Diane Roy
Director, Regulatory Affairs - Gas
FortisBC Energy Inc.

16705 Fraser Highway
Surrey, B.C. V4N 0E8
Tel: (604) 576-7349
Cell: (604) 908-2790
Fax: (604) 576-7074
Email: diane.roy@fortisbc.com
www.fortisbc.com

Regulatory Affairs Correspondence
Email: gas.regulatory.affairs@fortisbc.com

November 23, 2012

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")

Application for Approval of Rate Treatment of Expenditures under the Greenhouse Gas Reductions (Clean Energy) Regulation ("GGRR") and Prudency Review of Incentives under the 2010 – 2011 Commercial NGV Demonstration Program (the "Application")

Response to the Commercial Energy Consumers Association of British Columbia ("CEC") Information Request ("IR") No. 2

On August 21, 2012, FEI filed the Application as referenced above. In accordance with the Regulatory Timetables set out by Commission Order No. G-154-12 for Phase 3, FEI respectfully submits the attached response to CEC IR No. 2.

In addition, Appendix W of the Application has been amended to correct the volume assumption used for Waste Management in the derivation of the delivery rate benefit. The Amended Appendix W has been included as Attachment 4.1 provided in the response to CEC IR 2.4.1.

If there are any questions regarding the attached, please contact the undersigned.

Yours very truly,

FORTISBC ENERGY INC.

Original signed by: Shawn Hill

For: Diane Roy

Attachment

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

1. Reference: Exhibit B-1, Page 44 and Exhibit B-5, CEC 1.14.1

> The NGV incentives of $5.6 million provided in 2010 and 2011 were prudent expenditures and in the public interest. They generated throughput, represented an investment in promoting a much larger potential market, and were supported by the same policy considerations that underpin the prescribed undertaking expenditures for vehicle incentives in the GGRR. Given
>
> 14.1 Please describe the FEI views on what the public interest assessment of the Commission should consider with respect to this $5.6 million investment.
>
> **Response:**
>
> This question is related to the recovery of past incentives, which is the subject matter of Phase 3 of this proceeding. FEI understands that Phase 3 will have its own process. As such, FEI respectfully submits that the question should be deferred until the Phase 3 process.

1.1 Please answer the question at this time for the Phase 3 proceeding.

Response:

The legal test that governs this proceeding is the prudence test, as described by FEI in response to BCSEA IR 2.22.1. While the prudence test does not actually use the phrase "public interest", FEI submits that the concept of expenditures being in the "public interest" will often be synonymous with expenditures that are "prudent". With respect to whether the presumption of prudence has been rebutted, and/or the prudence of the expenditures at issue, the relevant considerations are described by FEI in Part 2 of the Application (Exhibit B-1), as supplemented by FEI's responses to information requests. All of the subsections of this Part of the Application (as supplemented through information request responses) are relevant to the issue of prudence, but the central and most significant section regarding the prudence of the expenditures is section 7.5. With respect to the first stage of the prudence inquiry (whether the presumption of prudence has been rebutted), the facts described in sections 7.6 and 7.7 are also key considerations.

2. Reference: Exhibit B-1, Page 28

> Undertaking 1. In the event that the Commission approves the recovery of some or all of the 2010-2011 NGV Incentives, FEI will commit to reduce the amount of incentives dispensed under Prescribed Undertaking 1 by the amount of the 2010-2011 NGV Incentives approved for recovery. Therefore, the total amount of vehicle incentives that can be dispensed in 2012 and onwards as a result of this Application (inclusive of the amount of 2010-2011 NGV Incentives if approved) will not exceed the Prescribed Undertaking 1 maximum of $62 million.

2.1 Is FEI's commitment to reduce the amount of incentives dispensed under Prescribed Undertaking 1 by the amount of the recovery allowed an option for the Commission to consider or is it FEI's proposal that this is what it plans to do?

Response:

Please refer to the response to CEC IR 1.10.1 which asked for an explanation of why FEI would reduce its future ability to offer incentives by deducting the past expenditures from the future ability to provide funding. In that response, FEI stated that while it believed that both the past vehicle grants and future grants under the GGRR provide real benefits to customers it had made its proposal in consideration of the concerns of some stakeholders about greater spending on vehicle grants. The response also noted that if the Commission was to determine that the full GGRR prescribed amount of $62 million should be spent, in addition to allowing the past expenditures, that FEI would be amenable to that approach. In that sense, FEI's proposal to deduct the approved amount of 2010-2011 vehicle grants from the $62 million spending envelope may be considered an option for the Commission.

2.2 Can the Commission approve the recovery with its own amortization period and choose not to impact the Prescribed Undertaking 1 potential incentive expenditures?

Response:

Yes, the Commission can approve recovery of the $5.6 million of 2010-2011 NGV Incentives, in addition to allowing the full $62 million of expenditures under Prescribed Undertaking 1 of the GGRR. The Commission can also establish a separate accounting treatment, including a different amortization period, for the 2010-2011 NGV Incentives. However, given that the 2010-2011 NGV Incentives have the same purpose and intent as the vehicle grants to be provided under the GGRR, and the same rate design considerations are equally applicable, FEI believes

that the accounting treatment approved for the GGRR vehicle grants by BCUC Order No. G-161-12, should also be applied to the 2010-2011 Incentives.

2.3 Please provide the estimated NPVs to customers if the Commission were to approve the recovery of the full $5.6 million requested if held in a deferral account with a rate of return to the company and then amortized over 10 years and over 20 years, based on projections through to 2030 and beyond as necessary, without impacting Prescribed Undertaking 1 and with full deduction from Prescribed Undertaking 1 and assuming Prescribed Undertaking 1 is used to its full limit but nothing further is invested in incentives or zero-interest loans for the duration of the Prescribed Undertaking 1.

Response:

The estimated NPV of Net COS Benefits (Costs) of the following options has been provided in the table below. Each option has been run using both Scenario 1 (Planned Growth) and Scenario 2 (GGRR Load Growth Only). The present value calculations have been extended by three years to 2033 to accommodate the twenty year amortization period.

Option 1 amortizes the $5.6 million deferral account over 10 and 20 years without impacting Prescribed Undertaking 1. Total vehicle grants equal $67.6 million.

Option 2 amortizes the $5.6 million deferral account over 10 and 20 years and is deducted from Prescribed Undertaking 1. Total vehicle grants equal $62 million.

	Prescribed Undertaking 1 Capital $M			NPV of Net COS Benefits (Costs) $M (2012 – 2033)			
				Scenario 1: Planned Growth		Scenario 2: GGRR Load Growth Only	
	Deferral Account	Balance	Total	10 Yrs	20 Yrs	10 Yrs	20 Yrs
Option 1:	5.6	62.0	67.6	108.2	108.2	39.3	39.2
Option 2:	5.6	56.4	62.0	99.8	99.8	32.8	32.8

3. Reference: Exhibit B-1, Page 31 and Exhibit B-5, CEC 1.11.2

Table 7-1: Commercial NGV Demonstration Program – 2010/2011 Incentives Committed26

Customer Receiving NGV Incentive	Incentive Amount Committed ($)	Date of Agreement for EEC Incentive Funding (MM/DD/YYYY)	Estimated Fuel Savings to Customer ($)	Customer Estimated Avoided Diesel (L)	Customer Estimated GHG Reductions (tonnes)	Estimated Revenue to FortisBC Energy ($)	Total Resource Cost (TRC) Test Ratio
City of Surrey	$ 26,700	9/15/2010	$ 18,566	34,000	13	$ 5,611	1.7
Kelowna School District	$ 363,286	3/17/2011	$ 17,587	95,436	120	$ 21,888	1.1
Waste Management	$ 803,560	12/3/2010	$ 202,651	468,000	214	$ 38,728	1.4
Vedder Transport	$ 4,393,300	12/10/2010	$ 1,877,989	3,582,850	3,754	$ 548,460	1.4
Total	$ 5,586,846		$ 2,116,793	4,180,286	4,100	$ 614,687	

Source: 2011 NGV Incentive Review, Exhibit B-1, BCUC IR 1.7.2 (Totals added)

Customer Receiving NGV Incentive	Incentive Amount Committed ($)	Date of Agreement for EEC Incentive Funding (MM/DD/YYYY)	Estimated Fuel Savings to Customer ($ per year)	Customer Estimated Avoided Diesel (L per year)	Customer Estimated GHG Reductions (tonnes per year)	Estimated Revenue to FortisBC Energy ($ per year)	Total Resource Cost (TRC) Test Ratio
City of Surrey	$ 13,350	9/15/2010	$ 19,889	29,751	10	$ 4,448	2.1
Kelowna School District	$ 363,286	3/17/2011	$ 17,587	116,415	132	$ 17,406	1.3
Waste Management	$ 803,560	12/3/2010	$ 562,320	776,100	317	$ 39,679	1.8
Vedder Transport	$ 4,393,300	12/10/2010	$ 2,595,060	4,656,600	5,604	$ 729,000	1.6
Total	$ 5,573,496		$ 3,194,856	5,578,866	6,063	$ 790,534	

These calculations are based on the following assumptions:

- Actual amount paid to City of Surrey was $13,350 (as stated at page 31 of the Application);
- Fuel savings estimates based on current natural gas delivery rates and diesel price estimates;
- Actual volumes (GJ and diesel litres) described at page 43 of the Application;
- GHG emission reductions based on GHGenius version 4.01;
- 2012 delivery rates used to calculate Estimated Revenue to FEI; and
- No changes to the TRC test model, other than volumes (and cost input for City of Surrey).

3.1 Please provide the assumption used for the price of diesel, in $/GJ and $/DLE, for the purpose of estimating the customer savings.

Response:

The assumption used for the price of diesel in the updated table (CEC IR 1.11.2) is FEI's best estimate at this time.

MJ Ervin & Associates maintains a database of historic diesel fuel costs. According to this source, diesel prices (retail including tax) in Vancouver area over the past three years have ranged from approximately $1.00 to $1.50.[1]

- 2010: Low $1.04, High $1.18
- 2011: Low $1.18, High $1.41
- 2012: Low $1.34, High $1.49

FEI estimates that large fleets pay slightly lower costs due to their superior buying power. This has also been communicated to FEI by its customers.

Therefore, FEI's underlying assumptions used for the current price of diesel (in CEC IR 1.11.2) are as follows:

- City of Surrey - $1.20 per diesel litre, or $31.04 per GJ
- Kelowna School District - $1.20 per diesel litre, or $31.04 per GJ
- Vedder Transport - $1.10 per diesel litres, or $28.48 per GJ
- Waste Management - $1.20 per diesel litre, or $31.04 per GJ

FEI has assumed that Vedder, who operates a fleet of over 300 diesel tractors, pays a lower cost for diesel than other mid-size fleets (with a fleet size ranging from 10 to 100 vehicles).

3.2 Please provide the assumptions being used for the price of diesel, in $/GJ and $/DLE, for the purpose of long term (through to 2030) projections in this regulatory proceeding.

Response:

FEI has not made any assumptions of the long term price of diesel in this regulatory proceeding for the purpose of calculating customer fuel savings. For the purposes of calculating the savings in Table 7.1, FEI has simply calculated an annual fuel price savings in year 1. The price of diesel for each account is detailed in the response to CEC IR 2.3.1.

[1] MJ Ervin & Associates, www.kentmarketingservices.com

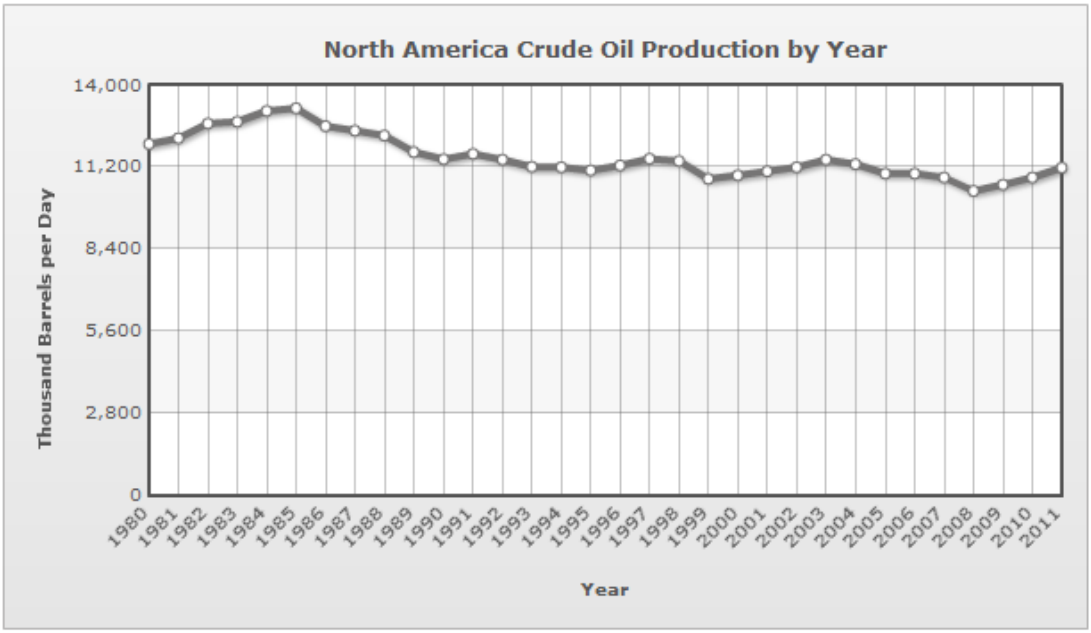
To the extent that diesel prices increase at a rate greater than natural gas prices the benefits may be understated. Please refer to the response to CEC IR 2.3.3 for a long term view of diesel pricing over the next 10 years.

3.3 Please discuss the oil supply situation in North America as it exists now and is likely to unfold in the next 10 years, including the likely impact on diesel and gasoline prices.

Response:

North American crude oil production has decreased from its high levels in the mid 1980's. More recently, it has recovered from the lows seen in 2008 which were caused by reduced production due to the global recession and Gulf of Mexico hurricane disruptions. The increase since 2008 is mainly due to strong oil sands development in Canada and operators drilling in the Eagle Ford, Bakken and other shale formations combining horizontal wells and hydraulic fracturing - the same technologies used to significantly increase shale gas production - to boost oil production.

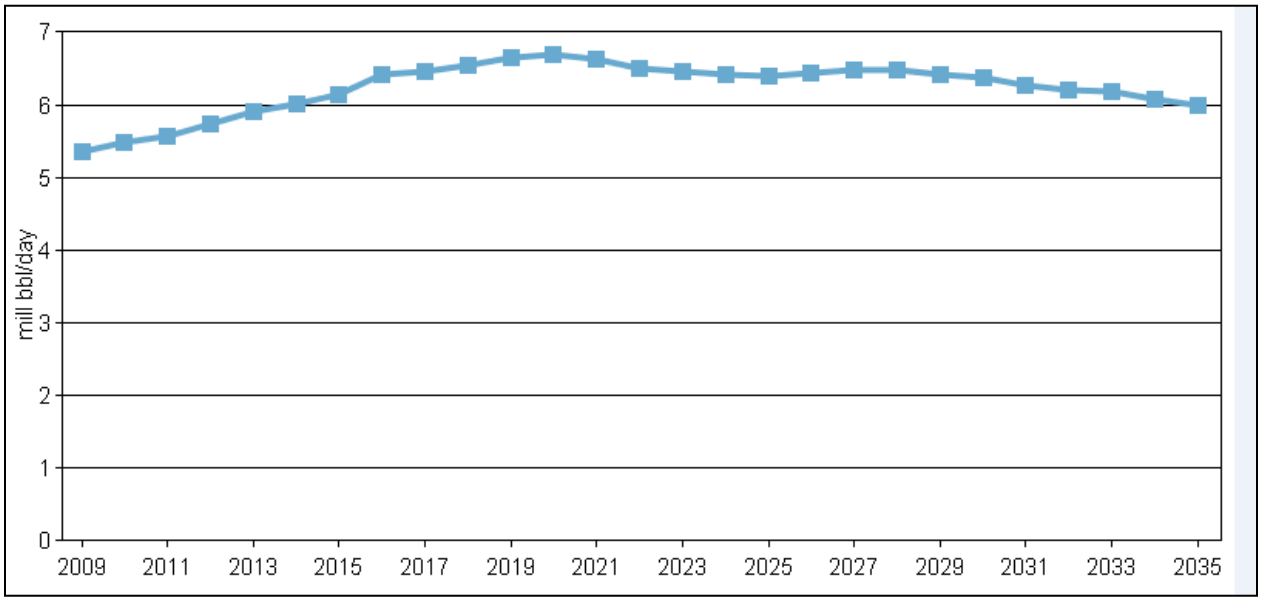
Figure 1: North American Crude Oil Production[2]



[2] U.S. Energy Information Administration

At this point, North American crude oil production is expected to continue to grow for the next decade. According to the Canadian Association of Petroleum Producers ("CAPP") 2012 forecast, Canadian crude oil production will more than double to 6.2 million barrels a day by 2030, from 3 million a day in 2011.[3] In the U.S., crude oil production is forecast to increase until 2020, and then decline. The following figure shows the latest long term forecast reference case from the U.S. Energy Information Administration ("EIA").

Figure 2: U.S. Crude Oil Production Forecast[4]



However, because the technology advances that have provided for recent increases in supply are still in the early stages of development, future U.S. crude oil production could vary significantly, depending on the outcomes of key uncertainties related to well placement and recovery rates.

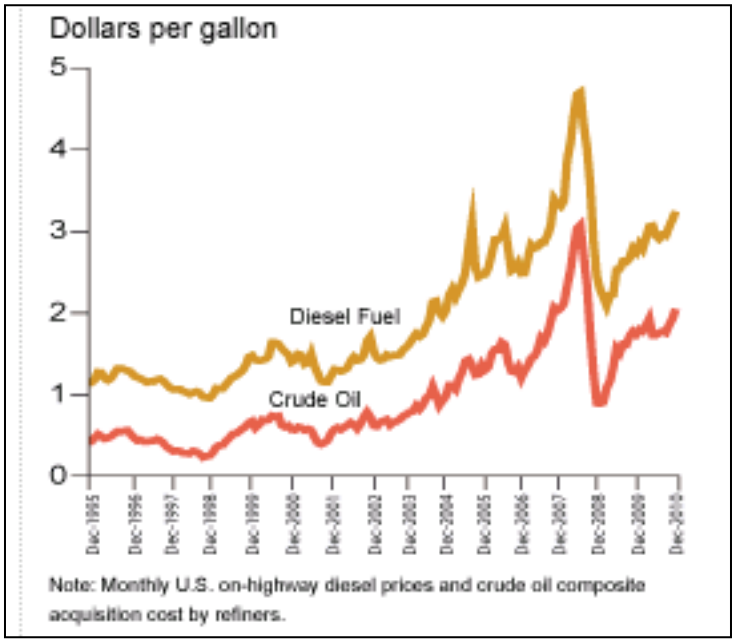
Despite this increase in forecast oil supply, changes in North American oil production have only a modest impact on domestic crude oil and petroleum product prices. This is because any change in North American oil production is diluted by the much larger world oil market. For example, the United States produced 5.5 million barrels per day, or 7 percent of total world crude oil production of 73.9 million barrels per day in 2010, and is projected generally to maintain that share of world crude oil production through 2035[5].

[3] http://blogs.wsj.com/canadarealtime/2012/06/27/u-s-wakes-up-to-north-american-oil-abundance/
[4] U.S. Energy Information Administration, 2012 Annual Energy Outlook, Reference Case
[5] http://www.eia.gov/forecasts/aeo/source_oil_all.cfm#oilprice

North American crude oil prices are tied to global oil prices as oil is an internationally traded commodity. Therefore, it is expected that the North American benchmark West Texas Intermediate ("WTI") oil prices will continue to be impacted by global supply and demand factors. These include geopolitical factors, such as tensions between western nations and Iran over its nuclear program and disruptions in North Africa and the Middle East. They also include global economic factors, such as the strong economic forecasts for China and India and concerns regarding Euro-zone recovery. Furthermore, the Organization of Petroleum Exporting Countries ("OPEC") supply decisions also impact global prices as OPEC countries have essentially all of the world's spare oil production capacity.

Diesel and gasoline prices are highly correlated with crude oil prices. This is because diesel and gasoline are refined from crude oil. While there will be differences related to refining costs, distribution, retail marketing, taxes and profit, the prices of these commodities generally move together. The following figure shows historical U.S. diesel versus crude oil prices.

Figure 3: Crude Oil versus Diesel Prices[6]



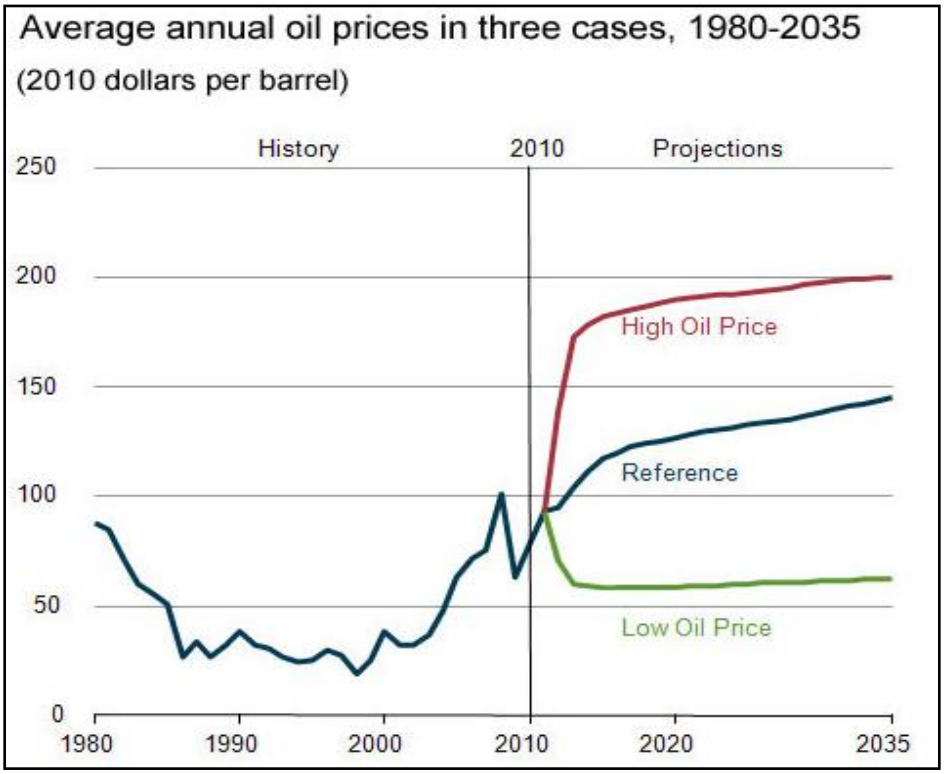
Given this relationship between crude oil and diesel and gasoline prices, one can expect that crude oil prices will continue to impact diesel and gasoline prices in the future.

[6] http://www.eia.gov/energyexplained/index.cfm?page=diesel_factors_affecting_prices

As the following figure shows, crude oil prices have been highly volatile in the recent past. Prices ran up to record highs in 2008 as global supply and demand tightened. Prices declined sharply in the second half of 2008 due to the financial crisis and global recession and prices have generally trended upwards since that time.

The future outlook for crude oil prices is highly uncertain as prices will continue to be influenced by various global supply and demand factors. In its latest outlook, the U.S. Energy Information Administration ("EIA") provides high, low and reference scenarios for crude oil prices given their high degree of volatility.

Figure 4: U.S. WTI Oil Price Forecasts[7]



The Reference case assumes that the current price discount for WTI relative to similar "marker" crude oils (such as Louisiana Light Sweet and the European benchmark Brent) will fade when adequate pipeline capacity is built between Cushing and the Gulf of Mexico.

In the Low Oil Price case, economic growth in countries outside OPEC is slower than in the Reference case, resulting in lower demand for oil, and producing countries develop stable fiscal policies and investment regimes that encourage resource development. OPEC nations

[7] U.S. Energy Information Administration, *Annual Energy Outlook 2012*, Figure 64 (June 2012).

increase production, achieving approximately a 46-percent market share of total petroleum and other liquids production in 2035.

The High Oil Price case depicts the scenario in which total economic growth in countries outside the Organization for Economic Cooperation and Development (non-OECD), such as China and India, is faster than in the Reference case, driving up demand for petroleum and other liquids. Production of crude oil and natural gas liquids (NGL) is restricted by political decisions and limits on access to resources (such as the use of quotas and fiscal regimes) compared with the Reference case. Petroleum and other liquids production in the major producing countries is reduced (for example, the OPEC share averages 40 percent), and the consuming countries turn to more expensive production from other liquids sources to meet demand.

Based on these scenarios, the outlook for crude oil prices is highly uncertain and unpredictable. Therefore, based on this range of oil price scenarios, the outlook for diesel and gasoline prices is also highly uncertain and unpredictable and may fluctuate within a wide range in the future.

3.4 Please provide an analysis of the point at which customer savings from adopting NPV would breakeven with the customers estimated costs for making conversion, with and without the projected Prescribed Undertaking 1 incentives.

Response:

FEI assumes that IR 3.4 should read "Please provide an analysis of the point at which customer savings from adopting **NGV** would…"(emphasis added).

Due to a calculation error, the fuel savings for the Kelowna School District (KSD) were incorrectly stated as $17,587 annually in the response to CEC IR 1.11.2. Based on the past year, estimated annual fuel savings are $57,578. The table provided in response to CEC IR 1.11.2 has been updated to reflect this change, and is provided below:

Customer Receiving NGV Incentive	Incentive Amount Committed ($)	Date of Agreement for EEC Incentive Funding (MM/DD/YYYY)	Estimated Fuel Savings to Customer ($ per year)	Customer Estimated Avoided Diesel (L per year)	Customer Estimated GHG Reductions (tonnes per year)	Estimated Revenue to FortisBC Energy ($ per year)	Total Resource Cost (TRC) Test Ratio
City of Surrey	$ 13,350	9/15/2010	$ 19,889	29,751	10	$ 4,448	2.1
Kelowna School District	$ 363,286	3/17/2011	$ 57,578	116,415	132	$ 17,406	1.3
Waste Management	$ 803,560	12/3/2010	$ 562,320	776,100	317	$ 39,679	1.8
Vedder Transport	$ 4,393,300	12/10/2010	$ 2,595,060	4,656,600	5,604	$ 729,000	1.6
Total	$ 5,573,496		$ 3,194,856	5,578,866	6,063	$ 790,534	

The incentive amounts (column 2) and fuel savings estimates (column 4) in the table above are used to calculate breakeven points for these customers. As described in the GGRR Application, incentive funding equivalent to 100% of the cost premium for a natural-gas fueled vehicle versus a comparable diesel or gasoline fuelled vehicle was offered to the customers listed in the table above. Kelowna School District (KSD)[8], Waste Management (WM) and Vedder Transport (VT) received incentives that offset 100% of the cost difference between diesel and natural gas fueled vehicles, while City of Surrey (CS) received 50%.

The following analysis demonstrates how long (in years) it takes the fuel savings to pay back the capital outlay, therefore for simplicity FEI ignores timing differences between when the capital outlay for the vehicles was incurred, when the incentive was awarded/paid and when the vehicles were put into service. Also for simplicity the calculations ignore income tax effects.

The analysis also assumes that the vehicles are in service on January 1 in the year that they were placed into service, diesel fuel costs are constant over the analysis period and annual fuel savings remain constant over the analysis period.

Table 1 below shows that for all customers, their fuel savings (column 6) outweighs their net of incentives capital outlay (column 5) in the same year that the vehicles went into service. Therefore, with incentives, all customers break even in the same year (column 7) that the vehicles were placed into service (column 2).

[8] KSD later received a small amount of other third party funding which reduced FEI's contribution below the 100% of the vehicle price differential initially offered.

Table 1: Breakeven year with Incentives

Customer Receiving NGV Grant	Vehicle In-Service Year	Customer Capital Outlay	Incentive Received	Net Customer Capital Outlay after Incentive	Estimated Fuel Savings per year	Break even year with Prescibed Undertaking 1 incentivees
(1)	(2)	(3)	(4)	(5)	(6)	(7)
City of Surrey	2010	$ (26,700)	$ 13,350	$ (13,350)	$ 19,889	2010
Kelowna School District	2011	$ (363,286)	$ 363,286	$ -	$ 57,578	2011
Waste Management	2011	$ (803,560)	$ 803,560	$ -	$ 562,230	2011
Vedder Transport	2010	$ (4,393,300)	$ 4,393,300	$ -	$ 2,595,060	2010
Total		$ (5,586,846)	$ 5,573,496	$ (13,350)	$ 3,234,757	
				(3) + (4)		

In Table 2, FEI calculates the cumulative present value cash flow for each customer assuming that they did not receive any incentives. When the cumulative present value cash flow is greater than zero, then that is the year that fuel savings benefits outweigh the capital outlay.

Table 2: Breakeven year without Incentives

			Year						
			1	2	3	4	5	6	7
Line	Particulars	Reference	2010	2011	2012	2013	2014	2015	2016
1	**City of Surrey**								
2	Capital Outlay	Table 1, Column 3	(26,700)						
3	Incentive Received (assumed 0)		-						
4	Fuel Savings Benefit	Table 1, Column 6	19,889	19,889					
5	Net Cash Flow	Sum of lines 2 to 4	(6,811)	19,889					
6	Cumulative Net Cash Flow	Cumulation of Line 5	(6,811)	13,078					
7	WACC		6.81%	6.81%					
8	Discount Factor	(1 + Line 7) ^ Year	106.81%	114.08%					
9	Present Value of Cumulative Net Cash Flow	Line 6 / Line 8	(6,377)	11,464					
10									
11	*When the Present Value of the Cumulative Cash Flow (Line 9) is positive, then that equals the breakeven year*								
12									
13									
14	**Kelowna School District**								
15	Capital Outlay	Table 1, Column 3	(363,286)						
16	Incentive Received (assumed 0)		-						
17	Fuel Savings Benefit	Table 1, Column 6	57,578	57,578	57,578	57,578	57,578	57,578	57,578
18	Net Cash Flow	Sum of lines 15 to 17	(305,708)	57,578	57,578	57,578	57,578	57,578	57,578
19	Cumulative Net Cash Flow	Cumulation of Line 18	(305,708)	(248,130)	(190,552)	(132,974)	(75,396)	(17,818)	39,760
20	WACC		6.81%	6.81%	6.81%	6.81%	6.81%	6.81%	6.81%
21	Discount Factor	(1 + Line 20) ^ Year	106.81%	114.08%	121.85%	130.15%	139.01%	148.48%	158.59%
22	Present Value of Cumulative Net Cash Flow	Line 19 / Line 21	(286,217)	(217,498)	(156,379)	(102,169)	(54,236)	(12,000)	25,070
23									
24	*When the Present Value of the Cumulative Cash Flow (Line 22) is positive, then that equals the breakeven year*								
25									
26									
27	**Waste Management**								
28	Capital Outlay	Table 1, Column 3	(803,560)						
29	Incentive Received (assumed 0)		-						
30	Fuel Savings Benefit	Table 1, Column 6	562,230	562,230					
31	Net Cash Flow	Sum of lines 28 to 30	(241,330)	562,230					
32	Cumulative Net Cash Flow	Cumulation of Line 31	(241,330)	320,900					
33	WACC		6.81%	6.81%					
34	Discount Factor	(1 + Line 33) ^ Year	106.81%	114.08%					
35	Present Value of Cumulative Net Cash Flow	Line 32 / Line 34	(225,943)	281,285					
36									
37	*When the Present Value of the Cumulative Cash Flow (Line 35) is positive, then that equals the breakeven year*								
38									
39									
40	**Vedder Transport**								
41	Capital Outlay	Table 1, Column 3	(4,393,300)						
42	Incentive Received (assumed 0)		-						
43	Fuel Savings Benefit	Table 1, Column 6	2,595,060	2,595,060					
44	Net Cash Flow	Sum of lines 41 to 43	(1,798,240)	2,595,060					
45	Cumulative Net Cash Flow	Cumulation of Line 44	(1,798,240)	796,820					
46	WACC		6.81%	6.81%					
47	Discount Factor	(1 + Line 46) ^ Year	106.81%	114.08%					
48	Present Value of Cumulative Net Cash Flow	Line 45 / Line 47	(1,683,588)	698,452					
49									
50	*When the Present Value of the Cumulative Cash Flow (Line 48) is positive, then that equals the breakeven year*								

As demonstrated in the tables above, CS, WM and VT would reach breakeven points within 2 years of their initial capital outlay. The KSD is forecast to breakeven within 7 years of its initial

capital outlay. This longer breakeven period is due to KSD's low fuel savings estimate, which is based on the customer's relatively high fueling station rate and moderate fuel consumption.

FEI acknowledges that fuel savings are substantial and that vehicle premium costs for large fleets such as WM and VT are recovered within a couple years of operation. However FEI's experience from speaking with customers is that the capital premium on vehicles remains a significant barrier to adoption. This is supported by the fact that near minimal customer adoption of heavy duty NGVs has occurred in B.C. over the past decade in the absence of vehicle incentive funding from government, utilities or other sources.

As well, analyzing the breakeven based on estimated fuel savings does not necessarily reflect the net cost-benefit for each customer. Customers adopting natural gas for their fleet may incur costs such as upgrades to their maintenance shop, incremental driver training and sales costs, and cost risk related to commodity, LNG supply, vehicle performance, and vehicle salvage value.

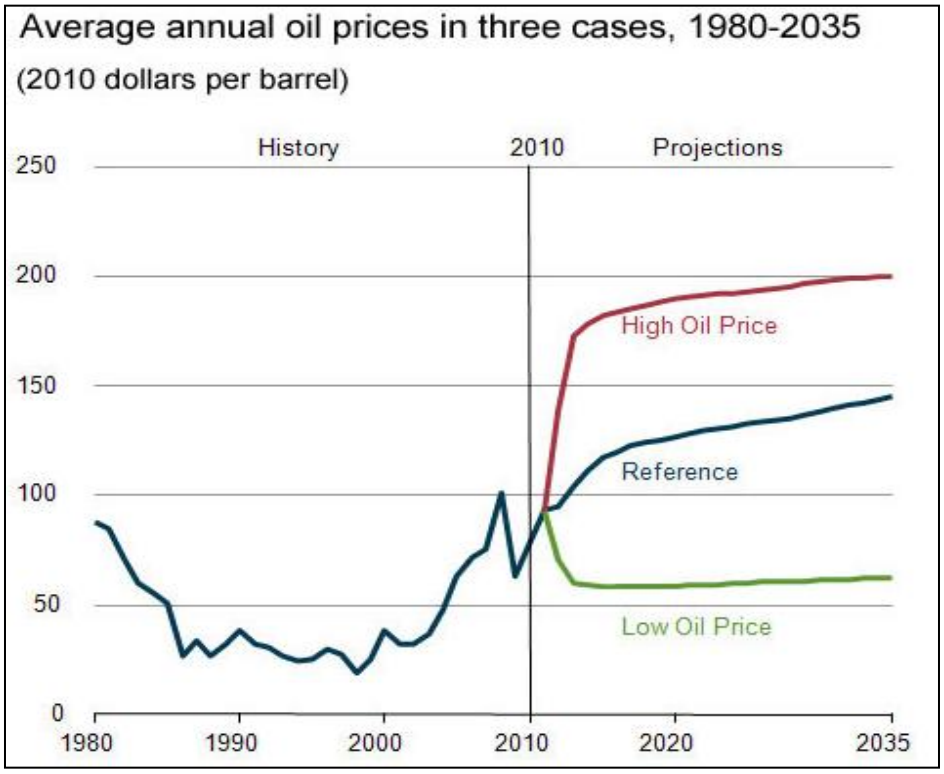
3.5 Please comment on the degree to which this program will be robust enough to be sustainable through a lengthy period of lower oil prices than those we have recently experienced through 2011 and 2012.

Response:

As discussed in the response to CEC IR 2.3.3, oil prices are highly volatile and difficult to predict. The U.S. Energy Information Administration ("EIA") does provide some scenarios for future oil prices, including a low price scenario. U.S. West Texas Intermediate ("WTI") crude oil prices futures are currently trading near $90 per barrel. If we compare this low price scenario with the EIA's forecast of natural gas prices, this will give us some indication of the ability of natural gas to maintain its price advantage over oil in the future and therefore the sustainability of the efforts to encourage the use of natural gas in heavy duty transportation over time.

The following figure (also presented in CEC IR 2.3.3) shows the EIA's forecast of oil prices, including high and low case scenarios.

Figure 1: U.S. WTI Oil Price Forecasts[9]

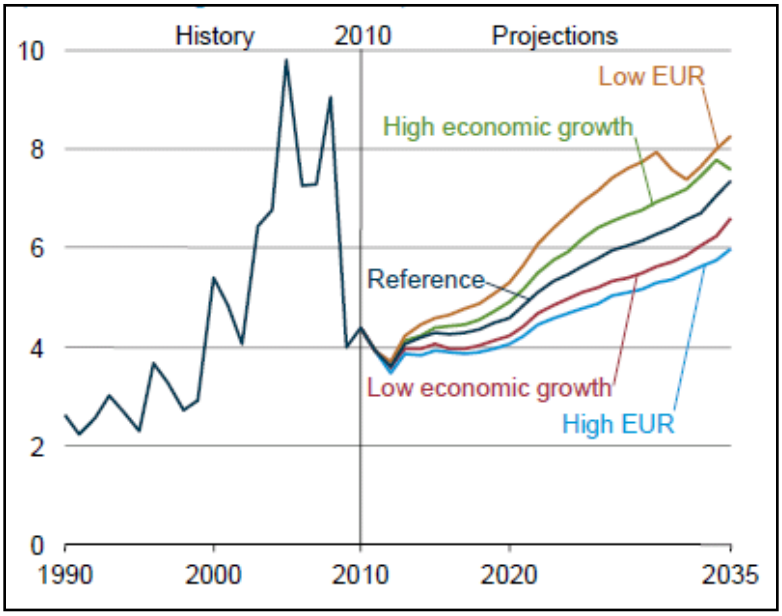


In the low oil price scenario, oil prices average about $60 US per barrel. This is well below the range of $76 per barrel to $114 per barrel in which oil prices have traded during 2011 and so far in 2012.

The EIA also provides a forecast of natural gas prices based on several scenarios (Henry Hub prices in 2010 dollars and US per million Btu). U.S. natural gas prices rise over time based on the cost of developing incremental production capacity. As the figure shows, in the high case scenario, natural gas prices are forecast to double by 2035.

[9] U.S. Energy Information Administration, *Annual Energy Outlook 2012*, Figure 64 (June 2012).

Figure 2: U.S. Natural Gas Price Forecasts[10]



In this figure, 'EUR' stands for estimated ultimate recovery per well and is a measure of the expected cumulative production of shale gas wells over their lifetimes.

By using the low oil price forecast and the high natural gas price forecast, we can assess the robustness and future sustainability of the program.

In order to compare the low oil price scenario with the high natural gas price scenario, the prices need to be converted to a diesel litre equivalent ("DLE") "pump" price.

In the low oil price scenario, oil prices fall to $60 per barrel, which is about 66%, or two thirds, of their current price level near $90 per barrel. Current diesel pump prices in Vancouver are about $1.299 per litre[11]. About half of the diesel pump price is related to the cost of crude oil and the remaining half relates to distribution, refiner's margin, marketing, and taxes[12]. Therefore, a drop in oil prices to two thirds of their current price would result in a diesel pump price of about $0.86 per litre.[13]

[10] U.S. Energy Information Administration, *Annual Energy Outlook 2012*, Figure 105 (June 2012).
[11] http://www.bcgasprices.com/GasPriceSearch.aspx?fuel=D&qsrch=v5a3w5
[12] http://www.shell.ca/home/content/can-en/products_services/on_the_road/pricing/fuel_pricing/
[13] $1.299/litre divided by two equals crude oil cost of $0.65/litre. Two thirds of $0.65/litre equals $0.43/litre. Doubling this equals $0.86/litre.

In the high natural gas price scenario, gas prices double from current levels near $4 per GJ to $8 per GJ. Based on this, the comparable Vancouver "pump" price for LNG would be about $0.78 per litre.[14]

As these price scenarios are based on a number of assumptions including supply and demand and economic conditions, it is unlikely that the low oil price scenario would coincide with the high natural gas price scenario. Nevertheless, for the purposes of responding to this question, it can be seen that even if the low oil price scenario and high gas price scenario did coincide, the estimated "pump" price of LNG of $0.78 per litre is still below the diesel pump price of $0.86 per litre. Based on these assumptions of potential oil and gas price ranges, this indicates that the program will be sustainable over the long run.

In addition, once an operator has made the transition to a cleaner fuel such as natural gas, FEI believes it is likely that a substantial economic advantage would be needed to encourage that operator to move back to use of the higher emission fuel.

[14] Estimate based on gas commodity price of $8/GJ plus Tilbury terminal Rate Schedule 16 delivery charge of $4.05/GJ plus $2/GJ transport + $4/GJ fueling station fee + GST and Carbon Tax of $1.50/GJ. Energy equivalent conversion factor from GJ's to litres is based on energy value in diesel of 38,600 MJ/litre as per GH Genius model published by NRCan.

4. Reference: Exhibit B-1, Page 34

Table 7-2: Residential Customer Addition Equivalent by Contract

Fleet Operator	Additional Annual Load (GJs)	Residential Customer Addition Equivalent
City of Surrey	1538	17
Kelowna School District	6000	67
Waste Management	21140	235
Vedder	138500	1539
Total	**167178**	**1858**

These load additions are anticipated to provide a present value delivery rate benefit of $1.2 million by 2030 for FEI's non-bypass customers[38].

4.1 Please provide an update of the $1.2 million estimate for the updated assumptions provided in CEC 1.11.2.

Response:

This response is organized in two parts. The response first describes an amendment to Appendix W. Second, it discusses an update of the delivery margin estimate and NPV of the COS benefits using the assumptions from CEC IR 1.11.2.

Amendment to Appendix W

Appendix W shows the derivation of the NPV net COS benefit of $1.2 million (or $1,229,000) for 2012 to 2030 for the four 2010-2011 NGV grant recipients. In reviewing Appendix W for the responses, FEI has identified an incorrect volume assumption used for Waste Management. To make this correction, FEI has filed an amended version of Appendix W, and provided it as Attachment 4.1 to this response. This correction lowers the $1.229 million NPV net COS estimate (based on 176 TJ per year) to $1.074 million (based on 167 TJ per year which matches Table 7-2). FEI has made this correction to ensure that this calculation is based on information that was available to FEI at the time the decisions were made to issue the incentives. The table below summarizes the volume correction.

Fleet Operator	Appendix W	Amended Appendix W
City of Surrey	1,538	1,538
Kelowna School District	6,000	6,000
Waste Management	30,000	21,140
Vedder	138,500	138,500
Total (GJ)	176,038	167,178

Updated NPV of Cost of Service Benefit

Based on actual experience and the updated information provided in CEC IR 1.11.2, FEI has revised the load additions generated by each these four customers to a total of 226 TJ per year.[15] The response to CEC IR 2.4.10 further explains the reasons for updated annual volume of each customer.

Fleet Operator	Appendix W	Updated consumption
City of Surrey	1,538	1,150
Kelowna School District	6,000	5,000
Waste Management	21,140	30,000
Vedder	138,500	190,000
Total (GJ)	167,178	226,150

Based on 226 TJ / year, the recalculated estimate of the NPV of net COS benefit is $3.1 million for 2012 to 2030. This calculation uses the same model as amended Appendix W but using the updated volume assumptions of 226 TJ / year.

4.2 Please provide the company's average cost per customer for connection and system extension for the connection of new customers (include all costs direct, indirect and overhead please).

Response:

The average FEI service line unit cost was $1,810 in 2011. This amount represents an average, aggregate service line unit cost that includes all service types in all FEI geographic areas.

The average main extension unit cost for all FEI geographic areas was $61 per metre in 2011.

4.3 Does the PV estimate of $1.2 million delivery rate benefit include growth assumptions for the customers to which these benefits relate?

[15] The response to CEC 1.11.2 assumes a volume for Vedder of 180,000 GJ per year. Based on the customer's most recent consumption and Vedder's Rate Schedule 16 commitment, this has been updated to 190,000 GJ per year.

Response:

No, the annual loads used to calculate the NPV estimate of $1.1 million in the amended Appendix W (Attachment 4.1, CEC IR 2.4.1) do not include any load growth assumptions. To be conservative in its estimate, FEI has assumed these loads are constant in each year until 2030.

4.4 Does the PV estimate of $1.2 million delivery rate benefit include the additional fleet expansion for these customers undertaken since the initial incentives?

Response:

No, the NPV estimate of $1.1 million delivery rate benefit in the amended Appendix W (Attachment 4.1, CEC IR 2.4.1) does not include any additional fleet expansion since the initial incentives. Any expansion initiatives undertaken by fleets would be incremental to the $1.1 million and create additional benefit to all non-bypass customers. For example, the incentive grant awarded for the City of Surrey CNG truck led to BFI's purchase of 52 CNG trucks to serve the Surrey waste collection contract, which creates incremental throughput of 60,000 GJ per year that is not included in the PV calculation of $1.1 million.

4.5 Does the PV estimate of $1.2 million delivery rate benefit include the additional volumes expected from the use applications undertaken by these customers since the initial incentives?

Response:

The amended Appendix W (please refer to Attachment 4.1 to the response to CEC IR 2.4.1) NPV estimate of $1.1 million by 2030 does not reflect any additional volumes.

4.6 Please confirm that the success of the initial incentives has in part provided a basis for the Prescribed Undertaking 1 plans.

Response:

Confirmed. The success of the initial grant program has provided a set of reference accounts that can confirm the benefits of using natural gas vehicles. It has also confirmed the benefits projected from increased NG load on the FEI system to all non-bypass customers. In addition it has given FEI additional information that helps inform FEI in the setting of the incentive program level for Prescribed Undertaking 1.

4.7 Please provide information on the Energy Returned on Energy Invested for oil and natural gas at the margin at this current time and the expected trends.

Response:

Energy Returned on Energy Invested ("EROEI" or "EROI") is the ratio of how much energy is gained from a production process compared to how much energy is required to extract that particular energy source. The units used in this calculation must be the same for the energy produced and the energy used to produce a relative ratio that can be used to compare across different energy resources and that is independent of prices.

As of 2005, for which the most current data are available for crude oil and natural gas, the EROEI for global crude oil production is estimated to be about 18:1. This means that 18 units of energy are produced from each 1 unit of energy required for crude oil production. This compares to an EROEI of about 2-4:1 for oil production from oil sands, which is a much more energy intensive production process due to the various and higher cost energy inputs required for extraction.[16]

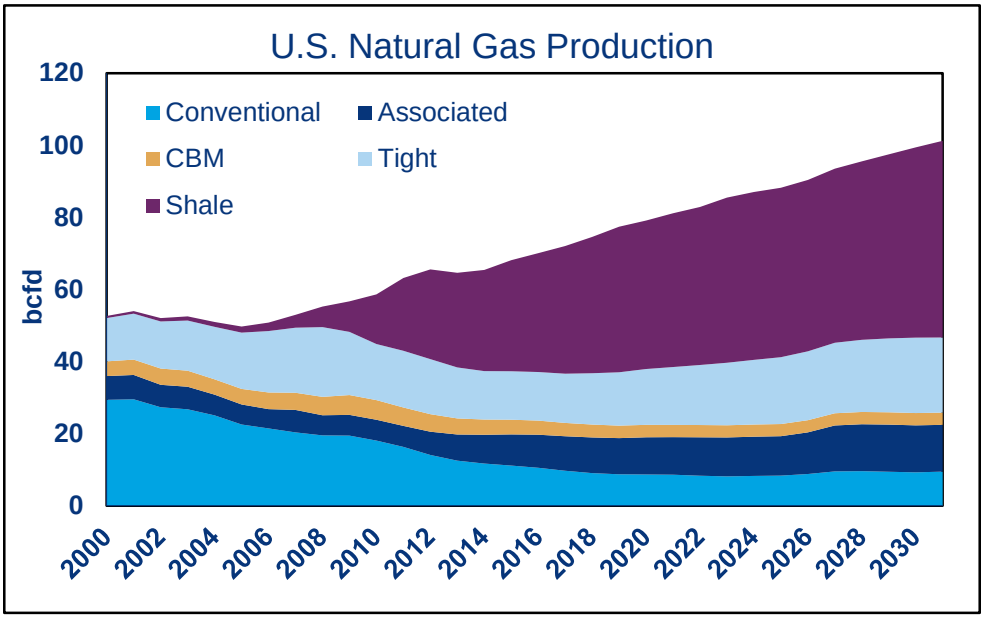
Global natural gas production as of 2005, which was predominately conventional in nature, had an estimated EROEI of about 10:1. However, since 2005, the proliferation of shale gas in North America has resulted in the highest level of natural gas production on record despite the lowest gas prices in nearly a decade. The relatively high marginal productive capacity of an unconventional natural gas well has allowed producers to extract more gas with fewer drilled wells. As a result, some recent estimates of EROEI for unconventional shale gas production are in the range of 70-100:1.[17]

[16] Year in Review – EROI, David J. Murphy, and Charles A. S. Hall, Annals of New York Academy of Sciences, 2010, pages 102-118

[17] Shale gas EROI: Preliminary estimate suggests 70 or greater, http://www.energybulletin.net/stories/2011-08-19/shale-gas-eroi-preliminary-estimate-suggests-70-or-greater

As illustrated in the figure below gas production from shales in the U.S. is expected to increase in the future over current levels. Therefore, the EROEI for gas production can be assumed to be in the range of 10-100:1 with a bias towards the upper end of this range, as shale production will contribute more to overall gas production than in the past.

Figure 1: U.S. Natural Gas Production[18]



4.8 Please discuss the proposition that if one takes a longer term view than the period through to 2030 the use of natural gas to displace diesel or a better alternative will likely continue, because the costs for production of oil supply is likely to remain above the costs for production of natural gas supply for equivalent energy for some time to come.

Response:

Please refer to the responses to CEC IRs 2.3.5 and 2.4.7.

[18] Wood Mackenzie – North America Gas Service, Long Term View, November 2012

4.9 Please confirm that the end customer benefits in reduced fuel costs and the customer's NPV of participation is not included in the $1.2 million delivery benefit but would be additive for total commercial customer benefit.

Response:

Confirmed. The reduced fuel costs would be in addition to the $1.1 million NPV delivery margin benefit in the amended Appendix W (see Attachment 4.1, in the response to CEC IR 2.4.1). The fuel cost reductions would benefit the customers or service recipients of the fleets as well as the fleet owner/operators. The reduced costs of transportation to deliver goods or provide services would lead to lower bids in competitive bidding processes (such as for the waste collection services for Surrey and Abbotsford, as identified in the October 24, 2012 Streamlined Review Processes) or lower operating costs for publicly-owned fleets. Thus there is potential for the benefit of lower fuel costs to be distributed widely in the province.

4.10 If the estimate does not include all of the known changes to load and benefits to date and any others anticipated based on current knowledge, please provide a new estimate inclusive of all current information.

Response:

FEI has responded to this question under the assumption that the "estimate" referred to in the question is the NPV delivery margin benefit of $1.2 million. In the response to CEC IR 2.4.1, FEI provided a recalculation of the NPV delivery margin benefit estimate based on updated volumes for each customer. The revised NPV of the delivery rate benefit by 2030 is approximately $3.1 million. This response provides an explanation of why load additions stimulated by the grants have generally been higher than expected.

1. City of Surrey - The single vehicle that was purchased by the City of Surrey was used in a trial program that allowed Surrey to become more familiar and comfortable with the use of natural gas vehicles. This subsequently led the City of Surrey to issue an RFP for refuse and recycling collection services that required proponents to bid using NGV's. The bid was awarded to BFI who purchased 52 NGVs without the benefit of incentives. These vehicles are projected to consume 60,000 GJ/year of natural gas delivered through FEI's system. The City of Surrey also was able to reduce collection costs by approximately $2 million per year versus the amount paid to the previous incumbent

using diesel powered vehicles. In addition, Emterra, the company that was the incumbent service provider in Surrey has subsequently adopted NGVs for two successful bids – one in Abbotsford and one in Winnipeg[19].

This experience shows how the grant program is designed to achieve follow on benefits that stimulate and lever market forces to kick-start a market transformation from diesel the natural gas.

2. Waste Management ("WM") – WM has increased the utilization of the NGVs in their fleet. The original consumption estimate was based on fleet average use. WM is using the vehicles more than the fleet average as they have lower operating costs. Hence their fuel consumption has increased to approximately 30,000 GJ per year, equivalent to 333 residential customer additions.

3. Vedder – Vedder has also made greater use of the LNG powered vehicles in their fleet to take advantage of the lower operating costs of NGVs. As a result of the vehicles being redeployed onto longer and heavier fuel consumption routes Vedder's consumption rate has increased from 138,500 GJ per year to approximately 190,000 GJ per year.[20] This is equivalent to 2,111 residential customer additions.

4. Kelowna School District ("KSD") – Page 43 of the Application states KSD's fuel consumption over a one year period from August 2011 to July 2012 was nearly 4,600 GJ per year. Based on more recent consumption information, FEI expects KSD's annual volume to be approximately 5,000 GJ per year. This slight decrease from the estimate of 6,000 GJ is attributed to KSD's initial estimate of how much diesel their buses would displace. KSD has future plans to increase the number of natural gas buses at their site and increase their overall fuel consumption.

[19] The revised NPV delivery rate benefit of $3.1 million provided in CEC IR 2.4.1 does not include any spin-off benefits of the CNG-based refuse collection in Surrey or Abbotsford. If, for example the delivery rate benefit for BFI, for the Surrey waste collection contract is included the NPV of the delivery rate benefit increases from $3.1 million to $4.2 million.

[20] Page 43 of the Application states an annual estimate of 175,000 GJ per year. Based on the most recent consumption and Vedder's revised volume commitment under Rate Schedule 16 this volume estimate has been adjusted to 190,000 GJ per year.

5. Reference: Exhibit B-1, Page 42 and Exhibit B-5, CEC 1.7.3

> **7.5.9 COMPLEMENTARY BENEFITS**
>
> There were a number of complementary benefits anticipated by FEI at the time the incentives were issued that further support the prudence of the $5.6 million in expenditures:
>
> - The development of further markets for BC's vast resources of natural gas will generate economic benefits from natural gas production, processing and transmission.
> - The development of further markets for BC's vast resources of natural gas will generate economic benefits to the Provincial treasury in the form of increased production royalties.
> - Lower costs of providing trucking services achieved from the reduction in fuel pricing, will help to improve the competitive position of products produced in BC.
> - Lower costs of providing public transportation services (e.g. transit and/or school bus service) assists transit agencies and school districts in providing such services.
> - A significant reduction in GHG emissions, which will benefit all citizens of BC.
> - The expenditures support the development of natural gas transportation technology in BC.
>
> In addition to GHG emission reductions (CO2e), the transformation to NGT will reduce air pollutants such as NOx, SOx and other Particulate Matter. FEI has used data from the GHGenius version 4.01 to quantify these reductions. The table below summarizes the percentage reduction in air pollutants that would occur from transitioning diesel fueled vehicles to NGT vehicles.

Reduction in Air Pollutants vs Diesel Fuel	CNG	LNG
NOx	-20.9%	-30.9%
SOx	-70.2%	-73.7%
Other Particulate Matter (PM)	-46.4%	-50.2%

5.1 Please confirm that in addition to these complimentary benefits that there are health and safety benefits related to a reduction in other pollutants between natural gas and diesel.

Response:

Confirmed. Based on the data provided from GHGenius v.4.01, there are significant reductions in air pollutants such as NOx, SOx and Particulate Matter. These reductions are summarized in the table included in response to CEC IR 1.7.3 and are also shown above. All three air pollutants are significant contributors to smog formation in local airsheds and have been linked

to health issues which include breathing disorders and lung cancer. For example, the following link provides additional information on the linkage between diesel engine exhaust and health risks identified by the California Department of Health Services, Occupational Health Branch.[21]

5.2 Please provide any health study impacts of the use of diesel and gasoline as a consequence of their emissions in urban areas.

Response:

Since FEI's target market focuses on displacing diesel fuel in heavy duty vehicles, this response focuses on the impacts and consequences of diesel emissions.

The consequences of diesel exhaust on human health have been documented in recent articles. Experts at the World Health Organization ("WHO") stated that diesel engine exhaust fumes can cause cancer in humans, and said further that "they belong in the same potentially deadly category as asbestos, arsenic and mustard gas."[22]

In addition, the International Agency for Research on Cancer reclassified diesel exhausts from its group of probable carcinogens, to its group of substances that have definite links to cancer. It claimed that "diesel emissions cause lung cancer and increase the risk of bladder cancer. They say their decision was unanimous and based on "compelling" scientific evidence."[23]

The study conducted by the WHO determined that the particulate matter that is emitted from diesel buses, trucks and other diesel engines, contain particles fine enough to penetrate the deepest part of the lungs where they trigger asthma attacks, bronchitis, emphysema, heart disease and now cancer.

A fact sheet published by the California Environment Protection Agency's Office of Environmental Health Hazard Assessment and the American Lung Association confirmed the WHO findings. The fact sheet advised that exposure to diesel exhaust can irritate the eyes, nose, throat and lungs, and it can cause coughs, headaches, lightheadedness and nausea. It can also make people with allergies more susceptible to the materials to which they are allergic, such as dust and pollen, and causes inflammation in the lungs. This inflammation may aggravate chronic respiratory symptoms and increase the frequency or intensity of asthma attacks.

[21] http://www.cdph.ca.gov/programs/hesis/Documents/diesel.pdf
[22] http://www.abc.net.au/news/2012-06-13/diesel-fumes-carcinogenic/4068414
[23] ibid

"Diesel engines are a major source of fine-particle pollution. The elderly and people with emphysema, asthma, and chronic heart and lung disease are especially sensitive to fine-particle pollution. Numerous studies have linked elevated particle levels in the air to increased hospital admissions, emergency room visits, asthma attacks and premature deaths among those suffering from respiratory problems. Because children's lungs and respiratory systems are still developing, they are also more susceptible than healthy adults to fine particles. Exposure to fine particles is associated with increased frequency of childhood illnesses and can also reduce lung function in children.

Like all fuel-burning equipment, diesel engines produce nitrogen oxides, a common air pollutant in California. Nitrogen oxides can damage lung tissue, lower the body's resistance to respiratory infection and worsen chronic lung diseases, such as asthma. They also react with other pollutants in the atmosphere to form ozone, a major component of smog."[24]

The fact sheet went on to say that alternatives to diesel fuel, such as natural gas, produce fewer polluting emissions than the current formulations of diesel fuel.

[24] http://oehha.ca.gov/public_info/facts/dieselfacts.html

6. Reference: Exhibit B-1, Page 44 and Exhibit B-5, CEC 1.3.2

7.8 Conclusion

The NGV incentives of $5.6 million provided in 2010 and 2011 were prudent expenditures and in the public interest. They generated throughput, represented an investment in promoting a much larger potential market, and were supported by the same policy considerations that underpin the prescribed undertaking expenditures for vehicle incentives in the GGRR. Given that the 2010-2011 NGV Incentives are similar in nature to those that will be issued under Prescribed Undertaking 1, FEI submits that a similar financial treatment is appropriate. FEI is intending to count any recoveries approved from the 2010-2011 NGV Incentives towards the

categorized vehicle energy use in British Columbia. In 2010, FEI's target market assessment included the following categories, in 2007 energy values:

- Passenger cars 66 PJ;
- Light duty trucks 78 PJ;
- Medium trucks 20 PJ;
- Heavy duty trucks 66 PJ;
- Buses 5 PJ; and
- Marine vessels 54 PJ.

These categories total approximately 290 PJ (2007) and projected to 458 PJ by 2030 (escalated at 2% growth rate per year).

At present FEI is no longer targeting the passenger cars segment and opportunities within the light duty trucking segment are not a primary focus. As well, the eligible vehicle categories under the GGRR are limited to medium trucks, heavy duty trucks, buses and marine vessels.

FEI has removed these values from the target market assessment which results in market size of 146 PJ in 2007, which projects to 230 PJ by 2030. Thus the 25 PJ of expected volume additions under the GGRR presented in this Application represents roughly 11 percent market penetration of the FEI's target market by 2030.

6.1 Please confirm that there are possible scenarios whereby the conversion and transformation of the transportation market over the next 20 years could be significantly greater than 11%.

Response:

Confirmed. The strength of the value proposition for NGT would indicate that penetration rates could be substantially greater than 11%. Natural gas is a lower cost fuel that provides emissions reductions and GHG reductions. In addition it is a local resource that is in abundant supply. These benefits provide a compelling value proposition.

FEI has taken a conservative view of market adoption rates because history has demonstrated that motor vehicle markets are difficult markets to transform from one fuel to another. Initial barriers are substantial and perceived risks are high. However, once a certain critical mass of market share is achieved that will support ongoing investments in fueling infrastructure, there is no reason to expect that the market transformation would be capped at 11%.

6.2 Please confirm that the scenarios FEI has provided in its planning are based on assumptions it finds reasonable given its current state of development but preclude anticipation of further continuation of work with government and others to increase the rate of transformation of the market.

Response:

Confirmed.

Attachment 4.1

Appendix W (Amended) : Forecast Results of 2010 - 2011 NGV Incentives
Potential Rate Impact to Existing FEI Natural Gas Customers
Schedule 1: Summary of Costs and Benefits (2012 -2021)
City of Surrey, Kelowna School District, Waste Management, Vedder Transport
$000's, unless otherwise stated

Appendix W (Amended) : Forecast Results of 2010 - 2011 NGV Incentives
Schedule 1: Summary of Costs and Benefits (2012 -2021)

Attachment 4.1, CEC IR 2.4.1

		Reference	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	Annual NG Volume (TJ)		167	167	167	167	167	167	167	167	167	167
2												
3	Discount Rate	2014 FEI After-Tax WACC	6.81%									
4	Discount Period (years)		1	2	3	4	5	6	7	8	9	10
5												
6	FEI Total Delivery Margin Projections $Millions	Note 1	575	577	588	600	612	624	637	649	662	676
7												
8	Net COS Benefit (Cost) to Existing Natural Gas Customers											
9	Annual Incremental Margin from additional NGT volume		517	527	526	527	542	557	568	580	591	603
10	Annual Incentive Funding COS				(974)	(934)	(893)	(853)	(813)	(773)	(732)	(692)
11	Net Annual COS Benefit (Cost) '000$	Line 9 + Line 10	517	527	(448)	(407)	(352)	(296)	(245)	(193)	(141)	(89)
12												
13	Approximate Annual FEI Delivery (Reduction) Increase, %	-Line 11 / (Line 6 x 1000), Note 2			0.08%	0.07%	0.06%	0.05%	0.04%	0.03%	0.02%	0.01%
14												
15	Present Value of Annual Net COS Benefit (Cost)	Line 11/(1+Line 3)^(Line 4)	484	462	(367)	(313)	(253)	(199)	(154)	(114)	(78)	(46)
16												
17	NPV of Net COS Benefit (Cost) '000$	Sum Line 15 2012 to year	484	946	579	266	13	(186)	(340)	(454)	(532)	(578)
18												
19	NPV of Net COS Benefit (Cost) 2012 to 2030 (19 Years)			1,074								

20 Note:

21 1: 2012, 2013 based on 2012-2013 RRA G-44-12 Compliance Filing May 1, 2012; 2014+ increase at 2%/year reflecting high level long range planning assumptions,

22 does not include any impact of the 2010 - 2011 NGV Incentives

23 2: Cumulative FEI Delivery (Reduction) increase, FEI delivery margin does not include any impact of the 2010 - 2011 NGV Incentives

Appendix W (Amended) : Forecast Results of 2010 - 2011 NGV Incentives
Potential Rate Impact to Existing FEI Natural Gas Customers
Schedule 1: Summary of Costs and Benefits (continued 2022 - 2030)
City of Surrey, Kelowna School District, Waste Management, Vedder Transport
$000's, unless otherwise stated

Appendix W (Amended) : Forecast Results of 2010 - 2011 NGV Incentives
Schedule 1: Summary of Costs and Benefits (2012 -2021)

Attachment 4.1, CEC IR 2.4.1

		Reference	2022	2023	2024	2025	2026	2027	2028	2029	2030
1	Annual NG Volume (TJ)		167	167	167	167	167	167	167	167	167
2											
3	Discount Rate	2014 FEI After-Tax WACC									
4	Discount Period (years)		11	12	13	14	15	16	17	18	19
5											
6	FEI Total Delivery Margin Projections $Millions	Note 1	689	703	717	731	746	761	776	792	808
7											
8	Net COS Benefit (Cost) to Existing Natural Gas Customers										
9	Annual Incremental Margin from additional NGT volume		615	627	640	653	666	679	693	707	721
10	Annual Incentive Funding COS		(652)	(611)	0	0	0	0	0	0	0
11	Net Annual COS Benefit (Cost) '000$	Line 9 + Line 10	(37)	16	640	653	666	679	693	707	721
12											
13	Approximate Annual FEI Delivery (Reduction) Increase, %	-Line 11 / (Line 6 x 1000), Note 2	0.01%	(0.00)%	(0.09)%	(0.09)%	(0.09)%	(0.09)%	(0.09)%	(0.09)%	(0.09)%
14											
15	Present Value of Annual Net COS Benefit (Cost)	Line 11/(1+Line 3)^(Line 4)	(18)	7	272	259	248	237	226	216	206
16											
17	NPV of Net COS Benefit (Cost) '000$	Sum Line 15 2012 to year	(596)	(588)	(317)	(57)	190	427	653	868	1,074
18											
19											

20 Note:

21 1: 2012, 2013 based on 2012-2013 RRA G-44-12 Compliance Filing May 1, 2012; 2014+ increase at 2%/year reflecting high level long range planning assumptions,

22 does not include any impact of the 2010 - 2011 NGV Incentives

23 2: Cumulative FEI Delivery (Reduction) increase, FEI delivery margin does not include any impact of the 2010 - 2011 NGV Incentives