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Submitted to: LCFSworkshop@arb.ca.gov

RE: 2017 LCFS Workshop and Draft Regulation

To Whom It May Concern:

Thank you for the opportunity to comment on the draft regulatory amendment language to the Low Carbon Fuel Standard (LCFS) and the September 22, 2017 Rulemaking Workshop. Attached for your reference and consideration is the Social Gas comment letter on the Draft LCFS Regulatory Amendments document submitted September 5, 2017. In addition to the previous comments, Social Gas has additional concerns with the draft regulatory language, as outlined below.

Regulatory Process

The only workshop draft regulatory language was held on September 22, 2017 and comments on this and the regulatory language, which was released only a few days prior, are due on October 6, 2017. Two weeks is not a sufficient timeframe for stakeholders to properly comment on both the draft amendment language and the workshop. This is a major initiative that greatly impacts the natural gas and other fuel industries. There have been considerable changes made in the draft language that will require detailed review by stakeholders and the expedited process set by that ARB does not allow this to happen. Additionally, comments on the draft concepts were due on September 5, 2017, which was followed a little more than two weeks by the workshop. It begs the question whether comments on the concepts were read and considered in preparing the draft language.

Furthermore, ARB has yet to release a full version of their modified GREET 3.0 for stakeholder review. Many of the important changes in the regulation are based on GREET 3.0 assumptions, therefore, GREET 3.0 should be released in its entirety and adequate time must be allotted for stakeholder review prior to making changes in the regulation. Stakeholders are unable to substantively comment on the technical merits of the regulatory changes without reviewing the changes to GREET 3.0.

We request that the GREET 3.0 model be released for public review and comment as soon as possible. We also request that the LCFS regulatory process be suspended until GREET 3.0 is reviewed and finalized.

Fuel Neutrality

Natural gas has helped the LCFS program achieve significant greenhouse gas emission reduction as fossil natural gas and will continue to do so as renewable natural gas. New provisions in the draft LCFS regulatory amendment language to the LCFS will impede the growth of RNG production and the advancement of the natural gas industry as a whole. The LCFS is built on a concept of fuel neutrality with the ultimate goal of reducing the carbon intensity of California's transportation sector fuels. Instead of promoting the fuel and technology neutral concept, the draft amendments appear to provide inequitable regulatory advantages to electric vehicle (EV) applications at the expense of other low carbon fuels, especially RNG. Such built-in inequalities will affect the integrity of the LCFS program and can jeopardize the future availability of low carbon fuel to California.

Updated Energy Economy Ratio Values for EV and Fuel Cell Applications

There needs to be accurate accounting of the relative efficiencies of all technologies in the LCFS program. The Energy Economy Ratio (EER) assigned to each technology have a significant impact on the credits generated within the program, as well as competition amongst the technologies for market share. Despite these implications, Staff is only proposing to amend the EER values for EV applications while all other fuel application EERs remain the same. Furthermore, Staff is proposing to eliminate the EER classification for EV buses and trucks and classify all EV on road fuel under a single EER. Under this assumption, the EER for electric heavy-duty trucks double when there has been no substantive truck data to support this. There are no electric heavy-duty trucks in service today. Truck and transit duty cycles are dissimilar with different weights, driving patterns, and operational loads (lighting, comfort features, doors, etc.). They should not be grouped into one category with the same EER unless they have been thoroughly tested to support the assigned EERs.

The studies to determine EER for electric transit vehicles are inadequate. The use of chassis dynamometer data for EVs neglects the substantial energy demands associated with heating, ventilation, and cooling systems. Internal combustion engines generate significant amounts of waste heat that are typically used to supplement HVAC heating demands. By contrast, EVs must typically supply all the heat demand through heat pumps and resistance heaters. These demands can be substantial, relative to the average propulsion energy demand of the vehicle.

Additionally, the Altoona test data used to calculate EERs for electric buses does not include charger efficiency losses. Based on charging data included in the Altoona reports, charging efficiencies could range from 75-90%. Because neither CA-GREET 2.0 or the draft CA-GREET 3.0 model include impacts of charging efficiencies in the calculated carbon intensity for electricity, the charging efficiencies must be incorporated into the EER values for these vehicles. It does not appear that ARB's analysis has appropriately accounted for the impacts of charging efficiency.

The study cited to support the proposed EER amendment is flawed and does not reflect the true efficiency of EV vehicles on road today. Staff is using impractical assumptions with

respect to the future deployment of EV fleets at low speed duty cycles. These broad assumptions ignore the driving cycles of EVs on road-today and allow less efficient EVs to benefit from research conducted only on the most favorable models of the technology. This approach of modeling EERs or CIs using the most advanced technology has not been allowed in modeling CIs or EERs of other fuel applications such as NGVs. In fact the EER value for NGVs and the fossil CNG lookup value were determined using the most conservative assumptions and data available. Conservative data should also be used of EVs until there is enough accurate data available.

As previously stated, the EER values have a significant impact on the credits generated in the program which emphasizes the need for Staff to update all fuel application EERs at the same time, including the baseline for gasoline and diesel. If Staff does not provide the same evaluations for all technologies to do this in the final draft amendments, it will create a competitive advantage for EVs (doubling the amount of credits generated by EV trucks) which is not consistent with the fuel neutrality premise of the LCFS program. This is especially the case when we believe newer NGV technology is providing a better EER value than ARB is currently applying to our industry.

Verification

Another competitive advantage afforded to EV fuel applications is the lack of an annual CI verification requirement. Under the verification proposal, a fuel pathway holder must verify that their actual operating CI is equal to or less than the certified CI that is used to generate credits. EV fuel applications are able to generate credits using the California grid mix lookup pathway. All other producers of biofuels must apply for their own specific fuel pathway and be subject to annual CI verification. Invalidation risk is a strong concern for low carbon producers and certified pathway holders. However, that EV credits generators are immune to this risk based on the system that Staff has developed.

More specifically, LCFS credits are generated quarterly yet CI verification occurs annually after credits have been generated and possibly monetized. This means that producers will be generating credits before having the operational data necessary to corroborate the certified CI for the given year. This puts the credits generated during the period (up to four quarters worth of credits) at risk of invalidation if the operational CI is higher than the certified CI. As a result, credit generators will hold perpetual invalidation risk which will have significant negative impacts on the LCFS credit market. EV credit generators on the other hand have zero invalidation risk since use of a lookup value pathway does not require annual CI verification. This allows EV credits generators to generate and monetize credits uninhibited while bearing no additional cost for CI verification. It also allows EV credit generators to take full advantage of the credits they generate without having to contribute a single allowance to the proposed buffering account. This is clearly a competitive advantage to EV fuel applications as all other biofuel pathways are subject to costly (and artificial) invalidation risk in addition to unknown but inevitably significant verification costs.

The rationale that all EVs use electricity is not sufficient justification for this change. An EV can use grid power, all renewable power or a mix, with wide ranges in the overall carbon intensity. Verification of EV fuel use (power generation mix) is just as important for program accuracy as verification of gas type for a natural gas vehicle. There is simply no valid reason why verification requirements should be different for different fuel or vehicle types, particularly when both EV's and NGV's can provide a wide range of greenhouse gas reductions (CI's).

Additionally, ARB Staff should remove the annual CI verification requirement from the proposed verification program. With respect to biogas pathways, the differences between GREET 1.8b, GREET 2.0, and GREET 3.0 have been significant. Over a short three year time frame, biogas CIs have been subject to changes of 50% or more due to changing methodologies and assumptions in the GREET model. Given the volatility in the GREET model over the years, it would make the most sense to avoid annual CI verifications as it is likely that another significant change can come in the next release of the GREET model which would render previous model assumptions and annual "verification" against these assumptions moot.

Buffer Account

There are significant issues with the proposed buffer account. As proposed, the buffer account would be maintained by the Executive Officer who would manage LCFS credits generated by producers who have invested significantly in their operations to best the certified CI. The producers of these credits would not be able to take advantage of these credits. This sends the wrong message to producers who are significantly investing in low carbon fuel production. We view this generation of credits as a taking from the producer which sends a very bad policy signal to the low carbon fuel industry.

Biofuel pathway holders are the only entities subject to this provision since there is no CI verification requirement for the EV pathway using the California grid mix. In essence, biofuel pathway holders who diligently work to improve their operating CI score automatically lose out on any value generated between the lower operating CI and the certified CI. Instead the value is absorbed by ARB to protect the integrity of the LCFS program. While we certainly can understand and appreciate Staff's desire to identify a way to further protect the program's integrity, this is unfair to a producer, especially if that producer is small or depends upon full credit generation to make the project pencil.

Temporary Fuel Pathways

This lost value associated with the delta between operational and certified CIs becomes a problem for entities reporting transactions under a temporary fuel pathway. The draft amendments for NGV temporary fuel pathways, for example, are extremely conservative and are in no way indicative of actual biogas or fossil NGV fuel delivered in California. In fact, the temporary pathway CI values appear completely arbitrary and without consideration of the current or future RNG mix in California. Credit generators who are forced to generate credits under these pathways will lose significant value and revenue associated with the delta between the actual operating CI and these nonsensical abnormally high temporary fuel pathway CIs.

Biogas digester pathways will be affected most by this provision considering ARB has eliminated the lookup pathway value for biogas derived from a high solid anaerobic digestion process. This means that any digester project that does not have its own pathway will have to generate LCFS credits on at least one of the temporary biogas to NGV pathways while their actual pathway is under review. This will represent a significant amount of lost revenue considering digester pathways achieve significantly negative carbon intensities (as low as -300 g/MJ or more).

Fuel pathway holders must be able to recognize the full value of emissions reductions associated with delivery of fuel to California. ARB plans to update the California grid mix EV pathway every year following the release of grid mix data from the California Energy Commission which will allow EV pathways to take full advantage of recognizing the actual emissions of their fuel with zero lost value for their assigned values with no invalidation risk. Further, EV credit generators using the California grid mix pathway are likely over-generating actual values as it does not appear that since the LCFS program does not account for time of use of EV charging. Renewable While it is true that renewable energy represents an increasing share of the California grid mix, however these renewable sources are in short supply during peak hours when the majority of EV charging occurs meaning that most EVs are charging with non-renewable and more carbon intense electricity than otherwise reported. The fact that EVs are likely over-generating environmental value and biofuels will be under-generating environmental value is again a competitive advantage for EVs that should not and cannot be allowed in under the a fuel neutral LCFS Program.

Fossil CNG and LNG Values

Over the last three years the LCFS program has utilized three versions of the GREET model. Each iteration of the model has made sweeping changes in assumptions that have drastically impacted the CI values of the majority of fuels in the LCFS program. Under the GREET 1.8b model, fossil CNG had a carbon intensity of 67.7 g/MJ and achieved 30% GHG reduction relative to conventional diesel. The CI for fossil CNG has increased in each model from 79.46 g/MJ under GREET 2.0 and now up to 86.57 g/MJ under GREET 3.0. This represents nearly a 30% increase in just three years. CI's for other fossil fuels have not increased at all over this time and in fact the conventional diesel CI has decreased slightly under the GREET 3.0 model. Such large increases in the fossil CNG CI are puzzling especially considering there has not been a corresponding increase in the gasoline or diesel CIs which are also fossil fuels with similar upstream production emissions. The natural gas industry will conduct a thorough analysis to validate this CI but cannot do so until the full unaltered version of the GREET 3.0 model is released. Any changes in to CI values should not be placed into a draft rule until stakeholders are given a proper amount of time to review and verify all associated calculations and assumptions.

ARB has listed the temporary fossil LNG and LCNG values at 100 g/MJ each, a seemingly arbitrary value that is poses an immediate, unnecessary and unfair challenge to the natural gas industry. Although it is unlikely that these pathways will ever be used, ARB must understand the implications of publishing these unrealistic abnormally high CIs. While some

might argue that these are only temporary fuel pathways, unrealistic values effectively communicate to the fuel market that fossil LNG and LCNG emit 10% more GHG emissions (EER adjusted LNG and LCNG) than conventional diesel which is absolutely both false and misleading. The NGV industry experts have worked tirelessly across California to convert heavy duty diesel trucks to run on clean burning LNG. ARB's decision to arbitrarily inflate CI values only undermines these efforts by indicating that fossil LNG and LCNG have a CI of 100 g/MJ regardless if these are temporary. In fact, we have seen advocates use similar data in the past as a representative number of NGV technology to show other transportation strategies to be better when it is not the case. These We therefore strongly believe that these values must be revised in the final draft to accurately reflect the current CI of fossil LNG and LCNG in the market.

Thank you again for the opportunity to comment on the draft regulatory language. If you have any questions please feel free to contact me.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'KM' or similar initials, written in a cursive style.

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Cc: Sam Wade, ARB

Enclosure