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**STATE OF CALIFORNIA
BEFORE THE CALIFORNIA ENERGY COMMISSION**

In the matter of:

Developing Regulations and Guidelines
for the 33 Percent Renewables Portfolio
Standard

And

Implementation of Renewables
Investment Plan Legislation

Docket No. 11-RPS-01**Docket No. 02-REN-1038****Re: Pipeline Biomethane
Workshop****September 30, 2011**

**Comments of the Sacramento Municipal Utility District
(SMUD) on the Use of Biomethane Delivered via
the Natural Gas Pipeline System for California's
Renewables Portfolio Standard**

Introduction

SMUD appreciates the opportunity to comment in this RPS Proceeding, 02-REN-1038 and 11-RPS-01, on issues related to the use of biomethane delivered by pipeline and used for compliance with the Renewables Portfolio Standard (RPS) in California. SMUD is committed to meeting the RPS. Our governing board adopted a 33% by 2020 target in 2008, long before passage of SBX1 2 this year, which placed that target in law for all electric utilities. SMUD is the only large utility that met the 20% by 2010 goal using resources that meet the eligibility requirements of the current CEC RPS Eligibility Guidebook.¹

SMUD also has a very high percentage of biomass resources among our renewable energy sources. In 2010, about 60% of our renewable energy came from biopower – approximately three times the goal established by Executive Order S-06-06, which commits the state to a target of generating 20% of California's renewable energy from biopower by 2010 and maintaining that percentage through 2020. Seventeen percent

¹ Another 3.9% of SMUD's retail load participates in our green pricing program, outside of the RPS. Thus, the total amount of SMUD energy from renewable sources in 2010 is approximately 24%.

of SMUD's renewable resources come from biogas (as opposed to solid fuel biomass), and approximately 9% is biomethane that has been injected into the interstate pipeline system and designated for use at SMUD's highly efficient Consumnes Power Plant, a vital power plant providing local resource adequacy in SMUD's service area.

In the near term, SMUD plans to expand our use of biomethane, approximately doubling our current use by as early as 2015. In the long-term, beyond 2020, SMUD sees biomethane as a key component of our resources to achieve higher RPS goals and reduce our Greenhouse Gas (GHG) footprint to 10% of our 1990 level, while maintaining sufficient local, dispatchable generation to provide reliable electrical service.

SMUD supports biomethane (and biomass and biogas in general) as a key renewable resource for the RPS for the following important reasons:

- Most importantly, biomethane capture and use for electricity generation displaces the use of natural gas that would otherwise be imported into the state, reducing GHG emissions.
- Biomethane use in efficient, flexible combined cycle plants provides renewable integration services for intermittent wind and solar generation, thereby facilitating additional GHG reductions and further development of these renewable resources.
- Biomethane capture and use can keep the existing fleet of gas fired power plants operating with lower GHG emissions, thereby allowing the maintenance of the value of investment in these assets and the use of flexible resources to keep serving load.
- Biomethane capture and use adds to the on-site opportunities to reduce emissions of methane from biogenic sources, providing an additional GHG benefit by making productive use of this methane in instances where it is not feasible to combust the biogas on-site due to economics, emission restrictions, or other site-specific issues.
- Biomethane capture and use from in-state sources reduces criteria pollutants in the state by allowing combustion of this renewable resource in larger, more-efficient power plants where criteria emissions are more easily controlled and enforced by permit conditions and control technologies.
- Biomethane production and use helps to keep ratepayer costs low, by providing a cost-effective option to meet the RPS requirements.
- Biomethane development as a lower cost renewable resource provides room under potential RPS cost caps, allowing subsequent development of additional renewable generation.
- Biomethane capture and use helps to create local jobs, by providing a renewable fuel that can keep local power plants operating and by helping to keep electricity costs lower, which helps local businesses to prosper and add jobs.
- Finally, in-state biomethane development supports local generation of electricity to meet the RPS goals, which contributes to resource adequacy requirements and reduces demand on an already strained transmission system.

For these reasons, SMUD encourages the CEC to:

1. Continue to allow use of biomethane for the RPS under current rules, without adding new restrictions that are not necessary or required by SBX1 2. SMUD believes that the CEC has been correct in the rules developed in the RPS Eligibility Guidebook regarding biomethane, and nothing in SBX1 2 provides a need to or reason to change those rules.
2. Work with other agencies in the Bioenergy Interagency Working Group to expand the potential use of biomethane in the state by removing legal and regulatory barriers to injecting biomethane in state pipelines, and by continuing to support and engage in research to facilitate improvements in bioenergy technologies.
3. Determine that biomethane designated for use in in-state power plants shall be a Category 1 RPS resource under new regulations established pursuant to SBX1 2. This category in SBX1 2 clearly and explicitly relates to where electricity is generated and interconnected, not to where the fuel for that generation originates. So, SBX1 2 does not require any change to the current biomethane requirements.

It is clear that the language that describes Category 1 in SBX1 2 has nothing to do with the location of the fuel source. The language addresses the location of the electricity generator, requiring only that its first point of interconnection be with a California balancing authority or be scheduled to a California balancing authority without substituting *electricity* from some other source or be dynamically scheduled into a California balancing authority. Under SBX1 2, Category 1 biomass can be sourced from outside California, whether the fuel is woody biomass trucked into California, or biomethane piped into California. What matters is where the interconnection of the power plant is located.

Biomethane, like most renewable resources, is location constrained – it is produced at facilities in specific, defined locations. Biomethane is different than most other renewables, however, in that it can be transported to and used in conventional power plants, allowing those facilities to be located within California where they can provide local resource adequacy, integration services for intermittent resources, and local jobs. This makes biomethane a valuable renewable option, and its relatively low cost adds to this value.

The only viable method for delivering biomethane to California is the existing natural gas pipeline system. Through this method, the biomethane is cleaned to pipeline quality, injected into the pipeline system at the source, and mingles with conventional natural gas flowing into California. Using our existing pipeline system enables regulators to know where the biomethane is captured, that it is safe to combust in California, and that it displaces natural gas from the pipeline system.

Presently, the best (and perhaps only) way of accounting for this beneficial use, and crediting California consumers for the beneficial use of biomethane is through the current “designation” process, the same process that is used contractually for natural gas to “track” from source to sink. The entity that purchases and injects biomethane into the pipeline, and designates where that biomethane is “used”, receives credit for its use. This is current practice under the CEC RPS Eligibility Guidebook – the practice is efficient and beneficial and should be continued through the 33% by 2020 RPS enacted by SBX1 2. It is completely impractical, and environmentally damaging to contemplate constructing biomethane-specific pipelines to carry the fuel to specific facilities in California.

Similarly, it is impossible to track the biomethane in a pipeline molecule by molecule because it mingles with and becomes inseparable from other pipeline gas. Thus, the only way to provide RPS credit for delivery and use of biomethane is through the current system, whereby the facility designated by the entity that has contracted for the biomethane is considered to be the combustion sink for the biomethane.

SMUD provides answers to the specific questions asked of Panel A and Panel B at the September 20, 2011 CEC staff workshop, in the sections below.

Section 1: Questions Related To Biomethane Produced Outside The State And Injected In Pipelines For Designated Use In California At An In-state Electric Generating Facility.

1. The fourth edition of the RPS guidebook requires biomethane to be delivered to California or the electricity generation facility if it is located outside of California before it can be used in the generation facility. Given the two separate pipeline systems in California is it appropriate to require:

- a. Delivery of biomethane to the gas pipeline system in California from which the facility accepts delivery of gas, or directly to the electricity generation facility if it is located outside of California, or
- b. Delivery of biomethane directly to the electricity generating facility.

SMUD Response:

SMUD encourages the CEC to not prohibit or restrict the ability of entities to use standard natural gas industry operating practices to effectively balance their supply and demand. Holding biomethane to a different standard than conventional natural gas in how it is transported would put an undue burden on the traders and schedulers in operating their systems. We believe that there are sufficient protections, such as requiring a contract path to California and the reporting requirements, in the existing RPS Guidebook language to ensure a resource is not double counted and provides benefit to California. Therefore, either change to the existing language in our view is unnecessary.

It is consistent with standard RPS practice to consider any eligible renewable generation that is within or first interconnected to California as essentially “interchangeable”, so that no transmission path within the state is required. The important point is that electricity is delivered to California (by contract, since electricity flows are governed by physics, not intent). Similarly, with imported biomethane, all that should be important for the RPS on the fuel side is that the fuel is contractually sent to California for designated use in an in-state electricity generation facility, regardless of which in-state pipeline system the biomethane is first delivered to.

Since injection of biomethane into the interstate pipeline system results in pipeline quality gas that is indivisible, a requirement of delivery to an electric generation facility within California would serve no separate purpose. It would only add costs that would make out of state gas cost prohibitive. Thus, not only would such a requirement have no environmental justification or economic benefit to California, it would likely place an undue burden on interstate commerce in pipeline quality natural gas. Such a regulation would be unwise from both economic and legal perspectives.

2. Should the Energy Commission consider adding any location requirements to sources allowed to provide biomethane to facilities participating in California’s RPS in addition to any restrictions implied by required delivery agreements?

SMUD Response:

We believe the existing language in the RPS Eligibility Guidebook, that the biomethane should be injected into a pipeline that is interconnected to the WECC, is appropriate. This rule serves the rational purpose of displacing conventional fuels with biomethane within the WECC, with the result of reducing GHG emissions within the WECC and California. The existing Guidebook also tends to promote development of this renewable fuel within the WECC and California. In summary, it is our view that if the source injects into a pipeline that is interconnected into the WECC and the seller has demonstrated a contractual transportation path to California, it should continue to be eligible.

3. The Energy Commission currently allows backhaul and forward haul transportation agreements that are either firm or interruptible to be considered eligible delivery methods, should the Energy Commission:

- a. Retain the current requirements?
- b. Restrict delivery to only forward haul transportation?
- c. Restrict delivery to only firm transportation agreements?

Please provide reasoning for your response.

SMUD Response:

The Energy Commission should keep the current requirements. Nothing in SBX1 2 changes the current eligibility rules for biomethane, and there is no reason to change them.

In our view, the existing language is appropriate. Backhaul or transportation by displacement is an industry standard transportation method. Holding biomethane to a different standard than conventional natural gas in how it is transported would put an undue burden on the traders and schedulers in operating their systems. Requiring either forward haul only or firm only transportation agreements would not just impact out-of-state resources but could also prevent transportation of in-state resources. The flow on pipelines can change, thus eliminating the ability to be sure a supply will remain eligible throughout the life of a contract if the flow of the pipeline changes after execution. Preventing or restricting the standard use of the existing infrastructure for transporting this valuable renewable energy resource seems counterproductive to promoting renewable energy usage in California. The important point about biomethane use as currently allowed is that GHG reductions are occurring, in a variety of ways, and there is no reason to constrain these reductions with restrictions that would differ from current pipeline and natural gas practices.

Renewable electricity is considered delivered to California, or under SB1X 2 scheduled into California, by a contract path even if the power flow from the interconnection point is in the opposite direction of the sink. There is no requirement that the renewable power flow be in the same direction of the actual power flow. Such schedules are beneficial to the system, since they reduce congestion and enhance the transmission grid capability. Similarly, backhaul biomethane transfers will reduce congestion on the gas pipeline system and enhance system capability.

4. Should any delay be allowed in the consumption of biomethane at the electric generating facility once it has been delivered to California or the electricity generating facility? If so, please specify what reasons for delays should be allowed and what, if any, limits should be imposed on the delay. Explain your answer. If no delay should be allowed, please explain why.

SMUD Response:

Prohibiting or restricting the ability to use standard natural gas industry operating practices (including storage) would unnecessarily restrict the ability of traders and schedulers to balance the supply and demand of their system. Natural gas and biomethane are fungible products that can be stored. Storage is a valuable service to match supply and demand as well as to provide increased reliability in a system. Accurate tracking of biomethane can be and is being accomplished through accounting rules, that ensure that the biomethane delivered within the reporting period is matched with an appropriate amount of electricity from a generating facility within that reporting period, These accounting conventions are adequate to assure the Commission that the

quantity of biomethane used and credited to the RPS is reasonable and accurate. No additional restrictions should be placed on how a utility safely and reliably operates their system.

5. How should the Energy Commission treat biomethane imbalances resulting from differences between scheduling and use of the biomethane?

- a. Specify why such imbalances could occur, and if they should be allowed. Please explain.
- b. What limits are placed on imbalances by pipelines, and should the Energy Commission enforce stricter limits on imbalances? Please explain.
- c. What is the magnitude of imbalances in natural gas deliveries, and how do imbalances in biomethane deliveries differ?

SMUD Response:

In general, the concern about gas pipeline imbalances with regard to biomethane is unwarranted. At a basic level, so long as an entity can show a contract path for the gas delivery into California, then during any measurement period (typically a month) the amount of RECs produced from a power plant burning biomethane has to be the lower of the electricity production directly associated with the quantity of biomethane under contract that is actually injected into the pipeline system during that month, or the actual generation from the power plant.

Gas schedules are done on a daily basis. Gas delivery imbalances occur either because the receiving generator draws a different gas quantity than scheduled from the pipeline system, or the gas supplier injects a different gas quantity than scheduled into the pipeline system. Further, pipelines normally pack and draft their pipelines over the course of several days, providing a source of gas storage. As such, gas injected into a pipeline on a given day can be physically burned several days later. Biomethane gas imbalances should be allowed, because it's standard practice for the gas pipeline industry.

Limits and policies on imbalances vary by pipeline and are regulated by the FERC. The Energy Commission should not enforce stricter limits on imbalance than the pipelines themselves, as imbalances are an important element in maintaining economic pipeline operations for end-users.

Imbalances for biomethane can occur, as they do for conventional natural gas, on the supplier side, because biomethane production can vary in a given day from an expected/scheduled quantity. To the extent that a power plant that is receiving the biomethane pulls a larger quantity of gas from the pipeline than injected by the source, that additional gas would not qualify for generating RECs until an equal amount of biomethane is injected into the system. In short, the current structure for imbalances works fine for biomethane injection, and does not cause concerns from an RPS perspective. No changes in that structure are necessary.

6. What records should an applicant for an electric generating facility using pipeline biomethane be required to maintain and provide to the Energy Commission in the event of an audit process. How will these records ensure that the biomethane has not been claimed for use by more than one entity and all delivery and eligibility requirements have been met?

SMUD Response:

The recordkeeping required by the existing RPS Guidebook language should be sufficient. Existing procedures and requirements contained in individual pipeline tariffs filed with the FERC, operational balancing agreements, and service agreements contain all of the necessary data at receipt points into the natural gas pipeline and delivery points at the city gate to assure accurate volumes of biomethane. With respect to the potential for multiple claims, the CEC can access facility reporting regarding biomethane use in-state from the Air Resources Board's annual mandatory GHG reporting system, including 3rd party verification of that data. This verified data will ensure that the party claiming credit for biomethane use is the same party entitled to do so. There is no need to require such information separately from the ARB's annual reporting, as that would represent costly duplicative reporting for no real benefit.

Section 2: Questions Related To Biogas Produced In State.

1. Biogas can be utilized as an energy resource or disposed of by flaring. Biogas can be used to produce energy in heating, electricity generation, and transportation applications.

- a. Are there environmental benefits to using biogas for energy production vs. flaring?
- b. Are there additional benefits beyond air quality?
- c. Is electricity generation the highest and best use of biogas?

SMUD Response:

There are indeed significant environmental benefits from using biogas and biomethane to produce electricity as opposed to simply flaring the gas. Most importantly, producing electricity from the biogas displaces conventional fossil fuels – in California, this would mostly be displacement of natural gas generation, either locally or from imported sources. This represents a clear reduction in GHG emissions to the atmosphere, and of California responsibility for GHG emissions.

In addition, depending on the relative emissions from the electricity generator used to combust the gas, other air pollutants (such as the criteria air pollutants typically

controlled in California and toxic air contaminants) will be reduced compared to flaring raw output from the biogas source.

If the biogas is cleaned up to pipeline quality and injected into a pipeline for combustion at an efficient combined cycle power plant, these benefits are enhanced. Larger, efficient, combined cycle plants are constrained by permit conditions to emit lower levels of criteria pollutants than typical distributed generation. In addition, these facilities combust fuel more efficiently, leading to greater GHG reductions per MWh of electricity generated. The higher stacks on these generators, and their relative location, can also serve to reduce impacts of criteria pollutants on sensitive populations and promote compliance with Clean Air Act ambient air quality standards.

Use of biomethane to produce electricity has other environmental benefits beyond the clear air-quality benefits. In many cases, biogas/biomethane projects provide other local environmental benefits by reducing water pollution and odor issues at the sites that produce the gas. For example, a dairy that changes its practices from manure pools to manure collection and processing to develop electricity will reduce local water pollution and odor issues. This is true whether the biogas is combusted on-site or injected into a pipeline after cleanup, and having the option to do either of these increases opportunities to create these benefits. For example, where on-site generation is prohibitively expensive (due to small size, space constraints, or permitting issues) creation and injection of biomethane may be a viable option.

In addition, producing electricity with biomethane can avoid or defer investments in transmission resources that may otherwise be necessary for resource adequacy or for delivery of renewable power. When this happens, any environmental impacts of the transmission investments are also avoided or deferred, and ratepayers benefit by the avoidance and deferral of the transmission costs. Ratepayers also benefit by the production of lower cost renewable generation, allowing meeting the RPS at lower cost than otherwise.

Finally, developing in-state biogas or biomethane projects will provide California jobs. There will be construction jobs as the projects are built, of course, but also ongoing jobs to operate the facilities and as the host dairies and similar biogas producing facilities are able to stay in business for a longer period. Lower electricity costs from the lower cost renewable power will also translate into additional local jobs as employers are more able to expand or stay in business locally.

In summary, electricity generation is clearly among the highest and best uses of biogas. Flaring the gas, or simply letting it escape into the atmosphere, are significantly more damaging to the environment and do not provide other the benefits that come from producing electricity with the biogas.

2. How does use of pipeline quality biomethane produced from in-state sources benefit California ratepayers?

SMUD Response:

As mentioned in the response to question 1 above, pipeline quality biomethane use results in lower electric rates due to:

- Lower cost RPS compliance;
- Reduced GHG and criteria emissions;
- Deferred transmission need;
- Maintaining local generation for resource adequacy;
- Extended use of ratepayer investment in power plants;
- Improved integration, using renewables, of intermittent renewable generation; and
- Creation of local jobs, benefitting the local economy.

All of these benefits can and do represent potential benefits to California ratepayers.

3. Consider the following for biogas sources not derived from landfill gas.

- a. Please provide a description of utility gas quality standards as they relate to biomethane received into the natural gas transportation pipeline.
- b. Can biomethane -- not derived from landfill gas -- be injected into pipelines serving California customers without causing harm to public health or degrading pipeline safety?

SMUD Response:

Part “a” may be best answered by the state’s natural gas utilities, rather than SMUD. While SMUD has a dedicated pipeline for provision of fuel to four of our local generating facilities, this pipeline provides no retail customer gas service, and hence may not be subject to the same standards as most of the pipelines in the state.

Our understanding, however, is that biomethane that is injected into a standard natural gas transportation or delivery pipeline can have:

- No more than 1% CO₂;
- Less than 4ppm H₂S;
- Minimal liquids;
- Oxygen content below 0.1 or 0.2%;
- A minimum heating value of approximately 990 btus per cubic foot.

It should be noted that standard pipeline natural gas varies in composition as well, depending on the source, and can be as little as 80% methane, with other components including higher chained carbon compounds.

SMUD believes that biomethane from non-landfill sources can be cleaned up to be essentially indistinguishable -- within required boundaries -- from the standard natural gas in the state's pipelines.

4. Consider the following for biogas sources derived from landfill gas.

a. Can landfill gas consistently meet the CPUC's Standards for Gas Service in the State of California General Order 58-A, which requires the concentration of vinyl chloride be limited to less than 1,170 parts per billion by volume?

b. Can landfill gas be injected into pipelines serving California customers without causing harm to public health or degrading pipeline safety?

SMUD Response:

SMUD believes that landfill gas can meet the vinyl chloride standard in all cases. Recent data (from the GTI study presented at the workshop) indicate zero vinyl chloride is common, if not universal. Even in cases where vinyl chloride may be present in gas from a landfill, and present above the 1170 ppb standard, General Order 58-A allows dilution with pipeline or other gas so that the eventual injected gas meets the standard. All that is required is for the state's natural gas utilities to allow such dilution if necessary, and to consider pipeline injection as a feasible option for biomethane use.

SMUD believes that biomethane from landfill sources can be cleaned up to be essentially indistinguishable -- within required boundaries -- from the standard natural gas in the state's pipelines.

5. What are the biggest challenges to developing in state biogas resources? What are the biggest challenges to injecting biomethane, regardless of source, into the natural gas pipeline in California?

SMUD Response:

The greatest current impediments to widespread implementation of biomethane for pipeline injection are regulatory and institutional barriers.

Primary among these barriers are tariff prohibitions that prevent injection of biomethane from landfill gas into the two large state pipeline systems. These tariff provisions appear to go well beyond the requirements placed in law by Assembly Bill 4037 (Hayden, Chapter 932, Statutes of 1988). That law prohibited the sale or purchase of landfill gas into a pipeline in California if that gas contains too much vinyl chloride, and required the CPUC to establish such a limit by 1990. In a 1990 proceeding, the CPUC complied, establishing in General Order 58 the following limit:

e. Vinyl Chloride No regulated gas utility shall knowingly purchase landfill gas if that landfill gas, when supplied to any existing gas customer,

contains vinyl chloride in a concentration greater than 1,170 parts per billion by volume. This value is adopted as instructed by Section 25421(b) of the California Health and Safety Code as the maximum amount of vinyl chloride that may be found in landfill gas supplied to a gas utility customer pursuant to Section 25421(a). Testing for vinyl chloride shall be performed as specified by Section 25421(d) of the Health and Safety Code. When vinyl chloride exceeds the limits set forth herein, the gas utility shall notify the Commission and commence remedial action immediately. The gas utility shall notify the Commission when the level of vinyl chloride is reduced to allowable limits. Direct delivery for industrial use of landfill gas is exempted from these requirements as provided by Section 25421(e). A gas utility desiring to purchase landfill gas with a vinyl chloride content that exceeds the Commission adopted standard shall file an application with the commission. The application shall demonstrate that dilution of landfill gas exceeding the Commission's standard with other natural gas in the utility's system shall not result in any customer receiving gas with a vinyl chloride concentration level exceeding the Commission's standard.

Note that the CPUC decision allows dilution of biomethane found to have excess vinyl chloride to a level so that it meets the standard. Despite being allowed by the General Order, however, it is SMUD's understanding that gas utility tariff conditions allow no landfill gas to be injected into the state's gas utility pipelines, with or without dilution.

Another barrier for local biogas or biomethane projects is a complex and relatively arduous permitting process for such facilities. Enhanced coordination among regulatory agencies is needed to streamline the permitting processes for biogas projects, particularly anaerobic digestion systems.

It is difficult to meet the current regional air quality permit levels with internal combustion engines or turbines, making on-site production of electricity hard to establish. Creation of biomethane to inject in a pipeline and burn in a generation facility with even tighter permitting conditions is an excellent solution to this barrier until research develops and demonstrates a small engine technology or inexpensive control technology that allows local generation to meet these limits.

In addition, for biomethane production, the costs of interconnecting to the state's pipeline system are currently high, representing an economic barrier to development. The state should help to develop lower cost interconnection equipment and procedures,

and help to determine where interconnection to the pipelines is most feasible and least expensive in relation to the location of biomethane sources.

Respectfully submitted,

/s/

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