THE COALITION FOR RENEWABLE NATURAL GAS

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1516 Ninth Street
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Subject: Docket Number 13-IEP-1L, Transportation Energy Scenarios and the CEC Joint IEPR-Transportation Lead Commissioner Workshop

Commission and Staff:

We thank you for your service to the California Energy Commission (Commission) and the State of California. This letter is intended as our comments in reply to the Joint IEPR-Transportation Lead Commissioner Workshop hosted by the Commission on July 31, 2013. Once again, we are appreciative for both the invitation and opportunity to present information regarding the potential of renewable natural gas (biomethane or RNG) as a transportation fuel.

On behalf of the Coalition For Renewable Natural Gas ("Coalition"), this comment letter will summarize for the record the key points from our July 31st presentation. We trust the following information will serve the development of the transportation section of the Commissions 2013 Integrated Energy Policy Report (IEPR) to the Governor and the Legislature.

Introduction to Renewable Natural Gas: Definitions, Comparisons & End Uses

DEFINITIONS:

Biogas: biogas is a mixture of hydrocarbons that is a gas at 60 degrees Fahrenheit and 1 atmosphere of pressure that is produced through the conversion of organic matter.

Biogas includes landfill gas, gas from waste digesters, and gas from waste treatment plants.

Waste digesters include digesters processing animal wastes, biogenic waste fats/oils/ greases (FOG), separated food and yard wastes, and crop residues. Waste treatment plants include wastewater treatment facilities and publicly owned treatment works (EPA, RFS2 Proposed).

Renewable Compressed Natural Gas (R-CNG): biogas that is processed to the standards of pipeline natural gas (biomethane) as defined in 40 CFR 72.2 and that is compressed to pressures up to 3600 psi. (EPA, RFS2 Proposed).

Only Renewable CNG that qualifies as renewable fuel and is used for transportation fuel can generate Renewable Identification Numbers (RINs).

Renewable Liquefied Natural Gas (R-LNG): biogas that is processed to the standards of pipeline natural gas as defined in 40 CFR 72.2 and that goes through the process of liquefaction in which the biogas is cooled below its boiling point and weighs less than half the weight of water so it will float if spilled on water. (EPA, RFS2 Proposed)

Only renewable LNG that qualifies as renewable fuel and is used for transportation fuel can generate RINs.

> *NOTE: Biomethane is raw biogas that has undergone a significant chemical treatment process; one biogas has undergone this treatment process, usually to meet pipeline quality specifications required by investor-owned utilities, it is refered to as "biomethane", "renewable natural gas" or "pipeline quality biogas".*
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> *A schematic of the treatment process is included on slide 7 of the July 31 presentation, included as an attachment to these comments.*

COMPARISONS:

Biomethane vs. Fossil Natural Gas: Renewable Natural Gas or Biomethane is primarily methane (95%+ CH_4). Fossil Fuel Natural Gas is primarily methane (80%+ CH_4)

Both include Carbon Dioxide (CO_2), Water (H_2O), Nitrogen (N), Oxygen (O) and Hydrogen Sulfide (H_2S). Major Difference between RNG and natural gas is their respective sources of decay *(T-Rex or last night's Tuna Sandwich?*).

END USES:

There are three primary end uses available for developers and purchasers of RNG. RNG can be combusted to generate electricity, thermal heat, or be used for transportation fuel purposes.

Our focus, for the sake of the Commission's IEPR is on utilization and potential available volumes of RNG for Transportation Fuel purposes in California by 2020.

Transportation Fuel: According to General Electric and CNG Now, there are currently 16.4 million natural gas vehicles worldwide (2012). There are an estimated 250,000 natural gas vehicles in the United States – a number that is growing every day.

Presuming there is available supply, the operational transition for fleets from CNG or LNG to Renewable CNG or Renewable LNG is seamless.

Potential: Drivers behind Growth & Increased Use of RNG in California as Transportation Fuel

In considering the potential volume of RNG available for use as a transportation fuel in California, we must also be conscious of what drives the projected growth. Technical Data, including the technical and financial engineering that goes into developing, operating and maintaining an RNG project is a factor, as is the effect of public policy, good or bad.

TECHNICAL DATA

Technical Engineering: Generally, the MMBtu of gas produced by a potential biogas source (landfill, wastewater treatment plant, dairy digester, etc.) per day factors into how and for what end-use purpose the eligible source might be developed. We have referred to this as a volumetric ration, or diesel gallon equivalent (dge) produced per MMBtu.

Smaller landfills are usually developed for on-site electric power purposes, for thermal heat and or to fuel fleets with access to the on-site fueling station

Larger landfills are usually developed to deliver pipeline quality biomethane for off-site generation of electric power, thermal heat or utilization as a transportation fuel. To deliver for off-Site Transportation Fuel in large quantities, RNG must meet Pipeline Specifications; 97%+ methane, ultra low impurities & high Btu heating value (970 MMBtu for example; varies depending on the utility).

Financial Engineering: There is also a secret formual that must be met in order for High Btu biomethane projects to obtain financing, be developed, and remain in operation. Simply stated, the secret formula is that revenues must exceed all expenses, predictably.

As a case and point, due to investment required (tens of millions of dollars) and limitation on access to markets, **only 39 out of 594 operational landfills in the United States**

have been developed into High Btu projects;

Worse, there are zero (0) High Btu LFG projects in California, and only one (1) High Btu wastewater treatment facility (WWTF). Incidentally, the WWTF project (Point Loma, CA) was developed with two-thirds of the required capital coming from grant monies ($30 million) not currently available at the either the State or Federal level for development of High Btu LFG projects.

Costs to develop a Landfill Gas to Pipeline Quality RNG Project:

If you sum the total costs of plant capital amortization ($1.80), operations and maintenance for the processing plant facilities ($2.20), annual collection system expansion ($0.38), operations and maintenance for the collection system ($0.61), initial collection system and flare capital amortization ($0.49) and corresponding royalties ($0.78 at 12.5%), the total costs to develop a High Btu LFG project is approximately $5.48 per MMBtu.

Revenue from a Landfill Gas to Pipeline Quality RNG Project:

The Henry Hub pricing point (as of May, 2013) for natural was $4.23. The obvious problem is that compared to the costs to develop a High Btu RNG project ($5.48 per MMBtu) the commodity price for the energy content in RNG does NOT meet the aforementioned secret formula. In fact, developers and owners of projects would lose $1.25 per MMBtu on average if there were not any policy drivers or incentives in place.

Return On Investment from a developed Landfill Gas to Pipeline Quality RNG Project:

Investors like to know they are getting their money back, and expect a return on investment. Project owners and developers also want to realize a profit. Likewise, taxpayers want to know that their money is not being wasted or misused. Absent these assurances, it is very difficult to procure project financing necessary to develop High Btu projects.

PUBLIC POLICY

Fortunately, there is good news. That is, public policy drives demand, and demand drives value. With good public policy in place, the above financing can and does work, even with the low current commodity pricing.

For example, the Federal Renewable Fuel Standard (RFS) created the RIN market [when you produce renewable fuel and dedicate that fuel for transportation use you generate a commodity that can be traded (sold) in the market.]

There are 11.2 RINs per MMBtu, with a value range between $0.30 - $1.29 per RIN (as of July 16, 2013).

Granted this is a basic level digest of the market influence, but when you add the Commodity price of the gas, the RIN value and the value of any application Low Carbon Fuel Standard (LCFS) credits, you can finance development of a High Btu biomethane project in a manner that meets the secret formula (Revenues . Expenses, Predictably).

Example:

Natural Gas Price ($4.23 MMBtu) + RIN Value ($3.36 - $14.45 per MMBTu) = $7.59 - $18.68 MMBtu + LCFS Credits (valued at approx. $5 per MMBtu) = $12.59 – 23.68 MMBtu

The growth of available RNG volume for transportation fuel by 2020 is dependent upon the continuation of and certainty provided by good public policy programs like the Federal RFS2 and California's LCFS.

Estimated Volumes of RNG Available for Transportation Fuel by 2020: Idealistic vs. Realistic

There are three potential types of sources of biomethane in California: landfills, digesters at wastewater treatment plants, and digestors that co-digest other organic material (such as fats, oils, grease, agricultural waste and municipal solid waste).

The size of the source, including the volume of organic matter being deposited at the site, the proximity of the source to the natural gas pipeline system, along with the substantial (millions) capital investment required are each and all factors that limit development of available sources into biomethane producing facilities.

In order to justify the economics, these projects are typically developed at larger landfills and digesters that are located relatively near existing pipelines.

For perspective, 100% of all potential biogas sources were developed in California, for purposes of producing pipeline quality biogas, the amount of biomethane would be less than 2% by volume of the natural gas presently consumed in the State.

IDEALISTIC

<u>Idealistic RNG Volume Estimates (Volumetric Ratio):</u>

In estimating the idealistic volume of of RNG available for transportation fuel purposes, we have relied upon the following volumetric Ration:

Volumetric Ration: For every 1000 mmbtu / 1 Billion Btus of biomethane produced per day = 7,752 diesel gallon equivalents are produced per day.

Based on a diesel truck driving an average 150 miles per day (at 6 miles per gallon), a diesel truck will consume an average of 25 gallons per day.

Thus, it can be reduced that every 1 Billion Btus of biomethane can supply enough gallon equivalents to fuel 310 trucks each day.

If all 80 Operating/Candidate landfills in California identified by the EPA's Landfill Methane Outreach Program (LMOP) were developed to capture and process methane exclusively for transportation fuel purposes, within 18 months these 80 landfills could produce approximately 31,008,000 diesel gallon equivalents (dge).

400,000,000 dge would be enough RNG volume to fuel an estimated 1,282,051 trucks per day between now and 2020. There are approximately 1,000,000 diesel vehicles operated on California's roadways each year.

REALISTIC

Realistic RNG Volume Estimates (Volumetric Ratio): Considering that there are only 39 High Btu Landfill gas to energy projects in the entire United States (and only 4 in Canada), it has been estimated by developer members of the Coalition For Renewable Natural Gas that realistically, it is likely only 20 of the Operating or Candidate landfills in California identified by the LMOP will be developed to capture and process methane exclusively for transportation fuel purposes between now and 2020.

As such, within 18 months these 20 landfills could realistically produce approximately 465,120 diesel gallon equivalents of RNG. Based on a diesel truck driving an average 150 miles per day (at 6 miles per gallon) a diesel truck will consume an average of 25 gallons per day.

465,120 dge is enough RNG volume to fuel an estimated 18,600 trucks per day between now and 2020 (just 1% of all diesel vehicles operated in CA).

NOTE: This assumes 100% RNG fuel, which can be blended with fossil fuel natural gas to improve the environmental attributes of the gas while furthering the realistic in-State supply of estimated RNG available for transportation fuel purposes between now and 2020.

RNG Industry Insights: Challenges Faced & Recommendations for Government Action

There is a key factor that will either stunt or serve as a catalyst for growth of RNG development and availability of RNG for transportation fuel purposes in California.

Good Public Policy is that key factor. The reality is that public policy drives demand, demand drives value, that value drives investment, and investment is what ultimately enables development to begin with.

PUBLIC POLICY:

Goal of AB 1900: As the primary organization responsible for initiating and supporting AB 1900, understanding the basic tenets of the bill are tantamount to proper implementation. It is also important for future policy recommendations. The goals of AB 1900 are to "*promote the in-State production and distribution of biomethane" and to "facilitate the development of a variety of sources of in-State biomethane" (Public Utilities Code Section 399.24.*

Anaerobic digestion of organic matter produces methane, biogas or renewable natural gas (RNG). Biogas that has been treated to meet pipeline quality specifications (currently a challenge to procurement in CA since 1988) is referred to as biomethane. In spite of the relatively small quantity of available biomethane, as a base load, storable, dispatchable, renewable fuel it could still contribute significant value toward achieving California's renewable electric power and low carbon transportation fuel goals.

Impediments to Biomethane Project Development in California: To elaborate on the financial engineeringd here are three categories of constraints that hinder development of biomethane projects; physical limitations, costs, utility or other energy customer constraints, legal and regulatory constraints.

<u>Taxes, Investment Capital, Interconnection Costs:</u>

As already mentioned, source proximity to the natural gas common carrier pipeline is a physical limitation because it represents a large financial constraint. Applicable sales taxes, energy taxes and property taxes also drive up costs for developers.

In addition to the fixed costs of development, operation and maintenance, the astronomically high cost to interconnect with California pipelines, when compared to the rest of the nation, is also an impediment. For example, three projects developed outside California paid interconnections costs of $82,546, $70,816, and $272,170 respectively, as recent as this year (2013). In California, the utilities have quoted interconnection costs estimated somewhere between $1,500,000 - $3,000,000.

<u>Investor-owned Utility Tariffs:</u>

Unlike most other states, California's investor-owned utilities' pipeline specification tariffs do not currently accommodate differences in biomethane from fossil fuel natural gas (higher chain hydrocarbons with higher heating values). For these reasons, with the exception of the Point Loma Wastewater Treatment Plant, not a single biomethane project has been developed in California in the last twenty-five years.

Inconsistency in State Renewable Policy Regulations:

Currently, California landfills are flaring biogas, or in limited cases, converting it into transportation fuel through on-site generation. However, prohibitive air emission regulations are threatening even these operations, and as a result they are reverting back to flaring the biogas being produced. A lack of synchronization between the State's Clean Air and Renewable Energy policies, like the Low Carbon Fuel Standard (LCFS) and Renewable Portfolio Standard (RPS) also represent an impediment to the development of biomethane projects in California.

Potential Policy Solutions for California: Policies drive demand and determine value. Considering that there are zero federal credits or grants available for RNG development, the industry is forced to rely upon policy solutions that at least address existing barriers. As such, on behalf of the industry we represent, the Coalition For Renewable Natural Gas proposes the following potential solutions:

Increase Access to California Market:

1. *Pipeline Interconnection* - have pipeline utility pay costs of interconnection and allows the costs to be included in their utility rate base.

2. *Pipeline Easements* - have interconnecting pipeline utility pay costs to acquire pipeline easements or rights of way required for pipeline to interconnect the biomethane project to the natural gas pipeline

> Justification: This is the same as having electric utilities pay for transmission line costs and costs to construct, operate, fuel and maintain fossil-fuel based generation to support grid stability for intermittent renewable electric power resources, like wind and solar. These utility-borne (and ratepayer paid) costs underwrite and encourage development of wind and solar projects. Likewise, this would allow biomethane project development to proceed without the much higher costs for interconnection in California becoming an economic roadblock to the financing, and financial success of the project.
>
> The ratepayer burden of paying for interconnection costs (by inclusion in the utility ratebase) is offset by solid waste disposal costs for landfill gas collection systems or digester infrastructure costs are paid by biomethane developers. Utility ratepayers and waste disposal customers overlap. Costs paid by biomethane developers support lower waste disposal fees, whether at landfills or digester projects such as wastewater treatment plants.

3. Pipeline Quality Specifications -

Heating Value - require the investor owned utilities to lower their 990 btus/scf requirement and adopt a heating value standard for biomethane of between 950 -975 btus/ scf, which is the most common heating value standard in other states for injection of both

fossil-fuel natural gas and biomethane into natural gas pipelines (PG&E and SoCalGas Company have both "grandfathered" and previously accepted natural gas producers into their pipelines at 970 btus/scf).

4. *Reasonable Testing & Monitoring Protocols* - adopt reasonable frequencies and costs for monitoring constituents of interest in biomethane. CARB & OEHHA have recommended standards relative to human health and safety in their May 15th Report to the CPUC that can reasonably be met by RNG industry. Regulation should prohibit, or at least require the utility to pay the costs for any additional tests or incremental monitoring performed at their own discretion, above and beyond a) the monitoring frequency or testing schedule required by regulation, commensurate with implementation of AB 1900 and or b) the monitoring frequency or testing schedule performed by investor-owned utilities for fossil-fuel natural gas.

<u>Promote Biomethane Development & Procurement in California:</u>

1. *Biomethane or Renewable Natural Gas Standard* - similar to how the RPS worked for the development of renewable electric power, create an RNG Standard that will require natural gas marketers in California, including investor owned utilities, to procure a minimum percentage of their total gas purchases from RNG . Such percentage should increase incrementally each year from the inception of the standard until the percentage goal is reached.

We recommend that the RNG Standard begin at .5% and increase every year by .25 -.5% until a 2-3% RNG Standard goal is reached.

If gas marketer fails to meet the prescribed RNG Standard in any year, they would be required to pay a specific penalty in an amount to be determined (e.g., $1.00/MMBtu) each year for each MMBtu that they fall below the required RNG Standard in any given year, unless they can demonstrate that there was no RNG available from California sources. The funds would be put into a fund administered by the California Energy Commission, or appropriate State body, to be used as grants for the development of RNG projects in California.

Offer **mandatory** Gas Sale Agreement at prices that allow for project financing and profitability. Minimum Price equal to <u>greater</u> of following:

I. $10.00 / MMBtu in 2013 dollars – escalated by increases over term of GSA by increases in CPI All Items for U.S. reported by U.S. Bureau of Labor Statistics; OR

II. Sum of following prices (average commodity price + average RIN price + average LCFS credit price) determined semi-annually:

a. Average Published commodity closing price in dollars per MMBtu of natural gas at identified California border for second month prior to start of next

semi-annual billing period

b.Gives time for incorporation in pricing of published data in recognized publication such as Inside FERC

c.Example, if semi-annual billing period begins in June of a year, then the published data would be the average closing price per MMBtu for the month of April of that year.

d.Average price of RINS, expressed in dollars per MMBtu, for second month prior to start of next semi-annual billing period as published by either Platt's or Argus Media

e.Average price of LCFS credits, expressed in dollars per MMBtu, for second month prior to start of next semi-annual billing period as published by either Platt's or Argus Media

The RNG Standard should provide that RNG purchased by a gas marketing firm, whether it is an investor owned utility or gas marketing firm, will be allowed inclusion of the price paid for RNG in its rate base or otherwise recoverable as an additional renewable fuel charge added to the price of natural gas sold to customers.

Lastly, we propose that an RNG Standard should provide that RNG injected into a natural gas pipeline that is not sold to the interconnecting natural gas pipeline company, but that is subsequently delivered to a California customer for vehicle fuel, either as renewable CNG or renewable LNG, will count toward the RNG Standard requirement of such interconnecting pipeline company.

2. *State Vehicle Mandate* - require that all State and Municipal CNG and LNG Vehicles procure at least 25% of their natural gas fuel from RNG, with in-state sources of RNG receiving double credit if used to satisfy this requirement, in order to provide an incentive for procurement of in-State resources.

3. *Economic incentive*s - encourage development and operation of RNG projects in California by affording the following:

I. Sales tax exemption for equipment used to collect, process, produce and deliver RNG:

a. This duplicates the concept incorporated into SB 71, which provides for a 100% exclusion of the value of solar energy property from property taxation

II. Real and Personal property tax exemption for RNG property

a. Similar to type of exemption available to solar projects

b. Does not take away funding from municipalities and schools since, without such exemption, these projects may not exist and no tax revenues would be realized. This could be made to apply only to new RNG projects developed, which, because of the Hayden Amendment, would mean virtually all projects to be developed in California from today on.

c. Adopted by most other states

d. Would exempt from property tax both real property interests (such as possessory interests arising from leases with municipalities as well as leases of real property from private entities) and personal property (all of the processing equipment, collection system, pipes, meters, metering equipment, etc.)

III. Transferable California Tax Credit

a. To be applied against California taxes equal to a percentage of either of the following:

i. the value of the RNG facility installed, or

ii. the value of the RNG energy sold each year for 10 years

b. Transferability allows developer to utilize value of credits by monetizing them with California entities with large tax bill – same concept used for federal Section 29 tax credits

IV. Grant for specified percentage

a. For example, 30% of installed capital costs of RNG project payable 60 days after it is "placed in service." Can use same approach as Section 1603 grant provided by federal government, which has proven to be a very successful program.

V. Minimum "cap and trade"

a. provide minimum 'cap and trade' pricing and transferable and tradable credit for carbon capture benefits realized from in-state RNG projects

b. Specifically exclude carbon capture credits from environmental attributes that must be transferred to obligated utility in order to meet RPS requirement

c. Coordinate carbon capture credits allowable with Low Carbon Fuel Standard

Offset credits to avoid double dipping when RNG used a vehicle fuel

4. *Financing Assistance* - provide California guarantee of debt used to finance project development

I. Provide California guarantee of debt used to finance up to 90% of project costs provided that project can support minimum 1.2: 1 debt coverage ratio

II. Authorize and provide preferential tax exempt bond cap allocation to in-state RNG projects for use of tax-exempt bonds to finance RNG projects in California

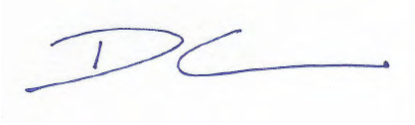
a. When coupled with state guarantee provision above, will help obtain investment grade rating for bonds that improve marketability of bonds and reduce interest expenses to projects

5. *Feed-in Tariff* - has been used successfully to increase available renewable electric power in California and other states. Premium prices to be paid would costs to be recoverable as part of the utilities rate base. Pipeline utilities would also be excused from offering feed-in tariff if biomethane project sells biomethane, transporting it through the natural gas pipeline to an in-State electric power utility or marketer (for RPS purposes) or to a transportation fuel supplier (for LCFS purposes)

6. *Allow in-State Transportation by Displacement* - provide clarification that physical transportation by displacement of biomethane is acceptable for purposes of using RNG as a vehicle fuel in California, for Low Carbon Fuel Standard (LCFS) purposes. This would ensure that implementation of an approved LCFS is consistent with rules for the Federal EPA's Renewable Fuel Standard 2 (RFS2).

On behalf of the Coalition For Renewable Natural Gas , thank you for the opportunity to provide written comments, summarizing industry identified challenges and proposed solutions relative to the projected availability of biomethane for transportation fuel purposes by 2020, which we also presented during the Commission's July 31st Workshop. We trust the information will both aid the development of the Commission's Bioenergy Action Report(s) to the Governor and the Legislature.

Respectfully Submitted,



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