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: | First Name: Ty | Middle Name:
Last Name: Lewis | Suffix:

Title: City Manager

Complete Address:

Street1: 1000 Spring Street
Street2:
City: Paso Robles | State: CA: California
Zip / Postal Code: 93446 | Country: USA: UNITED STATES

Phone Number: 805-237-3888 | **Fax Number:**

E-mail Address: tlewis@prcity.com

Payee: *Individual authorized to accept payments.*

Name: Prefix: | First Name: Ryan | Middle Name:
Last Name: Cornell | Suffix:

Title: Director, City Treasurer

Complete Address:

Street1: 1000 Spring Street
Street2:
City: Paso Robles | State: CA: California
Zip / Postal Code: 93446 | Country: USA: UNITED STATES

Phone Number: 805-237-3999 | **Fax Number:**

E-mail Address: rcornell@prcity.com

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

Name: Prefix: | First Name: | Middle Name:
Last Name: | Suffix:

Title:

Complete Address:

Street1:
Street2:
City: | State:
Zip / Postal Code: | Country:

Phone Number: | **Fax Number:**

E-mail Address:

EPA Form 5700-54 (Rev 4-02)

EPA KEY CONTACTS FORM

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

Name: **Prefix:** | **First Name:** Adam | **Middle Name:**

Last Name: Spaulding | **Suffix:**

Title: Solid Waste and Recycling Manager

Complete Address:

Street1: 3200 Sulphur Springs Road

Street2:

City: Paso Robles | **State:** CA: California

Zip / Postal Code: 93446 | **Country:** USA: UNITED STATES

Phone Number: 805-423-8255 | **Fax Number:**

E-mail Address: aspaulding@prcity.com

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: City of Paso Robles

Address: 1000 Spring Street

City: Paso Robles

State: CA: California Zip Code: 93446

B. Unique Entity Identifier (UEI): RM2SNCH8JJD5

C. Applicant/Recipient Point of Contact

Name: Adam Spaulding

Phone: 8054238255

Email: aspaulding@prcity.com

Title: Solid Waste and Recycling Manager

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.)

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.)

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))

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.

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.**

Shannon Foutz, HR/Risk Manager, 1000 Spring Street, Paso Robles, CA 93446, sfoutz@prcity.com, 805-237-3962

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.**

All claims and issues regarding legal liability, etc., are handled through the City's HR Department
https://www.prcity.com/170/Human-Resources

Additionally, each Bargaining Unit has a prescribed Grievance Procedure included in their MOUs
https://www.prcity.com/171/Memorandum-of-Understanding

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
Adam J Spaulding	City Manager	04/01/2024

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

City of Paso Robles

* PRINTED NAME AND TITLE OF AUTHORIZED REPRESENTATIVE

Prefix: | * First Name: Ty | Middle Name:

* Last Name: Lewis | Suffix:

* Title: City Manager

* SIGNATURE: Adam J Spaulding | * DATE: 04/01/2024

Other Attachment File(s)

*** Mandatory Other Attachment Filename:** 1235-California CPRG Priority Climate Action Plan

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

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

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

Project Narrative File(s)

*** Mandatory Project Narrative File Filename:** 1239-Paso Robles CPRG Implementation Grant Narrative.

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: 04/01/2024

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: City of Paso Robles

* b. Employer/Taxpayer Identification Number (EIN/TIN): 77-0488880

* c. UEI: RM2SNCH8JJD5

d. Address:

* Street1: 1000 Spring Street
Street2:
* City: Paso Robles
County/Parish:
* State: CA: California
Province:
* Country: USA: UNITED STATES
* Zip / Postal Code: 93446-2599

e. Organizational Unit:

Department Name:

Division Name:

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

Prefix: Mr.
* First Name: Adam
Middle Name: Joseph
* Last Name: Spaulding
Suffix:

Title: Solid Waste & Recycling Manager

Organizational Affiliation: City of Paso Robles

* Telephone Number: 8054238255
Fax Number:

* Email: aspaulding@prcity.com

Application for Federal Assistance SF-424

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

C: City or Township 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:**

City of El Paso de Robles - Regional Renewable Energy Park

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: 24th
* b. Program/Project: 24th

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

1234-Congressional Districts.xlsx | Add Attachment | Delete Attachment | View Attachment

17. Proposed Project:

* a. Start Date: 10/01/2024
* b. End Date: 06/30/2028

18. Estimated Funding ($):

* a. Federal	99,999,999.99
* b. Applicant	896,206.00
* c. State	0.00
* d. Local	0.00
* e. Other	0.00
* f. Program Income	0.00
* g. TOTAL	100,896,205.99

*** 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 04/01/2024.

☐ 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:
* First Name: Ty
Middle Name:
* Last Name: Lewis
Suffix:

* Title: City Manager

* Telephone Number: 805-237-3888
Fax Number:

* Email: tlewis@prcity.com

* Signature of Authorized Representative: Adam J Spaulding
* Date Signed: 04/01/2024

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. Anaerobic Digestor		$	$	$ 47,942,000.00	$	$ 47,942,000.00
2. H2 & Energy Generation & Distribution				18,796,000.00		18,796,000.00
3. Biosolids				25,397,000.00		25,397,000.00
4. Construction & Administration				7,864,999.99		7,864,999.99
5. Totals		$	$	$ 99,999,999.99	$	$ 99,999,999.99

Standard Form 424A (Rev. 7- 97)
Prescribed by OMB (Circular A -102) Page 1

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY (1) Anaerobic Digestor	(2) H2 & Energy Generation & Distribution	(3) Biosolids	(4) Construction & Administration	Total (5)
a. Personnel	$	$	$	$ 724,999.99	$ 724,999.99
b. Fringe Benefits					
c. Travel					
d. Equipment	47,942,000.00	13,221,000.00	25,397,000.00		86,560,000.00
e. Supplies					
f. Contractual		5,575,000.00		7,140,000.00	12,715,000.00
g. Construction					
h. Other					
i. Total Direct Charges (sum of 6a-6h)	47,942,000.00	18,796,000.00	25,397,000.00	7,864,999.99	$ 99,999,999.99
j. Indirect Charges					$
k. TOTALS (sum of 6i and 6j)	$ 47,942,000.00	$ 18,796,000.00	$ 25,397,000.00	$ 7,864,999.99	$ 99,999,999.99
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. Anaerobic Digestor	$	$	$	$
9. H2 & Energy Generation & Distribution				
10. Biosolids				
11. Construction & Administration	896,206.00			896,206.00
12. TOTAL (sum of lines 8-11)	$ 896,206.00	$	$	$ 896,206.00

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	$ 34,163,000.00	$ 300,000.00	$ 33,863,000.00	$	$
14. Non-Federal	$ 121,786.00	30,446.50	30,446.50	30,446.50	30,446.50
15. TOTAL (sum of lines 13 and 14)	$ 34,284,786.00	$ 330,446.50	$ 33,893,446.50	$ 30,446.50	$ 30,446.50

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. Anaerobic Digestor	$ 5,000,000.00	$ 22,311,000.00	$ 20,631,000.00	$ 0.00
17. H2 & Energy Generation & Distribution	3,466,000.00	15,330,000.00	0.00	0.00
18. Biosolids	25,397,000.00			
19. Construction & Administration	300,000.00	3,820,000.00	3,320,000.00	424,999.99
20. TOTAL (sum of lines 16 - 19)	$ 34,163,000.00	$ 41,461,000.00	$ 23,951,000.00	$ 424,999.99

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges:

22. Indirect Charges:

23. Remarks: There is a supplemental "In-Kind" budget attached to submission to express the City's contribution of labor towards completion of the project - but should not be considered as requested funding. The $121,786 non-federal in Section D is this "in-kind"

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: City of Paso Robles
* Street 1: 1000 Spring Street
Street 2:
* City: Paso Robles
State: CA: California
Zip: 93446
Congressional District, if known: 19

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:*

9. Award Amount, *if known:*
$

10. a. Name and Address of Lobbying Registrant:

Prefix: * First Name: Adam Middle Name:
* Last Name: Spaulding Suffix:
* Street 1: 3200 Sulphur Springs Road Street 2:
* City: Paso Robles State: CA: California Zip: 93446

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

Prefix: * First Name: Adam Middle Name:
* Last Name: Spaulding Suffix:
* Street 1: 3200 Sulphur Springs Road Street 2:
* City: Paso Robles State: CA: California Zip: 93446

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:** Adam J Spaulding

***Name:** Prefix: * First Name: Adam Middle Name:
* Last Name: Spaulding Suffix:

Title: **Telephone No.:** 8052277500 **Date:** 04/01/2024

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The State of California's Priority Climate Action Plan

Created under the U.S. Environmental Protection Agency's Climate Pollution Reduction Grants Program

Submitted to the U.S. Environmental Protection Agency

March 1, 2024

Acknowledgements

The State's Priority Climate Action Plan (PCAP) was generously funded through the United States Environmental Protection Agency's Climate Pollution Reduction Grants (CPRG) Program. It was primarily developed by the California Air and Resources Board (CARB) and the California Environmental Protection Agency (CalEPA), in strong partnership with several state agencies (listed below) that have demonstrable work and commitment to California's climate policies and contributed directly to the development of the State's PCAP. The State's PCAP was also made possible through contributions from dozens of air districts, local governments, and through consultation with Tribal Nations not otherwise covered by a CPRG Planning Grant. This PCAP was also shaped through coordinated conversations with the 10 metropolitan statistical areas (MSAs) offered a CPRG Planning Grant and drafting their own PCAPs. Finally, this PCAP has been shaped by the comments and feedback CARB has received from community-based organizations, various advocates, the public and other stakeholders.

State agencies contributing to this PCAP include:

- California Environmental Protection Agency
- California Natural Resources Agency
- California Labor and Workforce Development Agency
- California State Transportation Agency
- California Business, Consumer Services, and Housing Agency
- California Government Operations Agency
- Governor's Office of Business and Economic Development
- California Volunteers – Office of the Governor
- Governor's Office of Planning and Research
- California Public Utilities Commission
- California Energy Commission
- California Department of Conservation
- California Department of Transportation
- Department of Resources Recycling and Recovery
- California Air Resources Board
- California Department of Food and Agriculture
- California Infrastructure and Economic Development Bank
- California Department of General Services
- California Department of Public Health

Table of Contents

List of GHG Reduction Measures included in Section 3.5

Transportation Measures:

1. Create a Holistic, Heavy-Duty Zero-Emissions Vehicle Buydown Program
2. Install Truck Charging to Support Zero-Emissions Goods Movement at California Ports and Warehouse Districts
3. Advance the Deployment of Clean Off-Road Equipment
4. Bolster Investments in the State's Sustainable Port and Freight Infrastructure
5. Support Mobility Projects Uplifted by Communities
6. Allow for Local Deployment of ZEV Infrastructure and Low-Income ZEV Support

Industrial Measure:

1. Accelerate Industrial Decarbonization by expanding the existing Industrial Decarbonization and Improvement to Grid Operations Program

Energy Measures:

1. Expand Decarbonization through the Energy Conservation Assistance Act (ECCA)
2. Create a Funding Program to Upgrade the Capacity of Distribution Systems
3. Expand the Success of California's Self Generation Incentive Program for Behind the Meter Energy Storage
4. Bolster Healthy Landscapes and Resilient Communities through Expanding the Biomass to Carbon Negative Biofuels Program
5. Deploy Equitable Building Decarbonization
6. Implement Bioenergy Projects
7. Enable Renewable Microgrids for Rural Communities and Tribes

High Global Warming Potential Gases Measure:

1. Expand F-gas Reduction Incentive Program (FRIP)

Agriculture Measures:

1. Expand California's Healthy Soils Practices
2. Reduce Methane Emissions by Expanding California's existing Dairy Digester Research and Development Program

Natural and Working Lands Measures:

1. Bolster California's Forest Health Program
2. Expand Urban and Community Forest Projects
3. Expand the State's Wetland Restoration Program

Waste Measures:

1. Food Waste Prevention and Edible Food Recovery Program
2. Bolster Organics Recycling Infrastructure

List of Acronyms

AB	Assembly Bill
ACF	Advanced Clean Fleets Regulation
ACCII	Advanced Clean Cars II Regulation
ACT	Advanced Clean Trucks Regulation
AQIP	Air Quality Improvement Program
CALFIRE	California Department of Forestry and Fire Protection
CARB	California Air Resources Board
CCI	California Climate Investments
CDFA	California Department of Food and Agriculture
CDFW	California Department of Fish and Wildlife
CDTFA	California Department of Tax and Fee Administration
CEC	California Energy Commission
CERF	Community Economic Resilience Fund
CMIS	Clean Mobility in Schools
CO_2	carbon dioxide
CORE	Clean Off-Road Equipment Voucher Incentive
CPRG	Climate Pollution Reduction Grants
CPUC	California Public Utilities Commission
DDRDP	Dairy Digester Research and Development Program
ECAA	Energy Conservation Assistance Act
EVSE	electric vehicle supply equipment
FCEV	fuel cell electric vehicle
FRIP	F-Gas Incentive Program
GGRF	Greenhouse Gas Reduction Fund
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbons
HVIP	Clean Truck and Bus Incentive Program
INDIGO	Industrial Decarbonization and Improvement to Grid Operations Program
IRA	Inflation Reduction Act
MHD	Medium- and heavy-duty vehicle
$MMTCO_2e$	million metric tons of carbon dioxide equivalent
MRR	mandatory reporting of GHG emissions
NO_x	oxides of nitrogen
NWL	natural and working lands
ODS	ozone depleting substances
PCAP	Priority Climate Action Plan
PFAS	polyfluoroalkyl substances

PFIP	Sustainable Port and Freight Infrastructure Program
SB	Senate Bill
SDFR	Socially Disadvantaged Farmers and Ranchers
SF_6	sulfur hexafluoride
SGIP	Self-Generation Incentive Program
SLCP	short-lived climate pollutant
STEP	Sustainable Transportation Equity Project
SO_2F_2	sulfuryl fluoride
U.S. EPA	United States Environmental Protection Agency
VMT	vehicle-miles traveled
ZE	Zero-emissions
ZEV	zero-emissions vehicle

List of Figures

Executive Summary

California's Priority Climate Action Plan (PCAP) presents a strong portfolio of proven climate programs specifically chosen to guide a range of coordinated implementation grant applications throughout the State. With federal funding, the climate measures included in this PCAP would immediately begin to help California meet its long-term goal of achieving carbon neutrality by 2045 and deliver a range of short-term benefits over the next five years.

In particular, this PCAP delivers the benefits of clean energy, technology, and transportation to historically underserved and marginalized communities. These are the communities that have all too often borne the brunt of heavy pollution, especially in California, from fossil fuel combustion, mobile sources, and industries. Californians in these frontline communities live in or near regions of the State that are not attaining federal air quality standards, which are often communities near ports and federally recognized freight corridors, or adjacent to fossil gas power plants and large fossil-fueled industrial facilities. Communities most affected by environmental burdens also includes those in or near forested areas that are increasingly prone to wildfire risk and encompasses remote Tribal lands and rural areas.

The measures included in this PCAP leverage a variety of existing programs from multiple state agencies that directly incorporate Governor Gavin Newsom's whole-of-government approach to tackling climate change. The measures are also consistent with the Governor's Executive Order N-16-22[1] to take additional actions to embed equity considerations in every State climate plan and program.

Since this PCAP directly addresses the major sectors of one of the world's largest economies, the programs and approaches outlined will also advance the national climate goals pursuant to the Paris Agreement.[2] This PCAP will help further U.S. energy independence by supporting the development and transmission of clean and renewable energy, including scalable hydrogen and bio-methane projects. The PCAP will take strides toward achieving the federal environmental Justice 40 goal, ensuring that 40% of overall benefits of certain Federal investments "flow to disadvantaged communities that are marginalized, underserved, and overburdened by pollution."[3] It will help develop and propel innovative and practical climate solutions and technologies that can be exported to other states – and even beyond our national borders. This PCAP will help ensure that the U.S. leads by example in tackling this global threat while delivering co-benefits at home.

This PCAP was developed with public participation and input, including a kickoff virtual public workshop, multiple comments and recommendations from a broad group of interested parties and communities, and three virtual public webinars to present the draft

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[1] 2022. Executive Order N-16-22. *https://www.gov.ca.gov/wp-content/uploads/2022/09/9.13.22-EO-N-16-22-Equity.pdf*

[2] UNFCC. *https://unfccc.int/process-and-meetings/the-paris-agreement.*

[3] The White House. Justice40. *https://www.whitehouse.gov/environmentaljustice/justice40/* .

PCAP, where CARB received written comments in an online docket. Staff had several meetings with representatives of Tribal Nations and with the 10 Metropolitan Statistical Areas (MSAs) in California that were offered their own CPRG planning grants. These MSAs are home to more than 90% of the state's 40 million residents, and each engaged in their own outreach on their respective PCAPs. The State organized more than 15 meetings with MSAs in the development of the PCAP. Many of the agencies and programs in this PCAP include statutory and ministerial requirements to consult with representatives of low-income and disadvantaged communities to ensure program implementation provides meaningful engagement opportunities and direct community benefits.

In developing this PCAP, California was fortunate to have a decade and a half of climate planning experience, as well as many successful climate programs and projects to leverage from across dozens of state agencies and multiple economic sectors. Over that same decade and a half, California has also witnessed first-hand the growing ravages of the effects of climate change. Weather whiplash has become commonplace with years of severe drought followed by seasons of atmospheric rivers bringing flooding, mudslides, and even the reappearance on Central Valley farmland of an inland sea that had not been seen in more than a century.

California's forestlands have also been hit hard. Nearly 200 million trees, stressed by drought, were killed by bark beetle infestation linked to warmer winters, and now stand dead and dry throughout the State's forests. Hotter summers and strong dry winds are resulting in catastrophic megafires. In the 2017 and 2018 fire seasons alone, more than 17,000 wildfires burned over 3 million acres – nearly 3% of California's land mass. These fires killed 139 people, destroyed tens of thousands of homes and businesses, and devastated millions of acres of precious habitat and critical watersheds. In addition to the destruction, these megafires are converting hundreds of thousands of acres of conifer forests to shrub land and emitting black carbon, further compounding the climate change crisis. By the end of this century, California's wildfires are expected to burn 77% more acreage — roughly the size of Delaware — every year.

Rising temperatures also adversely impact those communities already suffering disproportionately from fossil fuel pollution. The impacts to low-income and disadvantaged communities, coupled with emerging studies that indicate increasing temperatures may start to reverse progress already made to improve air quality,[4] underscore the need to move with all possible haste to slash carbon and air pollution. California's unique weather, topography, and the size of its population and economic activity leave it with some of the worst air quality in the nation: over half of its residents (21 million of roughly 40 million) live

[4] U. Ifran. 2015. Global Warming Could Undo 50 Years of Health Gains. *https://www.scientificamerican.com/article/global-warming-could-undo-50-years-of-health-gains/*.

in areas that exceed the most stringent federal ozone standard[5] and the State is home to the only three 'extreme non-attainment' areas for federal ozone standards. As the EPA recently established more health-protective fine particle limits, more regions of the State are falling into non-attainment of federal clean air quality standards, highlighting the need to move more quickly to zero-emissions transportation and other clean-energy solutions.

CARB submits this PCAP not as a definitive compendium of California programs but as a careful selection of climate solutions that, over the next five years, will cut climate pollution and deliver benefits to those communities who most need them.

The funding offered by the U.S. EPA under this program will help California achieve climate and clean air goals, protect the State's forests and rural communities, provide resources to Tribal Nations, and help clean the air for low-income and disadvantaged communities. It will also establish a new and important level of cooperation and partnership with U.S. EPA, further strengthening the meaning and reality of cooperative federalism that has benefited California and the nation for decades.

[5] 2022. CARB. 2022 State Strategy for the State Implementation Plan. *https://ww2.arb.ca.gov/sites/default/files/2022-08/2022_State_SIP_Strategy.pdf*.

1. Introduction

California has a statutory goal of reducing anthropogenic emissions by at least 85% below 1990 levels and achieving carbon neutrality by 2045. CARB is currently building on 15 years of climate action experience with an economy-wide, multi-sector approach to cutting greenhouse gases while providing maximum benefits to communities that have historically borne the public health burdens of exposure to pollution from fossil fuel combustion, mobile sources, and industries. The Climate Pollution Reduction Grants (CPRG) program will definitively support accelerated efforts and help achieve both goals.

California appreciates the unprecedented lift by the Biden Administration to tackle climate change, as evidenced by the passing of the Inflation Reduction Act (IRA) and the creation of the CPRG program, among other accomplishments. Through the CPRG program, U.S. EPA seeks to support the development and expansion of state, territory, Tribal and local climate action plans that aggressively reduce greenhouse gases (GHGs), provide equitable access and solutions to new technologies, and support a resilient equitable economy that benefits all Americans. California values its long-standing relationship with U.S. EPA and has developed this Priority Climate Action Plan (PCAP) not only to showcase the State's current climate priorities but as a foundation to help deliver the steep GHG reductions needed to contribute to the U.S. commitment under the Paris Agreement and ensure that it meets its Justice 40 Initiative policy goals.

This PCAP builds on over a decade of California's climate leadership. Most recently, California passed Assembly Bill (AB) 1279 (Muratsuchi, Chapter 337, Statutes of 2022) which sets goals to achieve carbon neutrality by 2045 and ensures that by 2045, statewide anthropogenic GHG emissions are reduced at least 85% below 1990 levels. California's 2022 Scoping Plan Update[6] lays out the sector-by-sector roadmap for California to achieve the mandates in AB 1279, outlining a technologically feasible and cost-effective path to achieve the State's climate target. The 2022 Scoping Plan Update also highlights how increased climate ambition can address persistent air pollution and opportunity gaps faced by low-income communities and communities of color.

In this PCAP, California has leveraged the substantial work of the 2022 Scoping Plan Update, and the directives, sector-specific plans, and reports it incorporates.[2] Further, this PCAP covers the geographic extent of California, nearly every economic sector, and in the inventory below, accounts for all GHG sources across the State.[3] This PCAP uplifts a strong set of impactful near-term actions and elevates many existing programs that stand ready to catalyze CPRG funding into action to help California and the U.S. achieve a historic rate of clean

[6] CARB. 2022. 2022 Scoping Plan for Achieving Carbon Neutrality. December 22. *https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf*

technology production, deployment, and rapid consumer adoption, while ensuring affordability and maximizing myriad co-benefits.

2. Approach to Developing the PCAP

Given the substantial body of climate planning across the State and local governments at the start of CPRG, California's work to develop the PCAP began with an extensive review of existing climate plans, policies, and programs, as well as lessons learned from them to date. These were captured through document review,[7] in-depth discussions with relevant State agency staff, and the collection of input from across State agencies and other interested parties via surveys and detailed questionnaires.

Consistent with Governor Gavin Newsom's whole-of-government approach to tackling climate change, this PCAP formally brought together multiple agencies across the administration via the California State Agency CPRG Task Force, whose membership is listed in the Acknowledgement section above. This PCAP has also incorporated as many comments as possible from dozens received during three public webinars held on January 31 and February 1, 2024, and attended by a total of over 300 participants.[8] In all, this PCAP is the direct result of several distinct outreach and coordination pieces:

- A kick-off public webinar in August 2023
- Three regional public webinars on January 31 and February 1
- Monthly meetings of the State Agency CPRG Task Force
- Direct solicitation from State agencies on their top climate priorities for CPRG
- Continued conversations with MSAs leading their own planning grants
- Regular dialogue with air districts across the State
- Outreach and solicitation from local governments without CPRG planning grants
- Sector-specific coordination meetings across State and local agencies on goods movement, ZEV infrastructure, waste, bioenergy, agriculture, and natural and working lands
- Outreach and consultation with Tribal Nations

In addition, this draft PCAP includes layers of analysis and assessment. The statewide GHG inventory included here leverages the State's GHG emissions inventory. Using it and other robust and vetted data sources, this PCAP also includes the GHG abatement potential of

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[7] This includes but is not limited to: The 2022 Scoping Plan Update, The 2022 State Strategy for the State Implementation Plan, The Community Air Protection Blueprint, the SB 100 Joint Agency Report, the Climate Action Plan for Transportation Infrastructure, the Short-Lived Climate Pollution Strategy, the Climate Smart Lands Strategy, California Climate Insurance Report: Protecting Communities, Preserving Nature, and Building Resiliency, the SB1000 Electric Vehicle Infrastructure Deployment Assessment, 2021 Integrated Energy Policy Report: Vol 1: Building Decarbonization, Fourth Cap and Trade Auction Proceeds Investment Plan, Achieving Carbon Neutrality Report, and California Transportation Plan 2050.

[8] CARB. 2024. Public Comments on California's Draft Priority Climate Action Plan Under the U.S. EPA Climate Pollution Reduction Grants program. *https://ww2.arb.ca.gov/approved-comments?entity_id=34706*.

each measure included in this PCAP. In addition, mapping analysis was used to identify low-income and disadvantaged communities under U.S. EPA's recommended definition for CPRG, and against the State's existing definition. Both were used to assess the merit of PCAP measures to uplift equity and ensure benefits to low-income and disadvantaged communities. Across each measure, a review of the legal framework and authority to implement each measure was also carried out. Where possible, workforce considerations, job creation potential and interactions with other funding sources were assessed.

3. PCAP elements

Section three includes several PCAP elements: a statewide GHG emissions inventory, the State's overarching GHG targets, an overview of the State's approach to low-income and disadvantaged community benefits analysis, workforce considerations, and the measures that make up the bulk of this plan.

3.1 Greenhouse Gas (GHG) Inventory

This PCAP leverages California's AB 32 GHG Inventory[9] which was initiated after the passage of the State's landmark climate bill, the Global Warming Solutions Act, (AB 32), (Nunez, Chapter 488, Statutes of 2006).[10] The AB 32 inventory includes emissions from the following types of sources: fossil fuel combustion, including combustion for imported electricity consumed in state, by-products of chemical reactions in industrial processes, use of GHG-containing consumer products and human-made chemicals, agricultural operations, and recycling and waste sector operations. The exchange of ecosystem carbon between the atmosphere and plants and soils (including through wildfires) is separately quantified in the Natural and Working Lands Ecosystem Carbon Inventory.[11] The methods used to quantify emissions included in the AB 32 GHG Inventory are consistent with international and national practices[12] and meet the requirements of AB 32.

The 2023 edition of the AB 32 GHG Inventory includes the emissions of the seven GHGs identified in AB 32 for the years 2000 to 2021. There are additional climate pollutants that are not included in AB 32 that are tracked separately. These include black carbon and sulfuryl fluoride (SO_2F_2), which are discussed in the Short-Lived Climate Pollutant (SLCP)

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[9] CARB. 2023. California Greenhouse Gas Emissions from 2000 to 2021: Trends of Emissions and Other Indicators. *https://ww2.arb.ca.gov/sites/default/files/2023-12/2000_2021_ghg_inventory_trends.pdf* .

[10] CARB. AB 32 Global Warming Solutions Act of 2006. *https://ww2.arb.ca.gov/resources/fact-sheets/ab-32-global-warming-solutions-act-2006.*

[11] CARB. 2018. An Inventory of Ecosystem Carbon in California's Natural & Working Lands. *https://ww2.arb.ca.gov/sites/default/files/classic/cc/inventory/pubs/nwl_inventory.pdf*

[12] Intergovernmental Panel on Climate Change. IPCC Guidelines for National Greenhouse Gas Inventories, Volume 1 - General Guidance and Reporting. [Online]. Available: *https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol1.html*

Strategy,[13] and ozone depleting substances (ODS), which are being phased out under a 1987 international treaty.[14,15]

Statewide GHG emissions are calculated using several data sources. The primary data source is from reports submitted to CARB through the Regulation for the Mandatory Reporting of GHG Emissions (MRR).[16] MRR requires facilities and entities with more than 10,000 metric tons CO_2e per year of combustion and process emissions, all facilities belonging to certain industries, and all electricity importers to submit an annual GHG emissions data report directly to CARB. Reports from facilities and entities that emit more than 25,000 metric tons of CO_2e per year are verified by a CARB-accredited third-party verification body.[17]

CARB also relies on data from other California State and federal agencies to develop the AB 32 GHG Inventory. These agencies include, but are not limited to, the California Energy Commission, California Department of Tax and Fee Administration, California Department of Conservation, California Department of Food and Agriculture, California Department of Resources Recycling and Recovery, U.S. Energy Information Administration, and U.S. EPA. The timing for when these data sources are available drives the publication date for the AB 32 GHG Inventory each year. All data sources used to develop the AB 32 GHG Inventory are listed in supporting documentation alongside California's AB 32 GHG Emission Inventory Data.[18] Figure 1 below shows the breakdown of the most recent AB 32 inventory, and Figure 2 below shows how the State's overall levels of AB 32 sources have trended downward, in line with the State's climate targets and efforts, over the past 20 years. Lastly, Figure 3 shows the percentage of different gases that make up the State's total GHGs.

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[13] CARB. 2017. Short-Lived Climate Pollutant (SLCP) Strategy. [Online]. Available: *https://ww2.arb.ca.gov/our-work/programs/slcp*

[14] Many ODS substitutes are GHGs whose emissions are included in the AB 32 GHG Inventory, consistent with IPCC Guidelines.

[15] United Nations Environmental Programme, "About Montreal Protocol," 2023. [Online]. Available: https://www.unep.org/ozonaction/who-we-are/about-montreal-protocol.

[16] CARB. Mandatory Greenhouse Gas Reporting Regulation. *https://ww2.arb.ca.gov/mrr-regulation* .

[17] For additional information see: emissions data reported to MRR *https://ww2.arb.ca.gov/mrr-data.*

[18] CARB. Current California GHG Emission Inventory Data. *https://ww2.arb.ca.gov/ghg-inventory-data*.

Figure 1: California's AB 32 GHG Emissions Inventory

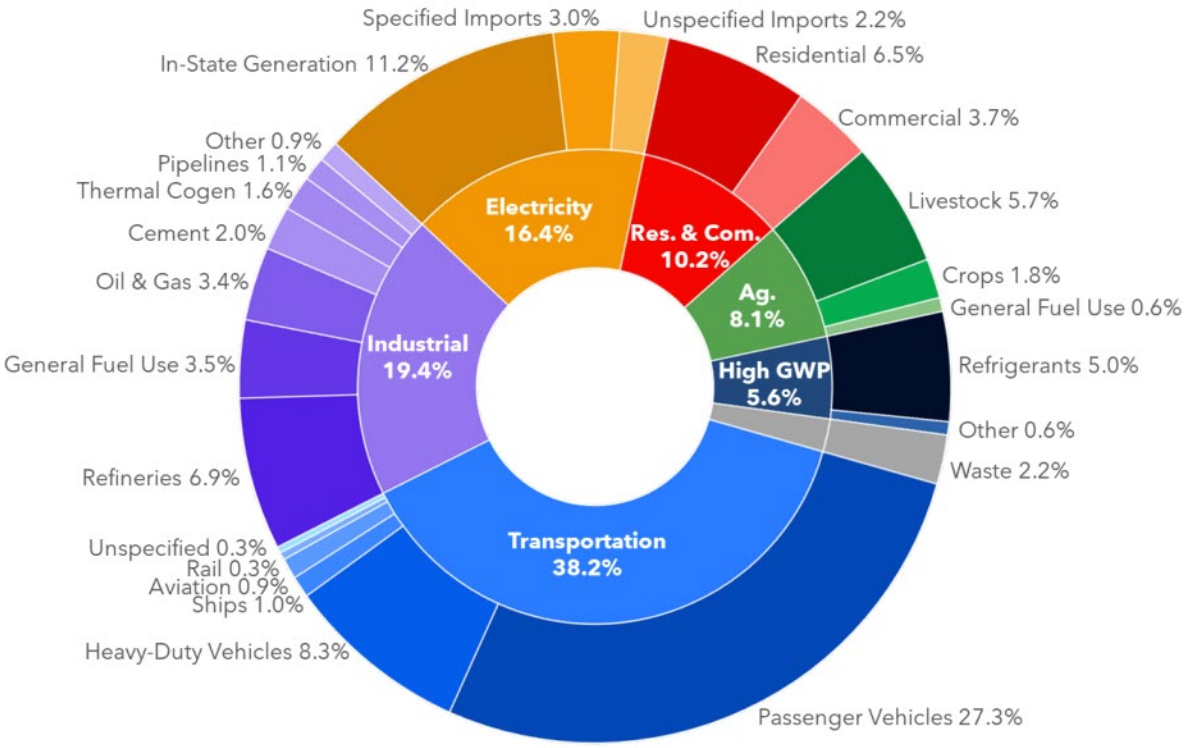

Figure 1 shows 2021 GHG emissions by Scoping Plan category. The inner ring shows the Scoping Plan sectors, while the outer shows the sub-sectors. Values do not reflect some rounding.

Figure 2: California's Annual Greenhouse Gas Emissions (2000 to 2022)

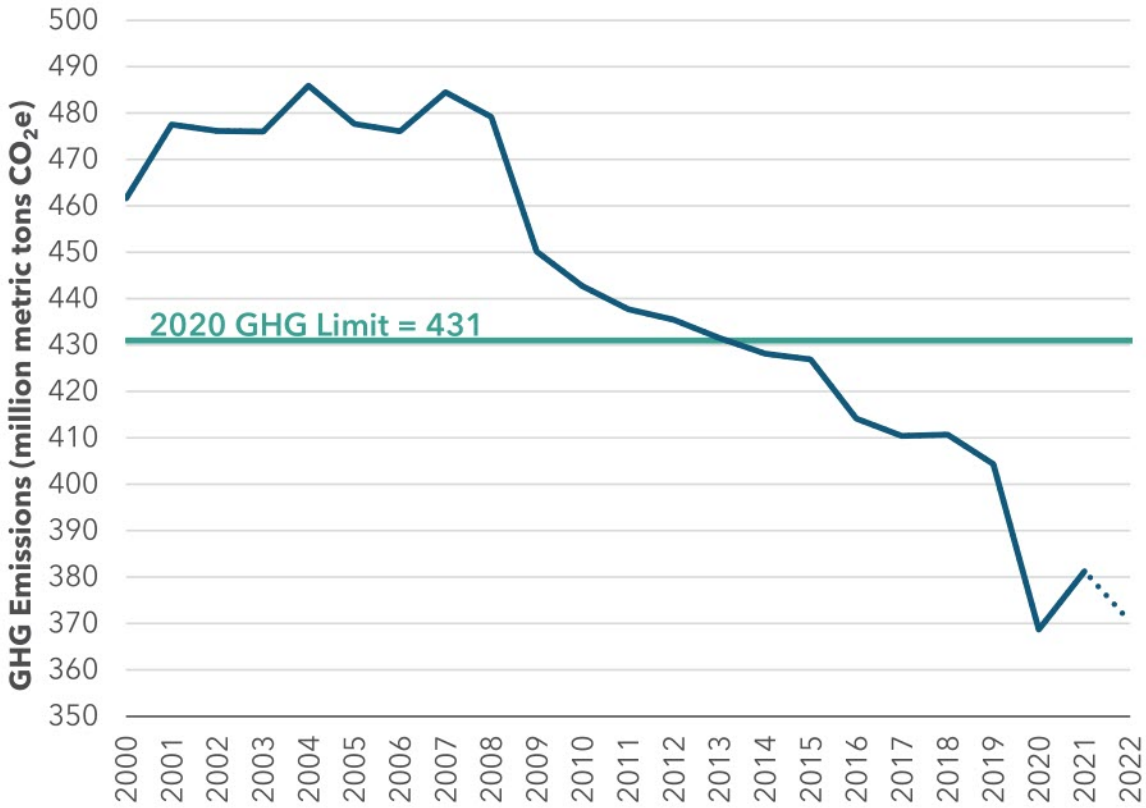

Figure 2 above shows California's annual GHG emissions from 2000 to 2021 in relation to the 2020 GHG Limit established by AB 32 **Error! Reference source not found.**. The dotted blue line shows an estimate of AB 32 GHG Inventory emissions for 2022 based solely on data reported and third-party verified to CARB pursuant to the Regulation for the Mandatory Reporting of GHG Emissions (MRR). The 2022 estimate is provided for informational purposes only and should not be used for any policy making decisions or regulatory compliance. The 2022 estimate of AB 32 GHG Inventory emissions is calculated as 2022 MRR non-biogenic emissions, divided by the ratio of 2019-2021 MRR non-biogenic emissions to 2019-2021 AB 32 GHG Inventory emissions. California's GHG emissions dropped below the 2020 GHG Limit in 2014 (428.2 $MMTCO_2e$) and have remained below this level since that time.

Figure 3: California's 2021 Greenhouse Gase Emissions by Gas

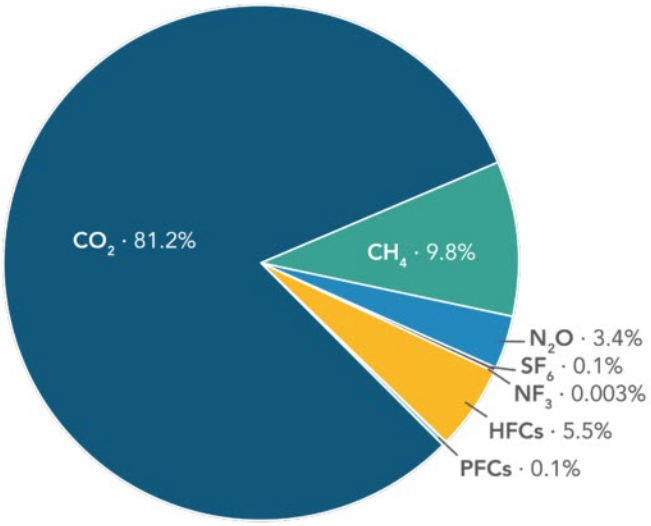

Figure 3 shows the 2021 GHG Emissions by gas. The above does not include biogenic CO_2 and sources "excluded" from the Inventory (e.g., international flights, military, international shipping).

3.2 GHG Reduction Targets

With the passage of AB 32 in 2006, California established its first statewide climate target – to return to 1990 GHG levels (431 MMT CO_2e) by 2020, which the State subsequently met several years ahead of schedule. In 2016, with the passage of SB 32 (Pavley, Chapter 249, Statutes of 2016),[19] California solidified the target to reduce statewide anthropogenic emissions 40% below 1990 levels by 2030. In 2022, the State codified its most ambitious target to date with the passage of AB 1279 (Muratsuchi, Chapter 337, Statutes of 2022),[20] which sets California on a path to reduce anthropogenic emissions 85% below 1990 levels by 2045 and to also achieve carbon neutrality by 2045. This PCAP and California's participation in U.S. EPA's CPRG Program are well aligned with the State's climate targets and the all-hands-on-deck approach to meeting them.

3.3 Prioritizing Benefits to Low-Income and Disadvantaged Communities

Addressing climate change and advancing California's equity and economic opportunity goals cannot be decoupled. In line with Governor Newsom's Executive Order N-16-22[21] to

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[19] 2016. California SB 32. *http://www.leginfo.ca.gov/pub/15-16/bill/sen/sb_0001-0050/sb_32_bill_20160908_chaptered.htm*
[20] 2022. California AB 1279. *https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202120220AB1279*
[21] 2022. Executive Order N-16-22. *https://www.gov.ca.gov/wp-content/uploads/2022/09/9.13.22-EO-N-16-22-Equity.pdf*

take additional actions to embed equity analysis and considerations, this plan works to center equity by addressing some of the disparities for historically underserved and marginalized communities. California strives to ensure that its climate and air research regulations, investments, and plans include provisions that specifically address and advance equity. This includes engaging with representatives of these communities, reducing and eliminating air pollution disparities, removing barriers that can prevent frontline communities from accessing benefits, lowering costs for low-income Californians, and promoting high-quality jobs. California can simultaneously confront the climate crisis and build a more resilient, just, and equitable future for all communities. Importantly, it is recognized that due to persisting health and opportunity gaps, not all communities are equally resilient in the face of climate impacts. The 2022 Scoping Plan Update began the work to better understand how to capture incremental additional economic impacts faced by overly burdened communities since a global metric, such as the Social Cost of Carbon, cannot adequately capture that detail.[22]

While the State has a long history of public health and environmental protection, California's unique weather, topography, and the size of its population and economic activity leave it with some of the worst air quality in the nation.: More than half of its residents (21 million of roughly 40 million) live in areas that exceed the most stringent federal ozone standard,[23] and the State is home to the only three 'extreme non-attainment' areas for federal ozone standards. As U.S. EPA recently established more health-protective fine particle limits, more regions of the state are falling into non-attainment of federal clean air quality standards. Low income and disadvantaged communities are more likely to live in these areas, often as a result of discriminatory practices such as redlining that have disproportionately exposed these communities to health hazards and pollution burdens that affect lives.[24] For example, Black children are four times more likely to be hospitalized for asthma compared with white children, and urban Black and Latino children are two to six times more likely to die from asthma than white children.[25] Native American children also experience more impacts from asthma and they, along with Black children, have the highest prevalence of asthma.[26] This context also elevates the urgent need to partner with federal leaders on pollution sources that are primarily under federal authority – such as interstate trucks, locomotives, and planes – and to invest federal funding in the kinds of proven emissions-reducing solutions included

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[22] CARB. 2022. Appendix K: Climate Vulnerability Metric. 2022 Scoping Plan for Carbon Neutrality. *https://ww2.arb.ca.gov/sites/default/files/2022-11/2022-sp-appendix-k-climate-vulnerability-metric_0.pdf*

[23] CARB. 2022. 2022 State Strategy for the State Implementation Plan. *https://ww2.arb.ca.gov/sites/default/files/2022-08/2022_State_SIP_Strategy.pdf* .

[24] CalEPA. 2021. Pollution and Prejudice: Redlining and Environmental Injustice in California. August 16. *https://storymaps.arcgis.com/stories/f167b251809c43778a2f9f040f43d2f5*

[25] California Department of Public Health. Asthma Inequities in California Children. 2021. *https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHIB/CPE/CDPH%20Document%20Library/CA_Asthma_Inequities_Children_2021-Infographic.pdf*

[26] Meng, Y., S. H. Babey, T. A. Hastert, and E. Brown. 2007. California's Racial and Ethnic Minorities More Adversely Affected by Asthma. UCLA: Center for Health Policy Research. Retrieved from *https://escholarship.org/uc/item/4k45v3xt*

in this PCAP. This PCAP helps deliver on the promise to close these disparities and move expeditiously away from fossil fuels and to clean alternatives. It also prioritizes working with the communities most impacted to ensure that these strategies address their needs.

For the purposes of this PCAP, and per U.S. EPA guidance, California is considering low-income and disadvantaged communities as identified through both the Climate and Economic Justice Screening Tool (CEJST) as well as the supplemental data from U.S. EPA's Environmental Justice Screening and Mapping Tool (EJScreen).[27] The footprint of the federal definition is visualized alongside a comparison of the State's definition for disadvantaged communities, as defined by California Senate Bill 535 (De León, Chapter 830, Statutes of 2012), which directs minimum funding levels from the State's Cap-and-Trade auction proceeds to be spent within and to benefit California's disadvantaged communities.[28]

[27] Data and EPA guidance can be found here: *https://www.epa.gov/inflation-reduction-act/cprg-tools-and-technical-assistance-low-income-and-disadvantaged*

[28] A summary of California's definitions for disadvantaged communities can be found here: *https://oehha.ca.gov/calenviroscreen/sb535*

Figure 4: Low Income and Disadvantaged Communities under CPRG

Federal disadvantaged status based on EPA IRA map (Jan 2024).
California status based on SB 535 designation (May 2022).
Tribal areas are generally considered disadvantaged for both; map is based on SB 535 tribal areas.

California State Parks, Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, USFWS

CARB also has conducted a spatial analysis to assess how the climate measures included in Section 3.5 below would affect low-income and disadvantaged communities across California (inclusive of the yellow and light blue areas in Figure 4 above).

In summary, CARB's analysis considers how the measures below would affect low-income and disadvantaged communities that live in or near: regions of the State not attaining federal air quality standards; near ports and federally recognized freight corridors; fossil gas power plants; large industrial facilities; forested areas prone to wildfire risk; proposed wetland remediation sites; and often remote and underserved Tribal lands and rural areas with limited infrastructure and job opportunities. This analysis also looks at how U.S. EPA's definition of low income and disadvantaged communities overlaps with areas of California expected to bear the greatest cost from both the effects of climate change and the cost of confronting it. While this is not an exhaustive list of the impacts that could be disproportionately felt by low-income and disadvantaged communities, even this analysis shows that over 90% of low income and disadvantaged communities in California would benefit from the package of measures included in this PCAP. The data sources, methods, and results of this analysis can be found in Appendix A.

3.4 Workforce Considerations

California is working aggressively to transition away from fossil fuels, reach its climate goals, and ensure that its climate policies generate high-quality, local jobs.

The State acknowledges the challenge associated with transitioning to carbon neutrality, especially for workers in fossil fuel industries, and has developed job training and job placement programs to assist in this workforce transition. Programs such as the Community Economic Resilience Fund Program (CERF) and the Regional Investment Initiative within the Governor's California Jobs First portfolio support this transition. These programs specifically aid communities and regional groups in producing regional roadmaps for economic recovery and resilience that prioritize the creation of accessible, high-quality jobs in sustainable industries.[29] Additionally, programs like the California Conservation Corps' Training and Workforce Development Program provides funding for job training and workforce development in the building energy efficiency and forestry sectors.[30]

California Climate Investments (CCI) – the State's fund through which its Cap-and-Trade auction proceeds flow – has funded 569,477 projects and subsidies totaling $9.8 billion as of May 2023, which are expected to reduce an estimated 98 $MMTCO_2e$.[31] Cumulatively, $7.2 billion in implemented funds are benefiting disadvantaged communities and low-income households and communities, and low-income household in California. CARB estimates through its models that for roughly $7.5 billion of awarded CCI funds, 85,000 direct, indirect, and induced jobs are being supported.[32] Workforce development is a critical part of this existing funding opportunity at the State level.

Furthering efforts to facilitate the workforce transition, in 2021, the California State Legislature passed Assembly Bill 680 (AB 680) (Burke, Chapter 746, Statutes of 2021), requiring that CARB work with the California Labor and Workforce Development Agency to

update the Funding Guidelines for Agencies that administer CCI (Funding Guidelines) to include new workforce standards. Specifically, the Funding Guidelines were updated to require administering agencies to prioritize investments in projects that directly support jobs or job training and placement programs. Although these standards are only required for a subset of CCI programs, all programs are encouraged to incorporate recommended workforce development strategies and workforce standards to support a robust workforce in the new, low-carbon economy and improve access to high-quality jobs. As many of the measures in this plan leverage existing programs funded by CCI, this PCAP similarly supports the growth of high-quality jobs.

In addition, the California High-Speed Rail Project, which receives substantial funding from CCI, along with $3.1 billion in federal funds, has been a job creator. The project has directly supported 92,000 job-years of employment and generated $18 billion in total economic activity. In addition, the High-Speed Rail Authority's expenditures through completion of the Phase 1 system from San Francisco to Los Angeles/Anaheim are expected to support 945,000 job-years, nearly $79 billion in labor income, and $203.6 billion in total economic output, with a focus on construction employment and training opportunities that also benefit economically disadvantaged areas.

CPRG funding, alongside the State's climate investments, will further accelerate growth in the high-quality jobs that underpin State and federal climate efforts, and that help deliver cleaner air for communities most impacted by air pollution.

3.5 GHG Reduction Measures

The list of measures presented below outline necessary and no-regrets actions that will help ensure the State and the U.S. stay on course to avoid the worse effects of climate change. The measures are grouped into seven sectors: transportation, industrial, energy, high global warming potential, agriculture, natural and working lands, and waste. Some measures have been included by contributing State agencies, while others, listed at the end of each subsection, have been nominated by communities or local governments without their own CPRG planning grants.

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[29] Office of Planning and Research. Community Economic Resilience Fund. https://opr.ca.gov/economic-development/cerf/

[30] California Climate Investments. 2022 Profiles: California Conservation Corps Supporting San Bernardino Mountains Restoration. *https://www.caclimateinvestments.ca.gov/2022-profiles-1/cccsanbernardino*

[31] 2023. California High Speed Rail Authority. *https://hsr.ca.gov/wp-content/uploads/2024/01/Agenda-Item-4-FY2022-23-Economic-Impact-Analysis-Fact-Sheet-011824-A11Y.pdf* .

[32] 2023. Annual Report: Cap-and-Trade Auction Proceeds. *https://ww2.arb.ca.gov/sites/default/files/auction-proceeds/cci_annual_report_2023.pdf*

Per U.S. EPA's PCAP guidelines,[33] each measure below contains a description of many elements. Calculations are provided to assess how each measure would reduce GHGs (see disclaimer below). A qualitative analysis of its benefits to low-income and disadvantaged communities along with other benefits is also included. Agencies and programs that could implement the measure and a review of their authority to implement them are enumerated, and where possible, the interaction of the measure with other funding sources is outlined. Lastly, an outline of the expected schedule of milestones and metrics for tracking implementation success are included for each measure.

Disclaimer on GHG emissions estimates

Estimates of GHG reductions for each measure below rely on many unknown factors, including the level of additional funding support each measure would receive. The estimates below draw from past allocations to similar programs as well as data on past program performance, among other sources. It is also difficult to isolate the impact of any one specific measure or project given the portfolio approach California is taking to reduce its greenhouse gas emissions. This approach for developing estimates is also overly conservative because it does not capture economies of scale as technologies become less expensive to deploy. Because methods may vary, estimates presented in this PCAP may not match quantification estimates of similar actions conducted for other State plans, regulations, or incentive programs. For some of the calculations, data were limited, which may also result in differences in what is estimated in this document versus actual reductions achieved in practice. Finally, the estimates provided in this document should not be used for any other purpose outside of this document.

Transportation

The transportation sector has long relied on liquid petroleum fuels as the primary energy source for internal combustion engine vehicles, including cars, trucks, locomotives, aircraft, marine, construction, agriculture, and other off-road equipment. Combustion of fossil fuels in vehicles emits significant amounts of GHGs, criteria pollutants, and toxic air contaminants. In 2021, the transportation sector, when including fossil fuels processing, accounted for approximately 50% of statewide GHG emissions.[34] As seen in Figure 5 below, the largest source of GHGs from this sector is passenger vehicles.

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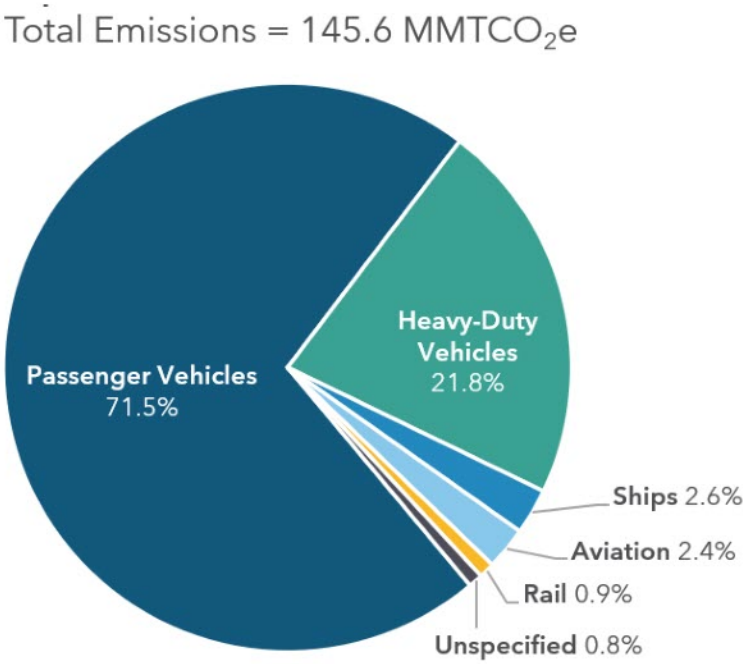
[33] Guidance for State development of PCAPs can be found on U.S. EPA's website: *https://www.epa.gov/inflation-reduction-act/about-cprg-planning-grant-information*

[34] CARB. Current California GHG Emission Inventory Data. *https://ww2.arb.ca.gov/ghg-inventory-data*.

Figure 5: Transportation Sector Emissions in 2021



In addition, the transportation sector accounted for over 80% of statewide NO_x emissions and 30% of fine particulate matter emissions, including toxic diesel particulate matter.[35] In California, communities adjacent to congested roadways, including ports and distribution centers, are often low-income or communities of color. These communities are exposed to the highest concentration of criteria and toxic air pollution from vehicles and equipment consuming fossil fuels, leading to a number of demonstrated health impacts such as respiratory illnesses, higher likelihood of cancer development, and premature death.[36] While CARB's programs, along with local action, have made substantial progress in reducing harmful local air pollution over the past few decades,[37] it is clear that California must transition away from fossil fuels to zero-emissions technologies in order to meet its GHG and air quality targets.

California is a leader in designing and implementing transportation decarbonization policies. Delivering on Governor Newsom's Executive Order N-79-20[38] to transition away

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[35] CARB. California Greenhouse Gas Emission Inventory Program. *https://ww2.arb.ca.gov/our-work/programs/ghg-inventory-program*

[36] CARB. Overview: Diesel Exhaust & Health. *https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health*

[37] CARB. 2022. 2022 State Strategy for the State Implementation Plan. *https://ww2.arb.ca.gov/sites/default/files/2022-08/2022_State_SIP_Strategy.pdf*.

[38] CARB. Governor Newsom's Zero-Emission by 2035 Executive Order (N-79-20). *https://ww2.arb.ca.gov/resources/fact-sheets/governor-newsoms-zero-emission-2035-executive-order-n-79-20*.

from internal combustion vehicles, CARB's Advanced Clean Cars II Regulation (ACCII)[39] requires manufacturers to sell an increasing number of zero-emissions cars, SUVs, and light-duty trucks, reaching 100% by 2035. California hit its goal of 1.5 million light-duty ZEVs on the road in April 2023, two years ahead of schedule. CARB's Advanced Clean Trucks Regulation (ACT)[40] similarly requires truck manufacturers to sell zero-emissions trucks (100% by 2045 where possible). The Advanced Clean Fleets Rule (ACF),[41] adopted in 2023, requires specific truck fleets to buy zero-emissions trucks as soon as 2024.

The State's Low Carbon Fuel Standard[42] is the primary mechanism to transform the transportation fuel pool with low-carbon energy alternatives and is in the process of being updated to further support growth in renewable and clean transportation fuels.[43] The State also has supported several policies and programs, many developed by and with local representatives of California's low-income and disadvantaged communities, that provide alternatives to driving, such as transit, walking and biking, to reduce overall vehicle miles travelled.

Funds from CPRG would leverage California's pioneering and proven transportation policies and help deliver GHG and cobenefits faster, especially for low-income and disadvantaged communities. California's proposed measures under transportation also further support U.S. EPA's Clean Ports Initiative[44] and proposed vehicle standards,[45] as well as President Biden's 2030 GHG targets.[46] The measures below outline critical transportation measures across goods movement, community-focused transportation options, and light-duty zero-emissions vehicles and infrastructure.

Transportation Measure 1: Create a Holistic, Heavy-Duty Zero-Emissions Vehicle Buydown Program

The newly created Heavy-Duty Zero-Emissions Vehicle Buydown Program would expand and leverage three existing programs to accelerate the deployment of zero-emissions (ZE) medium- and heavy-duty (MHD) vehicles, particularly for small fleets that face the greatest barriers to their adoption. While CARB has regulations in place to require the cleanest

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[39] CARB. Advanced Clean Cars II. *https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/advanced-clean-cars-ii.*
[40] CARB. Advanced Clean Trucks.*https://ww2.arb.ca.gov/our-work/programs/advanced-clean-trucks.*
[41] CARB. Advanced Clean Fleets.*https://ww2.arb.ca.gov/our-work/programs/advanced-clean-fleets.*
[42] CARB. Low Carbon Fuel Standard. *https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard.*
[43] CARB. Proposed Low Carbon Fuel Standard Amendments. *https://ww2.arb.ca.gov/rulemaking/2024/lcfs2024.*
https://ww2.arb.ca.gov/rulemaking/2024/lcfs2024
[44] U.S. EPA. Ports Initiative. *https://www.epa.gov/ports-initiative.*
[45] U.S. EPA. Biden-Harris Administration Proposes Strongest-Ever Pollution Standards for Cars and Trucks to Accelerate Transition to a Clean-Transportation Future. *https://www.epa.gov/newsreleases/biden-harris-administration-proposes-strongest-ever-pollution-standards-cars-and*
[46] U.S. White House. 2021. Fact Sheet: President Biden Sets 2030 Greenhouse Gas Pollution Reduction Target Aimed at Creating Good-Paying Union Jobs and Securing U.S. Leadership on Clean Energy Technologies. *https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/fact-sheet-president-biden-sets-2030-greenhouse-gas-pollution-reduction-target-aimed-at-creating-good-paying-union-jobs-and-securing-u-s-leadership-on-clean-energy-technologies/*

technology for specific fleets, many smaller fleets are not subject to such regulations. This measure would accelerate and provide stronger support for the transition to ZE technology for small fleets by building off the Clean Truck and Bus Incentive Program (HVIP)[47] that provides vouchers for medium- and heavy-duty vehicle purchases; the Innovative Small E-fleet[48] program that helps small fleets access ZE trucks; and a new ZEV loan pilot program under development.[49] CARB could lead this measure with key roles for the State Treasurer's Office and the California Energy Commission. Alternatively, this measure could be leveraged by local governments eligible to apply for CPRG implementation grants looking to purchase, finance, or subsidize ZE trucks directly. This measure builds off CARB's successful incentive and loan programs that have been in place for over 10 years, have appropriated $3.7 billion in funding, leveraged millions of dollars in private funding, and have helped deploy thousands of cleaner trucks. CARB's existing loan programs have a low default rate of 4%.

The combined, new program under this measure would simultaneously help overcome two barriers faced by small fleets: 1) the high upfront cost of ZE trucks, and 2) the difficulty encountered by small fleets in qualifying for affordable loans, which are very difficult for small fleets to obtain without the significant buy-down this program would offer. The program could also potentially create a used-vehicle voucher incentive, which CARB's current incentive programs do not cover, to prove the residual value of ZE MHD trucks and further develop the ZE MHD market. This innovative program could be replicated by other states and influence national initiatives for cleaner transportation.

California's MHD vehicles contribute disproportionately to mobile source emissions. They comprise roughly 3% of California's 30 million vehicles but are responsible for one-third of mobile source NO_x emissions and one-fourth of mobile source GHG emissions. Diesel exhaust emissions are classified as carcinogenic toxic air contaminants and account for 70% of the known cancer risk from toxic air contaminants in California.[50] Due to historical inequities, low-income and disadvantaged communities are often located close to goods movement operations and have higher incidents of such diseases. To achieve equitable public health outcomes across the State, California must continue to pursue all available avenues to invest in ZE MHD vehicles, and this measure can play a pivotal role in achieving those goals. In addition, consistent with Justice40 targets, this measure would leverage CARB's existing outreach and engagement practices to ensure that ZE MHD investments benefit the most disadvantaged communities.

If implemented statewide and depending on total funding support, this measure could lead to annual emissions reductions of approximately 109,000 $MTCO_2e$, as well as 436,000

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[47] CARB. Clean Truck and Bus Vouchers (HVIP). *https://ww2.arb.ca.gov/resources/fact-sheets/clean-truck-and-bus-vouchers-hvip.*

[48] CARB. Innovative Small e-Fleet Pilot Program. *https://ww2.arb.ca.gov/resources/fact-sheets/innovative-small-e-fleet-pilot-program.*

[49] CARB. Truck Loan Assistance. *https://ww2.arb.ca.gov/resources/fact-sheets/truck-loan-assistance.*

[50] *Ibid.*

$MTCO_2e$ cumulatively between 2025 and 2030, and 2,615,000 $MTCO_2e$ cumulatively between 2025 and 2050.[51]

In terms of implementation, this measure could be defined by the following key phases and milestones: conduct outreach to small fleet operators to identify and prioritize needs (first three to six months); conduct outreach to low-income and disadvantaged communities near freight sites and corridors to maximize direct community benefits of CPRG investments (first three to six months); conduct public workshop on proposed investment (within first year); enroll private lenders and establish agreements to access loan-loss reserve (first year); launch program (first/second year); deploy loans and track ZE MHD vehicle purchases (continuously as needed); and amend program as needed.

To track progress under this measure, CARB would rely on and expand existing systems that require detailed reports for loan and incentive programs and regulatory compliance. For example, these systems track vehicle purchases under CARB programs, active finance and insurance companies in the ZE MHD vehicle market, and underpin publicly available data dashboards. These data, alongside vehicle registration and other sources, would allow CARB to create regular reports on this measure.

Many laws authorize and govern existing programs and would similarly apply to the new Heavy-Duty Zero-Emissions Vehicle Buydown Program. SB 372 (Leyva, Chapter 639, Statutes of 2021)[52] requires that CARB provide financial and non-financial assistance to applicants for ZEVs. AB 1496 (Chapter 1164, Statutes of 1993) established the California Capital Access Program, approving CARB as an "Independent Contributor," which is an entity that contributes funds to a loan support program, in this case, one that assists fleets procure loans at lower interest rates. In addition, CARB has offered cleaner vehicle incentives since 1998 when the Carl Moyer Program — supporting the transition away from the State's dirtiest diesel trucks to the latest, cleaner technologies — was first enacted by state law. In 2012, three bills were approved — AB 1532 (Pérez, Chapter 807), SB (SB) 535 (de León, Chapter 830), and SB 1018 (Budget and Fiscal Review Committee, Chapter 39) — that established the Greenhouse Gas Reduction Fund (GGRF) to receive Cap-and-Trade auction proceeds and provide a framework for investing the proceeds to further the purposes of California's groundbreaking climate law, AB 32 (Nunez, Chapter 488, Statutes of 2006). This framework also underpins CCI, the main program to distribute GGRF funds and mentioned in section 3.4 above. Many local governments could also demonstrate their authority to implement this measure.

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[51] See disclaimer about GHG emissions reductions estimates on page 21.

[52] 2021. California SB 372. *https://legiscan.com/CA/text/SB372/id/2436302*.

Transportation Measure 2: Install Truck Charging to Support Zero-Emissions Goods Movement at California Ports and Warehouse Districts

This measure would accelerate the development of charging infrastructure and hydrogen refueling stations. This measure could be administered by local governments or across the State by leveraging and adding federal funds to an existing block grant program run by the California Energy Commission (CEC) and administered by CALSTART.[53] That program, known as Energy Infrastructure Incentives for Zero-Emissions Commercial Vehicles, or EnergIIZE,[54] is the nation's first large-scale commercial fleet ZE infrastructure incentive project, and is run in coordination with the programs that underpin Transportation Measure 1 above to provide fleets with a suite of ZE upgrades. Under statewide implementation, CEC would manage the federal funds, conduct oversight, and provide general direction while CALSTART would administer the program in conjunction with Tetra Tech.[55] CPRG awards via EnergIIZE would prioritize urgently needed, shovel-ready projects, with strong operations plans and community-level benefits.

Past rounds of EnergIIZE funding were oversubscribed *within minutes*, definitive proof that the need for ZE medium- and heavy-duty charging infrastructure in California is pressing. That need will only grow as a result of the State's existing climate goals and regulations that are compelling the transition to ZE MHD vehicles and equipment. Accordingly, the scale of statewide truck charging needed is immense; there are about 1 million MHD trucks in California currently, and the most recent CEC Report[56] estimates that 109,000 depot and 5,500 public electric vehicle chargers will be needed to support 155,000 MHD EVs in 2030. By 2035, California will need about 256,000 depot and 8,500 public electric vehicle chargers to support 377,000 MHD EVs. Electrification infrastructure for the trucking industry will require continued and significant funding and will likely prove more complex than light-duty vehicle charging due to the need for higher-powered chargers, higher site-level power levels, and larger site footprints. Recent data show that MHD vehicles and infrastructure technology have matured, and this measure could utilize additional funding quickly.

Ultimately, the resulting GHG reductions from this measure will be influenced by several factors, including the size of an overall award under CPRG, the portion of each project covered by federal funding, the amount of match required (CEC traditionally uses a 50% match requirement for charger incentive funding), and whether it is a public or private depot station. Given these considerations, and if implemented statewide, this measure could lead to annual emissions reductions of approximately 18,000 $MTCO_2e$, as well as

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[53] CALSTART is a nonprofit organization working nationally and internationally with businesses and governments to develop clean, efficient transportation solutions. *https://calstart.org/.*

[54] EnergIIZE website: *https://energiize.org/resources..*

[55] Tetra Tech website: *https://www.tetratech.com/.*

[56] CEC. Electric Vehicle Charging Infrastructure Assessment - AB 2127. *https://www.energy.ca.gov/data-reports/reports/electric-vehicle-charging-infrastructure-assessment-ab-2127.*

roughly 74,000 $MTCO_2e$ cumulatively between 2025 and 2030, and 441,000 $MTCO_2e$ cumulatively between 2025 and 2050.[57]

In addition, as described in Transportation Measure 1 above, investments in ZE goods movement will greatly improve public health, particularly for low-income and disadvantaged communities often traversed and intersected by MHD vehicles. This is especially true of the concentrations of distribution centers and the many related delivery trucks that, in California, are most often found in or adjacent to low-income and disadvantaged communities. Addressing this disparity equitably will be aided by leveraging CEC's Disadvantaged Communities Advisory Group,[58] a legislative-created body that advises the CEC on energy issues in California. Federal funding could be folded under CEC's annual process to draft and solicit feedback on investment plans through a robust public process and in consultation with an advisory group that includes members of disadvantaged communities. Similar to Justice40, CEC's funding programs have long required that 50% of benefits accrue to low-income and disadvantaged communities.

To implement this measure, CEC or local governments could: conduct outreach to port operators and logistics companies to prioritize investments (first six months); conduct outreach to low-income and disadvantaged communities proximate to potential project sites to maximize direct community benefits of such investments (first six months); finalize ports, warehouses, and connecting corridors to be targeted with CPRG funding (within first year); finalize analysis of chargers, energy levels, number of ports, and all associated costs (within first year); conduct public workshops (within first year); launch the measure (at start of second year); and monitor the construction and other metrics of the measure (continuously as needed).

To ensure progress of this measure, government agencies could require site owners and operators to document: site control, permits or permit applications, outreach to local communities, consultation with utility providers, statements of intent from fleet operators, clear descriptions of construction and operation plans, and a maintenance and operation plan to meet uptime requirements. Following any awards, CEC or local governments could track construction progress and charger uptime and operation.

The authority for CEC to implement this measure is well established by the Warren Alquist Act, which created the CEC and its purview;[59] AB 118 (Núñez, Chapter 750, Statutes of 2007) that created CEC's Clean Transportation Program, and AB 8 (Perea, Chapter 401, Statutes of 2013) and AB 126 (Reyes/Gonzalez), which extended the program. AB 2127 (Ting, Chapter 365, Statutes of 2018) further requires CEC to publish a biennial report on

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[57] See disclaimer about GHG emissions reductions estimates on page 21.

[58] This group was established by Senate Bill 350 (de León, Chapter 547, Statutes of 2015), the Clean Energy and Pollution Reduction Act of 2015. (California Leg Info. 2015: SB 350. October 7. *SB 350 Senate Bill – CHAPTERED (ca.gov)*)

[59] CEC. About. *https://www.energy.ca.gov/about*.

the charging infrastructure needed to meet California's zero-emission vehicle targets and SB 1000 (Lara, Chapter 368, Statutes of 2018) requires CEC, in consultation with CARB, to assess equity in funded transportation projects. Many local governments could also demonstrate authority to implement this measure.

Transportation Measure 3: Advance the Deployment of Clean Off-Road Equipment

This measure would expand programs and efforts that help lower the upfront cost and deploy ZE heavy-duty off-road equipment, including ZE agricultural equipment, airport ground support equipment, cargo handling equipment, commercial harbor craft, construction equipment, heavier lift forklifts, mobile power units, railcar movers and freight locomotives, terminal tractors (yard trucks), transport refrigeration units, and Electric Vehicle Supply Equipment (EVSE) and other supporting infrastructure. This measure is largely informed from CARB's experience implementing the Clean Off-Road Equipment Voucher Incentive Project (CORE).[60] This streamlined voucher incentive project helps offset the higher cost of ZE technology with a point-of-sale discount. CARB could similarly lead this measure, with CALSTART already competitively selected to provide implementation support. Alternatively, air districts, local governments, and port authorities, each with eligibility to receive CPRG implementation funds, could also implement this measure. CARB's experience with CORE illustrates the need for this measure as well as its potential outcomes and benefits.

The outstanding need for this measure can be illustrated in part by CORE's success to date. Demand for CORE funding has been high, and the project has been oversubscribed each funding cycle since its inception in 2020. For example, in 2022, $125 million in CORE funding was oversubscribed by more than $100 million, and three of the 10 eligible equipment categories sold out within 90 minutes. In 2023, $185 million was available, and within 60 minutes, three of the 11 categories were oversubscribed. In the last round, a $10 million small business set aside was exhausted within 22 minutes. Given how many pieces of fossil fueled off-road equipment exist in California, CARB staff expect demand for programs like CORE to remain high. Meanwhile, funding to meet such demand is uncertain.

If implemented statewide, and depending on total additional funding, this measure could lead to annual emissions reductions of approximately 10,000 $MTCO_2e$, as well as 41,000 $MTCO_2e$ cumulatively between 2025 and 2030, and 244,000 $MTCO_2e$ cumulatively between 2025 and 2050.[61]

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[60] CARB. Clean Off-Road Equipment Vouchers. *https://ww2.arb.ca.gov/our-work/programs/clean-off-road-equipment-voucher-incentive-project*.

[61] See disclaimer about GHG emissions reductions estimates on page 21.

As with the above goods movement measures, a transition to ZE off-road equipment carries measurable air quality and other cobenefits that would lessen pollution and public health burdens most often shouldered by low-income and disadvantaged communities. CORE also currently aims for at least 50% of funding to support equipment domiciled in disadvantaged communities, and to date, has achieved a rate higher than 75%. The CORE team would continue these practices under this measure, as well as continue to conduct outreach and partnership with community-based organizations, along with efforts to convene community members and equipment manufacturers to foster communication and ZE equipment awareness.

This measure would help encourage additional manufacturers to bring ZE products to market, support technology transfer to new equipment types and market segments and grow the overall ZE off-road market. The benefits of this measure, and related lessons learned and technologies developed, would apply not only to California but across the U.S.

In the first three to six months of this measure, the key implementation features could include outreach to potential applicants as well as low-income and disadvantaged communities to maximize their direct benefits from CPRG investment. Public workshops could follow in the first year, and the program could process applications and make awards in the beginning of the second year.

To track progress under this measure CARB would rely on and expand existing systems that require detailed reports for incentive programs, including tracking the number and cost of equipment purchased and operated under this measure. Tracked progress could be made available through regular reports and public dashboards.

CARB's authority to implement this measure is well established. In addition to the bills that established the State's GGRF to further statewide climate investments as mentioned under Transportation Measure 1 above, AB 118 (Nunez, Chapter 750, Statutes of 2007) created the Air Quality Improvement Program (AQIP), a voluntary incentive program implemented by CARB to fund clean vehicle and equipment projects, air quality research, and workforce training. Several bills have appropriated funding from the GGRF or through AQIP to fund ZE technology, including ZE equipment through CORE. Governor Newsom's Executive Order N-79-20 also calls for 100% of off-road vehicles and equipment operations to be ZE by 2035 where feasible. Many local governments could also demonstrate authority to implement this measure.

Transportation Measure 4: Bolster Investments in the State's Sustainable Port and Freight Infrastructure

This measure would augment the Sustainable Port and Freight Infrastructure Program (PFIP),[62] which advances clean, efficient, sustainable, and resilient port and freight infrastructure. At its core, PFIP and this measure would champion projects that deploy electric equipment and vehicles, renewable energy, and other emissions-reducing technologies. While PFIP projects vary according to context-specific needs, they include strategically integrating electrical infrastructure into port projects to reduce emissions during vessel berthing; optimizing truck access to vital freight hubs; installation of all-electric heavy lift cargo cranes; and much more. Increased funding under CPRG in the future would empower PFIP to unlock GHG emissions reductions, improve air quality, and bolster logistics and economic efficiency of goods movement across the State and beyond.

The State's ambitious $1.2 billion initial allocation provided an effective kickstart to PFIP and showed that additional funding would be needed to fully meet the critical needs it identified. In its pipeline of emissions reducing projects, PFIP has showed that there are at least $430 million worth of shovel-ready projects that fit within PFIP's objectives of reducing environmental impacts.

If implemented statewide and depending on total additional funding, this measure could lead to annual emissions reductions of approximately 18,000 $MTCO_2e$, as well as roughly 72,000 $MTCO_2e$ cumulatively between 2025 and 2030, and 434,000 $MTCO_2e$ cumulatively between 2025 and 2050.[63]

The California State Transportation Agency and the California Department of Transportation could lead this measure in partnership with local governments, ports, air quality management districts, and rail operators. Alternately, local governments whose projects have been submitted and vetted by the PFIP program but have been waitlisted, could also implement this measure by pursuing CPRG funding for eligible projects that were not funded in the original PFIP award.

As described in the above goods movement transportation measures, PFIP projects would cut air pollution across the State's most burdened populations, many of which are adjacent to some of the nation's largest port operations. PFIP projects would also help reduce NO_x and $PM_{2.5}$ emissions from freight – a large contributor for non-attainment of the National Ambient Air Quality Standards for ozone and $PM_{2.5}$. Quarterly reports would also include public-facing activities to help ensure meaningful engagement with communities effected by each project, and the California Department of Transportation Office of State Planning, Equity, & Engagement framework would be followed.

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[62] CalSTA. Freight, Rail and Border. *https://calsta.ca.gov/subject-areas/freight-rail-border.*

[63] See disclaimer about GHG emissions reductions estimates on page 21.

Different projects under PFIP also have the potential to generate local, high-quality jobs. Standards to ensure the inclusion of job quality that are embedded in PFIP include community workforce agreements, diversity and inclusion initiatives, career advancement opportunities, local hiring preferences, regular workforce feedback mechanisms, collaboration with workforce development agencies, and inclusive hiring practices for underserved groups. This measure would also help modernize goods movement systems to improve economic efficiency and help strengthen State and U.S. goods movement operations.

As this measure focuses on shovel-ready sustainable port and freight projects, milestones of this measure in the first year would include outreach to potential project leads and impacted communities, prioritization of projects to fund, any public events to advertise this measure, project selection, and the award of funding. Continuously thereafter, progress on awarded projects would be tracked.

To ensure success, quarterly progress reports could be required under this measure. In addition, implementing authorities could be required to submit a final delivery report that compares proposed and delivered project elements, including project scope and timeline, performance outcomes, and final costs by component and fund type.

In addition to a proven track record to implement such projects, several laws and directives ensure the State's authority to implement this measure. For example, SB 198 (Chapter 71, Statutes of 2022) established the PFIP Program. [64] Other bills and directives also further underpin the State's authority to implement this measure.[65] Many local governments could substantiate their own authority to implement this measure as well.

Transportation Measure 5: Support Mobility Projects Uplifted by Communities

This measure would expand existing grant programs to fund projects identified by communities, including any that local governments would like to pursue under CPRG. This measure would also cover clean mobility projects identified through CARB's Clean Mobility in Schools (CMIS), the Sustainable Transportation Equity Project (STEP), or the Clean Mobility Options Program, which each aim to directly improve transportation equity in disadvantaged and low-income communities by addressing community-identified transportation needs, increasing access to key destinations and services, reducing vehicle

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[64] SB 198 also established the Transportation Infrastructure Climate Adaptation Strategy Grant Program and the Local Transportation Infrastructure Climate Adaptation Project Program, both designed to tackle climate-related challenges in transportation systems. California Legislative Info. 2022: SB 198. June 30. *https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220SB198*

[65] These include, but are not limited to, SB 375 which aims to reduce greenhouse gas emissions by integrating land use, transportation, and housing planning, Executive Order B-16-12 which outlines directives to improve the efficiency of freight transportation in California,

miles travelled (VMT), and reducing GHGs. This measure aims to elevate unique transportation concerns and to address different barriers faced by various communities.

This measure would cover a diverse collection of projects, including active transportation infrastructure; new and expanded zero-emission public transit and school bus services; and shared mobility services such as ZE micro transit and e-bike lending libraries. The projects could also include a variety of necessary supporting elements such as workforce training in the clean transportation sector; diverse community engagement, outreach, and education activities; displacement avoidance considerations; and clean transportation subsidies.

Under implementation by CARB, qualified but unfunded projects from the CMIS, STEP, or CMO programs would be prioritized. The combined total need of such unfunded projects is substantial, and funding from CPRG for these community-driven transportation solutions could be matched with local sources and any available State funding.

Many of the projects identified through CARB's programs have been chosen because they benefit low-income and disadvantaged communities. In addition, projects were chosen because they were informed and developed through a concerted process of community engagement that was inclusive and representative of the diversity of the community being served. All proposed projects also identified ways in which, through the proposed project, community-led decision-making would continue, including through direct community decision making, focus groups, and surveys.

If implemented statewide and depending on total additional funding, this measure could lead to annual emissions reductions of approximately 1,000 $MTCO_2e$, as well as 4,000 $MTCO_2e$ cumulatively between 2025 and 2030, and 25,000 $MTCO_2e$ cumulatively between 2025 and 2050.[66]

This measure could be implemented by or alongside various local authorities and community-based organizations. CARB would also leverage a network of local implementers working on community-based clean mobility projects through an effort known as the Clean Mobility Equity Alliance. The partnerships developed through CMEA and between local governments and community-based organizations would help build the social infrastructure needed to pursue future funding opportunities, helping to spur transformational change at the community scale.

In terms of implementation schedule and milestones, within the first few months of this measure, CARB or local governments would prioritize a list of already-vetted mobility projects alongside community outreach and engagement. Once funded, projects could begin implementation, some of which may take up to three years to complete.

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[66] See disclaimer about GHG emissions reductions estimates on page 21.

To track progress under this measure, CARB or local governments could prepare quarterly progress reports tracking technology or services provided, as well as their costs, and any explanation for differences in completed versus anticipated implementation.

The State has the authority to implement this measure as established by several State bills and directives, including, but not limited to, SB 1275 (de León, Chapter 530, Statutes of 2014),[67] which established a broad suite of statewide transportation equity programs under the Charge Ahead Initiative, including CMIS and STEP. Further, SB 350 (de León, Chapter 547, Statutes of 2015),[68] directed CARB to undertake a study to identify the barriers to accessing clean transportation and mobility investments for low-income Californians, work that underpins this measure.[69] In addition, local governments may have their own authority to implement this measure.

Transportation Measure 6: Allow for Local Deployment of ZEV Infrastructure and Low-Income ZEV Support

California's light-duty ZEV market is one of the largest and most dynamic in the world. Over 1.7 million light duty ZEVs have been sold through the third quarter of 2023(including Fuel Cell Electric Vehicles (FCEVs) and Plug-In Hybrid Electric Vehicles. ZEVs now account for over 25% of new vehicle sales.[70] However, many communities lack reliable ZEV infrastructure or the access to affordable ZEV options.

This measure elevates the fact that many local governments serving low-income and disadvantaged communities, and Tribal Nations without their own CPRG planning grants, are seeking every available opportunity to fund light-duty ZEV infrastructure projects in their regions and communities, and in some cases, to fund ZEV incentive programs similar to CARB's Clean Cars 4 All,[71] which targets incentives to low-income residents. Not only have such needs been prioritized at the local level under CPRG, the urgency for such action is also outlined in the State's 2022 Scoping Plan Update and CEC's Electric Vehicle Charging Infrastructure Assessment, mandated biennially under AB 2127 (Ting, Chapter 365, Statutes of 2018), among other reports.[72]

Additional benefits from the further deployment of ZEVs for low-income residents and installation of light-duty ZEV infrastructure are reduced vehicle operating costs, reduced air

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[67] California Legislative Info. 2014: California SB 1275. September 21. *http://leginfo.ca.gov/pub/13-14/bill/sen/sb_1251-1300/sb_1275_bill_20140921_chaptered.pdf*.

[68] California Legislative Info. 2015: SB 350. September 15. *http://www.leginfo.ca.gov/pub/15-16/bill/sen/sb_0301-0350/sb_350_bill_20151007_chaptered.htm*.

[69] In addition, the bills that establish the State's Greenhouse Gas Reduction Fund and the Air Quality Improvement Program also apply here, as do SB 375, SB 150, AB 118 (Chapter 750, Statutes of 2007), and AB 398 (Eduardo Garcia, Chapter 135, Statutes of 2017).

[70] CEC. Zero Emission Vehicle and Infrastructure Statistics. *https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics*.

[71] CARB. Clean Cars 4 All. *https://ww2.arb.ca.gov/sites/default/files/movingca/vehiclescrap.html*.

[72] CEC. 2024: Electric Vehicle Charging Infrastructure Assessment - AB 2127. January. *https://www.energy.ca.gov/data-reports/reports/electric-vehicle-charging-infrastructure-assessment-ab-2127*.

pollution, and in many cases, the first opportunity for community members to access ZEV technology or to charge a ZEV reliably. Exact costs and GHG emissions reductions would vary based on local projects.

While implementation schedules and milestones may differ across sites, potential steps for ZEV infrastructure could include outreach, site identification and selection, consultation with utilities, estimating the number of chargers and associated costs, and securing contractors for implementation. For ZEV incentive programs for low-income residents, steps could include outreach to target residents, incentive program design, public workshops, launch of incentive programs, and tracking progress.

Metrics for local governments in tracking ZEV infrastructure deployment could include measurements of charger uptime, number of drivers served, and others as appropriate. For low-income ZEV incentives, metrics for success could include number of residents served, number of ZEVs deployed, and estimated avoided emissions.

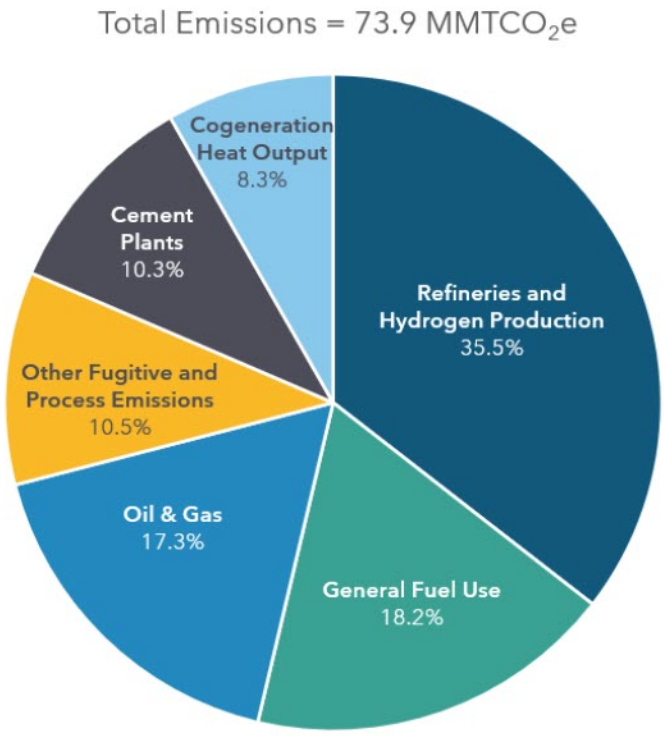
Local governments and Tribal Nations typically have the necessary authority to plan, permit, site, and build ZEV infrastructure in their jurisdictions, as well as to run vehicle incentive programs.

Industrial

California's industrial sector, which includes upstream oil and gas extraction and refining operations for transportation fuels, contributes roughly 19% of California's total emissions,[73] and can be further broken down as shown in Figure 6 below.

[73] CARB. 2023. Current California GHG Emission Inventory Data. *https://ww2.arb.ca.gov/ghg-inventory-data*.

Figure 6:Industrial Sector Emissions in 2021



California's industrial sector contributes significantly to the state's economy, with a total output from manufacturing in 2019 of $324 billion (10.4% of the state total)[74] and employment of 1,222,000 manufacturing jobs (7.6% of the total state workforce).[75] The industrial sector includes a diverse range of sources, including cement plants, refineries, glass manufacturers, oil and gas producers, paper manufacturers, mining operations, metal processors, and food processors. Combustion of fossil gas, other gaseous fossil fuels, and solid fossil fuels provide energy to meet three broad industry needs: electricity, steam, and process heat. There are also fugitive emissions from processing (such as clinker production in cement plants) and other chemical transformations inherent to some manufacturing processes.

Decarbonizing industrial facilities will benefit low-income and disadvantaged communities where, as described in Section 3.3 above, many of the industrial facilities are located and contribute to inequitable health disparities. Achieving this goal will primarily depend upon replacing or reducing existing fossil fuel use with a mix of electrification, solar thermal heat, biomethane, low- or zero-carbon hydrogen, and other low-carbon energy to provide energy

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[74] National Association of Manufacturers (NAM). 2021 California Manufacturing Facts. *https://www.nam.org/state-manufacturing-data/2021-california-manufacturing-facts/*

[75] National Association of Manufacturers. 2021: California Manufacturing Facts. *https://nam.org/state-manufacturing-data/2021-california-manufacturing-facts/*

for heat and reduce combustion emissions. Emissions also can be reduced by implementing energy efficiency measures and using substitute raw materials that can reduce energy demand and some process emissions. Some remaining combustion emissions and some noncombustion CO_2 emissions can be captured and sequestered.

Transforming this sector will require the demonstration and deployment of advanced decarbonization technologies targeted to the unique needs and requirements of the many industrial sub-sectors. That is to say, there is no 'one-size fits all' solution for industry to contribute and support the State's transition to a net-zero economy by 2045 and to meet air quality goals. The measure included in this PCAP directly addresses the complexity of this sector, and supports solutions that can provide examples of innovative, cost-effective and practical solutions that decarbonize specific industrial and sub-sector needs. Those solutions, focused on the State's hardest hit communities, can be transferred to other states as their effectiveness is demonstrated here. The end result of this effort will be the consistent decline overall in the use of fossil energy usage and lower process emissions in the industrial sector, resulting in improved air quality, especially in low income and disadvantaged neighborhoods where many of these facilities are located.

In addition, the measure below is consistent with federal efforts to reduce industrial emissions, including the U.S. Department of Energy's Industrial Decarbonization Roadmap[76] and similar programs.[77]

Industrial Measure 1: Accelerate Industrial Decarbonization

This measure would leverage CEC's existing Industrial Decarbonization and Improvement to Grid Operations Program (INDIGO) to quickly and seamlessly fund industrial decarbonization projects across California's manufacturing sector, including chemicals, metals, food and beverages, and nonmetallic minerals, such as cement, glass, electronics, pharmaceuticals, and related support facilities. CEC would lead this measure with input from CARB and the California Department of Food and Agriculture (CDFA). Industrial stakeholders and utilities would implement the projects.

With bolstered CPRG funding, new INDIGO projects would accelerate the decarbonization of California's industry; ensure substantial and lasting GHG reductions; provide reliability benefits to local electricity grid operations; reduce air pollution, particularly for low-income and disadvantaged communities; provide replicable examples that could stretch beyond the State; and provide workforce opportunities.

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[76] U.S. Department of Energy (U.S. DOE). 2022: DOE Industrial Decarbonization Roadmap. September 7. *https://www.energy.gov/industrial-technologies/doe-industrial-decarbonization-roadmap*.

[77] This includes the Advanced Energy manufacturing and Recycling Grant Program (BIL 40209), and the Industrial Demonstrations Program. (for more information see U.S. EPA. 2023: Investing in America. Climate Action Funding Fair. August 11. *https://www.epa.gov/system/files/documents/2023-08/6. Industrial_Waste_508-combined.pdf*)

While the decarbonization technologies and practices supported by this measure would vary, they could include process heat electrification (such as industrial heat pumps), alternative processes (such as thermal energy storage, use of evaporators replaced with membranes, and use of feedstocks that reduce use of fossil fuels), renewable energy generation, energy efficiency, and load flexibility.

Depending on the level of additional funding, this measure could yield annual emissions reductions of approximately 2,800 $MTCO_2e$, as well as roughly 11,000 $MTCO_2e$ cumulatively between 2025 and 2030, and 68,000 $MTCO_2e$ cumulatively between 2025 and 2050.[78]

This measure would also decrease air pollution, and consistent with CEC's current practices, 60% of installations would be located in or directly benefit low-income and disadvantaged communities. Project developers would also develop community benefits plans. It is expected that this measure will require a skilled workforce to manufacture, design, install, and operate the GHG reduction technologies, leading to job creation in the communities served. These projects also have the potential to generate real-world technical and economic data on installed decarbonization equipment in use, initiate service and maintenance infrastructure in California, and ultimately, spur similar private-sector investment in decarbonization technologies across different industries.

As this measure leverages CEC's existing administrative structure under INDIGO, the key expected milestones include a release of a competitive solicitation to industry three to four months following a CPRG award, an award of funds to industry by CEC approximately six to nine months after solicitation release, and ongoing tracking to ensure success thereafter. Such tracking would involve third-party verification of anticipated GHG and local air emission reductions based on actual installations and operations. Tracking would also ensure the development of community benefits plans by industry grant recipients, with input from local community groups, along with, workshops and site visits for community members and fellow industrial operators to facilitate transparency and clean technology transfer.

Recognizing the need for decarbonization of the industrial sector, AB 209 (Committee on Budget, Chapter 251, Statutes of 2022) created the CEC's INDIGO program, and among other bills and directives, demonstrates the State's authority to implement this measure.

Energy

Electricity currently comprises 16% of the State's GHGs, according to the latest inventory,[79] constituting the third largest sector in terms of carbon pollution. Further, the majority of

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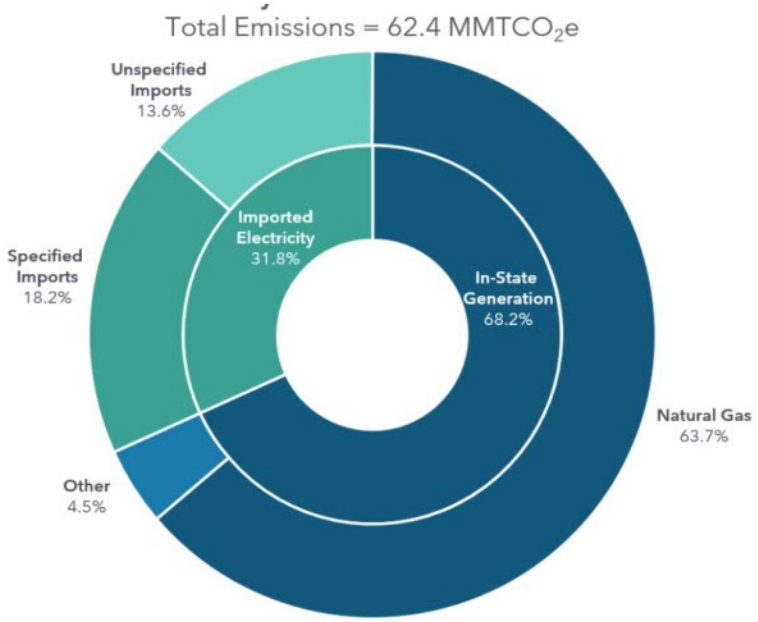
[78] See disclaimer about GHG emissions reductions estimates on page 21.

[79] CARB. 2023: Current California GHG Emission Inventory Data. *https://ww2.arb.ca.gov/ghg-inventory-data*.

emissions from generation serving California comes from natural gas as shown in Figure 7 below.

Figure 7: Electricity Sector Emissions in 2021



Emissions from electricity – both imported and local generation – have dropped dramatically over time. Much of the State's success in reducing GHGs is due to focused decarbonization requirements, programs, and investments in the electricity sector. This includes pioneering efforts such as the Renewable Portfolio Standard, SB 350 Clean Energy and Pollution Reduction Act, SB 100 implementation (requirement to achieve 100% electric retail sales to end-use customers by 2045), and the Cap-and-Trade Program (in effect since 2012). These initiatives have delivered significant reductions from this sector, notably related to electricity imports. (This has also resulted in incentivizing lower-carbon electric generation in adjoining states that deliver electricity to California.) It is also worth noting that California's policies have provided strong investment signals for renewable electricity that have benefited other jurisdictions that can now deploy these technologies at lower costs and at scale.

As the State begins to implement broad-scale additional efforts to reach carbon neutrality by 2045, as set forth in the 2022 Scoping Plan Update, a clean, affordable, and reliable electricity grid will serve as the backbone to support deep decarbonization across California's economy and air quality improvements across the State. In fact, the State will not be able to transition away from the burning of fossil fuels in transportation, freight, industry, and buildings that disproportionately burden and harm low-income and disadvantaged communities without substantial, continued investment in clean energy and electricity. The transportation and industrial measures preceding this subsection rely on it.

Such critical emissions reductions across several of the State's sectors depend on an unprecedented energy transition and include the measures listed below. These measures build on California's past success and continue to develop and deploy affordable renewable and zero-carbon electricity, upgrades to grid capacity, increased energy storage, the deployment of ZE appliances, efficiency upgrades for homes and commercial buildings, bolstering long-term energy planning, and more. It is a pivotal time where the actions taken today have significant impacts on the State's goals years into the future. For example, the 2022 Scoping Plan Update estimates that a five-year delay in renewable capacity would increase emissions by 8% in 2030 (25 $MMTCO_2e$), compared to an approach at current levels.

The measures below also align with the federal goal to achieve 100% clean electricity by 2035,[80] and can also help provide jobs and economic opportunity, energy security and resiliency, and air quality and health benefits particularly for low-income and disadvantaged communities. The measures below were chosen in line with these critical actions and the important benefits they offer.

Energy Measure 1: Expand Decarbonization through the Energy Conservation Assistance Act

The proposed expansion of the Energy Conservation Assistance Act (ECAA) would scale zero- and one-percent interest loans to educational agencies, municipalities, and Tribal Nations for clean energy generation, energy storage, ZEV infrastructure, and energy efficiency upgrades. The measure aims to ensure that loan repayments do not exceed the utility bill savings generated by these energy-efficient measures, thereby maintaining budget neutrality for the applicants. CEC would have primary responsibility for this measure.

This measure could unlock funding for 20 eligible projects without otherwise identified funding, which includes $44 million in wait list applications from low-income and disadvantaged communities. In fact, with the recent expansion of ECCA program to include Tribal applicants and additional opportunities to fund energy storage and ZEV infrastructure, this program has greater capacity than ever to expand clean energy measure opportunities for low-income and disadvantaged communities. In addition, projects under ECCA would deliver improved air quality, clean energy generation, grid resilience, and decarbonization of buildings, contributing to healthier living environments.

Depending on the amount of additional funding received, this measure could yield annual emissions reductions of approximately 63,000 $MTCO_2e$, as well as roughly 188,000 $MTCO_2e$

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[80] U.S. DOE. 2023: On The Path to 100% Clean Electricity. May. *https://www.energy.gov/sites/default/files/2023-05/DOE%20-%20100%25%20Clean%20Electricity%20-%20Final.pdf*.

cumulatively between 2025 and 2030, and 1.4 million $MTCO_2e$ cumulatively between 2025 and 2050.[81]

To implement this measure, within six months of receiving a CPRG award, CEC could first consider its waitlisted ECAA projects for low-income residents and Tribal Nations, and from there, conduct any necessary outreach and hold public workshops as needed to arrive at the final selection of projects and help ensure direct community benefits. Within six months of receiving a CPRG award for this measure, CEC anticipates awarding loans, and tracking progress thereafter. Such tracking could include location and type of loans, and the associated energy bill savings, GHG reductions, and benefits to end users.

The ECAA program operates under the authority granted by the Energy Conservation Assistance Act of 1979 (Public Resources Code §§ 25410-25422), most recently amended in 2021. The CEC's established track record in managing a vast portfolio of energy projects, along with its low default rate, underscores its capability and authority to successfully implement this expanded initiative. Recent legislation (AB 33, Ting, Chapter 226, Statutes of 2021) expanded the ECAA program to California Native American Tribes and expanded allowable measures to include energy storage and ZEV infrastructure.

Energy Measure 2: Create a Funding Program to Upgrade the Capacity of Distribution Systems

This measure would create a new Distribution System Capacity Upgrades Funding Program to enhance the electric distribution system in California. Its primary goal would be to increase capacity to support climate initiatives, particularly transportation and building electrification, which are crucial for reducing the State's reliance on fossil fuels and for meeting several sector-specific climate goals, the State's overarching 2045 carbon neutrality target, the State's air quality goals, and to closing pollution disparities for low income and disadvantaged communities. The program aims to address the challenges posed by the increased electrical demand from electric vehicles (EVs), heat pumps, and other electrification technologies, which the current distribution system is not fully equipped to handle. It also aims to help mitigate rising electricity costs that disproportionately affect low-income customers and currently acts as a disincentive for consumers to switch from fossil fuels in vehicles and buildings. The California Public Utilities Commission (CPUC), in consultation with CEC and CARB, would implement the program.

The cost of overall distribution system upgrades is immense and would traditionally be funded by ratepayers. CPRG funding would kick-start this program, help alleviate the financial burden on consumers, and accelerate grid upgrades that will otherwise become a bottleneck to ZE technologies across the State.

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[81] See disclaimer about GHG emissions reductions estimates on page 21.

Depending on level of additional funding support, this measure could yield annual emissions reductions of approximately 1.8 million $MTCO_2e$, as well as roughly 3.6 million $MTCO_2e$ cumulatively between 2025 and 2030, and 39 million $MTCO_2e$ cumulatively between 2025 and 2050.[82]

The program is also expected to deliver considerable benefits to disadvantaged communities, especially those affected by high levels of trucking emissions, such as near ports and along major transportation corridors. To facilitate the transition to electric vehicles and reduce these emissions in such communities, urgent upgrades to the distribution systems in these highway corridors and port areas are essential. In addition, the CPUC has an open proceeding on distribution system planning and in which numerous representatives from low-income and disadvantaged communities participate. The CPUC could leverage this proceeding for further meaningful engagement with community groups.

In setting up this measure, the CPUC expects to reach the following key milestones in the first year following a CPRG award: outreach with low-income and disadvantage communities through open proceedings as program design features are solidified, analysis of and prioritization for grid capacity upgrades, coordination with utilities, and selecting specific sites for upgrades. Sub-awarding CPRG funds to selected sites could follow in the second year, and tracking progress could follow continuously from there. This measure could ensure success through tracking metrics such as miles of distribution circuit capacity installed, timelines for customers to have capacity for full-electric homes, and more.

The CPUC, vested with broad authority over investor-owned utilities, will spearhead this program. CPUC's jurisdiction covers approximately 75% of California's customers, providing CPUC with substantial leverage and capacity to implement such a large-scale program effectively.

Energy Measure 3: Expand the Success of California's Self-Generation Incentive Program for Behind-the-Meter Energy Storage

The proposed expansion of the Self-Generation Incentive Program (SGIP) would enhance behind-the-meter energy storage and resilience during power outages, particularly for low-income residential customers. Energy storage systems would be charged when electricity rates are low and renewable generation is high, and discharge energy during peak hours when electricity rates and GHGs from fossil generation are highest. These practices enhance resilience, reduce emissions, and support affordability. This initiative would be led by the CPUC using existing proceedings and program implementers to expand SGIP and scale its transformative impact.

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[82] See disclaimer about GHG emissions reductions estimates on page 21.

Depending on additional funding received, this measure could yield annual emissions reductions of approximately 175 $MTCO_2e$, as well as roughly 520 $MTCO_2e$ cumulatively between 2025 and 2030, and 4,000 $MTCO_2e$ cumulatively between 2025 and 2050.[83]

The majority of the avoided emissions from this measure would likely come from natural gas Peaker plants, and reducing their use across the State would deliver air quality benefits, especially where those Peaker plants are located in or adjacent to low-income and disadvantaged neighborhoods. In addition, increasing the number of energy storage systems and integrating them into demand response programs can further bolster grid reliability, potentially transforming them into virtual power plants.

Within the first six months following a CPRG award, this measure would be incorporated into an existing CPUC proceeding in which diverse stakeholders representing low-income communities already participate. Once the CPUC adopts a decision on how to expand SGIP with CPRG support, funds would be disbursed through existing program implementors with a proven track record of efficient and effective fund distribution. From there, the success of this measure would be ensured through continual tracking of metrics such as expenditures made, number of batteries installed, and number of customers served by location and income level.

The SGIP, established in 2001, has been supported by legislative actions including AB 209, which amends Public Utilities Code Section 379.6 and adds Section 379.10, gives CPUC authority to use SGIP to offer California residents solar and storage incentives. This authority, and a track record in financing over 1.23 GW of capacity through SGIP across numerous projects, demonstrate CPUC's capability to successfully implement this measure.

Energy Measure 4: Bolster Healthy Landscapes and Resilient Communities through Expanding the Biomass to Carbon Negative Biofuels Program

This measure seeks to expand the existing Biomass to Carbon Negative Biofuels Program at the California Department of Conservation,[84] and ultimately play a unique role in addressing climate change by producing low-carbon and carbon-negative fuels from forest and agricultural biomass while addressing critical issues such as forest health, wildfire risk, and air quality concerns. In particular, using agricultural waste that has historically been burned in the San Joaquin Valley will help reduce fine particulates across some of the State's most overburdened low-income and disadvantaged communities. The Department of Conservation would lead this measure, in partnership with various State and federal agencies, local governments, and Tribes. These entities – alongside community input to

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[83] See disclaimer about GHG emissions reductions estimates on page 21.

[84] California Department of Conservation. 2023: Forest Biomass to Carbon-Negative Biofuels Pilot Program. November 15. *https://www.conservation.ca.gov/cgs/fbp*.

maximize local co-benefits – could collectively contribute to the measure's development, solicitation crafting, and application review processes.

Depending on total additional funding added to this measure, it could yield annual emissions reductions of approximately 10,000 $MTCO_2e$, as well as roughly 38,000 $MTCO_2e$ cumulatively between 2025 and 2030, and 230,000 $MTCO_2e$ cumulatively between 2025 and 2050.[85]

The financial scope of the program is significant, with implementation costs ranging from $60 million to $500 million per facility, where grants are designed to cover at least 10% of the total costs. CPRG funding would be leveraged and matched with private and public funding, including local funding from jurisdictions – many of which are rural – that would benefit from these facilities with enhanced forest resilience, improved air quality, and jobs.

Additionally, by avoiding wildfire risks and by providing an alternative to the open burning of agricultural waste, this measure promises substantial public health and safety benefits, for rural low-income and disadvantaged communities as well as Tribal Nations, many of which live in California's San Joaquin Valley, and face persistent air quality challenges.[86] The program also aims to create hundreds of construction jobs and numerous long-term operational roles, with a focus on local hiring to boost employment for priority populations. This measure can yield biochar and other soil amendments that have the potential to both store carbon and improve soil quality.

The transformative potential of this program is significant. It is expected to lead to notable advancements in sustainable forestry and biofuel technology, thereby setting a national model for combining rural economic opportunities with environmental stewardship and improvements in air quality. The program also can contribute substantially to renewable energy, potentially supplying renewable electricity to the grid and replacing fossil fuel combustion.

This measure would include several major milestones. One month after CPRG funding was awarded, a solicitation would be finalized and made available for biofuels implementation. Within two months, five existing pilot regions could be awarded funds to help with biomass aggregation, and a workshop for all other interested parties would be held, in part to help ensure direct benefits to local communities. Within five months, biofuels implementation awards could be made. Within 18 months, the final legal entities in aggregation pilot regions would be established, and within two years, the first long-term feedstock contracts would be available through aggregation pilot regions. Between two and five years after the CPRG award, facilities would be built, generating carbon-negative fuels. Tracking these milestones will help ensure measure success as could the number of sites and facilities

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[85] See disclaimer about GHG emissions reductions estimates on page 21.

[86] CARB. 2022: 2022 State Strategy for the State Implementation Plan. September 22. *https://ww2.arb.ca.gov/sites/default/files/2022-08/2022_State_SIP_Strategy.pdf*.

funded by the measure, biofuel produced or energy sold, aggregation site purchases, bone-dry tons of biomass acquired, acres of improved forests, plans indicating agricultural areas targeted, lifecycle carbon assessments, awardee facility job counts, and others as appropriate.

The Department of Conservation derives its authority from Chapter 2 of Division 1 of the California Public Resources Code (Pub. Resources Code, §§ 600 et seq.), which provides the Department with powers and responsibilities over several natural resource areas, including forestry, agriculture, and energy, which are directly relevant to the existing Biofuels Program and this measure. Furthermore, the Department's general statutory authorization to award grants and accept federal grants for relevant purposes is outlined in Public Resources Code, section 604, and section 608, respectively. Section 608 is particularly crucial as it allows the Department to expend federal funds under conditions set by the federal government, which aligns with the objectives of the Biofuels Program. Additional specific authorizations for various grant programs related to natural resource management are found in separate statutes, such as Public Resources Code, §§ 10200 et seq. (California Farmland Conservancy Program) and §§ 4208 et seq. (Regional Forest and Fire Capacity Program).

The Department's mission to balance contemporary needs with future challenges, particularly in the realms of carbon management, sustainable economic development, watershed management, and hazards management, further reinforces its capacity to implement such a comprehensive program. SB 155, passed in 2021, is a critical legislative piece that directly supports the Biofuels Program. It includes an appropriation in the 2022-23 Fiscal Year for pilot projects in the Sierra Nevada to create carbon-negative fuels from materials resulting from forest vegetation management, explicitly stating that eligible projects should focus on California-based hydrogen or liquid fuel use (Section 50).

Energy Measure 5: Deploy Equitable Building Decarbonization

This measure would help accelerate the energy transition and further energy equity by directly upgrading low-income homes, providing them greater energy efficiency, and replacing fossil burning equipment with high-efficiency electric appliances such as heat pump water heaters, heat pump space heating and cooling, heat pump dryers, and induction cooktops. These direct installations would be done at no or low cost to residents of single family, multifamily, or mobile homes. This measure would be implemented by CEC through its existing Equitable Building Decarbonization (EBD) Direct Install Program, in consultation with CARB, and carried out by regional administrators. This measure could span the entire State or be limited to one or more of the three distinct regions it serves – Northern California, Southern California, or Central California.[87] The targeted population for

[87] CEC. 2023: Equitable Building Decarbonization Direct Install Program Guidelines. October 23. *https://www.energy.ca.gov/publications/2023/equitable-building-decarbonization-direct-install-program-guidelines* (The counties that fall into each region can be found on page 5.)

this measure could be homes within the LIDAC geographies established under the Inflation Reduction Act and discussed in Section 3.3 above.

The need for this measure is substantial. Over 75% of the homes and commercial structures in California were constructed prior to the establishment of the Building Energy Efficiency Standards in 1978. Approximately 14 million single-family homes and multifamily units exist in California, with under-resourced communities accounting for 59% of the State's population. With an initial allocation of $922 million to the EBD program, CEC is expected to reach only a fraction of low-income homes that need upgrades and electrification. Other funding sources, including CCI and the HOMES Program created under the Inflation Reduction Act, are simply not enough to cover the need identified in this measure.

Homes retrofitted through this measure could reduce energy consumption and begin to yield GHG reductions starting in 2025. Improved energy efficiency also could mean monthly savings for low-income households and improved indoor air quality from eliminating the burning of fossil gas indoors, which has been linked with heart and respiratory disease and premature death.[88] This measure will help reduce these risks, particularly for overburdened low-income and disadvantaged communities. In addition, this measure would leverage the direct input received through CEC's EBD program design process, which was attended by hundreds of public participants in multiple stages.

Depending on the level of additional funding, this measure could yield annual emissions reductions of approximately 14,000 $MTCO_2e$, as well as roughly 42,000 $MTCO_2e$ cumulatively between 2025 and 2030, and 319,000 $MTCO_2e$ cumulatively between 2025 and 2050.[89]

This measure could also be transformative. It could help advance the deployment and scale of heat pumps, create sizeable energy savings through demand response across the State, transform the market for non-combustion equipment, and help create high-quality jobs in the communities served.

The major implementation milestones of this measure could include the competitive selection of regional administrators, regional administrators' submission of proposals for how they would implement the measure, and identification and outreach to initial community focus areas to maximize benefits to communities. The dispersion of funds and the tracking of progress could follow. To ensure success, bi-annual reports could be required on all project-related activities and outcomes for completed projects, including GHG emission reductions, criteria air pollution reduction, energy savings, job creation, and other benefits created by the program. Additionally, regional program administrators could

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[88] American Lung Association. 2022. Literature Review on the Impacts of Residential Combustion. July. *https://www.lung.org/getmedia/2786f983-d971-43ad-962b-8370c950cbd6/ICF_Impacts-of-Residential-Combustion_FINAL_071022.pdf.*

[89] See disclaimer about GHG emissions reductions estimates on page 21.

be required to collect and report specified data from program activities, analyze data on a regular basis, and present results to CEC managers on a monthly basis to provide early identification of challenges, performance, and necessary adjustments to the program.

Through AB 209 (Committee on Budget, Chapter 251, Statutes of 2022), CEC was directed to develop the EBD Program. This and other statutes establish the State's authority to implement this measure.

Energy Measure 6: Implement Bioenergy Projects

This measure includes emerging opportunities elevated by local jurisdictions to create renewable energy, including renewable hydrogen from various organic waste sources such as landfill methane; [90] woody biomass, yard and agricultural waste; and biosolids. This measure could apply to projects that capitalize on any one of these practices, or that are able to combine them to more cost effectively reduce emissions and achieve greater co-benefits. These actions could have a significant impact on reducing methane emissions, a powerful short-lived climate pollutant. Sustainable management of forests and prohibitions on agricultural waste burning will reduce smoke exposure from fires in rural communities and in the central valley which continue to be in nonattainment region of federal air quality standards. Many of these projects would also provide an alternative to fossil combustion energy for the transportation sector and stationary sources.

In particular, this measure could include, but would not be limited to, the following:

- Anaerobic digestors to process organic waste and collect renewable gas
- Systems to process organic waste and create renewable energy (including onsite use of the energy created)
- Equipment that processes organic waste to feedstock for the above technologies (e.g., dewatering presses)
- Equipment and processes to upgrade landfill gases for energy uses
- Upgrades to help meet SB 1383 goals for landfill operators, such as waste sorting technologies
- On-site renewables energy and storage for increased energy processing needs
- Other onsite construction as needed to combine the above operations

This measure would prioritize technologies or practices that do not expand fossil gas or hydrogen combustion.

Emissions estimates for this measure will vary for each local project. An investment that leverages CPRG funds could thus lead to substantial greenhouse gas emissions reductions.

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90 This measure is meant to address methane emissions from organic decomposition in landfills, consistent with SB 1383 (Lara, Chapter 395, Statutes of 2016). California Legislative Info. 2016: SB 1383. September 19. *Bill Text - SB-1383 Short-lived climate pollutants: methane emissions: dairy and livestock: organic waste: landfills. (ca.gov)*

This measure could also help lead to a variety of benefits. Any projects that support destruction of polyfluoroalkyl substances (PFAS), a known carcinogen associated with water, wastewater, and landfills, could help lower public health risks. [91] These projects could also help create jobs, and help test and scale emerging renewable energy technologies, practices, and markets. All projects could bring these benefits to low-income and disadvantaged communities, depending on their location and operational contexts. Outcomes, benefits, and public engagement efforts from each project could be tracked and documented to help ensure these benefits, share lessons learned, and scale success.

While they will vary for different local governments, major implementation milestones of this measure may include outreach to communities to ensure local benefits, site selection, permitting, contracting and coordination with relevant local agencies, selecting contractors and making subawards, and site construction and equipment installation. Similarly, metrics for tracking success will vary but may include expenditures made, number of equipment installations, jobs created, tons of organic waste utilized, amount of renewable energy generated, and more.

This measure would be led directly through local governments with authority to implement it and eligibility to pursue CPRG implementation grants.

Energy Measure 7: Enable Renewable Microgrids for Rural Communities and Tribes

This measure elevates interest from local State governments and Tribal Nation in rural parts of California to pursue renewable microgrid projects that can contribute to lower emissions and manage local energy resiliency. This measure would be led directly through local governments or Tribes with authority to implement it and eligibility to pursue CPRG implementation grants. Microgrids would need to be created in accordance with any relevant CPUC and utility directives concerning microgrids.

Emissions estimates for this measure will vary by local project but could include cost-effectiveness of roughly $1,500 per $MTCO_2e$ across all funding sources. [92]

All such projects could bring jobs and other benefits – such as energy reliability and resilience, energy sovereignty, economic development, improved air quality and health, and GHG reductions – to low-income and disadvantaged communities, depending on their location and operational contexts. Implementation milestones and schedules will necessarily vary by context. Outcomes, benefits, and public engagement efforts from each project could be tracked and documented to help ensure these benefits, share lessons learned, and scale success.

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[91] U.S. EPA. 2021: Potential PFAS Destruction Technology: Pyrolysis and Gasification. January. *https://www.epa.gov/sites/default/files/2021-01/documents/pitt_research_brief_pyrolysis_final_jan_25_2021_508.pdf*

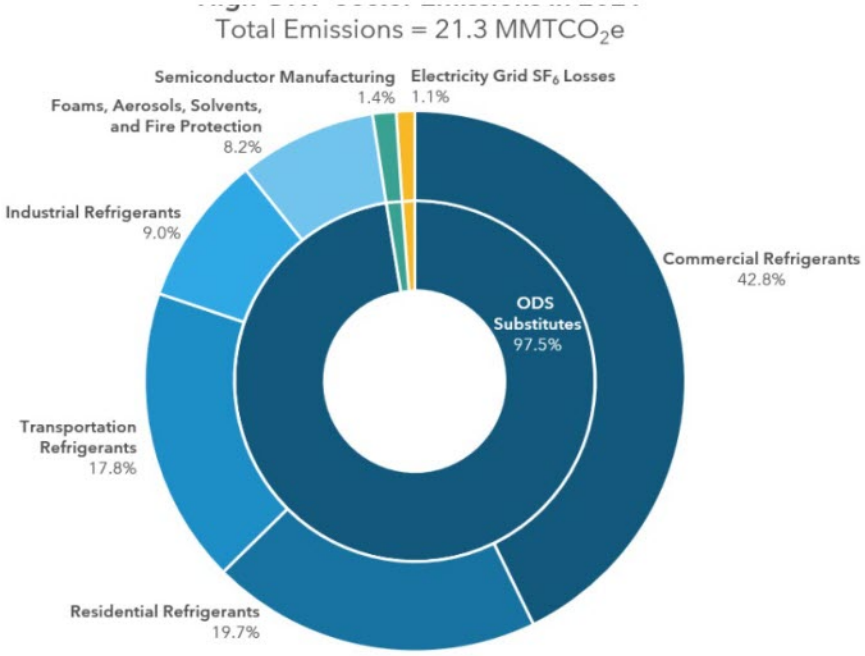
[92] See disclaimer about GHG emissions reductions estimates on page 21.

High Global Warming Potential

The High Global Warming Potential sector includes emissions from releases of ozone depleting substance (ODS) substitutes, sulfur hexafluoride (SF_6) emissions from the electricity transmission and distribution system, and gases that are emitted in the semiconductor and other manufacturing process. ODS substitutes, which are primarily hydrofluorocarbons (HFC), are used in refrigeration and air conditioning equipment, solvent cleaning, foam production, fire retardants, and aerosols.

As of the latest California GHG Inventory, gases with high global warming potential (GWP) comprise 5.6% of California's emissions. Emissions of ODS substitutes account for 97.5% of emissions from this sector and consist primarily of HFC. In 2021, refrigeration and air conditioning equipment contributed 91.6% of ODS substitutes emissions (see Figure 8 below).

Figure 8: High-Global Warming Potential Sector Emissions in 2021



California began regulating high-GWP emissions at the start of its action on climate in the 2010s and established a program to manage and reduce emissions from refrigeration systems, a major source of high-GWP emissions in the State. This effort began with the largest systems, including all facilities with refrigeration systems containing more than 50 pounds of high-GWP refrigerant. Early actions required such facilities to conduct and report periodic leak inspections, promptly repair leaks, and keep service records on site. This brought thousands of grocery and convenience stores under regulation, many of which are in low-income and disadvantaged neighborhoods.

To support the refrigeration sector and other sectors reliant on high-GWP refrigerants, SB 1013 (Lara, Chapter 375, Statutes of 2018)[93] established the F-Gas Incentive Program (FRIP) to promote the voluntary adoption of climate-friendly low-GWP refrigerant technologies and alleviate barriers that prevent the adoption of these technologies. The current proposed action in this sector will, in part, help to address those barriers – especially in low-income and disadvantaged neighborhoods – with funding to assist facilities to transition to less climate polluting refrigeration alternatives while also generating local jobs. This proposed measure also complements the federal High GWP Gases Voluntary Programs (or Fluorinated Gas Partnership Programs).[94]

High Global Warming Potential Measure 1: Expand F-gas Reduction Incentive Program

This measure would expand CARB's existing FRIP and propel its success in reducing HFC and hydrochlorofluorocarbons (HCFCs), or F-gases, which have outsized near-term climate impacts and global warming potential thousands of times that of CO_2. HFC are also the fastest growing source of GHG emissions in California, the U.S., and the world.[95] This measure focuses on reducing such emissions from industrial and commercial refrigeration and would continue to be led by CARB with industry partners as appropriate.

Despite the urgency to reduce F-gases from industrial and commercial refrigeration and the effectiveness of this climate action, funding for upgrades from high-GWP refrigerants (GWP 2000 – 4000) to low-GWP (GWP less than 10) is limited. While California regulations prohibit HFC in new technology, without additional funding, thousands of existing units are likely to undergo needed upgrades to mid-range GWP systems (GWP~1400) due to the higher cost of low or ultra-low GWP alternatives and the refrigeration system conversions they require, which could include upgrades to display cases, piping, compressors, and/or condensers.[96] Upgrades to mid-GWP refrigerants lock in higher emissions for 20 to 30 years. This measure would prioritize stores in disadvantaged communities and food deserts, and additional consideration would be given to small businesses.

CARB expects this measure to yield substantial GHG reductions. As an example, the FRIP 2019 allocation of $1 million reduced emissions by ~38,000 $MTCO_2e$ with a cost-effectiveness of roughly$27/$MTCO_2e$ across 15 supermarket projects.[97]

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[93] California Legislative Info. 2018: SB1013 Fluorinated refrigerants. September 13. *https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB1013*

[94] U.S. EPA. 2017: Voluntary Energy and Climate Programs. January 17. *https://19january2017snapshot.epa.gov/climatechange/voluntary-energy-and-climate-programs_.html and https://19january2017snapshot.epa.gov/f-gas-partnership-programs_.html*

[95] CARB. 2017: Short-Lived Climate Pollutant Reduction Strategy. March. *https://ww2.arb.ca.gov/sites/default/files/2020-07/final_SLCP_strategy.pdf*

[96] Viable high-GWP alternatives exist and include carbon dioxide (GWP = 1), Ammonia (GWP = 0), and hydrocarbons (GWP < 5).

[97] See disclaimer about GHG emissions reductions estimates on page 21.

Funding to spur greater adoption of low-GWP refrigerants and associated equipment will help scale these markets and bring down costs over time, which could be transformative for this sector beyond California. Installation of newer systems will lower such businesses operating costs under a national HFC phasedown and could lower electricity-related criteria pollution from increased energy efficiency. This measure would follow FRIP's requirement to conduct outreach to small and independent businesses in low-income and disadvantaged communities.[98] This measure also would leverage FRIP's mandate to help build a workforce skilled in low-GWP technologies by continuing to require applicants to provide hands-on and virtual trainings by industry, engineering design firms, and public utilities, among others, to contractors and technicians.

Within the first six months following a CPRG award, the implementation milestones of this measure could include completing outreach to identify participating facilities and to engage local communities to help ensure direct community benefits from CPRG investments. Within the first year, a timetable of GHG reduction goals could be made, implementation partners selected, and awards determined through existing FrIP administration. Throughout this measure, success would be ensured through requiring that implementation partners and awardees submit to CARB periodic project progress reports. Funds would be awarded upon the installation of the low-GWP refrigeration system, except in unique circumstances, and a portion retained until CARB is able to measure and verify installation success. CARB could also track funds encumbered and liquidated on a regular basis.

California's authority to implement this measure is created by, among other bills and directives, SB 1383 (Chapter 395, Statutes of 2016), which mandated the reduction of HFC or fluorinated gases by 40% below 2013 levels by 2030, and by SB 1013 (Chapter 375, Statutes of 2018), which created FRIP.

Agriculture

California is responsible for more than half of all U.S. domestic fruit and vegetable production and nearly three-quarters of U.S. fruits and nuts. The State's croplands are some of the most productive in the world, with a farmgate value of over $55 billion, making California a global leader in agriculture. These lands are becoming increasingly vulnerable to the impacts of climate change. Between 2020-2022, an estimated 750,000 acres of farmland were fallowed due to drought causing more than $1.2 billion in direct impacts. Impacts to food processing and related industries amounted to an additional $845 million in losses and over19,420 jobs were lost.[99] California is taking aggressive measures to ensure the agriculture sector is more resilient to the effects of climate change. Climate smart

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[98] California Air Resources Board. 2023: F-Gas reduction incentive program (FRIP): third-party administrator solicitation. June 26. *https://ww2.arb.ca.gov/sites/default/files/2023-06/FRIP 2023 3PA Solicitation.pdf*.

[99] UC Merced. 2022: Continued drought conditions add billions in California agriculture losses, UC Merced Report Finds. November 22. *https://news.ucmerced.edu/news/2022/continued-drought-conditions-add-billions-california-agriculture-losses%C2%A0uc-merced-report*

agricultural practices have the potential to transform this sector to increase soil carbon storage, reduce GHG emissions, and reduce pesticide exposure and health impacts. They also support California's pathway to carbon neutrality while simultaneously improving the lives of those who live and work in the agricultural community.

The State has established several ambitious targets to help guide its efforts. Some key targets include accelerating the adoption of healthy soils practices to 80,000 acres annually by 2025, conserving at least 8,000 acres of crops annually through conservation easements or fee acquisitions, and increasing organic agriculture to 20% of all cultivated acres by 2045. The State has also established a target to electrify 25% of agricultural energy demand by 2030 and 75% by 2045. Not only will these goals help address climate change, but they will also bring air quality improvements to polluted areas including the San Joquin Valley — home to many low income and disadvantaged communities.

To support these targets, California has made significant investments in climate smart agriculture. The 2022–23 budget includes $160 million to support agricultural water conservation practices, provide on-farm technical assistance, and provide direct drought relief to small farm operators.[100] These investments also support other strategies identified in the 2022 Scoping Plan Update, including accelerating deployment of healthy soils practices, organic farming, sustainable pest management practices, and more.

Although the State has made large investments in this space, there is still significant work to be done to increase practice adoption across California's 43 million acres of agricultural land and to reduce agriculture GHGs, as broken out in Figure 9 below. Since its establishment in 2014, CDFA's Healthy Soils Program has been able to incentivize 130,000 acres of healthy soils practices.[101] CPRG funding would play a vital role in supporting the sustained funding of the proposed programs, specifically the Healthy Soils Program and the Dairy Digester Research and Development program. The State chose to include these programs in its PCAP because they have already proven successful, and they would result in near-term GHG emissions reductions and benefit from additional funding. Furthermore, they prioritize rural, low-income, and disadvantaged communities. Details on these programs are discussed below.

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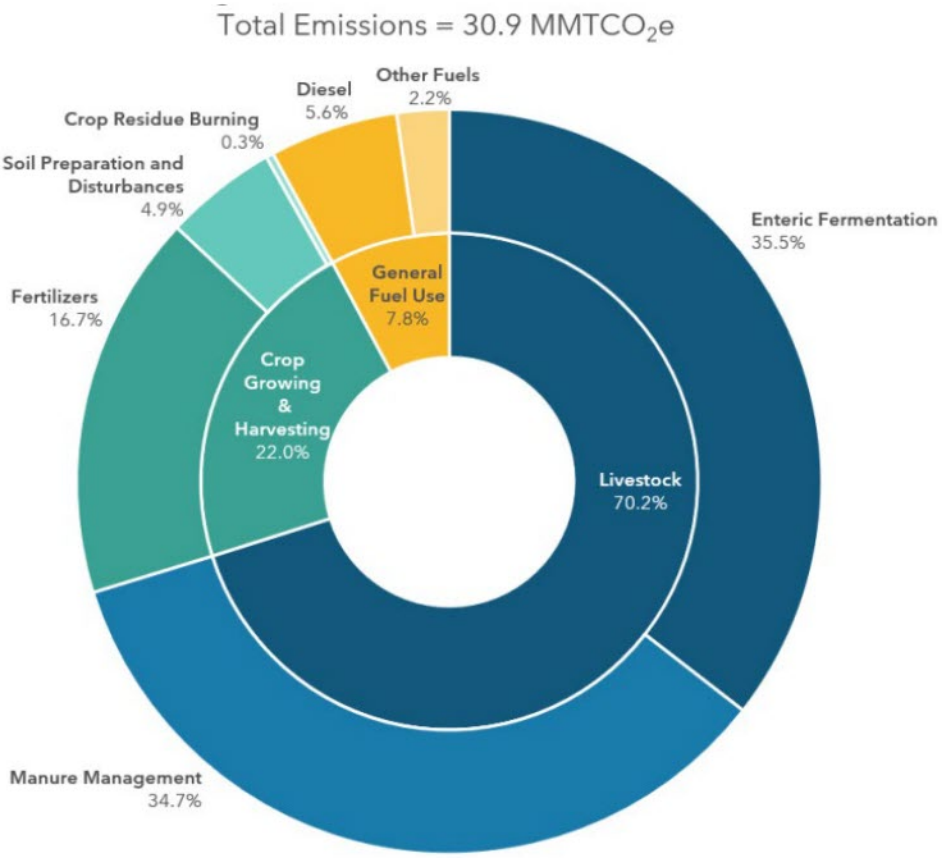
[100] California 2022-2023 State Budget. Climate Change Section. *https://ebudget.ca.gov/2022-23/pdf/Enacted/BudgetSummary/ClimateChange.pdf*

[101] California Department of Food and Agriculture. 2023: CDFA Healthy Soils Program. September. *https://www.cdfa.ca.gov/oefi/healthysoils/docs/HSP_Flyer-English.pdf*

Figure 9: Agriculture Sector Emissions in 2021



Agricultural Measure 1: Expand California's Healthy Soils Practices

This measure would expand support for various conservation practices such as compost application, nutrient management, conservation tillage, and cover cropping across California's diverse agricultural landscape, including through outreach and technical assistance to the farmers who need it most. These practices are designed not only to enhance the carbon storage capability of the soil but also to improve agricultural productivity, soil water holding capacity, and environmental health factors such as air quality. CDFA, in close coordination with farmers, ranchers, and agricultural entities across California with a focus on Socially Disadvantaged Farmers and Ranchers (SDFRs), could lead this measure under its Healthy Soils Program. Alternatively, local governments with the appropriate authority and eligibility to pursue CPRG funding could implement this measure.

Following the example of CDFA's Healthy Soils Program, this measure could be designed to be inclusive with a strong emphasis on aiding SDFRs and low-income communities. For example, as of May 31, 2023, 40% of the funds implemented through CDFA's program have benefited priority populations. By enhancing soil health, this measure would also indirectly

contribute to food security, local job creation, and overall rural economic resilience, benefiting these communities significantly. In addition, improved soil health leads to better crop yields, reduced need for synthetic fertilizers and pesticides, and enhanced biodiversity. In the 2022 Healthy Soils Program funding round, projects resulted in 1.2 million pounds of NO_x reduction.

Depending on total additional funding provided, this measure could deliver approximately 54,000 $MTCO_2e$, as well as roughly 216,000 $MTCO_2e$ cumulatively between 2025 and 2040, and 1.3 million $MTCO_2e$ between 2025 and 2050.[102]

The implementation schedule and milestones for this measure will depend on whether it is acted upon by the State or local governments. Early milestones could include the completion of outreach to farmers and communities, public workshops, and prioritization of funded activities. Additional milestones may include solicitations, awards, and the identification and deployment of technical assistance providers. Ensuring success of this measure could include tracking metrics such as the types of healthy soils practices deployed by location and acreage, as well as funding encumbered and spent for each action, jobs created, hours of technical assistance provided, and others as appropriate.

Legislative support for the Healthy Soils Program is anchored in SB 859 (Chapter 368, Statutes of 2016),[103] which established the program under CDFA's jurisdiction. The Environmental Farming Act Science Advisory Panel, as designated by this legislation, provides guidance. This legal framework empowers CDFA to effectively manage and expand the program, integrating soil health into the broader context of California's climate action and agricultural policy. Many local governments have their own authority to implement this measure as well.

Agriculture Measure 2: Reduce Methane Emissions through Dairy Digesters

This measure aims to increase small farm dairy digesters and fund research and demonstration projects for hydrogen production from dairy digesters. It could be implemented by local governments or by the State through the expansion of its existing Dairy Digester Research and Development Program (DDRDP) carried out by CDFA. It would leverage DDRDP's demonstrated success in helping small farms afford and install livestock manure anaerobic digesters and would further help implement linear generators and fuel cell technology for converting dairy biogas into renewable electricity and hydrogen. Such investments are critical to meeting State and federal clean energy and climate goals.

This measure could multiply DDRDP's significant methane emissions reductions and cost-effectively draw down emissions. Depending on the level of additional investment, this

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[102] See disclaimer about GHG emissions reductions estimates on page 21.

[103] SB 859. Public resources: greenhouse gas emissions and biomass. *https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201520160SB859*

measure could yield annual emissions reductions of approximately 452,000 $MTCO_2e$, as well as roughly 1.8 million $MTCO_2e$ in cumulative reductions between 2025 and 2030, and 10.8 million $MTCO_2e$ of cumulative reductions between 2024 and 2050.[104]

Most DDRDP projects are in California's San Joaquin Valley, home to many low-income and disadvantaged communities. In these areas, this measure would promote rural economic growth, create local jobs, improve local environmental conditions, and support California's interagency efforts to grow its emerging hydrogen market.

The schedule and milestones for this measure will depend on whether it is implemented by the State or local agencies. Early milestones could include the completion of outreach to small dairy farmers, communities, and technology providers, as well as public workshops to ensure direct community benefits. Additional milestones may include award selection and distribution, followed by digester installation. Ensuring the success of this measure could include tracking the number of digesters installed by timeframe and farm size, expenditures made, and estimated GHG reductions, among others.

Operated under SB 1383's authority,[105] DDRDP sets targets for methane emission reduction. The CDFA's Office of Environmental Farming and Innovation, experienced in administering similar programs, could manage the DDRDP expansion. Many local authorities could demonstrate their own authority to implement this measure as well.

Natural and Working Lands

As climate change increases the likelihood of extreme wildfires, drought, heat, and other impacts, carbon stocks in California's Natural and Working Lands (NWL) will face increased risks and impacts. NWL cover approximately 90% of the State's 105 million acres and include California Native American Tribes' ancestral and cultural lands, parks and green spaces in cities and communities, and the waters and iconic landscapes the nation knows and loves. The diverse landscapes and biodiversity found throughout the State's NWL provide a multitude of benefits to the people of California, including clean water, clean air, biodiversity, food, economic prosperity, recreational opportunities, continuation of traditional Tribal ways of life, mental health benefits, and many others.

California's approach to climate action in the NWL sector is not solely focused on maximizing carbon stocks. The State prefers to support carbon management that holistically fosters ecosystem health, resilience, provision of overall climate function, public health, and reduction of short-lived climate pollutants, providing an array of related benefits. CPRG would uniquely support the State's climate strategy in the NWL sector by allowing it to accelerate and expand successful, existing programs that would benefit from additional funding and can be quickly implemented. By helping to scale nature-based climate

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[104] See disclaimer about GHG emissions reductions estimates on page 21.

[105] 2016: SB 1383. September 19. *https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB1383*

solutions across the State, California can further prioritize equity by helping residents and communities hit worst by climate change impacts.

Governor Newsom's Executive Order N-82-20 established a target to conserve 30% of California's lands and coastal water by 2030, also known as 30x30. This target directly supports President Biden's Executive Order committing the United States to 30x30 through its America the Beautiful initiative.[106] There are a number of other key targets,[107] legislation,[108] and plans[109] that guide and uplift California's NWL strategies.

The 2022 Scoping Plan models that emissions from the NWL sector will decrease by 2 million $MTCO_2e$ annually compared to the business-as-usual scenario. By continuing to invest in the health of the land, California's NWL will, in due course, be able to function as a carbon sink instead of a carbon source.

The programs included in the PCAP were selected because they are all shovel-ready projects that can be implemented in a five-year time frame and will significantly reduce emissions by 2030. They also prioritize equity, community voice, job benefits, and complement other federal funding. Taking these criteria into consideration, the State is proposing three measures below.

Natural and Working Lands Measure 1: Bolster California's Forest Health Program

This measure would bolster the Forest Health Program, an initiative of the California Department of Forestry and Fire Protection (CALFIRE). The measure would expand funding for a critical range of activities, including fuel reduction, controlled burns, pest management, reforestation projects, and biomass utilization. Its primary aim would be to continue to enhance forest resilience against wildfires, pests, and diseases, while promoting

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[106] The White House. 2021: Executive order on tackling the climate crisis at home and abroad. January 17. *https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/executive-order-on-tackling-the-climate-crisis-at-home-and-abroad/*

[107] Target: Treat 2.3 million acres statewide annually in forests, shrublands/chaparral, and grasslands through strategies like prescribed fire, thinning, and harvesting.
Target: Implement climate smart practices for annual and perennial crops on ~80,000 acres annually.
For full list of NWL targets see California Air Resources Board. 2022: The 2022 Scoping Plan for Achieving Carbon Neutrality. December. *https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents*.

[108] Senate Bill 27 requires CNRA to create a Carbon Sequestration and Climate Resiliency Project Registry to facilitate funding of nature-based and direct air capture projects. California Legislative Information. 2021: SB 27. September 23. *https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220SB27*
Assembly Bill 1757 requires CARB and CNRA to establish targets for carbon sequestration and nature-based climate solutions. California Legislative Info. 2016: AB 1757. September 16. *https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220AB1757*.
Senate Bill 1386 declares NWL are an important strategy in meeting GHG reduction goals. California Legislative Info. 2016: SB 1386. September 23. *https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB1386*

[109] Resources Agency. 2022: Natural and working lands climate smart strategy. April. *https://resources.ca.gov/-/media/CNRA-Website/Files/Initiatives/Expanding-Nature-Based-Solutions/CNRA-Report-2022---Final_Accessible.pdf*.
Ca.gov. 2022: The California Climate Adaptation Strategy. *https://climateresilience.ca.gov/*
California Air Resources Board. 2022: The 2022 Scoping Plan for Achieving Carbon Neutrality. December. *https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents*

carbon sequestration in forest ecosystems. CALFIRE, as the lead State agency for the Forest Health Program, would continue to administer this measure alongside the involvement of local, State, and federal agencies, universities, special districts, Native American Tribes, private landowners, and non-profits like fire safe councils and land trusts.

This measure would leverage the Forest Health Program's past success. For example, from 2017 to 2023, the program funded 108 projects expected to result in a reduction of 16.2 million $MTCO_2e$ over their 60-year lifetimes. The program's efficiency is further highlighted by its cost-effectiveness, with an average cost of $24 per $MTCO_2e$ reduced. Despite the success of this program, funding is still desperately needed to shore up forest health, prevent further wildfire and emissions from forests, and help these ecosystems and communities store carbon into the future. CPRG funding could have a similar GHG impact and help achieve these critical outcomes.[110]

This measure would deliver substantial benefits to low-income and disadvantaged communities, aligning with Justice40 and ensuring that at least 40% of CPRG funding would benefit such populations. This strategic focus addresses the heightened risks these communities face due to climate change and their limited resources to adapt or recover from such impacts. The measure would help protect public health by reducing wildfire smoke, a significant source of severe episodic air pollution statewide. The program also supports rural economies through the development of sustainable wood product markets and improves biodiversity and water quality. Its multifaceted approach provides a model for comprehensive nature-based climate solutions.

The schedule and milestones for this measure could include early needs assessment for additional forest health investment, outreach and public workshops to help ensure local communities receive direct benefits from CPRG investment, and the prioritization of viable projects. Subsequent milestones may include site and activity selection, award distribution, and project implementation. Ensuring the success of this measure could include tracking the number of forested acres treated, waste biomass removed, trees treated for pests, funds distributed, and estimated GHG reductions, among others as appropriate.

The authority for the Forest Health Program is firmly established under California Public Resources Code §4799.05. The program aligns with California's broader climate and environmental strategies, including the Wildfire and Forest Resilience Action Plan[111] and the Natural and Working Lands Climate Smart Strategy.[112] The continued commitment to

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[110] See disclaimer about GHG emissions reductions estimates on page 21.

[111] Governor's Forest Management Task Force, 2021: Wildfire and Forest Resilience Action Plan. January. *https://wildfiretaskforce.org/action-plan/*

[112] CNRA, 2022: Natural and Working Lands Climate Smart Strategy. April 22. *https://resources.ca.gov/-/media/CNRA-Website/Files/Initiatives/Expanding-Nature-Based-Solutions/CNRA-Report-2022---Final_Accessible.pdf*

this program is also supported by legislative actions, such as SB 901 passed in 2018, ensuring its alignment with state-wide climate goals and policy directives.

Natural and Working Lands Measure 2: Expand Urban and Community Forest Projects

This measure would expand urban canopy while delivering energy conservation and storm-water runoff reduction; improving air, soil, and water quality; and enhancing public health and property values. This measure would expand and improve management of urban and community forests through planting and maintaining trees, developing green spaces, and implementing sustainable urban forestry practices. Utilizing its track record under its Urban and Community Forest Program, CALFIRE could be the lead agency for this measure, continuing to collaborate with cities, counties, air districts, and non-profit organizations to execute projects. Alternatively, local governments with the appropriate authority and with eligibility to pursue CPRG funding, could implement this measure.

This measure could contribute substantial GHG reductions and other benefits, as evidenced by CALFIRE's Urban and Community Forest Program. As of May 31, 2023, the program, through its 115 projects, resulted in an estimated 0.48 million $MTCO_2e$ of GHG reductions. Depending on the amount, additional funding could yield similar results, or annual emissions reductions of approximately 17,000 million $MTCO_2e$, and cumulative reductions of 69,000 million $MTCO_2e$ between 2025 and 2030, and 412,000 million $MTCO_2e$ cumulatively between 2025 and 2050.[113]

This measure would be structured to prioritize disadvantaged communities. Along with climate and air quality considerations, planting and supporting trees and tree shade in these communities also provides definitive improvements in quality of life. For example, in its 2021/2022 solicitation, 96% of the funds implemented under CALFIRE's Urban and Community Forest Program benefited low-income and disadvantaged communities, well aligned with Justice40 goals, and meaningfully addressing the disproportionate impact of climate change and urban heat islands on these communities.

This measure would continue to help mitigate urban heat, enhance groundwater infiltration, and improve overall urban air and water quality. It would also provide health benefits by reducing stress levels and encouraging physical activity, as well as boost local economies by creating urban forestry jobs, reducing energy costs through strategic shading, and protecting properties from flood damage.

The schedule and milestones for this measure could include early needs assessment for community and urban forest investment, outreach and public workshops to foster direct community benefits, and the prioritization of projects. Subsequent milestones may include

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[113] See disclaimer about GHG emissions reductions estimates on page 21.

site selection, award distribution, and project implementation. Ensuring the success of this measure could include tracking the number of trees planted, location of communities served and their LIDAC status, funds distributed, and estimated GHG reductions.

The Urban and Community Forest Program operates under the authority of the California Urban Forestry Act of 1978 (Public Resources Code 4799.06-4799.12). This legal framework, alongside State directives, aligns this measure with California's broader goals for urban environmental improvement and community resilience. Many local governments could similarly demonstrate their autonomy to implement this measure.

Natural and Working Lands Measure 3: Expand the State's Wetland Restoration Program

This measure would further the achievement of the existing Wetland Restoration Program, a joint initiative of the Sacramento-San Joaquin Delta Conservancy (Delta Conservancy) and the California Department of Fish and Wildlife (CDFW). This measure could support a variety of wetland restoration projects, including re-wetting peat soils to reduce carbon emissions, restoring mountain meadows for carbon sequestration, and enhancing wetland biodiversity. This measure would focus on the Delta region, which includes over 150,000 acres of highly organic peat soils that are significantly subsided to depths of 20 to 30 feet below sea level, resulting in over 1.5 million tons of carbon dioxide emissions annually. Re-wetting the peat soil stops subsidence and resulting GHGs. The Delta Conservancy and CDFW would oversee the measure, with implementation by non-profits, public agencies, and Tribal Nations, with an emphasis on projects that benefit disadvantaged communities and further environmental justice.

This measure could leverage proven program success. For example, operating since 2010, the Delta Conservancy has made over $130 million available for more than 145 locally supported ecosystem restoration, climate resilience, drought response and economic development projects, all while reducing GHGs. The re-wetting of peat soils in the Delta region alone could deliver substantial greenhouse gas benefits, at a cost of roughly $86 per $MTCO_2e$. Despite this strong track record, and support from State funding sources, the benefits of this measure are limited without additional funding from flexible sources such as CPRG. Depending on the level of additional investment, this measure could deliver additional annual emissions reductions of approximately 58,000 $MTCO_2e$ as well as roughly 232,000 $MTCO_2e$ cumulatively between 2025 and 2030, and 1.4 million $MTCO_2e$ cumulatively between 2025 and 2050.[114]

Consistent with existing practices, this measure would set aside funding for projects that benefit low-income and disadvantaged communities, particularly those facing floods and other disproportionate climate change-related risks. This measure would also meaningfully

[114] See disclaimer about GHG emissions reductions estimates on page 21.

engage those who have been historically underrepresented, as well as those that have a cultural interest in the project site, such as Tribes with ties to ancestral lands.

Restored wetlands also provide crucial habitats for wildlife, support local economies through sustainable recreation and tourism, and act as natural buffers against sea-level rise and flooding from extreme weather events. These ecosystems also play a key role in water purification and supply, contributing to the overall health and resilience of California's natural landscapes.

The schedule and milestones for this measure could include needs assessment for specific investments, outreach and public workshops to catalyze direct community benefits, the creation of a detailed project schedule, the designation of the implementation team, and ultimately implementation. Ensuring the success of this measure could include tracking the number of acres treated, funds distributed, and estimated GHG reductions.

The Wetland Restoration Program is underpinned by the Delta Reform Act of 2009[115] and subsequent legislation, which mandates the restoration and conservation of wetland ecosystems. The collaborative efforts of the Delta Conservancy and CDFW, guided by these legal frameworks, ensure the effective implementation of the program and this measure, and align with the State's broader environmental and climate resilience strategies.

Waste

Municipal solid waste landfills are the second largest source of methane emissions in California. Because about a third of California's waste stream is made up of organic waste, it is critical that the State focuses on both diverting organic waste and improving landfill operations to tackle waste sector emissions from multiple angles. Due to the multidecadal time frame required to break down landfilled organic material, the emissions reductions from diverting organic material in one year are realized over the course of several decades. Combined with the fact that methane is a powerful GHG and short-lived climate pollutant, near-term action is crucial to avoid locking in future landfill methane emissions. CPRG would allow California to expand and accelerate near-term efforts that will significantly reduce emissions for decades to come while also providing immediate benefits to climate change and public health.

Although approximately 95% of all waste disposed in the State has been deposited in a landfill that is equipped with a gas collection and control system, as required by California's Landfill Methane Regulation,[116] a portion of the methane still escapes into the atmosphere. Technologies to utilize landfill gas efficiently can contribute further emission reductions in the energy sector.

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[115] 2009: SBX7. November 12. *http://www.leginfo.ca.gov/pub/09-10/bill/sen/sb_0001-0050/sbx7_1_bill_20091112_chaptered.html*

[116] CARB. Landfill Methane Regulation. *https://ww2.arb.ca.gov/our-work/programs/landfill-methane-regulation*.

To address organic waste diversion, the SLCP Reduction Strategy[117] outlines how California will achieve its SB 1383 goals to reduce organic waste disposal 75% from 2014 levels by 2025 and recover at least 20% of edible food for human consumption.[118] Strategies such as expanding markets for products made from organic waste, recovering edible food to combat food insecurity, investing in organics recycling infrastructure, and more, will be used. Additional legislation and targets[119] passed over the last few years have reinforced California's commitment to protecting the climate by making critical advances in the waste sector.

CPRG funding would have a substantial positive impact by allowing California to scale up successful programs such as the State's Organics Recycling Infrastructure Grants program and Food Waste Prevention and Edible Food Recovery program. These programs were included in this PCAP because they have immediate GHG reduction potential, provide jobs, protect the environment, help address food insecurity issues, and put organic waste back to work growing food and building healthy soil. Furthermore, these programs directly align with the federal strategies discussed in EPA's Strategies for Methane Mitigation,[120] as well as EPA's Draft National Strategy for Reducing Food Loss and Waste and Recycling Organics.[121] Additional detail on these programs is discussed below.

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[117] California Air Resources Board. 2017: Final short lived climate pollutant reduction strategy. March. *https://ww2.arb.ca.gov/resources/documents/slcp-strategy-final*.

[118] California Legislative Information. 2016: SB 1383. September 19. *https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201520160SB1383.*

[119] California Legislative Information. 2018: SB 1440. Implement biomethane procurement targets for investor-owned utilities to reduce GHG emissions in remaining pipeline gas and reduce methane emissions from organic waste. September 24: *https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB1440.*

2014: AB 1826. Requires businesses to recycle their organic waste, depending on the amount of waste they generate per week. September 28. *http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB1826&search_keywords.*

2014: AB 1594. Eliminates incentives to use green materials as alternative daily cover by ensuring it counts as disposal. September 28. *http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB1594&search_keywords=.*

(The CPUC approved a decision in February 2022 implementing the biomethane procurement program, which will require investor-owned utilities by 2025 to procure 17.6 billion cubic feet (BCF) of biomethane produced from organic wastes to support the landfill disposal reduction and SLCP target and reduce fossil gas reliance for residential and commercial customers. Additionally, the organic waste stream includes more than one million tons of edible food that could be recovered before it enters the waste stream through food rescue programs that combat hunger in communities throughout California.)

California Public Utilities Commission. 2022: CPUC sets biomethane targets for utilities. February 24. https://www.cpuc.ca.gov/news-and-updates/all-news/cpuc-sets-biomethane-targets-for-utilities#:~:text=The%20short%2Dterm%202025%20biomethane,waste%20diverted%20annually%20from%20landfills.

[120] United States Environmental Protection Agency. 2022. Downstream management of organic waste in the United States: strategies for methane mitigation. January: *https://www.epa.gov/system/files/documents/2022-01/organic_waste_management_january2022.pdf*

[121] United States Environmental Protection Agency. 2023. Draft national strategy for reducing food loss and waste and recycling organics. December 2: *https://www.epa.gov/circulareconomy/draft-national-strategy-reducing-food-loss-and-waste-and-recycling-organics#feedback*

Waste Measure 1: Food Waste Prevention and Edible Food Recovery Program

This measure would leverage CalRecycle's existing grant programs,[122] and build a new program to holistically prevent food waste, reduce food waste in landfills, and recover edible food for human consumption. CalRecycle could administer this measure statewide, in collaboration with local governments and in partnership with hunger relief organizations. This measure could also be implemented directly by local governments with the appropriate authority and with eligibility to apply for CPRG funds.

The measure would operate in two primary areas. First, funds would support activities including food waste tracking software, preservation equipment, and training, to reduce food loss throughout supply chains.[123] Second, this measure would aim to recover at least 20% of currently disposed edible food by 2025, using additional staffing for volunteer coordination and donor recruitment, transportation, refrigeration and food storage, and distribution systems to recover excess edible food. This measure aligns with California's Short Lived Climate Pollutant law (SB1383) and emphasizes reducing the environmental impact of food waste while addressing food insecurity, and alleviating burdens to organics processing facilities to manage additional food waste.

According to CalRecycle's 2021 Waste Characterization Study,[124] 4.3 million tons of food is landfilled annually in California, including 1.5 million tons of potentially donatable food. The more than 290 million pounds of edible food that has been recovered for human consumption as a result of CalRecycle funding is equivalent to a reduction of 0.27 million $MTCO_2e$. Additional funding sources, including those from CPRG, could similarly lead to cost-effective emissions reductions of approximately $40 per $MTCO_2e$. If implemented statewide and depending on additional funding received, this measure could yield annual emissions reductions of approximately 25,000 $MTCO_2e$, as well as roughly 101,000 $MTCO_2e$ cumulatively between 2025 and 2030, and 604,000 $MTCO_2e$ cumulatively between 2025 and 2050.[125]

This measure would directly benefit low-income and disadvantaged communities by providing nutritious food at little to no cost to food-insecure populations. More extensive food recovery networks would help ensure that food recovery resources are available to communities in need while also keeping excess edible food where it is generated, rather

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[122] CalRecycle. 2020. The Food Waste Prevention and Rescue Grant Program. *https://calrecycle.ca.gov/climate/grantsloans/foodwaste/fy201920/.* And the Edible Food Recovery Grant Program. *https://calrecycle.ca.gov/climate/grantsloans/foodwaste/fy202123/.*

[123] Notable initiatives like the Pacific Coast Food Waste Commitment, which features some of the nation's largest food businesses working collaboratively with local, state, and provincial governments to implement industry-wide actions that prevent wasted food along the West Coast, highlight powerful public-private partnerships targeting food waste reduction.

[124] Calrecycle. 2021: Disposal Facility-Based Waste Characterization Study. *https://calrecycle.ca.gov/wcs/dbstudy/.*

[125] See disclaimer about GHG emissions reductions estimates on page 21.

than being removed from local communities due to lack of food recovery or distribution infrastructure.

Milestones for the implementation of this measure would vary by location but could include notices of upcoming awards and public workshops, solicitation for applications, application review, finalizing projects and implementation partners, and sub-awarding CPRG funds. The success of this measure could be ensured through the tracking of pounds, tons, and meal equivalents of food waste prevented, or food recovered for human consumption, funding levels invested, and estimated GHGs reduced.

The authority to implement this program is established under California's SB1383 and other related statutes, which mandate the reduction of organic waste and support the recovery of edible food. CalRecycle, with its history of managing similar programs and expertise, is well-equipped to implement these actions, and local governments are also experienced deploying funds for these purposes.

Waste Measure 2: Bolster Organics Recycling Infrastructure

This measure would enhance organics recycling infrastructure to divert more green materials, food materials, or alternative daily cover from landfills, thereby reducing methane emissions and improving air and water quality. This measure would support composting, co-digestion, and anaerobic digestion projects, along with emerging, non-combustion biomass conversion technologies. This measure could be administered by CalRecycle or by local governments also eligible to apply for CPRG funds.

According to the SB 1383 Infrastructure and Market Analysis study, full implementation of SB 1383 and the Short-Lived Climate Pollutant Reduction Strategy requires diverting an additional 12 to 14 million tons of organic waste from landfills to avoid methane emissions. CalRecycle's analysis in 2020 anticipates an organic recycling capacity shortfall of about eight million tons by 2025, highlighting the urgency of investing in organics recycling infrastructure. Despite significant contributions from the State, this funding has been insufficient to meet the rising demand. For example, in the 2023 grant cycle, although CalRecycle awarded over $130 million to 23 projects, 10 eligible projects were waitlisted due to lack of funds. CPRG funding could bring these projects to fruition and attract substantial matching private investments in the process.

The GHG impacts of this measure depend on total funding received. For example, the 2023 cycle of CalRecycle's Organics Grant Program is expected to divert 7.7 million tons of green and food material from landfills, which has the capacity to cut 2 million $MTCO_2e$ in emissions over the next decade. New funding sources, including those from CPRG, could similarly lead to emissions reductions with a cost-effectiveness of approximately $250 per $MTCO_2e$. If implemented statewide and depending on total funding received, this measure could yield annual emissions reductions of approximately 20,000 $MTCO_2e$, as well as roughly 80,000

$MTCO_2e$ cumulatively between 2025 and 2030, and 479,000 $MTCO_2e$ cumulatively between 2025 and 2050.[126]

This measure could benefit low-income and disadvantaged communities by creating local jobs and targeting hiring in these communities. Projects will also offer organic material diversion for communities, compost availability, and reductions in odor and air pollutants. In addition, this measure could provide renewable energy and fuel from organic waste, reducing dependence on fossil fuels. The use of produced compost could also support carbon sequestration across the State.

While the implementation of this measure may vary by location, early milestones could include outreach and public workshops, finalization of project details and implementation partners, and ultimate installation of equipment and infrastructure. The success of this measure could be tracked through metrics such as the tons of organic waste diverted from landfills, counts of infrastructure equipment installed by location, funding levels invested, and estimated GHGs reduced or avoided.

The authority for this measure stems from SB 1383 and AB 1826, which provides for organic waste collection services in California and sets a goal of 75% organic waste diversion from landfills. CalRecycle's expertise and track record in managing similar programs since 2001 demonstrate its capability to successfully implement these actions. Public Resource Code 42999 authorizes CalRecycle to administer a grant program to provide financial assistance to promote in-state development of infrastructure to reduce organic waste or process organic and other recyclable materials into new, value-added products.

4. Conclusion and Next Steps

The State's Priority Climate Action Plan outlines urgently needed climate investments across the economy to benefit our most vulnerable communities. By pinpointing near term climate implementation priorities and giving them the opportunity to compete for federal implementation funding, this plan puts the State on stronger footing to achieve its science-based carbon neutrality target and will help the U.S. meet its commitments under the Paris Agreement. It will also help meet the nation's Justice40 initiative goals by providing a broad range of benefits to California's low-income and disadvantaged communities that have historically had to shoulder the negative impacts of fossil fuel powered transportation and industry. Importantly, California's statutory, regulatory, and policy framework supports a broad authority to take decisive and quick action to utilize any federal funding received by the State.

California's next deliverable under the CPRG Program, the Comprehensive Climate Action Plan, will build off the processes and ideas that underpin the PCAP, expanding on its

[126] See disclaimer about GHG emissions reductions estimates on page 21.

stakeholder engagement and the scope of climate actions included. This holistic approach will be the State's next step under CPRG to help address the global climate crisis.

Appendix A: Low-Income and Disadvantaged Community Analysis

Overview

As mentioned previously, low income and disadvantaged communities are more likely to live in and be exposed to toxics and air pollution, often as a result of discriminatory practices such as redlining that have disproportionately exposed these communities to health hazards and pollution burdens that affect lives.[127] Low income and disadvantaged communities are often more vulnerable to the effects of climate change and the least prepared to adapt to it. To assess how the 22 measures outlined in this PCAP would affect low income and disadvantaged communities, CARB identified several spatial variables to overlay with U.S. EPA's defined low income and disadvantaged communities. As seen in the list below, these fall into three broad categories. First, some spatial variables represent emissions sources or areas of poor ambient air quality where the measures in this PCAP could lead to cleaner air for low income and disadvantaged communities. Second, CARB included land type variables to show where this PCAP would improve landscapes or decrease natural hazard risks. Finally, CARB used the Climate Vulnerability Metric[128] to show where strong climate action could lesson expected economic losses associated with climate change. Developed under the 2022 Scoping Plan Update, the CVM includes the projected impacts of climate change on human welfare across four impact categories through midcentury (2050) under a moderate emissions scenario, including human mortality, hours worked in high-risk sectors (e.g., with high heat exposure), household energy costs, and flood-related property damage.

Spatial variables to show areas of air quality improvement

1. Non-attainment areas for U.S. EPA's 2015 ozone standard[129]
2. Non-attainment areas for U.S. EPA's 2015 $PM_{2.5}$ standard[130]
3. California ports and a half-mile buffer around each[131]
4. The Federal Highway Administration's National Highway Freight Network[132]

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[127] CalEPA. 2021. Pollution and Prejudice: Redlining and Environmental Injustice in California. August 16. *https://storymaps.arcgis.com/stories/f167b251809c43778a2f9f040f43d2f5*

[128] CARB. 2022. 2022 Scoping Plan Update Appendix K: Climate Vulnerability Metric. November. *https://ww2.arb.ca.gov/sites/default/files/2022-11/2022-sp-appendix-k-climate-vulnerability-metric_0.pdf*. Note that these data were created under the 2010 U.S. Census boundaries. A crosswalk from the Census Bureau relating 2010 Census Boundaries to 2020 Census boundaries was used to relate the CVM to U.S. EPA's low income and disadvantaged communities definition. Available: *https://www.census.gov/geographies/reference-files/2020/geo/relationship-files.html#tract*

[129] U.S. EPA. *https://www.epa.gov/green-book/green-book-gis-download*

[130] *ibid*

[131] California Open Data. Ports. *https://lab.data.ca.gov/dataset/ports*.

[132] Federal Highway Administration. National Highway Freight Network. *https://usdot.maps.arcgis.com/apps/webappviewer/index.html?id=c4c0fdef029a4093b169e493e1883988*.

5. Large industrial point sources subject to California's Cap-and-Trade Regulation and a half-mile buffer around each[133]
6. Fossil gas fired power plants, and a half-mile buffer around each[134]
7. Forested areas
8. Croplands
9. Sacramento delta
10. Negative impacts under the Climate Vulnerability Metric

Methodology and Results

The methodology underpinning this assessment was a spatial overlay and intersection of the above 10 spatial layers with U.S. EPA's spatial definition of low income and disadvantaged communities. Across the 10 variables, over 90% of low income and disadvantaged community block groups are expected to benefit from the climate measures in this PCAP. Measures that reduce fine particulates and ground level ozone are expected to have the greatest reach in terms of benefiting low income and disadvantaged communities, including all transportation measures and those that reduce wildfire risk. In the end, measures that help curb the climate crisis will create widespread positive effects on low income and disadvantaged communities as seen in the Climate Vulnerability Metric map below.

The maps below illustrate these findings further. Additionally, the block group IDs for all low income and disadvantaged communities expected to benefit from the measures in this PCAP would be too lengthy to list here. Instead, they can be found at this website: *https://ww2.arb.ca.gov/sites/default/files/2024-03/California%20LIDACs%20in%20CPRG%20Priority%20Climate%20Action%20Plan%20v2.xlsx*

[133] CARB. Pollution Mapping Tool. *https://www.arb.ca.gov/carbapps/pollution-map/*

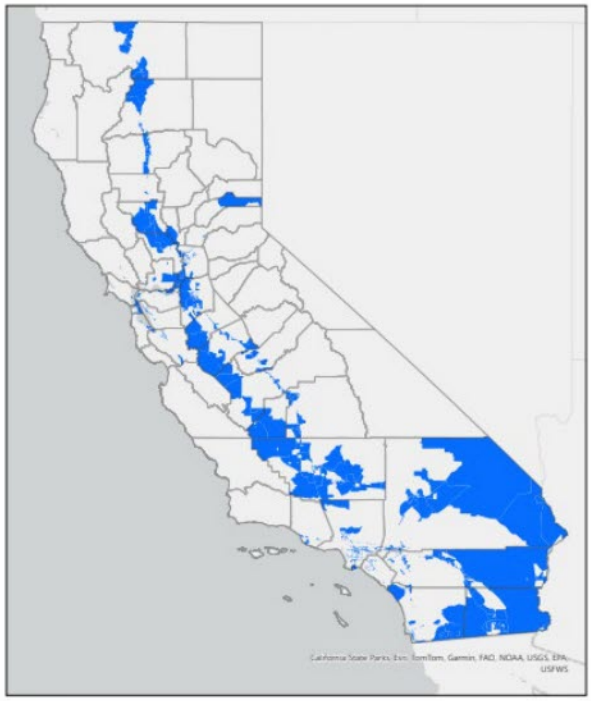
[134] Energy Information Agency. *https://eia.maps.arcgis.com/home/item.html?id=bf5c5110b1b944d299bb683cdbd02d2a.* Note that the entire fossil fuel generation category was used, but this can largely be assumed to be natural gas, as there is very little generation from coal or oil in California. See more here: *https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2022-total-system-electric-generation*

LIDACs in nonattainment of U.S. EPA's 2015 standard for ozone

LIDACs in nonattainment of U.S. EPA's 2015 standard for $PM_{2.5}$

LIDACs within a half-mile of a port

LIDACs intersected by the National Freight Highway Network



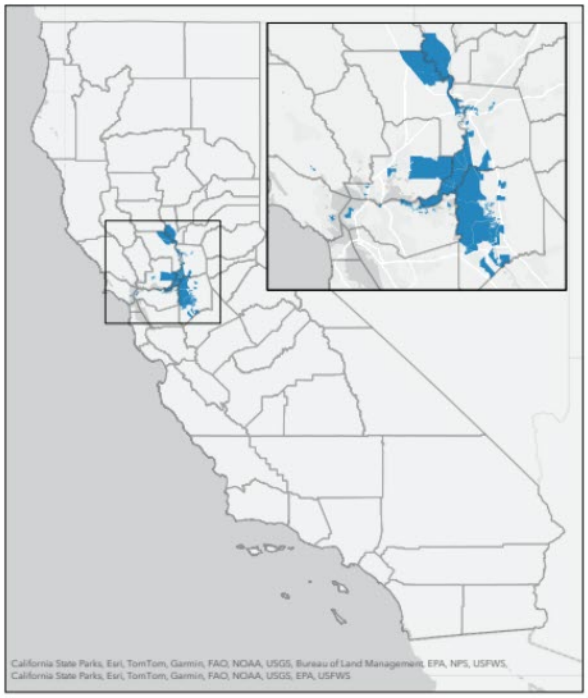
LIDACs within a half-mile of a large industrial facility

LIDACs within a half-mile of a fossil gas fired power plant

LIDACs with forested areas

LIDACs with cropland

LIDACs in the Sacramento Delta Area



LIDACs vulnerable to the costs of climate change under CVM

LIDACs with one or more intersection across variables

Climate and Economic Justice Screening Tool (CEJST)

	Census Tract 2010 ID			Population
Phase 1	06079010016	San Luis Obispo County	California	5029
	06079010102	San Luis Obispo County	California	6937
	06079012800	San Luis Obispo County	California	234
	06083000801	Santa Barbara County	California	3550
	06083001101	Santa Barbara County	California	4973
	06083001102	Santa Barbara County	California	4556
	06083002009	Santa Barbara County	California	4008
	06083002101	Santa Barbara County	California	4291
	06083002103	Santa Barbara County	California	4495
	06083002205	Santa Barbara County	California	5606
	06083002206	Santa Barbara County	California	5033
	06083002209	Santa Barbara County	California	3613
	06083002303	Santa Barbara County	California	6601
	06083002304	Santa Barbara County	California	6041
	06083002305	Santa Barbara County	California	7077
	06083002402	Santa Barbara County	California	13173
	06083002403	Santa Barbara County	California	6850
	06083002404	Santa Barbara County	California	8949
	06083002502	Santa Barbara County	California	7573
	06083002604	Santa Barbara County	California	2879
	06083002702	Santa Barbara County	California	7781
	06083002705	Santa Barbara County	California	4162
	06083002706	Santa Barbara County	California	6440
	06083002806	Santa Barbara County	California	2505
	06083002924	Santa Barbara County	California	6280
	06083002926	Santa Barbara County	California	6272
	06083980100	Santa Barbara County	California	10
		PHASE 1 POPULATION TOTAL		144918
Phase 2				
	06019007801	Fresno County	California	2731
	06019007802	Fresno County	California	5354
	06019007901	Fresno County	California	3251
	06019008100	Fresno County	California	6532
	06029004500	Kern County	California	2635
	06031001601	Kings County	California	4101
	06031001701	Kings County	California	10015
	06031981800	Kings County	California	2972
	06053010804	Monterey County	California	5469
	06053010900	Monterey County	California	8821
	06053011101	Monterey County	California	5924
	06053011102	Monterey County	California	12388
	06053011202	Monterey County	California	7263
	06053011204	Monterey County	California	3749
	06053011302	Monterey County	California	5933

06053011304	Monterey County	California	7595

PHASE 2 POPULATION TOTAL	94733
PHASE 1 & 2 TOTAL	239651

SLO COUNTY apcd | Air Pollution Control District
San Luis Obispo County

March 29, 2024

Administrator Michael S. Regan
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

RE: Climate Pollution Reduction Grant (CPRG) - Implementation Grant Letter of Support for Innovative, Transformative, and Replicable Regional Renewable Energy Park

Dear Administrator Michael S. Regan,

I am writing on behalf of the San Luis Obispo County Air Pollution Control District (SLO County APCD) to express our strong support for the CPRG implementation grant application from the City of Paso Robles that is backed by a thirteen jurisdiction Memorandum of Understanding (MOU). To protect the current and future generations along the Central Coast and beyond, the City of Paso Robles Regional Renewable Energy Park (RREP) will be an innovative, transformative, and replicable example of how to 1) effectively manage organic waste, 2) address climate impacts across sectors, and 3) protect against other significant environmental threats.

Through the MOU, a biodigester will process the regional organic waste stream at the RREP and produce renewable biogas (RCNG) and green hydrogen to fuel the waste haulers servicing the facility and other vehicles in the region; mitigating greenhouse gas (GHG), criteria air pollutant, and toxic diesel particulate emissions from transportation. Since the RREP will be located at the city owned landfill, the landfill gas that is currently flared will augment the RCNG production. The biosolids from the digester will be burned in a high-temperature pyrolysis system designed to sequester carbon in the form of biochar. Our local Resource Conservation Districts have demand for the biochar to support their members' regenerative agricultural practices. The RREP will include a solar farm to offset its power needs. The RREP will also provide the co-benefit of helping jurisdictions with the growing need to alleviate PFAS (aka "forever chemicals") contamination in their municipal biosolids and landfill leachates. Low-income and disadvantaged communities throughout the region will be served by the RREP as it enhances our collective economic vitality.

The interconnected nature of the RREP design aligns well with federal environmental initiatives and the CPRG goals and objectives outlined in the CPRG Notice of Funding Opportunity. The RREP is also consistent with California's organic waste reduction goals in SB 1383 (Lara: 75% by 2025) and the state's progression of GHG reductions over time specified in SB 32 (Pavley: 40% GHG reduction by 2030) and AB 1279 (Muratsuchi: carbon neutrality by 2045).

T 805.781.5912 F 805.781.1002 W slocleanair.org 3433 Roberto Court, San Luis Obispo, CA 93401

As an agency that helped develop SLO County's GHG inventory, SLO County APCD recognizes that the energy sector has provided the bulk of the county's GHG reductions to date. Reductions from the other emission sectors are critical to meeting local, regional, state, and federal GHG reduction targets. The Paso Robles RREP will provide an opportunity to secure GHG and co-benefit emission reductions from other sectors including waste, transportation, energy, and natural and working lands. Some of these reductions can meet carbon offset protocols and thus provide GHG mitigation for new land uses that emit more than SLO County APCD's GHG land use significance thresholds.

Our agency is excited to support and collaborate with the City of Paso Robles on the Regional Renewable Energy Park. The RREP will serve as a key renewable energy hub along the Highway 46 corridor. Its solutions are revolutionary in their scope and in the environmental benefits they offer. The project will also serve as an example of how coordinated regional efforts can lead to multisector sustainable solutions and replicable change for California and nationwide. To realize the benefits described above, SLO County APCD urges EPA to select the Paso Robles RREP for CPRG implementation grant funding.

Sincerely,

GARY WILLEY
Executive Director / Air Pollution Control Officer
SLO County Air Pollution Control District
(805) 781-5912
SLOCleanAir.org

March 27, 2024

The Honorable Michael S. Regan
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.

Washington, DC 20460

RE: Support for the City of Paso Robles Regional Renewable Energy Park application under the Climate Pollution Reduction Grants Program

Dear Administrator Regan:

I am writing on behalf of the California Air Resources Board (CARB) to express strong support for the Climate Pollution Reduction Grants (CPRG) Implementation Grant application submitted by the City of Paso Robles. To protect this and future generations, the City of Paso Robles Regional Renewable Energy Park (RREP) will sizably reduce GHG emissions and safeguard against other significant environmental threats throughout California's Central Coast.

The Paso Robles RREP will serve as a key renewable energy hub along the Highway 46 corridor. The creation of clean hydrogen and renewable energy onsite will allow for the expansion of zero-emission transportation throughout Central California, helping to achieve both State and federal environmental initiatives. The Paso Robles RREP solution is pioneering in its scope and in the environmental solutions it will offer. The Paso Robles RREP will also serve as an example of how coordinated regional efforts can lead to multisector sustainable solutions and replicable change in California and nationwide.

California has been a leader in cleaning the air and the fight against climate change for decades. Most recently, California passed Assembly Bill 1279 (AB 1279) (Muratsuchi, Chapter 337, Statutes of 2022).[1] This bill establishes the State's science-based policy to reduce anthropogenic greenhouse gas emission (GHGs) and achieve carbon neutrality by 2045. This transition will require a historic rate of clean technology production, deployment, rapid consumer adoption, and coordination across all levels of government, while ensuring affordability and maximizing myriad co-benefits. CARB's 2022 Scoping Plan Update[2] lays out the sector-by-sector, technologically feasible, and cost-effective path for California to achieve the mandates in AB 1279 and highlights how increased climate ambition can address persistent air pollution and opportunity gaps faced by low-income communities and communities of color.

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[1] Available online at: *https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202120220AB1279*
[2] Available online at: *https://ww2.arb.ca.gov/resources/documents/2022-scoping-plan-documents*

Paso Robles RREP aligns with the State's overall long-term climate work that calls for ambitious and innovative actions to reduce GHGs and develop renewable energy markets at all levels of government. It is also well aligned with Energy Measure Six: Implement Bioenergy Projects in the State's Priority Climate Action Plan[3] developed under its U.S. Environmental Protection Agency CPRG Planning Grant.

CARB is glad to support and collaborate with the City of Paso Robles as appropriate, as the Regional Renewable Energy Park will provide needed and critical solutions to local communities and a powerful example of turning organic waste to energy and reducing GHGs.

If you have any questions or need further information, please contact International Advisor Sarah Jo Szambelan, at *SarahJo.Szambelan@arb.ca.gov*.

Thank you for your consideration.

Sincerely,

Steven S. Cliff, Ph.D., Executive Officer

cc: without enclosures
Rajinder Sahota, Deputy Executive Officer, Climate Change and Research
Matt Botill, Chief, Industrial Strategies Division

[3] Available online at: *https://ww2.arb.ca.gov/sites/default/files/2024-03/California%20CPRG%20Priority%20Climate%20Action%20Plan%202024%20March%201_0.pdf*

COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE
COAST GUARD AND MARITIME TRANSPORTATION, RANKING MEMBER
AVIATION
HIGHWAYS AND TRANSIT
COMMITTEE ON ARMED SERVICES
STRATEGIC FORCES
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Salud O. Carbajal
24th District, California

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March 29, 2024

Administrator Michael S. Regan
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

RE: Climate Pollution Reduction Grant - Implementation Grant Letter of Support

Dear Mr. Regan,

I am writing in support of the Climate Pollution Reduction Grant - Implementation Grant application submitted by the City of Paso Robles. To protect this and future generations along the Central Coast, the City of Paso Robles Regional Renewable Energy Park (RREP) will dramatically reduce GHG emissions in partnership with numerous cities and service districts in the 24th Congressional District.

The Paso Robles RREP will serve as a key renewable energy hub along the Highway 46 corridor. The creation of green hydrogen and renewable energy onsite will allow for the expansion of zero-emission transportation throughout Central California, helping to achieve both State and Federal environmental initiatives.

The Paso Robles RREP will serve as an example of how coordinated regional efforts can lead to multisector sustainable solutions and replicable change in California and nationwide.

Again, I support this application submitted by the City of Paso Robles on behalf of partners on the California Central Coast region, consistent with all relevant rules and regulations.

Thank you for considering this grant application.

Sincerely,

Salud Carbajal
Member of Congress

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Assembly
California Legislature

DAWN ADDIS
ASSEMBLYMEMBER, THIRTIETH DISTRICT

COMMITTEES
HIGHER EDUCATION
MILITARY AND VETERANS AFFAIRS
NATURAL RESOURCES
PUBLIC EMPLOYMENT AND RETIREMENT
RULES

SELECT COMMITTEES
CHAIR: OFFSHORE WIND ENERGY IN CALIFORNIA
CHAIR: SERVING STUDENTS WITH DISABILITIES

VICE CHAIR: JOINT COMMITTEE ON FISHERIES AND AQUACULTURE

Administrator Michael S. Regan
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

RE: Climate Pollution Reduction Grant - Implementation Grant Letter of Support

Dear Administrator Michael S. Regan,

I write to express my strong support for the Climate Pollution Reduction Grant - Implementation Grant application submitted by the City of Paso Robles. To protect this and future generations along the Central Coast, the City of Paso Robles Regional Renewable Energy Park (RREP) will dramatically reduce GHG emissions in our local community and protect against other significant environmental threats throughout the region.

The Paso Robles RREP will serve as a key renewable energy hub along the Highway 46 corridor. The creation of green hydrogen and renewable energy onsite will allow for the expansion of zero-emission transportation throughout Central California, helping to achieve both State and Federal environmental initiatives.

The Paso Robles RREP solution is revolutionary in its scope and in the environmental solutions it will offer. The Paso Robles RREP will also serve as an example of how coordinated regional efforts can lead to multisector sustainable solutions and replicable change in California and nationwide.

I am excited to support and collaborate with the City of Paso Robles as the Regional Renewable Energy Park will provide needed and critical environmental solutions to all members of our community.

Sincerely,

DAWN ADDIS
Assemblymember, 30th District

SLOCOG
SAN LUIS OBISPO COUNCIL OF GOVERNMENTS

CONNECTING COMMUNITIES
ARROYO GRANDE | ATASCADERO | GROVER BEACH
MORRO BAY | PASO ROBLES | PISMO BEACH
SAN LUIS OBISPO | SAN LUIS OBISPO COUNTY

March 29, 2024

Administrator Michael S. Regan
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

RE: Climate Pollution Reduction Grant - Implementation Grant Letter of Support

Dear Administrator Michael S. Regan,

I am writing on behalf of San Luis Obispo Council of Governments to express our strong support for the Climate Pollution Reduction Grant - Implementation Grant application submitted by the City of Paso Robles. To protect this and future generations along the Central Coast, the City of Paso Robles Regional Renewable Energy Park (RREP) will dramatically reduce GHG emissions in our local community and protect against other significant environmental threats throughout the region.

The Paso Robles RREP will serve as a key renewable energy hub along the Highway 46 corridor. The creation of green hydrogen and renewable energy onsite will allow for the expansion of zero-emission transportation throughout Central California, helping to achieve both State and Federal environmental initiatives.

The Paso Robles RREP solution is revolutionary in its scope and in the environmental solutions it will offer. The Paso Robles RREP will also serve as an example of how coordinated regional efforts can lead to multisector sustainable solutions and replicable change in California and nationwide.

At SLOCOG we look forward to contributing to the success of the PRRREP by coordinating efforts for the further development of sustainable transportation and clean energy goals

We are excited to support and collaborate with the City of Paso Robles as the Regional Renewable Energy Park will provide needed and critical environmental solutions to all members of our community.

Sincerely,

John DiNunzio
Senior Regional Transportation Planner
San Luis Obispo Council of Governments

City of Atascadero
Public Works

March 29, 2024

Administrator Michael S. Regan
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

RE: Climate Pollution Reduction Grant – Implementation Grant Letter of Support

Dear Administrator Michael S. Regan:

I am writing on behalf of the City of Atascadero Public Works Department to express our strong support for the Climate Pollution Reduction Grant - Implementation Grant application submitted by the City of Paso Robles. To protect this and future generations along the Central Coast, the City of Paso Robles Regional Renewable Energy Park (RREP) will dramatically reduce GHG emissions in our local community and protect against other significant environmental threats throughout the region.

The Paso Robles RREP will serve as a key renewable energy hub along the Highway 46 corridor. The creation of green hydrogen and renewable energy onsite will allow for the expansion of zero-emission transportation throughout Central California, helping to achieve both State and Federal environmental initiatives.

The Paso Robles RREP solution is revolutionary in its scope and in the environmental solutions it will offer. The Paso Robles RREP will also serve as an example of how coordinated regional efforts can lead to multisector sustainable solutions and replicable change in California and nationwide.

A foundational tenet of the original "Atascadero Colony" was sustainability, with experts in agriculture, engineering and planning hired to establish and develop a thriving rural community. Minimizing waste and maximizing the efficiency of how we use (and reuse) our valuable natural resources are core values for the City of Atascadero's Public Works Department that are mirrored in the PRRREP's objectives (protection of groundwater resources, reliable local energy and fuel generation, etc.).

We are excited to support and collaborate with the City of Paso Robles as the Regional Renewable Energy Park will provide needed and critical environmental solutions to all members of our community.

Sincerely,

Nicholas D. DeBar, PE
Director of Public Works/City Engineer

P.O. Box 180
1765 Bonita Place
San Miguel, CA 93451

Tel. 805-467-3388
Fax 805-467-9212

Date: March 29, 2024

Administrator Michael S. Regan
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

RE: Climate Pollution Reduction Grant - Implementation Grant Letter of Support

Dear Administrator Michael S. Regan,

I am writing on behalf of San Miguel Community Services District to express our strong support for the Climate Pollution Reduction Grant - Implementation Grant application submitted by the City of Paso Robles. To protect this and future generations along the Central Coast, the City of Paso Robles Regional Renewable Energy Park (RREP) will dramatically reduce GHG emissions in our local community and protect against other significant environmental threats throughout the region.

The Paso Robles RREP will serve as a key renewable energy hub along the Highway 46 corridor. The creation of green hydrogen and renewable energy onsite will allow for the expansion of zero-emission transportation throughout Central California, helping to achieve both State and Federal environmental initiatives.

The Paso Robles RREP solution is revolutionary in its scope and in the environmental solutions it will offer. The Paso Robles RREP will also serve as an example of how coordinated regional efforts can lead to multisector sustainable solutions and replicable change in California and nationwide.

At San Miguel Community Services District we look forward to contributing to the success of the PRRREP by coordinating efforts for the further development of San Miguel Community Services Districts goals that are supported in the PRRREP's objectives (sustainable transportation, healthy soils, etc.).

We are excited to support and collaborate with the City of Paso Robles as the Regional Renewable Energy Park will provide needed and critical environmental solutions to all members of our community.

Sincerely,

Kelly Dodds

Kelly Dodds, General Manager

GOVERNOR'S OFFICE OF BUSINESS AND ECONOMIC DEVELOPMENT
STATE OF CALIFORNIA ♦ OFFICE OF GOVERNOR GAVIN NEWSOM

March 25, 2024

Administrator Michael S. Regan
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

RE: Climate Pollution Reduction Grant - Implementation Grant Letter of Support

Dear Administrator Regan,

I am writing on behalf of the CA Governor's Office of Business and Economic Development (GO-Biz) to express our strong support for the Climate Pollution Reduction Grant - Implementation Grant application submitted by the City of Paso Robles.

The City of Paso Robles Regional Renewable Energy Park (PR-RREP) project proposed for this grant will dramatically reduce GHG emissions in the local community, protect against other significant environmental threats and generate high quality jobs to support the State's transition to clean energy industries.

.

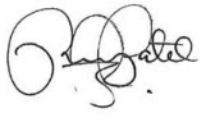
The PR-RREP will serve as a key renewable energy hub along the Highway 46 corridor, an integral east-west connector for the State's transportation system. The creation of green hydrogen and renewable energy onsite will allow for the expansion of zero-emission transportation throughout Central California, helping to achieve both State and Federal environmental and GHG reduction initiatives.

The Paso Robles RREP solution is innovative in its scope and in the environmental solutions it will offer and will also serve as an example of how coordinated regional efforts can lead to multisector sustainable solutions and replicable change in California and nationwide.

At GO-Biz we look forward to supporting and collaborating with the PR-RREP by coordinating efforts for the further development of quality jobs that align with the State's climate goals and are supported in the PR-RREP's objectives (sustainable transportation, healthy soils, etc.).

If you have any questions regarding our support, as expressed in this letter, please do not hesitate to contact me at poonum.patel@gobiz.ca.gov.

Sincerely,



Poonum Patel
Assistant Deputy Director, Business Investment Services
Governor's Office of Business and Economic Development (GO-Biz)

Administrator Michael S. Regan
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

RE: Climate Pollution Reduction Grant - Implementation Grant Letter of Support

Dear Administrator Michael S. Regan,

I am writing on behalf of Travel Paso - the nonprofit marketing organization whose mission is to promote tourism - to express our strong support for the Climate Pollution Reduction Grant - Implementation Grant application submitted by the City of Paso Robles. To protect this and future generations along the Central Coast, the City of Paso Robles Regional Renewable Energy Park (RREP) will dramatically reduce GHG emissions in our local community and protect against other significant environmental threats throughout the region.

The Paso Robles RREP will serve as a key renewable energy hub along the Highway 46 corridor. The creation of green hydrogen and renewable energy onsite will allow for the expansion of zero-emission transportation throughout Central California, helping to achieve both State and Federal environmental initiatives.

The Paso Robles RREP solution is revolutionary in its scope and in the environmental solutions it will offer. The Paso Robles RREP will also serve as an example of how coordinated regional efforts can lead to multisector sustainable solutions and replicable change in California and nationwide.

At Travel Paso we look forward to contributing to the success of the PRRREP by coordinating efforts for the further development of tourism in a sustainable way that supports our environment and economic vitality.

We are excited to support and collaborate with the City of Paso Robles as the Regional Renewable Energy Park will provide needed and critical environmental solutions to all members of our community.

Sincerely,

Stacie Jacob,
President & CEO
Travel Paso

CITY OF MORRO BAY
PUBLIC WORKS DEPARTMENT
955 Shasta Avenue
Morro Bay, CA 93442

Administrator Michael S. Regan
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Date: March 29, 2024
RE: Climate Pollution Reduction Grant - Implementation Grant Letter of Support
Dear Administrator Michael S. Regan,

I am writing on behalf of the City of Morro Bay to express our strong support for the Climate Pollution Reduction Grant - Implementation Grant application submitted by the City of Paso Robles. To protect this and future generations along the Central Coast, the City of Paso Robles Regional Renewable Energy Park (RREP) will dramatically reduce GHG emissions in our local community and protect against other significant environmental threats throughout the region. The Paso Robles RREP will serve as a key renewable energy hub along the Highway 46 corridor. The creation of green hydrogen and renewable energy onsite will allow for the expansion of zero-emission transportation throughout Central California, helping to achieve both State and Federal environmental initiatives.

The Paso Robles RREP solution is revolutionary in its scope and in the environmental solutions it will offer. The Paso Robles RREP will also serve as an example of how coordinated regional efforts can lead to multisector sustainable solutions and replicable change in California and nationwide.

The City of Morro Bay is excited to support and collaborate with the City of Paso Robles as the Regional Renewable Energy Park will provide needed and critical environmental solutions to all members of our community.

Sincerely,

Greg Kwolek
Public Work Director
City of Morro Bay

GOLETA SANITARY
Water Resource Recovery District

March 29, 2024

Administrator Michael S. Regan
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

RE: Climate Pollution Reduction Grant - Implementation Grant Letter of Support

Dear Administrator Michael S. Regan,

I am writing on behalf of Goleta Sanitary District to express our strong support for the Climate Pollution Reduction Grant - Implementation Grant application submitted by the City of Paso Robles. To protect this and future generations along the Central Coast, the City of Paso Robles Regional Renewable Energy Park (RREP) will dramatically reduce GHG emissions in our local community and protect against other significant environmental threats throughout the region.

The Paso Robles RREP will serve as a key renewable energy hub along the Highway 46 corridor. The creation of green hydrogen and renewable energy onsite will allow for the expansion of zero-emission transportation throughout Central California, helping to achieve both State and Federal environmental initiatives.

The Paso Robles RREP solution is revolutionary in its scope and in the environmental solutions it will offer. The Paso Robles RREP will also serve as an example of how coordinated regional efforts can lead to multisector sustainable solutions and replicable change in California and nationwide.

At the Goleta Sanitary District, we look forward to contributing to the success of the PRRREP by coordinating efforts for the further development of the harnessing of renewable resources, advancing sustainable transportation, and protection of the environment.

We are excited to support and collaborate with the City of Paso Robles as the Regional Renewable Energy Park will provide needed and critical environmental solutions to all members of our community.

Sincerely,

Steve Wagner

Steve Wagner, P.E.
General Manager
Goleta Sanitary District

One William Moffett Place, Goleta CA 93117
(805) 967-4519 office (805) 964-3583 fax
www.GoletaSanitary.org

Public Utilities
879 Morro Street, San Luis Obispo, CA 93401-2710
805.781.7215
slocity.org

To: Administrator Michael S. Regan
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

From: Aaron Floyd, City of San Luis Obispo Utilities Director

Date: March 29, 2024
RE: **Climate Pollution Reduction Grant - Implementation Grant Letter of Support**
Cc: Adam Spaulding, City of Paso Robles Solid Waste & Recycling Manager

---

Dear Administrator Michael S. Regan,

I am writing on behalf of the City of San Luis Obispo to express our strong support for the Climate Pollution Reduction Grant - Implementation Grant application submitted by the City of Paso Robles. To protect this and future generations along the Central Coast, the City of Paso Robles Regional Renewable Energy Park (RREP) will dramatically reduce GHG emissions in our local community and protect against other significant environmental threats throughout the region.

The Paso Robles RREP will serve as a key renewable energy hub along the Highway 46 corridor. The creation of green hydrogen and renewable energy onsite will allow for the expansion of zero-emission transportation throughout Central California, helping to achieve both State and Federal environmental initiatives.

The Paso Robles RREP solution is revolutionary in its scope and in the environmental solutions it will offer. The Paso Robles RREP will also serve as an example of how coordinated regional efforts can lead to multisector sustainable solutions and replicable change in California and nationwide.

At the City of San Luis Obispo, we look forward to contributing to the success of the PRRREP by coordinating efforts for the further development of the City of San Luis Obispo's major city goals of climate action and carbon neutrality for the region that are mirrored in the PRRREP's objectives (sustainable transportation, healthy soils, etc.).

We are excited to support and collaborate with the City of Paso Robles as the Regional Renewable Energy Park will provide needed and critical environmental solutions to all members of our community.

Sincerely,

Aaron Floyd
Utilities Director
City of San Luis Obispo

CAPITOL OFFICE
1021 O STREET, SUITE 8720
SACRAMENTO, CA 95814
TEL (916) 651-4017
FAX (916) 651-4917

MONTEREY DISTRICT OFFICE
99 PACIFIC STREET, SUITE 575-F
MONTEREY, CA 93940
TEL (831) 657-6315
FAX (831) 657-6320

SAN LUIS OBISPO DISTRICT OFFICE
1026 PALM STREET, SUITE 201
SAN LUIS OBISPO, CA 93401
TEL (805) 549-3784
FAX (805) 549-3779

SANTA CRUZ DISTRICT OFFICE
701 OCEAN STREET, SUITE 318A
SANTA CRUZ, CA 95060
TEL (831) 425-0401
FAX (831) 425-5124

SANTA CLARA COUNTY SATELLITE OFFICE
TEL (408) 847-6101

California State Senate

SENATOR
JOHN LAIRD
SEVENTEENTH SENATE DISTRICT

COMMITTEES
BUDGET SUBCOMMITTEE #1 (EDUCATION)
CHAIR
JOINT COMMITTEE ON RULES
VICE CHAIR
BUDGET & FISCAL REVIEW
JUDICIARY
LABOR, PUBLIC EMPLOYMENT & RETIREMENT
NATURAL RESOURCES & WATER
RULES
JOINT LEGISLATIVE AUDIT COMMITTEE

March 25, 2024

Administrator Michael S. Regan
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Subject: Support for City of Paso Robles Regional Renewable Energy Park (RREP) Climate Pollution Reduction Grant-Implementation Grant

Dear Administrator Regan,

As the State Senator representing San Luis Obispo County, which includes the City of Paso Robles, and as a former California Secretary for Natural Resources, I am writing to express my strong support for their Climate Pollution Reduction Grant - Implementation Grant application. With this funding, the City of Paso Robles Regional Renewable Energy Park (RREP) to reduce greenhouse gas (GHG) emissions would develop the local community and protect against other significant environmental threats throughout the region.

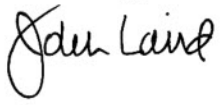
The Paso Robles RREP will serve as a key renewable energy hub along the Highway 46 corridor. The creation of green hydrogen and renewable energy onsite will allow for the expansion of zero-emission transportation throughout Central California, helping to achieve both state and federal environmental initiatives.

The Paso Robles RREP is revolutionary in its scope and in the environmental solutions it will offer such as upgrading organic material into biochar for utilization as a soil amendment to improve soil health, reduce water demand, protect groundwater and reduce pesticide application. The Paso Robles RREP will also serve as an example of how coordinated regional efforts can lead to multisector sustainable solutions and provide a model for other projects in California and nationwide. The City of Paso Robles

as the Regional Renewable Energy Park will provide needed and critical environmental solutions to all members of our community.

If you need further information, please contact me or my San Luis Obispo Senior District Representative Clint Weirick at (805) 549-3784 or Clint.Weirick@sen.ca.gov. Thank you for your consideration and I urge your support to secure funding for this visionary project.

Sincerely,



JOHN LAIRD
State Senator, 17th District

JIMMY PANETTA
19TH DISTRICT, CALIFORNIA

COMMITTEE ON WAYS AND MEANS
COMMITTEE ON ARMED SERVICES
COMMITTEE ON BUDGET
CHIEF DEPUTY WHIP

304 CANNON HOUSE OFFICE BUILDING

1200 AGUAJITO ROAD, SUITE 003
MONTEREY, CA 93940

701 OCEAN STREET, ROOM 318C
SANTA CRUZ, CA 95060

841 BLOSSOM HILL ROAD, SUITE 209
SAN JOSE, CA 95123

800 PINE STREET
PASO ROBLES, CA 93446

Congress of the United States
House of Representatives
Washington, DC 20515

March 21, 2024

Administrator Michael S. Regan
Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Dear Administrator Regan,

I write in strong support of the City of Paso Robles' application to the Climate Pollution Reduction Grant program. If awarded funding, the City of Paso Robles will implement its Regional Renewable Energy Park (RREP) to dramatically reduce greenhouse gas emissions in northern San Luis Obispo County in California's 19th Congressional District and protect against other harmful pollution.

The City's proposal explains how it will use this program's training and technical resources to implement the RREP as a key renewable energy hub along the Highway 46 corridor. The onsite creation of green hydrogen and renewable energy will allow for the expansion of zero-emission transportation throughout the Central Coast, helping to achieve both federal and local climate goals.

The Paso Robles RREP will also serve as an example of how coordinated regional efforts can lead to multisector sustainable solutions and replicable change in California and nationwide. I am hopeful that this project has the potential to protect this and future generations along the Central Coast.

Thank you, in advance, for your full and fair consideration of its proposal. Please contact my office if you have any questions about this request.

Sincerely,

Jimmy Panetta
U.S. Representative, California
19th Congressional District

Paso Robles Main Street Association

835 12th St. Suite D, Paso Robles, CA 93446 805-238-4103 Fax 805-238-4029

March 26, 2024

Administrator Michael S. Regan
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

RE: Climate Pollution Reduction Grant - Implementation Grant Letter of Support

Dear Administrator Michael S. Regan,

I am writing on behalf of the Downtown Paso Robles Main Street Association to express our strong support for the Climate Pollution Reduction Grant - Implementation Grant application submitted by the City of Paso Robles. To protect this and future generations along the Central Coast, the City of Paso Robles Regional Renewable Energy Park (RREP) will dramatically reduce GHG emissions in our local community and protect against other significant environmental threats throughout the region.

The Paso Robles RREP will serve as a key renewable energy hub along the Highway 46 corridor. The creation of green hydrogen and renewable energy onsite will allow for the expansion of zero-emission transportation throughout Central California, helping to achieve both State and Federal environmental initiatives. The Paso Robles RREP solution is revolutionary in its scope and in the environmental solutions it will offer. The Paso Robles RREP will also serve as an example of how coordinated regional efforts can lead to multisector sustainable solutions and replicable change in California and nationwide.

At Downtown Paso Robles Main Street Association, we look forward to contributing to the success of the PRRREP by coordinating efforts for the further development of sustainable transportation, reduced water demand and healthy soils.

We are excited to support and collaborate with the City of Paso Robles as the Regional Renewable Energy Park will provide needed and critical environmental solutions to all members of our community.

Sincerely,

DOWNTOWN PASO ROBLES MAIN STREET ASSOCIATION

Norma Moye
Executive Director

COUNTY OF SAN LUIS OBISPO
BOARD OF SUPERVISORS
John Peschong *District One Supervisor*

March 26, 2024

Michael S. Regan, Administrator
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

RE: Climate Pollution Reduction Grant - Implementation Grant Letter of Support

Dear Administrator Regan,

I am the San Luis Obispo County District One Supervisor and the City of Paso Robles falls with my supervisorial district. I'm writing to express my strong support for the Climate Pollution Reduction Grant - Implementation Grant application submitted by the City of Paso Robles. To protect this and future generations along the Central Coast, the City of Paso Robles Regional Renewable Energy Park (RREP) will dramatically reduce GHG emissions in our local community and protect against other significant environmental threats throughout the region.

The Paso Robles RREP will serve as a key renewable energy hub along the Highway 46 corridor. The creation of green hydrogen and renewable energy onsite will allow for the expansion of zero-emission transportation throughout Central California, helping to achieve both State and Federal environmental initiatives.

The Paso Robles RREP solution is revolutionary in its scope and in the environmental solutions it will offer. The Paso Robles RREP will also serve as an example of how coordinated regional efforts can lead to multisector sustainable solutions and replicable change in California and nationwide.

I work collaboratively with the City of Paso Robles and look forward to the Regional Renewable Energy Park which will provide needed and critical environmental solutions to all members of our community.

Sincerely,

John Peschong
District One Supervisor

County of San Luis Obispo Government Center
1055 Monterey Street, Ste. D430 | San Luis Obispo, CA 93408 | (P) 805-781-5450 | (F) 805-781-1350
slocounty.ca.gov

253 Elks Lane
San Luis Obispo, CA 93401
(805) 781-4472 Fax (805) 781-1291
www.slorta.org

March 26, 2024

Administrator Michael S. Regan
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

RE: **Climate Pollution Reduction Grant - Implementation Grant Letter of Support**

Dear Administrator Michael S. Regan,

I am writing on behalf of the San Luis Obispo Regional Transit Authority (RTA) to express our strong support for the Climate Pollution Reduction Grant - Implementation Grant application submitted by the City of Paso Robles. To protect this and future generations along the Central Coast, the ***City of Paso Robles Regional Renewable Energy Park (RREP)*** will dramatically reduce GHG emissions in our local community and protect against other significant environmental threats throughout the region.

The ***Paso Robles RREP*** will serve as a key renewable energy hub along the Highway 46 corridor. The creation of green hydrogen and renewable energy onsite will allow for the expansion of zero-emission transportation throughout Central California, helping to achieve both State and Federal environmental initiatives.

The ***Paso Robles RREP*** solution is revolutionary in its scope and in the environmental solutions it will offer. The Paso Robles RREP will also serve as an example of how coordinated regional efforts can lead to multisector sustainable solutions and replicable change in California and nationwide.

At the RTA, we look forward to contributing to the success of the ***Paso Robles RREP*** by coordinating efforts for the further development of the RTA's 2023 Zero-Emission Transition Plan that has been accepted by the Federal Transit Administration and is supported/mirrored in the Paso Robles RREP's objectives of sustainable transportation, healthy soils, and other important community-supported efforts.

We are excited to support and collaborate with the City of Paso Robles as the Regional Renewable Energy Park will provide needed and critical environmental solutions to all members of our community.

Sincerely,

Geoff Straw
Executive Director

The Regional Transit Authority is a Joint Powers Agency serving residents and visitors of:

Arroyo Grande Atascadero Grover Beach Morro Bay Paso Robles Pismo Beach San Luis Obispo and The County of San Luis Obispo

REACH

Ideas + Action for a Thriving Central Coast

March 20, 2024

Administrator Michael S. Regan
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

RE: Climate Pollution Reduction Grant - Implementation Grant Letter of Support

Dear Administrator Michael S. Regan,

I am writing to express REACH's support for the Climate Pollution Reduction Grant - Implementation Grant application submitted by the City of Paso Robles. The Regional Renewable Energy Park (RREP) will dramatically reduce GHG emissions in our local community and protect against other significant environmental threats throughout the region.

REACH is a nonprofit, economic impact organization with a mission to increase economic prosperity on the Central Coast of California through big thinking, bold action and regional collaboration. The north star of our work is collaboration with business, education, government and nonprofit partners to create good paying jobs and provide current and future generations the opportunity to thrive. As part of these efforts, our region is actively working to ensure we have the infrastructure to sustain a resilient community.

The Paso Robles RREP will serve as a key renewable energy hub along the Highway 46 corridor. The creation of green hydrogen and renewable energy onsite will allow for the expansion of zero-emission transportation throughout Central California, helping to achieve both State and Federal environmental initiatives.

The Paso Robles RREP solution is revolutionary in its scope and in the environmental solutions it will offer. The Paso Robles RREP will also serve as an example of how coordinated regional efforts can lead to multisector sustainable solutions and replicable change in California and nationwide.

We greatly appreciate the consideration of this project and grant application for the City of Paso Robles' Regional Renewable Energy Park to provide needed and critical environmental solutions to all members of our community.

Sincerely,

Melissa James
President/CEO
REACH
melissa@reachcentralcoast.org

CAL POLY | Initiative for Climate Leadership and Resilience

Mar 18, 2024

RE: Climate Pollution Reduction Grant - Implementation Grant Letter of Support

Dear Administrator Michael S. Regan,

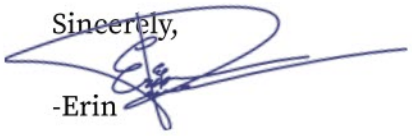
I am writing on behalf of the Cal Poly Initiative for Climate Leadership and Resilience (ICLR) to express our strong support for the Climate Pollution Reduction Grant - Implementation Grant application submitted by the City of Paso Robles. To protect this and future generations along the Central Coast, the City of Paso Robles Regional Renewable Energy Park (RREP) will dramatically reduce GHG emissions in our local community and protect against other significant environmental threats throughout the region.

The Paso Robles RREP will serve as a key renewable energy hub along the Highway 46 corridor. The creation of green hydrogen and renewable energy onsite will allow for the expansion of zero-emission transportation throughout Central California, helping to achieve both State and Federal environmental initiatives. The Paso Robles RREP solution is revolutionary in its scope and in the environmental solutions it will offer. The Paso Robles RREP will also serve as an example of how coordinated regional efforts can lead to multisector sustainable solutions..

At ICLR, we look forward to contributing to the success of the PRRREP by coordinating efforts to leverage biochar, a “waste” product from the facility that has great value as an agricultural soil amendment. Indeed, regenerative agriculture is a key climate solution for the Central Coast (an agricultural center), and we do not currently have a local source of biochar. The PRRREP fills a critical gap and will help accelerate the adoption of climate-smart agriculture.

We are excited to support and collaborate with the City of Paso Robles as the Regional Renewable Energy Park will provide needed and critical environmental solutions to all members of our community.

Sincerely,



-Erin

Dr. Erin P. J. Pearse | he/him
Initiative for Climate Leadership and Resilience
Professor of Mathematics
Bailey College of Science and Mathematics
Cal Poly, San Luis Obispo, CA

climate.calpoly.edu
CAL POLY

PASO ROBLES
WINE COUNTRY ALLIANCE

March 15, 2024

Administrator Michael S. Regan
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

RE: Climate Pollution Reduction Grant - Implementation Grant Letter of Support

Dear Administrator Michael S. Regan,

I am writing on behalf of The Paso Robles Wine Country Alliance to express our strong support for the Climate Pollution Reduction Grant - Implementation Grant application submitted by the City of Paso Robles. To protect this and future generations along the Central Coast, the City of Paso Robles Regional Renewable Energy Park (RREP) will dramatically reduce GHG emissions in our local community and protect against other significant environmental threats throughout the region.

The Paso Robles RREP will serve as a key renewable energy hub along the Highway 46 corridor. The creation of green hydrogen and renewable energy onsite will allow for the expansion of zero-emission transportation throughout Central California, helping to achieve both State and Federal environmental initiatives.

The Paso Robles RREP solution is revolutionary in its scope and in the environmental solutions it will offer. The Paso Robles RREP will also serve as an example of how coordinated regional efforts can lead to multisector sustainable solutions and replicable change in California and nationwide.

At the Paso Robles Wine Country Alliance, we look forward to contributing to the success of the PRRREP by coordinating efforts for the further development of sustainable transportation, healthy soils, and the protection of the Paso Robles Wine Country for future generations.

We are excited to support and collaborate with the City of Paso Robles as the Regional Renewable Energy Park will provide needed and critical environmental solutions to all members of our community.

Sincerely,

Joel Peterson
Executive Director
Paso Robles Wine Country Alliance

ADDRESS
1446 Spring St. · Ste 103
Paso Robles, CA 93446

CONTACT
P: 805.239.8463
E: info@pasowine.com

PASOWINE.COM

Upper Salinas-Las Tablas Resource Conservation District

5855 Capistrano Ave., Suite D, Atascadero, CA 93422 | 805.460.7272 | www.us-ltrcd.org

Administrator Michael S. Regan
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

RE: Climate Pollution Reduction Grant - Implementation Grant Letter of Support

Dear Administrator Michael S. Regan,

I am writing on behalf of Upper Salinas – Las Tablas Resource Conservation District (USLTRCD) to express our strong support for the Climate Pollution Reduction Grant - Implementation Grant application submitted by the City of Paso Robles. To protect this and future generations along the Central Coast, the City of Paso Robles Regional Renewable Energy Park (RREP) will dramatically reduce GHG emissions in our local community and protect against other significant environmental threats throughout the region.

The Paso Robles RREP will serve as a key renewable energy hub along the Highway 46 corridor. The creation of green hydrogen and renewable energy onsite will allow for the expansion of zero-emission transportation throughout Central California, helping to achieve both State and Federal environmental initiatives.

The Paso Robles RREP solution is revolutionary in its scope and in the environmental solutions it will offer. The Paso Robles RREP will also serve as an example of how coordinated regional efforts can lead to multisector sustainable solutions and replicable change in California and nationwide.

At USLTRCD we look forward to contributing to the success of the PRRREP by coordinating efforts for the further development of identifying and creating closed loop systems to address fire/fuels management, climate smart agricultural practices, renewable and alternative energy sources, and healthy soils.

We are excited to support and collaborate with the City of Paso Robles as the Regional Renewable Energy Park will provide needed and critical environmental solutions to all members of our community.

Sincerely,

Devin Best
Executive Director
Upper Salinas – Las Tablas Resource Conservation District

SAN LUIS OBISPO COUNTY
INTEGRATED WASTE MANAGEMENT AUTHORITY
Connecting the Community to Waste Solutions

March 11, 2024

Administrator Michael S. Regan
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

RE: Climate Pollution Reduction Grant - Implementation Grant Letter of Support

Dear Administrator Michael S. Regan,

I am writing on behalf of the San Luis Obispo County Integrated Waste Management Authority to express our strong support for the Climate Pollution Reduction Grant - Implementation Grant application submitted by the City of Paso Robles. To protect this and future generations along the Central Coast, the City of Paso Robles Regional Renewable Energy Park (RREP) will dramatically reduce GHG emissions in our local community and protect against other significant environmental threats throughout the region.

The Paso Robles RREP will serve as a key renewable energy hub along the Highway 46 corridor. The creation of green hydrogen and renewable energy onsite will allow for the expansion of zero-emission transportation throughout Central California, helping to achieve both State and Federal environmental initiatives.

The Paso Robles RREP solution is revolutionary in its scope and in the environmental solutions it will offer. The Paso Robles RREP will furthermore demonstrate how coordinated regional efforts can lead to multisector sustainable solutions and replicable change both in California and across the nation.

At the San Luis Obispo County Integrated Waste Management Authority, we look forward to contributing to the success of the PRRREP by supporting our mission to provide coordinated efforts to comply with state waste and recycling policy on behalf of member agencies through practical and cost-effective programs, education and technical support.

We are excited to support and collaborate with the City of Paso Robles as the Regional Renewable Energy Park will provide needed and critical environmental solutions to all members of our community.

Sincerely,

Jan Marx
Board President,
San Luis Obispo County Integrated Waste Management Authority

870 Osos Street, San Luis Obispo, CA. 93401 | Phone (805) 782-8530 | Email: info@iwma.com

Memorandum of Understanding
for Central Coast
Regional Biosolids Cooperative

This Memorandum of Understanding ("MOU"), effective as of the last date signed below, is by and among the following government entities in the Central Coast region of California: City of San Luis Obispo, City of Paso Robles, City of Santa Maria, City of Atascadero, City of Morro Bay, Cayucos Sanitary District, South San Luis Obispo County Sanitation District, Avila Beach Community Services District, San Miguelito Mutual Water Company, Templeton Community Services District, San Miguel Community Services District, Cambria Community Services District, City of Pismo Beach, City of Santa Barbara, Goleta Sanitary District, and the Nipomo Community Services District. These agencies are individually referred to herein as a "Party," and collectively as "Parties".

Whereas, all the Parties operate wastewater treatment systems that generate biosolids. The volume of biosolids each Party generates varies, depending on the size and type of its wastewater system (e.g., ponds systems vs. mechanical treatment processes), but all Parties have a similar need to properly dispose biosolids.

Whereas, biosolids contain pollutants and are closely regulated by the State of California (Central Coast Regional Water Quality Control Board) and U.S. Environmental Protection Agency. The County of San Luis Obispo has a moratorium on land application of biosolids. Landfill regulations recently changed and biosolids may no longer be disposed in landfills. Due to a lack of local disposal options, most Parties haul their biosolids to facilities in Santa Maria or Kern County, where it is mixed with other organic waste streams and composted, then applied to land.

Whereas, the State of California recently required most Parties to test their biosolids for per- and polyfluorinated alkyl substances (PFAS), which are commonly referred to as "forever chemicals" due to their resistance to degradation in the environment. PFAS have been widely used in common household and personal care products for many years. In general, all Parties have low levels of various PFAS species in their biosolids.

Whereas, composting does not break down PFAS, because very high temperatures are required to break the strong carbon-fluorine bonds in PFAS. Consequently, compost derived from biosolids contains PFAS. Compost also contains micro-plastics, which is an emerging concern for local farmers. Existing biosolids receiving facilities do not have plans to address these issues, and rather, are counting on classification as PFAS passive receivers in order to be exempt from liability, which is uncertain.

Whereas, in 2021, representatives of the Cities of Paso Robles and San Luis Obispo began to collectively explore ways to advance the processing of their biosolids and eliminate potential future liabilities associated with PFAS. They discovered new technologies are available, such as high-temperature pyrolysis, which are capable of

eliminating PFAS in biosolids and converting biosolids into valuable products such as biochar. These technologies would be very expensive for any individual Party to install and operate, but may be cost-effective if all wastewater agencies in the region pool their biosolids waste streams and process it all at one regional facility.

In 2022 and 2023, the Parties convened a series of workshops, conducted by a professional facilitator, to explore interest in a regional biosolids cooperative. The Parties learned:

a. Most of the communities between northern San Luis Obispo County and northern Santa Barbara County already cooperate on a variety of common areas of interest, including water and solid waste management;
b. Pending regulatory changes at the State and Federal level could lead to a prohibition of land application of biosolids or compost derived from biosolids;
c. Cooperating would enable a facility to be large enough that it would be economical to install advanced processing equipment;
d. A local facility would reduce out-of-county truck trips, thus help control long-term costs and reduce greenhouse gas emissions;
e. Advanced processing would greatly reduce the volume of biosolids and convert the material into valuable products such as renewable natural gas and biochar. These products may be sold to markets and the revenue may be used to offset the cost of an advanced processing facility;
f. Cooperating increases the likelihood that private enterprises will participate in establishing a new facility, by ensuring the facility receives enough feedstock to justify a large expenditure for advanced equipment;
g. Several regional biosolids cooperatives are presently forming throughout California;
h. State Senate Bill (SB) 1383 has created demand for new facilities that divert organic waste streams from landfills and process it into valuable products such as renewable natural gas;
i. Grant funding is available from the State of California for establishment of new organic waste processing facilities;
j. There may be potential to further improve the economics of a regional facility by making it large enough to receive and process all organic waste streams, including green waste collected by waste haulers, spoiled packaged food waste, agricultural waste, etc.; and
k. Additional work is needed, such as evaluating available technologies, visiting model facilities in other areas, and soliciting proposals from professional engineering firms to help with project delivery.

In May and June 2023, representatives of the Parties each stated informally their commitment to participate in a cooperative with the purpose of establishing a regional facility capable of advanced processing of biosolids. The purpose of this MOU is to formalize that commitment and clarify how the Parties will participate.

NOW, THEREFORE, the Parties do hereby agree as follows:

a. The Parties will support further efforts to plan a regional advanced biosolids processing facility by allowing appropriate staff to participate in any future workshops and providing any non-confidential information about their biosolids reasonably requested.

b. Parties will, in each Party's reasonable discretion, cooperate on applications to the State and Federal government for grant funding. For example, if any one Party takes the lead on a grant application, the other Parties agree to provide information and timely letters of support as needed.

c. Grant programs often require "matching funds" in the form of "in-kind" or "cost share," which can be fulfilled by staff time spent working on the funded project. If necessary, Parties agree to the extent reasonably feasible to track and report their staff time spent on the grant-funded activity.

d. The Parties will endeavor to establish a regional facility that receives and processes biosolids for a fee that is no greater than the average cost of what all Parties are currently paying (e.g., $70 per ton) for biosolids hauling and disposal. However, the Parties acknowledge that current costs are projected to rise and will take that into consideration when evaluating the cost of a new regional facility. The Parties will also consider the many other less quantifiable benefits of a new regional facility, such as environmental improvements (e.g., reduction of greenhouse gas emissions) and reduction of liabilities associated with pollutants such as PFAS.

e. Many private entities are well-equipped to efficiently deliver advanced biosolids processing facilities. The Parties or a Party may solicit proposals from private entities to design, build, operate, and finance a new regional advanced biosolids processing facility. This MOU is intended to signal to such private entities that the Parties will commit to supporting the facility by entering into long-term agreements to deliver their biosolids.

f. This MOU does not include any financial obligations for the Parties other than staff time at this time. However, this MOU may be amended from time-to-time, as needed, to address the evolving needs of the Parties as they explore establishing a regional facility. For example, if funding is needed for planning, siting, or environmental permitting, the Parties may decide to share the costs.

g. This MOU shall not be changed or amended except upon written consent of the Parties.

h. This MOU is not intended to and does not create any legally binding obligations, rights or remedies between the Parties. This MOU reflects the good-faith intention of the Parties to cooperate in the manner set forth herein, while recognizing that no Party shall be bound to any action as a result of this MOU.

i. Each Party represents that each such Party signing this MOU has been duly authorized by that entity to execute this Memorandum of Understanding on its behalf.

j. Any Party may withdraw from this MOU at any time for any reason. However, the Parties will make their best effort to provide no less than 60 days' notice of a Party's intent to withdraw.

k. This MOU may be executed in counterparts, each of which shall constitute an original, but all of which shall constitute one and the same agreement.

l. Each Party agrees and acknowledges that this MOU does not commit any agency to take any action, expend any funds, or commit to any specific project. Any future facility will be subject to review pursuant to the California Environmental Quality Act.

m. This MOU shall become effective on the last date set forth below.

By: Aaron Floyd (Nov 7, 2023 08:35 PST) Date: Nov 7, 2023
Aaron Floyd
Utilities Director
City of San Luis Obispo

By: Christopher Alakel (Nov 8, 2023 09:42 PST) Date: Nov 8, 2023
Christopher Alakel
Utilities Director
City of Paso Robles

By: Date: Nov 9, 2023
Shad Springer
Utilities Director
City of Santa Maria

By: Date: Nov 14, 2023
Nick DeBar
Public Works Director
City of Atascadero

By: Gregory Kwolek (Nov 14, 2023 15:18 PST) Date: Nov 14, 2023
Greg Kwolek
Public Works Director
City of Morro Bay

By: Rick Koon Date: Nov 16, 2023
Rick Koon
District Manager
Cayucos Sanitary District

By: Date: Nov 20, 2023
Jeremy Ghent
District Administrator
South San Luis Obispo County Sanitation District

By: Avila Beach CSD (Nov 20, 2023 10:06 PST) Date: Nov 20, 2023
Brad Hagemann
General Manager
Avila Beach Community Services District

By: Dwayne Chisam (Nov 21, 2023 12:46 PST) Date: Nov 21, 2023
Dwayne Chisam
General Manager
San Miguelito Mutual Water Company

By: Jeff Briltz Jeff Briltz (Nov 24, 2023 09:47 PST) Date: Nov 24, 2023
Jeff Briltz
General Manager
Templeton Community Services District

By: _____ Date: _____
Kelly Dodds
General Manager
San Miguel Community Services District

By: _____ Date: _____
Matthew McElhenie
General Manager
Cambria Community Services District

By: _____ Date:_____
Greg Kwolek
Public Works Director
City of Morro Bay

By: _____ Date:_____
Rick Koon
District Manager
Cayucos Sanitary District

By: _____ Date:_____
Jeremy Ghent
District Administrator
South San Luis Obispo County Sanitation District

By: _____ Date:_____
Brad Hagemann
General Manager
Avila Beach Community Services District

By: _____ Date:_____
Dwayne Chisam
General Manager
San Miguelito Mutual Water Company

By: _____ Date:_____
Jeff Briltz
General Manager
Templeton Community Services District

By: Kelly Dodds _____ Date: Nov 27, 2023
Kelly Dodds
General Manager
San Miguel Community Services District

By: Matthew McElhenie _____ Date: Nov 27, 2023
Matthew McElhenie
General Manager
Cambria Community Services District

Ben Fine

By: Ben Fine (Nov 28, 2023 08:51 PST) Date: Nov 28, 2023

Ben Fine
Public Works Director
City of Pismo Beach

By: _____ Date: Nov 28, 2023

Clifford Maurer
Public Works Director
City of Santa Barbara

Steve Wagner

By: Steve Wagner (Nov 28, 2023 14:32 PST) Date: Nov 28, 2023

Steve Wagner
General Manager
Goleta Sanitary District

Raymond Dienzo

By: _____ Date: Nov 28, 2023

Ray Dienzo
General Manager
Nipomo Community Services District

END OF DOCUMENT

City of Paso Robles:
Regional Renewable Energy Park

CPRG Implementation Grant
Organization: City of El Paso de Robles
Primary Contact Name: Adam Spaulding
Phone Number: 805-423-8255
Email Address: aspaulding@prcity.com
Type of Application: Individual Application
Funding Requested: $99,999,999.99
Application Title: City of Paso Robles: Regional Renewable Energy Park

Brief Description of GHG Measures

The Paso Robles Regional Renewable Energy Park will be composed of several interconnected advanced technologies, each independent in their reduction and/or conversion/upgrading to reduce GHG emissions.

Methane and F-gas reduction measures will be delivered through the collection, cleaning and conversion of landfill gas, and biogas collected from the on-site Anaerobic Digester. GHG reductions will be seen throughout this process in the utilization of previously uncaptured organic waste streams (agricultural and winery/brewery waste) and in the expansion of organic recovery throughout the region. This additional methane capture will then be used to supplement the power needed to produce green hydrogen, and charge electric vehicles.

Green hydrogen derived from the site will be further utilized to support three critical GHG-emitting sectors (Industry, Electric Generation, and Transportation). These sectors all currently rely heavily on energy derived from fossil fuels. Supporting the transition away from fossil fuels in these sectors will be transformative and impact local and regional communities, allowing residents, travelers, regional transit operators and jurisdictions to explore newer and greener transportation opportunities.

Additional GHG reduction measures will also be seen in the conversion of organic material to biochar for use in Agriculture/ Working Lands, and even in the production of concrete. These anticipated results will be seen in reduced GHG emissions from treated agricultural/working lands, reduction in transportation (vehicle miles traveled (VMT)for disposal of biosolids), reduced demand for water resources, and a reduction of aggregate utilized to create a necessary building material, concrete. An additional benefit that is difficult to accurately quantify will be reduced GHG emissions linked to a regional facility to treat materials for PFAS. As regulations evolve in the coming years and disposal becomes more restrictive, management of this hazardous material will force jurisdictions to explore more remote and costly disposal options which will inevitably increase VMT and GHG emissions.

Additionally, the proposed site is adjacent to two large vineyards and within 5 miles of the City-owned airport. The Paso Robles Regional Renewable Energy Park (PRRREP) will look to support these locations with needed, on-demand green electricity and hydrogen. The ability to create energy independence and redundancy is enticing to existing energy users, and is a critical infrastructure investment that will be necessary to help expand the planned Tech Corridor and Spaceport at the Paso Robles Municipal Airport.

Sectors

- ✓ Electricity Generation
- ✓ Industry
- ✓ Transportation
- ✓ Agriculture/Natural & Working Lands
- ✓ Waste Materials Management

Expected Total Cumulative GHG Emission Reductions

Expected Cumulative GHG Reductions for 2025-2030	Expected Cumulative GHG Reductions for 2025-2050
874,278 MTCO2E	**4,401,034 MTCO2E**

Location:

City: Paso Robles
State: CA

Applicable Priority Climate Action Plan(s) (PCAP) On Which Measures Are Based

PCAP Lead Organization(s): California Air Resources Board
PCAP Title(s): The State of California's Action Plan
PCAP Website Link:
https://ww2.arb.ca.gov/sites/default/files/2024-03/California%20CPRG%20Priority%20Climate%20Action%20Plan%202024%20March%201_0.pdf

List of GHG Reduction Measures & PCAP Page Reference For Each

Electricity Generation - p.37, p.42, p.46-47
Industry- p.34, p.36, p.40,
Transportation- p.21, p.26, p.31, p.33,
Agriculture/Natural & Working Lands- p.42, p.50, p.52
Waste Materials Management- p.42, p.46, p.59

Letters of Support:

California Air Resources Control Board (CARB)
San Luis Obispo County Air Pollution Control District (SLO APCD)
Governor's Office of Business and Economic Development (Go-Biz)
US House of Representatives- Jimmy Panetta
US House of Representatives - Salud Carbajal
CA State Senate - James Laird
CA State Assembly - Dawn Addis
San Luis Obispo County - Supervisor John Peschong
San Luis Obispo Council of Governments (SLOCOG)
Integrated Waste Management Authority (IWMA) (a San Luis Obispo County JPA)
Regional Transit Authority (RTA, San Luis Obispo County)
Upper Salinas - Las Tablas Resource Conservation District (USLT RCD)
California State Polytechnic University, San Luis Obispo - Initiative for Climate Leadership and Resilience (Cal Poly)
Regional Economic Action Coalition (REACH - Central Coast)
Paso Robles Main Street Association
Travel Paso
Wine Country Alliance
City of San Luis Obispo
City of Morro Bay
San Miguel CSD
City Atascadero

Project Narrative

OVERALL PROJECT SUMMARY AND APPROACH

DESCRIPTION OF GHG REDUCTION MEASURES

The City of Paso Robles is proposing the development of a new and replicable Regional Renewable Energy Park (RREP) pilot program with the key goals of addressing greenhouse gas emissions and capture, renewable energy creation (fueling local fleets and powering local business/community), PFAS destruction (for water, wastewater and solid waste management), carbon sequestration, landfill gas reutilization, SB 1383 compliance for partner jurisdictions, healthy soil regeneration, sustainable watershed management, job creation and providing access to renewable fuels along a key transportation artery in Central California to both commercial and residential users.

The City of Paso Robles owns 133+ acres adjacent to the City's Landfill located on California State Route 46. This road serves not only the local community but also surrounding jurisdictions as a critical link between the Coast and the Central Valley. This single road moves well over $8 Billion in trade annually.

The City's Landfill is ideally suited to process, manage and solve a host of environmental issues for the City as well as the surrounding partner jurisdictions (CARB, 266). The Paso Robles landfill is one of very few municipal-owned landfills and is located in a sparsely populated stretch of the County. The RREP will utilize this ideal location to develop an integrated solution to manage organic waste (reducing GHG emissions) and deliver groundbreaking solutions for the region. Paso Robles and the surrounding communities generate a significant amount of organic material through food scraps, yard waste, cultivation, industrial processing and proper forest management. The goal of the RREP is to integrate all of these varying waste streams into one facility where each of these resources can be fully utilized to deliver benefits to the community and to reduce any adverse environmental impacts.

The facility will consist of a series of interconnected solutions, all utilized to extract as much benefit from the materials as possible (CARB, 268). The Anaerobic Digester will be utilized to process organic waste to collect renewable gas(PCAP, Electric Generation, p.46). High-temperature pyrolysis units will be installed to treat biosolids and organic material for PFAS, while simultaneously extracting further energy production (PCAP, Energy, p46). A dewatering press will additionally be necessary, to ensure that material meets the minimum requirements for pyrolysis or Anaerobic Digestion, which will be powered in-part by the power generated through the High-Temperature Pyrolysis process. Because of the facility's location, it will also be directly connected to the methane capture technologies at the landfill(PCAP -(Energy, p.46) (Waste, p.59)). Currently being flared, this gas will now be collected and upgraded along with the other recovered gasses, further reducing GHG emissions (CARB, 234). This upgraded gas can then be utilized by power local fleets as they deliver material to the site, or if necessary, can be connected to SoCal Gas, and this power can be utilized to fulfill SB 1383 procurement requirements for partner (or other interested) jurisdictions (PCAP, Transportation, pgs. 21, 26, 31, 33).

Further fueling opportunities exist to connect the power from this upgraded gas to both a private (Regional Transit Authority) and public renewable fueling station along CA-46 (PCAP, Transportation, pgs. 21, 26, 31, 33). This station will be connected to Green Hydrogen (additionally created on site), and electricity from biogas (Landfill and Anaerobic Digester derived) and from electricity created through various solar arrays on and surrounding the Landfill, not yet mentioned) (PCAP, p.37, p.42, p.46-47). This station represents the type of local solution to energy demand and security that would benefit not only Paso Robles and the surrounding community but can be utilized to demonstrate how this approach can be beneficial and replicable for other communities throughout the State (CARB, 267-268), and nation.

Through the high-temperature pyrolysis process, beyond the creation of beneficial renewable energy (in the form of hot water for the dewatering process), another byproduct of the process is the creation of Biochar. The processing of organic material through pyrolysis additionally provides the benefits of carbon capture through its reintegration back into the soil, and its elimination of smoke and fire risks while helping to reduce air pollution throughout the region (PCAP, Electric Generation, p.46). This single product will be critical for many solutions generated in this Program, including healthy soil regeneration, watershed management, carbon sequestration and various critical PFAS Treatment

opportunities. The benefits of biochar are significant and represent a key solution derived from a previous liability. At this time it is difficult to quantify the MTCO2E estimates regarding the land application of biochar, as standards of application and use mary varry, more research needs to be completed to fully quantify the benefits of application. Two interested parties, see Letters of Support, the USLT RCD and Cal Poly are both interested in further developing the adoption of biochar throughout the region, and could serve as key stakeholders for both the adoption of the use of biochar, and in clearly quantifying its benefits (including associated MTCO2E reduction).

The material being sent to this facility includes all organic material, from forest fuel reduction to Fats, Oils, and Grease (FOG) and yard waste. Biosolids are another organic waste stream that the facility will treat. Biosolids have also been identified as a key location for PFAS in a community. Including high-temperature pyrolysis in the RREP allows for the partner jurisdictions to have an identified solution to their known PFAS disposal/destruction issues. High-temperature pyrolysis will also be critical to treat PFAS-containing elements involved in the water treatment process(Granular Activated Carbon, GAC) and in eliminating PFAS exposure through leachate treatment at landfills.

Beyond being replicable, the RREP is also scalable, so where opportunity (additional volume) may present itself in the future, the RREP has the ability to either expand its operations or include additional units of whatever component is necessary. While there is sufficient acreage to allow for continued growth, the future for this Program is to show and help develop similar facilities throughout the State, reducing the need for mega facilities and allowing for a more responsive local solution to key local challenges. Each RREP will prove to provide needed environmental solutions and economic benefits to a local community/region.

The Paso Robles Regional Renewable Energy Park hopes to address issues in the Waste Materials Management, Transportation, Energy Generation, Agriculture/ Natural & Working Lands, Industry sectors but it also looks to provide needed solutions to key the most critical Infrastructure programs, Water and Wastewater. These two critical sectors can be overlooked, and are generally managed by local jurisdictions. Creating a needed solution and reducing a significant future burden from these processes is critical for the health and safety of all communities throughout the nation.

Major milestones for this program will include the establishment and construction of the necessary anaerobic digester (and methane capture and refining equipment) to handle the various streams of organic waste (agricultural and industrial waste, forestry materials, food and yard waste, grocery waste, FOG, etc.) The RREP will also include the build-out of high-temperature pyrolysis unit(s) to further treat the digested material. Dewatering will also be necessary as many jurisdictions do not have individual processes that are able to reduce the water content in their biosolids which will allow for proper treatment for PFAS and further anaerobic digestion and/or pyrolysis. This extracted water can then be utilized (once treated with Biochar/Activated Carbon, for dust mitigation on the subject property, including the Landfill, and with testing, could prove to be the supply of water needed for

Green Hydrogen generation). Construction will also be necessary to connect the electricity generated from the Landfill gas collection to the larger project site.

Further development will also include the establishment of a fueling station; the Regional Transit Authority (RTA)could establish a regional transit hub at the PR RREP. The vehicles would have the ability to charge/fuel 24/7 on green, renewable energy sources. This process and availability of Zero-Emission Fuels, servicing the community and servicing LIDAC communities would greatly reduce exposure to harmful emissions, directly in those communities. The RTA has offered the City a Letter of Support (attached)to demonstrate their desire to help the PR RREP become a reality. The co-located transit facility would allow for the expansion of service to the Paso Robles area and for the quicker adoption of Zero Emission Vehicles for service. Additional benefits exist, in that with the creation of Green Hydrogen on site, the RTA would be able to explore alternative engines for different routes. Currently electricity demands on transit buses make connecting Paso Robles and the larger regional hub of San Luis Obispo problematic, as a significant grade exists between the two communities, where much stored energy in EVs is lost in the ascent (~40% loss). If Hydrogen vehicles prove to be more efficient in their conversion of fuel and can be utilized in this specific route, it could prove to be a boon for the riders and the RTA, expanding the capabilities of its fleet.

The PR RREP will also consist of several acres of solar arrays. The project component covered through the CPRG grant will include the installation of 5 acres worth of solar. This installation will supplement the creation of green hydrogen, and for the charging of electric vehicles. The scale of the solar onsite will continue to evolve. The City's Landfill will be undergoing Partial Final Closure activities to cover the Southern facing portions (the oldest) of the Landfill. The City will be exploring in what way they can utilize this as an opportunity to expand solar onsite, and to create a "Brightfield." None of the expansion options for GHG Emission Reduction have been added to the overall GHG Emission Reductions calculated for this grant. However, the scale for the expected growth of the facility is significant. The total site is just over 133 acres, not including the closed portion of the landfill that will be upgraded to a Brightfield. Leaving enough room for expansion of the various components of the program, access roads etc. it would not be unreasonable to assume over 90 acres in solar production. Calculations are included below and in the supplemental information, the current 5MW solar array is estimated to utilize 15 acres. The City, when possible, would look to fully utilize this additional land. The additional 75 acres of land, using the same calculations included below, would amplify the PR RREP's estimated GHG Emission Reductions by an additional 956,195 MTCO2E, between 2025-2050).

The CPRG grant will be utilized to establish the regional facility, it will allow for the integration for the most challenging components of the technologies to be installed. From there the expansion and further reduction becomes more economically feasible. The current Anaerobic Digester costs are significant, they represent an annual processing of 40,000 Tons of material, and an annual reduction in GHG Emissions of 110,343 MTCO2E. However, based on the proposed budget a second additional 40,000 Ton digestor can be added, within the same footprint and utilizing the existing infrastructure for only 10% of the installation of the first digestor (~$5M). Which is to say, the CIty will be looking to expand its facility, to double its GHG emission reduction, with the reinvestment of tipping fees from

the Anaerobic Digester for a fraction of the price. The material exists throughout this and surrounding jurisdictions, and based on the GHG Emission Reduction calculations submitted for this grant, adding this additional unit, (likely by 2030) would expand the reduction in GHG emissions to include an additional (110,343 mtCO2e x 20 years) 2,206,860 MTCO2E to the current total. This would bring the total GHG Reduction to 6,607,894 MTCO2E for 2025-2050. Combined with the Solar Expansion this would total **7,564,089 MTCO2E ($13.22/MTCO2E Removed)**. The goal of the facility would be to capture all of the organic material currently not being diverted from the Landfill, or being land-applied throughout the area, this estimated tonnage is in the neighborhood of 200,000 T annually. This further expansion and calculation will not be included, but will be the objective of the PR RREP. The collection and continued diversion of this material, serves to benefit the environment and the growth of the project. If possible and through growth opportunities, it would not be impossible to see the PR RREP having the ability to further reduce emissions by nearly 400,000 MTCO2E a year.

The establishment of the Paso Robles Regional Renewable Energy Park will serve as a template that can show the scale and opportunity that exists in underserved areas throughout the State and nation (CARB, 269). Historically the most consequential investments are made in large metropolitan areas, leaving lesser developed areas to attempt to manage the same challenging problems with little to no resources. The City and its partners are endeavoring to demonstrate that with collective action and planning, a solution like this can not only be successful but can be a boon to the local environment, community and economy. The coalition that has been developed in support of this project is expansive, ranging from State and Local enforcement authorities to State and Local elected members. The coalition includes organizations focussed on economic development and tourism, which is linked to the focus of additional members, being environmental sustainability, research and development.

Letters of support have been provided by; California Air Resources Control Board (CARB), San Luis Obispo County Air Pollution Control District (SLO APCD), Governor's Office of Business and Economic Development (Go-Biz), US House of Representatives- Jimmy Panetta, US House of Representatives - Salud Carbajal, CA Senate - James Laird, CA Assembly - Dawn Addis, San Luis Obispo County Supervisor John Peschong, San Luis Obispo Council of Governments (SLOCOG), Integrated Waste Management Authority (IWMA) (a San Luis Obispo County JPA), Regional Transit Authority (RTA), Upper Salinas - Las Tablas Resource Conservation District (USLT RCD), California State Polytechnic University, San Luis Obispo - Initiative for Climate Leadership and Resilience (Cal Poly), Regional Economic Action Coalition (REACH - Central Coast), Paso Robles Main Street Association, Travel Paso, Wine Country Alliance. Additional Letters of Support from the following Utilities Directors: City of San Luis Obispo, City of Morro Bay, San Miguel CSD, City Atascadero, City of Goleta

A final show of support for the PR RREP can also be seen in the attached Memorandum of Understanding between 16 Regional Jurisdictions of the Central Coast Biosolids Coalition.

MOU Member Jurisdictions:

- City of El Paso de Robles
- City of San Luis Obispo
- City of Santa Maria
- City of Atascadero
- City of Morro Bay
- Cayucos Sanitary District
- South San Luis Obispo County Sanitation District
- Avila Beach Community Service District
- San Miguelito Mutual Water Company
- Templeton Community Services District
- San Miguel Community Services District
- Cambria Community Services District
- City of Pismo Beach
- City of Santa Barabara
- Goleta Sanitary District
- Nipomo Community Service District

The PR RREP will show a myriad of benefits that can be derived from developing an innovative regional solution to universal challenges. Once operational, the full scale of additional opportunities and benefits will be clear, and these developments can be replicated and implemented where sufficient volume, interest and collaboration are possible, both in California and throughout the nation. Delivering a successful replicable program will allow smaller and more remote communities to address significant environmental and health issues without having to attempt to overcome these burdens alone.

The success of the PR RREP will also support State initiatives to advance identified GHG reduction strategies (CARB, 241, 247 and 252). The PR RREP will provide solutions to the following Sectors identified in the State of California's PCAP: Electricity Generation (p.37, p.42, p.46-47), Industry (p.34, p.36, p.40), Transportation (p.21, p.26, p.31, p.33), Agriculture/Natural & Working Lands (p.42, p.50, p.52), Waste Materials Management (p.42, p.46, p.59).

DEMONSTRATION OF FUNDING NEED

The City has explored and is exploring all known grants to fund this Pilot Program. The City was unsuccessful in joining a previously submitted DOE Grant, and has since expanded the scope and capabilities to be included in the program. The City will simultaneously be looking to fund initial development, including CEQA and the development of an RFP, both internally and through grant funding where available. These preliminary activities will help establish a clear direction for developers to design and deliver on the necessary infrastructure. Beyond those initial steps, the City has discussed internalizing or financing some portion of construction. To secure the best possible result for our community and to impact the environment in the most beneficial way, the City would need significant additional funding to offset these significant construction costs. Additionally, many of the jurisdictions that have cosigned the MOU do not have the significant resources or personnel to dedicate to the development and delivery of the project.

The City has already made significant progress in the development of a regional cooperative by securing 16 member jurisdictions to an MOU (listed above and attached in Other Attachments), who

are committed to the development of a regional facility to manage their biosolids. There has even been interest expressed by a State/Federal entity to utilize the facility once built. The biosolids MOU has been two years in the making.

Additional funding opportunities will continue to be explored to expand the benefits that will be offered through the development of the RREP. Ideally, further energy generation will be created through additional solar arrays, microgrid systems can be installed, and additional energy can be delivered to neighboring communities and businesses. Additionally, the CIty hopes to be able to deliver 100% renewable energy to the City's Airport, which is currently being built out as a Tech Corridor. Many of the installations/companies that are hoping to utilize these facilities have consistent energy demands that can become challenging with brownouts, which do currently occur. The PR RREP would be able to provide renewable, reliable energy 24hrs a day 7 days a week, by combining both Solar and Green Hydrogen as energy sources. The integration of these two projects will prove to be beneficial for each. As the City can establish base users for its energy production, and the Airport can offer reliable, independent and green, renewable energy to its current and future clients.

These continued developments will take place after the initial construction of the PR RREP.

The City and partners will be looking to secure additional funding wherever possible to not overburden our relatively small population. Current opportunities exist at the state I-Bank, through grants EPA-Regional Source Reduction Assistance Grant, California Energy Commission- Large-Scale Centralized Hydrogen Production (H2Central) Grant, WaterSMART, Solid Waste INfrastructure for Recycling Grant (SWIFR), Greenhouse Reduction Fund, USDA Composting and Food Waste Reduction Program and NREL Waste-to-Energy Technical Assistance. These opportunities continue to develop and the City will utilize these additional opportunities to help grow the PR RREP to the largest scale possible that can still deliver on its initial goal of reducing GHG Emissions and providing needed, transformative and cost effective environmental solutions for the region.

The most critical component of need is in the initial funding request to the CPRG. While in theory it would be possible to establish individual portions of this facility, they would likely only serve a small cross section. Additionally, the types of funding structures that would be required dramatically reduces the overall impact of GHG Emission reductions for our communities. For example, if CPRG grant funding is not provided for the PR RREP, funding may be secured to develop a Green Hydrogen installation, but there would be a partnership with a vendor who would determine where that product would be sold and who it would benefit. Those beneficiaries would likely not be local organizations as pricing would likely send produced hydrogen to high demand locations like Los Angeles or San Francisco. Where the CPRG grant is intended to be transformative and impactful, many of these opportunities would be dramatically reduced or eliminated if the resources produced through the process were distributed solely based upon market demand. And even where green hydrogen would be produced, it would not be a viable solution to increase usage in our surrounding communities, as the material would be under contract to distant locations.

Biochar, has a significant value as the base for carbon black, a clothing dye, it additionally has a significantly increased value when used in Carbon negative concrete - and where those processes are good and needed - they do not directly serve the community where we live. If CPRG funding is able to support the initial investment into the PR RREP it would allow the City and its collaborative partners to identify the most beneficial uses of these products. Where land application is desired, Biochar could be available, otherwise the entirety of production would be sold to more remote locations for different uses. None of which would be beneficial to the local community.

Additionally, CPRG funding would establish necessary infrastructure for continued GHG emission reduction. Where the CIty is due for landfill flare upgrades, the PR RREP would create the opportunity to integrate this budgeted flare expansion, into the purchase of a gas generator. This will not be possible without the CPRG funding. A component included in the budget is the gas upgrading that will be needed for Landfill gas ~$800,000 , a generator is roughly ~$550,000+. Putting the ability to generate electricity onsite at $1.35M, however the City has ~450,000 scheduled for investment in a Landfill Flare upgrade. If the infrastructure (gas upgrader) is already present, this funding could be utilized to expand further gas recovery and conversion to electricity, reducing or eliminating landfill flare emissions (including F-Gases, (PCAP, High Global Warming Potential Gasses, p.48).

The CPRG funding is not the entire project. It is the funding that establishes the base from which our community and the surrounding communities can build a lasting legacy of environmental stewardship and innovation. The CPRG will fund the establishment of an independent renewable energy production facility, sponsor industry leading innovative PFAS mitigation efforts, invest in the future of green, renewable transportation connectivity throughout Central California, and make it possible for farmers to see the benefits of Biochar on their lands, and for students to study and promote those same activities (See letters of support from Cities of Atascadero, Morro Bay, Goleta, San Luis Obispo, the San Miguel Community Services District, Cal Poly and the USLT RCD).

TRANSFORMATIVE IMPACT

The PR RREP development will be critical for the long-term reduction of GHG emissions in San Luis Obispo, Santa Barbara and surrounding Counties. The scale of its impacts will not fully be known until many years after its full development. As tonnages increase and land application of biochar grows these significant reductions will then be able to be tabulated. The collective effects of these measures will also be transformative, in that they will demonstrate that the PR RREP can be an effective and replicable template to drive significant environmental change in previously underserved areas throughout the State, and nation.

As the development of the PR RREP advances additional opportunities can also be unlocked, allowing for continued development at the site. These advancements include expanded energy delivery to surrounding communities and businesses. One prospect would be to utilize funding through the

continued development of the program to directly improve energy resiliency in the City of Paso Robles, including a focus on the City's LIDAC communities.

The creation of the PR RREP will also allow for the exploration of funding to expand the size and capabilities of the fueling station. There are several DOE Transportation grants that would be able to support a more robust development at the site, allowing for a full-service station for all travelers. The co-location of the RTA at the PR RREP will be integral in helping to transform the project. By establishing the facility as a known and reliable charging or fueling location, it will only enhance its usage as the project expands and demand for those resources increases through the further adoption of EV and Hydrogen vehicles. The PR RREP will also be able to address the needs for a key transportation sector of medium to heavy-duty, serving as a critical refueling node along the renewable energy highway infrastructure (PCAP, 26).

The pioneering effort that would be established through the destruction of PFAS on site, its conversion to a usable and needed agricultural amendment (with its associated key GHG reduction benefits) as well being a fully replicable solution for a complete circular economy, is not only unmatched, it is unprecedented. To the City's knowledge no other existing project in the United States has so completely integrated every aspect of production and reuse into a circular and replicable environmental solution. Beyond the goals established by the CPRG program, the PR RREP would address a future imminent environmental risk (PFAS). Where these challenges typically are most harshly felt by rural and LIDAC communities, the CPRG Grant, makes liability an asset. The integration and co-location of these key advanced technologies, while dramatically reducing GHG emissions, will also serve as a demonstration on the future of waste handling in the United States.

Additionally, integration of green hydrogen into the PR RREP will serve as a transformative effort for the community, the region and the State. Paso Robles is located at a key cross roads in Central California, connecting the Central Coast and the Central Valley. Providing a needed renewable energy hub (including hydrogen) will allow for the faster adoption of new vehicle technologies (PCAP, ps. 30-31) for both commercial and non-commercial uses. Beyond transportation uses, green hydrogen could prove to be critical for the expansion of renewable energy, as it could support solar installations allowing for 24/7 dependable power.

IMPACT OF GHG REDUCTION MEASURES

There are several critical GHG efforts that will be undertaken at the same time during the course of delivery of the RREP. The collection, digestion and pyrolysis of organic material will be a significant source of GHG reduction. This material includes significant tonnages from the agricultural and forestry industries, which to date have not been captured. In the processing of some biosolids material, some jurisdictions do not have advanced anaerobic digestion systems, so these emissions have previously not been captured. Additionally, because of the site's location, there will be a significant reduction in vehicle miles traveled in the delivery of these biosolids. Santa Barbara alone

sends six (6) loads a day past the Paso Robles Landfill to Lost Hills (a single load reduction of just over 106 vehicle miles).

Additional GHG reduction will also be attributed to the development and utilization of Green Hydrogen or Electricity from the facility. ONce a program has been developed to track and measure these avoided GHG emissions, they can be included on the quarterly or annual reports to the EPA.

While challenging to determine, Landfill gas is regarded as the second-highest stand-alone producer of methane. Converting the City's flare to a recoverable and useful product will offset and reduce further the impact of GHG emissions from the Landfill (CARB, 234).

Biochar utilization as a soil amendment and as carbon storage, both efforts reduce GHG emissions and align with government directives (CARB, 254), however, for now these numbers are not included in the GHG Emissions Reduction totals as there are too many unknown variables to determine with certainty the quantity of emissions reduction.

Between 2025-2030, the City anticipates these emissions reductions to be significant. As the RREP continues to expand its impact will continue to grow, creating an even more significant reduction in GHG emissions and improved regional air quality. The City anticipates between 2025-2050 there may be an opportunity for continued expansion of refinement which will allow the system established to show the full scale of its benefit to the community. Additional PR RREP expansion totals were estimated above but the only reportable numbers are those directly tied to the CPRG funding.

Related GHG Emissions reductions are also likely when the PR RREP is used as a template to implement replicable projects throughout the US. These additional emissions are not calculated, but should be considered, as they are a likely result of this successful development, and would lead to a vast reduction in GHG emissions throughout the State and country.

There are further GHG Emissions that can also not currently be tabulated, as the City does not know the full scale of Vehicle Miles Traveled that will be reduced regionally in the use of this facility. Where many industrial users are making weekly and even daily trips to Bakersfield, each one of these trips could see a reduction of over 100 miles (roundtrip), this reduction calculated to scale would increase the total GHG emissions reduced significantly, however it is too early to begin to quantify the full effect of this project. Additional research through Cal Poly (see letter of support) and other regional institutions will allow for a more complete picture to develop once the PR RREP has been constructed.

Total Estimated GHG Reductions/ Project/ Time Frame (MTCO2E)		
	2025-2030	**2025-2050**
Landfill (Methane Capture)	199,500	997,500
Anaerobic Digestor (Methane Capture)	551,715	2,758,576
Transit (RTA Emissions Avoided by Converting to Renewable Power)	76,893	422,909
Transit (Remaining Emissions Avoided by Landfill Power Generation)	7,922	30,810
Power (Electric and Vehicle Charging)	38,248	191,239
Total GHG Reduction	**874,278**	**4,401,034**
* Not Calculated GHG Emission Reductions		
GHG Emission Reduction through Biochar Application		
Reduced Fertilizer Usage converted to GHG Emissions Reductions		
Reduced Vehicle Miles Travelled by vendors: Waste Haulers, FOG Haulers, Bisolids Haulers, and Organic Material Haulers		
Additional benefits beyond MTCO2E reduction that exist in the conversion of Landfill and AD biogas into green Hydrogen (example F-gas)		

Exhibit A

MAGNITUDE OF GHG REDUCTIONS FROM 2025 THROUGH 2030

874,278 MTCO2E

MAGNITUDE OF GHG REDUCTIONS FROM 2025 THROUGH 2050

4,401,034 MTCO2E

COST-EFFECTIVENESS OF GHG REDUCTIONS

2025-2030 (see Exhibit A)

($100,000,000/874278 MTCO2E) = **$114.38 / MTCO2E**

The steep initial costs of construction are significant and can be seen in the value of MTCO2E / dollar spent. However, these returns are consistent and are non-elastic. The proposed diversion will continue throughout the project's lifecycle by consistently generating the same GHG EMission Reductions. However, it must also be noted that after the installation of the first AD, upgrading to a second unit is far less burdensome and will greatly amplify the GHG EMission reductions and would make the unit cost of per MTCO2E avoided significantly less, which would cut this estimated cost/unit nearly in half.

2025-2050 (see Exhibit A)

($100,000,000/4401034 MTCO2E) = **$22.72 / MTCO2E**

During this longer time frame the true cost of GHG Emission Reductions are more easily seen. While the initial cost was significant the life of these facilities allows for a far more effective unit cost as the projects age. Additionally, as mentioned above, at this point the City would have already invested in a 2nd Digester and these unit prices would be nearing single digit dollars per MTCO2E avoided.

DOCUMENTATION OF GHG REDUCTION ASSUMPTIONS

Please see "GHG Calculations Spreadsheet" and "Technical Appendix: GHG Emissions Calculations document for Calculations." Totals and explanations of emission calculations and assumptions to calculate above GHG Emission Reduction totals.

ENVIRONMENTAL RESULTS – OUTPUTS, OUTCOMES, AND PERFORMANCE MEASURES

EXPECTED OUTPUTS AND OUTCOMES

The City estimates that the amount of MTCO2E reduced for 2025-2030 to be 874,278, and for 2025-2050 to be 4,401,034. It is further estimated that the CIty will generate over 8 tons of biochar annually for use in local agriculture and working lands. Annually the City also expects to create over 292,000kg of Green hydrogen. The PR RREP also looks to deliver a fully renewably fueled fleet for use by the Regional Transit Authority. The PR RREP will also be looking to fully integrate local government infrastructure (Paso Robles Airport/ Spaceport), and some private industry and residents into an independent renewable energy mini grid system. The solutions provided by the PR RREP will also be serving communities in six different counties, representing over 240,000 individuals who reside in LIDAC communities.

All of these activities and measures will be tracked, updated and integrated into the reporting required by the EPA.

Additionally, all of these efforts will result in several important benefits to the community, including lower energy costs (for some users), resilient infrastructure (where applicable), high-quality soil amendments and pollution reduction (CARB, 262)(PCAP, pgs. 21, 34, 37, 42, 46). The facility will be able to reduce or eliminate the need for future rate increases (that would have occurred if PFAS destruction opportunities did not exist within the county, this includes rates from both water and wastewater utilities).

PERFORMANCE MEASURES AND PLAN

Modeling provided by the EPA can help track many of the above outputs. Tracking will occur by material type and sector when arriving at the facility, volume of hydrogen produced. KWh generated, fuel/electricity utilized by local fleets, procurement credits used to fulfill SB 1383 targets, tons of Biochar produced and sold, and methane generation from the Landfill will also be captured and included in reports. All of these outputs will provide better context for the success and challenges that are faced in the implementation of such a RREP, and can be utilized to help replicate the PR RREP throughout the State and country. Additional tracking will also be possible to determine where material is being produced, where it previously was going for disposal and the associated Vehicle Miles that were avoided. Follow up will also be possible regarding the best and most effective utilization of biochar. GHG emission reduction tests and analysis will be able to be completed through work with our partner organizations and these future data points will also be included in future reports.

AUTHORITIES, IMPLEMENTATION TIMELINE, AND MILESTONES

The PR RREP will be managed and operated under many different regulatory bodies; The SLO Air Pollution Control District, California Air Resource Boards, California Waterboards, Department of Toxic Substances Control , CalRecycle etc. All of these agencies require different regulatory compliance measures and frequencies throughout the development of the project; it will be a core focus to track and manage the data associated with the elimination or avoidance of GHG Emissions. The PR RREP will be the first of its kind, being able to properly quantify and demonstrate its key benefits will be integral for its adoption as a pilot program and its ability to be scaled and replicated throughout the State and Country. Efforts will be made to track all measurable commodities and production. Not only does assist with grant tracking but it additionally helps with the fiscally responsible manner by which to run a facility with interconnected advanced technologies.

Measures will be collected daily, as commodities are produced, delivered or sold. These efforts will be paired with research which will accompany the utilization of many of these beneficial byproducts. All of this data and any additional relevant measures will be included in monthly, quarterly and annual reports.

Timelines for implementation can move quickly. As the land is already owned by the CIty and the partner organizations are supportive of the creation of the PR RREP, which benefits their constituents, most hurdles to development should be alleviated in short order. The longest hurdle to full operation is simply the timeline for materials to arrive on site, and the necessary waiting period to award contracts for construction or technology delivery. Ideally those efforts will be completed prior to the end of this calendar year, 2024 if awarded. Even though these technologies are co-located they can be delivered independently and begin GHG Emission reduction near immediately, from the installation of gas cleanup for the Landfill generator, the installation of the dewatering units and the high temperature pyrolysis units, and the installation of the solar array and Green Hydrogen production facility. All of these portions of the PR RREP should be completed or near completion by the end of

2025. The remaining large outstanding item would be the installation of the Anaerobic Digester, once a vendor is selected the AD facility would be operational in 20-24 months, mid to late 2026.

In early spring/summer of this year, even before we have been identified as a recipient of the CPRG funding an RFP for the various technologies will be developed to secure their products. Once the EPA selects Paso Robles as a winner of the award, this RFP will be distributed for bidding to determine the best suited technologies to deliver the desired results for the facility. All of these activities could be completed prior to the funding arriving in the City's account. All of this is to say the City would be acting most expeditiously to ensure the prompt expenditure and delivery of the project.

The buildout, procurement and reporting would all adhere to the standards required through work completed through the EPA as well as the City of Paso Robles design and delivery standards. Additional consideration will be paid to the "Best Practice Guide for Procuring Services, Supplies, and Equipment Under EPA Assistance Agreements."

The City anticipates being able to report on the completed installation of the full PR RREP by the end of 2026 or the middle of 2027 at latest. However, ongoing reporting will be ongoing to cover the portions of the installation that are already operating and successfully avoiding/converting GHG Emissions.

LOW-INCOME AND DISADVANTAGED COMMUNITIES

COMMUNITY BENEFITS

The PR RREP presents an opportunity for all communities in San Luis Obispo & Santa Barbara County, and portions of the surrounding counties (Kern, Kings, Monterey, Fresno) to destroy PFAS, a known carcinogen. Eliminating key risks associated with this harmful compound, from known sources (water, wastewater and landfills) will be a benefit, improving the quality of life for every community member and visitor to the affected jurisdictions (CARB, 254) (PCAP, p.42). In servicing the growing coalition of jurisdictions and agencies, the PR RREP would in practice, be servicing PFAS waste from these Counties, creating a solution for all LIDAC communities in the region. Collectively it is estimated that this number would be around 240,000 individuals who reside in LIDAC communities, covering 43 different CEJST census tracts.

At this time, the PR RREP does not represent a disbenefits to any of these affected tracts, as the processing of the materials and the avoidance of further contamination within other local jurisdictions removes this burden and risk from these populations. Additionally, the ability for the RTA to integrate clean renewable green transportation options for the Paso - San Luis Obispo service area will improve air quality in these associated tracts.

COMMUNITY ENGAGEMENT

To date, the RREP has been developed and expanded through the utilities in these areas. As the RREP grows and implementation timing becomes more refined, outreach will continue and will include all sectors of the community, demonstrating the benefits of the program to LIDAC Communities throughout the partnered region. Additionally, this submission has attached 23 Letter of Support representing many differing community organizations, elected officials and regulatory agencies, all of which see benefit and need in the solution that the City of Paso Robles is attempting to deliver through the PR RREP. The city of Paso Robles will look to continue outreach to the communities we hope to benefit, through these organizations and independently - to draw awareness to the real environmental risks faced by our communities and to provide insight into the solutions we are pursuing on all of our community member's behalf.

Letters of support have been provided by; California Air Resources Control Board (CARB), San Luis Obispo County Air Pollution Control District (SLO APCD), Governor's Office of Business and Economic Development (Go-Biz), US House of Representatives- Jimmy Panetta, US House of Representatives - Salud Carbajal, CA Senate - James Laird, CA Assembly - Dawn Addis, San Luis Obispo County Supervisor John Peschong, San Luis Obispo Council of Governments (SLOCOG), Integrated Waste Management Authority (IWMA) (a San Luis Obispo County JPA), Regional Transit Authority (RTA), Upper Salinas - Las Tablas Resource Conservation District (USLT RCD), California State Polytechnic University, San Luis Obispo - Initiative for Climate Leadership and Resilience (Cal Poly), Regional Economic Action Coalition (REACH - Central Coast), Paso Robles Main Street Association, Travel Paso, Wine Country Alliance. Additional Letters of Support from the following Utilities Directors: City of San Luis Obispo, City of Morro Bay, San Miguel CSD, City Atascadero, City of Goleta

	CEJST Census Tracts	Counties	POPULATION
PHASE 1	**27**	**2**	**144,918**
PHASE 2	**43**	**6**	**239,651**

JOB QUALITY

The City of Paso Robles utilizes defined criteria to determine vendors and suppliers for the City, including the use of the "Greenbook" Standards. Priority and scoring will benefit organizations that engage and attempt to deliver solutions through Diversity and Inclusion, additionally, where

applicable the City will look to incorporate the Department of Labor's "Good Jobs Principles" to help identify priority opportunities for delivery of goods and services. These principles will be utilized throughout the delivery of the PR RREP for vendors, sub-contractors, etc.

PROGRAMMATIC CAPABILITY AND PAST PERFORMANCE

PAST PERFORMANCE

Identified below are a list of current and past infrastructure projects that the City has and is completing. All of these activities require monitoring by the CIty itself, or through contractors who oversee portions of this compliance. All of these efforts result in timely submissions of grant reports and clearly defined compliance schedules and resolutions. The below activities typically all require mandatory compliance with prevailing wage, Buy America Build America (for new projects), restrictions on origin of Steel, labor compliance and material and labor cost oversight.

The City will look to the "Best Practice Guide for Procuring Services, Supplies, and Equipment Under EPA Assistance Agreements" for further advice regarding any future procurements associated with the PR RREP.

Airport Airfield Electrical Upgrade- FAA

Grant Award: $1.2M

Agreement # FAA AIP 3-06-0184-028-2021
CFDA # 20.106
Grant Manager- Ditas Esperanza/Mark Scandalis
Description of the agreement):
FAA grant funded project to upgrade the Airfield lighting to LED lighting at Paso Robles Municipal Airport
Contact:
Federal Aviation Administration, FAA
Was the City successfully able to complete and manage the listed agreement?
Yes.
Did the City submit acceptable interim and final reports for agreement?
Yes, Reimbursement payments/grant draws were submitted to the FAA.
What process was/is in place to ensure reporting compliance?
FAA review of the grant and engineering specifications. City Council acceptance of the grant offer.
Was it successful for that agreement?
Yes.

Fiber Network Installation

Grant Award:$2.8M
Est. Total Project Cost:$3.5M
Economic Development Administration through US Department of Commerce
Description of the agreement):
Grant to install city wide fiber network system at various locations
Contact:
Ulehla@eda.gov
Was the City successfully able to complete and manage the listed agreement?
Yes. This is a current project. Construction is about to begin.
Did the City submit acceptable interim and final reports for agreement?
Yes, Monthly and quarterly reports are required to be submitted
What process was/is in place to ensure reporting compliance?
Monthly communication (virtual) allowed success to carry out project
Was it successful for that agreement?
Yes, ongoing.

24th Street Bridge Rehab

Grant Award:$1.8M Planning
Pending Construction Grant Award: $14.7M
Est. Total Project Budget: $18.5M
Agreement # BHLS-5084 (017)
CFDA # 20.205
Grant Manager- Ditas Esperanza
Description of the agreement:
Prepare environmental documents, final engineering, and right of way acquisition to expand the 24th Street Bridge over Union Pacific Railroad
Contact and Organization :
Federal Highway Administration (FHWA)
Caltrans Local Assistance Engineer Tammy Mar tammy.mar.dot.ca.gov
Was the City successfully able to complete and manage the listed agreement?
Yes, still in process. Environmental complete, Design is 65% complete and we are in the midst of acquiring right of ways
Did the City submit acceptable interim and final reports for agreement?
Yes
What process was/is in place to ensure reporting compliance?
Monthly communication with Grant Administrator, including
Was it successful for that agreement?
Yes

Recycled Water Pipeline Installation
California State Revolving Fund
Grant Award: $31M

Description of the agreement:

The State Revolving fund has agreed to support the construction of 8 miles of Recycled Water Pipeline to the East of the City, Phase 1 is complete, Phase 2 is set to begin after receipt and selection of vendor after RFP is flown.

Contact and Organization :

State Revolving Fund

Was the City successfully able to complete and manage the listed agreement?

Yes, still in process.

Did the City submit acceptable interim and final reports for agreement?

Yes

What process was/is in place to ensure reporting compliance?

Monthly communication with Grant Administrator. Including frequent phone calls and emails

Was it successful for that agreement?

Yes

REPORTING REQUIREMENT

As stated above all activities will be structured to comply with all Federal Standards required by the EPA, and will also be required to fulfill all requirements by the City prior to, during and to complete any associated work or the purchase of services

All construction, labor and development will take place within the standards required in the CPRG, through and through State and local mandates. Additional specific efforts will be made to encourage construction companies to hire a diverse and local labor force. Safety, pay and quality standards will also be monitored and enforced by a Construction and Compliance Manager. The selection of contractors will reflect their commitment to deliver on the above-listed priorities, as well as a demonstrated history of successful delivery of similarly complicated projects.

The City is the owner of the subject property and it has begun activities to formally incorporate it into the City, (CEQA, where an IS/MND is anticipated shortly). The City will then act as the lead authority for the PR RREP and will assist in its successful implementation. In keeping with the City's Climate Action Plan objectives, (reduction of GHG emissions (AB 32), as well as renewable energy production), and in coordination with the City's Hazardous Mitigation Plan (incorporating efforts to reduce the high risks associated with Wildfires and Draught and Water Shortage), the Program will align with previously identified key City objectives.

STAFF EXPERTISE

Total Staff Experience in Infrastructure Delivery - 137 years
Total Estimated Historical Project Delivery Budget - $945,000,000

Christopher Alakel, MBA, MS Engineering, PE, Utilities Director
BS Civil Engineering
Licensed California Civil Engineer
Area(s) of focus: 27+ years of Municipal Infrastructure Project Delivery
Awards:

- American Society of Civil Engineers: Sustainable Project of the Year Award 2016

Projects:

- Nacimiento Water Treatment Plant ($14M)
- Westside Reservoir ($8M)
- Sherwood Arsenic Removal Systems ($5M)
- Annual Utilities Capital Improvement Projects ($4.5M)

Total Historical Project Delivery Budgets ($135M+)

Ditas Esperanza, MPA, PE, Capital Projects Engineer
BS Civil Engineering
Licensed California Civil Engineer
Area(s) of focus: 25+ years of project management of roadways, bridges, sewer, water, fiber conduit. From Planning to Construction Completion both public and private sector.
Projects:

- Niblick Bridge Expansion (over Highway 101, Union Pacific Railroad and Salinas River)
- Realignment Theater Drive at Highway 46
- Southbound Ramp Improvements from Highway 46 to US 101 South
- New Southbound Ramp at 17th Street and US 101
- Seismic Retrofit of 13th St Bridge (over Salinas River) and 24th St Bridge (over Union Pacific Railroad)

Total Historical Project Delivery Budgets ($150M+)

Kirk Gonzalez, Utilities Engineering Manager
BS and MS - Civil and Environmental Engineering
Registered Civil Engineer (California), Certified Public Manager
Area(s) of focus: 18 years of expertise in Water Resources & Municipal Utilities
Projects:

- Recycled Water Distribution System ($31MM) (in progress)
- Main West Tank ($8MM)
- WRRF Energy Efficiency Sustainable Solutions Turnkey Program ($14MM)

- Southland Treatment Plant Upgrade ($13MM)

Total Historical Project Delivery Budgets ($200M+)

Chris Huot, Assistant City Manager
BA. Public Relations, Masters, Mass Communication
Awards:

- GFOA Distinguished Budget Presentation Award (2012 to 2019)

Area(s) of focus: Senior executive municipal management, project management, internal service delivery, legislative engagement, budget development and implementation, innovation, efficiencies, and outcomes. 13 years of experience.
Projects:

- Measure N – 1 cent general sales tax; Generates $121 million/annual revenues (FY24 projected)
- CARES Act Funding Administration; $33.5 million allocated
- Bakersfield Fire Station 8 Rehabilitation; $2 million
- Clean City Initiative; $800,000+ annually

Total Historical Project Delivery Budgets ($160M+)

Matt Thompson, Recycled Water Manager, Civil Engineer
Areas of Focus: Wastewater Tertiary Treatment and Recycled Water Distribution.
Years in area(s) of expertise: 15 years
Projects:

- Wastewater Tertiary treatment Facilities: $14.1 million
- Wastewater Treatment Plant Upgrade: $45.9 million
- Recycled Water Distribution System: $9.3 million expended-to-date ($35.4 million project)

Total Historical Project Delivery Budgets ($150M+)

David LaCaro, Public Works Operations Manager
Ecology and Systematic Biology, Cal Poly, San Luis Obispo
Area(s) of focus: Stormwater Management (design, permit compliance, project management), Public Works municipal operations and maintenance.
10 years experience (8 years SW Program, and 2 years PW Ops).
Projects:

- Bolen Street CIPP Rehabilitation Project (cure-in-place storm drain pipe installation) ($330,000)
- Niblick Road Corridor Traffic Signal Upgrades (upgraded 8 intersections to improve safety through the roadway) ($220,000)
- Centennial Creek Strom Rehabilitation Project (multi-agency project) (1.2M)

Total Historical Project Delivery Budgets ($50M+)

David Athey, PE, Water Resources Manager/Acting City Engineer
BS Environmental Engineering, Masters of Engineering Management

Registered California Civil Engineer
Background: Water Supply engineering, City engineering, utilities, roads, environmental remediation, landfill engineering, traffic engineering, CIP
Years in area(s) of expertise: 29
Projects:

1. Niblick Road Corridor Project, In design, Grant Award 18M
2. Two Bridge Projects, 10 M, Developed successful Grant application.
3. City of Atascadero Downtown Corridor Project, 1M
4. Other transportation and utility Projects delivered ~ 5M

Total Historical Project Delivery Budgets ($100M+)

The City is well versed in complying with the various state and federal obligations associated with various funding structures including prevailing wage, American Iron and Steel, Buy America Build America. Completion of the Paso Robles Regional Renewable Energy Park will reflect the continued successful delivery of transformative infrastructure projects in the City of Paso Robles and San Luis Obispo County.

BUDGET

Budget Narrative:
The PR RREP requested funding caps out just under $100,000,000. The design and desire of teh CIty is to be able to develop and implement needed environmental solutions to address known and future environmental risks. The hazards and dangers associated with GHG emissions are significant, the PR RREP is determined to provide a needed solution for that concern and to head off developing environmental issues associated with PFAS. The City plans to deliver an integrated advanced technology renewable energy park that can process all types of organic material and create environmentally beneficial products and opportunities.
The City is looking to leverage its location on a key corridor in Central California to offer the opportunity to create immediate and lasting solutions for our community and the communities that surround us.
The CPRG grant funds would be utilized to establish the base infrastructure that the City will then utilize to fully scale up all of the various technologies integrated at the site. The City plans to further develop solar installations, on the landfill and adjoining City-owned property, expand Hydrogen production, fully capture and repurpose landfill emissions, expand and incorporate more anaerobic digesters and pyrolysis units. The PR RREP requires funding to support this initial investment, the future growth and development will be possible by the reinvestment of revenue created at the RREP.

While revenue is integral to the growth and success of the project, it is not the only goal. This is why you will not see “Revenue” identified on the budget sheet. The City acknowledges that the services it is set to provide will generate revenue, however, the pricing, sale and utilization of these resources will not be wholly determined by market demand. Where higher environmental benefit to the local

community is possible the PR RREP will prioritize the ability to improve the local environment over profit wherever possible, this can be seen in public utilization of biochar and green hydrogen to power municipal buildings, fleets etc.

Expenditure of Awarded Funds:

The City intends to utilize standard procedures required by the EPA and by the CIty to oversee and report out expenses and compliance. The vast majority of the spending will be in purchasing of containerized technologies, so while the investment is significant the oversight, construction and reporting should be relatively straight forward and manageable.

Reasonableness of Costs:

The development of the PR RREP was done to generate the highest amount of GHG reductions in the most cost effective manner, while still simultaneously addressing the varying and complex nature of the environmental hazards/challenges that are faced by the communities of the Central Coast. The solutions identified are costly, however they are also the most technologically advanced solutions that can effectively and reliably solve the complex issues that are being faced by our communities. Costs were managed in a way to allow for future investment by the City to fully maximize the initial investment by the EPA. The City acknowledges that some associated technologies are expensive, however the environmental benefits that our community and the members of the surrounding communities will enjoy offset these initial cost hurdles - over the long run the total investment will reduce a single MTCO2E to less than a dollar per unit. Which would be an incredible value and a reasonable cost.

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 include the

BUDGET BY YEAR								
COST-TYPE	**CATEGORY**	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**		**TOTAL**
Direct Costs	TOTAL PERSONNEL	*$0*	*$250,000*	*$250,000*	*$225,000*	*$0*		*$724,999.99*
	TOTAL FRINGE BENEFITS	*$0*	*$0*	*$0*	*$0*	*$0*		*$0*
	TOTAL TRAVEL	*$0*	*$0*	*$0*	*$0*	*$0*		*$0*
	TOTAL EQUIPMENT	*$33,863,000*	*$32,066,000*	*$20,631,000*	*$0*	*$0*		*$86,560,000*
	TOTAL SUPPLIES	*$0*	*$0*	*$0*	*$0*	*$0*		*$0*
	TOTAL CONTRACTUAL	*$300,000*	*$9,145,000*	*$3,070,000*	*$200,000*	*$0*		*$12,715,000*
	TOTAL OTHER	*$0*	*$0*	*$0*	*$0*	*$0*		*$0*
	TOTAL DIRECT	*$34,163,000*	*$41,461,000*	*$23,951,000*	*$425,000*	*$0*		*$100,000,000*
	TOTAL INDIRECT	$0	$0	$0	$0	$0		$0
TOTAL FUNDING		**$34,163,000**	**$41,461,000**	**$23,951,000**	**$424,999.99**	**$0**		**$99,999,999.99**

BUDGET BY PROJECT			
Project Number	**Project Name**	**Total Cost**	**% of Total**
1	*Anaerobic Digestor*	*$47,942,000*	*48%*
2	*H2 & Energy Generation*	*$18,796,000*	*19%*
3	*Biosolids*	*$25,397,000*	*25%*
4	*Construction & Administration*	*$7,865,000*	*8%*
Total		*$99,999,999.99*	*100%*

In-Kind BUDGET FOR PROJECT			
Project	**Project Name**	**Total Cost**	**% of Total**
-	*City Personnel (In-Kind)*	*$896,206*	*1%*
Total		*$896,206*	*1%*

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**						
							$0
							$0
							$0
	TOTAL PERSONNEL	$0	$0	$0	$0	$0	$0
	Fringe Benefits						
							$0
							$0
							$0
	TOTAL FRINGE BENEFITS	$0	$0	$0	$0	$0	$0
	Travel						
							$0
							$0
							$0
	TOTAL TRAVEL	$0	$0	$0	$0	$0	$0
	Equipment						
	Anaerobic Digester		*$19,206,000*	*$19,206,000*			*$38,412,000*
	Grinder (Overs to under 2")			*$850,000*			*$850,000*
	(4) Pyrolysis (Slow-Woody Biomass)		*$3,105,000*				*$3,105,000*
	Technology Interconnection (Conveyors and Accessories)			*$575,000*			*$575,000*
	Fire Suppression (1M gallon tank and Interconnection)	*$5,000,000*					*$5,000,000*
	TOTAL EQUIPMENT	*$5,000,000*	*$22,311,000*	*$20,631,000*	*$0*	*$0*	*$47,942,000*
	Supplies						
							$0
							$0
	TOTAL SUPPLIES	$0	$0	$0	$0	$0	$0
	Contractual						
							$0
							$0
							$0
							$0
	TOTAL CONTRACTUAL	$0	$0	$0	$0	$0	$0
	OTHER						

							$0
							$0
							$0
	TOTAL OTHER	$0	$0	$0	$0	$0	$0
	TOTAL DIRECT	$5,000,000	$22,311,000	$20,631,000	$0	$0	$47,942,000
Indirect Costs	**Indirect Costs**						
							$0
							$0
	TOTAL INDIRECT	$0	$0	$0	$0	$0	$0
TOTAL FUNDING		***$5,000,000***	***$22,311,000***	***$20,631,000***	***$0***	***$0***	***$47,942,000***

Additional Information:

Anaerobic Digester (AD) Includes: *sized for 40,000 tons annually

Feedstock Pre-treatment equipment
Autonomous Crane
Depackager
Feed System
Digester
Liquid/Solid seperation
Liquid Digestate Storage Tank
Controls
H2S/VOC Removal
Moisture Removal
Mechanical and Electrical Installation
Start-Up and Commissioning Service

Grinder

Used to reduce size of overs from AD process to under 2" for pyrolysis treatment

(4) Woody Biomass Pyrolysis Units

Each manages 10,000 tons/year, AD sized for 40k tons annually
Run at a lower temperature, will not treat for PFAS as material will not include biosolids
Significantly lower cost per unit (compared to High-Temperature Pyrolysis) at just over ~$750,000, based on recent installation in neighboring county

Technology Interconnection:

Budget for engineering and conveyor systems to connect AD material to Slow Pyrolysis & Dried Biosolids to High-Temperature Pyrolysis

Fire Suppression System

No City water exists at site so tank will need to be installed sufficient to handle any potential fire event
Estimate is based off of recent bid (FEB 2024) for the same size tank for another City project

Detailed Budget Table

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BUDGET BY YEAR							
COST-TYPE	**CATEGORY**	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**TOTAL**
Direct Costs	**Personnel**						
							$0
							$0
							$0
	TOTAL PERSONNEL	$0	$0	$0	$0	$0	$0
	Fringe Benefits						
							$0
							$0
							$0
	TOTAL FRINGE BENEFITS	$0	$0	$0	$0	$0	$0
	Travel						
							$0
							$0
							$0
							$0
	TOTAL TRAVEL	$0	$0	$0	$0	$0	$0
	Equipment						
	(2) Electric Generator	*$1,216,000*					*$1,216,000*
	Landfill Gas Refinement (h2s & Siloxanes)	*$1,800,000*					*$1,800,000*
	Electrical Interconnection (Transformer,Switchgear)	*$450,000*	*$450,000*				*$900,000*
	h2 Generation System (electrolyzer, h2o treatment)		*$7,805,000*				*$7,805,000*
	(12) EV Chargers (Transit buses)		*$1,500,000*				*$1,500,000*
	TOTAL EQUIPMENT	*$3,466,000*	*$9,755,000*	*$0*	*$0*	*$0*	*$13,221,000*
	Supplies						
							$0
							$0
	TOTAL SUPPLIES	$0	$0	$0	$0	$0	$0
	Contractual						
	(15 acres) 5MW Solar Array		*$5,575,000*				
							$0
							$0
							$0
							$0

	TOTAL CONTRACTUAL	*$0*	*$5,575,000*	*$0*	*$0*	*$0*	*$0*
	OTHER						
							$0
							$0
							$0
							$0
							$0
							$0
	TOTAL OTHER	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
	TOTAL DIRECT	*$3,466,000*	*$15,330,000*	*$0*	*$0*	*$0*	*$18,796,000*
Indirect Cos	**Indirect Costs**						
							$0
							$0
	TOTAL INDIRECT	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
TOTAL FUNDING		***$3,466,000***	***$15,330,000***	***$0***	***$0***	***$0***	***$18,796,000***

Additional Information:

(2) Electric Generator:

Selected to generate electricity from various gas sources (Methane, biogas, hydrogen) to allow for greateset flexibility in application and future expansion

~$608,000 each

Landfill Gas Refinement:

Cleanup of h2s and siloxanes required for use biogas in any generator, or would damage generaator

One units is needed for each source: Landfill & Anaerobic Digestor

~$900,000 for each system

Electrical Interconnection:

Transformer or local 480V distribution (for 4 generators) $1000/kw

Balance of Plant

Construction

Permitting

H2 Generation System:

Electrolyzer

H2 Compression Units

Water Treatment

(3) Water Storage Tanks

Estimate referenced previous installation of same sized h2 plant

(12) EV Chargers:

EV Chargers for Transit buses are $125,000 each

12 chargers will help meet the demand of current service

5MW Solar Array:

Installation cost estimated to be ~$380,000/ acre based on recently installed system

3 acres = 1MW

Detailed Budget Table

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BUDGET BY YEAR							
COST-TYPE	**CATEGORY**	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**TOTAL**
Direct Costs	**Personnel**						
							$0
							$0
							$0
	TOTAL PERSONNEL	$0	$0	$0	$0	$0	$0
	Fringe Benefits						
							$0
							$0
							$0
	TOTAL FRINGE BENEFITS	$0	$0	$0	$0	$0	$0
	Travel						
							$0
							$0
							$0
	TOTAL TRAVEL	$0	$0	$0	$0	$0	$0
	Equipment						
	(2) Dewatering Unit	*$10,700,000*					*$10,700,000*
	(6) High-Temperature Pyrolysis Unit	*$14,697,000*					*$14,697,000*
	TOTAL EQUIPMENT	*$25,397,000*	*$0*	*$0*	*$0*	*$0*	*$25,397,000*
	Supplies						
							$0
							$0
	TOTAL SUPPLIES	$0	$0	$0	$0	$0	$0
	Contractual						
							$0
							$0
							$0
							$0
	TOTAL CONTRACTUAL	$0	$0	$0	$0	$0	$0
	OTHER						
							$0
							$0
							$0
	TOTAL OTHER	$0	$0	$0	$0	$0	$0
	TOTAL DIRECT	*$25,397,000*	*$0*	*$0*	*$0*	*$0*	*$25,397,000*
Indirect Costs	**Indirect Costs**						
							$0
							$0
	TOTAL INDIRECT	$0	$0	$0	$0	$0	$0
TOTAL FUNDING		***$25,397,000***	***$0***	***$0***	***$0***	***$0***	***$25,397,000***

Additional Information:

(2) Dewatering Units:

Dewatering is necessary to remove water from biosolids to allow it to be processed in the high-temperature pyrolysis units

~$5,350,000 each

Each unit can handle around 15,000 tons of biosolids annually (at 15-20% solids) and remove water up 99% of water to prepare for pyrolysis treament

Capacity can be increased to process additional tons by adding more plates as communities grow

Process will run 24hrs a day creating 10 batches

(6) High-Temperature Pyrolysis Units:

~$2,500,000 each

Units were selected because they have been shown to destroy PFAS. These units run at a higher temperature than typical pyrolysis units. Similar but more advanced technology = increased price

6 units will be used simultaneously to allow for 24/7 processing of material.

Will be continuously processed and fed by dewatered biosolids

Detailed Budget Table

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BUDGET BY YEAR							
COST-TYPE	**CATEGORY**	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**TOTAL**
Direct Costs	**Personnel**						
	Grant Administration		*$50,000*	*$50,000*	*$24,999.99*		*$124,999.99*
	Project Management		*$200,000*	*$200,000*	*$200,000*		*$600,000*
							$0
	TOTAL PERSONNEL	*$0*	*$250,000*	*$250,000*	*$225,000*	*$0*	*$724,999.99*
	Fringe Benefits						
							$0
							$0
							$0
	TOTAL FRINGE BENEFITS	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
	Travel						
							$0
							$0
							$0
							$0
	TOTAL TRAVEL	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
	Equipment						
							$0
							$0
	TOTAL EQUIPMENT	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
	Supplies						
							$0
							$0
	TOTAL SUPPLIES	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
	Contractual						
	Concrete Pad and Footings		*$1,000,000*	*$800,000*			*$1,800,000*
	(2) Steel Building Construction		*$270,000*	*$270,000*			*$540,000*
	Site Engineering	*$300,000*	*$300,000*				*$600,000*
	Site Work		$2,000,000	$2,000,000	$200,000		*$4,200,000*
	TOTAL CONTRACTUAL	*$300,000*	*$3,570,000*	*$3,070,000*	*$200,000*	*$0*	*$7,140,000*
	Other						
							$0
							$0
							$0
							$0
							$0

							$0
	TOTAL OTHER	$0	$0	$0	$0	$0	$0
	TOTAL DIRECT	$300,000	$3,820,000	$3,320,000	$425,000	$0	$7,864,999.99
Indirect Costs	**Indirect Costs**						
							$0
							$0
	TOTAL INDIRECT	$0	$0	$0	$0	$0	$0
TOTAL FUNDING		**$300,000**	**$3,820,000**	**$3,320,000**	**$425,000**	**$0**	**$7,864,999.99**

Additional Information:

Grant Administration:

The City anticipates needing assistance with reporting and tracking associated with the grant award

Where available, the City would look to divert any additional funds to this intiative and Project Management

Additional funding is also likely to be obtained through partner jursdictions

Project Management:

This estimate may be conservative, as this is a large installation, but most efforts are delivered as containerized solutions, limiting needed oversight/coordination.

The largest effort will be in the delivery of the AD facility and any electrical interconnection, if necessary.

Concrete Pad & Footings:

Based on estimated pad coverage of installed technology units and approximate footing sizes/pad levels

Steel Building Construction:

Estimate is for two open-span covered spaces - AD Receiving and Biosolids Receiving/Dewatering

Site Engineering:

Estimated based on % of estimated Site Work

~14.5%

Site Work:

Based on development of similar type City installation and includes annual CIP to estimate cost

Detailed Budget Table

BUDGET BY YEAR							
COST-TYPE	**CATEGORY**	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**TOTAL**
Direct Costs	**Personnel (Fully Burdened)**						
	Solid Waste & Recycling Manager (@50%)	*$64,079*	*$65,681*	*$67,323*	*$69,006*	*$70,731*	*$336,820*
	Utilities Planning and Engineering Manager (@3.75%)	*$6,134*	*$6,287*	*$6,445*	*$6,606*	*$6,771*	*$32,242*
	Water Utility Engineer (@3.75%)	*$4,806*	*$4,926*	*$5,049*	*$5,176*	*$5,305*	*$25,262*
	Wastewater Manager (@3.75%)	*$6,134*	*$6,287*	*$6,445*	*$6,606*	*$6,771*	*$32,242*
	Water Resources Manager (@3.75%)	*$6,134*	*$6,287*	*$6,445*	*$6,606*	*$6,771*	*$32,242*
	Utilities Director (@3.75%)	*$7,674*	*$7,866*	*$8,062*	*$8,264*	*$8,471*	*$40,337*
	Captial Projects Engineer (@3.75%)	*$6,134*	*$6,287*	*$6,445*	*$6,606*	*$6,771*	*$32,242*
	Assistant Capital Projects Manager (@3.75%)	*$4,806*	*$4,926*	*$5,049*	*$5,176*	*$5,305*	*$25,262*
	Administration (Executive Team, Finance, etc.) (@15% of annual total)	*$15,885*	*$16,282*	*$16,689*	*$17,106*	*$17,534*	*$83,497*
	TOTAL PERSONNEL	*$121,786*	*$124,831*	*$127,951*	*$131,150*	*$134,429*	*$640,147*
	Fringe Benefits						
	TOTAL FRINGE BENEFITS	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
	Travel						
	TOTAL TRAVEL	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
	Equipment						
							$0
							$0
	TOTAL EQUIPMENT	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
	Supplies						
	TOTAL SUPPLIES	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
	Contractual						
	TOTAL CONTRACTUAL	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
	OTHER						
							$0
							$0
							$0
							$0
							$0
	TOTAL OTHER	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
	TOTAL DIRECT	*$121,786*	*$124,831*	*$127,951*	*$131,150*	*$134,429*	*$640,147*
Indirect Costs	**Indirect Costs**						
	Associated costs with employment to include insurance, benefits, etc. (measured as 40% of salary)	*$48,714*	*$49,932*	*$51,181*	*$52,460*	*$53,772*	*$256,059*
							$0
	TOTAL INDIRECT	*$48,714*	*$49,932*	*$51,181*	*$52,460*	*$53,772*	*$256,059*
TOTAL FUNDING		***$170,500***	***$174,763***	***$179,132***	***$183,610***	***$188,201***	***$896,206***

Total Estimated GHG Reductions/ Project/ Time Frame (MTCO2E)		
	2025-2030	**2025-2050**
Landfill (Methane Capture)	199,500	997,500
Anaerobic Digestor (Methane Capture)	551,715	2,758,576
Transit (RTA Emissions Avoided by Converting to Renewable Power)	76,893	422,909
Transit (Remaining Emissions Avoided by Landfill Power Generation)	7,922	30,810
Power (Electric and Vehicle Charging)	38,248	191,239
Total GHG Reduction	**874,278**	**4,401,034**

* Not Calculated GHG Emission Reductions

GHG Emission Reduction through Biochar Application

Reduced Fertilizer Usage converted to GHG Emissions Reductions

Reduced Vehicle Miles Travelled by vendors: Waste Haulers, FOG Haulers, Bisolids Haulers, and Organic Material Haulers

Additional benefits beyond MTCO2E reduction that exist in the conversion of Landfill and AD biogas into green Hydrogen (example F-gas)

Emission Reductions and Environmental and Energy Benefits for Landfill Gas Energy Projects

Last Updated: May 2023

Instructions: This calculator estimates the direct methane, avoided carbon dioxide and total GHG reductions attributable to an LFG energy project for the current year, calculated from the project size entered by the user. Estimates can be calculated for two types of LFG energy projects: (1) Electricity and (2) Direct-use. For electricity projects, users may either select the AVERT region where the project is located or use the national average value. Additional information about the AVERT regions and national average value as well as equations and references for all calculations in this tool are available in the final two tabs of this file.

For electricity generation projects, enter megawatt (MW) capacity: _____

- OR -

For direct-use projects, enter landfill gas utilized by project: _____ million standard cubic feet per day (mmscfd)

or

260 standard cubic feet per minute (scfm)

Select the AVERT region for the location of the electricity project. As an alternative, you may use the national average value. (See 'CO_2 Emission Factors' tab for map and names of AVERT regions.): National Average

Direct Equivalent Emissions Reduced [Reduction of methane emitted directly from the landfill]		Avoided Equivalent Emissions Reduced [Offset of carbon dioxide from avoiding the use of fossil fuels]		Total Equivalent Emissions Reduced [Total = Direct + Avoided]		
$MMTCO_2E/yr$ million metric tons of carbon dioxide equivalents per year	**tons CH_4/yr** tons of methane per year	**$MMTCO_2E/yr$** million metric tons of carbon dioxide equivalents per year	**tons CO_2/yr** tons of carbon dioxide per year	**$MMTCO_2E/yr$** million metric tons of carbon dioxide equivalents per year	**tons CH_4/yr** tons of methane per year	**tons CO_2/yr** tons of carbon dioxide per year
0.0367	1,445	0.0032	3,567	0.0399	1,445	3,567

Equivalent to any one of the following annual benefits:		Equivalent to any one of the following annual benefits:		Equivalent to any one of the following annual benefits:	
Environmental Benefits		Environmental Benefits		Environmental Benefits	
• Carbon sequestered by __ acres of U.S. forests in one year:	43,701	• Carbon sequestered by __ acres of U.S. forests in one year:	3,853	• Carbon sequestered by __ acres of U.S. forests in one year:	47,553
• CO2 emissions from __ barrels of oil consumed:	85,369	• CO2 emissions from __ barrels of oil consumed:	7,526	• CO2 emissions from __ barrels of oil consumed:	92,895
• CO2 emissions from __ gallons of gasoline consumed:	4,130,617	• CO2 emissions from __ gallons of gasoline consumed:	364,140	• CO2 emissions from __ gallons of gasoline consumed:	4,494,758

Energy Benefits (based on project size entered):

• Heating __ homes: 1,058

View Calculations and References

For additional environmental benefit options, view the Greenhouse Gas Equivalencies Calculator on EPA's Energy and the Environment website.

Waste Reduction Model (WARM) -- Results

Total GHG Emissions from Baseline MS	(2,688.47)
Total GHG Emissions from Alternative M	-
Incremental GHG Emissions ($MTCO_2E$):	**INPUT ERROR: Make sure tons managed equals tons generated**

$MTCO_2E$ = metric tons of carbon dioxide equivalent

Per Ton Estimates of GHG Emissions for Baseline and Alternative Management Scenarios

Material	GHG Emissions per Ton of Material Source Reduced ($MTCO_2E$)	GHG Emission per Ton of Material Anaerobically Digested ($MTCO_2E$)
Corrugated Containers	(5.58)	NA
Magazines/third-class mail	(8.57)	NA
Newspaper	(4.68)	NA
Office Paper	(7.95)	NA
Phonebooks	(6.17)	NA
Textbooks	(9.02)	NA
Mixed Paper (general)	(6.07)	NA
Mixed Paper (primarily residential)	(6.00)	NA
Mixed Paper (primarily from offices)	(7.37)	NA
Food Waste	(3.66)	(0.04)
Food Waste (non-meat)	(0.76)	(0.04)
Food Waste (meat only)	(15.10)	(0.04)
Beef	(30.09)	(0.04)
Poultry	(2.45)	(0.04)
Grains	(0.62)	(0.04)
Bread	(0.66)	(0.04)
Fruits and Vegetables	(0.44)	(0.04)
Dairy Products	(1.75)	(0.04)
Yard Trimmings	NA	(0.09)
Grass	NA	0.00
Leaves	NA	(0.14)
Branches	NA	(0.22)
HDPE	(1.42)	NA
LDPE	(1.80)	NA
PET	(2.17)	NA
LLDPE	(1.58)	NA
PP	(1.52)	NA
PS	(2.50)	NA
PVC	(1.93)	NA
Mixed Plastics	(1.87)	NA
PLA	(2.45)	NA
Desktop CPUs	(20.86)	NA
Portable Electronic Devices	(29.83)	NA
Flat-Panel Displays	(24.19)	NA
CRT Displays	NA	NA
Electronic Peripherals	(10.32)	NA
Hard-Copy Devices	(7.65)	NA
Mixed Electronics	(20.79)	NA
Aluminum Cans	(4.80)	NA
Aluminum Ingot	(7.48)	NA
Steel Cans	(3.03)	NA
Copper Wire	(6.72)	NA
Mixed Metals	(3.65)	NA
Glass	(0.53)	NA
Asphalt Concrete	(0.11)	NA
Asphalt Shingles	(0.19)	NA
Carpet	(3.68)	NA
Clay Bricks	(0.27)	NA
Concrete	NA	NA
Dimensional Lumber*	(2.11)	NA
Drywall	(0.22)	NA
Fiberglass Insulation	(0.38)	NA
Fly Ash	NA	NA
Medium-density Fiberboard	(3.05)	NA
Structural Steel	(1.67)	NA
Vinyl Flooring	(0.58)	NA
Wood Flooring*	(4.11)	NA
Tires	(4.30)	NA
Mixed Recyclables	NA	NA
Mixed Organics	NA	(0.06)
Mixed MSW	NA	NA

Emissions Reductions through Source Reduction & AD Efforts	Anticipated Tons for AD Facility	Total Emission Reduction by
3.62	10000	36,180.81
15.06	4145	62,426.28
0.58	7500	4,346.63
0.40	18500	7,389.31
Total Emission Reduction Estimate MTCO2E		110,343.04

Annual total will be the same for every year between 2025 until 2050

GHG Emissions from Baseline Management of Municipal Solid Wastes

Material	Baseline Recycling (Tons)	GHG Emissions from Combustion ($MTCO_2E$)	Baseline Composting (Tons)	GHG Emissions from Composting ($MTCO_2E$)	Baseline Anaerobic Digestion (Tons)	GHG Emissions from Anaerobic Digestion (MTCO2E)	Total GHG Emissions ($MTCO_2E$)
Corrugated Containers	0.00	0.00	NA	NA	NA	NA	0.00
Magazines/third-class mail	0.00	0.00	NA	NA	NA	NA	0.00
Newspaper	0.00	0.00	NA	NA	NA	NA	0.00
Office Paper	0.00	0.00	NA	NA	NA	NA	0.00
Phonebooks	0.00	0.00	NA	NA	NA	NA	0.00
Textbooks	0.00	0.00	NA	NA	NA	NA	0.00
Mixed Paper (general)	0.00	0.00	NA	NA	NA	NA	0.00
Mixed Paper (primarily residential)	0.00	0.00	NA	NA	NA	NA	0.00
Mixed Paper (primarily from offices)	0.00	0.00	NA	NA	NA	NA	0.00
Food Waste	NA	0.00	0.00	0.00	7,800.00	(325.00)	(325.00)
Food Waste (non-meat)	NA	0.00	0.00	0.00	0.00	0.00	0.00
Food Waste (meat only)	NA	0.00	0.00	0.00	4,000.00	(166.67)	(166.67)
Beef	NA	0.00	0.00	0.00	0.00	0.00	0.00
Poultry	NA	0.00	0.00	0.00	0.00	0.00	0.00
Grains	NA	0.00	0.00	0.00	15,650.00	(652.09)	(652.09)
Bread	NA	0.00	0.00	0.00	0.00	0.00	0.00
Fruits and Vegetables	NA	0.00	0.00	0.00	37,150.00	(1,547.93)	(1,547.93)

Dairy Products	NA	0.00	0.00	0.00	0.00	0.00	0.00
Yard Trimmings	NA	0.00	0.00	0.00	0.00	0.00	0.00
Grass	NA	0.00	0.00	0.00	700.00	3.22	3.22
Leaves	NA	0.00	0.00	0.00	0.00	0.00	0.00
Branches	NA	0.00	0.00	0.00	0.00	0.00	0.00
HDPE	0.00	0.00	NA	NA	NA	NA	0.00
LDPE	NA	0.00	NA	NA	NA	NA	0.00
PET	0.00	0.00	NA	NA	NA	NA	0.00
LLDPE	NA	0.00	NA	NA	NA	NA	0.00
PP	0.00	0.00	NA	NA	NA	NA	0.00
PS	NA	0.00	NA	NA	NA	NA	0.00
PVC	NA	0.00	NA	NA	NA	NA	0.00
Mixed Plastics	0.00	0.00	NA	NA	NA	NA	0.00
PLA	NA	0.00	0.00	0.00	NA	NA	0.00
Desktop CPUs	0.00	0.00	NA	NA	NA	NA	0.00
Portable Electronic Devices	0.00	0.00	NA	NA	NA	NA	0.00
Flat-Panel Displays	0.00	0.00	NA	NA	NA	NA	0.00
CRT Displays	0.00	0.00	NA	NA	NA	NA	0.00
Electronic Peripherals	0.00	0.00	NA	NA	NA	NA	0.00
Hard-Copy Devices	0.00	0.00	NA	NA	NA	NA	0.00
Mixed Electronics	0.00	0.00	NA	NA	NA	NA	0.00
Aluminum Cans	0.00	0.00	NA	NA	NA	NA	0.00
Aluminum Ingot	0.00	0.00	NA	NA	NA	NA	0.00
Steel Cans	0.00	0.00	NA	NA	NA	NA	0.00
Copper Wire	0.00	0.00	NA	NA	NA	NA	0.00
Mixed Metals	0.00	0.00	NA	NA	NA	NA	0.00
Glass	0.00	0.00	NA	NA	NA	NA	0.00
Asphalt Concrete	0.00	NA	NA	NA	NA	NA	0.00
Asphalt Shingles	0.00	0.00	NA	NA	NA	NA	0.00
Carpet	0.00	0.00	NA	NA	NA	NA	0.00
Clay Bricks	NA	NA	NA	NA	NA	NA	0.00
Concrete	0.00	NA	NA	NA	NA	NA	0.00
Dimensional Lumber*	0.00	0.00	NA	NA	NA	NA	0.00
Drywall	0.00	NA	NA	NA	NA	NA	0.00
Fiberglass Insulation	NA	NA	NA	NA	NA	NA	0.00
Fly Ash	0.00	NA	NA	NA	NA	NA	0.00
Medium-density Fiberboard	NA	0.00	NA	NA	NA	NA	0.00
Structural Steel	0.00	NA	NA	NA	NA	NA	0.00
Vinyl Flooring	NA	0.00	NA	NA	NA	NA	0.00
Wood Flooring*	0.00	0.00	NA	NA	NA	NA	0.00
Tires	0.00	0.00	NA	NA	NA	NA	0.00
Mixed Recyclables	0.00	0.00	NA	NA	NA	NA	0.00
Mixed Organics	NA	0.00	0.00	0.00	0.00	0.00	0.00
Mixed MSW	NA	0.00	NA	NA	NA	NA	0.00
Total	0.00	0.00	0.00	0.00	65,300.00	(2,688.47)	(2,688.47)

GHG Emissions from Alternative Management of Municipal Solid Wastes

Material	Alternative Source Reduction (Tons)	GHG Emissions from Landfilling ($MTCO_2E$)	Alternative Combustion (Tons)	GHG Emissions from Combustion ($MTCO_2E$)	Alternative Composting (Tons)	GHG Emissions from Composting ($MTCO_2E$)	Alternative Anaerobic Digestion (Tons)	GHG Emissions from Anaerobic Digestion (MTCO2E)	Total GHG Emissions ($MTCO_2E$)
Corrugated Containers	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Magazines/third-class mail	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Newspaper	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Office Paper	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Phonebooks	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Textbooks	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Mixed Paper (general)	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Mixed Paper (primarily residential)	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Mixed Paper (primarily from offices)	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Food Waste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Food Waste (non-meat)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Food Waste (meat only)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Beef	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Poultry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grains	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bread	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fruits and Vegetables	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dairy Products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Yard Trimmings	NA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grass	NA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Leaves	NA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Branches	NA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HDPE	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
LDPE	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
PET	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
LLDPE	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
PP	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
PS	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
PVC	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Mixed Plastics	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
PLA	0.00	0.00	0.00	0.00	0.00	0.00	NA	NA	0.00
Desktop CPUs	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Portable Electronic Devices	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Flat-Panel Displays	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
CRT Displays	NA	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Electronic Peripherals	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Hard-Copy Devices	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Mixed Electronics	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Aluminum Cans	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Aluminum Ingot	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Steel Cans	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Copper Wire	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Mixed Metals	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Glass	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Asphalt Concrete	0.00	0.00	NA	NA	NA	NA	NA	NA	0.00

Asphalt Shingles	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Carpet	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Clay Bricks	0.00	0.00	NA	NA	NA	NA	NA	NA	0.00
Concrete	NA	0.00	NA	NA	NA	NA	NA	NA	0.00
Dimensional Lumber*	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Drywall	0.00	0.00	NA	NA	NA	NA	NA	NA	0.00
Fiberglass Insulation	0.00	0.00	NA	NA	NA	NA	NA	NA	0.00
Fly Ash	NA	0.00	NA	NA	NA	NA	NA	NA	0.00
Medium-density Fiberboard	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Structural Steel	0.00	0.00	NA	NA	NA	NA	NA	NA	0.00
Vinyl Flooring	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Wood Flooring*	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Tires	0.00	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Mixed Recyclables	NA	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Mixed Organics	NA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mixed MSW	NA	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Incremental GHG Emissions from Alternative Alternative Management of Municipal Solid Wastes

Material	Incremental GHG Emissions from Source Reduction ($MTCO_2E$)	Incremental Combustion (Tons)	Incremental GHG Emissions from Combustion ($MTCO_2E$)	Incremental Composting (Tons)	Incremental GHG Emissions from Composting ($MTCO_2E$)	Incremental Anaerobic Digestion (Tons)	Incremental GHG Emissions from Anaerobic Digestion ($MTCO_2E$)	Total Incremental GHG Emissions ($MTCO_2E$)
Corrugated Containers	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Magazines/third-class mail	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Newspaper	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Office Paper	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Phonebooks	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Textbooks	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Mixed Paper (general)	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Mixed Paper (primarily residential)	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Mixed Paper (primarily from offices)	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Food Waste	0.00	0.00	0.00	0.00	0.00	(7,800.00)	325.00	als tons generated
Food Waste (non-meat)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Food Waste (meat only)	0.00	0.00	0.00	0.00	0.00	(4,000.00)	166.67	als tons generated
Beef	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Poultry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grains	0.00	0.00	0.00	0.00	0.00	(15,650.00)	652.09	als tons generated
Bread	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fruits and Vegetables	0.00	0.00	0.00	0.00	0.00	(37,150.00)	1,547.93	als tons generated
Dairy Products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Yard Trimmings	NA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grass	NA	0.00	0.00	0.00	0.00	(700.00)	(3.22)	als tons generated
Leaves	NA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Branches	NA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HDPE	0.00	0.00	0.00	NA	NA	NA	NA	0.00
LDPE	0.00	0.00	0.00	NA	NA	NA	NA	0.00
PET	0.00	0.00	0.00	NA	NA	NA	NA	0.00
LLDPE	0.00	0.00	0.00	NA	NA	NA	NA	0.00
PP	0.00	0.00	0.00	NA	NA	NA	NA	0.00
PS	0.00	0.00	0.00	NA	NA	NA	NA	0.00
PVC	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Mixed Plastics	0.00	0.00	0.00	NA	NA	NA	NA	0.00
PLA	0.00	0.00	0.00	0.00	0.00	NA	NA	0.00
Desktop CPUs	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Portable Electronic Devices	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Flat-Panel Displays	0.00	0.00	0.00	NA	NA	NA	NA	0.00
CRT Displays	NA	0.00	0.00	NA	NA	NA	NA	0.00
Electronic Peripherals	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Hard-Copy Devices	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Mixed Electronics	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Aluminum Cans	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Aluminum Ingot	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Steel Cans	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Copper Wire	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Mixed Metals	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Glass	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Asphalt Concrete	0.00	NA	NA	NA	NA	NA	NA	0.00
Asphalt Shingles	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Carpet	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Clay Bricks	0.00	NA	NA	NA	NA	NA	NA	0.00
Concrete	NA	NA	NA	NA	NA	NA	NA	0.00
Dimensional Lumber*	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Drywall	0.00	NA	NA	NA	NA	NA	NA	0.00
Fiberglass Insulation	0.00	NA	NA	NA	NA	NA	NA	0.00
Fly Ash	NA	NA	NA	NA	NA	NA	NA	0.00
Medium-density Fiberboard	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Structural Steel	0.00	NA	NA	NA	NA	NA	NA	0.00
Vinyl Flooring	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Wood Flooring*	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Tires	0.00	0.00	0.00	NA	NA	NA	NA	0.00
Mixed Recyclables	NA	0.00	0.00	NA	NA	NA	NA	0.00
Mixed Organics	NA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mixed MSW	NA	0.00	0.00	NA	NA	NA	NA	0.00
Total	0.00	0.00	0.00	0.00	0.00	(65,300.00)	2,688.47	als tons generated

*Wood Flooring and Dimensional Lumber model reuse under the recycling management pathway.

a) For explanation of methodology, see the EPA WARM Documentation:
Documentation Chapters for Greenhouse Gas Emission and Energy Factors Used in the Waste Reduction Model (WARM)
-- available on the Internet at https://www.epa.gov/warm/documentation-chapters-greenhouse-gas-emission-and-energy-factors-used-waste-reduction-model
b) Emissions estimates provided by this model are intended to support voluntary GHG measurement
and reporting initiatives.

Regional Transit Authority Annual Miles (2022)	Miles	Avg, Gallons/Mile	Total Gallons/year	
Local Service	112102	3.4	381,147	
Inter City (Paso Robles - San Luis Obispo)	396854	3.4	1,349,304	
		2025-2035	1,730,450	
		2035-2050 (1.5x for increased service)	2,595,676	*** EPA CO2 Calculator**
		Total 2025-2030	**8,652,252**	**76893 Metric Tons of CO2**
		Total 2025-2050	**47,587,386**	**422909 Metric Tons of CO2**

* https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

15378.6

	Total Gallons	MTCO2E / year
2025	1730450	15378.6
2026	1730450	15378.6
2027	1730450	15378.6
2028	1730450	15378.6
2029	1730450	15378.6
2030	1730450	15378.6
2031	1730450	15378.6
2032	1730450	15378.6
2033	1730450	15378.6
2034	1730450	15378.6
2035	1730450	15378.6
2036	2595676	16916.29
2037	2595676	16916.29
2038	2595676	16916.29
2039	2595676	16916.29
2040	2595676	16916.29
2041	2595676	16916.29
2042	2595676	16916.29
2043	2595676	16916.29
2044	2595676	16916.29
2045	2595676	16916.29
2046	2595676	16916.29
2047	2595676	16916.29
2048	2595676	16916.29
2049	2595676	16916.29
2050	2595676	16916.29

Passenger-Miles per Gallon

Passenger-miles per gallon (pmpg) is a metric for comparing passenger vehicle travel across modes. Transportation system efficiency increases as the number of passengers increases or as the vehicle fuel economy increases for each transportation mode.

Vehicle	mpg*
Car – national average	27.5
Car – high occupancy	27.5
Pickup Truck – national average	20.2
Pickup Truck – high occupancy	20.2
Transit Bus – national average**	3.4
Transit Bus – high ridership	3.4
Transit Train – national average**	6
Transit Train – high ridership	6

* All fuel converted to gallons of gasoline on an energy content basis. For trains, most of this fuel is

** National average ridership numbers are from table 2.13 of the Transportation Energy Data Book. https://afdc.energy.gov/conserve/public_transportation.html

Estimated GHG Reduction Estimates, For Landfill Gas Energy Production

* to include power for full Regional Transit Authority Fleet and to calculate remaining power

https://ww2.arb.ca.gov/sites/default/files/2022-06/ratesanddemand_ADA.pdf

California Air Resouces Board

Annual Number of Electric Buses Powered by 5MW Solar

Estimated Electric Bus Use per month 10,000 kwh			120,000	kwh per bus per year
		Current Total Buses	13	
		Future Estimated Growth (2035)	20	
(2) Generators	230kw/h production		3,828,120	total kwh produced by (2) generators annually
			Remaining Power After RTA Bus Usage	
		2025-2030	11,340,600	
		2025-2050	44,103,000	
		GHG Total 2025-2030	7922	Metric Tons of CO2 / year
		GHG Total 2025-2050	30810	Metric Tons of CO2 / year

13 Buses in Use	2025	
13 Buses in Use	2026	
13 Buses in Use	2027	
13 Buses in Use	2028	
13 Buses in Use	2029	
13 Buses in Use	2030	
13 Buses in Use	2031	
13 Buses in Use	2032	
13 Buses in Use	2033	
13 Buses in Use	2034	
20 Buses in Use	2035	Annual Excess Power from 25-34, minus the additiona usage of (120,000kw) annual bus charging demand x by 7 new units. This total is then utilized to calculate additional GHG Emissions
20 Buses in Use	2036	
20 Buses in Use	2037	
20 Buses in Use	2038	
20 Buses in Use	2039	
20 Buses in Use	2040	
20 Buses in Use	2041	
20 Buses in Use	2042	
20 Buses in Use	2043	
20 Buses in Use	2044	
20 Buses in Use	2045	
20 Buses in Use	2046	
20 Buses in Use	2047	
20 Buses in Use	2048	
20 Buses in Use	2049	
20 Buses in Use	2050	

Estimated GHG Reduction Estimates, For Solar Power Generation

https://www.eia.gov/tools/faqs/faq.php?id=104&t=3
US Energy Information Administration
1MW solar = 8,760MWh at 24hrs production
* Los Angeles typically receives 6 peak hours of sun

Solar Installation (in MW)	Peak Hours	Total Annual MWh	Total Annual KWh
5	6	10,950	10,950,000

https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

GHG Total 2025-2030	54,750,000	kwh	38248 Metric Tons of CO2 / year
GHG Total 2025-2050	273,750,000	kwh	191239 Metric Tons of CO2 / year

	5MW (15 acres)	30 MW (90 acres)	
	Kw/year	kw/year	
2025	10,950,000	65,700,000	
2026	10,950,000	65,700,000	
2027	10,950,000	65,700,000	
2028	10,950,000	65,700,000	
2029	10,950,000	65,700,000	
2030	10,950,000	65,700,000	
2031	10,950,000	65,700,000	
2032	10,950,000	65,700,000	
2033	10,950,000	65,700,000	
2034	10,950,000	65,700,000	
2035	10,950,000	65,700,000	
2036	10,950,000	65,700,000	
2037	10,950,000	65,700,000	
2038	10,950,000	65,700,000	
2039	10,950,000	65,700,000	
2040	10,950,000	65,700,000	
2041	10,950,000	65,700,000	
2042	10,950,000	65,700,000	
2043	10,950,000	65,700,000	
2044	10,950,000	65,700,000	
2045	10,950,000	65,700,000	
2046	10,950,000	65,700,000	
2047	10,950,000	65,700,000	
2048	10,950,000	65,700,000	
2049	10,950,000	65,700,000	
2050	-	-	
TOTAL	273,750,000	1,642,500,000	(30Mw -5Mw Total) Estimated Expansion Reduction Total
GHG Reduction Value	191239	1147434	956195

Calculations and References

Return to Tool

Factors Used in the Calculations:

Conversion Factors

8,760	hours/year
365	days/year
24	hours/day
60	minutes/hour
1E+03	kilowatts/megawatt
2,000	pounds/short ton
0.9072	metric tons/short ton
1E+06	metric tons/million metric tons
1E+06	standard cubic feet/million standard cubic feet

Methane Conversions

0.0423	pounds methane/standard cubic foot methane
0.50	standard cubic feet methane/standard cubic foot landfill gas

Heating Values and Heat Rates

1,012	Btu/standard cubic foot methane	[Ref: *Chemical Engineers' Handbook*. John H Perry, ed. McGraw-Hill Book Company: New York, 1963. Pg 9-9.]
1,050	Btu/standard cubic foot natural gas	[Ref: *Compilation of Air Pollutant Emission Factors (AP-42)*. US EPA. Volume 1, Fifth Edition. Sept 1985. App. A, Pg A-6.] https://www.epa.gov/sites/default/files/2020-11/documents/appa.pdf (PDF, 32 pp, 104K)
11,700	Btu/kilowatt-hour (weighted average for engines, gas turbines, and boiler/steam turbines)	

Emission Factors

varies	pounds carbon dioxide/kilowatt-hour; regional grid factors for 2022 from EPA's AVERT (see 'CO_2 Emission Factors' tab)
1.438	pounds carbon dioxide/kilowatt-hour (estimated national average electric power plant emission rate for 2022 from EPA's AVERT)
0.12037	pounds carbon dioxide/standard cubic foot natural gas [Ref: 2013 Revisions to the Greenhouse Gas Reporting Rule. U.S. EPA. Nov. 2013. Table C-1. Conversion from kg CO_2/mmBtu assumed weighted national average for heating value of 1,029 Btu/scf.] https://www.govinfo.gov/content/pkg/FR-2013-11-29/pdf/2013-27996.pdf (PDF, 79 pp, 932K)

Capacity and Other Factors

0.93	gross capacity factor for generation units of electricity projects (to account for availability and operating load)
0.85	net capacity factor for generation units of electricity projects (to account for availability, operating load, and parasitic losses)
0.91	factor for power delivered to households for electricity projects (to account for transmission and distribution losses)
0.90	gross capacity factor for direct-use projects (to account for availability of landfill gas)

Global Warming Potentials (GWPs)

28	GWP of methane [updated May 2023 to reflect the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC)]

Direct Equivalent Emissions Reduced Calculations for Electricity Generation Projects:

Calculations and References

Return to Tool

$MMTCO_2E/yr$ = megawatts (MW) of generating capacity * 0.93 [gross capacity factor] * (8,760 hours/year) * (1,000 kilowatts/megawatt) *

Calculations and References

Return to Tool

(11,700 Btu/kilowatt-hour) / (1,012 Btu/standard cubic foot methane) * (0.0423 pounds methane/standard cubic foot methane) / (2,000 pounds/short ton) * (0.9072 metric tons/short ton) / (1E+06 metric tons/million metric tons) * 28 [GWP of methane]
tons CH_4/yr = $MMTCO_2E$/yr * (1E+06 metric tons/million metric tons) / (0.9072 metric tons/short ton) / 28 [GWP of methane]
Avoided Equivalent Emissions Reduced Calculations for Electricity Generation Projects:
$MMTCO_2E$/yr = megawatts (MW) of generating capacity * 0.85 [net capacity factor] * (8,760 hours/year) * (1,000 kilowatts/megawatt) * (regional or national grid factor for 2022 in pounds/kilowatt-hour) / (2,000 pounds/short ton) * (0.9072 metric tons/short ton) / (1E+06 metric tons/million metric tons)
tons CO_2/yr = $MMTCO_2E$/yr * (1E+06 metric tons/million metric tons) / (0.9072 metric tons/short ton)
Direct Equivalent Emissions Reduced Calculations for Direct-Use Projects:
$MMTCO_2E$/yr = million standard cubic feet per day (mmscfd) of LFG utilized * (365 days/year) * (1E+06 standard cubic feet/million standard cubic feet) * (0.5 standard cubic feet methane/standard cubic foot landfill gas) * (0.0423 pounds methane/standard cubic foot methane) / (2,000 pounds/short ton) * (0.9072 metric tons/short ton) / (1E+06 metric tons/million metric tons) * 28 [GWP of methane]
tons CH_4/yr = $MMTCO_2E$/yr * (1E+06 metric tons/million metric tons) / (0.9072 metric tons/short ton) / 28 [GWP of methane]
Avoided Equivalent Emissions Reduced Calculations for Direct-Use Projects:
$MMTCO_2E$/yr = million standard cubic feet per day (mmscfd) of LFG utilized * 0.90 [gross capacity factor] * (365 days/year) * (1E+06 standard cubic feet/million standard cubic feet) * (0.5 standard cubic feet methane/standard cubic foot landfill gas) * (1,012 Btu/standard cubic foot methane) / (1,050 Btu/standard cubic foot natural gas) * (0.12037 pounds carbon dioxide/standard cubic foot natural gas) / (2,000 pounds/short ton) * (0.9072 metric tons/short ton) / (1E+06 metric tons/million metric tons)
tons CO_2/yr = $MMTCO_2E$/yr * (1E+06 metric tons/million metric tons) / (0.9072 metric tons/short ton)
Environmental and Energy Benefit Equivalencies:

0.84	metric tons carbon dioxide sequestered annually by one acre of average U.S. forest	Environmental factors are from the Greenhouse Gas Equivalencies Calculator on EPA's Energy and the Environment website at https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator
181.38	metric tons carbon dioxide emitted per railcar of coal burned	
0.43	metric tons carbon dioxide emitted per barrel of oil consumed	
0.008887	metric tons carbon dioxide emitted per gallon of gasoline consumed	
10,566	kilowatt-hours per household (average annual electricity usage)	

Calculations and References

Return to Tool

56,000 cubic feet of natural gas per household (average annual household heating usage; transmission and distribution losses considered negligible)
References
• For acres of forest: Greenhouse Gas Equivalencies Calculator at https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references#pineforests
• For railcars of coal: Greenhouse Gas Equivalencies Calculator at https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references#railcars
• For barrels of oil: Greenhouse Gas Equivalencies Calculator at https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references#oil
• For gallons of gasoline: Greenhouse Gas Equivalencies Calculator at https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references#gasoline
• For households: *2020 Residential Energy Consumption Survey: Consumption & Expenditures Tables* (Release date March 29, 2023). US DOE/EIA. Table CE2.1. https://www.eia.gov/consumption/residential/data/2020/index.php?view=consumption

Color Legend for Cells	
	User inputs
	Calculated or locked cells
NA	Data cannot be entered
Color Legend For Tabs	
	User inputs
	GHG and Energy Impacts
	Economic Impacts

WARM User's Guide

Calculating Greenhouse Gas Emissions, Energy Impacts, and Economic Impacts with the Excel© Version of the Waste Reduction Model

WHAT IS THE WASTE REDUCTION MODEL?

EPA created the Waste Reduction Model (WARM) to provide high-level comparisons of potential greenhouse gas (GHG) emissions reductions, energy savings, and economic impacts when considering different materials management practices. Materials management practices include - source reduction, recycling, anaerobic digestion, combustion, composting and landfilling.

WARM is a comparative tool rather than a comprehensive measurement tool. WARM was not developed for and, as such, should not be used for final site-specific materials management decisions, when other human health and environmental impacts of the different management methods may need to be considered (such as air pollution, water pollution, noise, etc.). It also should not be used for developing GhG inventories, which need to establish a baseline and measure reductions over time on an annual basis for an entity.

WARM calculates GHG emissions, energy savings, and economic impacts for baseline and alternative waste management practices, including source reduction, recycling, combustion, composting, and landfilling. The model calculates emissions in metric tons of carbon dioxide equivalent (MTCO2E), energy in millions of BTUs (MMBTU), wage impacts, tax impacts, and labor hours supported across a wide range of material types commonly found in municipal solid waste (MSW).

The user can construct various scenarios by simply entering data on the amount of waste handled by material type and by management practice. WARM then automatically applies material-specific emission, energy and economic factors for each management practice to calculate the GHG emissions, energy savings, and economic impacts of each scenario. Several key inputs, such as landfill gas recovery practices and transportation distances to MSW facilities, can be modified by the user.

The GHG emission factors used in WARM are based on a life cycle perspective. The model documentation describes this methodology in detail.

WHO SHOULD USE WARM?

WARM was developed for solid waste managers (from state and local governments and other organizations) who want to estimate and compare the GHG emissions, energy savings and economic impacts associated with different waste management options. Emissions, energy savings and economic estimates provided by WARM are intended to support broad solid waste planning. WARM is a comparative tool rather than a comprehensive measurement tool. WARM was not developed for and, as such, should not be used for final site-specific materials management decisions, when other human health and environmental impacts of the different management methods may need to be considered (such as air pollution, water pollution, noise, etc.). It also should not be used for developing GhG inventories, which need to establish a baseline and measure reductions over time on an annual basis for an entity.

USING THE EXCEL© VERSION OF WARM

Before using WARM, you first need to gather data on your baseline waste management practices and an alternative scenario. In order to effectively use the tool, users should know how many tons of waste you manage (or would manage) for a given time period under each scenario by material type and by management practice. The model allows you to customize your results based on project-specific landfill gas recovery practices, anaerobic digestion practices, and transportation distances. Note that you may use default values if you are unsure of landfill gas recovery practices, anaerobic digestion practices and/or transportation distances.

Instructions:

-- Click on the "Analysis Inputs" tab at the bottom center of the screen to open the input sheet. Follow the instructions for Steps 1 and 2. This involves filling in the tables describing your baseline and proposed alternative waste management scenarios. Please enter data in short tons (1 short ton = 2,000 lbs.). The "mixed" material types are defined as the following:

Mixed Metals: Aluminum Cans 35%, Steel Cans 65%
Mixed Plastics: HDPE 40%, PET 60%
Mixed Electronics: Desktop CPUs 10%, Portable Electronic Devices 12%, Flat-Panel Displays 45%, CRT Displays 13%, Electronic Peripherals 2%, Hard-Copy Devices 19%
Mixed Paper (general): Corrugated Containers 48%, Magazines/Third-class Mail 8%, Newspaper 24%, Office Paper 20%
Mixed Paper (primarily residential): Corrugated Containers 53%, Magazines/Third-class Mail 10%, Newspaper 23%, Office Paper 14%
Mixed Paper (primarily from offices): Corrugated Containers 5%, Magazines/Third-class Mail 36%, Newspaper 21%, Office Paper 38%
Mixed Recyclables: Aluminum Cans 1.3%, Steel Cans 2.4%, Glass 6.0%, HDPE 1.2%, PET 1.8%, Corrugated Containers 56.8%, Magazines/Third-class Mail 7.3%, Newspaper 9.6%, Office Paper 7.8%, Phonebooks 0.1%, Textbooks 0.6%, Dimensional Lumber 5.2%
Food Waste: Beef 9%, Poultry 11%, Grains 13%, Fruits and Vegetables 49%, Dairy Products 18%
Food Waste (meat only): Beef 46%, Poultry 54%
Food Waste (non-meat): Grains 16%, Fruits and Vegetables 61%, Dairy Products 22%
Mixed Organics: Food Waste 53%, Yard Trimmings 47%
Mixed MSW: Grass 5.2%, Leaves 6.8%, Branches 5.0%, Wood 5.1%, Food Waste 18.1%, Pastic 10.1%, Metal 2.3%, Glass 4.4%, Magazines/Third-class mail 2.7%, Newsprint 4.5%, Corrugated Cardboard 14.2%, Office Paper 2.4%, Other Paper 10.0%, Other (e.g., Textiles, Rubber/Leather) 8.8%

For more information on these mixed material weightings, please reference the model documentation chapters specific to each material type.

-- Fill in the data requested in Steps 3–9. WARM will use the answers to these questions to customize GHG estimates to reflect your waste management situation and location. For example, you are asked for data on transportation distances and on your landfill gas recovery systems, if applicable. If the requested data are not available, WARM will use the national average defaults.

-- Step 10 allows you to customize your report, with your name, organization, and project period.

-- Once you have completed Steps 1–9 on the "Analysis Inputs" sheet, WARM will calculate the GHG emissions, energy, and economic impacts attributable to the baseline and alternative waste management scenarios you have specified. Emissions, energy, and economic impact calculations are presented on separate output sheets, as described below. From the "Analysis Inputs" sheet, click on a tab at the bottom of the screen for the results sheet you want to view first.

-- The "Summary Report" sheet provides a concise report of GHG emissions, energy, or economic results from the baseline and alternative waste management scenarios, as well as an estimate of net emissions, energy, wages, taxes, or labor hours.

-- The "Analysis Results" sheet shows GHG emissions, energy, or economic results for each scenario in the units selected. You can compare the total impact of the baseline and alternative scenarios, or, if you want more detail, you can scroll down to view GHG emissions, energy, or economic results by material type and management practice. The bottom table shows the relative emissions, energy, wages, taxes, or labor hours difference between the alternative and baseline scenarios for each material type and management pathway.

ASSISTANCE

If you need additional assistance with using WARM, please email orcrWARMquestions@epa.gov.

Technical Appendix: GHG Emissions Calculations

The Calculations for the Paso Robles Regional Renewable Energy Park have been broken down by Sector.

Landfill: TAB 2

Used by inputting estimated Landfill Gas Emission data into the provided tool created by the EPA, Emissions Reduction and Environmental and Energy Benefits for Landfill Gas Energy Projects, **Tab 2**,on the provided GHG Emissions spreadsheet.

The Landfill is due for an upgrade to its flare and will install and upgrade the gas collection system, including new headers, and blowers which will increase the amount of gas collected from the site.

Current estimations are at 260 SCFM once this work is complete.

That number was used to calculate the associated GHG Emission Reduction Estimates utilizing the provided EPA Tool.

Anaerobic Digestor: TAB 3

https://www.epa.gov/system/files/documents/2023-12/warm_v16.xls

The City has estimates of the anticipated various waste streams that are likely to be processed in the Anaerobic Digestor. From those estimates, they were categorized by type/stream and cross-referenced to the associated Emissions reduction, as identified in the WARM tool, provided by the EPA. Calculations are shown in **Tab 3**

Transit Bus (MTCO2E) Gas Calculation based on Miles Travelled Annually: TAB 4

https://afdc.energy.gov/conserve/public_transportation.html

Information was provided by the Regional Transit Authority Identifying the amount and type of vehicle miles traveled annually, 112,102 miles for Local Service and 396,854 miles for Inter-City Routes.

These miles were then converted using the US Department of Energy's estimates to fuel economy for transit buses (3.4 miles/gallon) (see link above)

The miles data was converted to discover how many gallons of gasoline was utilized annually, and then that total was input into the EPA's GHG Equivalency Calculator to determine the total reduction by phase (2025-2030, and 2025-2050) https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

The total gasoline usage conversion is shown in the totals in **Tab 4**

Transit Emissions Offset Through Energy Production from Converted Landfill Gas (Minus the demand to charge Regional Transit Buses): TAB 5

California Air Resources Control Board has provided an estimate for Monthly Electricity Demand for a Transit Bus at 10,000kwh. The two generators purchased through this grant would produce 230kwh each or 460kwh total. The estimated uptime for these installations is 95%.

The total annual production was then calculated at (460 kwh produced/hour x (24x.95 for total uptime) x 365days) to determine total Kwh production for the two generators per year. (3,828,120 kwh/ year)

For Phase 1 of the grant (2025-2030) the City estimates all 13 vehicles could be converted to Electric power. (13 vehicles x monthly demand (10,000kwh) x 12 months in a year). This number is then subtracted from the total annual production (3,828,120kwh) and then multiplied by 5 for a total of 11,340,600 kwh that were not used for energy production for Transit Buses.

This remaining power was then converted using the same EPA GHG Emission Conversion Tool to generate associated MTCO2E.

This same process was mirrored in the calculations of the entire length of the project, where the remaining annual total unused electricity was multiplied by the number of years (25). However, at this stage the City estimates that the RTA would have purchased an additional 7 vehicles (to make 20 total vehicles that would need to be charged). These reductions were also included in the calculations, based on the inclusion of the additional vehicles in 2035.

https://ww2.arb.ca.gov/sites/default/files/2022-06/ratesanddemand_ADA.pdf

This is all calculated in **Tab 5**

Solar Energy Production Estimated to Offset GHG Emissions: TAB 6

Estimated utilizing the numbers provided in the US Energy Information Administration report (https://www.eia.gov/tools/faqs/faq.php?id=104&t=3) which when converted estimates that 1MW Solar array could produce 8760MWh /year if it ran for 24hrs.

A search determined that the average Peak Sun Hours for (Los Angeles, similar to our location) is equal to around 6 hours a day

https://www.turbinegenerator.org/solar/california/los-angeles/

This number was then utilized as a base to establish what energy production could more realistically look like from a solar array at our site.

Annual 8760MWh/4 (only 6 peak hours can be utilized) = 2190MWh per 1MW Solar.

The proposed installation by the City would be for a 5MW solar installation, which when converted equals 10,950,000 kwh annually.

This number was then utilized to calculate GHG Emission Reduction totals for the two separate reported year categories (2025-2030 and 2025-2050).

Paso Robles Regional Renewable Energy Park
Congressional Districts Served
18th
19th
20th
22nd
24th