



# Air Resources Board



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Governor

TO: Carla Sanchez  
Special Assistant  
California Department of Food and Agriculture

FROM: Cynthia Marvin, Chief  
Transportation and Toxics Division  
Air Resources Board

DATE: October 29, 2014

SUBJECT: GREENHOUSE GAS REDUCTION FUND: CDFA EXPENDITURE  
RECORD FOR FISCAL YEAR 2014-15

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Thank you for submitting the final expenditure record (attached) on behalf of the California Department of Food and Agriculture (CDFA) on October 29, 2014 to satisfy the requirements of Senate Bill 1018 (Budget and Fiscal Review Committee, Chapter 39, Statutes of 2012) for expenditures from the Greenhouse Gas Reduction Fund (Fund). We appreciate the iterative consultation process with CDFA staff on the development of this record to support expenditures from the Fund for activities that increase the use of alternative and renewable fuels.

This memorandum documents that Air Resources Board (ARB) staff concurred on October 29, 2014 that the attached record is consistent with the statutory requirements of Government Code Section 16428.9 and with ARB's expectations, as documented in the August 6, 2014 final ARB *Interim Guidance to Administering Agencies on Expenditure Record and Fiscal Procedures*.

The CDFA Expenditure Record for Fiscal Year 2014-15, along with this memorandum, will be published on the ARB Cap-and-Trade Auction Proceeds website at: [www.arb.ca.gov/auctionproceeds](http://www.arb.ca.gov/auctionproceeds).

If you have any questions concerning this memorandum, please call me at (916) 324-0062 or via email at [Cynthia.Marvin@arb.ca.gov](mailto:Cynthia.Marvin@arb.ca.gov).

Attachment

cc: See next page.

*The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website: <http://www.arb.ca.gov>.*

California Environmental Protection Agency

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Carla Sanchez  
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cc: Kevin Masuhara  
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**Greenhouse Gas Reduction Fund: Expenditure Record**

**Fiscal Year: 2014-15**

California Department of Food and Agriculture  
Alternative and Renewable Fuels Program  
2014-15 Expenditure Record to  
Expend \$3 Million in Greenhouse Gas Reduction Funds

**Authorizing Legislation:**

Item 8570-001-3228 of the Budget Act of 2014 (Chapter 25, Statutes of 2014) includes \$3,000,000 from the Greenhouse Gas Reduction Fund (GGRF) for the California Department of Food and Agriculture (CDFA) to implement an Alternative and Renewable Fuels Program (Program).

**Agency:** CDFA

**Intended Recipient:** CDFA-Division of Measurement Standards (DMS).

**Project Category:** Agricultural Energy Production and Achieving Operational Efficiency

**Program Description:** CDFA's program activities will support further deployment and use of renewable natural gas, its analogues, and other low carbon renewable biofuels derived from agricultural waste in the transportation sector. Deploying low carbon transportation renewable fuels will utilize waste as a resource and reduce greenhouse gas emissions.

*Per Government Code §16428.9, prior to expending any moneys appropriated to it by the Legislature from the fund, a state agency shall prepare a record consisting of all of the following:*

**(1) A description of each expenditure proposed to be made by the state agency pursuant to the appropriation.**

In direct alignment with the Cap-and-Trade Auction Proceeds Investment Plan, CDFA-Division of Measurement Standards (DMS) is establishing an Alternative and Renewable Fuels Program to support the deployment of advanced biofuel from the state's agricultural sectors as a renewable source of low-carbon transportation fuels. The program will lead to reductions in greenhouse gas (GHG) emissions associated with agriculture and transportation. The Budget Act of 2014 (Chapter 25, Statutes of 2014) provides CDFA with \$3,000,000 to develop and implement solutions to fuel quality and metrological barriers preventing the commercial use of biofuels from dairy digesters and other technologies that process agricultural waste into viable renewable energy sources. Renewable fuels that can be generated from agricultural waste include: renewable natural gas, dimethyl ether, renewable hydrogen, bio-butanol, and other alcohol based fuels. The California Business and Professions Code (BPC) Division 5, §13440 and §13450 require CDFA to establish and enforce tolerances and specifications for transportation fuels, including alternative and renewable fuels sold at retail. The introduction of alternative fuels in California requires a significant expansion of the CDFA's regulatory and oversight activities.

To support marketplace introduction of renewable transportation fuels, CDFA/DMS must establish fuel sampling and testing procedures, acquire necessary equipment, and validate test methods for oversight and regulatory activities. For the first two years, DMS will focus on deployment of standards and testing procedures for renewable natural gas (RNG), including renewable compressed natural gas (RCNG) and other transportation biofuels produced from agricultural waste. While the California Public Utilities Commission has developed standards<sup>1</sup> for renewable natural gas injected into the natural gas transmission pipeline, standards and fuel quality testing for RNG, RCNG, LRNG, and other biofuels produced from agricultural waste provided directly to retail transportation customers still need to be developed and implemented before these fuels can be more widely used.

CDFA, in collaboration with other standards setting institutions, will work to characterize the hydrocarbon profile and the full spectrum of contaminants and constituents that will be restricted when biofuels are used as transportation fuels and will develop consensus quality standards and performance specifications for these fuels. Once these standards and specifications are developed, CDFA must ensure standards compliance by conducting fuel quality testing before these biofuels, like non-pipeline RNG, RCNG, and LRNG, can be sold directly to retail customers. For standards and fuel quality testing implementation, CDFA will acquire the equipment and staff necessary for the sampling and testing procedures and for supporting the required oversight for renewable transportation fuels being introduced into the marketplace. Concurrent activities will include: adoption of standards via rulemaking; development of methods necessary to perform biofuel quality sampling and quantity verification; and development of training materials for weights and measures officials. All work related to implementing standards will be completed by the CDFA Alternative and Renewable Fuels Program; no funding has been allocated for external research projects.

Supporting the standards development, testing, and eventual deployment of renewable fuels in the transportation sector will increase the usage of renewable transportation fuels, displace petroleum based transportation fuels, and reduce California GHG emissions. CDFA's program activities will support further deployment and use of renewable natural gas, its analogues, and other low carbon renewable biofuels derived from agricultural waste in the transportation sector. Deploying low carbon renewable fuels into the transportation sector will allow California to maximize greenhouse gas (GHG) emission reductions by reducing emissions from California dairies, supporting digester technologies and renewable fuels production, and displacing an energy equivalent amount of petroleum based fuels.

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<sup>1</sup> California Public Utilities Commission. 2014. *Order Instituting Rulemaking to Adopt Biomethane Standards and Requirements, Pipeline Open Access Rules, and Related Enforcement Provisions*. Decision 14-01-034; Rulemaking 13-02-008. <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M086/K466/86466318.PDF>

This program falls under the project category of agricultural energy production and achieving operational efficiency. The work that will be completed by this program also applies to waste diversion, since standards are a key element of establishing mass production and use of biofuels.

**(2) A description of how a proposed expenditure will further the regulatory purposes of Division 25.5 (commencing with Section 38500) of the Health and Safety Code, including, but not limited to, the limit established under Part 3 (commencing with Section 38550) and other applicable requirements of law.**

AB 1532 requires that GGRF monies be appropriated in a manner that is consistent with the three-year Investment Plan. The 2013 "Cap-and-Trade Auction Proceeds Investment Plan" notes that it is important to target "expenditures [that] are critical to help California realize the transformational changes in energy generation and efficiency" as well as fund "projects to treat waste as a resource for low-carbon fuels". The 2013 "Cap-and-Trade Auction Proceeds Investment Plan" also recommends that clean transportation receive a significant allocation of auction proceeds investments because the transportation sector is the largest California contributor of both GHGs and criteria pollutants.

There is adequate scientific information available to show that the use of natural gas and other low carbon renewable biofuels derived from agricultural waste will allow California to maximize GHG emission reductions from digester technologies and other agriculturally-based energy sources. A U.S. Department of Energy (DOE) / National Renewable Energy Laboratory (NREL) study<sup>2</sup> demonstrated that methane powered transport vehicles have "75 percent lower emissions for carbon monoxide, 49 percent lower oxides of nitrogen, and 95 percent lower particulate matter than the diesel trucks of similar age. The hydrocarbon emissions were about four percent higher for the diesel trucks than were the non-methane hydrocarbons for the CNG trucks. The carbon dioxide emissions were seven percent lower for the CNG trucks, which were equipped with an exhaust catalyst." The Air Resources Board Low Carbon Fuel Standard (LCFS) mandates California transportation fuel providers to reduce the Carbon Intensity (CI) of fuels used in the State. Agricultural waste derived biofuels create a low carbon engine fuel that directly reduces net GHG emissions from dairies, feedlots, and other agricultural operations throughout the State.

The first update to the Climate Change Scoping Plan identified the agriculture sector playing an important role in the production of biofuels that will support the reduced reliance on fossil-based fuels. For example, capturing methane from agriculture operations will provide climate benefits while also affording opportunities to produce bioenergy and biofuels. In addition, the first update to the Scoping Plan recommended a key action that to work with the Bioenergy Interagency Working Group that will "strengthen, refine, and implement actions contained in its Bioenergy Action Plan to

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<sup>2</sup> U.S. Department of Energy and the National Renewable Energy Laboratory, 2002. *United Parcel Service (UPS) CNG Truck Fleet: Final Results*. <http://www.nrel.gov/vehiclesandfuels/fleetest/pdfs/31227.pdf>

promote the input of digester biogas into natural gas pipelines and bioenergy onto the electric grid.” Therefore, the expenditures covered by this record are consistent with the Investment Plan and Scoping Plan and align with the priorities expressed in both Plans.

**(3) A description of how a proposed expenditure will contribute to achieving and maintaining greenhouse gas emission reductions pursuant to Division 25.5 (commencing with Section 38500) of the Health and Safety Code.**

Currently, the transportation sector is the biggest contributor (36 percent) to California’s GHG emissions from high-carbon motor vehicle fuels, and agriculture contributes an additional six percent. Production of biofuels from agricultural waste has potential to reduce air pollutants in both sectors. Of the approximately six percent of total GHGs derived from California agriculture, the primary GHGs emitted are carbon dioxide, methane and nitrous oxide. Direct carbon dioxide emissions stem from on-farm energy use including nonrenewable fuels. Agricultural production and distribution requires the use of engine fuels which have been identified as a major source of GHG and other components of air pollution. This program will deploy fuel standards for the biofuels derived from agricultural waste such as methane, and has the potential to yield significant GHG emissions reductions. Each pound of methane captured and converted to energy for transportation displaces an equivalent amount of petroleum-based fuel. The GHG effect of methane is greater than CO<sub>2</sub>. Capturing and preventing its release into the atmosphere removes a very potent GHG from the atmosphere and transforming captured biogas into a transportation fuel provides additional GHG emissions reduction benefits by replacing diesel or non-renewable fuel systems with those that can utilize renewable biofuels such as digester gas. BPC Division 5 § 13440 and 13450 require the Department to establish and enforce tolerances and specifications for transportation fuels sold at retail. The development and adoption of fuel quality standards, test methods and specifications are necessary precursors to the introduction of alternative and renewable biofuels into the commercial fuel infrastructure.

The proposed expenditures will fund program activities including: 1) the establishment of fuel quality specifications and the development and validation of associated laboratory test methods for renewable biofuels derived from agricultural waste; 2) the development of protocols and procedures for biofuel quality sampling and quantity verification; 3) active participation with ASTM International (formerly known as the American Society for Testing and Materials), SAE International (formerly known as Society of Automobile Engineers), and the National Conference on Weights and Measures to create consensus standards which can be adopted via rulemaking; and (4) the development of policies, performance and use requirements as well as the application and interpretation of laws and regulations for measuring devices, equipment users, manufacturers, engineers and other government officials.

CDFA will complete the establishment of recommended fuel quality specifications and associated test methods over a two year period. Biofuel quality sampling and quantity verification methods and procedures will be concurrently developed. Consensus standard adoption timelines vary by organization. CDFA will continue its efforts to

promote standards adoption via participation in appropriate committees and working groups. The transition from petroleum and other nonrenewable fuels to renewable biofuels will create continued and sustainable GHG emission reductions that will continue beyond 2020.

**(4) A description of how the state agency considered the applicability and feasibility of other nongreenhouse gas reduction objectives of Division 25.5 (commencing with Section 38500) of the Health and Safety Code.**

The development of fuel quality specifications for biogas as a transportation fuel will lead directly to the opportunity to utilize this cleaner transportation technology platform. Under the Alternative and Renewable Fuels Program, the production and use of low-carbon and low-polluting fuels will immediately benefit communities in the Central Valley, home for many disadvantaged communities. While no direct investment is made from the program activities, the expected outcomes may provide significant benefits to this region.

A large proportion of the dairy and agriculture industries are concentrated in Central Valley where current CalEnviroScreen mapping indicates there may be communities identified as disadvantaged. The development of fuel standards for biofuels strengthens the economic vitality and sustainability of dairy operations utilizing digester technology by supporting the installation and operation of bio-gas trapping, cleaning, and compression technology in the very communities that need additional quality employment opportunities. These jobs would include construction, maintenance, engineering, and support roles for the design, installation, and operation of digesters as well as the associated testing and validation positions necessary for proper oversight and regulation.

Additional co-benefits may be realized from the program, including localized production of renewable energy for farm operations. Utilization of dairy digesters with diverse energy applications will serve as a model solution to keep farms and rural communities economically viable long into California's future. The project will result in diversification of our transportation energy platforms and create the standards to bring forward a low carbon engine fuel that directly reduces net GHG emissions from dairies, feedlots, and other agricultural operations throughout the State.

**(5) A description of how the state agency will document the result achieved from the expenditure to comply with Division 25.5 (commencing with Section 35800) of the Health and Safety Code.**

After biofuel standards are established and regulations adopted, California will be able to begin documenting the benefits achieved from this program. The technological platforms for biofuel powered transport (e.g., engine conversions) are already established. Therefore, it is anticipated that prior to 2020, the State will begin to see demonstrable benefits from the program.

Program status and benefits, will be reported in the annual legislative report and reported to the Air Resources Board (ARB) and the Department of Finance in accordance with ARB's funding guidelines on GGRF expenditures, as required by Health and Safety Code Section 39720.

The net carbon displacement of traditional fuel and the associated GHG emission reductions can be calculated using the quantity displaced and comparing the CI of the fuels. ARB's fuel pathway carbon intensity matrix identifies the relative CI values of various pathways for fuels sold or used in California.

Program funding will be utilized to establish an internal program within CDFA/DMS laboratories in Sacramento and Anaheim. Reporting of program activities, expenditures, and results will be communicated in regular quarterly reports to CDFA management and ARB. A comprehensive final report of all program activities and expenditures will be provided to ARB at the conclusion of the initial two year program.