FALSE	43	0.0001		
02198000100	Prince of Wales-Hyder Census Area	100	40	2322	0.75	0.38	TRUE	FALSE	FALSE		0	FALSE	0	0	FALSE	6	0		
02198000200	Prince of Wales-Hyder Census Area	100	100	2417	0.61	0.29	FALSE	FALSE	FALSE		0	FALSE	0	0	FALSE	4	0		
02198940100	Prince of Wales-Hyder Census Area	100	50	1654	0.7	0.34	TRUE	FALSE	FALSE		0	FALSE	0	0	FALSE	4	0		
02240000100	Southeast Fairbanks Census Area	100	50	2442	0.64	0.3	FALSE	FALSE	FALSE		0	FALSE	0	0	FALSE	96	0.0019	94	42
02261000100	Valdez-Cordova Census Area	100	57	2080	0.7	0.34	TRUE	FALSE	FALSE		0	FALSE	9	0.0009	TRUE	99	0.0058		
02275000300	Wrangell City and Borough	100	33	2502	0.65	0.31	TRUE	FALSE	FALSE		0	FALSE	0	0	FALSE	58	0.0002	73	13
02282000100	Yakutat City and Borough	100	33	649	0.67	0.32	TRUE	FALSE	FALSE		0	FALSE	0	0	FALSE	11	0	82	17
02290000100	Yukon-Koyukuk Census Area	100	40	1158	0.91	0.53	TRUE	FALSE	FALSE		0	FALSE	82	0.0509	FALSE	83	0.0006	53	8
02290000300	Yukon-Koyukuk Census Area	100	75	1821	0.8	0.42	TRUE	FALSE	FALSE		0	FALSE	76	0.037	FALSE	71	0.0003	5	0
02290000400	Yukon-Koyukuk Census Area	100	71	1126	0.91	0.53	TRUE	FALSE	FALSE		0	FALSE	37	0.0083	FALSE	78	0.0005	5	0

Alaska CEJST Identified Disadvantaged Census Tracts

Census tract 2010 ID	County Name	Greater than or equal to the 90th	Greater than or equal to the 90th	Share of properties at risk of fire in 30	Share of properties at risk of fire in 30	Greater than or equal to the 90th	Greater than or equal to the 90th	Greater than or equal to the 90th	Energy burden (percentile)	Energy burden	Greater than or equal to the 90th	PM2.5 in the air (percentile)	PM2.5 in the air	Greater than or equal to the 90th	Diesel particulate matter exposure	Diesel particulate matter exposure	Greater than or equal to the 90th	Traffic proximity and volume	Traffic proximity and volume
02013000100	Aleutians East Borough	FALSE	FALSE			FALSE	FALSE	FALSE	83	4	FALSE			FALSE	0	0	FALSE		
02020000600	Anchorage Municipality	FALSE	FALSE			FALSE	FALSE	FALSE	70	3	FALSE			FALSE	80	0.43	FALSE	56	379.24
02020000703	Anchorage Municipality	TRUE	TRUE			FALSE	FALSE	FALSE	66	3	FALSE			FALSE	53	0.26	FALSE	68	591.91
02020000801	Anchorage Municipality	TRUE	TRUE			FALSE	FALSE	FALSE	59	3	FALSE			FALSE	77	0.4	FALSE	83	1134.63
02020000802	Anchorage Municipality	TRUE	TRUE			FALSE	FALSE	FALSE	46	2	FALSE			FALSE	78	0.4	FALSE	65	532.44
02020000901	Anchorage Municipality	FALSE	FALSE			FALSE	FALSE	FALSE	63	3	FALSE			FALSE	83	0.45	FALSE	86	1379.59
02020001000	Anchorage Municipality	FALSE	FALSE			FALSE	FALSE	FALSE	44	2	FALSE			FALSE	86	0.5	FALSE	89	1741.21
02020001100	Anchorage Municipality	FALSE	FALSE			FALSE	FALSE	FALSE	15	1	FALSE			FALSE	86	0.49	TRUE	91	1992.72
02020002000	Anchorage Municipality	FALSE	FALSE			FALSE	FALSE	FALSE	73	4	FALSE			TRUE	95	0.74	FALSE	82	1105.72
02050000100	Bethel Census Area	FALSE	FALSE			FALSE	FALSE	TRUE	99	9	FALSE			FALSE	0	0	FALSE		
02050000200	Bethel Census Area	FALSE	FALSE			FALSE	FALSE	FALSE	68	3	FALSE			FALSE	0	0	FALSE		
02050000300	Bethel Census Area	FALSE	FALSE			FALSE	FALSE	TRUE	99	8	FALSE			FALSE	0	0	FALSE		
02068000100	Denali Borough	FALSE	FALSE			FALSE	FALSE	FALSE	86	4	FALSE			FALSE	0	0	FALSE	5	5.92
02070000100	Dillingham Census Area	FALSE	FALSE			FALSE	FALSE	TRUE	99	11	FALSE			FALSE	0	0	FALSE		
02070000200	Dillingham Census Area	FALSE	FALSE			FALSE	FALSE	FALSE	77	4	FALSE			FALSE	0	0	FALSE		
02090000100	Fairbanks North Star Borough	TRUE	TRUE			FALSE	FALSE	FALSE	77	4	FALSE			FALSE	41	0.2	FALSE	74	752.59
02090000300	Fairbanks North Star Borough	TRUE	TRUE			FALSE	FALSE	FALSE	63	3	FALSE			FALSE	44	0.21	FALSE	61	458.42
02090000500	Fairbanks North Star Borough	TRUE	FALSE			FALSE	FALSE	FALSE	77	4	FALSE			FALSE	38	0.19	FALSE	76	820.5
02105000200	Hoonah-Angoon Census Area	FALSE	FALSE			FALSE	FALSE	FALSE	99	9	FALSE			FALSE	0	0.01	FALSE	5	7.23
02122000100	Kenai Peninsula Borough	FALSE	FALSE			FALSE	FALSE	TRUE	99	11	FALSE			FALSE	0	0	FALSE		
02122001200	Kenai Peninsula Borough	FALSE	FALSE			FALSE	FALSE	TRUE	98	8	FALSE			FALSE	0	0.01	FALSE		
02122001300	Kenai Peninsula Borough	FALSE	FALSE			FALSE	FALSE	FALSE	80	4	FALSE			FALSE	0	0	FALSE	20	57.37
02150000100	Kodiak Island Borough	FALSE	FALSE			FALSE	FALSE	FALSE	89	5	FALSE			FALSE	0	0	FALSE		
02164000100	Lake and Peninsula Borough	FALSE	FALSE			FALSE	FALSE	TRUE	99	10	FALSE			FALSE	0	0	FALSE		
02170000101	Matanuska-Susitna Borough	FALSE	FALSE			FALSE	FALSE	TRUE	99	8	FALSE			FALSE	0	0	FALSE	1	0.46
02170000200	Matanuska-Susitna Borough	FALSE	FALSE			FALSE	FALSE	TRUE	99	9	FALSE			FALSE	0	0	FALSE	4	5.35
02170000401	Matanuska-Susitna Borough	FALSE	FALSE			FALSE	FALSE	TRUE	96	6	FALSE			FALSE	2	0.04	FALSE	12	23.59
02170000402	Matanuska-Susitna Borough	FALSE	FALSE			FALSE	FALSE	TRUE	99	9	FALSE			FALSE	0	0	FALSE	7	10.72
02170000501	Matanuska-Susitna Borough	FALSE	FALSE			FALSE	FALSE	TRUE	95	6	FALSE			FALSE	5	0.06	FALSE	1	0.63
02180000100	Nome Census Area	FALSE	FALSE			FALSE	FALSE	TRUE	99	9	FALSE			FALSE	0	0	FALSE		
02185000100	North Slope Borough	FALSE	FALSE			FALSE	FALSE	FALSE	4	1	FALSE			FALSE	0	0	FALSE		
02185000200	North Slope Borough	FALSE	FALSE			FALSE	FALSE	TRUE	90	5	FALSE			FALSE	0	0	FALSE		
02188000100	Northwest Arctic Borough	FALSE	FALSE			FALSE	FALSE	TRUE	99	9	FALSE			FALSE	0	0	FALSE		
02188000200	Northwest Arctic Borough	FALSE	FALSE			FALSE	FALSE	FALSE	73	4	FALSE			FALSE	0	0.01	FALSE		
02198000100	Prince of Wales-Hyder Census Area	FALSE	FALSE			FALSE	FALSE	TRUE	90	5	FALSE			FALSE	0	0	FALSE		
02198000200	Prince of Wales-Hyder Census Area	FALSE	FALSE			FALSE	FALSE	FALSE	68	3	FALSE			FALSE	0	0	FALSE		
02198940100	Prince of Wales-Hyder Census Area	FALSE	FALSE			FALSE	FALSE	FALSE	68	3	FALSE			FALSE	0	0	FALSE		
02240000100	Southeast Fairbanks Census Area	TRUE	FALSE			FALSE	FALSE	FALSE	93	5	FALSE			FALSE	0	0	FALSE	3	2.83
02261000100	Valdez-Cordova Census Area	FALSE	FALSE			FALSE	FALSE	TRUE	96	6	FALSE			FALSE	0	0	FALSE	3	3.11
02275000300	Wrangell City and Borough	FALSE	FALSE			FALSE	FALSE	FALSE	63	3	FALSE			FALSE	0	0	FALSE		
02282000100	Yakutat City and Borough	FALSE	FALSE			FALSE	FALSE	TRUE	92	5	FALSE			FALSE	0	0	FALSE		
02290000100	Yukon-Koyukuk Census Area	FALSE	FALSE			FALSE	FALSE	TRUE	99	8	FALSE			FALSE	0	0	FALSE		
02290000300	Yukon-Koyukuk Census Area	FALSE	FALSE			FALSE	FALSE	TRUE	97	7	FALSE			FALSE	0	0	FALSE		
02290000400	Yukon-Koyukuk Census Area	FALSE	FALSE			FALSE	FALSE	TRUE	99	9	FALSE			FALSE	0	0	FALSE		

Alaska CEJST Identified Disadvantaged Census Tracts

Census tract 2010 ID	County Name	Greater than or equal to the 90th	DOT Travel Barriers Score	Greater than or equal to the 90th	Housing burden (percent) (percentil	Housing burden (percent)	Greater than or equal to the 90th	Percent pre-1960s housing (lead	Percent pre-1960s housing (lead	Median value ($) of owner-occupied	Median value ($) of owner-occupied	Greater than or equal to the 90th	Greater than or equal to the 90th	Share of the tract's land area that is	Share of the tract's land area that is	Does the tract have at least 35 acres in	Tract experienced historic	Tract experienced historic	Share of homes with no kitchen or
02013000100	Aleutians East Borough	FALSE	34	FALSE	19	14	FALSE	25	7	24	119900	FALSE	FALSE				FALSE		0.94
02020000600	Anchorage Municipality	FALSE	64	FALSE	88	41	FALSE	40	17	54	211000	FALSE	FALSE				FALSE		0.21
02020000703	Anchorage Municipality	FALSE	59	FALSE	86	40	FALSE	13	2	50	194200	FALSE	FALSE				FALSE		0.21
02020000801	Anchorage Municipality	FALSE	11	FALSE	64	27	FALSE	28	9	55	217000	FALSE	FALSE				FALSE		0.86
02020000802	Anchorage Municipality	FALSE	7	FALSE	61	26	FALSE	9	1	32	141400	FALSE	FALSE				FALSE		0.84
02020000901	Anchorage Municipality	FALSE	46	FALSE	89	42	FALSE	44	20	23	116600	FALSE	FALSE				FALSE		0.92
02020001000	Anchorage Municipality	FALSE	3	FALSE	90	44	FALSE	54	28	69	290900	FALSE	FALSE				FALSE		0.9
02020001100	Anchorage Municipality	FALSE	4	FALSE	75	32	FALSE	45	20	82	419400	FALSE	FALSE				FALSE		0.99
02020002000	Anchorage Municipality	FALSE	7	TRUE	92	46	FALSE	34	13			FALSE	FALSE				FALSE		0.95
02050000100	Bethel Census Area	FALSE	45	FALSE	18	14	FALSE	16	3	2	52100	FALSE	FALSE				FALSE		0.99
02050000200	Bethel Census Area	FALSE	40	FALSE	29	16	FALSE	15	3	67	280400	FALSE	FALSE				FALSE		0.96
02050000300	Bethel Census Area	FALSE	45	FALSE	42	20	FALSE	8	1	40	160900	FALSE	FALSE				FALSE		0.99
02068000100	Denali Borough	FALSE	26	FALSE	3	8	FALSE	16	3	57	223000	FALSE	FALSE				FALSE		0.99
02070000100	Dillingham Census Area	FALSE	46	FALSE	43	20	FALSE	14	2	11	85900	FALSE	FALSE				FALSE		0.99
02070000200	Dillingham Census Area	FALSE	34	FALSE	20	14	FALSE	22	6	65	263600	FALSE	FALSE				FALSE		0.97
02090000100	Fairbanks North Star Borough	FALSE	16	FALSE	88	41	FALSE	71	46	33	143600	FALSE	FALSE				FALSE		0.21
02090000300	Fairbanks North Star Borough	FALSE	22	FALSE	82	37	FALSE	35	13	44	172200	FALSE	FALSE				FALSE		0.91
02090000500	Fairbanks North Star Borough	FALSE	33	FALSE	88	41	FALSE	46	21	49	190600	FALSE	FALSE				FALSE		0.21
02105000200	Hoonah-Angoon Census Area	FALSE	55	FALSE	86	40	FALSE	45	21	5	70000	FALSE	FALSE				FALSE		0.99
02122000100	Kenai Peninsula Borough	FALSE	50	FALSE	68	29	FALSE	17	4	0	32200	FALSE	FALSE				FALSE		0.99
02122001200	Kenai Peninsula Borough	FALSE	41	FALSE	25	16	FALSE	26	7	54	211900	FALSE	FALSE				FALSE		0.99
02122001300	Kenai Peninsula Borough	FALSE	35	FALSE	34	18	FALSE	49	24	56	220300	FALSE	FALSE				FALSE		0.98
02150000100	Kodiak Island Borough	FALSE	55	FALSE	37	18	FALSE	13	2	71	308000	FALSE	FALSE				FALSE		0.93
02164000100	Lake and Peninsula Borough	FALSE	34	FALSE	17	13	FALSE	29	9	22	114900	FALSE	FALSE				FALSE		0.99
02170000101	Matanuska-Susitna Borough	FALSE	82	FALSE	59	25	FALSE	18	4	25	122900	FALSE	FALSE				FALSE		0.99
02170000200	Matanuska-Susitna Borough	TRUE	99	FALSE	62	26	FALSE	14	2	41	164500	FALSE	FALSE				FALSE		0.99
02170000401	Matanuska-Susitna Borough	TRUE	96	FALSE	73	31	FALSE	12	2	41	163900	FALSE	FALSE				FALSE		0.99
02170000402	Matanuska-Susitna Borough	TRUE	95	FALSE	63	26	FALSE	12	2	52	200400	FALSE	FALSE				FALSE		0.99
02170000501	Matanuska-Susitna Borough	FALSE	67	FALSE	40	19	FALSE	18	4	55	214500	FALSE	FALSE				FALSE		0.97
02180000100	Nome Census Area	FALSE	37	FALSE	38	19	FALSE	29	9	12	88100	FALSE	FALSE				FALSE		0.99
02185000100	North Slope Borough	FALSE	31	FALSE	23	15	FALSE	36	14	48	185000	FALSE	FALSE				FALSE		0.98
02185000200	North Slope Borough	FALSE	38	FALSE	28	16	FALSE	21	5	15	95200	FALSE	FALSE				FALSE		0.99
02188000100	Northwest Arctic Borough	FALSE	38	FALSE	48	22	FALSE	17	3	15	95900	FALSE	FALSE				FALSE		0.99
02188000200	Northwest Arctic Borough	FALSE	23	FALSE	20	14	FALSE	25	7	60	236500	FALSE	FALSE				FALSE		0.96
02198000100	Prince of Wales-Hyder Census Area	FALSE	56	FALSE	13	12	FALSE	21	5	42	167600	FALSE	FALSE				FALSE		0.99
02198000200	Prince of Wales-Hyder Census Area	FALSE	32	FALSE	31	17	FALSE	16	3	56	218500	FALSE	FALSE				FALSE		0.91
02198940100	Prince of Wales-Hyder Census Area	FALSE	38	FALSE	2	7	FALSE	44	19	37	155100	FALSE	FALSE				FALSE		0.78
02240000100	Southeast Fairbanks Census Area	FALSE	24	FALSE	10	12	FALSE	21	5	32	142600	FALSE	FALSE				FALSE		0.99
02261000100	Valdez-Cordova Census Area	FALSE	25	FALSE	19	14	FALSE	30	10	53	208500	FALSE	FALSE				FALSE		0.99
02275000300	Wrangell City and Borough	FALSE	35	FALSE	18	14	FALSE	46	21	55	216200	FALSE	FALSE				FALSE		0.96
02282000100	Yakutat City and Borough	FALSE	15	FALSE	30	17	FALSE	29	10	52	202300	FALSE	FALSE				FALSE		0.92
02290000100	Yukon-Koyukuk Census Area	FALSE	42	FALSE	33	17	FALSE	28	9	12	88100	FALSE	FALSE				FALSE		0.99
02290000300	Yukon-Koyukuk Census Area	FALSE	43	FALSE	22	15	FALSE	11	1	7	76600	FALSE	FALSE				FALSE		0.99
02290000400	Yukon-Koyukuk Census Area	FALSE	35	FALSE	55	24	FALSE	22	6	2	55600	FALSE	FALSE				FALSE		0.99

Alaska CEJST Identified Disadvantaged Census Tracts

Census tract 2010 ID	County Name	Share of homes with no kitchen or	Greater than or equal to the 90th	Proximity to hazardous waste	Proximity to hazardous waste	Greater than or equal to the 90th	Proximity to NPL (Superfund) sites	Proximity to NPL (Superfund) sites	Greater than or equal to the 90th	Proximity to Risk Management Plan	Proximity to Risk Management Plan	Is there at least one Formerly Used	Is there at least one abandoned mine in	There is at least one abandoned mine in	There is at least one Formerly Used	Is there at least one Formerly Used	Is there at least one abandoned mine in	Greater than or equal to the 90th	Wastewater discharge (percentil
02013000100	Aleutians East Borough	0.04	FALSE	0	0	FALSE	0	0	FALSE	74	1.01	TRUE		FALSE	TRUE	TRUE	FALSE	FALSE	
02020000600	Anchorage Municipality	0	FALSE	55	1.02	TRUE	91	0.31	FALSE	57	0.51	FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	
02020000703	Anchorage Municipality	0	FALSE	30	0.21	FALSE	88	0.24	FALSE	67	0.75			FALSE	FALSE	FALSE	FALSE	FALSE	
02020000801	Anchorage Municipality	0.02	FALSE	53	0.92	FALSE	88	0.24	FALSE	52	0.41			FALSE	FALSE	FALSE	FALSE	FALSE	
02020000802	Anchorage Municipality	0.02	FALSE	50	0.8	FALSE	82	0.17	FALSE	40	0.23			FALSE	FALSE	FALSE	FALSE	FALSE	
02020000901	Anchorage Municipality	0.03	FALSE	66	1.75	FALSE	84	0.18	FALSE	63	0.65			FALSE	FALSE	FALSE	FALSE	FALSE	
02020001000	Anchorage Municipality	0.02	FALSE	50	0.81	FALSE	78	0.15	FALSE	72	0.92			FALSE	FALSE	FALSE	FALSE	FALSE	
02020001100	Anchorage Municipality	0.11	FALSE	48	0.73	FALSE	79	0.15	FALSE	72	0.93	FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	
02020002000	Anchorage Municipality	0.04	FALSE	33	0.25	FALSE	67	0.1	FALSE	83	1.44			FALSE	FALSE	FALSE	FALSE	FALSE	
02050000100	Bethel Census Area	0.63	FALSE	0	0	FALSE	0	0	FALSE	0	0	FALSE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	
02050000200	Bethel Census Area	0.04	FALSE	0	0	FALSE	0	0	FALSE	0	0	TRUE		FALSE	FALSE	TRUE	FALSE	FALSE	
02050000300	Bethel Census Area	0.4	FALSE	0	0	FALSE	0	0	FALSE	0	0	TRUE		FALSE	TRUE	TRUE	FALSE	FALSE	
02068000100	Denali Borough	0.21	FALSE	17	0.09	FALSE	3	0	FALSE	0	0	FALSE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	
02070000100	Dillingham Census Area	0.28	FALSE	0	0	FALSE	0	0	FALSE	2	0.02	FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	
02070000200	Dillingham Census Area	0.05	FALSE	0	0	FALSE	0	0	FALSE	41	0.24	FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	
02090000100	Fairbanks North Star Borough	0	FALSE	46	0.65	FALSE	83	0.18	FALSE	39	0.23	FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	
02090000300	Fairbanks North Star Borough	0.03	FALSE	59	1.27	FALSE	83	0.18	FALSE	51	0.38			FALSE	FALSE	FALSE	FALSE	FALSE	
02090000500	Fairbanks North Star Borough	0	FALSE	40	0.43	FALSE	79	0.15	FALSE	30	0.17			FALSE	FALSE	FALSE	FALSE	FALSE	
02105000200	Hoonah-Angoon Census Area	0.26	FALSE	8	0.04	FALSE	0	0	FALSE	0	0			FALSE	FALSE	FALSE	FALSE	FALSE	
02122000100	Kenai Peninsula Borough	0.14	FALSE	3	0.02	FALSE	7	0.01	FALSE	1	0.02	FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	
02122001200	Kenai Peninsula Borough	0.16	FALSE	0	0	FALSE	1	0	FALSE	0	0		TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	
02122001300	Kenai Peninsula Borough	0.06	FALSE	1	0	FALSE	3	0	FALSE	57	0.49	TRUE		FALSE	TRUE	TRUE	FALSE	FALSE	
02150000100	Kodiak Island Borough	0.03	FALSE	12	0.06	FALSE	0	0	FALSE	5	0.04	TRUE		FALSE	FALSE	TRUE	FALSE	FALSE	
02164000100	Lake and Peninsula Borough	0.15	FALSE	14	0.08	FALSE	0	0	FALSE	0	0	TRUE		FALSE	TRUE	TRUE	FALSE	FALSE	
02170000101	Matanuska-Susitna Borough	0.25	FALSE	1	0	FALSE	3	0	FALSE	0	0.01	FALSE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	
02170000200	Matanuska-Susitna Borough	0.16	FALSE	1	0.01	FALSE	10	0.01	FALSE	5	0.04	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	
02170000401	Matanuska-Susitna Borough	0.12	FALSE	4	0.02	FALSE	24	0.02	FALSE	2	0.02		TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	
02170000402	Matanuska-Susitna Borough	0.13	FALSE	2	0.01	FALSE	16	0.01	FALSE	1	0.02	FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	
02170000501	Matanuska-Susitna Borough	0.05	FALSE	5	0.03	FALSE	30	0.03	FALSE	2	0.03			FALSE	FALSE	FALSE	FALSE	FALSE	
02180000100	Nome Census Area	0.45	FALSE	0	0	FALSE	0	0	FALSE	0	0	TRUE		FALSE	TRUE	TRUE	FALSE	FALSE	
02185000100	North Slope Borough	0.07	FALSE	0	0	FALSE	0	0	FALSE	0	0	TRUE		FALSE	FALSE	TRUE	FALSE	FALSE	
02185000200	North Slope Borough	0.22	FALSE	0	0	FALSE	0	0	FALSE	0	0	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	
02188000100	Northwest Arctic Borough	0.32	FALSE	0	0	FALSE	0	0	FALSE	0	0	TRUE		FALSE	TRUE	TRUE	FALSE	FALSE	
02188000200	Northwest Arctic Borough	0.04	FALSE	0	0	FALSE	0	0	FALSE	0	0	FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	
02198000100	Prince of Wales-Hyder Census Area	0.17	FALSE	0	0	FALSE	51	0.06	FALSE	1	0.02	FALSE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	
02198000200	Prince of Wales-Hyder Census Area	0.03	FALSE	0	0	FALSE	25	0.02	FALSE	50	0.37	TRUE		FALSE	FALSE	TRUE	FALSE	FALSE	
02198940100	Prince of Wales-Hyder Census Area	0.01	FALSE	0	0	FALSE	7	0.01	FALSE	4	0.04	TRUE		FALSE	TRUE	TRUE	FALSE	FALSE	
02240000100	Southeast Fairbanks Census Area	0.16	FALSE	0	0	FALSE	1	0	FALSE	0	0	TRUE		FALSE	FALSE	TRUE	FALSE	FALSE	
02261000100	Valdez-Cordova Census Area	0.19	FALSE	1	0	FALSE	1	0	FALSE	0	0	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	
02275000300	Wrangell City and Borough	0.04	FALSE	0	0	FALSE	7	0.01	FALSE	76	1.1	FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	
02282000100	Yakutat City and Borough	0.03	FALSE	0	0	FALSE	0	0	FALSE	0	0	TRUE		FALSE	TRUE	TRUE	FALSE	FALSE	
02290000100	Yukon-Koyukuk Census Area	0.54	FALSE	0	0	FALSE	1	0	FALSE	0	0	TRUE		FALSE	TRUE	TRUE	FALSE	FALSE	
02290000300	Yukon-Koyukuk Census Area	0.31	FALSE	0	0	FALSE	0	0	FALSE	0	0	TRUE		FALSE	TRUE	TRUE	FALSE	FALSE	
02290000400	Yukon-Koyukuk Census Area	0.38	FALSE	0	0	FALSE	0	0	FALSE	0	0	TRUE		FALSE	TRUE	TRUE	FALSE	FALSE	

Alaska CEJST Identified Disadvantaged Census Tracts

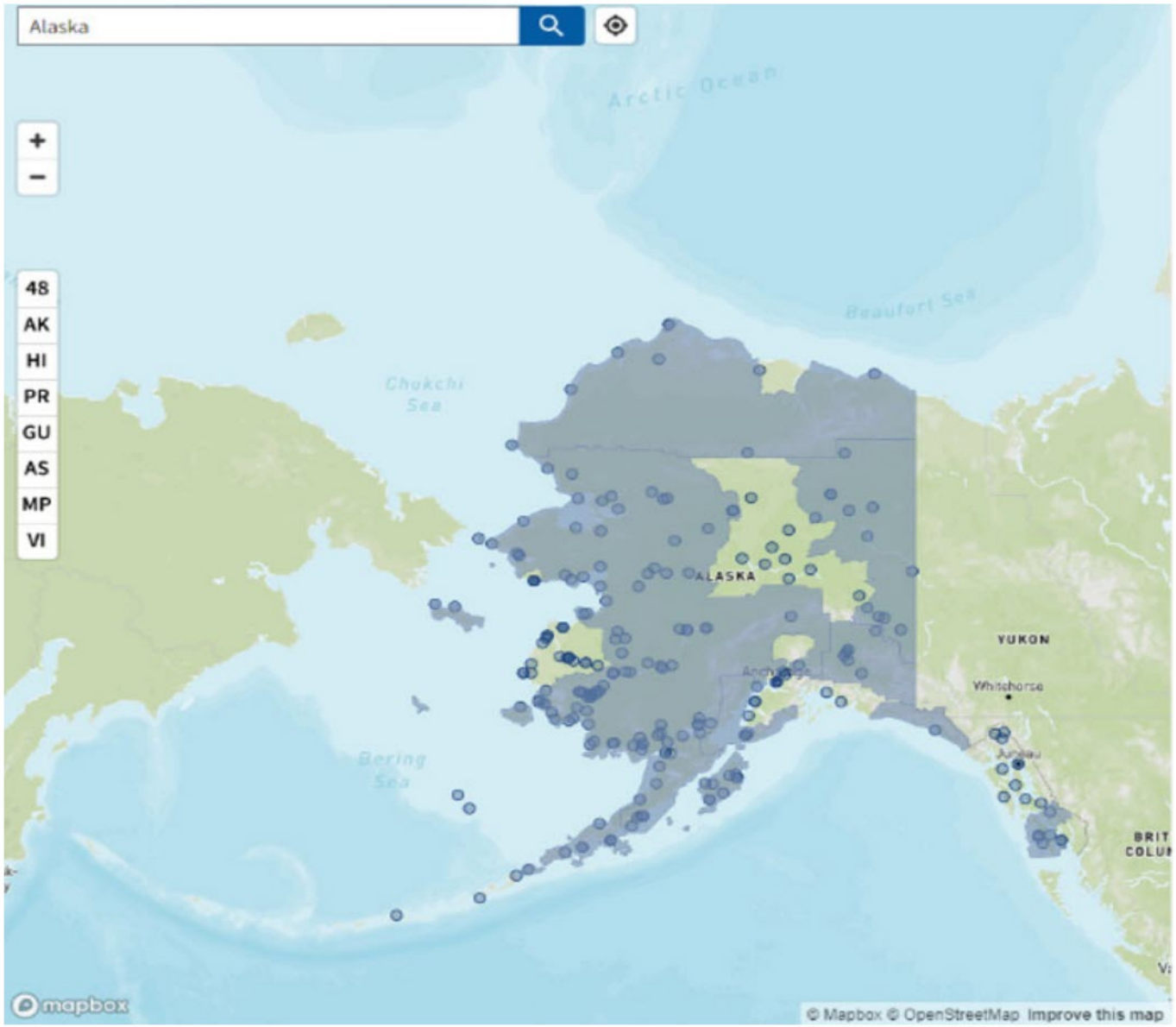
Census tract 2010 ID	County Name	Wastewater discharge	Greater than or equal to the 90th	Leaky underground storage	Leaky underground storage	Greater than or equal to the 90th	Current asthma among adults	Current asthma among adults	Greater than or equal to the 90th	Diagnosed diabetes among adults	Diagnosed diabetes among adults	Greater than or equal to the 90th	Coronary heart disease among	Coronary heart disease among	Greater than or equal to the 90th	Low life expectancy (percentil	Life expectancy (years)	Greater than or equal to the 90th	Low median household income
02013000100	Aleutians East Borough		FALSE	5	0	FALSE	14	819	FALSE	63	1150	FALSE	31	500	FALSE	1	86.9	FALSE	55
02020000600	Anchorage Municipality		FALSE	86	8.46	TRUE	90	1180	FALSE	72	1250	FALSE	57	630	TRUE	98	69.2	TRUE	95
02020000703	Anchorage Municipality		FALSE	88	10.03	FALSE	80	1090	FALSE	52	1060	FALSE	47	580	FALSE	67	76.7	FALSE	70
02020000801	Anchorage Municipality		FALSE	60	2.72	FALSE	80	1090	FALSE	34	919	FALSE	25	470	FALSE	65	76.9	FALSE	74
02020000802	Anchorage Municipality		FALSE	67	3.53	FALSE	80	1090	FALSE	22	830	FALSE	16	420	FALSE			FALSE	69
02020000901	Anchorage Municipality		TRUE	95	19.63	FALSE	88	1150	FALSE	56	1090	FALSE	47	580	TRUE	97	69.8	TRUE	90
02020001000	Anchorage Municipality		FALSE	97	23.75	FALSE	68	1030	FALSE	18	790	FALSE	19	440	FALSE	92	72.4	FALSE	87
02020001100	Anchorage Municipality		FALSE	86	8.46	FALSE	46	950	FALSE	33	910	FALSE	39	540	TRUE	99	67.3	FALSE	71
02020002000	Anchorage Municipality		TRUE	97	26.98	FALSE	68	1030	FALSE	37	940	FALSE	29	490	TRUE	95	71.4	FALSE	89
02050000100	Bethel Census Area		FALSE	5	0	TRUE	98	1430	TRUE	92	1650	TRUE	96	1000	FALSE	16	82	TRUE	92
02050000200	Bethel Census Area		FALSE	24	0.36	FALSE	88	1150	FALSE	46	1010	FALSE	43	560	FALSE	32	80.2	FALSE	36
02050000300	Bethel Census Area		FALSE	2	0	TRUE	97	1340	FALSE	87	1490	TRUE	91	900	FALSE	86	74	FALSE	89
02068000100	Denali Borough		FALSE	5	0	FALSE	46	950	FALSE	25	850	FALSE	41	550	FALSE			FALSE	37
02070000100	Dillingham Census Area		FALSE	2	0	TRUE	95	1290	FALSE	84	1430	FALSE	89	869	FALSE	1	86.5	TRUE	91
02070000200	Dillingham Census Area		FALSE	17	0.15	FALSE	82	1100	FALSE	50	1040	FALSE	53	610	FALSE	34	80	FALSE	47
02090000100	Fairbanks North Star Borough		TRUE	92	13.86	FALSE	80	1090	FALSE	69	1220	FALSE	81	790	TRUE	99	65.7	TRUE	96
02090000300	Fairbanks North Star Borough		FALSE	82	6.96	FALSE	87	1140	FALSE	27	869	FALSE	25	470	TRUE	96	71	FALSE	78
02090000500	Fairbanks North Star Borough		FALSE	85	7.99	FALSE	79	1080	FALSE	21	819	FALSE	31	500	FALSE	69	76.4	FALSE	78
02105000200	Hoonah-Angoon Census Area		FALSE	2	0	FALSE	91	1190	FALSE	92	1670	FALSE	96	1000	FALSE			TRUE	90
02122000100	Kenai Peninsula Borough		FALSE	2	0	FALSE	32	900	FALSE	69	1210	FALSE	75	740	FALSE			FALSE	93
02122001200	Kenai Peninsula Borough		FALSE	2	0	FALSE	70	1040	FALSE	65	1170	FALSE	78	760	FALSE	45	79	FALSE	74
02122001300	Kenai Peninsula Borough		FALSE	15	0.12	FALSE	49	960	FALSE	37	940	FALSE	53	610	FALSE	18	81.8	FALSE	65
02150000100	Kodiak Island Borough		FALSE	5	0	FALSE	85	1120	FALSE	59	1120	FALSE	64	670	FALSE			FALSE	53
02164000100	Lake and Peninsula Borough		FALSE	5	0	TRUE	93	1230	FALSE	75	1290	FALSE	76	750	FALSE	64	77	FALSE	88
02170000101	Matanuska-Susitna Borough		FALSE	5	0	FALSE	68	1030	FALSE	66	1180	FALSE	79	770	FALSE			TRUE	90
02170000200	Matanuska-Susitna Borough		FALSE	8	0.02	FALSE	52	969	FALSE	39	960	FALSE	53	610	FALSE	65	76.9	FALSE	89
02170000401	Matanuska-Susitna Borough		FALSE	2	0	FALSE	73	1050	FALSE	31	900	FALSE	45	570	FALSE	62	77.2	FALSE	82
02170000402	Matanuska-Susitna Borough		FALSE	2	0	FALSE	57	990	FALSE	48	1030	FALSE	69	700	FALSE	2	86	FALSE	83
02170000501	Matanuska-Susitna Borough		FALSE	23	0.33	FALSE	63	1010	FALSE	42	980	FALSE	57	630	FALSE	25	81	FALSE	74
02180000100	Nome Census Area		FALSE	5	0	TRUE	97	1350	FALSE	87	1500	TRUE	90	890	FALSE	4	84.7	FALSE	89
02185000100	North Slope Borough		FALSE	2	0	FALSE	85	1120	FALSE	51	1050	FALSE	41	550	FALSE	32	80.2	FALSE	32
02185000200	North Slope Borough		FALSE	5	0	TRUE	94	1240	FALSE	63	1150	FALSE	62	660	FALSE	65	76.9	FALSE	61
02188000100	Northwest Arctic Borough		FALSE	2	0	TRUE	97	1350	FALSE	84	1440	TRUE	90	880	FALSE	79	75.09	TRUE	90
02188000200	Northwest Arctic Borough		FALSE	81	6.51	FALSE	91	1190	FALSE	50	1040	FALSE	51	600	FALSE	35	79.9	FALSE	38
02198000100	Prince of Wales-Hyder Census Area		FALSE	2	0	FALSE	73	1050	FALSE	66	1180	FALSE	79	770	FALSE	56	77.9	FALSE	87
02198000200	Prince of Wales-Hyder Census Area		FALSE	2	0	FALSE	80	1090	FALSE	58	1110	FALSE	66	680	FALSE	45	79	FALSE	64
02198940100	Prince of Wales-Hyder Census Area		FALSE	2	0	TRUE	93	1220	FALSE	84	1430	FALSE	83	810	FALSE	67	76.7	FALSE	74
02240000100	Southeast Fairbanks Census Area		FALSE	10	0.04	FALSE	79	1080	FALSE	69	1210	FALSE	83	810	FALSE	67	76.7	FALSE	74
02261000100	Valdez-Cordova Census Area		FALSE	5	0	FALSE	60	1000	FALSE	50	1040	FALSE	67	690	FALSE	45	79	FALSE	66
02275000300	Wrangell City and Borough		FALSE	60	2.72	FALSE	63	1010	FALSE	57	1100	FALSE	75	740	FALSE	48	78.7	FALSE	77
02282000100	Yakutat City and Borough		FALSE	2	0	FALSE	70	1040	FALSE	58	1110	FALSE	60	650	FALSE			FALSE	51
02290000100	Yukon-Koyukuk Census Area		FALSE	5	0	TRUE	95	1280	TRUE	90	1600	TRUE	95	980	FALSE	79	75.09	TRUE	97
02290000300	Yukon-Koyukuk Census Area		FALSE	5	0	TRUE	93	1230	FALSE	87	1490	TRUE	92	910	FALSE	79	75.09	FALSE	89
02290000400	Yukon-Koyukuk Census Area		FALSE	5	0	TRUE	95	1270	FALSE	88	1540	TRUE	94	960	FALSE	53	78.2	TRUE	92

Alaska CEJST Identified Disadvantaged Census Tracts

Census tract 2010 ID	County Name	Median household income as a	Greater than or equal to the 90th	Linguistic isolation (percent) (percentil	Linguistic isolation (percent)	Greater than or equal to the 90th	Unemployment (percent) (percentil	Unemployment (percent)	Greater than or equal to the 90th	Percent of individuals below 200%	Percent of individuals below 200%	Percent of individuals < 100% Federal	Percent of individuals < 100% Federal	Percent individuals age 25 or over	Percent individuals age 25 or over	Percent of residents who are not	Unemployment (percent) in 2009	Percentage households below	Greater than or equal to the 90th
02013000100	Aleutians East Borough	89	FALSE	60	2	FALSE	37	3	FALSE	57	34	57	13	67	14	97	3	10	FALSE
02020000600	Anchorage Municipality	42	FALSE	74	5	FALSE	73	7	TRUE	90	61	93	35	70	15	95	10	24	FALSE
02020000703	Anchorage Municipality	76	FALSE	53	1	FALSE	87	10	FALSE	70	42	79	22	42	8	91	10	13	FALSE
02020000801	Anchorage Municipality	71	FALSE	59	2	FALSE	58	5	FALSE	62	36	76	21	69	15	94	12	18	FALSE
02020000802	Anchorage Municipality	77	FALSE	58	2	FALSE	86	10	FALSE	69	41	64	15	52	10	93	8	16	FALSE
02020000901	Anchorage Municipality	52	TRUE	93	17	TRUE	93	12	FALSE	84	53	85	27	78	19	92	11	23	FALSE
02020001000	Anchorage Municipality	57	FALSE	65	3	TRUE	92	12	FALSE	56	33	69	17	52	10	90	8	15	FALSE
02020001100	Anchorage Municipality	74	FALSE	75	5	FALSE	64	6	FALSE	72	43	70	18	35	7	93	11	17	FALSE
02020002000	Anchorage Municipality	55	FALSE	80	6	FALSE	89	11	FALSE	67	39	67	17	72	16	93	9	17	FALSE
02050000100	Bethel Census Area	50	FALSE	85	9	TRUE	99	25	TRUE	96	71	93	35	88	25	98	22	25	FALSE
02050000200	Bethel Census Area	107	FALSE	65	3	FALSE	85	9	FALSE	53	32	64	15	50	10	95	7	7	FALSE
02050000300	Bethel Census Area	54	FALSE	51	1	TRUE	99	25	FALSE	89	59	85	27	76	18	97	14	15	FALSE
02068000100	Denali Borough	105	FALSE	12	0	FALSE	6	1	FALSE	59	35	65	16	4	1	96	1	4	FALSE
02070000100	Dillingham Census Area	52	FALSE	78	6	TRUE	97	18	FALSE	91	62	77	21	71	16	97	22	22	FALSE
02070000200	Dillingham Census Area	96	FALSE	61	2	FALSE	68	6	FALSE	46	28	51	11	55	11	96	3	12	FALSE
02090000100	Fairbanks North Star Borough	42	FALSE	40	0	FALSE	71	6	FALSE	70	42	46	10	57	11	95	4	15	FALSE
02090000300	Fairbanks North Star Borough	68	FALSE	52	1	TRUE	95	15	FALSE	71	42	75	20	62	13	91	7	15	FALSE
02090000500	Fairbanks North Star Borough	68	FALSE	58	2	TRUE	96	16	FALSE	45	28	46	10	67	14	93	3	8	FALSE
02105000200	Hoonah-Angoon Census Area	53	FALSE	63	3	FALSE	0	0	FALSE	44	27	42	9	75	17	100	6	3	FALSE
02122000100	Kenai Peninsula Borough	48	FALSE	52	1	FALSE	97	19	FALSE	80	49	79	22	7	2	89	17	29	FALSE
02122001200	Kenai Peninsula Borough	72	FALSE	58	2	FALSE	48	4	FALSE	61	36	71	18	32	6	96	8	19	FALSE
02122001300	Kenai Peninsula Borough	80	FALSE	40	0	FALSE	59	5	FALSE	59	35	62	15	31	6	98	3	9	FALSE
02150000100	Kodiak Island Borough	90	FALSE	40	0	TRUE	93	13	FALSE	47	29	64	15	66	14	93	4	15	FALSE
02164000100	Lake and Peninsula Borough	56	FALSE	36	0	TRUE	95	15	FALSE	72	43	66	16	58	11	98	9	21	FALSE
02170000101	Matanuska-Susitna Borough	53	FALSE	12	0	TRUE	97	18	FALSE	71	42	82	24	64	13	98	6	29	FALSE
02170000200	Matanuska-Susitna Borough	54	FALSE	28	0	FALSE	96	16	FALSE	65	38	65	16	49	9	96	6	12	FALSE
02170000401	Matanuska-Susitna Borough	63	FALSE	30	0	FALSE	95	14	FALSE	63	37	44	10	50	9	97	15	12	FALSE
02170000402	Matanuska-Susitna Borough	63	FALSE	12	0	FALSE	80	8	FALSE	68	40	59	14	53	10	96	0	6	FALSE
02170000501	Matanuska-Susitna Borough	72	FALSE	12	0	FALSE	89	10	FALSE	62	37	64	15	50	10	98	10	12	FALSE
02180000100	Nome Census Area	55	FALSE	55	2	TRUE	99	24	FALSE	92	63	89	31	82	21	97	21	35	FALSE
02185000100	North Slope Borough	111	FALSE	78	6	TRUE	95	15	FALSE	44	27	51	12	61	12	95	16	14	FALSE
02185000200	North Slope Borough	84	FALSE	65	3	TRUE	98	20	FALSE	62	37	68	17	84	22	95	26	9	FALSE
02188000100	Northwest Arctic Borough	54	FALSE	69	4	TRUE	99	28	TRUE	92	63	90	31	85	23	99	26	23	FALSE
02188000200	Northwest Arctic Borough	104	FALSE	55	2	FALSE	78	8	FALSE	56	33	71	18	53	10	93	14	15	FALSE
02198000100	Prince of Wales-Hyder Census Area	57	FALSE	12	0	FALSE	78	7	FALSE	68	40	76	20	53	10	97	13	15	FALSE
02198000200	Prince of Wales-Hyder Census Area	81	FALSE	12	0	FALSE	88	10	FALSE	55	33	63	15	42	8	95	8	17	FALSE
02198940100	Prince of Wales-Hyder Census Area	72	FALSE	12	0	FALSE	97	17	FALSE	64	38	62	15	40	8	96	14	9	FALSE
02240000100	Southeast Fairbanks Census Area	71	FALSE	63	3	TRUE	95	15	FALSE	60	36	71	18	61	12	94	14	15	FALSE
02261000100	Valdez-Cordova Census Area	79	FALSE	27	0	FALSE	68	6	FALSE	59	35	50	11	29	6	98	11	14	FALSE
02275000300	Wrangell City and Borough	69	FALSE	26	0	FALSE	69	6	FALSE	57	34	33	7	64	13	96	7	8	FALSE
02282000100	Yakutat City and Borough	92	FALSE	57	2	FALSE	62	5	FALSE	59	35	30	7	44	8	97	4	4	FALSE
02290000100	Yukon-Koyukuk Census Area	38	FALSE	74	5	TRUE	98	22	TRUE	89	59	92	34	80	20	94	28	24	FALSE
02290000300	Yukon-Koyukuk Census Area	55	FALSE	50	1	TRUE	97	19	FALSE	79	48	84	25	61	12	94	29	25	FALSE
02290000400	Yukon-Koyukuk Census Area	49	FALSE	12	0	TRUE	97	18	FALSE	86	55	88	30	66	14	97	19	28	FALSE

Alaska CEJST Identified Disadvantaged Census Tracts						
Census tract 2010 ID	County Name	Greater than or equal to the 90th	Greater than or equal to the 90th	Number of Tribal areas within	Names of Tribal areas within Census tract	Percent of the Census tract that is within Tribal areas
02013000100	Aleutians East Borough	FALSE	FALSE	8	Agdaagux, Akutan, Belkofski, False Pass, Nelson Lagoon, Pauloff Harbor, Qagan Tayagungin, Unga	
02020000600	Anchorage Municipality	FALSE	FALSE			
02020000703	Anchorage Municipality	FALSE	FALSE			
02020000801	Anchorage Municipality	FALSE	FALSE			
02020000802	Anchorage Municipality	FALSE	FALSE			
02020000901	Anchorage Municipality	FALSE	FALSE			
02020001000	Anchorage Municipality	FALSE	FALSE			
02020001100	Anchorage Municipality	FALSE	FALSE	5	Chenega, Georgetown, Ivanof Bay Tribe, Portage Creek, Ugashik	
02020002000	Anchorage Municipality	FALSE	FALSE			
02050000100	Bethel Census Area	FALSE	FALSE	25	Akiachak, Akiak, Atmautluak, Chefornak, Eek, Goodnews Bay, Kasigluk, Kipnuk, Kongiganak, Kwethluk, Kwigillingok, Kwinhagak, Mekoryuk, Napakiak, Napaskiak, Newtok, Nightmute, Nunakauyarmiut, Nunapitchuk, Oscarville, Platinum, Tuluksak, Tuntutuliak, Tununak, Umkumiut	
02050000200	Bethel Census Area	FALSE	FALSE	2	Napaimute, Orutsararmiut	
02050000300	Bethel Census Area	FALSE	FALSE	8	Aniak, Chuathbaluk, Crooked Creek, Kalskag, Lower Kalskag, Red Devil, Sleetmute, Stony River	
02068000100	Denali Borough	FALSE	FALSE	1	Cantwell	
02070000100	Dillingham Census Area	FALSE	FALSE	8	Aleknagik, Clark's Point, Ekwok, Manokotak, New Koliganek, New Stuyahok, Togiak, Twin Hills	
02070000200	Dillingham Census Area	FALSE	FALSE	2	Curyung, Ekuk	
02090000100	Fairbanks North Star Borough	FALSE	FALSE	1	Birch Creek	
02090000300	Fairbanks North Star Borough	FALSE	FALSE			
02090000500	Fairbanks North Star Borough	FALSE	FALSE			
02105000200	Hoonah-Angoon Census Area	FALSE	FALSE	1	Chilkat	
02122000100	Kenai Peninsula Borough	FALSE	FALSE	1	Tyonek	
02122001200	Kenai Peninsula Borough	FALSE	FALSE	3	Nanwalek, Port Graham, Seldovia	
02122001300	Kenai Peninsula Borough	FALSE	FALSE			
02150000100	Kodiak Island Borough	FALSE	FALSE	7	Akhiok, Alutiiq Tribe of Old Harbor, Kaguyuk, Karluk, Larsen Bay, Ouzinkie, Port Lions	
02164000100	Lake and Peninsula Borough	FALSE	FALSE	14	Chignik Bay, Chignik Lagoon, Chignik Lake, Egegik, Igiugig, Iliamna, Kokhanok, Levelock, Newhalen, Nondalton, Pedro Bay, Perryville, Pilot Point, Port Heiden	
02170000101	Matanuska-Susitna Borough	FALSE	FALSE			
02170000200	Matanuska-Susitna Borough	FALSE	FALSE	1	Chickaloon	
02170000401	Matanuska-Susitna Borough	FALSE	FALSE			
02170000402	Matanuska-Susitna Borough	FALSE	FALSE			
02170000501	Matanuska-Susitna Borough	FALSE	FALSE			
02180000100	Nome Census Area	FALSE	FALSE	16	Brevig Mission, Chinik, Diomede, Elim, Gambell, Koyuk, Mary's Igloo, Savoonga, Shaktoolik, Shishmaref, St. Michael, Stebbins, Teller, Unalakleet, Wales, White Mountain	
02185000100	North Slope Borough	FALSE	FALSE	2	Arctic Slope, Barrow	
02185000200	North Slope Borough	FALSE	FALSE	7	Anaktuvuk Pass, Atqasuk, Kaktovik, Nuiqsut, Point Hope, Point Lay, Wainwright	
02188000100	Northwest Arctic Borough	FALSE	FALSE	10	Ambler, Buckland, Deering, Kiana, Kivalina, Kobuk, Noatak, Noorvik, Selawik, Shungnak	
02188000200	Northwest Arctic Borough	FALSE	FALSE	1	Kotzebue	
02198000100	Prince of Wales-Hyder Census Area	FALSE	FALSE	3	Annette Island, Hydaburg, Kasaan	
02198000200	Prince of Wales-Hyder Census Area	FALSE	FALSE	2	Craig, Klawock	
02198940100	Prince of Wales-Hyder Census Area	FALSE	FALSE	1	Annette Island	94
02240000100	Southeast Fairbanks Census Area	FALSE	FALSE	5	Dot Lake, Eagle, Northway, Tanacross, Tetlin	
02261000100	Valdez-Cordova Census Area	FALSE	FALSE	7	Cheesh-Na, Chitina, Gakona, Gulkana, Kluti-Kaah, Mentasta, Tazlina	
02275000300	Wrangell City and Borough	FALSE	FALSE	1	Wrangell	
02282000100	Yakutat City and Borough	FALSE	FALSE	1	Yakutat	
02290000100	Yukon-Koyukuk Census Area	FALSE	FALSE	7	Arctic Village, Beaver, Chalkyitsik, Circle, Fort Yukon, Venetie, Venetie	
02290000300	Yukon-Koyukuk Census Area	FALSE	FALSE	9	Alatna, Allakaket, Galena, Hughes, Huslia, Kaltag, Koyukuk, Nulato, Ruby	
02290000400	Yukon-Koyukuk Census Area	FALSE	FALSE	9	Anvik, Grayling, Holy Cross, Lime, Mcgrath, Nikolai, Shageluk, Takotna, Telida	

AK CEJST Map



Source: Council on Environmental Quality Climate and Economic Justice Screening Tool

Alaska Population Estimates by Alaska Native Village Statistical Area (ANVSA), 2010 and 2020		
	Census Total April 2010	Census Total April 2020
ANVSA Name		
Akhiok ANVSA	71	63
Akiachak ANVSA	627	683
Akiak ANVSA	346	462
Akutan ANVSA	1,003	1,585
Alakanuk ANVSA	677	756
Alatna ANVSA	32	15
Aleknagik ANVSA	219	211
Algaaciq ANVSA	424	497
Allakaket ANVSA	171	177
Ambler ANVSA	258	274
Anaktuvuk Pass ANVSA	324	425
Andreafsky ANVSA	83	102
Angoon ANVSA	459	357
Aniak ANVSA	501	510
Annette Island Reserve	1,460	1,562
Anvik ANVSA	85	70
Arctic Village ANVSA	152	151
Atka ANVSA	61	53
Atmautluak ANVSA	277	386
Atqasuk ANVSA	233	276
Barrow ANVSA	4,212	4,927
Beaver ANVSA	84	48
Belkofski ANVSA	0	2
Bethel ANVSA	6,080	6,325
Bill Moore's ANVSA	0	0
Birch Creek ANVSA	33	35
Brevig Mission ANVSA	388	428
Buckland ANVSA	416	550
Cantwell ANVSA	219	197
Canyon Village ANVSA	0	0
Chalkyitsik ANVSA	69	56
Chefornak ANVSA	418	506
Chenega ANVSA	76	59
Chevak ANVSA	938	951
Chickaloon ANVSA	23,087	25,487
Chignik ANVSA	91	97
Chignik Lagoon ANVSA	78	72
Chignik Lake ANVSA	73	65
Chilkat ANVSA	99	93
Chilkoot ANVSA	441	410
Chistochina ANVSA	78	50
Chitina ANVSA	96	78
Chuathbaluk ANVSA	118	104
Chulloonawick ANVSA	0	1
Circle ANVSA	104	91
Clarks Point ANVSA	62	67
Copper Center ANVSA	442	449
Council ANVSA	0	2
Craig ANVSA	1,478	1,251
Crooked Creek ANVSA	105	90
Deering ANVSA	122	182
Dillingham ANVSA	2,378	2,350
Dot Lake ANVSA	62	23
Douglas ANVSA	5,474	5,542
Eagle ANVSA	69	54
Eek ANVSA	296	404
Egegik ANVSA	109	39
Eklutna ANVSA	54	62
Ekuk ANVSA	2	2
Ekwok ANVSA	115	111
Elim ANVSA	330	366
Emmonak ANVSA	762	825
Evansville ANVSA	26	35

Eyak ANVSA	128	134
False Pass ANVSA	35	394
Fort Yukon ANVSA	583	428
Gakona ANVSA	122	107
Galena ANVSA	470	472
Gambell ANVSA	681	640
Georgetown ANVSA	2	1
Golovin ANVSA	156	175
Goodnews Bay ANVSA	243	258
Grayling ANVSA	194	210
Gulkana ANVSA	136	121
Hamilton ANVSA	0	2
Healy Lake ANVSA	13	24
Holy Cross ANVSA	178	176
Hoonah ANVSA	760	931
Hooper Bay ANVSA	1,093	1,375
Hughes ANVSA	78	86
Huslia ANVSA	275	304
Hydaburg ANVSA	376	380
Igiugig ANVSA	50	68
Iliamna ANVSA	109	108
Inalik ANVSA	115	83
Ivanof Bay ANVSA	7	1
Kake ANVSA	557	543
Kaktovik ANVSA	239	283
Kalskag ANVSA	210	212
Kaltag ANVSA	190	158
Karluk ANVSA	37	27
Kasaan ANVSA	49	30
Kasigluk ANVSA	569	623
Kenaitze ANVSA	32,902	34,637
Ketchikan ANVSA	12,742	13,225
Kiana ANVSA	363	449
King Cove ANVSA	938	757
King Salmon ANVSA	167	125
Kipnuk ANVSA	639	704
Kivalina ANVSA	374	444
Klawock ANVSA	591	528
Knik ANVSA	65,768	81,495
Kobuk ANVSA	151	191
Kodiak ANVSA	0	2
Kokhanok ANVSA	170	152
Kongiganak ANVSA	439	486
Kotlik ANVSA	577	655
Kotzebue ANVSA	3,201	3,102
Koyuk ANVSA	332	312
Koyukuk ANVSA	96	98
Kwethluk ANVSA	721	812
Kwigillingok ANVSA	321	380
Kwinhagak ANVSA	669	776
Lake Minchumina ANVSA	11	16
Larsen Bay ANVSA	87	34
Lesnoi ANVSA	0	0
Levelock ANVSA	69	69
Lime Village ANVSA	29	13
Lower Kalskag ANVSA	282	278
Manley Hot Springs ANVSA	89	169
Manokotak ANVSA	442	487
Marshall ANVSA	414	492
Mary's Igloo ANVSA	0	1
McGrath ANVSA	346	301
Mekoryuk ANVSA	191	206
Mentasta Lake ANVSA	92	108
Minto ANVSA	210	150
Mountain Village ANVSA	813	621
Naknek ANVSA	544	470
Nanwalek ANVSA	254	247
Napaimute ANVSA	2	0

Napakiak ANVSA	354	358
Napaskiak ANVSA	405	509
Nelson Lagoon ANVSA	52	41
Nenana ANVSA	378	358
New Koliganek ANVSA	209	183
New Stuyahok ANVSA	510	512
Newhalen ANVSA	190	168
Newtok ANVSA	354	308
Nightmute ANVSA	261	306
Nikolai ANVSA	94	89
Nikolski ANVSA	18	39
Ninilchik ANVSA	14,512	16,004
Noatak ANVSA	514	570
Nome ANVSA	3,681	3,794
Nondalton ANVSA	164	133
Noorvik ANVSA	668	694
Northway ANVSA	242	227
Nuiqsut ANVSA	402	512
Nulato ANVSA	264	239
Nunam Iqua ANVSA	187	217
Nunapitchuk ANVSA	496	594
Ohogamiut ANVSA	0	1
Old Harbor ANVSA	218	216
Oscarville ANVSA	70	70
Ouzinkie ANVSA	172	118
Paimiut ANVSA	0	2
Pedro Bay ANVSA	42	43
Perryville ANVSA	113	88
Petersburg ANVSA	2,347	2,360
Pilot Point ANVSA	68	70
Pilot Station ANVSA	568	615
Pitkas Point ANVSA	109	120
Platinum ANVSA	59	55
Point Hope ANVSA	674	830
Point Lay ANVSA	189	330
Port Alsworth ANVSA	159	186
Port Graham ANVSA	177	162
Port Heiden ANVSA	102	100
Port Lions ANVSA	194	170
Portage Creek ANVSA	2	4
Rampart ANVSA	24	57
Red Devil ANVSA	23	22
Ruby ANVSA	166	139
Russian Mission ANVSA	312	421
Salamatof ANVSA	980	1,078
Sand Point ANVSA	976	536
Savoonga ANVSA	671	835
Saxman ANVSA	411	384
Scammon Bay ANVSA	474	600
Selawik ANVSA	829	809
Seldovia ANVSA	427	448
Shageluk ANVSA	83	100
Shaktoolik ANVSA	251	212
Shishmaref ANVSA	563	576
Shungnak ANVSA	262	272
Sitka ANVSA	4,480	4,459
Skagway ANVSA	967	1,240
Sleetmute ANVSA	86	95
Solomon ANVSA	0	1
South Naknek ANVSA	79	67
St. George ANVSA	102	67
St. Michael ANVSA	401	456
St. Paul ANVSA	479	413
Stebbins ANVSA	556	634
Stevens Village ANVSA	78	37
Stony River ANVSA	54	57
Takotna ANVSA	52	56
Tanacross ANVSA	136	144

Tanana ANVSA	246	246
Tatitlek ANVSA	88	90
Tazlina ANVSA	319	263
Telida ANVSA	3	2
Teller ANVSA	229	249
Tetlin ANVSA	130	135
Togiak ANVSA	817	817
Toksook Bay ANVSA	563	658
Tuluksak ANVSA	373	444
Tuntutuliak ANVSA	382	469
Tununak ANVSA	327	411
Twin Hills ANVSA	74	103
Tyonek ANVSA	177	161
Ugashik ANVSA	12	4
Unalakleet ANVSA	688	806
Unalaska ANVSA	4,376	4,254
Uyak ANVSA	0	1
Venetie ANVSA	149	205
Wainwright ANVSA	556	628
Wales ANVSA	145	168
White Mountain ANVSA	190	185
Wrangell ANVSA	1,189	1,173
Yakutat ANVSA	662	657
		270,186
Source: US Census Bureau and Alaska Department of Labor and Workforce Development, Research and Analysis Section		

Alaska Native Villages (ANVs) are tribes, bands, clans, groups, villages, communities, or associations in Alaska that are recognized pursuant to the ANCSA of 1972. The Census Bureau established Alaska Native village statistical areas (ANVSAs) as geographic entities for data tabulation purposes.

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.

Benefit Quantification			
Benefits	**Quantifiable**	**Measure**	**Tracking**
Decrease in Energy Burden	Tbtu / Million $	Site Energy Savings Energy Costs Savings	2009 Baseline – annual and cumulative
Decrease in environmental exposure	MMT	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

Disadvantaged Communitites, Other Considerations

City/Borough	FIPS*	Pop.	Rural (OMB)	National SVI Ranking (CDC)	Areas of Persistent Poverty* (DOT)	Difficult to Develop* (HUD)	Distressed Communities (Denali Commission)
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

Federally Recognized Tribes

EntityName	EntityType	AlternateName	Address	City	State	CommunityName	ZIPCode
Agdaagux Tribe of King Cove	Federally Recognized Tribe	King Cove	PO Box 249	King Cove	AK	King Cove	99612
Akiachak Native Community	Federally Recognized Tribe		PO Box 51070	Akiachak	AK	Akiachak	99551-0070
Akiak Native Community	Federally Recognized Tribe		PO Box 52127	Akiak	AK	Akiak	99552
Alatna Village	Federally Recognized Tribe		PO Box 70	Allakaket	AK	Alatna	99720
Algaaciq Native Village	Federally Recognized Tribe	St. Mary's	PO Box 48	St. Mary's	AK	St. Mary's	99658
Allakaket Village	Federally Recognized Tribe		PO Box 50	Allakaket	AK	Allakaket	99720
Alutiiq Tribe of Old Harbor	Federally Recognized Tribe	Native Village of Old Harbor or Village of Old Harbor or Old Harbor Tribal Council	PO Box 62	Old Harbor	AK	Old Harbor	99643
Angoon Community Association	Federally Recognized Tribe		PO Box 328	Angoon	AK	Angoon	99820
Anvik Village	Federally Recognized Tribe		PO Box 10	Anvik	AK	Anvik	99558
Arctic Village	Federally Recognized Tribe	Native Village of Venetie Tribal Government	PO Box 22069	Arctic Village	AK	Arctic Village	99722
Asa'carsarmiut Tribe	Federally Recognized Tribe		PO Box 32249	Mountain Village	AK	Mountain Village	99632
Atqasuk Village	Federally Recognized Tribe	Atkasook	PO Box 91108	Atqasuk	AK	Atqasuk	99791
Beaver Village	Federally Recognized Tribe		PO Box 24029	Beaver	AK	Beaver	99724
Birch Creek Tribe	Federally Recognized Tribe	Birch Creek Tribal Council	PO Box 73505	Fairbanks	AK	Birch Creek	99707
Central Council of the Tlingit & Haida Indian Tribes of Alaska	Federally Recognized Tribe	Central Council	9097 Glacier Hwy	Juneau	AK	Juneau	99801
Chalkyitsik Village	Federally Recognized Tribe		PO Box 57	Chalkyitsik	AK	Chalkyitsik	99788
Cheesh-Na Tribe	Federally Recognized Tribe	Native Village of Chistochina	PO Box 241	Gakona	AK	Chistochina	99586
Chevak Native Village	Federally Recognized Tribe		PO Box 140	Chevak	AK	Chevak	99563-0140
Chickaloon Native Village	Federally Recognized Tribe		PO Box 1105	Chickaloon	AK	Chickaloon	99674-1105
Chignik Bay Tribal Council	Federally Recognized Tribe	Native Village of Chignik	PO Box 50	Chignik	AK	Chignik	99564
Chignik Lake Village	Federally Recognized Tribe		PO Box 33	Chignik Lake	AK	Chignik Lake	99548
Chilkat Indian Village	Federally Recognized Tribe	Klukwan	HC 60 Box 2207	Haines	AK	Klukwan	99827
Chilkoot Indian Association	Federally Recognized Tribe	Haines	PO Box 490	Haines	AK	Haines	99827-0490
Chinik Eskimo Community	Federally Recognized Tribe	Golovin	PO Box 62020	Golovin	AK	Golovin	99762
Chuloonawick Native Village	Federally Recognized Tribe		PO Box 245	Emmonak	AK	Chuloonawick	99581-0245
Circle Native Community	Federally Recognized Tribe		PO Box 89	Circle	AK	Circle	99733
Craig Tribal Association	Federally Recognized Tribe		PO Box 828	Craig	AK	Craig	99921
Curyung Tribal Council	Federally Recognized Tribe		PO Box 216	Dillingham	AK	Dillingham	99576
Douglas Indian Association	Federally Recognized Tribe		811 W. 12th Street	Juneau	AK	Douglas	99801
Egegik Village	Federally Recognized Tribe		PO Box 29	Egegik	AK	Egegik	99579
Eklutna Native Village	Federally Recognized Tribe		26339 Eklutna Village Road	Chugiak	AK	Eklutna	99567-6339
Emmonak Village	Federally Recognized Tribe		126 Frontage Road	Emmonak	AK	Emmonak	99581
Evansville Village	Federally Recognized Tribe	Bettles Field	PO Box 26087	Bettles Field	AK	Evansville	99726
Galena Village	Federally Recognized Tribe	Louden Village	100 Tiger Highway	Galena	AK	Galena	99741
Gulkana Village	Federally Recognized Tribe		PO Box 254	Gulkana	AK	Gulkana	99586
Healy Lake Village	Federally Recognized Tribe		PO Box 60300	Fairbanks	AK	Healy Lake	99706-0300
Holy Cross Village	Federally Recognized Tribe		PO Box 89	Holy Cross	AK	Holy Cross	99602
Hoonah Indian Association	Federally Recognized Tribe		PO Box 602	Hoonah	AK	Hoonah	99829-0602
Hughes Village	Federally Recognized Tribe		PO Box 45029	Hughes	AK	Hughes	99745
Huslia Village	Federally Recognized Tribe		PO Box 70	Huslia	AK	Huslia	99746
Hydaburg Cooperative Association	Federally Recognized Tribe		PO Box 349	Hydaburg	AK	Hydaburg	99922
Igiugig Village	Federally Recognized Tribe		PO Box 4008	Igiugig	AK	Igiugig	99613
Inupiat Community of the Arctic Slope	Federally Recognized Tribe		PO Box 934	Barrow	AK	Utqiagvik	99723
Iqurmuit Traditional Council	Federally Recognized Tribe		PO Box 09	Russian Mission	AK	Russian Mission	99657
Ivanof Bay Tribe	Federally Recognized Tribe	Ivanof Bay Village	6407 Brayton Drive Suite 201	Anchorage	AK	Ivanof Bay	99507
Kaguyak Village	Federally Recognized Tribe		PO Box 5078	Akhiok	AK	Kaguyak	99615
Kaktovik Village	Federally Recognized Tribe	Barter Island	PO Box 52	Kaktovik	AK	Kaktovik	99747
Kasigluk Traditional Elders Council	Federally Recognized Tribe	Kasigluk Traditional Council	PO Box 19	Kasigluk	AK	Kasigluk	99609-0019
Kenaitze Indian Tribe	Federally Recognized Tribe		PO Box 988	Kenai	AK	Kenai	99611-0988
Ketchikan Indian Corporation	Federally Recognized Tribe		2960 Tongass Avenue	Ketchikan	AK	Ketchikan	99901
King Island Native Community	Federally Recognized Tribe		PO Box 682	Nome	AK	Nome	99762
King Salmon Tribe	Federally Recognized Tribe		PO Box 68	King Salmon	AK	King Salmon	99613-0068
Klawock Cooperative Association	Federally Recognized Tribe		PO Box 430	Klawock	AK	Klawock	99925-0430
Knik Tribe	Federally Recognized Tribe		PO Box 871565	Wasilla	AK	Wasilla	99687-1565
Kokhanok Village	Federally Recognized Tribe		PO Box 1007	Kokhanok	AK	Kokhanok	99606
Koyukuk Native Village	Federally Recognized Tribe		PO Box 109	Koyukuk	AK	Koyukuk	99754
Levelock Village	Federally Recognized Tribe		PO Box 70	Levelock	AK	Levelock	99625
Lime Village	Federally Recognized Tribe		PO Box LVD	McGrath	AK	Lime Village	99627
Manley Hot Springs Village	Federally Recognized Tribe		PO Box 105	Manley Hot Springs	AK	Manley Hot Springs	99756
Manokotak Village	Federally Recognized Tribe		PO Box 169	Manokotak	AK	Manokotak	99628
McGrath Native Village	Federally Recognized Tribe		PO Box 134	McGrath	AK	McGrath	99627
Mentasta Traditional Council	Federally Recognized Tribe		PO Box 6019	Mentasta	AK	Mentasta Lake	99780-6019
Metlakatla Indian Community Annette Island Reserve	Federally Recognized Tribe		PO Box 8	Metlakatla	AK	Metlakatla	99926-0008
Naknek Native Village	Federally Recognized Tribe		PO Box 210	Naknek	AK	Naknek	99633
Native Village of Afognak	Federally Recognized Tribe		323 Carolyn Street	Kodiak	AK	Afognak	99615
Native Village of Akhiok	Federally Recognized Tribe		PO Box 5030	Akhiok	AK	Akhiok	99615
Native Village of Akutan	Federally Recognized Tribe		PO Box 89	Akutan	AK	Akutan	99553-0089
Native Village of Aleknagik	Federally Recognized Tribe		PO Box 115	Aleknagik	AK	Aleknagik	99555
Native Village of Ambler	Federally Recognized Tribe		PO Box 47	Ambler	AK	Ambler	99786
Native Village of Atka	Federally Recognized Tribe		PO Box 47030	Atka	AK	Atka	99547
Native Village of Barrow Inupiat Traditional Government	Federally Recognized Tribe		PO Box 1130	Barrow	AK	Utqiagvik	99723
Native Village of Belkofski	Federally Recognized Tribe		PO Box 57	King Cove	AK	King Cove	99612
Native Village of Brevig Mission	Federally Recognized Tribe		101 Mission Street	Brevig Mission	AK	Brevig Mission	99785
Native Village of Buckland	Federally Recognized Tribe		PO Box 67	Buckland	AK	Buckland	99727

Native Village of Cantwell	Federally Recognized Tribe		PO Box 94	Cantwell	AK	Cantwell	99729
Native Village of Chenega	Federally Recognized Tribe	Chanega	PO Box 8079	Chenega Bay	AK	Chenega	99574-8079
Native Village of Chignik Lagoon	Federally Recognized Tribe		PO Box 09	Chignik Lagoon	AK	Chignik Lagoon	99565
Native Village of Chitina	Federally Recognized Tribe		PO Box 31	Chitina	AK	Chitina	99566
Native Village of Chuathbaluk	Federally Recognized Tribe	Russian Mission or Kuskokwim	#1 Teen Center Trail	Chuathbaluk	AK	Chuathbaluk	99557-8999
Native Village of Council	Federally Recognized Tribe		PO Box 2050	Nome	AK	Nome	99762
Native Village of Deering	Federally Recognized Tribe		PO Box 36089	Deering	AK	Deering	99736
Native Village of Diomede	Federally Recognized Tribe	Inalik	PO Box 7079	Diomede	AK	Diomede	99762
Native Village of Eagle	Federally Recognized Tribe		PO Box 19	Eagle	AK	Eagle Village	99738
Native Village of Eek	Federally Recognized Tribe		PO Box 89	Eek	AK	Eek	99578-0089
Native Village of Ekuk	Federally Recognized Tribe		PO Box 530	Dillingham	AK	Ekuk	99576
Native Village of Ekwok	Federally Recognized Tribe		PO Box 70	Ekwok	AK	Ekwok	99580
Native Village of Elim	Federally Recognized Tribe	Elim IRA	PO Box 39070	Elim	AK	Elim	99739
Native Village of Eyak	Federally Recognized Tribe	Cordova	PO Box 1388	Cordova	AK	Eyak	99574-1388
Native Village of False Pass	Federally Recognized Tribe		PO Box 29	False Pass	AK	False Pass	99583
Native Village of Fort Yukon	Federally Recognized Tribe		PO Box 126	Fort Yukon	AK	Fort Yukon	99740
Native Village of Gakona	Federally Recognized Tribe		PO Box 102	Gakona	AK	Gakona	99586
Native Village of Gambell	Federally Recognized Tribe	Sivuqaq	PO Box 90	Gambell	AK	Gambell	99742
Native Village of Georgetown	Federally Recognized Tribe		5313 Arctic Boulevard	Anchorage	AK	Georgetown	99518
Native Village of Goodnews Bay	Federally Recognized Tribe		PO Box 03	Goodnews Bay	AK	Goodnews Bay	99589-0138
Native Village of Hamilton	Federally Recognized Tribe		PO Box 20248	Kotlik	AK	Kotlik	99620
Native Village of Hooper Bay	Federally Recognized Tribe		PO Box 69	Hooper Bay	AK	Hooper Bay	99604
Native Village of Kanatak	Federally Recognized Tribe		PO Box 876822	Wasilla	AK	Kanatak	99687
Native Village of Karluk	Federally Recognized Tribe		PO Box 22	Karluk	AK	Karluk	99608
Native Village of Kiana	Federally Recognized Tribe		PO Box 69	Kiana	AK	Kiana	99749
Native Village of Kipnuk	Federally Recognized Tribe		PO Box 57	Kipnuk	AK	Kipnuk	99614
Native Village of Kivalina	Federally Recognized Tribe		PO Box 50051	Kivalina	AK	Kivalina	99750
Native Village of Kluti-Kaah	Federally Recognized Tribe	Copper Center	PO Box 68	Copper Center	AK	Copper Center	99573-0068
Native Village of Kobuk	Federally Recognized Tribe		PO Box 51039	Kobuk	AK	Kobuk	99751
Native Village of Kongiganak	Federally Recognized Tribe		PO Box 5069	Kongiganak	AK	Kongiganak	99559-5069
Native Village of Kotzebue	Federally Recognized Tribe		PO Box 296	Kotzebue	AK	Kotzebue	99752-0296
Native Village of Koyuk	Federally Recognized Tribe		PO Box 53030	Koyuk	AK	Koyuk	99753
Native Village of Kwigillingok	Federally Recognized Tribe		PO Box 90	Kwigillingok	AK	Kwigillingok	99622
Native Village of Kwinhagak	Federally Recognized Tribe	Quinhagak	PO Box 149	Quinhagak	AK	Quinhagak	99655
Native Village of Larsen Bay	Federally Recognized Tribe		PO Box 50	Larsen Bay	AK	Larsen Bay	99624
Native Village of Marshall	Federally Recognized Tribe	Fortuna Ledge	PO Box 110	Marshall	AK	Marshall	99585
Native Village of Mary's Igloo	Federally Recognized Tribe		PO Box 546	Teller	AK	Teller	99778
Native Village of Mekoryuk	Federally Recognized Tribe		PO Box 66	Mekoryuk	AK	Mekoryuk	99630
Native Village of Minto	Federally Recognized Tribe		PO Box 58026	Minto	AK	Minto	99758-0026
Native Village of Nanwalek	Federally Recognized Tribe	English Bay	PO Box 8028	Nanwalek	AK	Nanwalek	99603
Native Village of Napaimute	Federally Recognized Tribe		PO Box 1301	Bethel	AK	Napaimute	99559
Native Village of Napakiak	Federally Recognized Tribe		PO Box 34069	Napakiak	AK	Napakiak	99634
Native Village of Napaskiak	Federally Recognized Tribe		PO Box 6009	Napaskiak	AK	Napaskiak	99559
Native Village of Nelson Lagoon	Federally Recognized Tribe		PO Box 913	Nelson Lagoon	AK	Nelson Lagoon	99571
Native Village of Nightmute	Federally Recognized Tribe		PO Box 90021	Nightmute	AK	Nightmute	99690
Native Village of Nikolski	Federally Recognized Tribe		PO Box 105	Nikolski	AK	Nikolski	99638
Native Village of Noatak	Federally Recognized Tribe		PO Box 89	Noatak	AK	Noatak	99761
Native Village of Nuiqsut	Federally Recognized Tribe	Nooiksut	PO Box 89169	Nuiqsut	AK	Nuiqsut	99789
Native Village of Nunam Iqua	Federally Recognized Tribe	Native Village of Sheldon's Point	PO Box 27	Nunam Iqua	AK	Nunam Iqua	99666-0027
Native Village of Nunapitchuk	Federally Recognized Tribe		PO Box 130	Nunapitchuk	AK	Nunapitchuk	99641
Native Village of Ouzinkie	Federally Recognized Tribe		PO Box 130	Ouzinkie	AK	Ouzinkie	99644
Native Village of Paimiut	Federally Recognized Tribe		PO Box 230	Hooper Bay	AK	Paimiut	99604
Native Village of Perryville	Federally Recognized Tribe		PO Box 89	Perryville	AK	Perryville	99648
Native Village of Pilot Point	Federally Recognized Tribe		PO Box 109	Pilot Point	AK	Pilot Point	99766
Native Village of Pitka's Point	Federally Recognized Tribe		PO Box 127	St. Mary's	AK	Pitka's Point	99658
Native Village of Point Hope	Federally Recognized Tribe		PO Box 109	Pt. Hope	AK	Point Hope	99766
Native Village of Point Lay	Federally Recognized Tribe		PO Box 59031	Point Lay	AK	Point Lay	99759
Native Village of Port Graham	Federally Recognized Tribe		PO Box 5510	Port Graham	AK	Port Graham	99603-5510
Native Village of Port Heiden	Federally Recognized Tribe		PO Box 49007	Port Heiden	AK	Port Heiden	99549
Native Village of Port Lions	Federally Recognized Tribe		PO Box 69	Port Lions	AK	Port Lions	99550
Native Village of Ruby	Federally Recognized Tribe		PO Box 68210	Ruby	AK	Ruby	99768
Native Village of Saint Michael	Federally Recognized Tribe		PO Box 59050	St. Michael	AK	St. Michael	99659
Native Village of Savoonga	Federally Recognized Tribe		PO Box 120	Savoonga	AK	Savoonga	99769
Native Village of Scammon Bay	Federally Recognized Tribe		PO Box 126	Scammon Bay	AK	Scammon Bay	99662
Native Village of Selawik	Federally Recognized Tribe		59 North Tundra Street	Selawik	AK	Selawik	99770
Native Village of Shaktoolik	Federally Recognized Tribe		PO Box 100	Shaktoolik	AK	Shaktoolik	99771-0100
Native Village of Shishmaref	Federally Recognized Tribe		PO Box 72110	Shishmaref	AK	Shishmaref	99772
Native Village of Shungnak	Federally Recognized Tribe		PO Box 73064	Shungnak	AK	Shungnak	99773
Native Village of Stevens	Federally Recognized Tribe		PO Box 74016	Stevens Village	AK	Stevens Village	99774
Native Village of Tanacross	Federally Recognized Tribe		PO Box 76009	Tanacross	AK	Tanacross	99776
Native Village of Tanana	Federally Recognized Tribe		PO Box 130	Tanana	AK	Tanana	99777
Native Village of Tatitlek	Federally Recognized Tribe		PO Box 171	Tatitlek	AK	Tatitlek	99677
Native Village of Tazlina	Federally Recognized Tribe		PO Box 87	Glennallen	AK	Tazlina	99588-0087
Native Village of Teller	Federally Recognized Tribe		PO Box 567	Teller	AK	Teller	99778
Native Village of Tetlin	Federally Recognized Tribe		PO Box 797	Tok	AK	Tetlin	99780
Native Village of Tuntutuliak	Federally Recognized Tribe		PO Box 8086	Tuntutuliak	AK	Tuntutuliak	99680

Native Village of Tununak	Federally Recognized Tribe		PO Box 77	Tununak	AK	Tununak	99681
Native Village of Tyonek	Federally Recognized Tribe		PO Box 82009	Tyonek	AK	Tyonek	99682-0009
Native Village of Unalakleet	Federally Recognized Tribe		PO Box 270	Unalakleet	AK	Unalakleet	99684
Native Village of Unga	Federally Recognized Tribe		PO Box 508	Sand Point	AK	Unga	99661
Native Village of Venetie Tribal Government	Federally Recognized Tribe	Arctic Village or Village of Venetie	PO Box 81080	Venetie	AK	Venetie	99781
Native Village of Wales	Federally Recognized Tribe		PO Box 549	Wales	AK	Wales	99783
Native Village of White Mountain	Federally Recognized Tribe		PO Box 84090	White Mountain	AK	White Mountain	99784
Nenana Native Association	Federally Recognized Tribe		PO Box 369	Nenana	AK	Nenana	99760
New Koliganek Village Council	Federally Recognized Tribe		PO Box 5057	Koliganek	AK	Koliganek	99576
New Stuyahok Village	Federally Recognized Tribe	New Stuyahok Traditional Council	PO Box 49	New Stuyahok	AK	New Stuyahok	99636
Newhalen Village	Federally Recognized Tribe		PO Box 207	Newhalen	AK	Newhalen	99606
Newtok Village	Federally Recognized Tribe		PO Box 5596	Newtok	AK	Newtok	99559
Nikolai Village	Federally Recognized Tribe		PO Box 9107	Nikolai	AK	Nikolai	99691
Ninilchik Village	Federally Recognized Tribe		PO Box 39070	Ninilchik	AK	Ninilchik	99639
Nome Eskimo Community	Federally Recognized Tribe		PO Box 1090	Nome	AK	Nome	99762
Nondalton Village	Federally Recognized Tribe		PO Box 49	Nondalton	AK	Nondalton	99640
Noorvik Native Community	Federally Recognized Tribe		PO Box 209	Noorvik	AK	Noorvik	99763
Northway Village	Federally Recognized Tribe		PO Box 516	Northway	AK	Northway Village	99764
Nulato Village	Federally Recognized Tribe	Nulato Tribal Council	PO Box 65049	Nulato	AK	Nulato	99765
Nunakauyarmiut Tribe	Federally Recognized Tribe		PO Box 37048	Toksook Bay	AK	Toksook Bay	99637-7048
Organized Village of Grayling	Federally Recognized Tribe	Holikachuk	PO Box 49	Grayling	AK	Grayling	99590
Organized Village of Kake	Federally Recognized Tribe		PO Box 316	Kake	AK	Kake	99830-0316
Organized Village of Kasaan	Federally Recognized Tribe		PO Box 26 - Kasaan	Kasaan	AK	Kasaan	99950-0340
Organized Village of Kwethluk	Federally Recognized Tribe		PO Box 130	Kwethluk	AK	Kwethluk	99621-0130
Organized Village of Saxman	Federally Recognized Tribe	Saxman IRA	Route 2	Ketchikan	AK	Saxman	99901
Orutsararmiut Traditional Native Council	Federally Recognized Tribe	Orutsararmuit Native Village (aka Bethel)	PO Box 927	Bethel	AK	Bethel	99559
Oscarville Traditional Village	Federally Recognized Tribe		PO Box 6129	Napaskiak	AK	Oscarville	99559
Pauloff Harbor Village	Federally Recognized Tribe		PO Box 97	Sand Point	AK	Sand Point	99661
Pedro Bay Village	Federally Recognized Tribe		PO Box 47020	Pedro Bay	AK	Pedro Bay	99647
Petersburg Indian Association	Federally Recognized Tribe		PO Box 1418	Petersburg	AK	Petersburg	99833
Pilot Station Traditional Village	Federally Recognized Tribe		PO Box 5119	Pilot Station	AK	Pilot Station	99650
Platinum Traditional Village	Federally Recognized Tribe		PO Box 8	Platinum	AK	Platinum	99651
Portage Creek Village	Federally Recognized Tribe	Ohgsenakale	1327 E. 72nd Avenue	Anchorage	AK	Portage Creek	99515
Qagan Tayagungin Tribe of Sand Point Village	Federally Recognized Tribe	QTT	PO Box 447	Sand Point	AK	Sand Point	99661
Qawalangin Tribe of Unalaska	Federally Recognized Tribe		PO Box 334	Unalaska	AK	Unalaska	99685
Rampart Village	Federally Recognized Tribe		PO Box 67029	Rampart	AK	Rampart	99767
Saint George Island	Federally Recognized Tribe		PO Box 940	St. George Island	AK	Saint George	99591-0940
Saint Paul Island	Federally Recognized Tribe		PO Box 86	St. Paul Island	AK	Saint Paul	99660
Seldovia Village Tribe	Federally Recognized Tribe		Drawer L	Seldovia	AK	Seldovia Village	99663
Shageluk Native Village	Federally Recognized Tribe		PO Box 35	Shageluk	AK	Shageluk	99665
Sitka Tribe of Alaska	Federally Recognized Tribe		456 Katlian Street	Sitka	AK	Sitka	99835-7505
Skagway Village	Federally Recognized Tribe	Skagway Traditional Council	PO Box 1157	Skagway	AK	Skagway	99840-1157
South Naknek Village	Federally Recognized Tribe	Qinuyang	PO Box 70029	South Naknek	AK	South Naknek	99670
Stebbins Community Association	Federally Recognized Tribe		PO Box 71002	Stebbins	AK	Stebbins	99671
Sun'aq Tribe of Kodiak	Federally Recognized Tribe	Shoonaq' Tribe of Kodiak	312 West Marine Way	Kodiak	AK	Kodiak	99615
Takotna Village	Federally Recognized Tribe		PO TYC	Takotna	AK	Takotna	99675
Tangirnaq Native Village	Federally Recognized Tribe	Lesnoi Village (aka Woody Island)	3449 East Rezanof Drive	Kodiak	AK	Woody Island	99615
Telida Village	Federally Recognized Tribe		PO Box 9104	Nikolai	AK	Telida	99691
Traditional Village of Togiak	Federally Recognized Tribe		PO Box 310	Togiak	AK	Togiak	99678
Tuluksak Native Community	Federally Recognized Tribe		PO Box 95	Tuluksak	AK	Tuluksak	99679-0095
Twin Hills Village	Federally Recognized Tribe		PO Box TWA	Twin Hills	AK	Twin Hills	99576-8996
Ugashik Village	Federally Recognized Tribe		2525 Blueberry Road Suite 205	Anchorage	AK	Ugashik	99503
Umkumiut Native Village	Federally Recognized Tribe		PO Box 90062	Nightmute	AK	Umkumiut	99690
Village of Alakanuk	Federally Recognized Tribe	Alakanuk Traditional Council	PO Box 149	Alakanuk	AK	Alakanuk	99554-0149
Village of Anaktuvuk Pass	Federally Recognized Tribe	Naqsragmiut Tribe	PO Box 21170	Anaktuvuk Pass	AK	Anaktuvuk Pass	99721
Village of Aniak	Federally Recognized Tribe		PO Box 349	Aniak	AK	Aniak	99557
Village of Atmautluak	Federally Recognized Tribe		PO Box 6568	Atmautluak	AK	Atmautluak	99559
Village of Bill Moore's Slough	Federally Recognized Tribe		PO Box 20288	Kotlik	AK	Kotlik	99620
Village of Chefornak	Federally Recognized Tribe		PO Box 110	Chefornak	AK	Chefornak	99561-0110
Village of Clarks Point	Federally Recognized Tribe		PO Box 90	Clarks Point	AK	Clarks Point	99569-0090
Village of Crooked Creek	Federally Recognized Tribe		401 Main St.	Crooked Creek	AK	Crooked Creek	99575
Village of Dot Lake	Federally Recognized Tribe		PO Box 2279	Dot Lake	AK	Dot Lake Village	99737-2279
Village of Iliamna	Federally Recognized Tribe		PO Box 286	Iliamna	AK	Iliamna	99606
Village of Kalskag	Federally Recognized Tribe	Native Village of Kalskag	PO Box 50	Kalskag	AK	Upper Kalskag	99607
Village of Kaltag	Federally Recognized Tribe		PO Box 129	Kaltag	AK	Kaltag	99748
Village of Kotlik	Federally Recognized Tribe		PO Box 20210	Kotlik	AK	Kotlik	99620
Village of Lower Kalskag	Federally Recognized Tribe		PO Box 27	Lower Kalskag	AK	Lower Kalskag	99626
Village of Ohogamiut	Federally Recognized Tribe		PO Box 49	Marshall	AK	Ohogamiut	99585
Village of Red Devil	Federally Recognized Tribe		PO Box 61	Red Devil	AK	Red Devil	99656
Village of Salamatoff	Federally Recognized Tribe		PO Box 2682	Kenai	AK	Salamatof	99611
Village of Sleetmute	Federally Recognized Tribe		PO Box 109	Sleetmute	AK	Sleetmute	99668
Village of Solomon	Federally Recognized Tribe		PO Box 2053	Nome	AK	Solomon	99762
Village of Stony River	Federally Recognized Tribe		PO Box SRV	Stony River	AK	Stony River	99557
Village of Venetie	Federally Recognized Tribe	Native Village of Venetie Tribal Government	PO Box 81119	Venetie	AK	Venetie	99781
Village of Wainwright	Federally Recognized Tribe		PO Box 22	Wainwright	AK	Wainwright	99782
Wrangell Cooperative Association	Federally Recognized Tribe		PO Box 2021	Wrangell	AK	Wrangell	99929

Yakutat Tlingit Tribe	Federally Recognized Tribe		PO Box 418	Yakutat	AK	Yakutat	99689
Yupiit of Andreafski	Federally Recognized Tribe		PO Box 88	St. Mary's	AK	St. Mary's	99658-0088

Source: State of Alaska Department of Commerce, Community & Economic Development

A note on Tribal Nations

To respect Tribal sovereignty and self-government and to fulfill Federal trust and treaty responsibilities to Tribal Nations, land within the boundaries of Federally Recognized Tribes are designated as disadvantaged on the map.

Alaska Native Villages are included as point locations that are smaller than a census tract. The boundaries of census tracts and the lands of Federally Recognized Tribes are different.

Source: EPA Inflation Reduction Act Disadvantaged Communities Map

Northwest Arctic Borough

SERVING THE COMMUNITIES OF:

Ambler Buckland Deering Kivalina Kiana
Kobuk Kotzebue Noatak Noorvik Selawik Shungnak

March 25, 2024

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

RE: Letter of Intent for EPA-R-OAR-CPRGI-23-07: Alaska Energy Authority, Coalition Application – Rural Energy Measure

Executive Director Thayer,

This letter provides notice of the Northwest Arctic Borough's (NAB) formal intent to participate with the Alaska Energy Authority (AEA) and the Tanana Chiefs Conference (TCC) under a coalition application to be submitted by the AEA for funding through the EPA's Climate Pollution Reduction Grants (CPRG) Implementation General Competition. This grant application will include the AEA Diesel Genset Replacement Program (DGR), the Village Energy Efficiency Program (VEEP), and Rural Distribution Measures (the "Project").

The NAB is excited to be a part of a potential generational opportunity for transformative impacts on the energy systems of disadvantaged, rural communities in Alaska especially when considering the array of benefits to be realized from the multi-faceted, programmatic elements of the application including engine replacements through DGR, upgrades to rural distribution systems, and energy efficiency upgrades measures through VEEP. This application is comprehensive and seeks to ensure reliable and safe utility operation, the future integration and maximum use of renewable energy resources, and supports the efficient energy use and practices within disadvantaged, rural Alaskan communities. These activities promise long-term emissions reductions (GHG and criteria pollutants), greater resiliency to disruptive climate change related events, economic and environmental benefits, and improved quality of life.

The NAB is a committed coalition member on this application and will work in collaboration with AEA and those coalition members in drafting and executing a Memorandum of Agreement (MOA) which addresses all roles and responsibilities required to be undertaken by each member for the successful implementation of the coalition application. The NAB understands that July 1, 2024 is the target date for an MOA signed by all coalition members to be made available to the Environmental Protection Agency as required under the CPRG requirements and with the coalition, intends to achieve this target.

Respectfully,

Dickie Moto
Mayor, Northwest Arctic Borough

Tanana Chiefs Conference

122 First Ave
Fairbanks, AK 99701
907-452-8251

March 22, 2024

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

RE: Letter of Intent for EPA-R-OAR-CPRGI-23-07: Alaska Energy Authority, Coalition Application – Rural Energy Measure

Executive Director Thayer,

Please find this letter as Tanana Chiefs Conference's formal intent to join as a coalition member for the coalition application being submitted by the Alaska Energy Authority (AEA) in conjunction with Northwest Arctic Borough (NWAB) and Tanana Chiefs Conference (TCC) for funding through the Climate Pollution Reduction Grants (CPRG) Implementation General Competition for the AEA Diesel Genset Replacement Program (DGR), the Village Energy Efficiency Program (VEEP), and Rural Distribution Measure (the "Project").

TCC is excited to be a part of a potential generational opportunity for transformative impacts on the energy systems of disadvantaged, rural communities in Alaska, especially when considering the array of benefits to be realized from the multi-faceted, programmatic elements of the application, including engine replacements through DGR, upgrades to rural distribution systems, and energy efficiency measures through VEEP. This application is comprehensive and seeks to address those primary barriers to ensuring reliable and safe utility operation, future integration of renewable energy resources, and supporting efficient energy use and practices within those disadvantaged, rural Alaskan communities. These activities promise long-term emissions reductions, greater resiliency to disruptive events, economic and environmental benefits, and improved quality of life.

TCC is a committed coalition member on this application and will work in collaboration with AEA and those coalition members in drafting and executing a Memorandum of Agreement (MOA) which addresses all roles and responsibilities required to be undertaken by each member for the successful implementation of the coalition application. TCC understands that July 1, 2024 is the target date for an MOA signed by all coalition members to be made available to the Environmental Protection Agency as required under the CPRG program and will work with other coalition members to achieve this target.

Tanana Chiefs Conference

122 First Ave
Fairbanks, AK 99701
907-452-8251

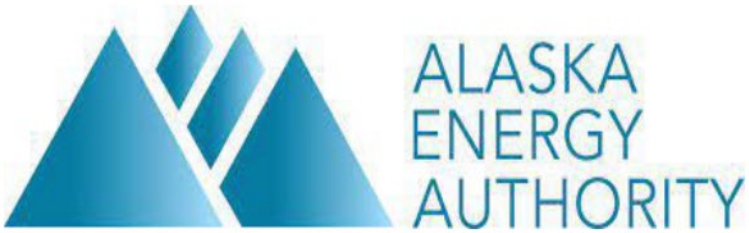
Sincerely,
TANANA CHIEFS CONFERENCE

Brian Ridley
Chief

PROPOSAL TO ADDRESS RURAL ALASKA'S CRITICAL ENERGY CHALLENGES

TEAM BIOGRAPHIES

Alaska Energy Authority
Tanana Chiefs Conference
Northwest Artic Borough



Business Point of Contact

Curtis Thayer

Curtis Thayer serves as the Alaska Energy Authority (AEA) executive director. Previously, he was the commissioner for the Department of Administration and cabinet member for Governor Sean Parnell, responsible for 1,100 public employees and an annual budget of $350 million. As part of his public service, he served as the deputy commissioner of the Department of Commerce, Community, and Economic Development, and worked in Washington, D.C. with Alaska's Congressional Delegation. A graduate of the United States Department of Energy's National Renewable Energy Laboratory Executive Energy Leadership Institute program, Thayer has gained a comprehensive understanding of advanced energy technologies that has helped him guide his organizations in making energy-related decisions. The project budget and work plan anticipate a 3%-time commitment from Thayer to the project.

Timothy Sandstrom

Tim Sandstrom is AEA's Chief Operating Officer and will represent Mr. Thayer, directly overseeing the rural energy team. He has been with AEA since 2011 and served as director of rural programs. Sandstrom oversees the management of AEA's Rural Power System Upgrade, Bulk Fuel Upgrade, Circuit Rider, Emergency Response, and Training Programs. As a senior management team member, he is also responsible for implementing AEA's strategy and budget management for his programs. With over 35 years in construction, project management, and engineering project management throughout Alaska, Sandstrom brings a broad range of private sector experience to his work. The project budget and work plan anticipate a 3% time commitment from Sandstorm to the project.

Technical Point of Contact

Rebecca Garrett

Rebecca is the Rural Programs Manager and has been with Alaska Energy Authority since 1997 and has managed projects and programs in varying size and complexity since 1998. She earned her project management professional (PMP) certification and keeps an active registration. She will take on the day-to-day administration of this award, starting by preparing the Project Management Plan. From there, she will assign individual projects to qualified project managers who will provide project oversight, review, and accept plans, procedures, deliverables, and reports. Ms. Garrett will be responsible for project communications between contractors, consultants, and the AEA team. She will track specific contractual deliverables against the schedule to ensure contractors are on track to meet critical milestones. She will be the primary point of contact for the award. The budget and work plan anticipate 25% of Garrett's time committed to this project.

Dave Messier

790 Pelican Way, Fairbanks, AK 99709
Dave.pm@tananachiefs.org or 907-978-1866

EDUCATION

University of Alaska Fairbanks, Fairbanks, Alaska **Dec. 2012**
Masters of Business Administration
G.P.A. 3.7
Relevant Coursework: Human Resource Management, Financial Markets and Strategy, Innovation Management

Cornell University, College of Agriculture and Life Sciences, Ithaca, New York **May 2008**
Bachelor of Science in Natural Resource Management, minor in Business Management
Honors: Graduated **Cum Laude**
G.P.A.: 3.45
Relevant Coursework: Finance · Marketing · Financial Accounting · Public Policy in Natural Resources · International Conservation · Multinational Business Management · Semester in New Zealand

Project Management Professional (PMP) Certification **Feb 2014**
Certified Energy Manager (CEM) **Dec 2014**
Solar Energy International PV 101, PV 201, Solar Thermal 101, Wind Energy 101 **July 2012**

EXPERIENCE

Infrastructure Division Director, Tanana Chiefs Conference, Fairbanks, AK **Oct 2022-Present**
Leading TCC efforts in the areas of Broadband Development, Energy, Transportation and Housing

- Successfully receive 30.3M ReConnect 3 grant to supply broadband to 5 villages along the Koyukuk River
- Led the development of the Interior Broadband Plan

Rural Energy Coordinator, Tanana Chiefs Conference, Fairbanks, AK **Oct 2012-Present**
Work with tribal governments and regional, local or federal entities to lower the cost of energy and facilitate tribal energy security.

- Financed, developed managed Hughes 80k gal Bulk Tank Farm Fuel project $813k, 2020
- Increased TCC regional building efficiency standards for new construction to the highest efficiency standards in the nation
- Led the design and construction of Huslia $1.2M multi purpose building 2019
- Developed DOE Strategic and Readiness Technical Assistance (START) grants for Minto and Koyukuk, AK and assisted with START project management for both communities. Project funds totaling $500k.
- Project Manager for the Interior Regional Energy Plan, Interior Broadband Plan
- Financed, developed managed Hughes 120kW Solar and 337kwh battery storage project $1.2M
- Presented on rural energy issues at the Alaska House and Senate Energy subcommittees, Rural Energy Forum, Biz of Clean Energy in Alaska Conf., Alaska Solar Conference etc
- Managed $2.5M in Diesel generator change outs '14-'21
- Brought in or managed more than $12M worth of State, federal and private foundation grant funds
- Led 46kW Solar install and training in Tanacross, AK
- Developed $30M Reconnect round 3 USDA broadband app
- Designed and Installed 18kW solar PV system in Ft Yukon
- Led the separate submission of $2.6M Northway broadband project and regional $89M broadband application to NTIA
- Led 2020 TCC business formation development study looking at the viability of TCC starting a tribal business

Adjunct Professor, Interior Aleutians Campus, RD-250 **March 2013-March 2017**
Led 1-2 courses per year on grant writing for community development, renewable energy and energy efficiency, all classes were taught to rural and urban Alaskans at the Bristol Bay Campus in Dillingham, AK

- Positive course reviews and students who went on to write successful grants for their communities
- Bristol Bay Campus asked me to expand course offerings

Energy Department Director, Yukon River Inter-tribal Watershed Council, Fairbanks, AK **June 2009-Oct 2012**
Performed a range of grant writing, partnership development, project installation and energy data management for the YRITWC, a tribal consortium of 70 indigenous communities in the Yukon River watershed of North America

- Led installation of the first New Energy hydrokinetic turbine installed on the Yukon River in Ruby, Alaska
- Led the installation of Solar thermal project, Nenana, AK
- Developed and Executed $300k AKP Efficiency Project
- Developed and Executed $300k Alaska Dept of Labor Renewable Technologies Training Grant
- Designed and managed install of 4.4kW Nenana Solar Project
- Presented at Alaska Hydrokinetics conference, AK Forum on the Environment, Dept. of Energy Tribal Energy summit
- Managed department employees and seasonal interns
- Led Training/Install of a 3kW array in Alatna, AK

Dave Messier

790 Pelican Way, Fairbanks, AK 99709
Dp2477@gmail.com or 907-978-1866

Project Details

Owner, Daylight Energy Services LLC **Feb 2012-Present**
Daylight Energy Services is a renewable energy and energy efficiency company specializing in LED lighting and solar supply and consulting. Through this company, I use my skillset to assist other Alaskan communities and individuals with renewable energy projects

- Partnered to manage construction of 573kw Kotzebue Solar PV Project for Kotzebue Electric Assn
- Led the design and procurement of material for the $2.2M , 223kw Shungnak Solar PV and 384kwh battery project tied into AVEC grid

Owner, Daylight Rentals LLC/MT Enterprises **Feb 2014-Present**
Daylight Rentals LLC is a Fairbanks based owner and lessor of two small apartment buildings, MT Enterprises is a sole proprietor of small residential rental properties

- Owner/Managing member of LLC and Sole Proprietorship that own over $2.5M worth of residential real estate assets
- Oversee management of 41 residential rental units providing quality rental units at affordable prices

Treasurer, Golden Valley Electric Association **2017- Present**
Treasurer on the GVEA Board of Directors, a local electric generation, transmission and distribution cooperative serving 44,000 members and 100,000 residents across the interior of Alaska.

- Youngest board member serving on the GVEA board
- Chair of the Finance Audit and Rate Committee

Board Member, Renewable Energy Alaska Project (REAP) **Feb 2010-Present**
Board of Director Co-chair rural energy subcommittee, REAP is a consortia of energy stakeholders in Alaska committed to the expansion of renewable energy across the state

- Represented rural Alaska alongside state/industry partners
- Co-Chair: Rural Energy subcommittee

Outdoor Education Instructor **September 2005-December 2008**
Outdoor Environmental Adventure Camp for Youth in North America and S.E. Asia

- Negotiated contract with China Light and Power in Hong Kong to install a solar/wind co-gen educational installation.
- Instructed Outdoor Leadership courses focused on group management, teambuilding, expedition behavio

English Teacher, Loke Pangma Government School, Nepal **January 2009-April 2009**

- Lived with a Nepali hill tribe for 3 months teaching English
- Taught English in a primary level, Nepalese government school
- Organized after-school English classes for community group

SKILLS AND INTERESTS

Travel and Travel Writing
Certified Wilderness First Responder and CPR
Climbing
Designed and Built personal home
Backpacking
Carpentry
Hunting
Teambuilding
Outdoor Education
Energy
Experience in leadership positions
Conversational in Spanish

Ben Shilling

415 Iver Street, Fairbanks, AK 99709
907-712-7925
benjshilling@gmail.com

Experience

Tanana Chiefs Conference, Fairbanks, Alaska

2013 - Current

Chief Financial Officer – Responsible for the accounting department and all financial reporting. At $470M of assets and $250M of annual revenues while maintaining an A+ Bond Rating and many years of clean audits with no findings. Directly responsible for a staff of 12 and shared oversight of another 10.

Schneider & Shilling CPAs

2002 - 2012

Partner - Governmental auditor and accountant with emphasis on Alaskan Tribal Governments. Extensive training of tribal staff in the operation of governmental accounting and the use of automated accounting systems. Negotiated audit requirements with State and Federal audit agencies.

University of Alaska, Systems Office

1993 - 2002

Director of Internal Audit Department – Conducted fraud, compliance, efficiency, and information technology audits throughout the university system and the State. Reported directly to the Board of Regents. Testified at trials and presented at national Internal Audit conferences. Directly responsible for 4 staff.

KMG Main Hurdman evolved into Cook & Haugeberg CPAs

1986 - 1993

Audit Manager – Managed governmental and non-profit audit engagements including the City of Fairbanks and the Fairbanks North Star Borough School District. Clients included local financial institutions, non-profits and local governments and school districts across the interior.

Education

University of Alaska, Fairbanks

Bachelor of Business Administration – Accounting, Cum Laude 1985
Associate of Arts – Computer Information Systems, Cum Laude 1983

Certifications

Certified Public Accountant 1989
Certified Information System Auditor 1994

EDWARD DELLAMARY

1902 Mary Ann Street, Fairbanks, AK, 99701· +7606437866
eddellamary@gmail.com · https://www.linkedin.com/in/edward-dellamary-155a10a1/ ·

Experience

December 2022-Present

Rural Energy Specialist, Tanana Chiefs Conference , Fairbanks, Alaska

- Working with the Village of Hughes and City of Hughes on a Power Purchase Agreement
- Improving, ensuring smooth maintenance& operation, handling solutions for existing powerplants in TCC region
- Working on future energy projects, e.g. Galena Solar Project

September-December 2022

Contractor, Deerstone Consulting LLC. , Fairbanks, Alaska

- Working with the Village of Hughes and City of Hughes on a Power Purchase Agreement
- Assisting Federally Recognized Tribes in the Tanana Chiefs Conference region apply for the DOE 40101d grant

May – June 2022

Contractor (Commissioning); Hughes, Alaska

- Commissioning, maintenance and operation of operate the 120 kW Solar PV array as well as the 353 kWh EMesh battery system during the week of: May 13th – May 20th 2022

May 2020 – July 2020

Renewable Energy Investigator, Cordova, Alaska

Explored options for creating a microgrid between three remote towns in the Prince William Sound.

May 2019 – January 2020

Manufacturing Commissioning Lead, NorthVolt AB, Sweden

Coordinating the Installation and Commissioning of an Active Cathode Material Factory. Leading and training a team of Future Operators.

EDUCATION

August 2017 - June 2019

M.Sc. Advanced Materials Engineering and Science, LULEÅ TEKNISKA UNIVERSITET & UNIVERSITAT POLITÈCNICA DE CATALUNYA

- Specialization - Advanced Metallic Materials
- Thesis: Cu_2O/TiO_2 Nanorod Heterojunctions: Synthesis, Characterization and Applications as Solar Cells on the Nanoscale
-

September 2012 - July 2016

Bachelor of Science in Chemistry, UNIVERSITY OF CALIFORNIA SAN DIEGO

- Specialization – Inorganic Chemistry

August 2008 - June 2012

High School Diploma, MISSION HILLS HIGH SCHOOL SAN MARCOS, CALIFORNIA

CORTNIE DOAN

INFRASTRUCTURE PROJECT MANAGEMENT

I am a qualified and professional project manager with over thirteen years of experience in accounting, construction and administration and a team player with an eye for detail.

907-378-7003

cortnie.doan@tananachiefs.org

2380 Dano Ct. North Pole, AK 99705

tananachiefs.org

SKILLS

- Project Design
- Job Costing
- Problem-Solving
- Multitasker
- Project Management Tools
- Strong Communication

EDUCATION

ASSOCIATES OF APPLIED SCIENCE ACCOUNTING

University of Alaska Fairbanks

2009

ASSOCIATES OF APPLIED SCIENCE MARKETING

University of Alaska Fairbanks

2009

HONORS

University of Alaska
Cum Laude 2009

EXPERIENCE

INFRASTRUCTURE GRANT & OFFICE MANAGER

Tanana Chiefs Conference 2023- Present

- Contract Management
- Grant Applications
- Manages over $12 million in budgets for the Infrastructure Division
- Project Management
- Proficient use in Oracle, Agiloft, Word, Excel, Outlook, Adobe Pro

PROPERTY MANAGEMENT

Mission Properties, LLC 2008 - Present

- Manages rentals in North Pole, Alaska
- Schedules repairs and maintenance
- Proficient with Adobe InDesign, Photoshop, Publisher

FUND ACCOUNTANT

Tanana Chiefs Conference 2011-2023

- Grant accounting for a nonprofit organization
- Monthly reconciling, state and federal reporting
- Budget controller for all grant application
- Proficient in Oracle Grant Accounting

CHIEF FINANCIAL OFFICER

Mission Construction, LLC 2012-2020

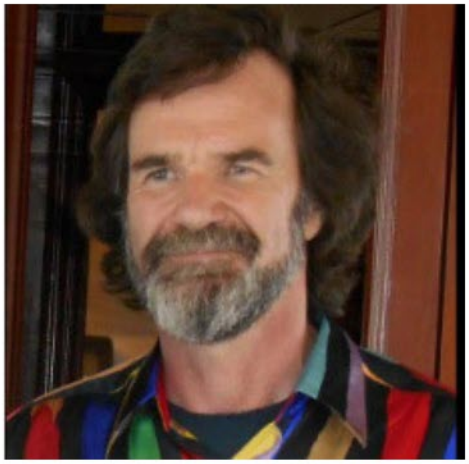
- Owner of residential construction company
- Job costing, bookkeeping, inspector, working closely with sub-contractors
- Estimates, project reviews, and scheduling, ordering materials for jobs.
- Proficient in QuickBooks and Payroll

REFERENCES

Justin Witt	907-978-7873
Wendell Clark	907-322-6571
Richard Stevens	907-347-2570

NORTHWEST ARCTIC BOROUGH PROJECT MANAGER

Ingemar Mathiasson



Ingemar Mathiasson is the Northwest Arctic Borough Energy Program Manager. He will serve as the primary technical and management point of contact for this grant, overseeing all aspects of the award. With over a decade of managerial experience along with personal experience working in the power and renewable energy industry, Mr. Mathiasson has successfully led various energy projects, including renewable energy integrations, wind power and solar projects. He is experienced in leading numerous grant-funded initiatives and managing compliance with grant requirements. He understands the requirements for the proposed upgrades to the community power plants and how these upgrades will achieve reduced diesel consumption, thereby reducing greenhouse gas emissions. Mr. Mathiasson regularly works with the various community utilities, the Alaska Energy Authority, the Native Regional Corporation, and tribal and city governments. He reports to the Borough Mayor, Dickie Moto, and will keep him informed on the project progress.

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

Curtis Thayer
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 proposal to address Alaska's critical energy challenges

Executive Director Thayer,

On behalf of the Alaska Municipal League (AML), 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 Authority (AEA), as part of a coalition that includes the Tanana Chiefs Conference (TCC) and Northwest Arctic Borough (NAB). In drafting the state plan, we saw the role of the AEA as a key transformative leader contributing to emissions reductions.

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 especially when considering the array of benefits to be realized from the multi-faceted, programmatic elements of the application including engine replacements through DGR, upgrades to rural distribution systems, and energy efficiency measures through VEEP. 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. As a sub-recipient, AML will support the application with workforce development infrastructure which will consist of aiding applicants with recruitment, skill development, career navigation, and wraparound services such as childcare, housing and living stipends.

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

CEJST EJ Screen Supplemental Indexes - Rural Program CPRG Application

	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
Northwest Arctic Borough				No data for Alaska												No data for Alaska
Ambler	2188000100	Yes	2188000100			3	19	15	100	missing	53	12	2	10	0	
Buckland	2188000100	Yes	2188000100			3	19	15	100	missing	53	12	2	10	0	
Deering	2188000100	Yes	2188000100			3	19	15	100	missing	53	12	2	10	0	
Kiana	2188000100	Yes	2188000100			3	19	15	100	missing	53	12	2	10	0	
Kivalina	2188000100	Yes	2188000100			3	19	15	100	missing	53	12	2	10	0	
Kobuk	2188000100	Yes	2188000100			3	19	15	100	missing	53	12	2	10	0	
Noatak	2188000100	Yes	2188000100			3	19	15	100	missing	53	12	2	10	0	
Noorvik	2188000100	Yes	2188000100			3	19	15	100	missing	53	12	2	10	0	
Selawik	2188000100	Yes	2188000100			3	19	15	100	missing	53	12	2	10	0	
Shungnak	2188000100	Yes	2188000100			3	19	15	100	missing	53	12	2	10	0	
Kotzebue	2188000200	Yes	2188000200			29	17	19	87	missing	70	3	0	3	86	
Tanana Chiefs Conference																
Healy Lake	2240000400	Yes	2240000400			11	41	69	59	11	61	42	16	49	23	
Arctic Village	2290000100	Yes	2290000100			3	52	42	59	missing	97	56	18	39	39	
Eagle	2240000100	Yes	2240000100			6	22	26	24	10	82	32	8	28	54	
Rampart	2290000200	Yes	2290000200			8	47	61	30	15	83	47	17	52	24	
Allakaket	2290000300	Yes	2290000300			0	64	75	0	missing	38	21	3	11	14	
Alatna	2290000300	Yes	2290000300			0	64	75	0	missing	38	21	3	11	14	
Northway	2240000100	Yes	2240000100			6	22	26	24	10	82	32	8	28	54	
Evansville	2290000200	Yes	2290000200			8	47	61	30	15	83	47	17	52	24	
Bettles	2290000200	No	2290000200			8	47	61	30	15	83	47	17	52	24	
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	
Aleknagik	2070000100	Yes	2070000100			23	17	24	52	missing	86	14	63	11	0	
Anaktuvuk Pass	2185000200	Yes	2185000200			2	26	40	77	30	84	8	13	33	20	
Angoon	2105000300	Yes	2105000400			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	
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	30	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	
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	
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	71	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	
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 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	
Ekwok	2070000100	Yes	2070000100			23	17	24	52	missing	86	14	63	11	0	
Elfin Cove	2105000300	No	2105000400			44	31	32	40	2	88	25	40	36	25	
Elim	2180000100	Yes	2180000100			14	5	5	0	0	94	3	2	3	34	
Emmonak	2270000100	Yes	2158000100			6	8	7	0	missing	71	5	5	5	0	
False Pass	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	

CEJST EJ Screen Supplemental Indexes - Rural Program CPRG Application

	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
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	
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	
Kake	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	
Kaltag	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	
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	
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	
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	
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	2060000100	Yes	2060000100			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	
Naukati 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	
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	
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	

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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	
Shageluk	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	
Skagway	2230000100	Partially	2230000100			32	9	16	33	53	81	10	11	29	19	
Slana	2261000100	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	2060000100	Yes	2060000100			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	60	6	4	85	11	

WORKPLAN
CPRG – PROPOSAL TO ADDRESS RURAL ALASKA'S CRITICAL ENERGY CHALLENGES

1. Overall Project Summary and Approach

a. Description of GHG Reduction Measures

The Alaska Energy Authority (AEA), the state's energy office, submits this coalition application in partnership with Tanana Chiefs Conference (TCC) and the Northwest Arctic Borough (NAB) to address rural Alaska's critical energy challenges and provide significant greenhouse gas (GHG) emissions reductions. AEA, as the lead applicant, will submit a Memorandum of Agreement signed by all coalition members by July 1, 2024. This grant application requests $49,986,112 and encompasses several measures that will result in decreased greenhouse gas (GHG) emissions across the State of Alaska. 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). AEA, TCC and NAB propose funding for five distinct initiatives in this application related to a measure in Alaska's PSEAP under the electric generation sector that will reduce GHG emissions through energy efficiency upgrades to public buildings and infrastructure, distribution system upgrades, and diesel engine efficiency. AEA proposes programs conceptually similar to its current and past activities under the Diesel Emissions Reductions Act program (DERA), the Village Energy Efficiency Program (VEEP), and rural distribution upgrades program. These activities are included in the "AEA DERA, VEEP, and Rural Distribution Programs" measure on page 47-49 of the PSEAP. In addition, this measure in the PSEAP provides for AEA to subaward to coalition members for similar activities including rural distribution upgrades, diesel power plant upgrades, and energy efficient improvements to public buildings and infrastructure to better serve the unique needs of each community. TCC proposes to implement a program for upgrades to the distribution lines and power plants in nine communities in the TCC Region. NAB proposes upgrades at power plants and water plants in communities to maximize alternative energy use. The measures proposed in this application enable greater access and deployment of affordable, reliable, and emissions-reducing generation. These measures were chosen as a priority as they have the most potential to result in tangible improvements for rural, disadvantaged communities, including reductions in GHG emissions and lower energy burdens, they are ready to begin implementing upon funding being made available, and they will have a transformative impact by enabling future renewable integrations allowing for a transition to a clean energy economy in rural Alaska.

Addressing the issues with rural Alaska's energy efficiency and resiliency is an on-going challenge. Compared to other states, Alaska contains many isolated non-road connected communities that must rely on islanded electrical grids. Approximately 30% of the state's population resides in over 200 rural and tribal communities that rely on local and regional power generation. Typically, these community power plants have at least one diesel engine running continuously. Rural Alaskans rely on these engines for their prime power; however, many of these power plants are older and lack modern controls, emissions reducing technology, and operating efficiency is low. These islanded grids are owned and operated by approximately 100 utility operators, including cooperatives, tribal, and municipal entities. Many of these rural Alaska communities are only accessible by plane or marine vessel, with over half classified by the Denali Commission as distressed communities.

In addition to the sub-standard diesel engine inventory, many of Alaska's rural communities suffer from degraded electric distribution systems and infrastructure. These systems were built for a 30-year life but are now approaching 50+ years old, with aging poles and sagging lines that create a life and health safety risk and lower overall system efficiency through line losses. Many poles are installed in permafrost and

with on-going climate change and the melting of this permafrost, many poles are subject to significant shifting.

Pictures of leaning poles and distribution lines in Oscarville

AEA Project Description

AEA is spearheading a comprehensive measure proposal aimed at addressing critical energy challenges faced by rural communities in Alaska. AEA requests $30,031,791 to fund three key initiatives, each of which are a vital piece to the state's PSEAP: expansion of diesel engine and genset replacements, distribution system upgrades, and enhanced VEEP support. AEA, and the coalition members, are committed to making substantial, long-term emissions reductions while simultaneously delivering additional benefits to these remote communities.

The federal DERA program provides formula-based funding based on population. 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 are typically located within the village and have a substantial impact on its air quality.

In most rural Alaskan communities, the absence of a larger electric grid and road connections requires each community to generate electricity locally. Small diesel power plants are used for this purpose, creating isolated grids. The average rural power plant engines have about 90,000 hours or 10 years of run time, which is approaching the end of the typical operating life, meaning many are inefficient compared to newer models, resulting in 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. With the money that would be awarded under this CPRG, AEA intends to issue sub-award grants in a DERA-like program to replace the oldest gensets and diesel engines in rural Alaska communities, enabling more engines to be replaced, and expanding the scope and reach of the EPA's DERA program.

Given the complexities of working in rural Alaska, the limited construction season, and supply chain challenges, AEA typically sees a two-year cycle for these replacement projects. Due to the volume of the funds, we intend to distribute the sub-awards over the 5-year period allowed by the grant and provide three rounds of funding opportunities. The milestones involved with this measure are: 1) confirm each rural community has an eligible engine and prepare emission tables and budget; 2) procurement of contractors and design of the engine/generator installations and development of specifications specific to each installation; 3) construction procurement; 4) submittals by contractors to AEA; 5) installation and commissioning; and 6) final closeout of award. Additional details related to milestones are included in Section 3 of the application.

The second initiative of the proposed measures is the upgrade of distribution systems in rural communities. The framework for this program will follow the process of AEA's existing Rural Power System Upgrade (RPSU) Program. AEA will issue sub-award grants to communities determined to be of the highest priority. AEA is currently working on a distribution inventory and assessment to rank the highest need communities. These microgrids, predominantly diesel-generated (as described above), are typically 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 personnel will project manage the distribution upgrades in each community. Based on current staffing levels, consulting engineers, and statewide construction contractor support, it is reasonable to expect that AEA could construct two (2) distribution projects per year. Costs for the upgrade will vary significantly depending on the size of the community, the soil conditions, buried or above ground, and if above ground – the number of poles that need to be replaced. The milestones for this proposal are: 1) project planning, including selection of community, stakeholder engagement, development of a project management plan (PMP); 2) project design, including engineering and procurement; 3) construction and integration; and 6) final closeout of award.

The overall project timeline for each distribution upgrade is two years. The tasks in the first year include planning, design, permitting, and purchasing long lead items. Should AEA have funding for multiple projects, a bulk purchase of commonly used, BABA-certified transformers may be made. This would help move projects through the queue at a more rapid pace and potentially secure lower per-unit costs owing to bulk-order discounts. The tasks in the second year (or season) will be for construction. Most of Alaska's construction season ranges from early April to as late as October. Alaska's extreme climate conditions are always considered when planning construction projects accordingly. This is to minimize any risks that could lead to delays with project deliverables; any delay in project implementation will result in a corresponding delay in GHG reductions.

AEA's third initiative of the proposed measures is VEEP. The Alaska Legislature established VEEP in 2010 under 3 AAC 108.400, as an AEA-administered 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 public spaces and facilities within small, high-energy-cost rural Alaskan communities.

Energy efficiency upgrades provide a rapid return on investment, significant cost savings, and corresponding GHG reductions. Project scope can range anywhere from smaller measures, such as replacing antiquated lighting technology with LED, to larger improvements, such as upgrading a building's thermal envelope by installing new windows and doors, ventilation systems, boilers, and water heaters. These projects generally take eighteen to twenty-four months to complete. AEA anticipates issuing 10-15 awards through one solicitation, targeting larger projects with maximum GHG reductions. The milestones for this proposal are: 1) project planning, including request for proposals, grants to communities, development of a PMP; 2) construction, including energy audits, punch list, and final inspection; and 6) final closeout of award.

Prior applicants to the VEEP program have been solicited through a competitive process and ranked based on cost, energy demand, cost match, administrative capacity, participation in other end-use efficiency programs, and equitable geographic distribution of funding. AEA intends to use similar scoring criteria for funds available through CPRG emphasizing GHG emissions reduction. Once selected, applicants are awarded a pass-through grant, which the community manages with support from AEA. The most recent solicitation was sponsored by the Denali Commission and Wells Fargo and awarded in 2019 and has successfully facilitated 56 projects. Collectively these projects have offset 1,098,688 kWh resulting in an estimated $566,612 saved annually throughout the awarded communities.

By working as a coalition, this application will enhance the opportunities to improve the needs of specific remote communities in the state. The additional CPRG funding with more targeted outcomes will improve the outcomes during the 5-year period than if AEA was to administer the CPRG program on its own.

TCC Project Description

TCC proposes to implement a program for upgrades to the distribution lines and power plants of nine tribal communities in the TCC Region. The nine communities include: Allakaket, Alatna, Evansville, Bettles, Healy Lake, Eagle, Rampart, Northway, and Arctic Village. These tribes would work with the respective utilities in each community to implement upgrades to increase utility generation and distribution efficiency and unlock the ability to the electric utility to integrate high-penetration renewables. TCC will work with the respective utilities and complete estimates for all utility upgrades and integration requirements, to include engineering, construction, operations, and maintenance, etc. The proposed budget of $10 million is based upon recent experience for distribution and power plant upgrades in similar remote, microgrid communities, including those who have implemented high penetration renewable energy. CPRG funding is a unique opportunity for these communities to dramatically change their generation to be more resilient, improve economic conditions through reduced energy burdens (expenditures for diesel), and create local jobs both during construction and for maintenance of the system.

NAB Project Description

The NAB represents and includes the 11 federally recognized and rural tribal communities of Kotzebue (Qikiqtabruk), Kivalina (Kivalieiq), Noatak (Nautaaq), Selawik (Aqulibaq), Deering (Ipnatchiaq), Buckland (Nunachiaq), Kiana (Katyaak), Noorvik (Nuurvik), Ambler (Ivisaappaat), Shungnak (Issingnak), and Kobuk (Laugviik). NAB proposes upgrades at power plants and water plants in these communities to maximize alternative energy use. The NAB recently received a grant award from the Department of Energy (DOE), Office of Clean Energy Demonstrations (OCED) for up to $54.8 million to implement solar and battery energy storage systems (BESS) for each community in the borough with the objective of significantly reducing diesel consumption, improving the heating of borough residences, and lowering the cost of living. The OCED project will also significantly reduce GHG emissions. However, achieving maximum diesel savings requires the ability to “turn off” the community’s diesel generators when sufficient power is available through the solar/BESS; unfortunately, the power plants and drinking water plants for each community require waste heat from the generators to keep these critical facilities warm. Shutting the diesel generators off for even a few hours during the sunlight-rich, but still very cold months of March and April could result in freeze-ups of the generators or the water plant.

This proposed initiative from NAB requests $9,954,321 to fund the addition of external, electric boilers for these critical facilities. These boilers will be sized to operate with the anticipated excess electricity produced from the solar/BESS. Appropriate controls and thermostats will also be integrated with the units to enable the remote monitoring and control of the boilers. The proposed upgrades for Kotzebue

also include improvements to the power plant's intake air and cooling system that will significantly improve the overall plant's efficiency.

Similar to the smaller communities, an electric boiler is planned for the power plant to provide heat when wind/solar meets community demand and the diesel engines can be shut off. This will also heat the office area of the plant (currently the full building is heated with excess generator heat). Additional upgrades include protection of the plant cooling and intake air system to optimize the operation of the generators. Insulation and motorized dampers will be provided in this area to minimize the introduction of outside cold air when the engines are not operating.

Currently five communities in the Borough have implemented solar and/or BESS at varying levels (Kotzebue, Deering, Buckland, Noatak, and Shungnak). In these communities (such as Shungnak), the diesel engines are run at low levels (like 25-30% load), even when the solar/BESS system could meet the entire electrical demand of the community to ensure the power plants and water plants are kept warm. The OCED project will build-out these systems to a greater extent and build new systems for the other NAB communities. In each case, excess solar power is anticipated to be available to support the proposed electric boilers during periods of peak solar production.

TCC and the NAB expect projects in the communities they represent to be completed within 36 months of receiving funding. The risks associated with the projects are similar for all activities proposed in this application. The complexities of working in rural Alaska, the limited construction season, and supply chain challenges, may delay projects but there is sufficient time in the timeline to address any challenges that arise and successfully complete the proposed projects within the five-year period of performance of the grant. The milestones for TCC and NAB's proposals are: 1) project planning, including procurement and stakeholder engagement; 2) project development; 3) construction and integration; and 6) final closeout of award. Additional details related to milestones are included in Section 3 of the application.

AEA, as the lead applicant, would provide subawards to TCC and NAB to perform all activities related to this proposal. In line with the Alaska Municipal League's (AML) infrastructure program and long-term work with the Department of Enviromental Conservation (DEC) on the State of Alaska's CPRG PCAP, AML will support the coalition with planning support, community outreach, progress tracking, and energy data needs. As a sub-recipient to this application, AML will support the coalition with workforce development infrastructure which will consist of aiding applicants with recruitment, skill development, career navigation, and wraparound services such as childcare, housing and living stipends.

b. Demonstration of Funding Need

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 high energy burden experienced by Alaska residents is attributed, in part, to a small population and harsh climate. Funding for capital projects in rural Alaska is consistently challenging due to the lack of a tax base in these communities. The low populations and high costs for these communities also limit opportunities for most other forms of project financing. AEA, in collaboration with TCC and NAB is requesting funds through the CPRG program, because it is the missing link that will help Alaska meet its obligation of providing a better quality of life to its residents and environment by reducing GHG emissions. If awarded, the possibility of maximized energy efficiency and sustainability in Alaska's rural communities would quickly become a long-sought reality.

Most of the funding opportunities from the Inflation Reduction Act (IRA) and the Infrastructure Investment and Jobs Act (IIJA) support the deployment of renewable energy generation and carbon

[1] https://www.eia.gov/state/seds/data.php?incfile=/state/seds/sep_sum/html/rank_pr.html&sid=US

sequestration but there are no funding opportunities that provide for the infrastructure upgrades necessary to successfully integrate renewable energy sources into remote microgrids. These upgrades are an essential step in transitioning rural communities to clean energy. Furthermore, these types of activities do not qualify for any of the dozens of tax incentives authorized by the IRA. A tax credit is available for some energy efficiency upgrades to commercial buildings; however, that credit is not extended to public buildings and the energy efficiency tax credits are not eligible for elective pay, which provides the benefit of the credit to tax exempt agencies such as state, local, and tribal governments.

DERA, rural distribution upgrades, and VEEP have received funding from the local, state, and federal level in the past including state cost matching, the Denali Commission, the VW Settlement Trust Fund, and the U.S. Department of Agriculture's (USDA) High Energy Cost Grant program. Unfortunately, the demand for these initiatives far exceeds the available funding resources.

Starting in federal fiscal year 2015, AEA has received $3.3 million in funds from the U.S. Environmental Protection Agency (EPA) through the DERA program. The state has consistently provided a 1-to-1 match of $3.3 million for a total of $6.6 million in project costs. This has enabled AEA to fund the replacement of 27 high-emission engines for higher tier 2 or 3 engines in 17 distressed communities. Due to recent inflation, the number of engines AEA can replace with existing federal and state funding has decreased. In 2020, only four engines were replaced compared to six the previous year (2019) and eight the year prior to that[2]. In 2022, AEA received $1,038,138 in DERA funds. That amount secured the replacement of four engines with new low-emission engines in two communities.

AEA and rural communities have requested funds for distribution upgrade projects through federal programs such as the Denali Commission, Bureau of Indian Affairs, USDA, as well as state matches. However, the funds currently available from these agencies do not meet the high demand for these upgrades and often these sources combined still fall short of fully funding a given project. Currently, five communities have active projects and several more are awaiting funding. For example, in Kipnuk, the distribution system is in extremely poor condition with leaning poles and aging infrastructure. The community had a new power system and tank farm constructed with AEA and Denali Commission funds as of 2017-2019 in addition to other funds sourced from AEA's Renewable Energy Fund (REF) program and other federal sources. The community was able to provide $250,000 in cash for design. AEA matched their funds and took their story to the Denali Commission, which was able secure Bureau of Indian Affairs funds in the amount of $800,000. And still the total amount secured to date is insufficient to complete all the improvements needed.

Figure 1 Manokotak Utility Company performing repairs during power outage December 2023

Another example is the distribution upgrade for the Native Village of Manokotak. Manokotak is a small community located within the Dillingham Census Area. According to the Economic Innovation Group's distressed community index, Manokotak scores 88.9 (out of 100) which deems it as 'distressed' due to several economic factors. The community is isolated and powered by a diesel engine power plant that has no outside interties or local sources of

[2] www.akenergyauthority.org/what-we-do/rural-energy/diesel-emission-reduction-act-program

alternative energy. In November 2023, AEA applied for a $3 million grant under the USDA's Rural Utilities Service High-Energy Cost Grant (HECG) program to provide Manokotak with the funds needed for its distribution and powerhouse upgrades. Although Manokotak was awarded partial funding in the amount of $2 million, it still leaves the community roughly $1.5 million short of being able to complete the project in its entirety.

Manokotak declared a state of emergency on December 21, 2023. The community lost power due to a winter storm, leaving 300 of the 450 without power and heating. As a result, pipes began to freeze and burst[3]. Many residents evacuated their homes to seek shelter in the local school which became an emergency shelter. AEA spent all of what remained in its contingency funds for the year to restore power to the community. In addition to harsh winter conditions, it was determined that the power outage was a direct result of degraded powerhouse and distribution lines in the community[4].

In addition to the previously mentioned communities, AEA is aware of additional communities that require extensive upgrades to their distribution systems: Nelson Lagoon, Napaskiak, Venetie, Port Heiden, and Rampart. This list does not include many other rural communities that may be facing the same challenges. AEA is currently performing a distribution inventory and assessment. The inventory will help AEA to create a list of high-priority distribution upgrade projects that will be ranked by life, health, safety, and prioritized for potential CO_2 emission reductions.

Between 2016 and 2023, AEA conducted VEEP solicitations for a total of $2.7 million of project funds administered. AEA has $2.5 million in VEEP funding available from sources such as the Denali commission, Wells Fargo, Department of Energy's Energy Efficiency and Conservation Block Grant Program, and state legislature. But, like the DERA and distribution upgrade programs, the funds available do not meet the demand. There is no funding budgeted from the state for the current fiscal year, or for next year.

TCC Specific Funding Need

The nine TCC communities, seven microgrids, included in this proposal have not yet pursued funding for renewable energy projects due to the high barrier of entry required to include implement power plant upgrades to enable future renewable development. Alaska Power and Telephone (AP&T), as the major utility for seven of these nine communities, has led the way with renewable energy in rural Alaska with 75% of their energy generation coming from hydropower. This funding opportunity will allow for increased renewable energy generation by AP&T in the interior, where power is currently 100% generated by fossil fuels.

NAB Specific Funding Need

Funding capital projects for communities in the NAB is challenging for those aforementioned reasons mentioned in this section; the recent OCED award will provide a transformative change to the communities in the borough but cannot realize maximum diesel reductions unless the diesel engines can be shutdown. Auxiliary heating for the power and water plants is necessary to enable "engine off" conditions. Achieving the maximum diesel savings for each community will limit emissions, improve air quality, and provide economic opportunity due to lower power costs.

c. Transformative Impact

Alaska has the third highest per capita energy-related CO_2 emissions in the United States[5]. Communities in rural Alaska are experiencing some of the most significant impacts from on-going climate change,

[3] Manokotak issues state of disaster emergency (kdlg.org)

[4] Power outage plagues Western Alaska town for days (alaskasnewssource.com)

[5] Carbon Emissions by State

including coastal erosion, permafrost melting, and reductions in subsistence species populations that most communities rely upon as part of their food source. These impacts threaten the ability for several communities to continue to exist. As a result, these communities acutely understand the need to reduce GHG emissions and transform their economies. Efficient diesel power plants, upgraded distribution lines, and energy efficiency project funding will reduce GHG emissions, lower the energy burden of rural communities, improve resiliency to disruptive events concerning fuel conveyance, and provide opportunities for economic development. Upgraded distribution infrastructure will allow for the future integration of renewable generation sources.

CPRG funding for this application would have a transformative impact on the energy systems of disadvantaged, rural communities in Alaska. Replacing inefficient diesel engines is expected to provide fuel savings, emission reductions, and health benefits for many years into the future. Upgrades to rural distribution systems and power plants will reduce line losses, decrease diesel fuel usage, and ensure readiness for renewable energy integration. Making disadvantaged, rural communities renewable ready is an essential step towards ensuring environmental justice and equitable access to the benefits of clean energy. According to the International Energy Agency, integrating higher shares of renewable energy into the grid can decrease electricity system costs by 15-40 percent[6].

The utility upgrades TCC is planning with AP&T, Rampart's Electric Utility, and Arctic Village's Electric Utility mark a significant stride towards fostering future renewable development in Alaska. These upgrades signify a crucial step in modernizing the energy infrastructure of these regions, laying a robust foundation for integrating renewable energy sources efficiently. With a focus on digital compatibility, these utilities are poised to seamlessly incorporate industry-leading power electronics into their systems, such as SMA and SolarEdge inverters, Woodward EasYgen, and ComAp diesel generator controls, among others. By ensuring compatibility with these technologies, the utilities are positioning themselves to accommodate the growing demand for renewable energy solutions, enabling smoother integration and management of solar, wind, and other renewable sources into their grids.

Distribution and efficiency upgrades facilitate the integration of advanced technologies such as smart grids and smart meters. These technologies enable better monitoring and management of energy use, reducing waste and improving overall energy efficiency[7]. Energy efficiency upgrades reduce long-term fixed energy costs in communities through improvements including outdoor lighting retrofits. Not only do these upgrades provide a rapid return on investments and significant cost savings, but they also add to the safety of these communities by increasing visibility in school yards, public work facilities, and streets. In particular, the proposed subaward to NAB will enable each community to achieve maximum diesel savings and optimize the benefits provided through the OCED grant. Furthermore, less fuel consumption 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. It also reduces the opportunity for fuel spills or other releases.

If awarded, the work done with CPRG funding can provide a framework for a viable path to renewable integration in other rural communities. The transformative impacts of the proposed initiatives are strategically aligned with the broader goal of fostering a more sustainable energy ecosystem in Alaska. As the state continues to embrace renewable energy initiatives, improvements and upgrades funded by CPRG will play a pivotal role in accelerating the transition towards cleaner and more resilient energy systems, ultimately contributing to a more sustainable future for Alaska and its communities.

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[6] Assessing the Economic Impact of Electrical Grid Upgrades An Investor Perspective (energy5.com)

[7] Assessing the Economic Impact of Electrical Grid Upgrades An Investor Perspective (energy5.com)

2. Impact of GHG Reduction Measures

The measures contained in this coalition application contribute to energy efficiency in rural communities through different means and will result in a significant reduction of CO_2 equivalent GHG by displacing large amounts of diesel fuel that would have been consumed if not for implementation of these measures. The sections below will address and quantify how each proposed measure will reduce emissions in five years and then in the next twenty-five years.

a. Magnitude of GHG Reductions from 2025 through 2030

For AEA's genset and diesel engine replacement, AEA anticipates having ten engines installed by the end of 2026, another ten by the end of 2027, and finally eight more online by the end of 2028. All upgrades will be fully operational and contributing to lower emissions in unison no later than the start of federal fiscal year 2029. By the end of federal fiscal year 2030, replacing 28 engines would reduce about 4,739 metric tons of CO_2 emitted.

A series of studies and simulations for rural distribution upgrades in four rural Alaska communities, performed by a contractor on behalf of AEA, were used as a proxy for determining potential GHG reductions that would result from CPRG funding. The four proxy projects would displace approximately 121,000 gallons of fuel and a reduction of 767 metric tons CO_2 equivalent for 2025 – 2030.

Although there is no way to specifically quantify GHG reductions for future projects not yet scoped, AEA used historical performance and funding, adjusted for inflation, to estimate the impact of CPRG funding for the VEEP program. From 2016 through 2023, 56 communities were awarded $2.7 million under VEEP. This offset 1,189,463 kWh per year, totaling 830.9 metric tons of CO_2 equivalent. AEA anticipates VEEP funding through CPRG will offset 3,002,198 kWh per year and result in a reduction of 8,388 metric tons CO_2 equivalent for 2025 – 2030.

TCC's proposed measure will reduce diesel fuel use by over 72,000 gallons annually and reduce emissions by 774 tons annually based on the existing efficiency of the communities' systems compared to expected increased efficiency of 23.12% after the improvements.

NAB's proposed measure will reduce diesel fuel use by over 155,635 gallons annually and reduce emissions by 1,590 tons annually based on achieving maximum, feasible diesel off hours and the expected increased efficiency at the Kotzebue power plant.

Below are the estimates for each proposed measure:

Total GHG Reductions 2025 – 2030

- Genset Replacement Program – 4,739 metric tons CO_2
- VEEP – 8,388 metric tons CO_2
- Distribution Upgrades – 767 metric tons CO_2
- TCC Region Powerplant & Distribution Upgrades – 3,484 metric tons CO_2
- Northwest Arctic Borough Powerplant Upgrades – 5,565 metric tons CO_2

TOTAL: 22,943 metric tons CO2

b. Magnitude of GHG Reductions from 2025 through 2050

Through constant equipment monitoring, proper operations, and preventative maintenance the durability and quantity of GHG reduction measures could continue reducing GHG emissions at the same rate year by year through 2050. To ensure proper operations and maintenance, AEA and coalition members will provide training and operator manuals to ensure operators have the information and skills needed. As part of its existing work, AEA provides comprehensive technical assistance to rural utilities to ensure infrastructure lasts its full economic life, preventing catastrophic electrical emergencies, and building community self-sufficiency. In addition, AEA has full time circuit rider positions that support

rural powerhouse operators. Assuming a best-case scenario, the total amount of GHG reductions could reach as high as 146,846 metric tons of CO_2 equivalent in that timeframe.

Below are the estimates for each proposed measure:

Total GHG Reductions 2025 – 2050

- Genset Replacement Program – 35,310 metric tons CO_2
- VEEP – 50,328 metric tons CO_2
- Distribution Upgrades – 4,873 metric tons CO_2
- TCC Region Powerplant & Distribution Upgrades – 18,968 metric tons CO_2
- Northwest Arctic Borough Powerplant Upgrades – 37,367 metric tons CO_2

TOTAL: 146,846 metric tons CO2

c. Cost Effectiveness of GHG Reductions

Formula = (Requested CPRG Funding) / (Sum of Quantified GHG Emission Reductions from 2025-2030)

AEA's Proposals = ($30,031,790) / (13,894 metric tons CO_2) = $2,162 per one (1) metric ton CO_2

TCC Proposals = ($10,000,000) / (3,484 metric tons CO_2) = $2,869 per one (1) metric ton CO_2

NWAB Proposals = ($9,954,321) / (5,565 metric tons CO_2 (2025-2030)) = $1,796 per one (1) metric ton CO_2

Combined Cost Effectiveness = ($49,986,112) / (22,943 metric tons CO_2) = **$2,179 per one (1) metric ton CO_2**

The factors that impact the proposed measures' cost effectiveness are the higher cost of shipping and construction in rural, remote communities (many of which are not on the road system), the age and condition of the existing infrastructure, harsh climate, and short construction seasons.

d. Documentation of GHG Reduction Assumptions

The models and tools used to calculate GHG emissions reductions were the EPA Diesel Emissions Quantifier (DEQ), Heat Recovery Simulation Analysis, Power Cost Equalization Reports, EPA GHG Equivalencies Calculator and Microsoft Excel. Please reference the Technical Appendix enclosed in this application for a detailed breakdown of the GHG calculations, methodology, and assumptions.

3. Environmental Results – Outputs, Outcomes, and Performance Measures

a. Expected Outputs and Outcomes

Alaska Energy Authority

An expected output for the overall CPRG grant is timely reporting. As the lead applicant for the coalition, AEA will prepare and submit required progress reports and a final report including information regarding technical progress; accomplishments; milestones achieved; summary of expenditures; community engagement; strategy for mitigating environmental risks; and progress on job quality. The NAB and TCC will provide AEA with reporting on their measures to include in the required reports.

Outputs and Outcomes for Expansion of DERA-like program

Outputs: Over three rounds of subawards, AEA expects to install approximately 25-28 new gensets in 12-14 communities. AEA expects to create construction jobs to implement this measure.

Outcomes: AEA expects this measure to reduce GHG emissions by 35,310 metric tons between 2025-2050. Expected outcomes of this measure are reduced diesel usage, cost savings from reduced diesel usage, reduced GHG emissions, and improved public health and climate impacts due to GHG emission reductions. In addition, AEA expects to hire one circuit rider to support all activities in the CPRG grant.

Outputs and Outcomes for Rural Distribution Upgrades

Outputs: AEA expects to construct two distribution projects per year over the five-year period of performance for the CPRG grant. AEA expects to complete 3-5 rural distribution upgrade projects in total depending on the cost of each upgrade. Costs for the upgrade will vary significantly depending on the size of the community, the soil conditions, buried or above ground, and the number of poles to be replace. AEA expects to create construction jobs to implement this measure.

Outcomes: AEA expects this measure to reduce GHG emissions by 4,873 metric tons between 2025-2050. Expected outcomes of this measure are:

- Improved Environmental Impact: AEA expects benefitted communities will begin to integrate renewable energy sources because of this measure, contributing to sustainability. Upgrading the distribution infrastructure will improve overall system efficiency by reducing line losses and diesel fuel usage at the powerhouse. Distribution upgrades also ensure that the microgrids are well-equipped for renewable energy, enabling the local distribution systems to effectively manage the fluctuations introduced to the system.
- Reduced Diesel Consumption and Associated Savings: Less reliance on diesel generators lowers emissions, improving air quality and environmental health. It also reduces the potential for diesel spills and releases.
- Resilience: Modernized infrastructure enhances community resilience to disruptions, ensuring a reliable power supply.
- Health and Safety: Replacement of aging structures, leaning power poles, sagging lines, reduces accidents and enhances public safety and system reliability.
- Economic Opportunity: Reliable energy infrastructure attracts businesses, fostering economic development and job creation.
- Community Empowerment: Access to sustainable energy solutions improves overall quality of life, fostering education, skill development and entrepreneurship.

Outputs and Outcomes for VEEP

Outputs: AEA expects to issue 10-15 awards for VEEP through one solicitation but will have time for additional rounds if all funding is not expended with the first solicitation. Each award may benefit more than one community, depending on the subawardee. AEA expects to create construction jobs to implement this measure.

Outcomes: AEA expects this measure to reduce GHG emissions by 50,328 metric tons between 2025-2050. Expected outcomes of this measure are reduced diesel usage, cost savings from reduced diesel usage, reduced GHG emissions, and improved public health and climate impacts due to GHG emission reductions. In addition, VEEP projects benefit the community through increasing public safety by implementing energy efficient lighting projects in public spaces.

Tanana Chiefs Conference

The integration of high-penetration renewables and increased energy efficiency should lead to environmental benefits, such as reduced greenhouse gas emissions and mitigated environmental impacts associated with energy generation through diesel generators.

Upgrade Plans: Develop detailed plans for upgrading the distribution lines and power plants in each community, considering factors such as energy efficiency, reliability, and integration of high-penetration renewables.

Infrastructure Upgrades: Implement upgrades to the distribution lines and power plants in all nine communities according to the developed plans. This may include installing new equipment, upgrading existing infrastructure, and improving overall system capacity.

Collaborative Efforts: Foster collaboration between the Tribes and respective utility service areas to ensure successful implementation of the upgrades. This may involve regular meetings, joint planning sessions, and coordination of resources.

Outcomes: The proposed project will reduce diesel fuel use by over 72,000 gallons annually and reduce emissions by over 770 tons annually and 18,968 metric tons between 2025-2050.

Increased Energy Efficiency: The upgrades to distribution lines and power plants should lead to improved energy efficiency, reducing energy losses and optimizing overall system performance. The impacted power plants are anticipated to increase their efficiency by 23.12% after completion of this project.

Enhanced Reliability: By upgrading the infrastructure, the reliability of the electrical grid in the 9 communities should be improved, resulting in fewer power outages and disruptions.

Integration of Renewables: The upgrades should enable the electric utility to integrate high-penetration renewables more effectively into the grid, such as solar and wind power, thereby reducing reliance on fossil fuels and promoting sustainability. The proposed project will enable development of solar and battery energy storage infrastructure for each community that will result in an estimated 1.5M kwh of renewable generation annually and further fuel reductions of over 72,000 gallons annually.

Cost Savings: As a result of increased energy efficiency and reduced maintenance needs, the upgraded infrastructure should lead to cost savings for both the utility and the communities. Across the benefitting utilities, diesel fuel savings are anticipated to be over $325,000 annually.

Community Empowerment: Through collaboration and capacity building, the project should empower local communities to take more active roles in managing their energy infrastructure, leading to greater self-sufficiency and resilience.

Environmental Benefits: The integration of high-penetration renewables and increased energy efficiency should lead to environmental benefits, such as reduced greenhouse gas emissions and mitigated environmental impacts associated with energy generation.

Northwest Arctic Borough
Outputs: Expected outputs for this project are efficiency upgrades for the overall electrical systems in the 11 communities through diesel use reduction.

Outcomes: This measure is expected to reduce GHG emissions by 1,753 tons of CO2e annually and by 37,367 metric tons between 2025-2050.

Energy efficiency is one of the most effective means of reducing diesel consumption in rural Alaska. Expected outcomes of this measure are reduced diesel usage, cost savings from reduced diesel usage, reduced GHG emissions, and improved public health and climate impacts due to GHG emission reductions. The proposed project will reduce diesel fuel use by over 155,635 gallons annually. Furthermore, decreased and stabilized energy prices will encourage opportunities for future economic development, offering potential job opportunities.

b. Performance Measures and Plan
As an extension of Alaska Municipal League's (AML) current support to the Alaska Dept. of Environmental Conservation (DEC), which is administering the CPRG planning grant, AML will work with DEC to establish a statewide tracking and reporting system for CRPG awardees. AML will work with DEC to establish a statewide tracking and reporting system for CRPG awardees to utilize. This system will include consistent reporting timelines, methodology consistent with the State's GHG emissions

inventory, and a dashboard providing reporting individually and cumulatively. This State-led effort not only complements EPA's own activities but ensures a platform for long-term accountability and progress. While targeted to meet the needs of CPRG and Tribal CPRG implementation awardees, the ability to report progress will be available to any state agency, or local or Tribal government, as aligned with measures described in Alaska's Priority (and eventually Comprehensive) Action Plan. AML will work with DEC and awardees to establish a consistent and simplified reporting structure, which will be completed through an online portal that leads to progress demonstrated via a publicly available dashboard. Reporting will be based on the outputs and outcomes identified in each awardee's implementation plan and built to include both unique measures and those that are similar across projects. AEA expects a robust subrecipient monitoring process that will require each sub awardee to complete timely reporting. AEA and sub awardees will implement a system of monitoring that is initiated through a baseline assessment that vets and downscales broadly available data, after which quarterly (depending on grant award terms) data is included and submitted for review and analysis. AEA will leverage the statewide reporting and monitoring effort led by DEC, through AML, such that subrecipient engagement is managed through a single entity across awards. This dedicated position will ensure consistency of data collection and alleviate any staff burden of AEA, TCC, and the NAB. The project's technical points of contact at AEA, TCC, and the NAB will track project's benefits and avoided disbenefits that are quantifiable and measurable, see table below. Baseline measures will be determined prior to project implementation and measured at each project's end.

Outputs/Outcomes	**Measure**
Decrease in Energy Burden	Energy Costs Savings
Decrease in environmental exposure	GHG Reduction
Upgrades/Improvements completed	Number of projects completed / communities benefited
Public health benefits	TBD
Increase in job creation and training	Jobs and training opportunities
Increased Efficiency	efficiency at power plants reduced line losses efficiency achieved through VEEP Reduction in diesel used
Enhanced Reliability	Reduction in power outages and disruption

c. Authorities, Implementation Timeline, and Milestones

Alaska Energy Authority

AEA will implement the DERA-like, rural distribution upgrades, and VEEP as described in this application, and has the authority to do so in coordination local governments and tribes; AEA will work local governments and tribes early in the planning phase for each measure to secure local approval and support. AEA has the authority to procure services and issue subawards. 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 is in 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.

The schedule below indicates what is typical for AEA's projects under the DERA Program. Given the complexities of working in rural Alaska, the limited construction season, and supply chain challenges, AEA typically sees a two-year cycle for these replacement projects. Due to the volume of the funds, we intend to distribute the sub-awards over the 5-year period allowed by the grant and provide three rounds of funding opportunities. The table below reflects a typical genset replacement project schedule given its key deliverables (Task') if it were to be funded through the CPRG program.

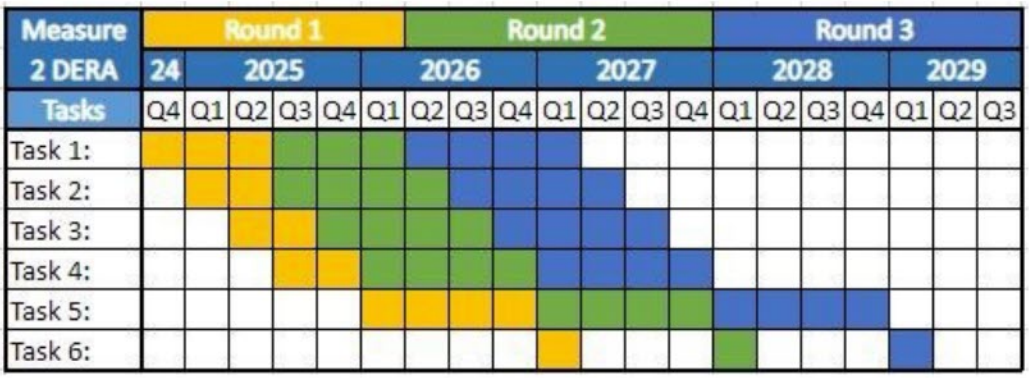

Figure 1 Standard DERA Project Timeline spread across five years.

- Task 1: Confirm each rural community has an eligible engine and prepare emission tables and budget.
- Task 2: Design and identify specifications – Procure contractual assistance for the design of the engine/generator installations and development of specifications specific to each installation.
- Task 3: Construction procurement – Issue invitation to bid (ITB) to select a contractor that will provide engines, generators, and associated equipment, including any required assembly and testing, and installation.
- Task 4: Submittals – Contractor delivers submittals for AEA review and approval.
- Task 5: Installation and Commissioning – Install generator repowers/replacements and help integrate the electronically controlled engines with the existing switchgear, fuel, exhaust, and

cooling systems. If requested, AEA staff will offer technical assistance during the startup and commissioning of the engines.

- Task 6: Final closeout of award.

The table below reflects the schedule for and milestones for rural distribution upgrades. AEA will project manage these projects and expect individual projects will closeout at different times. AEA can complete 2 upgrade projects a year but timing can vary based on location, improvements, and supply chain. Distribution projects will be needs based meaning they will be selected based on needs from our distribution inventory and assessment database. Communities that have the greatest need for an upgrade will be selected to receive a project.

Mile	Task/Phase	Start	End	Deliverable
1.	**Planning**	Sep 24	Jun 25	
	Select Communities based on need	Sep 24	Dec 24	
	Meet with the Community	Sep 24	Mar 25	Resolution
	Project Management Plan	Jan 25	Mar 25	Signed PMP
	Grant to Community	Mar 25	Jun 25	Grant agreement
2.	**Design**	Jun 25	Jun 29	
	Engineering	Jun 25	Jun29	Signed Notice to Proceed
	95% Design	Jan 26	Jun 26	Design documents, community acceptance
	Long lead items	Jun 26	Jun 27	Transformers
	Final Design, ITB	Jun 26	Jun 27	Design documents, permitting, ITB
3.	**Construction**	Apr 27	Sep 29	
	On-site construction	Apr 27	Aug 29	Field Reports
	Final inspection	Aug 29	Sep 29	Checklists, photos
4.	**Close Out**	Sep 29	Sep 29	Final Report

The table below reflects the schedule for and milestones for VEEP. Individual subawards will closeout at different times. These projects typically take 18 to 24 months to complete but can vary based on location, improvements, and supply chain.

Milestone	Task	Start	End	Deliverable
1.	**Planning**	Sep 24	Dec 24	Project Management Plan
	Request for Applications	Jan 25	Mar 25	Applications from Eligible Applicants
	Grant to Community	Mar 25	Jun 25	Signed Agreements

2.	**Construction**	Jun 25	Jun 29	
	Audit (if applicable)	Jun 25	Jun 26	Audit Report
	Construction	Jun 25	Jun 29	Monthly/Quarterly Reports
	Punch List	Sep 27	Aug 29	Punch List
	Final Inspection	Sep 27	Aug 29	Trip Report
3.	**Project closeout**	Dec 27	Sep 29	Final Report

Tanana Chiefs Conference

TCC will implement efficiency upgrades to power plants and water plants as discussed in this application and has the authority to do so for the tribes it represents.

Estimated Performance Period: September 2024 – August 2027

Task 1.0: Project Planning (September 2024 – December 2024)

Task Details: The project planning task includes RFP development, contract procurement, stakeholder engagement.

Subtask 1.1: Procurement: Negotiate with EPA for award allocation, formalize written agreements, develop RFPs for Engineering Services and Construction Contractors and complete competitive bid process.

Deliverables: Project and Risk Management Plans, RFPs, and contracts

Subtask 1.2: Community Engagement: Community meetings, informal interviews with village leadership, develop stakeholder engagement plan, presentations and listening sessions at annual and subregional meetings, coordinate and schedule trainings, contemplate cooperative labor agreements.

Deliverables: Documented engagement plan for life of project

Task 2.0: Project Development (January 2025 – July 2025)

Task Details: The project development task includes design, permitting, site control, and associated activities to prepare for construction, as detailed in the subtasks below.

Subtask 2.1: Engineering Design**:** Complete 35%, 65%, 95%, and construction ready drawings through standard engineering design and review process.

Deliverables: Construction ready drawing set, calculations, basis of design, specifications, review and version logs

Subtask 2.2: Permitting: Prepare permit applications, review, and submit to jurisdictional agencies for approval., as necessary.

Deliverables: Secured permits

Subtask 2.3: Community Engagement: Community meetings, implement stakeholder engagement plan, collect feedback and respond, create project webpage, post project information publicly, presentations and listening sessions at annual and subregional meetings, assess community needs for local workforce, coordinate training opportunities, stablish workplace committees for project hires, update webpage.

Deliverables: Formal coordination and documentation of workforce development requests, community needs assessment

Task 3.0: Construction and Integration (August 2025 – August 2027)

Task Details: The construction and integration task includes pre-construction activities, construction, inspection, and closeout, as detailed in the subtasks below over two years across the proposed communities. The tasks are generally the same for each community.

Subtask 3.1: Pre-construction: Review construction plans with selected contractor and confirm schedule, finalize contract, procure materials and mobilize
Deliverables: Construction contract, bill of materials
Subtask 3.2: Construction: Site preparation, improves to each power plant
Deliverables: Installed assets
Subtask 3.3: Community Engagement, Community meetings, update project webpage
Deliverables: Updates to project webpage, community meetings reports
Subtask 3.4: Inspection and Closeout: Substantial completion inspection and punch list, address punch list items, final and regulatory inspections, troubleshooting, operator training
Deliverables: Punchlist, inspection reports, training logs, signed transmittal from contractor to owner indicating completion and turnover

Northwest Arctic Borough
The NAB will implement efficiency upgrades to power plants and water plants as discussed in this application and has the authority to do so for the communities it represents.

Estimated Performance Period: September 2024 – August 2027
Task 1.0: Project Planning (September 2024 – December 2024)
Task Details: The project planning task includes RFP development, contract procurement, and stakeholder engagement.
Task 2.0: Project Development (January 2025 – July 2025)
Task Details: The project development task includes design, permitting, and contractor procurement for construction
Task 3.0: Construction and Integration and closeout (August 2025 – August 2027)
Task Details: The construction and integration task includes pre-construction activities, construction, inspection, and closeout. The tasks are generally the same for each community. We anticipate that the water/power plant upgrades for five communities will be completed in 2026 and upgrades for the remaining five communities in 2027. Construction for the proposed upgrades in Kotzebue will be completed in 2027. Required reporting will be complete throughout the project.

Alaska Municipal League
As a sub-recipient, AML will support the application with workforce development infrastructure which will consist of aiding applicants with recruitment, skill development, career navigation, and wraparound services such as childcare, housing and living stipends. Workforce development infrastructure is an ongoing effort, and the coalition will have access to these tools when the planning process begins in the fall/winter of 2024. 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. The tracking and reporting system will be piloted in time to complete the first round of semi-annual reporting required by the grant program. Lastly, AML will lead a statewide cohort of awardees to participate in CPRG planning and creation of a sustainability plan.

4. Low-Income and Disadvantaged Communities
The benefits from the measures proposed by the coalition in this application will almost entirely benefit low-income and disadvantaged communities.

Although AEA has not selected communities for its measures at the time the application was submitted, AEA expects almost all subawards to benefit communities that are in disadvantaged census tracts, Power Cost Equalization (PCE) communities, or communities where most residents are Alaska Native. The reasoning for this expectation is the type of work proposed by AEA and the criteria it uses to select projects for subawards. The PCE program is an endowed fund source that provides economic assistance to communities and residents of rural electric utilities where the cost of electricity can be three to five times higher than for customers in more urban areas of the state. This program serves over 88,000 Alaskans in over 190 communities that are largely reliant on diesel fuel for power generation. Of the PCE communities, only five communities are considered not disadvantaged and another seven communities are considered partially disadvantaged, details are provided in the attachment to this application. Please note the CEJST disadvantaged status was adjusted to reflect the presence of federally recognized tribes in a community to reflect the intent for these tribal communities to be included in the definition of disadvantaged. For communities where there are tribal governments and >50% of the population is Alaska Native, our list presumes full disadvantaged status; for communities where there are tribal governments and <50% of the population is Alaska Native, this list presumes partial disadvantaged status.

For the 20 communities that will benefit from the work performed by TCC and NAB, only the community of Bettles is considered not disadvantaged. Bettles is included in the application because Evansville and Bettles are electrically intertied and neighboring communities; Evansville is a federally recognized tribe. The table below includes residential electricity rates for these communities, before PCE assistance.

NAB Community	Residential Utility Rate ($/kW-hr)	TCC Community	Residential Utility Rate ($/kW-hr)
Kotzebue	$0.41	**Allakaket**	$1.10
Kivalina	$0.66	**Alatna**	$1.10
Deering	$0.67	**Evansville**	$0.78
Buckland	$0.50	**Bettles**	$0.78
Selawik	$0.67	**Healy Lake**	$1.00
Noatak	$0.67	**Eagle**	$0.89
Kiana	$0.73	**Rampart**	$0.81
Noorvik	$0.69	**Northway**	$0.65
Ambler	$0.86	**Arctic Village**	$1.00
Shungnak	$0.77		
Kobuk	$0.77		

The replacement of older diesel engines and gensets through a DERA-like program are expected to result in immediate fuel savings and emissions reductions. Energy efficiency improvements through an expansion of VEEP will reduce diesel consumption, providing immediate cost savings and this program also enhances community safety through improved lighting in public areas and buildings. Upgrades to

rural distribution systems 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 consumer costs.

The work proposed by TCC in this application will provide improved electricity reliability, energy savings costs, access to future renewable energy integration, jobs, community empowerment, and health and safety benefits, and environmental protection to the nine communities benefitted.

The work proposed by the NAB in this application will improve efficiency enabling each community to achieve maximum diesel savings and optimize the benefits provided through the recent DOE OCED grant. These improvements will improve reliability, reduce energy burden, create jobs, and provide health and environmental impacts. Four NAB communities (Noatak, Ambler, Shungnak, and Kobuk) receive fuel via air shipment, resulting in per gallon diesel prices in excess of $16.

The project's technical points of contact at AEA, TCC, and NAB will track project's benefits and avoided disbenefits that are quantifiable and measurable. Reduced GHG emissions from all measures in this application will provide improved public health and mitigate climate impacts over the long term. In addition, less fuel consumption 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.

The coalition does not anticipate negative effects on benefited communities. AEA, TCC, and NAB will solicit feedback from communities and engage stakeholders throughout the projects to identify and address potential negative impacts.

Community Engagement

AEA, TCC, and NAB are accustomed to engaging with local governments and tribal entities through permitting and regulatory processes for rural energy projects. The applicable projects would establish milestones urging earlier dialogue with local governments and Tribal entities. These talks should begin early enough to inform project development in response to local communities' needs and concerns. Local governments and Tribal entities 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.

AEA, TCC, and NAB also have established relationships with tribal entities, local governments, and other State departments, with a focus on workforce, permitting, and community development. Early engagement with these stakeholders will help ensure the project is responsive to local energy plans and goals.

In line with the infrastructure program and long-term work with the State of Alaska's CPRG PCAP, the Alaska Municipal League intends to support AEA with planning support, community outreach, progress tracking, and energy data needs. AEA, TCC, NAB will coordinate with AML to develop a stakeholder engagement strategy that focuses on rural, disadvantaged communities and includes municipal and Tribal governments, and public and cooperative utilities. 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 plan will include: public meetings, both in person and virtual; social media posts; updates on participating organization's websites; participation in recurring events, such as, Alaska Municipal League Office Hours, Tribal Council meetings, City Council meetings; and, participation in more informal settings, such as the Alaska Federation of Natives Convention, Alaska Rural Energy Conference, the Alaska State Fair, and other energy and environmental conferences held throughout the state. One recurring conference, which AEA, TCC and NAB participate in, that is critical to

sharing information amongst rural communities is the Alaska Rural Energy Conference (AREC), scheduled this year for October 2-4, 2024[9], in Fairbanks, Alaska. The AREC enables communities and experts from around the state to work together and share practical information on energy projects.

5. Job Quality

AEA and the coalition members are focused on ensuring the CPRG grant funds and GHG reduction measures offer high-quality jobs within a diverse and skilled workforce. The coalition expects to create new job opportunities, primally in construction, while implementing the GHG reduction measures outlined in our proposal. We expect to create local jobs that will likely be seasonal, part-time work which would provide meaningful employment. The goal is to recruit a diverse pool of workers that is also representative of the communities impacted by these measures. As with most projects in Alaska, those with Alaska experience are preferred. AEA anticipates adding one circuit rider position to support the measures proposed in this application. AEA offers competitive wages, comprehensive health and retirement benefits, tuition reimbursement, 11 paid holidays, and generous leave accrual.

As a state agency, AEA is obligated to a fair and transparent procurement process for the bid and selection of all our intended labor per 2 CFR § 200.317. We are committed to fostering safe, healthy, and inclusive workplaces with equal opportunity free from harassment and discrimination and will utilize these funds in alignment with the U.S. Dept of Labor and Commerce Good Jobs Principles. Work performed with this funding will be done in compliance with Alaska public contracting law, which contains provisions for local hire, registered apprenticeship training, prevailing wages, equal employment opportunity and other forward-looking policies. TCC follows a Native preference policy per the requirements of section 7 of Public Law 93-638. The coalition fully intends to follow federal guidelines by including clauses in construction contracts that require construction contractors and subcontractors to pay wages at rates not less than those prevailing, as determined by the Davis-Bacon Act wages and submit certified payroll when necessary.

The coalition will participate in the statewide workforce development activities organized by the Alaska Municipal League (AML) for applicants to CPRG implementation grants. This program provides a pathway for the coalition and sub awardees to leverage existing but coordinated recruitment and retention resources, as well as skills development. Funding will be available to provide opportunities for:

- Recruitment – AML's partnership with the Associated General Contractors includes the ability for projects to participate in AGC's *We Build Alaska* public outreach campaign, which has the ability to geofence and target social media messaging.
- Skills Development – AML works with the Alaska Safety Alliance, Alaska Works Partnership, University of Alaska, and Alaska AFL-CIO to identify appropriate workforce training opportunities. As workforce needs are identified, including the need for reskilling, they can access any of these partnerships.
- Career Navigation – AML will coordinate with DOL&WD for access to Alaska Job Centers, as well as through AFL-CIO and other programs, to support project workforce career navigation, including pathways for certification, apprenticeship, and degree programs.
- Wraparound Services – AML works closely with multiple partners who have mechanisms in place to facilitate childcare, housing, and housing stipends for staff and contractors, especially in conjunction with infrastructure investments across Alaska.

AEA and its partners are committed to competitive wages, comprehensive benefits, collaborative health and safety planning, utilization of skilled labor from Registered Apprenticeship programs, collaboration with labor organizations, implementation of second chance hiring policies, and expanding outreach to disadvantaged communities with high unemployment.

6. Programmatic Capability and Past Performance

a. Past Performance

AEA is an independent and public corporation of the State of Alaska, est. 1976, and is the state's energy office and leading agency for statewide energy policy and program development. AEA is governed by a board of directors with the mission to "reduce the cost of energy in Alaska." Our 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. 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 and is the hub for information exchanges, technical assistance, multiagency coordination, and dynamic pilot projects informing policy decisions and funding solutions for energy and efficiency projects in the future.

AEA staffs a full suite of highly qualified individuals, including engineers, planners, project developers, project managers, accountants and finance officers, and policy analysts. AEA has successfully managed, completed, and closed well over three-hundred grants in the last decade, several of which were grant funds from the EPA. We are registered at Grants.gov and SAM.gov, have a UEI number, and have the legal authority to enter a financial assistance relationship with the EPA CPRG program.

AEA has mature staff and management systems in place to administer awards. 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 coordinator. Internal control procedures are in place for compliance reviews, budgetary controls, invoice approvals, 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 prepared to manage this project, including through a subaward and project delivery and assessment process. Following is a sample of the many awards AEA manages from federal agencies:

Alaska Energy Authority

BIL Preventing Outages and Enhancing the Resilience of the Electric Grid
Agency: Department Of Energy (DOE)
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). This project's objective is to improve the electric grid's resilience against a disruptive event such as being 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

2022 Black Rapids Training Center Line Extension
Agency: U.S. Department of Defense (DOD)
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

State Clean Diesel Emission Reduction Act 2016-2022
Agency: Environmental Protection Agency (EPA)
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

Tanana Chiefs Conference
Federal Low Income Home Energy Assistance Program
Funding Source: U.S. DHHS Administration for Children & Families
Funding Source Award #: 21PNAKE5C6
Contact: Desiree Joseph desiree.joseph@tananachiefs.org (907) 452-8251, Ext. 3521
Description: This grant provides funds for The Low-Income Home Energy Assistance Program (LIHEAP) helps keep families safe and healthy through initiatives that assist families with energy costs. LIHEAP provides federally funded assistance to reduce the costs associated with home energy bills, energy crises, weatherization, and minor energy-related home repairs. Reporting History and Status: TCC provided regular and timely reporting per the terms of the grant and completed delivery of the varied scope of work.

Federal Diesel Emission Reduction Project Manley Hot Springs
Funding Source: U.S. EPA GAP Program
Funding Source Award #: DE-01J89201
Contact: Sherry Davis davis.sherry@epa.gov 907-271-6322
Description: The project replaced two unregulated diesel gensets located in Manley, AK that were producing at a very inefficient rate with two Tier 3 diesel gensets that are more efficient for the community. The project also included the replacement of manual switchgear with an automatic control system to safely switch between gen-sets, balancing runtime and maximize the life of the system; as well as allow for the power generation system to be prepared to accept renewable power in the future. The project dramatically reduced emissions (75.7% reduction in NOx and 81.5% reduction in PM2.5) positively impacting community health and wellbeing simply by the increased efficiency and is expected to reduce annual diesel usage in the community by 16.4% or 7,154 gallons.

b. Reporting Requirements

Alaska Energy Authority
BIL Preventing Outages and Enhancing the Resilience of the Electric Grid
Performance Period: 7/24/2023 - 4/30/2028
This award is active and requires quarterly project and award management reporting. DOE also requires that all projects under this grant adhere to BABA and Davis-Bacon requirements. AEA was awarded at the beginning of the Q3, 2023 and has been obligated to submit for two quarters. AEA has successfully managed grant requirements to-date through close communication with the DOE project officer.
2023 Q3 – Submitted 10/23/23
2023 Q4 – Submitted 1/10/2024

2022 Black Rapids Training Center Line Extension

Performance period: 9/1/2022-3/31/2027
This is an active project and 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.

State Clean Diesel Emission Reduction Act 2016-2022
Performance Period: 10/1/2017 - 9/30/24
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.

Tanana Chiefs Conference
Federal Low Income Home Energy Assistance Program
Start Date: 11-Mar-21 End Date: 30-Sep-22
Reporting History and Status: TCC provided regular and timely reporting per the terms of the grant and completed delivery of the varied scope of work.

Federal Diesel Emission Reduction Project Manley Hot Springs
Funding Source: U.S. EPA GAP Program
Start Date: 1-Oct-20 End Date: 30-Jun-23
Reporting History and Status: TCC provided regular and timely reporting per the terms of the grant and completed delivery of the varied scope of work.

c. Staff Expertise

Alaska Energy Authority (AEA):
Business Point of Contact: Curtis Thayer serves as the Alaska Energy Authority (AEA) executive director. Previously, he was the commissioner for the Department of Administration and cabinet member for Governor Sean Parnell, responsible for 1,100 public employees and an annual budget of $350 million. As part of his public service, he served as the deputy commissioner of the Department of Commerce, Community, and Economic Development, and worked in Washington, D.C. with Alaska's Congressional Delegation. A graduate of the United States Department of Energy's National Renewable Energy Laboratory Executive Energy Leadership Institute program, Thayer has gained a comprehensive understanding of advanced energy technologies that has helped him guide his organizations in making energy-related decisions. The project budget and work plan anticipate a 3%-time commitment from Thayer to the project.

Tim Sandstrom is AEA's Chief Operating Officer and will represent Mr. Thayer, directly overseeing the rural energy team. He has been with AEA since 2011 and served as director of rural programs. Sandstrom oversees the management of AEA's Rural Power System Upgrade, Bulk Fuel Upgrade, Circuit Rider, Emergency Response, and Training Programs. As a senior management team member, he is also responsible for implementing AEA's strategy and budget management for his programs. With over 35 years in construction, project management, and engineering project management throughout Alaska, Sandstrom brings a broad range of private sector experience to his work. The project budget and work plan anticipate a 3% time commitment from Sandstorm to the project.

Technical Point of Contact: Rebecca Garrett, Rural Programs Manager, has been with Alaska Energy Authority since 1997 and has managed projects and programs in varying size and complexity since 1998. She earned her project management professional (PMP) certification and keeps an active registration.

She will take on the day-to-day administration of this award, starting by preparing the Project Management Plan. From there, she will assign individual projects to qualified project managers who will provide project oversight, review, and accept plans, procedures, deliverables, and reports. Ms. Garrett will be responsible for project communications between contractors, consultants, and the AEA team. She will track specific contractual deliverables against the schedule to ensure contractors are on track to meet critical milestones. She will be the primary point of contact for the award. The budget and work plan anticipate 25% of Garrett's time committed to this project.

Program/Project Managers: AEA has a team of highly qualified project and program managers who work under Rebecca Garrett, Rural Programs Manager, and Audrey Alstrom Director of Renewable Energy and Energy Efficiency. Staff assignments will be made as projects, and the technologies they will implement become clear.

Financial Management: AEA's Controller will oversee the project's financial progress. Once the Project Management Plan is accepted, a grant agreement will be issued to the individual project sites. Each Project has a unique project code and grant number used to track each funding source and required match. The finance team will certify financial reports for EPA's reporting requirements. AEA's Grants Manager will oversee the award from the EPA and the grant agreement documents with remote Alaskan communities and ensure AEA's compliance with grant requirements and related reporting.

Tanana Chiefs Conference (TCC):
Dave Messier, TCC Infrastructure Division Director | Dave Messier will serve as the Project Manager of the project. He has overseen more than $40M in grant funded infrastructure projects in rural, Tribal communities over the past 8 years. Dave manages TCC's Rural Energy program; in that capacity he works with the various remote power utilities in the TCC region. Dave has many years of project management experience working for small Tribes across the state. He is well equipped to manage the team, develop contracts, provide contract oversight, and operate in accordance with grant provisions. Dave will act as the liaison for all the stakeholders including participating Tribal communities, landowners, contractors, and Tanana Chiefs Conference. Dave has an undergraduate degree with a minor in business from Cornell University, received his MBA in 2012 and is a Certified Project Management Professional.

Ben Shilling, TCC Chief Financial Officer | Ben Shilling will oversee all financial aspects of this grant. Ben oversees TCC's financial reporting, accounting and procurement departments which are directly responsible for the financial management of grants and managing procurement. Within these departments Ben has a team of 22 employees under him at TCC. TCC has over $470 million in assets and over $250 million in annual revenues. Under Mr. Shilling's leadership TCC has maintained an A+ Bond Rating and has had many years of clean audits with no findings. Ben has been a CPA since 1989 and Certified Information Systems Auditor since 1994. Ben also leads the distribution of both restricted and unrestricted funds to TCC tribes. Dave and Ben will be supported by **Edward Dellamary, TCC Rural Energy Specialist** to conduct day to day oversight and review of technical deliverables, perform community outreach, prepare grant reports and review technical deliverables. **Cortnie Doan, TCC Grants and Office Manager** will review invoices and financial account.

Northwest Arctic Borough:
Ingemar Mathiasson, NAB Energy Manager, works in the NAB's Economic Development Department. He will be the Project Manager and oversee all aspects of the project. He has developed and managed renewable energy and energy efficiency projects in all 11 communities within the Borough and has been the Project Manager for successful solar, battery, and diesel hybrid systems in Buckland, Deering, Shungnak, and Noatak, along with a biomass construction project in Ambler. Mr. Mathiasson will also ensure community engagement and outreach, in coordination with the Northwest Arctic Energy Steering Committee's education and outreach efforts.

Angie Sturm has been the NAB Treasurer since 2016. Ms. Sturm received her Bachelor of Business Administration degree in Accounting and Management from the University of Alaska Anchorage. Before accepting her position at the Borough, Angie was an Auditor for KPMG, an international accounting firm with an office in Anchorage. She will oversee all financial transactions and financial reporting associated with this project.

Alaska Municipal League:
Nils Andreassen, AML's Executive Director, has worked with communities across Alaska for more than 15 years, including to serve in a management role at nonprofit organizations for 10 years. Nils has contributed to State efforts and helped draft its Arctic policy, as well as its Climate Action Plan. Nils serves on the Denali Commission, served on the Governor's Broadband Task Force, and is on the board of directors of the National League of Cities (NLC). His role in this project is to maintain and cultivate relationships that strengthen delivery of the program, assist with outreach to communities, and contribute input into the strategic direction and deployment of the project. The Alaska Municipal League (AML) is a member-based service organization that works to strengthen Alaska's 165 cities and boroughs. AML has responded to Executive Order 14008 and the federal prioritization of tackling climate change, environmental justice, and inequity by providing a suite of services that help local governments meet associated goals. AML members and associated Tribal governments can utilize our shared service program to contract for a coordinated approach to addressing equity and environmental justice within the context of project development and implementation.

7. Budget and Timely Expenditure of Grant Funds

a. Budget Detail

The budget detail is included as an attachment to this application.

b. Expenditure of Awarded Funds

AEA, TCC, and NAB have developed a project budget and schedule that is reasonable and achievable within a 5-year period of performance. This plan is grounded in previous experience with the type of work proposed in this application and recent cost estimates for equipment, such as diesel engines and electric boilers.

AEA, TCC, and NAB have extensive experience in issuing and managing contracts to complete the type of work proposed. The coalition's procurement teams will issue contracts that include specific deliverables with expenditures linked to milestones and associated completion dates. Reimbursement will be 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 subawardees' and contractors' performance against the timeline and milestones and adjust the plan accordingly to ensure timely completion. AEA, TCC, and NAB use financial management systems that allow for tracking of expenditures and comparison to budgets and will meet regularly with the project teams to assess progress. Each coalition member has experienced financial staff.

c. Reasonableness of Costs

The proposed budget is grounded in previous experience with the type of work proposed in this application, knowledge of site conditions, and recent cost estimates for equipment, such as diesel engines and electric boilers. 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, travel was included in the budget for site visits to account for the remote nature of the work. The budget detail attachment includes a narrative description of the budget that supports the values used and the corresponding excel attachment includes a detailed breakout of budgeted costs for each measure.

COVER PAGE

CPRG – PROPOSAL TO ADDRESS RURAL ALASKA'S CRITICAL ENERGY CHALLENGES

APPLICANT INFORMATION

Organization: Alaska Energy Authority (AEA)

Primary Contact Name: Curtis W. Thayer, AEA Executive Director

Phone Number: 907-771-3009

Email Address: cthayer@akenergyauthority.org

TYPE OF APPLICATION: Lead Applicant for a Coalition; coalition members include the Tanana Chiefs Conference (TCC) and Northwest Arctic Borough (NAB)

FUNDING REQUESTED: $49,986,112

APPLICATION TITLE: CPRG – Proposal to Address Rural Alaska's Critical Energy Challenges

BRIEF DESCRIPTION OF GHG MEASURES: AEA is spearheading a comprehensive measure proposal aimed at addressing critical energy challenges faced by rural communities in Alaska. This proposal encompasses the following components presented by AEA and its coalition partners: Diesel Genset Replacement, Distribution System Upgrades, Village Energy Efficiency Program (VEEP), NAB's Power and Water Plant Upgrades, and TCC's distribution and powerplant upgrades. AEA is committed to making substantial, long-term emissions reductions while simultaneously delivering numerous benefits to these remote communities.

SECTORS: Electricity Generation

EXPECTED TOTAL CUMULATIVE GHG EMISSION REDUCTIONS:

Estimated cumulative GHG reductions for 2025 – 2030 (in metric tons) - **22,943**

Estimated cumulative GHG reductions for 2025 – 2050 (in metric tons) - **146,846**

LOCATIONS: The proposed measures will be implemented in numerous disadvantaged communities located throughout much of rural Alaska.

APPLICABLE PRIORITY CLIMATE ACTION PLAN (PCAP) ON WHICH MEASURES ARE BASED:

PCAP Lead Organization: Alaska Department of Environmental Conservation (DEC)
PCAP Title: State of Alaska Priority Sustainable Energy Action Plan
PCAP Website: CPRG - Alaska Federal Funding (akfederalfunding.org)

List of GHG reduction measures and PCAP page reference for each measure:

- Replacement of low tier high-emitting diesel generators with more advanced Tier 2 and 3 marine engines that emit lower PM levels.

- Upgrade distribution systems throughout rural Alaska. These modifications will improve overall system efficiency by reducing line losses and diesel fuel usage within powerhouses.

- Expand upon the Village Energy Efficiency Program (VEEP) by upgrading public buildings and infrastructure with energy-efficient materials for high-energy cost communities.

These measures are included in the "AEA DERA, VEEP, and Rural Distribution Programs" measure on page 47-49 of the PCAP.

TECHNICAL APPENDIX

CPRG – PROPOSAL TO ADDRESS RURAL ALASKA'S CRITICAL ENERGY CHALLENGES

GHG Reduction Estimate Method

The reduction of diesel fuel consumption is the primary driver of all components proposed in this application to reduce GHG emissions. Before being able to determine the amount of CO_2 equivalent that may be reduced, the first agenda was gathering data of previous projects that were identical in scope and determining how much fuel was saved after implementation of these measures. The main source of data, which will be mentioned often in this section, comes from the Power Cost Equalization (PCE) Program.[1] This program is the number one most-used resource to gather data for all measures listed in this application.

The PCE program was created to provide economic assistance to communities and residents of rural electric utilities where the cost of electricity can be three to five times higher than for customers in more urban areas of the state. AEA, along with the Regulatory Commission of Alaska (RCA), administers the program that serves over 88,000 Alaskans in 193 communities that are largely reliant on diesel fuel for power generation. All communities discussed in this application, whether those used as proxies or the ones to be funded for upgrades if awarded this grant, are all part of the PCE program.

Utilities that are eligible for this program submit monthly reports to AEA that document the eligible power sold and PCE credits applied to eligible customers' bills. AEA calculates the amount of PCE on a monthly basis and issues payment to the utility. At end of each Alaska fiscal year (1 July – 30 June), the PCE report for that year for all eligible communities is generated and posted to AEA's website.[2]

Although these particular calculations are not used in determining GHG reductions, their results do provide the metrics needed to determine GHG emission reductions proposed in this application. The four main data points used from each PCE report were: 1) Diesel kWh Generated; 2) Fuel Used (gallons); 3) Line Loss (%); and 4) Fuel Efficiency (kWh per gallon of diesel)

Although the calculations are already indicated on each PCE report, the fuel efficiency and line loss data formulas are as follows:

Fuel Efficiency (kWh) = Diesel kWh Generated / Fuel Used (gallons)

Line Loss (%) = 100 - (Total kWh Sold & Powerhouse Consumption / Diesel kWh Generated)

These two metrics that proved valuable in determining if projects funded for distribution and power plant upgrades, reduced GHG emissions.

The methods used for gathering data with respect to the diesel genset replacement was EPA's Diesel Emissions Quantifier (DEQ) tool.[3] Required data was input for the baseline engine (engine model currently utilized at various locations requiring upgrade) as well as data for the upgraded engine. Short tons were then converted to metric tons using a standard calculator.

Models/Tools Used

The models and tools used were the following: EPA Diesel Emissions Quantifier (DEQ); Heat Recovery Simulation Analysis; Power Cost Equalization Reports; EPA GHG Equivalencies Calculator, and multiple excel spreadsheets with formulas

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[1] Alaska Energy Authority > What We Do > Power Cost Equalization (akenergyauthority.org)

[2] Alaska Energy Authority > What We Do > Power Cost Equalization > PCE Reports & Publications (akenergyauthority.org)

[3] My Account: Diesel Emissions Quantifier | Diesel Emissions Reduction Act (DERA) | US EPA

The DEQ was the primary tool used when calculating GHG reductions for diesel genset replacements. However, some uncontrolled nonroad engines are to be replaced by Tier 2 or 3 marine engines. The DEQ uses load factors, applied to rated engine horse power to determine average engine horsepower for emission calculations. The nonroad and marine engine load factors are different, and are not representative of actual average engine horsepower. Additionally, the DEQ does not directly support comparing emissions reductions unless the baseline and replacement are of the same category (e.g. nonroad -> nonroad, marine -> marine). Therefore, to determine emissions reductions for different engine types accurately, the DEQ calculator was run for each engine separately and the results were exported to Excel for comparison.

Below is an example of a DEQ study for a nonroad -> marine engine project exported to excel for comparison. The engines used in this model are as follows:

- Baseline Engine – John Deere 4039, Non-Certified, 30kW Prime
- Replacement Engine – John Deere 4045TFM75, Tier 2 Marine, 65kW Prime

Annual Results (metric tons)	***Carbon Dioxide - CO2 (1 diesel engine)***	***Nitrogen Oxide (NOx)***	***PM 2.5***	***Carbon Monoxide (CO)***	***Hydrocarbon (HC)***
Baseline of Entire Project	253.29	1.55	0.64	1.86	0.29
Upgrade of Entire Project	211.01	1.71	0.05	0.25	0.10
Amount Reduced After Upgrades	42.28	-0.16	0.59	1.61	0.19
Percent Reduced After Upgrades	16.7%	-9.9%	91.6%	86.8%	66.7%

Figure 1 Nonroad to Marine Engine Comparison

In addition to the DEQ, a Heat Recovery Simulation Analysis model is used for distribution upgrade projects as needed. This model is commonly used and provided by an engineering firm that works closely with the applicant on many rural projects: Gray Stassel Engineering (GSE), Inc.[4] This firm has supported over 120 communities in Rural Alaska by providing services for many aspects of a project's life cycle. GSE firm has extensive knowledge and experience with the diesel genset replacements and RPSU programs as they have been directly involved in the design and construction of over 65 diesel power plants design/construction and 30 distribution projects which included small-scale interties to connect neighboring communities.

The distribution upgrade projects normally involve heat recovery analysis and implementation in conjunction with upgrading transformers, power lines, and poles. The data required for the heat recovery simulator includes generation metrics from the applicable PCE report, the proposed engine's heat rejection rates, and the estimated annual heating requirements of the end user buildings. The completed results will indicate has shown for Manokotak's study below.

[4] Gray Stassel Engineering (gse.engineering)

Manokotak Heat Recovery Simulation - With Clinic

11/18/2022

PROGRAM RESULTS:

Annual O&M cost:	0	$/year.	Savings, year 0, gallons 6200
Cost Estimate		$	
Fuel heat value:	134000	Btu/gall.	
Fuel cost	0.00	$/gallon	
Fuel cost escal.	0	/year	
Power increase	0	/year	
Discount rate	0	/year	

GEN DATA: Jacket Water Only

Heat rate at kw-load above	55	3079 Btu/kwh
Heat rate at kw-load above	76	2437 Btu/kwh
Heat rate at kw-load above	102	1963 Btu/kwh
Heat rate at kw-load above	128	1756 Btu/kwh
Heat rate at kw-load above	154	1579 Btu/kwh
Heat rate at kw-load above	176	1446 Btu/kwh
Heat rate at kw-load above	200	1364 Btu/kwh
Heat rate at kw-load above	227	1272 Btu/kwh
Heat rate at kw-load above	251	1234 Btu/kwh
Heat rate at kw-load above	278	1204 Btu/kwh
Heat rate at kw-load above	302	1186 Btu/kwh

SYSTEM LOSS DATA:

Constant losses:

Plant piping:	5000	Btu/hr.	Piping Mains Insulated (default heat loss)
Buried Arctic piping:	36990	Btu/hr.	Note 1: North Shop: 150' of 2" @ 22.6 BTU/H-ft); Note 4: New Clinic 1500' of 75mm @ 2
Genset Eng. Preheat:	7000	Btu/hr.	Assume 2kW for engine preheat
Total constant:	48990	Btu/hr.	

Variable losses:

Plant Heating:	50	Btu/hr.xF	Control Room
Exterior piping:	62	Btu/hr.xF	South Shop/VPSO: 440' above-grade arctic pipe @ 0.14 BTU/Hr-ft-F; Note 2

GENERATION DATA: PCE FY20

Kwh/month: Note 3	
January	148833
February	123318
March	106700
April	61972
May	78499
June	92279
July	97316
August	101116
September	101116
October	134509
November	111174
December	136281
	1293113

WEATHER DATA:

HDD/Month: Dillingham	
	1516
	1373
	1330
	1008
	694
	424
	312
	354
	537
	989
	1268
	1567
	11372

NOTES:

1 150' Buried - Round Trip from Power Plant to North Shop
2 400' Above Grade from PP to South Shop/VPSO, includes 5' at end of Each Run at Each Building (5' X 4 building
3 Generation Data is average kWh generated from FY18 thru FY20
4
5

BUILDING DATA:

Fuel use, gallons	Seasonal	Non-Seasonal	Boiler Efficiency	Building in use, 1=yes, 0=no January	February	March	April	May	June	July	August	September	October	November	December		OPER. HDD
North Shop	1200	0	75%	1	1	1	1	1	1	1	1	1	1	1	1	12	11373
South Shop	2000	0	75%	1	1	1	1	1	1	1	1	1	1	1	1	12	11373
VPSO	1000	0	75%	1	1	1	1	1	1	1	1	1	1	1	1	12	11373
Clinic	2000	0	75%	1	1	1	1	1	1	1	1	1	1	1	1	12	11373
building 4	0	0	75%	1	1	1	1	1	1	1	1	1	1	1	1	12	11373
building 5	0	0	75%	1	1	1	1	1	1	1	1	1	1	1	1	12	11373
building 6	0	0	75%	1	1	1	1	1	1	1	1	1	1	1	1	12	11373
building 7	0	0	75%	1	1	1	1	1	1	1	1	1	1	1	1	12	11373
building 8	0	0	75%	1	1	1	1	1	0	0	0	1	1	1	1	9	10283
-	0	0	75%	1	1	1	1	1	0	0	0	1	1	1	1	9	10283

Figure 2 Heat Recovery Simulator

Once the estimated fuel savings are calculated, this number will be converted into CO_2 equivalent by using EPA's equivalencies calculator which uses Intergovernmental Panel on Climate Change's (IPCC) standard below:

10,180 grams of CO_2/gallon of diesel = 10.180 x 10^{-3} metric tons CO_2/gallon of diesel

Measure Implementation Assumptions

All measures are expected to have a lifetime of at least 20-25 years.

When calculating GHG emissions reductions on the DEQ for one Engine A and one Engine B, the results were used to calculate emissions reductions from 2025 through 2050. See two tables below.

Genset Replacement	# Communities		# Engines	
	A - <1M kWh	B - >1M - 2M kWh	Type A	Type B
Round 1 Q424 – Q426	3	2	6	4
Round 2 Q325 – Q427	3	2	6	4
Round 3 Q226 – Q428	3	1	6	2
Total	14		28	

Table 1 Breakdown of Size Communities/Type Engines Per Round

Engine A		Engine B	
Baseline	**Replacement**	**Baseline**	**Replacement**
John Deere 4039, Non-Certified	John Deere 4045TFM75, Tier 2 Marine	CAT3406C Non-Certified	Detroit Diesel 6063TK35, Tier 1 – Low PM
Emissions Reduced	**42.28 metric tons**	Emissions Reduced	**76.75 metric tons**

Table 2 Engine A and B Results from DEQ

With the data above, formulas were inputted to this spreadsheet which indicate how many metric tons of GHG are reduced each year and as diesel genset projects progress during all three rounds.

Diesel Genset Replacement GHG Reductions 2025 - 2050										
	Round 1			Round 2			Round 3			
Year	6x Engine A	4x Engine B	Total CO_2 (MT)	6x Engine A	4x Engine B	Total CO_2 (MT)	6x Engine A	2x Engine B	Total CO_2 (MT)	Grand Total CO_2 (MT)
2025	Diesel Genset Replacement In Progress									
2026				Diesel Genset Replacement In Progress						
2027	254	307	561				Diesel Genset Replacement In Progress			**561**
2028	507	614	1,121	254	307	561				**1,682**
2029	761	921	1,682	507	614	1,121	254	154	407	**3,211**
2030	1,015	1,228	2,243	761	921	1,682	507	307	814	**4,739**
2031	1,268	1,535	2,803	1,015	1,228	2,243	761	461	1,222	**6,268**
2032	1,522	1,842	3,364	1,268	1,535	2,803	1,015	614	1,629	**7,796**
2033	1,776	2,149	3,925	1,522	1,842	3,364	1,268	768	2,036	**9,325**
2034	2,029	2,456	4,485	1,776	2,149	3,925	1,522	921	2,443	**10,853**
2035	2,283	2,763	5,046	2,029	2,456	4,485	1,776	1,075	2,850	**12,382**
2036	2,537	3,070	5,607	2,283	2,763	5,046	2,029	1,228	3,257	**13,910**
2037	2,790	3,377	6,167	2,537	3,070	5,607	2,283	1,382	3,665	**15,439**
2038	3,044	3,684	6,728	2,790	3,377	6,167	2,537	1,535	4,072	**16,967**
2039	3,298	3,991	7,289	3,044	3,684	6,728	2,790	1,689	4,479	**18,496**
2040	3,552	4,298	7,850	3,298	3,991	7,289	3,044	1,842	4,886	**20,025**
2041	3,805	4,605	8,410	3,552	4,298	7,850	3,298	1,996	5,293	**21,553**
2042	4,059	4,912	8,971	3,805	4,605	8,410	3,552	2,149	5,701	**23,082**
2043	4,313	5,219	9,532	4,059	4,912	8,971	3,805	2,303	6,108	**24,610**
2044	4,566	5,526	10,092	4,313	5,219	9,532	4,059	2,456	6,515	**26,139**
2045	4,820	5,833	10,653	4,566	5,526	10,092	4,313	2,610	6,922	**27,667**
2046	5,074	6,140	11,214	4,820	5,833	10,653	4,566	2,763	7,329	**29,196**
2047	5,327	6,447	11,774	5,074	6,140	11,214	4,820	2,917	7,736	**30,724**
2048	5,581	6,754	12,335	5,327	6,447	11,774	5,074	3,070	8,144	**32,253**
2049	5,835	7,061	12,896	5,581	6,754	12,335	5,327	3,224	8,551	**33,781**
2050	6,088	7,368	13,456	5,835	7,061	12,896	5,581	3,377	8,958	**35,310**

Table 3 Genset Replacement GHG Reductions, 2025-2050

For AEA's proposed distribution projects, the assumptions were that made that a total of four projects would be completed with CPRG funds. AEA used simulations from four proxy communities to determine GHG reductions. This is a conservative estimate; AEA anticipates completing up to five distribution upgrades. For the Native Village of Manokotak, which was briefly mentioned in Section 1 of the application, studies and simulations have indicated that the project will save the community around 7,000 gallons of diesel fuel per year upon completion. The community of Napaskiak's distribution upgrade involves the purchase and installation of high-efficiency transformers. This measure would reduce line loss and save the community 3,000 gallons of diesel per year. Nelson Lagoon, a small community apart of the Aleutian Island chain, is in dire need of distribution and heat recovery upgrades. Simulations for this community have also indicated that 7,000 gallons of diesel fuel would be saved once upgrades are complete. Kipnuk's distribution system is considered in extremely poor condition. Simulations indicate this project would bring the community up to standards, reducing line losses, and

saving approximately 9,000 gallons of diesel per year. Due to logistics, funding, and feasibility, the projects would be staggered over the 5-year period of performance. Due to this schedule, the reduction measures were calculated as depicted in the table below.

Year	AEA Distribution Upgrades 2025 - 2050								
	Project 1		Project 2		Project 3		Project 4		Combined Total (MT
	GHG Reductions per Year (MT)	Cumulative Reductions (MT)	GHG Reductions per Year (MT)	Cumulative Reductions (MT)	GHG Reductions per Year (MT)	Cumulative Reductions (MT)	GHG Reductions per Year (MT)	Cumulative Reductions (MT)	
2025	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2026	59.0	59.0	0.0	0.0	0.0	0.0	0.0	0.0	59.0
2027	59.3	118.3	59.0	59.0	0.0	0.0	0.0	0.0	177.3
2028	59.3	177.6	59.3	118.3	61.0	61.0	0.0	0.0	356.9
2029	59.3	236.9	59.0	177.3	61.0	122.0	26.0	26.0	562.2
2030	59.3	296.2	59.3	236.6	61.0	183.0	26.0	52.0	**767.8**
2031	59.3	355.5	59.3	295.9	61.0	244.0	26.0	78.0	973.4
2032	59.3	414.8	59.3	355.2	61.0	305.0	26.0	104.0	1,179.0
2033	59.3	474.1	59.3	414.5	61.0	366.0	26.0	130.0	1,384.6
2034	59.3	533.4	59.3	473.8	61.0	427.0	26.0	156.0	1,590.2
2035	59.3	592.7	59.3	533.1	61.0	488.0	26.0	182.0	1,795.8
2036	59.3	652.0	59.3	592.4	61.0	549.0	26.0	208.0	2,001.4
2037	59.3	711.3	59.3	651.7	61.0	610.0	26.0	234.0	2,207.0
2038	59.3	770.6	59.3	711.0	61.0	671.0	26.0	260.0	2,412.6
2039	59.3	829.9	59.3	770.3	61.0	732.0	26.0	286.0	2,618.2
2040	59.3	889.2	59.3	829.6	61.0	793.0	26.0	312.0	2,823.8
2041	59.3	948.5	59.3	888.9	61.0	854.0	26.0	338.0	3,029.4
2042	59.3	1,007.8	59.3	948.2	61.0	915.0	26.0	364.0	3,235.0
2043	59.3	1,067.1	59.3	1,007.5	61.0	976.0	26.0	390.0	3,440.6
2044	59.3	1,126.4	59.3	1,066.8	61.0	1,037.0	26.0	416.0	3,646.2
2045	59.3	1,185.7	59.3	1,126.1	61.0	1,098.0	26.0	442.0	3,851.8
2046	59.3	1,245.0	59.3	1,185.4	61.0	1,159.0	26.0	468.0	4,057.4
2047	59.3	1,304.3	59.3	1,244.7	61.0	1,220.0	26.0	494.0	4,263.0
2048	59.3	1,363.6	59.3	1,304.0	61.0	1,281.0	26.0	520.0	4,468.6
2049	59.3	1,422.9	59.3	1,363.3	61.0	1,342.0	26.0	546.0	4,674.2
2050	59.3	1,482.2	59.3	1,422.6	61.0	1,403.0	26.0	572.0	**4,879.8**

Table 4 Distribution Upgrades Implementation Assumptions

With the funds requested for VEEP projects, we're anticipating up to 15 projects to be complete during the period of performance. Project lengths would vary from 18 months or as long as 36 months. The number of anticipated projects and assumed timelines were considered when calculating GHG emissions as indicated on the following table. AEA used historical performance and funding, adjusted for inflation, to estimate the impact of CPRG funding for the VEEP program. From 2016 through 2023, 56 communities were awarded $2.7 million under VEEP; this offset 1,189,463 kWh per year, totaling 830.9 metric tons of CO_2 equivalent. AEA adjusted the historical VEEP funding for inflation to determine the amount of kWh reduced per VEEP dollar spent in 2024 dollars, which is shown below, and applied that to the proposed CPRG VEEP budget and then used the EPA's GHG Equivalencies Calculator to determine GHG reductions. AEA anticipates VEEP funding through CPRG will offset 3,002,198 kWh per year and result in a reduction of 8,388 metric tons CO_2 equivalent for 2025 – 2030.

	VEEP	Actual/Budget	Annual kWh reduced	kWh reduced per $ spent	Annual CO2 metric tons reduction**
		(a)	(b)	(c)	(d)
(1)	2016-2023 Actual	$ 2,700,000	1,189,463	0.440541852	831
(2)	2016-2023 ($2024)*	$ 3,308,248	1,189,463	0.35954469	831
(3)	CPRG VEEP *** Subaward Budget	$ 8,350,000	3,002,198	0.35954469	2,097
CPRG VEEP 1 Year Reduction = 3,149 metric tons					

* $2024 calculated using inflation calculator on www.bls.gov

** CO2 metric ton reduction calculated using the EPA's Greenhouse Gas Calculator

*** Calculation CPRG VEEP Subaward Budget kWh annual reduced is (c)(2)*(a)(3)

Year	VEEP Projects 2025 - 2050						
	Group 1 (18 mos)		Group 2 (24 mos)		Group 3 (36 mos)		Combined Total (MT)
	GHG Reductions per Year (MT)	Cumulative Reductions (MT)	GHG Reductions per Year (MT)	Cumulative Reductions (MT)	GHG Reductions per Year (MT)	Cumulative Reductions (MT)	
2025	0	0	0	0	0	0	0
2026	699	699	0	0	0	0	699
2027	699	1,398	699	699	0	0	2,097
2028	699	2,097	699	1,398	699	699	4,194
2029	699	2,796	699	2,097	699	1,398	6,291
2030	699	3,495	699	2,796	699	2,097	**8,388**
2031	699	4,194	699	3,495	699	2,796	10,485
2032	699	4,893	699	4,194	699	3,495	12,582
2033	699	5,592	699	4,893	699	4,194	14,679
2034	699	6,291	699	5,592	699	4,893	16,776
2035	699	6,990	699	6,291	699	5,592	18,873
2036	699	7,689	699	6,990	699	6,291	20,970
2037	699	8,388	699	7,689	699	6,990	23,067
2038	699	9,087	699	8,388	699	7,689	25,164
2039	699	9,786	699	9,087	699	8,388	27,261
2040	699	10,485	699	9,786	699	9,087	29,358
2041	699	11,184	699	10,485	699	9,786	31,455
2042	699	11,883	699	11,184	699	10,485	33,552
2043	699	12,582	699	11,883	699	11,184	35,649
2044	699	13,281	699	12,582	699	11,883	37,746
2045	699	13,980	699	13,281	699	12,582	39,843
2046	699	14,679	699	13,980	699	13,281	41,940
2047	699	15,378	699	14,679	699	13,980	44,037
2048	699	16,077	699	15,378	699	14,679	46,134
2049	699	16,776	699	16,077	699	15,378	48,231
2050	699	17,475	699	16,776	699	16,077	**50,328**

Table 5 VEEP Project Implementation Assumptions

TCC and NAB used similar assumptions and considerations for their proposals, relying on diesel offset to determine GHG reduction and 2023 PCE data as a baseline. NAB's diesel reductions are driven, in part, by being able to maximize diesel off time at its water and power plants. TCC is anticipating being 50% complete with their projects by end of 2026 and 100% complete in 2027. NAB is anticipating 50% completion by end of 2027 and fully complete in 2028. These assumptions were then applied to the following spreadsheets to calculate their respective emissions reductions.

NAB Community Diesel Savings and GHG Reductions are below.

Table 2. Community Diesel Savings and GHG Emissions Reductions

Community	Current Alternative Energy (kW-hr, 2023)	Percent of Total	2023 Diesel Offset (gals)	Potential Additional Diesel Reduction (gals)
Kotzebue	3,662,784	19%	268,403	100,000
Kivalina	0	0	12,639	5,745
Deering	145,466	17%	11,566	3,442
Buckland	189,145	10%	18,229	9,528
Selawik	0	0	21,092	9,587
Noatak	0	0	11,701	5,319
Kiana	0	0	9,905	4,502
Noorvik	0	0	14,895	6,771
Ambler	0	0	9,016	4,098
Shungnak	193,423	11%	14,986	6,643
Kobuk	0	0	Note 3	

Notes: (1) Overall data is from 2023 Power Cost Equalization reports produced by AEA. (2) Blue values indicate estimates based on 11% offset of current diesel usage from implementation of solar/BESS. (3) Kobuk receives primary power from Shungnak; additional diesel savings from the proposed project are anticipated to be negligible.

TCC Target Communities								
Year	GHG Reductions per Year (MT)	Cumulative Reductions (MT)	Year	GHG Reductions per Year (MT)	Cumulative Reductions (MT)	Year	GHG Reductions per Year (MT)	Cumulative Reductions (MT)
2025	0	0	2034	774	6,581	2043	774	13,549
2026	387	387	2035	774	7,355	2044	774	14,323
2027	774	1,161	2036	774	8,129	2045	774	15,097
2028	774	1,936	2037	774	8,903	2046	774	15,871
2029	774	2,710	2038	774	9,678	2047	774	16,646
2030	774	3,484	2039	774	10,452	2048	774	17,420
2031	774	4,258	2040	774	11,226	2049	774	18,194
2032	774	5,032	2041	774	12,000	2050	774	18,968
2033	774	5,807	2042	774	12,774			

Table 6 TCC Implementation Assumptions

Northwest Arctic Borough Communities								
Year	GHG Reductions per Year (MT)	Cumulative Reductions (MT)	Year	GHG Reductions per Year (MT)	Cumulative Reductions (MT)	Year	GHG Reductions per Year (MT)	Cumulative Reductions (MT)
2025	0	0	2034	1,590	11,926	2043	1,590	26,237
2026	0	0	2035	1,590	13,516	2044	1,590	27,827
2027	795	795	2036	1,590	15,106	2045	1,590	29,417
2028	1,590	2,385	2037	1,590	16,696	2046	1,590	31,007
2029	1,590	3,975	2038	1,590	18,286	2047	1,590	32,597
2030	1,590	5,565	2039	1,590	19,876	2048	1,590	34,187
2031	1,590	7,155	2040	1,590	21,466	2049	1,590	35,777
2032	1,590	8,746	2041	1,590	23,056	2050	1,590	37,367
2033	1,590	10,336	2042	1,590	24,647			

Table 7 NAB Implementation Assumptions

GHG Reduction Estimate Assumptions/Measure-Specific Activity Data

The heat recovery simulator is a tool used to calculate potential fuel savings. Additionally, assumptions are based on similar projects that have already been implemented. To keep assumptions as realistic as possible, planned projects are compared with past projects that are similar in project scope, genset type, energy demand, population, and location. Data is pulled from PCE reports to determine GHG reductions before and after an emissions-reduction project is completed.

From the PCE reports, total diesel kWh generated, total diesel fuel used (gallons), and fuel efficiency are the metrics gathered for review. Line loss is also referenced to indicate if energy efficiency projects funded under VEEP had improved for the community. Furthermore, data is gathered from a community's report ***before*** a project is completed, and then again ***after*** it is implemented.

Reference Case Scenario (GHG Emissions or Activity Level)

Nikolai is a good example of how projects funded under the RPSU program have reduced GHG emissions with fuel savings. Nikolai recently had upgrades to its distribution, heat recovery, power plant replacement, and fuel upgrades. The project began in 2021 and was completed in March 2023. Below is a table of vital data pulled from the PCE reports for fiscal years 2021 – 2023 during that timeframe.[5]

Nikolai, AK				
State of Alaska Fiscal Year	Diesel kWh Generated	Total Fuel Used (gal)	Fuel Efficiency (kWh per gal)	Line Loss (%)
2021	355,204	37,474	9.48	17%
2022	532,152	55,378	9.61	19.40%
2023	446,222	38,294	11.65	10.30%

Table 8 Nikolai PCE Data, 2021-2023

The fuel consumption numbers are misleading. Since 2021, Nikolai's upgrades allowed for a total of **10,212 gallons of diesel fuel** to be displaced. 512 gallons of fuel were displaced in 2022 and 9,700 gallons were displaced in 2023. Those amounts were calculated by using the following method:

Fuel efficiency improved with 9.61 kWh per gallon in 2022 versus 2021's efficiency of 9.48 kWh per gallon. If 2021 had the same efficiency as 2022, it would have saved 512 gallons of fuel because:

- ***355,204 kWh (2021 diesel kWh generated) / 9.61 kWh per gal (2022 fuel efficiency) = 36,961.91 gal***
- ***37,474 gal (2021 total fuel used) - 36,961.91 gal (2021 fuel used with 9.61 efficiency) = 512 gal saved***

For comparison between 2023 and 2022:

- ***532,152 kWh (2022 diesel kWh generated) / 11.65 kWh per gal (2023 fuel efficiency) = 45,678.28 gal***
- ***55,378 gal (2022 total fuel used) – 45,678.28 gal (2022 fuel used with 11.65 efficiency) = 9,700 gal saved***

[5] Alaska Energy Authority > What We Do > Power Cost Equalization > PCE Reports & Publications (akenergyauthority.org)

GHG Emissions Reduced

The following tables indicate measure-specific reductions to GHG emissions. Table 5 breaks it down by each specific measure for annual reductions through 2050. Table 6 shows the consolidated amount of GHG reductions from all proposed measures.

	AEA Measures							NAB Measures		TCC Measures		
	Genset Replacement		VEEP		Distribution		Combined					
Year	Reductions/Yr	Cumulative	Reductions/Yr	Cumulative	Reductions/Yr	Cumulative	Cumulative	Reductions/Yr	Cumulative	Reductions/Yr	Cumulative	
2025	0	0	0	0	0	0	0	0	0	0	0	
2026	0	0	699	699	59	59	758	0	0	387	387	
2027	561	561	1,398	2,097	118	178	2,835	795	795	774	1,161	
2028	1,121	1,682	2,097	4,194	180	357	6,233	1,590	2,385	774	1,935	Combined total
2029	1,529	3,211	2,097	6,291	205	563	10,064	1,590	3,975	774	2,710	2025-2030
2030	1,529	4,739	2,097	8,388	205	768	13,895	1,590	5,565	774	3,484	**22,943**
2031	1,529	6,268	2,097	10,485	205	973	17,726	1,590	7,155	774	4,258	
2032	1,529	7,796	2,097	12,582	205	1,178	21,557	1,590	8,746	774	5,032	
2033	1,529	9,325	2,097	14,679	205	1,384	25,387	1,590	10,336	774	5,806	
2034	1,529	10,853	2,097	16,776	205	1,589	29,218	1,590	11,926	774	6,581	
2035	1,529	12,382	2,097	18,873	205	1,794	33,049	1,590	13,516	774	7,355	
2036	1,529	13,910	2,097	20,970	205	2,000	36,880	1,590	15,106	774	8,129	
2037	1,529	15,439	2,097	23,067	205	2,205	40,711	1,590	16,696	774	8,903	
2038	1,529	16,967	2,097	25,164	205	2,410	44,542	1,590	18,286	774	9,678	
2039	1,529	18,496	2,097	27,261	205	2,616	48,372	1,590	19,876	774	10,452	
2040	1,529	20,025	2,097	29,358	205	2,821	52,203	1,590	21,466	774	11,226	
2041	1,529	21,553	2,097	31,455	205	3,026	56,034	1,590	23,056	774	12,000	
2042	1,529	23,082	2,097	33,552	205	3,231	59,865	1,590	24,647	774	12,774	
2043	1,529	24,610	2,097	35,649	205	3,437	63,696	1,590	26,237	774	13,549	
2044	1,529	26,139	2,097	37,746	205	3,642	67,527	1,590	27,827	774	14,323	
2045	1,529	27,667	2,097	39,843	205	3,847	71,358	1,590	29,417	774	15,097	
2046	1,529	29,196	2,097	41,940	205	4,053	75,188	1,590	31,007	774	15,871	
2047	1,529	30,724	2,097	44,037	205	4,258	79,019	1,590	32,597	774	16,645	
2048	1,529	32,253	2,097	46,134	205	4,463	82,850	1,590	34,187	774	17,420	Combined total
2049	1,529	33,781	2,097	48,231	205	4,669	86,681	1,590	35,777	774	18,194	2025-2050
2050	1,529	35,310	2,097	50,328	205	4,874	90,512	1,590	37,367	774	18,968	**146,846**

Table 9 Individual Breakdown of Coalition Measures' GHG Reduction

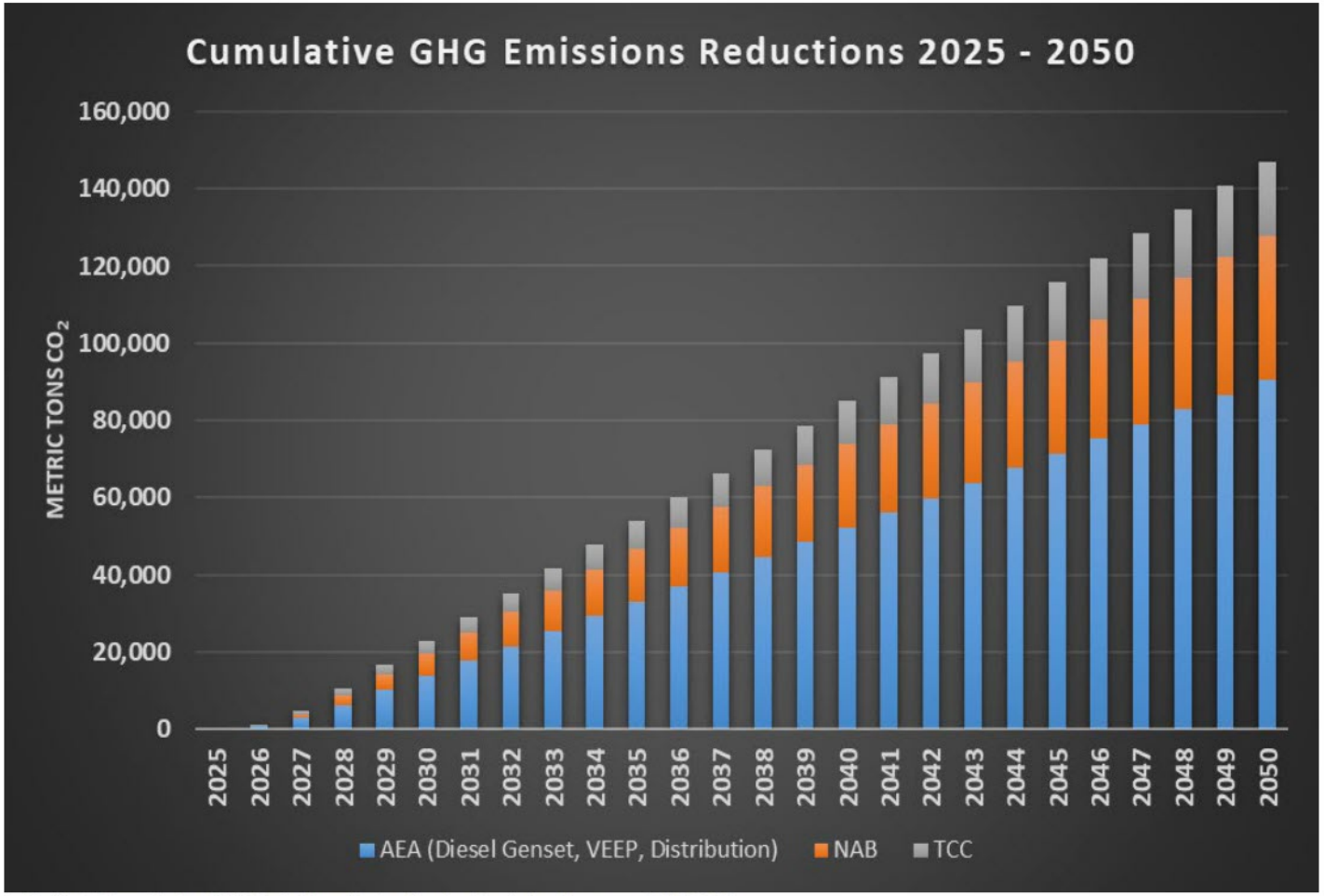

Table 6 Cumulative GHG Emissions Reduction for Coalition Partners 2025-2050

Consolidated Amounts:

Annual Reductions – **6,196 metric tons CO_2 equivalent**

2025-2030 – **22,943 metric tons CO_2 equivalent**

2025-2050 – **146,846 metric tons CO_2 equivalent**

Alaska Energy Authority Budget Detail - Section 7

Personnel – Measure 1 Genset Replacement.

Personnel	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
Executive Director @209,995.5/yr @1% with salary increases	$2,100	$2,142	$2,184	$2,226	$2,286	$10,938
General Counsel @190,008/yr @2% with salary increases	$3,800	$3,876	$3,952	$4,028	$4,104	$19,760
Rural Programs Manager @ 139,229.50/yr @10% with salary increases	$13,223	$13,488	$13,752	$14,016	$14,281	$68,760
Planning Manager @$120,139.5 @5 %/ year for two yrs with salary increase	$6,007	$6,127				$12,134
Rural Assistance Manager@$115,401/yr @10%/yr with salary increases	$11,540	$11,771	$12,002	$12,233	$12,464	$60,010
Circuit Rider @$77,161.5/yr @ 50% year with salary increases	$19,291	$39,353	$40,124	$40,896	$41,667	$181,331
Assistant Project Manager @$77,161.5/ yr @7% with salary increases	$5,401	$5,509	$5,619	$5,732	$5,847	$28,108
Project Manager@ 97,597.50 @50% year with salary increases	$48,798	$49,775	$50,751	$51,727	$52,703	$253,754
Project Manager @ 104,656.5 @10%/yr with salary increases	$10,465	$10,675	$10,884	$11,094	$11,303	$54,421
GIS @$91,279.5 @1% yr with salary increase	$1,521	$1,552	$949	$968	$986	$5,976
Communications Director @$126,789/ yr @ 1%/yr with salary increases	$1,268	$1,293	$1,319	$1,344	$1,369	$6,593
Contracting Officer @ 88,081.5/yr @3% with salary increases	$3,263	$3,327	$2,780	$2,829	$2,874	$15,073
Contracting Officer @ $97,597.50 @ 1%/yr yrs 1&2 with salary increases	$977	$995				$1,972
TOTAL PERSONNEL	**$127,654**	**$149,883**	**$144,316**	**$147,093**	**$149,884**	**$718,830**

Executive Director and General Council[1]: Minimal amount of time spent working on this award to ensure all regulations and requirements are being followed at the state and federal level. Meetings with Governor, legislator, and federal partners. Will direct staff when needed.

Rural Program Manager: Monitors the AEA project staff and project to ensure all regulations and requirements are being followed at the state and federal level. Provides high-level direction and guidance to the Project Mangers as needed. May travel to the sites for inspections and provide technical assistance when needed. **The Rural Programs Manager will be the primary point of contact for the award.**

Planning Manager: Assist the team in organizing and setting up the program for success. Ensure proper program and project controls are in place for compliance and distributing work.

Project Managers, Assistant Project Manager: The Project Manager (50%) will prepare the project management plan (PMP) for the program, provide project oversight, review and accept plans, procedures, deliverables and reports. The Project Manager (PM) will be responsible for project communication between sub-grantees, consultants, and the AEA team. The PM will track specific contractual deliverables against the schedule to ensure contractors are on track to meet critical

[1] Staff that is repeated will be described here and not repeated with subsequent measures.

milestones. Other project managers and assistant project manager will take direction from the PM and be assigned specific projects that result from the program.

Rural Assistance Program Manager, Circuit Rider: Will offer quality assurance and quality control during each phase of construction, in partnership with the consulting engineers. Periodic onsite inspections will be performed and the Circuit Rider staff will be on site for substantial completion and final testing and inspection.

GIS, Communications Director: Outreach and education are important aspects of everything we do at AEA. Rural power systems are surveyed and assessed, this will be updated once the project is completed. Updated on the project, press release, social media, working groups, informational materials will be prepared by this group.

Contracting Officers: AEA will issue sub recipient grants to eligible rural utilities and then issue procurements on their behalf. Typically the procurement will be for engineering services and construction. At times long lead items are purchased separately. AEA's professionals are able to ensure all federal procurement guidelines are met including the build America buy America guidelines.

Fringe Benefits - Measure 1 Genset Replacement.

Fringe Benefits	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
Executive Director @148,005/yr @1% with salary increases	$1,480	$1,510	$1,539	$1,569	$1,598	$7,696
General Counsel @$123,532.5/yr @2% with salary increases	$2,470	$2,520	$2,570	$2,620	$2,668	$12,848
Rural Programs Manager @ 109,278/yr @10% with salary increases	$10,927	$11,146	$11,364	$11,582	$11,801	$56,820
Planning Manager @$87,145.5 @5 %/ year for two yrs with salary increase	$4,357	$4,444				$8,801
Rural Assistance Manager@$98,709/yr @10%/yr with salary increases	$9,871	$10,067	$10,264	$10,462	$10,658	$51,322
Circuit Rider @$64,740/yr @ 50% year with salary increases	$16,187	$33,021	$33,668	$34,316	$34,962	$152,154
Assistant Project Manager @$62,107.5/ yr @7% with salary increases	$5,480	$5,588	$5,209	$5,309	$5,410	$26,996
Project Manager@ 77,668.5 @50% year with salary increases	$38,830	$39,606	$40,383	$41,160	$41,936	$201,915
Project Manager @ $91,962 @10%/yr with salary increases	$9,196	$9,380	$9,564	$9,748	$9,931	$47,819
GIS @$72,111 @1% yr with salary increase	$1,202	$1,226	$750	$765	$779	$4,722
Communications Director @$93,444/ yr @ 1%/yr with salary increases	$935	$953	$972	$991	$1,009	$4,860
Contracting Officer @ $70,434/yr @3% with salary increases	$2,112	$2,155	$2,199	$2,241	$2,283	$10,990
Contracting Officer @ $77,668.5 @ 1%/yr yrs 1&2 with salary increases	$777	$792				$1,569
TOTAL FRINGE	**$103,824**	**$122,408**	**$118,482**	**$120,763**	**$123,035**	**$588,512**

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 – Measure 1 Genset Replacement.

Travel	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
2 trips per year per site; assume 5 sites. Rural travel estimated at $1,500 per trip with an overnight stay. Cost is based on past experience	$15,000	$15,000	$15,000	$15,000	$15,000	$75,000
Out of state conference - on per year cost based on past experience		$3,000		$3,000		$6,000
TOTAL TRAVEL	**$15,000**	**$18,000**	**$15,000**	**$18,000**	**$15,000**	**$81,000**

This budget includes two trips for **one** person **five** communities to perform site visits and help the sub-award grantees and their contractors with any technical assistance needed. Travel is budgeted based on experience within the region. With these presumptions, costs are broken down as follows. Round trip airfare $1000, ground transportation per visit $200, per diem $60/day, lodging $180/night. The AEA staff that will travel to the sites include the technical Circuit Rider who may assist in commissioning the projects and may troubleshoot installation issues that could arise, and the AEA Program Manager and/or AEA Project Manager for a final inspection to ensure all the requirements of the funding have been met.

Out-of-state (One person Project Manager or Executive) events would be to share information on the success of this program with peers. Round trip airfare $1,500, hotel 3 nights @ $250/night $750, perdiem $240, transportation $110, conference fee $400.

Contractual– Measures 1, 2 and 3

Contractual	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
Alaska Municipal League	$51,865	$17,628	$17,916	$18,212	$20,164	$125,785

Reported on Measure 1 Genset replacement tab, this contract will be used for all three of the AEA measures. AEA will contract with the Alaska Municipal League to host a cohort of applicants and sub-recipients for regular calls sharing updates and progress, build the reporting dashboard for statewide tracking, and facilitate the workforce development activities that are necessary to meet the requirements of this award.

Other – Measure 1 Genset Replacement

OTHER	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	
Sub-recipient awards for Diesel Genset Replacement (2 - 5 projects needs-based)	$500,000	$2,000,000	$4,000,000	$2,000,000	$142,662	$8,642,662

Sub-recipient grants will be issued to five utilities based on need, using data from the Rural Power System Assessment. The spread across years is an estimate of grant spending.

Personnel – Measure 2 Distribution

Personnel	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
Executive Director @209,995.5/yr @1% with salary increases	$2,100	$2,142	$2,184	$2,226	$2,286	$10,938
General Counsel @190,008/yr @2% with salary increases	$3,800	$3,876	$3,952	$4,028	$4,104	$19,760
Rural Programs Manager @ 139,229.50/yr @8.5% with salary increases	$11,414	$11,644	$11,873	$12,106	$12,342	$59,379
Rural Assistance Manager@$115,401/yr @10%/yr with salary increases	$11,537	$11,771	$12,002	$12,233	$12,464	$60,007
Circuit Rider @$77,161.5/yr @ 50% year with salary increases	$19,288	$39,353	$40,124	$40,896	$41,667	$181,328
Circuit Rider @$77,161/yr @ 20% year with salary increases		$15,741	$16,050	$16,358	$16,667	$64,816
Project Manager @ 111,774 @10%/yr with salary increases	$11,177	$11,401	$11,624	$11,848	$12,072	$58,122
GIS @$91,279.5 @1% yr with salary increase	$1,521	$1,552	$949	$968	$986	$5,976
Communications Director @$126,789/ yr @ 1%/yr with salary increases	$1,268	$1,293	$1,319	$1,344	$1,369	$6,593
Contracting Officer @ 88,081.5/yr @3% with salary increases	$3,263	$3,327	$2,780	$2,829	$2,874	$15,073
Contracting Officer @ $97,597.50 @ 1%/yr yrs 1&2 with salary increases	$976	$995				$1,971
TOTAL PERSONNEL	**$66,344**	**$103,095**	**$102,857**	**$104,836**	**$106,831**	**$483,963**

Project Manager: The Project Manager (PM) will be responsible for project communication between sub-grantees, consultants, and the AEA team. The PM will track specific contractual deliverables against the schedule to ensure contractors are on track to meet critical milestones. Other project managers and assistant project managers will take direction from the PM and be assigned specific projects that result from the program.

Rural Assistance Program Manager, Circuit Rider: The Rural Assistance Manager will take on project management for this measure as well as quality control.

Fringe - Measure 2 Distribution

Fringe Benefits	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
Executive Director @148,005/yr @1% with salary increases	$1,480	$1,510	$1,539	$1,569	$1,598	$7,696
General Counsel @$123,532.5/yr @2% with salary increases	$2,470	$2,520	$2,570	$2,620	$2,668	$12,848
Rural Programs Manager @ 109,278/yr @8.5% with salary increases	$10,200	$10,403	$10,117	$10,311	$10,504	$51,535
Rural Assistance Manager@$98,709/yr @10%/yr with salary increases	$9,871	$10,069	$10,266	$10,464	$10,660	$51,330
Circuit Rider @$64,740/yr @ 50% year with salary increases	$16,187	$33,021	$33,668	$34,316	$34,960	$152,152
Circuit Rider @$64,740/yr @ 20% year with salary increases		$13,208	$13,467	$13,726	$13,986	$54,387
Project Manager @ 85,332 @10%/yr with salary increases	$8,533	$8,704	$8,874	$9,045	$9,216	$44,372
GIS @$72,111 @1% yr with salary increase	$1,202	$1,226	$750	$760	$779	$4,717
Communications Director @$93,444/ yr @ 1%/yr with salary increases	$935	$953	$972	$991	$1,007	$4,858
Contracting Officer @ $70,434/yr @3% with salary increases	$2,112	$2,155	$2,199	$2,241	$2,283	$10,990
Contracting Officer @ $77,668.5 @ 1%/yr yrs 1&2 with salary increases	$777	$792				$1,569
TOTAL FRINGE BENEFITS	**$53,767**	**$84,561**	**$84,422**	**$86,043**	**$87,661**	**$396,454**

Benefits - Measure 2 Distribution

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 – Measure 2 Distribution.

Travel	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
2 trips per year per site; assume 2 sites. Rural travel estimated at $1,500 per trip with an overnight stay. Cost is based on past experience	$ 6,000	$ 6,000	$ 6,000	$ 6,000	$ 6,000	$30,000
Out of state conference - on per year cost based on past experience	$3,000		$3,000			$6,000
TOTAL TRAVEL	**$9,000**	**$6,000**	**$9,000**	**$6,000**	**$6,000**	**$36,000**

This budget includes two trips for **one** person **two** communities to perform site visits and help the sub-award grantees and their contractors with any technical assistance needed. Travel is budgeted based on experience within the region. With these presumptions, costs are broken down as follows. Round trip airfare $1000, ground transportation per visit $200, per diem $60/day, lodging $180/night. The AEA staff that will travel to the sites include the technical Circuit Rider who may assist in commissioning the projects and may troubleshoot installation issues that could arise, and the AEA Program Manager and/or AEA Project Manager for a final inspection to ensure all the requirements of the funding have been met.

Out-of-state (Project Manager or Executive) events would be to share information on the success of this program with peers. Round trip airfare $1,500, hotel 3 nights @ $250/night $750, per diem $240, transportation $110, conference fee $400.

Other – Measure 2 Distribution

OTHER	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	
Distribution Upgrades **(2-4 awards needs based)**	$500,000	$2,000,000	$4,000,000	$2,000,000	$300,000	$8,800,000

Sub-recipient grants will be issued to two to four utilities based on need, using data from the Rural Power System Assessment, and the need to be renewable ready. The spread across years is an estimate of grant spending.

Personnel – Measure 3 Village Energy Efficiency Program.

Personnel	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
Executive Director @209,995.5/yr @1% with salary increases	$2,046	$2,142	$2,184	$2,226	$2,286	$10,884
General Counsel @190,008/yr @2% with salary increases	$3,800	$3,876	$3,952	$4,028	$4,104	$19,760
Rural Programs Manager @ 139,229.50/yr @5% with salary increases	$6,612	$6,743	$6,876	$7,009	$7,140	$34,380
Renewable Energy and Energy Efficency Director at $155,649 /yr @5% /yr with salary increases	$7,782	$7,939				$15,721
Renewable Energy Programs Manager @ $ 123,025.50/yr at 15% down to 5% with salary increases.	$18,453	$18,823	$12,795	$13,041	$6,643	$69,755
Assistant Project Manager @$77,161.5/ yr @37.5% with salary increases	$27,029	$27,569	$28,111	$28,657	$29,205	$140,571
GIS @$91,279.5 @1% yr with salary increase	$1,520	$1,552	$949	$968	$986	$5,975
Communications Director @$126,789/ yr @ 1%/yr with salary increases	$1,268	$1,293	$1,319	$1,344	$1,369	$6,593
Contracting Officer @ 88,081.5/yr @3% with salary increases	$3,263	$3,327	$2,780	$2,829	$2,874	$15,073
Contracting Officer @ $97,597.50 @ 1%/yr yrs 1&2 with salary increases	$976	$996				$1,972
TOTAL PERSONNEL	**$72,749**	**$74,260**	**$58,966**	**$60,102**	**$54,607**	**$320,684**

REEE Director and Programs Manager: Pull in resources for the renewable energy and energy efficiency section. Participate in the development of the VEEP request for application, scoring, project evaluation, and potential implementation. Effort will lessen as the program wraps up.

Assistant Project Manager: The Assistant Project Manager (APM) will be responsible for project communication between sub-grantees, consultants, and the AEA team. The APM will track specific contractual deliverables against the schedule to ensure contractors are on track to meet critical milestones. Other project managers and assistant project managers will take direction from the PM and be assigned specific projects that result from the program.

Fringe Benefits - **Measure 3 Village Energy Efficiency Program**

Fringe Benefits	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
Executive Director @148,005/yr @1% with salary increases	$1,480	$1,510	$1,539	$1,569	$1,599	$7,697
General Counsel @$123,532.5/yr @2% with salary increases	$2,470	$2,520	$2,570	$2,620	$2,668	$12,848
Rural Programs Manager @ 109,278/yr @5% with salary increases	$5,463	$5,572	$5,682	$5,792	$5,901	$28,410
Renewable Energy and Energy Efficency Director at $116,317.5/yr @5% /yr with salary increases	$5,816	$5,932				$11,748
Renewable Energy Programs Manager @ $91,416/yr at 15% down to 5% with salary increases.	$13,712	$13,987	$9,507	$9,690	$4,937	$51,833
Assistant Project Manager @$62,107.5/ yr @ 37.5% with salary increases	$24,118	$24,599	$24,591	$25,064	$25,542	$123,914
GIS @$72,111 @1% yr with salary increase	$1,202	$1,226	$750	$765	$779	$4,722
Communications Director @$93,444/ yr @ 1%/yr with salary increases	$935	$953	$972	$991	$1,009	$4,860
Contracting Officer @ $70,434/yr @3% with salary increases	$2,112	$2,155	$2,199	$2,241	$2,283	$10,990
Contracting Officer @ $77,668.5 @ 1%/yr yrs 1&2 with salary increases	$777	$792				$1,569
TOTAL FRINGE BENEFITS	**$58,085**	**$59,246**	**$47,810**	**$48,732**	**$44,718**	**$258,591**

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 – **Measure 3 Village Energy Efficiency Program.**

Travel	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
2 trips per year per site; assume 3 sites. Rural travel estimated at $1,500 per trip with an overnight stay. Cost is based on past experience	$ 9,000	$ 9,000	$ 9,000	$ 9,000	$ 9,000	$45,000
Out of state conference - on per year cost based on past experience					$3,000	$3,000
TOTAL TRAVEL	$9,000	$9,000	$9,000	$9,000	$12,000	$48,000

This budget includes two trips for **one** person **three** communities to perform site visits and help the sub-award grantees and their contractors with any technical assistance needed. Travel is budgeted based on experience within the region. With these presumptions, costs are broken down as follows. Round trip airfare $1000, ground transportation per visit $200, per diem $60/day, lodging $180/night. The AEA staff that will travel to the sites include the technical Circuit Rider who may assist in commissioning the projects and may troubleshoot installation issues that could arise, and the AEA Program Manager and/or AEA Project Manager for a final inspection to ensure all the requirements of the funding have been met.

Out-of-state (Project Manager or Executive) events would be to share information on the success of this program with peers. Round trip airfare $1,500, hotel 3 nights @ $250/night $750, per diem $240, transportation $110, conference fee $400.

Other – Measure 3 Village Energy Efficiency Program

OTHER		YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
Village Energy Efficiency Program (**Competitive Process - 10-15 awards**)		$3,000,000	$3,000,000	$2,000,000	$350,000	$8,350,000

Alaska Energy Authority will issue a request for applications under the Village Energy Efficiency Program (VEEP). This program exists in statute and has been extremely successful in the past. Rural Alaskan communities will apply to implement energy conservation measures on public buildings and facilities. Estimate 10-15 large awards.

Measure 4 Tanana Chiefs Conference sub-award

AEA will issue a sub-award to Tanana Chiefs Conference (TCC) **$10,000,000**, to upgrade distribution lines and power plants in nine (9) rural villages in the region. These improvements will improve the efficiency of the local microgrid and prepare it for the next phase, integrating renewable energy.

Measure 5 Northwest Arctic Borough sub-award

AEA will issue a sub-award to the Northwest Arctic Borough (NWAB) **$9,954,321**, to install electric boilers in power plants and water plants where renewable energy will have diesel electricity off, thereby causing there to be no heat recovery. Breakdowns of this sub-award are included in the optional Budget Table as Measure 5 NWAB Partner Budget.

Indirect Charges – ALL MEASURES

AEA is currently in negotiations with the Department of Interior to develop a FY2024 Negotiated Indirect Cost Rate Agreement (NICRA) in accordance with 2CFR, 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. **Our provisional NICRA is 31.86%.** Indirect has been calculated against the direct charges of personnel, fringe, and travel ($2,932,033). The first $25,000 of each grant award, AEA is estimating 26 awards*25,000 =650,000. There will be one contract for $125,785 that will cover the 5 years of the project. **The total indirect comes to $1,181,311**.
If the rate has not been finalized at the time of award, AEA will use the 10% de Minimis rule allowed under 2 Code of Federal Regulation (CFR) 200.41(f) until the NICRA has been finalized.

Schedule:

Alaska Energy Authority					2024		2025				2026				2027				2028				2029	
Tasks & Milestones					Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
M1	M2	M3	M4	M5	AEA Award Administration																			
X	X	X	X	X	Notification of Award																			
X	X	X	X	X	Receive Grant Funds																			
			X		Subaward to TCC																			
				X	Subaward To NWAB																			
X	X	X			Write PMP for each measure																			
X	X	X	X	X	Quarterly Reporting																			
X	X				Determine Grantee Based on Need																			
		X			Prepare VEEP Solicitation																			
X	X				Issue Subrecipiant Grants																			
		X			Evaluate VEEP Applications																			
X	X	X			Engage Engineering																			
X	X	X			Design																			
X	X				Procurement																			
X	X				Long Lead Item Procurement																			
X	X	X			Construction																			
X	X	X	X	X	Close Out																			

AEA has a plan in place to move quickly upon award to implement the projects. We will start with planning and Project Management Plans (PMPs) so that everyone understands the roles and

responsibilities. Agreements will be put in place. For each measure, programs already exist so identifying project sites or releasing Request for Applications will be a fairly quick process.

Sub-awards to our partners, TCC and NWAB will be awarded as soon as the PMP is complete. They have a close relationship with communities in their region and a plan in place for implementation. Both entities estimate only 3 years for project completion.

AEA has several term contracts with engineering firms for Rural Power System projects. This will shorten the timelines needed for procuring engineering firms. Design can get underway and long lead items can be purchased. If waivers are needed, the EPA will be notified. Construction will start rolling out in 2025 at the earliest, 2026 at the latest. VEEP projects can be completed year-round.

Construction season (May – September) 2029 will be reserved for final site visits and closeout.

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	$266,747	$327,238	$306,138	$312,031	$311,322	$1,523,476
	TOTAL FRINGE BENEFITS	$215,676	$266,215	$250,714	$255,538	$255,414	$1,243,557
	TOTAL TRAVEL	$33,000	$33,000	$33,000	$33,000	$33,000	$165,000
	TOTAL EQUIPMENT	$0	$0	$0	$0	$0	$0
	TOTAL SUPPLIES	$0	$0	$0	$0	$0	$0
	TOTAL CONTRACTUAL	$51,865	$17,628	$17,916	$18,212	$20,164	$125,785
	TOTAL OTHER	$2,317,264	$16,225,921	$20,411,136	$6,000,000	$792,662	$45,746,983
	TOTAL DIRECT	$2,884,552	$16,870,002	$21,018,904	$6,618,781	$1,412,562	$48,804,801
	TOTAL INDIRECT	$222,174	$246,621	$235,053	$238,560	$238,903	$1,181,311
TOTAL FUNDING		**$3,106,726**	**$17,116,623**	**$21,253,957**	**$6,857,341**	**$1,651,465**	**$49,986,112**

BUDGET BY PROJECT			
Project Number	**Project Name**	**Total Cost**	**% of Total**
1	Genset Replacement	$10,550,559	21%
2	Distribution	$10,110,187	20%
3	VEEP	$9,371,045	19%
4	Tanana Chiefs Partnership	$10,000,000	20%
5	NWAB Partnership	$9,954,321	20%
Total		$49,986,112	100%

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	**Personnel**	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**TOTAL**
	Executive Director @209,995.5/yr @1% with salary increases	$2,100	$2,142	$2,184	$2,226	$2,286	$10,938
	General Counsel @190,008/yr @2% with salary increases	$3,800	$3,876	$3,952	$4,028	$4,104	$19,760
	Rural Programs Manager @ 139,229.50/yr @10% with salary increases	$13,223	$13,488	$13,752	$14,016	$14,281	$68,760
	Planning Manager @$120,139.5 @5 %/ year for two yrs with salary increase	$6,007	$6,127				$12,134
	Rural Assistance Manager@$115,401/yr @10%/yr with salary increases	$11,540	$11,771	$12,002	$12,233	$12,464	$60,010
	Circuit Rider @$77,161.5/yr @ 50% year with salary increases	$19,291	$39,353	$40,124	$40,896	$41,667	$181,331
	Assistant Project Manager @$77,161.5/ yr @7% with salary increases	$5,401	$5,509	$5,619	$5,732	$5,847	$28,108
	Project Manager@ 97,597.50 @50% year with salary increases	$48,798	$49,775	$50,751	$51,727	$52,703	$253,754
	Project Manager @ 104,656.5 @10%/yr with salary increases	$10,465	$10,675	$10,884	$11,094	$11,303	$54,421
	GIS @$91,279.5 @1% yr with salary increase	$1,521	$1,552	$949	$968	$986	$5,976
	Communications Director @$126,789/ yr @ 1%/yr with salary increases	$1,268	$1,293	$1,319	$1,344	$1,369	$6,593
	Contracting Officer @ 88,081.5/yr @3% with salary increases	$3,263	$3,327	$2,780	$2,829	$2,874	$15,073
	Contracting Officer @ $97,597.50 @ 1%/yr yrs 1&2 with salary increases	$977	$995				$1,972

TOTAL PERSONNEL	$127,654	$149,883	$144,316	$147,093	$149,884	$718,830
Fringe Benefits	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**TOTAL**
Executive Director @148,005/yr @1% with salary increases	$1,480	$1,510	$1,539	$1,569	$1,598	$7,696
General Counsel @$123,532.5/yr @2% with salary increases	$2,470	$2,520	$2,570	$2,620	$2,668	$12,848
Rural Programs Manager @ 109,278/yr @10% with salary increases	$10,927	$11,146	$11,364	$11,582	$11,801	$56,820
Planning Manager @$87,145.5 @5 %/ year for two yrs with salary increase	$4,357	$4,444				$8,801
Rural Assistance Manager@$98,709/yr @10%/yr with salary increases	$9,871	$10,067	$10,264	$10,462	$10,658	$51,322
Circuit Rider @$64,740/yr @ 50% year with salary increases	$16,187	$33,021	$33,668	$34,316	$34,962	$152,154
Assistant Project Manager @$62,107.5/ yr @7% with salary increases	$5,480	$5,588	$5,209	$5,309	$5,410	$26,996
Project Manager@ 77,668.5 @50% year with salary increases	$38,830	$39,606	$40,383	$41,160	$41,936	$201,915
Project Manager @ $91,962 @10%/yr with salary increases	$9,196	$9,380	$9,564	$9,748	$9,931	$47,819
GIS @$72,111 @1% yr with salary increase	$1,202	$1,226	$750	$765	$779	$4,722
Communications Director @$93,444/ yr @ 1%/yr with salary increases	$935	$953	$972	$991	$1,009	$4,860
Contracting Officer @ $70,434/yr @3% with salary increases	$2,112	$2,155	$2,199	$2,241	$2,283	$10,990
Contracting Officer @ $77,668.5 @ 1%/yr yrs 1&2 with salary increases	$777	$792				$1,569
TOTAL FRINGE	**$103,824**	**$122,408**	**$118,482**	**$120,763**	**$123,035**	**$588,512**
Travel	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**TOTAL**
2 trips per year per site; assume 5 sites. Rural travel estimated at $1,500 per trip with an overnight stay. Cost is based on past experience	$15,000	$15,000	$15,000	$15,000	$15,000	$75,000

	Out of state conference - on per year cost based on past experience		$3,000		$3,000		$6,000
	TOTAL TRAVEL	**$15,000**	**$18,000**	**$15,000**	**$18,000**	**$15,000**	**$81,000**
	Equipment						
	None						*$0*
							$0
	TOTAL EQUIPMENT	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
	Supplies						
	None						*$0*
							$0
	TOTAL SUPPLIES	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
	Contractual	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**TOTAL**
	Alaska Municipal League	$51,865	$17,628	$17,916	$18,212	$20,164	$125,785
	TOTAL CONTRACTUAL	$51,865	$17,628	$17,916	$18,212	$20,164	$125,785
	OTHER	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	
	Sub-recipient awards for Diesel Genset Replacement (2 - 5 projects needs-based)	$500,000	$2,000,000	$4,000,000	$2,000,000	$142,662	$8,642,662
							$0
							$0
	TOTAL OTHER	$500,000	$2,000,000	$4,000,000	$2,000,000	$142,662	$8,642,662
	TOTAL DIRECT	$798,343	$2,307,919	$4,295,714	$2,304,068	$450,745	$10,156,789
Indirect Costs	**Indirect Costs**						
	Indirect Rate - Provisional NICRA - 31.86%. A separate spreadsheet will be provided to show the calculations	$78,754.00	$78,754.00	$78,754.00	$78,754.00	$78,754.00	$393,770
	Grants (Max $25,000 per award * 5 awards = $125,000. For purposes is estimating costs assumed even distribution among grant period.)						$0
	TOTAL INDIRECT	$78,754	$78,754	$78,754	$78,754	$78,754	$393,770
TOTAL FUNDING		**$877,097**	**$2,386,673**	**$4,374,468**	**$2,382,822**	**$529,499**	**$10,550,559**

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**	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**TOTAL**
	Executive Director @209,995.5/yr @1% with salary increases	$2,100	$2,142	$2,184	$2,226	$2,286	$10,938
	General Counsel @190,008/yr @2% with salary increases	$3,800	$3,876	$3,952	$4,028	$4,104	$19,760
	Rural Programs Manager @ 139,229.50/yr @8.5% with salary increases	$11,414	$11,644	$11,873	$12,106	$12,342	$59,379
	Rural Assistance Manager@$115,401/yr @10%/yr with salary increases	$11,537	$11,771	$12,002	$12,233	$12,464	$60,007
	Circuit Rider @$77,161.5/yr @ 50% year with salary increases	$19,288	$39,353	$40,124	$40,896	$41,667	$181,328
	Circuit Rider @$77,161/yr @ 20% year with salary increases		$15,741	$16,050	$16,358	$16,667	$64,816
	Project Manager @ 111,774 @10%/yr with salary increases	$11,177	$11,401	$11,624	$11,848	$12,072	$58,122
	GIS @$91,279.5 @1% yr with salary increase	$1,521	$1,552	$949	$968	$986	$5,976
	Communications Director @$126,789/ yr @ 1%/yr with salary increases	$1,268	$1,293	$1,319	$1,344	$1,369	$6,593
	Contracting Officer @ 88,081.5/yr @3% with salary increases	$3,263	$3,327	$2,780	$2,829	$2,874	$15,073
	Contracting Officer @ $97,597.50 @ 1%/yr yrs 1&2 with salary increases	$976	$995				$1,971
	TOTAL PERSONNEL	**$66,344**	**$103,095**	**$102,857**	**$104,836**	**$106,831**	**$483,963**
	Fringe Benefits	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**TOTAL**
	Executive Director @148,005/yr @1% with salary increases	$1,480	$1,510	$1,539	$1,569	$1,598	$7,696
	General Counsel @$123,532.5/yr @2% with salary increases	$2,470	$2,520	$2,570	$2,620	$2,668	$12,848
	Rural Programs Manager @ 109,278/yr @8.5% with salary increases	$10,200	$10,403	$10,117	$10,311	$10,504	$51,535

Rural Assistance Manager@$98,709/yr @10%/yr with salary increases	$9,871	$10,069	$10,266	$10,464	$10,660	$51,330
Circuit Rider @$64,740/yr @ 50% year with salary increases	$16,187	$33,021	$33,668	$34,316	$34,960	$152,152
Circuit Rider @$64,740/yr @ 20% year with salary increases		$13,208	$13,467	$13,726	$13,986	$54,387
Project Manager @ 85,332 @10%/yr with salary increases	$8,533	$8,704	$8,874	$9,045	$9,216	$44,372
GIS @$72,111 @1% yr with salary increase	$1,202	$1,226	$750	$760	$779	$4,717
Communications Director @$93,444/ yr @ 1%/yr with salary increases	$935	$953	$972	$991	$1,007	$4,858
Contracting Officer @ $70,434/yr @3% with salary increases	$2,112	$2,155	$2,199	$2,241	$2,283	$10,990
Contracting Officer @ $77,668.5 @ 1%/yr yrs 1&2 with salary increases	$777	$792				$1,569
TOTAL FRINGE BENEFITS	**$53,767**	**$84,561**	**$84,422**	**$86,043**	**$87,661**	**$396,454**
Travel	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**TOTAL**
2 trips per year per site; assume 2 sites. Rural travel estimated at $1,500 per trip with an overnight stay. Cost is based on past experience	$ 6,000	$ 6,000	$ 6,000	$ 6,000	$ 6,000	$30,000
Out of state conference - on per year cost based on past experience	$3,000		$3,000			$6,000
TOTAL TRAVEL	**$9,000**	**$6,000**	**$9,000**	**$6,000**	**$6,000**	**$36,000**
Equipment						
None						*$0*
						$0
TOTAL EQUIPMENT	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
Supplies						
None						*$0*
						$0
TOTAL SUPPLIES	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
Contractual						
None						*$0*
						$0
						$0
						$0
						$0

	TOTAL CONTRACTUAL	$0	$0	$0	$0	$0	$0
	OTHER	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	
	Distribution Upgrades **(2-5 awards needs based)**	$500,000	$2,000,000	$4,000,000	$2,000,000	$300,000	$8,800,000
							$0
							$0
							$0
							$0
Indirect Costs							$0
	TOTAL OTHER	$500,000	$2,000,000	$4,000,000	$2,000,000	$300,000	$8,800,000
	TOTAL DIRECT	$629,111	$2,193,656	$4,196,279	$2,196,879	$500,492	$9,716,417
	Indirect Costs						
TOTAL FUNDING	Indirect Rate - Provisional NICRA - 31.86%. A separate spreadsheet will be provided to show the calculations	78754	78754	78754	78754	78754	$393,770
	Grants (Max $25,000 per award * 4 awards = $100,000. For purposes is estimating costs assumed even distribution among grant period.)						$0
	TOTAL INDIRECT	$78,754	$78,754	$78,754	$78,754	$78,754	$393,770
		$707,865	**$2,272,410**	**$4,275,033**	**$2,275,633**	**$579,246**	**$10,110,187**

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**	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**TOTAL**
	Executive Director @209,995.5/yr @1% with salary increases	$2,046	$2,142	$2,184	$2,226	$2,286	$10,884
	General Counsel @190,008/yr @2% with salary increases	$3,800	$3,876	$3,952	$4,028	$4,104	$19,760
	Rural Programs Manager @ 139,229.50/yr @5% with salary increases	$6,612	$6,743	$6,876	$7,009	$7,140	$34,380
	Renewable Energy and Energy Efficency Director at $155,649 /yr @5% /yr with salary increases	$7,782	$7,939				$15,721
	Renewable Energy Programs Manager @ $ 123,025.50/yr at 15% down to 5% with salary increases.	$18,453	$18,823	$12,795	$13,041	$6,643	$69,755
	Assistant Project Manager @$77,161.5/ yr @37.5% with salary increases	$27,029	$27,569	$28,111	$28,657	$29,205	$140,571
	GIS @$91,279.5 @1% yr with salary increase	$1,520	$1,552	$949	$968	$986	$5,975
	Communications Director @$126,789/ yr @ 1%/yr with salary increases	$1,268	$1,293	$1,319	$1,344	$1,369	$6,593
	Contracting Officer @ 88,081.5/yr @3% with salary increases	$3,263	$3,327	$2,780	$2,829	$2,874	$15,073
	Contracting Officer @ $97,597.50 @ 1%/yr yrs 1&2 with salary increases	$976	$996				$1,972
	TOTAL PERSONNEL	**$72,749**	**$74,260**	**$58,966**	**$60,102**	**$54,607**	**$320,684**
	Fringe Benefits	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**TOTAL**
	Executive Director @148,005/yr @1% with salary increases	$1,480	$1,510	$1,539	$1,569	$1,599	$7,697
	General Counsel @$123,532.5/yr @2% with salary increases	$2,470	$2,520	$2,570	$2,620	$2,668	$12,848
	Rural Programs Manager @ 109,278/yr @5% with salary increases	$5,463	$5,572	$5,682	$5,792	$5,901	$28,410
	Renewable Energy and Energy Efficency Director at $116,317.5/yr @5% /yr with salary increases	$5,816	$5,932				$11,748
	Renewable Energy Programs Manager @ $91,416/yr at 15% down to 5% with salary increases.	$13,712	$13,987	$9,507	$9,690	$4,937	$51,833

Assistant Project Manager @$62,107.5/ yr @ 37.5% with salary increases	$24,118	$24,599	$24,591	$25,064	$25,542	$123,914
GIS @$72,111 @1% yr with salary increase	$1,202	$1,226	$750	$765	$779	$4,722
Communications Director @$93,444/ yr @ 1%/yr with salary increases	$935	$953	$972	$991	$1,009	$4,860
Contracting Officer @ $70,434/yr @3% with salary increases	$2,112	$2,155	$2,199	$2,241	$2,283	$10,990
Contracting Officer @ $77,668.5 @ 1%/yr yrs 1&2 with salary increases	$777	$792				$1,569
TOTAL FRINGE BENEFITS	**$58,085**	**$59,246**	**$47,810**	**$48,732**	**$44,718**	**$258,591**
Travel	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**TOTAL**
2 trips per year per site; assume 3 sites. Rural travel estimated at $1,500 per trip with an overnight stay. Cost is based on past experience	$ 9,000	$ 9,000	$ 9,000	$ 9,000	$ 9,000	$45,000
Out of state conference - on per year cost based on past experience					$3,000	$3,000
TOTAL TRAVEL	$9,000	$9,000	$9,000	$9,000	$12,000	$48,000
Equipment						
None						*$0*
						$0
TOTAL EQUIPMENT	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
Supplies						
None						*$0*
						$0
TOTAL SUPPLIES	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
Contractual						
None						*$0*
						$0
						$0
TOTAL CONTRACTUAL	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
OTHER		**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	TOTAL
Village Energy Efficiency Program (**Competitive Process - 10-15 awards**)		$3,000,000	$3,000,000	$2,000,000	$350,000	$8,350,000
						$0
						$0
						$0
						$0
						$0

	TOTAL OTHER	$0	$3,000,000	$3,000,000	$2,000,000	$350,000	$8,350,000
	TOTAL DIRECT	$139,834	$3,142,506	$3,115,776	$2,117,834	$461,325	$8,977,275
Indirect Costs	**Indirect Costs**						
	Indirect Rate - Provisional NICRA - 31.86%. A separate spreadsheet will be provided to show the calculations	78754	78754	78754	78754	78754	$393,770
	Grants (Max $25,000 per award * 15 awards = $375,000. For purposes is estimating costs assumed even distribution among grant period.)						$0
	TOTAL INDIRECT	$78,754	$78,754	$78,754	$78,754	$78,754	$393,770
TOTAL FUNDING		**$218,588**	**$3,221,260**	**$3,194,530**	**$2,196,588**	**$540,079**	**$9,371,045**

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**						
	Rural Energy Specialist	$10,790	$11,195	$11,614			$33,599
	Grants and Office Manager	$4,856	$5,038	$5,226			$15,120
	Project Manager	$134,875	$139,933	$145,180			$419,988
	TOTAL PERSONNEL	$150,521	$156,165	$162,021	$0	$0	$468,707
	Fringe Benefits						
	Rural Energy Specialist	$4,272	$4,296	$4,322			$12,890
	Grants and Office Manager	$2,075	$2,085	$2,095			$6,255
	Project Manager	$57,366	$57,888	$58,430			$173,684
	TOTAL FRINGE BENEFITS	$63,712	$64,269	$64,848	$0	$0	$192,829
	Travel						
	Travel Per Diem	$ 2,198	$ 2,198	$ 4,396			$8,792
	Travel Transportation	$ 2,800	$ 2,800	$ 5,600			$11,200
							$0
							$0
	TOTAL TRAVEL	$ 4,998	$ 4,998	$ 9,996	$0	$0	$19,992
	Equipment						
							$0
							$0
	TOTAL EQUIPMENT	$0	$0	$0	$0	$0	$0
	Supplies						
							$0
							$0
	TOTAL SUPPLIES	$0	$0	$0	$0	$0	$0
	Contractual						
	Engineering Design and Permitting	$307,392					$307,392
	Construction		$4,176,250	$4,176,250			$8,352,500
							$0
							$0
	TOTAL CONTRACTUAL	$307,392	$4,176,250	$4,176,250	$0	$0	$8,659,892
	Other						
							$0
							$0

							$0
							$0
							$0
							$0
	TOTAL OTHER	$0	$0	$0	$0	$0	$0
	TOTAL DIRECT	$526,622	$4,401,683	$4,413,115	$0	$0	$9,341,420
Indirect Costs	**Indirect Costs**						
		$87,935	$283,431	$287,215			$658,580
							$0
	TOTAL INDIRECT	$87,935	$283,431	$287,215	$0	$0	$658,580
TOTAL FUNDING		**$614,557**	**$4,685,114**	**$4,700,330**	**$0**	**$0**	**$10,000,000**

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**						
	Borough Energy Manager (I. Mathiasson) [15% salary coverage]	$17,368	$17,368	$17,368			$52,103
	Borough Finance/Grant Manager (25% of salary coverage)	$32,500	$32,500	$32,500			$97,500
							$0
	TOTAL PERSONNEL	$49,868	$49,868	$49,868	$0	$0	$149,603
	Fringe Benefits						
	Borough Energy Manager (I. Mathiasson); Fringe ratio is 75%	$7,989	$7,989	$7,989			$23,967
	Borough Finance/Grant Manager ; Fringe ratio is 46%	$14,950	$14,950	$14,950			$44,850
							$0
	TOTAL FRINGE BENEFITS	$22,939	$22,939	$22,939	$0	$0	$68,817
	Travel						
	1-Day Design Visits to Communities ($1,500 per community w/ RT travel)	$15,000					$15,000
	2-Day Community Visits Construction Start and Check-Up ($1800 per community w/ RT travel; 5 communities constructed per year)		$18,000	$18,000			$36,000
							$0
							$0
							$0
							$0
							$0
							$0
							$0
	TOTAL TRAVEL	$15,000	$18,000	$18,000	$0	$0	$51,000
	Equipment						
							$0
							$0
	TOTAL EQUIPMENT	$0	$0	$0	$0	$0	$0
	Supplies						
							$0
							$0

	TOTAL SUPPLIES	$0	$0	$0	$0	$0	$0
	Contractual						
	Village Boiler Systems Designs (7% of construction cost; includes engineer site visits)	$494,900					$494,900
	Village Water Plant Electric Boilers (10 systems)		$1,825,000	$1,825,000			$3,650,000
	Village Power Plant Electric Boilers (9 systems; not for Kobuk)		$1,900,000	$1,520,000			$3,420,000
	Kotzebue Power Plant Design (6% of construction cost)	$120,000					$120,000
	Kotzebue Power Plant Electric Boiler/Controls		$725,000		$0	$0	$725,000
	Kotzebue Power Plant Cooling/Intake Air System Upgrades			$1,275,000			
							$0
							$0
							$0
							$0
							$0
							$0
	TOTAL OTHER	$614,900	$4,450,000	$4,620,000	$0	$0	$9,684,900
	TOTAL DIRECT	$702,707	$4,540,807	$4,710,807	$0	$0	$9,954,321
Indirect Costs	**Indirect Costs**						
							$0
							$0
	TOTAL INDIRECT	$0	$0	$0	$0	$0	$0
TOTAL FUNDING		**$702,707**	**$4,540,807**	**$4,710,807**	**$0**	**$0**	**$9,954,321**

Detailed Budget Table

BUDGET BY YEAR							
COST-TYPE	CATEGORY	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
Direct Costs	Personnel						
	Project Manager @ $80,000/yr, .5 FTE, with salary increase	$40,000	$42,500	$45,000	$47,500	$50,000	$225,000
	Project Staff @ $60,000 .5 FTE each year with salary increase	$30,000	$32,500	$35,000	$37,500	$40,000	$175,000
	TOTAL PERSONNEL	$70,000	$75,000	$80,000	$85,000	$90,000	$400,000
	Fringe Benefits						
	Full-time Employees @ 17% of salary	$11,900	$12,750	$13,600	$14,450	$15,300	$68,000
							$0
							$0
	TOTAL FRINGE BENEFITS	$11,900	$12,750	$13,600	$14,450	$15,300	$68,000
	Travel						
	Travel for conference and workshop presentations:						
	Airfare - $400 roundtrip @ 1 roundtrip per year	$400	$400	$400	$400	$400	$2,000
	Luggage Fees - $25 per flight @ 2 flights per year	$50	$50	$50	$50	$50	$250
	Hotel - $150 per day @ 3 days per year	$450	$450	$450	$450	$450	$2,250
	Per Diem - $71 per day @ 3.5 days per year	$248	$248	$248	$248	$248	$1,240
	Taxi - $45 per year	$45	$45	$45	$45	$45	$225
	Parking - $20 per day @ 4 days per year	$80	$80	$80	$80	$80	$400
	Mileage for local travel (500 miles per year at $0.655/mi)	$328	$328	$328	$328	$328	$1,640
	TOTAL TRAVEL	$1,601	$1,601	$1,601	$1,601	$1,601	$8,005
	Equipment						
	2 Building Thermal Imagers @ $9,000 each	$18,000					$18,000
							$0
	TOTAL EQUIPMENT	$18,000	$0	$0	$0	$0	$18,000
	Supplies						
	1 Laptop Computer @ $2,500 each	$2,500	$0	$0	$0	$0	$2,500
							$0
	TOTAL SUPPLIES	$2,500	$0	$0	$0	$0	$2,500
	Contractual						
	Contractor to perform 30 energy assessments per year at industrial facilities. Assumes 740 hours per assessment (pre-visit analysis, site visit, post-visit analysis, report with recommendations) @ $46/hr	$1,021,200	$1,021,200	$1,021,200	$1,021,200	$1,021,200	$5,106,000
	Contract for 10 small or medium-scale projects per year at industrial facilities (renewable energy, energy storage, energy efficiency, electrification, or energy planning). Assumes average cost $450,000/project	$4,500,000	$4,500,000	$4,500,000	$4,500,000	$4,500,000	$22,500,000
	Contract for 5 large-scale energy efficiency or decarbonization demonstration projects per year at industrial facilities (e.g., industrial heat pumps). Assumes average cost $3 million/project	$15,000,000	$15,000,000	$15,000,000	$15,000,000	$15,000,000	$75,000,000
							$0
	TOTAL CONTRACTUAL	$20,521,200	$20,521,200	$20,521,200	$20,521,200	$20,521,200	$102,606,000
	OTHER						
	Participant Support Costs: Stipends for 2 Summer Interns	$8,000	$8,000	$8,000	$8,000	$8,000	$40,000
	Participant Support Costs: Industrial Retrofit Rebates, 50 facilities/yr @ $200,000 each	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$50,000,000
							$0
	TOTAL OTHER	$10,008,000	$10,008,000	$10,008,000	$10,008,000	$10,008,000	$50,040,000
	TOTAL DIRECT	$30,633,201	$30,618,551	$30,624,401	$30,630,251	$30,636,101	$153,142,505
Indirect Costs	Indirect Costs						
							$0
							$0
	TOTAL INDIRECT	$0	$0	$0	$0	$0	$0
TOTAL FUNDING		$30,633,201	$30,618,551	$30,624,401	$30,630,251	$30,636,101	$153,142,505

Detailed Budget Table

BUDGET BY YEAR							
COST-TYPE	CATEGORY	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
Direct Costs	**Personnel**						
	Project Manager @ $80,000/yr, .5 FTE, with salary increase	*$40,000*	*$42,500*	*$45,000*	*$47,500*	*$50,000*	*$225,000*
							$0
							$0
	TOTAL PERSONNEL	*$40,000*	*$42,500*	*$45,000*	*$47,500*	*$50,000*	*$225,000*
	Fringe Benefits						
	Full-time Employees @ 17% of salary	*$6,800*	*$7,225*	*$7,650*	*$8,075*	*$8,500*	*$38,250*
							$0
							$0
	TOTAL FRINGE BENEFITS	*$6,800*	*$7,225*	*$7,650*	*$8,075*	*$8,500*	*$38,250*
	Travel						
	Workforce development program:						
	Travel for conference and workshop presentations:						
	Airfare - $400 roundtrip @ 1 roundtrip per year	*$400*	*$400*	*$400*	*$400*	*$400*	*$2,000*
	Luggage Fees - $25 per flight @ 2 flights per year	*$50*	*$50*	*$50*	*$50*	*$50*	*$250*
	Hotel - $150 per day @ 3 days per year	*$450*	*$450*	*$450*	*$450*	*$450*	*$2,250*
	Per Diem - $71 per day @ 3.5 days per year	*$248*	*$248*	*$248*	*$248*	*$248*	*$1,240*
	Taxi - $45 per year	*$45*	*$45*	*$45*	*$45*	*$45*	*$225*
	Parking - $20 per day @ 4 days per year	*$80*	*$80*	*$80*	*$80*	*$80*	*$400*
	Mileage for local travel (500 miles per year at $0.655/mi)	*$328*	*$328*	*$328*	*$328*	*$328*	*$1,640*
	TOTAL TRAVEL	*$1,601*	*$1,601*	*$1,601*	*$1,601*	*$1,601*	*$8,005*
	Equipment						
							$0
							$0
	TOTAL EQUIPMENT	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
	Supplies						
	2 Laptop Computer @ $2,500 each	*$5,000*	*$0*	*$0*	*$0*	*$0*	*$5,000*
							$0
	TOTAL SUPPLIES	*$5,000*	*$0*	*$0*	*$0*	*$0*	*$5,000*
	Contractual						
							$0
	TOTAL CONTRACTUAL	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
	OTHER						
	Subaward for workforce ecosystem capacity building and coordination (e.g., partnerships, employer engagement, student recruitment, marketing)	*$75,000*	*$75,000*	*$75,000*	*$75,000*	*$75,000*	*$375,000*
	Subaward for pre-apprenticeship program for 300 students (including personnel and instructors; classroom instruction, hands-on training, curriculum, supplies, supportive services for students, and mentorship program)	*$125,000*	*$156,250*	*$156,250*	*$156,250*	*$156,250*	*$750,000*
	Subaward for registered apprenticeship program for 200 apprentices (including personnel and instructors; classroom instruction, on-the-job training, curriculum, supplies, employer incentives, supportive services for students). Note: apprenticeship wages paid by the employer in this example	*$333,332*	*$416,667*	*$416,667*	*$416,667*	*$416,667*	*$2,000,000*
							$0
							$0
							$0
	TOTAL OTHER	*$533,332*	*$647,917*	*$647,917*	*$647,917*	*$647,917*	*$3,125,000*
	TOTAL DIRECT	*$586,733*	*$699,243*	*$702,168*	*$705,093*	*$708,018*	*$3,401,255*
Indirect Costs	**Indirect Costs**						
							$0
							$0
	TOTAL INDIRECT	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
TOTAL FUNDING		***$586,733***	***$699,243***	***$702,168***	***$705,093***	***$708,018***	***$3,401,255***

Detailed Budget Table

BUDGET BY YEAR							
COST-TYPE	CATEGORY	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
Direct Costs	**Personnel**						
	Project Manager @ $80,000/yr, .5 FTE, with salary increases	*$40,000*	*$42,500*	*$45,000*	*$47,500*	*$50,000*	*$225,000*
	Project Staff @ $60,000 .5 FTE each year with salary increase	*$30,000*	*$32,500*	*$35,000*	*$37,500*	*$40,000*	*$175,000*
							$0
	TOTAL PERSONNEL	*$70,000*	*$75,000*	*$80,000*	*$85,000*	*$90,000*	*$400,000*
	Fringe Benefits						
	Full-time Employees @ 17% of salary	*$11,900*	*$12,750*	*$13,600*	*$14,450*	*$15,300*	*$68,000*
							$0
							$0
	TOTAL FRINGE BENEFITS	*$11,900*	*$12,750*	*$13,600*	*$14,450*	*$15,300*	*$68,000*
	Travel						
	Workforce development program:						
	Travel for conference and workshop presentations:						
	Airfare - $400 roundtrip @ 1 roundtrip per year	*$400*	*$400*	*$400*	*$400*	*$400*	*$2,000*
	Luggage Fees - $25 per flight @ 2 flights per year	*$50*	*$50*	*$50*	*$50*	*$50*	*$250*
	Hotel - $200 per day @ 3 days per year	*$600*	*$600*	*$600*	*$600*	*$600*	*$3,000*
	Per Diem - $71 per day @ 3.5 days per year	*$245*	*$245*	*$245*	*$245*	*$245*	*$1,225*
	Taxi - $45 per year	*$45*	*$45*	*$45*	*$45*	*$45*	*$225*
	Parking - $20 per day @ 4 days per year	*$80*	*$80*	*$80*	*$80*	*$80*	*$400*
							$0
	TOTAL TRAVEL	*$1,420*	*$1,420*	*$1,420*	*$1,420*	*$1,420*	*$7,100*
	Equipment						
							$0
							$0
	TOTAL EQUIPMENT	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
	Supplies						
	1 Laptop Computer @ $2,500 each	*$2,500*	*$0*	*$0*	*$0*	*$0*	*$2,500*
							$0
	TOTAL SUPPLIES	*$2,500*	*$0*	*$0*	*$0*	*$0*	*$2,500*
	Contractual						
	Tribal Community Center Solar Project: 5 MW PV + 3 MW/12 MWh battery storage:						*$0*
	Storage system	*$0*	*$6,200,000*	*$0*	*$0*	*$0*	*$6,200,000*
	PV module and inverter	*$0*	*$3,142,000*	*$0*	*$0*	*$0*	*$3,142,000*
	Installation labor	*$0*	*$850,000*	*$0*	*$0*	*$0*	*$850,000*
	PV operation & maintenance/yr	*$0*	*$82,100*	*$82,100*	*$82,100*	*$82,100*	*$328,400*
	TOTAL CONTRACTUAL	*$0*	*$10,274,100*	*$82,100*	*$82,100*	*$82,100*	*$10,520,400*
	OTHER						
	Participant Support Cost: Environmental Intern @ $4000/yr summer stipend	*$4,000*	*$4,000*	*$4,000*	*$4,000*	*$4,000*	*$20,000*
							$0
							$0
							$0
							$0
							$0
	TOTAL OTHER	*$4,000*	*$4,000*	*$4,000*	*$4,000*	*$4,000*	*$20,000*
	TOTAL DIRECT	*$89,820*	*$10,367,270*	*$181,120*	*$186,970*	*$192,820*	*$11,018,000*
Indirect Costs	**Indirect Costs**						
	Indirect Cost Rate: 40% of full time personnel and fringe benefits	*$32,760*	*$35,100*	*$37,440*	*$39,780*	*$42,120*	*$187,200*
							$0
	TOTAL INDIRECT	*$32,760*	*$35,100*	*$37,440*	*$39,780*	*$42,120*	*$187,200*
TOTAL FUNDING		***$122,580***	***$10,402,370***	***$218,560***	***$226,750***	***$234,940***	***$11,205,200***