California Department of Food and Agriculture and California Air Resources Board

Interim

Greenhouse Gas Quantification Methodology for the California Department of Food and Agriculture State Water Efficiency and Enhancement Program

Greenhouse Gas Reduction Fund
FY 2015-16
to be used for the November 2015 Solicitation

November 20, 2015

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Section A. Introduction

The California Air Resources Board (ARB) is responsible for providing the quantification methodology to estimate greenhouse gas (GHG) emission reductions from projects receiving monies from the Greenhouse Gas Reduction Fund (GGRF). For the California Department of Food and Agriculture (CDFA) State Water Efficiency and Enhancement Program (SWEEP), CDFA, in consultation with ARB, developed this interim quantification methodology and the accompanying calculator tool for the applicants of the first solicitation of Fiscal Year (FY) 2015-16 to use to estimate the GHG emission reductions from the proposed projects.

ARB staff will periodically review each quantification methodology to evaluate its effectiveness and update methodologies to make them more robust, user-friendly, and appropriate to the projects being quantified. ARB quantification methods are posted on ARB's auction proceeds webpage at:
http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/quantification.htm

GHG Emission Reductions Quantification Approach

The metric used to assess the effectiveness of the project to reduce GHG emissions per dollar of GGRF funds will be reported by the applicant as:

$$\frac{Total\ Project\ GHG\ Reductions\ in\ Metric\ Tons\ of\ CO_2e}{Total\ GGRF\ Funds\ Requested\ (\$)}$$

GGRF Funds Requested is the dollar amount requested through CDFA SWEEP and any other GGRF programs to which the applicant has or may apply. Additional documentation and reporting requirements are provided in sections C and D.

Section B. Quantification Methodology

CDFA developed SWEEP to provide financial incentives for farmers to implement GHG reducing water conservation and energy savings measures on farms throughout the State.

CDFA, in consultation with ARB, developed the attached interim quantification methodology for use in estimating proposed project GHG emission reductions for the November 2015 solicitation for FY 2015-16 GGRF monies. The interim quantification methodology uses the CDFA SWEEP GHG emission calculator to determine GHG reductions from estimated on-farm fuel and/or energy savings from measures such as:
- Reduced pumping due to water savings from irrigation and scheduling improvements.
- Pump improvements such as installation of variable frequency drive controllers on pump(s) and pump efficiency retrofits.
- Any other fuel or energy saving measures associated with the proposed project.

The calculator tool can be accessed here: https://apps1.cdfa.ca.gov/emissioncalculator/.

The CDFA SWEEP GHG emissions calculator allows users to determine GHG reductions from on-farm fuel and/or energy savings as a result of project implementation. In addition, the user should account for any increases in energy or fuel use from irrigation system conversions, such as conversion from furrow or border strip method to a pressurized irrigation system, as part of the overall package of on-farm improvements. The calculator provides fields for users to input annual pre-project fuel usage and estimated annual post-project fuel usage from a number of energy types including electricity, diesel, gasoline, natural gas, butane, propane, and biodiesel. After the user inputs are entered, the calculator displays potential annual fuel savings and the associated potential annual GHG emission savings. The calculator utilizes Environmental Protection Agency (EPA) stationary combustion emission factors for GHG inventories which can be accessed here: http://www.epa.gov/climateleadership/documents/emission-factors.pdf.

In addition, for the purposes of GGRF quantification methodologies, ARB developed an average California grid electricity emission factor based on total in-state and imported electricity emissions ($MTCO_2e$) divided by total consumption in MWh. Emissions from ARB GHG inventory (2013), available online at:
http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_by_sector_00-12_sum_2014-03-24.pdf.
Consumption data from CEC Energy Almanac (2013), available online at:
http://energyalmanac.ca.gov/electricity/electricity_generation.html

Section C. Documentation

Applicants must report the Net GHG Benefits and provide documentation of the calculations and inputs used. The Net GHG Benefits are equal to the Total Project GHG Emission Reductions estimated in the calculator tool.

Applicants are required to provide electronic documentation that is complete, and sufficient to allow the calculations to be reviewed and replicated. Paper copies of supporting materials must be available upon request by CDFA or ARB staff.
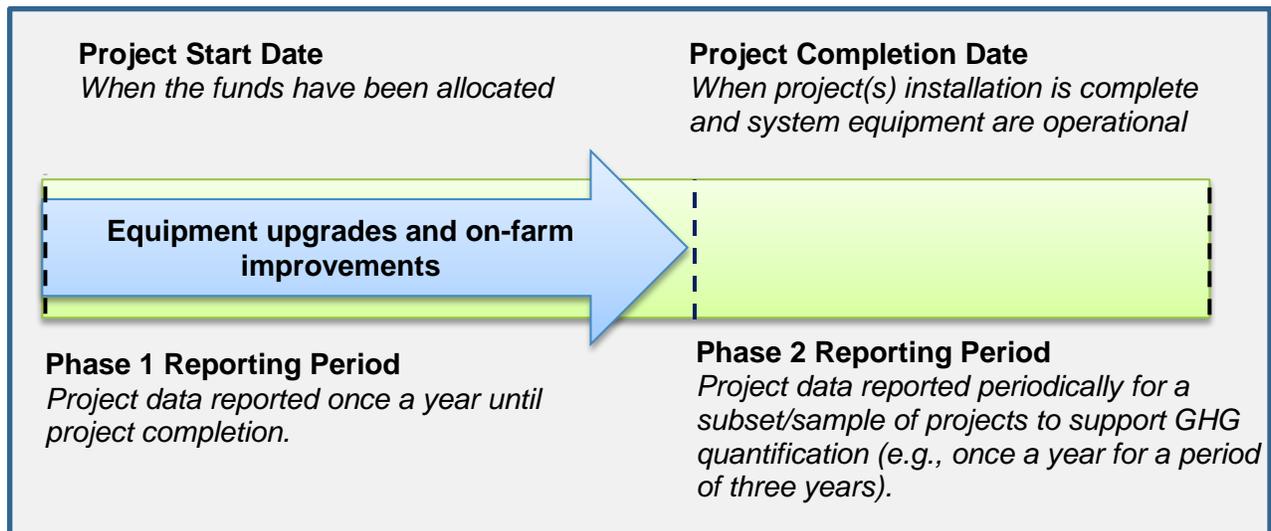
Documentation must include, at a minimum:

- Project application;
- Populated calculator tool file;
- Project description, including the project information necessary to complete the applicable portions of the quantification methodology; and
- Project data support, including:
    - Documentation of the project data used to estimate reduction in fuel consumption from project improvements;
    - References to public documents that are the source of the project data.

Section D. Reporting after Funding Award

Accountability and transparency are essential elements for all projects funded by the GGRF. Each administering agency is required to track and report on the benefits of the California Climate Investments funded under their program(s) and each funding recipient has the obligation to provide the necessary data or access to data for their project to support reporting on project outcomes.

In 2015, ARB developed Funding Guidelines for Agencies Administering California Climate Investments (Funding Guidelines).[1] These Funding Guidelines describe the reporting requirements and set the <u>minimum</u> project-level reporting requirements for projects funded by CDFA. Volume III of the Funding Guidelines summarizes the major reporting components that CDFA must report to ARB. Because much of this data comes directly from CDFA SWEEP applicants, funding recipients will need to provide project data to CDFA to support these reporting requirements.

Table 1 and the figure below show the project phases and when reporting is required.

Project Start Date
When the funds have been allocated

Project Completion Date
When project(s) installation is complete and system equipment are operational

Equipment upgrades and on-farm improvements

Phase 1 Reporting Period
Project data reported once a year until project completion.

Phase 2 Reporting Period
Project data reported periodically for a subset/sample of projects to support GHG quantification (e.g., once a year for a period of three years).

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[1] California Air Resources Board. Funding Guidelines for Agencies Administering California Climate Investments. September 4, 2015.
http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/funding_guidelines_public_proposed_draft_09-04-2015.pdf

Table 1. Quantification and Reporting By Project Phase

	Timeframe	Quantification Methodology Section
Project Selection	Covers the period from solicitation to selection of projects and funding awards	All applicants use methods in this QM to **estimate** GHG reductions based on application data.
Phase 1	Covers the period from the beginning of the project until it becomes operational or the initial implementation is completed	Funded projects use methods in this QM, as needed, to update GHG **estimates** based on project changes.
Phase 2	Starts after Phase 1 is complete and a project becomes operational	GHG reductions **achieved** are quantified and reported for a subset of funded projects.

Phase 1 reporting is <u>required for all SWEEP projects.</u> CDFA will collect and submit data to ARB to satisfy Phase 1 reporting requirements. Recipients of SWEEP funding must report any changes that impact GHG emission reduction estimates (i.e., fuel or energy use) to CDFA prior to project completion.

Phase 2 reporting is <u>required for only a subset of CDFA projects</u> and is intended to <u>document actual project benefits achieved after the project becomes operational</u>. Phase 2 data collection and reporting will not be required for every project. CDFA will be responsible for identifying the subset of individual projects that must complete Phase 2 reporting, identifying who will be responsible for collecting Phase 2 data, and for reporting the required information to ARB. ARB will work with CDFA to address "Phase 2" procedures, including but not limited to:

- The **timelines** for Phase 2 reporting, i.e., when does Phase 2 reporting begin, how long will Phase 2 reporting be needed.
- As applicable, **approaches for determining the subset of projects** that need Phase 2 reporting (i.e., how many **X** projects out of **Y** total projects are required to have Phase 2 reporting).
- **Methods for monitoring or measuring** the necessary data to quantify and document achieved GHG reductions and other select project benefits.
- **Data to be collected**, including data field needed to support quantification of GHG emission benefits.
- Reporting requirements for transmitting the data to ARB or CDFA for program transparency and use in reports.

Once the Phase 2 quantification method and data needs are determined, ARB will develop and post the final ARB approved Phase 2 methodology for use in Phase 2 reporting.