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California Air Resources Board
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RE: Clean Energy's Comments in Response to December 2, 2016 LCFS Workshop

Dear ARB Staff,

Clean Energy appreciates the opportunity to submit comments in response to staff's "Natural Gas as a Transportation Fuel" discussion white paper as well as the December 2016 Natural Gas Transportation Fuel workshop. Clean Energy applauds the efforts of ARB staff to strengthen the integrity of the LCFS program through the implementation of a robust verification program combined with a streamlined approach for reporting natural gas vehicle fueling transactions. Clean Energy owns the nation's largest network of natural gas vehicle fueling infrastructure and has been a long-time advocate and participant in the LCFS program with approximately 60 million gallons of renewable natural gas dispensed in California in 2016 under the brand name Redeem. We look forward to continued collaboration with ARB staff and other industry stakeholders through this regulatory amendment process.

Simplified GREET Model Application Form

The Tier 1 application process implemented through the Re-Adoption of the LCFS program has been successful in streamlining the CI application process for new facilities. However, the complexity of the CA-GREET 2.0 model oftentimes leaves applicants uncertain about what operating data must be tracked and how such data affects their CI calculation. Furthermore, although the Tier 1 calculator may streamline the CI calculation process, this comes at the expense of the applicant's true CI value due to the conservative default operating assumptions utilized within the model. These conservative assumptions lie buried within the CA-GREET 2.0 model and often go undetected by the applicant.

The proposed simplified application form provides the necessary transparency into the CI calculation process and clearly identifies the operating data that the applicant will be responsible for tracking on an ongoing basis. The data required is already tracked and recorded on a regular basis by landfill gas (LFG) facilities using gas chromatographs and through receipt of utility bills tracking energy use. However, we would suggest that the form be simplified even further by clearly identifying the fields and cells that are user inputs and those which are not. In addition, all default assumptions should be directly identified in order to prevent any confusion as to how the final CI is calculated. These assumptions include but are not limited to biogas processing leakage rate, methane leakage in transportation, and assumption of end use of biomethane consumed during processing. Under the current model, the Tier 1 calculator assumes all biomethane that is not injected into the pipeline as sales product is consumed in a stationary on-site reciprocating engine instead of combusted in a flare or thermal oxidizer (TOX).

This conservative assumption does not reflect true operating conditions at the majority of LFG facilities that flare or destroy unusable biomethane in a flare or TOX. The default assumption in the simplified application form should be that any biomethane not sold into a pipeline is destroyed in a flare or TOX which has considerably less methane slip than an on-site stationary reciprocating engine.

Fossil CNG Lookup Table

It is important to encourage all CNG station owners in California to register and participate in the LCFS program. CNG is a low carbon alternative to diesel and station owners both large and small should have equal opportunity to realize the environmental benefits under the LCFS. However, under the new requirements of the Re-Adoption each individual CNG station must be registered and obtain its own certified CI. These new registration and CI application requirements have become administrative hurdles for new entrants especially those with multiple CNG fueling locations. Requiring a facility specific CI application for fossil CNG will add little benefit relative to one default value given that all CNG stations in California operate similarly. Furthermore, requiring facility specific fossil CNG applications will undoubtedly create a significant workload for ARB staff with regard to pathway certification which will delay the certification of other pending fuel pathway applications.

The timely implementation of one fossil CNG lookup pathway is a solution that is advantageous for all parties involved but only if the lookup pathway is truly representative of the typical operating conditions across CNG stations. A default 96% compression efficiency has been proposed for the lookup pathway which is below the average compression efficiency of a CNG station and this will likely incentivize new entrants to file their own applications with 24 months of site specific data. Clean Energy owns and operates over 80 CNG stations in California and our portfolio of stations operate much more efficiently at 98% compared to the proposed default compression efficiency. The Clean Energy network of CNG station data can serve as a representative sample for the baseline compression efficiency for the fossil CNG lookup table. The lookup pathway must have an immaterial effect on an applicant's CI relative to a full application in order for it to be effective. This will not be achievable with an ultra-conservative compression efficiency assumption.

CNG Fueling Facility ID's

Clean Energy supports the use of the natural gas utility meter number as well as the permanent address as the basis for a unique LCFS identifier for each CNG fueling facility. Any CNG station built off a utility distribution system will have a dedicated meter with a specific meter number for identification and billing purposes. There are off site CNG stations that are not connected to a utility system and therefore a utility meter number is not always applicable in which case the physical address will suffice.

Limiting Reporting Requirements to NGV Fueling Only

Unlike other liquid fuels, the credits for natural gas fueling (CNG and LNG) can only be generated and recognized once the regulated party demonstrates that the fuel was consumed as a transportation fuel. Upstream supply chain transactions provide little insight into the actual dispensing of the fuel at end use but rather only track the title transfer of the fuel. Recording these upstream transactions in the LRT is unnecessary because the contractual pathway from biomethane production facility to final consumption addresses title transfer, regulated party status, and rights to environmental commodities. Since this information is covered in detail in the contractual pathway, only the entity with regulated party status needs to enter transactions for fuel dispensed into the LRT.

Clean Energy typically obtains regulated party status for all biomethane delivered through our station infrastructure because we are the entity with responsibility for operating the dispensing point in the supply chain. Given this position, Clean Energy is able to aggregate all production, title transfer, and dispensing information necessary to generate environmental credits. In some instances, a marketer upstream in the supply chain can hold regulated party status in which case Clean Energy would have to supply all necessary downstream information for credit generation to the marketer. Due to the confidential nature of our downstream fueling contracts often specific customer information cannot be provided to a marketer and would have to be supplied directly to a verifier under a confidentiality agreement. Regardless, the biomethane supply contracts bind each party to comply with all requirements, including supporting documentation requests necessary to generate environmental credits.

Third Party Aggregator

As mentioned earlier, it is important to encourage all CNG station owners in California to register and participate in the LCFS program. However, many station owners have insufficient resources to participate in the program and maintain robust procedures for compliance. Clean Energy offers compliance services to these station owners to assist them in registration and fuel reporting under the LCFS as a value-add service. Regardless of these services, the station owner is still the responsible and “regulated” party for LCFS management as required by the rule. Implementing a third party aggregator system would help take the burden of LCFS management away from small CNG station owners and allow them to focus on their core business. Clean Energy and other aggregators would be able to assume all registration and reporting responsibilities for contracted station owners and transact on behalf of such station owners in our own accounts. Not only would the station owners be offered full scale compliance services, but they would also be gaining access to market liquidity. Clean Energy and other aggregators are active market participants transacting large volumes of credits on a regular basis. Small station owners do not have the same market presence and therefore may have difficulty

monetizing a relatively small volume of credits with obligated parties. The aggregator model allows small stations access to market liquidity and pricing without adding yet another barrier to entry.

Verification

The implementation of a verification program is a necessary step in protecting the integrity and effectiveness of the LCFS Regulation. ARB staff should endeavor to develop a program that is feasible and applicable to all fuel types in addressing invalidation risk while promoting current market operating conditions. Unlike other ARB air quality programs with verification requirements, the LCFS program is a system of ongoing credit/deficit transactions which requires a system of ongoing verification and monitoring the day-to-day operations and transactions of regulated parties. Although credits and deficits are generated quarterly, they are generated based on perpetual facility operations and transactions that must be monitored on an ongoing basis in order to truly verify credit and deficit generation.

It should also be noted that biomethane production facilities registered under the RFS program are already subject to such ongoing verification through the EPA's QAP program. The strict QAP protocols in place require comprehensive onboarding audits followed by monthly documentation review in order to maintain "Q-Status". Clean Energy recommends that ARB adopt the same principles already deployed in the successful QAP program for its verification regulations. Aligning the programs will minimize duplicative compliance efforts required of regulated parties.

Compliance with QAP Structure Should Satisfy All Aspects of LCFS Verification Other than CI Review

Enrollment into an EPA sponsored QAP program is voluntary but the market for non-QAP D3 RINs (generated by biomethane) is almost non-existent. Access to liquidity and the marketability of RINs are important for biomethane production facilities. As a result, the industry as a whole has been driven to participate in QAP programs. Clean Energy and other biomethane producers have been producing Q-RINs since the start of 2015. Although there are a limited number of QAP auditors in the market, each auditor develops their own unique QAP protocol approved by EPA. Biomethane production facilities (RIN Generators) must submit to a comprehensive onboarding QAP audit through which the QAP auditor reviews the entire supply chain operation for producing and dispensing renewable natural gas. The auditor will typically analyze the most recent quarter of operating data when conducting the onboarding audit and a site visit to the biomethane production facility is required. Prior to the site visit the auditors will review various engineering related documentation including but not limited to:

- RFS2 Third Party Engineering Review
- RFS2 and EMTS Registration

- Biomethane facility motor list and usage estimates
- Process Flow Diagrams (Showing equipment for each step)
- All required permits
- Process and Instrument Diagram
- LandGEM Models
- Utility Bills (Water, natural gas, sewer, electricity, etc.)
- Biogas Production Records
- Biogas to Pipeline Records
- Physical Pathway Documentation
- Spill Prevention, Control, and Countermeasure Plan
- Hazardous communications program
- Gas Chromatograph Analysis Reports (Indicating Pipeline Quality Gas)
- Standard Operating Procedures

At the initial site visit the auditor verifies the biomethane production process through detailed inspection of the facility relative to the supplied process flow diagrams as well the process description in the RFS2 engineering report. This includes identification and analysis of all meters and gas chromatographs measuring product gas delivered to the utility pipeline and meter. The EPA requires two annual QAP site visits or one annual site visit with ongoing plant data monitoring. In the latter scenario, the QAP auditor can install monitoring equipment at the facility that measures total energy consumed and produced on an ongoing basis.

Following the conclusion of the engineering segment of the review, the QAP auditor will proceed with a transactional process review. Through this process the auditor will review all commercial contracts submitted to the EPA including:

- Contracts with the landfill
- Contracts with the production facility
- Pipeline interconnect agreements
- Supply off-take agreements
- Intermediary marketing contracts
- Downstream fueling contracts
- Affidavits confirming volume and final use as a vehicle fuel

Together these contractual documents and affidavits form the supply chain contractual pathway necessary for detailing title transfer of the biomethane and environmental attributes from production through end use consumption as transportation fuel. The contractual pathway is crucial in defining the roles of all parties within the supply chain as well as identifying volume limits, title transfer, delivery points, and compliance responsibilities with respect to environmental credits. Some biomethane pathways are simple with a limited number of entities along the supply chain, but others may include multiple marketers transacting along the

contractual path. Regardless of the number of entities involved along the supply chain, the title to the biomethane and environmental attributes are tracked at all times by the credit generator through contracts, transaction confirmations, pipeline statements, invoices etc. Supply chain management of the contractual pathway through ongoing recordkeeping is necessary in order to confirm the production, sale, and consumption of biomethane which is delivered via displacement. Without confirmation of adherence to the contractual pathway (or physical pathway), biomethane cannot be delivered via displacement and environmental credits cannot be generated.

The last step for the QAP auditor is to validate the transaction process and RIN generation over a lookback period. The typical lookback period is a calendar quarter of operations and RIN generation. The QAP auditor validates the number of RINs generated over the period by analyzing verified biomethane production injected and withdrawn from the commercial distribution system. Supporting documentation is given to the QAP auditor confirming that the RIN generation process follows the registered contractual pathway necessary to generate RINs. Supporting documentation can include but is not limited to:

- LFG Production Reports
- Pipeline Injection and Nomination Reports
- Transaction Confirmations
- Gas Commodity Invoices
- Downstream Pipeline Statements
- Station Utility Invoices
- Dispenser Reports
- LNG Production Reports
- Bills of Lading
- Biogas Allocation Reports

Once the facility has passed the onboarding review process the QAP auditor will classify the facility as “QAP Verified”, a status that is reflected in the EPA’s EMTS system which will allow the facility to generate Q-RINs. The QAP Verified designation or “Q-Status” is maintained on an ongoing basis which prevents any disruption in the generation and monetization schedule of RINs. However, a facility’s Q-Status can be revoked at any time by the QAP auditor due to non-compliance. A facility maintains its Q-RIN status by supplying supporting documentation to the QAP auditor each month and quarter as applicable to validate the RINs generated. The QAP auditor will verify the total number of RINs generated through an analysis of the volume of biomethane produced, sold through the supply chain and dispensed as a vehicle fuel.

Clean Energy Proposed LCFS Verification Structure

The RFS QAP program extensively examines and validates the production of biomethane and its ultimate consumption as a transportation fuel. Given the level of scrutiny and review that

biomethane pathways are already subject to under the RFS2 QAP protocol it is unnecessary to design an LCFS verification program that would require the same scope of verification already covered under the QAP through a separate audit. The only real key difference between the RFS2 and LCFS programs is the lifecycle analysis and carbon intensity approach for credit calculation under the LCFS. Ideally with respect to biomethane, the LCFS verification program would mimic the exact requirements of the RFS2 QAP program with an additional requirement for pathway carbon intensity (CI) verification. Pathway CI calculation and verification is something that a QAP auditor can easily implement into their ongoing protocol given the fact that most biomethane pathways are Tier 1 pathways and the operational data is supplied to the auditor on an ongoing basis. The QAP auditor is the only firm with an in-depth knowledge and understanding of biomethane production and delivery logistics necessary to attest to the validity of environmental credit generation and is therefore perfectly positioned to add the LCFS CI verification to its services.

Simplicity is the key to success in an LCFS verification program. As previously mentioned, the CI calculation is the only unique aspect of the biomethane pathway that is not included in the standard QAP protocol. We believe that CI verification should only be completed on a 2-year cycle. The CI calculation also happens to be the most complicated facet of the entire LCFS program given the complexity of the CA-GREET 2.0 model and its underlying assumptions. There is a small number of firms or individuals outside the ARB that have an in-depth understanding of the GREET model let alone the derivation of the standard assumptions used within the model. The lack of GREET model experts in the market leaves us concerned about the proposed requirement to verify a CI on an ongoing basis which is a departure from the current accepted practice of calculating a CI with two years of operational data. Ongoing verification of a CI is not possible without experts who can apply the GREET model assumptions to the daily operations of a biomethane facility. The two years of operational data serve as a requirement to develop a baseline of “normal operating conditions” under which the facility’s true carbon intensity can be calculated. Requiring a CI verification in any timeframe shorter than two years creates a requirement that will be impossible to meet, and risks holding credit generators responsible for their “actual CI” using conservative default assumptions in the GREET model.

We are proposing that CI’s be reviewed (or verified) every two years consistent with the requirement of submitting 24 months of operating data to certify a CI. Adjusting the CI verification to two years provides a fresh set of 24 months of data that can be used to calculate the most accurate CI rather than relying on a verifier to analyze data from a shorter time period and determine if the data represents “normal operating conditions” warranting a CI change.

The upstream biogas processing facility has the largest overall impact on biomethane CIs but it is understood that verifiers will also have to verify downstream operations to complete a full “well to wheels” analysis. A consistent approach to verification should be applied to the downstream segment of a pathway under which site visits and full verification activities are completed every two years. In fact, downstream site visits can be limited to LNG production facilities during the

onboarding process. With respect to CNG, site visits are unnecessary for any reason other than to confirm that the site exists and is operational which overall is not the purpose of verification. The focus for downstream operations should be verification of LNG produced, fuel volumes delivered and station level energy consumption which is tracked through LNG production reports, utility meter statements, dispenser reports, and bills of lading. Furthermore, Clean Energy operates the largest network of CNG stations in the State which would become problematic if the scope of verification required individual station level review with site visits rather than a portfolio review approach with random sampling. Clean Energy does not intend to utilize the default 96% compression efficiency in any of our pathways because our operational data proves that we operate our portfolio of stations at a much higher level of efficiency. This decision should not subject Clean Energy to costly and burdensome station level verification with redundant and unnecessary site visits. Instead, verifiers should be able to analyze station level fuel deliveries and energy consumption data through reasonable random sampling.

Clean Energy remains committed to providing unwavering support of an LCFS verification program and will continue to act as a resource to Staff through its implementation. We believe that the best path forward is a verification program that leverages off of the foundation of work already implemented through the RFS2 QAP program. A verification program modeled after QAP will maintain a level of ongoing review that QAP clients are already subject to while not disrupting the balance in the LCFS market.

We appreciate the opportunity to provide comments and please feel free to reach out to us if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Todd Campbell', with a stylized, cursive script.

Todd Campbell

Vice President, Public Policy and Regulatory Affairs
Clean Energy Fuels Corporation