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May 28, 2013

Via Email
Original via Mail

Commercial Energy Consumers Association of British Columbia
c/o Owen Bird Law Corporation
P.O. Box 49130
Three Bentall Centre
2900 – 595 Burrard Street
Vancouver, BC
V7X 1J5

Attention: Mr. Christopher P. Weafer

Dear Mr. Weafer:

Re: FortisBC Energy Inc. (FEI)

Biomethane Service Offering: Post Implementation Report and Application for Approval for the Continuation and Modification of the Biomethane Program on a Permanent Basis (2012 Biomethane Application) (the Application)

Response to the Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1

On December 19, 2012, FEI filed the Application as referenced above. In accordance with the British Columbia Utilities Commission Order G-53-13 setting out the Regulatory Timetable for review of the Application, FEI respectfully submits the attached response to CEC IR No. 1.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC ENERGY INC.

Original signed by: Ilva Bevacqua

For: Diane Roy

Attachments

cc (e-mail only): Commission Secretary
Registered Parties

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1. Reference: Exhibit B-1, Application Page 21, Section 3 RNG Offering, Product Roll-Out and Results 3.1 Background

FEI utilized a phased-in implementation approach of the RNG Offering in order to confirm market interest, demonstrate the ability of producers to deliver a reliable supply of Biomethane, and to verify that processes supporting the business model function effectively, while ensuring costs of supply were recovered by customers who opt into the program. Eligible customers of the RNG Offering are residential Rate Schedule 1 customers (single family or separately metered multi-family) and small and large commercial customers (Rate Schedules 2 & 3) located in the Lower Mainland or Fraser Valley, Inland (Interior and North) or Columbia (Kootenays).

1.1 Please provide the numbers of customers in each of the categories (single family or separately metered multi-family) residential Rate Schedule 1 customers in the Lower Mainland and Fraser Valley, inland (interior and North) or Columbia (Kootenays).

Response:

Please see the breakdown of accounts and energy by region below

RATE 1	Accounts	Energy (GJ)
COLUMBIA	20,388	1,685,540
INLAND	209,880	16,073,482
LOWER MAINLAND	528,192	51,926,931

1.2 Please provide the size of each category in gigajoules (GJ) (single family or separately metered multi-family) residential Rate Schedule 1 customers in the Lower Mainland and Fraser Valley, inland (interior and North) or Columbia (Kootenays).

Response:

Please refer to the response to CEC IR 1.1.1.

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1 1.3 Please provide the number of customers in each of the categories (small and
2 large) commercial customers Rate Schedule 2 and 3 customers in the Lower
3 Mainland and Fraser Valley, inland (interior and North) or Columbia (Kootenays).

4
5 **Response:**

6 Please see the breakdown of accounts and energy by region for Rate Schedule 2 and 3

	Accounts	Energy (GJ)
RATE 2		
COLUMBIA	2,034	657,069
INLAND	20,079	5,876,695
LOWER MAINLAND	49,880	17,710,729
RATE 3		
COLUMBIA	75	270,577
INLAND	673	2,587,976
LOWER MAINLAND	3,918	13,824,308

7
8

9
10 1.4 Please provide the size of each category in gigajoules (GJ) (single family or
11 separately metered multi-family) residential Rate Schedule 1 customers in the
12 Lower Mainland and Fraser Valley, inland (interior and North) or Columbia
13 (Kootenays).

14
15 **Response:**

16 Please refer to the response to CEC IR 1.1.3.

17

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1 **2. Reference: Exhibit B-1, Application, Page23**

3.2.1.1 Residential Customers - Motivations

FEI's market research has indicated that the primary residential target customers are those who not only act in the interest of the environment, but also tend to be among the first to use new products and services to better the environment. They routinely act on their concern about their environmental footprint in everything they do and buy. They are concerned about the current and future state of the planet, have taken steps to save energy in the past and do not necessarily make decisions based on economics. FEI conducted an online survey in October 2012 of existing residential RNG subscribers. FEI received 856 responses which represents a margin of error of +/- 2.76% at the 95% confidence level²⁸. The survey, as attached in Appendix E-1, showed that the primary motivations for customers subscribing to the RNG Offering were preserving the environment, providing for future generations and doing the right thing.

2

3 2.1 Please clarify if the 'primary residential target customers' who routinely act in the
4 interest in the environment represents a segment of the total residential market of
5 natural gas users that FEI intends to or does already target, or if FEI is
6 discussing the characteristics of the existing RNG subscribers.

7

8 **Response:**

9 The primary target customers represent a segment of the total residential market and not the
10 subscribers themselves.

11

12

13

14 2.2 Please identify the other segments in the total residential market that are
15 identified whether or not they are considered target markets.

16

17 **Response:**

18 The residential customers are segmented at a broad level by demographics and region but
19 additional research has been done to further segment them based on their attitudes and lifestyle
20 on adoption of green products. The segmentation categories are described in slide 12 of Exhibit
21 B-4 of the FEI workshop presentation materials. The primary target markets for FEI are "dark
22 greens" to "extreme practical."

23

24

25

26 2.3 Please identify the number of customers estimated to be in each market segment
27 and provide any demographics that FEI has with respect to each segment.

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1

2 **Response:**

3 FEI has only qualitatively identified the market segments as described in response to CEC IR
4 1.2.2 but does not have the total number of customers identified in each segment and the
5 penetration rates. The penetration rates and market potential are described in Appendix E of the
6 2012 Biomethane application (Exhibit B-1) in slides 17 & 18 across the entire residential
7 segment. It is not unreasonable to assume that the penetration would be highest in dark greens
8 and then gradually drop towards extreme practical.

9

10

11

12 2.4 Please identify the penetration rate that FortisBC has achieved with respect to
13 each market segment targeted.

14

15 **Response:**

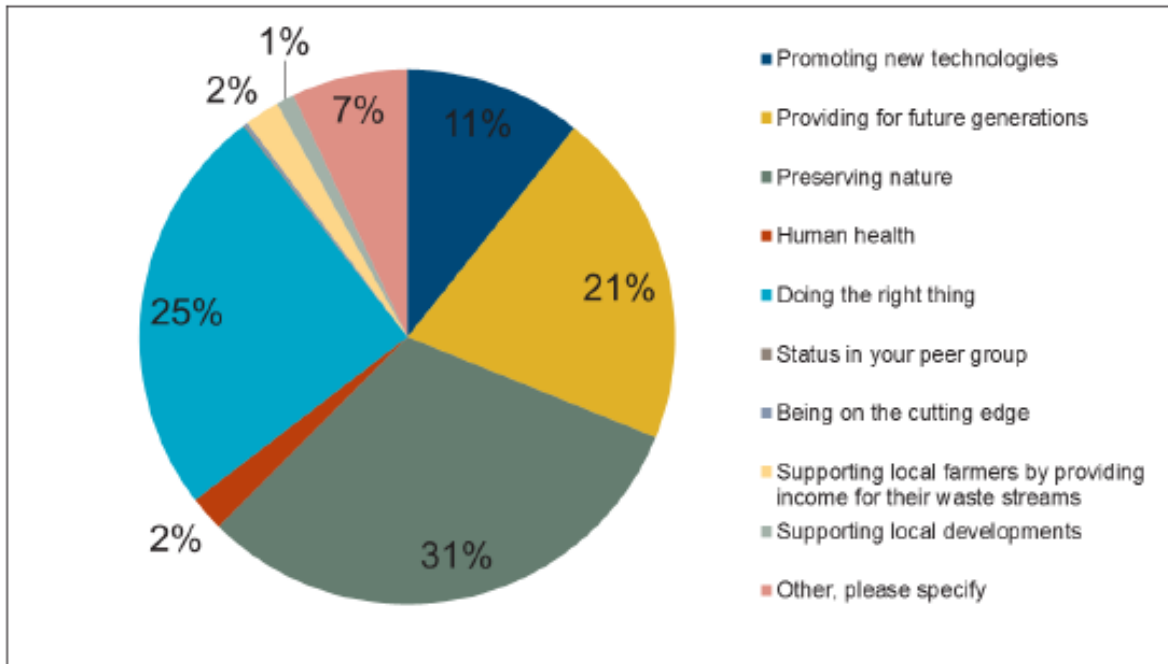
16 Please refer to the response to CEC IR 1.2.3.

17

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1 3. **Reference: Exhibit B-1, Application, Page 24**

Figure 3-1: FEI Oct 2012 Survey - Existing Subscribers Primary Motivation



2

There is also a large secondary target market of residential customers. The customers in this market consider themselves to be environmentally-minded and have taken steps to conserve energy, reduce their costs and generally participate in well-established programs such as recycling that do not increase their costs. They also aspire to be more environmentally conscious in their actions and choices. These customers are price sensitive and therefore tend to require additional tangible benefits to participate in the program. This secondary market accounts for a large portion of FEI's current participants. Over seventy percent (a ranking of 3.65 out of 5) of those surveyed indicated that FEI thanking customers with AIR MILES reward miles was a motivation for them to sign up for RNG.

3

4 3.1 Please clarify if the "large secondary target market of residential customers" who

5 are environmentally-minded but are also price sensitive represents a segment of

6 the total residential market of natural gas users or if it describes the

7 characteristics of the existing RNG subscribers.

8

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1 **Response:**

2 The statement “large secondary target market of residential customers” who are
3 environmentally-minded but are also price sensitive represents a segment of the total residential
4 market of natural gas users and not characteristics of existing subscribers.

5

6

7

8 3.2 Please confirm that the survey did not include earning Air Miles as a respondent
9 option for a primary motivation of residential customers in their survey.

10

11 **Response:**

12 Confirmed. AIR MILES was not a respondent option for a primary motivation of residential
13 customer in the survey. However, some respondents who chose the option “others” indicated
14 that AIR MILES was the primary motivation for them to sign up.

15

16

17

18 3.3 Please provide information as to what the 7% designated as “Other” includes.

19

20 **Response:**

21 Some of the responses include:

- 22 • Concerned about climate change
- 23 • Promoting renewable, sustainable sources of energy
- 24 • Supports the notion that people will pay more for better energy sources
- 25 • AIR MILES
- 26 • Help to reduce GHG emissions
- 27 • Pay less carbon tax
- 28 • To put waste into positive use

29

30

31

32 3.4 Please provide the proportions of those citing ‘earning Air Miles’ as a motivation
33 in each subscriber segment.

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- 1
- 2 **Response:**
- 3 FEI is unable to provide the proportions of the respondents who cited “earning AIR MILES” as a
- 4 motivation as they were two different questions on the survey.
- 5 Since the survey was done anonymously, FEI only knows how many people answered each
- 6 separate question. Without a means to identify the customer FEI cannot determine who said
- 7 yes to both questions.
- 8

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4. Reference: Exhibit B-1, Application, Page 25, Section 3.2.1.2, Residential Customers – Demographics

3.2.2.1 Commercial Customers – Motivation

As indicated in FEI's survey of current commercial customers (Appendix E-2), the primary motivation for businesses participating in the Program that responded to the survey was "Doing the right thing" followed by "Meeting corporate environmental initiatives". Since the commercial survey had a low response rate (9 responses out of 50, representing 18% of commercial accounts at the time), it may not be an true indicator of the primary motivation for businesses and should be treated as qualitative research. This is applicable for both the motivation question and blend question addressed in Section 8.3.1.

4.1 Will FEI be conducting additional market research to generate more reliable information as to the motivation for commercial users in choosing RNG?

Response:

Yes, FEI will be conducting additional research in the next two years such as surveys, taking feedback from participants on the program, focus group sessions and joint workshops with other programs such as energy efficiency and conservation where appropriate to generate more information and refine the program to increase participation. As an example FEI is already investigating options to provide coupons for signed customers through an online platform to connect the residential and commercial businesses that share the same values and increase awareness.

4.1.1 If so, please identify the market research FEI will be undertaking with respect to the commercial market over the next two years.

Response:

Please refer to the response to CEC IR 1.4.1.

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1 **5. Reference: Exhibit B-1, Pages 25 and 26, Section 3.2.1.2, Residential Customers**
2 **– Demographics**

3.2.1.2 Residential Customers - Demographics

The majority of participants are over the age of 50, with 90% of participants over the age of 35. The majority of participants reside in a single detached home and almost 2/3rds of participants are located in the Lower Mainland. Twenty-seven percent of overall enrolments are located in the Interior, indicating strong participation in that region given the relatively smaller number of customers there compared to the Lower Mainland. FEI's original demographics target market showed the greatest participation between the age of 35-55; results to date show that the largest demographic is actually 45-65+, with the single largest segment in the 65+ category. Therefore, the market is slightly older than what was reflected in the original market research.

Residence	
Single detached home	77.10%
Apartment building/condo	3.00%
Row house/Townhouse	12.00%

Residence	
Duplex/Triplex	4.70%
Mobile or manufactured home	3.20%

5.1 Does FEI intend to continue to focus on this market or address different market segments?

Response:

Please refer to the responses to BCUC IRs 1.15.1 and 1.15.3 where FEI addresses the need for an integrated marketing campaign and the need to conduct research to guide the marketing plan.

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5.2 If FEI intends to target different market segments, please identify and provide a rationale for each.

Response:

Please refer to the responses to BCUC IRs 1.15.1 and 1.15.3 where FEI addresses the need for an integrated marketing campaign and the need to conduct research to guide the marketing plan.

5.3 If FEI intends to target this segment, how will it modify its marketing approach to capture a larger segment of the identified adopters (65+ category) on the RNG Offering?

Response:

For the 65+ category segment, FEI would continue to utilize its existing effective marketing channels such as bill inserts, community newspapers, local events to attract this demographic while researching ways to further penetrate this segment and continuously reaching out to other segments.

Please refer to the responses to BCUC IRs 1.15.1 and 1.15.3 where FEI addresses the need for an integrated marketing campaign and the need to conduct research to guide the marketing plan.

5.4 Please provide a breakdown of residential customers in the single detached home category by age, by region, and by age and region.

Response:

The survey used to collect the demographics of the existing residential subscribers was not configured to collect the data in the format requested. FEI is only able to supply the data independently, as was done in Exhibit B-1, indicating the majority of customers enrolled in the Biomethane Program live in a single detached home, are in the age group 45 – 65, and reside in the Lower Mainland.

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Answer Options	Response Percent	Response Count
18-24	0.6%	5
25-34	8.8%	75
35-44	17.2%	147
45-54	20.6%	176
55-64	24.2%	207
65 years or more	28.7%	246
Single detached home	77.1%	660
Apartment building/condo	3.0%	26
Row house/Townhouse	12.0%	103
Duplex/Triplex	4.7%	40
Mobile or manufactured home	3.2%	27

5.5 Please provide a breakdown of residential customers in the Apartment building/condo category by age, by region, and by age and region.

Response:

Please refer to the response to CEC IR 1.5.4.

5.6 Please provide a breakdown of residential customers in the Row house/Townhouse category by age, by region, and by age and region.

Response:

Please refer to the response to CEC IR 1.5.4.

5.7 Please provide a breakdown of residential customers in the Duplex/Triplex category by age, by region, and by age and region.

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1

2 **Response:**

3 Please refer to the response to CEC IR 1.5.4.

4

5

6

7 5.8 Please provide a breakdown of residential customers in the Mobile or
8 manufactured home category by age, by region, and by age and region.

9

10 **Response:**

11 Please refer to the response to CEC IR 1.5.4.

12

13

14

15 5.9 Please provide breakdown by 10 percentiles for consumption for residential by
16 demographic (age distribution).

17

18 **Response:**

19 Please refer to the response to CEC IR 1.5.4.

20

21

22

23 5.10 Please provide breakdown by 10 percentiles for consumption for residential by
24 demographic (age distribution).

25

26 **Response:**

27 Please refer to the response to CEC IR 1.5.4.

28

29

30

31 5.11 Please provide breakdown by 10 percentiles of consumption for residential by
32 dwelling type.

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- 1
- 2 **Response:**
- 3 Please refer to the response to CEC IR 1.5.4.
- 4 FEI is unable to provide a breakdown of consumption for residential customers by dwelling type
- 5 but on average Rate 1 residential customers use 90 GJ / year. When enrolled in RNG, the
- 6 customer designates 10 percent of their usage as renewable, resulting in 9 GJ of RNG.

7

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1 **6. Reference: Exhibit B-1, Application, Page 26, Section 3.2.2, Commercial**
2 **Customers**

3 **3.2.2 COMMERCIAL CUSTOMERS**

FEI's primary commercial target segments are Rate Schedule 2 (small commercial) and 3 (large commercial) customers. These customers can primarily be divided into the following categories: apartment/condos, commercial/office buildings, education, restaurant, wholesale/retailers and other (includes transportation, recreation, hotels, printing, and construction). Within these categories, FEI specifically targeted the following types of businesses:

3

4 6.1 Does FEI consider commercial customers as a secondary market to residential
5 customers?

6

7 **Response:**

8 FEI is not sure what is meant by the term secondary market as referenced in the question. FEI
9 considers the commercial customers as important as the residential market to grow the volumes
10 and meet the goals. FEI delayed the launch of the program to commercial customers until the
11 time the customer information system was successfully implemented in house, but FEI does not
12 consider them as a secondary market when compared to residential.

13

14

15

16 6.1.1 If so, please provide the rationale for doing so.

17

18 **Response:**

19 Please refer to the response to CEC IR 1.6.1.

20

21

22

23 6.1.2 Please provide the relative proportion of marketing expense that FEI
24 intends to attribute to the commercial market relative to the residential
25 market and provide a rationale for doing so.

26

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1 **Response:**

2 FEI allocated approximately 50 percent of its approved budget on residential and commercial
3 segments. However, it would be difficult to conclusively state the exact proportion of expenses
4 that could be attributed to each of the commercial and residential segments. In 2012, FEI
5 developed an integrated marketing plan as attached in response to BCUC IR 1.10.1 to
6 effectively and efficiently allocate resources to create awareness and increase participation
7 across all segments. To achieve this objective, FEI allocated the expenditure accordingly. It
8 would be difficult to isolate expenditures by market as some of the print media such as
9 newspapers featured commercial customers, but were targeted towards residential customers.
10 This strategy allowed FEI to appeal to residential customers by featuring household retail
11 customers such as Thrifty's foods. Such expenditure could be either in residential or commercial
12 budget. 2012 was also the first year when FEI launched the program to commercial customers
13 and as part of its strategy developed customer-focused videos for a few early adopters to attract
14 other commercial and residential customers. The radio ads were also developed to educate
15 and promote to both residential and commercial customers and as such would be difficult to
16 provide a breakdown.

17 Please refer to the response to CEC IR 1.16.1.

18

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1 **7. Reference: Exhibit B-1, Application page 27**

2 An emerging secondary market is public sector organizations (PSOs). PSOs are currently
3 mandated to be carbon neutral through government policy²⁹ and view Biomethane as an
4 alternative to buying offsets in order to reach their carbon neutrality goals. Other PSOs are
5 developing co-generation projects using Biomethane to meet BC Hydro's clean energy criteria³⁰
6 for the Standing Offer Program or Load Displacement Agreements.

7 7.1 Why does FEI consider PSOs to be a secondary market?

8 **Response:**

9 FEI's early response from PSOs was that biomethane was too expensive an alternative when
10 compared to the offsets they would have to purchase from PCT. This was especially true for
11 hospitals and school districts. However, as FEI furthered discussions with municipalities and
12 universities, there turned out to be interest in this market from a handful of PSOs, that resulted
13 in large volume potential.

14 7.2 What is the anticipated size in GJ of the emerging public sector market?

15 **Response:**

16 Please refer to the response to BCUC IR 1.38.1 for a breakdown of PSO and Municipality
17 emerging market demand.

18 7.3 Please confirm that several of FEI's anticipated new business opportunities are
19 public sector organizations and identify the potential demand from each,
20 including those already mentioned and any others of which FEI may be aware.

21 **Response:**

22 Confirmed. Please refer to the response to BCUC IR 1.38.1 for a breakdown of demand by
23 municipalities and PSOs.

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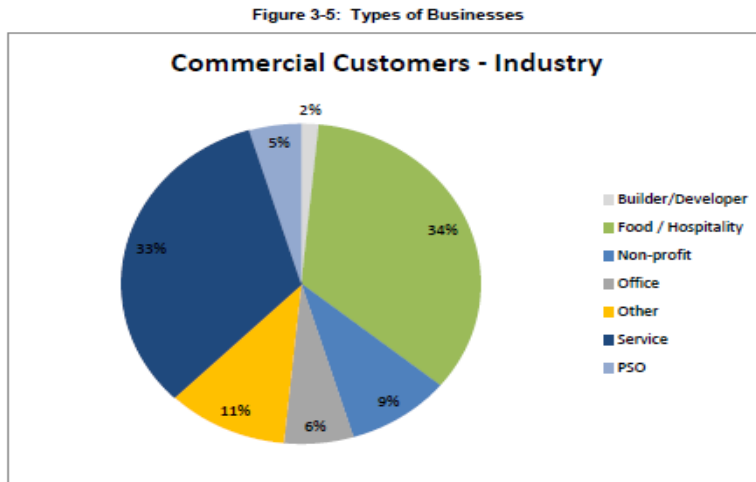
7.4 Please provide an estimate of the number of PSOs in BC that are mandated to be carbon neutral.

Response:

There are over 100 PSOs that are mandated and 180 municipalities that have signed on to the Climate Action Charter to be carbon neutral.

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1 **8. Reference: Exhibit B-1, application, Page 28**



2

3 8.1 Please provide specific numbers regarding RNG commercial customers in each
4 market category: apartment/condos, commercial/office buildings, education,
5 restaurant, wholesale/retailers and others (includes transportation, recreation,
6 hotels, printing and construction) per region (LML, Kootenay, and Inland).

7

8 **Response:**

9 Below are the corresponding numbers to Figure 3-5.

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1

Commercial Customer Industry by Region

Region	Industry	Total
Interior	Food / Hospitality	6
	Non-profit	3
	Office	1
	Service	7
INT Total		17
Kootenay	Builder/Developer	1
	Food / Hospitality	1
	Other	1
Kootenay Total		3
Lower Mainland	Food / Hospitality	15
	Non-profit	3
	Office	3
	Other	6
	PSO	3
	Service	14
LML Total		44
Grand Total		64

2

3 For a breakdown by the market categories indicated please refer to the responses to CEC IRs
4 1.12.6 and 1.12.7.

5

6

7

8 8.2 Please provide specific numbers of food/hospitality RNG commercial customers
9 identified as a large market segment in Figure 3-5: Types of Businesses graph
10 per region (LML, Kootenay Region and Inland).

11

12 **Response:**

13 Please refer to the response to CEC IR 1.8.1.

14

15

16

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8.3 Please provide the average consumption in each industry segment of commercial RNG subscribers.

Response:

Below is the average consumption that corresponds with the chart above. RNG annual consumption is based on 10 percent of the customer's 2012 annual consumption. The actual biomethane sold to these customers in 2012 will vary depending on what time in the year the customer enrolled. For actuals, please refer to the response to BCUC IR 1.8.2.

Sector	RNG Consumption (GJ)
Food / Hospitality	1,860
Non-profit	694
Office	277
Other	505
PSO	9,330
Service	2,042
Grand Total	14,708

8.4 Please provide the number of all commercial consumers of natural gas by industry segment including builder/developer; food/hospitality; non-profit; office; service; PSO and other industry groups, specifying the industries in the "other segment".

Response:

FEI does not classify commercial consumers of natural gas by the segments requested above. FEI can provide the breakdown by Rate Class for Commercial customers and the corresponding RNG uptake by region.

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	Accounts	2012 RNG Enrollments (2B & 3B)	Uptake	Energy (GJ)	Available Energy @ 10% Blend	RNG Consumption (10% of 2012 Consumption)	Uptake
RATE 2							
COLUMBIA	2,034	2	0.10%	657,069	65,707	16	0.02%
INLAND	20,079	19	0.09%	5,876,695	587,669	373	0.06%
LOWER MAINLAND	49,880	41	0.08%	17,710,729	1,771,073	1,538	0.09%
RATE 3							
COLUMBIA	75		0.00%	270,577	27,058		0.00%
INLAND	673		0.00%	2,587,976	258,798		0.00%
LOWER MAINLAND	3,918	11	0.28%	13,824,308	1,382,431	4,012	0.29%

Please refer to the response to CEC IR 1.12.7 for breakdown of RNG commercial customers by industry segment.

8.5 Please provide the average consumption of natural gas in each industry segment of all commercial customers of natural gas.

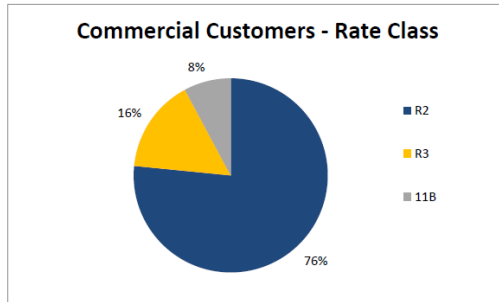
Response:

Please refer to the response to CEC IR 1.8.4.

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1 **9. Reference: Exhibit B-1, Application, Page 29**

Figure 3-7: The majority of Commercial Customers are from Rate Schedule 2



2

3

4 9.1 Please provide a breakdown of the specific numbers and types of industry for the
5 Commercial Customers captured in Rate Class 2 as depicted in Figure 3-7: The
6 majority of Commercial Customers are from Rate Schedule 2.

7

8 **Response:**

9 Please see the breakdown by Industry for Rate Schedule 2 below:

Industry	Customers Enrolled
Builder/Developer	1
Food / Hospitality	17
Non-profit	5
Office	3
Other	6
Service	17
Grand Total	49

10

11

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1 **10. Reference: Exhibit B-1, Page 29, Section 3.3, Validation of Market Research and**
2 **Program Results – Residential Uptake**

Table 3-1: Original Targets: 2010 Biomethane Application

		# of Customers	Volume (GJ)	# of Eligible Customers ^[1]	% of Customers	Enrolments	Volume (GJ)	Volume (GJ) @ 10%
Oct 2010 - Dec 2010	Residential	752,416	72,348,220	616,981	0.50%	3,085	73,267	7,327
2011	Residential	752,416	72,348,220	616,981	1.00%	6,170	586,132	58,613
2012 ^[2]	Residential	752,416	72,348,220	616,981	2.00%	12,340	1,172,264	117,226

3

4 10.1 Please provide a breakdown of Residential Customers (752,416) “Table 3-1:
5 Original Targets: 2010 Biomethane Application” into the following categories:
6 Single detached home, Apartment building/condo, Row house/Townhouse,
7 Duplex/Triplex, and Mobile or manufactured home by region (LML, INT,
8 Colombia Kootenay).

9

10 **Response:**

11 Please note 2012 data is revised to 758,460 eligible Residential Customers.

12 Historically FEI has not categorized existing residential customers by dwelling type. FEI was
13 able to pull new completion data by dwelling type from BC Assessments c/o Landcor Data Corp.
14 FEI has applied the 2012 new completions by dwelling type against total number of residential
15 customers to determine approximate number of customers by dwelling type per region. This is
16 a snapshot of 2012 new completions and will not represent the cumulative housing stock in B.C.

	New Completions	% New Completions	Number of Customers
SemiDetached	288	3%	25,653
LML	211	73%	
INT	62	22%	
Kootenay	15	5%	
SFD	5,884	69%	524,108
LML	4,483	76%	
INT	1,200	20%	
Kootenay	201	3%	

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	New Completions	% New Completions	Number of Customers
Townhouse	2,184	26%	194,536
LML	2,002	92%	
INT	167	8%	
Kootenay	15	1%	
Apartment Buildings¹	159	2%	14,163
LML	156	98%	
INT	NA	NA	
Kootenay	3	2%	
Total	8,515	100%	758,460

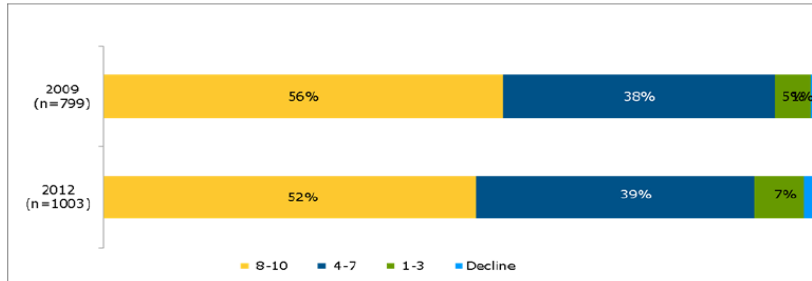
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¹ Numbers represent apartment buildings. Apartment units equal approximately 4600.

<p style="text-align: center;">FortisBC Energy Inc. (FEI or the Company)</p> <p style="text-align: center;">Biomethane Service Offering: Post Implementation Report and Application for Approval for the Continuation and Modification of the Biomethane Program on a Permanent Basis (2012 Biomethane Application) (the Application)</p>	<p>Submission Date: May 28, 2013</p>
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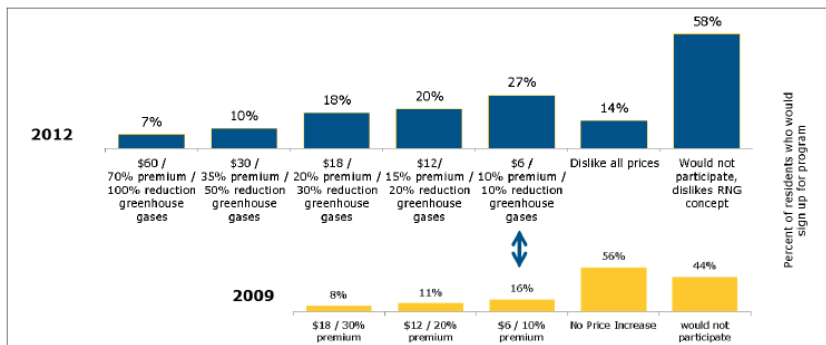
11. Reference: Exhibit B-1, Application, Pages 31 and 32

Figure 3-8: Likelihood to Sign Up for FEI RNG Program



Q5: (On a scale of 1 – Not very likely to 10 – Definitely) All things being equal, if FortisBC offered a RNG program?

Figure 3-9: 2012 Demand Curve for User Pay Pricing Model



11.1 Please provide details of the 2009 survey “Figure 3-8: Likelihood to Sign up for FEI RNG Program” defining Residential Customers in the following categories: Single detached home, Apartment building/condo, Row house/Townhouse, Duplex/Triplex, and Mobile or manufactured home by region (LML, INT, Colombia Kootenay) as they relate to the 56%, 38%, 5% and declined bars on the graph.

Response:

Breakdowns by housing type and region are provided in the following table. Figures may not add up to 100 percent due to rounding or non-response from respondents.

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	Very Likely: 8-10	Somewhat Likely 4-7	Not Very Likely 1-3
Housing Type			
Single Detached	75%	73%	85%
Town Home	4%	6%	3%
Condo / Apartment	9%	12%	8%
Duplex / Triplex	4%	3%	0%
Suite within Home	1%	1%	0%
Mobile	7%	5%	5%
Region			
Lower Mainland	57%	60%	40%
Interior	29%	29%	45%
Vancouver Island	11%	8%	13%
Whistler	0%	1%	0%
Sunshine Coast	1%	2%	3%

11.2 Please provide details of the 2012 survey “Figure 3-8: Likelihood to Sign up for FEI RNG Program” defining Residential Customers in the following categories: Single detached home, Apartment building/condo, Row house/Townhouse, Duplex/Triplex, and Mobile or manufactured home by region (LML, INT, Colombia Kootenay) as they relate to the 52%, 39%, 7%, and declined bars on the graph.

Response:

Breakdowns by housing type and region are provided in the following table. Please note that some housing categories were aggregated for 2012. Additionally, the 2012 survey excludes Vancouver Island customers.

Figures may not add up to 100 percent due to rounding or non-response from respondents.

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	Very Likely: 8-10	Somewhat Likely 4-7	Not Very Likely 1-3
Housing Type			
Single Detached	75%	75%	81%
Town Home	15%	14%	7%
Condo	3%	4%	6%
Apartment	2%	1%	1%
Other	6%	7%	4%
Region			
Lower Mainland	70%	70%	67%
Interior	30%	30%	33%

11.3 Please provide the specific number of Residential Customers that were in the \$6/10% premium group for 2009 and 2012 in the survey "Figure 3-9: 2012 Demand Curve for User Pay Pricing Model" defining Residential Customers in the following categories: Single detached home, Apartment building/condo, Row house/Townhouse, Duplex/Triplex, and Mobile or manufactured home by region (LML, INT, Colombia Kootenay).

Response:

FEI did not collect dwelling type from the respondents to the survey question referenced above. FEI did ask existing customers to provide their dwelling type in the RNG Residential Existing Customer Survey filed in Exhibit B-1, Appendix E-1.

The results show the demographics of RNG customers by dwelling type to be:

Dwelling Type	%
Single detached home	77%
Apartment building/condo	3%
Row house/Townhouse	12%
Duplex/Triplex	5%
Mobile or manufactured home	3%

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12. **Reference: Exhibit B-1, Page 33 and Page 51**

Table 3-3: Results vs. Forecast Demand Residential & Commercial⁽¹⁾

		Target # of Customers	Actual # of Customers	Target Demand (GJ)	Actual Annual Demand (GJ)
June 2011 - Dec 2011	Residential	3,085	1,088	7,327	5,168
As of December 12 th 2012	Residential	6,170	4,693	58,613	44,584
	Commercial		72		5,720
	On System Sales		3		9,660
	Total	6,170	4,768	58,613	59,964

Notes:

⁽¹⁾ For comparison purposes, annual demand incorporates average UPC rates from Biomethane Application.

As in 2008, based on enrolments, residential participants account for the majority of participation with more than 95% of total participation⁴⁸. Commercial enrolments account for only 5% of participation but 46% of volumes⁴⁸.

12.1 Please confirm that in the FEI RNG offering commercial customers account for approximately 1.6% of total customers, and approximately 25.6% of annual actual demand.

Response:

Confirmed. Please also refer to the response to BCUC IR 1.7.4 for an updated version of this table.

12.2 Does FEI consider this relationship to be in keeping with industry averages in which commercial enrollments account for 5% of participation but 46% of volumes. Please explain.

Response:

No. In 2012 FEI had commercial participation of less than 2 percent and volumes of only 22 percent, which is much less than industry averages. However, by the 2014/2015 time frame, FEI expects to add approximately 43 percent of total volumes from the commercial sector. By 2022, FEI expects to account for the bulk of the volumes from customers such as UBC and others for power generation.

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12.2.1 Would FEI anticipate that if commercial customers were to represent approximately 5% of total customers, they could account for significantly more than 50% of total annual volumes.

Response:

Participation rates are not directly proportional to volumes. In the case of commercial sector, FEI could add one high volume customer such as UBC, which alone could represent 50 percent of the total volumes, even though the overall customers could be less than 5 percent.

12.3 Please confirm that in the FBE RNG offering residential customers account for approximately 98.6 % of customers and approximately 74.4% of annual actual demand.

Response:

Confirmed. Please also refer to the response to BCUC IR 1.7.4 for the calculations.

12.4 Does FEI expect the current relationship of proportionate demand between residential and commercial customer to continue or to change over the future? Please explain.

Response:

FEI does expect the relationship to change with commercial volumes contributing to more than 85 percent of the volumes by 2022. Please refer to the responses to CEC IR 1.12.2 and BCUC IR 1.38.1 for the volumes.

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12.5 Why did FEI not develop commercial targets in 2011 and 2012?

Response:

FEI did not develop any specific targets for the commercial sector in that time period as FEI's plan was to implement a phased approach to first gauge consumer demand from the residential sector and monitor the supply before launching the program to commercial customers. FEI in its demand forecast has now developed specific targets for the commercial sector.

12.6 Please provide a breakdown of the 75 Commercial Customers into the following categories: apartment/condos, commercial/office buildings, education, restaurant, wholesale/retailers and others (includes transportation, recreation, hotels, printing and construction) per region (LML, Kootenay, and Inland).

Response:

FEI is assuming that the 75 Commercial Customers referenced above is referring to the commercial customers that were enrolled at the end of 2012.

At the end of 2012 there were 76 commercial customers enrolled in the program.

Rate 2B: 61 customers

Rate 3B: 11 customers

Rate 11B: 3 customers

Below is the breakdown of these customers by apartment/condos, commercial/office buildings, education, restaurant, wholesale/retailers and others (includes transportation, recreation, hotels, printing and construction) per region (LML, Kootenay, and Inland):

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Region	Sector	Total
Inland	Commercial/Office	6
	Education	1
	Others	6
	Wholesale/Retailers	7
Inland Total		20
Kootenay	Commercial/Office	2
Kootenay Total		2
LML	Commercial/Office	21
	Education	1
	Others	15
	Restaurant	3
	Wholesale/Retailers	14
LML Total		54
Grand Total		76

12.7 Please provide the actual annual demand (GJ) per categories: apartment/condos, commercial/office buildings, education, restaurant, wholesale/retailers and others (includes transportation, recreation, hotels, printing and construction) per region (LML, Kootenay, and Inland).

Response:

Please refer to the response to CEC IR 1.12.6.

RNG consumption is based on actual consumption for 11B and 10 percent of 2012 annual consumption for customers in rate schedules 2B and 3B. Please note sold volumes will vary slightly due to the timing of customer enrollments, as not all customers would have been enrolled in RNG for the entire year. FEI anticipates this consumption volume will materialize in 2013 when the customers undergo a full billing cycle.

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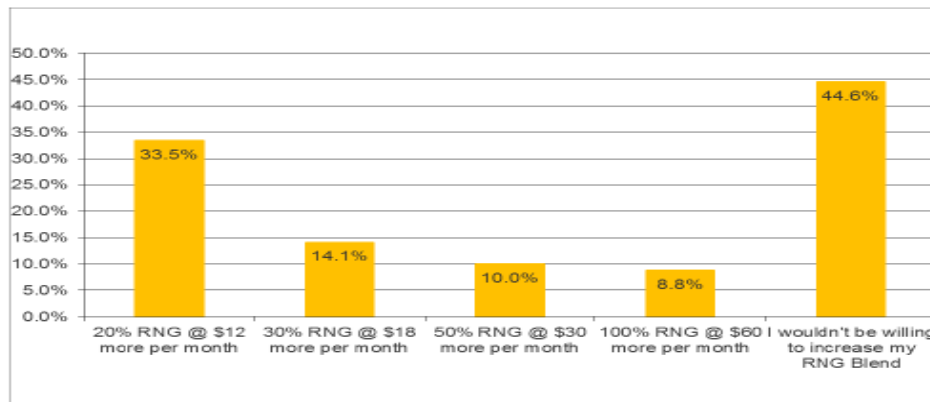
Region	Sector	RNG Consumption
Inland	Commercial/Office	66
	Education	81
	Others	136
	Wholesale/Retailers	390
Inland Total		673
Kootenay	Commercial/Office	16
Kootenay Total		16
LML	Commercial/Office	10,265
	Education	16
	Others	1,748
	Restaurant	156
	Wholesale/Retailers	2,695
LML Total		14,880
Grand Total		15,569

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1 **13. Reference: Exhibit B-1, Application, Pages 43 and 44**

As part of FEI's primary research attached in Appendix E-1, FEI asked existing residential subscribers if they would be interested in increasing the percentage of renewable natural gas in their gas usage. 66% of residential participants indicated that they would be interested in increasing their current blend. As indicated in Figure 3-13 below, almost 20% of residential participants said they would subscribe for a blend as high as 50-100%.

Figure 3-13: 66% of Residential Participants Indicate Interest in Increasing their Current Blend
FortisBC is looking at increasing the percentage of your natural gas use you can designate as renewable natural gas. Would you consider any of the following options if they became available?

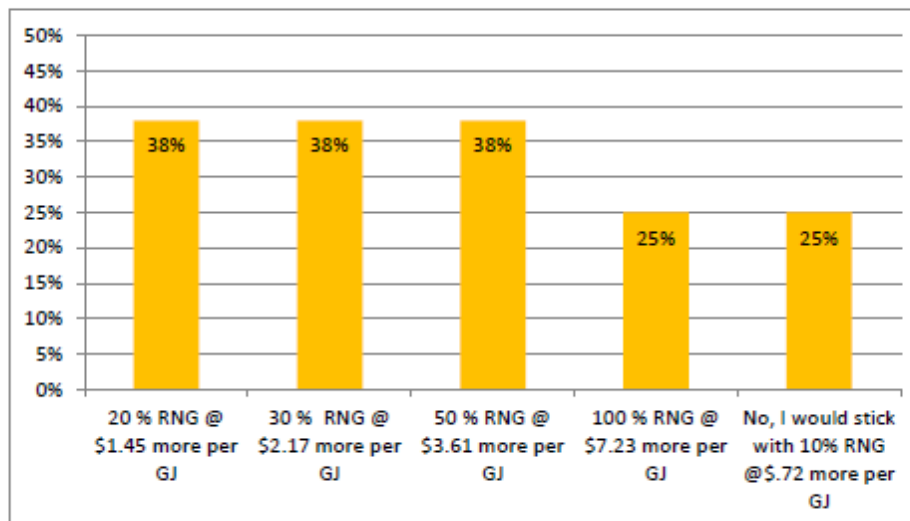


2

Based on FEI's primary research,³⁹ 75% of commercial customers surveyed would be interested in increasing their blend from the current 10% offering. As shown in Figure 3-13, 63% indicated they would subscribe for a blend as high as 50-100%.

3

Figure 3-14: 63% of Commercial Participants Indicate Interest in Increasing their Current Blend
FortisBC is looking at increasing the blend options available for renewable natural gas (RNG). Would you consider any of the following options if they became available? (check all that apply)



4

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13.1 Would FEI agree that commercial customers are significantly more likely to increase their blend than residential customers?

Response:

FEI agrees that commercial customers are significantly more likely to increase their blend than residential customers. Higher blends will allow commercial customers to meet their corporate environmental goals. In addition, commercial customers can in some cases pass on the incremental costs back to their customers and there may be brand building aspects of the business case that apply for commercial customers that do not apply for residential customers.

13.2 Does FEI consider residential customers as being more price sensitive than commercial customers?

Response:

Although FEI's primary research indicates that commercial customers are more likely to increase their blends to as high as 50 percent than residential customers, FEI does not have definitive information to comment on the degree of price sensitivity at this stage. For commercial customers, the degree of price sensitivity will vary depending on a number of factors including:

- The organization's goals with respect to environmental issues
- The degree to which energy costs are significant within the overall cost of the organizations end product

For residential customers, it will depend on factors such as their personal beliefs and attitude towards green products and income levels. FEI expects that there will be a wide range of price sensitivity in the commercial market and that there will be a wide range of price sensitivity in the residential market. It is therefore difficult to make a blanket statement such as the one posed in the question.

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1 **14. Reference: Exhibit B-1, Application, Page 39**

2 **3.6.2 COMMERCIAL CUSTOMERS FEEDBACK**

Customer feedback amongst our commercial customers has also been positive. Through our testimonials with a small sampling of our commercial customers, satisfaction seems apparent. Here are a few quotes we have collected which represent 10% of our existing commercial enrolments:

2

3 14.1 Please provide any negative feedback that FEI received from commercial
4 customers.

5

6 **Response:**

7 FEI is not aware of any negative feedback that it received from commercial customers. In fact
8 most of them supported the concept and the efforts taken by FEI to put together the green
9 leader rewards package to make this an attractive offer. The only complaint that FEI received
10 was the premium associated with this product.

11

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1 **15. Reference: Exhibit B-1, Application, Page 41**

Table 3-5: 2010/ 2011 RNG Offering Education Expenditures

		2010/2011 Budget	2010/2011 Actuals
Media			
	Targeted Print & Online Communications	\$ 220,000	\$ 150,036
	Direct Marketing	\$ 20,000	\$ 12,790
	Radio		\$ 28,441
		\$ 240,000	\$ 191,267
Production			
	Print Communications (Incl. bill insert)	\$ 40,000	\$ 19,953
	Event Materials (incl. booth signage)	\$ 5,000	\$ 28,770
	Quarterly Email Newsletter	\$ 20,000	
	Video	\$ 20,000	\$ 39,799
		\$ 85,000	\$ 88,522
Promotions/Events			
	Partnerships and Events		\$ 35,332
	Research and Promotions	\$ 75,000	\$ 70,465
		\$ 75,000	\$ 105,797
Total		\$ 400,000	\$ 385,586

2

3 15.1 Please provide a breakdown of the amount of RNG Offering Education
4 Expenditures spent on Residential and Commercial Customers.

5

6 **Response:**

7 FEI did not incur any customer education expenditures on commercial customers in 2010/2011
8 as RNG was not available to commercial customers at that time.

9

10

11

12 15.2 Please provide cost per GJ of RNG Offering Education Expenditures per for
13 residential customers.

14

15 **Response:**

16 Cost per GJ of RNG Offering Expenditures for residential customers = Total Education
17 Expenditures for residential customers / Total GJ sold to residential customer

18 = \$385,586 / 3,715 GJ = \$103.79/ GJ.

19 The reason the cost is high on a per GJ basis is that the volumes at the beginning of launching
20 this new program are low. In addition, the education expenditures relate to establishing

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1 awareness with all customers, not just those that have entered the program. Please refer to the
2 response to CEC IR 1.16.1

3
4

5
6 15.3 Please provide cost per GJ of RNG Offering Education Expenditures per
7 commercial customers.

8

9 **Response:**

10 The RNG program was not available to commercial customers in 2010/2011, and hence there
11 was no cost associated with commercial customers.

12

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1 **16. Reference: Exhibit B-1, Application, Page 42**

Table 3-6: 2012 Biomethane Education Summary

	2012 BUDGET	2012 Forecasted Actuals
Media		
Targeted print & online communications	\$ 185,000	\$ 65,000
Direct marketing	\$ 20,000	\$ 36,059
Radio		\$ 60,000
	\$ 205,000	\$ 161,059
Production		
Print communications (incl. bill insert)	\$ 40,000	\$ 36,657
Event materials (incl. booth signage)	\$ 5,000	\$ 5,373
	\$ 45,000	\$ 42,030
Promotions / Events		
Partnerships and Events	\$ 50,000	\$ 30,765
Promotions (Airmiles and Customer Videos)		\$ 63,118
	\$ 50,000	\$ 93,883
Total	\$ 300,000	\$ 296,972

2

3 16.1 Please provide a breakdown of the amount of 2012 Biomethane Education
4 Summary Budget estimate which will be spent on Residential.

5

6 **Response:**

7 In the response to BCUC IR 1.18.2.1, FEI updated the 2012 actual Biomethane Education
8 expenditure to \$301,233.

9 FEI tracks residential and commercial expenditure through separate internal order numbers, but
10 this is not a true measure of the costs incurred in those categories. FEI's integrated marketing
11 plan allocated resources to create awareness and increase participation across all segments.
12 Many marketing campaigns were created to target both residential and commercial customers
13 and it is difficult trying to isolate the costs and effects for each segment. Since FEI uses
14 commercial customers and media to target residential customers, the expenditure can be
15 tracked either in the residential or commercial categories. Please also refer to the response to
16 CEC IR 1.6.1.2.

17 With the caveat discussed above, \$130,858 of the 2012 expenditures were tracked under the
18 residential category and the remaining towards commercial as follows:

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Category	2012 Actuals
Commercial	\$170,375
Residential	\$130,858

1

2 FEI believes that assessing costs incurred on a per GJ basis is not a true measure of assessing
3 the effectiveness of its marketing campaigns. As noted in the response to CEC IR 1.15.2, the
4 cost will be high on a per GJ basis given that the program is new and volumes are relatively low.
5 FEI expects customer education cost to go down every year as customer awareness increases
6 and biomethane volumes grow. For example, the 2012 cost per GJ of RNG offering for
7 residential customers of \$6.39/GJ was significant lower compared to \$103.79 in 2010/11 (the
8 year RNG program was introduced). Additionally, the cost per GJ of RNG offering for
9 commercial customers in 2012 (the first year RNG was available to commercial customers) was
10 significant lower compared to the per GJ of RNG offering for residential customers in 2010/11.

11 Moreover, as also noted in the response to CEC IR 1.15.2, the education expenditures relate to
12 establishing awareness with all customers, not just those that have entered the program.
13 Therefore, education dollars per GJ is of little relevance, especially in the early years of
14 programs when volumes are still ramping up.

15 Nonetheless, FEI provides the cost per GJ of RNG per residential and commercial customers
16 below.

17 The cost per GJ of RNG offering per residential customer equals the 2012 residential education
18 expenditure divided by the 2012 total residential Biomethane demand (GJ). This equals:

19
$$\$130,858 / 20,469 \text{ GJ} = \$6.39 / \text{GJ}$$

20 The cost per GJ of RNG offering per commercial customer equals the 2012 commercial
21 education expenditure divided by the 2012 total commercial Biomethane demand (GJ). This
22 equals:

23
$$\$170,375 / 6,255 \text{ GJ} = \$27.24 / \text{GJ}$$

24

25

26

27 16.2 Please provide a breakdown of the amount of 2012 Biomethane Education
28 Summary Budget estimate which will be spent on Commercial customers.
29

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1 **Response:**

2 Please refer to the response for CEC IR 1.16.1.

3

4

5

6 16.3 Please provide cost per GJ of RNG Offering per for residential customers.

7

8 **Response:**

9 Please refer to the response to CEC IR 1.16.1.

10

11

12

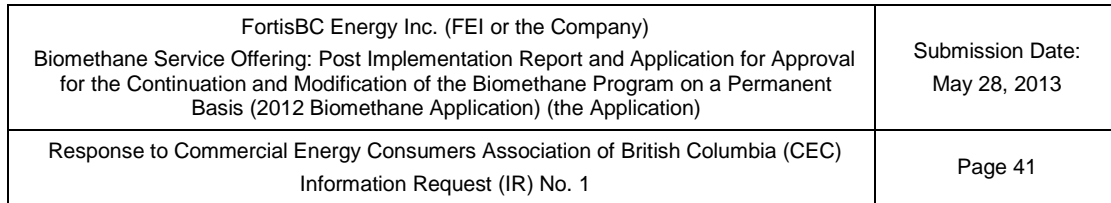
13 16.4 Please provide cost per GJ of RNG Offering per commercial customers.

14

15 **Response:**

16 Please refer to the response to CEC IR 1.16.1.

17



- Fortis BC emailed an Online Survey to 19 businesses (40 businesses were enrolled at the time)

7 **Response:**

90

4 **Response:**

6

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1 **18. Reference: Exhibit B-1, Application, Appendix E-2, FEI Survey Existing**
2 **Commercial Subscribers**

**Did you receive Green Leader marketing items / recognition from
FortisBC as a result of your subscription to renewable natural gas?**

Answer Options	Percentage	Count
Yes	76%	7
No	11%	1
Don't know	11%	1
answered question		9
skipped question		0

3
4 18.1 Please confirm that 89% of those surveyed may have received Green Leader
5 marketing items.
6

7 **Response:**

8 Confirmed.

9
10

11
12 18.2 Please provide the total number of commercial subscribers and the total number
13 of commercial subscribers who received Green Leader marketing
14 items/recognition from FEI/FortisBC as a result of their subscription to renewable
15 natural gas.
16

17 **Response:**

18 FEI had a total of 76 subscribers enrolled into the Biomethane program end of 2012. All the 76
19 subscribers were sent the green leader rewards package. FEI only featured those companies
20 that responded back to our request on our website.
21

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19. Reference: Exhibit B-1, Application, Appendix E-2, FEI Survey Existing Commercial Subscribers

Profile on FortisBC's website

	1	2	3	4	5	Total Responses
	0 (0%)	0 (0%)	0 (0%)	3 (38%)	5 (62%)	8

Q5



19.1 How many businesses surveyed were profiled on FortisBC's website?

Response:

FEI is unable to answer this question as the survey was conducted anonymously and FEI does not know who the survey respondents were.

19.2 How many businesses in total were profiled on FortisBC's website?

Response:

Twenty Six.

19.3 What proportion of those surveyed were profiled on FortisBC's website?

Response:

FEI is unable to answer this response as the survey was conducted anonymously and FEI does not know who the survey respondents were

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**20. Reference: Exhibit B-1, Page 47, Section 3.9, Future Expansion of the RNG
Offering to Rate Schedules 5, 14A, and 16**

Rate Schedule 5

Expanding the offering to Rate Schedule 5 would allow for customers using large volumes of natural gas to lower their emissions by designating a portion of their consumption as renewable. This customer group offers significant opportunity for emission reductions. Rate Schedule 5 customers each consume approximately 5,000 GJ per year of natural gas. By providing the RNG Offering to customers under this rate schedule, reductions in greenhouse gases would result. For example, based on a 10% blend and the potential demand of 500 GJ of Biomethane, there is the potential reduction of 25 tonnes CO₂e (carbon dioxide equivalent) per year per customer. However, this increment may not serve this Rate Schedule as the volumes are so

high, therefore, FEI is currently considering whether it would be applicable to offer smaller blends to these large volume customers. As attached in Appendix G-1, Lonsdale Energy Corporation is currently a Rate Schedule 5 customer and wishes to purchase RNG through FEI's RNG Offering at a smaller increment than 10%.

20.1 Please provide specific number of Rate Schedule 5 customers and annual consumption volumes.

Response:

Year	Number of customers	Volume (GJ)
2009	282	2,899,181
2010	234	2,463,576
2011	224	2,534,474
2012	216	2,315,536

20.2 Please provide any forecasts that FEI may have with respect to the anticipated growth of Rate Schedule 5 customers and projected consumption volumes.

Response:

FEI has forecast in the year 2014 for approximately 216 customers resulting in approximately 2,315,536 GJ. This is currently expected to remain the same until 2018.

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1 **21. Reference: Exhibit B-1 Application, Page 48**

Rate Schedule 16

Natural gas for transportation is a growing market in B.C. The current forecast⁴¹ predicts that this market could grow by 300% over the next 5 years, representing volumes of over 2 million GJ per year of natural gas throughput by 2016. Natural gas for transportation offers GHG emission reductions between 20-30% and fuel cost savings between 30-50% compared to diesel. RNG is an attractive alternative for fleets to achieve even higher GHG reductions as even 100% RNG is still less expensive than diesel and offers almost a 90% reduction in GHGs. As discussed in section 4, Waste Management in the US is currently working on plans to incorporate RNG into their natural gas refuse fleet (over 1,200 trucks) and currently produces 13,000 gallons of renewable liquefied natural gas (RLNG) per day for their transportation fleet. By offering Biomethane as an option for transportation fuel, a unique opportunity is created for municipalities to use the energy produced from their waste to fuel their vehicles that haul the waste, as contemplated by the City of Surrey.⁴²

2

3 21.1 Please provide current annual GJ consumption numbers for the natural gas for
4 transportation market.

5

6 **Response:**

7 In 2012, FEI Tariff Supplement customers (Waste Management CNG, BFI CNG and Vedder
8 LNG) consumed more than 200,000 GJ of natural gas, as shown in the table below.

Customer	2011 (GJ)	2012 (GJ)
Waste Management	25,766	29,450
BFI Canada	-	22,561
Vedder Transport	8,180	153,667
Total	33,946	205,678

9

10 Additional natural gas volumes were also generated through “non-fueling station” customers
11 such as Coast Mountain Bus Company and Rate Schedule 6 customers.

12 With the successful advancement of its NGT Incentive Program, FEI expects CNG/LNG
13 volumes to exceed 400,000 GJ in 2013 and grow beyond 2 PJ over the 2016-2017 timeframe.

14

15

16

17 21.2 Please provide any forecasts that FEI may have with respect to the anticipated
18 growth of Rate Schedule 16 customers and projected consumption volumes.

19

<p>FortisBC Energy Inc. (FEI or the Company)</p> <p>Biomethane Service Offering: Post Implementation Report and Application for Approval for the Continuation and Modification of the Biomethane Program on a Permanent Basis (2012 Biomethane Application) (the Application)</p>	<p>Submission Date:</p> <p>May 28, 2013</p>
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1 **Response:**

2 FEI's most recent LNG forecast was presented in the Rate 16 Amendment Application, filed on
3 September 24, 2012. FEI provided a revised version of its LNG forecast (in response to BCUC
4 IR 1.8.3) on December 7, 2012, which is summarized in the table below.

Item	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
LNG Trucks	54	219	284	344	454	454	454	454	454	454	454
LNG Truck Demand (GJ)	150,000	843,000	1,116,000	1,368,000	1,830,000	1,830,000	1,830,000	1,830,000	1,830,000	1,830,000	1,830,000
LNG Marine Vessels	0	0	1	2	3	3	3	3	3	3	3
LNG Marine Demand (GJ)	0	0	150,000	250,000	350,000	350,000	350,000	350,000	350,000	350,000	350,000
Total NGT Demand (GJ)	150,000	843,000	1,266,000	1,618,000	2,180,000	2,180,000	2,180,000	2,180,000	2,180,000	2,180,000	2,180,000

5

6

FortisBC Energy Inc. (FEI or the Company) Biomethane Service Offering: Post Implementation Report and Application for Approval for the Continuation and Modification of the Biomethane Program on a Permanent Basis (2012 Biomethane Application) (the Application)	Submission Date: May 28, 2013
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1 **22. Reference: Exhibit B-1, Application, Page 50, Section 4, Demand in BC**

Table 4-2: Program Start Year for Top 10 Utility Green Pricing Programs

Utility	Green Pricing Program Type	Customer Participation Rate	Program Start Year
City of Palo Alto Utilities	Wind, PV	21.50%	2003
Portland General Electric	Wind	12.80%	2002
Farmers Electric Cooperative of Kalona	Biodiesel, Wind	11.20%	2009
Madison Gas and Electric	Wind (0.7% local solar)	9.00%	1999
Sacramento Municipal Utility District	Wind, Landfill Gas, Hydro, PV	8.70%	1997
City of Naperville, IL	Wind, Small Hydro, PV	8.00%	2005
Silicon Valley Power	Wind, PV	7.80%	2004
Pacific Power - Oregon Only	Wind	6.90%	2000
River Falls Municipal Utilities	Small Hydro, Wind, Biogas	6.40%	2001
Lake Mills Light & Water	Small Hydro, Wind, Biogas	5.30%	2001

2

3 22.1 Please provide a breakdown of customer participation rates for each of the Top

4 10 Programs between Residential and Commercial customers.

5

6 **Response:**

7 FEI does not have program specific information regarding the breakdown between Residential

8 and Commercial customers. Exhibit B-1, Appendix F-2, provides a breakdown on average for

9 green pricing programs across the United States.

10 On average for all green pricing programs the breakdown of participation and consumption

11 between residential and non-residential customers is the following:

	Participation	Consumption
Residential	96%	54%
Non-residential	4%	46%

12

13

14 22.2 Please provide any details available on consumption for each of the Top 10

15 Programs broken down between Residential and Commercial customers.

16

17 **Response:**

18 Please refer to the response to CEC IR 1.22.1.

19

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23. Reference: Exhibit B-1, Application, Page 75, Section 5.5, Capital Cost of Interconnection Facilities

Table 5-7: Capital Costs of Interconnect Facilities (excludes AFUDC and Overhead Capitalized)

Particulars	\$000's		
	Fraser Valley Biogas	Salmon Arm Landfill	Kelowna Landfill Gas
Year in Service	2010	2013	2013
472 Structures	\$ 134	\$ 32	\$ 81
474 Regulator & Meter Installation	21	-	-
475 Mains	73	34	452
477 Mesuring & Regulating Equipment	269	439	576
478 Meter	7	4	8
Total Direct Costs	\$ 504	\$ 509	\$ 1,117

23.1 Please provide breakdown of capital cost per GJ for each project.

Response:

This response addresses the response to CEC IRs 1.23.1 and 1.25.1. The following table provides the average unit total capital cost in \$ / GJ of the interconnection facilities for all seven projects. The volumes are for a twenty-year period for each of the RNG suppliers. Fraser Valley Biogas includes three years of actual volumes and 17 years of forecast volumes. All of the other suppliers' volumes are a 20-year forecast beginning in 2013 or 2014.

Particulars	Fraser Valley Biogas	Salmon Arm Landfill	Kelowna Landfill	Dicklands Farm	Seabreeze Farm	Earth Renu	MetroVan
Total Interconnection Cost (\$000's)	\$ 504	\$ 509	\$ 1,117	\$ 1,014	\$ 1,189	\$ 786	\$ 739
20 Year Expected Supply Volume (GJ)	1,485,555	675,000	1,928,535	867,000	801,000	950,000	800,000
Capital Cost \$/GJ	\$ 0.34	\$ 0.75	\$ 0.58	\$ 1.17	\$ 1.48	\$ 0.83	\$ 0.92

23.2 Please provide a breakdown of operating costs per GJ for each project to show a total cost per GJ per project.

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1
2 **Response:**

3 FEI has estimated gross operating costs per GJ by dividing the estimated 20 Year O&M costs
4 (yearly un-inflated costs x 20 years) by the total estimated volume for 20 years. These gross
5 O&M costs are for the interconnection facilities referred to in Table 5-7 in the question as well as
6 the Table 7-1 referred to in the response to CEC IR 1.25.1.

Particulars	Fraser Valley Biogas	Salmon Arm Landfill	Kelowna Landfill	Dicklands Farm	Seabreeze Farm	Earth Renu	MetroVan
20 Year Expected Supply Volume (GJ)	1,485,555	675,000	1,928,535	867,000	801,000	950,000	800,000
Gross Operating Cost \$/GJ ¹	\$ 0.13	\$ 0.30	\$ 0.10	\$ 0.23	\$ 0.25	\$ 0.21	\$ 0.25

7 1 FEI has estimated operating costs at \$10k/year for each station

8

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1 **24. Reference: Exhibit B-1, Application Page 86, Section 6.3, FEI Ownership of**
2 **Upgrading Facilities**

Table 6-1: Ownership of Upgrader

Project	Type	Organization	Profit motivated?	FEI or Partner Owns Upgrader	Comment
Fraser Valley Biogas*	On-farm waste	Private	Yes	Partner	
Salmon Arm LF*	Landfill	Regional Gov't	No	FEI	Salmon Arm approached FEI
Kelowna LF*	Landfill	Municipal Gov't	No	FEI	Kelowna approached FEI
Earth Renu**	Waste organics	Private	Yes	Partner	Partner
Metro Van Lulu**	Wastewater Plant	Regional Gov't	No	Partner	Strong process equipment experience
Seabreeze Farm**	On-farm waste	Private	Yes	Partner	
Dicklands Farms**	On-farm waste	Private	Yes	Partner	
City of Vancouver LF***	Landfill	Municipal Gov't	No	FEI	Proposed. FEI Responded to Vancouver Request
City of Surrey***	Digester	Municipal Gov't	No	Unknown	Surrey is developing concept

* Existing Approved

** Included in this Application

*** Possible future project

3
4 24.1 Please provide a breakdown of the cost per GJ when FEI owns Upgrader
5 compared to when an RNG producer owns the Upgrader.
6

7 **Response:**

8 This response discusses commercially sensitive information and is therefore being filed
9 confidentially in order to not compromise or influence future negotiations with suppliers.

10
11
12
13 24.2 Please provide a breakdown of operating costs per GJ for each project to show a
14 total cost per GJ per project.
15

16 **Response:**

17 Please refer to the response to CEC IR 1.24.1.
18

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1 **25. Reference: Exhibit B-1, Application, Page 95, Section 7.3, Capital Expenditures**

Table 7-1: Capital Costs of Interconnect Facilities (excludes AFUDC and Overhead Capitalized)

Particulars	\$000's			
	Sea Breeze Farm	Earth Renu	Metro Van Lulu Island	Dicklands Farm
Year in Service	2013	2014	2014	2014
472 Structures	\$ 82	\$ 91	\$ 91	\$ 89
474 Regulator & Meter Installation	-	-	-	-
475 Mains	607	151	100	394
477 Mesuring & Regulating Equipment	491	535	538	522
478 Meter	9	9	10	9
Total Direct Costs	<u>\$ 1,189</u>	<u>\$ 786</u>	<u>\$ 739</u>	<u>\$ 1,014</u>

2

3 25.1 Please provide a breakdown of capital cost per GJ per project.

4

5 **Response:**

6 Please refer to the response to CEC IR 1.23.1.

7

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1 **26. Reference: Exhibit B-1, Page 111, Section 8.2.1, Under-Supply Risk**

In the event that, for any reason, there is more consumption of Biomethane than there is supply, the Company would purchase carbon offset credits in order to retain the integrity of the GHG reduction. This measure would be used to make up any shortfalls on a short-term basis. As a result of the mitigation measures, however, the risk of the Company having to purchase carbon offsets for the Biomethane program is very low. In the event that the Company does need to purchase carbon offsets it would be for a small portion of the gas under Biomethane program.

2

3 26.1 Please define the impact to cost per GJ if carbon offsets need to be purchased
4 because of shortfalls in Biomethane production.

5

6 **Response:**

7 Offsetters will provide carbon credits at the following thresholds and prices:

Tonnes	Price per tonne
1-1,000 tonnes	\$15
1,001 to 2,000 tonnes	\$14
2,001 to 5,000 tonnes	\$13
5,001 to 15,000 tonnes	\$12

8

9 The current price premium for Biomethane is \$7.23 GJ, this translates into \$144 tonne / CO₂e,
10 therefore, FEI is confident that purchasing offsets should not adversely increase the BERC rate.
11 All costs will be tracked in the BVA and be reported to the Commission in the quarterly gas cost
12 report.

13 \$15 per tonne is equivalent to \$0.75 per GJ. The greater impact would be in cases where FEI
14 owns the upgrader and that project is not delivering as expected, this scenario would have a
15 greater impact on the cost of Biomethane going forward.

16 Please also refer to the response to BCSEA IR 1.28.2.

17

18

19

20

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If the under-supply is resulting in a structural deficit, such as a supply project not meeting supply projections or a surge in customer demand or usage that was unexpected where FEI could not meet demand on a longer-term, more permanent basis, FEI has also reserved the right to remove customers from the RNG Offering in accordance with Section 28 of the FEI General Terms and Conditions. See Appendix D-3.

- 1
- 2 26.2 Please provide methodology to identify appropriate customer group(s) to remove
- 3 from RNG Offering. Appendix D-3 only identifies FEI's right to remove.

4

5 **Response:**

- 6 Please refer to the response to BCUC IR 1.30.2.

7

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27. Reference: Exhibit B-1, Pages 115 and 116, Biomethane Cost Recovery Via MCRA

As explained in the section above, since the product is a notional delivery of Biomethane rather than the physical supply of the product, FEI has the option of notionally banking the Biomethane and selling it to customers at a later point in time. FEI will notionally bank a volume of Biomethane appropriate to current market conditions for demand and supply projections on a quarterly and annual basis. Having the ability to sell bulk purchases of Biomethane on or off system, maintaining demand-side focused measures and carrying a manageable inventory of unsold Biomethane are appropriate and effective mechanisms to manage supply risks. It is

possible however, that there could be unsold inventory in the BVA that FEI is unable to sell at the BERC rate. In such a scenario, it is important for all parties involved with the Biomethane Program to understand how costs would be treated as a last resort. This will provide certainty for supply to be developed to meet demand.

If there were a circumstance of inventory in the BVA that FEI was not able to sell at the BERC rate, FEI proposes that it would, at such time, file an application that would propose that the notional inventory in the BVA be incorporated into FEI's supply portfolio to serve all customers and costs recovered through the MCRA. FEI expects that should such a request be required, that it would be included within the quarterly gas cost report. As this measure would be a last resort, once all risk mitigation tools have been exhausted, it is expected the rate impact of any recovery through the MCRA would be minimal. For example, based on the current BERC rate of \$11.696/GJ, if 100 TJ of unsold Biomethane was transferred to the MCRA, the impact to the midstream rate for a Lower Mainland residential customer would be approximately \$0.003/GJ. This is based on the midstream having to sell the Biomethane at the same value as conventional natural gas (i.e. maximum discount / loss scenario) and this worse case loss in value being captured in the MCRA deferral account and amortized over three years via the MCRA rate rider. The annual bill for a typical Lower Mainland residential customer with an average annual consumption of 95 GJ per year would increase by approximately 29 cents for each of the following three years under this worst case scenario.

27.1 How would FEI determine when it would become appropriate to file an application to incorporate FEI's notional inventory into FEI's supply portfolio and recover costs through the MCRA?

Response:

Please refer to the response to BCUC IR 1.70.2.

27.2 Please identify how unsold Biomethane would be expected to impact commercial customer bills and provide examples based on average commercial customer demand for each industry type.

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1 **Response:**

2 In Exhibit B-1, FEI provided a worst case scenario under which the excess Biomethane could be
3 sold for no more than the value of conventional natural gas. This is considered an extreme
4 scenario as it would mean the green attributes of the Biomethane would have no value and; no
5 value would be placed on the current Carbon Tax offset of approximately \$1.50/GJ. Under this
6 worst case scenario, the notional inventory in the BVA could be incorporated into FEI's supply
7 portfolio to serve all customers and costs recovered through the MCRA. As this measure would
8 be a last resort, once all risk mitigation tools have been exhausted, it is expected the rate impact
9 of any recovery through the MCRA would be minimal.

10 For example, based on the current BERC rate of \$11.696/GJ, if 100 TJ of unsold Biomethane
11 was transferred to the MCRA, the impact to the midstream rate for a Lower Mainland Rate
12 Schedule 3 commercial customer would be approximately \$0.003/GJ or 0.04% of the average
13 annual bill. This is based on the midstream having to sell the Biomethane at the same value as
14 conventional natural gas (i.e. maximum discount / loss scenario) and this loss in value being
15 captured in the MCRA deferral account and amortized over three years via the MCRA rate rider.
16 The annual bill impact for a typical Lower Mainland commercial customer can be found in Table
17 1, below. This is considered an extreme worst case scenario.

18 **Table 1: Annual Bill Impacts for Typical Lower Mainland Customers ⁽¹⁾**

	Rate 1	Rate 2	Rate 3	Rate 4	Rate 5	Rate 6	Rate 7
Average Annual Consumption (GJ)	95	300	2,800	5,400	9,700	2,900	8,100
Average Annual Bill \$ / Year	889	2,446	19,594	28,488	62,637	22,206	50,266
Impact on Midstream \$/GJ ^(A)	0.0033	0.0033	0.0026	0.0019	0.0019	0.0010	0.0019
Annual Impact \$ / Year ^(A)	0.29	0.90	8.40	10.80	19.40	2.90	16.20
Annual Impact % / Year	0.03%	0.04%	0.04%	0.04%	0.03%	0.01%	0.03%

19
20 Notes:

21 ⁽¹⁾ Table 1 provides the impacts of the loss associated with 100 TJ of unsold Biomethane being
22 absorbed in the MCRA. The value of the loss, in this case approx. \$832 thousand, has been
23 calculated based on the difference between the existing January 1, 2013 BERC rate and the
24 2013 12-month weighted average market price of natural gas based on the 5-day average
25 forward prices of November 1, 2, 5, 6, and 7, 2012, as filed in the FEI 2012 Fourth Quarter
26 Gas Cost Report. The calculated loss also excludes the current value of Carbon Tax offsets
27 of approx. \$1.50 per GJ.

28 ^(A) Midstream riders have been calculated and shown to 4 decimals for purposes of this table;
29 variable per GJ charges in tariff rate schedules are set at 3 decimals. Annual bill impacts, in
30 dollars, are rounded and shown to 2 decimals.

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27.3 Please confirm that in a worst case scenario in which FEI was not able to sell significant volumes of Biomethane at the BERC rate, that recovery of costs through the MCRA would not result in double charging of those customers who purchased RNG.

Response:

Under a scenario in which FEI was to seek recovery of costs related to Biomethane inventory that could not be sold at the BERC rate, there would not be any double charging of customers who purchased RNG. Currently, all non-bypass customers pay via their delivery rates for the costs associate with making the Biomethane Program available, and only those customers electing to receive Biomethane under the program pay, at the BERC rate, for those volumes of notional Biomethane they consume. Any costs related to Biomethane inventory that could not be sold at the BERC rate would, subject to Commission approval, be captured in the MCRA and recovered via future midstream rates. FEI would propose the costs to be recovered from all sales class customers. This is a fair allocation of the cost of making the program available to all customers and the environmental attributes would flow through to the end users.

27.4 Please provide further details of having Biomethane available for later sale. In particular, please address what FEI considers to be a 'manageable inventory' and how long FEI believes it can sustain having the inventory on record and how long it may take to sell the balance.

Response:

Please refer to the responses to BCUC IRs 1.64.1 and 1.70.2.

27.5 Please identify what FEI would consider to be a maximum inventory to carry.

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1 **Response:**

2 Please refer to the response to BCUC IR 1.70.2.

3

4

5

6 27.6 Please provide the cost per GJ to bank volumes of Biomethane and sell it later,
7 with specific reference to the time value of the banked Biomethane.

8

9 **Response:**

10 Under the current model and the limited volume of Biomethane supply, FEI does not incur any
11 costs related to carrying the banked Biomethane, which are actually just banked notional
12 Biomethane attributes. The value of notional Biomethane inventory is contained within the BVA,
13 which is a non-rate base deferral account, and FEI is not booking AFUDC on the notional
14 balance of the inventory.

15 The physical Biomethane gas is consumed downstream of the various injection points on the
16 FEI distribution system and the notional Biomethane attributes are what are banked and sold to
17 those customers electing to enroll in the Biomethane Program.

18 At this point in time, the biomethane volumes are very small and not material enough for FEI to
19 consider shedding other supply resources to meet core customer load requirements. In the
20 future, should the biomethane volumes become material in terms of FEI's total resource
21 portfolio, FEI would consider shedding some regular gas supply resources. However, the
22 biomethane supply volumes would have to be consistent and reliable on a daily basis,
23 particularly during peak winter demand periods, before any portfolio changes would be made.

24

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**28. Reference: Exhibit B-1, Application Page 77, Section 5.7, Bio-methane Review,
Review of Lost Projects**

5.7 Review of Lost Projects

Even though Biomethane delivers more energy to customers, providing a societal benefit, developers are choosing to develop electricity projects. FEI believes that the current uncertainty regarding the permanency of the Biomethane program creates a perceived regulatory hurdle for developers. This perceived hurdle has led to lost projects. This was evident in the post-decision discussions with Harvest and Wastech. Approval of a permanent Biomethane Program would remove the regulatory uncertainty and allow proponents to choose between electricity and Biomethane options based on the substantial merits of the options.

28.1 Please describe all the alternative options for the “lost projects” in relation to working with FEI. Where do they take their energy for sale and why?

Response:

The alternative options for the “lost projects” involved the sale of electricity to BC Hydro in both cases. Harvest qualified for a Power Purchase Agreement with BC Hydro under the Community Based Biomass Electricity Call and Wastech has chosen to use the Standing Offer Program to sell to BC Hydro as well. FEI is not aware of other options beyond selling electricity to BC Hydro that may have been considered by these parties.

Harvest revealed that a contributing factor in its decision was to work with a known and established program rather than contending with the uncertainty in the regulatory process for the biomethane program, even though the sale to BC Hydro did not provide a better business case. With respect to Wastech, it was stated that the regulatory approval process involved too much uncertainty (Please see Exhibit B-1, p.78).

28.2 Please provide evidence of where any lost projects may be re-directed.

Response:

FEI is unsure of what is meant by the question. There are a limited number of possible alternatives that may be considered for raw biogas: simple flaring, producing electricity, upgrading to biomethane and injecting into the natural gas system, or upgrading to biomethane and then used locally for purposes such as CNG vehicle fuel. In some cases the waste heat and CO2 produced from the combustion of biogas can be put to useful purposes in the immediate

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vicinity of biogas production facility. The options or combinations of options that exist for any particular biogas source are to some degree unique to the particular locale and the nature of the project.

28.3 Assuming the alternative for the “lost projects” is to sell to BC Hydro, please explain why FortisBC Inc. is or is not purchasing electrical energy from these sources.

Response:

As discussed in its most recent long term resource plan, FortisBC Inc. (FBC), the electric distribution utility, is not seeking to build or contract for any incremental long term resources to meet its requirements in the near to medium term (the next 5 to 10 years). In the longer term, however, FBC expects to need to add additional energy and capacity resources, and would consider electricity sourced from biomass or biomethane projects among its other resource options at that time. FBC may also consider contracting for electricity from such projects if the power can cost-effectively displace current contracted resources or if customers have requested a new power supply service option based on these resources against which any incremental costs could be recovered.

28.4 Please explain whether or not these projects are going to the BC Hydro standing offer program and or whether or not they are going into Bio-energy Call programs at BC Hydro and if not these programs please explain the other options in detail.

Response:

Please refer to Exhibit B-1, p. 78-79.

Wastech was able to use the Standing Offer Program and Harvest qualified for a Power Purchase Agreement with BC Hydro under the Community Based Biomass Electricity Call.

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28.5 Assuming these “lost projects” are getting into the BC Hydro purchases, please provide whatever understanding FEI has with respect to the prices being offered through the BC Hydro programs and or if they are lost to other than BC Hydro the prices of the alternative being selected.

Response:

FEI has not tracked the projects in terms of the prices being offered under the BC Hydro programs. However the Standing Offer Program currently has a price of \$97.02 / MWh (2010\$) for projects in the Kelly / Nicola region where the Wastech project is located. This is approximately \$27/GJ. This price is subject to inflation at 100 percent of CPI annually before contract signing and 50 percent of CPI annually after contract signing. FEI is unfamiliar with how pricing was finalized in the Community Based Biomass (CBB) Power Call. The BC Hydro website states “...contract terms and prices have not been pre-determined and will be specific to a project...”¹ Although FEI has no direct evidence, it believes that the prices established under the CBB process are likely somewhat higher than those set for the Standing Offer Program based on the fact that another recent bioenergy power call of BC Hydro’s, the Bioenergy Phase 2 Call RFP, allowed for pricing of up to \$150 per MWh.

28.6 Again assuming the “lost projects” are getting into the BC Hydro purchases please provide the known information with respect to BC Hydro’s load resource balance for the next 20 years, at this time taken from their Integrated Resource Planning (IRP) documents filed with the provincial government and explicitly show the BC Hydro surplus and the Mid-C market prices for energy expected by BC Hydro.

Response:

BC Hydro’s forecast load resource balance for the next 20 years is copied below in Figure 2-6. This chart is taken from Chapter 2 of the BC Hydro draft 2012 integrated resource plan found at the following webpage:

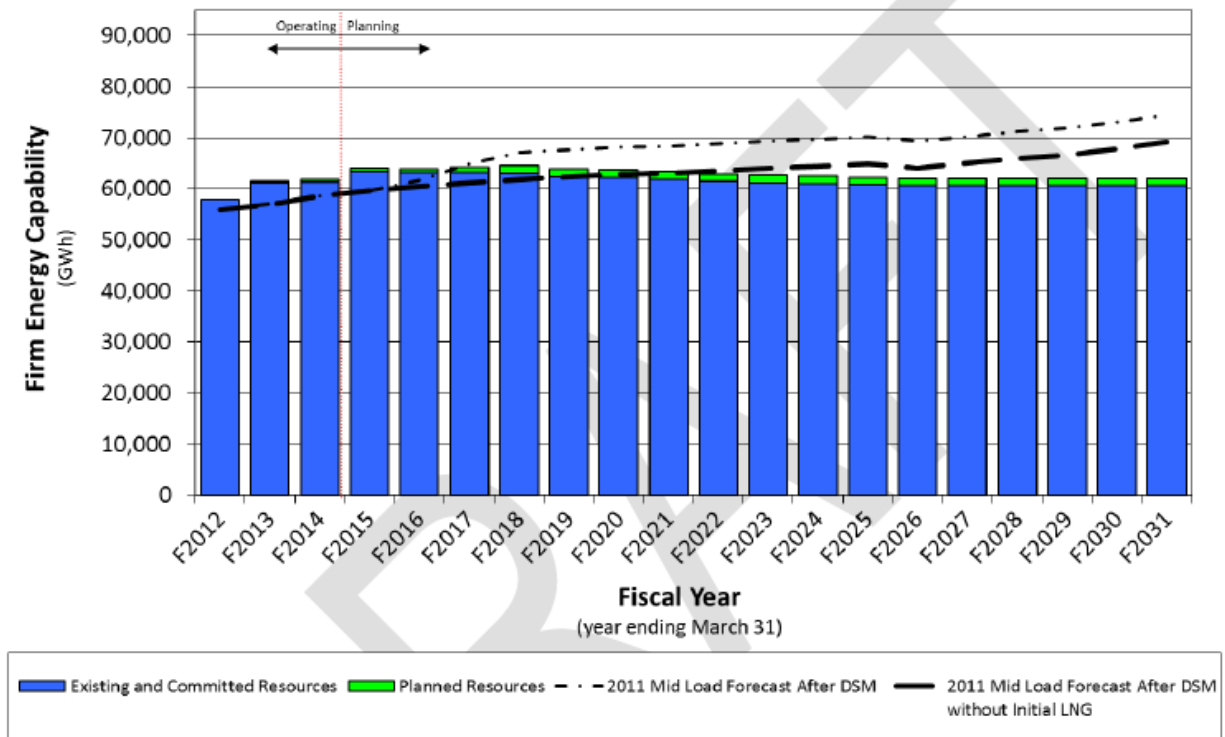
https://www.bchydro.com/energy-in-bc/meeting_demand_growth/irp/document_centre/reports/draft_irp.html

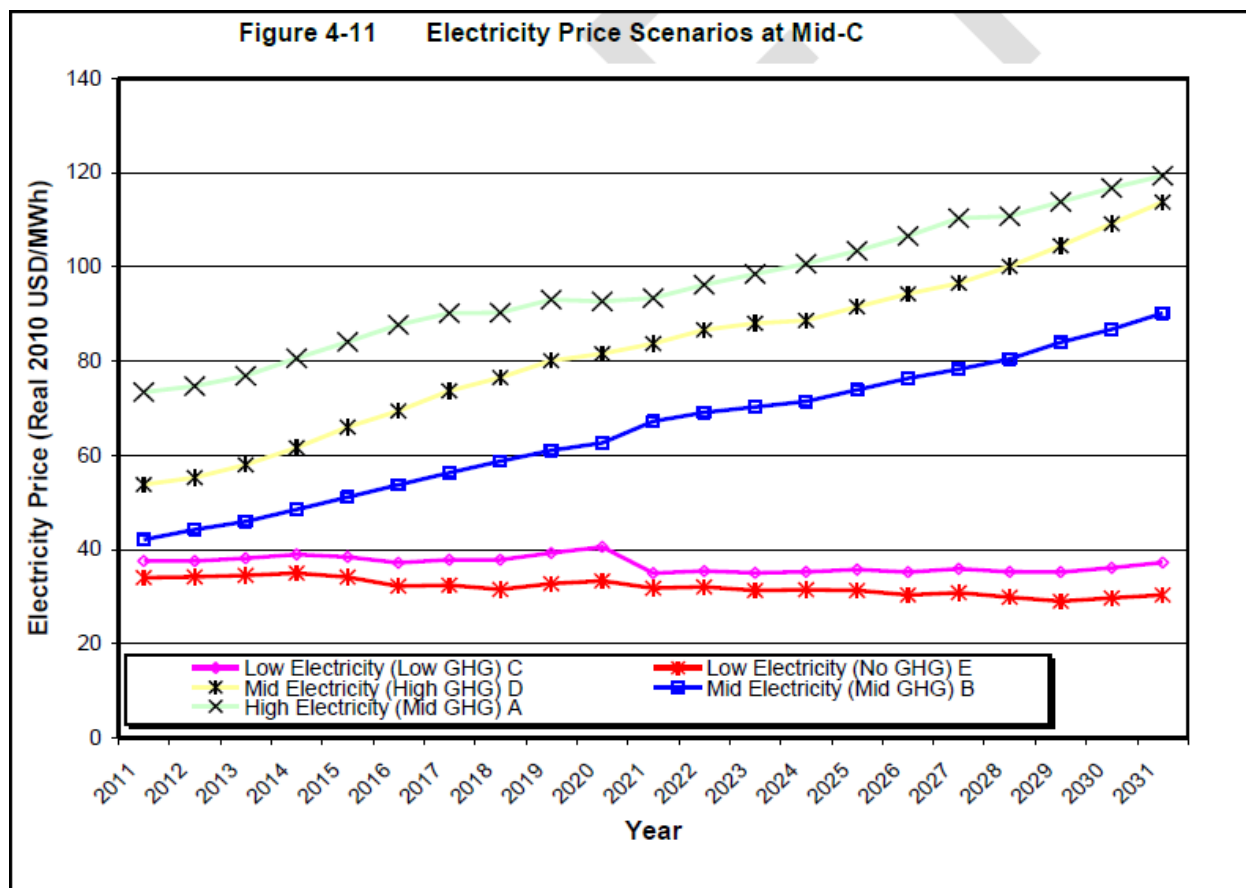
¹ https://www.bchydro.com/energy-in-bc/acquiring_power/closed_offerings/cbb_rfq/gas.html (Question 12)

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- 1 The Mid-C market price forecasts are found at the same webpage in Chapter 4, section 4.6.3.
- 2 The various Mid-C forecast scenarios are depicted graphically in Figure 4-11 and numerically in
- 3 Table 4-8.

Figure 2-6 Energy Load/Resource Balance





28.7 Please confirm that selling the GJ from the “lost projects” to customers willing to pay a premium for green energy versus selling power to BC Hydro or the alternative being selected by the “lost projects” is more profitable for the provincial or combined customer average than selling to FEI’s RNG program but from a provincial point of view has the potential to be a substantial economic loss.

Response:

Whether using biogas to produce electricity and selling to BC Hydro is more profitable for the project proponent than upgrading to biomethane and selling to FEI will vary from case to case depending on the specific circumstances of the project. Project proponents of the “lost projects” were, in FEI’s understanding, swayed towards producing electricity by the uncertain regulatory

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approval process if they were to pursue the biomethane alternative that did not exist with the electricity option.

From the broader provincial point of view there are several considerations which point to the conclusion that using the biogas resources to produce biomethane is better from an economic (and environmental) perspective than producing electricity:

- Producing biomethane from biogas is a less costly form of energy than making electricity. This can be seen from a simple comparison of the relative price paid for electricity under the Standing Offer Program compared to the cost of biomethane. The current SOP pricing for the Lower Mainland is in the range of \$109/MWh (\$103.69/MWh in 2010\$ plus 3 years of inflation) which is approximately \$30/GJ. Biomethane on the other hand is in the range of \$12 – \$14/GJ. Even after accounting for appliance efficiency differences at the end use, the biomethane option is still in the range of half to two thirds of the cost of electricity from the consumer's perspective.

Please refer to the response to CEC IR 1.29.3 which provides a more detailed analysis of from the consumer's perspective of biogas being used for electricity versus biomethane. The analysis confirms that from a provincial energy consumer point of view, an energy customer will pay a higher price for energy if biogas is converted to electricity (option #1) than if biomethane is produced and injected into the FEI distribution system (option #2). Therefore it is more cost effective for energy consumers in British Columbia to have the "lost projects" on the FEI system and losing these projects to BC Hydro results in an economic loss. The high cost of biogas produced electricity is borne by all BC Hydro electricity customers, while most of the costs associated with biomethane are borne by customers in the voluntary biomethane program. The fact that FEI's RNG customers are willing to pay a premium for the biomethane they receive simply increases the benefit of option #2 overall.

- In addition to the economic benefit of lower cost energy described above, another consideration when looking at the value difference and the potential economic loss is to recognize that using biogas to make biomethane creates more end use energy than making electricity. As shown in Exhibit B-1, Table 5-9, p.77, biomethane delivers more than 2 times more energy to the system from a given quantity of raw biogas energy than electricity does. Therefore biomethane provides the highest and best use of energy from the source. After consideration of end use efficiency differences, Table 5-10 illustrates that biomethane has a greater amount of "remaining" energy and therefore creates greater social and environmental benefits (such as greater GHG emission reductions) than producing electricity.
- A third consideration is related economic loss for British Columbia related to biogas-based electricity being generated when the BC Hydro system is in a surplus. This may

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result in losses from having to sell the power into soft markets (discussed further in the response to CEC IR 1.28.8).

28.8 Please provide any analysis FEI can provide to quantify the loss of economic value to the province created by the “lost projects” and the potential future “lost projects” if they are not developed and sold into FEI where they have a time frame possibility of attracting premium fees for the product.

Response:

FEI has not done an analysis on the loss of economic value to the province overall from the current and future “lost projects” specifically but has analyzed the economic value difference for the BC energy consumer of an illustrative example case in the response to CEC IR 1.29.3. The response to CEC IR 1.29.3 demonstrates that an economic benefit results if biomethane is made from the biogas resource and injected into the FEI system rather than converting the biogas to electricity.

However, FEI is also aware of the concern that using the biogas resource to produce electricity to sell to BC Hydro when there is a situation of surplus electricity supply may result in net losses to the BC electricity consumer when in low demand periods the power has to be resold by BC Hydro at market prices that are below the price being paid for the electricity (through programs such as the SOP) to the biogas-based IPP. On the other hand, if the biogas is upgraded to biomethane the premium paid by RNG customers recovers the incremental commodity costs of the biomethane relative to natural gas. There is therefore not a loss similar to what may occur with electricity sales to BC Hydro.

28.9 Please quantify the net present value benefit, from a provincial perspective, for using the RNG from the available and potential projects versus having them all move into the “lost project” column.

Response:

Please refer to the responses to CEC IRs 1.28.8 and 1.29.3.

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28.10 Please distinguish between the FEI RNG program selling at some point in the future to willing customer for the “green premium” and the BC Hydro buy from IPP program and sell into the Mid-C market the surplus energy at a loss.

Response:

Please refer to the response to CEC IR 1.28.7.

28.11 Please describe and quantify the “public interest” involved in getting the RNG program to a point of success versus having continued sales of these opportunities to BC Hydro or other alternative sales for the “lost projects”.

Response:

As demonstrated in the response to CEC IR 1.29.3, there is greater economic value for the provincial energy consumer and the “public interest” is better served if biogas is used for biomethane and injected into the FEI system rather than producing electricity into the BC Hydro system.

Therefore FEI believes that advancing the RNG program to a more mature state so that producing biomethane is viewed as a viable and even preferred option to producing electricity will serve valuable public interest purposes. To summarize the benefits are:

- Greater economic value for the provincial energy consumer from lower cost biomethane rather than producing higher cost electricity from biogas;
- Producing biomethane rather than electricity will make better use of the biogas resources by producing more end use energy to displace conventional energy use;
- Producing biomethane will better achieve provincial energy objectives and produce greater GHG emission reductions; and
- Producing biomethane will help to mitigate the cost pressures from adding new higher cost supply resources in the electricity sector and avoid the potential losses linked to being in a surplus electricity supply situation.

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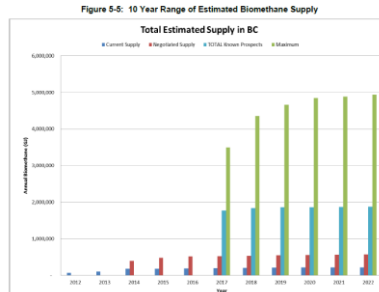
28.12 Please advise whether or not any of the “lost projects” can be re-couped or whether they are permanently lost.

Response:

While the information available on BC Hydro’s website for these two projects does not indicate that their review processes are finalized or that they have been awarded EPAs as yet, it is FEI’s understanding that these proponents intend to continue pursuing an electricity purchase agreement with BC Hydro. As neither party has expressed interest in re-opening discussions in regard to pursuing a biomethane agreement FEI believes these two projects should be considered permanently lost.

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1 **29. Reference: Exhibit B-1, Application, Page 79**



2

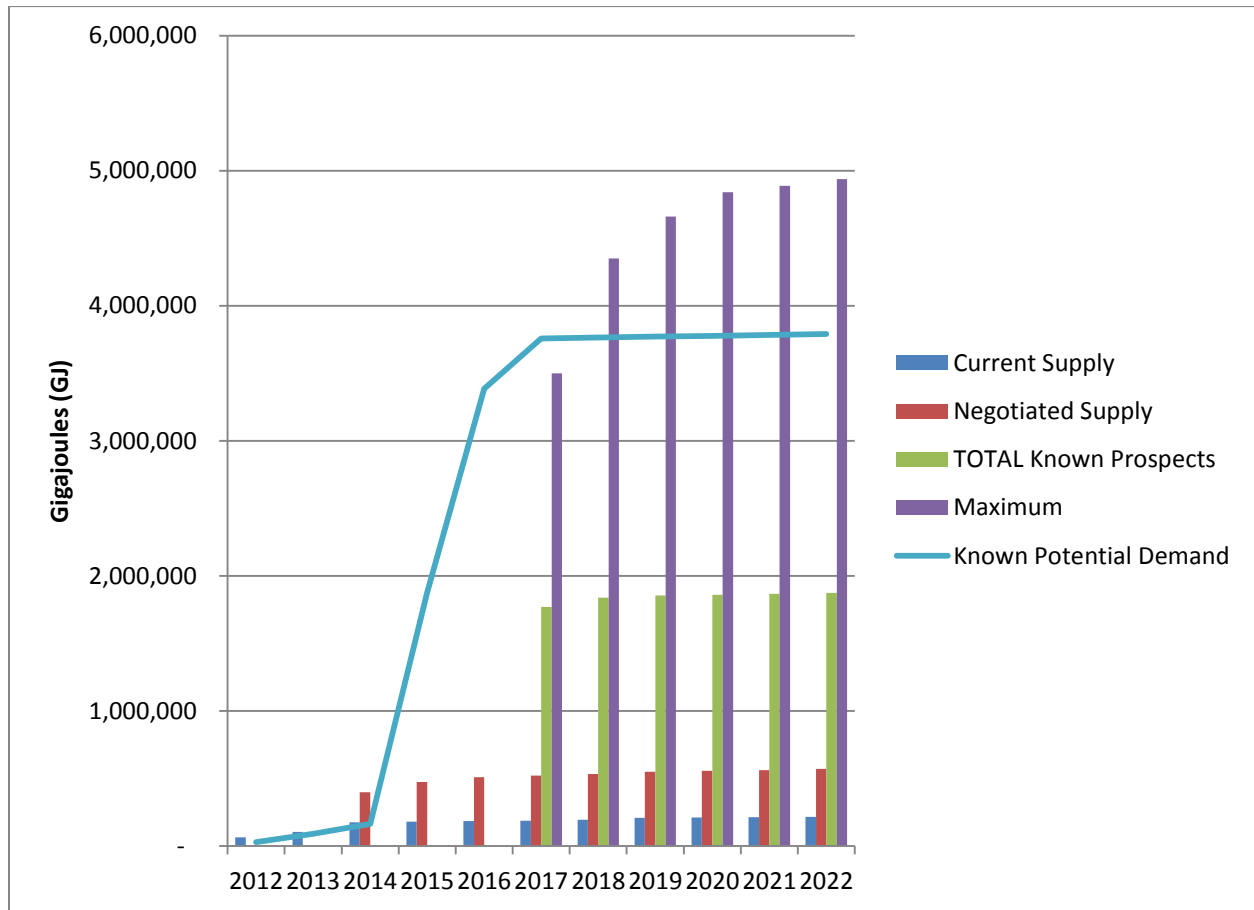
3 29.1 Please match the range of estimated supply for BC to the estimated demand for
4 RNG for BC.

5

6 **Response:**

7 The chart below matches estimated supply for BC to the estimated demand for RNG. Matching
8 Exhibit B-1, Figure 5-5 to Exhibit B-1, Figure 4-1.

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29.2 Please fully describe, including with quantitative analysis, the potential for FEI to mitigate and manage the potential for over supply risk.

Response:

As discussed in Section 8.2.2 of the Application, FEI has identified several activities it could undertake to mitigate the risk associated with an over-supply of biomethane in the event of higher than expected production, under-subscription by customers, or by a lag between supply and when actual demand comes online. These activities are: (i) notionally banking the over-supply of biomethane and selling it at a later time, (ii) selling to third parties through an off-system transaction, or (iii) sales to on-system customers through Rate Schedule 11B.

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FEI expects to be able to sell all of the Biomethane supply through the Biomethane Program. However, should some unforeseen circumstance occur whereby FEI was not able to sell all of the Biomethane supply at the BERC rate, FEI believes the environmental attributes of the Biomethane would still command a premium in the marketplace. For example, the value of the Carbon Tax offset alone for Biomethane in BC is currently approx. \$1.50 per GJ.

If there were a circumstance of inventory in the BVA that FEI was not able to sell at the BERC rate or through the other risk mitigation measures, FEI proposes that it would, at such time, file an application that would propose that the notional inventory in the BVA be incorporated into FEI's supply portfolio to serve all customers and costs recovered through the MCRA. Please refer to the response to BCUC IR 1.70.2 for further details.

Please refer to the response to CEC IR 1.27.2 for the quantitative analysis for the rate impact to commercial customers.

29.3 Please compare and contrast, quantitatively as much as possible, the FEI over supply risk properly managed, with the potential risk to BC gas and electric customers of having the potential supply move to BC Hydro or some such other alternative, under the current known conditions.

Response:

A biomethane supply project has two options to consider: 1) Convert biomethane to electricity and sell the power to BC Hydro; 2) Upgrade the biomethane and sell to FEI. We have compared the two options from an electric / gas company point of view, assuming both types of energy are used to heat homes.

Electric Option: Convert biomethane to electricity and sell power to BC Hydro. Electricity is used for residential heating.

Supply Size: Assume a typical supply project to be in the 200TJ range. Since upgrading biomethane is more efficient than electric generation, the electric option has to start with a 391TJ supply to match the energy available from biomethane upgrading.

Term: 20 years based on the average biomethane supply contract term.

Electric Price: Electricity sold to BC Hydro under the current Standing Offer Program

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1 Generator Efficiency: 35.8% efficiency based on Caterpillar G3516 Generator for landfill
2 gas.

3 Home Heating Efficiency: 100% for electric baseboard heating
4

5 **Biomethane Upgrade Option:** Upgrade biomethane and sell gas to FEI. Gas is used for
6 residential heating.

7 Supply Size: Assume a typical supply project to be in the 200TJ range.

8 Term: 20 years based on the average biomethane supply contract term.

9 Gas Price: Price based on the forecasted BERC rate contained in the response to BCUC
10 IR 1.72.2 (moderate demand / negotiated supply).

11 Upgrader Efficiency: 76% efficiency based on 85% recovery and 90% efficiency.

12 Home Heating Efficiency: 92% for high efficiency home furnace.
13

14 **Comparison of Options:** If a biomethane developer decides to generate and sell power to BC
15 Hydro instead of selling upgraded gas to FEI, the additional cost to provide the same energy for
16 residential heating, results in the electric option costing \$20.9 million more than the gas option in
17 NPV terms over twenty years (line 31 of the attached table).
18

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CEC IR1, 29.3: Comparison of Biomethane to Electricity from Electric / Gas Company Point of View

	Reference	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
1	Convert Biomethane to Electricity, Sell to BC Hydro, Home Heating using Electric Baseboard										
2	Generator Plant										
3	Available Raw Energy (TJ)	Note 3	391	391	391	391	391	391	391	391	391
4	Efficiency Factor - Power Generation	Note 1	0.358	0.358	0.358	0.358	0.358	0.358	0.358	0.358	0.358
5	Remaining Energy at Plant Gate (TJ)	Line 3 * Line 4	140	140	140	140	140	140	140	140	140
6	kWh / GJ Conversion	Note 4	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036
7	Remaining Energy at Plant Gate (GWh)	Line 5 / Line 6 / 1000	39	39	39	39	39	39	39	39	39
8	Home Heating										
9	Electric Baseboard Efficiency Factor		1	1	1	1	1	1	1	1	1
10	Remaining Energy at Home (GWh)	Line 7 * Line 9	39	39	39	39	39	39	39	39	39
11	Cost to Electric Company										
12	SOP Price (2017) \$/MWh	Note 5	114.4	115.6	116.7	117.9	119.1	120.3	121.5	122.7	123.9
13	Total Cost '000\$	Line 7 * Line 12	4,445	4,490	4,535	4,580	4,626	4,672	4,719	4,766	4,814
14	Biomethane Upgrading, Sell to FortisBC, Home Heating using Gas Furnace										
15	Upgrading Plant										
16	Available Raw Energy (TJ)	Note 3	200	200	200	200	200	200	200	200	200
17	Efficiency Factor - Upgrader	Note 2	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
18	Remaining Energy at Plant Gate TJ	Line 16 * Line 17	152	152	152	152	152	152	152	152	152
19	Home Heating										
20	Gas Furnace Efficiency factor		0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
21	Remaining Energy at Home (TJ)	Line 18 * Line 20	140	140	140	140	140	140	140	140	140
22	Cost to Gas Company										
23	Biomethane Price \$/GJ	Note 6	14.54	15.26	16.09	16.86	17.58	18.29	18.47	18.84	19.22
24	Total Cost '000\$	Line 18 * Line 23	2,209	2,320	2,446	2,562	2,672	2,780	2,808	2,864	2,921
25											
26	Cost Difference Electric - Gas '000\$	Line 13 - Line 24	2,236	2,170	2,089	2,018	1,953	1,892	1,911	1,902	1,892
27											
28	Discount Rate	Note 7	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068
29	Discount Period (Years)		1	2	3	4	5	6	7	8	9
30	Annual PV '000\$	Line 26 (1+Line 28)^(Line 29)	2,093	1,902	1,714	1,550	1,405	1,274	1,205	1,122	973
31	NPV of Cost Difference '000\$	Sum Line 30 2017 to year	2,093	3,995	5,709	7,260	8,665	9,938	11,143	12,265	13,311

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CEC IR1, 29.3: Comparison of Biomethane to Electricity from Electric / Gas Company Point of View (Continued)

	Reference	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
1	Convert Biomethane to Electricity, Sell to BC Hydro, Home Heating using Electric Baseboard										
2	Generator Plant										
3	Available Raw Energy (TJ)	Note 3	391	391	391	391	391	391	391	391	391
4	Efficiency Factor - Power Generation	Note 1	0.358	0.358	0.358	0.358	0.358	0.358	0.358	0.358	0.358
5	Remaining Energy at Plant Gate (TJ)	Line 3 * Line 4	140	140	140	140	140	140	140	140	140
6	kWh / GJ Conversion	Note 4	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036
7	Remaining Energy at Plant Gate (GWh)	Line 5 / Line 6 / 1000	39	39	39	39	39	39	39	39	39
8	Home Heating										
9	Electric Baseboard Efficiency Factor		1	1	1	1	1	1	1	1	1
10	Remaining Energy at Home (GWh)	Line 7 * Line 9	39	39	39	39	39	39	39	39	39
11	Cost to Electric Company										
12	SOP Price (2017) \$/MWh	Note 5	126.4	127.7	129.0	130.2	131.5	132.9	134.2	135.5	136.9
13	Total Cost '000\$	Line 7 * Line 12	4,910	4,960	5,009	5,059	5,110	5,161	5,212	5,265	5,370
14	Biomethane Upgrading, Sell to FortisBC, Home Heating using Gas Furnace										
15	Upgrading Plant										
16	Available Raw Energy (TJ)	Note 3	200	200	200	200	200	200	200	200	200
17	Efficiency Factor - Upgrader	Note 2	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
18	Remaining Energy at Plant Gate TJ	Line 16 * Line 17	152	152	152	152	152	152	152	152	152
19	Home Heating										
20	Gas Furnace Efficiency factor		0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
21	Remaining Energy at Home (TJ)	Line 18 * Line 20	140	140	140	140	140	140	140	140	140
22	Cost to Gas Company										
23	Biomethane Price \$/GJ	Note 6	20.00	20.40	20.80	21.22	21.64	22.08	22.52	23.43	23.90
24	Total Cost '000\$	Line 18 * Line 23	3,039	3,100	3,162	3,225	3,290	3,356	3,423	3,561	3,632
25											
26	Cost Difference Electric - Gas '000\$	Line 13 - Line 24	1,871	1,859	1,847	1,834	1,820	1,805	1,790	1,773	1,738
27											
28	Discount Rate	Note 7	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068
29	Discount Period (Years)		11	12	13	14	15	16	17	18	20
30	Annual PV '000\$	Line 26 (1+Line 28)^(Line 29)	906	843	784	729	677	629	583	541	465
31	NPV of Cost Difference '000\$	Sum Line 30 2017 to year	15,190	16,033	16,817	17,546	18,223	18,851	19,435	19,976	20,943

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Notes:

- 1: Caterpillar G3516 Generator for Landfill Gas found on data sheet (Company Website)
- 2: 85% recovery, 90% efficiency based on quotation from ARC Technologies
- 3: Electric generation requires a greater amount of raw biomethane to equate with amounts from biomethane upgrading
- 4: 1 kWh = 0.0036 GJ
- 5: BC Hydro Standing Offer Program - Program Rules Version 2.2 March 2013, adjusted for 2017 start, Price escalation based on 50% of 2% CPI / year
- 6: 2017-22 based on biomethane forecast BERC rate (BCUC IR1, 72.2, moderate demand / negotiated supply), 2023+ inflated at 2%/year
- 7: 2013 FEI After-Tax WACC, Capital structure and rates based on BCUC Order No G-44-12, Tax Rate = 25%

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1 **30. Reference: Exhibit B-1, Application, Page 32**

2 **2.2.2 WORKING WITH LOCAL GOVERNMENTS AND LANDFILLS**

Many of the logical partners for FEI in the development of Biomethane projects are municipalities or regional districts. This is because landfills and sewage treatment facilities owned and/or operated by municipalities or regional districts are often excellent sources of raw Biogas. This Biogas presently represents a GHG emission liability for local governments due to their commitment to reduce GHG emissions. The capture of Biogas, and its upgrading to pipeline quality Biomethane, can help local governments generate revenue and meet the municipal GHG emission reduction targets through the beneficial use of waste methane rather than flaring it. Established examples of projects with municipalities or regional districts are CSRD landfill Biogas project and the Kelowna landfill Biogas project. In addition, Metro Vancouver and the City of Surrey have demonstrated a strong interest to work with FEI to develop local Biomethane projects.

In the case of landfills, provincial government policy specifically requires the collection and destruction of landfill gas. This means that local governments either already have gas collection systems in place or they are required to put gas collection systems in place at their landfills within a certain timeframe. Therefore, the result of this provincial policy is the creation of several new sources of energy. The Biomethane Program is a specific way in which these local governments can partner with FEI to find a use for energy that is available and would otherwise go to waste

30.1 How many municipalities and regional districts in BC could reasonably be considered as possible partners for FEI?

Response:

There are a total of 29 regional districts within BC, and only about 15 clearly overlap the FEI service territory and have a significant population. There are 25 municipalities with a population over 15,000. There are probably approximately 20 (and a maximum of approximately 40) municipalities and regional districts that could reasonably be considered to be possible partners for FEI.

Of these municipalities FEI does not have an accurate count of wastewater plants that have existing digesters or that would consider building digesters. It is likely that there are only a few based upon the relative population of municipalities in BC. One clear opportunity is on Vancouver Island with the CRD. According to its website, utilization of biogas is a priority for CRD and one clear option is biomethane production either for vehicles or injection.

There are 35 landfills in BC, and 18 of them are as big as or larger than the Salmon Arm landfill which FEI considers to be one of the smallest economically viable landfills for upgrading. If

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existing landfills with projects are excluded there are 10 remaining. FEI has not confirmed accessibility to pipelines, but expects that many will be within a reasonable distance of population centers.

30.2 Please provide an approximation of the number of landfill and sewage treatment facilities that may be available as potential suppliers of biogas for FEI.

Response:

Please refer to the response to CEC IR 1.30.1.

30.3 Please identify all the options such as flaring, working with FEI to develop local Biomethane projects, working with BC Hydro to provide electricity or others that a landfill might reasonably consider to meet the provincial government policy requirements of collecting and destroying landfill gas.

Response:

FEI understands that landfills either are or will be required to collect and “destroy” a certain portion of the methane generated from buried waste. Typically, this is done by flaring.

There are three general options for utilizing the gas rather than simply flaring it on site. Each option essentially replaces the flare and provides the benefit of either displacing heat or electricity. FEI has not done a financial analysis of options other than the biomethane option, but has commented on the relative capital and expected revenue of each of the options.

1. Direct Use: Landfill gas can be directed to a boiler or furnace nearby via pipeline and burned directly with very little gas processing. This option can be very cost effective because it does not require gas processing equipment, but it requires a load to be in close proximity. FEI knows of two landfills in BC where this option was used – in both cases the user of the gas is no longer in business and the landfills are flaring again. It also requires construction of a pipeline to transmit the thermal energy from combustion, which can be cost prohibitive very quickly, if the load is not very close. Because the gas is not cleaned, the user may incur additional costs associated with equipment maintenance (due to fouling) and the consistency of the heating value is not good.

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Typically the gas is valued below natural gas costs because it is perceived as inferior to Natural Gas.

2. Biomethane: This option is the subject of this application. This option is relatively capital intensive. An advantage of this option is the access to the existing natural gas system and the relative cost vs. electricity. The gas can be used anywhere on the FEI system (by displacement). The revenues of this option are comparable to an electricity project and both CSRD and Kelowna have commented that FEI is a desirable partner due to its expertise in gas equipment, broad presence, ability to supply RNG back and cooperativeness.

3. Electricity: This option also requires upfront capital, but is generally less than the biomethane option. However due to the typical low efficiency (a result of being unable to use the heat), this option is either less favorable or similar to the biomethane option in regard to revenues.

30.3.1 Please provide a list of the advantages and disadvantages that a landfill owner would reasonably perceive as associated with each option.

Response:

Please refer to the response to CEC IR 1.30.3. In addition to the issues listed in that response there has been an advantage in pursuing an electricity contract in that the regulatory process has been settled and has removed the uncertainty for project proponents about whether their contracts will be approved by the Commission or not.

30.3.2 Please provide a calculation of the relative capital costs that a landfill owner could reasonably anticipate from pursuing any of the options with explanations.

Response:

Please refer to the response to CEC IR 1.30.3.

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30.3.3 Please provide an estimate of the relative value of revenue streams that a landfill owner could reasonably anticipate from pursuing any of the options and provide explanations.

Response:

Please refer to the response to CEC IR 1.30.3.

30.4 Please identify any other types of logical partners in BC that FEI would envision working with over the next 10 years to develop supply and provide an estimate of the number of additional supply opportunities this may create for FEI.

Response:

Given the line of questions from CEC IR 1.30.1 through 30.3 addresses the municipal and landfill opportunities and potential partners in terms of municipal districts, FEI interprets this question as being focused on partners we might work with in other biomethane supply projects. (i.e. non- landfill or waste water treatment plants)

For these projects, FEI would expect to see a similar pattern to what it has experienced to date. Future partners will likely be made up of entrepreneurs. This broadly includes energy developers, farmers, agriculture or food related industry.

At this time, FEI cannot accurately estimate the number of possible opportunities. As a rough estimate FEI would expect to have about 20 to 30 projects of this nature over the next 10 years.

30.4.1 Please identify the key motivations that would be driving these types of partners to develop biogas projects and the criteria they might be expected to use to assess their options.

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1 **Response:**

2 The category of developers mentioned above in the response to CEC IR 1.30.4, would likely be
3 motivated by a number of factors. In its experience, FEI has seen sustainability and local job
4 creation as motivators provided that a project can be executed economically (with a reasonable
5 return).

6 A clear price range, better defined application and approval process and regulatory certainty will
7 be required to see these developers move forward. In addition, FEI believes that the success of
8 the current approved projects will factor into future decisions for developers to move forward.

9

10

11

12 30.5 What is the time frame in which gas collection systems must be in place for
13 landfills?

14

15 **Response:**

16 FEI understands that the deadline related to gas collection in the Landfill Regulation is the
17 beginning of the year 2016.

18

19

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1 **31. Reference: Exhibit B-1, Application, Page 40**

During the 6 months the program was active in 2011, the program saw 1,158 residential customer enrolments, with a drop rate of 6%. As of December 1, 2012 the program had enrolled an additional 3,764 residential customers and experienced a drop rate of 7.6%. Due to the complexity of the billing and reporting systems, it is extremely difficult to separate drops, moves, transfers, and disconnections. Based on a sample of 175 dropped accounts, only 20% of those accounts sampled requested to be removed from the RNG Offering, the other drops were predominantly a result of a customer moving. Given this information, the Company believes a drop rate of 1% in 2011 and 1.5% in 2012, more accurately portrays the true drops of the program, i.e. – those that returned back to the standard rate. FEI has therefore used these drop rates in its future forecasts. In both scenarios the RNG Offerings attrition rate is in line with

31.1 Has there been any drop from commercial customers?

Response:

Yes.

31.2 If so, please provide the drop rate and the industry segments in which they occurred.

Response:

The drop rate for commercial customers in 2012 was 6.8 percent. 80 percent of those customers that dropped from RNG moved out of their premise.

The drops occurred from various industry segments including commercial/office buildings, education, transportation, and construction.

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1 **32. Reference: Exhibit B-1, Application, Page 85 and Exhibit B-1, TGI 2010**
2 **Biomethane Application, Appendix L, CSRD Letter of Support**

As FEI indicated in the Biomethane Application, ownership of the upgrading facilities is sometimes necessary to secure supply for its customers, ensure a consistent and reliable supply of Biomethane, and provide a signal to the market that Biomethane projects can be undertaken with confidence by other project developers. FEI has experienced with two cases where ownership of upgrading facilities was necessary to ensure that Biomethane supply was developed for its customers.

1. **External capital investment will harvest more value from the landfill project.** Without Terasen's capital investment commitment, it is unlikely that the gas capture project at the landfill would have gone beyond the minimum requirements of simply capturing and flaring the gas generated at the landfill. As a regional district, capital budgets are difficult to increase when there is a direct influence on area taxes or fees.

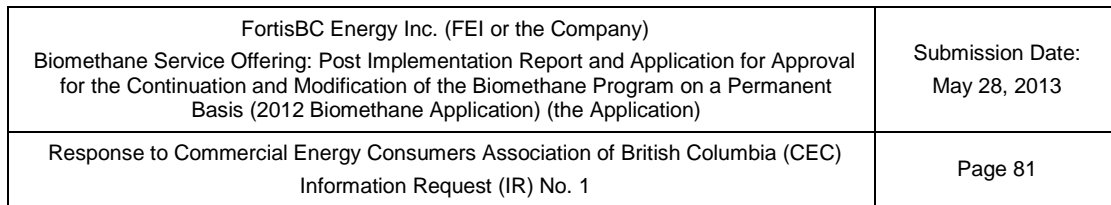
32.1 Please confirm that the necessity for FEI ownership of the upgrading facilities to which FEI is referring is related to the constraints on municipal or regional district capital budgets identified in the CSRD Letter of Support.

Response:

FEI can confirm that this is one aspect of the necessity of ownership of upgrading facilities. In addition, regional and municipal governments have indicated that FEI:

1. Provides expertise and competence for operating gas equipment;
2. Is subject to regulation and is therefore held accountable to external standards (trusted partner); and
3. Has an established service network.

32.1.1 Please identify any other factors influencing the ownership of upgrading facilities.



Please refer to response to CEC IR 1.32.1.

Response:

- Level of technical expertise, experience and competence of the third party;
- Financial stability of third party;
- Contractual complications that may arise by having three parties involved (landfill operator, upgrader operator and FEI);
- Potential for supply interruptions and no ability to control same; and
- Potential reputation risk to program if the operator runs into difficulties with respect to the project.

There may also be cases where a utilization project may not be undertaken at all. In this case, there would be a missed opportunity for the beneficial use of the gas.

32.2 Please confirm that in providing 'confidence' to project developers FEI is stating that the project developer's concern is with ensuring a continued demand for the biomethane they produce, or otherwise explain.

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1 **Response:**

2 In this context, FEI is indicating that developers need both ‘confidence’ that there is demand for
3 biomethane (a program) and ‘confidence’ that projects can be successfully developed (meet
4 technical specifications).

5 In addition, FEI is a well-recognized company with a broad base of operations in the province.
6 This provides ‘confidence’ that projects may potentially occur anywhere within the FEI service
7 territory.

8
9

10

11 32.3 Please explain how ownership of the upgrading facilities provides a signal to the
12 market that Biomethane projects can be undertaken with confidence.

13

14 **Response:**

15 FEI has addressed this concept in the response to CEC IR 1.32.2.

16
17

18

19 32.4 What, if any, are the other advantages that flow from FEI owning the upgrading
20 facilities?

21

22 **Response:**

23 FEI has addressed these advantages in the responses to CEC IRs 1.32.1 and 1.32.2. Please
24 also refer to the response to BCUC IR 1.51.2.

25
26

27

28 32.5 What advantages would flow from the model in which FEI does not own the
29 upgrading facilities?

30

31 **Response:**

32 The main advantage of FEI not being involved in the ownership of upgrading facilities is the
33 potential for stranded assets.

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1 In cases where FEI owns the upgrader, FEI identified that there is a potential for capital risk
2 associated with stranding. FEI addressed these risks in the 2010 Biomethane Application
3 (Sections 9.2.7 and 11.3) There is minimal risk of stranding an upgrader, as these assets can
4 be mounted onto skids and redeployed to another location, or sold, should the need arise.
5 However, in cases where FEI does not own the upgrader, FEI believes that suppliers will
6 incorporate any risk they bear in the form of higher biomethane prices.

7 A potential further advantage might be development of additional technologies for upgrading
8 biogas. FEI is by nature a conservative organization with a low tolerance for technology risk
9 and other parties may have a higher risk tolerance with respect to trialing new gas purification
10 technologies. This of course would introduce a level of program risk as the supply project may
11 or may not perform to expectations.

12

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1 **33. Reference: Exhibit B-1, Application, Page 70**

2 2. Gas Specification: FEI used gas composition data as a basis for acceptance in the
3 landfill gas purchase contract with Kelowna. Only gas which meets the raw landfill gas
4 specification will be purchased. This provides confidence that equipment selected for the
5 project will operate as expected.

6 33.1 Will FEI require Gas Specifications in all its contracts for projects in which it owns
7 the upgrading facilities?

8 **Response:**

9 Yes. This will ensure that FEI upgrading equipment will function appropriately to ensure pipeline
10 quality biomethane can be produced.

11 33.1.1 If not, please explain how FEI will ensure that its equipment will operate
12 as required in the event the gas does not meet the anticipated
13 specifications.

14 **Response:**

15 Please refer to the response to CEC IR 1.33.1.

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34. Reference: Exhibit B-1, Application, Pages 70 and 71

the cost of service of the upgrader plant. Under the terms of the Agreement FEI is obligated to make a royalty payment to CSRD based upon the total amount of Biomethane delivered to the

FEI system up to the maximum volume. FEI is not obligated to make a minimum purchase. In the event of default, CSRD is obligated to make a payment to FEI to cover the value of stranded assets.

34.1 Is FEI required to make a minimum purchase in any of its other agreements?

Response:

In all of its contracts, FEI only purchases gas that meets the required specification. This question contemplates the case where the supplier is in default. In this case the minimum purchase obligations do not apply. FEI's obligations only apply if the supplier has met his obligations including delivering biomethane that meets specifications.

34.1.1 If so, please identify the minimums specified in each contract.

Response:

Please refer to the response to CEC IR 1.34.1.

34.2 Does FEI have a policy with respect to contracting for minimum purchases, and if so, what is it?

Response:

FEI does not have a specific policy with respect to minimum purchases of biomethane. FEI's approach to contracting recognizes that the biomethane supplier needs to have a contracted revenue stream in order to justify the investment in the project. The minimum purchase commitment provides the supplier with this benefit and it also allows FEI a level of confidence in

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- 1 the amount of supply that will be delivered to the biomethane program. This is important in
- 2 order to be able to have sufficient supply to meet demand.
- 3 The minimum purchase commitment does not apply if the product does not meet the
- 4 biomethane specification.
- 5

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1 **35. Reference: Exhibit B-1, Application, Pages 75 and 76**

The actual / projected costs for the Fraser Valley Biogas and Salmon Arm Landfill which total \$1.013 million is expected to be approximately \$257 thousand less than forecasted in the Biomethane Application and in the 2012 -2013 Revenue Requirements and Rates Application. A comparison of the total interconnect capital cost for these two projects to the Biomethane Application and the 2012-2013 RRA is included in Table 5-8 below.

Table 5-8: Interconnect Capital Costs for Fraser Valley Biofuels & Salmon Arm Landfill

Particulars	\$000's Fraser Valley Biogas & Salmon Arm Landfill		
	Actual / Projected	Biomethane Appl'n ¹	FEU 2012 - 2013 RRA ²
Mains	\$ 107	\$ 273	\$ 120
Measuring & Regulating, Odourizer, Gas Analyzer et al	906	998	1,150
Total Direct Costs	\$ 1,013	\$ 1,271	\$ 1,270

1. FortisBC Energy Inc. (formerly Terasen Gas Inc.) Biomethane Application, Appendix J-2, Schedule 1, Lines 17-20.

2. FEU 2012-2013 Revenue Requirements and Rates Application, Volume 2, Appendix J, Page 6, Table J-1

35.1 Please provide a breakdown of the costs labeled "Measuring & Regulating, Odourizer, Gas Analyzer et al" to identify Structures, Regulators and Meter Installation, Measuring and Regulating Equipment and Meters as per Table 5-8, Capital Costs of Interconnection Facilities.

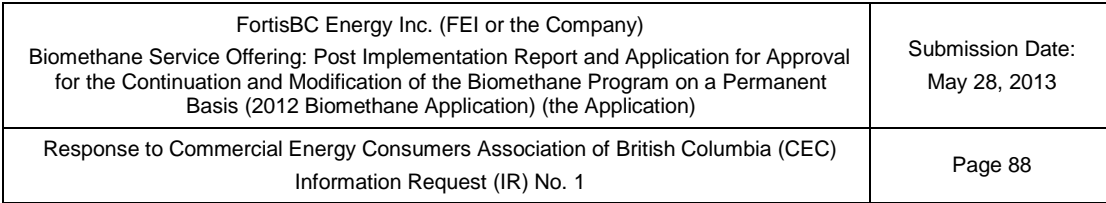
Response:

This response addresses the response to CEC IRs 1.35.2 and 1.35.2.1.

Actual costs by asset plant category for each of the two projects, Fraser Valley Biogas and the Salmon Arm Landfill is provided in Table 5-7: Capital Costs of Interconnect Facilities on Page 75 of the Post Implementation Report and Application For Approval of the Biomethane Program on a Permanent Basis.

The following table is an excerpt from Attachment 188.1, page 1, that was filed on June 30, 2011 in response to BCUC IR 1.188.1 regarding the FortisBC Energy Utilities 2012-2013 Revenue Requirements & Rates Application (FEU 2012-2013 RRA) (Exhibit B-9-1), that provides comparative detail on the interconnect costs for the two projects as filed in the Biomethane Application and updated for the FEU 2012-2013 RRA.

Actual costs for each of the projects were lower than projected in the FEU 2012-2013 RRA.

[illegible]

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35.2 Please provide the above cost information and comparative forecasts
(Biomethane Application and FEU 2012-2013 RRA) for each of the two projects.

Response:

Please refer to the response to CEC IR 1.35.1.

35.2.1 If not available, please confirm if the costs were lower than anticipated
for each of the two projects individually, or if one project

Response:

Please refer to the response to CEC IR 1.35.1.

35.3 Please provide explanations as to why the costs are lower than previously
anticipated.

Response:

The initial projections in the 2010 Biomethane Application were completed ahead of the actual
work. The two largest variances between the actual and projected costs were the mains costs
and the gas analyzer costs.

The combined cost of the mains were lower primarily due to a change in the design at the
Salmon Arm landfill requiring a shorter length of main and a conservative cost estimate at the
FVB site.

The interconnection station costs were lower than expected at the Salmon Arm landfill due to
lower than expected costs associated with equipment (gas chromatograph) and efficiencies
gained by using the same design for both stations.

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1 **36. Reference: Exhibit B-1, Application, Appendix E-3, Executive Summary, Page 6**

Preference in pricing models is driven by perceptions of fairness – those willing to participate in the RNG initiative believe everyone should contribute while those who do not wish to participate feel only participants should shoulder the costs. Approximately 42% of FortisBC customers show a strong interest in participating in the RNG program. These customers would prefer to see FortisBC introduce a pricing model that is borne by all customers (instead of being user pay). A slightly larger customer base is in favour of a user pay program. The split is similar to 2009.

2

3 36.1 Does FortisBC anticipate any changes with respect to the relative proportion of
4 those customers wishing to participate in an RNG program?

5

6 **Response:**

7 At this point in time FEI does not anticipate any changes with respect to the proportion of
8 customers wishing to participate in an RNG program from the commercial and residential
9 customers (i.e. Rate Schedules 1B-3B). FEI forecasts that participation rates will continue to
10 trend towards industry averages. However, as discussed in the demand forecast, volumes in
11 the industrial / commercial sectors are likely to outweigh the demand from these existing Rate
12 Schedules 1B-3B.

13

14

15 36.2 Please confirm that in the event of a pricing model in which the costs are borne
16 by all customers, the same amount of biomethane would be introduced into the
17 system as would be provided under any given pricing model.

18

19 **Response:**

20 FEI believes that a model in which the costs are borne by all customers or a model where there
21 is a hybrid of a user pay program and an RPS standard or allowance, would result in more
22 biomethane being introduced to the system.

23 Please refer to the response to BCUC IR 1.36.2.

24

25

26 36.3 If not, please explain how FortisBC would determine the amount of biomethane
27 that would be introduced into the system.

28

29 **Response:**

30 Please refer to the response to BCUC IR 1.36.2.

FortisBC Energy Inc. (FEI or the Company) Biomethane Service Offering: Post Implementation Report and Application for Approval for the Continuation and Modification of the Biomethane Program on a Permanent Basis (2012 Biomethane Application) (the Application)	Submission Date: May 28, 2013
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1 **37. Reference: Exhibit B-1, Application, Appendix E-3, Executive Summary, Page 6**

Under a user pay model, there emerges a debate between maximizing the number of participating households versus maximizing the volume of RNG sold. At lower price increases (\$12 or less per month) a significantly higher number of households say they would sign up. At higher price points (\$18, \$30, \$60 monthly increases), there are fewer households participating, but they will generate a higher overall level of RNG consumption. Up to 7% of customers are fully committed to the RNG program, indicating they would sign up at the highest price point if it meant a 100% reduction in their GHG emissions. To resolve this divide, we recommend a user pay, menu pricing option. In this option, customers are given the choice of different prices depending on their commitment. Committed customers can pay a higher price point for a greater reduction in their GHG reductions. More price sensitive customers, would have the option to pay a lower monthly increase.

2

3 37.1 Why did FEI not choose to maximize the overall level of RNG consumption?

4

5 **Response:**

6 FEI led the initial offering with a 10 percent blend option in order to gauge market interest,
7 maximize customer uptake and awareness. At the time of launch, FEI only had one supply
8 source and a single option allowed FEI to better manage the uncertainty of supply versus
9 demand. As well, FEI was changing billing systems part way through the pilot period, so a
10 single option made the most sense from a billing system change requirement in the near term.

11 Now that FEI has stabilized its own billing system and has numerous supply projects, FEI has
12 requested the ability to offer additional blends so as to maximize the overall level of RNG
13 consumption.

14

15

16

17 37.2 Has FEI conducted the above analysis weighing the value of user pay models vs.
18 maximizing participation with respect to commercial customers?

19

20 **Response:**

21 Yes, FEI conducted detailed research with respect to commercial customers in 2010 as part of
22 its primary research for the 2010 Biomethane Application. As well, FEI surveyed existing
23 customers as discussed in Section 3.8 of the 2012 Biomethane. FEI chose not to do another
24 detailed survey in 2012 in order to manage costs associated with market research.

25 Please also refer to the response to BCSEA IR 1.23.1.

26

27

28

FortisBC Energy Inc. (FEI or the Company) Biomethane Service Offering: Post Implementation Report and Application for Approval for the Continuation and Modification of the Biomethane Program on a Permanent Basis (2012 Biomethane Application) (the Application)	Submission Date: May 28, 2013
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1 37.2.1 If so, please provide the results of that analysis.

2
3 **Response:**

4 Please refer to Attachment 37.2.1 for the detailed findings of the commercial study in 2010.

5
6
7
8 37.2.2 If not, why have FEI not conducted this analysis.

9
10 **Response:**

11 Please refer to the response to CEC IR 1.37.2.1.

Attachment 37.2.1

Commercial Green Gas

Terasen Gas

February 2010

Agenda

- Study Methodology
- Carbon Offsets Or Renewable Energy Program?
- Market Size For Biogas Program
 - Other Pricing Considerations
- Profile Of The Potential Biogas Energy Market
- Drivers Leading To Sign Up For Biogas Program
- Impact Of Biogas Program On Corporate Image
- Recommendations

Agenda

→ Study Methodology

- Carbon Offsets Or Renewable Energy Program?
- Market Size For Biogas Program (Among Terasen Customers)
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Recap Of Objectives And Study Methodology

Study Objective

- The potential market for green gas
- The market drivers
- Factors affecting the implementation of a green gas program

Methodology

- 500 online interviews (recruited from telephone)
- December 14 to January 22, 2010
- Terasen Gas commercial customers
- Accessed from Terasen customer database
- Margin of error on 500 interviews is +/- 4.4% (at 95% confidence level)

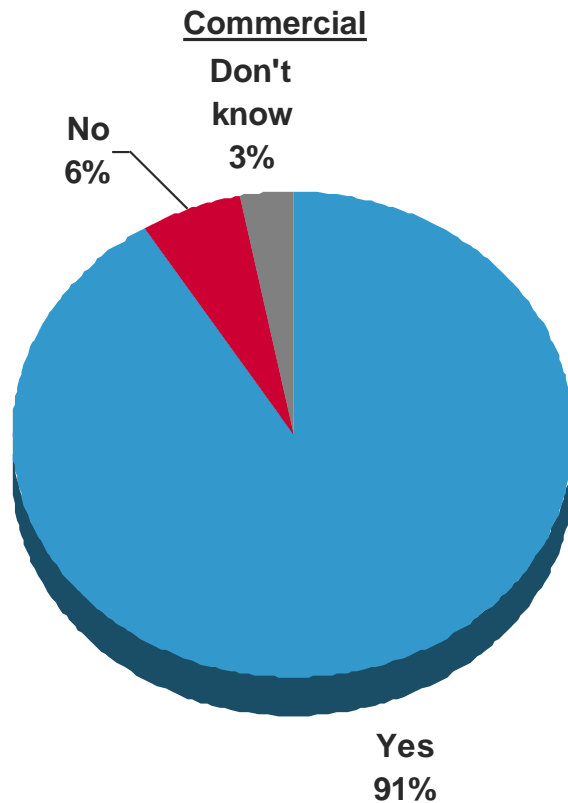
Agenda

- Study Methodology
- **Carbon Offsets Or Renewable Energy Program?**
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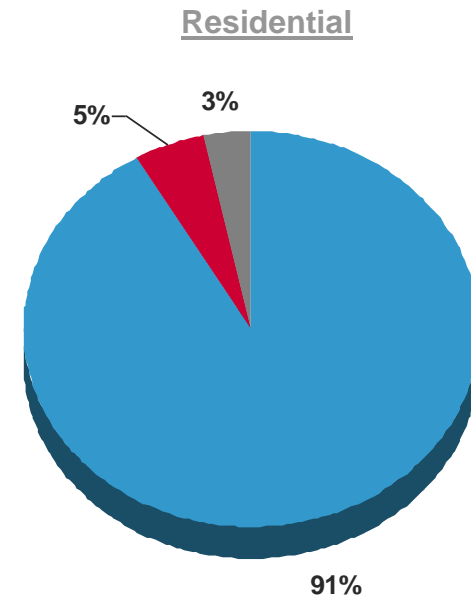
Commercial Customers Receptive To Energy Conservation Programs

- Since commercial customers already buy into energy improvements, they should be receptive to similar programs like a green gas initiative

Whether Steps Taken To Save Energy



Base: Total respondents (n=500)



Base: Total respondents (n=1,401)

Energy Conservation Steps Already Taken

- A similar proportion of commercial customers have taken steps to save energy as BC household residents

Steps Taken To Save Energy

Commercial

	Total
Base: Total respondents who have taken steps to save energy at home	(453)
Re-using / reducing / recycling materials	78%
Energy efficient lighting	76%
Installed a programmable thermostat	50%
Weather stripping / caulking	40%
Installed timers for lighting	35%
Reduced water use	33%
Conducted energy saving awareness program for employees	31%
Insulated windows/ doors/ spaces	27%

Residential

	Total
Base: Total respondents who have taken steps to save energy at home	(1,280)
Re-using / reducing / recycling materials	88%
Energy efficient lighting	84%
Reduced water use (e.g., low flow showerheads)	69%
Weather stripping / caulking	54%
Insulating windows / doors / spaces	47%
Installed a programmable thermostat	36%
Installed timers for lighting	22%
Replaced existing furnace with a high-efficiency furnace	19%

Opinions On Biogas Initiative Very Positive

- Organizations would throw their support behind the concept of a biogas program offered by Terasan

Commercial

Should Terasen Be Investing In Biogas

	Total
Base: Total respondents	(500)
Yes (8-10)	67%
Maybe (4-7)	23%
No (1-3)	3%
Decline	7%

Should Terasen Offer A Biogas Program

	Total
Base: Total respondents	(500)
Yes (8-10)	71%
Maybe (4-7)	22%
No (1-3)	2%
Decline	5%

Residential

	Total
Base: Total respondents	(1,401)
Yes (8-10)	67%
Maybe (4-7)	27%
No (1-3)	2%
Decline	4%

	Total
Base: Total respondents	(1,401)
Yes (8-10)	65%
Maybe (4-7)	30%
No (1-3)	1%
Decline	4%

QT2: (On a scale of 1 – Definitely not to 10 – Definitely) Does your organization support Terasen Gas investing in biogas projects?

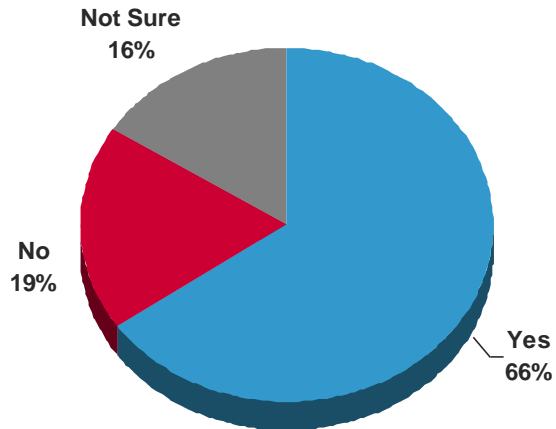
QT3: (On a scale of 1 – Definitely not to 10 – Definitely) Do you think Terasen Gas should invest in offering a biogas program to its commercial customers?

Opinions On Carbon Offsets

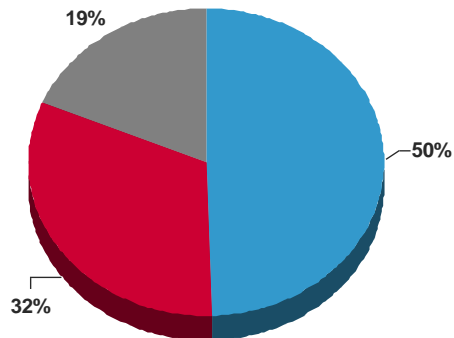
- Organizations have a higher awareness of carbon offsets, but slightly lower appetite for them (compared to residents)

Awareness Of Carbon Offsets

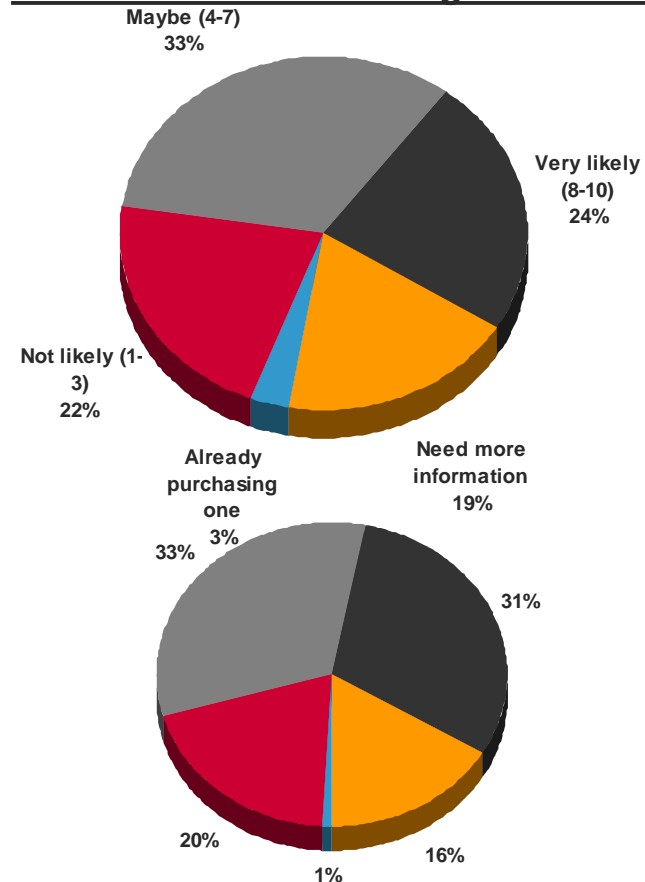
Commercial



Residential



Likelihood Of Purchasing Carbon Offsets



QC1: Have you ever heard of the term “carbon offset”?

QC2: (On a scale of 1 – Not at all likely to 10 – Extremely likely) Knowing this information, how likely would your organization be to purchase a carbon offset for its natural gas use in order to reduce your organizations environmental footprint?

Opinions On Carbon Offsets

- If organizations were to purchase a carbon offset, Terasen would be preferred over a 3rd party provider
- A large number of organizations would want more information first. This suggests many organizations will purchase on an informed, rational basis.

Preferred Source

Commercial

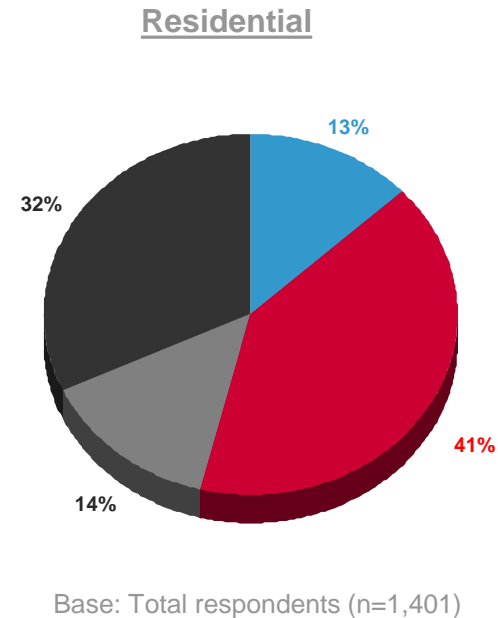
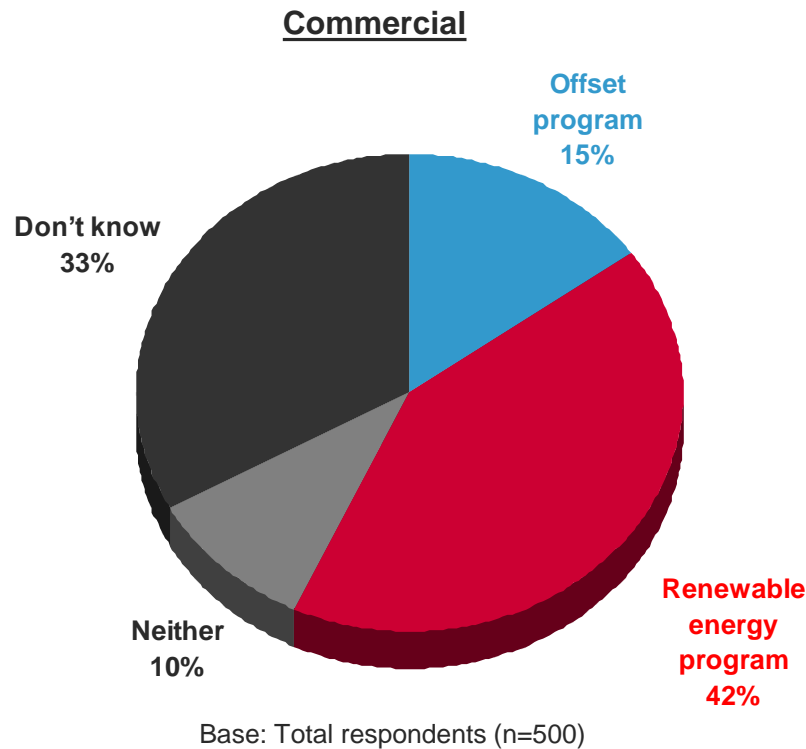
	Total
Base: Total respondents who are extremely likely to purchase a carbon offset in order to reduce their environmental footprint	(120)
Your local utility provider	42%
A 3 rd -party provider that supports projects in BC	13%
A 3 rd -party provider that supports projects outside BC	2%
Need more information / Don't know	43%

Residential

	Total
Base: Total respondents who are extremely likely to purchase a carbon offset in order to reduce their environmental footprint	(428)
Your local utility provider	50%
A 3 rd -party provider that supports projects in BC	21%
A 3 rd -party provider that supports projects outside BC	1%
Need more information / Don't know	37%

Carbon Offset Versus Renewable Energy Programs

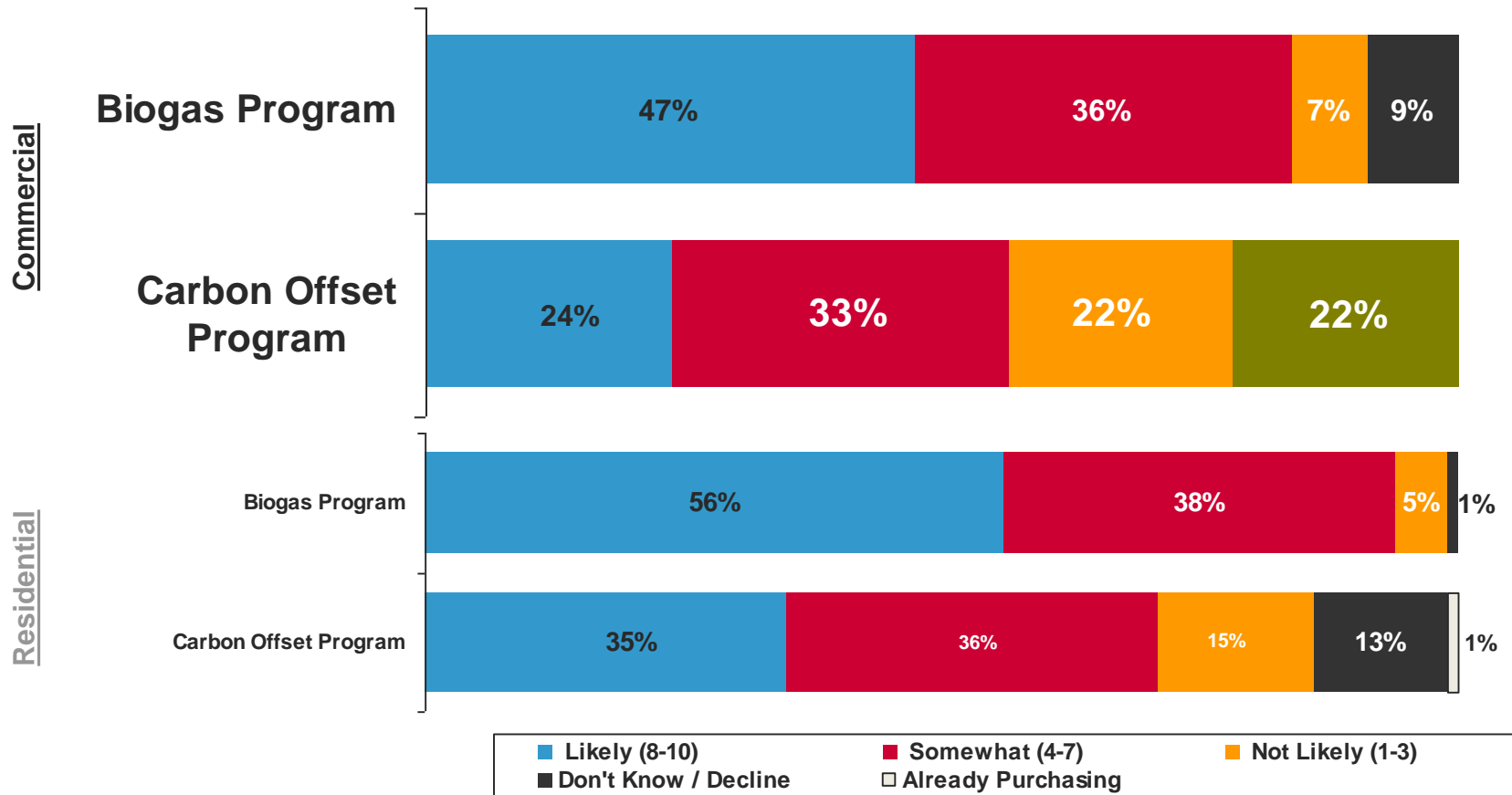
- Biogas is favoured in the market approximately three-to-one
- But one-third of this market is undecided



QC4: Which of these two programs would your organization be more inclined to see Terasen Gas introduce, if it were to do so? (select one only)

Market More Likely To Sign Up For Biogas

Likelihood To Sign Up For Terasen Offered Programs:



QT4: (On a scale of 1 –Not very likely to 10 – Very likely) All things being equal, if Terasen Gas offered a biogas program, how likely would your organization be to sign up?

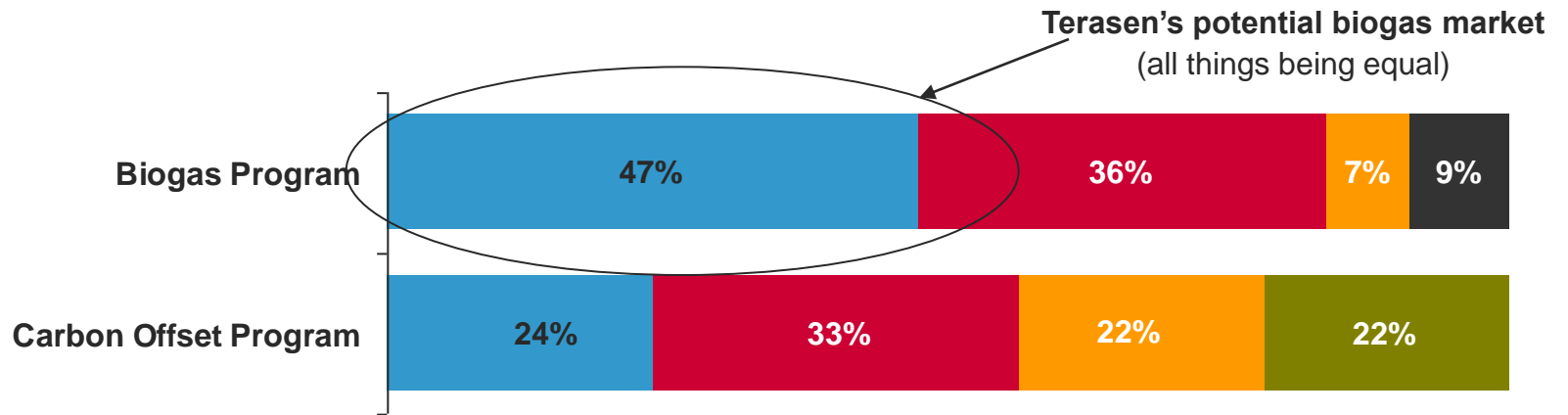
QC2: Knowing this information, how likely would your organization be to purchase a carbon offset for its natural gas use in order to reduce your organization's environmental footprint?

Agenda

- Study Methodology
- Carbon Offsets Or Renewable Energy Program?
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Commercial Customers More Likely To Sign Up For Biogas

Likelihood To Sign Up For Terasen Offered Programs



■ Likely (8-10) ■ Somewhat (4-7) ■ Not Likely (1-3) ■ Don't Know / Decline ■ Need More Info / Already Purchasing One

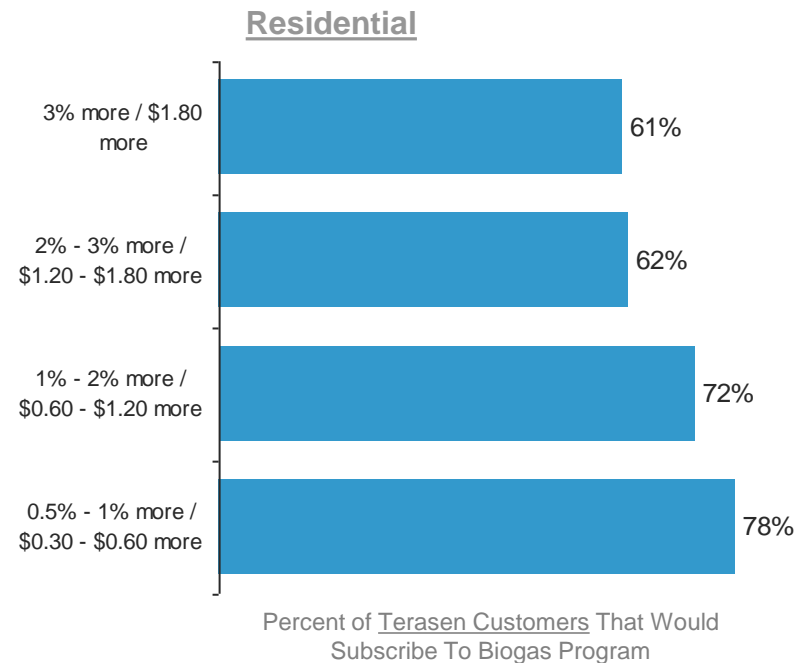
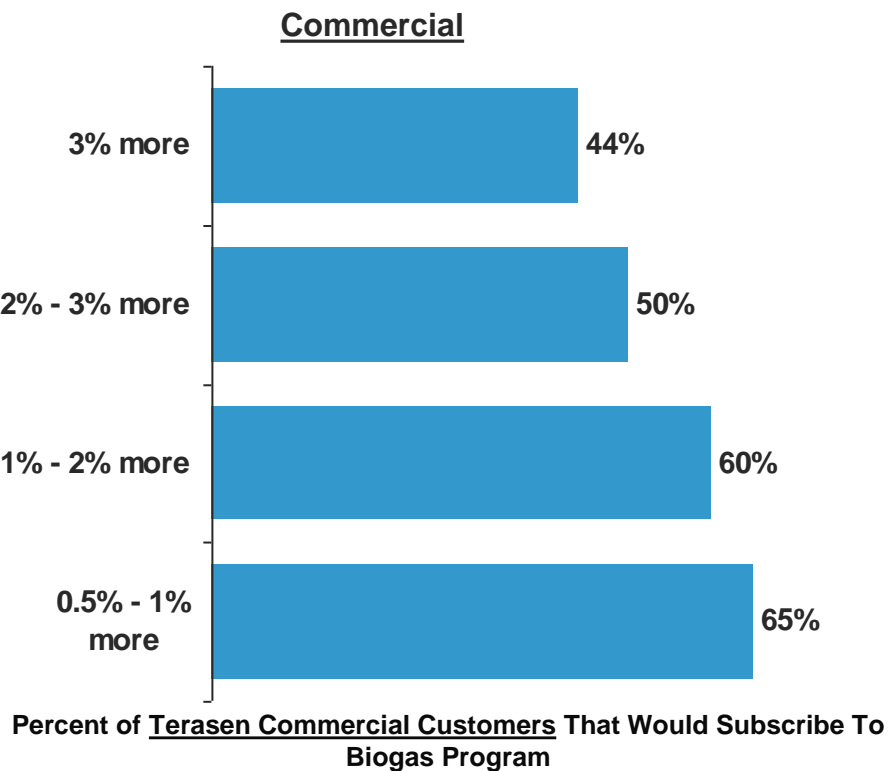
Base: Total respondents (n=500)

QT4: (On a scale of 1 –Not very likely to 10 – Very likely) All things being equal, if Terasen Gas offered a biogas program, how likely would your organization be to sign up?

QC2: Knowing this information, how likely would your organization be to purchase a carbon offset for its natural gas use in order to reduce your organization's environmental footprint?

Market Reaction To Universal Price Increases (Borne By All Customers)

- There is greater price sensitivity on the part of commercial customers to support a price initiative once they are told of price increases to their monthly gas bill



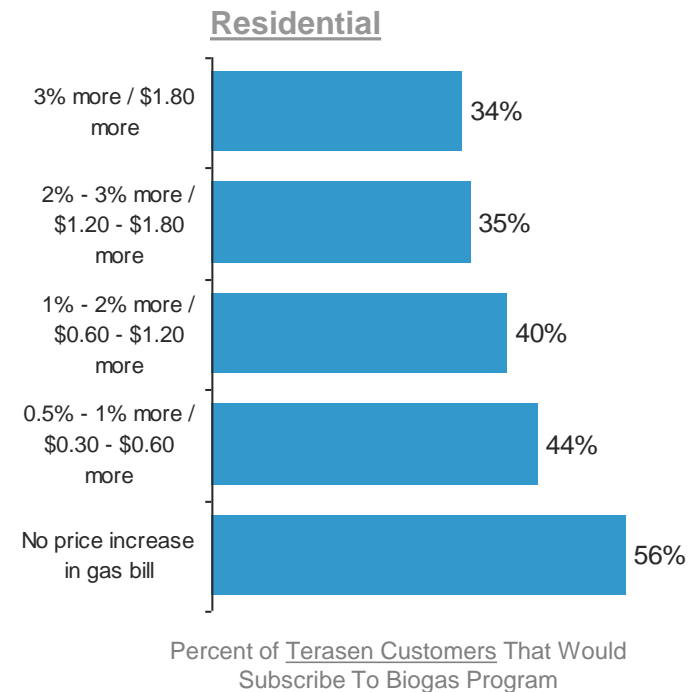
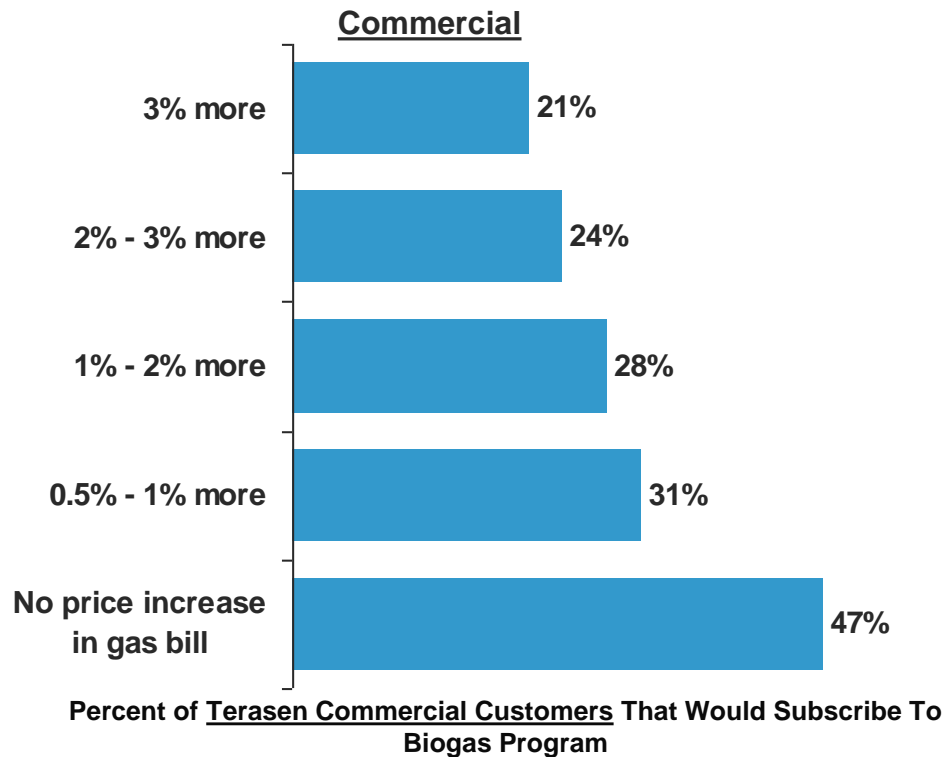
QP1A: If your organization had to pay 3% more than the current commodity price of natural gas, would your organization support or would your organization not support such a biogas program?

QP1B / QP2A: If your organization had to pay 2% more than the current commodity price of natural gas, would your organization support or would your organization not support such a biogas program?

QP2B / QP3A: ... pay 1% more than the current commodity price of natural gas...?

QP3B: ...pay 0.5% more than the current commodity price of natural gas...?

Market Size At Different Price Points (Maximum Potential)



Market share figures calculated from multiplying the proportion of customers who would sign up for program (47%) by proportion of customers willing to support biogas program at each price point.

QP1A: If the cost of biogas is borne by all customers and you had to pay 3% more than the current commodity price of natural gas-which is about \$1.80 more than the current monthly charge-would you or would you not support such a biogas program?

QP1B / QP2A: If the cost of biogas is borne by all customers and you had to pay 2% more than the current commodity price of natural gas-which is about \$1.20 more than the current monthly charge-would you or would you not support such a biogas program?

QP2B / QP3A: ... pay 1% more than the current commodity price of natural gas-which is about \$0.60...?

QP3B: ...pay 0.5% more than the current commodity price of natural gas-which is about \$0.30...?

Agenda

- Study Methodology
- Carbon Offsets Or Renewable Energy Program?
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Higher Pricing Options Also Explored Using Discrete Choice Model

The Three Levels and The Choice Elements

Energy Initiative

- Renewable Energy Program
- Carbon Offset Program

Percent Reduction In Green House Gas Emissions

- 10%
- 20%
- 30%
- 50%
- 80%
- 100%

Effect On Monthly Gas Bill

- The current commodity price + 10%
- The current commodity price + 20%
- The current commodity price + 30%

DCM Simulation – With Three Pricing Levels

- Preference drops off as price goes up
- Proportionate increases in GHG reductions not enough to offset increase in prices

Choice #1

Renewable energy
program

10% price increase

10% GHG reductions

Choice #2

Renewable energy
program

20% price increase

20% GHG reductions

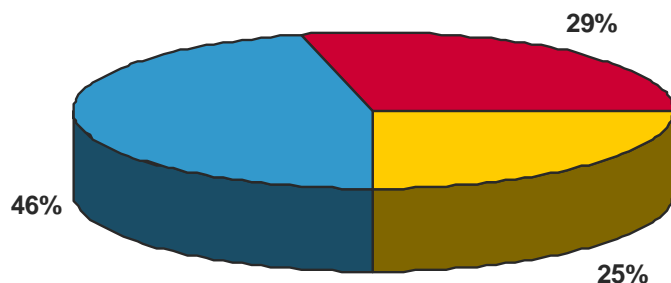
Choice #3

Renewable energy
program

30% price increase

30% GHG reductions

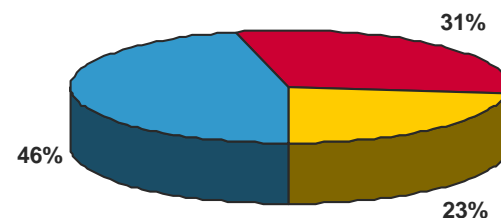
Commercial



■ Choice #1 ■ Choice #2 ■ Choice #3

Base: The 47% of Terasen commercial customers Who Are Likely To Sign Up For A Biogas Program (n=237)

Residential



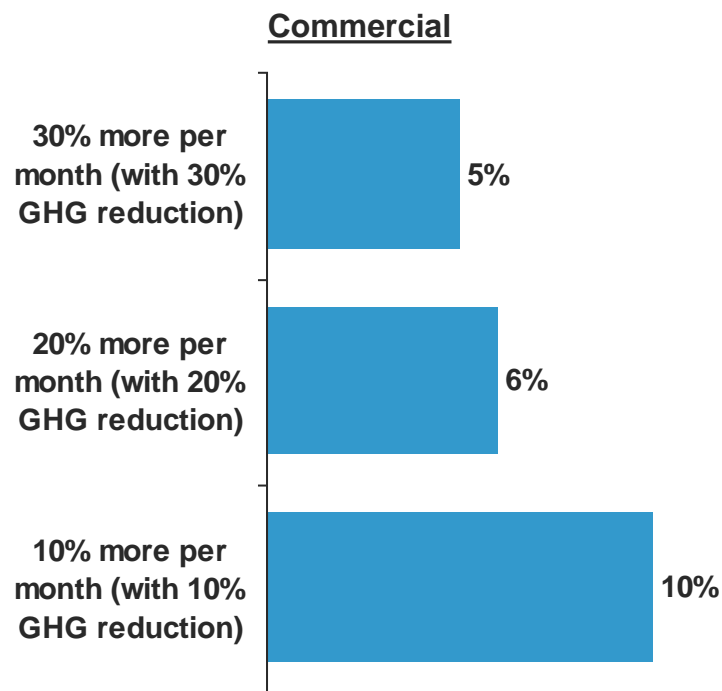
■ Choice #1 ■ Choice #2 ■ Choice #3

Base: The 56% of Terasen customers who are likely to sign up for a biogas program (n=445)

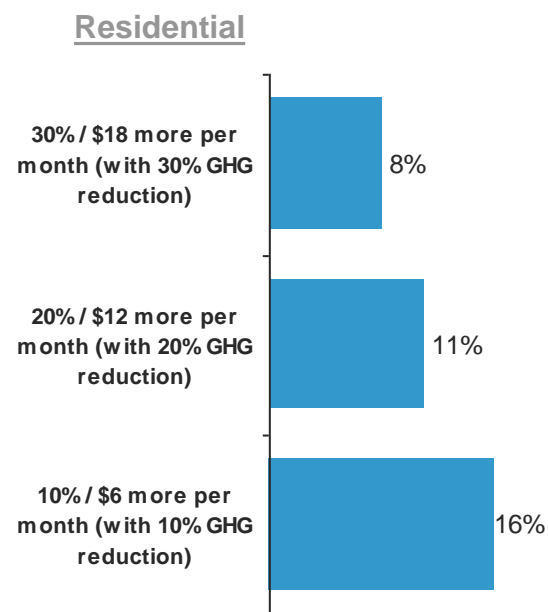
The reader should bear in mind that “none of the above” is not an option, because the model has already excluded those customers who would not sign up for the program.

Market Size Projections Based On DCM

- A significantly smaller proportion of commercial customers would sign-up for a biogas initiative at the higher price premiums



Percent of Terasen Commercial Customers That Would Subscribe To Biogas Program

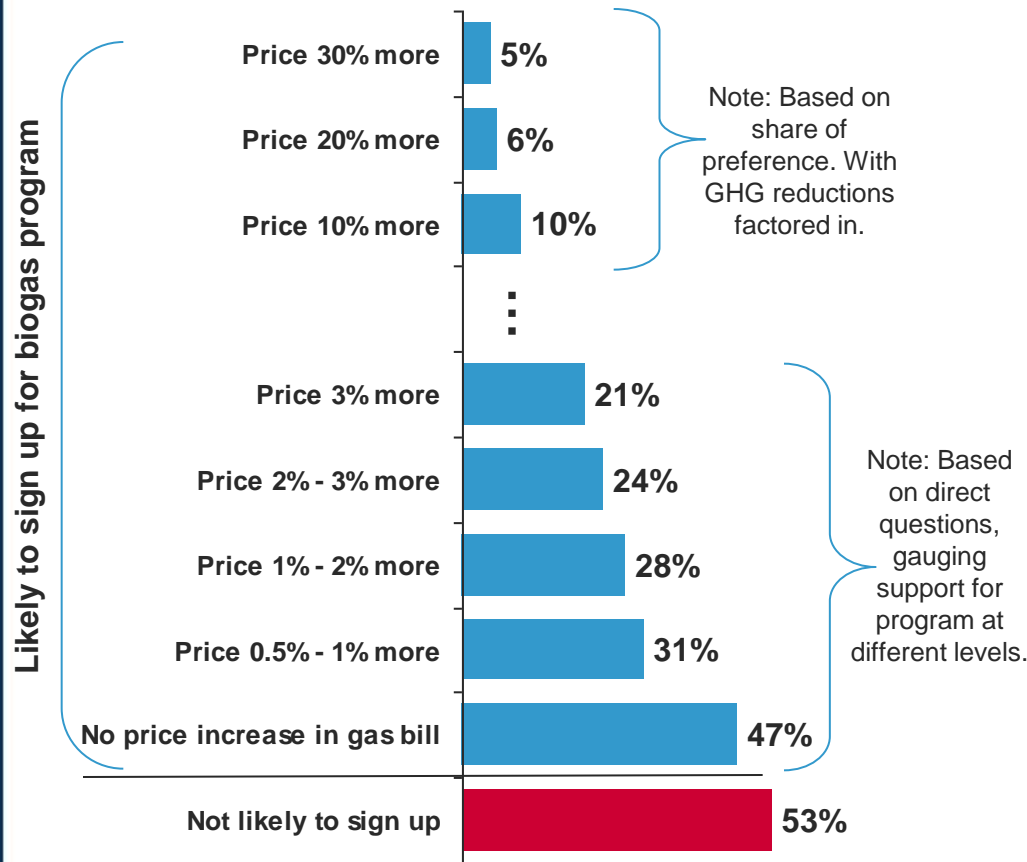


Percent of Terasen Customers That Would Subscribe To Biogas Program

Market share estimates derived by multiplying previous share of preference figures against percentage of customers who are willing to spend at least 3% more on a biogas program.

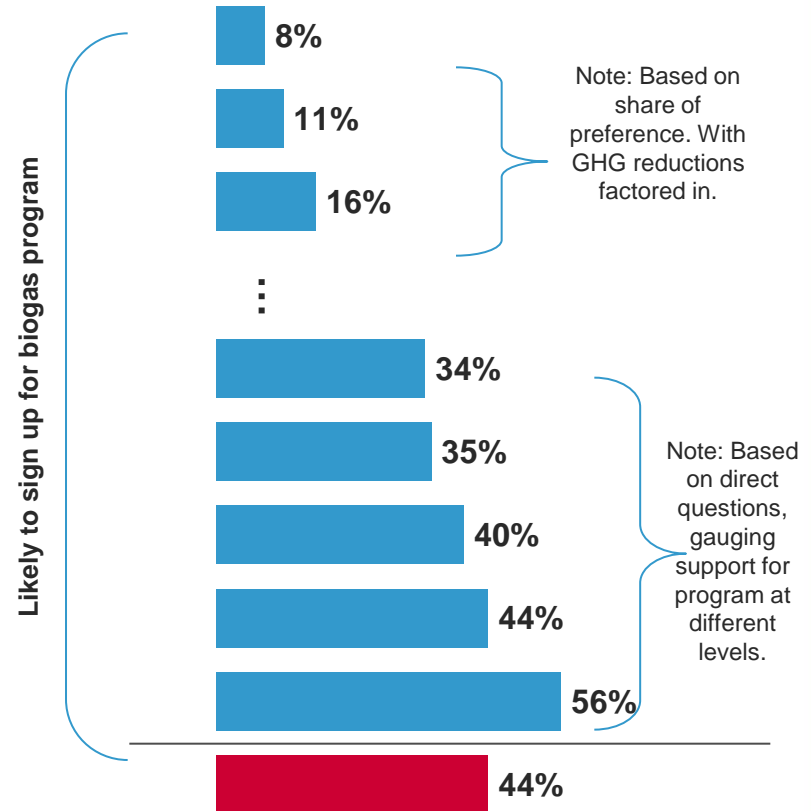
Summary Of Market Size (Maximum Potential)

Commercial



Percent of Terasen Commercial Customers That Would Subscribe To Biogas Program

Residential

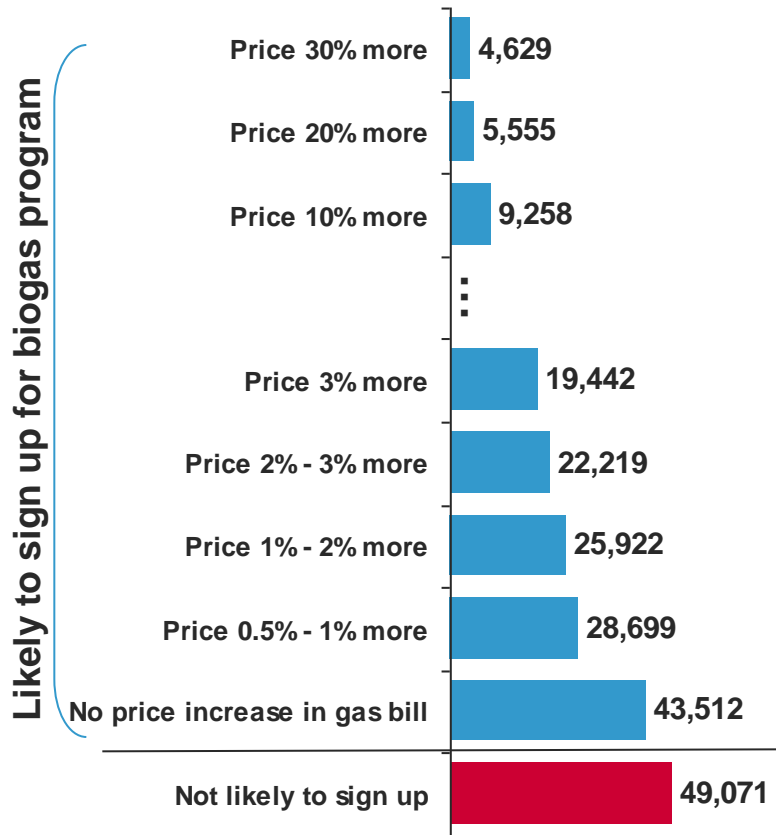


Percent of Terasen Customers That Would Subscribe To Biogas Program

Summary Of Market Size

Commercial

Number of commercial customers
that would sign-up *

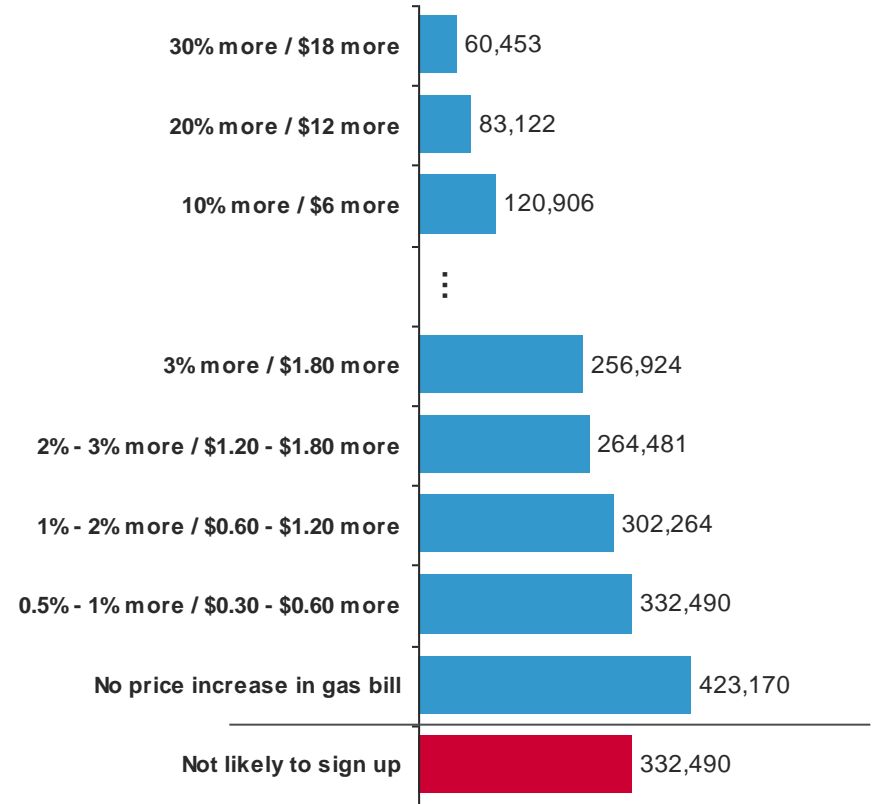


Number of Terasen Commercial Customers That Would Subscribe To Biogas Program

* Calculated from 92,579 commercial customers, as per customer counts supplied by Terasen.

Residential

Number of Terasen households that
would sign-up *

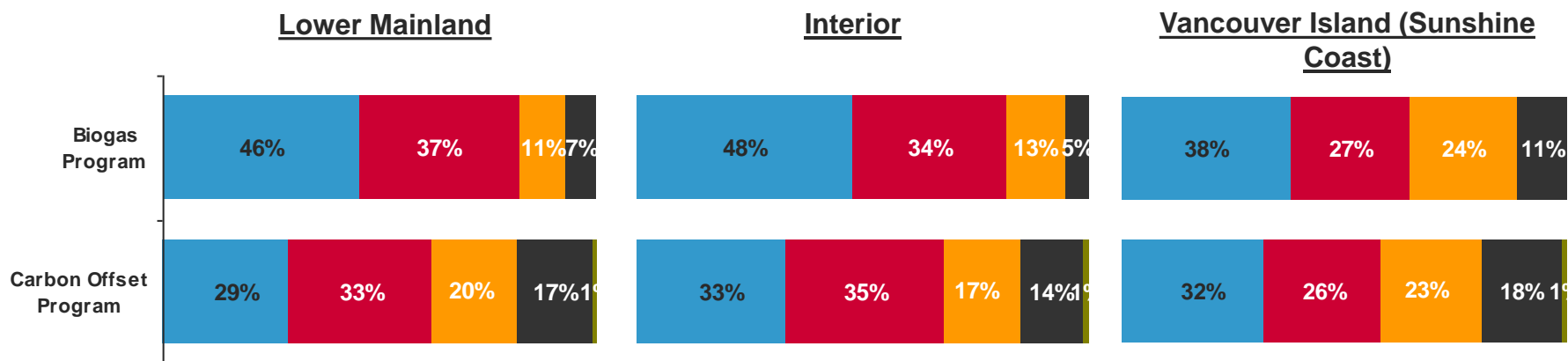


Number of Terasen Customer Households That Would Subscribe To Biogas Program

* Calculated from 755,660 households, as per December 2009 Rate 1 customer counts supplied by Terasen.

Regional Differences (For Residential)

Likelihood To Sign Up For Terasen Offered Programs

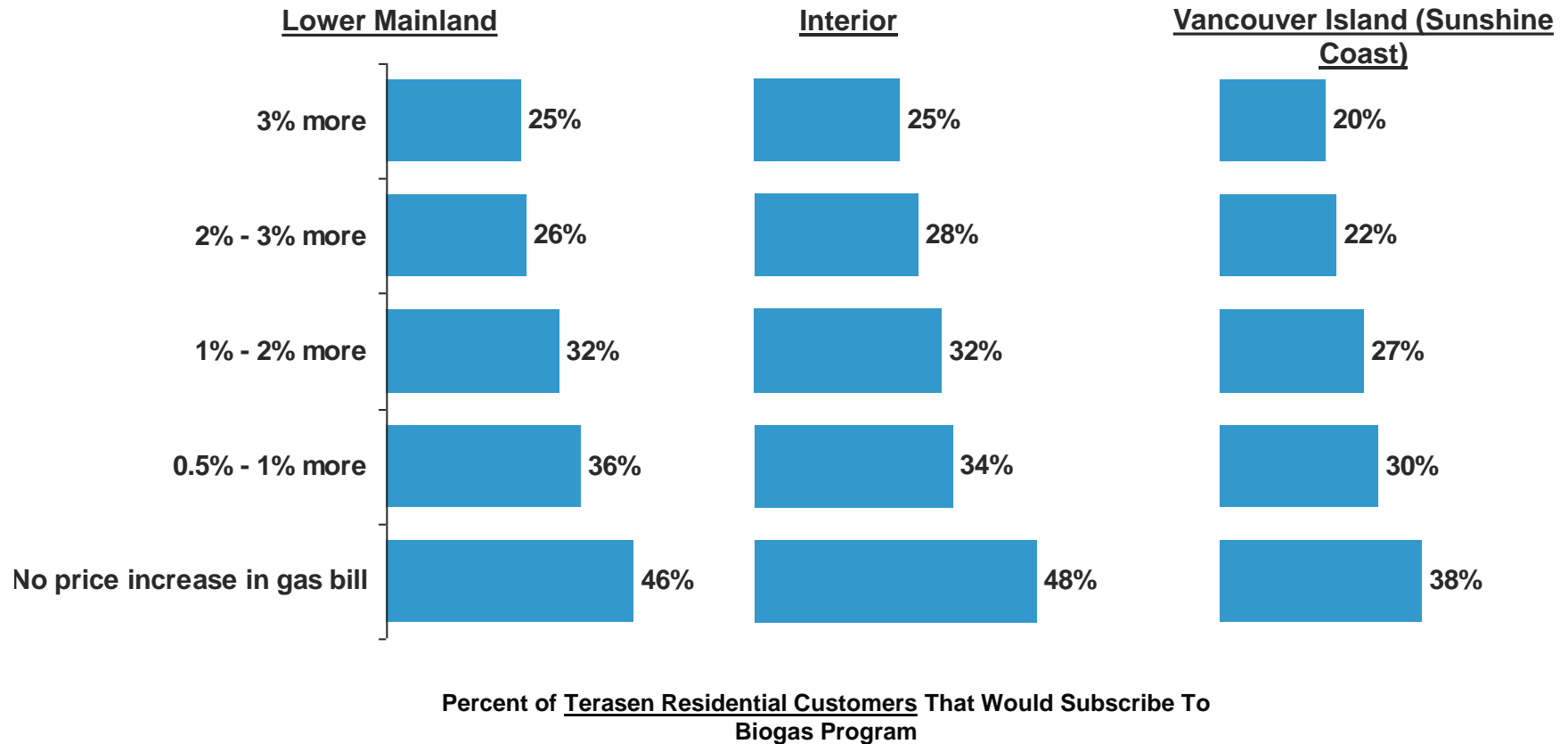


■ Likely (8-10)
 ■ Somewhat (4-7)
 ■ Not Likely (1-3)
 ■ Don't Know / Decline
 ■ Need More Info / Already Purchasing One

QT4: (On a scale of 1 –Not very likely to 10 – Very likely) All things being equal, if Terasen Gas offered a biogas program, how likely would your organization be to sign up?

QC2: Knowing this information, how likely would your organization be to purchase a carbon offset for its natural gas use in order to reduce your organization's environmental footprint?

Residential Market Size By Region (Maximum Potential)



Market share figures calculated from multiplying the proportion of customers who would sign up for program by proportion of customers willing to support biogas program at each price point.

QP1A: If the cost of biogas is borne by all customers and you had to pay 3% more than the current commodity price of natural gas-which is about \$1.80 more than the current monthly charge-would you or would you not support such a biogas program?

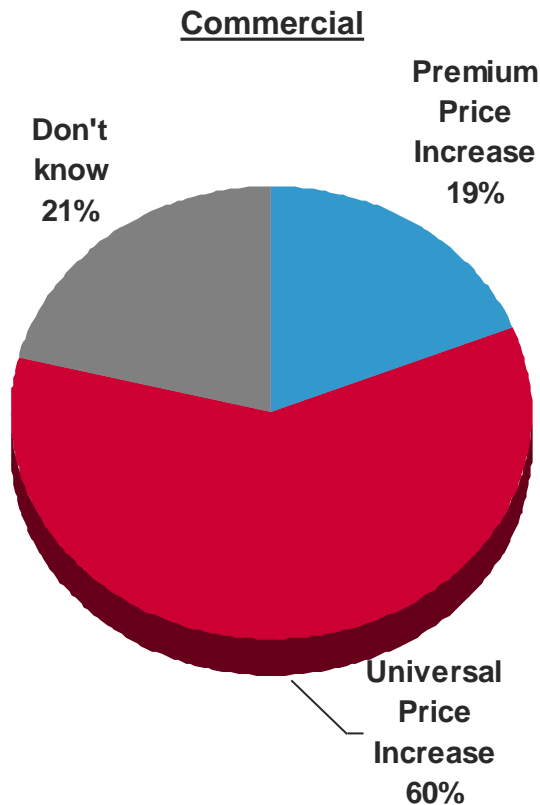
QP1B / QP2A: If the cost of biogas is borne by all customers and you had to pay 2% more than the current commodity price of natural gas-which is about \$1.20 more than the current monthly charge-would you or would you not support such a biogas program?

QP2B / QP3A: ... pay 1% more than the current commodity price of natural gas-which is about \$0.60...?

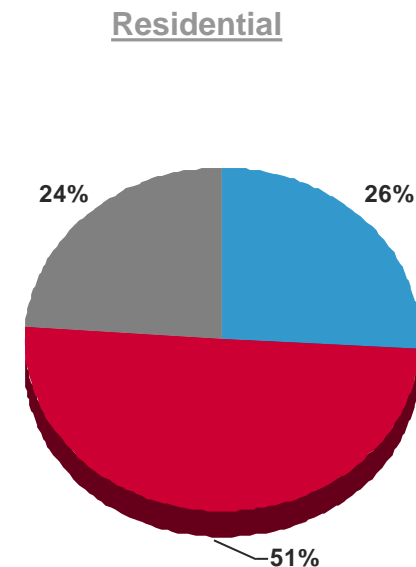
QP3B: ...pay 0.5% more than the current commodity price of natural gas-which is about \$0.30...?

Price Premiums Versus Universal Price Increase

- Commercial customers favour a universal price increase instead of price premiums



Base: Total respondents who are likely to sign up for biogas program (n=237)



Base: Total respondents who are likely to sign up for biogas program (n=628)

QP1: The costs for a biogas program can be offered to consumers in one of two ways. Which way would you prefer to see Terasen offer this program, if it were to do so? (select one only)

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Who's Most Interested In Biogas Program?

- Interest in biogas program does not correlate very strongly to firmographic variables
- Attitudinal variables seem to have more predictive influence on who would sign up – including Green Businesses

	Level of Interest in Biogas Program		
	Not likely to sign up	Very likely to sign up	Very likely to sign-up AND pay extra *
Base Size	(219)	(237)	(73)
PAST BEHAVIOUR			
Have taken steps to save energy in past	88%	<u>95%</u>	92%
NUMBER OF OFFICE LOCATIONS			
One	55%	<u>66%</u>	<u>63%</u>
Multiple	<u>44%</u>	34%	37%
CONCERNED FOR:			
Current state of environment	47%	<u>63%</u>	59%
Future state of environment	63%	<u>79%</u>	<u>77%</u>
Global warming / climate change	44%	<u>69%</u>	<u>62%</u>
Greenhouse gas emissions	44%	<u>61%</u>	<u>62%</u>
Greenhouse gas regulations	44%	<u>57%</u>	52%
Loss of oxygen producing forests	55%	<u>71%</u>	<u>69%</u>
Government / Industry leadership on environmental issues	50%	<u>64%</u>	56%
Access to alternative energy solutions	52%	<u>65%</u>	58%

* Based on those willing to pay extra 3% per month

Measuring Commitment To A Lifestyle

Do not consider
the environment
impact in anything
you do

Lifestyles

Consider the
environmental
impact when
it is practical
to do so

Consider the
environmental
impact in
everything you do

TNS' Conversion Model solution was used to measure commitment to one of three different lifestyles.

Residents / businesses can be closely associated with one of the three lifestyles, or they can straddle multiple lifestyles – living one, but aspiring to another.

Conversion model was used because it has predictive qualities on future behaviour.

The Resulting Lifestyle Segments



1. Greens: Extreme Environmentalists: Committed to considering the environmental impact in everything they do



2. Light greens: Not as committed to the environment as the Greens, but still caring



3. Potential Switchers: Consider themselves environmentally friendly, but thinking of switching to a more practical lifestyle



4. Try harders: Practical but striving to be more environmental caring



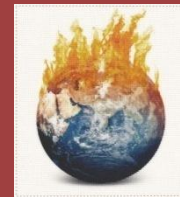
5. Extreme Practical: Committed to a pragmatic lifestyle; only considers the environmental impact when it is reasonable or practical to do so



6. Practicals: Committed to a practical environmental impact lifestyle



7. Unconcerned: Don't think that much about the impact their decisions have on the environment

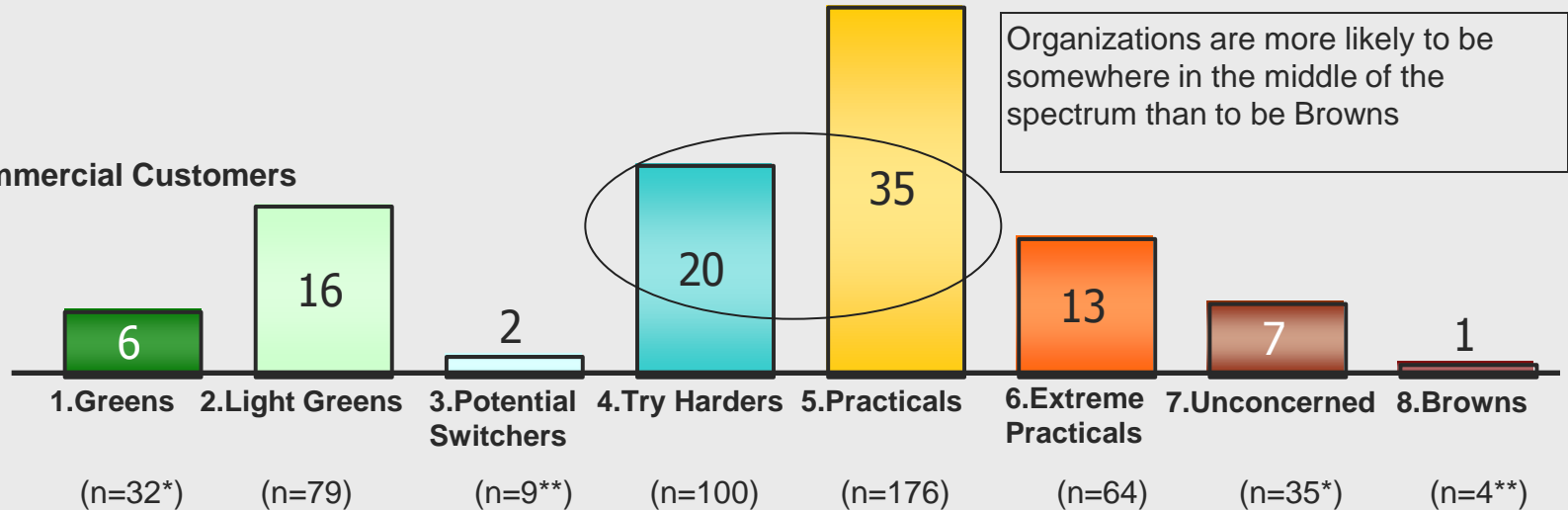


8. Browns: Don't think at all about the environmental impact in anything they do

Business Practice Segments (Distribution)

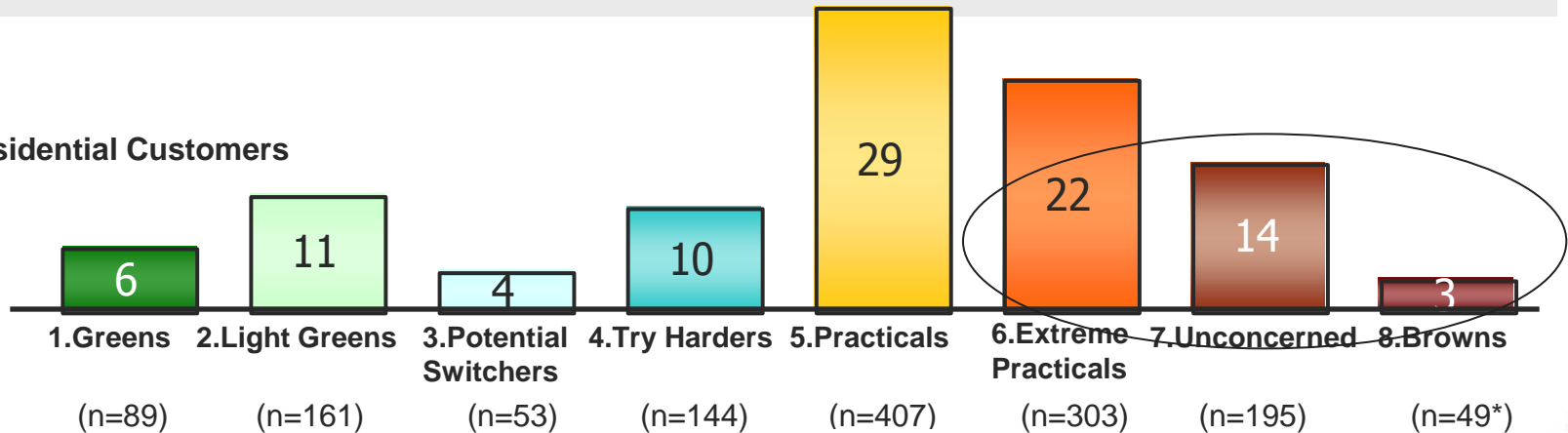
Total – Commercial Customers

(n=499)



Total – Residential Customers

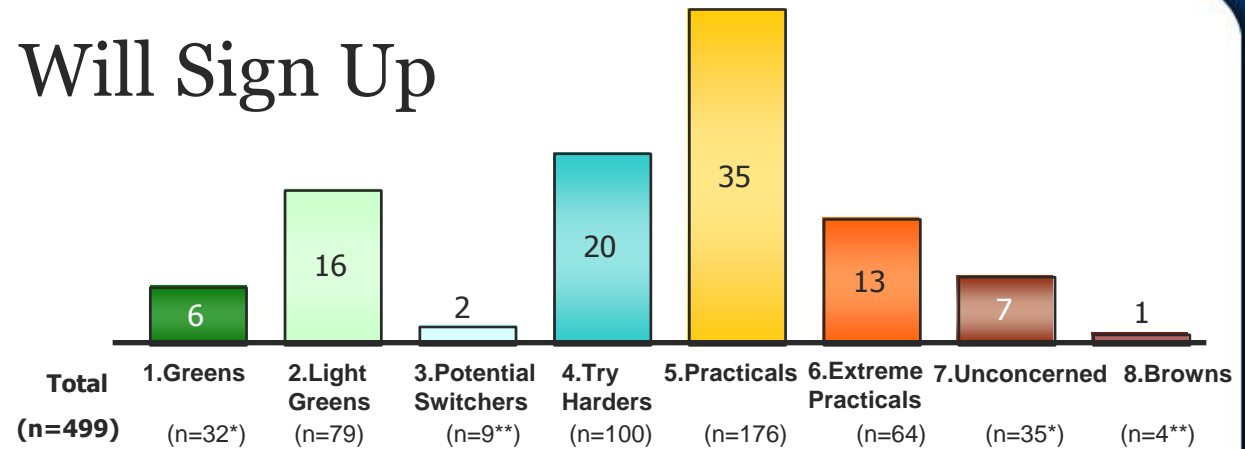
(n=1401)



* Caution= small base size

** Caution= base size too small for analysis

Green Businesses Will Sign Up



Top two box scores taken

QT2. Does your organization support Terasen Gas investing in biogas projects?

Total (n=499)	1. Greens (n=32*)	2. Light Greens (n=79)	3. Potential Switchers (n=9**)	4. Try Harders (n=100)	5. Practicals (n=176)	6. Extreme Practicals (n=64)	7. Unconcerned (n=35*)	8. Browns (n=4**)
49	63	58	44	61	45	36	29	25

QT3. Do you think Terasen Gas should invest in offering a biogas program to its commercial customers?

Total (n=499)	1. Greens (n=32*)	2. Light Greens (n=79)	3. Potential Switchers (n=9**)	4. Try Harders (n=100)	5. Practicals (n=176)	6. Extreme Practicals (n=64)	7. Unconcerned (n=35*)	8. Browns (n=4**)
53	69	63	44	63	50	36	37	25

QT4. All things being equal, if Terasen Gas offered a biogas program, how likely would your organization be to sign up?

Total (n=499)	1. Greens (n=32*)	2. Light Greens (n=79)	3. Potential Switchers (n=9**)	4. Try Harders (n=100)	5. Practicals (n=176)	6. Extreme Practicals (n=64)	7. Unconcerned (n=35*)	8. Browns (n=4**)
31	50	48	22	35	24	22	20	25

QC2. Knowing this information, how likely would your organization be to purchase a carbon offset for its natural gas use in order to reduce your organization's environmental footprint?

Total (n=499)	1. Greens (n=32*)	2. Light Greens (n=79)	3. Potential Switchers (n=9**)	4. Try Harders (n=100)	5. Practicals (n=176)	6. Extreme Practicals (n=64)	7. Unconcerned (n=35*)	8. Browns (n=4**)
13	31	25	11	13	9	9	6	0

Try Harders are practical but like the idea of environmentally conscious business practices. They tend to rate the Biogas program highly, however, may not sign up for practical reasons

* Caution= small base size

** Caution= base size too small for analysis

Percentages with n<30 in the denominator greyed out

Agenda

- Study Methodology
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 - Other Pricing Considerations
- Profile Of The Potential Biogas Energy Market
- **Drivers Leading To Sign Up For Biogas Program**
- Impact Of Biogas Program On Corporate Image
- Recommendations

GHG Levels Most Important For Commercial Customers

- Commercial customers are influenced more by GHG reductions relative to price and type of energy initiative
- Whereas for residential customers, the gap between price and GHG reductions not as strong

Summary of DCM Attribute Importance

Commercial

Utility Values	Total
Energy Initiative	6.5
Percent Reduction In Green House Gas Emissions	16.3
Effect On Monthly Gas Bill	11.4

Residential

Utility Values	Total
Energy Initiative	7.9
Percent Reduction In Green House Gas Emissions	18.5
Effect On Monthly Gas Bill	14.4

Need To Go Big With GHG Reduction Levels

Commercial

Reduction In Green House Gas Emissions (Utility Values)

Utility Values	Total
10%	10.0
20%	10.0
30%	15.2
50%	21.5
80%	23.8
100%	26.3

Effect On Monthly Gas Bill (Utility Values)

Utility Values	Total
Current Price + 10%	21.4
Current Price + 20%	16.8
Current Price + 30%	10.0

Energy Initiative (Utility Values)

Utility Values	Total
Renewable Energy Program	16.5
Carbon Offset Program	10.0

Residential

Reduction In Green House Gas Emissions (Utility Values)

Utility Values	Total
10%	10.0
20%	10.7
30%	16.4
50%	23.6
80%	25.1
100%	28.5

Effect On Monthly Gas Bill (Utility Values)

Utility Values	Total
Current Price + 10%	24.4
Current Price + 20%	18.3
Current Price + 30%	10.0

Energy Initiative (Utility Values)

Utility Values	Total
Renewable Energy Program	17.9
Carbon Offset Program	10.0

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Impact Of Biogas Initiative On Views Of Terasen

Introducing a Biogas Initiative will have similar, positive effects on Terasen's corporate image among the business community as with residents.

Level of agreement that Terasen ...	Before DCM (mean out of 10)		After DCM (mean out of 10)
Cares about employees	6.68		7.23
Cares about its role in the community	6.34		7.91
Cares about the environment	6.40	Exposure To Environmental Options (DCM)	8.22
Cares about making a profit	7.70		7.79
Cares about re-investing in new environmentally-friendly technologies	6.38		8.29

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- ➔ **Recommendations**

Recommendations

- Results indicate similar direction for resident and commercial customers
- Introduce a renewable energy program – not a carbon offset program.
- The price for a new biogas program should be set depending on your goals:
 - To maximum revenues, increase prices as high as 30%
 - To balance revenues with involvement, increases prices by 3%
 - To maximize involvement, do not increase prices
- Communications strategy (Commercial):
 - More general, less targeted communications needed
- Communications strategy (Residential):
 - Target and speak to the higher educated, higher income, and females
 - Target those who have participated in past energy savings programs
 - Use monthly bills as a channel for communications (inserts)
- Incorporate into main messaging how signing up for biogas program will reduce GHG levels



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