LOW CARBON FUEL STANDARD
FREQUENTLY ASKED QUESTIONS

Credit Generation for Reduction of Methane Emissions from Manure Management Operations

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INTRODUCTION

The California Air Resources Board's (CARB) Low Carbon Fuel Standard (LCFS) regulation, which appears at sections 95480 to 95503 of title 17, California Code of Regulations, is designed to reduce greenhouse gas emissions associated with the life cycle of transportation fuels used in California. CARB staff has prepared this guidance document to describe the regulatory requirements in a user-friendly format. Unlike the LCFS regulation itself, this document does not have the force of law. It is not intended to and cannot establish new mandatory requirements beyond those that are already in the LCFS regulation, nor can it supplant, replace or amend any of the legal requirements of the LCFS regulation. Conversely, any omission or truncation of regulatory requirements does not relieve entities of their legal obligation to fully comply with all requirements of the LCFS regulation.

BACKGROUND

The California Air Resources Board (CARB) incentivizes, through credits generated under two of its climate programs, the reduction of greenhouse gas (GHG) emissions achieved by the voluntary capture and use, or destruction, of methane from anaerobic digestion of livestock manure. The destruction of methane is incentivized under the Cap-and-Trade Program via the opportunity to generate CARB compliance offset credits and the use of captured methane as a transportation fuel in California generates credits under the Low Carbon Fuel Standard (LCFS).

This guidance document is prepared pursuant to Health and Safety Code section 39730.7(e), enacted by SB 1383 (Lara, 2016),[1] which directs CARB to provide guidance on credit generation under the two programs relating to a future regulatory requirement to reduce manure methane emissions from livestock and dairy projects (hereinafter referred

[1] SEC. 4. [H&S code Section 39730.7(e)]: No later than January 1, 2018, the state board shall provide guidance on credits generated pursuant to the Low-Carbon Fuel Standard regulations (Subarticle 7 (commencing with Section 95480) of Title 17 of the California Code of Regulations) and the market-based compliance mechanism developed pursuant to Part 5 (commencing with Section 38570) of Division 25.5 from the methane reduction protocols described in the strategy and shall ensure that projects developed before the implementation of regulations adopted pursuant to subdivision (b) receive credit for at least 10 years. Projects shall be eligible for an extension of credits after the first 10 years to the extent allowed by regulations adopted pursuant to the California Global Warming Solutions Act of 2006 (Division 25.5 (commencing with Section 38500)).

to as “projects”). This future regulatory emissions control requirement to reduce manure methane emissions from livestock and dairy projects is hereinafter referred to as the “Regulation” or “Regulation requirement” in this guidance document.

What is the crediting period for avoided methane emissions from manure management projects under the Cap-and-Trade Program and LCFS?

The Board-adopted Compliance Offset Protocol Livestock Projects[2] (Livestock Protocol) provides the framework for quantification, project eligibility, monitoring, reporting, and verification of GHG emissions reductions from manure methane operations under the Cap-and-Trade Program. Under the Livestock Protocol, the crediting period for an eligible project is 10 reporting periods, with the first reporting period lasting from 6 to 24 months and subsequent reporting periods being 12 months in duration.[3] The LCFS utilizes the same quantification framework to determine avoided methane emissions in the production of biomethane from manure management operations that is used as a transportation fuel.[4] Consistent with SB 1383, CARB will ensure that eligible projects will receive compliance offset credit and/or LCFS credit for at least 10 years.[5] The 10-year crediting period begins with the first reporting period in either program, and continues with credit generation in either program.

How would adoption of a Regulation affect credit generation for avoided methane emissions under the two programs?

As discussed in the Short Lived Climate Pollutant (SLCP) Strategy,[6] projects developed after the Regulation’s emission reduction requirements are in effect would not be eligible for compliance offset credits or an LCFS carbon intensity that reflects avoided methane emissions, as the methane reductions associated with those projects would not be additional to the Regulation, (i.e., the methane reduction requirements of the Regulation would establish a new baseline or business-as-usual scenario under the Livestock

[2] CARB. Compliance Offset Protocol Livestock Projects. Adopted November 14, 2014. Available at: https://www.arb.ca.gov/regact/2014/capandtrade14/ctlivestockprotocol.pdf

[3] For the remainder of this guidance document, we refer to the crediting period as a 10-year crediting period for simplicity.

[4] LCFS Tier 1 Simplified CI Calculator for Biomethane from Anaerobic Digestion of Dairy and Swine Manure (August 13, 2018). All Board-adopted LCFS life cycle analysis tools including Simplified CI Calculators and Instruction Manuals are available at: https://ww2.arb.ca.gov/resources/documents/lcfs-life-cycle-analysis-models-and-documentation

[5] LCFS regulation section 95488.9(f). Available at: https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard/lcfs-regulation. As specified in section 95488.9(f)(3)(C), the LCFS crediting period is aligned with the Cap-and-Trade crediting period, and does not reset when the project is certified under the LCFS.

[6] Page 69 of the SLCP Strategy reads:

Once the regulatory requirements are in effect, credits for avoided methane emissions under the LCFS or the Cap-and-Trade Programs would not be available for new projects as the reductions would not be additional to regulation (which becomes the business-as-usual case). However, projects in place before the new requirements take effect would still be able to generate credits for avoided methane emissions for their current crediting period, which is ten years of operation. Available at: https://www.arb.ca.gov/cc/shortlived/meetings/03142017/final_slcp_report.pdf

Protocol quantification methodology). Only the GHG emissions reductions that exceed any GHG emissions reductions required by the Regulation would be eligible for either compliance offset credits or a carbon intensity that reflects avoided methane emissions for the purpose of generating LCFS credits.

Consistent with SB 1383, projects which are listed[7] under Cap-and-Trade or have submitted an LCFS fuel pathway application before the new requirements take effect would still be able to generate credits using the original baseline conditions for the remainder of each project's 10-year crediting period. Under section 95488.9(f) of the LCFS regulation, such projects' GHG reductions will continue to be quantified throughout the 10-year crediting period against the regulatory conditions that existed at the time of project listing.

Would the quantity of credits be consistent throughout the crediting period?

Not necessarily; the magnitude of credit generation may vary from year to year due to many factors. The quantification methodology relies on certain parameters that are updated annually, including the climate data at the project location and the actual livestock population or quantity of manure treated in the project system. Such changes could affect the magnitude of credit generation, and therefore the credits issued in the initial reporting period do not necessarily reflect the potential credits issued in subsequent reporting periods.

Additionally, during the crediting period for a project, the methodology for quantifying carbon intensity under the LCFS may change; the adoption of an updated version of the CA-GREET model, which the LCFS program uses to translate GHG reductions into the carbon intensity score used to generate credits under LCFS, may result in variation in the quantity of credits generated. Furthermore, under the LCFS, the carbon intensity benchmarks decline annually, meaning that alternative fuels generate fewer credits as the standard becomes more stringent, even if the carbon intensity and quantity of fuel produced remains constant.

How would adoption of a Regulation in California affect credit generation for avoided methane emissions associated with out-of-state projects?

Under both programs, in-state and out-of-state projects would be impacted identically, meaning that out-of-state projects would not be eligible for compliance offset credits or an LCFS carbon intensity that reflects avoided methane emissions if the project is listed or pathway application is submitted after the Regulation requirement goes into effect in California.

Can crediting for avoided methane emissions be extended if the initial 10-year crediting period expires prior to the Regulation requirement going into effect?

[7] The Livestock Protocol specifies that the crediting period begins on the first day of the initial reporting period. See the Offset Protocol Livestock Projects FAQ available at: https://www.arb.ca.gov/cc/capandtrade/protocols/livestock/livestock.2014.faq.pdf

Yes, if the project's initial 10-year crediting period expires prior to the Regulation requirement going into effect, the project may be granted up to two additional 10-year crediting periods. Similar to the initial crediting period, the subsequent adoption of a Regulation would not affect credit generation for avoided methane emissions during a second or third 10-year crediting period that began before the Regulation requirement goes into effect.

Can crediting for avoided methane emissions be extended if the Regulation requirement goes into effect prior to the expiration of the initial 10-year crediting period?

No, the project would not be eligible for an additional 10-year crediting period for avoided methane emissions.

Can a project switch between the LCFS and Cap-and-Trade Program, receiving credit from one program for one reporting period and from the other program for the next reporting period?

Yes, a project is able to switch between the LCFS and Cap-and-Trade Program from one reporting period to the next. Switching from the Cap-and-Trade Program to LCFS does not initiate a new crediting period. Project operators should notify the participating registry under which program the project intends to report at the beginning of each reporting period.

Can a project receive credit under both the LCFS and Cap-and-Trade Program during the same reporting period?

No, the existing Livestock Protocol does not include an accounting mechanism to address crediting in two programs. A project may not receive credits under the Cap-and-Trade Program and LCFS within the same reporting period, even for reductions that are not credited under the LCFS program.

However, the LCFS places no restriction on recognition by any other program for emission reductions that are demonstrated to be additional to reductions claimed under the LCFS transportation fuel pathway.[8]

Do all the requirements of the Livestock Protocol apply to LCFS fuel pathways?

No. The LCFS utilized the quantification framework of the Livestock Protocol in development of the Board-adopted Simplified CI Calculator for Biomethane from Anaerobic Digestion of Dairy and Swine Manure and requires many of the same conditions for project eligibility. The following table lists the sections of the Livestock Protocol which are applicable to LCFS fuel pathway certification. In addition, LCFS fuel

[8] Some projects may destroy a portion of biogas via flaring, or use a portion of biogas outside of the California transportation sector. In such cases a portion of the methane emission reduction is allocated outside of the LCFS system boundary, and may be eligible for voluntary credits or recognition in other jurisdictions.

pathway holders and reporting entities are subject to all applicable requirements of the LCFS regulation, including the reporting and recordkeeping requirements pursuant to sections 95488.8(i), 95488.10, 95491, and 95491.1, and third-party verification requirements pursuant to section 95500 of the LCFS regulation.

Livestock Protocol Requirements for LCFS Dairy and Swine Manure Fuel Pathways

Areas where LCFS requirements are intended to be identical to the Livestock Protocol	**Protocol Reference**
Definitions used in the Livestock Protocol.	Chapter 1.2
Eligible Activities; in addition, to be eligible for an LCFS fuel pathway, the project must produce 1) a transportation fuel for use in California, or 2) a fuel provided directly for use as process energy in a facility that produces a transportation fuel for use in California.	Chapter 2
General Eligibility Requirements apply, except 3.1(a)(3) as noted below.	Chapter 3.1
The LCFS crediting period (section 95488.9(f)) is aligned with the Offset project crediting period.	Chapter 3.6
The LCFS Pathway system boundary is a subset of the Livestock Protocol's Offset Project Boundary.	Chapter 4
GHG sources and sinks; for example, emissions from enteric fermentation are considered outside the fuel system boundary and will not be included. Exceptions as noted below.	Table 4.1
Methodology for quantifying GHG Emission Reductions generally applies, with specific exceptions as noted below. LCFS pathways must use the Simplified CI Calculator for Dairy and Swine Manure.	Chapter 5
Appendices, with exceptions as noted below.	Appendices A and B

Areas of the Livestock Protocol Not Applicable or Excluded from LCFS Requirements	**Protocol Reference**
Timing of application and reporting periods must adhere to the frequency and deadlines specified in the LCFS regulation.	
Registry listing, project monitoring parameters, reporting, and third-party verification requirements. Refer to the LCFS regulation requirements for program registration (95483), fuel pathway certification (95488-95488.10) transactions reporting (95491), recordkeeping (95491.1) and verification (95500) requirements.	Chapters 6 through 8
Additionality requirements that are referenced in the Livestock Protocol 95973(a)(2) of the Cap-and-Trade Regulation are not required under LCFS.	Chapter 3.1(a)(3) and 3.4
LCFS pathways are not required to have a commencement date after December 31, 2006.	Chapter 3.5(c)

Areas of the Livestock Protocol Not Applicable or Excluded from LCFS Requirements (continued)	**Protocol Reference**
Regulatory compliance requirements.	Chapter 3.7
LCFS Fuel Pathways do include emissions of CH_4 and N_2O from equipment upgrading biogas for pipeline injection and use as CNG/LNG fuel (SSR 10) and at the end user (SSR 12).	Table 4.1
The Livestock average mass ($Mass_L$), per livestock category from Table A.1 must be used in LCFS Fuel Pathways.	Chapter 5.1(h)
LCFS Fuel Pathways should rely on the method to determine baseline monthly volatile solids retention described in the Instruction Manual for the Tier 1 Simplified CI Calculator for Biomethane from Anaerobic Digestion of Dairy and Swine Manure. Less than annual cleaning schedules may be "amortized" to the equivalent fractional cleanout per year during the month the cleanout occurred (e.g., one complete cleaning in October every five years is modeled as a 20% removal in October of each year).	Chapter 5.1(k)
Methane concentration measurement must be recorded every 15 minutes (at a minimum) with instrumentation capable of electronic archival.	Chapter 5.2(d)
The correct conversion factor from pounds to metric tons should be used (0.000454)	Equation 5.6
Parameters BDE (CH_4 destruction efficiency) and F (Monthly volume of biogas from digester to destruction devices) must be reported for each device to allow for allocation of emissions between transportation fuel and other destruction methods.	Equations 5.6, 5.10, and Table 6.1
Emission factors for energy use, fuel properties (e.g., energy density) and global warming potentials (GWP) from CA-GREET are used, when available.	Chapter 5(e), Equations 5.12 and 5.13, Tables A.7 and A.8