

Application No: A-12-04-024  
Exhibit No: \_\_\_\_\_  
Witness: Jim Lucas

Application of Southern California Gas  
Company (U904G) to Establish a Biogas  
Conditioning/Upgrading Services

Application 12-04-024  
(Filed April 25, 2012)

**CHAPTER II**  
**SERVICES AND BENEFITS**  
**PREPARED DIRECT TESTIMONY OF**  
**JIM LUCAS**

**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA**

**APRIL 25, 2012**

**TABLE OF CONTENTS**

**I. INTRODUCTION.....1**

**II. OVERVIEW OF PROPOSED SERVICE.....2**

**III. BACKGROUND .....4**

**IV. OVERVIEW OF RENEWABLE NATURAL GAS MARKET POTENTIAL.....6**

**A. Current Situation ..... 7**

**B. Opportunity for Growth..... 8**

**C. Needs of the Biogas Industry ..... 9**

        1) Siting, permitting, and state policy challenges..... 9

        2) Economics and financing issues ..... 10

        3) Potential for the Proposed Service ..... 11

**V. Description of Biogas Conditioning/Upgrading Services Tariff.....12**

**A. Proposed Tariff and Services Agreement..... 12**

**B. Technology and Service to be Provided..... 14**

**VI. SOCALGAS’ NEW BIOGAS SERVICE PROVIDES CUSTOMER BENEFITS....16**

**VII. CONCLUSION .....17**

**VIII. WITNESS QUALIFICATIONS .....19**

**IX. APPENDICES .....19**

1  
2  
3  
4  
5  
6  
7  
8

**CHAPTER II**

**SERVICES AND BENEFITS**

**PREPARED DIRECT TESTIMONY OF**

**RON GOODMAN**

9  
10  
11  
12  
13

**I. INTRODUCTION**

The purpose of this testimony is to provide a detailed description of Southern California Gas Company’s (“SoCalGas”) proposed Biogas Conditioning/Upgrading Services<sup>1</sup> Tariff, an overview of the current biogas industry, benefits of the proposed service as well as other support for the proposed tariff.

SoCalGas believes there are several compelling reasons that support California Public Utilities Commission (“CPUC” or “Commission”) approval of SoCalGas’ Biogas Conditioning/Upgrading Services Tariff including the following: 1) the state has clearly articulated its commitment to facilitating the development of bioenergy resources to support its greenhouse gas (“GHG”) emission reduction goals; 2) customers have regularly sought out SoCalGas through inquiries and requests to help them create value from organic waste; 3) SoCalGas is a trusted provider of gas related services<sup>2</sup>; 4) SoCalGas’ Biogas Conditioning/Upgrading Services Tariff is consistent with SoCalGas’ core service offerings; and

---

<sup>1</sup> This is a generic name for the service requested in this filing. SoCalGas will establish a formal name to be used once the service is approved by the Commission.

<sup>2</sup> Southern California Gas Company received the highest numerical score among large LDCs in the Western U.S. in the proprietary J.D. Power and Associates 2011 Gas Utility Residential Customer Satisfaction Study<sup>SM</sup>. Study based on 62,711 online interviews ranking 9 providers in the Western U.S. (AZ, CA, CO, ID, MT, NV, NM, OR, UT, WA). Proprietary study results are based on experiences and perceptions of consumers surveyed in September 2010-July 2011.

1 5) Commission policy supports the development of new, adequate, and reliable long term natural  
2 gas supplies<sup>3</sup>.

3 The testimony in Chapter I discussed how SoCalGas' proposed service is consistent with,  
4 and supportive of, existing state law and Commission policy which encourages utilities to  
5 propose programs that promote the environmentally beneficial use of biogas in end-use  
6 applications. Chapter III provides details concerning the cost tracking procedures and regulatory  
7 treatment that will track, record, and segregate costs associated with SoCalGas' Biogas  
8 Conditioning/Upgrading Services Tariff, ensuring that ratepayers are reimbursed at full cost<sup>4</sup> for  
9 utility activities funded through general rates that are used in the delivery of the tariff service.

## 10 **II. OVERVIEW OF PROPOSED SERVICE**

11 SoCalGas requests Commission approval in this Application to establish a new tariff to  
12 offer Biogas Conditioning/Upgrading Services (Appendix A – Proposed Tariff G-BCUS) as a  
13 response to customer inquiries<sup>5</sup> and requests.<sup>6</sup> The proposed service is designed to meet the  
14 current and future needs of biogas producers seeking to upgrade their biogas for beneficial uses  
15 such as pipeline injection, onsite power generation, or compressed natural gas vehicle refueling  
16 stations. Biogas<sup>7</sup> that is conditioned and upgraded<sup>8</sup> to, or near pipeline quality<sup>9</sup> is also referred to  
17 as renewable natural gas.

---

<sup>3</sup> On January 22, 2004, the CPUC issued Order Instituting Rulemaking, Rulemaking (R.) 04-01-025 (Gas OIR) to establish policies and rules to ensure reliable, long-term supplies of natural gas to California. The SoCalGas Biogas Conditioning/Upgrading Services Tariff supports Commission policy as pipeline injected renewable natural gas can help contribute towards a more diverse portfolio of gas supplies throughout SoCalGas' service territory

<sup>4</sup> "Full cost" includes all direct costs that benefit a specific project and the associated indirect costs associated with those costs. See Chapter III "Cost Tracking & Regulatory Treatment" for further detail.

<sup>5</sup> An inquiry is defined as an email or phone call from a customer or developer who is seeking general information about biogas.

<sup>6</sup> A request is a customer or developer seeking Utility support in determining the economic feasibility of a biogas conditioning/upgrading project.

<sup>7</sup> Biogas is defined as untreated gas produced through the anaerobic digestion of organic waste material.

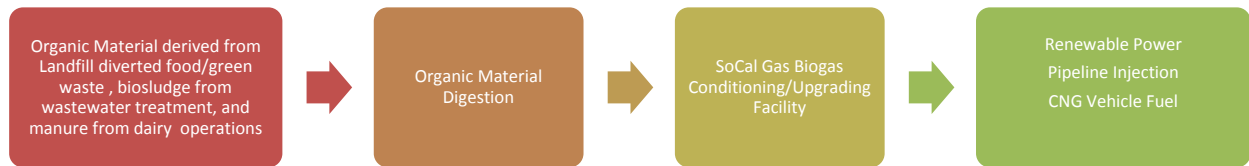
1           When a customer contacts SoCalGas and expresses interest in the Biogas/Conditioning  
2 Upgrading Services Tariff, SoCalGas will conduct a feasibility analysis with the intent of  
3 determining the technical and economic feasibility of the design, installation, operation and  
4 maintenance of the gas conditioning equipment, and as described in the Feasibility Analysis  
5 Agreement (Appendix B: Feasibility Analysis). Pending the outcome of the Feasibility Analysis,  
6 and for those customers who elect to proceed with the tariff service, SoCalGas will design,  
7 install, own, operate, and maintain the biogas conditioning/upgrading facility (“BC Facility”) on  
8 or adjacent to the tariff service customer’s premises and charge the tariff service customer the  
9 fully allocated cost of providing the service under a long term (10 to 15 year) service agreement,  
10 identified as the Biogas Conditioning/Upgrading Services Agreement (“Services Agreement”)  
11 (Appendix C: Services Agreement). SoCalGas is not proposing to charge any of the costs of this  
12 service to its general ratepayers. SoCalGas will not own the biogas entering the biogas  
13 conditioning/upgrading facility or the processed renewable natural gas leaving the biogas  
14 conditioning/upgrading facility. SoCalGas’ role will be to process the tariff service customer’s  
15 biogas and condition/upgrade it to the gas quality level(s) contractually specified by the tariff

---

<sup>8</sup> Conditioning is the process of removing gas impurities such as hydrogen sulfide and siloxane. Upgrading is the process of increasing heating value by removing gas inerts such as nitrogen, oxygen, and carbon dioxide.

<sup>9</sup> Pipeline quality renewable natural gas is required for pipeline injection only. A customer could specify the biogas to be conditioned/upgraded to a purity level of less than pipeline quality for operating onsite power generation equipment (e.g. fuel cell), or a compressed natural gas vehicle refueling station.

1 service customer in the Services Agreement, and as outlined in the process flow diagram below.



2  
3 SoCalGas will contract with a third party technology service provider, which will  
4 perform the day to day operation and maintenance of the biogas conditioning/upgrading facility.

### 5 **III. BACKGROUND**

6 There is growing interest regarding biogas production potential in SoCalGas' service  
7 territory. This interest includes the following activities: landfill diversion of organic waste  
8 material, wastewater treatment, concentrated animal feeding operations, and food/green waste  
9 processing.

10 Biogas is a renewable energy source, derived from the decomposition of organic waste  
11 material, and can be injected into the natural gas pipeline system or used onsite or offsite to  
12 generate power from internal combustion engines, fuel cells, or turbines, but there are instances  
13 where biogas is being vented naturally or flared to the atmosphere. Venting and flaring wastes  
14 this valuable renewable resource and fails to support the state in achieving its emission reduction  
15 targets set forth by Assembly Bill ("AB") 32 and the Renewables Portfolio Standard ("RPS")<sup>10</sup>  
16 goals (as discussed in Chapter I - Policy). On March 28, 2012, the California Energy  
17 Commission voted to suspend provisions for the consumption of biomethane as eligible for RPS  
18 and will limit the use of biomethane to pre-certified power plants until resolution of the

---

<sup>10</sup> Renewables Portfolio Standard Eligibility – Commission Guidebook 4<sup>th</sup> Edition

1 suspension.<sup>11</sup> SoCalGas is hopeful this issue will be addressed this legislative session, which  
2 ends August 31, 2012, and optimistic that in-state biomethane will continue to be eligible for  
3 RPS credit. Pending the outcome of the suspension, renewable natural gas that is injected into  
4 the utility pipeline network may be nominated to an RPS certified generation facility and applied  
5 towards a power generator's RPS goals.

6 Furthermore, as a result of the state's emission reduction targets and more restrictive  
7 South Coast Air Quality Management District emission Rule 1110.2<sup>12</sup>, both of which require  
8 costly upgrades to SoCalGas' customer's emission controls and monitoring devices, many  
9 internal combustion engine operators currently using biogas as a fuel in SoCalGas' service  
10 territory will be forced to consider an alternative use for this renewable resource. SoCalGas'  
11 proposed Biogas Conditioning/Upgrading Services Tariff offers an additional alternative option  
12 to such customers for this renewable resource by providing a means to process a customer's  
13 biogas so that as renewable natural gas it can be injected into the utility pipeline network so that  
14 it can be used for the beneficial purposes described above.

15 Prior to the recent pipeline injection project at the Point Loma Wastewater Treatment  
16 Facility in San Diego, there were no active renewable natural gas pipeline injection facilities in  
17 California.<sup>13</sup> SoCalGas has a great deal of experience in gas processing and compression  
18 through the long operation of its many gas storage fields, and views biogas processing as a  
19 logical tariffed service whereby we can aid our customers in developing their potential  
20 renewable natural gas resources to achieve both customer and social benefits.

---

<sup>11</sup> California Energy Commission Business Meeting on Wednesday March 28, 2012: "Notice to Consider Suspension of the RPS Eligibility Guidelines Related to Biomethane"

<sup>12</sup> [http://www.aqmd.gov/rules/support.html#Rule\\_1110.2](http://www.aqmd.gov/rules/support.html#Rule_1110.2)

<sup>13</sup> The Point Loma Wastewater Treatment Facility in San Diego California is producing 1.5 million cubic feet per day of biogas which is conditioned and upgraded for pipeline injection into SDG&E's pipeline network.

1           Although SoCalGas’ Biogas Conditioning/Upgrading Service Tariff might not suit all  
2 industry sector needs, it does offer a solution to aid in the potential capture and use of this  
3 abundant renewable commodity.<sup>14</sup>

4       **IV.    OVERVIEW OF RENEWABLE NATURAL GAS MARKET POTENTIAL**

5           SoCalGas’ Biogas Conditioning/Upgrading Services Tariff is not limited to any particular  
6 customer groups or end-use applications (i.e. fuel cell, internal combustion engine, pipeline  
7 injection, etc), but SoCalGas has identified the greatest initial potential demand for the Biogas  
8 Conditioning/Upgrading Services Tariff to be from landfill diversion operations, wastewater  
9 treatment facilities, concentrated animal feeding operations, and food/green waste processing.  
10 Each of these activities generates or processes large amounts of organic waste material, which as  
11 a feedstock for anaerobic digestion can produce enough biogas to satisfy the economies of scale  
12 (approximately 1.5 million standard cubic feet per day) for a pipeline injection project as  
13 described below. This new service offering provides an option for customers to make beneficial  
14 use of their biogas by creating economic, environmental and societal benefits.

15           The estimated theoretical potential for biogas production in SoCalGas’ service territory is  
16 approximately 150 million standard cubic feet per day (MMscfd). This is the total biogas daily  
17 volume resulting from the capture of all feedstock in each of the following customer sectors;  
18 wastewater treatment facilities (20MMscfd),concentrated animal feeding operations  
19 (70MMscfd),, and food/green waste processing (60MMscfd).<sup>15</sup>

---

<sup>14</sup> According to An Assessment of Biomass Resources in California, 2007, CEC, PIER Collaborative Report, 16% of California’s natural gas consumption could potentially offset if all available organic waste were captured and processed into renewable natural gas

<sup>15</sup> The publicly available source/reference information/reports used to develop the estimated amounts can be found in SoCalGas’ workpapers as follows: Wastewater treatment facilities (workpaper 7), concentrated animal feeding operations (workpaper 8), food/green waste processing (workpaper 9).



1           **A.     Current Situation**

2           While the option for customers (excluding landfills<sup>16</sup>) to capture, process and inject  
3 renewable natural gas into SoCalGas’ pipeline network has been available for some time, as of  
4 this filing date, there is only one instance of such injection in California, as referenced above.

5           Some biogas producers do not want to be responsible for: 1) biogas processing, as this is  
6 not their core business; and 2) taking on the operating risk of meeting the utility gas quality  
7 specification for pipeline injection. A utility tariff upgrade option for such biogas producers will  
8 allow them an opportunity to help better manage their waste streams, support the state’s  
9 environmental goals, and offset fossil fuel consumption.

10           Significant technology developments and governmental incentives will continue to make  
11 biogas conditioning/upgrading services even more viable. According to a report published by  
12 International Energy Agency (IEA) Bioenergy, as of 2009, there are approximately 100 biogas  
13 upgrading plants in the world, with the majority of them being in Europe. Ten European  
14 countries account for over 60% of the biogas upgrading plants worldwide which are successfully  
15 injecting renewable natural gas into the utility pipeline network. The success seen in Europe  
16 promotes worldwide awareness as to the benefits of renewable natural gas.<sup>17</sup>

17           With the Commission’s approval of its Biogas Conditioning/Upgrading Services Tariff,  
18 SoCalGas anticipates being a part of the state’s environmental ‘long-term’ solution by offering a  
19 service that helps customers produce renewable energy sources.

---

<sup>16</sup> SoCalGas Rule No. 30 provides the general terms and conditions applicable whenever the Utility transports customer-owned gas over its system. Per Rule No. 30, Section I.3.o, gas from landfills will not be accepted or transported.

<sup>17</sup> [http://biogasmx.info/media/iea\\_2biogas\\_upgrading\\_tech\\_025919000\\_1434\\_30032010.pdf](http://biogasmx.info/media/iea_2biogas_upgrading_tech_025919000_1434_30032010.pdf), Page 4

1           **B.      Opportunity for Growth**

2           SoCalGas sees three initial opportunities for its biogas-producing customers to benefit  
3 from its Biogas Conditioning/Upgrading Services Tariff.

4           First, as discussed in Chapter I, California environmental policy is driving demand for  
5 sources of clean, renewable energy; most prominently, the RPS and Low Carbon Fuel Standard  
6 Program goals. As discussed earlier, the California Energy Commission voted to suspend  
7 provisions for the consumption of biomethane as eligible for RPS, but we are hopeful this issue  
8 will be addressed this legislative session to allow in-state biomethane injected into the utility  
9 pipeline network to be eligible for RPS. The energy produced at the RPS certified facility from  
10 renewable natural gas should be considered renewable energy and counted towards an electric  
11 utility's RPS goals.<sup>18</sup>

12           Second, SoCalGas' Biogas Conditioning/Upgrading Services Tariff will aid SoCalGas'  
13 customer's entry into the renewable natural gas market which entry will, in turn, contribute to  
14 offsetting the amount of waste that goes to landfills, as well as the reduction of greenhouse gases  
15 that would normally be going to the atmosphere as further described below.

16           Third, biogas that is upgraded to compressed natural gas standards has the lowest carbon  
17 intensity of any certified transportation fuel under the California Low Carbon Fuel Standard  
18 Program.<sup>19</sup> Natural gas vehicles are among the cleanest transportation options available today  
19 and benefit from the price spread between petroleum and natural gas. Utilizing biogas for  
20 compressed natural gas fueling stations helps the state meet its Low Carbon Fuel Standard  
21 Program goals and promotes the development of alternative fuels

---

<sup>18</sup> Renewables Portfolio Standard Eligibility – Commission Guidebook 4<sup>th</sup> Edition, Page 18

<sup>19</sup> CARB Staff Report: Initial Statement of Reasons Proposed Regulation to Implement the Low Carbon Fuel Standard, Volume 1 March 5, 2009.

1           **C.     Needs of the Biogas Industry**

2           It has been SoCalGas’ experience through discussions with biogas developers and  
3 participation in various biogas industry events that the parties involved in a project need to  
4 collectively overcome “Challenges to Bioenergy Development” as identified in the 2011  
5 Bioenergy Action Plan.<sup>20</sup> The primary challenges that are applicable to biogas  
6 conditioning/upgrading include:

7                   **1) Siting, permitting, and state policy challenges.**

8                   “Numerous utility rules and state and local regulations and policies  
9 apply to developers and operators of bioenergy facilities.  
10 Improving consistency among regulations and increasing  
11 coordination among regulators and policy makers could encourage  
12 development of Bioenergy facilities. Permitting assistance for  
13 project proponents of new and emerging technologies could  
14 facilitate growth of the bioenergy industry in California.”<sup>21</sup>

15           SoCalGas has developed internal expertise pertaining to the various permitting processes  
16 and requirements at the local, state and federal levels. SoCalGas has also developed constructive  
17 relationships with these permitting agencies over a period of years which SoCalGas believes will  
18 aid in streamlining the permitting process for the biogas conditioning/upgrading facilities.

19           In addition, SoCalGas has experience in gas processing and compression through the  
20 long operation of its many gas storage fields and compressed natural gas fueling station  
21 installations. This experience, along with the knowledge gained from working closely with a  
22 variety of biogas consultants, equipment vendors and industry experts provides SoCalGas with a  
23 high confidence level that various upgrading technologies are capable of meeting customer

---

<sup>20</sup> 2011 Bioenergy Action Plan, Page 30

<sup>21</sup> 2011 Bioenergy Action Plan, Page 31

1 equipment gas quality requirements and SoCalGas' gas quality specifications<sup>22</sup> for pipeline  
2 injection.

### 3 **2) Economics and financing issues**

4 "Many of the challenges of developing new projects or  
5 maintaining existing facilities are related to the economics of the  
6 project. Financing new bioenergy projects carry a high-risk  
7 premium to lending institutions, driven by return on investment  
8 and uncertainty surrounding feedstock costs and costs of meeting  
9 stringent regulatory standards."<sup>23</sup>

10 SoCalGas has participated in multiple technology studies and attended many industry  
11 conferences in order to understand how to best manage the technology, operational risk, and  
12 financial risk associated with biogas conditioning/upgrading facilities. Studies indicate that  
13 many projects fail due to unanticipated circumstances such as failing to secure a solid feedstock  
14 agreement, understand the variability of gas constituents and ranges to be conditioned to pipeline  
15 quality, and ensure there are adequate performance guarantees in place to minimize risk of  
16 equipment downtime. Based on this research SoCalGas believes the Biogas  
17 Conditioning/Upgrading Services Tariff will be able to effectively manage the associated risks  
18 and potential obstacles.

19 Bioenergy developers are faced with a variety of risk factors (e.g. solid feedstock  
20 agreements, sustainable tipping fees, future value of carbon credits, consistent methane  
21 production, gas quality specifications for pipeline injection, etc) which can severely impact the  
22 economics of a project. By partnering with strong counterparties that are willing to take on some  
23 of the project risk, and taking advantage of SoCalGas' Biogas Conditioning/Upgrading Services  
24 Tariff, SoCalGas believes bioenergy developers are more likely to secure better financing terms

---

<sup>22</sup> SoCalGas Rule 30 - gas quality specification for pipeline injection

<sup>23</sup> 2011 Bioenergy Action Plan, Page 45

1 from lending institutions which will help the project economics. SoCalGas' Biogas  
2 Conditioning/Upgrading Services Tariff also likely reduces the amount of financing required by  
3 the bioenergy developer as SoCalGas is responsible for the upfront costs and ongoing operation  
4 and maintenance costs of the biogas conditioning/upgrading facility.

### 5 **3) Potential for the Proposed Service**

6 California has abundant biomass resources produced by the state's agricultural, forest,  
7 and urban waste streams. Increasing the state's bioenergy production will help California  
8 achieve the state's renewable energy and climate change goals with a sustainable and dependable  
9 resource.<sup>24</sup> As such, SoCalGas believes the Biogas Conditioning/Upgrading Services Tariff will  
10 be primarily utilized for the following producers of organic waste streams: 1) landfill diversion  
11 of organic waste; 2) food and green waste; 3) wastewater treatment plant facilities; and 4)  
12 concentrated animal feeding operations.

13 SoCalGas' Biogas Conditioning/Upgrading Services Tariff responds to customer and  
14 state needs and provides biogas resource owners (biogas developers, owners of organic waste,  
15 etc) with a turnkey option to help overcome some of the current barriers in developing the biogas  
16 industry. Additionally, the Biogas Conditioning/Upgrading Services Tariff can help: 1) divert  
17 organic waste from landfills; 2) provide a solution to facilities where the economics for onsite  
18 generation is difficult due to stringent air emission standards<sup>25</sup>; 3) assist the industries associated  
19 with concentrated animal feeding operations to minimize manure transportation and disposal;  
20 and 4) support California's GHG emission reduction goals and objectives (as discussed in  
21 Chapter I - Policy).

---

<sup>24</sup> 2011 Bioenergy Action Plan, Page 2

<sup>25</sup> SCAQMD Rule 1110.2, <http://www.aqmd.gov/rules/support.html#Rule 1110.2>

1 In speaking with customers across the waste hauling, livestock, and wastewater treatment  
2 plant industries, and based on the estimated theoretical potential for biogas production as  
3 described on page 6 in this testimony, SoCalGas believes there will be roughly 20 projects in  
4 SoCalGas' service territory over the next 5-10 years that will likely provide enough feedstock to  
5 justify an economical project without incentives. If achieved, this would account for at least  
6 300-500 tons per day of organic waste (per project) that would be diverted from a landfill and  
7 produce approximately 1.5 million cubic feet per day (per project) of biogas through an  
8 anaerobic digestion process.

9 **V. DESCRIPTION OF BIOGAS CONDITIONING/UPGRADING SERVICES**  
10 **TARIFF**

11 **A. Proposed Tariff and Services Agreement**

12 As stated above, the SoCalGas Biogas Conditioning/Upgrading Services Tariff will  
13 provide biogas producers with a solution that allows them to upgrade their biogas to the level(s)  
14 specified by the tariff service customer in the Services Agreement, and use it for beneficial  
15 purposes such as pipeline injection, onsite generation or a compressed natural gas vehicle  
16 refueling. SoCalGas will provide the Biogas Conditioning/Upgrading Services Tariff to  
17 customers located within SoCalGas' service territory. For customers which elect the Biogas  
18 Conditioning/Upgrading Services Tariff, SoCalGas will design, install, own, operate, and  
19 maintain the biogas conditioning/upgrading facility on, or adjacent to, the tariff service  
20 customer's premises and charge the tariff service customer a service fee as established in a long  
21 term Services Agreement. The applicable service fees will recover the fully allocated cost of  
22 serving that tariff service customer. The service fee will include the recovery of the full capital  
23 cost, operations and maintenance, and SoCalGas overhead costs through payments under the  
24 tariff and contract. Essentially, since this is a customer specific service, the customer will pay

1 the full cost of the service. Potential tariff service customers must meet certain basic  
2 requirements including credit establishment and economic feedstock volumes (i.e. approximately  
3 1.5 million standard cubic feet per day of biogas as a minimum) in order to be eligible for  
4 SoCalGas' Biogas Conditioning/Upgrading Services Tariff.

5 SoCalGas' Biogas Conditioning/Upgrading Services Tariff is a biogas  
6 conditioning/upgrading tariff and does not contemplate ownership of the biogas or the renewable  
7 natural gas leaving the biogas conditioning/upgrading facility. As such, the owner(s) of each of  
8 these two commodities would be responsible for using or selling the biogas or establishing an  
9 off-take agreement with an agent or marketer who could broker the commodity transaction with  
10 an end-user.

11 The Biogas Conditioning/Upgrading Services Tariff service will be provided through a  
12 long-term Services Agreement that the customer and utility must execute prior to the  
13 commencement of service. SoCalGas will negotiate each contract on an individual basis to meet  
14 its specific project requirements with non-discriminatory terms and conditions. The pricing  
15 (service fees) for SoCalGas' Biogas Conditioning/Upgrading Services Tariff and associated  
16 charges will be expressly set forth in the executed Services Agreement. SoCalGas will apply  
17 reasonable creditworthiness requirements consistent with SoCalGas' existing requirements for  
18 non-residential customers<sup>26</sup>. Customers who elect the Biogas Conditioning/Upgrading Services  
19 Tariff service will be responsible for complying with the utility's other tariff provisions, as  
20 applicable, including, but not limited to, SoCalGas' Rule Nos. 30 and 39.

---

<sup>26</sup> Refer to Section IX for additional detail on SoCalGas' Biogas Conditioning/Upgrading Services Customer Creditworthiness Requirements

1           **B.       Technology and Service to be Provided**

2           SoCalGas plans to contract with a third-party for system installations and a third-party to  
3 manage the day-to-day operations and maintenance of the system. The technology at each  
4 biogas producer site will be selected on a case-by-case basis based upon a variety of site specific  
5 variables including but not limited to the size of the facility, volume of biogas, quality of biogas  
6 and operating costs.

7           SoCalGas will consider a variety of proven biogas conditioning/upgrading technologies  
8 focusing on those that are cost effective, reliable and safe, easy to operate, and environmentally  
9 responsible.

10          The biogas conditioning/upgrading facility will accept biogas from the onsite producer's  
11 digestion process and will condition/upgrade the biogas to meet the customer's gas quality  
12 specifications for end use, as set forth in the Services Agreement.

13          The gas quality will likely vary from project to project depending upon processing and its  
14 intended use, whether it is for pipeline injection, onsite use, onsite power generation, or natural  
15 gas vehicle fuel. For example, if the upgraded biogas is intended for onsite power generation or  
16 process heating, the gas quality requirements will be determined by the equipment utilizing the  
17 biogas, but all applicable regulatory and environmental requirements will be met.

18          If the renewable natural gas is destined for injection into the SoCalGas pipeline network,  
19 it must meet the pipeline quality gas specifications defined in SoCalGas' Rule No. 30 and  
20 comply with interconnection requirements set forth in SoCalGas' Rule No. 39. When processed  
21 to pipeline quality, renewable natural gas exhibits properties and performance that are  
22 indistinguishable from fossil-based natural gas. Additionally, renewable natural gas has the



1 transportation and storage attributes of natural gas and for those with a renewable energy  
2 requirement, it is considered storable and dispatchable.

3 SoCalGas has researched the technologies available to process biogas into pipeline  
4 quality renewable natural gas which can meet SoCalGas' Gas Quality Specification for injected  
5 renewable natural gas (Rule 30).<sup>27</sup> Based on this research, SoCalGas currently believes there are  
6 three viable technologies to treat the waste gas stream into a pipeline-quality gas. (See  
7 Appendix\_: Biogas Conditioning Technology) Those three technologies are as follows<sup>28</sup>:

- 8 • Amine gas treating;
- 9 • Temperature Swing Adsorption; and
- 10 • Pressure Swing Adsorption.

11 Each technology has positive attributes, but SoCalGas currently believes that the most  
12 viable technology to implement initially is pressure swing adsorption because of its  
13 comparatively low cost and reduced complexity. Although SoCalGas is initially focusing on  
14 implementing pressure swing adsorption, as technologies mature and new technologies are  
15 introduced, SoCalGas will continue to review, evaluate, and, when appropriate, implement more  
16 advantageous technology.

---

<sup>27</sup> Some of those studies include, but are not limited to the following: Food Waste and Wastewater BioGas Research, Wheless and Dennison, January 2009; Renewable Energy Technologies, GTI, May 2011; BioGas Tax Credits and Incentives Research, Ernst and Young, March 2011; Dairy BioGas, SeaHold, September 2011; Organic Waste Anaerobic Digestion Feasibility Study, CH2MHill, February 2011; Gas Cleanup Reliability Availability Maintenance Study, Black and Veatch, April 2010; BioGas Energy Recovery Technologies and Systems, Black and Veatch, October 2008.

<sup>28</sup> Refer to Section IX for additional detail on the three technologies.

1 Because SoCalGas does not contemplate ownership of the raw biogas entering the biogas  
2 conditioning/upgrading facility nor the upgraded biogas leaving the biogas  
3 conditioning/upgrading facility, the biogas producer will be responsible for entering into the  
4 appropriate Utility Access Agreement (Rule 39) for delivery and metering of the conditioned gas  
5 into SoCalGas' system, and for complying with the gas quality and interconnection requirements  
6 as set forth in Rule No. 30 - Transportation of Customer-Owned Gas and SoCalGas' Biomethane  
7 Guidance Document.<sup>29</sup>

## 8 **VI. SOCIALGAS' PROPOSED SERVICE PROVIDES CUSTOMER BENEFITS**

9 As shown below and discussed in Chapter I, expanded use of biogas will provide  
10 environmental benefits to natural gas ratepayers, and biogas use is encouraged by both state law  
11 and Commission policy. SoCalGas' Biogas Conditioning/Upgrading Services Tariff is provided  
12 as a non-discriminatory service<sup>30</sup>, and enables SoCalGas' biogas producing customers with the  
13 means to provide environmental benefits consistent with California Public Utilities Code Section  
14 § 740.8.

15 SoCalGas' Biogas Conditioning/Upgrading Services Tariff will also provide bioenergy  
16 resource owners with additional options to make effective use of their biogas. To the extent that  
17 the Biogas Conditioning/Upgrading Services Tariff results in an expansion of the biogas and  
18 renewable natural gas industry in the SoCalGas service territory, SoCalGas ratepayers will  
19 recognize the following benefits from the proposed tariff service: 1) cleaner air in that methane  
20 created by various sources of organic waste can be captured and provide clean renewable energy  
21 instead of being released as a GHG to the atmosphere; 2) any injected renewable natural gas will

---

<sup>29</sup> [http://www.socalgas.com/documents/business/Rule30\\_BiomethaneGuidance.pdf](http://www.socalgas.com/documents/business/Rule30_BiomethaneGuidance.pdf)

<sup>30</sup> At this time, SoCal Gas' gas quality specification (Rule 30) prohibits landfill gas from being accepted as a source of biogas for pipeline injection.

1 displace the use of fossil-based natural gas, resulting in a reduction in fossil-fuel emissions; and  
2 3) the amount of organic waste disposed in landfills will be reduced through landfill diversion  
3 projects.

4 An example of an emission reduction measure pertaining to the bioenergy industry is  
5 landfill diverted organic waste that is anaerobically digested. Using the Climate Action  
6 Reserve's Organic Waste Protocol<sup>31</sup>, SoCalGas estimates one economical renewable natural gas  
7 injection project has annual emission reductions of 56,250 metric tons of CO<sub>2</sub> equivalent  
8 (MTCO<sub>2e</sub>) based on 411 tons per day of landfill diverted organic waste that is anaerobically  
9 digested.<sup>32</sup> This is the equivalent of taking approximately 11,000 passenger vehicles off the  
10 road.<sup>33</sup> Also, using a carbon credit value of \$37.50/ MTCO<sub>2e</sub><sup>34</sup> would produce annual carbon  
11 credits valued at approximately \$2.1 million.

12 SoCalGas' Biogas Conditioning/Upgrading Services Tariff can provide a tool to help  
13 individual owners of organic waste create value from the biogas while at the same time  
14 providing SoCalGas ratepayers with significant environmental benefits from the use of this  
15 renewable resource.

## 16 **VII. CONCLUSION**

17 California continues to show a deep commitment to facilitating the development of  
18 bioenergy resources to support its greenhouse gas emission reduction goals as described in the  
19 2011 Bioenergy Action Plan and to support the development of renewable energy. Concurrently,

---

<sup>31</sup> Climate Action Reserve Organic Waste Digestion Project Protocol, Version 2.0, June 29, 2011. Appendix C.4. Digestion Economics (pages 90-92)

<sup>32</sup> Approximately 300-500 tons of food waste per day is required to produce 1.5 million cubic feet per day of biogas

<sup>33</sup> EPA Greenhouse Gas Equivalencies Calculator - <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>

<sup>34</sup> Average \$/MTCO<sub>2e</sub> value between 2012 and 2027 in the 2011 MPR Model

1 producers of organic waste are looking for viable solutions on how best to manage an otherwise  
2 wasted byproduct of their daily process.

3 Over the last few years, SoCalGas has received numerous inquiries and requests from  
4 customers who are looking for a way to create value from organic waste. The timing of  
5 SoCalGas' Biogas Conditioning/Upgrading Services Tariff is pertinent in support of the state's  
6 environmental goals, and is consistent with SoCalGas' core service offerings.

7 SoCalGas has developed the Biogas Conditioning/Upgrading Services Tariff in response  
8 to the challenges faced by SoCalGas customers, such as high upfront capital investment  
9 requirements, lack of expertise in gas processing, ongoing O&M expenses, and gas quality risk.  
10 To help alleviate these issues, SoCalGas has developed an innovative tariff that benefits  
11 ratepayers, supports customers, improves the environment, and assists the state in meeting  
12 program and policy goals and mandates.

13 For all of the reasons outlined herein, SoCalGas encourages the Commission to act  
14 expeditiously to approve the Biogas Conditioning/Upgrading Services Tariff as proposed.

1 **VIII. WITNESS QUALIFICATIONS**

2 My name is Jim L. Lucas. My business address is 555 W. Fifth St., Los Angeles, CA  
3 90013. I am a shared service employee of the Southern California Gas Company and San Diego  
4 Gas and Electric and am the Market Development Manager for Biofuels.

5 At Southern California Gas Company, I'm responsible for leading SoCalGas' market  
6 development activities in the area of biogas. Since starting with SoCalGas over 17 years ago, I  
7 have held various positions of increasing responsibility in the areas of Product Development,  
8 Project Management, Energy Efficiency, Financial Analysis, Pipeline Operations and  
9 Engineering. From August 2000 through June 2002, I was employed by the non-regulated  
10 subsidiaries of Sempra Energy where I held various positions responsible for operations  
11 management, research and development, and project and financial analysis.

12 I hold a Bachelors degree in Mechanical Engineering from the University of California at  
13 Santa Barbara, a Masters degree in Business Administration from California State University,  
14 Fullerton and am a registered Professional Mechanical Engineer in the State of California.

15 I have not previously testified before the California Public Utilities Commission. This  
16 concludes my prepared testimony.

17  
18 **IX. APPENDICES**

19  
20 **CUSTOMER CREDITWORTHINESS:**

21 Creditworthiness – Customer shall provide adequate assurance acceptable to SoCalGas to  
22 establish Customer's creditworthiness according to the amount to establish credit contained  
23 herein. Such adequate assurance shall be supplemented from time to time thereafter during the  
24 term hereof to the extent requested by SoCalGas.

1           Amount to Establish or Re-Establish Credit – The amount of credit required to establish  
2 or re-establish credit for Biogas Conditioning/Upgrading Services will be the full cost of the  
3 Biogas Conditioning/Upgrading Services consisting of the summation of the monthly service  
4 fees for the duration of the contract term.

## 5 **ESTABLISHMENT OF CREDIT**

### 6 1.     Application for Credit

7  
8           The Customer shall be required to complete a credit application that includes financial  
9 and other relevant information needed to establish credit.

10           SoCalGas shall use financial and other relevant information, along with the Customer's  
11 service request and any other available information, to determine the Customer's credit limit. If  
12 unsecured credit is granted based on the financial strength of a parental corporation, a parental  
13 guaranty will be required.

#### 14           Acceptable Forms of Guaranty:

15           A guaranty in form, substance and in an amount reasonably acceptable to SoCalGas may  
16 be provided by a Customer from the Customer's parent company or some other guarantor  
17 acceptable to SoCalGas. Any guarantor must submit to a creditworthiness evaluation and  
18 provide necessary financial and other information as requested by SoCalGas.

19           SoCalGas will provide acceptable guaranty forms and any amendments thereto and will  
20 allow reasonable modifications to the guaranty forms. To assure the continued validity of an  
21 established credit facility with SoCalGas, the Customer shall be required to furnish SoCalGas  
22 with financial and other relevant information satisfactory to SoCalGas during the term of the  
23 Customer's project. In the event that SoCalGas determines that a financial change has affected,  
24 or could adversely affect the creditworthiness of a Customer, or if the Customer does not provide

1 the requested financial information, SoCalGas may terminate the Customer's participation in the  
2 program. SoCalGas will provide written notice to the Customer with a commercially reasonable  
3 cure time not to be less than 3 business days prior to termination.

4 In the event that SoCalGas determines that the Customer qualifies for unsecured credit,  
5 security may be required at a future date if SoCalGas determines that a material change has  
6 occurred, or becomes aware of a material change in a Customer's financial position, or if the  
7 provisions of this Rule are changed.

8 3. Utilizing Security

9 Customer may submit a security deposit in lieu of the creditworthiness evaluation to  
10 qualify for participation. The security deposit may be in the form of

- 11 a. Cash
- 12 b. Letter of Credit

13 An irrevocable and renewable Standby Letter of Credit in form, substance and amount  
14 reasonably acceptable to SoCalGas and issued by a major financial institution within the United  
15 States, acceptable to SoCalGas.

- 16 c. Surety Bond

17 Renewable Surety Bond(s) in a form reasonably acceptable to SoCalGas and issued by a  
18 major insurance company within the United States, acceptable to SoCalGas.

19 4. Reestablishment of Credit

20 A Customer may be required to reestablish credit if in the reasonable determination of  
21 SoCalGas, the conditions under which credit was originally established have changed, or if in the  
22 opinion of SoCalGas a condition of high risk exists.

23 5. Termination of Service

1 In the event SoCalGas determines that a financial change has or could adversely  
2 affect the creditworthiness of the customer, or if the customer does not provide the requested  
3 financial information, SoCalGas may terminate the customer's participation in the program with  
4 the sum of the remaining payments due immediately.

5 At the time of termination, if the customer has not paid SoCalGas billings, any security  
6 held on the customer's accounts shall be applied to recoup unpaid bills. In addition, if a customer  
7 is terminated and/or declares bankruptcy, the customer will be liable to SoCalGas for any and all  
8 costs, expenses, and attorney's fees incurred by SoCalGas as a result of such termination or  
9 bankruptcy. Payment by the customer of all such costs, expenses and attorney's fees will be a  
10 condition of re-entry into, or continuation in, the program.

## 11 **TECHNOLOGIES:**

### 12 **A. Pressure Swing Adsorption**

13 Carbon Dioxide is removed through an adsorption process where the process gas passes  
14 over a fixed bed of material. Acid gases (including CO<sub>2</sub>) adsorb to the material, allowing  
15 methane rich gas to pass through. Adsorption typically occurs at roughly 100 psig. Material for  
16 the adsorption of acid gases can either be regenerable, allowing the material to be reused, or for  
17 one-time use. Regeneration of the beds to remove the acid gases happens near atmospheric  
18 pressure. This cycling between high and low pressure is why this type of process is known as  
19 Pressure Swing Adsorption (PSA).

20 Biogas fed to a PSA process is first compressed to adsorption pressure prior to the PSA  
21 bed. Multiple beds are typically used in a PSA process to allow regeneration of saturated beds  
22 without taking the units off-line and to reduce energy consumption. The cleaned gas exits the  
23 adsorber beds and is sent downstream for further processing if necessary. Gas from regeneration



1 of PSA beds can be recycled back to the compressor or digester (for additional methane  
2 recovery), or compressed for alternative use. Activated carbon and molecular sieves are  
3 typically used in PSAs for acid gas removal. However, more selective types of solids, such as  
4 specially designed molecular sieves with specific pore sizes, are preferred due to the high  
5 selectivity for carbon dioxide. Besides removing acid gases, many PSA designs can also remove  
6 H<sub>2</sub>S, water and a limited amount of inert gases such as nitrogen and oxygen. This increases the  
7 methane purity leaving the beds without having to install additional equipment. A bulk of the  
8 water can be removed (and potentially reused) after gas compression, with fine removal to  
9 pipeline specifications occurring in the PSA. The downside of the ability of PSAs to remove  
10 multiple components is the loss of methane in the adsorbent. PSA equipment and adsorbents can  
11 be produced by generic suppliers and by suppliers that tailor their products and service offering  
12 specifically for the biogas industry. PSAs are commonly utilized in the biogas cleaning industry,  
13 and are in commercial application for upgrading to natural gas.

#### 14 **B. Temperature Swing Adsorption**

15 Temperature swing adsorption (TSA) is another technique use for regenerating a bed of  
16 adsorbent that is loaded with the targeted impurity gas. Whereas pressure swing adsorption  
17 (PSA) uses changes in pressure to release adsorbed gas, TSA modulates or swings temperature to  
18 drive off the adsorbed gas.

#### 19 **C. Amine Gas Treating**

20 Amine plants used for acid gas removal operate in a similar fashion to water scrubbers.  
21 Amine solutions can be tailored to the specific needs of the design. For example, amines can be  
22 configured to maximize CO<sub>2</sub> or H<sub>2</sub>S removal, while letting a large amount of the other  
23 component through. The gas stream enters the absorber at roughly 100° F and anywhere from 70

1 to 600 psig. Most solvent systems typically operate at high pressure to raise the partial pressure  
2 of the acid gas to increase efficiency. After contact with the amine, the clean gas exits the top of  
3 the absorber while rich amine is pumped to a regeneration unit. This regeneration unit lowers  
4 the pressure of the rich amine solution to near atmospheric and heats the liquid to roughly 220°F  
5 to liberate the acid gases. The lean amine is then re-pressurized and sent back to the absorber.  
6 Amines are more selective for acid gases than water, so they require smaller vessels, lower  
7 circulation rates, and lead to lower methane losses. However, they require significantly more  
8 process heat than water stripping, are more complex, and can have problems related to corrosion  
9 and degeneration of the solvent. Water would need to be removed in a knockout drum prior to  
10 the gas entering the absorber.