

**ENVIRONMENTAL FARMING ACT SCIENCE ADVISORY PANEL (EFA SAP)
CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE**

**MEETING AGENDA
November 18, 2016**

**9 AM to 11:30 AM (Science Panel members only)
Field Tour**

**Public Meeting
1 PM to 5 PM**

**Stanislaus County Agricultural Commissioner Office
3800 Cornucopia Way, Room A
Modesto, CA 95358
916-654-0433**

REMOTE ACCESS

Webinar information

Registration URL: <https://attendee.gotowebinar.com/register/7931335202038825730>

Webinar ID: 646-622-027

Call-in information

1-877-238-3903

Passcode: 6655460

Presentation materials will be posted at the following link prior to the meeting:

https://www.cdffa.ca.gov/EnvironmentalStewardship/Meetings_Presentations.html

EFA SAP MEMBERSHIP

Don Cameron, Terranova Ranch, Member and Chair

David Bunn, PhD, Resources Agency, DOC, Member	Jocelyn Bridson, MSc, Rio Farms, Member
David Mallory, CalEPA, ARB, Member	Jeff Dlott, PhD, SureHarvest, Member
Vicky Dawley, Tehama RCD, Member	Judith Redmond, Full Belly Farms, Member
	Julie Alvis, Resources Agency, Member
Luana Kiger, MSc, Subject Matter Expert	
Doug Parker, PhD, Subject Matter Expert	

- | | |
|--|---|
| 1. Introductions | Chair Cameron |
| 2. Minutes from previous meeting | Chair Cameron |
| 3. Healthy Soils Initiative and Program <ul style="list-style-type: none">• Update on program and new funding• Proposed program timeline for program implementation | Dr. Joshi |
| 4. The State Water Efficiency and Enhancement Program (SWEEP) <ul style="list-style-type: none">• Update on program and new funding• ARB QM methodology• Proposed program timeline for new funding | Scott Weeks
Bailey Smith (ARB) |
| 5. DWR-CDFA Joint Pilot Project <ul style="list-style-type: none">• ARB QM methodology | Carolyn Cook and Martin Berbach (DWR)
Bailey Smith (ARB) |
| 6. Habitat Exchange Program | Environmental Defense Fund |
| 7. Public Comments on SWEEP | Chair Cameron |
| 8. Next meeting and location | Chair Cameron |

Amrith (Ami) Gunasekara, PhD, CDFA Liaison to the Science Panel

All meeting facilities are accessible to persons with disabilities. If you require reasonable accommodation as defined by the American with Disabilities Act, or if you have questions regarding this public meeting, please contact Amrith Gunasekara at (916) 654-0433.

More information at: <http://cdffa.ca.gov/Meetings.html> and http://www.cdffa.ca.gov/EnvironmentalStewardship/Meetings_Presentations.html



HEALTHY SOILS INCENTIVES PROGRAM

ENVIRONMENTAL FARMING ACT – SCIENCE ADVISORY PANEL
MEETING
NOVEMBER 18, 2016
MODESTO, CA

Geetika Joshi, PhD
Senior Environmental Scientist

UPDATE: FUNDING

- CDFFA appropriated \$7.5 million in FY 2016-17 to develop and administer a new incentive and demonstration program on the CA Healthy Soils Initiative from the Greenhouse Gas Reduction Fund.
- Funds must be encumbered by June 30, 2018 and expended/liquidated by June 30, 2020 (AB 1613, Section 13).

UPDATE: QUANTIFICATION METHODOLOGY FOR GHG EMISSION REDUCTIONS

- ARB, in collaboration with CDFA, is evaluating COMET-Planner, published research, assessment reports and other possible approaches to develop a quantification methodology for the Healthy Soils Incentives Program.
 - Process is ongoing.
 - QM tool will have a public comment period.

FRAMEWORK PROPOSED FOR DISCUSSION: INCENTIVES PROGRAM TENTATIVE TIMELINE

ITEM	ESTIMATED DATES
Program framework development including Quantification Methodology	September – November 2016
Public Stakeholder Meetings for Program Design Feedback	November 2016 – January 2017
Development of grant solicitation	February – April 2017
Grant solicitation released and Grant Application Workshops	May 2017
Applications proposals due	June 2017
Proposal evaluation (Technical Review)	June – September 2017
Announce grant awardees	September 2017
Project Implementation to begin	October 2017

EFA SAP MEETINGS PROPOSED TO GET FEEDBACK ON PROGRAM DEVELOPMENT

- 4 Meetings in January, March, May and July 2017 to discuss program framework development and receive feedback.
- Proposed dates: 3rd Thursday of the month.
 - January 19, 2017 – Sacramento
 - March 16, 2017 – Location TBD
 - May 18, 2017 – Location TBD
 - July 20, 2017 – Location TBD

PROGRAM CONTACTS

Geetika Joshi, Ph.D.

Senior Environmental Scientist

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Amrith Gunasekara, Ph.D.

Science Advisor to CDFA Secretary

Manager, Office of Environmental Farming and Innovation

Amrith.Gunasekara@cdfa.ca.gov

Visit us at: <https://www.cdfa.ca.gov/oefi/healthsoils/>

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Send comments to: cdfa.oefi@cdfa.ca.gov

SWEEP UPDATE

EFA SCIENTIFIC ADVISORY PANEL

November 18th 2016

Scott Weeks
Environmental Scientist



CALIFORNIA DEPARTMENT OF
FOOD & AGRICULTURE

SWEEP BACKGROUND

- **\$10 million: Emergency Drought Legislation Bill** - SB 103 signed by Governor Brown on March 1, 2014
- **\$10 million: AB 91** allocated additional funds March 27, 2015
- **\$40 million: Budget Act of 2015**, Item 8570-001-3228 (Chapter 321, Statutes of 2015) appropriate funds from the Greenhouse Gas Reduction Fund



*“...to invest in irrigation and water pumping systems that **reduce water use, energy use and greenhouse gas emissions.**”*

SWEEP AUTHORITY

• Environmental Farming Act of 1995

Division 1, Part 1, Chapter 3, Article 8.5, Sections 560-568, Section 566 (a)

“The department shall establish and oversee an environmental farming program. The program shall provide incentives to farmers whose practices promote the well-being of ecosystems, air quality, and wildlife and their habitat”



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PROJECT TYPES



Water Conservation

- Sensors for Irrigation Scheduling (*weather, soil or plant based*)
- Micro-Irrigation or Drip Systems



AND



GHG Reductions

- Fuel Conversion
- Improved Energy Efficiency
- Low Pressure Systems
- Variable Frequency Drives
- Reduced Pumping



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MOST RECENT ROUND OF FUNDING – SWEEP ROUND I

FUNDING

- \$16 million awarded
- \$9.5 million in matching funds

ACREAGE

- 128 projects
- 27,300-acres impacted
- 213-acres average project size

BENEFITS

- GHG Reductions: 5,635 MT CO₂e/yr
- Water Savings: 22,267 ac-ft/yr

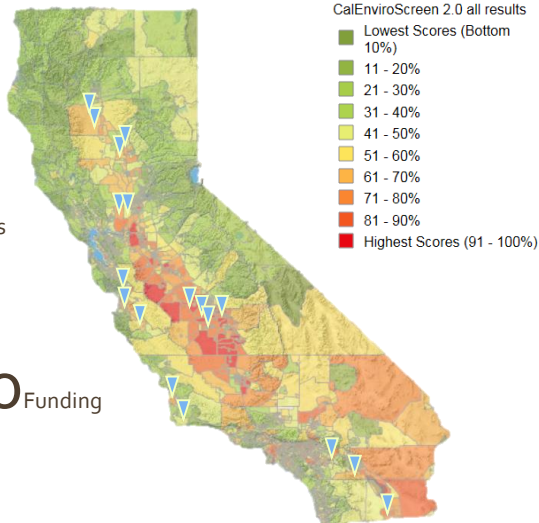
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USDA-NRCS TECHNICAL ASSISTANCE WORKSHOPS

23 Workshops

11 Organizations

\$50,000 Funding



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Technical Assistance Workshop

UC Cooperative Extension Fresno



Ruth Dahlquist-Willard and Felipe Perez



These Fresno Technical Assistance Workshops were taught in three languages (Hmong, Spanish, and English) Incorporated Univision TV and directly impacted 60 individuals

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AWARDED PROJECT EXAMPLE

Henry Pruitt Anderson, III SWEEP Project

\$150,000 - Tulare CA

80 Acres of almonds

- Changing from flood to drip irrigation
- Installation of soil moisture sensors and weather stations
- Solar array and VFD and flowmeter
- Estimated Water Savings of **23.9 acre in/year/acre**
- GHG Savings of **0.0130 MT CO₂e/year/acre**



Flow meter



Solar Array



Double lined drip irrigation

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COLLABORATION WITH RESOURCE CONSERVATION DISTRICT



- Contracted with the RCDs to conduct onsite project verifications
- RCDs verify projects were implemented in accordance with the Grant Agreement SOW and take photos of project components

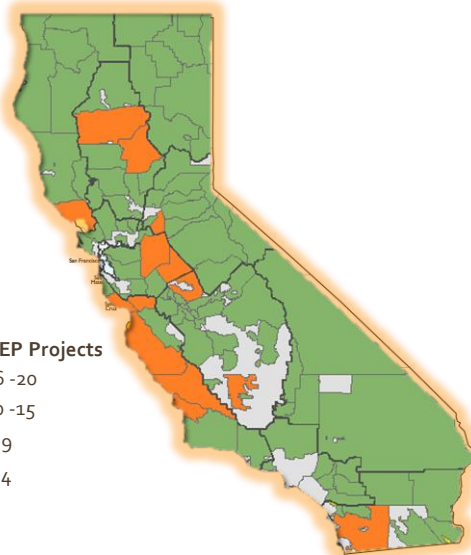


Brian Hockett, NW Kern RCD

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CONTRACTED STATEWIDE with RCDs

128 Projects for Verification



RCD Partners

1. Butte County
2. Coastal San Luis
3. East Merced
4. East Stanislaus
5. Greater San Diego
6. Loma Prieta
7. Monterey County
8. North West Kern
9. San Joaquin
10. Santa Cruz
11. Sloughouse
12. Sonoma
13. Tehama County
14. Upper Salinas Las Tables

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SWEEP 2016 Round II

2nd solicitation of total \$40 million ~ \$21 million

- Announced the application period in June 2016
- Completed August 5th 2016
- **Solicitation changes** include: the use of an updated GHG Quantification Methodology and GHG Calculator developed by CA Air Resources Board.
<http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/quantification.htm>
- **Technical assistance workshops** were be made available to applicants thanks to funding from USDA NRCS
<https://www.cdfa.ca.gov/oefi/sweep/docs/2016-CDFA-NRCSTechnicalAssistanceWorkshopsRFP.pdf>

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SWEEP 2016 Round II

- **268** submitted grant applications
- Totaling **\$34,330,134**
- Average amount requested is **\$128,000**

- **126** incomplete Applications
- Totaling **\$5,276,629**
- Average amount requested is **\$42,000**

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SWEEP 2016 Round II

- Of the **268** submitted applications **207** had required information to go to Technical Review

- After Technical Review



- Total potential Acres: **36,470 Acres**
- Total potential GHG reductions: **11,453.5 MTCO₂e**
- Total Funds Requested: **\$26.2 Million**
- Total Funds Matched: **\$14.4 Million**



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APPLICATION REQUIREMENTS

- Applicants must establish a baseline water use and GHG emissions from the current system and project savings due to the project. Supporting documentation is required including:

- Energy bills
- Water Use Calculator Tool
- Pump Tests



ARB GHG Calculator Tool

- Awardees must maintain records for 3 years and agree to verifications site visit

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CDFA SWEEP FY 2016-17

Quantification Methodology (QM) Updates
November 18, 2016

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Background

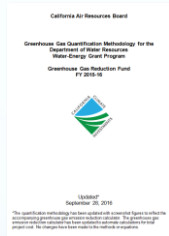
- ARB is required by statute to develop quantification methods (QM) for Greenhouse Gas Reduction Fund projects. QMs provide a mechanism to *estimate* the GHG reductions from project implementation.
- Quantification Methodology Principles:
 - Apply at the project-level.
 - Align with the project measures proposed for funding.
 - Estimate GHG emission reductions from direct, on-site energy savings.
 - Default values provided, where applicable
- Updates made for FY 2016-17 to improve usability and address comments from applicants, reviewers, and CDFA.

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Resources Available

<https://www.arb.ca.gov/cqi-quantification>

- Document + Excel-based tool to guide users in applying the methodology



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General Project Information		
Input Data	Pre-Project	
Field or Ranch Name		West Field
Total Irrigated Project Area (Acres)		1000
Total G/GHt funds requested (\$)	5	100,000
Pump fuel or electricity use (gallons, scf, kWh)		5,000
Fuel type		Other
Fuel Emissions Factor		0.013818117

- Quantification assistance available – questions about the tool can be directed to GGRFprogram@arb.ca.gov
- Open for comment today (Nov 18 – Dec 2)

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GHG Emission Reductions

- Calculator estimates GHG emission reductions from on-farm reductions in energy use.
- This energy use reduction correlates to a reduction in pumping demand; pumping demand can be a result of:
 - Replacing inefficient pumps and motors;
 - Repairing systems leaks;
 - Reducing amount of water delivered to the system; or
 - Changing to less-carbon intensive fuels, including renewable energy.
- The QM incorporates each of these measures to estimate post-project energy use and reports estimated GHG emission reductions.

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QM Updates for FY 2016-17

- Overall pumping efficiency
- Usability
 - Simplified inputs for total project cost and total project acreage.
 - Ranch/Field name by sheet.
 - Inputs replaced with default values for project life and VFD efficiency.
- Groundwater depth limits
- NRCS Water Savings Tool

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California Environmental Protection Agency
Air Resources Board

California Air Resources Board (ARB)
Greenhouse Gas Emission Reduction Calculator for the
California Department of Food and Agriculture (CDFA)
State Water Energy Efficiency Program (SWEET)
Greenhouse Gas Reduction Fund
Fiscal Year 2016-17

General Project Information		
Input Data	Pre-Project	
Field or Ranch Name		
Total Irrigated Project Area (acres)		
Total GGRF funds requested (\$)		
Pump fuel or electricity use (gallons, scf, kWh)		
Fuel type		
Fuel Emissions Factor	#N/A	
Pump and Motor Enhancement and Replacement - This Section required for all applicants		
Input Data	Pre-Project	Post-Project
Motor Rated Horsepower (hP)		
Operational Hours (hr) (if Known) - If unknown, leave cell blank		
Overall Pumping Efficiency (%)		
System Pressure (ft)	User may override system pressure if known	User may override system pressure if known
Pumping depth (ft)		
Discharge pressure (ft)		
Friction losses (ft)		
Are you installing a VFD?	N/A	
Irrigation System Enhancement (for systems utilizing pumps)		
Input Data	Pre-Project	Post-Project
Water savings (from NRCS) (%)	N/A	
Fuel Conversions and Renewable Energy		
Input Data	Post-Project	
Renewable energy capacity (kW)		
New fuel type		
Fuel Emissions Factor	#N/A	
Fuel conversion	No change	
Conversion Factor		

AB 1613 BUDGET ACT 2016

- Appropriates 65,000,000 to CDFA from GHGRF
 - \$7,500,000 for SWEEP

SWEEP

- Propose to reduce total grant award amount from \$200,000 to \$100,000
- CDFA hopes to fund ~50-80 projects from this funding cycle



ITEM	PROPOSED DATES*
Request for Applications released	January 2017
Grant Application Workshops	January - February 2017
Applications Due	February 2017
Application Review period	February - April 2017
Announce grant awardees	May 2017
Project Implementation begins	May 2017
*Subject to change	

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STAKEHOLDER FEEDBACK

Suggested improvements to SWEEP

- Maintain Technical Assistance
- Simplify the Quantification Methodology
 - Create a web form
 - Develop simplified QM for applications under \$50,000
- Coordinate with the Healthy Soils Program
 - Encourage and allow for applicants to apply for both funding sources

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MEDIA PROJECT

- Producing videos that highlight SWEEP
 - Highlight large and small farms as well as innovative projects
- Increase SWEEPs visibility



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Thank you for the time and your attention

Scott Weeks – Environmental Scientist, CDFA
Scott.Weeks@cdfa.ca.gov

Carolyn Cook – Senior Environmental Scientist, CDFA

Crystal Myers – Office of Grants Administration, CDFA

Sarah Weaver – Office of Grants Administration, CDFA

Bailey Smith - Air Resources Engineer, ARB

Amrith (Ami) Gunasekara – Manager, OEFI, CDFA



Agricultural Water Use Management Program & SWEEP

**A Joint Department of Water Resources and
Department of Food and Agriculture Project**
Update to the EFA Science Advisory Panel
November 18, 2016



DWR's Role in Agricultural Water Management

- The Department of Water Resources (DWR) is responsible for managing and protecting California's water.
- DWR works with other agencies to benefit the state's people, and to protect, restore and enhance the natural and human environments.
- Responsible for the conveyance of water to farmers through irrigation districts
- Implementation of SBX7-7, Water Conservation Act of 2009

Proposition 1 (DWR)

- For 2015, \$33 million was budgeted for agricultural water use efficiency grants to implement Proposition 1 §79746(a)(2).
- **\$3 million will be available for ag water suppliers for joint grant** with CDFA to implement a pilot project targeting agricultural water supplier water use efficiency improvements in conjunction with on-farm improvements.
- **50% Cost Share** is required for all projects unless Disadvantaged Communities (DAC) or Economically Distressed Areas (EDA) status is claimed and documented.

CDFA's Role in Agricultural Water Management

- The State Water Efficiency and Enhancement Program (SWEET) began in 2014 to incentivize on-farm water conservation and GHG emission reductions from irrigation systems.
- Department of Water Resources and State Water Control Board are key partners in the development of the program.
- Authority of the Environmental Farming Act of 1995 – EFA Science Advisory Panel role in program development.

SWEEP (CDFA)

- **\$10 million: Emergency Drought Legislation Bill** - SB 103 signed by Governor Brown on March 1, 2014
- **\$10 million: AB 91** allocated additional funds March 27, 2015
- **\$40 million: Budget Act of 2015**, Item 8570-001-3228
- **\$7.5 million: Budget Act of 2016**, Item 8570-101-3228
 - \$3 million have been set aside for this joint program with DWR

.....to invest in irrigation and water pumping systems that **reduce water use, energy use and greenhouse gas emissions.**

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The Joint Program

The grant funding provided in this joint program is intended to address multiple goals including:

- 1) Water use efficiency, conservation and reduction
- 2) Greenhouse gas emission reductions
- 3) Groundwater protection
- 4) Sustainability of agricultural operations and food production.

It is also anticipated that there will be benefits to water and air quality, groundwater security, surface water conservation, and improved nutrient management and crop health through this program

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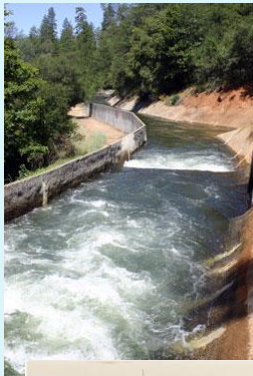
The Joint Program

A program to:

1. Incentivize the pressurization of the delivery of water to farms
2. Facilitate the use of surface water on farms where currently groundwater is the main source for irrigation
3. Incentivize efficient on-farm irrigation systems that increase water use efficiency and reduce greenhouse gases
4. Encourage the use of on-farm water management tools such as soil moisture sensors, plant sensors and weather stations.

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The Joint Program - DWR



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The Joint Program - CDFA



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The Joint Program and Funding



Conveyance

Funded by DWR
Prop 1 funding - \$3 million



Application Process

1. One application from agricultural water supplier with farmer applications included
2. Show significant decrease in use of on-farm groundwater pumps to reduce GHGs
3. Water and GHG savings to be quantified by agricultural water supplier through the use of a GHG Calculator developed by the CA Air Resources Board

[Quantification Methodology for CDFA Sweep - DWR \(Prop 1\) Joint Project for FY 2015-16 \(PDF\)](#)

[CDFA SWEEP - DWR \(Prop 1\) Joint Project GHG Emission Reduction Calculator for FY 2015-16 \(.xlsx\)](#)

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CDFA SWEEP DWR Joint Project FY 2016-17

Quantification Methodology (QM)
November 18, 2016

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Background

- ARB is required by statute to develop quantification methods (QM) for Greenhouse Gas Reduction Fund projects. QMs provide a mechanism to *estimate* the GHG reductions from project implementation.
- Quantification Methodology Principles:
 - Apply at the project-level.
 - Align with the project measures proposed for funding.
 - Estimate GHG emission reductions from direct, on-site energy savings.
 - Default values provided, where applicable
- Solicited public comment

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Resources Available

<https://www.arb.ca.gov/cci-quantification>

- Document + Excel-based tool to guide users in applying the methodology



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California Air Resources Board (ARB)
Greenhouse Gas Emission Reduction Calculator for the
California Department of Food and Agriculture (CDFA)
State Water Efficiency Program (SWEEP)
Greenhouse Gas Reduction Fund
Fiscal Year 2016-17

General Project Information		Pre-Project
Field or Ranch Name		West Field
Total Irrigated Project Area (acres)		100
Total GARD Funds Requested (\$)	5	100,000
Pump Fuel or electricity use (gallons, vol, kWh)		5,000
Fuel Type		Diesel
Fuel Emissions Factor		0.011818122


- Water supplier completes the QM on behalf of the growers.
- Quantification assistance available – questions about the tool can be directed to GGRFprogram@arb.ca.gov 14

DWR Joint Project QM

- Calculator estimates net GHG emission reductions from the reduced energy use as a result of the project.
- The energy use considered as a part of the QM:
 - Elimination of on-farm pumping;
 - Irrigation delivery system enhancements (including pressurization);
 - Changing to less-carbon intensive fuels, including renewable energy.
- Water supplier completes the QM on behalf of the growers.

DWR Joint Project Calculator

<https://www.arb.ca.gov/cci-quantification>



California Air Resources Board (ARB)
Greenhouse Gas Emission Reduction Calculator for the
California Department of Food and Agriculture (CDFA)
State Water Energy Efficiency Program (SWEEP) DWR (Prop 1) Joint Project
Greenhouse Gas Reduction Fund
Fiscal Year 2016-17

Existing Portion of Delivery System to be Enhanced	
Input Data	Pre-Project
Water deliveries in previous year (gallons)	
Total existing system pump fuel use (gallons, scf)	
Fuel type from existing system fuel use	
Fuel Emissions Factor	#N/A
Total existing system pump electricity use (kWh)	
Pre-project system emissions	-
Proposed Enhanced System	
Input Data	Post-Project
Estimated post project annual water delivery (gallons)	
Total proposed system pump fuel use (gallons, scf)	
Fuel type from proposed system fuel use	
Fuel Emissions Factor	#N/A
Total proposed system pump electricity use (kWh)	
Post-project system emissions	-
Renewable Energy	
Input Data	Post-Project
Renewable energy capacity (kW)	
Nearest Reference City	
Renewable energy emission reductions	#N/A
GHG Emission Increase	#N/A

DWR Joint Project Calculator



California Air Resources Board (ARB)
Greenhouse Gas Emission Reduction Calculator for the
California Department of Food and Agriculture (CDFA)
State Water Energy Efficiency Program (SWEEP) DWR (Prop 1) Joint Project
Greenhouse Gas Reduction Fund
Fiscal Year 2016-17

Agricultural Operation Information (Name, Location)	GGRF Funds Requested (\$)	Engine / Motor Make	Engine / Motor Model	Engine / Motor Serial Number	Rated Horse power	Annual Pump fuel or electricity use (gallons, scf, kWh)	Fuel type	Fuel Emissions Factor	Annual Emissions (MTCO ₂ e)
								#N/A	-
								#N/A	-
								#N/A	-
								#N/A	-
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								#N/A	-
On-Farm GHG Emission Reductions									0.00

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Timeline

Activity	Date
Draft Request for Applications Released	August 26, 2016
Public Comment Workshops	September 27, 28, & 29, 2016
Public Comment Period Closed	September 30, 2016
Anticipated Release of Final Request for Applications	November/December 2016
Project Closeout	June 30, 2018

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THANKS.....



<http://www.water.ca.gov/wuegrants/AgWUEPilot.cfm>

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