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By Electronic Filing

British Columbia Utilities Commission
Suite 410, 900 Howe Street
Vancouver, BC V6Z 2N3

Attention: Patrick Wruck, Commission Secretary

Dear Sirs/Mesdames:

Re: British Columbia Utilities Commission – An Inquiry into Gasoline and Diesel Prices in British Columbia – Project No. 1599007
Parkland Fuel Corporation ("Parkland") Evidence

We are the solicitors for Parkland.

We enclose, for filing in the above noted Inquiry, the written Evidence of Parkland (the "Parkland Evidence"). The Parkland Evidence consists of:

1. Parkland's company evidence, which appends its responses to the BCUC Questionnaire and excerpts from Bonbright, *Principles of Public Utility Rates*, on the role of regulation; and

2. The independent expert report of Dr. Henry Kahwaty, Managing Director of the Berkeley Research Group, LLC.

Dr. Kahwaty's expert report includes a preliminary response to aspects of the materials filed by the BCUC on June 21, 2019.

The compressed timelines associated with this Inquiry, combined with the volume of materials that BCUC staff has continued to file up until two days ago (well after the date contemplated in the published timetable), have represented a significant challenge to fair and meaningful participation by interveners. Parkland will be relying on the oral phase as an opportunity to have its representative(s) and Dr. Kahwaty explain and highlight aspects of their evidence and elaborate regarding their views on materials filed by the BCUC.

Yours truly,

FASKEN MARTINEAU DuMOULIN LLP

ORIGINAL SIGNED BY MATTHEW GHIKAS.

Matthew Ghikas
Personal Law Corporation
MG/lh
Enclosure

*Fasken Martineau DuMoulin LLP includes law corporations.

British Columbia Utilities Commission
Inquiry into Gasoline and Diesel Prices

Evidence

of

Parkland Fuel Corporation

June 27, 2019

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The following is the evidence of Parkland Fuel Corporation ("Parkland") on the matters outlined in the Inquiry Terms of Reference.

1.0 INTRODUCTION

Although perception among some consumers may be that gasoline and diesel prices are too high, the majority of the costs that people pay at the pump for a litre of fuel in BC are:

(a) taxes, which are higher in BC than just about anywhere in North America *by design,* so as reduce consumption and GHG emissions; and

(b) the cost of the unrefined commodity.

The remaining portion of the pump price has to cover multiple steps in the supply chain, from transporting the crude to a refinery, refining costs, storing and transporting the refined product to retailers, and the cost of retail operations. BC faces a unique set of circumstances when it comes to, among other things, constrained capacity on the Trans Mountain Pipeline (for both refined products and unrefined crude), higher than average regulatory compliance costs than in the rest of the country, and some of the highest real estate prices and rents in Canada.

Parkland is one of a number of providers of wholesale gasoline and diesel in BC, all of whom compete for market share. There are hundreds of retail stations in BC, which compete aggressively, augmenting typically thin profit margins on fuel with volume sales that can be converted to more profitable sales at convenience stores, restaurants and car washes. The price fluctuations that people experience at the pump - within the day, over the course of multiple days, and over periods of months - are all rooted in basic market fundamentals of supply and demand. Data presented in this evidence, and the attached report of Dr. Kahwaty of Berkeley Research Group ("BRG"), show the tight relationships between prices at the pump and commodity prices, scheduled and unscheduled refinery closures, and the logistical, supply chain, and regulatory challenges inherent in the gasoline and diesel industry in British Columbia.

In short, it would be incorrect to equate (as the Terms of Reference appear to do) the "refining margin" and "retail margin" to refining and retail profits, when those are gross measures and do not account for most of the costs of doing business or sales volumes. It would be equally incorrect to suggest that excessive wholesale and retail margins are the cause of higher prices in BC. Competition provides appropriate checks on the wholesale and retail markets.

Parkland's Evidence is organized around the following points:

- **Section 2** explains that, because the Inquiry Terms of Reference exclude the impact of taxes and regulatory requirements, the result is that the BCUC is examining significantly less than half of the retail price in BC, and the main

causes of the pump price differentials with the rest of Canada. Taxes and compliance costs are higher in BC than in most other places in Canada. When taxes are removed from consideration, the price per litre in BC is much more aligned with what it is in other parts of the country.

- **Section 3** describes Parkland's business, across Canada and in British Columbia. We own or operate a number of retail stations in British Columbia under various brands. We own and operate a refinery in Burnaby (the "Burnaby Refinery"), which serves a portion of the wholesale market in BC.

- **Section 4** places Parkland's retail operations in context of the overall BC retail market. Parkland faces significant competition from other retailers, with our operations being only a portion of the over 1,300 gas stations in BC. We explain the costs that gross retail margin (the difference between the wholesale price and retail price, less taxes) must cover. We show how sales volume and ancillary business (e.g., convenience stores), not just gross retail margin on fuel, are critical to profitability in a highly competitive environment.

- **Section 5** addresses the economics of the refining business.

- **Section 6** describes the wholesale market competitive landscape in British Columbia. Parkland's Burnaby Refinery serves approximately one quarter of the market in British Columbia. We compete with other providers of wholesale gasoline and diesel located in BC, Alberta and the Pacific Northwest that collectively supply approximately three quarters of the BC market.

- **Section 7** describes the checks and balances that are in place to ensure that we operate within the bounds of fair competition. There are robust anti-trust rules in place, as well as corporate codes of conduct.

- **Section 8** concludes this Evidence.

Parkland's responses to the BCUC's questionnaire to companies (the "Questionnaire") are included as **Appendix "A"** to this Evidence.

Appendix "B" is an independent expert report prepared by Dr. Henry Kahwaty of BRG that speaks to a number of issues related to the Terms of Reference.

Appendix "C" is an excerpt from the text Bonbright, *Principles of Public Utility Rates*, that discusses the negative consequences associated with attempting to impose price regulation where competition exists.

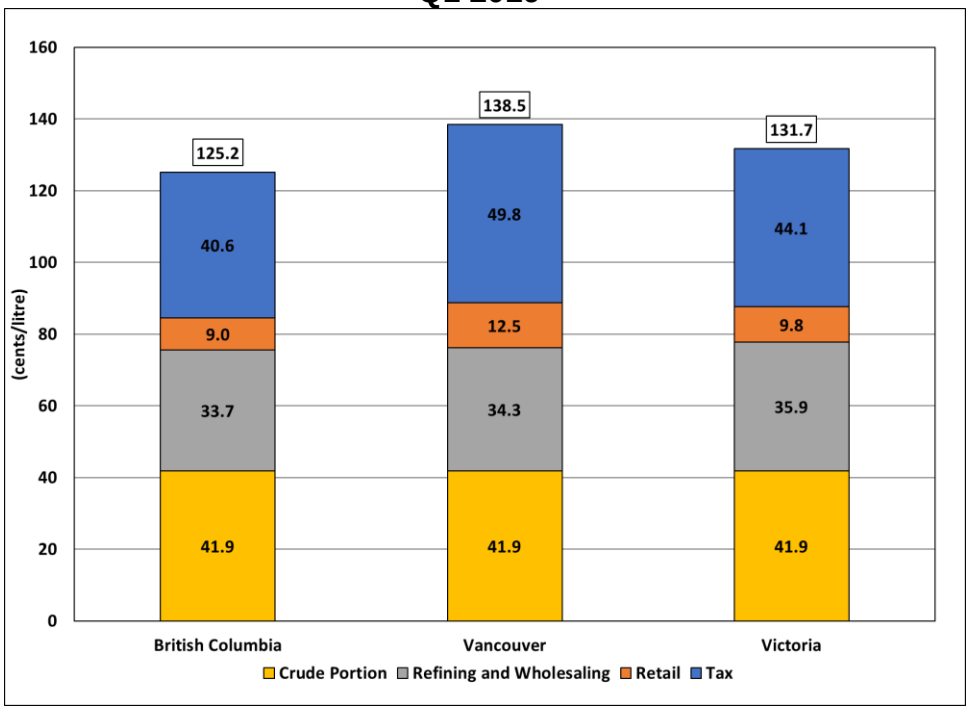
2.0 MOST OF BC RETAIL FUELS PRICE IS TAXES, COMPLIANCE COSTS AND COMMODITY COSTS

In BC, the majority of the cost paid by consumers for a litre of gasoline or diesel is associated with taxes, costs to comply with federal, provincial, and local regulations, and the delivered commodity price (the complete supply chain to bring crude to the refinery). Taxes in BC are higher than many other places in Canada, and on a pre-tax basis, prices at the pump are more aligned with other provinces. Retail margins, as a portion of the pump price have actually declined since 2015.

2.1 Figures Showing the Role of Taxes and Declining Retail Margins

The following figures are taken from Dr. Kahwaty's report (Appendix "B" to this Evidence), which show the composition of the price of gasoline in British Columbia. They show that taxes and crude represent approximately two-thirds of the cost of gasoline at the pump, and this has been the case since 2015.

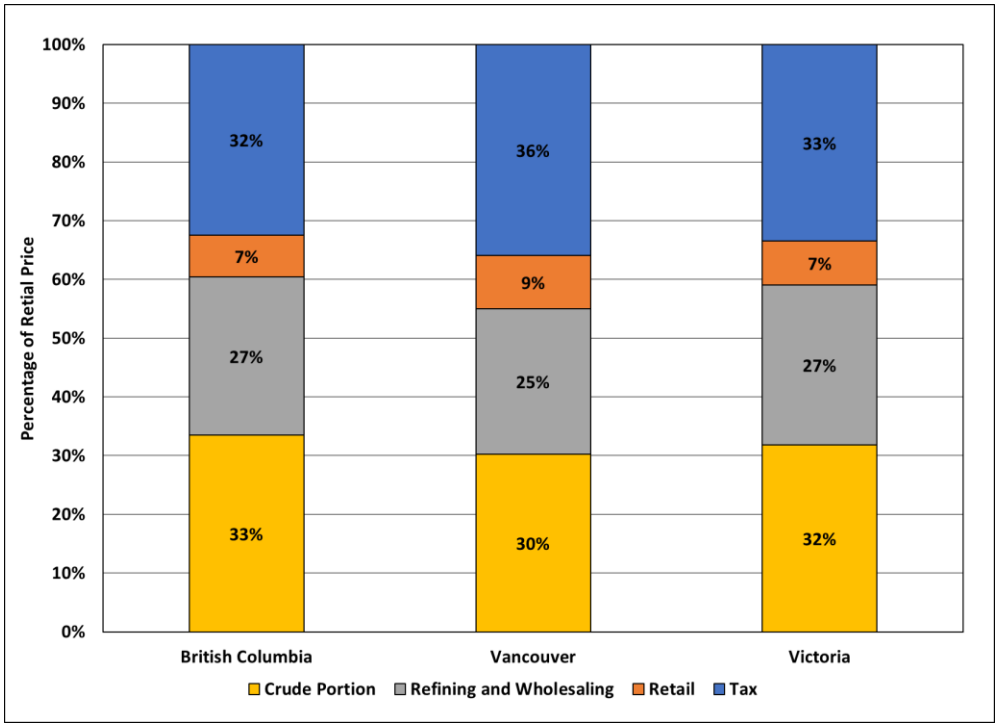
Average Retail Price Breakdown for Regular Gasoline in British Columbia Q1 2019[1]



Source: Kent Petroleum Price Data, Kent Group Ltd., available at https://charting.kentgroupltd.com/.

[1] Figure 10 from Appendix "B", Dr. Kahwaty's Report, p. 32

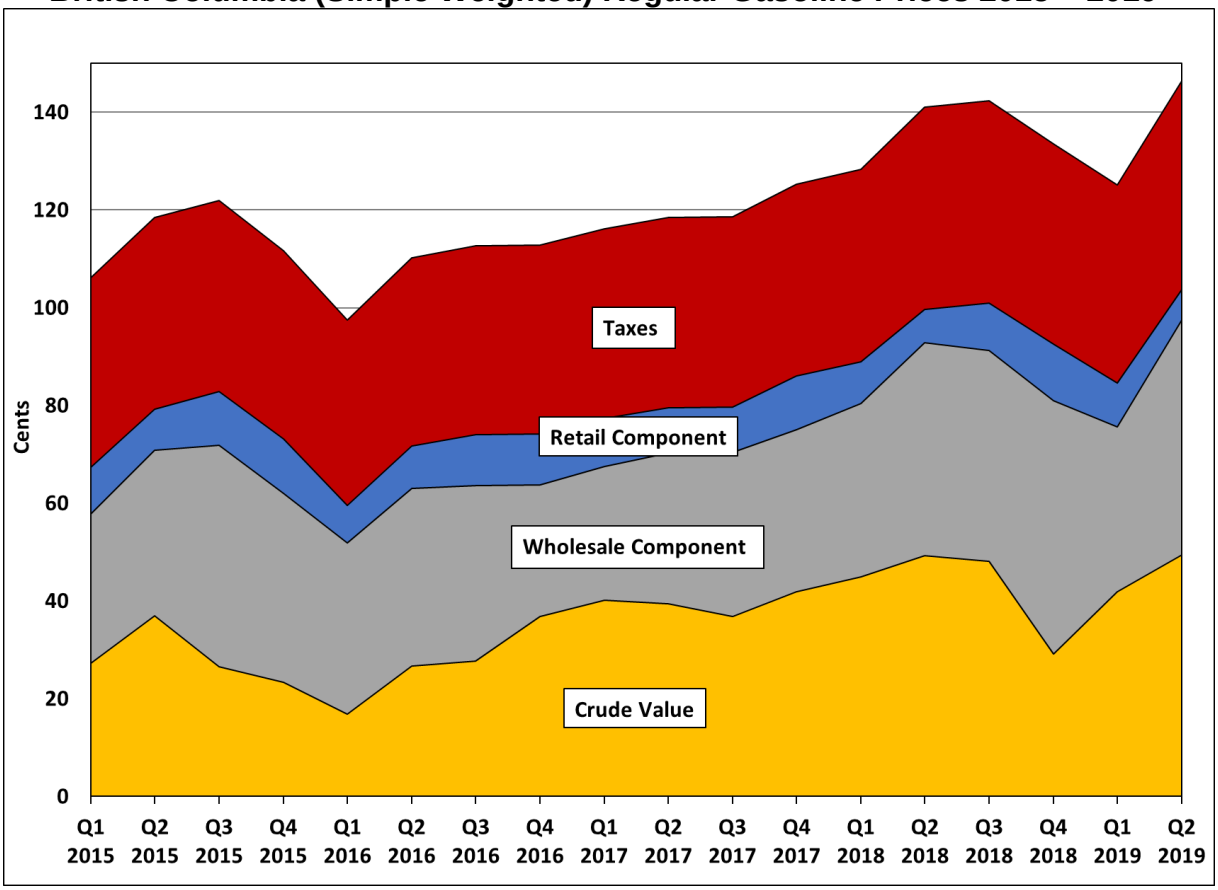
Average Retail Price Percentage Breakdown for Regular Gasoline in British Columbia Q1 2019[2]



Source: Kent Petroleum Price Data, Kent Group Ltd., available at https://charting.kentgroupltd.com/.

[2] Figure 11 from Appendix "B", Dr. Kahwaty's Report, p. 33.

British Columbia (Simple Weighted) Regular Gasoline Prices 2015 – 2019[3]



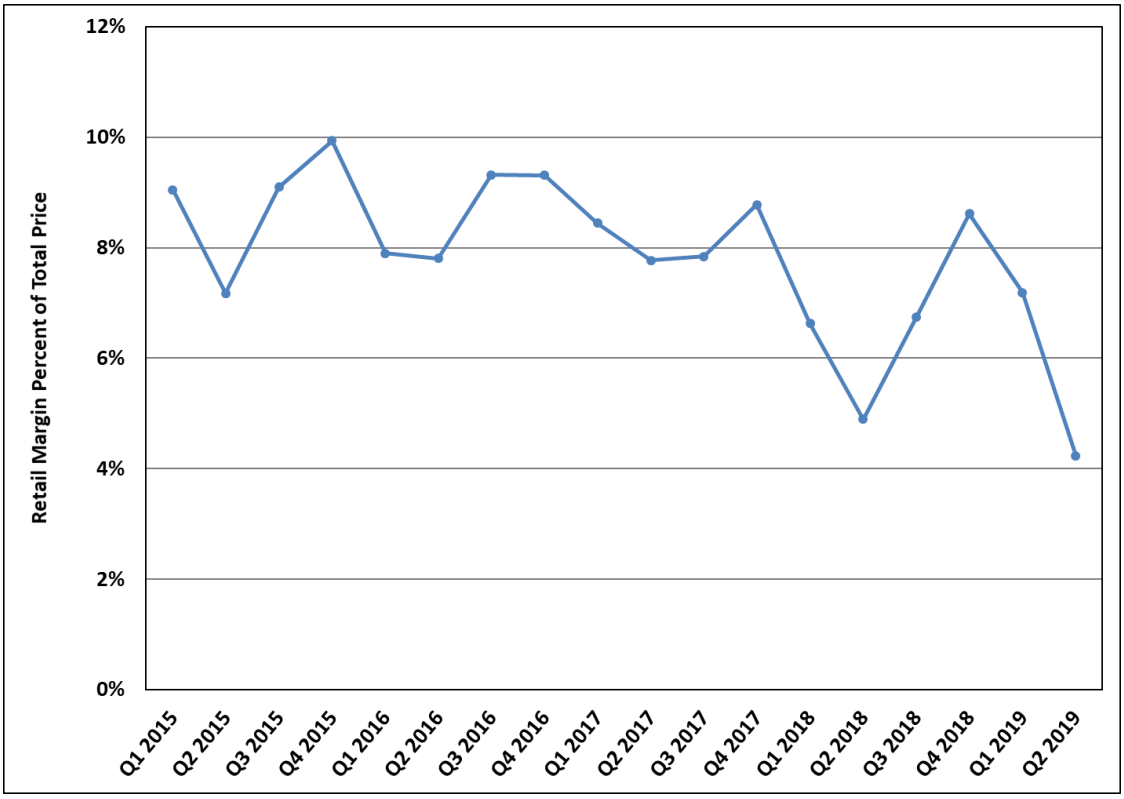
Source: Kent Petroleum Price Data, British Columbia (Simple Weighted) Unleaded Crude Price, through May 31, 2019, available at https://charting.kentgroupltd.com/

Although the Terms of Reference are inquiring about retail margins, they have actually declined since 2015 as a percentage of the total pump price.[4]

[3] Figure 37 from Appendix "B", Dr. Kahwaty's Report, p. 95.

[4] Figure 7 from Appendix "B", Dr. Kahwaty's Report, p. 27.

British Columbia Regular Gasoline Retail Gross Margin as a Percent of Total Price Q1 2015 - Q2 2019



Source: Kent Petroleum Price Data, Kent Group Ltd., available at https://charting.kentgroupltd.com/

Three factors contributing to the price of fuel in British Columbia are further described below.

2.2 Taxes in British Columbia Are Higher than Many Other Parts of Canada

The taxes applicable to a litre of gasoline and diesel in British Columbia include the following. (Note this table does not include the costs associated with more stringent regulation that indirectly raise costs, which are discussed later.)

BC taxes charged per Litre (in $)	**Gasoline**	**Diesel**
Federal Excise Tax	0.1000	0.0400
BC Carbon Tax	0.0889	0.1023
BC Motor Fuel Tax	0.1450	0.1500
BC MFT in Vancouver Area	0.2550	0.2600
BC MFT in Victoria Area	0.2000	0.2050
Total (Vancouver area)	**0.4439**	**0.4023**
Total (Victoria area)	**0.3889**	**0.3473**
Total (other BC)	**0.3339**	**0.2923**
Plus GST	**5%**	**5%**

By contrast, the taxes in most other provinces are simpler (i.e., do not have to account for the regional differences) and lower. For example:

Alberta Taxes charged per Litre (in $)	**Gasoline**	**Diesel**
Federal Excise Tax	0.1000	0.0400
AB PFT	0.1300	0.1300
Total	**0.2300**	**0.1700**
Plus GST	**5%**	**5%**

Ontario Taxes charged per Litre (in $)	**Gasoline**	**Diesel**
Federal Excise Tax	0.1000	0.0400
Federal Fuel Charge	0.0442	0.0537
ON PFT	0.1470	0.1430
Total	**0.2912**	**0.1967**
Plus HST	**13%**	**13%**

Gasoline taxes in most of BC are more than 10¢ per litre higher than in Alberta; in Victoria are nearly 16¢ higher than in Alberta; and in Vancouver are more than 21¢ higher than in Alberta.

2.3 British Columbia Has More Onerous Regulations

In addition to the direct taxes detailed above, British Columbia has regulations that are more onerous than regulations in other provinces. The gross refining margin (which is the difference between the commodity cost and the wholesale price) must cover these higher costs in order to sell refined product into the British Columbia market profitably. Notable examples of these BC regulations include:

- **Renewable fuel content standards**, which in British Columbia require 5% renewable content for gasoline and 4% for diesel. Parkland's Burnaby refinery, and any other refinery that wishes to sell into the British Columbia market, are subject to these requirements. These standards, and their negative cost and operating flexibility implications are discussed in Appendix "A", Parkland's response to BCUC Question 4;

- **BC Low Carbon Fuel Regulation (LCFR)**, which is unique to BC and which require refiners who produce fuel for the British Columbia market to progressively lower the carbon intensity of fuels produced at the facility every year. There are limited pathways to comply with this legislation, and compliance credits are not readily available in a liquid market to purchase, often exceeding $200 / MT (i.e., 1.5 cpl) when they are available at all. The LCFR standards have significant implications for production costs for refineries that wish to sell fuel in British Columbia, and a divergence in prices in British Columbia from the rest of Canada coincided with the introduction of the LCFR. This is discussed in Appendix "A", Parkland's response to BCUC Question 4; and

- **Cleaner gas regulations for gasoline**, which in BC are more stringent during certain times of the year in terms of vapour pressure and other specifications than the other provinces or the US Pacific Northwest, leading to higher manufacturing and blending costs for any refineries selling product for the British Columbia market during those times.

The above regulatory requirements are in addition to the more typical environmental regulations. Burnaby refinery is subject to **Wastewater regulations**, which require comprehensive water testing to meet Metro Vancouver discharge limits; and **Air permit and emissions controls**, including new conditions included in the Metro Vancouver air permit that may require significant capital investment by the refinery. It is not possible for Parkland to simply pass on costs in wholesale prices as a matter of course because wholesale prices are driven by market considerations. This is particularly difficult where other refineries may not experience these costs.

2.3 There Are Numerous Steps in the British Columbia Supply Chain

The remaining significant contributor to the price of fuel after taxes and regulatory costs is the multi-component / multi-participant supply chain between the point where the commodity is acquired and the end use consumer purchases the product. The components of the supply chain include crude oil, refined products, distribution and retailing. Each of the participants in the supply chain has its own costs and needs to earn a profit. For example, the costs to transport crude oil to the refinery, or to operate a retail gas station, are not incorporated in the "crack spread" or "refining margin" or "retail margin" as defined in the Terms of Reference and the Questionnaire. As discussed in Section 3, Parkland operates in certain portions of this supply chain in BC, but not others. In those areas where Parkland is involved in the supply chain, it is not the only provider.

3.0 ABOUT PARKLAND

In this section, we provide an overview of Parkland's operations, both across Canada and in British Columbia.

3.1 Company Overview

Parkland is an independent marketer of fuel and petroleum products and a leading convenience store operator. We operate in Canada, the US and the Caribbean. Parkland serves customers through three channels: retail, commercial and wholesale.

Parkland's 2019 Annual Information Form[5] ("AIF") describes our core competencies as follows:

> While Parkland's reach extends across North America and the Caribbean, its service and value proposition are local.
>
> Parkland's core capabilities include:
>
> • leading convenience store brands tailored to local markets, along with fuel marketing capability with the ability to provide local services through retail and commercial networks;
>
> • broad supply and distribution infrastructure reach and scope that allows it to identify opportunities between markets that other independents may not be able to capitalize on;

[5] Available online at: https://www.parkland.ca/application/files/9515/5439/0541/2019-AIF-EN.pdf.

- a diverse portfolio of regional markets, brands and products that help mitigate the risk of market, economic, operational and environmental disruptions in any one market;

- supply security through the Burnaby Refinery and supply relationships and agreements with all major refiners in the markets where Parkland operates; and

- distribution channels that provide a balanced sales portfolio of gasoline, diesel and propane that gives Parkland a competitive supply advantage and customers a broad product offering.

Parkland seeks to diversify risks through multiple offerings and geographic coverage. The convenience store operations, often operated in tandem with the retail gasoline and diesel operations, play a key role in that diversification. Being involved in multiple elements of the supply chain also helps to manage some of the business risk inherent in the wholesale and retail sale of refined petroleum products. For instance, the Burnaby Refinery plays a key role in securing supply for Parkland's retail operations, commercial customers, and cardlock locations.

Parkland's Canadian Retail Operations

Our Canada Retail segment ("Parkland Retail")[6] supplies and supports a network of approximately 1,855 retail gas stations in Canada. Parkland operates under six key retail fuel brands: Ultramar, Esso, Fas Gas Plus, Chevron, Pioneer, and Race Trac. These brands are variously owned or licensed (both exclusively and non-exclusively) by Parkland.

The following table provides site count as of December 31, 2018 by brand and business model within the Canadian Parkland Retail segment:

	Ultramar	Esso	Fas Gas Plus	Chevron	Pioneer	Race Trac	Other	Total
Company sites	160	75	91	163	123	1	11	624
Dealer sites	482	514	96	19	39	62	18	1,230
Site count, as at March 31, 2019	642	589	187	182	162	63	29	1,854

In addition, Parkland operates a leading national convenience store brand, On the Run / Marché Express, as well as other regional convenience store brands.

Parkland Retail operates under two main business models:

[6] We sell our products through a variety of marketing channels, including retail gas stations, commercial diesel cardlocks, and commercial fuel, propane and lubricant delivery branches. We also supply third parties over and above our own system requirements.

- Company – The Company business model includes retail sites that are owned or leased by Parkland, and are operated and managed by either Parkland or by independent retailers on its behalf. Parkland owns the fuel inventory and determines the retail selling price at the pumps. Convenience store inventory may be owned by the retailer or Parkland. If the site is operated by a retailer, Parkland pays the retailer based on its proprietary model. Sites operating under industry models such as "company-owned retailer-operated" and "company-owned company-operated" are included under the Company business model. (Note there are no "company owned company-operated" sites in British Columbia.)

- Dealer – The Dealer business model includes sites owned or leased by an independent dealer or Parkland, and are operated and managed by the independent dealer. Parkland secures a wholesale fuel supply contract with the dealer and supplies fuel to the dealer based on independently published rack prices. The dealer typically owns the fuel inventory and determines the retail price at the pumps. Convenience store inventory is owned by the dealer. Sites operating under industry models such as "dealer-owned dealer-operated", "company-owned dealer-operated", or "consignment dealer-operated" are included under the Dealer business model.

The following table provides the split between company and dealer business models as of March 31, 2019 within the Canadian Parkland Retail segment:

Province	Company Model	Dealer Model	Total
Alberta	78	182	260
British Columbia	173	97	270
Manitoba	17	73	90
New Brunswick	8	35	43
Nova Scotia	19	22	41
Newfoundland	11	34	45
Northwest Territories	0	2	2
Ontario	164	420	584
Quebec	116	279	395
Prince Edward Island	2	6	8
Saskatchewan	29	84	113
Yukon	0	4	4
Total	617	1,238	1,855

We discuss the Parkland Retail business in British Columbia in greater detail later in this evidence.

Parkland's Canadian Supply Segment

Parkland's Supply segment ("Parkland Supply") consists of three business units: the Burnaby Refinery, Elbow River Marketing, and Supply and Distribution. Parkland Supply optimizes fuel supply by operating the Burnaby Refinery and contracting and purchasing fuel from other refiners and suppliers. This segment distributes fuel products using ships, rail, and trucks and stores fuel in owned and leased facilities, serving wholesale and reseller customers in North America and producing and selling aviation fuel to airlines operating out of the Vancouver International Airport.

Parkland Supply:

- serves external customers, and markets products via the Parkland, Les Pétroles Parkland, Elbow River Marketing, and Chevron brands;[7]
- sells, at an arm's length transfer price, to other Parkland segments; and
- provides transportation and logistics services to other Parkland segments at an arm's length transfer price.

Parkland's wholly-owned subsidiary Elbow River Marketing is an independent fuel marketing, logistics and transportation operating entity. It buys crude, refined products, and natural gas liquids from producers and other marketers and sells these products to distributors and large consumers. Typically, the suppliers and buyers are separated by distances that require the transportation and logistics capabilities of Elbow River Marketing, which earns a "spread" between the purchase and selling prices for its unique services. Elbow River Marketing operates in Canada, the US and Mexico.[8]

Parkland Supply and Distribution sources fuels from third party refineries and the Burnaby Refinery, and organizes the pickup and delivery of products to other Parkland segments as well as third parties.

We discuss the Burnaby Refinery later in this Evidence.

[7] Parkland Q1 2019 Management's Discussion and Analysis ("MD&A"), p. 18. Available online at: https://www.parkland.ca/application/files/9215/5675/1108/English_MDA_Q1_2019_final_copy_May_12019.pdf.

[8] Q1 2019 MD&A, p. 18.

3.2 Parkland's BC Retail Business: Different Operating Models and Brands

Parkland Retail operates under the following business models in BC:

- **Company-Owned Retailer-Operated** – These sites are either owned or leased by Parkland and operated and managed on its behalf by independent retailers. Parkland owns the fuel inventory and maintains control of the retail selling price at the pumps. Parkland pays the retailer a "cents per litre" commission on the fuel sales and collects a fixed rent for the facilities plus a percentage rent on the convenience store sales.

- **Dealer-Owned Dealer-Operated** – These sites are either owned or leased by an independent third-party dealer. Parkland secures a wholesale fuel supply agreement with the independent dealer. These agreements are associated with a fuel brand such as Chevron, Esso, or Fas Gas, depending on the preference of the dealer and the characteristics of the site. Over the term of the agreement, Parkland supplies fuel to the dealer based on rack prices that fluctuate frequently. The independent dealer owns the fuel inventory. It has the ultimate authority to set retail prices and make other competitive decisions. Parkland does not control or influence the decisions (including pricing decisions) of the independent dealers within its network; indeed, this is a critical aspect of competition compliance for Parkland and all fuel retailers. Parkland has implemented significant internal controls to ensure it exerts no influence, either intentionally or inadvertently, over gasoline and diesel pricing decisions made by independent dealers. These controls are discussed further in Section 7.

Parkland's BC Retail Operations include the following brands:

- **Esso** – The Esso-branded wholesaler agreement with Imperial Oil provides Parkland with the opportunity to offer Imperial Oil's nationally-recognized premium brand to Parkland's own network and to independent dealers. Parkland does not have exclusive rights to use the Esso brand. Many Esso-branded retail stations in BC are owned and operated by others and use fuel supplied by other branded wholesalers.

- **Chevron** – Chevron is a premium brand based principally in the Greater Vancouver area with locations across British Columbia and opening soon in Alberta. Other services include Town Pantry branded convenience stores and Triple O branded franchise restaurants. Parkland is the exclusive distributor and retailer of Chevron-branded fuels in Canada through an exclusive license agreement with Chevron.

- **Fas Gas Plus** – Fas Gas Plus is Parkland's home-grown fuel and convenience store brand, operating in Western Canada, including over 25 in British Columbia.

- **On the Run / Marché Express** convenience store brand – Parkland is the franchisor and trademark owner of the On the Run / Marché Express convenience store brand in Canada. On the Run / Marché Express provides Parkland with a nationally recognized and reputable convenience store brand that enhances our convenience store offering in company-owned and franchise locations. Parkland currently has 122 company-owned locations in Canada, with two located in British Columbia.

The table below indicates the number of stations in Parkland's retail network in British Columbia as of June 26, 2019, including the operating model and the associated fuel brand:

Station Count in BC	Operating Model		
Brand	**Company**	**Dealer**	**Total**
Chevron	161	19	180
Esso	3	43	46
Fas Gas	9	18	27
Other		15	15
Total	**173**	**95**	**268**

3.3 The Burnaby Refinery

Parkland owns and operates the Burnaby Refinery through Parkland Refining (B.C.) Ltd., a wholly-owned subsidiary. We acquired the Burnaby Refinery from Chevron in October 2017. Its operations are described below:

- **Output capacity:** The Burnaby Refinery is a 55,000 bpd light/sweet crude refinery. While it is the largest of the two BC refineries, it is relatively small by the standards of refineries in North America. The British Columbia retail market as a whole is approximately 200,000 bpd, meaning that approximately three-quarters of the British Columbia market must be served from other sources in British Columbia, Washington, Alberta and elsewhere.

- **Location:** Its location in Burnaby is ideal for serving the key Lower Mainland and Vancouver Island markets. The Burnaby Refinery is the only refinery in

the Lower Mainland, which gives us an advantage relative to our competitors in British Columbia,[9] Washington[10] and Alberta[11] when it comes to the distances over which we must truck or transport the refined products to retail stations. This helps us to compete with larger, and potentially lower cost (on a per litre basis), refiners in Alberta and the Pacific Northwest, which serve the BC market by a combination of shipping refined products through the Trans Mountain Pipeline, by truck and / or by water.

- **Source of light crude:** The Burnaby Refinery primarily sources Canadian light crude by way of pipeline from Edmonton, Alberta. Over 90% of the light crude refined at the Burnaby Refinery is sourced by the Trans Mountain Pipeline. The Burnaby Refinery also has direct access to truck, rail, and marine terminals from which it can import or export crude and finished products, although there is very limited capacity to bring in crude via marine or rail, so the Trans Mountain Pipeline is the only viable mechanism to access crude at the scale required by the Burnaby Refinery. Because of capacity constraints on the Trans Mountain Pipeline and the method used to allocate capacity on the pipeline, the refinery is often forced to purchase space (if possible) from other shippers, which comes at a significant premium over tariff rates. Further information in this regard is provided in Appendix "A", our response to Question 2.

- **Customers:** Approximately 85% of the Burnaby Refinery output supplies internal demands (Parkland's Retail and commercial operations), with the remaining 15% being sold to third party customers. As indicated above, the Parkland Refinery serves only about one-quarter of the province's gasoline and diesel needs. Most of the British Columbia and Lower Mainland retailers obtain their wholesale gasoline and diesel by pipeline[12], truck or ship from other sources in British Columbia, Washington, Alberta and elsewhere.

Parkland's 2019 Annual Information Form (AIF)[13] summarizes the Burnaby Refinery operations as follows:

---

[9] Husky operates a refinery in Prince George with a capacity of 12,000 bpd.

[10] The BP Cherry Point, Phillips Ferndale, Shell Puget Sound, Tesoro's Anacortes and Tacoma Refineries in Washington State have capacities of 225,000 bpd, 101,000 bpd, 145,000 bpd, 120,000 bpd and 40,700 bpd, respectively.

[11] The Strathcona, Scotford, and Suncor Edmonton Refineries in Alberta have capacities of 191,063 bpd, 100,030 bpd and 142,000 bpd, respectively.

[12] The Trans Mountain Pipeline is used to carry a significant amount of refined product from Alberta to the Lower Mainland, where it is then distributed by various wholesalers, mostly by truck, to various retail stations in the province.

[13] 2019 AIF.

The Burnaby Refinery provides Parkland with a valuable asset that has operated with a track record of highly reliable operations since 1935 and is ideally located to serve the British Columbia market as the largest of only two refineries in the province, and the only refinery in the Vancouver supply area. Additionally, it is highly integrated with the retail, commercial, and wholesale businesses acquired as part of the Chevron Acquisition, whereby approximately 85% of the refined product output serves what is now Parkland's retail and commercial network.

The Burnaby Refinery includes two crude units, including a 25,000 barrel per day crude unit and a 32,000 barrel per day splitter, that are designed to process Canadian light and medium crudes. Substantially all of the crude oil sourced by the Burnaby Refinery is delivered from Alberta by the TMPL [Trans Mountain Pipeline] and comprises primarily light sweet crude, with some portion of Canadian synthetic crudes. This pipeline is the most efficient and reliable source to access crude oil. TMPL is a common carrier pipeline with a throughput capacity of approximately 300,000 barrels per day and transports crude oil and refined petroleum products from Edmonton, Alberta to refineries and terminals in British Columbia and Washington state. Line space on the TMPL will be apportioned based on nomination verification procedures based on the pipeline's historical deliveries to each facility connected to the pipeline at a land destination as defined on the tariff approved by the National Energy Board. Based on the Burnaby Refinery's historical usage Parkland's capacity on the pipeline varies under various market conditions. To manage month to month variability, Parkland has established systems, processes and resources to make the most economic supply decisions within the logistical and operational constraints. Parkland also sources crude oil or other feedstocks by vessel, rail and truck when economically favorable. Other feedstocks used by the Burnaby Refinery include vacuum gas oil, butane, isooctane, biofuels (including tallow and canola) and naphtha.

Refineries undergo periodic turnarounds to upgrade operating units and perform scheduled maintenance. While some minor turnaround activity may occur each year, larger-scale turnarounds typically occur every five to ten years. The planning for the next significant turnaround event at the Burnaby Refinery, scheduled for 2020, is currently underway. See "Risk Factors – Refinery Operations – Risks relating to scheduled and unscheduled maintenance".

The refinery utilization rate is a key performance metric for Parkland that is reported in our MD&A.

Refinery utilization	Refinery utilization refers to the amount of crude oil that is run through the crude distillation units compared to crude throughput.	The amount of crude oil that is run through the crude distillation units expressed as a percentage of the 55,000 barrels per day crude distillation capacity at the Burnaby Refinery.	Refinery utilization provides meaningful information to investors in evaluating the operational performance of the refinery.	A higher utilization generally allows for more efficient operations and lower costs per barrel.

Refinery utilization measures crude oil throughput and is expressed as a percentage of the 55,000 bpd total crude distillation capacity at the Burnaby Refinery. Refinery utilization was 92.0% for the first quarter of 2019 compared to 33.2% for the first quarter of 2018. The low utilization rate in that time period was primarily a result of the 2018 turnaround, which began in early February 2018 and was completed in the first week of April 2018.

4.0 RETAIL COMPETITION AND THE ECONOMICS OF THE RETAIL BUSINESS

In this section, we address the competitive landscape in the retail business and the steps that Parkland takes to compete in that landscape. Parkland faces significant competition from other retailers, with our operations being only a portion of the over 1,300 gas stations in BC. We explain the costs that gross retail margin (the difference between the wholesale price and retail price, less taxes) must cover. We show how sales volume and ancillary business (e.g. convenience stores), not just gross retail margin on fuel, are critical to profitability in a highly competitive environment.

4.1 The Retail Market is Highly Competitive

The retail gasoline and diesel business is highly competitive. Parkland's 2019 AIF[14] describes the landscape, in part, as follows, in the context of disclosure of risks that may affect potential investors in the public company. This description applies to the BC marketplace:

> *Competition*
>
> Parkland competes with the major national and international integrated oil companies, independent marketers, branded and unbranded independent wholesalers, independent retail stations, other commercial fuel and propane marketers, convenience store chains, independent convenience stores, large and small food retailers and also several non-traditional retailers that have entered the retail fuel business in recent years, including major grocery chains, supermarkets, club stores and mass merchants. These non-traditional motor fuel retailers have obtained a significant share of the motor fuel market and are significant retail competitors.
>
> *Pricing Pressure*
>
> Retail pricing for motor fuels is very competitive and influenced by a fragmented market consisting of major oil companies, international convenience operators, national grocery chains, and independent fuel

[14] 2019 AIF, p. 25.

retailers. Multiple price changes daily are the norm. Each retailer posts its price on street signage. From time to time, factors such as intensified price competition, seasonal over supply, and lack of responsiveness of retail pricing to changes in refined product costs may lead to margin pressure in Parkland's business. These pressures are normally restricted to relatively short, seasonal time periods and isolated market areas, but could occur more extensively across Parkland's network. Parkland partially mitigates this risk through the continued development of a national network, where geographic diversification helps offset any short-term pricing pressures in any individual market. Difficult market conditions may also adversely affect Parkland's major customers and create increased credit risk.

In many markets, street prices change multiple times per day. Each retailer markets its price on signage that is highly visible to the public from the street. Online tools, such as Gas Buddy, exist to help the public better understand real-time pricing and identify the lowest price in an area.

The following table indicates the number of retail stations in BC as of December 31, 2018, divided by regions in the province, including Parkland stations by operating model and non-Parkland (competitor) stations:

Retail Station Count - As of Dec 31, 2018

Region	Parkland - Company	Parkland - Dealer	Parkland Total	Competitor*	Total
GVRD and Fraser Valley	**97**	**19**	**116**	**350**	**582**
GVRD	81	13	94	244	432
Fraser Valley	16	6	22	106	150
Interior - Kamloops	**17**	**21**	**38**	**194**	**270**
Island	**25**	**4**	**29**	**188**	**246**
North	**20**	**31**	**51**	**136**	**238**
Interior - Rockies	**11**	**15**	**26**	**82**	**134**
Coast	**3**	**1**	**4**	**26**	**34**
Grand Total	**173**	**91**	**264**	**976**	**1504**

* Competitor locations are an estimate based on a combination of information from Kent Group Ltd. and Parkland's own market intelligence

In British Columbia, Parkland competes with major national and international integrated oil companies (including Suncor/Petro-Canada, Shell, Imperial Oil/Esso, and Husky), independent marketers, branded and unbranded independent wholesalers, independent retail stations, independent dealers who purchase fuel from Parkland, and the multiple non-traditional retailers who have entered the retail fuel

business in recent years, such as major grocery chains, supermarkets, club stores and mass merchants (including Costco and Canadian Tire). These non-traditional motor fuel retailers have obtained a significant share of the motor fuel market in a very short time. In some markets, they are not only significant retail competitors but may also play a material role in the local competitive dynamic as the lowest-priced retailers.

The relevant geographic market for retail service stations is very local. The size and competitive characteristics of local markets vary depending on a number of factors such as demographics, real estate prices, property taxes, local traffic patterns and store offerings. These differing characteristics mean that fuel pricing will often vary significantly by region, because each station's direct costs may be very different, even if the wholesale price of the fuel is similar to that in another location.

The following chart illustrates changes in BC retail stations from 2015 to 2018, based on data provided by Kent Group. This is indicative of an active market – dealers are able to change their fuel supplier and their fuel brand; and sites open and close in response to market forces.

BC Retail Station Count					
Type	**2018**	**2017**	**2016**	**2015**	**Comments**
Change in marketer	14	187	80	26	Reflects major entry (i.e., BG Fuels, 7-Eleven, Parkland) and exit (i.e., Loblaw, Imperial, Chevron) from market, and change in dealers
Change in brand	46	12	12	11	Reflects re-brand activity, often when independent dealers have decided to change suppliers (e.g. an independent dealer deciding to move to Shell instead of remaining a Parkland (Chevron) dealer).
New site	13	21	10	11	New to industry locations
Closed site	5	16	4	8	Site closures

Source: Kent Group Ltd.

Further discussion on the competitive landscape is included in Appendix "A", our response to Questions 22A and 27.

4.2 Commercial Cardlock Market is Highly Competitive

The commercial fuel industry is also highly competitive. Parkland competes on a network level with other highway cardlock networks. Examples of major competitors include:

- **Suncor/Petro-Canada** – which offers a national cardlock network in Canada, providing Petro-Pass customers with access to over 290 locations. It has 39

locations in British Columbia and in Alberta. A comprehensive directory of Petro- Canada's cardlock network is available at: https://www-prd-cdn.petro-canada.ca/-/media/project/petrocanada/content/pdfs/2019-petro-pass-locations-directory.pdf.

- **Federated Co-op** – which has a network of over 300 cardlock fuel stops across Western Canada, including 37 locations in British Columbia and 87 in Alberta. A map of Federated Co-op's cardlock network is available at: https://www.coopconnection.ca/wps/portal/fclretail/FCLInternet/Petroleum/CardlockGuide/.

- **Husky** – which offers 80 cardlock facilities to customers using the Husky Route Commander card or other authorized cards including Comdata and T-Chek. Husky has 53 locations in British Columbia and 52 in Alberta. A map of Husky's cardlock network is available at: https://www.myhusky.ca/station-locator/.

- **Imperial Oil/Esso** – which offers customers access to more than 1000 locations across North America using the "Key to the Highway" card. Esso has 48 locations in British Columbia and 41 in Alberta. A map of the Imperial Oil/Esso cardlock network in Canada is available at: https://www.essocardlocks.ca/en/wp-content/uploads/esso-commercial-cardlock-directory-all-canada-may17-2019.pdf.

- **Shell/Flying-J** – which is a joint venture offering access to over 1200 Shell and Shell Flying J cardlock locations in Canada using the Shell Fleet Card. Shell Flying J has 10 locations in British Columbia and 25 in Alberta. A map of the Flying J network in Canada is available at: https://pilotflyingj.com/store-locations/#next.

Commercial cardlocks compete fiercely on the basis of price, since our customers are often large businesses with significant purchasing power. Breadth of network coverage is also important, because customers need to be able to refuel across the country and into the United States without the inconvenience of working with multiple providers.

The following table identifies the number of cardlocks in British Columbia, current as of Q4 2018. This is based on an internal survey of national competitors conducted by Parkland, and may exclude independent cardlock providers in the province:

Marketer	Number of sites
AC Petroleum	2
AFD	8
Beecroft Fuels	7
Coop	37
Husky / Esso	48
Northwest Fuels	6
Parkland	50
Shell / Flying J	9
Suncor	38
UFA	2
Total	**207**

4.3 Retail Margin is Not Profit: Many Costs Are Not Reflected

The gross retail margin, which is the focus of the Terms of Reference, is essentially the retail price less taxes less the wholesale price. The gross margin of a retail business is only one determinant of the profitability of retail gasoline and diesel sales. Sales volume affects revenues, and there are other costs of doing business that are not reflected in the gross retail margin. This section focuses on the types of costs that must be considered when assessing the profitability of a retail business in BC.

The following are three examples of significant costs involved in conducting retail business in British Columbia that differentiate it from other provinces.

- **Credit card fees have disproportionate effect in British Columbia** - Credit card processing costs are often the largest operating cost after labour costs. These costs are charged as a percentage of the sale price, which means they are significantly impacted by the higher fuel prices in BC. Parkland's card processing costs represent approximately 1.25% of sales for its retail stations in BC. Based on data published by Kent Group, the average retail gasoline price in Vancouver increased from $1.332 per litre (week of October 3, 2017) to a high of $1.719 per litre (week of April 30, 2019). This implies an increase in credit card processing costs of about $0.005 per litre, or over 3.5% of the monthly retailing margin measured by Kent Group.

- **Land costs and property taxes** - Real estate and the associated property taxes provide another significant cost factor, either through Parkland's or a dealer's direct ownership of property, or through leasing costs (which can also pass through taxes to the lessee). The cost of real estate in the urban centres in BC has increased at a rate much faster than most other parts of the country, which has been accompanied by significant increases in property taxes. Gross retail margins do not reflect the impact of these costs, nor do they account for opportunity costs of using real estate for gas stations instead of for potentially more profitable commercial or high-density residential uses.

- **High minimum wage** - BC's minimum wage is among the highest in Canada ($13.85 and rising in 2020, third after Alberta at $15.00 and Ontario at $14.00). Since retail stations often employ younger employees and part-time hourly staff, minimum wages have a material impact on employment costs at retail fuel stations. In the case of a Parkland company station, these costs are borne by retailer and costed in Parkland's commercial arrangements with the retailer; in the case of a Parkland dealer station, these the dealer would pay these costs and these would, presumably, be considered in the dealer's fuel pricing decisions.

4.4 Volumes Also Affect the Profitability of Gasoline and Diesel Sales

Focusing on the gross retail margin, as the Terms of Reference do, also ignores the importance of sales volumes to the economics of the retail business. Sales volume directly affects revenues. In fact, net profit is largely a function of volume sold, so maintaining volumes on what is inherently a low margin gasoline and diesel product is critical. This often means lowering prices in order to avoid losing fuel volumes to competing locations with lower prices. These pricing dynamics are discussed further in Appendix "A", our response to Question 27.

4.5 Pricing Fuel Competitively Drives Profitable Non-Fuel Sales

It is also important to understand that running a profitable gas station in a competitive market can depend on more than just selling gasoline and diesel, and we have to account for this consideration in how we manage our retail fuel pricing.

Non-fuel revenues - primarily from convenience store merchandise sales, convenience store rents, car wash revenues, and other ancillary sales - are a critical part of maintaining successful and profitable operations. For this reason, Parkland is motivated to maintain competitive fuel pricing in order to encourage consumer traffic at its stations. These is discussed further in Appendix "A", our response to Question 22A.

The importance of non-fuel revenues is shown in Parkland's most recent MD&A. It illustrates that in Q1 2019 the non-fuel profits for the retail business represented almost one quarter of total adjusted gross profits. It also shows that fuel and petroleum product adjusted gross profit decreased $3 million for the first quarter of 2019, primarily due to declining retail margins in the market. At the same time, non-fuel adjusted gross profit increased $1 million for the first quarter of 2019 as a result of continued successful efforts in company convenience store activities such as the successful implementation of new On the Run / Marché Express store concepts and rollout of our private label offering.[15]

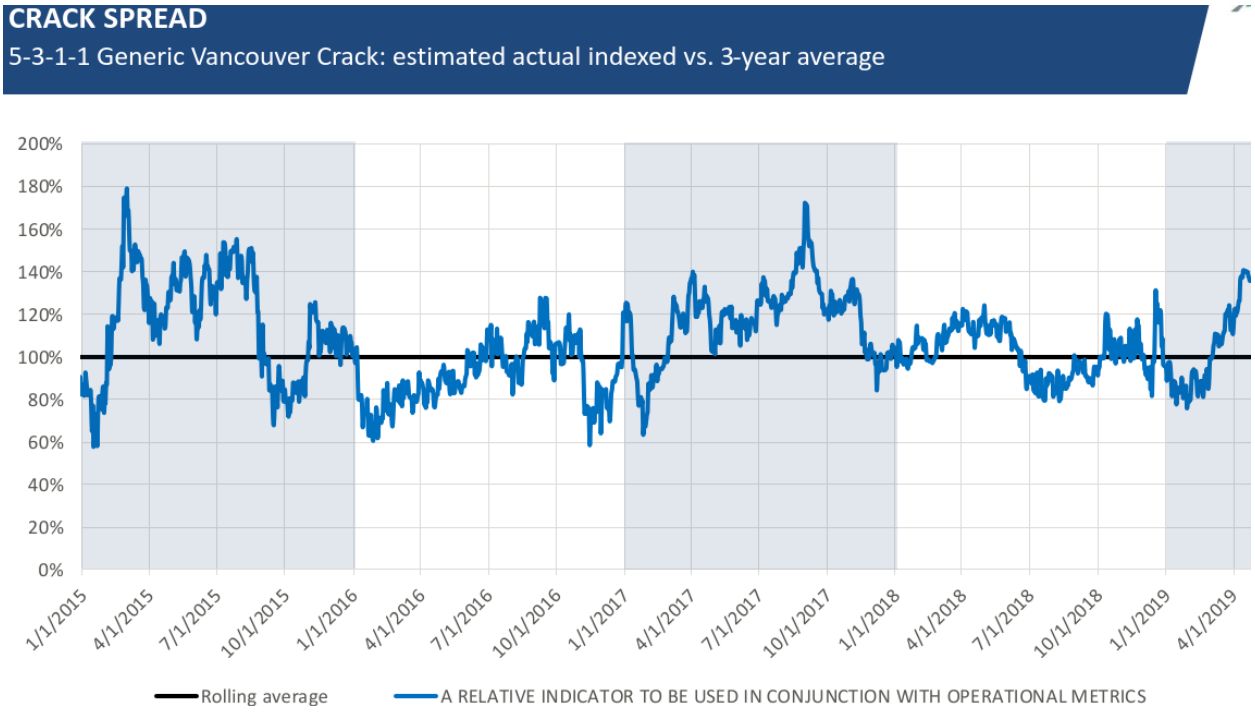
[15] Q1 2019 MD&A, p. 11.

5.0 THE ECONOMICS OF THE REFINING BUSINESS

The Terms of Reference focus on refining margins. As is the case with the retail business, examining refining margins alone provides an incomplete (and misleading) picture of the economics of the refining business. The refining margin (often called the "crack spread"[16]) is, in essence, the difference between the average price of crude and the average wholesale price of the products refined from crude. Gross refining margin should not be equated with profits. Gross margins do not include any costs except that of crude oil, and profits also depend on volumes and other factors. Refining is also subject to a number of significant business risks, for which investors and lenders must be compensated.

5.1 Refining (Gross) Margin is Not Profit: Only Reflects Some Production Costs

The chart below provides an illustrative estimated Vancouver crack spread since 2015. It uses the West Texas Intermediate crude index, which does not reflect the Burnaby Refinery's actual crude acquisition costs because of factors described elsewhere in this Evidence, including the refinery's requirement for costlier light crude and capacity issues on the Trans Mountain Pipeline.



Illustrative proxy for generic Vancouver Crack Spread based on Supply of 5 barrels of crude (WTI plus nominal transportation costs); Products

[16] Although the refining margin and "crack spread" are often treated as synonymous, the "crack spread" is actually only a proxy for the gross margin. The differences are explained below.

are Vancouver Rack pricing for 3 barrels of gasoline and 1 barrel of diesel plus 1 barrel of Jet fuel (L.A.). Source: Bloomberg (Bloomberg codes: CL1 Comdty, MOGPV87R Index, CRUMVNAG Index, JETFLAPL Index)

Although it is common for people to equate gross refining margin and crack spread, refining crack spread is only a proxy for actual gross margin that does not account for the following direct costs that are part of true gross margin:

- The cost to transport crude to the refinery, primarily on Trans Mountain Pipeline;
- The actual product slate manufactured by the refinery, including a material portion of production that is "Low Value Product" sold at less than the price of crude (fuel oil, asphalt, propane, butane). In other words, these products are sold at a loss. While all refineries try to maximize their proportion of gasoline, diesel, and jet fuel, the production of Low Value Products is an unavoidable by-product;
- Discounts from the posted "Wholesale Rack" offered to customers. These are typically multiple pennies per litre; and
- Renewable fuels requirements, which are discussed in Section 2.3 above and in Appendix "A" in our response to Question 4.

In addition to the true gross refining margin, there are many other costs of production that must be accounted for. These include operating and maintenance costs, compliance costs, and capital investment costs.

Operating the Burnaby Refinery is very capital intensive, much more so than the retail business. Parkland estimates that the total cost to operate the refinery has increased by approximately 35% since 2015. Although projected expenditures are not public and we decline to include those estimates in this document, the increasingly complex regulatory environment would indicate that such costs will continue to rise.

Refineries undergo periodic turnarounds to upgrade operating units and perform scheduled maintenance. While some minor turnaround activity may occur each year, larger-scale turnarounds typically occur every five to ten years. The planning for the next significant turnaround event at the Burnaby Refinery, scheduled for Q1 2020, is currently underway.

5.2 Refining (Gross) Margin is Not Profit: Profitability Depends on Volumes

Refinery utilization fluctuates for many reasons, including availability of feedstocks, impacts of scheduled and unscheduled outages, and economic factors that contribute to the optimization of the facility. Thus, product volumes fluctuate, as does overall profitability. The Burnaby Refinery has substantial fixed costs, and lower revenues

during times of lower volumes may impact the company's ability to recoup such costs. A simple gross refining margin measurement obscures this effect.

5.3 Refining (Gross) Margin is Not Profit: Volatility Impacts Profitability

The refining business is subject to significant volatility, and gross margins must account for this uncertainty in order to operate profitably. Refineries depend on periods when crack spreads (the difference between the price of crude oil and the price of refined products produced from that oil) are high to counteract periods when they are low, since refineries may need to subsist on low margins for an undetermined amount of time. This uncertainty creates risk, not only with respect to actual margins, but with respect to cash flow forecasting and other planning decision-making associated with the refinery. A review of Parkland's investor materials, or analyst reports on the company, provides an indication of the importance and focus that investors place on this volatility. We also note the number of refineries in North America has consistently declined in recent decades as weaker ones go out of business.

5.4 Higher Refining Margins Versus Retail Business Come With Increased Risk

Margins associated with the refining business must be greater relative to the retail business in order to finance significant capital costs and to compensate investors for operating in this higher risk business. The competitive nature of the wholesale market in British Columbia means that Parkland cannot simply flow through costs as a matter of course when risks materialize; doing so would harm Parkland's competitive position relative to other wholesalers who occupy three-quarters of the British Columbia market. Refinery earnings are volatile because of many risks and factors outside of the refiner's control, and the business carries environmental and safety risks that must be mitigated in order to ensure safe operations.

Parkland's 2019 AIF outlines for potential investors the types of risks associated with the Burnaby Refinery operations. Some of those risks are highlighted below.

Risks relating to refinery operations

There are risks inherent to the operations and activities of a refinery, including risks related to accidents, availability of crude oil and other feedstocks for use in the Burnaby Refinery, risks related to legislative and regulatory requirements, and risks related to local opposition. Parkland does not have full control over the supply of power, natural gas, or water to the refinery and, as such, a key operational risk for the Burnaby Refinery is the availability of sufficient power, natural gas, and water supplies to support refinery operations. This was a major factor since October 2018 as the Enbridge gas pipeline that supplies the Lower Mainland exploded near Prince George, materially impacting the refinery's gas supply.

Parkland contracts with third parties for the supply of crude oil and other feedstocks to the Burnaby Refinery and for the offtake of refined products from the Burnaby

Refinery. Adequate supply and offtake arrangements are a key operational risk for the Burnaby Refinery.

Health and safety risks

The Burnaby Refinery is subject to hazards of transporting and processing hydrocarbons including: blowouts; fires; explosions; railcar incidents; marine vessel incidents; gaseous leaks; migration of harmful substances; oil spills; corrosion; acts of vandalism and terrorism; and other accidents or hazards that may occur at or during transport to or from commercial or industrial sites.

Risks relating to scheduled and unscheduled maintenance

The Burnaby Refinery consists of several processing units, each of which is to undergo scheduled maintenance events every five to ten years. One or more of the units may require additional unscheduled downtime for unanticipated maintenance or repairs. Scheduled and unscheduled maintenance reduces Parkland's revenues and increases its operating expenses during the period of time that the processing units are not operating. Furthermore, material unanticipated costs and delays may be incurred in scheduled and unscheduled maintenance which may negatively impact Parkland's results of operations.

The Burnaby Refinery is scheduled to undergo a turnaround event in the first quarter of 2020, centered on our splitter, fluid catalytic cracking unit, and sulphur recovery units, where all the processing units are expected to be offline for approximately eight weeks. If unsuccessful or delayed, the turnaround could have a material adverse effect on Parkland's business, financial condition or results of operations.

Environmental risks relating to refinery operations

Commodity storage, refining, and transportation activities involve numerous risks that may result in environmental damage or otherwise adversely affect the operations of Parkland's business. Environmental risks inherent in the storage, refining and transportation of crude oil and other petroleum products include accidental spills or releases of crude oil, liquid petroleum products, chemicals or other hazardous substances, including without limitation, storm water and processed water. The occurrence or continuance of such events could result in significant environmental pollution; damage to local property, wildlife populations and natural resources; impairment or suspension of operations at the Burnaby Refinery; curtailment of offshore shipping activity; modifications to or revocation of existing regulatory approvals; fines; and serious reputational damage to Parkland. The consequences of an accidental spill or release at or near any marine terminal used in connection with the Burnaby Refinery's operations could be even more significant, given the complexities of addressing releases occurring in marine environments and/or along populated coastlines.

Commodity pricing risks

Refining gross margins are primarily driven by commodity prices and are a function of the difference between the costs of raw materials (primarily crude oil) and market prices for the marketing of finished products (such as gasoline, diesel, jet fuel, fuel oil, fuel additives and asphalt). Prices for commodities are determined by global and regional marketplaces and are influenced by many factors including supply/demand balances, inventory levels, industry refinery operations, import/export balances, currency fluctuations, seasonal demand, political climate, disruptions at the refinery resulting from unplanned outages due to severe weather, fires or other operational events, and plant capacity utilization.

Human resource risks relating to refinery operations

The Burnaby Refinery competes with companies to attract and retain key executives and other employees and third-party contractors with appropriate technical skills and managerial experience necessary to continue operating the Burnaby Refinery.

Refinery supply risks (obtaining crude)

The Burnaby Refinery crude supply is predominantly Alberta light crude transported by the Trans Mountain Pipeline, which is a common carrier regulated by the National Energy Board (the "NEB") that operates under a published tariff. However, Parkland's access to the Trans Mountain Pipeline is based upon historical usage rates, and when needs increase, additional line space is often available only by negotiating with other shippers on the pipeline. Such negotiated access comes at a significant premium to tariff rates, which can significantly increase Parkland's costs to obtain crude for the Burnaby Refinery, notwithstanding the actual price of the source crude.

The proposed expansion of the Trans Mountain Pipeline would help to address this issue, but the status of that expansion is currently uncertain. As part of the ongoing challenges to the expansion, the government of Alberta enacted curtailment rules effective January 1, 2019. The curtailment rules initially resulted in a decrease of approximately 325,000 barrels of production per day. Curtailment levels were reduced by approximately 75,000 barrels of production per day in February and March 2019, and again by 25,000 barrels per day in each of April, May, and June. However, it is not known with certainty whether curtailment levels will change beyond June 2019. The curtailment again increased costs to obtain crude for the Burnaby Refinery, because alternate (more expensive) sources were required.

Non-crude supply risks

Operating costs increased $11 million for the first quarter of 2019 in part due to a continued increase in natural gas costs to run the Burnaby Refinery resulting from a natural gas pipeline interruption in British Columbia in October 2018. The Burnaby Refinery is subject to risks from such occurrences because it relies on many different products, not just crude, in order to operate, and planned or unplanned interruptions in supply of such products can have a significant effect.

Climate Change Regulatory Risks

Climate change regulation is also a significant factor. Parkland can be adversely affected by federal and provincial legislation, regulations, and initiatives designed to reduce greenhouse gas emissions, which may increase costs and adversely affect Parkland's ability to operate the Burnaby Refinery. There are international agreements (e.g. the Paris Climate Agreement and the Kyoto Protocol), national agreements and federal legislation (e.g. carbon tax, Clean Fuel Standard, cap-and-trade or efficiency standards) and provincial legislation (e.g. British Columbia's CleanBC climate policy) that aim to reduce greenhouse gas emissions. These policies have continued to evolve and overlap one another.

These developments increase costs of compliance, costs of supply and the price of petroleum products. The Renewable and Low Carbon Fuel Requirements Regulation materially impacts the composition of fuel in BC as low carbon intensity renewables are sourced from a variety of sources. More jurisdictions are adopting low carbon policies and demand for compliant products is exceeding supply. British Columbia will increase the province's carbon tax rate by $5 per tonne of carbon dioxide equivalent emissions (CO2e) annually, until such rates are equal to $50 per tonne of CO2e on April 1, 2021.

Indigenous Rights Claims

Indigenous rights and title claims also pose a risk that has disproportionate impact on BC relative to other provinces, and the Burnaby Refinery relative to retail operations. Indigenous groups have claimed aboriginal treaty, title and rights to broad portions of western Canada, including virtually all of British Columbia.

While such claims are outstanding, the federal and provincial governments have a duty to consult with Indigenous people on actions and decisions that may affect the asserted Indigenous or treaty rights and, in certain cases, accommodate their concerns. The government's duty to consult may be triggered if Parkland applies to obtain or renew significant permits, leases, licenses and other approvals for its operations in areas that are subject to outstanding Indigenous rights claims. The fulfilment of the duty to consult associated with a permit application can add time, effort and risk to the review and its outcome. Opposition by Indigenous groups to industrial development or activity may also negatively affect Parkland operations.

Volatility and Utilization

The following table from the Q1 2019 MD&A shows the volatility in "Supply" earnings, a significant component of which is associated with the Burnaby Refinery; and shows the significant volatility in refinery utilization associated with turnarounds and other factors. The decline in "Supply" earnings coincided with quarters with low utilization rates (see yellow highlighted rows).[17]

[17] Q1 2019 MD&A, p. 28.

		Pre-IFRS 16						
($ millions, unless otherwise noted)	2019[6]	2018[6]				2017[6]		
For the three months ended	Mar 31	Dec 31	Sep 30	Jun 30	Mar 31	Dec 31	Sep 30	Jun 30
Financial Summary								
Sales and operating revenue	**4,215**	3,468	3,849	3,783	3,342	3,429	2,580	1,786
Adjusted gross profit[1]	**697**	587	465	513	430	469	266	168
Adjusted EBITDA including NCI[1]	**339**	285	200	249	153	198	96	54
Adjusted EBITDA attributable to NCI	**24**	—	—	—	—	—	—	—
Adjusted EBITDA attributable to Parkland ("Adjusted EBITDA")[1]	**315**	285	200	249	153	198	96	54
Canada Retail	**73**	78	87	82	69	94	74	38
Canada Commercial	**44**	30	11	19	38	28	8	5
USA	**11**	11	8	5	4	4	4	5
International	**71**	—	—	—	—	—	—	—
Supply	**143**	196	120	169	71	94	25	18
Corporate	**(27)**	(30)	(26)	(26)	(29)	(22)	(15)	(12)
Net earnings	**91**	77	49	60	20	49	12	(1)
Net earnings attributable to:								
Parkland	**77**	77	49	60	20	49	12	(1)
NCI	**14**	—	—	—	—	—	—	—
Net earnings per share ($ per share)								
Per share – basic	**0.53**	0.58	0.37	0.45	0.15	0.37	0.10	(0.01)
Per share – diluted	**0.52**	0.57	0.36	0.45	0.15	0.37	0.10	(0.01)
Distributable cash flow[2]	**122**	151	112	118	29	45	45	23
Per share[2][3]	**0.84**	1.14	0.84	0.89	0.22	0.33	0.35	0.20
Adjusted distributable cash flow[2]	**135**	175	138	139	110	102	64	39
Per share[2][3]	**0.93**	1.32	1.04	1.05	0.84	0.78	0.50	0.35
Dividends	**43**	41	39	41	38	39	38	33
Dividends declared per share outstanding	**0.2951**	0.2934	0.2934	0.2934	0.2902	0.2886	0.2886	0.2886
Dividend payout ratio[2]	**35%**	27%	35%	35%	131%	89%	83%	146%
Adjusted dividend payout ratio[2]	**32%**	23%	28%	29%	35%	38%	59%	84%
Total assets	**8,998**	5,661	5,736	5,592	5,492	5,412	4,830	4,281
Shares outstanding (millions)	**146**	134	133	132	132	131	131	130
Weighted average number of common shares (millions)	**145**	133	133	132	131	131	131	111
Operating Summary								
Fuel and petroleum product volume (million litres)[4]	**5,336**	4,354	4,211	4,202	4,211	4,432	3,557	2,588
Fuel and petroleum product adjusted gross profit (cpl)[5]								
Canada Retail	**7.59**	7.69	7.78	8.00	7.88	8.95	7.10	5.78
Canada Commercial	**7.91**	6.52	4.65	5.61	6.74	5.64	4.09	4.20
USA	**4.53**	4.97	3.27	3.66	3.65	3.48	2.97	3.31
International	**11.95**	—	—	—	—	—	—	—
Refinery Utilization[7]	**92.0%**	87.8%	97.7%	90.9%	33.2%	94.4%	—%	—%

[1] Measure of segment profit. See Section 13 of this MD&A.
[2] Non-GAAP financial measure. See Section 13 of this MD&A.
[3] Calculated using the weighted average number of common shares.
[4] Fuel and petroleum product volume represents external volumes only. Intersegment volumes, including volumes produced by the Burnaby Refinery and transferred to the Canada Retail and Canada Commercial segments, are excluded from this reported volume.
[5] "cpl" stands for cents-per-litre and is a key performance indicator. See Section 13 of this MD&A.
[6] 2019 results reflect the adoption of IFRS 16 as of January 1, 2019. 2018 and 2017 comparative figures reflect the accounting standards in effect for those years. Specifically, those periods are not restated to reflect the impact of IFRS 16 which is allowed under the modified retrospective approach for the adoptions of IFRS 16. Please see the reconciliation of IFRS 16's impact on Adjusted EBITDA for the three months ended March 31, 2019 on page 4 of this MD&A.
[7] Key performance indicator. See Sections 4 and 13 of this MD&A.

5.5 Gross Margin Must Cover the Cost of BC's Greater Compliance Obligations

As described above, refining in British Columbia requires adherence to numerous regulatory obligations. For example, the facility must adhere to emissions restrictions, fuels must meet renewables and carbon intensity requirements, and a significant amount of data must be tracked and reported in order to create and maintain sufficient units to comply with Part 2 and Part 3 requirements of the *Greenhouse Gas Reduction (Renewable & Low Carbon Fuel Requirements) Act*. These obligations carry substantial costs, and since wholesale prices are set by

competitive forces and not unilaterally by Parkland or by any one supplier, such costs may not always be recoverable in the product price.

One less obvious but significant factor is that, in addition to the direct costs of compliance, in a facility with inflexible storage capacity such as the Burnaby Refinery, the requirement to store an increasing volume of renewable fuels for blending into refined products will necessarily reduce the storage available for existing products. This exacerbates the supply uncertainty associated with the Trans Mountain Pipeline, and the Burnaby Refinery's ability to respond quickly to the market.

6.0 THE MULTIPLE SOURCES OF WHOLESALE GASOLINE AND DIESEL IN BC

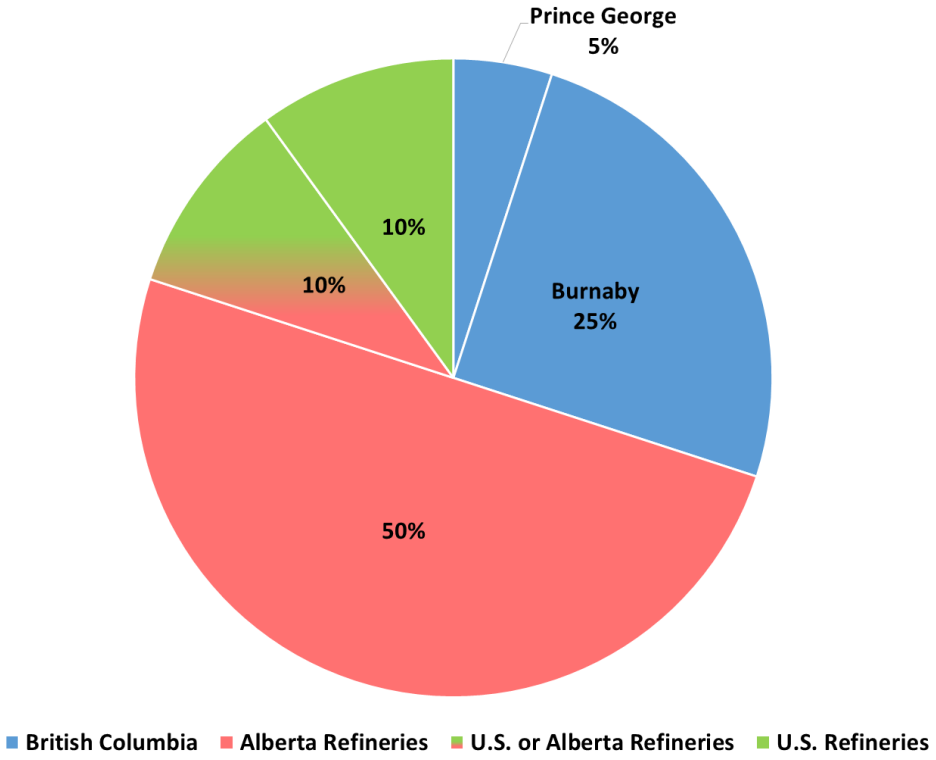
As discussed below, there is price competition among wholesalers, as well as other inherent market conditions that result in no organization having material market power in the wholesale fuel market in British Columbia.

6.1 Price Competition Exists from Alberta, US and BC Refineries

Parkland's Burnaby Refinery is one of a number of sources of wholesale gasoline and diesel in British Columbia. Once all of the competing sources of supply are taken into consideration, the Burnaby refinery supplies only approximately 23% of total supply of gasoline and 29% of total supply of diesel in British Columbia (and a smaller share of other types of fuel). The other sources of wholesale gasoline and diesel in British Columbia include the Husky refinery in Prince George, BC, plus refined product imported from Alberta and the Pacific Northwest via pipeline, barge, rail, and truck.

Dr. Kahwaty included the following figure in his report:

Estimated Percentage of Total British Columbia Refined Products Demand Supplied By Refinery Location[18]



Price Competition from Alberta Refineries by Pipeline

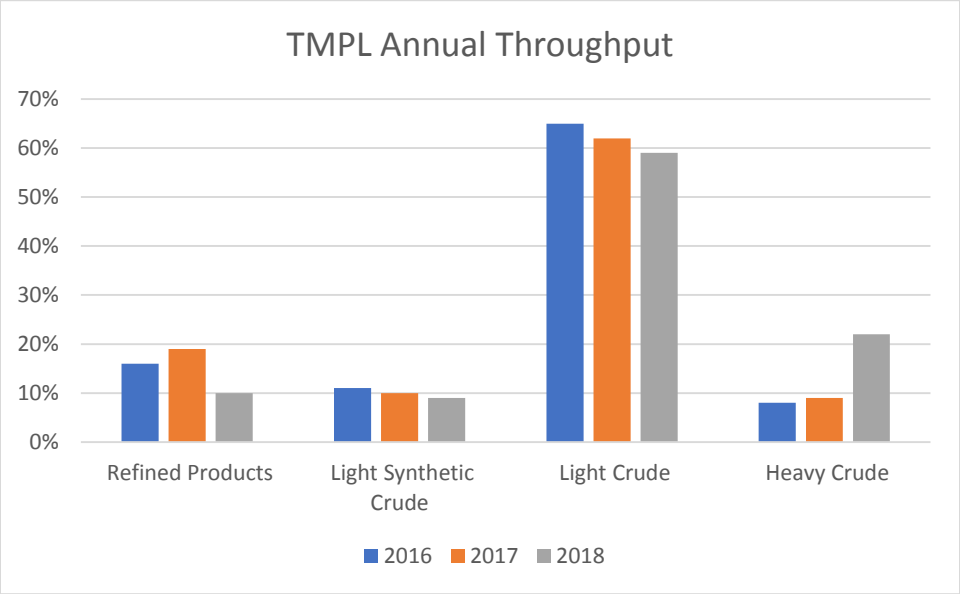
Parkland faces competition from the integrated majors who direct supply from Alberta into British Columbia through pipeline deliveries.

The planned expansion of the Trans Mountain Pipeline is expected to more than double the Trans Mountain Pipeline's capacity, which will make it more economic for other parties to bring refined fuels into BC. Presently, the Trans Mountain Pipeline is under allocation, which means that the desired shipping usage exceeds its capacity and therefore line space is allocated to shippers according to a formula based on historic usage. Thus, Parkland competes with other shippers for line space; those shippers may be shipping refined product for use in BC, or may be shipping crude to the Pacific Northwest for use in US refineries. When the Burnaby Refinery requires space to source sufficient crude, it must either purchase aftermarket line space from other shippers on the line or use alternate sources such as crude delivered by rail, neither of which is efficient or as cost effective as paying approved tolls on the Trans Mountain Pipeline. Aftermarket pipeline purchases come at a significant premium: the average successful bid has ranged from $70/m3 to in excess of $340/m3 CAD.

[18] Figure 22, Appendix "B", Dr. Kahwaty's Report, p. 47.

These bid values equate to approximately 7 to 34 times the Trans Mountain Pipeline base tariff.

The commodity throughput on the Trans Mountain Pipeline has changed in recent years, as illustrated by the chart below:



The Burnaby Refinery processes light crude, and this chart illustrates the fact that a steadily decreasing volume of light crude is carried on the pipeline in relation to heavy crude.

Price Competition from Alberta Refineries by Truck and Rail

In addition to refined product entering the BC market by pipeline, there is competition provided by imports via truck and rail. These transport modes are typically more expensive than pipelines, but for shorter haul deliveries to the BC interior, or when there are constraints on pipeline capacity, they are available options.

Price Competition from US Refineries

Price competition is also provided by the potential for increased imported volume (assuming terminal capacity, etc.) from several major refineries in the Pacific Northwest region of the United States. For example, the following refineries operate in Washington State alone:

- the BP Cherry Point refinery (225,000 bpd capacity) is located just 15 kilometres from the Canadian border;

- the Phillips 66 Ferndale refinery (101,000 bpd capacity) is located just 30 kilometres from the Canadian border;

- Shell's Puget Sound refinery (145,000 bpd capacity) is located just 90 kilometers from the Canadian border; and

- Tesoro's Anacortes refinery (120,000 bpd capacity) is located just 100 kilometers from the Canadian border).

6.2 Low Barriers to Entry Provide Additional Controls on Pricing

The wholesale/bulk sales channel is characterized by low barriers to entry, as is evidenced in part by the large number of small competitors that are active in this industry in Canada. Notably, ownership of a bulk plant and transportation network is not required to supply bulk fuel. For example, competitors may supply fuel from nearby supply points or transport fuel products greater distances from existing supply points to minimize the capital expenditures and lease costs associated with owning and operating a bulk plant. Two US refining companies supply 60% of the Vancouver International Airport by barge and tanker truck. Further, fuel marketers can and do enter the wholesale supply business with as little as a single truck, or may contract with local brokers or third party haulers to transport fuel on their behalf. Fuel marketers may also expand their service area with little capital expenditure by creating a new supply point with the acquisition of a large tank trailer which is parked in a pre-determined location and used to fill tandem trucks (i.e., smaller vehicles used to make deliveries to customers who require smaller volumes of bulk fuels). We understand that a number of small marketers haul fuel in trucks from Alberta, taking advantage of the 75 ML/year threshold contained in the BC low carbon fuels regulations, thereby avoiding some of the compliance costs that have been described in this Evidence.

7.0 OVERSIGHT AND CHECKS AND BALANCES

There are significant market and regulatory checks and balances in place to prevent undue profit-taking in the retail gasoline industry. Market participants, including Parkland, also have their own policies in place to ensure that they and their partners behave ethically and in compliance with their legal obligations.

7.1 Competition is a Check on Prices

As described in the earlier sections of this Evidence, market forces act to ensure that pricing at the gas station is competitive. Consumer prices are prominently posted by all gas stations, so consumers are able to choose the station that fits their needs, whether it be to fill up at the lowest price station, to choose the convenience store they prefer, or for any other reason.

The excerpts from Bonbright, *Principles of Public Utility Rates*, included in Appendix “C” address the benefits of competition, relative to regulation.

7.2 The Competition Bureau Oversees Market Practices

Regulatory requirements, including in particular those imposed by the Competition Bureau of Canada, ensure that Parkland and its competitors do not exercise improper upward pressure on retail pricing. The Competition Bureau conducts extensive assessments with respect to significant acquisitions in the industry to ensure no undue concentration of market power, and has in the past reviewed gasoline pricing practices. The Competition Bureau's presence acts as a strong incentive for participants to compete openly and fairly.

7.3 Parkland Follows Codes of Conduct

In addition to a general Code of Conduct that requires staff to behave ethically and in compliance with legal obligations, Parkland has an extensive *Competition Act* compliance policy and conducts regular competition compliance training for staff in all areas of the business. An anonymous whistleblower line allows staff and external parties to report suspected bad behaviour – any such report goes directly to the Chair of the Audit Committee of Parkland's Board of Directors, who has the responsibility to ensure such reports are investigated and resolved. Parkland understands that all other major participants in the market have similar policies and practices, and these obligations are taken very seriously.

Parkland Supply sells, at an internal transfer price, to Parkland's Retail and other segments. Parkland Supply also provides transportation services to other segments at an internal transfer price.[19] These arrangements ensure that retail fuel is supplied at a competitive price, taking into account all of the factors that contribute to the refining and delivery of fuel in British Columbia.

8.0 CONCLUSION

In this Evidence, Parkland has attempted to illustrate the many complex factors that affect wholesale and retail margins for retail gasoline and diesel in British Columbia, and that ultimately lead to retail pricing to the consumer. This is a highly competitive industry with many players, large and small, local and national and international, all of which are competing to conduct a profitable business within British Columbia while meeting the expectations of customers, regulators, shareholders, and other stakeholders. We appreciate the opportunity to present this Evidence to the BC Utilities Commission, and we welcome the opportunity to provide additional information and context as the Inquiry proceeds.

[19] 2019 AIF, p. 17.

APPENDIX A TO PARKLAND EVIDENCE

PARKLAND'S RESPONSES TO BCUC QUESTIONNAIRE TO COMPANIES

Note that Parkland acquired the shares of Chevron Canada R&M ULC from Chevron Canada Limited in September 2017. Prior to this date, the Burnaby refinery was owned and operated by Chevron Canada. Although we provide some data in this evidence from prior to this date, in many cases such data is not available to Parkland.

1. What are your sources and types of crude oil supply? Please outline any significant changes that have occurred to your sources and grades of crude oil supply since January 2015.

Parkland's Burnaby refinery runs predominantly light sweet crude produced throughout Western Canada. The rough breakdown of crude grades Parkland refines are as follows:

- 70% Light Conventional Sweet Blends (MSW)
- 20% Sweet Synthetic Blends (SYN)
- 10% Medium Sour Blends (MSR)

There have been two significant changes to crude supply in the period since January 2015:

- As of September 2016, the Burnaby refinery no longer receives BC Light or Boundary Lake crude from the Pembina Plateau pipeline. The Pembina Plateau pipeline was previously used to inject BC-based crudes at Kamloops where space in the pipeline was created by product offtakes into the BC Interior Region (e.g. Kamloops).
- As of February 2018, MSW and SYN crudes are now comingled on the Trans Mountain pipeline. The refinery used to receive neat crude types (MSW, Rainbow, Peace Sour and Premium Albian Synthetic), but this flexibility no longer exists due to the pooling of commodities that now occurs at the Trans Mountain pipeline's Edmonton tankage. A copy of correspondence from Kinder Morgan (who owned the Trans Mountain pipeline) in this regard is attached as **Attachment 1A** to Parkland's Questionnaire Responses.

  This has resulted in the Burnaby refinery receiving crudes that historically the Parkland Burnaby refinery had not processed. With varying pooled crude compositions, this has resulted in sub-optimal shifts in the refinery yield of products and has impacted our operations

resulting in lower refinery utilization and other impacts including catalyst life degradation and/or heat exchanger fouling.

2. How is crude oil transported to your refinery? Have there been any changes in transportation methods or costs since January of 2015? Please provide a price breakdown by month, where possible.

The majority of crude supplied to the Burnaby refinery (>90%) is received via the Trans Mountain pipeline. The remaining <10% is received via rail car. As described in the response to Question 1, the Burnaby refinery no longer receives any crude from the Pembina Plateau pipeline, which previously supplemented the supply from Edmonton via the Trans Mountain pipeline, and is no longer available.

Since January 2015, there have been significant changes in the availability of crude on the Trans Mountain pipeline, and an associated increase in shipping costs on the pipeline. The circumstances surrounding this change are outlined below:

- The NEB, in RHW-001-2013, transitioned all land shippers to a historical averaging volume allocation process effective in Q2 of 2015. Section 14 of Trans Mountain pipeline Tariff No. 105, which was released in October 2018, outlines the allocation process of available capacity on the Trans Mountain pipeline. A copy of Trans Mountain pipeline Tariff No. 105 is Exhibit A2-10 on the BCUC website.

- Historical averaging rules have created an ultra-competitive aftermarket for line space, whereby

  - land shippers bid for the right to ship and acquire crude on committed shippers' line space (Firm 50); and

  - both land shippers and Westridge Dock shippers (export) bid for the right to uncommitted Westridge line space.

  This aggressive bidding process is done to maximize the current and future delivery of crude to their facilities over time.

- There are large implications of aftermarket line space costs on the Burnaby refinery's marginal economics. As outlined in quarterly Westridge tanker results included as **Attachments 2A and 2B** to Parkland's Questionnaire Responses, bid premiums for line space have varied significantly in recent years. This has, at times, resulted in (a) negative last barrel (i.e., marginal) economics for the refinery or (b) an inability to acquire sufficient line space on the Trans Mountain

pipeline at all (also resulting in a coinciding shortfall in refined products production). The average successful bid has ranged from $70/m3 to in excess of $340/m3 CAD (e.g. $341.3/m3 CAD in Q4 of 2018 and $74.37/m3 CAD in Q1 of 2019). These bid values equate to approximately 7 to 34 times the Trans Mountain pipeline base tariff. The high cost of line space has at times been uneconomic for the Burnaby refinery to acquire as the available crack spread did not support the line purchase and associated cost of processing the crude into finished products.

The situation outlined above has resulted in the Burnaby refinery recommissioning a crude by rail program in Q4 2018, which now accounts for approximately 5 -10% of the overall crude supply for the Burnaby refinery. Rail transportation is, by far, the most expensive and least efficient method of shipping crude. The railed crude delivered into the Burnaby refinery are under a manifest load arrangement (i.e., approximately a dozen railcars) and carries higher costs than unit train delivery of hundreds of railcars (the latter being something that the Burnaby refinery is physically unable to accommodate).

The higher cost of transportation associated with crude delivered by rail relative to the Trans Mountain pipeline has increased the Burnaby refinery's average cost of delivered crude and reduced the Burnaby refinery's net margin.

Crude availability and price volatility have also been impacted by:

- Limited evacuation infrastructure of crude from Western Canada. This includes high cost of rail and insufficient pipeline capacity and/or stalled projects.

- Volatility in pricing of certain grades of crude (heavy versus light) that not only impacts the overall capacity of the Trans Mountain pipeline, but the relative valuation of the aforementioned aftermarket linespace.

- Government intervention into Western Canadian crude production that has created instability and uncertainty in the crude marketplace, impacting the Burnaby refinery.

It is important to note that, just because our cost of goods (raw material) and transportation costs are increasing does not mean that we can necessarily pass on those costs with a higher crack spread. The market sets the wholesale prices and the crack spread, and Parkland faces competition from other wholesale suppliers.

3. How do you manage your inventory valuation? How quickly does a change in your crude oil supply cost affect the price of refined products? Please provide any supporting data, where possible.

Parkland's Burnaby refinery has the ability to hold, and normally does hold, three days of crude inventory on-site. The majority of the Burnaby refinery's crude inventory is in transit on the Trans Mountain pipeline.

Parkland's Burnaby refinery uses the Weighted Average inventory valuation method, which values the crude throughout the supply chain, inclusive of time. This involves the value of inventoried crude from the prior month, the outflow of crude from inventory in the current month, and the revaluation of the ending inventory of crude with the incoming landed crude costs. With crude in the pipeline, in tankage and what is run through the refinery, the valuation changes quickly as the inventory turns within the month. The Burnaby refinery's limited tankage exposes its margin to swings in the crude market daily. However, the internal inventory valuation does not affect the price for refined products. The Burnaby refinery takes on the risk of price volatility that occurs between the time the crude is purchased and the time it is processed into refined products and then transported and sold.

The wholesale prices of refined products produced at Parkland's Burnaby refinery adjust in a lagging manner to the broader finished fuels marketplace. The price for refined products at the Burnaby refinery are based on independent market dynamics impacted by the broader West Coast (PADD V) refined products marketplace (supply, inventory and demand). This actively influences the price that refined products produced at the Burnaby refinery can be sold for in the market. Parkland is not able to unilaterally increase the price of wholesale products from the Burnaby refinery to pass through all increases in Parkland's cost of crude supply to customers or its retail operations. Parkland is constrained by how other wholesalers are pricing their products, and by whether Parkland retail operations can pass on any such increases to end users in the context of their own competitive market.

For example, if Parkland raised the wholesale price unilaterally to recover the increase in cost of purchasing aftermarket line space, it is very likely that sales volumes would quickly drop off as customers moved to alternative suppliers who had other alternatives and did not incur this additional cost of supply.

4. What are your refining cost drivers? Are there refining cost drivers which have substantially changed in the last 3–5 years?

Refining costs have increased in recent years, and disproportionately so in BC relative to the rest of the country. The Burnaby refinery has seen year over year

cost escalation from 2016 through 2019. Parkland provides further explanation of refining costs below.

The key cost drivers for any refinery are the cost of goods (i.e., raw materials – crude) and the operating costs (both fixed and variable) that are associated with refining the crude into finished products.

Refinery operating costs are a function of its size and complexity. Operating costs for the Burnaby refinery are not only impacted by the exposure to the Lower Mainland marketplace or CPI, but also by the costs to operate a typical refinery.

The following cost drivers impact on Parkland's Burnaby refinery. While some of these costs are applicable to any Canadian refinery, there are additional costs in the case of operating in BC:

- Regulatory Compliance

  - Federal Renewables Fuels Regulations – The Regulations, which came into effect in 2010, require fuel producers and importers to have an average renewable fuel content of at least 5% based on the volume of gasoline produced and at least 2% based on the volume of diesel fuel and heating distillate oil produced or imported into Canada. A barrel of renewable fuels, which at times can differ in cost from the finished product, will inherently back out a portion of a barrel of crude at the front end of a refinery.

  - British Columbia's Renewable and Low Carbon Fuel Requirements Regulation ("LCFR") - This is one significant factor that affects the costs of supplying fuel in BC, but that does not affect fuel suppliers elsewhere in the same way. It built further upon the federal regulations by imposing the following requirements:

    - Fuel suppliers must ensure that they have a minimum renewable fuel content of 5% for gasoline and 4% for diesel, on a provincial annual average basis.

    - Fuel suppliers must progressively decrease the average carbon intensity of their fuels to achieve a 10% reduction in 2020 relative to 2010.

These requirements in BC have significant ramifications for production costs and, ultimately prices:

- Renewable fuels that meet this lower carbon intensity requirement are typically higher in unit cost, are much lower in availability and must be sourced in the international marketplace. The international sourcing leads to exposure to other jurisdictions' clean fuels programs and demands that are larger and higher volume than BC.

- Production of a renewable fuel requires a manufacturer to invest in the refinery to process and produce low carbon fuels (i.e., R&D and actual scaled processing of bio-intermediate stocks to produce low carbon intensity renewable fuels), which can threaten the base operability of a refinery. These are experimental processes at or near the leading edge of renewable fuel production.

- It necessitates acquiring and trading credits in a marketplace that currently does not exist. When credits have been periodically made available through limited auctions and through a few agencies, bids have sold in excess $200/MT.

- US Environmental Protection Agency Tier 3 Gasoline Sulfur – The Canadian government maintained alignment with US air pollutant emission standards for vehicles, engines and fuels is consistent with the objectives of the Canada - United States Air Quality Agreement, the Government of Canada's Clean Air Regulatory Agenda and the Canada - US Regulatory Cooperation Council. From 2016 to 2020, the sulfur content of gasoline at any point in the distribution system is being reduced from 40 mg/kg sulfur to ultimately 10 mg/kg. In order to comply, the Burnaby refinery has had to operate in a more costly operating posture to produce low sulfur gasoline components to build credits for the 2020 deadline. The Burnaby refinery has also invested capital and absorbed additional operating expense to upgrade the refinery to ensure long-term adherence to the new sulfur specification for 2020 onwards.

- International Marine Organization ("IMO") 2020 Requirements – The IMO is moving forward with a marked reduction in the

global maximum sulfur content of marine fuel (also known as bunker fuel oil) on January 1, 2020 from 3.5% to 0.5%. Sulfur components come with the crude into the refinery and tend to concentrate with the heavier production barrels from a refinery. This regulation has required, and will continue to require, the Burnaby refinery to:

- Procure crude barrels that are lower in sulfur and lighter in composition, which are higher in acquisition costs and will be in demand by all international refiners as an IMO compliance pathway.

- Downgrade higher value distillate (e.g., diesel) barrels into a fuel oil (bunker) barrel to comply. The fuel oil market is below that of the cost of a crude barrel and higher sulfur fuel oil is exponentially lower in price depending on its sulfur content deviation from the IMO 2020 limit.

- British Columbia Cleaner Gasoline Regulation – Provinces regulate the gasoline quality in Canada. National specifications have been produced by the Canadian General Standards Board (the "CGSB"), and all provinces require that all gasoline meets CGSB standards. In BC, the gasoline specifications in terms of vapor pressure and other specifications (driveability index and distillation) are more stringent than the rest of the country (or the US Pacific Northwest, for that matter) for periods of the year. The BC gasoline specifications result in higher cost of manufacturing and blending for grades of gasoline during those periods of time.

- Environmental and Safety Compliance

  - Wastewater Permit & Plant
    - Rigorous and comprehensive water testing to meet local Metro Vancouver discharge limits for the Burnaby refinery.

  - Air Permit & Emissions Controls Measures
    - Requirements for decreased emissions stemming from new Canadian Ambient Air Quality Standards (typically reviewed every 5 years), which are typically reflected in further stringent provincial and municipal ambient air

quality objectives. The standards are published every few years and could potentially trigger new investment requirements for the Burnaby refinery.

- Metro Vancouver recently renewed the air permit for the Burnaby refinery. The new permit included several new conditions that have the potential to require significant capital investments to comply with the permit.

- Upcoming federal Volatile Organic Compound regulations requiring the development of a substantial program for fenceline monitoring of emissions as well as additional leak detection and repair program elements requiring capital investment by the Burnaby refinery over the last couple of years, in preparation for the regulation. This has increased costs.

5. What are the key factors affecting your refining margin (crack spread)? Have there been any significant changes since January of 2015?

Before addressing the substance of the question, it is important to understand that the crack spread is simply the difference between the price of crude purchased by a refinery and the price at which a small number of high value refined products can be sold. As explained below, the crack spread does not consider all revenue streams, yield structure, or operating costs and thus is a poor indicator of absolute profitability.

Refined products are identified as high value products ("HVP"), sold above crude price, and low value products ("LVP"), sold below crude price (HVP components include gasoline, diesel and jet fuel while LVP components include refinery fuel gas, propane, butanes, vacuum gasoil ("VGO"), fuel oil and asphalt). The crack spread provides little insight into either (a) the revenue generated by products other than the HVPs or (b) the variable and fixed costs associated with the operation. It is thus an imperfect proxy for refinery profitability.

Profitability is a function of total revenue generated by the sale of all products produced by the refinery and the costs (both the variable and fixed) associated with the operation of the refinery. Thus, any shift in refinery yield or cost structure that might adversely or positively affect the profitability of the operation will not be reflected in the crack spread. It should also be noted that each refinery is uniquely configured. More complex refineries generally have a higher value yield structure and, in most cases, corresponding higher levels of profitability in a given market even though they might have the identical crack

spread. In other words, the Burnaby refinery is less complex than its competitors in Edmonton or Washington State, and as such translates a smaller proportion of the Vancouver crack spread into its actual gross margin.

Although Parkland regards the use of this measure to produce misleading results in this context, it has provided the requested information below.

- Yield Changes
  - Changes in crude availably/accessibility and the increasing LCFR requirements have shifted the Burnaby refinery's yield and intermediate product balance, resulting in a higher cost of raw materials, and lower total product value. Specific examples include:
    - Naphtha – Increased volumes purchased at a slight discount to gasoline;
    - VGO – Increased sales of cracker feed at net loss relative to processing the VGO into finished product;
    - Biofuels – See our response to Question 4 – purchased above gasoline and diesel prices; and
    - Bio-feedstocks for processing – purchased closer to finished product pricing and well above crude; and
  - Operating costs changes
    - See our response to Question 4.

6. What refined products do you produce? What changes in demand for refined products has there been since January of 2015? Please provide supporting data, where possible.

At the Parkland Burnaby refinery, we produce the following basic products:

- HVP components which include gasoline, diesel and jet fuel; and
- LVP components which include refinery fuel gas, propane, butanes, fuel oil and asphalt.

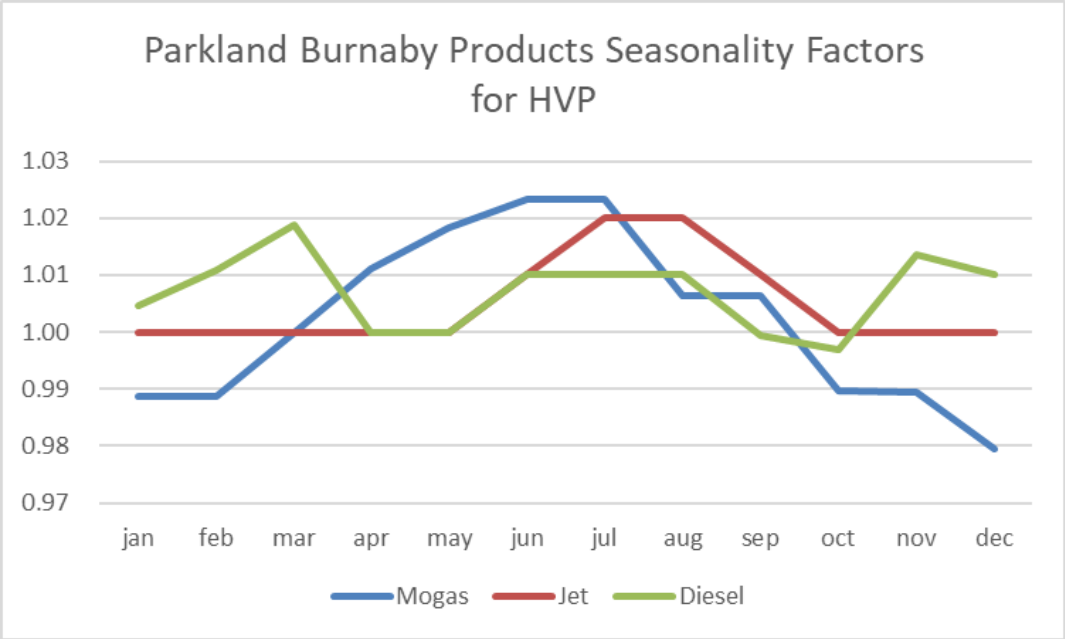
Parkland has observed a general reduction in fossil fuel demand in BC related to:

- Motor vehicle efficiency;

- Electrification of vehicles;
- Reduction in fossil fuel due to renewable fuel addition requirements; and
- Cross-border shopping.

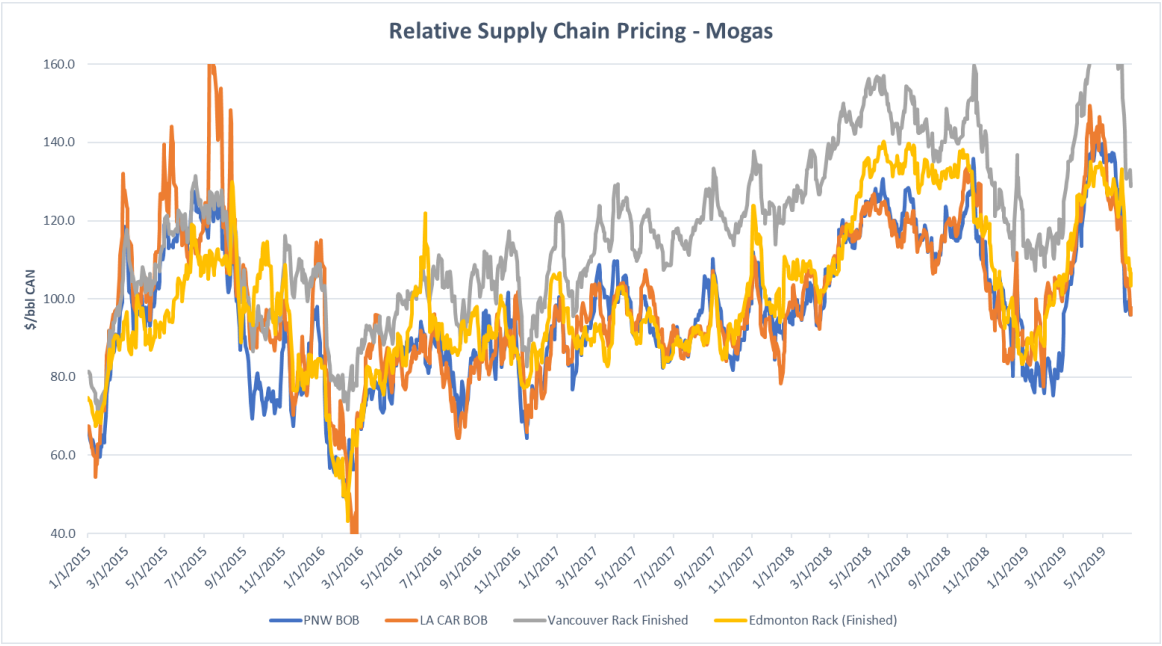
7. Please discuss the seasonal variations in the supply and demand of gasoline and diesel and how this affects your wholesale price. Have there been any significant changes since January of 2015?

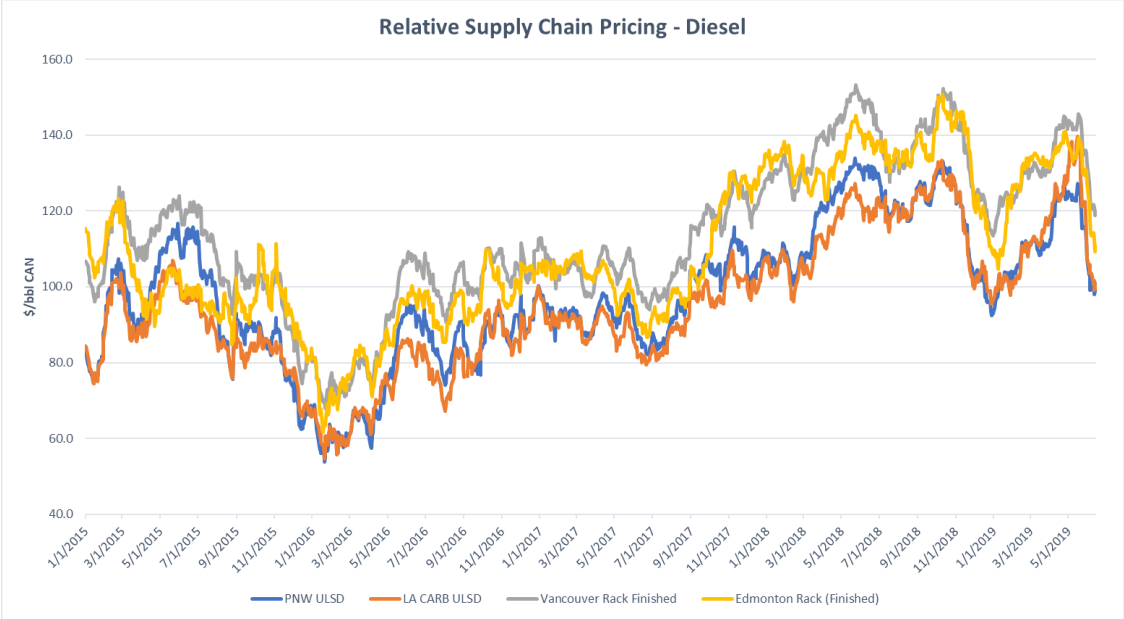
Supply and demand variations align with summer and winter seasonality, but differ slightly in relation to gasoline and diesel. Parkland's BC product supply/demand is set out below:



The BC product supply/demand balance is strongly related and influenced by the West Coast or PADD V product supply/demand (the PADD V region is shown in the first figure below) and product available via the Trans Mountain pipeline or Edmonton. The tight correlation between these markets can be seen in the second and third figures below, where the gasoline (mogas) and diesel markers for Edmonton, Los Angeles and Pacific Northwest wholesale pricing and Vancouver rack pricing are shown for the period 2015 to 2019.

There has been a change in terms of the posted "Before Oxygenate Blending" ("BOB") price for gasoline and fossil fuel based ultra-low-sulfur diesel ("ULSD") for diesel price with the finished Vancouver rack pricing (after oxygenate blending and biofuel blending) and between Edmonton racks and Vancouver racks, which coincides with the advent of the BC LCFR. Please see our response to Question 4 for further discussion of LCFR.





8. Does your refinery generally operate at full capacity? If not please explain.

The Burnaby refinery operates up to its economic utilization – up to the point where the margin on a products' barrel is breakeven with the crude barrel acquired. Crude barrels and product barrels prices will vary depending on the source, quality and destination. Due to the nature of the inbound aftermarket crude linespace on the Trans Mountain pipeline, the Burnaby refinery may operate in a negative margin position for the marginal or "last barrel." Please see the response to Question 2 for further discussion on this point.

In general crude distillation terms, the Burnaby refinery operates at >90% of its front-end crude distillation capacity. The lost crude capacity is generally associated with:

- Economic slowdown;
- Unplanned events and routine maintenance activity; and
- Operating limits that may be related to seasonal events or deteriorating operating conditions between start of run and end of run conditions.

9. How does your refining margin compare to other refiners:

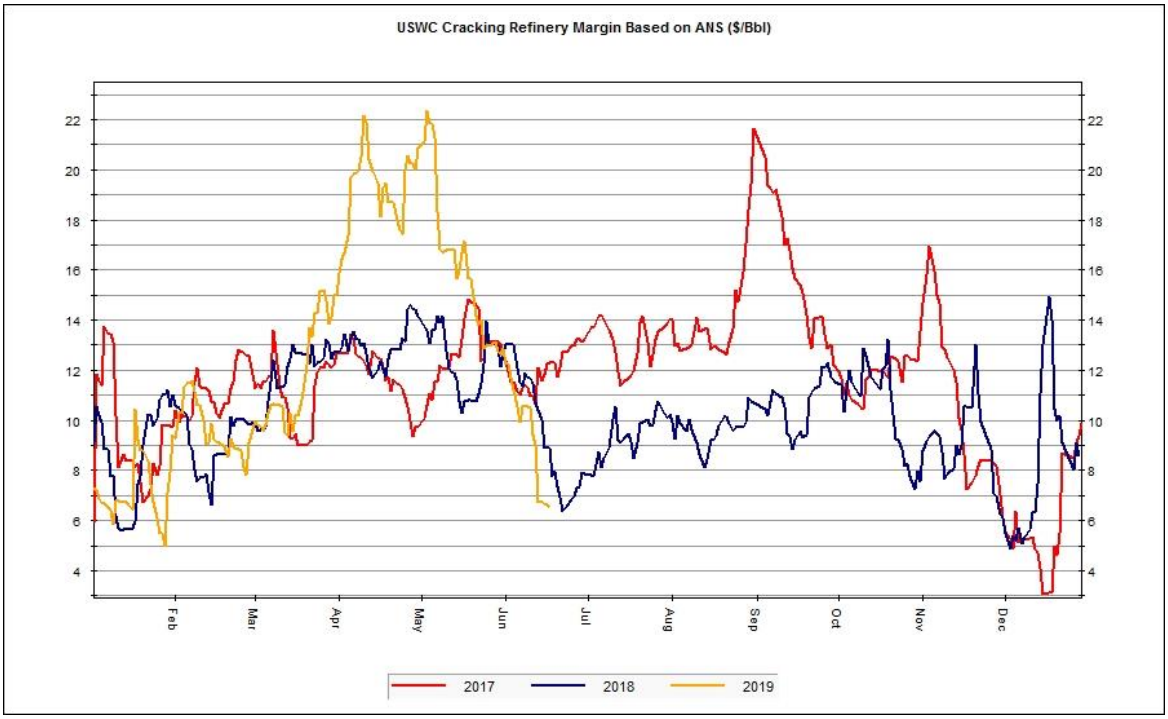
a. elsewhere in Canada? Please provide data and information by year.

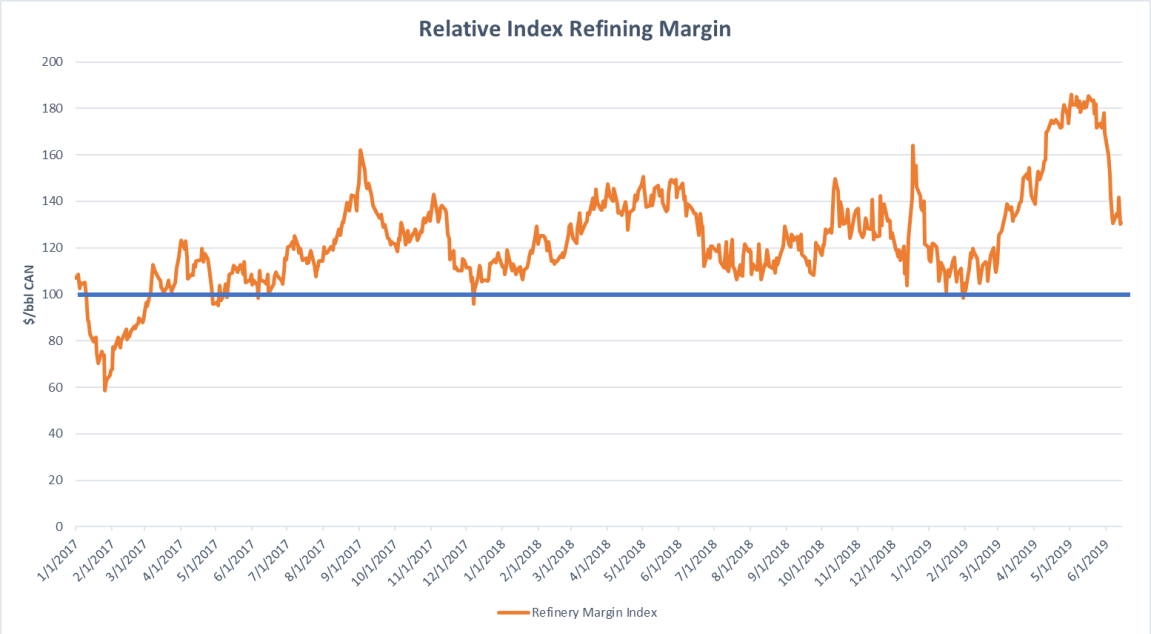
b. elsewhere in your market area?

Note that the gross refining margin / crack spread is simply the difference between the price of crude purchased by a refinery and the price at which the refined product can be sold. It provides little insight into the cost of the operation and cannot be equated to profitability. Profitability is a function of both the variable and fixed costs and volumes. Please also see our response to Question 5 for additional concerns related to using refinery margin or crack spread as a proxy for profitability.

Although Parkland regards the use of the (gross) refining margin as producing misleading results in this context, it has provided the requested information.

The (gross) refining margin represented below is margin for a "typical" crude to a base ratio HVP product margin only (e.g., 3-2-1 – 3 barrels of crude yields 2 barrels of gasoline and one 1 barrel of diesel). It does not include the LVP loss margin or selling into a market that yields a lower margin. Not all barrels are sold or valued the same.





10. Please provide information on your monthly average refining margin per litre of gasoline and diesel since January 2015 (by grade if possible).

Parkland respectfully declines to provide this information, given its commercial sensitivity. The information provided in response to Question 9 provides a "typical" crude to a base ratio HVP product margin, and describes the importance of not equating that information to all products produced at the Burnaby refinery or to refinery profitability.

11. Are there gasoline/diesel storage and distribution cost drivers which have substantially changed in the last 3–5 years? If so, please provide details on these changes.

Yes, there are. They include:

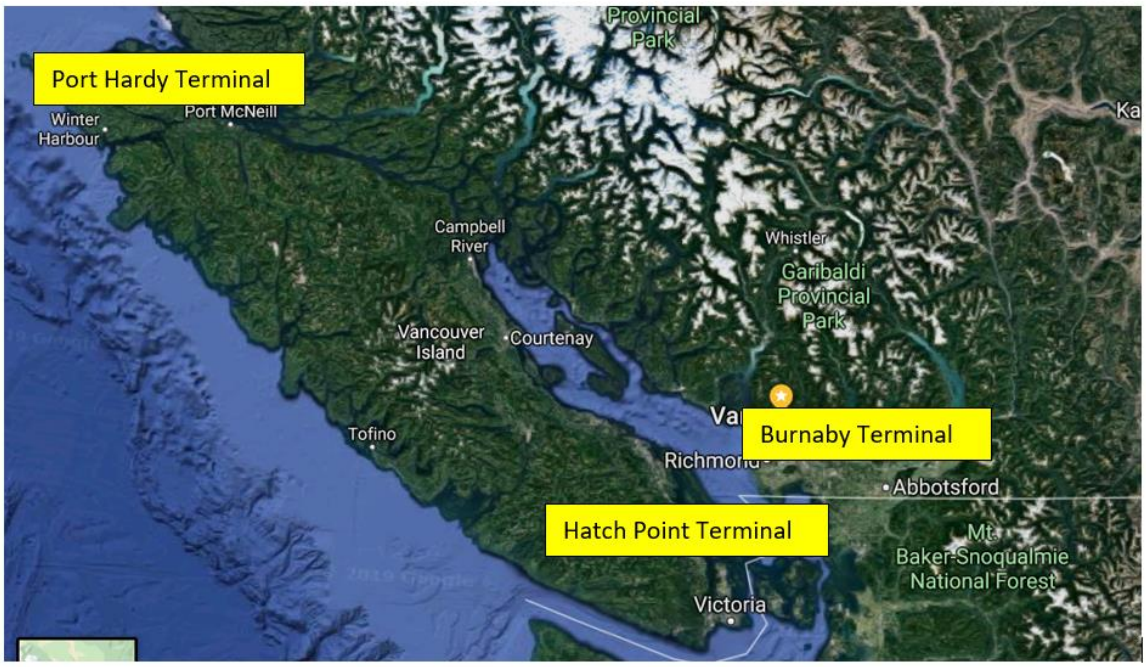
- General inflation in the industry plus the overall rising costs of maintenance, construction, and safe truck and marine transportation.
- Increase in low carbon mandates and initiatives resulting in:
    - increased supply chain complexity; and
    - reduction in working storage for refined products which in turn reduces operational flexibility and the ability to optimize the supply chain.

12. Where are your gasoline storage terminals located?

Parkland has three storage terminals in BC, which are shown on the map below.

a. Burnaby Parkland Refinery
b. Hatch Point terminal – Vancouver Island
c. Port Hardy terminal – Vancouver Island

Parkland BC Terminals



13. Where are your diesel storage terminals located?

The same three terminals identified in response to Question 12 are used for diesel.

14. What is your storage capacity for gasoline and diesel?

Our system storage capacity for gasoline and diesel is approximately 950,000 barrels for all BC terminals. This capacity is broken out between multiple products including: ULSD, Marine Gas Oil, Gasoline BOB Vancouver grade, Gasoline BOB Island grade, Supreme Plus Gasoline, produced and imported gasoline blend stocks and associated renewable fuels for gasoline and diesel.

Please explain if there have been any significant changes to your storage capacity since January of 2015.

There have been no new storage additions to our system since January 2015.

Since 2015, the increase in low carbon mandates and initiatives has resulted in an increased requirement for renewable feedstocks tankage. The reallocation of tank capacity has effectively reduced Parkland's working storage for refined products. This loss of supply chain flexibility has increased Parkland's overall cost of distribution and storage.

Please also explain whether your storage terminals operate at full capacity, at surplus capacity or if there are storage constraints.

Generally, our terminals are operating at, or close to, economic capacity. Each terminal typically operates against several operating constraints. These constraints include:

- Marine and wharf limitations;
- The inability or flexibility to change tank service from gasoline to diesel; and
- Overall volume capacity for different diesel and gasoline grade differentials.

15. How is gasoline transported from refineries to your storage terminals? How is the diesel transported from the refineries to your storage terminals? Have there been any changes in transportation methods and costs since January of 2015?

Transportation from the refinery to the three terminals is as follows:

- The Burnaby terminal is supplied directly from refinery via proprietary pipeline for both gasoline and diesel. Ethanol is supplied via tank truck from the Lower Mainland.
- The Hatch Point terminal is supplied via marine barge for both gasoline and diesel. Ethanol is supplied via tank truck from the Lower Mainland.
- The Port Hardy terminal diesel is supplied via marine barge. For gasoline, volume moves by truck from Hatch Point which is supplied via marine barge.

In 2016, there was a change on Vancouver Island where we changed from Regular gasoline to E10 driven by BC LCFR. This change necessitated material investment in the Hatch Point terminal, and increased costs by adding ethanol deliveries via truck to Vancouver Island.

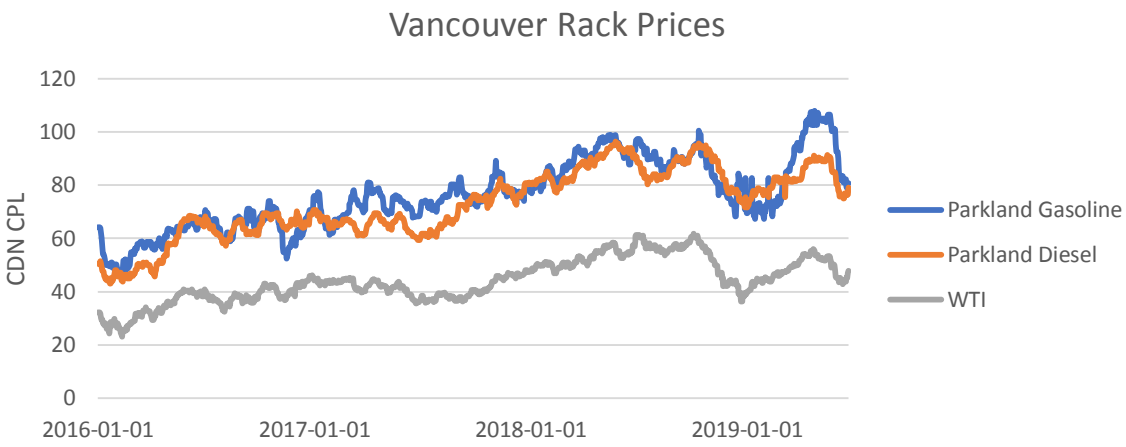
16. How does your transportation and storage costs compare to other storage facilities?

a. elsewhere in Canada?
b. elsewhere in your market?

We do not have equivalent operations outside of British Columbia.

17. What are the factors governing the level and changes in the wholesale price of gasoline and diesel? Are there seasonal variations in transportation, storage or distribution operations that affect the wholesale price?

There is a significant correlation between Vancouver Rack prices and West Texas Intermediate, as shown in the figure below.

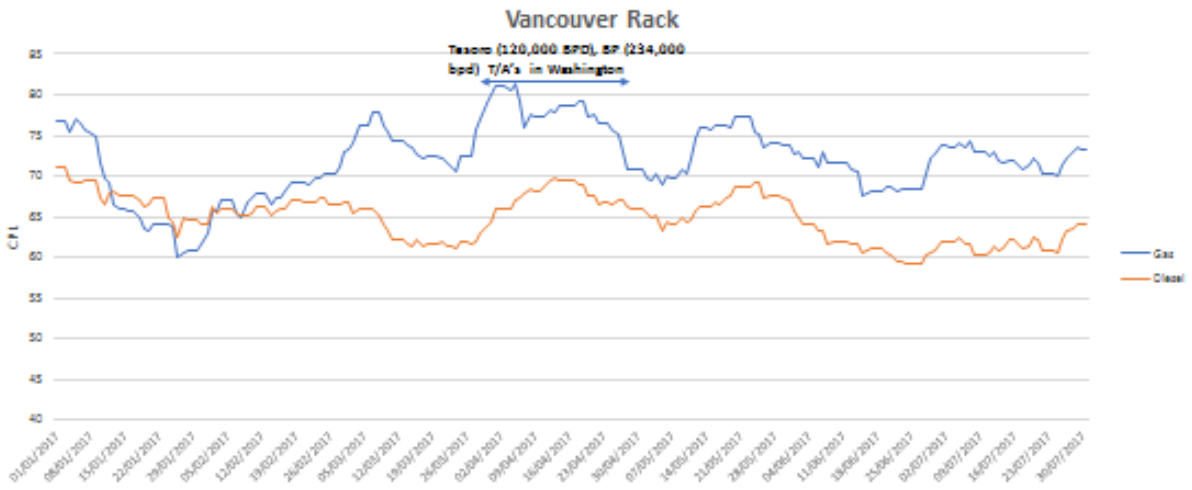


Otherwise, the biggest factor affecting the level and changes in the wholesale price of gasoline and diesel is the availability of supply. We illustrate this relationship in two ways below. First, by showing the price response to turnarounds at refineries in the region. Second, by showing the correlation between Vancouver Rack gasoline prices and prices for gasoline and distillate in the Pacific Northwest.

The Price Effects of a Turnaround

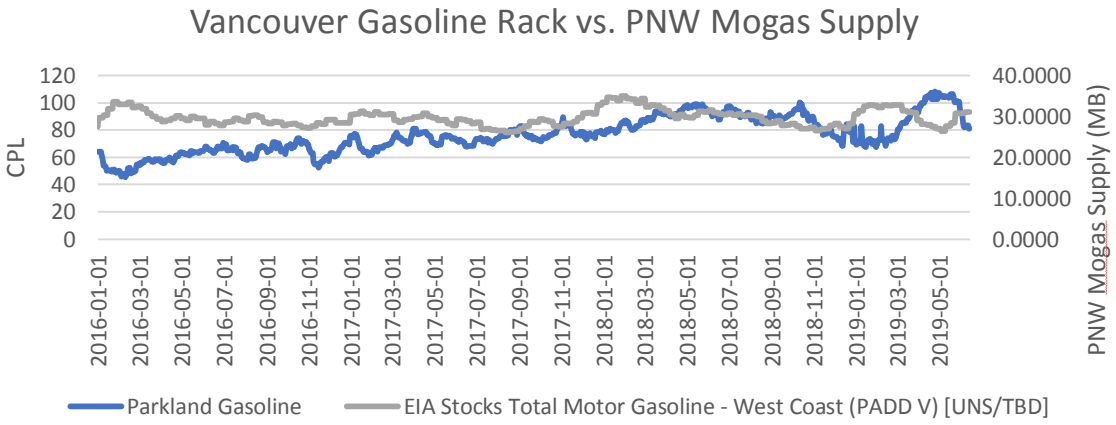
- The demand for refined product in BC is met by supply from Alberta via the Trans Mountain pipeline, Parkland's Burnaby refinery, and via barge from the USA. (Some parts of BC are also served directly by truck from refineries in Alberta in times of peak demand.) When there are supply disruptions from any of these supply points (for example, refinery turnarounds) it creates a scenario where demand exceeds supply and thus prices increase. In April of 2017, refinery turnarounds in the state of Washington (BP Cherry Point and Tesoro Anacortes) created a situation where demand exceeded supply. Additionally in 2018, industry turnarounds in late January at Parkland's Burnaby refinery and May turnarounds of the three major Alberta refiners (Suncor, Shell and Imperial) resulted in price increases for gas and diesel.

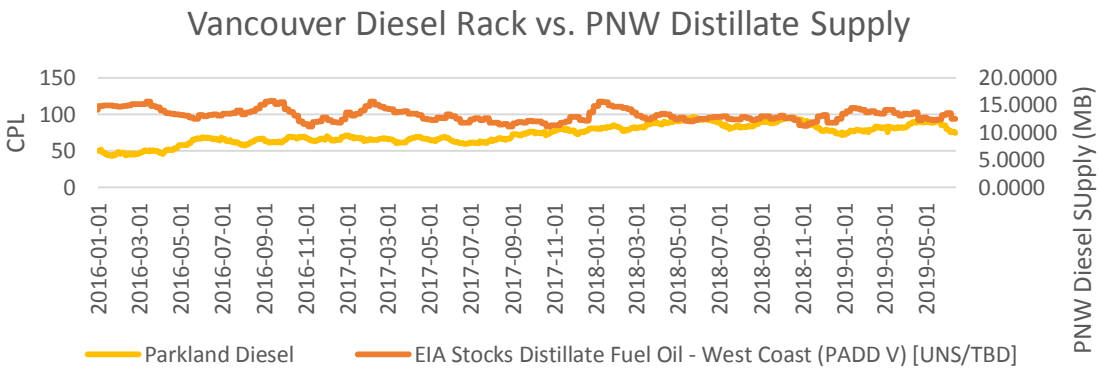
- The following two figures show the price response to the turnarounds in 2017 and 2018. It shows how the Vancouver Rack price is affected by refinery output in Alberta, the US Pacific Northwest, as well as in BC.



Relationship to Gasoline and Distillate Supply in the Pacific Northwest

- The following figure shows the relationship between the Vancouver Gasoline Rack and the supply of gasoline in PADD V. The figure shows an inverse correlation, such that when supply declines, Vancouver Gasoline Rack prices increase (and vice versa). A similar relationship, although less pronounced than is the case with gasoline, exists between the Vancouver Gasoline Rack and Pacific Northwest distillate supply.





18. What are the factors your company considers when setting the price for your fuel services?

Parkland considers several factors, most notably:

- *Market Supply/Demand*: As supply and demand of finished products fluctuates, so do the prices of those products. As shown in our response to Question 17, the supply shortage caused by refinery turnarounds increased the price of gas and diesel, and there is a relationship with supply in the Pacific Northwest. As product supply becomes more scarce, bidders are willing to pay higher prices to avoid product run-outs and shortages.

- *Local Market Competitiveness*: We strive to be competitively priced within our markets, and therefore we monitor and adjust our prices accordingly.

- *Benchmark Spot prices for Finished Products*: A benchmark price is a price per unit of quantity of a commodity that is traded in a marketplace. These traded prices apply to all commodities including gasoline and diesel. The closest actively traded marketplace to Vancouver is the Pacific Northwest benchmark located on the US West Coast. Fuel traders will buy and sell gas and diesel based on requirements. As an example, if the refineries in the Vancouver and US West Coast market are running at full capacity and supply is greater than demand, you may see fuel traders discount the price of gas or diesel in the Pacific Northwest marketplace to sell the excess product faster. The aforementioned example will reduce the Pacific Northwest benchmark spot price (price traders pay for instant delivery) because of the need to sell off excess product. When setting fuel prices in Vancouver, the benchmark spot prices for the Pacific Northwest are incorporated.

19. Have there been any constraints since January of 2015 in sourcing refined petroleum and diesel products? Please explain.

Since 2015 there have been ongoing constraints in sourcing refined petroleum products. This is the nature of our business. Constraints include:

- Planned or unplanned refinery events present constraints in refined product availability;
- Other West Coast refineries in the Pacific Northwest and California have had planned or unplanned refinery events, which can present constraints when we need to supplement product;
- Storage constraints from time to time limit our ability to maximize freight economics and access the most economic barrels in the market;
- Low carbon mandates and initiatives have increased the complexity of our supply chains and reduced overall supply chain efficiency and flexibility; and
- Access and overall availability of incremental prompt Alberta product impacts the market and is rarely an option given the challenges in obtaining additional Trans Mountain pipeline capacity which competes with crude.

All constraints reduce overall supply chain efficiency and increase the cost of supply. The significance of these constraints depends on the severity and the duration of the constraint. The cost associated with these constraints are borne by the supplier and may or may not be recoverable in the market. Industry supply issues tend to impact overall market supply and are more likely to impact the wholesale price. Unique supplier constraints are less likely to impact the wholesale price.

20. Have there been any constraints relating to refinery or pipeline access since 2015? How has this affected the wholesale prices? Please explain.

As noted above, there is no additional pipeline space from Alberta to BC whenever BC is short product. Please refer to the responses to Questions 1-3 as they relate to crude.

21. Are there gasoline and diesel retail cost drivers which have substantially changed in the last 3-5 years?

Parkland acquired the Burnaby refinery and other Chevron assets from Chevron Canada in September 2017. Prior to this acquisition, Parkland had limited retail gasoline and diesel sales in BC – about a 2.7% (gas) / 5% (diesel) market share across the province, with only a 0.5% (gas) / 1.5% (diesel) market share in Metro Vancouver. Given this, Parkland's responses to the questions below will focus on October 2017 onward, after Parkland purchased the assets from Chevron.

The following are drivers that are specific to gasoline or diesel retailing in BC, not shared by the broader retail industry in Canada, and have substantially changed in the last 3-5 years. Most notably:

- Wholesale prices of gasoline and diesel have increased since October 2017.

- Carbon tax increased in BC from 6.67 cents per litre ("cpl") to 7.78 cpl in 2018, and from 7.78 cpl to 8.89 cpl in 2019. Retailers must collect and remit the carbon tax, meaning it is treated as a cost; depending on local market dynamics, fuel pricing might or might not reflect this additional cost of the carbon tax.

- Credit card processing costs due to a substantial increase in after-tax gasoline and diesel prices in BC since October 2017. Credit card processing costs are generally the largest operating cost after labour for gasoline and diesel retailers. Card processing costs are highly susceptible to increases in the sales price of fuel products, as they are charged on a percentage of sales basis, inclusive of taxes; for Parkland, card processing costs are approximately 1.25% of sales for its retail stations in BC. Based on data published by Kent Group, the average retail gasoline price in Vancouver increased from $1.332 per litre (week of October 3, 2017) to a high of $1.719 per litre (week of April 30, 2019). This implies an increase in credit card processing costs of about $0.005 per litre, or over 3.5% of the monthly retailing margin measured by Kent Group (see the response to Question 23). Please note that, as an operating cost, credit card processing costs would not be accounted for in measurement of gasoline or diesel margin (see the response to Question 24).

22. What are the factors affecting your retailing margin for gasoline and diesel, and how have these factors changed since January of 2015.

While this question focusses on margin, it is critical to note that the margin is not the same as profit. First, margin in this context is a gross margin, or simply the

difference between the wholesale price and the retail price before taxes. Retailing margin thus does not account for operating costs, and management, general, and administrative expenses ("MG&A"), while profit would have to account for all of these costs. Second, as many of these operating costs and MG&A are fixed, profit is largely a function of volume sold; maintaining volumes on what is inherently a low margin gasoline and diesel product is critical.

Wholesale product costs and market dynamics are the two primary factors that affect Parkland's retailing (gross) margin. Based on data published by Kent Group (please see the response to Question 23), retailing (gross) margins in BC have not changed materially since October 2017.

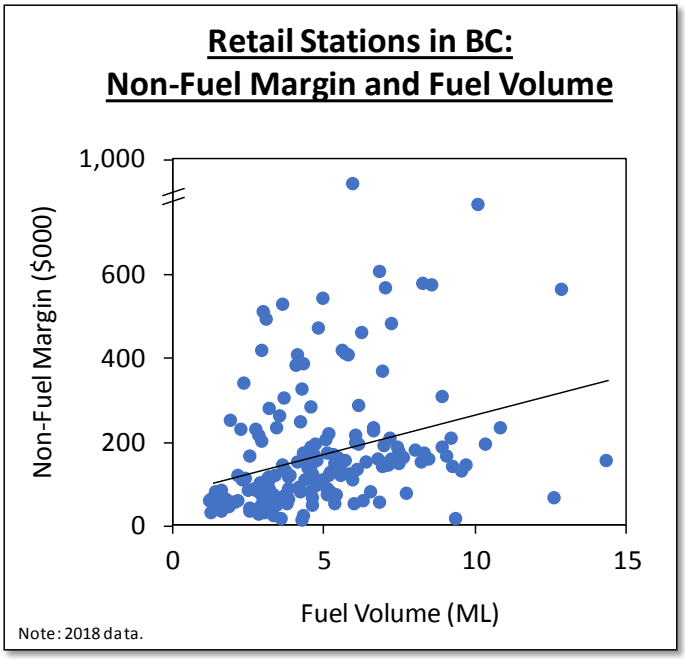
- Please see the response to Question 22a for more on Parkland's wholesale product costs.

- Regarding market dynamics, Parkland uses surveys of pricing information (i.e., posted street prices) – conducted by its employees, retail operators, and/or taken from other public sources (e.g., Gas Buddy, social media) – to determine specific street prices in accordance with its pricing strategies. Please see the response to Question 27 for more information on Parkland's pricing strategies.

a. Please explain the correlation between your retail price for gasoline and diesel and your wholesale costs.

As wholesale costs increase, retail prices will tend to increase but at a much slower rate. This is because no retail station wants to be the first to move prices up in the market, as this will reduce fuel and non-fuel sales and create a perception of being the "most expensive" to the consumer. The profitability of the retail business depends on volume, not just unit margins. There is an advantage to pricing fuel to increase traffic that can be converted to customers of the attached convenience stores, for instance, where the margins are higher. Price changes that result in reduced volume will have a detrimental effect on the bottom line as non-fuel sales and margins decrease with a decrease in fuel traffic.

This relationship can be observed in the market, with poor performing stations (and ultimately site closures) generally having lower fuel volume sales. It can also be observed in Parkland's retail network – where higher fuel volume stations generally have higher non-fuel margin. The figure below shows the correlation between non-fuel margins and fuel volumes for Parkland's stations in BC for 2018.



In most parts of BC, outside of extremely rural areas, there are typically two or more competing retail stations in close proximity to one another. For instance, it is not uncommon for service stations to be on multiple corners of the same major intersection. All prices are posted and visible to passing vehicles. In Parkland's experience, consumers are price responsive even to small differences in price between such competing stations. Even a tenth of a cent can make a difference to our sales volumes, despite the fact that the total savings on a tank of gas of such a price difference is insignificant to most people. As such, Parkland must be very cognizant of the prices offered by competitors and ensure that prices are not above those competitors for a material length of time.

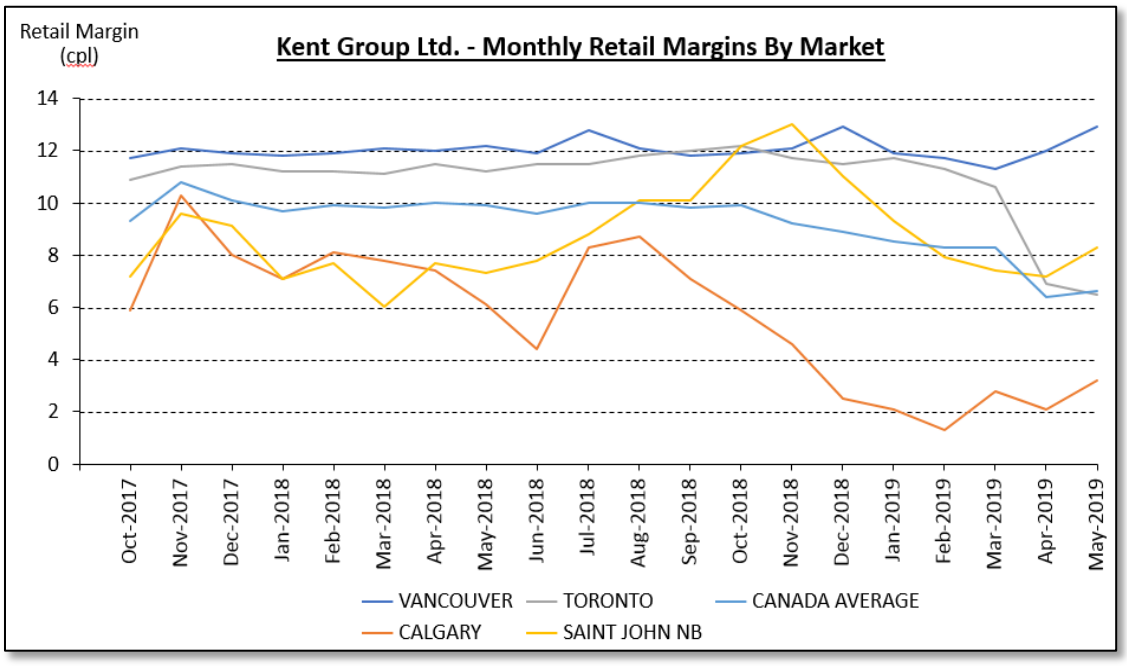
The same set of considerations that are outlined above apply in the case of declining wholesale costs with opposite implications on the retail price. As wholesale costs decrease, retail prices will quickly decrease. This is because certain retail stations want to be the first to move prices down in the market, as this will increase fuel and non-fuel sales and create a perception of being the "cheapest" to the consumer.

23. How does your retailing margins in BC compare to your retailing margins in other markets within Canada? Please provide any supporting data, where possible.

To the extent that the question is defining the term retailing margin as the difference between the wholesale price and the price at which fuel is sold to the consumer before taxes, it would only be a gross margin and is not telling the complete story. While this question focusses on margins only, it is critical to note

that the gross margin is not the same as profit. A gross retailing margin excludes operating costs, and MG&A, while profit includes these. As many of these operating costs and MG&A are fixed, profit is largely a function of volume sold; maintaining volumes on what is inherently a low margin gasoline and diesel product is critical.

Based on data published by Kent Group, gross retailing margins in BC have not changed materially since October 2017. Vancouver gross retailing margins have been higher than the Canadian average from October 2017 to May 2019. However, as the figure below depicts, gross margins in Toronto and Saint John may have been higher than Vancouver for periods of time. Please note that Kent measures gross margins based on as survey of street price (at a certain time in the day) versus the wholesale prices (which are publicly available from certain refiners), which may or may not reflect the entire daily margin of specific companies operating in a region, especially considering that in most markets prices can change several times per day.



Parkland's gross retailing margin reflects its operating arrangements (e.g., company-owned vs. dealer-owned), internal transfer pricing, and transportation costs. These are determined by accounting policies and are not separable in any way that would enable meaningful analysis across regions over time. For example, Parkland may change transfer pricing or transportation costs to reflect supply arrangements in a specific region. Due to financial system and process limitations it is impossible for Parkland to isolate a comparable "market margin" over time. This may be different for other companies that do not operate in different provinces across Canada, operate using a single operating model, do not have wholesale operations or transfer pricing mechanisms, and/or have superior data / reporting capabilities.

Comparison of gross retail margins across markets in Canada does not account for local differences (e.g., site complexity, demographics, capital investment).

Any observable trend would be subject to the time period measured, which could vary substantially in another time period.

While the Kent Group's data is limited in its accuracy of actual gross retail margins for companies in a market (including Parkland), the Kent Group's survey methodology and assumptions are consistent across markets and, as such, Parkland uses Kent Group data as a proxy for how markets may have performed, on a comparative basis (i.e., across markets, over time) for its internal analyses of market trends.

24. How do seasonal variations in supply and demand affect your retail margins?

Seasonal variations in supply and demand do not affect Parkland's retail margins, outside of the impact these variations may have on wholesale cost (as described in response to Question 22a).

25. Where do you sell your gasoline in BC? Where do you sell your diesel in BC? How many retail stations do you own, lease or franchise?

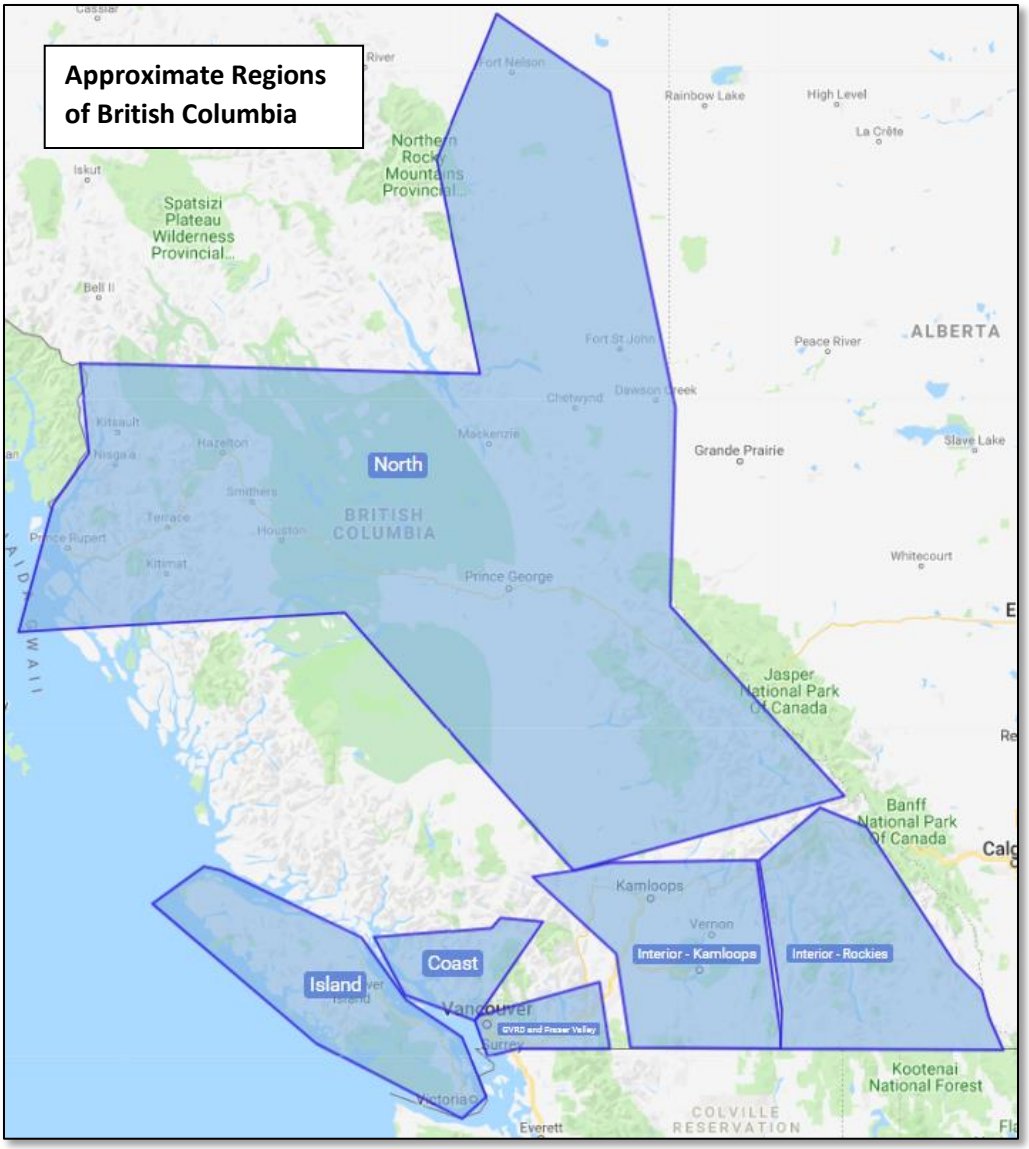
Parkland sells gasoline and diesel throughout the entire province of BC. For more information, including a map of its retail and commercial locations, please visit https://chevron.parkland.ca/

In BC, Parkland owned, leased, or franchised 268 retail stations as of December 31, 2018. These stations sold approximately 1,038 million litres of gasoline and diesel during the 2018 calendar year.

Further information in this regard is provided in Parkland's Evidence.

26. Where are your sources of supply and how are they transported to your retail locations? Please explain if this has changed since 2015.

The source of supply differs by region. The approximate regions are depicted in the following figure, and the sources of supply in each are then described.



North (Prince George and Highway 16)

- Supply is from a third-party fuel terminal in Prince George and comes from either Edmonton or the Prince George refinery. Fuel is transported to the retail station from the terminal via truck.

- There are some small exceptions to this. For example, on Highway 16 from Burns Lake to Prince Rupert, supply is from a third-party fuel terminal in Terrace and fuel is transported by truck to the retail station. In Fort Nelson, supply is from Parkland's Fort Nelson fuel terminal and fuel is transported by truck to the retail station. Parkland transports fuel to this terminal primarily by rail or truck from Edmonton.

Interior – Rockies

- South on Highway 23 and Highway 6 (i.e., Revelstoke to Castlegar) and east to Alberta border.

- Supply is from a fuel terminal in Calgary. Fuel is transported to the retail station from the terminal via truck.

Interior – Kamloops

- South on Highway 97 (i.e., Sicamous to Oliver) and west through Vernon, Kelowna and Kamloops to Merritt.

- Supply is from a third-party fuel terminal in Kamloops and is generally sourced from Edmonton by pipeline. Fuel is transported to the retail station from the terminal via truck.

Greater Vancouver Regional District and Fraser Valley

- Supply is from Parkland's fuel terminal in Burnaby. Fuel is transported to the retail station from the terminal via truck.

Coast

- Sunshine Coast Highway (i.e., Gibsons, Powell River) and Highway 99 (i.e., Squamish, Whistler, Pemberton):

- Supply is from Parkland's fuel terminal in Burnaby. Fuel is transported to the retail station from the terminal via truck.

Vancouver Island

- Supply is from Parkland's fuel terminals in Cobble Hill (Hatch Point) or Port Hardy, depending on the location. Parkland transports fuel to these terminals from its Burnaby refinery by barge. Hatch Point is the primary supply point for most of Vancouver Island. Fuel is transported to the retail station from the terminal via truck.

27. What factors do retailers selling your product consider when setting prices across BC? Please explain the factors that affect retail price differences in BC.

Market dynamics are the primary factor considered when Parkland sets its prices across BC. Parkland uses surveys of pricing information (i.e., posted street

prices) – conducted by its employees, retail operators, and/or taken from other public sources (e.g., Gas Buddy, social media) – to determine specific street prices in accordance with its pricing strategies. Parkland determines its pricing strategies based on local site characteristics, market factors and competitors, performance objectives (i.e., at a location, at several locations, in a region, across BC, across Canada, and / or across Parkland), and current performance. It evaluates and adjusts these pricing strategies regularly.

Retail fuel is an extremely dynamic industry with different competitors and different incentives and behavior, across different streets, markets, and regions, which change daily. A competitor's specific retail price could be impacted by unknown and diverse reasons (e.g., specific store staffing, ownership, local traffic patterns, store promotions, store hours). As such, Parkland does not have a fixed set of "rules" or "factors" and instead uses its retailing expertise and commercial discretion in evaluating and determining its pricing strategies.

28. Please discuss any seasonal variations that are taken into account when setting the retail prices within BC.

Seasonal variations are not considered in retail pricing decisions. Market dynamics are the only factor considered when setting prices across BC and, while these may differ over time, there is no meaningful trend across seasons.

a. What factors do retailers consider when setting intraday and intraweek prices?

Market dynamics are the only factor considered when setting prices across BC. Please see responses to Questions 22 and 27 for more detail. This would apply within a single day, over the course of a week, or over any other period of time.

Parkland frequently changes product prices at its locations multiple times per day. Across Parkland's company-owned network in Medium and Major Cities[1] during May 2019, 70% of its sites changed prices more than once per day, while 54% of its sites changed prices more than three times per day. While Parkland does not have this data for October 2017 to June 2019, it would expect similar figures for this entire period.

29. Please provide information on your monthly average retailing margin per litre of gasoline and diesel since January 2015 (by grade if possible).

In this response, Parkland has interpreted the term retailing margin to mean gross retailing margin, which is the difference between the wholesale price and

[1] Medium and Major Cities are defined as sites within dissemination areas in BC that have a population of at least 150 people per square kilometer. This includes the major centres in the Lower Mainland and Greater Victoria areas, among others.

the price at which fuel can be sold to consumers, before taxes. As discussed in response to Question 23, this is not synonymous with profit margin. Gross retailing margin excludes operating costs, and MG&A, while profit includes these. As many of these operating costs and MG&A are fixed, profit is largely a function of volume sold; maintaining volumes on what is inherently a low margin gasoline and diesel product is critical.

As mentioned in the response to Question 23 above, Parkland's average retailing margin per litre reflects its operating arrangements (e.g., company-owned vs. dealer-owned), internal transfer pricing, and transportation costs. These are determined by accounting policies and are not separable in any way that would enable meaningful analysis across regions over time. For instance:

- *Internal transfer pricing* - Parkland uses transfer pricing to allocate a consistent acquisition cost to its fuel products that reflect current wholesale market conditions for its sales channels, recognizing that its actual supply costs are based on varied and dynamic arrangements that reflect the sum of demand from its channels plus its supply, trading, and refining activity. This transfer price is generally a function of the local supply source (e.g., Burnaby rack price plus 2 cents per litre). The use of transfer pricing affects Parkland's average retailing margin per litre used for internal purposes because it changes over time across regions and is not separable from the actual product costs accounted for by its retailing business.

- *Transportation costs* - Parkland allocates transportation costs to its fuel products that reflect the transportation arrangements for its sales channels. This affects Parkland's average retailing margin per litre used for internal purposes because it changes over time across sites and is not separable from the actual product costs accounted for by its retailing business.

The Kent Group provides a measurement of gross retail fuel margins (gasoline and diesel) across several key orbits (e.g., Prince George, Kamloops, Vancouver). Kent regularly surveys price and volume of retail stations across the country, and its reported information is based on those surveys. Parkland recommends that this be used to understand retail margins in BC, and how they have changed over time. Internally, Parkland relies on the retail margin estimates provided by the Kent Group to understand market performance.

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December 12, 2017

To: All Shippers and Interested Parties on Kinder Morgan's Trans Mountain Pipeline System

Re: Changes to Light Petroleum Co-mingling

Trans Mountain's Service Standards identify how crude grades are handled and segregated. In 2018 Trans Mountain will be making necessary changes to co-mingling practices to support the TMEP project. All proposed changes are as permitted and identified in the current Service Standards.

Trans Mountain currently, with varying levels of success, exceeds the service standards with respect to the segregation of light sweet, light sour and light synthetic. For example, if necessary, TM may co-mingle all light sweet grades but exceeds the Service Standards by making efforts to segregate Rainbow.

Due to ongoing tank outages and anticipated TMEP impacts, effective January 1, 2018 Trans Mountain will co-mingle Rainbow with all other received light sweet grades. Rainbow will be equalized within the Trans Mountain MSW pool.

Additionally, effective February 1, 2018, Trans Mountain will establish separate synthetic and light sour crude pools. To facilitate this and to clearly identify that products of a product type are being co-mingled, Trans Mountain will utilize two product codes: MSR (Mixed Sour) and SYN (pooled Synthetic). When injected to Trans Mountain's mainline, co-mingled light synthetic and light sour grades will be identified as SYN and MSR, respectively. Syncrude receipts will be nominated and identified as SSP (consistent with industry practice). PAS will be excluded from the co-mingled synthetic grades, provided nominations and available tankage permit.

On implementation of light sour co-mingling, the light sour grades will be equalized utilizing the method provided by the Canadian Association of Petroleum Producers. At this time there is no plan to equalize co-mingled synthetic grades.

Attached find Trans Mountain's list of approved commodities identifying which light crudes will be co-mingled by the product types identified above.

In conjunction with the above and for February nominations, Trans Mountain will make available nomination summaries for each product grade co-mingled as MSW, MSR or SYN. Detailed will be receipt volume by product grade and a total co-mingled volume by product type.

Trans Mountain can not ensure blend uniformity, however will make efforts to promote ratability among feeders and the scheduled mainline injections.

Lastly, effective January 1, 2018 Trans Mountain's revised Service Standards will become effective. Within these standards are additional details with respect to permitted pooling.

If you have questions or concerns, please contact myself or your Customer Logistics representative.

Regards,

Shawn McGregor, P.Eng
Manager, Optimization and Strategy
Custody Transfer Measurement, Crude Quality and Scheduling

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February 14, 2019

To: Trans Mountain Shippers & Interested Parties

Re: Trans Mountain Westridge Dock Premium Information

Pursuant to the NEB's Reasons for Decision dated July 20, 2006, attached is the Trans Mountain Westridge Dock Bid Premium Information for the October - December 2018 period.

Yours truly,
Trans Mountain Pipeline ULC

Kevin MacFarlane
Director, Shipper Services

Trans Mountain Pipeline ULC

Westridge Dock - Aggregate Quarterly Bid Results

October - December 2018

Total Bid Volume		3,209,177.8	m3
Average Bid Price (CAD$)	$	280.53	per m3
Total Bid Premium (CAD$)		$900,268,333.65	

Total Accepted Bid Volume	343,675.0	m3
Average Accepted Bid Price (CAD$)	$341.40	per m3
Total Accepted Premium (CAD$)	$117,329,261.10	

**Average Bid Price and Average Accepted Bid Price are the weighted average of all dock bids or all accepted dock bids respectively (as originally nominated or accepted).*

Date of Issuance: February 14, 2019

Trans Mountain Canada Inc.
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May 14, 2019

To: Trans Mountain Shippers & Interested Parties

Re: Trans Mountain Westridge Dock Premium Information

Pursuant to the NEB's Reasons for Decision dated July 20, 2006, attached is the Trans Mountain Westridge Dock Bid Premium Information for the January - March 2019 period.

Yours truly,
Trans Mountain Pipeline ULC

Kevin MacFarlane
Director, Shipper Services

Trans Mountain Pipeline ULC

Westridge Dock - Aggregrate Quarterly Bid Results

January - March 2019

Total Bid Volume		1,983,488.9	m3
Average Bid Price (CAD$)	$	51.35	per m3
Total Bid Premium (CAD$)		$101,843,828.58	

Total Accepted Bid Volume	360,846.0	m3
Average Accepted Bid Price (CAD$)	$74.37	per m3
Total Accepted Premium (CAD$)	$26,836,117.02	

**Average Bid Price and Average Accepted Bid Price are the weighted average of all dock bids or all accepted dock bids respectively (as originally nominated or accepted).*

Date of Issuance: May 14, 2019

British Columbia Utilities Commission

An Inquiry into Gasoline and Diesel Prices in British Columbia
Project No. 1599007

Expert Report of Henry J. Kahwaty, Ph.D.

27 June 2019

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I. INTRODUCTION AND SUMMARY OF OPINIONS

1. My name is Henry J. Kahwaty. I am a Managing Director with Berkeley Research Group, LLC ("BRG"). BRG is an international firm providing expert analysis and management consulting services in the areas of economics, finance, accounting, and data analytics. My business address is 1800 M Street, N.W., Second Floor, Washington, DC 20036.

2. I have been retained by counsel to Parkland Fuel Corporation ("Parkland") in this proceeding to provide independent expert evidence to the British Columbia Utilities Commission (the "Commission") on the subject matter of this inquiry into gasoline and diesel prices in British Columbia (the "Inquiry"). My instructions from counsel are provided as **Appendix A** to this report.

3. Counsel to Parkland has asked me to address the following questions based on my expertise in economics, industrial organization, the oil and gas industry, and other information and data commonly used by experts in economics and in particular, by experts in industrial organization:

   (1) What, in general terms, are the components that make up the retail price of gasoline and diesel in British Columbia?

   (2) How does the market for gasoline and diesel in British Columbia differ from that in other parts of Canada and North America?

   (3) Is there currently, and has there been since 2015, a functioning retail market for gasoline and diesel in British Columbia?

   (4) Is there currently, and has there been since 2015, a functioning market for supply for retailers of gasoline and diesel in British Columbia?

   (5) What factors have contributed to increases in retail gasoline and diesel prices in British Columbia since 2015?

   (6) Does focusing only on retail and refining margins give a full picture of the economics of operating a gas station or refinery?

   (7) What would be the impact on consumers, retailers and refineries of government or regulatory intervention when it comes to gasoline or diesel prices, either at the retail level or vis-à-vis refining?

   (8) How could government reduce the retail price of gasoline and diesel?

4. Counsel for Parkland subsequently provided me a copy of a report prepared by Michael Wolinetz and Noel Melton of Navius Research Inc. dated June 20, 2019 (the "Navius Report") and asked me to provide my preliminary thoughts on this report. My preliminary

thoughts on the Navius Report are provided after my responses to the 8 questions counsel originally asked me to consider.

5. A summary of my opinions related to these questions and my initial thoughts on the Navius Report is set forth below:

(1) What, in general terms, are the components that make up the retail price of gasoline and diesel in British Columbia?

The retail prices of gasoline and diesel in British Columbia are comprised of numerous components related to the multi-layer supply chain through which product flows, starting upstream with the recovery of crude oil and ending downstream with the purchase of refined fuel products by final customers. The stages of the supply chain include the recovery and sale of crude oil, the transportation of crude oil to refineries, the refining of crude oil into gasoline and diesel, the transportation of gasoline and diesel to terminals, the wholesale distribution of gasoline and diesel to retail outlets, and the retail sale of gasoline and diesel to final consumers. The retail prices of gasoline and diesel also include a tax component.

The prices charged by sellers at each stage of the value chain need to provide a sufficient return to cover their costs and to compensate them for their investments or else they will not have incentives to continue to invest or to maintain their assets. For example, oil and gas exploration companies charge a price for the crude oil they sell. The revenue derived from crude oil sales compensates the exploration company for the cost of producing the crude oil, and also needs to provide a return on the capital employed in crude oil production and on the exploration company's investment in searching for and developing crude oil deposits. In a similar fashion, the price charged by a refinery needs to compensate the refinery for its costs of production, including crude oil acquisition costs and other operating costs, and also for its investment in plant and equipment. Without an expectation of earning a return on its capital, refiners would not have an incentive to invest in refining assets or to maintain existing refining assets.

(2) How does the market for gasoline and diesel in British Columbia differ from that in other parts of Canada and North America?

British Columbia differs from other, lower-priced regions in Canada and the U.S. in a number of ways. Key differences include: 1) British Columbia has relatively low refining capacity relative to demand; 2) due to its geography and limited pipeline access, it is relatively expensive to ship refined products to the province; 3) British Columbia has specific fuel standards that increase the cost of producing gasoline and diesel; and 4) British Columbia has relatively high fuel taxes. British Columbia's fuel standards include both Alternative Fuel Standard (renewable fuel content) and Low Carbon Fuel Standard (reduced carbon intensity) requirements. British Columbia is the only province with a Low Carbon Fuel Standard requirement.

(3) Is there currently, and has there been since 2015, a functioning retail market for gasoline and diesel in British Columbia?

Yes, there is now and has been a functioning retail market for gasoline and diesel in British Columbia. Markets are viewed as functioning well if they have a sufficient number of competitors or lack substantial barriers to entry. There are numerous retailers of gasoline and diesel fuels in British Columbia, and there has been a track record of retail gas station entry. There are many independent gas stations in British Columbia, and based on province-wide gas station counts, no marketer has control over the retail price for more than 12.6 percent of the gas stations in the province. In addition, retail gasoline and diesel prices in British Columbia have responded to factors that typically affect either supply or consumer demand in the manner expected in a well-functioning market.

(4) Is there currently, and has there been since 2015, a functioning market for supply for retailers of gasoline and diesel in British Columbia?

Yes, there is now and there has been a functioning market for the supply of gasoline and diesel to British Columbia retailers. This market is the wholesale market between the refining and retailing stages in the production value chain. There are two types of businesses active as sellers in the wholesale market: (1) refiners selling their products to downstream entities, and (2) non-refining wholesalers.

With regard to refineries, there are multiple sources for the supply of gasoline and diesel to retailers in British Columbia. Both Parkland and Husky Energy own and operate refining assets in the province. Parkland's refinery is located in Burnaby, and Husky's refinery is located in Prince George. Other refiners like Imperial Oil, Suncor, and Shell operate in Alberta and ship refined products into British Columbia. In addition, British Columbia imports gasoline and diesel supply from refineries located in Washington State.

With regard to non-refining wholesalers or marketers, there are several active in British Columbia and there has been recent entry into this line of business. Overall, there is a diversity of supply and no supplier is dominant. In addition, capacity utilization data indicate that no suppliers have exercised market power by reducing supply to increase prices.

(5) What factors have contributed to increases in retail gasoline and diesel prices in British Columbia since 2015?

With limited local production capacity, the retail market for gasoline and diesel in British Columbia has a tight balance between supply and demand, and any market changes over time that have increased refiners' costs or hindered their ability to supply have also in most cases resulted in higher retail prices. Some of the most significant factors that have affected retail prices since 2015 include increases in crude oil prices, decreases in the availability of Trans Mountain Pipeline's capacity to transport refined products into British

Columbia, increased taxes, increasingly stringent Low Carbon Fuel Standards, supply shocks, and other changes in costs. Demand growth, if any, may have also affected retail gasoline and diesel prices.

(6) Does focusing only on retail and refining margins give a full picture of the economics of operating a gas station or refinery?

No, focusing only on the retail margins on gasoline and diesel sales to customers and on the refining margins for the production and sale of gasoline and diesel fuels into wholesale markets does not give a full picture of the economics of operating a gas station or a refinery. These margins do not reflect many of the costs associated with operating these types of facilities. Without complete cost information, these margins cannot summarize profits.

The retail margin is the gross margin a gas station earns when selling gasoline and diesel to customers. It is the difference between the price it receives and its direct costs associated with the fuel sale. The retail margin does not reflect or make adjustments for capital costs, such as the costs of buildings, canopies, or other property improvements, or the land on which the gas station is located. It also does not reflect other, non-fuel costs associated with operating a gas station.

The refinery margin is not the actual profit margin earned by a refiner. Rather, it is the difference between the cost of the raw input material used by a refinery, *e.g.,* crude oil, and the value of the products produced by refinery, *e.g.,* the wholesale value of the gasoline produced by the refinery. The refinery margin does not reflect costs of production other than raw input material costs, nor does it reflect capital costs. Refineries are capital-intensive production facilities, and entities like refineries with large stocks of capital goods such as plant and equipment need to earn a sufficient return to compensate for their invested capital. If the owner of a large, capital-intensive production facility does not earn an adequate return on the capital it has invested, it will not have incentives to expand the production facility over time, or even to maintain the facility's productive capacity.

(7) What would be the impact on consumers, retailers and refineries of government or regulatory intervention when it comes to gasoline or diesel prices, either at the retail level or vis-à-vis refining?

Government intervention with regard to the retail pricing of gasoline or diesel fuels would involve price regulation, either by setting retail prices for different grades of motor fuels directly or by setting price ceilings. I assume that any retail price ceiling or directly regulated retail price for a product would be below the retail price that would have otherwise prevailed for that product. Both direct retail price regulation and the setting of retail price ceilings would have the effect of reducing the prices actually paid by consumers for the fuels they purchase, but they would also generate market distortions.

By restricting prices to be below the levels that would otherwise prevail, economic theory suggests that regulation would increase the quantity of gasoline and diesel customers would desire to purchase, while at the same time reducing the amount of these fuels sellers would choose to supply to customers. This would lead to an imbalance between the amounts that customers would like to purchase and the volumes available to them to purchase. Economists call this a situation of "excess demand." Ordinarily, situations involving excess demand generate upward pressure on market prices. Increases in prices would temper demands while encouraging increased supply. With price regulation, however, prices would not be permitted to increase, and therefore economic theory suggests that consumers would not respond to product scarcity by choosing to reduce their desired level of purchases, nor would sellers respond by choosing to increase their supply of products in the market. Price regulation would lead to market shortages.

By holding retail prices at artificially low levels and reducing the volumes of gasoline and diesel sold, the profitability of the production and supply of gasoline and diesel to consumers would be reduced. Margin would be removed from the supply chain, and economic theory suggests that this would reduce the incentives of refiners to invest in or maintain their refineries, leading to reductions in refining capacity over time relative to the levels of capacity that would have otherwise prevailed. In addition, economic theory suggests that the removal of margin at the retail level would reduce incentives for retailers to invest in and maintain retail gas stations. Gas stations that are weaker financially would be expected to close, and investment in new gas stations would be reduced.

An alternative to retail price regulation would be to regulate the wholesale prices charged by refiners or to regulate refiner profit margins directly. The effects of such a policy on refiners would be similar to the effects of retail price regulation, including reduced incentives to produce and supply fuels to customers in the short term and reduced incentives to maintain capital and invest in their businesses over the long term. Reductions in refinery production would lead to higher consumer prices, reduced volumes of consumer purchases, and reduced retailer sales.

(8) How could government reduce the retail price of gasoline and diesel?

Provincial policy has been to discourage the use of gasoline and diesel by making these fuels more expensive relative to other fuel sources and also to make vehicles powered by alternative fuels less expensive.

The easiest and most straight-forward policy option available would be to reduce the taxes applied to the retail sales of gasoline and diesel. A consumer in British Columbia pays provincial motor fuel tax, a British Columbia carbon tax, a British Columbia Transportation Finance Authority tax, and a goods and services tax. If the consumer lives in Vancouver or Victoria, the consumer would also pay a TransLink or transit tax. In

addition, there is a federal excise tax. The government in British Columbia could reduce or eliminate some of the British Columbia-specific taxes, and these would have direct and immediate effects on the retail prices of gasoline and diesel paid by consumers in the province. The British Columbia carbon tax, for example, could be lowered, or future annual increases in the carbon tax could be delayed or scrapped altogether. Such tax changes, however, would require an overall shift in government policy away from discouraging the use of gasoline and diesel.

Other policy options are available that would not have an immediate or short-run effect on gasoline and diesel prices but rather would cause effects that would be realized over time. Gasoline and diesel are imported into British Columbia from Alberta, but these imports are limited by the capacity of the Trans Mountain Pipeline. Trans Mountain is the only pipeline in Canada that connects British Columbia with areas in Alberta where gasoline and diesel production are concentrated. This pipeline is at capacity, and therefore sellers in Alberta cannot fully arbitrage price differentials between fuel prices in Alberta and those in British Columbia. Increases in pipeline capacity, either realized on the Trans Mountain Pipeline or a new pipeline, would enable increased volumes of motor fuels to move from Alberta to British Columbia. This would further integrate British Columbia fuel supplies with the rest of Canada – making British Columbia less of a "gasoline and diesel island." Prices would fall as arbitrage enhances the supply available in British Columbia. Of course, pipeline capacity expansion projects and new pipeline development take substantial time to complete because these expansions need to be designed, permitted, and constructed, which can take several years to accomplish. Price effects from arbitraging price differentials between areas of supply in Alberta and areas of consumption in British Columbia cannot be realized until the expanded capacity is actually available for use.

Initial Thoughts on the Navius Report

The Navius Report includes a summary of gasoline and diesel price regulation at both the wholesale and retail levels of the value chain, a comparison of the extent to which wholesale and retail prices for gasoline and diesel in British Columbia are transparent in comparison to other areas in North America, and a set of assertions regarding the market conditions that the authors claim may indicate that the market is uncompetitive, either because there is an asserted lack of competition in the market or because of some (unidentified) anticompetitive conduct in the market. Ultimately, the Navius Report addresses whether such an uncompetitive market should be subject to either price transparency regulation or direct wholesale or retail price regulation.

With regard to whether the market is uncompetitive, the Navius Report does not cite to standard indicia of competition or to standard tools of competition economics and market power analysis to support its recommendations. Standard competition analyses include the consideration of capacity utilization and the existence of barriers to entry. With regard to anticompetitive conduct, the Navius Report cites to none.

The Navius Report details an extensive list of data and information its authors think is required to address any issues with price transparency. The authors do not point to a single market where such information is collected and analyzed. Even if certain amounts of data are collected by regulators of natural monopolists (e.g., electric power distribution infrastructure), the collection of such detailed data in a market with numerous suppliers is extraordinary. Furthermore, the types of data to be collected and the characteristics of gasoline and diesel markets suggest that this is the type of information gathering and dissemination exercise that competition economics and policy views as having a very high potential of harming competition.

The Navius Report identifies no specific anticompetitive conduct by participants in the fuel markets in British Columbia; provides no evidence of collusion in these markets; engages in no empirical analysis of pricing, output, barriers to entry, or other characteristics of these markets; engages in no financial analysis of market participants; and identifies no firm economic basis for either price transparency regulation or price regulation itself in these markets.

II. QUALIFICATIONS

6. I received my Ph.D. in Economics from the University of Pennsylvania in 1991. My fields of specialization include microeconomics, industrial organization, and antitrust economics. Industrial organization is the branch of economics that studies competition and regulation in individual markets, including the analysis of pricing, market entry, business strategy, and the effects of government policy on market performance as measured by pricing, output, and other metrics. I have worked as an economic consultant specializing in the analysis of individual markets for nearly 24 years. Most of my work has been in the areas of antitrust and competition policy, and I have also studied market dynamics in intellectual property cases and in analyses of the effects of changes in government policy. Prior to my work as an economic consultant, I worked for nearly four years as an economist with the Antitrust Division of the U.S. Department of Justice ("Antitrust Division"). I worked on merger and monopolization investigations in a wide variety of industries while I was with the Antitrust Division. A copy of my curricula vitae is provided as **Appendix B** to this report.

7. Since leaving the Antitrust Division, I have completed numerous market studies as part of merger reviews, monopolization or abuse of dominance cases, and collusion or coordinated conduct cases. These studies have involved the mining, manufacturing, metals, avionics, pharmaceuticals, film exhibition, municipal solid waste, electricity, and hazardous waste industries, among others. I completed a study of competition in the banking industry for the Irish Competition Authority, and I also assisted the Irish Competition Authority with its study of the insurance industry. Both of these studies included recommendations for changes in government policy that would affect the competitiveness of the markets at issue. I have presented analyses on individual cases to

the Canadian Competition Bureau and testified before the Competition Tribunal in Canada. I have also presented analyses to the Antitrust Division, U.S. Federal Trade Commission, and European Commission, among other agencies, and have provided expert evidence at hearings on competition cases at the Federal Trade Commission and the European Commission.

8. I testified during the Competition Tribunal's hearing on the challenge by the Commissioner of Competition (the "Commissioner") to the proposed acquisition by Tervita Corporation (formerly known as CCS Corporation) of Complete Environmental Inc. and Babkirk Land Services Inc. My testimony in Tervita related to the definition of the geographic market, the analysis of competition in that market, and the analysis of efficiencies. My testimony was cited to by the Court of Appeals and the Supreme Court of Canada in their decisions on the appeal in Tervita, which was a case involving an acquisition challenged by the Commissioner of Competition related to the disposal of hazardous drilling wastes generated by the oil and gas industry in British Columbia.

9. My professional experience includes work related to the gasoline industry in Canada. I worked on the challenge by the Commissioner of Competition to Parkland's acquisition of the retail gasoline assets of Pioneer Petroleums Holding Limited Partnership and related entities ("Pioneer"). As part of my work on Parkland/Pioneer, I defined wholesale and individual local gasoline and diesel retail markets in Ontario and Manitoba and analyzed competition in these markets. I also defined markets and analyzed competition in wholesale and local retail gasoline and diesel markets as part of my work on Parkland's acquisition of British Columbia assets from Chevron Canada Limited, including the Burnaby refinery, 129 Chevron-branded retail gas stations, and 37 commercial cardlock locations. Finally, I analyzed competition in wholesale and local retail gasoline and diesel markets as part of my work on Parkland's acquisition of the majority of the Canadian assets of CST Brands Inc. ("CST"). In a separate transaction, CST was acquired by Alimentation Couche-Tard Inc. ("Couche-Tard"). After completing that transaction, Couche-Tard sold a majority of the former Canadian CST assets to Parkland. These assets include gas stations in Ontario, Québec, and Atlantic Canada.

10. My opinions expressed in this report relate to the wholesale and retail markets for gasoline and diesel in British Columbia and the prices achieved in those markets. My expertise in microeconomics and industrial organization relate directly to the study of pricing, market performance, and the effects of government policy in individual markets. Industrial organization includes the analysis of market structure, including the number and size distribution of the suppliers in a market and the effects these factors have on pricing. Markets with only one supplier are monopolies, and markets with one very large supplier and other, relatively smaller suppliers can perform like monopolies if there are significant barriers to entry into the market. In this report, I study the structure of the supply side of the wholesale and retail gasoline and diesel markets in British Columbia and address the impacts that various demand and supply shocks have had on gasoline and diesel prices in the province. Analyses such as these are commonly performed by

economists specializing in microeconomics and industrial organization. I also address policies adopted by the government in British Columbia and the effects of these policies on gasoline and diesel pricing. Finally, I address policies that the government of British Columbia could adopt to moderate gasoline and diesel prices and to bring these prices more closely in line with prices in the rest of North America.

III. DUTY OF INDEPENDENCE

11. I am aware that I have a duty to assist the Commission and that I am not to be an advocate for any party in this proceeding ("Duty of Independence"). I have prepared this report in accordance with this Duty of Independence. If I am called upon to provide further information to the Commission, I will provide that information in conformity with the Duty of Independence.

IV. QUESTIONS

12. I have been asked by counsel to Parkland to address the following questions:

(1) What, in general terms, are the components that make up the retail price of gasoline and diesel in British Columbia?

(2) How does the market for gasoline and diesel in British Columbia differ from that in other parts of Canada and North America?

(3) Is there currently, and has there been since 2015, a functioning retail market for gasoline and diesel in British Columbia?

(4) Is there currently, and has there been since 2015, a functioning market for supply for retailers of gasoline and diesel in British Columbia?

(5) What factors have contributed to increases in retail gasoline and diesel prices in British Columbia since 2015?

(6) Does focusing only on retail and refining margins give a full picture of the economics of operating a gas station or refinery?

(7) What would be the impact on consumers, retailers and refineries of government or regulatory intervention when it comes to gasoline or diesel prices, either at the retail level or vis-à-vis refining?

(8) How could government reduce the retail price of gasoline and diesel?

13. In this section, I set out my independent opinions related to the questions that have been posed to me.

A. Question (1): What, in general terms, are the components that make up the retail price of gasoline and diesel in British Columbia?

14. The retail prices of gasoline and diesel fuels in British Columbia are comprised of numerous components. These components are related to the multi-layer supply chain through which product flows, starting upstream with the recovery of crude oil and ending downstream with the purchase of refined fuel products by customers at gas stations and other points of retail distribution (*e.g.,* commercial card locks). A graphical depiction of the supply chain is shown in **Figure 1**. The refined fuel products supply chain includes:

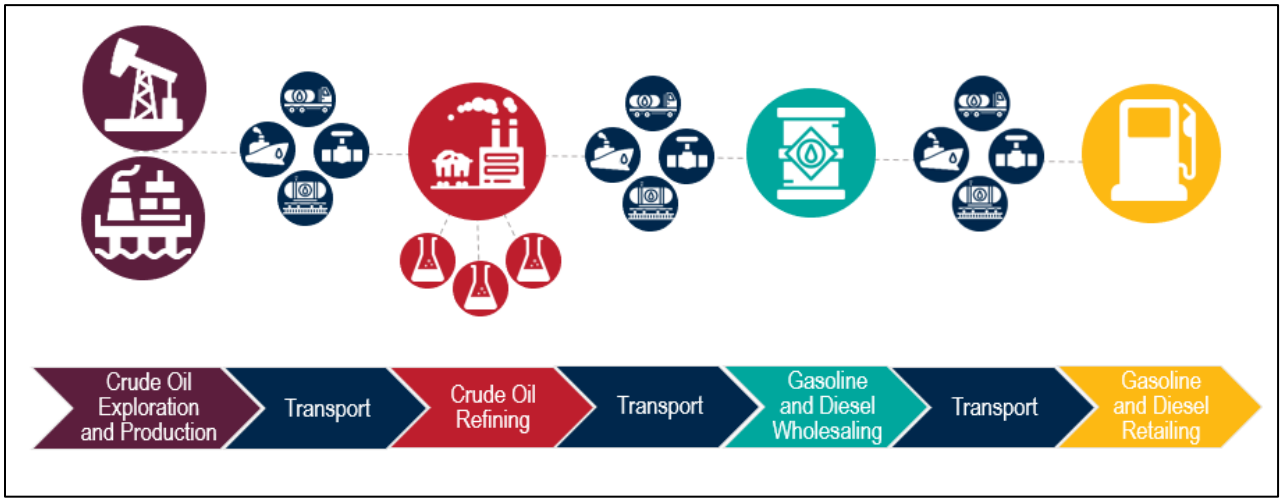
- The recovery and sale of crude oil,
- The transportation of crude oil to refineries,
- The refining of crude oil into gasoline and diesel,
- The transportation of gasoline and diesel to terminals,
- The wholesale distribution of gasoline and diesel to retail outlets, and
- The retail sale of gasoline and diesel to final consumers.

15. Economists describe the earlier stages of the chain of production and distribution in an industry as being upstream, and subsequent stages as being downstream. As product moves through the supply chain, it flows from the upstream production of raw materials – in this case, the recovery and sale of crude oil – to subsequent downstream activities, including refining, distribution, and retail sales. These activities are at times performed by different firms, though there are also vertically-integrated firms active in multiple stages of the chain of production. Firms like Shell and BP are active in the production of crude oil, and firms like Imperial Oil, Shell, Suncor, Husky, and Parkland are active in crude oil refining.[1] Imperial Oil, Shell, Suncor, Irving Oil, and Valero own and operate the majority of terminals across Canada.[2] Note that many of the activities in this production chain can be further broken down.

[1] Oil Sands Magazine – Canadian Refineries, available at https://www.oilsandsmagazine.com/projects/canadian-refineries.

[2] "2016 Report – Canada's Downstream Logistical Infrastructure: Refining, Biofuel Plants, Pipelines, Terminals, Bulk Plants & Cardlocks," Kent Group Ltd., October 20, 2017, available at https://www.kentgroupltd.com/wp-content/uploads/2017/12/Report-OverviewofCanadasLogisticalInfrastructure.pdf.

Figure 1
Gasoline and Diesel Supply Chain



Crude Oil Exploration and Production

16. The first step in the gasoline and diesel supply chain is crude oil exploration and production. Exploration involves the search for underwater and underground crude oil fields typically by searching for rock formations associated with oil deposits and then engaging in exploratory drilling at these rock formations. The world oil majors spend many billions of dollars annually on exploration activities.[3] Well development occurs after an economically recoverable oil deposit has been found.

17. The production phase includes the drilling, extraction and recovery of oil. Details of the production phase can differ significantly by well location (*e.g.,* on land or offshore, region, shale location, etc.). After the crude oil is extracted from the well it is transported, usually by gathering pipelines, to short term storage containers before being transported to a refinery. Most of Canada's domestic oil production occurs in the Western Canada Sedimentary Basin.[4] Domestic oil production made up 54 percent of Canada's total refinery inputs in 2018, while crude oil imports comprised the other 46 percent.[5] Parkland's Burnaby refinery sources crude oil from Alberta, the vast majority of which is

[3] Slav, Irina, "Oil Majors Bet Big On Offshore Drilling in 2019," OilPrice.com, January 14, 2019, available at https://oilprice.com/Energy/Crude-Oil/Oil-Majors-Bet-Big-On-Offshore-Drilling-In-2019.html. This article indicates expenditures on exploration and related activities amount to $208 billion annually.

[4] "Where does Canada's gasoline come from?" National Energy Board, May 2019, available at https://www.neb-one.gc.ca/nrg/sttstc/crdlndptrlmprdct/rprt/2019gslnrprt/index-eng.html.

[5] "Where does Canada's gasoline come from?" National Energy Board, May 2019, available at https://www.neb-one.gc.ca/nrg/sttstc/crdlndptrlmprdct/rprt/2019gslnrprt/index-eng.html.

received via the Trans Mountain pipeline.[6] Burnaby also receives some small, additional volumes by rail.[7]

18. Crude oil can be termed light or heavy and sweet or sour, depending on its API gravity and sulfur content, respectively. Crude oils with an API gravity of 31.1° or higher are considered "light" crudes and generally have higher yields of transportation fuels, making them more valuable.[8] Crude oils with a sulfur content of 0.5% or less are called "sweet" crudes while those with a sulfur content between 0.5% and 1.5% are sometimes called "intermediate sweet" or "intermediate sour" and those with 1.5% or more sulfur are called "sour."[9] Sulfur is considered a contaminant in finished petroleum products that must be processed out. Sweet crudes require less processing and, thus, usually have a higher value than sour crudes. **Figure 2** shows pricing between 2015 and April 2019 for four "benchmark" crude oils: West Texas Intermediate, Brent, Edmonton Par, and Western Canadian Select.

- West Texas Intermediate (WTI) crude is light-sweet crude that is produced in the Southwestern United States, specifically the Permian region. The Permian region contains parts of West Texas and Southeast New Mexico.[10] This crude typically has an API gravity of 39.60 and a sulfur content of 0.24%.[11]

- Brent crude is a light-sweet crude which is sourced from the East Shetland Basin in the North Sea (roughly halfway between Scotland and Norway). This crude typically has an API gravity of 38.06 and a sulfur content of 0.37%.[12]

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[6] "Parkland Burnaby Refinery Five-Year Outlook," Parkland Fuel Corporation, February 13, 2019, p. 8, available at http://www.parklandcap.ca/wp/wp-content/uploads/2019/03/Attachment-One_Parkland-Presentation_Feb_2019.pdf.

[7] "Parkland Burnaby Refinery Five-Year Outlook," Parkland Fuel Corporation, February 13, 2019, p. 8, available at http://www.parklandcap.ca/wp/wp-content/uploads/2019/03/Attachment-One_Parkland-Presentation_Feb_2019.pdf.

[8] API is calculated as API = (141.4 / Specific Gravity) – 131.5 where Specific Gravity = (Density of Oil / Density of Water). Any oils with an API above 10 will float in water, while any oils with an API below 10 will sink in water. Note that API and Sulfur properties can vary by batch of crude, meaning the API and Sulfur figures can deviate but generally are within a close range of the listed figures below. Petroleum UK – API Gravity, available at http://www.petroleum.co.uk/api; Petroleum UK – Sweet vs. Sour Crude Oil, available at http://www.petroleum.co.uk/sweet-vs-sour.

[9] Leffler, William L., Petroleum Refining in Nontechnical Language, 4th ed., pp. 19-22.

[10] "Permian region crude oil prices have increased with additional pipeline takeaway capacity," U.S. Energy Information Administration, March 26, 2019, available at https://www.eia.gov/todayinenergy/detail.php?id=38832.

[11] Petroleum UK – Benchmark Oils, available at http://www.petroleum.co.uk/benchmarks.

[12] Petroleum UK – Benchmark Oils, available at http://www.petroleum.co.uk/benchmarks.

- Canadian Light Sweet crude, also called Edmonton Par or Mixed Sweet Blend, is sourced from "a basket of light sweet crude [in Canada and] priced out of Edmonton."[13] This crude typically has an API gravity of 40-41.1 and a sulfur content of 0.3%-0.45%.[14]

- Western Canadian Select is a heavy-sour crude which is sourced from several oil streams in Western Canada and Alberta's oil sands.[15] This crude typically has an API gravity of 21.70 and a sulfur content of 3.66%.[16]

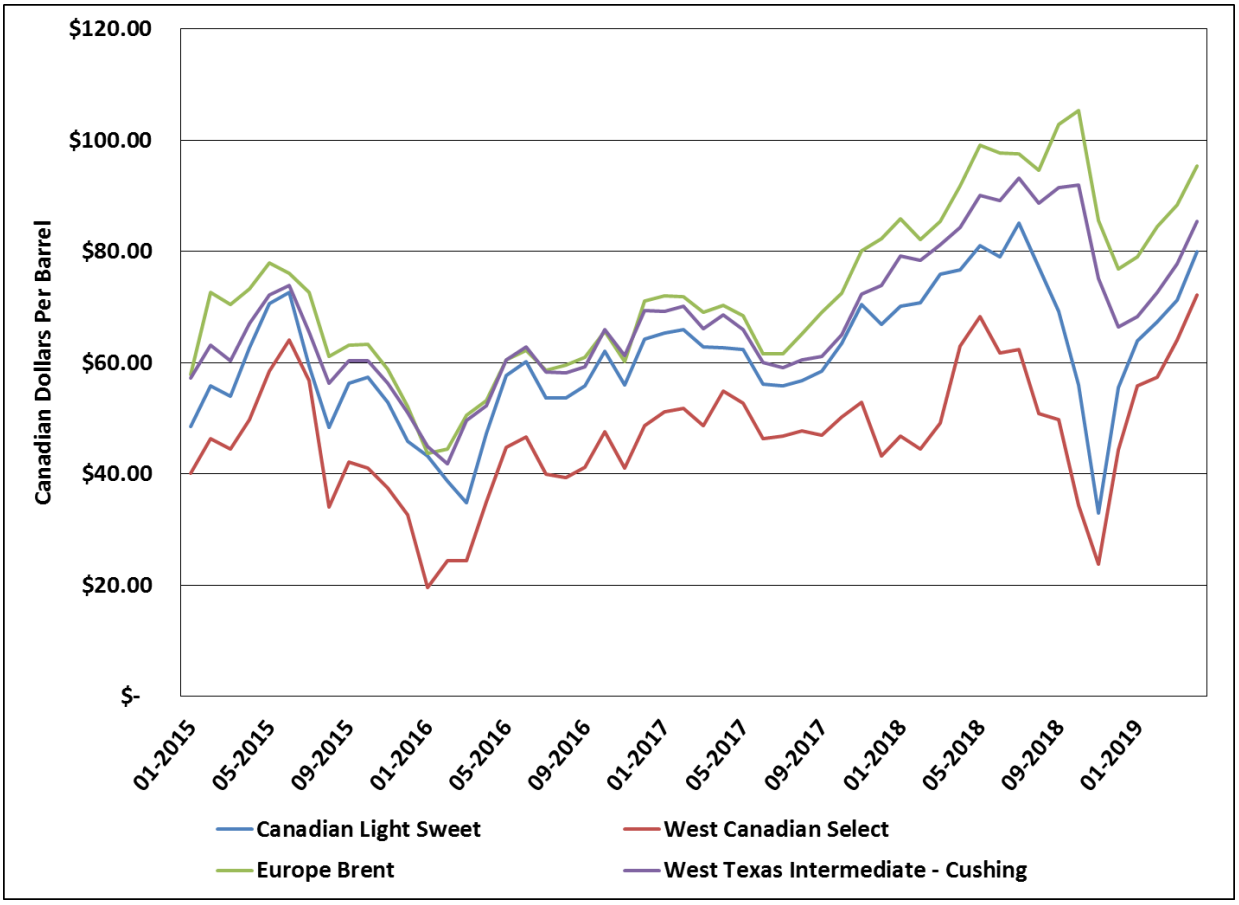
[13] "Oil Price Differentials Explained: Why Alberta Crude Sells At A Deep Discount," *Oil Sands Magazine*, December 13, 2018, available at https://www.oilsandsmagazine.com/market-insights/crude-oil-pricing-differentials-why-alberta-crude-sells-at-deep-discount-to-wti.

[14] "Understanding Gasoline Markets in Canada and Economic Drivers Influencing Prices," Natural Resources Canada, July 11, 2014, p. 5, available at https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/energy/files/pdf/2014/Issue12.pdf; "Specifications guide Americas crude oil," S&P Global Platts, May 2019, p. 6, available at https://www.spglobal.com/platts/plattscontent/_assets/_files/en/our-methodology/methodology-specifications/americas-crude-methodology.pdf.

[15] "Western Canadian Select Explained," *Oil Sands Magazine*, May 3, 2017, available at https://www.oilsandsmagazine.com/technical/western-canadian-select-wcs.

[16] "Specifications guide Americas crude oil," S&P Global Platts, May 2019, p. 6, available at https://www.spglobal.com/platts/plattscontent/_assets/_files/en/our-methodology/methodology-specifications/americas-crude-methodology.pdf.

Figure 2
Average Monthly Prices for Select Crude Oil Benchmarks
January 2015 - April 2019



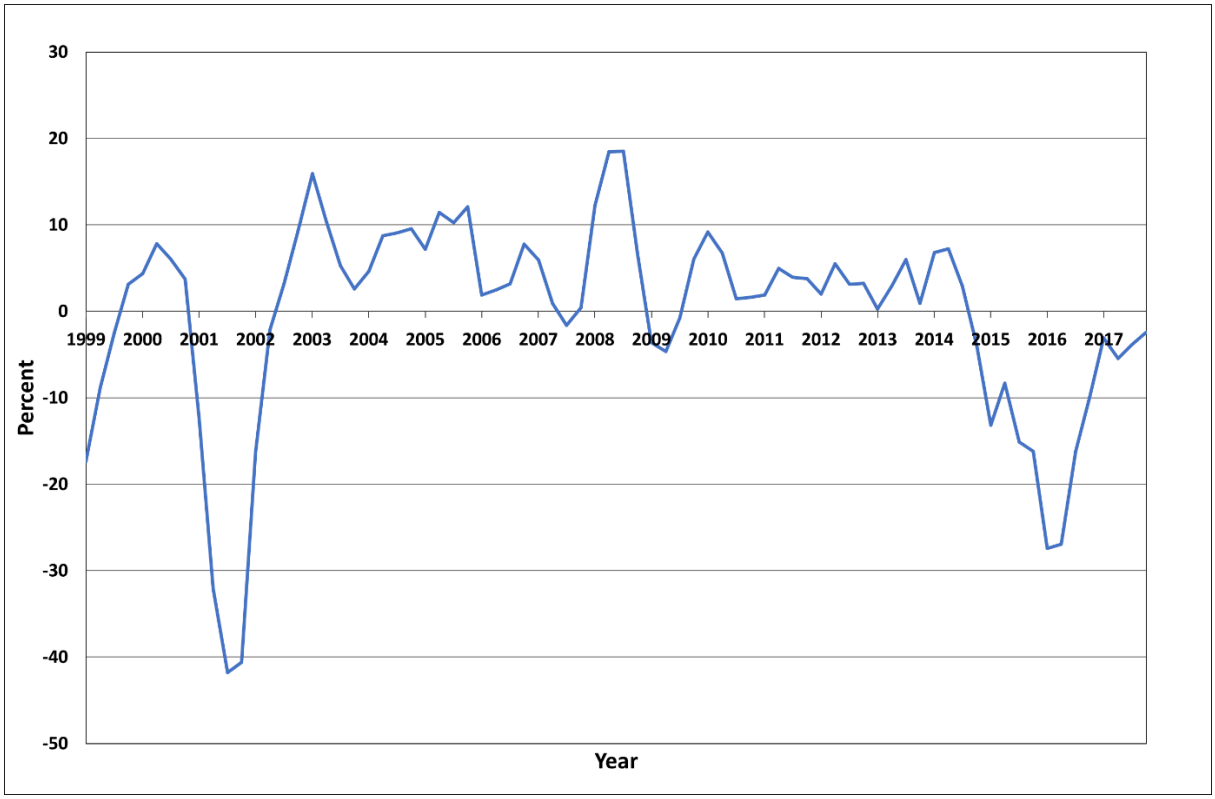
Note: Natural Resources Canada began reporting Canadian Light Sweet (Edmonton) as Canadian Mixed Sweet (Edmonton) in August 2018.

Sources: "Oil Pricing," Natural Resources Canada, available at https://www.nrcan.gc.ca/energy/energy-sources-distribution/crude-oil/oil-pricing/18087; "Petroleum & Other Liquids - Spot Prices," U.S. Energy Information Administration, available at https://www.eia.gov/dnav/pet/pet_pri_spt_s1_d.htm; "Canada / U.S. Foreign Exchange Rate," FRED Economic Research, available at https://fred.stlouisfed.org/series/DEXCAUS.

19. As shown in **Figure 2,** crude oil prices are very volatile, which makes crude oil production financially very risky.[17] For example, in recent years the average monthly price of West Canadian Select varied between $19.49 (January 2016) and $72.16 (April 2019) per barrel. According to data from the Conference Board of Canada, the profit margins for crude oil extraction in Canada also vary substantially from year to year and are often negative. **Figure 3** shows crude oil extraction profit margins over time.

[17] *See*, also, Smith, Jake J., "What Makes Oil Prices So Volatile?" *Kellogg Insight*¸ July 7, 2017.

Figure 3
Pre-Tax Profit Margin on Crude Oil Extraction in Canada
1999 - 2017



Source: The Conference Board of Canada – Oil Extraction Data.

Crude Oil Refining

20. Refineries process crude through a process of distillation, blending, and mixing additives. After receiving crude oil from short term storage, refiners use chemical separation and reaction processes to produce a variety of products including gasoline, diesel, jet fuel, fuel oil, lubricants, and asphalt.[18] There are 17 refineries in Canada, 14 of which produce gasoline.[19] These 14 refineries are operated by nine refining organizations, seven of which

[18] American Petroleum Institute – Oil Supply Chain, available at https://energyinfrastructure.org/~/media/energyinfrastructure/images/about-us-ei/supply-chain-and-production/oil-supply-chain-vs-2.pdf.

[19] "Where does Canada's gasoline come from?" National Energy Board, May 2019, available at https://www.neb-one.gc.ca/nrg/sttstc/crdlndptrlmprdct/rprt/2019gslnrprt/index-eng.html.

are integrated refiner marketers.[20] Although production varies by refinery, gasoline makes up the largest portion of refinery output at 36 percent, followed by diesel and middle distillates at 33 percent.[21] **Table 1** and **Figures 4 – 5** show the locations and capacities of the refineries in Canada.

Table 1
Canadian Crude Oil Refinery Locations and Capacities

Refinery Name	Owner	Location	Crude Oil Processing Capacity (barrels/day)
Strathcona Refinery	Imperial	Strathcona, AB	191,000
Suncor Energy Edmonton	Suncor	Edmonton, AB	142,000
Shell Scotford Complex	Shell	Scotford, AB	92,000
NWR Sturgeon Refinery	North West Redwater Partnership (NWR)	Sturgeon County, AB	79,000
Parkland Burnaby Refinery	Parkland Fuel (Parkland)	Burnaby, BC	55,000
Prince George Refinery	Husky	Prince George, BC	12,000
Co-op Refinery Complex (CRC)	Federated Co-operatives (FCL)	Regina, SK	130,000
Nanticoke Refinery	Imperial	Nanticoke, ON	113,000
Sarnia Refinery	Imperial	Sarnia, ON	119,000
Sarnia Manufacturing Centre (SMC)	Shell	Sarnia, ON	73,000
Sarnia Refinery	Suncor	Sarnia, ON	85,000
Montreal Refinery	Suncor	Montreal, QC	137,000
Jean Gaulin Refinery	Valero	Lévis, QC	235,000
Saint John Refinery	Irving	Saint John, NB	320,000
Come by Chance Refinery	Silverpeak - North Atlantic Refining LP (Silverpeak)	Come by Chance, NL	130,000

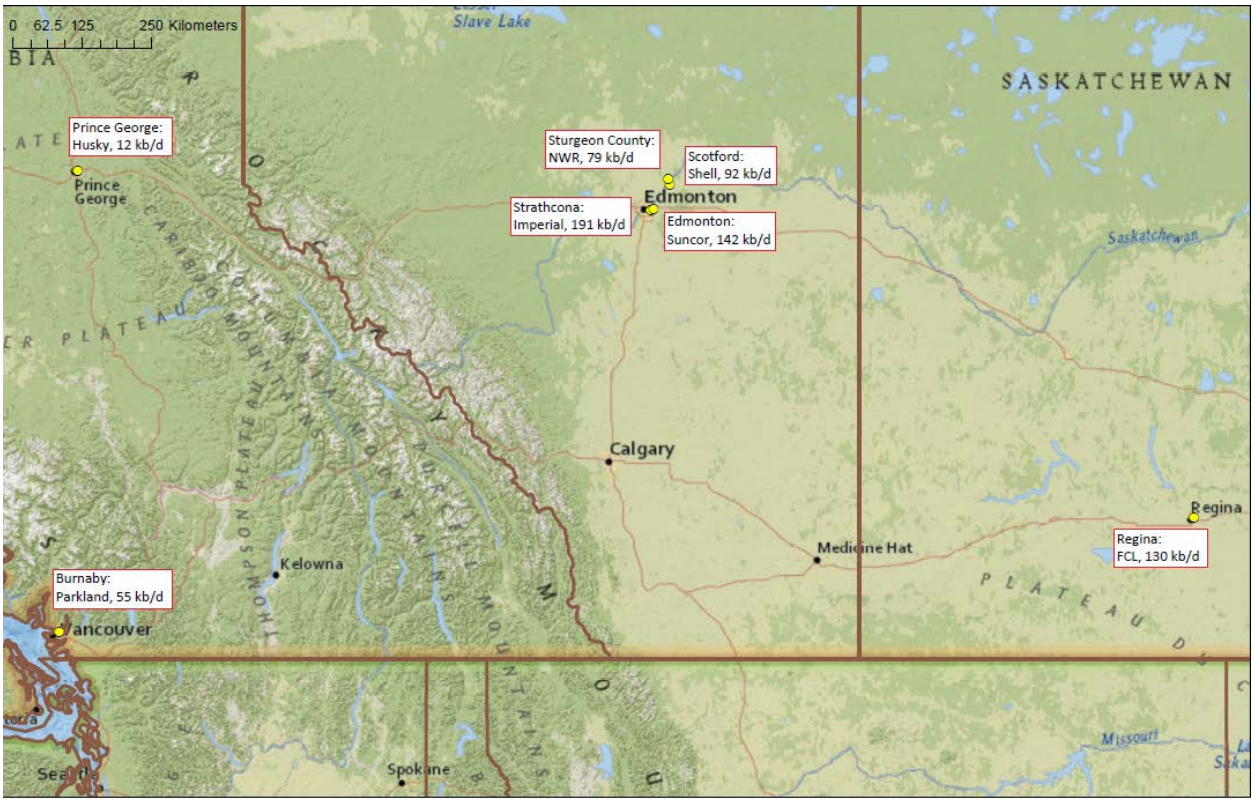
Note: Only refineries that produce gasoline and/or diesel are listed.

Sources: "2019 Crude Oil Forecast, Markets, and Transportation," Canadian Association of Petroleum Producers, 2019, available at https://www.capp.ca/publications-and-statistics/crude-oil-forecast; Valero – Jean Gaulin, available at https://www.valero.com/en-us/AboutValero/refining-segment/jean-gaulin.

[20] "2018 National Retail Petroleum Site Census," Kent Group Ltd., June 7, 2019, available at https://www.kentgroupltd.com/wp-content/uploads/2019/06/Executive-Summary-2018-National-Retail-Petroleum-Site-Census.pdf.

[21] "Where does Canada's gasoline come from?" National Energy Board, May 2019, available at https://www.neb-one.gc.ca/nrg/sttstc/crdlndptrlmprdct/rprt/2019gslnrprt/index-eng.html.

Figure 4
Western Canada Refineries



Source: "Crude Oil Forecast, Markets and Transportation," Canadian Association of Petroleum Producers, 2019, p. 14, available at https://www.capp.ca/publications-and-statistics/crude-oil-forecast; North America Political Boundaries, USGS, available at https://www.sciencebase.gov/catalog/item/4fb555ebe4b04cb937751db9; National Geographic World Map, Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, iPC.

Figure 5
Eastern Canada Refineries

Sources: "Crude Oil Forecast, Markets and Transportation," Canadian Association of Petroleum Producers, 2019, p. 15, available at https://www.capp.ca/publications-and-statistics/crude-oil-forecast; North America Political Boundaries, USGS, available at https://www.sciencebase.gov/catalog/item/4fb555ebe4b04cb937751db9; National Geographic World Map, Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, iPC; Valero – Jean Gaulin, available at https://www.valero.com/en-us/AboutValero/refining-segment/jean-gaulin.

21. The areas served by refineries can be highly localized. Refined gasoline is transported from the refinery to primary storage tanks located at or near the refinery. From there, the gasoline is transported to terminals for sale and subsequent distribution to retail outlets. Refined products can be transported longer distances to serve an area when the refining capacity in that area is not sufficient to meet demand. In cases such as this, areas that produce more refined products than are required locally will ship remaining product to under-supplied areas. British Columbia is one such example; more than half of the demand for refined products in British Columbia is supplied from sources outside the province.[22] In particular, Alberta refineries produce more gasoline and diesel than are

[22] *See*, for example, **Figure 22**.

needed locally and ship some of their remaining product to British Columbia, primarily via the Trans Mountain Pipeline.

22. A refiner's costs are highly dependent on the combination of its refinery's configuration (*i.e.,* how much complex machinery is used at the refinery) and the type of crude oil it chooses to refine. Crude oil is the primary input into the refining process. Because crude oil can be imported and exported across the world, and therefore is subject to worldwide supply and demand dynamics, refiners "are [considered] 'price takers' and have very little influence on the price they pay for crude oil."[23] As noted earlier, crude oil comes in wide spectrum of variants ranging from light-sweet to heavy-sour. A key issue refiners face when running their operations is whether to use light-sweet product, which is expensive but easier to refine, or heavy-sour, which is less expensive and more difficult to refine.

23. Light-sweet inputs are significantly easier to refine (*i.e.,* they require less complex machinery), but are more expensive and, in recent years, have been dwindling in supply.[24] Although light-sweet refiners have lower capital expenditures, they are also subject to higher input costs and risk becoming un-profitable if their inputs become too expensive due to lack of availability. As a result, if light-sweet crude becomes too expensive, a light-sweet refinery may shut down or upgrade its machinery, at a significant cost, to process heavy-sour crude.

24. Heavy-sour crude is more abundant and can be purchased at a discount relative to light-sweet crude. However, refining heavy-sour crudes requires significant investments in complex machinery as well as more skilled employees to maintain and operate the machinery. Although all refineries require constant maintenance and capital investments, heavy-sour refiners typically require more. Heavy-sour refiners must make sufficient returns on the difference between the crude oil they purchase and the refined products they produce, also called the "crack spread," to cover their higher and continuing capital expenditures. Heavy-sour refineries tend to be more profitable when the differential between light-sweet and heavy-sour crude is higher because they are able to purchase cheaper inputs relative to their light-sweet counterparts.[25]

25. Refineries are relatively risky businesses because of the volatile and complex supply and demand dynamics they face, and their tendency to be "low return, low growth, capital

[23] Natural Resources Canada – Refinery Economics, available at https://www.nrcan.gc.ca/energy/energy-sources-distribution/refinery-economics/4561.

[24] Natural Resources Canada – Refinery Economics, available at https://www.nrcan.gc.ca/energy/energy-sources-distribution/refinery-economics/4561.

[25] McKinsey Energy Insights – Light-heavy differential, available at https://www.mckinseyenergyinsights.com/resources/refinery-reference-desk/light-heavy-differential/.

intensive, politically sensitive and environmentally uncertain" businesses.[26] As noted in an industry report by the Canadian Fuels Association:

> A refinery will close if it cannot sustain its profitability, as they have in Dartmouth, Montréal and Oakville since 2005. Overall, more than 20 refineries have closed in Canada since 1970, a reflection of the shift to larger, more complex refineries and flat to declining demand.[27]

26. The refinery margin is the difference between the cost of the raw input material used by a refinery, *e.g.,* crude oil, and the value of the products it produces, *e.g.,* the wholesale value of the gasoline and diesel makes. A refinery margin is sometimes referred to as the "crack spread," and I discuss refinery margins in greater detail in my answer to **Question (6)**.

27. A refinery margin can vary based on a variety of factors, many of which are outside the control of the refiner. Financial risks associated with refining include volatility in crude oil prices, interruptions in crude oil supply, and unplanned refinery outages since refineries generally must run 24 hours a day every day in order to be competitive. In addition, refining is a very capital intensive business, and refiners, therefore, must earn an adequate return to cover their cost of capital if they are to have incentives to maintain their refineries and to invest in their businesses. It is important to note that a refinery margin is not a profit margin for a refinery. Refinery margins do not account for operating costs, nor do they reflect capital investments. As such, a refinery may not be profitable, even if it has a positive refinery margin. The costs associated with petroleum refining are discussed in more detail in my response to **Question (6)**. These costs include:

- Crude oil and other feedstock costs,
- Energy costs,
- Catalyst costs
- Chemical costs,
- Labour costs,
- Materials costs,
- Maintenance costs,
- Capital costs (including land, plant, and equipment),

[26] "The Economics of Petroleum Refining," Canadian Fuels Association, December 2013, p. 4.

[27] "The Economics of Petroleum Refining," Canadian Fuels Association, December 2013, p. 4.

- Opportunity costs, and

- Compliance and regulatory costs.

28. Refinery margins or crack spreads are just one component of refinery profit margins. Refinery profit margins are generally relatively thin, ranging between 1 and 10 percent of gross revenues.[28]

Gasoline and Diesel Wholesaling

29. Terminals serve as receipt and distribution points for domestic and imported gasoline and diesel. Refineries generally have storage terminals on site. In addition, other terminals are located throughout Canada. Blends of performance and efficiency-enhancing additives are added to the refined gasoline at the terminal before the gasoline is transported to the point of sale.[29] As of 2017, there were a total of 78 primary terminals in Canada: 29 are in Western Canada, one in Northern Canada, 21 in Ontario, 11 in Québec, and 16 in Atlantic Canada.[30] **Table 2** lists the locations of primary terminals in British Columbia.

Table 2
Primary Terminal Locations in British Columbia

Owner	Terminal Name	Location
Husky	Prince George Refinery Terminal	Prince George
Imperial Oil	Lougheed Terminal	Burnaby
Imperial Oil	Nanaimo Distribution Terminal	Nanaimo
Imperial Oil	IOCO Distribution Terminal	Port Moody
Parkland	Burnaby Terminal	Burnaby
Parkland	Hatch Pt. Terminal	Cobble Hill
Parkland	Pt. Hardy Terminal	Pt. Hardy
Shell	Burmount Terminal	Burnaby
Shell	Shellburn Terminal	Burnaby
Shell	Bare Point Terminal	Chemainus
Suncor	Kamloops Terminal	Kamloops
Suncor	Burrard Terminal	Port Moody
Suncor	Nanaimo Terminal	Nanaimo
Suncor	Terrace Terminal	Terrace
West Coast Reduction Ltd.	West Coast Reduction Ltd.	Vancouver

[28] Clews, Robert, Project Finance for the International Petroleum Industry, Elsevier, 2016, pp. 125-126.

[29] American Petroleum Institute – Oil Supply Chain, available at https://energyinfrastructure.org/~/media/energyinfrastructure/images/about-us-ei/supply-chain-and-production/oil-supply-chain-vs-2.pdf

[30] "Where does Canada's gasoline come from?" National Energy Board, May 2019, available at https://www.neb-one.gc.ca/nrg/sttstc/crdlndptrlmprdct/rprt/2019gslnrprt/index-eng.html.

Sources: "2016 Report - Canada's Downstream Logistical Infrastructure: Refining, Biofuel Plants, Pipelines, Terminals, Bulk Plants & Cardlocks," Kent Group Ltd., October 20, 2017; "Parkland Completes Acquisition of Chevron Canada's Downstream Fuel Business," *Business Wire*, October 1, 2017, available at https://www.businesswire.com/news/home/20171001005041/en/Parkland-Completes-Acquisition-Chevron-Canada's-Downstream-Fuel.

30. Bulk plants are storage/distribution facilities that are typically much smaller than primary terminals.

> Bulk plants are typically located in more distant markets where it would be uneconomical or impractical to deliver product to the end-use customer or retail site from a primary terminal. The vast majority of bulk plants receive product by means of tanker truck.[31]

31. **Figure 6** shows the locations of the primary terminals and bulk plants in British Columbia.

Figure 6
Primary Terminal and Bulk Plant Locations in British Columbia

Sources: "2016 Report - Canada's Downstream Logistical Infrastructure: Refining, Biofuel Plants, Pipelines, Terminals, Bulk Plants & Cardlocks," Kent Group Ltd., October 20, 2017; North America Political Boundaries, USGS, available at https://www.sciencebase.gov/catalog/item/4fb555ebe4b04cb937751db9;

[31] "2016 Report - Canada's Downstream Logistical Infrastructure: Refining, Biofuel Plants, Pipelines, Terminals, Bulk Plants & Cardlocks," Kent Group Ltd., October 20, 2017, p. 20.

National Geographic World Map, Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, iPC.

32. Terminals in British Columbia are supplied by a combination of pipelines, barges, trucks, and rail shipments. The Trans Mountain Pipeline runs west from Edmonton, and supplies terminals in Kamloops and Burnaby. Some gasoline produced in Parkland's Burnaby refinery is transported by pipeline to an adjacent terminal, some is transported by ship to terminals along the coast and Vancouver Island, and the remainder is transported by rail and trucks to terminals in mainland British Columbia. Husky's Prince George refinery supplies terminals in northern British Columbia and the Yukon via rail and truck.[32]

33. After the refined gasoline is blended with additives at the terminals, it is transported to the point of sale to consumers. Some terminals in Canada can offload the finished product onto ships, railcars, and pipelines; however, the transportation of finished gasoline from the terminal to the retailer is done almost exclusively by truck.[33] In some instances the finished gasoline is picked up from the terminal and delivered to a retailer by a wholesaler. This wholesaler pays a price based on the rack prices charged by the refinery and charges the retailer a wholesale price. The wholesale price to a retailer can be based on the rack price as well and may vary based on the retailer's volume, whether the gas is branded, and other factors. The wholesaler's margin between what it pays to the refiner and what it charges to the retailer compensates it for the services it provides, including transportation and marketing program support, and also its return on capital.

34. **Table 3** lists gasoline and diesel wholesalers/marketers operating in British Columbia. These wholesalers provide or arrange for third-party transportation of the gasoline and diesel from the terminal to the retail location, and provide other services such as branding to independent, third-party retailers.

[32] "Where does Canada's gasoline come from?" National Energy Board, May 2019, available at https://www.neb-one.gc.ca/nrg/sttstc/crdlndptrlmprdct/rprt/2019gslnrprt/index-eng.html.

[33] "Where does Canada's gasoline come from?" National Energy Board, May 2019, available at https://www.neb-one.gc.ca/nrg/sttstc/crdlndptrlmprdct/rprt/2019gslnrprt/index-eng.html.

Table 3
British Columbia Gasoline Marketers/Wholesalers

Marketer	Type	Brands
Parkland Fuel Corporation	Refiner-Marketer	Chevron, Esso, Fas Gas Plus, Race Trac
Unidentified Marketers or Dealers	Non-Refiner	Unbranded/Unknown
Suncor Energy Products, Inc.	Refiner-Marketer	Petro-Canada
Shell Canada Limited	Refiner-Marketer	Shell
Husky Energy Inc.	Refiner-Marketer	Husky
7-Eleven Canada, Inc	Non-Refiner	Petro-Canada, Esso, 7-Eleven
Federated Co-operatives Limited	Refiner-Marketer	Tempo, Save on Gas, Co-op
McDougall Energy	Non-Refiner	Pump, Esso, Unbranded/Unknown
Super Save Group	Non-Refiner	Super Save Gas
BCP IV Service Station LP/BG Fuels	Non-Refiner	Mobil
Proctor Petroleum	Non-Refiner	Gas N Go
Centex Petroleum	Non-Refiner	Centex, Unbranded/Unknown
Couche-Tard Inc.	Non-Refiner	Mac's, Shell, Petro-Canada, Esso, Husky
Sobeys Capital Inc.	Non-Refiner	Safeway
Gas Plus Inc.	Non-Refiner	Gas Plus, Unbranded/Unknown
Canco Petroleum	Non-Refiner	Canco
Costco Wholesale Canada Ltd.	Non-Refiner	Costco
XTR Energy Company Limited	Non-Refiner	Gulf, XTR
Canadian Tire Petroleum	Non-Refiner	Canadian Tire
Domo Gasoline Corporation Ltd.	Non-Refiner	Domo
Shell Pilot Flying J Joint Venture	Refiner-Marketer	Shell and Flying J
BVD Petroleum	Non-Refiner	Petro-Canada
G&B Fuels Inc.	Non-Refiner	G&B Fuels
GTI Petroleum Ltd.	Non-Refiner	GTI

Source: "2018 National Retail Petroleum Site Census," Kent Group Ltd., June 7, 2019.

Gasoline and Diesel Retailing

35. As of December 31, 2018, there were 11,929 retail gasoline stations operating in Canada selling 88 different brands of gasoline marketed by 67 distinct companies.[34] 1,368 of these retail gas stations were in British Columbia.[35] Stations in British Columbia sell 29 different brands of gasoline marketed by 24 distinct companies.[36]

36. A key player in the retail fuel market is the marketer. Marketers are companies that have the right to sell or consign a brand of fuel, and they maintain the primary supply relationship with retail sites.[37] Vertically integrated refiner-marketers are marketers

[34] "2018 National Retail Petroleum Site Census," Kent Group Ltd., June 7, 2019.

[35] "2018 National Retail Petroleum Site Census," Kent Group Ltd., June 7, 2019.

[36] "2018 National Retail Petroleum Site Census," Kent Group Ltd., June 7, 2019.

[37] "2018 National Retail Petroleum Site Census," Kent Group Ltd., June 7, 2019.

whose corporate structure also encompasses one or more domestic refineries. By comparison, non-refiner marketers are not involved in refining and obtain their gasoline and diesel supply from non-affiliated companies at arms' length transactions. **Table 4** shows the shares of integrated refiner-marketers and non-refiner marketers by number of stations they supply in Canada and British Columbia as of December 31, 2018.

Table 4
Canada and British Columbia Station Count-based Shares for Integrated Refiner-Marketers and Non-Refiner Marketers

Type	Share of Gas Stations in Canada	Share of Gas Stations in British Columbia
Integrated Refiner-Marketer	42.6%	57.9%
Non-Refiner Marketer	57.4%	42.1%

Source: "2018 National Retail Petroleum Site Census," Kent Group Ltd., June 7, 2019.

37. It is important to note that marketers do not always own or operate the gas stations for which they supply fuel. Ownership and operation of retail stations in Canada can be arranged in several different ways. Stations owned by a marketer can be operated by the marketer, a commissioned operator, or a lessee. Ownership of the station does not always indicate control over pricing. In the case of a lessee station, the lessee leases a station owned by a marketer and has the power to set retail fuel prices. In other cases, stations are owned by independent retailers, also referred to as dealers, which always have the right to set their own retail fuel prices. Independent retailers may have agreements with the marketer to market certain brands of fuel or they may choose to sell unbranded fuel. **Table 5** describes the different retailer business models for the sale of gasoline.

Table 5
Gasoline Retailer Business Models

Type	Station Owner	Business Model	Price Setter	Share of Canadian Gas Stations in 2017
Independent retail gas station	Retailer	Retailer buys gas from marketer	Retailer	46%
Commission operator gas station	Marketer	Retailer receives a commission (cents per litre) from marketer on gas sold	Marketer	40%
Marketer-operated gas station	Marketer	Marketer owns and controls the station	Marketer	13%
Lessee gas station	Marketer	Retailer leases station and buys gas from marketer	Retailer	~1%

Note: "Station Owner" refers to the owner of the retail outlet, not the fuel supplier of the station.

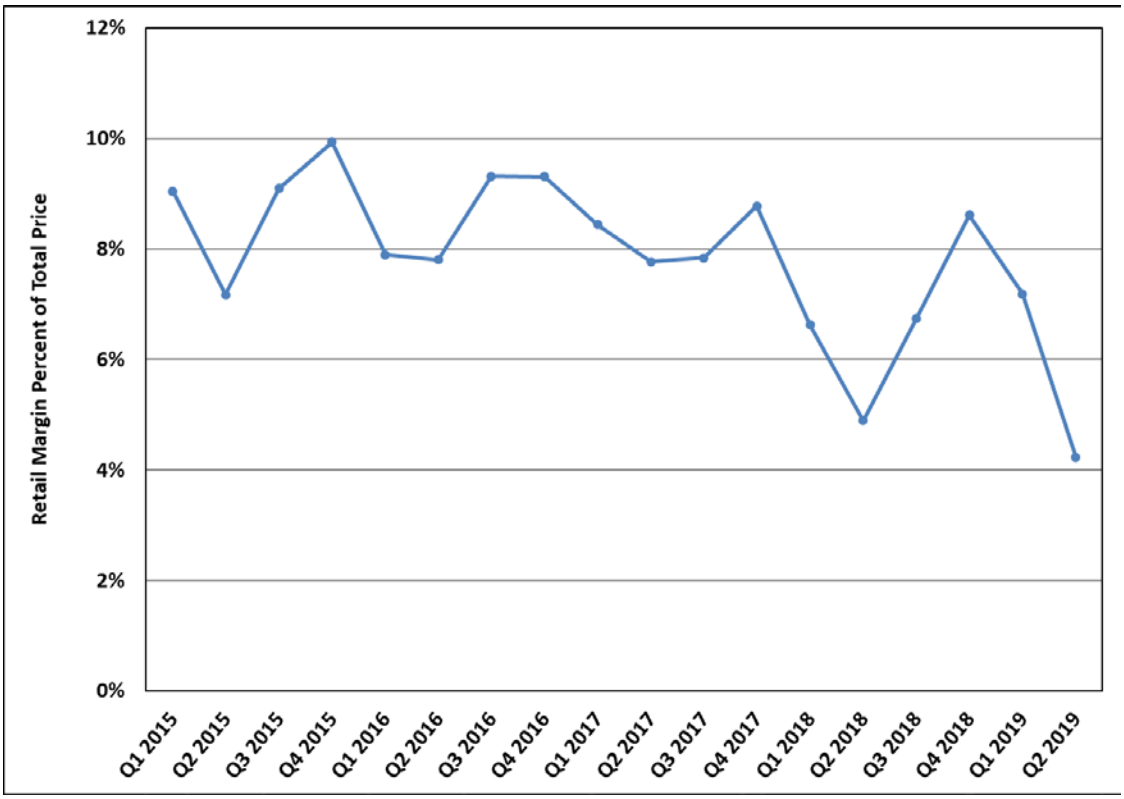
Source: "A Guide to Retail Gasoline Pricing in Canada," Government of Canada, May 17, 2019, available at https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04429.html#ann01.

38. With multiple brands and marketers seeking dealer business, dealer stations have options in terms of the brands they utilize and the sources of gasoline and diesel for their stations.

39. Parkland is an integrated refiner-marketer, producing gasoline and diesel at its Burnaby refinery and selling these fuels in British Columbia through its own Chevron-branded retail gas stations and Chevron-branded dealer stations. Chevron-branded gas stations also receive supply from Alberta refineries, especially in eastern British Columbia. In addition to operating as a refiner-marketer, Parkland operates as a wholesaler that sells gasoline and diesel to independent retailers, who make their own retail pricing and other decisions related to their sale of these fuels to end consumers.

40. **Figure 7** provides data on retail gross margins at gas stations in British Columbia. These data are not retail gas station profit margins because they consider only the retail price of the gasoline and diesel sold at the stations and the purchase costs of that gasoline and diesel. Other gas station costs, including both operating and capital costs, are excluded from these gross margins.

Figure 7
British Columbia Regular Gasoline
Retail Gross Margin as a Percent of Total Price
Q1 2015 - Q2 2019



Source: Kent Petroleum Price Data, Kent Group Ltd., available at https://charting.kentgroupltd.com/

Taxes

41. In addition to compensation for all of these activities related to bringing finished gasoline and diesel products to consumers, the final prices paid by consumers include various taxes. The tax component of retail fuel prices can be broken down into three categories: local taxes, provincial taxes, and federal taxes. The specific taxes paid by consumers in British Columbia in each of these three categories are:

Local Taxes

- In the Vancouver area, a dedicated motor fuel tax of 17 cents/litre to help fund TransLink, Vancouver's public transportation network.[38]

- In the Victoria Area, a dedicated motor fuel tax of 5.5 cents/litre to help fund BC Transit, British Columbia's public transportation system outside of the greater Vancouver area.[39]

Provincial Taxes

- A dedicated motor fuel tax of 6.75 cents/litre to BC Transportation Financing Authority, which constructs and operates transportation infrastructure throughout the province.[40]

- A provincial motor fuel tax of 7.75 cents/litre for clear gasoline and 8.25 cents/litre for clear diesel.[41]

- A carbon tax of 8.89 cents/litre for clear gasoline and 10.23 cents/litre for clear diesel.[42]

Federal Taxes

- An excise tax of 10 cents/litre on gasoline and 4 cents/litre on diesel.[43]

[38] "Tax Rates on Fuels," *British Columbia Ministry of Finance Tax Bulletin,* April 2019, available at https://www2.gov.bc.ca/assets/gov/taxes/sales-taxes/publications/mft-ct-005-tax-rates-fuels.pdf.

[39] "Tax Rates on Fuels," *British Columbia Ministry of Finance Tax Bulletin,* April 2019, available at https://www2.gov.bc.ca/assets/gov/taxes/sales-taxes/publications/mft-ct-005-tax-rates-fuels.pdf.

[40] "Tax Rates on Fuels," *British Columbia Ministry of Finance Tax Bulletin,* April 2019, available at https://www2.gov.bc.ca/assets/gov/taxes/sales-taxes/publications/mft-ct-005-tax-rates-fuels.pdf.

[41] Consumers in the Vancouver area pay a reduced provincial motor fuel tax of 1.75 cents/litre on clear gasoline and 2.25 cents/litre on clear diesel. "Tax Rates on Fuels," *British Columbia Ministry of Finance Tax Bulletin,* April 2019, available at https://www2.gov.bc.ca/assets/gov/taxes/sales-taxes/publications/mft-ct-005-tax-rates-fuels.pdf.

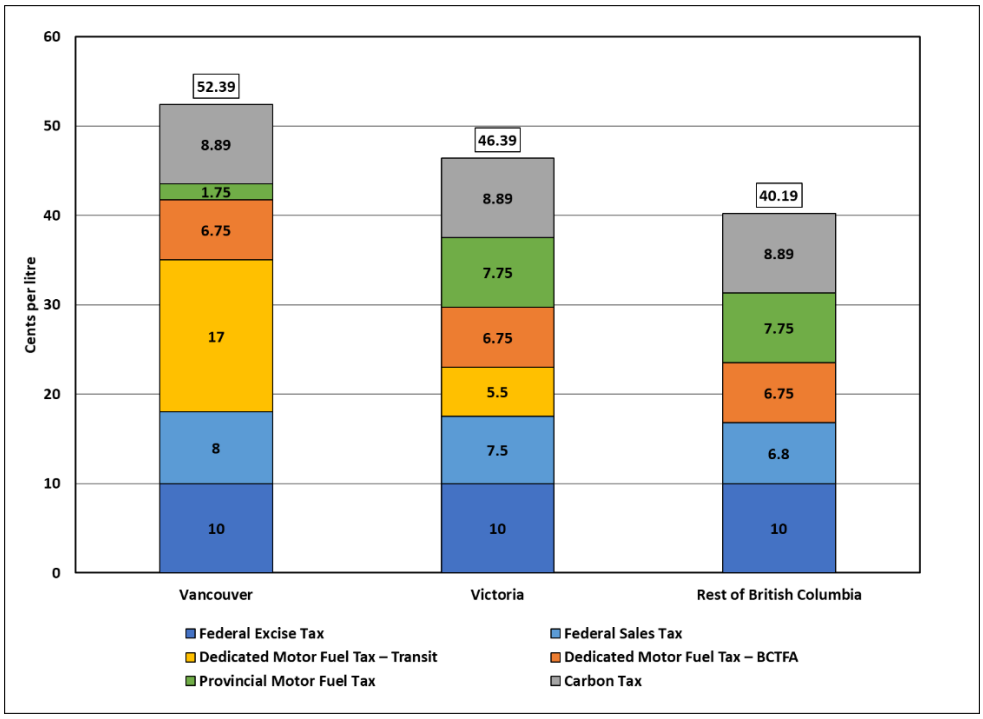
[42] "Tax Rates on Fuels," *British Columbia Ministry of Finance Tax Bulletin,* April 2019, available at https://www2.gov.bc.ca/assets/gov/taxes/sales-taxes/publications/mft-ct-005-tax-rates-fuels.pdf.

[43] Natural Resources Canada – Fuel Consumption Taxes in Canada, available at https://www.nrcan.gc.ca/our-natural-resources/domestic-and-international-markets/transportation-fuel-prices/fuel-consumption-taxes-canada/18885.

- A federal goods and services tax of 5% of the total retail price, including all other taxes.[44] In other words, all other federal, provincial, and local taxes are added to the retail rate and then a 5% sales tax is calculated based on that total. As a result, consumers in British Columbia and across Canada pay a percentage tax on a total amount that already includes several other taxes (*i.e.,* a "tax on tax").[45]

42. A breakdown of taxes paid per litre by consumers in British Columbia is shown in **Figure 8** for gasoline and **Figure 9** for diesel.

Figure 8
Tax Breakdown Per Litre of Clear Gasoline Sold in British Columbia
April 2019



Note: Federal sales tax figure shown is estimated by the Canadian Taxpayers Federation. This tax is not set per litre. The federal sales tax is calculated as an additional 5% of the sum of the price per litre and all other taxes.

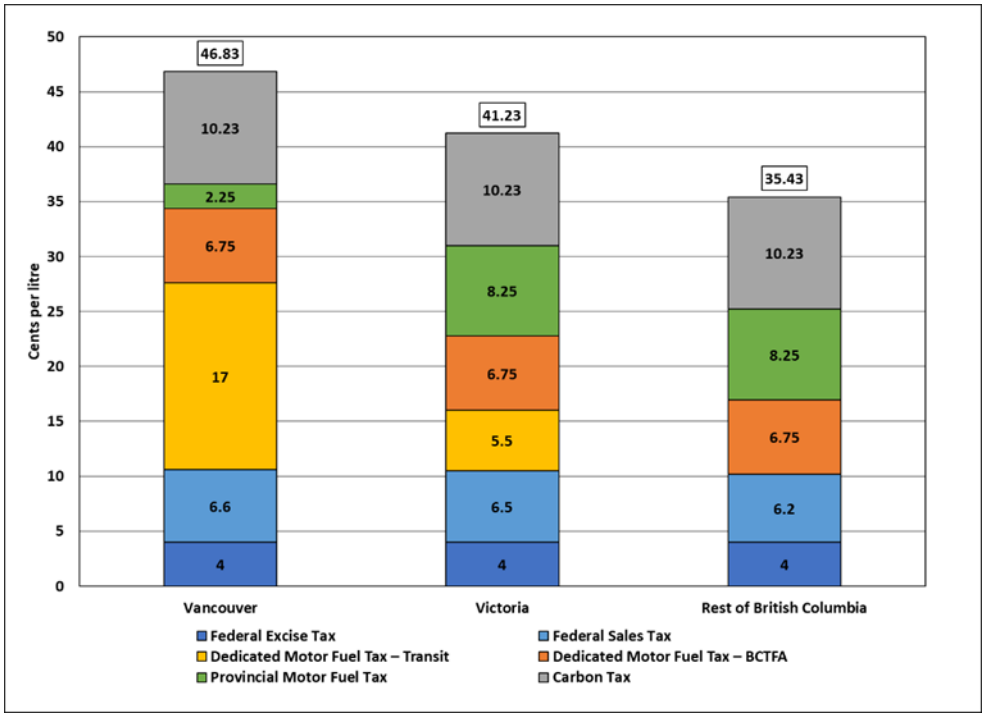
Sources: "Tax Rates on Fuels," *British Columbia Ministry of Finance Tax Bulletin*, April 2019, available at https://www2.gov.bc.ca/assets/gov/taxes/sales-taxes/publications/mft-ct-005-tax-rates-fuels.pdf; Bowes,

[44] "Fuel Consumption Taxes in Canada," National Resources Canada, April 29, 2019, available at https://www.nrcan.gc.ca/our-natural-resources/domestic-and-international-markets/transportation-fuel-prices/fuel-consumption-taxes-canada/18885.

[45] "Fuel Consumption Taxes in Canada," National Resources Canada, April 29, 2019, available at https://www.nrcan.gc.ca/our-natural-resources/domestic-and-international-markets/transportation-fuel-prices/fuel-consumption-taxes-canada/18885.

Jeff, "21st Annual Gas Tax Honesty Day Report," Canadian Taxpayers Federation, May 2019, available at http://www.taxpayer.com/media/2019-GTHD-EN.pdf.

Figure 9
Tax Breakdown Per Litre of Clear Diesel Sold in British Columbia
April 2019



Note: Federal sales tax figure shown is estimated by the Canadian Taxpayers Federation. This tax is not set per litre. The federal sales tax is calculated as an additional 5% of the sum of the price per litre and all other taxes.

Sources: "Tax Rates on Fuels," *British Columbia Ministry of Finance Tax Bulletin*, April 2019, available at https://www2.gov.bc.ca/assets/gov/taxes/sales-taxes/publications/mft-ct-005-tax-rates-fuels.pdf; Bowes, Jeff, "21st Annual Gas Tax Honesty Day Report," Canadian Taxpayers Federation, May 2019, available at http://www.taxpayer.com/media/2019-GTHD-EN.pdf.

Percentage of Retail Price at Each Stage

43. **Table 6** provides high-level summary information from the Competition Bureau regarding the prices charged by and paid to the various parties in the gasoline and diesel supply chain. It also provides summary information from the Competition Bureau on some of the factors that influence prices at each stage in the supply chain. For example, oil and gas exploration companies charge a price for the crude oil they sell. The revenue derived from crude oil sales compensates the exploration company for the cost of producing the crude oil, and also needs to provide a return on the capital employed in crude oil production and on the exploration company's investment in searching for and developing

crude oil deposits. Without the expectation of earning a return on exploration activities, companies would not have an incentive to search for new oil deposits.

Table 6
Pricing at Stages in the Gasoline and Diesel Supply Chain

Stakeholder	Price Paid	Price Charged	Factors Influencing Price Charged
Oil and gas exploration and development companies		Crude price	Global supply and demand for crude oil, and a profit margin.
Refineries	Crude price	Rack price	Cost of crude oil and related refining costs, and a profit margin.
Marketers and wholesalers	Rack price	Wholesale price	Rack price, overhead, and the distance between the refinery and the terminal as well as between the terminal and the retailer, and a profit margin.
Retailers	Wholesale price	Retail price	Wholesale price plus wages and salaries, benefits, equipment, rent, insurance, other overhead, and a profit margin.
End customers	Retail price + taxes		

Note: "Rack price" is a term used in the oil and gas industry. Different people and organizations use the term differently. For the purpose of this report, I use "rack price" to refer to the price that refineries charge to wholesalers.

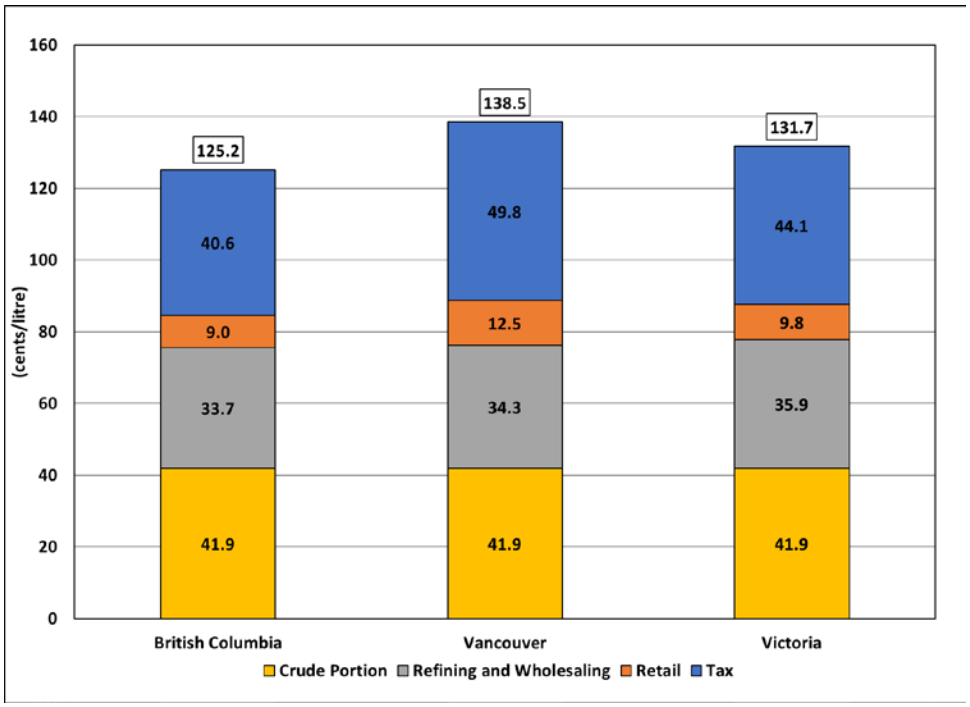
Source: "A Guide to Retail Gasoline Pricing in Canada," Government of Canada, May 17, 2019, available at https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04429.html#ann01.

44. In a similar fashion, the rack price charged by a refinery needs to compensate the refinery for its costs of production, including crude oil acquisition costs and other operating costs, and also for its investment in plant and equipment. Without an expectation of earning a return on its capital, refiners would not have an incentive to invest in refining assets or even to maintain existing refining assets.

45. **Figures 10 – 13** provide a breakdown of the retail price paid by consumers into crude oil, wholesale, retail, and tax components. **Figure 10** and **Figure 11** study regular gasoline, and **Figure 12** and **Figure 13** study diesel. The price components in two of the charts, **Figure 10** and **Figure 12**, are presented in terms of component value, while **Figure 11** and **Figure 13** are presented in terms of the percentage of the total price paid by consumers represented by the component. These are based on Kent Group data from various stages in the value chain. Kent Group collects retail pump prices each weekday morning directly from gas stations in 70 cities across Canada. The pump prices collected include all applicable federal, provincial, and municipal taxes as well as any sales taxes, and Kent

Group subtracts out all applicable taxes in order to arrive at a pre-tax retail price.[46] Wholesale prices for regular gasoline and diesel are collected each weekday directly from Canadian wholesalers in 24 cities. In addition, crude prices are collected each weekday from a number of crude oil reporting sources. As of September 2016, the crude price used for all cities west of Ontario is a blend of Synthetic Crude and Western Canadian Select.[47]

Figure 10
Average Retail Price Breakdown for Regular Gasoline in British Columbia
Q1 2019

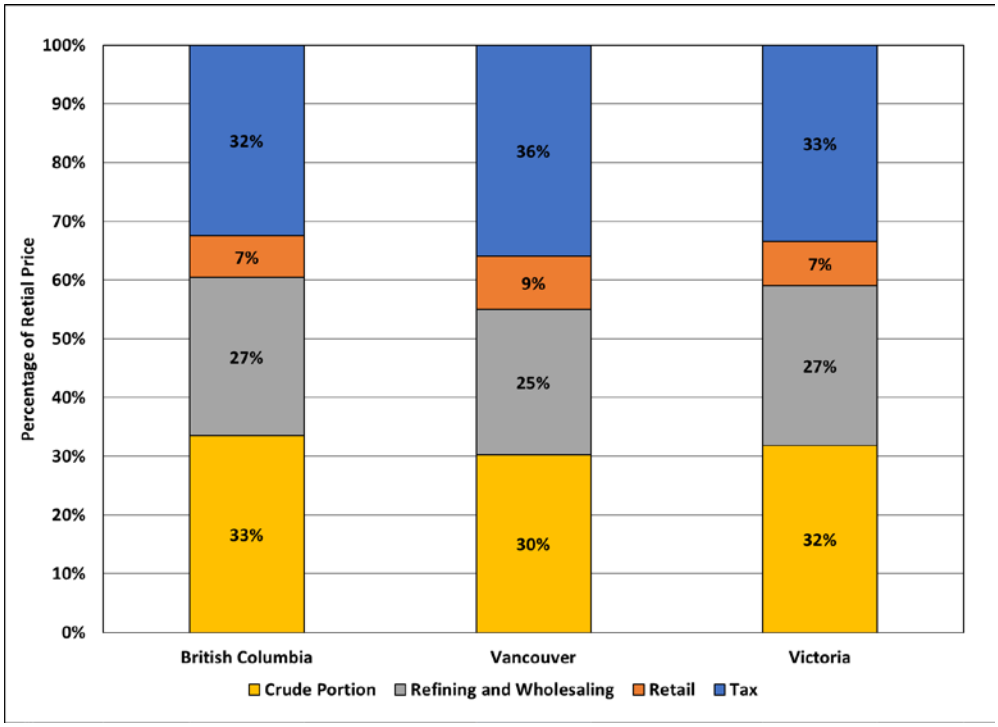


Source: Kent Petroleum Price Data, Kent Group Ltd., available at https://charting.kentgroupltd.com/.

[46] Kent Group Ltd. – Methodology Notes, available at http://www.kentgroupltd.com/methodology-notes/.

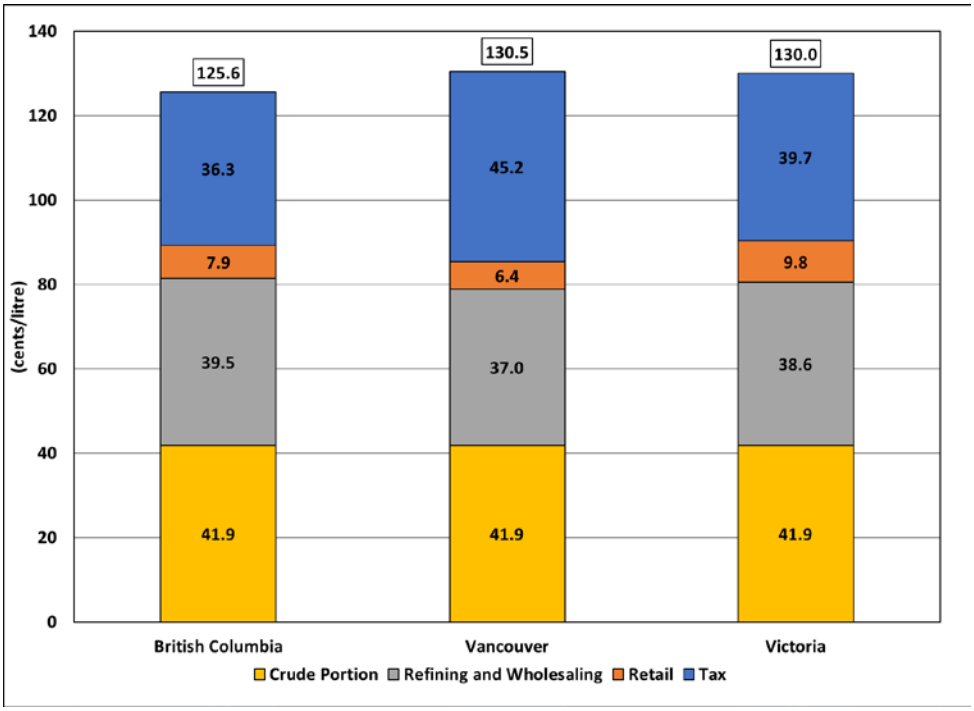
[47] Kent Group Ltd. – Methodology Notes, available at http://www.kentgroupltd.com/methodology-notes/.

Figure 11
Average Retail Price Percentage Breakdown for Regular Gasoline in British Columbia
Q1 2019



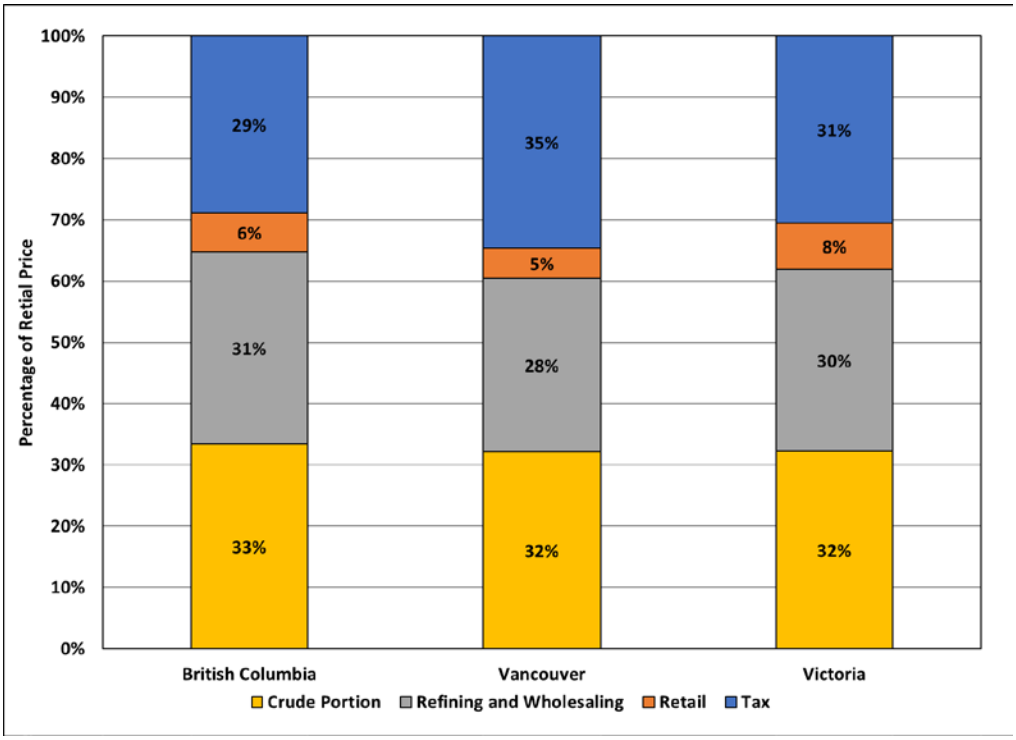
Source: Kent Petroleum Price Data, Kent Group Ltd., available at https://charting.kentgroupltd.com/.

Figure 12
Average Retail Price Breakdown for Diesel in British Columbia
Q1 2019



Source: Kent Petroleum Price Data, Kent Group Ltd., available at https://charting.kentgroupltd.com/.

Figure 13
Average Retail Price Percentage Breakdown for Diesel in British Columbia
Q1 2019



Source: Kent Petroleum Price Data, Kent Group Ltd., available at https://charting.kentgroupltd.com/.

B. Question (2): How does the market for gasoline and diesel in British Columbia differ from that in other parts of Canada and North America?

46. British Columbia differs from other, lower-priced regions in Canada and the U.S. in a number of ways. Key differences include: 1) British Columbia has relatively low refining capacity relative to demand; 2) due to its geography and limited pipeline access, it is relatively expensive to ship refined products to the province; 3) British Columbia has specific fuel standards that increase the cost of producing gasoline and diesel; and 4) British Columbia has relatively high fuel taxes.

British Columbia Refining Capacity and Demand

47. Among the provinces that have refineries,[48] British Columbia has the lowest amount of local refining capacity at 67,000 b/d. This is roughly half of the capacity of the province with the next lowest capacity (Newfoundland and Labrador – 130,000 b/d).[49] The result of a relatively high population (demand) coupled with a relatively low level of refining capacity (supply) is that British Columbia is only able to supply internally about 30 percent of its refined product needs.[50] The province has two refineries: Burnaby with a capacity of 55 kb/d and Prince George with a capacity of 12 kb/d, with Burnaby supplying about 25 percent of the demand in the province[51] and Prince George supplying the balance of local production. Price George output is supplied primarily in the central and northern parts of the province.[52]

48. British Columbia's refining capacity is relatively low compared to its population. **Figure 14** shows British Columbia's share of refining capacity compared to its share of population, and **Table 7** displays this in terms of refining capacity per capita. British Columbia only has 3.5 percent of Canada's refining capacity, but has 13.5 percent of the population. It has the lowest refining capacity per capita among the provinces with domestic refining capacity. Though not perfectly correlated, all else equal, a larger population is generally indicative of a greater demand for gasoline and diesel fuels.

[48] Nova Scotia, Manitoba, Prince Edward Island, Yukon, Nunavut, and Northwestern Territories are the territories and provinces that do not have local refinery capacity.

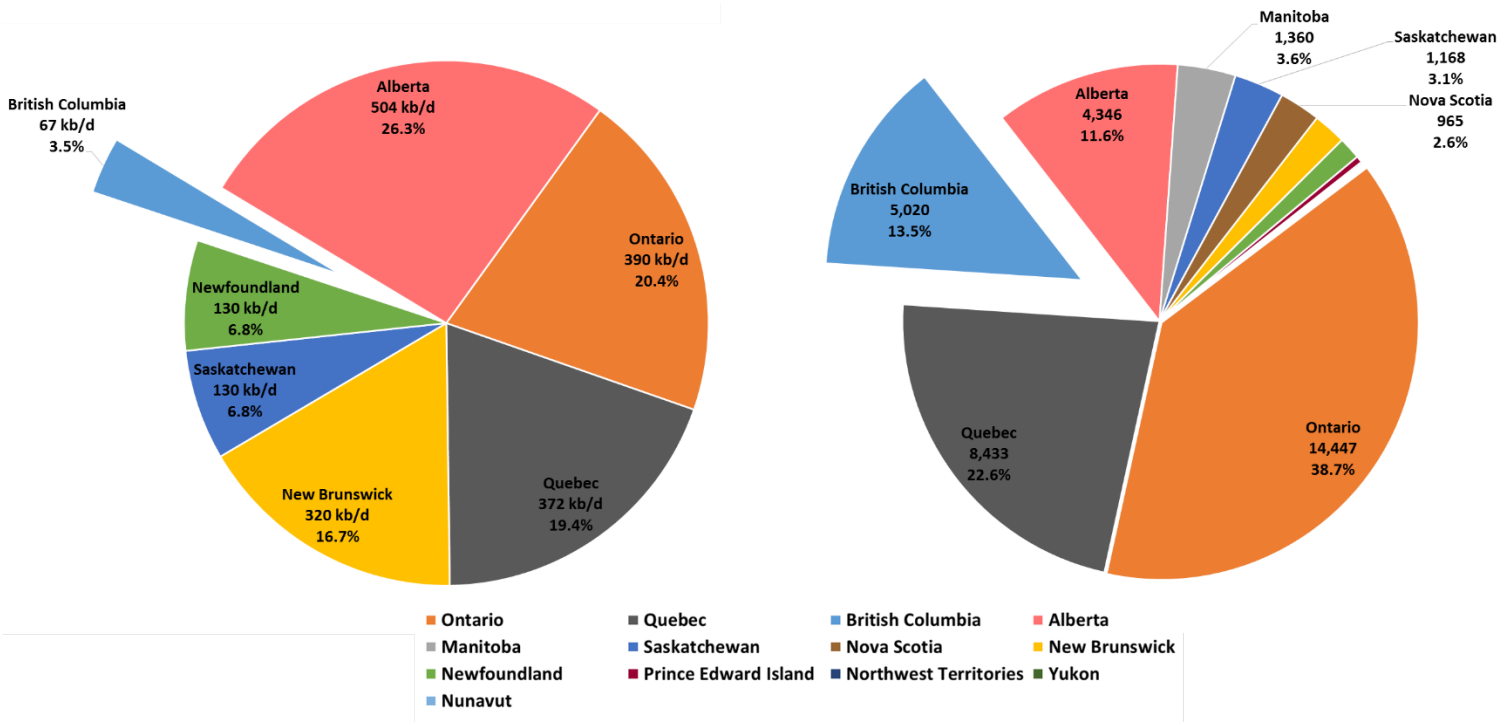
[49] Canadian Fuels Association – The Fuels Industry Fuel Production, available at https://www.canadianfuels.ca/The-Fuels-Industry/Fuel-Production/.

[50] Refined products in this case primarily refers to transportation fuels, *i.e.,* gasoline and diesel. "Retail Gasoline and Diesel Prices in the First Quarter of 2018 were at their Highest Levels since the end of 2014," Kent Group Ltd., Q1 2018, available at https://www.kentgroupltd.com/wp-content/uploads/2018/04/March_2018_Eng-1.pdf.

[51] "Five years in the making: a full mechanical shut-down of Burnaby Refinery," Canadian Fuels Association, April 12, 2018, available at https://www.canadianfuels.ca/Blog/April-2018/Five-years-in-the-making-a-full-mechanical-shut-down-of-Burnaby-Refinery/; "Parkland Burnaby Refinery Five-Year Outlook," Parkland Fuel Corporation, February 13, 2019, available at http://www.parklandcap.ca/wp/wp-content/uploads/2019/03/Attachment-One_Parkland-Presentation_Feb_2019.pdf.

[52] "RE: BC Low Carbon Fuels Compliance Pathway Assessment," Husky Energy, January 5, 2018, available at https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/electricity-alternative-energy/transportation/renewable-low-carbon-fuels/husky_energy_inc_-_response_to_bc_lcf_compliance_pathway_assessment_2017pdf_1_mb.pdf.

Figure 14
Refining Capacity and Population By Province



Notes: 1) Nova Scotia, Manitoba, Prince Edward Island, Yukon, Nunavut and Northwest Territories do not have any local refining capacity. 2) Population is based on Q1 2019 estimates and is in thousands.

Sources: "Crude Oil Forecast, Markets and Transportation," Canadian Association of Petroleum Producers, 2019, pp. 14-15, available at https://www.capp.ca/publications-and-statistics/crude-oil-forecast; Statistics Canada – Population estimates, quarterly, available at https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=1710000901#timeframe.

Table 7
Refining Capacity Per Capita By Province

Province	Population (Thousands)	Refining Capacity (b/d)	Refining Capacity Per 1,000 Population
New Brunswick	772	320,000	414.46
Newfoundland	524	130,000	248.19
Alberta	4,346	504,000	115.98
Saskatchewan	1,168	130,000	111.26
Quebec	8,433	372,000	44.11
Ontario	14,447	390,000	27.00
British Columbia	**5,020**	**67,000**	**13.35**
Manitoba	1,360	-	-
Nova Scotia	965	-	-
Prince Edward Island	155	-	-
Northwest Territories	45	-	-
Yukon	40	-	-
Nunavut	39	-	-

Notes: 1) Nova Scotia, Manitoba, Prince Edward Island, Yukon, Nunavut and Northwest Territories do not have any local refining capacity. 2) Population is based on Q1 2019 estimates.

Sources: "Crude Oil Forecast, Markets and Transportation," Canadian Association of Petroleum Producers, 2019, pp. 14-15, available at https://www.capp.ca/publications-and-statistics/crude-oil-forecast; Statistics Canada – Population estimates, quarterly, available at https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=1710000901#timeframe.

British Columbia Geography and Limited Pipeline Access

49. The bulk of the remaining demand for refined fuels in British Columbia is supplied by refineries in Alberta. Most of the refined products shipped to British Columbia from Alberta are transported via the Trans Mountain Pipeline, with the remaining volume coming into the province via truck or rail.[53]

50. The Trans Mountain Pipeline is the least expensive mode for British Columbia to receive refined products from Alberta.[54] There is limited capacity available on the pipeline,

[53] The writer of this article is quoting information received from the Canadian Fuels Association. Knox, Jack, "The great pipeline debate: Why isn't more oil refined in B.C.?" *Time Colonist*, April 29, 2018, available at https://www.timescolonist.com/news/local/the-great-pipeline-debate-why-isn-t-more-oil-refined-in-b-c-1.23284624. Parkland Burnaby Refinery Five-Year Outlook," Parkland Fuel Corporation, February 13, 2019, available at http://www.parklandcap.ca/wp/wp-content/uploads/2019/03/Attachment-One_Parkland-Presentation_Feb_2019.pdf.

[54] Affidavit of Michael J. Rensing, Director of the Low Carbon Fuels Branch in the Electricity and Alternative Energy Division of the British Columbia Ministry of Energy, Mines and Petroleum Resources, Court of Queen's Bench of

however, and competition for this limited capacity arises between the demand for refined fuels in British Columbia and the demand for crude oil in the Pacific Northwest, both of which rely on the same pipeline for transport.[55] Though not entirely dependent on the pipeline for crude oil, refineries in the Pacific Northwest will often take advantage of pipeline capacity when price differentials for Canadian crude are favorable. This increases the demand for pipeline space. Some crude transported via the Trans Mountain Pipeline is shipped to Asia through the Westridge Marine Terminal.[56]

51. For the past several years, Trans Mountain has been operating near or at capacity, with refined fuels for British Columbia making up only a relatively small amount of the products transported. The result of refined product competition with crude oil for space on Trans Mountain is that the transport of refined fuels into British Columbia is relatively more expensive than it would otherwise be.[57] Any refined fuels shipped from Alberta that cannot be allocated pipeline capacity are essentially required to be transported via truck or rail. On a per barrel basis, both of these are significantly more expensive than transport via pipeline at tariff rates.[58]

52. **Figure 15** provides a breakdown of 2018 Trans Mountain Pipeline shipments by product type measured in terms of average throughput per day. Refined products represented only 9.6 percent of average daily throughput on the pipeline. **Figure 16** provides the percent of total estimated capacity used on Trans Mountain Pipeline over time and the percent of throughput allocated to refined products. The percent of throughput allocated to refined products has generally trended downward in the past few years. Finally, **Figure 17** provides quarterly throughput allocated to refined products on Trans Mountain Pipeline since the start of 2015. It also shows the simple linear time trend in these data.

Alberta No. 1901-06115, April 11, 2019, p. 5, available at https://twitter.com/richardzussman/status/1123657044031037440.

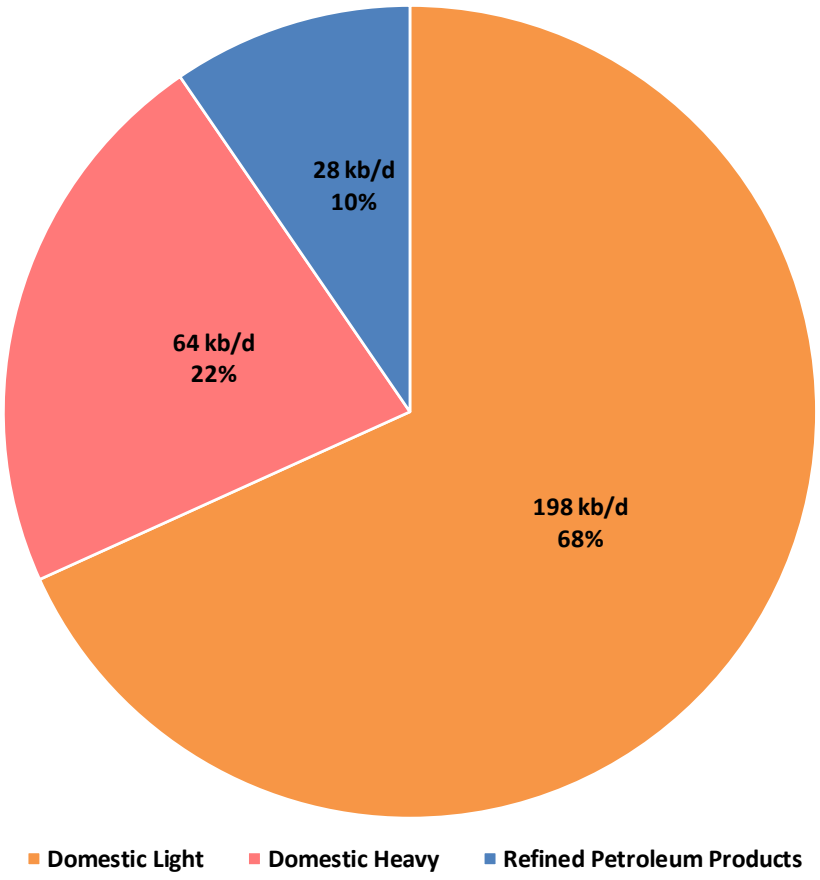
[55] "Pipeline Profiles: Trans Mountain," National Energy Board, September 2018, available at https://www.neb-one.gc.ca/nrg/ntgrtd/pplnprtl/pplnprfls/crdl/trnsmntn-eng.html?=undefined&wbdisable=true.

[56] Bennett, Nelson, "Crude exports via Vancouver totaled $1.4 billion last year," *Business in Vancouver*, June 13, 2019, available at https://biv.com/article/2019/06/crude-exports-vancouver-totalled-14-billion-last-year.

[57] Michael Ervin Senior Vice President of Kent Group, a downstream petroleum industry research and consulting firm, estimates the capacity constraints of the Trans Mountain pipeline can add as much as "$0.10 per litre to the wholesale price of gasoline in B.C." Bennet, Nelson, "A reality check for John Horgan's refinery pitch," *Business in Vancouver*, May 8, 2018, available at https://biv.com/article/2018/05/reality-check-john-horgans-refinery-pitch.

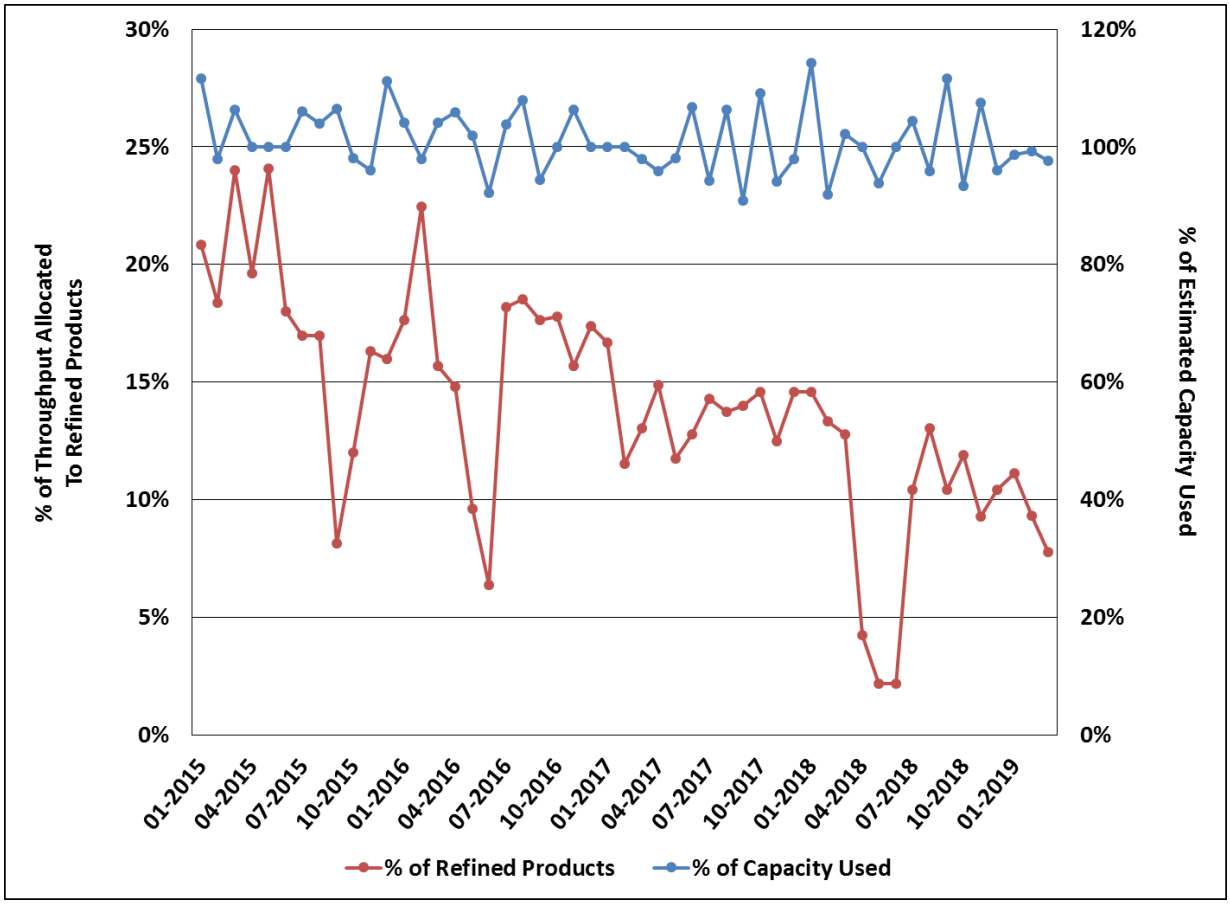
[58] Affidavit of Michael J. Rensing, Director of the Low Carbon Fuels Branch in the Electricity and Alternative Energy Division of the British Columbia Ministry of Energy, Mines and Petroleum Resources, Court of Queen's Bench of Alberta No. 1901-06115, April 11, 2019, pp. 4 and 5, available at https://twitter.com/richardzussman/status/1123657044031037440.

Figure 15
Trans Mountain Pipeline Usage by Product Type
2018 Annual Average (kb/d)



Sources: Government of Canada – Pipeline Throughput and Capacity Data - Trans Mountain Pipeline, available at https://open.canada.ca/data/en/dataset/dc343c43-a592-4a27-8ee7-c77df56afb34**; "**Pipeline Profiles: Trans Mountain," National Energy Board, September 2018, available at https://www.neb-one.gc.ca/nrg/ntgrtd/pplnprtl/pplnprfls/crdl/trnsmntn-eng.html?=undefined&wbdisable=true.

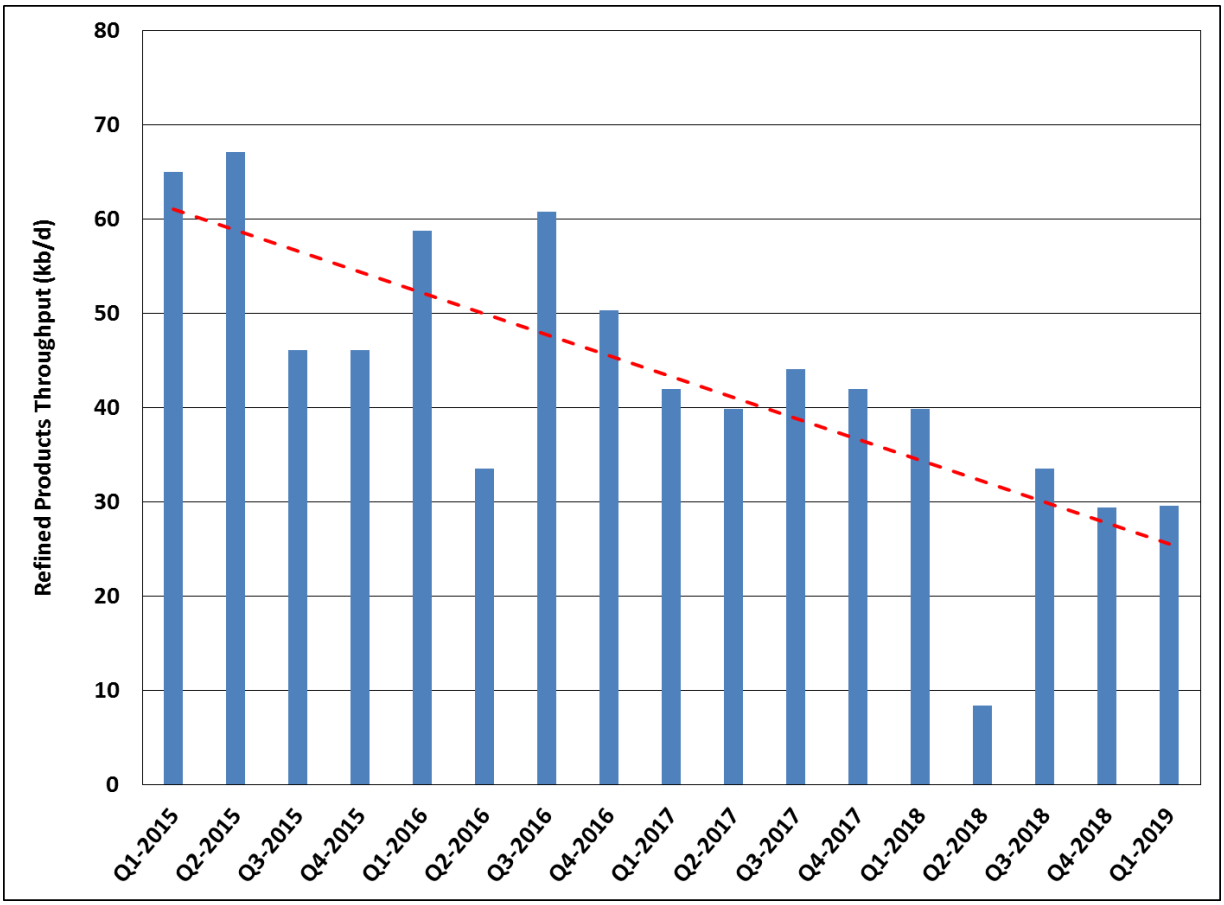
Figure 16
Trans Mountain Pipeline Percentage of Throughput Allocated to Refined Products and Percentage of Estimated Capacity Used
2015 - 2019



Note: As explained on the National Energy Board's website: "The physical capacity of a pipeline is based on many factors such as the products being carried, direction of flow, pipeline pumping capacity, and maintenance work or other pressure restrictions. The actual physical capacity of the pipeline may, at times, be higher than the assumed operational capacity stated here."

Sources: Government of Canada – Pipeline Throughput and Capacity Data - Trans Mountain Pipeline, available at https://open.canada.ca/data/en/dataset/dc343c43-a592-4a27-8ee7-c77df56afb34; "Pipeline Profiles: Trans Mountain," National Energy Board, September 2018, available at https://www.neb-one.gc.ca/nrg/ntgrtd/pplnprtl/pplnprfls/crdl/trnsmntn-eng.html?=undefined&wbdisable=true.

Figure 17
Trans Mountain Pipeline Average Quarterly Throughput Allocated to Refined Products
2015 – 2019



Note: The red dashed line is a simple linear trend line across all data points.

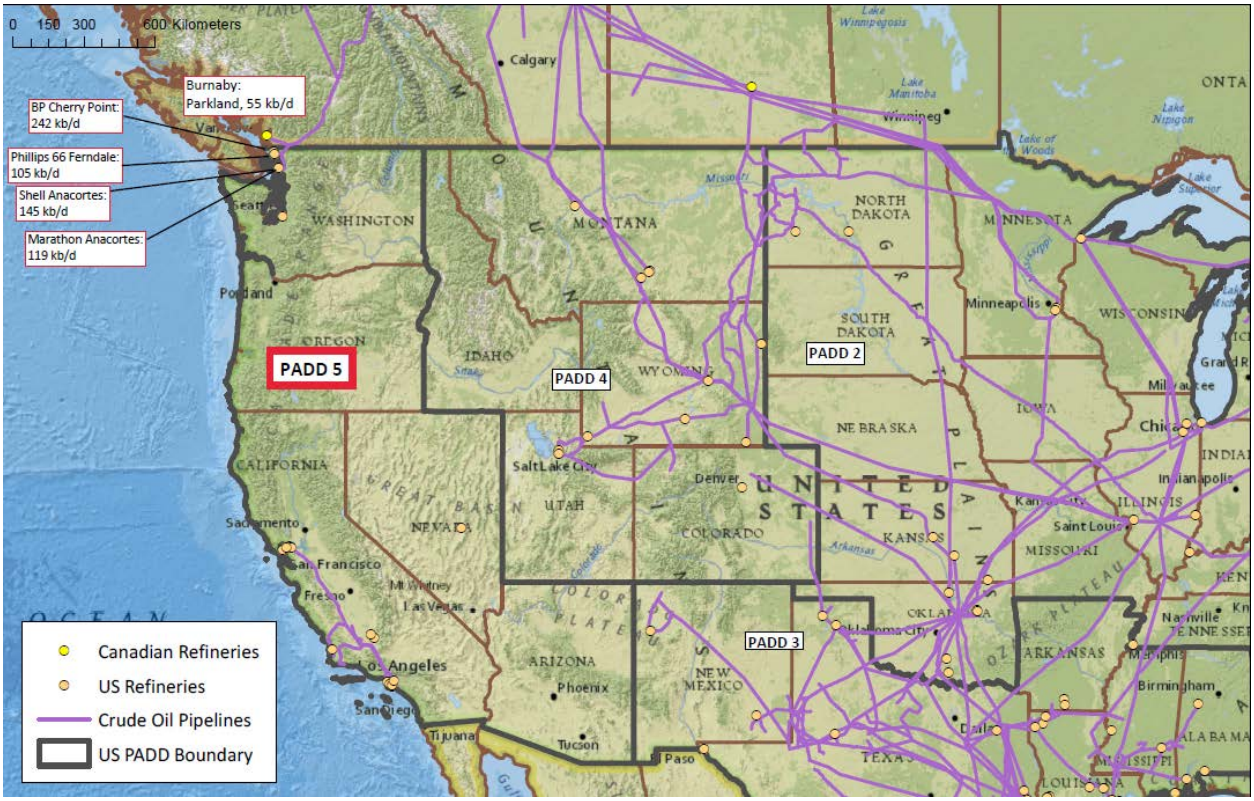
Sources: Government of Canada – Pipeline Throughput and Capacity Data - Trans Mountain Pipeline, available at https://open.canada.ca/data/en/dataset/dc343c43-a592-4a27-8ee7-c77df56afb34; "Pipeline Profiles: Trans Mountain," National Energy Board, September 2018, available at https://www.neb-one.gc.ca/nrg/ntgrtd/pplnprtl/pplnprfls/crdl/trnsmntn-eng.html?=undefined&wbdisable=true.

53. Supply gaps that cannot be filled with product from Alberta are filled by imported products. The majority of these imports typically come from the US West Coast (PADD 5).[59] PADD 5 is an expensive source for imported gasoline and diesel because "[t]he region

[59] The US Government organizes the United States into 5 different "PADD" regions which are used to track the flow of crude oil and petroleum products across the US. PADD 5 refers to the West Coast United States, and is often the PADD British Columbia will import refined products from if needed. "Retail Gasoline and Diesel Prices in the First Quarter of 2018 were at their Highest Levels since the end of 2014.," Kent Group, Q1 2018, available at https://www.kentgroupltd.com/wp-content/uploads/2018/04/March_2018_Eng-1.pdf; "PADD regions enable regional analysis of petroleum product supply and movements," U.S. Energy Information Administration, February 7, 2012, available at https://www.eia.gov/todayinenergy/detail.php?id=4890.

is geographically isolated from other U.S. refining centers"[60] meaning this region is heavily dependent on in-region refineries and is itself subject to under supply at times. This geographic isolation is primarily a result of the Rocky Mountains to the east and "only limited pipelines that deliver to PADD 5 from PADD 3 (Gulf Coast)."[61] **Figure 18** shows the locations of PADD 5 crude oil pipelines relative to central United States crude oil pipelines, and **Figure 19** shows the locations of PADD 5 refined products pipelines relative to central United States refined product pipelines. **Figures 20** and **21** are zoomed in versions of **Figures 18** and **19** that are focused on Washington State and Southern British Columbia.

Figure 18
Relative Isolation of PADD 5: Crude Oil Pipelines



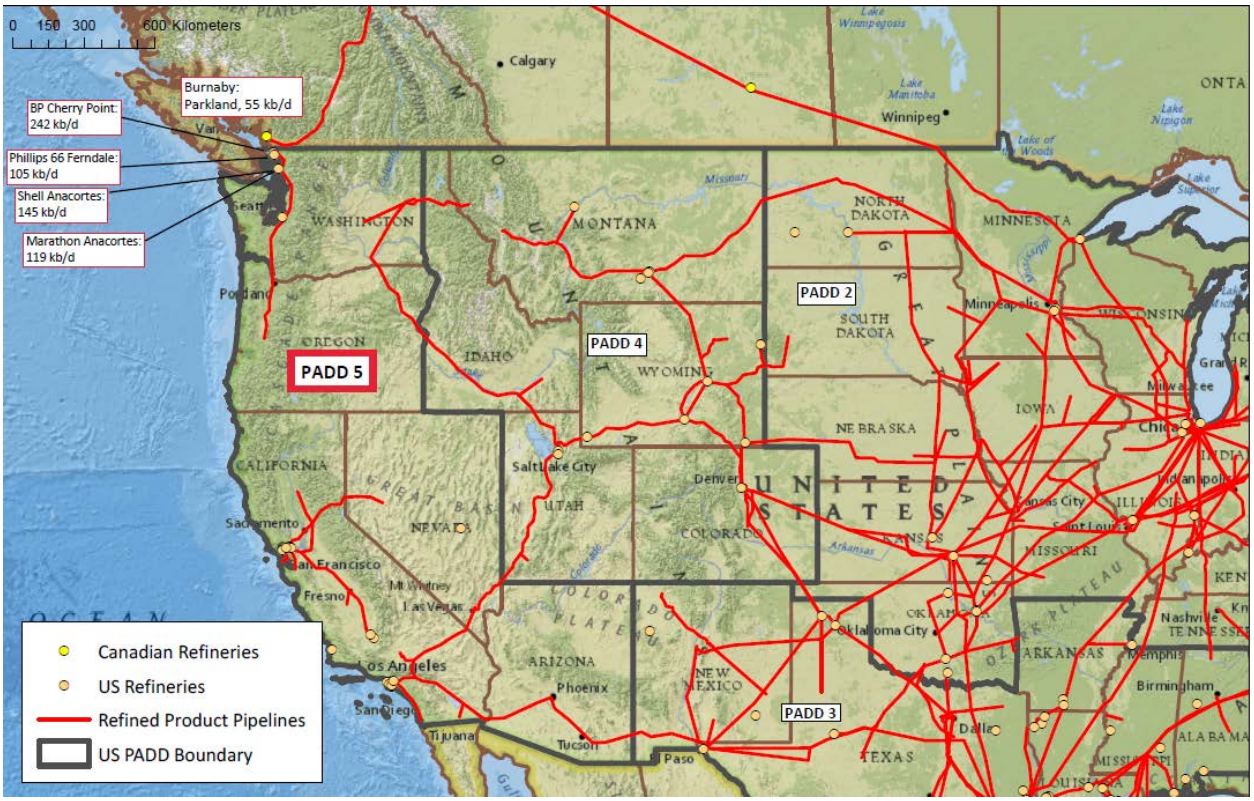
Source: "Crude Oil Forecast, Markets and Transportation," Canadian Association of Petroleum Producers, 2019, p. 14, available at https://www.capp.ca/publications-and-statistics/crude-oil-forecast; "Petroleum Refineries," EIA, available at https://www.eia.gov/maps/layer_info-m.php; "Crude Oil Pipelines, " EIA, available at https://www.eia.gov/maps/layer_info-m.php; "Crude Oil Forecast, Markets and Transportation," Canadian Association of Petroleum Producers, 2019, p. 40, available at https://www.capp.ca/publications-and-statistics/crude-oil-forecast; "Petroleum Administration for Defense Districts (PADD)," EIA, available at https://www.eia.gov/maps/layer_info-m.php; North America Political Boundaries, USGS, available at https://www.sciencebase.gov/catalog/item/4fb555ebe4b04cb937751db9; National Geographic World

[60] "PADD 5 Transportation Fuels Markets," U.S. Energy Information Administration, September 2015, p. 3.

[61] "PADD 5 Transportation Fuels Markets," U.S. Energy Information Administration, September 2015, p. 3.

Map, Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, iPC.

Figure 19
Relative Isolation of PADD 5: Refined Products Pipelines



Source: "Crude Oil Forecast, Markets and Transportation," Canadian Association of Petroleum Producers, 2019, p. 14, available at https://www.capp.ca/publications-and-statistics/crude-oil-forecast; "Petroleum Refineries," EIA, available at https://www.eia.gov/maps/layer_info-m.php; "Petroleum Product Pipelines," EIA, available at https://www.eia.gov/maps/layer_info-m.php; "Petroleum Administration for Defense Districts (PADD)," EIA, available at https://www.eia.gov/maps/layer_info-m.php; North America Political Boundaries, USGS, available at https://www.sciencebase.gov/catalog/item/4fb555ebe4b04cb937751db9; National Geographic World Map, Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, iPC.

Figure 20
Washington State and Southern British Columbia Crude Oil Pipelines

Source: "Crude Oil Forecast, Markets and Transportation," Canadian Association of Petroleum Producers, 2019, p. 14, available at https://www.capp.ca/publications-and-statistics/crude-oil-forecast; "Petroleum Refineries," EIA, available at https://www.eia.gov/maps/layer_info-m.php; "Crude Oil Pipelines, " EIA, available at https://www.eia.gov/maps/layer_info-m.php; "Crude Oil Forecast, Markets and Transportation," Canadian Association of Petroleum Producers, 2019, p. 40, available at https://www.capp.ca/publications-and-statistics/crude-oil-forecast; North America Political Boundaries, USGS, available at https://www.sciencebase.gov/catalog/item/4fb555ebe4b04cb937751db9; National Geographic World Map, Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, iPC.

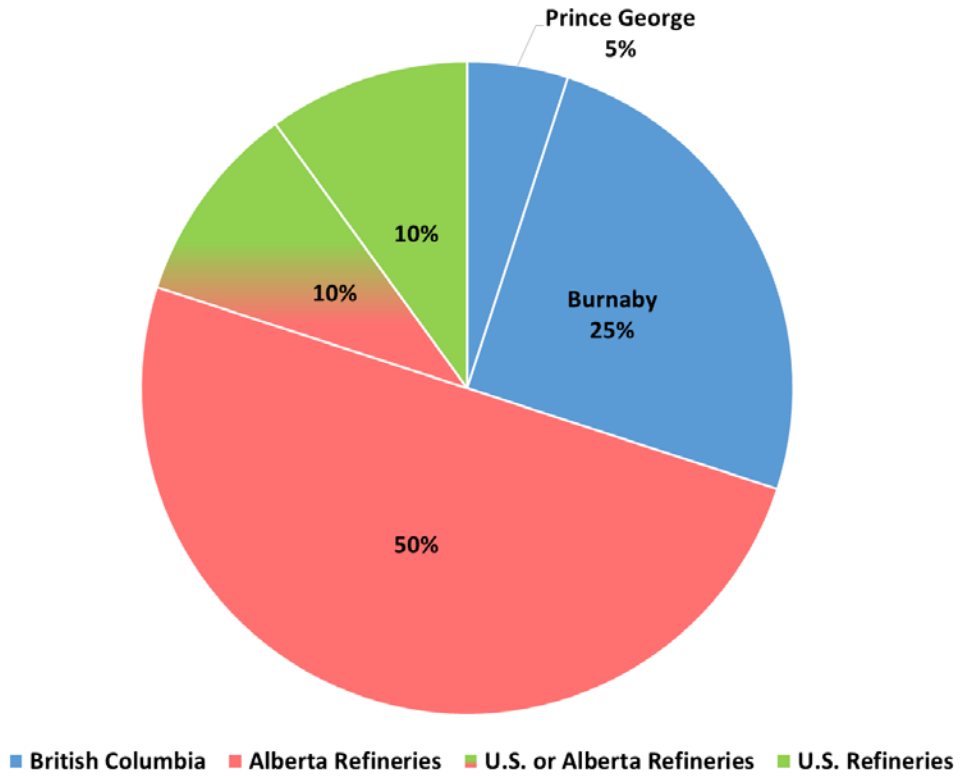
Figure 21
Washington State and Southern British Columbia Refined Products Pipelines

Source: "Crude Oil Forecast, Markets and Transportation," Canadian Association of Petroleum Producers, 2019, p. 14, available at https://www.capp.ca/publications-and-statistics/crude-oil-forecast; "Petroleum Refineries," EIA, available at https://www.eia.gov/maps/layer_info-m.php; "Petroleum Product Pipelines," EIA, available at https://www.eia.gov/maps/layer_info-m.php; North America Political Boundaries, USGS, available at https://www.sciencebase.gov/catalog/item/4fb555ebe4b04cb937751db9; National Geographic World Map, Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, iPC.

54. Roughly 10 percent to 15 percent[62] of the refined products used in British Columbia are sourced from PADD 5, particularly from the Washington refineries. **Figure 22** details the sources of refined products consumed in British Columbia.

[62] National Energy Board – Provincial and Territorial Energy Profiles British Columbia, available at https://www.neb-one.gc.ca/nrg/ntgrtd/mrkt/nrgsstmprfls/bc-eng.html; https://www.neb-one.gc.ca/nrg/ntgrtd/mrkt/nrgsstmprfls/bc-eng.html; Bennet, Nelson, "A reality check for John Horgan's refinery pitch," *Business in Vancouver*, May 8, 2018, available at https://biv.com/article/2018/05/reality-check-john-horgans-refinery-pitch; Pearson, Natalie Obiko and Robert Tuttle, "Vancouver Gasoline Hits $4.77 a Gallon, Tops in North America," *Bloomberg*, May 1, 2018, available at https://www.rigzone.com/news/wire/vancouver_gasoline_hits_477_a_gallon_tops_in_north_america-01-may-2018-154459-article/.

Figure 22
Estimated Percentage of Total British Columbia Refined Products Demand Supplied By Refinery Location



Sources: "Retail Gasoline and Diesel Prices in the First Quarter of 2018 were at their Highest Levels since the end of 2014," Kent Group, Q1 2018, available at https://www.kentgroupltd.com/wp-content/uploads/2018/04/March_2018_Eng-1.pdf**;** "Parkland Burnaby Refinery Five-Year Outlook," Parkland Fuel Corporation, February 13, 2019, available at http://www.parklandcap.ca/wp/wp-content/uploads/2019/03/Attachment-One_Parkland-Presentation_Feb_2019.pdf; Knox, Jack, "The great pipeline debate: Why isn't more oil refined in B.C.?" *Time Colonist*, April 29, 2018, available at https://www.timescolonist.com/news/local/the-great-pipeline-debate-why-isn-t-more-oil-refined-in-b-c-1.23284624; National Energy Board – Provincial and Territorial Energy Profiles – British Columbia, available at https://www.neb-one.gc.ca/nrg/ntgrtd/mrkt/nrgsstmprfls/bc-eng.html; Bennet, Nelson, "A reality check for John Horgan's refinery pitch," *Business in Vancouver*, May 8, 2018, available at https://biv.com/article/2018/05/reality-check-john-horgans-refinery-pitch; Pearson, Natalie Obiko and Robert Tuttle, "Vancouver Gasoline Hits $4.77 a Gallon, Tops in North America," *Bloomberg*, May 1, 2018, available at https://www.rigzone.com/news/wire/vancouver_gasoline_hits_477_a_gallon_tops_in_north_america-01-may-2018-154459-article/.

British Columbia Fuel Standards

55. In addition to the tight demand and supply dynamics for refined products in British Columbia, the province's Low Carbon Fuel Standard ("LCFS") and Alternative Fuel

Standard ("AFS") add compliance costs to the price of refined fuels.[63] The AFS and LCFS requirements are:[64]

> AFS: Fuel suppliers must ensure that they have a minimum renewable fuel content of five percent (5%) for gasoline and four percent (4%) for diesel, on a provincial annual average basis.[65]
>
> LCFS: Fuel suppliers must progressively decrease the average carbon intensity of their fuels to achieve a 10% reduction in 2020 relative to 2010.[66]

56. The AFS requirements add costs for fuel producers in the form of needing to blend renewable fuels (*i.e.,* ethanol or biomass-based diesel) into the conventional fuels they produce. British Columbia's AFS requirements are more stringent and require the use of more renewable fuels than the policies in some other provinces but are less stringent than the requirements in other provinces. As shown in **Table 8**, provinces like Ontario and Alberta have also instituted some form of AFS requirement since at least the late 2000s. In addition to the provincial AFS requirements, the Government of Canada has also instituted federal regulation which, similar to the provincial regulation, specifies "an average renewable fuel content of at least 5% [for] gasoline" and "2% [for] diesel fuel and

[63] The framework for British Columbia's LCFS and AFS are derived from the combination of the "Greenhouse Gas Reduction (Renewable & Low Carbon Fuel Requirements) Act" and, corresponding regulatory legislation, "Renewable & Low Carbon Fuel Requirements Regulation" which were ratified in 2008, but did not go into effect until January 1, 2010. "Greenhouse Gas Reduction (Renewable & Low Carbon Fuel Requirements) Act," Government of British Columbia, May 1, 2008, available at http://www.bclaws.ca/civix/document/id/complete/statreg/08016_01; "Renewable & Low Carbon Fuel Requirements Regulation," Government of British Columbia, December 9, 2008, available at http://www.bclaws.ca/civix/document/id/complete/statreg/394_2008.

[64] Some components of the act and regulatory legislation have been updated since their ratification, these key parts still remain in effect as of 2019. Additionally, though not formally part of the act, the Government of British Columbia recently released a Climate Action Plan called "Clean BC," which sets a target increasing the "Low Carbon Fuel Standard to 20% by 2030." "Clean BC," Government of British Columbia, 2018, p. 23, available at https://www2.gov.bc.ca/assets/gov/environment/climate-change/action/cleanbc/cleanbc_2018-bc-climate-strategy.pdf.

[65] Government of British Columbia – Renewable & Low Carbon Fuel Requirements Regulation, available at https://www2.gov.bc.ca/gov/content/industry/electricity-alternative-energy/transportation-energies/renewable-low-carbon-fuels.

[66] Government of British Columbia – Renewable & Low Carbon Fuel Requirements Regulation, available at https://www2.gov.bc.ca/gov/content/industry/electricity-alternative-energy/transportation-energies/renewable-low-carbon-fuels.

heating distillate oil[.]"[67] In addition, several U.S. states have AFS requirements (Hawaii, Washington, Oregon, Minnesota, Missouri, Louisiana, and Pennsylvania).[68]

Table 8
Provincial AFS Requirements For Diesel and Gasoline Fuel

Province	Provincial Regulation	Regulation Effective Date
Alberta	Gasoline: 5% Diesel: 2%	2011
British Columbia	Gasoline: 5% Diesel: 4%	2010 & 2011
Manitoba	Gasoline: 8.5% Diesel: 2%	2008 & 2009
Newfoundland	No Regulation	n/a
New Brunswick	No Regulation	n/a
Nova Scotia	No Regulation	n/a
Ontario	Gasoline: 5% Diesel: 4%	2007 & 2014
Prince Edward Island	No Regulation	n/a
Quebec	No Regulation	n/a
Saskatchewan	Gasoline: 7.5% Diesel: 2%	2007 & 2012

Note: Percentages refer to the percent of renewable fuel a given fuel must contain.

Sources: "Canada – Biofuels," USDA Foreign Agricultural Service, April 6, 2018, Table 1, available at https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Biofuels%20Annual_Ottawa_Canada_4-6-2018.pdf; "Renewable Fuels Regulations Report," Environment and Climate Change Canada, June 2016, pp. 38-39, available at http://publications.gc.ca/collections/collection_2016/eccc/En14-244-2016-eng.pdf; "Renewable & Low Carbon Fuel Requirements Regulation," Government of British Columbia, available at https://www2.gov.bc.ca/gov/content/industry/electricity-alternative-energy/transportation-energies/renewable-low-carbon-fuels.

[67] Government of Canada – Renewable fuel regulations, available at https://www.canada.ca/en/environment-climate-change/services/managing-pollution/energy-production/fuel-regulations/renewable.html.

[68] The U.S. Federal Government also has a "Renewable Fuel Standard" requirement, which is similar to an AFS. It requires a minimum volume of renewable fuels be used in transportation fuels. "Overview for Renewable Fuel Standard," U.S. Environmental Protection Agency, available at https://www.epa.gov/renewable-fuel-standard-program/overview-renewable-fuel-standard.

57. **Table 9** shows British Columbia's LCFS policy is currently the only one of its kind in effect in Canada, although the federal government is currently considering a similar nationwide policy. At this point, the federal government has conducted a cost-benefit analysis of the policy and is currently in the process of collecting consultations with regard to the design of the policy. British Columbia, however, is not the only jurisdiction to have an LCFS in place in North America; California and Oregon have similar policies.

Table 9
Provincial LCFS Requirements
Carbon Intensity Reductions for Fuel

Province	Provincial Regulation	Regulation Effective Date
Alberta	n/a	n/a
British Columbia	10% reduction in 2020 relative to 2010	2010
Manitoba	n/a	n/a
Newfoundland	n/a	n/a
New Brunswick	n/a	n/a
Nova Scotia	n/a	n/a
Ontario	n/a	n/a
Prince Edward Island	n/a	n/a
Quebec	n/a	n/a
Saskatchewan	n/a	n/a

Source: Ervin, Michael J. "Introduction to the Downstream Petroleum Industry - Presentation to the British Columbia Utilities Commission," BCUC Inquiry into Gasoline and Diesel, June 20, 2019, Exhibit A2-3, Slide 53.

58. In sum, British Columbia, California, Washington, and Oregon all have some form of an LCFS, AFS, or combination policy with regard to refined fuels,[69] and, as noted previously,

[69] The legislative analyst's office of the Government of California estimated that the Low Carbon Fuel Standard alone added roughly an additional 4 cents (CAD) a litre for gasoline without ethanol in 2018. "Assessing California's

California, Oregon, and Washington are all located in the geographically isolated PADD 5. California has additional formulation requirements for gasoline[70] that are specific enough so that only a few refineries outside California actually produce this type of fuel.[71] California, Oregon, Washington, and British Columbia have some of the highest fuel prices in North America.[72] However, because Washington has ample refining capacity and Oregon has direct pipeline access to these refineries, both have more flexibility and generally lower prices than California or British Columbia. Washington is not short capacity, unlike British Columbia.[73] California, on the other hand, despite having substantial refinery capacity, does not always produce enough gasoline to meet the state's demand and, like British Columbia, is sometimes reliant on out of state refined products especially when unplanned refinery outages occur.[74] Also similar to British Columbia, California relies on ship and truck delivery for any additionally needed volumes primarily because there are no inbound, interstate refined product pipelines connecting California to out-of-state refineries.[75] The combination of these factors results in California having the highest fuel prices in the U.S., even when compared to other non-conterminous PADD 5 states (*i.e.,* Hawaii and Alaska).[76] **Figures 23 – 25** summarize pricing information for British Columbia, other Canadian provinces, and selected U.S. states.

Climate Policies—Transportation," Legislative Analyst – Government of California, December 2018, available at https://lao.ca.gov/reports/2018/3912/climate-policies-transportation-122118.pdf; "Low Carbon and Alternative Fuel Standard," Center for Climate and Energy Solutions, available at https://www.c2es.org/document/low-carbon-fuel-standard/; "Foreign Exchange Rates - G.5A," Board of Governors of the Federal Reserve System, January 2, 2019, available at https://www.federalreserve.gov/releases/g5a/current/.

[70] "California Reformulated Gasoline Program," California Air Resources Board, May 31, 2018, available at https://www.arb.ca.gov/fuels/gasoline/gasoline.htm.

[71] Cowan, Jill, "Why Gas Prices Are Spiking," *The New York Times*, April 16, 2019, available at https://www.nytimes.com/2019/04/16/us/california-gas-prices-spiking.html.

[72] GasBuddy – Gas Price Map, available at https://www.gasbuddy.com/GasPriceMap?z=5&lng=-110.3464708125&lat=41.975640255866765.

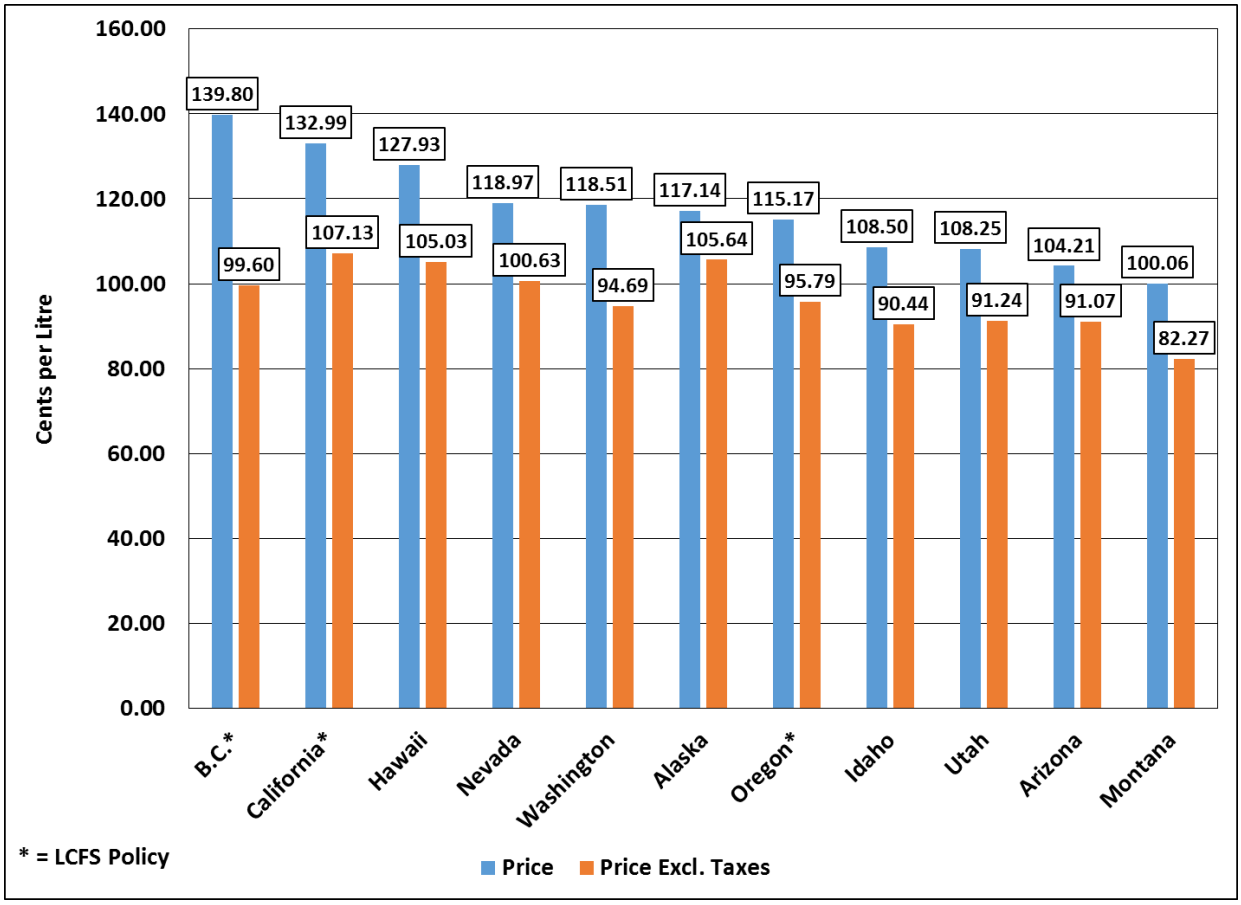
[73] For example, in 2013 the U.S. Energy Information Administration calculated that the production of gasoline in Oregon and Washington was "sufficient to meet 102% of regional demand[.]" "West Coast Transportation Fuels Markets," U.S. Energy Information Administration," September 2015, p. 9, available at https://www.eia.gov/analysis/transportationfuels/padd5/pdf/transportation_fuels.pdf.

[74] "West Coast Transportation Fuels Markets," U.S. Energy Information Administration, September 2015, p. 9, available at https://www.eia.gov/analysis/transportationfuels/padd5/pdf/transportation_fuels.pdf; "Western Regional Emergency Fuel Coordination Meeting," State of California Energy Commission, September 29, 2016, available at https://www.naseo.org/Data/Sites/1/schremp-1.pdf.

[75] Wald, Ellen R., "California Is Approaching $4 Gasoline, But It Has Only Itself To Blame," *Forbes*, September 28, 2018, available at https://www.forbes.com/sites/ellenrwald/2018/09/28/california-is-approaching-4-gasoline-but-it-has-only-itself-to-blame/#474dcd41a7a0.

[76] GasBuddy – Average Regular Gas Price by State - US, available at https://www.gasbuddy.com/USA.

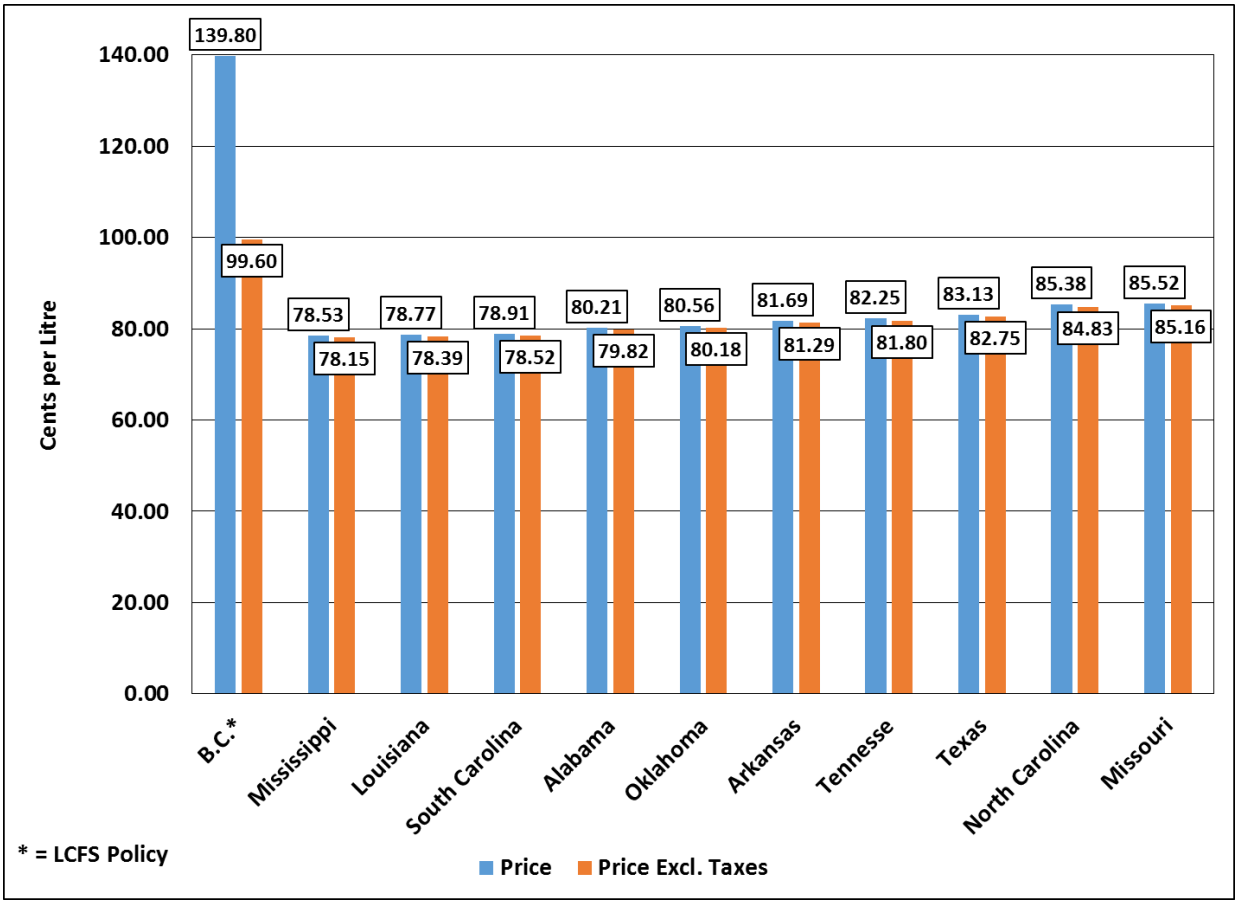
Figure 23
U.S. States with the Highest Average Prices for Regular Gasoline
2019



Notes: 1) A conversion rate of 1.33 CAD per USD has been used to convert these prices. This represents the 2019 average conversion rate year to date. 2) British Columbia has been included in this table for comparison purposes. 3) U.S. taxes include local, state and federal taxes. 4) Canada taxes include federal excise/sales, provincial excise/sales, transit and carbon taxes. 5) Prices are year to date as of June 17, 2019. 6) Prices are in Canadian dollars.

Sources: GasBuddy – Average Regular Gas Price by State - US, available at https://www.gasbuddy.com/USA; GasBuddy – Average Regular Gas Price by Province - Canada, available at https://www.gasbuddy.com/CAN; "Canada / U.S. Foreign Exchange Rate," FRED Economic Research, available at https://fred.stlouisfed.org/series/DEXCAUS; "Motor Fuels Taxes State Gasoline Tax Reports," American Petroleum Institute, April 2019, available at https://www.api.org/oil-and-natural-gas/consumer-information/motor-fuel-taxes; "Gas Tax Honesty Day Report," Canadian Taxpayers Federation, May 2019, available at http://www.taxpayer.com/media/2019-GTHD-EN.pdf.

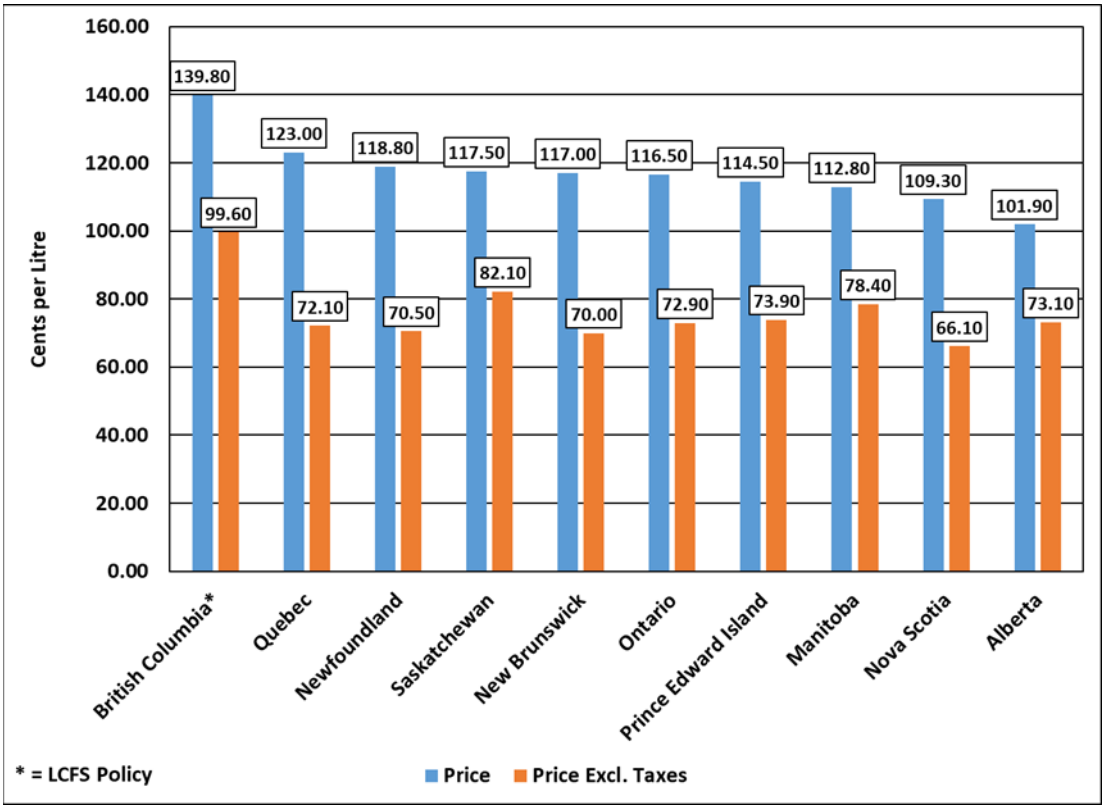
Figure 24
U.S. States with the Lowest Average Prices for Regular Gasoline
2019



Notes: 1) A conversion rate of 1.33 CAD per USD has been used to convert these prices. This represents the 2019 average conversion rate year to date. 2) US taxes include local, state and federal taxes. 3) Prices are year to date as of June 17, 2019. 4) Prices are in Canadian dollars.

Sources: GasBuddy – Average Regular Gas Price by State - US, available at https://www.gasbuddy.com/USA; GasBuddy – Average Regular Gas Price by Province - Canada, available at https://www.gasbuddy.com/CAN; "Canada / U.S. Foreign Exchange Rate," FRED Economic Research, available at https://fred.stlouisfed.org/series/DEXCAUS; "Motor Fuels Taxes State Gasoline Tax Reports," American Petroleum Institute, April 2019, available at https://www.api.org/oil-and-natural-gas/consumer-information/motor-fuel-taxes.

Figure 25
Average Prices for Regular Gasoline by Province
2019



Notes: 1) Canada taxes include federal excise/sales, provincial excise/sales, transit and carbon taxes. 2) Northwest Territories is not included since the Canadian Taxpayers Federation does not report taxes for this province. 3) Prices are year to date as of June 17, 2019.

Sources: GasBuddy – Average Regular Gas Price by Province - Canada, available at https://www.gasbuddy.com/CAN; "Gas Tax Honesty Day Report," Canadian Taxpayers Federation, May 2019, available at http://www.taxpayer.com/media/2019-GTHD-EN.pdf.

59. The LCFS policy, independent of other economic factors, adds compliance costs in the short term for producers either in the form of having to obtain credits to compensate for non-compliance or from the need to blend regular fuel with lower carbon fuel to meet the specification.[77] In California and British Columbia the early experience with this policy has been that many refined fuel producers have been achieving compliance by blending

[77] Bennet, Nelson, "Gas pains on road to green gains in B.C.," *Business In Vancouver*, April 16, 2019, available at https://biv.com/article/2019/04/gas-pains-road-green-gains-bc.

traditional fuels with either ethanol (gasoline) or bio-diesel (diesel).[78] This is further reflected by the fact that the LCFS policies in both California and British Columbia have resulted in ethanol and bio-diesel generating most of the LCFS credits.[79] Though as LCFS standards have increased (as they are designed to do), this blending of fuels has become less feasible because fuel refiners eventually achieve what is referred to as the "blend wall."[80] The blend wall is an issue that occurs when gasoline is blended with more than 10% ethanol content (E10). Specifically, since many vehicles are not yet designed to use gasoline with higher ethanol content than E10, consumers can risk damage to their engine and fuel systems by using these fuels. For the supply side, this means that producing E15 (15% ethanol) or E85 (85% ethanol) in larger quantities is not a feasible option for refiners to achieve LCFS compliance.[81]

60. The result of producers' inability to achieve compliance via blending is that they must begin to trade credits or alter production processes in order to achieve compliance.[82] Both options are rather costly, especially in the absence of a fundamental change in consumer preferences that would result in an increased supply of credits (*e.g.,* more electric vehicle acceptance/infrastructure). In recent years, California's experience has been that the use of credits has started to exceed their generation.[83] Because California's credit system allows firms to save unused credits, this has resulted in some of these credits being drained from the overall surplus to achieve compliance. The effect of this

[78] Lade, Gabriel E. and C.-Y. Cynthia Lin, "A Report on the Economics of California's Low Carbon Fuel Standard and Cost Containment Mechanisms," Institute of Transportation Studies UC Davis, October 2013, p. 3; Davis, Benjamin, "Speed Bump Ahead: Ottawa Should Drive Slowly On Clean Fuel Standard," C.D. Howe Institute, July 19, 2018, p. 6.

[79] Davis, Benjamin, "Speed Bump Ahead: Ottawa Should Drive Slowly On Clean Fuel Standard," C.D. Howe Institute, July 19, 2018, p. 3; "2017/18 Review of BC-LCFS Compliance Pathways," British Columbia Ministry of Energy, Mines and Petroleum Resources, January 21, 2018, slide 8.

[80] Green, Mark, "Hitting The Wall On The RFS," American Petroleum Institute, March 25, 2016, available at https://www.api.org/news-policy-and-issues/blog/2016/03/25/hitting-the-wall-on-the-rfs.

[81] As of 2018 the Canadian Vehicle Manufacturers Association noted that only "12% of light duty gasoline vehicles in operation in Canada are certified to run on E15 blends, and 8% are certified to run on E85[.]" "2017/18 Review of BC-LCFS Compliance Pathways," British Columbia Ministry of Energy, Mines and Petroleum Resources, January 21, 2018, slide 29.

[82] Both Parkland and Husky (B.C. refinery operators) have noted that the Low Carbon Fuel Standard may adversely impact their B.C. refinery operations and, in Parklands case, may require purchasing credits. Parkland has also been exploring "Co-Processing" a crude oil refining process in which some of the feedstock (crude oil) is blended with bio-oils to achieve a lower carbon intensity fuel. "CRIN Co-processing Webinar Calgary," Parkland Refining, June 17, 2019; Parkland Fuel Corporation Annual Report 2017, p. 26; Husky Energy Annual Report 2018, p. 46.

[83] Fingerman, Kevin R., Colin Sheppard, and Andrew Harris, "California's Low Carbon Fuel Standard: Modeling financial least-cost pathways to compliance in Northwest California," *Transportation Research Part D*, Vol. 63, 2018, pp. 330-331.

has been a rather sharp increase in the price of credits.[84] An increase in the price of credits translates into increased marginal costs to any firm that need to purchase them. Economic theory predicts that marginal cost increases will result in increased prices, especially for products, like gasoline, that have inelastic demand.[85] In California, industry analysts have estimated that at least some of the higher cost of credits is being passed-on to consumers.[86] British Columbia's credit prices have, in some quarters, trended higher than California's.[87] See **Figure 26**. Higher credit prices are a direct reflection of higher compliance costs.

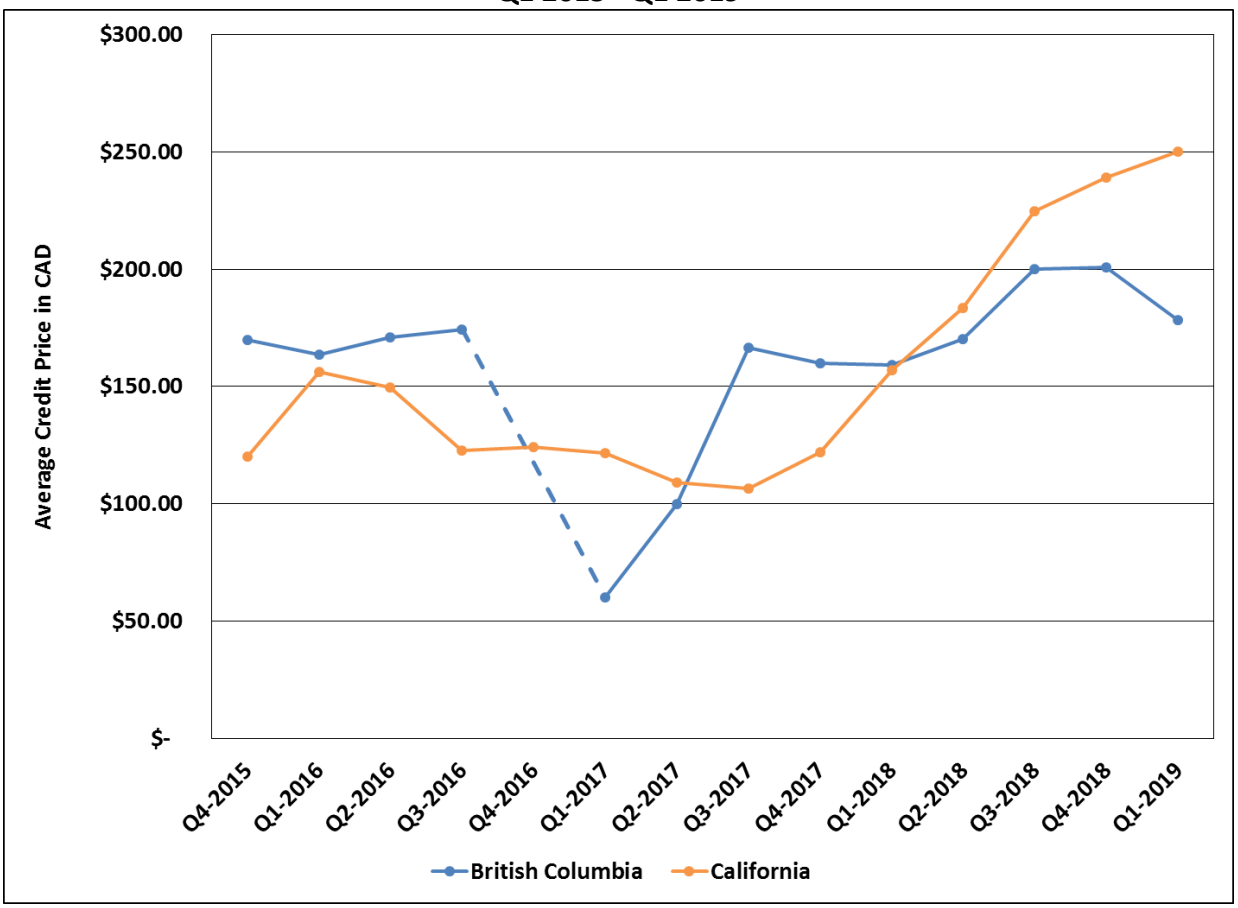
[84] Davis, Benjamin, "Speed Bump Ahead: Ottawa Should Drive Slowly On Clean Fuel Standard," C.D. Howe Institute, July 19, 2018, p. 8.

[85] Empirical studies have found that the demand for gasoline is inelastic. (*See*, for example, Chang, Dongfeng and Apostolos Serletis, "The Demand for Gasoline: Evidence from Household Survey Data," *Journal of Applied Econometrics*¸ Vol. 29, 2014, p. 291.) The more inelastic the demand for a product is, the less consumers are willing/able to switch to another product when faced with increasing prices. The result of this is that under normal market conditions an increase in marginal costs for suppliers will result in at least some increase in price because consumers do not have sufficiently good alternatives. (Gallo, Amy, "A Refresher on Price Elasticity," *Harvard Business Review*, August 21, 2015, available at https://hbr.org/2015/08/a-refresher-on-price-elasticity.)

[86] Noda, Leigh, "The LCFS Cost in Transportation Fuels – The Growing Hidden Tax," Stillwater Associates, June 7, 2017, available at https://stillwaterassociates.com/lcfs-cost-fuels-growing-hidden-tax/; Baker, David R., "California may tweak climate program that's pushing up gas prices," *The Seattle Times*, February 28, 2018, available at https://www.seattletimes.com/seattle-news/california-may-tweak-climate-program-thats-pushing-up-gas-prices/.

[87] Davis, Benjamin, "Speed Bump Ahead: Ottawa Should Drive Slowly On Clean Fuel Standard," C.D. Howe Institute, July 19, 2018, p. 8.

Figure 26
Average Quarterly LCFS Credit Prices in British Columbia and California
Q1 2015 - Q1 2019



Notes: 1) Both British Columbia's and California's credits trade on a per MT basis. 2) Data on average credit prices in Q4 2016 is unavailable for British Columbia. 3) Prices are in Canadian dollars.

Sources: "Canada / U.S. Foreign Exchange Rate," FRED Economic Research, available at https://fred.stlouisfed.org/series/DEXCAUS; "Monthly LCFS Credit Transfer Activity Reports," California Air Resources Board, available at https://www.arb.ca.gov/fuels/lcfs/credit/lrtmonthlycreditreports.htm; "Credit Market Overview," British Columbia Ministry of Energy, Mines and Petroleum Resources, October 2017, p. 1; "Credit Market Overview," British Columbia Ministry of Energy, Mines and Petroleum Resources, October 2018, p. 1; "Credit Market Overview," British Columbia Ministry of Energy, Mines and Petroleum Resources, April 2019, p. 1; "2017/18 Review of BC-LCFS Compliance Pathways," British Columbia Ministry of Energy, Mines and Petroleum Resources, January 31, 2018, slide 12.

61. Policy researchers have noted that LCFS policies, when compared to other carbon reduction polices, are relatively expensive and, without viable compliance paths (*i.e.,* fuel formulation innovation or changing consumer preferences), can lead to "costly and

volatile" credit markets.[88] LCFS credit markets are closely linked to the cost of supplying refined fuels and these markets can result in higher fuels prices. This is especially the case when the supply of compliant fuels is capacity constrained, resulting in more demand for credits.[89] The most efficient and least distortionary policy often mentioned by policy researchers is a revenue-neutral carbon tax that adds to the price of fuel the unpriced cost of emissions.[90] Rivers and Wigle (2018) estimate that the "[a]verage cost for reducing greenhouse gas emissions by 9.1 per cent [in a seven year time horizon]" using a revenue-neutral carbon tax costs around $76 per ton of greenhouse gas abatement. This is in contrast to an LCFS policy, which they estimate costs over three times more.

British Columbia Taxes

62. As discussed in my response to **Question (1)**, fuel taxes in British Columbia differ based on location. For parts of British Columbia other than Victoria or Vancouver, gasoline and diesel taxes are comparable to other Canadian provinces. Areas of British Columbia outside of Victoria and Vancouver have the 7th highest taxes per litre on gasoline and diesel out of the 10 provinces in Canada.[91] However, the Victoria and Vancouver areas, which account for more than half of the total population in British Columbia, have some of the highest fuel taxes in Canada. For gasoline, Vancouver has the 2nd highest taxes per litre in Canada, and Victoria ranks 6th highest.[92] For diesel, Vancouver ranks 4th highest, and Victoria ranks 7th highest.[93] **Figures 27 and 28** show a full breakdown and ranking of the taxes per litre across Canadian provinces, Vancouver, Victoria, and Montréal.

[88] Lade, Gabriel E. and C.-Y. Cynthia Lin Lawell, "A Report on the Economics of California's Low Carbon Fuel Standard and Cost Containment Mechanisms," Institute of Transportation Studies UC Davis, October 2013, pp. 1-3 and 10; Rivers, Nicholas and Randall Wigle, "Reducing Greenhouse Gas Emissions In Transport: All In One Basket?," University of Calgary, The School of Public Policy, February 2018, p. 2.

[89] Lade, Gabriel E. and C.-Y. Cynthia Lin Lawell, "A Report on the Economics of California's Low Carbon Fuel Standard and Cost Containment Mechanisms," Institute of Transportation Studies UC Davis, October 2013, p. 10.

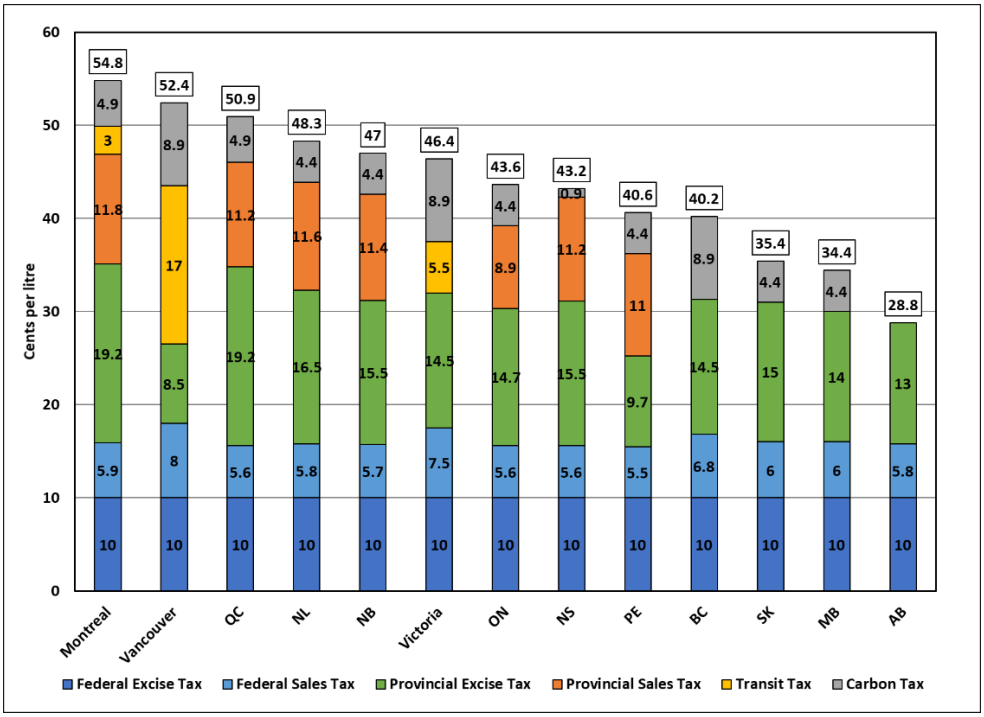
[90] Lade, Gabriel E. and C.-Y. Cynthia Lin Lawell, "Mandating green: On the design of renewable fuel policies and cost containment mechanisms," National Center for Sustainable Transportation, October 2015, p. 5; Rivers, Nicholas and Randall Wigle, "Reducing Greenhouse Gas Emissions In Transport: All In One Basket?" University of Calgary, The School of Public Policy, February 2018, p. 2.

[91] Bowes, Jeff, "21st Annual Gas Tax Honesty Day Report," Canadian Taxpayers Federation, May 2019.

[92] Bowes, Jeff, "21st Annual Gas Tax Honesty Day Report," Canadian Taxpayers Federation, May 2019.

[93] Bowes, Jeff, "21st Annual Gas Tax Honesty Day Report," Canadian Taxpayers Federation, May 2019.

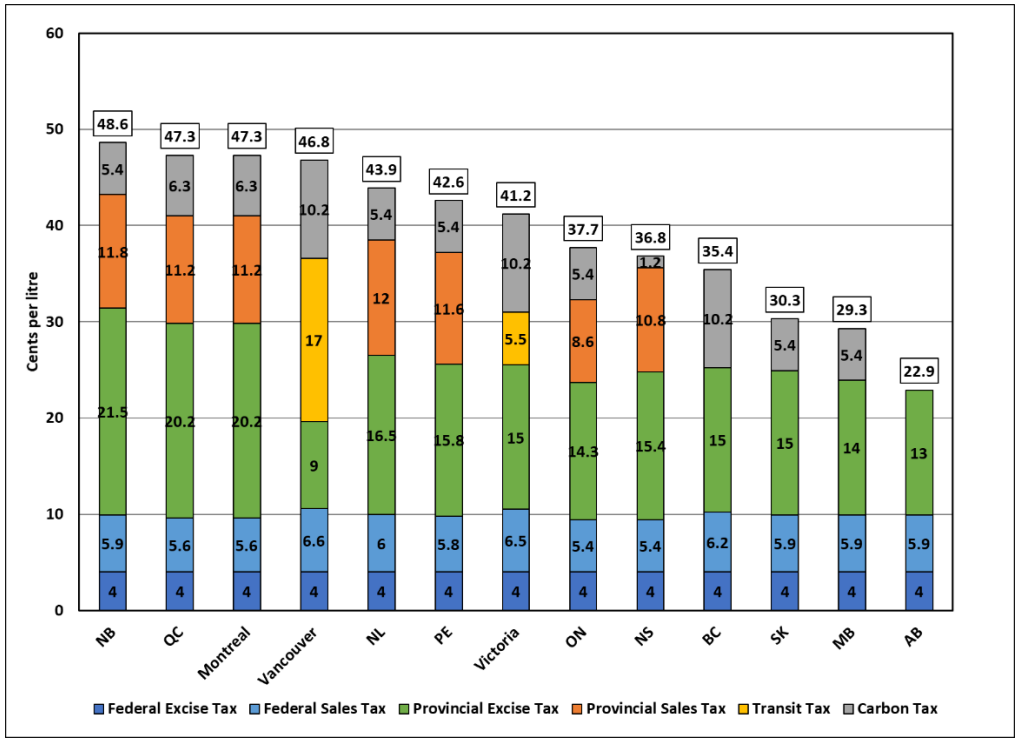
Figure 27
Comparison of Gasoline Taxes Across Provinces and Montréal, Vancouver, and Victoria



Notes: 1) Federal and provincial sales tax figures shown are estimated by the Canadian Taxpayers Federation. These taxes are not set per litre. The federal sales tax is calculated as an additional 5% of the sum of the price per litre and all other taxes. Similarly, provincial sales taxes vary and are calculated the same way. 2) Alberta's carbon tax was repealed and officially eliminated on June 4, 2019.

Source: Bowes, Jeff, "21st Annual Gas Tax Honesty Day Report," Canadian Taxpayers Federation, May 2019. available at http://www.taxpayer.com/media/2019-GTHD-EN.pdf.

Figure 28
Comparison of Diesel Taxes Across Provinces and Montréal, Vancouver, and Victoria



Notes: 1) Federal and provincial sales tax figures shown are estimated by the Canadian Taxpayers Federation. These taxes are not set per litre. The federal sales tax is calculated as an additional 5% of the sum of the price per litre and all other taxes. Similarly, provincial sales taxes vary and are calculated the same way. 2) Alberta's carbon tax was repealed and officially eliminated on June 4, 2019.

Source: Bowes, Jeff, "21st Annual Gas Tax Honesty Day Report," Canadian Taxpayers Federation, May 2019. available at http://www.taxpayer.com/media/2019-GTHD-EN.pdf.

63. In the U.S., federal taxes on gasoline are 18.4 cents/gallon, or about 6.5 Canadian cents/litre.[94] Federal taxes on diesel are higher at 24.4 cents/gallon, or about 8.6 Canadian cents/litre. These U.S. federal taxes are made up primarily of an excise tax of 18.3 cents/gallon on gasoline and 24.3 cents/gallon on diesel. The only additional federal tax is a 0.1 cents/gallon leaking underground storage tank fee on gasoline and diesel. Fuel taxes in the United States are also applied on the state, and in some cases local, level.

64. I chose California, Washington, and Oregon for comparison to British Columbia due to their geography and overall market conditions. California and Washington have the

[94] U.S. Energy Information Administration – Federal and state motor fuels taxes, March 8, 2019, available at https://www.eia.gov/tools/faqs/faq.php?id=10&t=10. Currency conversions were calculated based on the exchange rate of 1 USD = 1.34 CAD.

second and third highest tax per gallon of gasoline in all the U.S., behind only Pennsylvania.[95] In California, consumers pay about 49.9 cents/gallon in state taxes, or about 17.6 Canadian cents/litre on gasoline. California taxes on diesel are higher, at about 69.2 cents/gallon, or about 24.5 Canadian cents/litre. California state taxes are comprised of a state excise of 41.7 cents/gallon on gasoline and 36 cents/litre on diesel, a state sales tax of 2.25% on gasoline and 13% on diesel (for an average of 6 cents/gallon of gasoline and 31 cents/gallon on diesel), a storage tank fee of 2 cents/gallon and an oil spill prevention and administration fee of 0.2 cents/gallon.[96] Additionally, district sales taxes ranging from 0.1% to 1% may apply.[97]

65. In Washington, consumers pay about 49.5 cents/gallon in state taxes, or about 17.5 Canadian cents/litre on gasoline and diesel. Washington state gasoline and diesel taxes are mainly comprised of a 49.4 cents/gallon state excise. An oil spill administration tax, oil spill response tax, and hazardous substance tax make up the other 0.1 cents/gallon.[98] In Washington counties bordering Canada, an additional "Border Zone Area Motor Fuel Tax" of 1 cent/gallon, or about 0.4 Canadian cents/litre, is applied.[99]

66. In Oregon, consumers pay 34 cents/gallon, or about 12 Canadian cents/litre, of state excise tax on gasoline and diesel. In addition, some cities and counties charge taxes ranging from 1 to 10 cents/gallon on both gasoline and diesel.[100] Portland charges the highest tax of 10 cents/gallon on gasoline and diesel. **Figures 29 and 30** show federal taxes and provincial/state taxes per litre in British Columbia as compared to California, Washington and Portland, Oregon.

[95] U.S. Energy Information Administration – Federal and state motor fuels taxes, March 8, 2019, available at https://www.eia.gov/tools/faqs/faq.php?id=10&t=10.

[96] U.S. Energy Information Administration – Federal and state motor fuels taxes, March 8, 2019, available at https://www.eia.gov/tools/faqs/faq.php?id=10&t=10. The California state excise on gas is set to increase to 47.3 cents/gallon on July 1, 2019.

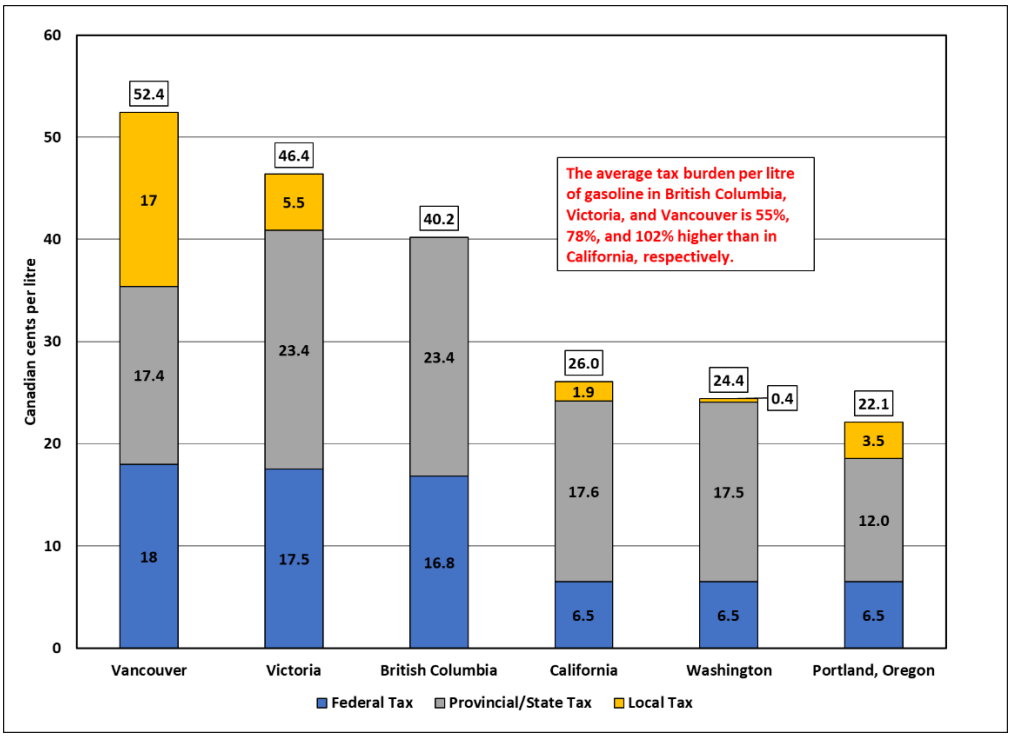
[97] California Department of Tax and Fee Administration – California City & County Sales & Use Tax Rates, available at https://www.cdtfa.ca.gov/taxes-and-fees/sales-use-tax-rates.htm.

[98] U.S. Energy Information Administration – Federal and state motor fuels taxes, March 8, 2019, available at https://www.eia.gov/tools/faqs/faq.php?id=10&t=10.

[99] U.S. Energy Information Administration – Federal and state motor fuels taxes, March 8, 2019, available at https://www.eia.gov/tools/faqs/faq.php?id=10&t=10.

[100] Oregon.Gov – Current Fuel Tax Rates, available at https://www.oregon.gov/ODOT/FTG/Pages/Current%20Fuel%20Tax%20Rates.aspx

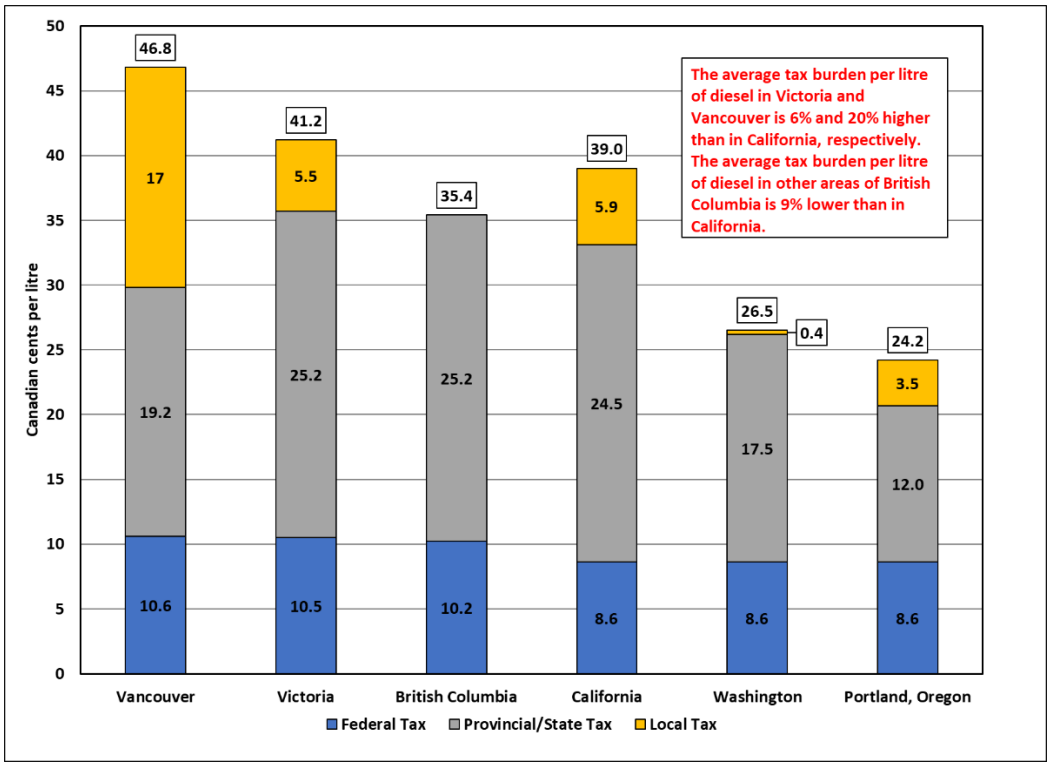
Figure 29
Comparison of Tax Per Litre for Gasoline in British Columbia and West Coast States



Notes: 1) Canadian federal sales tax figure shown is estimated by the Canadian Taxpayers Federation. Canadian federal sales tax is not set per litre. Rather, it is an additional 5% of the sum of the price per litre and all other taxes. 2) Canadian taxes shown are as of May 2019. United States taxes shown are as of February 2019. 3) Exchange rate of 1 USD = 1.34 CAD was used to convert figures. 4) California local taxes differ by district and are estimated on a weighted average based on county population.

Sources: Bowes, Jeff, "21st Annual Gas Tax Honesty Day Report," Canadian Taxpayers Federation, May 2019, available at http://www.taxpayer.com/media/2019-GTHD-EN.pdf; U.S. Energy Information Administration – Federal and state motor fuels taxes, March 8, 2019, available at https://www.eia.gov/tools/faqs/faq.php?id=10&t=10; "State Motor Fuel Taxes | Rates Effective 04/01/2019," American Petroleum Institute, available at https://www.api.org/~/media/Files/Statistics/StateMotorFuel-OnePagers-April-2019.pdf.

Figure 30
Comparison of Tax Per Litre for Diesel in British Columbia and West Coast States



Notes: 1) Canadian federal sales tax figure shown is estimated by the Canadian Taxpayers Federation. Canadian federal sales tax is not set per litre. Rather, it is an additional 5% of the sum of the price per litre and all other taxes. 2) Canadian taxes shown are as of May 2019. United States taxes shown are as of February 2019. 3) Exchange rate of 1 USD = 1.34 CAD was used to convert figures. 4) California local taxes differ by district and are estimated on a weighted average based on county population.

Sources: Bowes, Jeff, "21st Annual Gas Tax Honesty Day Report," Canadian Taxpayers Federation, May 2019, available at http://www.taxpayer.com/media/2019-GTHD-EN.pdf; U.S. Energy Information Administration – Federal and state motor fuels taxes, March 8, 2019, available at https://www.eia.gov/tools/faqs/faq.php?id=10&t=10; "State Motor Fuel Taxes | Rates Effective 04/01/2019," American Petroleum Institute, available at https://www.api.org/~/media/Files/Statistics/StateMotorFuel-OnePagers-April-2019.pdf.

C. Question (3): Is there currently, and has there been since 2015, a functioning retail market for gasoline and diesel in British Columbia?

67. Yes, there is now and has been a functioning retail market for gasoline and diesel in British Columbia. The retail market is at the end of the gasoline and diesel production value chains.

68. Markets are viewed as functioning well if they have a sufficient number of competitors or lack substantial barriers to entry. There are numerous retailers of gasoline and diesel fuels

in British Columbia, and there has been a track record of retail gas station entry. In addition, retail gasoline and diesel prices in British Columbia have responded in the manner expected to factors that typically affect either supply or consumer demand in a well-functioning market.

69. Consumers in British Columbia are served by nearly 1,400 retail gas stations that are supplied by at least 24 different marketers that sell at least 29 different brands of gasoline.[101] Parkland, Suncor, Shell, Husky, and 7-Eleven are the largest marketers in terms of the number of stations supplied in British Columbia. Brands, the trade name seen on the retail pump, are utilized by several different marketers and are becoming less indicative of ownership at the retail site. Esso is a leading example of this. Imperial Oil's Esso brand is offered by several different marketers, and Imperial Oil no longer owns any Esso-branded gas stations in Canada. The brands offered by different marketers include[102]

- Parkland: Chevron, Esso, Fas Gas Plus, and Race Trac
- 7-Eleven: Petro-Canada, Esso, and 7-Eleven
- Suncor: Petro-Canada
- Shell and Husky serve as the marketer for their own brands.

70. In some cases, the marketer controls the price of the fuel sold at the retail gas station, and in other cases the marketer does not. As of December 31, 2018, marketers controlled the pump prices of 52.4% of the gas stations in British Columbia, while independent dealers controlled the prices at the other 47.6% of stations. Independent dealer-controlled gas stations receive fuel from wholesale suppliers and make their own pricing, operating hours, and other commercial decisions. Parkland is the wholesale supplier for 100 independent dealer stations in British Columbia; it does not set the retail prices at any of these stations.[103] **Table 10** provides the current count of retail gas stations, by marketer, in British Columbia. **Table 11** provides the current count of retail gas stations, by brand, in British Columbia.

[101] According to Kent data, British Columbia had 1,368 gas stations in 2018. "2018 National Retail Petroleum Site Census," Kent Group Ltd., June 7, 2019.

[102] "2018 National Retail Petroleum Site Census," Kent Group Ltd., June 7, 2019.

[103] "2018 National Retail Petroleum Site Census," Kent Group Ltd., June 7, 2019.

Table 10
British Columbia Retail Gas Stations by Marketer
December 31, 2018

Marketers and Brands Sold			Number of Stations by Control			Marketer Share by Station Count	
Marketer	Type	Brands	Marketer Control	Dealer Control	Total	Share of Supply	Share of Price Control
Parkland Fuel Corporation	Refiner-Marketer	Chevron, Esso, Fas Gas Plus, Race Trac	173	100	273	20.0%	12.6%
Unidentified Marketers or Dealers	Non-Refiner	Unbranded/Unknown	0	204	204	14.9%	0.0%
Suncor Energy Products, Inc.	Refiner-Marketer	Petro-Canada	116	60	176	12.9%	8.5%
Shell Canada Limited	Refiner-Marketer	Shell	89	49	138	10.1%	6.5%
Husky Energy Inc.	Refiner-Marketer	Husky	80	45	125	9.1%	5.8%
7-Eleven Canada, Inc	Non-Refiner	Petro-Canada, Esso, 7-Eleven	124	0	124	9.1%	9.1%
Federated Co-operatives Limited	Refiner-Marketer	Tempo, Save on Gas, Co-op	0	77	77	5.6%	0.0%
McDougall Energy	Non-Refiner	Pump, Esso, Unbranded/Unknown	0	65	65	4.8%	0.0%
Super Save Group	Non-Refiner	Super Save Gas	25	15	40	2.9%	1.8%
BCP IV Service Station LP/BG Fuels	Non-Refiner	Mobil	39	0	39	2.9%	2.9%
Proctor Petroleum	Non-Refiner	Gas N Go	24	0	24	1.8%	1.8%
Centex Petroleum	Non-Refiner	Centex, Unbranded/Unknown	2	16	18	1.3%	0.1%
Couche-Tard Inc.	Non-Refiner	Mac's, Shell, Petro-Canada, Esso, Husky	14	0	14	1.0%	1.0%
Sobeys Capital Inc.	Non-Refiner	Safeway	10	0	10	0.7%	0.7%
Gas Plus Inc.	Non-Refiner	Gas Plus, Unbranded/Unknown	2	7	9	0.7%	0.1%
Canco Petroleum	Non-Refiner	Canco	0	7	7	0.5%	0.0%
Costco Wholesale Canada Ltd.	Non-Refiner	Costco	7	0	7	0.5%	0.5%
XTR Energy Company Limited	Non-Refiner	Gulf, XTR	0	5	5	0.4%	0.0%
Canadian Tire Petroleum	Non-Refiner	Canadian Tire	4	0	4	0.3%	0.3%
Domo Gasoline Corporation Ltd.	Non-Refiner	Domo	3	0	3	0.2%	0.2%
Shell Pilot Flying J Joint Venture	Refiner-Marketer	Shell and Flying J	3	0	3	0.2%	0.2%
BVD Petroleum	Non-Refiner	Petro-Canada	1	0	1	0.1%	0.1%
G&B Fuels Inc.	Non-Refiner	G&B Fuels	0	1	1	0.1%	0.0%
GTI Petroleum Ltd.	Non-Refiner	GTI	1	0	1	0.1%	0.1%
Total			717	651	1368	100.0%	52.4%

Notes: 1) “Share of Supply” in this table refers to the percentage of retail stations in British Columbia for which the marketer listed in the first column has the right to sell fuel. 2) “Share of Price Control” in this table refers to the percentage of retail stations in British Columbia for which the marketer listed in the first column has the right to set the price of fuel at the pump.

Source: “2018 National Retail Petroleum Site Census,” Kent Group Ltd., June 7, 2019.

Table 11
British Columbia Retail Gas Stations by Brand
December 31, 2018

Brand	Marketer Controlled	Dealer Controlled	Total	Brand Share of B.C. Stations
Petro-Canada	165	60	225	16.4%
Unbranded/Unknown	0	214	214	15.6%
Esso	85	108	193	14.1%
Chevron	161	19	180	13.2%
Shell	93	49	142	10.4%
Husky	81	45	126	9.2%
Co-op	0	59	59	4.3%
Super Save Gas	25	15	40	2.9%
Mobil	39	0	39	2.9%
Fas Gas Plus	9	20	29	2.1%
Gas N Go	24	0	24	1.8%
Centex	2	14	16	1.2%
Race Trac	0	15	15	1.1%
Tempo	0	14	14	1.0%
Safeway	10	0	10	0.7%
Canco	0	7	7	0.5%
Costco	7	0	7	0.5%
Canadian Tire	4	0	4	0.3%
Save on Gas	0	4	4	0.3%
XTR	0	4	4	0.3%
Domo	3	0	3	0.2%
Shell and Flying J	3	0	3	0.2%
7-Eleven	2	0	2	0.1%
Gas Plus	2	0	2	0.1%
Pump	0	2	2	0.1%
G&B Fuels	0	1	1	0.1%
GTI	1	0	1	0.1%
Gulf	0	1	1	0.1%
Mac's	1	0	1	0.1%
Total	717	651	1368	100%

Source: "2018 National Retail Petroleum Site Census," Kent Group Ltd., June 7, 2019.

71. Based on province-wide gas station counts, no marketer has control over the retail price for more than 12.6 percent of the gas stations in British Columbia. This is seen in the last column of **Table 10**. Pricing that is not controlled by the marketer is controlled by the independent station itself. Taken together, marketers as a group control pricing at just over half of the stations in British Columbia, which means that the pricing for nearly half of the gas stations in the province is determined by the dealer that operates the station. **Table 11** shows no brand serves more than 16.4 percent of British Columbia's gas stations.

72. In addition to retail gas station locations, commercial fleet vehicles can be served by cardlock facilities. Cardlocks are automated, unattended fueling stations open 24/7. Entities owning cardlocks in British Columbia include Columbia Fuels, Co-op, Husky,

Parkland (Chevron), Flying J Shell, Esso (Imperial Oil), Suncor (Petro-Canada), and UFA.[104] **Table 12** provides the current count of cardlocks, by brand, in British Columbia.

Table 12
British Columbia Cardlock Locations by Brand

Brand	Owner	Count
Esso/Husky	Imperial Oil Limited, Husky Energy Inc.	48
Petro-Pass	Suncor (Petro-Canada)	39
Co-op	Federated Co-operatives Limited	37
Chevron	Parkland Fuel	34
Columbia Fuels	Parkland Fuel	14
Flying J	Shell Flying J Joint Venture	10
AFD	AFD Petroleum Ltd.	7
Northwest Fuels	Northwest Fuels Limited	4
UFA	United Farmers of Alberta Co-operative Ltd.	2
Total		**195**

Note: Husky and Esso combined their travel center and cardlock networks. All cardlocks are being rebranded to Esso, but some of the travel centers still carry the Husky brand.

Sources: "2016 Report - Canada's Downstream Logistical Infrastructure: Refining, Biofuel Plants, Pipelines, Terminals, Bulk Plants & Cardlocks," Kent Group Ltd., October 20, 2017; "Find an Esso Commercial Cardlock" Esso, May 17, 2019, available at https://www.essocardlocks.ca/en/wp-content/uploads/esso-commercial-cardlock-directory-western-canada-may17-2019.pdf; "North American Directory," Petro-Pass, 2019; "24-Hour Cardlock Location guide," Co-op Petroleum, October 2018, available at https://www.coopconnection.ca/wps/wcm/connect/fclretail/6009dc1b-28f8-46b8-9abe-a7eb5983b040/8149+2018+Cardlock+Guide.pdf?MOD=AJPERES; "Commercial Cardlock Network," Chevron – Parkland, February 2019, available at https://chevron.parkland.ca/files/8515/4931/2320/CardlockBookletAllFeb2019-v01s.pdf; Pilot Flying J – Complete Location Listing, available at https://pilotflyingj.com/store-locations/; AFD Quality Fuels & Lubricants – British Columbia, available at https://www.afdpetroleum.com/locations/british-columbia; Northwest Fuels – Where We Serve, available at https://www.northwestfuels.ca/where-we-serve; UFA – Locations, available at https://www.ufa.com/Pages/Locations.aspx#.

[104] Husky and Esso have a combined cardlock fuel network. Columbia fuels is a division of Parkland Fuel Corporation. See Husky – Helping Professional Drivers Coast-to-Coast, available at https://www.myhusky.ca/for-your-business/facilities/cardlocks/; Esso Card Locks – Site Locater, available at https://www.essocardlocks.ca/en/site-locator/; Federated Co-operatives Limited – Cardlock Location Guide, available at https://www.coopconnection.ca/wps/portal/fclretail/FCLInternet/Petroleum/CardlockGuide?WCM_GLOBAL_CONTEXT=; Petro-Canada – Out Petro-Pass truck stops, available at https://www.petro-canada.ca/en/business/fuel-solutions-and-facilities/petro-pass-cardlock; United Farmers of Alberta Co-operative Ltd. – Cardlock, available at https://www.ufa.com/petroleum/Pages/cardlock.aspx. Columbia Fuels – Cardlock Network, available at https://www.columbiafuels.com/commercial/services/cardlock-network/. Pilot Flying J – Complete Location Listing, available at https://pilotflyingj.com/store-locations/; Chevron Parkland – Commercial & Industrial Locations, available at https://chevron.parkland.ca/commercial-industrial/locations/.

73. The retailers available in individual cities and towns can vary from these province-wide lists of retail gas station and cardlock owners.

74. As shown in **Tables 10 – 12**, numerous fuel retailers are active across British Columbia, and if demand is sufficient to support a new location or opportunities otherwise arise for retailers to move into new areas, they can and will do so. The following are examples of new gas stations that have opened in British Columbia since January 1, 2015:

- Esso – Tynehead Auto Center, 16811 96 Ave., Surrey;[105]
- Co-op – 4397 Westshore Pkwy., Victoria;[106]
- Esso – Happy Valley Food, 6221 Barnhartvale Rd., Kamploops;[107]
- Esso – 5538 Airport Way, Kelowna;[108] and
- Tano Fuel – 1040 Whenun Rd., Prince George.[109]

75. Entry into a market is an indication that the market is competitive because supra-competitive pricing cannot be maintained over time in the absence of barriers to entry. Simply put, entrants look for market opportunities, and pricing that is above a competitive level would be expected to draw entry. The track record of recent retail gas station entry in British Columbia indicates that there are no substantial barriers that prevent a city or town from adding gas stations if they can be supported by local market demand.

76. Parkland, Global, MacDougal, and other marketers compete for contracts to supply dealer stations. Dealer station switching between marketers would be evidence of competition in the wholesale market.

77. I provide a more detailed discussion of the factors that have affected retail gasoline and diesel prices in my response to **Question (5)**. Here, I focus on one such factor – supply shocks. I note in my answer to **Question (4)** that the marginal supply source for gasoline and diesel in British Columbia is refining capacity in Washington. I note in my answer to **Question (5)** that there have been unexpected changes or disruptions in supply such as a rupture on the Westcoast Transmission System, a natural gas pipeline, near Prince George, that had the effect of reducing production at Washington refineries. Economic

[105] "Esso and Tim Hortons" Sandhurst Group, available at http://www.sandhurstgroup.ca/real-estate/esso-tim-hortons; Google Maps.

[106] Google Maps; BRG staff member conversation with Co-op employee.

[107] Google Maps; https://www.facebook.com/HappyValleyFoods

[108] Google Maps.

[109] Google Maps; https://www.facebook.com/pg/tanofuelltn/videos/?ref=page_internal; BRG staff member conversation with Tano Fuel employee.

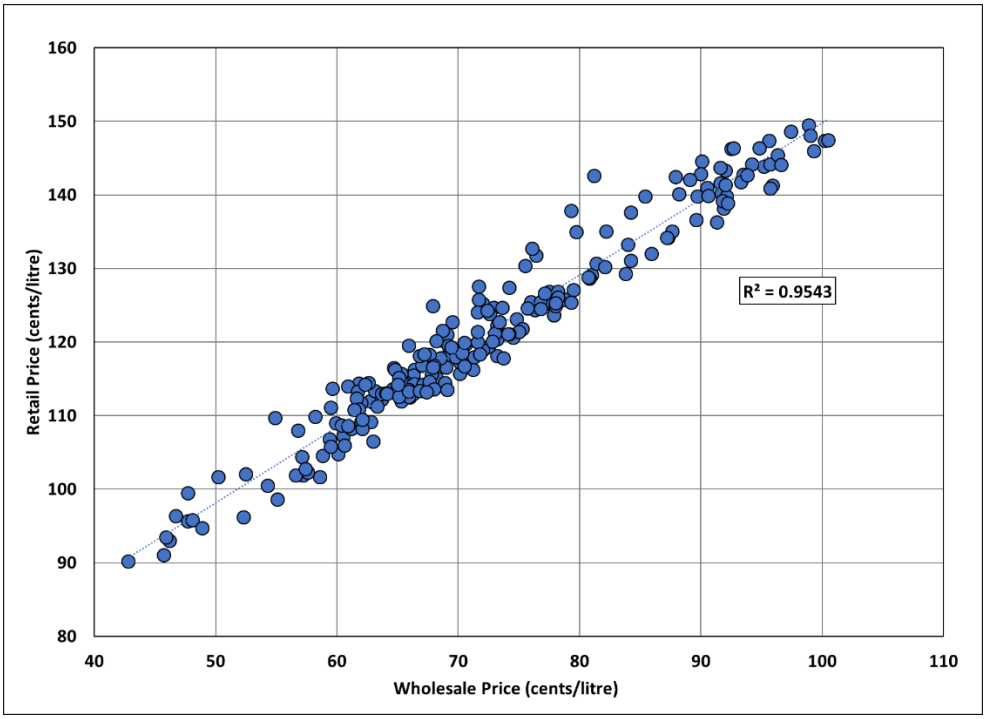
theory predicts that the impact of a production reduction such as this would be to increase prices both in the U.S. Pacific Northwest and in British Columbia. **Figure 35** shows that these prices did increase after the supply disruption. Retail prices in British Columbia have responded to supply and demand factors in the manner expected in a well-functioning market.

78. I have also considered both the wholesale and retail prices of gasoline and diesel. The wholesale prices I considered are rack prices, which are publicly available and are collected by organizations like National Resources Canada and Kent Group. Rack prices are list prices for wholesale purchases at distribution points. In addition, I have analyzed retail fuel prices. Retail prices are collected directly from retailers every weekday morning by Kent Group.[110] I find that retail prices are highly correlated with rack prices. Retail and rack prices move together closely, as can be seen in **Figures 31 – 32.** These **Figures** plot retail prices and rack prices for gasoline and diesel.[111] The values of R-squared are provided and are greater than 94%, signaling a very high correlation between retail and rack prices.

[110] For more information on Kent Group data, see Kent Group Ltd. - Methodology Notes, March 11, 2016, available at http://www.kentgroupltd.com/methodology-notes/.

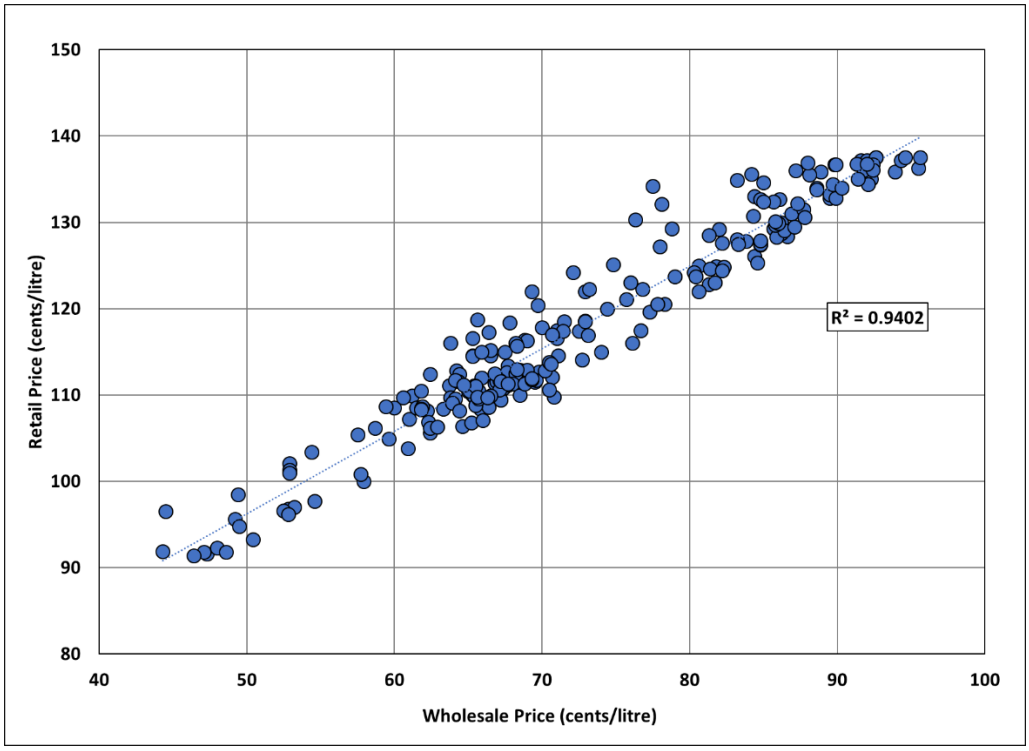
[111] **Figures 31 – 32** are based on retail prices including taxes. The results are very similar if instead the analysis is based on retail prices net of taxes.

Figure 31
British Columbia Weekly Retail and Wholesale Gasoline Prices
2015 – Q2 2019



Source: Kent Petroleum Price Data, Kent Group Ltd., available at https://charting.kentgroupltd.com/.

Figure 32
British Columbia Weekly Retail and Wholesale Diesel Prices
2015 – Q2 2019



Source: Kent Petroleum Price Data, Kent Group Ltd., available at https://charting.kentgroupltd.com/.

79. Given that retail prices move closely with wholesale prices,[112] it is not surprising that retail prices at one gas station tend to move closely with retail prices at other gas stations. I note that common retail gasoline and diesel price movements do not indicate that retail locations are colluding with each other with regard to the prices they charge consumers. Because retail prices at different gas stations are driven by common factors, retail prices should be expected to move together and to track each other. Parallel price-setting conduct is not evidence of retail gasoline or diesel fuel price fixing because retail margins are generally small and all retail locations in an area face similar wholesale market conditions. Absent direct evidence of collusion, it is difficult or impossible to determine whether there has been actual collusion among retailers of gasoline and diesel. Common price movements are insufficient to demonstrate that there has been collusive conduct. Often there is an alternative explanation of price movements based on market fundamentals that have nothing to do with collusive conduct.

[112] Ervin, Michael J. "Introduction to the Downstream Petroleum Industry - Presentation to the British Columbia Utilities Commission," BCUC Inquiry Into Gasoline and Diesel, June 20, 2019, Exhibit A2-3, Slides 124 and 125.

D. Question (4): Is there currently, and has there been since 2015, a functioning market for supply for retailers of gasoline and diesel in British Columbia?

80. Yes, there is now and there has been a functioning market for the supply of gasoline and diesel to British Columbia retailers. This market is the wholesale market between the refining and retailing stages in the production value chain. There are two types of businesses active as sellers in the wholesale market: (1) refiners selling their products to downstream entities, and (2) non-refining wholesalers.

81. There are multiple sources for the supply of gasoline and diesel for retailers in British Columbia. Both Parkland and Husky Energy own and operate refining assets in the province. Parkland's refinery is located in Burnaby, and Husky's refinery is located in Prince George. Other refiners like Imperial Oil, Suncor, and Shell operate in Alberta and ship refined products into British Columbia, primarily using the Trans Mountain Pipeline.[113] In addition, British Columbia imports gasoline and diesel supply from refineries located in Washington.

82. There are four refineries in Washington refineries located on the coast just south of Vancouver. These refineries and their capacities are:[114]

- BP Cherry Point – 242,000 barrels per day;
- Phillips 66 Ferndale – 105,000 barrels per day;
- Shell Anacortes – 145,000 barrels per day; and
- Marathon Anacortes – 119,000 barrels per day.

83. Gasoline and diesel from the Washington refineries is delivered to British Columbia primarily via waterborne transport.[115]

84. Refiners supply gasoline and diesel to two types of entities: non-refining wholesalers and retail outlets such as gas stations and cardlocks. Many refiners have historically owned

[113] Canadian Fuels Association - The Fuels Industry Fuel Production, 2019, available at https://www.canadianfuels.ca/The-Fuels-Industry/Fuel-Production/; Natural Energy Board - Pipeline Profiles: Trans Mountain, September 2018, available at https://www.neb-one.gc.ca/nrg/ntgrtd/pplnprtl/pplnprfls/crdl/trnsmntn-eng.html?=undefined&wbdisable=true.

[114] "Refinery Capacity 2019," U.S. Energy Information Administration, p. 20, available at https://www.eia.gov/petroleum/refinerycapacity/table3.pdf

[115] National Energy Board - Provincial and Territorial Energy Profiles British Columbia, available at https://www.neb-one.gc.ca/nrg/ntgrtd/mrkt/nrgsstmprfls/bc-eng.html.

downstream gas stations, but more recently some refiners like Imperial Oil in Canada[116] and Sunoco in the U.S.[117] have divested their corporately-owned gas stations. As a result, these gas stations are now owned and operated by third parties. Refiners have on-site terminals and also ship refined products to other "primary terminals" typically by pipeline, rail, or ship.[118] In addition, there are several "bulk plants" in British Columbia. These are smaller facilities that "typically receive product from a primary terminal versus a refinery."[119] Gasoline and diesel is then transported from terminals to individual retail locations, usually by truck.[120] The largest operators of primary terminals located in British Columbia are:

- Imperial Oil. Imperial Oil operates three primary terminals (Burnaby, Nanaimo, and Port Moody)[121] and eight bulk plants (Armstrong, Castlegar, Dawson Creek, Fort Nelson, Gibsons, Pemberton, Powell River, and Queen Charlotte City) in British Columbia.[122] There are about 2,080 Esso and Mobil gas stations across Canada, including 232 in British Columbia.[123] Imperial Oil does not own any Canadian gas stations itself, but rather supplies gas stations via marketers.

- Shell. Shell operates three primary terminals (Chemainus and two in Burnaby) in British Columbia.[124] In 2018, Shell supplied refined products in British Columbia to 138 retail outlets.

[116] "Imperial to sell remaining company-owned retail stations for $2.8 billion," *Imperial Oil Press Release*, March 8, 2016, available at https://news.imperialoil.ca/press-release/imperial-sell-remaining-company-owned-retail-stations-28-billion.

[117] "Sunoco LP Announces Strategic Divestiture of Convenience Stores in Continental United States" *Sunoco Press Release*, April 6, 2017, available at http://www.sunocolp.com/news-releases/news-releases-details/2017/Sunoco-LP-Announces-Strategic-Divestiture-of-Convenience-Stores-in-Continental-United-States/default.aspx.

[118] "2016 Report, - Canada's Downstream Logistical Infrastructure: Refining, Biofuel Plants, Pipelines, Terminals, Bulk Plants & Cardlocks," Kent Group Ltd., October 20, 2017, pp. 12-15.

[119] "2016 Report, - Canada's Downstream Logistical Infrastructure: Refining, Biofuel Plants, Pipelines, Terminals, Bulk Plants & Cardlocks," Kent Group Ltd., October 20, 2017, p. 12.

[120] "2016 Report, - Canada's Downstream Logistical Infrastructure: Refining, Biofuel Plants, Pipelines, Terminals, Bulk Plants & Cardlocks," Kent Group Ltd., October 20, 2017, p. 25.

[121] "2016 Report, - Canada's Downstream Logistical Infrastructure: Refining, Biofuel Plants, Pipelines, Terminals, Bulk Plants & Cardlocks," Kent Group Ltd., October 20, 2017, Annex E.

[122] "2016 Report, - Canada's Downstream Logistical Infrastructure: Refining, Biofuel Plants, Pipelines, Terminals, Bulk Plants & Cardlocks," Kent Group Ltd., October 20, 2017, Annex G.

[123] "2018 National Retail Petroleum Site Census," Kent Group Ltd., June 7, 2019.

[124] "2016 Report, - Canada's Downstream Logistical Infrastructure: Refining, Biofuel Plants, Pipelines, Terminals, Bulk Plants & Cardlocks," Kent Group Ltd., October 20, 2017, Annex E.

- Suncor. Suncor operates four primary terminals (Kamloops, Port Moody, Nanaimo, and Terrace)[125] and 20 bulk plants (100 Mile House, Campbell River, Chilliwack, Courtenay, Cranbrook, Dawson Creek, Fort Nelson, Fort St. John, Golden, Invermere, Kelowna, Mackenzie, Port Hardy, Prince George, Prince Rupert, Quesnel, Salmon Arm, Smithers, Terrace, and Williams Lake) in British Columbia.[126] In 2018, Suncor supplied refined products to 176 Petro-Canada branded stations in British Columbia.[127]

- Parkland. Parkland operates three primary terminals (Burnaby, Hatch, and Port Hardy)[128] and 11 bulk plants (Bella Coola, Campbell River, Dawson Creek, Duncan, Fort Nelson, Nanaimo, Peace River, Powell River, Sechelt, Ucluelet, and Wilfert) in British Columbia.[129] In 2018, Parkland supplied branded refined products to 273 retail outlets in British Columbia.[130]

- Husky. Husky operates one primary terminal in Prince George and three bulk plants (Fort Nelson, Fort St. John, and Prince George). In 2018, Husky supplied refined products to 125 Husky-branded stations in British Columbia.[131]

- Federated Co-operatives. Federated Co-operatives operates eleven bulk plants (Alberni, Aldergrove, Armstrong, Chilliwack, Dawson Creek, Fort St. John, Prince George, Quesnel, Sointula, Swan Lake and Vanderhoof) in British Columbia.[132] In 2018, Federated Co-operatives supplied branded refined products to 77 retail outlets in British Columbia.[133]

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[125] "2016 Report, - Canada's Downstream Logistical Infrastructure: Refining, Biofuel Plants, Pipelines, Terminals, Bulk Plants & Cardlocks," Kent Group Ltd., October 20, 2017, Annex E.

[126] "2016 Report, - Canada's Downstream Logistical Infrastructure: Refining, Biofuel Plants, Pipelines, Terminals, Bulk Plants & Cardlocks," Kent Group Ltd., October 20, 2017, Annex G.

[127] "2018 National Retail Petroleum Site Census," Kent Group Ltd., June 7, 2019.

[128] "2016 Report, - Canada's Downstream Logistical Infrastructure: Refining, Biofuel Plants, Pipelines, Terminals, Bulk Plants & Cardlocks," Kent Group Ltd., October 20, 2017, Annex E; "Parkland Completes Acquisition of Chevron Canada's Downstream Fuel Business," *Business Wire*¸ October 1, 2017.

[129] "2016 Report, - Canada's Downstream Logistical Infrastructure: Refining, Biofuel Plants, Pipelines, Terminals, Bulk Plants & Cardlocks," Kent Group Ltd., October 20, 2017, Annex G; "Parkland Completes Acquisition of Chevron Canada's Downstream Fuel Business," *Business Wire*¸ October 1, 2017.

[130] "2018 National Retail Petroleum Site Census," Kent Group Ltd., June 7, 2019.

[131] "2018 National Retail Petroleum Site Census," Kent Group Ltd., June 7, 2019.

[132] "2016 Report, - Canada's Downstream Logistical Infrastructure: Refining, Biofuel Plants, Pipelines, Terminals, Bulk Plants & Cardlocks," Kent Group Ltd., October 20, 2017, Annex G.

[133] "2018 National Retail Petroleum Site Census," Kent Group Ltd., June 7, 2019.

85. Non-refining marketers purchase refined products at terminals and sell these products to independent retail outlets. They may deliver these products to the retail locations themselves or contract with others to arrange for delivery. They can provide branding and marketing support (*e.g.,* customer loyalty programs) to independent retailers and may provide other services such as site planning as well. I refer to independent retail locations as "dealer stations" or "independents." Examples of non-refiner marketers operating in British Columbia include the following:

- BG/Global Fuels. Global Fuels is an authorized branded distributor for Esso and is the exclusive branded distributor for Mobil in Canada. It has partnered with BG Fuels to open Mobil branded gas stations throughout Canada.[134] Global Fuels has traditionally focused its operations in eastern Canada but recently began operations in British Columbia and Western Canada more broadly. In 2018, BG/Global Fuels supplied Mobil-branded refined products to 39 retail outlets in British Columbia.[135]

- McDougall Energy. McDougall Energy is an authorized branded distributor for Esso and also offers its own Pump brand to dealer stations.[136] In 2018, McDougall Energy supplied 65 retail outlets in British Columbia.[137]

86. In addition, there are vertically integrated marketers that supply refined fuels to their own stations. These include Costco, 7-Eleven, and Canadian Tire.[138]

87. Recent significant market entry is an indication that the market lacks significant barriers to entry or expansion. Global Fuels is a recent entrant competing to supply dealer stations in British Columbia. In 2018, Global Fuels supplied 71 stations in Ontario, 39 stations in Québec, and 13 stations in New Brunswick.[139] Ninety-three of these stations are Esso branded, 23 of these stations are Global branded, and 7 stations are Mobil branded.[140] Other non-refining marketers compete in this business elsewhere in Canada and could enter the business in British Columbia if the market in British Columbia had elevated prices due to insufficient competition among the current British Columbia market participants. As an example, MacEwen owns and operates retail gas stations in Ontario and Québec and also serves as a branded wholesaler of Esso products in Ontario, Québec,

[134] Global Fuels - Mobil, available at https://globalfuels.ca/brands/mobil/.

[135] "2018 National Retail Petroleum Site Census," Kent Group Ltd., June 7, 2019.

[136] McDougall Energy – Your Retail, available at https://www.mcdougallcorp.com/your-retail/.

[137] "2018 National Retail Petroleum Site Census," Kent Group Ltd., June 7, 2019.

[138] "2018 National Retail Petroleum Site Census," Kent Group Ltd., June 7, 2019.

[139] "2018 National Retail Petroleum Site Census," Kent Group Ltd., June 7, 2019.

[140] "2018 National Retail Petroleum Site Census," Kent Group Ltd., June 7, 2019.

and Manitoba.[141] In 2018, MacEwen supplied 97 stations in Ontario, 38 stations in Québec, and 1 station in Manitoba.[142] Entities like MacEwen could enter and become non-refining wholesalers in British Columbia.

88. With multiple shippers into British Columbia from Alberta, two refineries in British Columbia, and additional refineries in nearby Washington State, the province has a diversity of supply and the market is not dominated by any individual supplier. In my answer to **Question (2)**, I noted that the Parkland's Burnaby refinery – the larger of the two refineries in British Columbia – supplied roughly a quarter of the gasoline and diesel consumed in the province. Husky, the owner of the other refinery, has a share of supply that is about 5 percent.

89. Market power is the ability profitably to maintain prices above a competitive level. Anticompetitive conduct is conduct that has the effect of reducing the supply of a product in a market in an attempt to maintain its price above a competitive level. In the absence of conduct that has the effect of artificially reducing the amount of a product supplied in a market, market participants cannot be said to be engaging in conduct that has the effect of exercising market power.

90. The Parkland and Husky refineries generally operate near or at capacity. They have not withheld gasoline or diesel supply in an attempt to drive up the prices of these products as an exercise market power. The Prince George refinery's capacity utilization rate for the last five years has averaged 89.5 percent.[143] Burnaby has operated at less than its capacity recently because of an inability to import sufficient stocks of crude oil to operate the refinery at a higher level and due to an 8 week maintenance shutdown in 2018.[144] Of course, like other refineries, both the Prince George and Burnaby refineries need to be removed from service occasionally for regular maintenance and upgrades, but this is standard practice in the industry. Removing a plant from service in order to complete a turnaround and thereby adequately maintain and upgrade the plant's productive capacity over time is not an exercise of market power, nor is operating below capacity when a facility is unable to acquire the raw materials needed to produce at a higher level of output.

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[141] MacEwen – About, available at https://macewen.ca/about/.

[142] "2018 National Retail Petroleum Site Census," Kent Group Ltd., June 7, 2019.

[143] Husky Energy Annual Report 2015, pp. 16 and 38; Husky Energy Annual Report 2016, p. 39; Husky Energy Annual Report 2017, p. 40; Husky Energy Annual Report 2018, p. 40.

[144] Parkland Fuels Corporation Q1 2018 Report to shareholders, p. 4; Affidavit of Michael J. Rensing, Director of the Low Carbon Fuels Branch in the Electricity and Alternative Energy Division of the British Columbia Ministry of Energy, Mines and Petroleum Resources, Court of Queen's Bench of Alberta No. 1901-06115, April 11, 2019, p. 3, available at https://twitter.com/richardzussman/status/1123657044031037440.

91. In Q1 2019, the Burnaby refinery operated at 92% utilization while the Prince George refinery operated at 85% utilization.[145] In 2018, Burnaby operated at 78% utilization while Prince George operated at 89% utilization.[146] Burnaby's 2018 utilization was lower than usual due to major maintenance that occurred at Burnaby between February and April 2018.[147] Eliminating Q1 2018 (which is when the bulk of the maintenance occurred), Burnaby has operated at an average quarterly utilization of 92% since Parkland took over ownership in Q4 2017. To put this into perspective, a 95% utilization rate is considered optimal, the Canadian refinery utilization rate was 83.6% in 2018, and the average world refinery utilization rate was 83.5% in 2018.[148]

92. Parkland's Burnaby refinery sometimes is unable to have adequate capacity allocated by Trans Mountain Pipeline to receive all of the crude oil it needs as feedstock. There is an excess demand for Trans Mountain's services. Demand for the Trans Mountain Pipeline has surpassed capacity for many years.[149] When there is excess demand, the pipeline's capacity needs to be allocated among shippers.

93. Capacity on the Trans Mountain pipeline is allocated based on operating conditions and nominations submitted by shippers each month.[150] Each month, shippers submit requests to transport crude oil and refined products. Based on shipper nominations, Trans Mountain Pipeline determines its available capacity (which varies based on the products

[145] Parkland Fuel Corporation Q1 2019 Management's Discussion and Analysis, p. 20; Husky Energy Inc. Q1 2019 Management's Discussion and Analysis, p. 16.

[146] Parkland Fuel Corporation Q4 2018 Management's Discussion and Analysis, p. 40; Parkland Fuel Corporation Q3 2018 Management's Discussion and Analysis, p. 16; Parkland Fuel Corporation Q2 2018 Management's Discussion and Analysis, p. 15; Parkland Fuel Corporation Q1 2018 Management's Discussion and Analysis, p. 14; Husky Energy Inc. 2018 Management's Discussion and Analysis, p. 40.

[147] Parkland Fuel Corporation Q2 2018 Management's Discussion and Analysis, p. 4.

[148] "The Economics of Petroleum Refining," *Canadian Fuels Association,* December 2013, p. 12, available at https://www.canadianfuels.ca/website/media/PDF/Publications/Economics-fundamentals-of-Refining-December-2013-Final-English.pdf; "BP Statistical Review of World Energy 2019," *BP,* 68th edition, p. 25, available at https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2019-full-report.pdf; "Weekly Regional Report," National Energy Board.

[149] "Demand Surpasses Capacity on the Trans Mountain Pipeline: System Oversubscribed by 44 per cent in April," T*rans Mountain Pipeline System press release,* March 29, 2018, available at https://www.transmountain.com/news/2018/demand-surpasses-capacity-on-the-trans-mountain-pipeline-system-oversubscribed-by-44-per-cent-in-april; "Update: February 2019 Capacity Announcement for the Trans Mountain Pipeline System," T*rans Mountain Pipeline System press release,* January 31, 2019, available at https://www.transmountain.com/news/2019/update-february-2019-capacity.

[150] For each shipper's nomination, Trans Mountain requires either written third-party verification or a certificate executed by a shipper officers which verify that the shipper has capability to tender product to satisfy its nominated volume. "Optimizing Oil Pipeline and Rail Capacity out of Western Canada - Advice to the Minister of Natural Resources," *National Energy Board,* March 2019, available at https://www.neb-one.gc.ca/nrg/sttstc/crdlndptrlmprdct/rprt/2019ptmzngcpct/index-eng.html.

it will be shipping and other factors such as maintenance needs). If nominations are greater than available capacity, that capacity is apportioned among shippers using a methodology that is part of the pipeline's tariff. According to Trans Mountain Pipeline, "Apportionment of the Trans Mountain Pipeline system has been a regular monthly occurrence for the past decade."[151] The average monthly apportionment for 2018 was 40.4 percent.[152] The monthly apportionment percentages for January – June 2019 are:

Table 13
Monthly Trans Mountain Pipeline Apportionment Percentages
January – June 2019

Month	Apportionment Percentage
January 2019	24%
February 2019	32%
March 2019	33%
April 2019	29%
May 2019	28%
June 2019	39%

Note: Apportionment describes the amount of demand shippers place on the pipeline in excess of its available capacity.

Sources: "Update: January 2019 Capacity Announcement for the Trans Mountain Pipeline System," *Trans Mountain Pipeline System press release,* January 3, 2019, available at https://www.transmountain.com/news/2019/update-january-2019-capacity-announcement-for-the-trans-mountain-pipeline-system; "Update: February 2019 Capacity Announcement for the Trans Mountain Pipeline System," *Trans Mountain Pipeline System press release,* January 31, 2019, available at https://www.transmountain.com/news/2019/update-february-2019-capacity; "Update: March 2019 Capacity Announcement for the Trans Mountain Pipeline System," *Trans Mountain Pipeline System press release,* February 27, 2019, available at https://www.transmountain.com/news/2019/update-march-2019-capacity-announcement-for-the-trans-mountain-pipeline-system; "Update: April 2019 Capacity Announcement for the Trans Mountain Pipeline System," *Trans Mountain Pipeline System press release,* April 1, 2019, available at https://www.transmountain.com/news/2019/update-april-2019-capacity-announcement-for-the-trans-mountain-pipeline-system; "Update: May 2019 Capacity Announcement for the Trans Mountain Pipeline System," *Trans Mountain Pipeline System press release,* May 2, 2019, available at https://www.transmountain.com/news/2019/update-may-2019-capacity-announcement-for-the-trans-mountain-pipeline-system; "Update: June 2019 Capacity Announcement for the Trans Mountain Pipeline System," *Trans Mountain Pipeline System press release,* May 30, 2019, available at

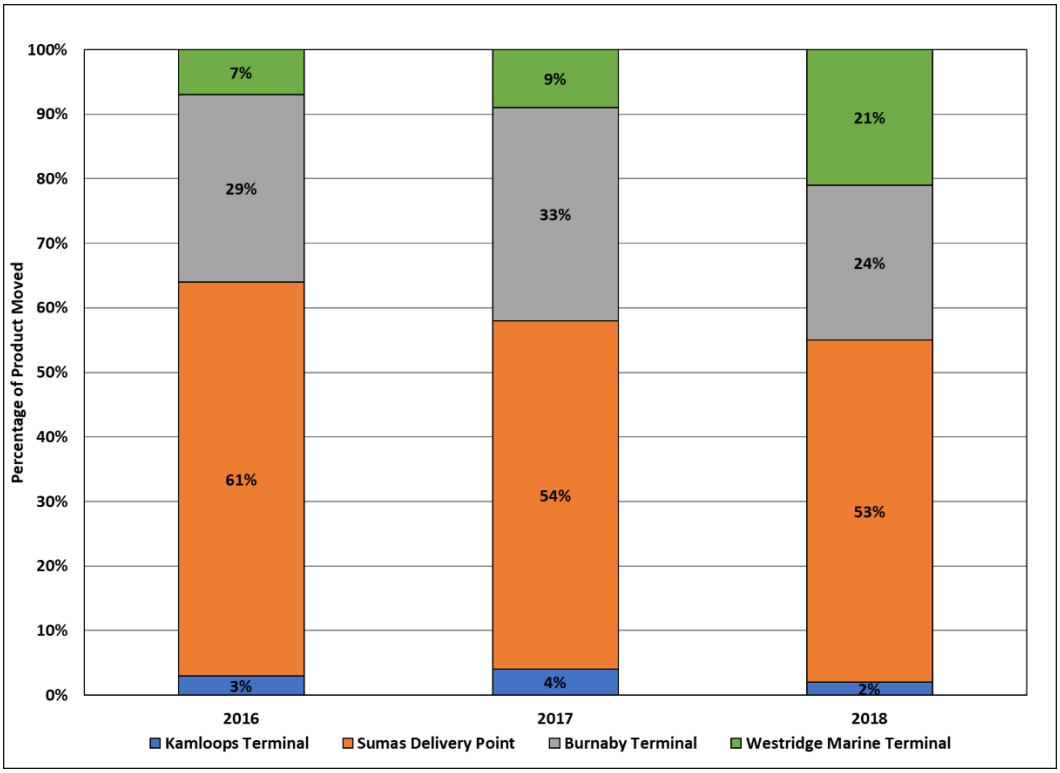
[151] "Update: February 2019 Capacity Announcement for the Trans Mountain Pipeline System" *Trans Mountain Pipeline System press release*, January 31, 2019, available at https://www.transmountain.com/news/2019/update-february-2019-capacity.

[152] Apportionment was at its highest level in 2012 and 2013. Average monthly apportionment in both of these years was 69.3 percent. "Pipeline Throughput and Capacity Data - Oil Pipeline Apportionment Dataset," Government of Canada, available at https://open.canada.ca/data/en/dataset/dc343c43-a592-4a27-8ee7-c77df56afb34.

https://www.transmountain.com/news/2019/update-june-2019-capacity-announcement-for-the-trans-mountain-pipeline-system.

94. Trans Mountain Pipeline is used to import crude oil into British Columbia for refining in the province, gasoline and diesel for consumption in the province, crude oil to be refined at refineries in Washington State, and crude oil for wider export. As shown in **Figure 33** in 2018, the Burnaby terminal received 24% of the product moved on the Trans Mountain pipeline.[153] In contrast, the Sumas delivery point, which routes crude oil to Washington state refineries, received 53% of the product moved.[154] Additionally, the percentage of product delivered to the Westridge Marine Terminal, which facilitates marine exports to the U.S. West Coast and Asia, more than doubled from 2017 to 2018.[155]

Figure 33
Percentage of Product Moved on the Trans Mountain Pipeline by Delivery Location
2016-2018



Source: Trans Mountain – Product Destination, available at https://www.transmountain.com/product-destination. 2016 and 2017 percentages retrieved from https://archive.org/web/.

[153] Trans Mountain – Product Destination, available at https://www.transmountain.com/product-destination.

[154] Trans Mountain – Product Destination, available at https://www.transmountain.com/product-destination.

[155] Trans Mountain – Product Destination, available at https://www.transmountain.com/product-destination.

95. Apportionment may lead to Burnaby receiving less feedstock than necessary to run at full capacity. Due to economies of scale in refinery operation, running Burnaby at a reduced level of output increases its per unit costs and adversely affects its profitability.

96. The Trans Mountain pipeline has a capacity of 300,000 barrels per day and flows at a rate of approximately eight kilometers per hour.[156] The Trans Mountain pipeline is unique in that it carries both refined product and crude oil through the pipeline in a process called batching, where one product moves though pipeline during a specific time period. In general, the flow of crude oil and refined products on the Trans Mountain pipeline is as follows: crude oil and refined products are received at either Edmonton or Kamloops and flow to the Kamloops terminal, the Sumas delivery point, the Burnaby terminal, or the Westridge marine terminal.[157]

- The Edmonton terminal is the beginning of the pipeline and is supplied by 20 incoming feeder lines that bring product from all over Alberta.[158]

- The Kamloops terminal, serves as both a hub for local distribution of product shipped from Edmonton and a receiving point for products from northeastern British Columbia.[159] Any products that need to be sent to the Kamloops terminal but cannot be transported through the pipeline are sent at a higher cost via truck or rail.

- At the Sumas delivery point, the Tran Mountain Pipeline connects with the Trans Mountain Puget Sound Pipeline, which delivers crude oil to four refineries on the west coast of Washington state.[160]

[156] As explained on the National Energy Board's website: "The physical capacity of a pipeline is based on many factors such as the products being carried, direction of flow, pipeline pumping capacity, and maintenance work or other pressure restrictions. The actual physical capacity of the pipeline may, at times, be higher than the assumed operational capacity stated here[.]" National Energy Board – Pipeline Profiles: Trans Mountain, September 2018, available at https://www.neb-one.gc.ca/nrg/ntgrtd/pplnprtl/pplnprfls/crdl/trnsmntn-eng.html; Trans Mountain – Pipeline System, available at https://www.transmountain.com/pipeline-system.

[157] Trans Mountain – Pipeline System, available at https://www.transmountain.com/pipeline-system.

[158] Trans Mountain – Pipeline System, available at https://www.transmountain.com/pipeline-system.

[159] Trans Mountain – Pipeline System, available at https://www.transmountain.com/pipeline-system.

[160] National Energy Board – Pipeline Profiles: Trans Mountain, available at https://www.neb-one.gc.ca/nrg/ntgrtd/pplnprtl/pplnprfls/crdl/trnsmntn-eng.html.

- The Burnaby terminal serves as a distribution point where crude oil and refined products are taken either to the Burnaby refinery, local marketing terminals, or to the Westridge Marine terminal.[161]

- The Westridge Marine terminal facilitates marine exports from the pipeline to coastal refineries, such as those on the U.S. West Coast or in Asia.[162]

97. The excess of demand for pipeline capacity creates intense competition for nomination on the pipeline, which is evident through the practice of over-nomination. Over-nominating is the practice of shippers nominating more barrels of oil than they intend to ship to increase the likelihood that they will receive the amount of pipeline capacity they desire.[163] Over-nomination can impact the allocation of capacity across shippers, limiting the supply of some shippers. In a March 2019 report, the Canadian National Energy Board indicated that there was evidence of over-nominations on the Trans Mountain pipeline.[164]

98. The Trans Mountain Pipeline does not have additional capacity that can be used to transport gasoline and diesel to British Columbia from production locations in Alberta. The Trans Mountain Pipeline is currently operating at capacity and has done so for at least the last several years. In particular, the pipeline is on apportionment, which means that the demand shippers place on the pipeline is greater than its available capacity and that capacity has to be allocated among various shippers.

99. In addition to shipping crude oil and refined products from Alberta to British Columbia, Trans Mountain Pipeline is used to ship crude oil from Alberta to several large refineries in Washington State and also to ship crude oil for export.[165] Parkland has at times needed to reduce production at Burnaby because it could not import sufficient quantities of crude oil feedstock to keep the Burnaby refinery operating at a higher level.[166] Indeed, Parkland

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[161] National Energy Board – Pipeline Profiles: Trans Mountain, September 2018, available at https://www.neb-one.gc.ca/nrg/ntgrtd/pplnprtl/pplnprfls/crdl/trnsmntn-eng.html.

[162] Trans Mountain – Pipeline System, available at https://www.transmountain.com/pipeline-system.

[163] "Optimizing Oil Pipeline and Rail Capacity out of Western Canada - Advice to the Minister of Natural Resources," National Energy Board, March 2019, available at https://www.neb-one.gc.ca/nrg/sttstc/crdlndptrlmprdct/rprt/2019ptmzngcpct/index-eng.html.

[164] "Optimizing Oil Pipeline and Rail Capacity out of Western Canada - Advice to the Minister of Natural Resources," National Energy Board, March 2019, available at https://www.neb-one.gc.ca/nrg/sttstc/crdlndptrlmprdct/rprt/2019ptmzngcpct/index-eng.html.

[165] Bennett, Nelson, "Crude exports via Vancouver totaled $1.4 billion last year," *Business In Vancouver*, June 13, 2019, available at https://biv.com/article/2019/06/crude-exports-vancouver-totalled-14-billion-last-year.

[166] Affidavit of Michael J. Rensing, Director of the Low Carbon Fuels Branch in the Electricity and Alternative Energy Division of the British Columbia Ministry of Energy, Mines and Petroleum Resources, Court of Queen's Bench of

at times has had to import crude oil for use at Burnaby via rail because it was unable to access lower-cost transport via pipeline.[167] A firm does not exercise market power when it fails to produce products because it cannot access the raw materials necessary to make them.

100. With local facilities operating at capacity and no additional pipeline capacity available to import gasoline and diesel from Alberta refineries, production in Washington State is the marginal source of supply for gasoline and diesel in British Columbia. There are multiple refineries operating in Washington that do or could supply at least some of the demand in British Columbia, including Marathon, Phillips 66, Shell, and BP.

101. British Columbia's gasoline and diesel supply comes from multiple refineries located in the province, in Alberta, and in Washington. With multiple refineries that do or could supply British Columbia's gasoline and diesel needs, it has diverse actual and potential supply options. In addition, the market shares of individual marketers supplying gas stations in British Columbia are not large. **Table 10** provides the market shares for these marketers based on the number of gas stations supplied. The largest share is 20 percent. Given the diversity of British Columbia's supply sources and the relatively low shares for individual gasoline and diesel marketers, the wholesale market for gasoline and diesel is competitive structurally and is a well-functioning market.

102. In my answer to **Question (5)**, I address the reaction of wholesale and retail prices in British Columbia to supply shocks. There have been recent instances when supply shocks or disruptions have removed productive capacity from the market. Wholesale and retail prices have responded to these supply shocks by increasing in the short term. In general, prices tend to increase in markets when supply is tight, and increase further when there are negative shocks to supply on top of generally tight conditions. This is a basic, standard principle of economics. An increase in prices because supply is tight, due to reasons other than conduct designed artificially to withhold supply from the market, is not a price increase arising from an exercise of market power. Prices arising from such conditions would be expected in a functioning market and are not an indication of anticompetitive activity.

E. Question (5): What factors have contributed to increases in retail gasoline and diesel prices in British Columbia since 2015?

103. As discussed in detail in my response to **Question (2)**, the retail market for gasoline and diesel in British Columbia currently operates (and has been operating) under circumstances that have resulted in a rather delicate balance of supply and demand in the

Alberta No. 1901-06115, April 11, 2019, p. 5, available at https://twitter.com/richardzussman/status/1123657044031037440.

[167] "Parkland Burnaby Refinery Five-Year Outlook," Parkland Fuel Corporation, February 13, 2019, p. 8, available at http://www.parklandcap.ca/wp/wp-content/uploads/2019/03/Attachment-One_Parkland-Presentation_Feb_2019.pdf.

region. This means any changes over time that have increased refiners' costs or hindered their ability to supply British Columbia have also in most cases resulted in higher retail prices. Some of the most significant factors that have affected retail prices since 2015 include:

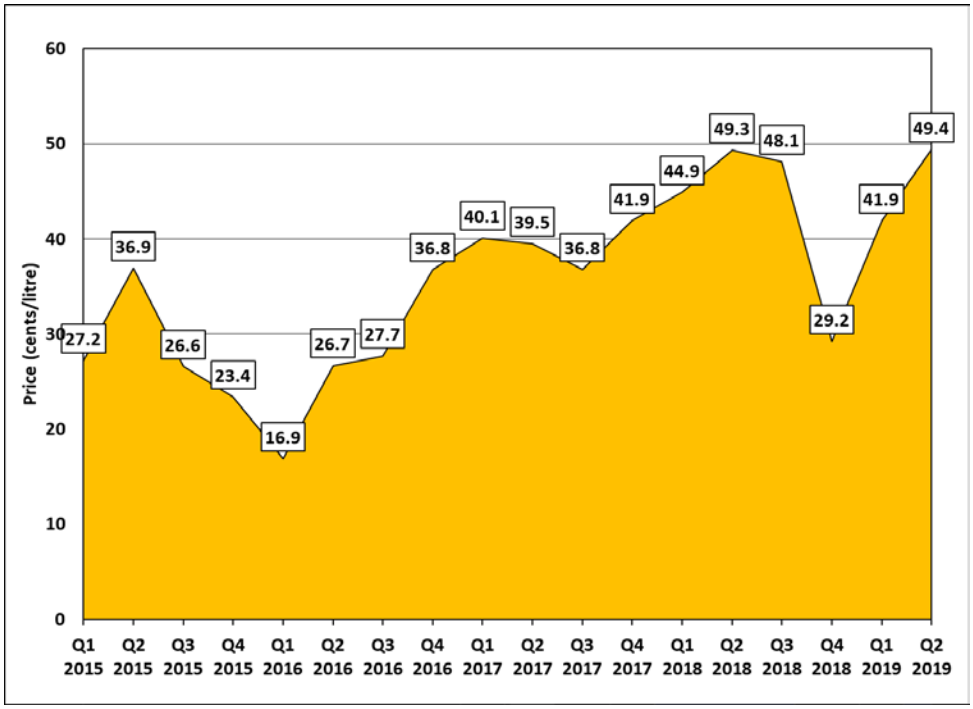
- Increases in crude oil prices;
- Decreases in the availability of Trans Mountain Pipeline's capacity to transport refined products into British Columbia;
- Increased taxes;
- Increasingly stringent British Columbia Low Carbon Fuel Standards;
- Supply shocks;
- Demand growth; and
- Changes in Costs.

Increases in Crude Oil Prices

104. The prices of various crude oil benchmarks, though subject to fluctuations over time, have increased dramatically since 2015. **Figure 2** in my answer to **Question (1)** provides data on several crude oil benchmark prices over time. All of the benchmarks exhibit substantial price volatility. **Figure 34** provides quarterly information on the value of the crude oil needed to refine 1 litre of regular gasoline over time. This value fluctuates between 16.9 cents/litre in Q1 2016 and 49.4 cents/litre in Q2 2019. The difference between the two is 32.5 cents/litre, and the maximum cost for the oil in a litre of regular gas over this time period is nearly three times the minimum. This component of the price of regular gasoline is highly volatile. Comparing the start and end of the period, in 2015 the cost of crude oil accounted for an average of 28.53 cents per litre of gasoline purchased by consumers in British Columbia. By 2019 this amount had risen to 45.65 cents per litre,[168] a change of 17.12 cents/litre.

[168] Kent Petroleum Price Data, Kent Group Ltd., British Columbia (Simple Weighted) Unleaded Crude Price, through May 31, 2019 available at https://charting.kentgroupltd.com/.

Figure 34
Value of the Crude Oil Included in 1 Litre of Regular Gasoline
Q1 2015 – Q2 2019



Source: Kent Petroleum Price Data, Kent Group Ltd., British Columbia (Simple Weighted) Unleaded Crude Price, through May 31, 2019 available at https://charting.kentgroupltd.com/.

Decreases in the Availability of Trans Mountain Pipeline's Capacity to Transport Refined Products into British Columbia

105. As discussed in my answer to **Question (2)**, about 70% of the demand for gasoline and diesel in British Columbia is met via products that are refined elsewhere and shipped into the province. A significant portion of these imports are transported on the Trans Mountain Pipeline.[169] Because Trans Mountain is the lowest cost method of transport available for importing refined fuels into British Columbia, any decrease in the volume of refined fuels imported via this pipeline will result in an increase in fuel prices in British Columbia (all else equal). Any decline in Trans Mountain imports would remove infra-

[169] "Retail Gasoline and Diesel Prices in the First Quarter of 2018 were at their Highest Levels since the end of 2014," Kent Group, Q1 2018, available at https://www.kentgroupltd.com/wp-content/uploads/2018/04/March_2018_Eng-1.pdf; "Parkland Burnaby Refinery Five-Year Outlook," Parkland Fuel Corporation, February 13, 2019, available at http://www.parklandcap.ca/wp/wp-content/uploads/2019/03/Attachment-One_Parkland-Presentation_Feb_2019.pdf; Knox, Jack, "The great pipeline debate: Why isn't more oil refined in B.C.?," *Time Colonist*, April 29, 2018, available at https://www.timescolonist.com/news/local/the-great-pipeline-debate-why-isn-t-more-oil-refined-in-b-c-1.23284624; "Provincial and Territorial Energy Profiles – British Columbia," National Energy Board, available at https://www.neb-one.gc.ca/nrg/ntgrtd/mrkt/nrgsstmprfls/bc-eng.html.

marginal supply from the market, meaning that demand will need to be satisfied using sources that are higher-cost on the margin. This has been noted by the British Columbia Ministry of Energy, Mines and Petroleum Resources:

> All other sources of refined fuels available to British Columbians are more expensive than shipments through the TMPL [Trans Mountain Pipeline]. Any reduction in supply of refined fuels will increase prices. When refined fuel prices increase, daily transportation becomes more expensive. The price of goods and services also increases, particularly for remote communities.[170]

106. As I discussed in my answer to **Question (2)**, refined products have accounted for a smaller percentage of the total volume transported via the Trans Mountain Pipeline over time. In addition, as shown in **Figure 17**, the throughput of refined products shipped via Trans Mountain has decreased substantially over the last few years. As I also noted in my answer to **Question (2)**, this has occurred while the pipeline has been operating at or near capacity, meaning that shipments of other products have crowded out shipments of gasoline and diesel on Trans Mountain. **Table 14** summarizes annual data on average daily throughput of refined products over the Trans Mountain Pipeline between 2015 and 2019. Average volumes have fallen by about a half since 2015. Industry analysts have estimated that, in recent years, the constraints on Trans Mountain Pipeline capacity have resulted in a price increase of 10 to 14 cents per litre of gasoline in British Columbia.[171]

Table 14
Trans Mountain Pipeline Annual Average Daily Throughput of Refined Products
2015 - 2019

Year	Throughput (kb/d)	% Change From 2015
2015	56	n/a
2016	51	-9%
2017	42	-25%
2018	28	-50%
2019	30	-47%

Note: 2019 figures are available up to March 2019.

[170] Affidavit of Michael J. Rensing, Director of the Low Carbon Fuels Branch in the Electricity and Alternative Energy Division of the British Columbia Ministry of Energy, Mines and Petroleum Resources, Court of Queen's Bench of Alberta No. 1901-06115, April 11, 2019, ¶ 27, available at https://twitter.com/richardzussman/status/1123657044031037440.

[171] Bennet, Nelson, "A reality check for John Horgan's refinery pitch," *Business In Vancouver*, May 8, 2018, available at https://biv.com/article/2018/05/reality-check-john-horgans-refinery-pitch.

Sources: "Pipeline Throughput and Capacity Data - Trans Mountain Pipeline," Government of Canada, available at https://open.canada.ca/data/en/dataset/dc343c43-a592-4a27-8ee7-c77df56afb34; "Pipeline Profiles: Trans Mountain,' National Energy Board, September 2018, available at https://www.neb-one.gc.ca/nrg/ntgrtd/pplnprtl/pplnprfls/crdl/trnsmntn-eng.html?=undefined&wbdisable=true.

Increased Taxes

107. Increased taxes also contributed to increases in retail gasoline and diesel prices in British Columbia. As I discussed in my answer to **Question 2**, consumers in British Columbia, and especially in Vancouver, pay some of the highest taxes on gasoline and diesel in Canada. Since 2015, two different British Columbia taxes have increased:

- The B.C. carbon tax on gasoline increased from 6.67 cents/litre to 7.78 cents/litre on April 1, 2018.[172]
- The B.C. carbon tax on gasoline increased further to 8.89 cents/litre on April 1, 2019.[173] Since the start of 2015, this tax has increased by a total of 2.22 cents/litre.
- The B.C. carbon tax on diesel increased from 7.67 cents/litre to 8.95 cents/litre on April 1, 2018.[174]
- The B.C. carbon tax on diesel increased further to 10.23 cents/litre on April 1, 2019.[175] Since the start of 2015, this tax has increased by a total of 2.56 cents/litre.
- In Victoria, the regional transit service area tax on gasoline and diesel increased by 2 cents/litre, increasing from 3.5 cents/litre to 5.5 cents/litre on April 1, 2018.[176]

[172] "Carbon Tax Rates by Fuel Type – From July 1, 2012," British Columbia Ministry of Finance, February 2018, available at https://www2.gov.bc.ca/assets/gov/taxes/sales-taxes/publications/carbon-tax-rates-by-fuel-type-from-july-1-2012.pdf.

[173] "Carbon Tax Rates by Fuel Type – From July 1, 2012," British Columbia Ministry of Finance, February 2018, available at https://www2.gov.bc.ca/assets/gov/taxes/sales-taxes/publications/carbon-tax-rates-by-fuel-type-from-july-1-2012.pdf.

[174] "Carbon Tax Rates by Fuel Type – From July 1, 2012," British Columbia Ministry of Finance, February 2018, available at https://www2.gov.bc.ca/assets/gov/taxes/sales-taxes/publications/carbon-tax-rates-by-fuel-type-from-july-1-2012.pdf.

[175] "Carbon Tax Rates by Fuel Type – From July 1, 2012," British Columbia Ministry of Finance, February 2018, available at https://www2.gov.bc.ca/assets/gov/taxes/sales-taxes/publications/carbon-tax-rates-by-fuel-type-from-july-1-2012.pdf.

[176] "Tax Rates on Fuels," British Columbia Ministry of Finance Tax Bulletin, April 2019, p. 3, available at https://www2.gov.bc.ca/assets/gov/taxes/sales-taxes/publications/mft-ct-005-tax-rates-fuels.pdf.

108. Additional gasoline and diesel tax increases are planned for British Columbia:

- The carbon tax on gasoline is set to increase from 8.89 cents/litre to 10.01 cents/litre on April 1, 2020;[177]
- A further increase in the carbon tax on gasoline to 11.12 cents/litre is set for April 1, 2021;[178]
- The carbon tax on diesel is set to increase from 10.23 cents/litre to 11.51 cents/litre on April 1, 2020;[179]
- A further increase in the carbon tax on diesel to 12.78 cents/litre is set for April 1, 2021;[180] and
- The Vancouver TransLink service region tax on gasoline and diesel is scheduled to increase from 17 cents/litre to 18.5 cents/litre on July 1, 2019.[181]

109. Although the federal goods and services tax rate has stayed constant at 5%, this tax is applied to the total retail price of fuels, including all other taxes. Thus, as the retail prices of gasoline and diesel before taxes has risen (*e.g.,* due to increases in the price of crude oil), so too has the federal goods and service tax. Furthermore, as carbon and other taxes have increased, so too has the federal goods and service tax. In ¶ 106 I indicated that the value of the crude oil in a litre of regular gasoline increased by 32.5 cents from Q1 2016 to Q2 2019. If this increase had not occurred and retail prices for regular gasoline had been 32.5 cents per litre lower in Q2 2019, the federal goods and service tax on a litre of gasoline would have been 1.625 cents lower. Along the same lines, the British Columbia carbon tax on a litre of gasoline is currently 8.89 cents/litre. In the absence of this tax, the federal goods and service tax on a litre of gasoline would be 0.44 cents lower.

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[177] "Carbon Tax Rates by Fuel Type – From July 1, 2012," British Columbia Ministry of Finance, Revised February 2018, available at https://www2.gov.bc.ca/assets/gov/taxes/sales-taxes/publications/carbon-tax-rates-by-fuel-type-from-july-1-2012.pdf.

[178] "Carbon Tax Rates by Fuel Type – From July 1, 2012," British Columbia Ministry of Finance, February 2018, available at https://www2.gov.bc.ca/assets/gov/taxes/sales-taxes/publications/carbon-tax-rates-by-fuel-type-from-july-1-2012.pdf.

[179] "Carbon Tax Rates by Fuel Type – From July 1, 2012," British Columbia Ministry of Finance, Revised February 2018, available at https://www2.gov.bc.ca/assets/gov/taxes/sales-taxes/publications/carbon-tax-rates-by-fuel-type-from-july-1-2012.pdf.

[180] "Carbon Tax Rates by Fuel Type – From July 1, 2012," British Columbia Ministry of Finance, February 2018, available at https://www2.gov.bc.ca/assets/gov/taxes/sales-taxes/publications/carbon-tax-rates-by-fuel-type-from-july-1-2012.pdf.

[181] "Making Life Better | Budget 2019," British Columbia Ministry of Finance, February 19, 2019, available at https://www.bcbudget.gov.bc.ca/2019/pdf/2019_budget_and_fiscal_plan.pdf.

110. As I discuss in more detail in my answer to **Question 8**, these tax increases are intended to discourage or provide a disincentive for the use of gasoline and diesel and to promote less carbon-intensive fuel sources and means of transportation.

Increasingly Stringent British Columbia Low Carbon Fuel Standards

111. Alongside rising crude prices and tight pipeline capacity, it is becoming increasingly more expensive to comply with the LCFS standards. The LCFS policy is not static but rather was purposefully designed so that the standards become increasingly stringent each year until the desired target is achieved (in this case, a 10% reduction of the carbon intensity of fuels, which is intended to be achieved by 2020).[182] This increasing standard raises fuel suppliers' costs by having suppliers blend in an increasing amount of (more expensive or less efficient) alternative fuels to produce fuels with a lower carbon intensity. Suppliers can also incur additional costs due to storage or logistical costs associated with lower carbon intensity alternatives. As I discussed in my response to **Question (2)**, blending is a viable approach to compliance until fuel suppliers hit the "blend wall" and must look for other compliance methods. Increasing both the costs to produce retail fuels and the final consumer prices of these fuels over time is a natural consequence of the LCFS policy.

112. Rivers and Wigle (2018) note this consequence of the LCFS policy. In their paper, they describe how increased costs under an LCFS policy are not steady, but include "small kinks where blending limits impinge on the ability of low carbon fuels to reduce emissions further."[183]

Supply Shocks

113. Due to the delicate balance of supply and demand in British Columbia, the province's limited refining capacity, and its limited options for importing crude oil and refined products, supply shocks caused, for example, by disruptions in the logistics for importing products or refinery outages can cause large imbalances between supply and demand. Such imbalances can lead to significant changes in market prices. Increases in prices due to a supply disruption would be expected to last at least as long as the supply disruption itself.

114. As an example, I understand from the British Columbia Ministry of Energy, Mines and Petroleum Resources that the Burnaby refinery typically operates at full capacity but at

[182] As noted in previous sections British Columbia is currently the only province in Canada to have an LCFS policy in effect. Government of British Columbia – Renewable & Low Carbon Fuel Requirements Regulation, available at https://www2.gov.bc.ca/gov/content/industry/electricity-alternative-energy/transportation-energies/renewable-low-carbon-fuels.

[183] Rivers, Nicholas and Randall Wigle, "Reducing Greenhouse Gas Emissions In Transport: All In One Basket?" University of Calgary The School of Public Policy, February 2018, p. 9.

times has not operated at full capacity due to an inability to access sufficient crude oil.[184] With Burnaby supplying roughly 25 percent of the refined products in British Columbia (see my answer to **Question (2)**), a 20 percent reduction in the plant's capacity utilization, for example, would amount to a loss of production equivalent to 5 percent of province-wide demand. This is a sizeable shortfall that would be expected to have a significant effect on the prices of refined products in the province.

115. As an example of such a disruption, in 2018 there was a natural gas fire near Prince George on the Westcoast Transmission System (a natural gas pipeline). The fire resulted from a rupture in the pipeline in a rural area and caused the closure of the pipeline and also a nearby pipeline as a safety precaution.[185] Many of the West Coast refineries rely on natural gas supplied from this pipeline as a source of power and steam for their operations.[186] At least three Washington State refineries (Marathon Oil, Royal Dutch Shell, and Phillips 66) were forced to reduce refinery production due to the Prince George fire.[187] These output reductions resulted in increases in the prices for refined fuels across the West Coast. According to Bloomberg, wholesale gasoline prices in Portland, Oregon, rose 19 cents (U.S.) per gallon and San Francisco prices rose 5 cents (U.S.).[188] Price effects in Vancouver were described as:

> You will definitely see price jump. The markets have not completely settled, won't for another hour, but I'm already looking at potential for a three-cent-a-litre increase, pushing average prices, which we saw here at the high-end in Metro Vancouver, from 158.9 to probably 161.9 for Friday…. This is really the result of [Washington] refineries not having

[184] Affidavit of Michael J. Rensing, Director of the Low Carbon Fuels Branch in the Electricity and Alternative Energy Division of the British Columbia Ministry of Energy, Mines and Petroleum Resources, Court of Queen's Bench of Alberta No. 1901-06115, April 11, 2019, ¶ 15, available at https://twitter.com/richardzussman/status/1123657044031037440.

[185] Marino, David and Rachel Adams-Heard, "Gas Flows Resume After Canada Pipe Rupture Hits Oil Refiners," *Bloomberg*, October 10, 2018, available at https://www.bloomberg.com/news/articles/2018-10-10/gas-line-break-forces-northwest-u-s-refiners-to-curb-production.

[186] Marino, David and Rachel Adams-Heard, "Gas Flows Resume After Canada Pipe Rupture Hits Oil Refiners," *Bloomberg*, October 10, 2018, available at https://www.bloomberg.com/news/articles/2018-10-10/gas-line-break-forces-northwest-u-s-refiners-to-curb-production.

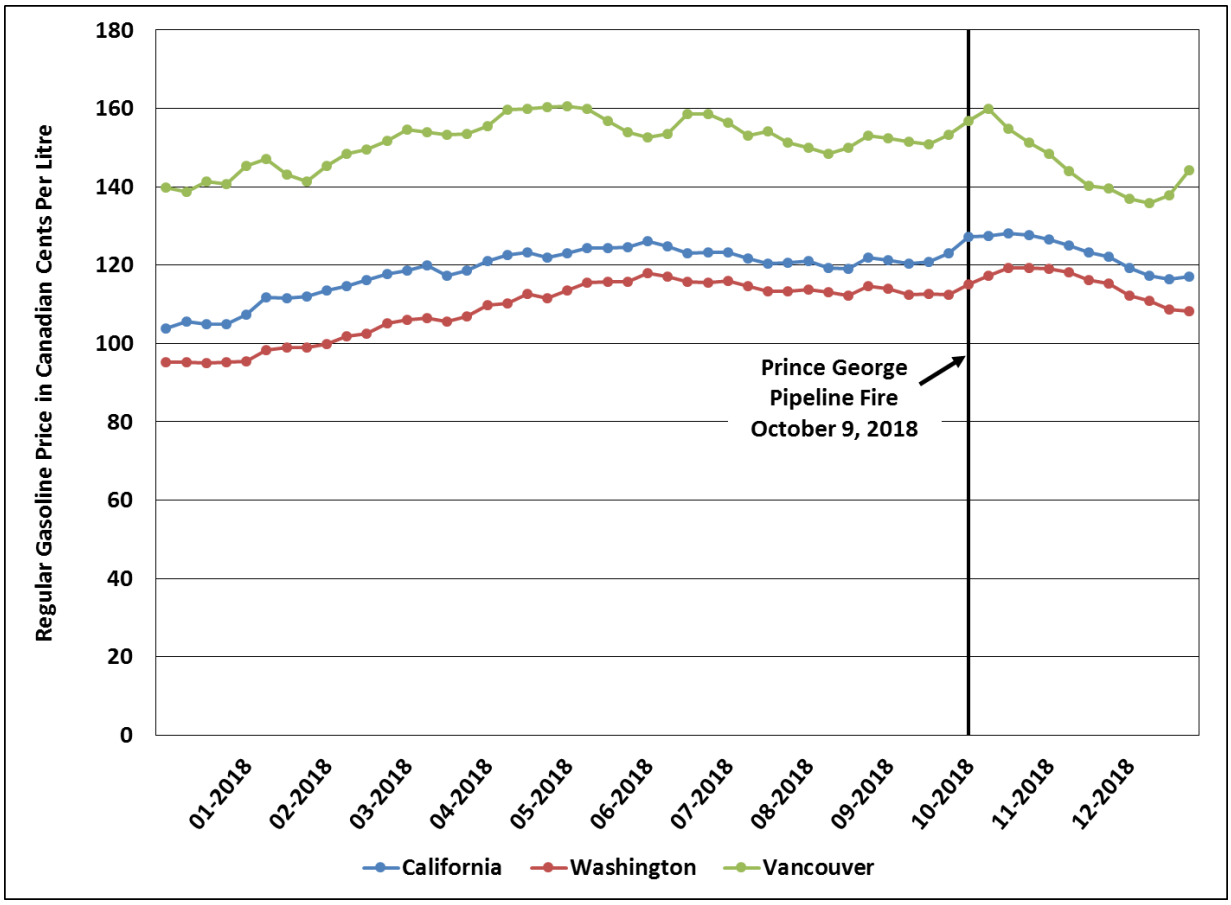
[187] "Update 2 – A third Washington Refinery Curbs Operations After Natgas Pipe Fire," *Reuters*, October 11, 2018, available at https://www.reuters.com/article/refinery-operations-andeavor-anacortes/update-2-a-third-washington-refinery-curbs-operations-after-natgas-pipe-fire-idUSL2N1WR1F5.

[188] Marino, David and Rachel Adams-Heard, "Gas Flows Resume After Canada Pipe Rupture Hits Oil Refiners," *Bloomberg*, October 10, 2018, available at https://www.bloomberg.com/news/articles/2018-10-10/gas-line-break-forces-northwest-u-s-refiners-to-curb-production.

feed-stock, or the co-generation. They use natural gas from Canada…to run their operations.[189]

116. Weekly average retail prices in California, Washington, and Vancouver are provided in **Figure 35**.

Figure 35
Weekly Average Regular Gasoline Prices in California, Washington and Vancouver
2018



Note: The pipeline was fully repaired by October 31, 2018. However, pipeline operations were not fully restored until early 2019. This is a result of the fact that the pipeline cannot immediately run at 100 percent capacity once operational. Instead, the pipeline must gradually ramp up operating pressure until it reaches full capacity which it did in early 2019. In the interim, some natural gas was transported through an adjacent pipeline and some was shipped via truck.

Sources: "Transportation Fuel Prices," Natural Resources Canada, available at https://www.nrcan.gc.ca/our-natural-resources/domestic-and-international-markets/transportation-fuel-

[189] "Jump at the pump expected as Washington state refineries cut output," October 10, 2018, available at https://www.citynews1130.com/2018/10/10/gas-expected-to-jump-as-washington-state-refineries-cut-output/ . The article is quoting Dan McTeague of GasBuddy.com.

prices/4593; "Weekly Retail Gasoline and Diesel Prices," U.S. Energy Information Administration, available at https://www.eia.gov/dnav/pet/PET_PRI_GND_A_EPMR_PTE_DPGAL_W.htm; "Canada / U.S. Foreign Exchange Rate," FRED Economic Research, available at https://fred.stlouisfed.org/series/DEXCAUS; "Update 2 – A third Washington Refinery Curbs Operations After Natgas Pipe Fire," *Reuters*¸ October 11, 2018, available at https://www.reuters.com/article/refinery-operations-andeavor-anacortes/update-2-a-third-washington-refinery-curbs-operations-after-natgas-pipe-fire-idUSL2N1WR1F5; "Natural gas supply still limited despite completed Enbridge pipeline repair," Fortis BC, November 2, 2018, available at https://www.fortisbc.com/news-events/media-centre-details/2018/11/03/20181102-Natural-gas-supply-still-limited-despite-completed-Enbridge-pipeline-repair; "Enbridge says one natural gas pipeline in British Columbia operational after rupture," Reuters, October 11, 2018, available at https://www.reuters.com/article/us-enbridge-inc-pipeline-ice/enbridge-says-one-natural-gas-pipeline-in-british-columbia-operational-after-rupture-idUSKCN1ML2Q4; Gahr, Tanya Laing, "See how we're using a "virtual pipeline" to transport natural gas to the Lower Mainland," Fortis BC, December 14, 2018, available at https://www.fortisbc.com/news-events/stories-and-news-from-fortisbc/stories-news-from-fortisbc/2018/12/14/see-how-we-re-using-a-virtual-pipeline-to-transport-natural-gas-to-the-lower-mainland.

117. There have been other supply shocks over time as well. In 2016, Suncor's Edmonton refinery was shut down by wildfires in Alberta, leading to gasoline shortages at company-owned Petro-Canada gas stations and Suncor-supplied dealer stations in Alberta, British Columbia, and elsewhere.[190]

Potential Demand Growth

118. There are several factors that may be limiting demand growth in British Columbia over time, including provincial policies designed to provide disincentives for consuming gasoline and diesel. There are other factors that would tend to increase demand for gasoline and diesel, such as population growth. The demand for gasoline and diesel can increase even if the demands of individual consumers decline (or at least do not increase). How these factors play out over time would be expected to impact market prices.

119. The population of British Columbia has grown over the past few years by 5.8 percent, increasing from 4,745,468 in Q1 2015 to 5,020,302 in Q1 2019.[191]

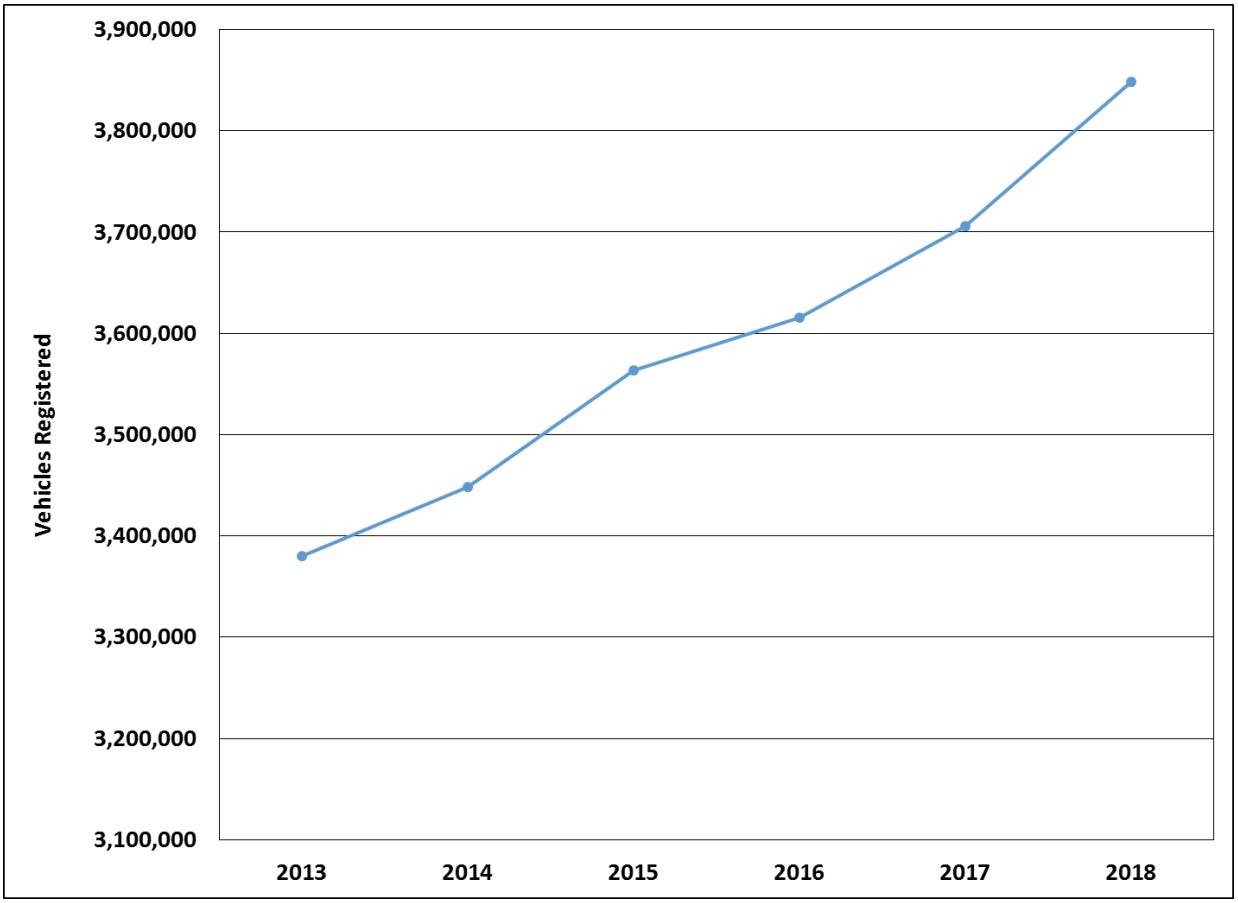
120. **Figure 36** provides data from Statistics Canada indicating that total British Columbia vehicle registrations have increased by about 14 percent over the six years from 2013 – 2018. Any continued increases in demand caused by demographic shifts in the province

[190] Penty, Rebecca, "Western Canada Facing Gasoline Shortages Amid Alberta Fires," *Bloomberg*, June 1, 2016, available at https://www.bloomberg.com/news/articles/2016-06-01/western-canada-facing-gasoline-shortages-amid-alberta-fires; "Petro-Canada stations running out of fuel due to Fort Mac wildfires, refinery outage" *Calgary Herald*, June 3, 2016, available at https://calgaryherald.com/business/energy/petro-canada-stations-running-out-of-fuel-due-to-fort-mac-wildfires-refinery-outage

[191] British Columbia Population Estimates, available at https://www2.gov.bc.ca/gov/content/data/statistics/people-population-community/population/population-estimates.

would serve to put upward pressure on prices, all else equal, due to the province's internal production capability and the capacity limits on the Trans Mountain Pipeline.

Figure 36
British Columbia Total Vehicle Registrations
2013 - 2018



Source: "Road Motor Vehicle Registrations, by Type of Vehicle," Statistics Canada, available at https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=2310006701.

Increased Costs

121. The costs of supplying gasoline and diesel to consumers in British Columbia have increased over time. I have already highlighted changes in the costs of crude oil, and I highlight several other changes in costs here.

122. Tolls on Trans Mountain Pipeline. Tolls on Trans Mountain Pipeline have generally increased over time. Tolls on the pipeline differ by petroleum type, receipt and destination point, and type of service. Petroleum type ranges from super light to super heavy. Burnaby receives light and super light petroleum from Edmonton and receives

light petroleum from Kamloops. Super light petroleum includes gasoline and light petroleum includes diesel and light crude, which is what is refined at the Burnaby refinery.[192] From 2015 to present, tolls from Edmonton to Burnaby on super light and light petroleum increased 6% to 8%, depending on the type of service. From 2015 to present, tolls from Kamloops to Burnaby on light petroleum increased 3% or decreased by 2%, depending on the type of service. **Table 15** below shows the Trans Mountain tolls on products delivered to Burnaby from 2015 to present.

Table 15

Trans Mountain Pipeline Tolls on Petroleum Products Delivered to Burnaby (CAD/barrel)

(2015 - Present)

Recipt	Destination	Type of Service	Petroleum Type	Toll as of 1/1/2015	Toll as of 5/1/2015	Toll as of 5/1/2016	Toll as of 5/1/2017	Toll as of 5/1/2018	Toll as of 5/1/2019	Percentage Increase Since 2015
Edmonton	Burnaby	Tank Metered	Super Light	$ 1.27	$ 1.24	$ 1.24	$ 2.09	$ 1.65	$ 1.37	8%
Edmonton	Burnaby	Tank Non Metered	Super Light	$ 1.24	$ 1.21	$ 1.21	$ 2.06	$ 1.62	$ 1.33	7%
Edmonton	Burnaby	Direct Injected	Super Light	$ 1.13	$ 1.09	$ 1.11	$ 1.96	$ 1.51	$ 1.21	7%
Edmonton	Burnaby	3rd Party Injected	Super Light	$ 1.10	$ 1.07	$ 1.09	$ 1.93	$ 1.48	$ 1.17	6%
Edmonton	Burnaby	Tank Metered	Light	$ 1.31	$ 1.29	$ 1.27	$ 2.13	$ 1.69	$ 1.42	8%
Edmonton	Burnaby	Tank Non Metered	Light	$ 1.29	$ 1.26	$ 1.25	$ 2.11	$ 1.66	$ 1.38	7%
Edmonton	Burnaby	Direct Injected	Light	$ 1.18	$ 1.14	$ 1.15	$ 2.01	$ 1.55	$ 1.26	7%
Edmonton	Burnaby	3rd Party Injected	Light	$ 1.15	$ 1.11	$ 1.12	$ 1.98	$ 1.52	$ 1.22	6%
Edmonton	Burnaby	Metered In, Direct N	Light	$ 1.18	$ 1.14	$ 1.15	$ 2.01	$ 1.56	$ 1.26	7%
Kamloops	Burnaby	Tank Metered	Light	$ 0.52	$ 0.52	$ 0.52	$ 0.80	$ 0.64	$ 0.54	3%
Kamloops	Burnaby	Direct Injected	Light	$ 0.42	$ 0.40	$ 0.41	$ 0.70	$ 0.53	$ 0.41	-2%

Note: Tolls shown are in Canadian dollars/barrel and include all additional surcharges and surcredits.

Source: "Tariff No. 93, 94, 96, 97, 98, 99, 100, 101, 103, 106, & 107 | Tolls Applying on Petroleum," *Trans Mountain Pipeline ULC*, available at https://apps.neb-one.gc.ca/REGDOCS/Item/View/552980.

123. Seasonal Formulations. Gasoline is more volatile in warmer temperatures, and summer gasoline must be formulated to have a lower Reid Vapor Pressure to reduce its volatility. The costs of making gasoline for sale in the summer is higher than that made for sale in the winter. Prices in the spring and summer reflect these additional costs after refineries switch from winter to summer formulations. This explains at least in part why gasoline prices consistently tend to rise in the summer months.[193] Similarly, diesel fuel must be

[192] "Tariff No. 94 | Tolls Applying on Petroleum," *Trans Mountain Pipeline ULC*, December 5, 2014, available at https://www.kindermorgan.com/content/docs/NEB_Tariff_No_94.pdf; "Parkland Burnaby Refinery Five-Year Outlook," Parkland Fuel Corporation, February 13, 2019, p. 8, available at http://www.parklandcap.ca/wp/wp-content/uploads/2019/03/Attachment-One_Parkland-Presentation_Feb_2019.pdf.

[193] "Date of switch to summer-grade gasoline approaches," U.S. Energy Information Administration, April 29, 2013, available at https://www.eia.gov/todayinenergy/detail.php?id=11031; Bennet, Nelson, "Gas pains on road to green gains in B.C.," *Business in Vancouver*, April 16, 2019, available at https://biv.com/article/2019/04/gas-pains-road-green-gains-bc.

"winterized" during the colder months in order to prevent the fuel from gelling,[194] and a by-product of this winterization is that winter-formulated diesel yields a lower km/litre that summer diesel formulations.

124. There is a long list of other types of costs that go into producing gasoline and diesel. These costs include personnel costs (salaries, wages, and benefits), maintenance costs (maintenance materials, contract maintenance labor, and equipment rental), insurance (both for the fixed assets and inventory), depreciation (annual accounting charge for the capital assets), general and administrative (all office and other administrative expenses), chemicals and additives, catalysts, royalties, utilities (electricity, steam, water), and refinery fuel (natural gas). Any of these categories of costs could have increased since 2015 and therefore could lead to changes in gasoline or diesel pricing over time.

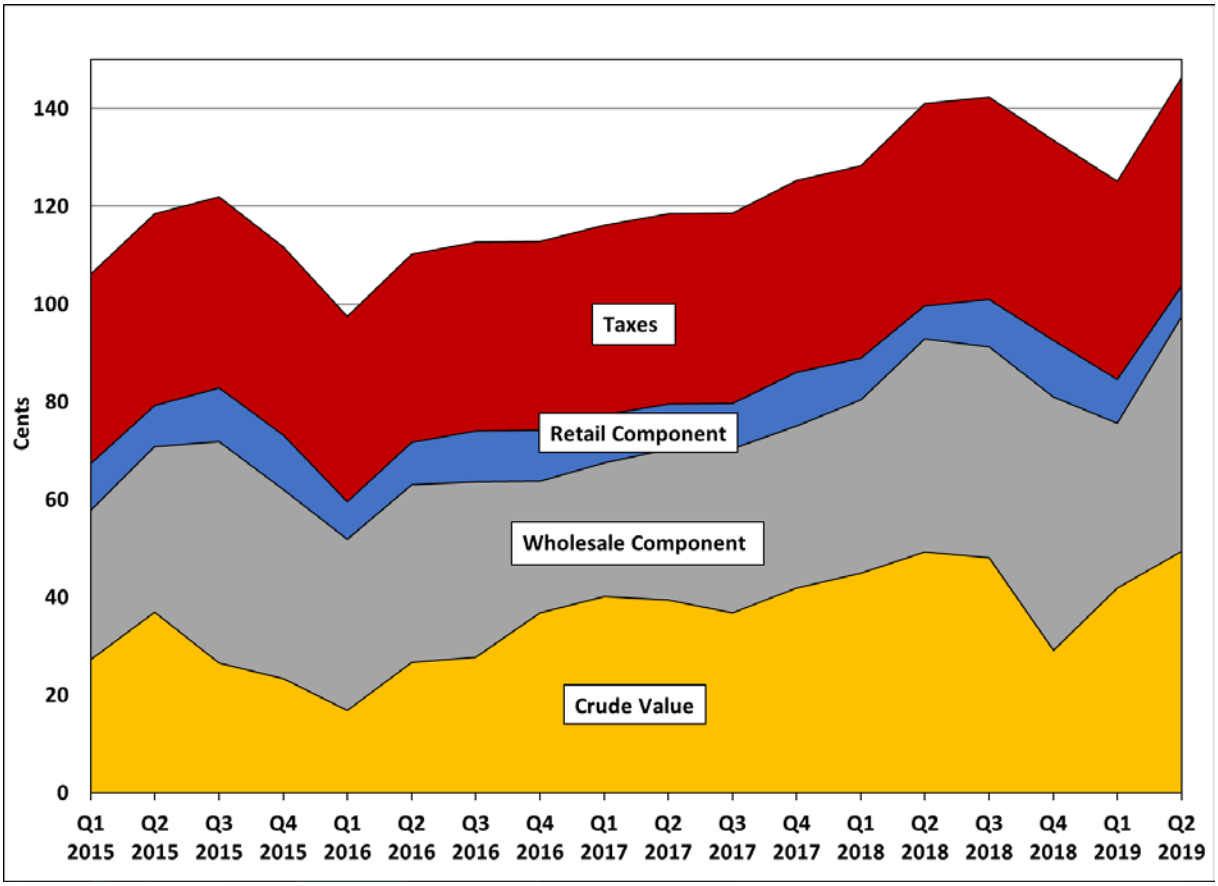
Concluding Comments

125. **Figure 37** builds on **Figure 34** by adding wholesale, retail, and tax information. The difference between the wholesale price for a litre of gasoline and the value of the crude oil in that litre provides a measure of the portion of the retail price paid by consumers that is earned by the wholesale level of the value chain. (Note that this measure is not a profit margin because it does not account for operating or capital costs.) Similarly, the difference between the retail price for a litre of gasoline and the wholesale price for that litre provides a measure of the portion of the retail price paid by consumers that is earned by the retail level of the value chain (again note that this is not a measure of profitability). The data in **Figure 37** do not allow me to break out the refining stage of the pipeline from the distribution stage; both are captured at the wholesale level. Finally, information on taxes is added. Taken together, all four regions sum up to the retail price paid by consumers.

126. **Figure 37** shows that the value earned by the retail level over time has been relatively constant, that the value of the crude oil in regular gasoline show the most volatility over time, and that there have been some changes over time in the amount of the retail price paid by consumers that is captured at the wholesale level. Changes in the value earned at the wholesale level in British Columbia over time are to be expected. Crude oil prices are set in international markets. When there are supply shocks in British Columbia leading to tight local supplies and upward pressure on local prices, economic theory predicts that both wholesale and retail prices would increase. Crude prices would not appear to be affected because of the size of global oil markets, and changes in the value captured at wholesale would increase. These increases, however, would be temporary because once the supply shock has ended, the value earned by the wholesale level of the value chain would be expected to revert to prior levels.

[194] "How refineries make fuels right for winter driving," Canadian Fuels Association, November 5, 2015, available at https://www.canadianfuels.ca/Blog/November-2015/How-refineries-make-fuels-right-for-winter-driving/.

Figure 37
British Columbia (Simple Weighted) Regular Gasoline Prices
2015 – 2019



Source: Kent Petroleum Price Data, British Columbia (Simple Weighted) Unleaded Crude Price, through May 31, 2019, available at https://charting.kentgroupltd.com/

F. Question (6): Does focusing only on retail and refining margins give a full picture of the economics of operating a gas station or refinery?

127. No, focusing only on the retail margins for gasoline and diesel sales to customers and on the refining margins for the production and sale of gasoline and diesel fuels into wholesale markets does not give a full picture of the economics of operating a gas station or a refinery. These margins do not reflect many of the costs associated with operating these types of facilities, such as raw materials other than crude oil, labour, energy, credit card fees, property taxes, and land leases. Without complete cost information, these margins cannot summarize profits.

Retail Margin

128. The retail margin is the gross margin the gas station earns when selling gasoline and diesel to customers, representing the difference between the price it receives and its direct costs associated with the fuel sale. The retail margin does not reflect or make adjustments for capital costs, such as the costs of buildings, canopies, or other property improvements, or the land on which the gas station is located.

129. The value of the land on which a gas station sits can be quite high, especially in Vancouver. Four Esso-branded gas stations owned by 7-Eleven are for sale currently and are described as "high-profile redevelopment sites." Three of these gas stations are located in the Vancouver Westside and the fourth is located in North Burnaby next to a SkyTrain light rapid transit system station. These are the four properties:

- 3205 Arbutus Street, Vancouver. This property is 16,787 square feet and is located on the south west corner of Arbutus Street and West 16th Avenue in Vancouver's west side. The site is located in the Arbutus-Ridge neighbourhood and is eligible to be redeveloped with a 6-storey building. It is near restaurants, shopping areas, and a recently-announced Millennium SkyTrain Line Extension.[195] BC Assessment estimates the value of the parcel at over $10 million.[196]

- 5702 Granville Street, Vancouver. This property is 27,559 square feet and is located on the south east corner of Granville Street and West 41st Avenue in Vancouver's west side in the Oakridge neighbourhood. Given its location, it is eligible to be redeveloped as a 3 ½-storey building.[197] The latest assessed value for the property is in excess of $16 million.[198]

- 6525 Oak Street, Vancouver. This property is 17,276 square feet and is located on the south west corner of Oak Street and 49th Avenue in Vancouver's west side in the heart of the Oakridge neighbourhood. The property is eligible for

[195] Colliers International Canada – For Sale: High Profile Mixed-Use Development Site | 3205 Arbutus Street, Vancouver, available at http://www.collierscanada.com/en/24532#.XQqFZVxKiUk.

[196] Chan, Kenneth, "Four more Esso gas stations in Vancouver listed for sale and redevelopment," *Daily Hive,* May 23, 2018, available at https://dailyhive.com/vancouver/esso-gas-station-sale-vancouver-may-2018.

[197] Colliers International Canada – For Sale: High Profile Mixed-Use Development Site | 5702 Granville Street, Vancouver, available at http://www.collierscanada.com/en/24534#.XQqJCFxKiUk.

[198] Chan, Kenneth, "Four more Esso gas stations in Vancouver listed for sale and redevelopment," *Daily Hive,* May 23, 2018, available at https://dailyhive.com/vancouver/esso-gas-station-sale-vancouver-may-2018.

redevelopment with a 12-storey building,[199] and its latest assessed value is $11.871 million.[200]

- 3965 North Road, Burnaby. This property is located on the corner of North Road and Austin Road in the Lougheed Town Centre area of Burnaby and is 57,560 square feet. The property is a short walk to the Lougheed Mall and Lougheed Town Centre Expo and Millennium Lines. The Lougheed Town Centre Plan identifies the property as a high-density mixed-use parcel; it can be redeveloped as both a retail and a residential site.[201] The property's latest assessed value is $22.629 million.[202]

130. Chevron sold the 16,369 square foot property 1698 West Georgia Street, which had been a gas station, to a real estate developer in April 2017 for $72 million. According to a Chevron spokesperson, the decision to sell the property was "a real estate decision… It was one of the highest performing sites in our network in B.C. but, given the vibrant real estate market in Vancouver, we made the decision last year to put the site on the market and now it is sold."[203]

131. A gas station's property and improvements can represent a sizeable investment for the site's owner, especially in a city like Vancouver. Together with earnings from other on-site amenities like a car wash or convenience store, the retail margin earned by a gas station must cover the gas station's labour costs, operating expenses, and the capital costs associated with the land and improvements, while also providing a return on investment to the station's owner. That return must be sufficiently high to compensate the owner for all of its costs, including the opportunity cost of the land. As shown in the examples of Vancouver-area gas stations currently for sale and the redevelopment options for them, if the station's return is insufficient to compensate the owner for its opportunity costs, the owner has the option to sell the land so that it can be put to a higher-value use. To continue operating as a retail gas station, the location must be sufficiently profitable to justify its owner's continued investment of capital in the site.

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[199] Colliers International Canada – For Sale: High Profile Mixed-Use Development Site | 6525 Oak Street, Vancouver, available at http://www.collierscanada.com/en/24535#.XQqMdVxKiUk.

[200] Chan, Kenneth, "Four more Esso gas stations in Vancouver listed for sale and redevelopment," *Daily Hive,* May 23, 2018, available at https://dailyhive.com/vancouver/esso-gas-station-sale-vancouver-may-2018.

[201] Colliers International Canada – For Sale: High Profile Mixed-Use Development Site | 3965 North Road, Burnaby, available at http://www.collierscanada.com/en/24536#.XQqTTFxKiUk.

[202] Chan, Kenneth, "Four more Esso gas stations in Vancouver listed for sale and redevelopment," *Daily Hive,* May 23, 2018, available at https://dailyhive.com/vancouver/esso-gas-station-sale-vancouver-may-2018.

[203] Korstrom, Glen, "Anthem Properties buys West Georgia Street Chevron for $72 million," *Business in Vancouver*, April 3, 2017, available at https://biv.com/article/2017/04/anthem-properties-buys-chevron-gas-station-west-ge.

Gross Refinery Margin

132. The term "gross refinery margin," which is commonly used by industry observers, is not the actual profit margin earned by a refiner. Rather, it is the difference between the cost of the raw input material used by a refinery, *e.g.,* crude oil, and the value of the products produced by refinery, *e.g.,* the wholesale value of the gasoline produced by the refinery.

> Refinery margins are a measure of the value contribution of the refinery per unit of input. Typically this is per barrel of crude oil processed, but it could also include other feedstocks as inputs.[204]

133. Refiners have costs associated with their production of gasoline and diesel in addition to their costs from purchasing or producing crude oil. In order to stay in business, refiners must cover all of their costs.

134. Refiners typically measure margins at several levels to assess different dimensions of performance:

- Gross margin – This is the difference between the value of the products made and the feedstock (crude and other feed) used to make them. This is typically used to measure the effects of changing market conditions or differences in yield across different refineries.

- Variable cash margin – This subtracts all variable costs (costs associated with running a single unit of feedstock, typically including energy and catalyst and chemical costs) from the gross margin. This is a measure of the value of marginal units of production and is useful for setting optimal short-term run levels and for evaluating crude and product slate options as part of refinery optimization.

- Cash operating margin – This subtracts all fixed cash costs (labour, maintenance, and materials) from variable cash margin. This is a measure of the cash contribution to the business from continuing to run the refinery on an ongoing basis.[205]

135. The refinery margin is a gross margin, and the variable cash margin and the cash operating margin add additional information to the calculations. It is important to note that none of these three margin calculations, however, consider the capital invested in the refinery.

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[204] McKinsey & Company – Margins, available at https://www.mckinseyenergyinsights.com/resources/refinery-reference-desk/margins/.

[205] McKinsey & Company – Margins, available at https://www.mckinseyenergyinsights.com/resources/refinery-reference-desk/margins/.

The gross margin considers feedstock costs. The variable cash margin adds other variable costs in addition to feedstock costs to the gross margin calculation, and the cash operating margin adds additional fixed costs arising from the continuing operation of the refinery, like labour and maintenance, into the calculation. None of these margins include information on or otherwise reflect prior investments in the refinery such as the costs associated with the development of the refinery or costs associated with additions to the refinery's plant and equipment over time. s

136. Entities with large stocks of capital goods such as plant and equipment need to earn a sufficient return to compensate for their invested capital. If the owner of a large, capital-intensive production facility does not earn an adequate return on the capital it has invested, it will not have incentives to expand the production facility over time, or even to maintain the facility's productive capacity. Firms in these industries need to earn large gross margins in order to cover their capital costs.

137. **Figure 38** is an aerial photograph of the Parkland's Burnaby refinery, one of the two refineries in British Columbia. Subsequent Figures show the Husky refinery in Prince George and refineries in Alberta and Washington. Refineries are examples of capital-intensive production facilities. The owner of a refinery needs to earn a sufficient return on the capital it has invested in it or else it will not have incentives to upgrade or even to maintain the refinery over time.

Figure 38
Parkland's Burnaby Refinery

Figure 39
Husky's Prince George Refinery

Figure 40
Suncor's Edmonton Refinery

Note: Photo licensed from Peak Aerials for purpose of inclusion in this report.

Source: "Suncor (Petro Canada) Refinery, Edmonton AB," Peak Aerials, September 10, 2013, available at https://www.stockaerialphotos.com/-/galleries/oil-industry/-/medias/25194ef2-8859-11e3-8b3e-055bac1742cf-suncor-petro-canada-refinery-edmonton-ab.

Figure 41
BP's Cherry Point Refinery

138. Refineries are like other large, capital-intensive production facilities in this regard, such as chemical plants, automobile manufacturing plants, oil production facilities, steel mills, and semi-conductor plants. In addition to covering raw material and operating costs, the gross margins earned at these facilities must provide a return on invested capital if the facility's owner is to have incentives to invest and maintain the facility. Airlines and telecommunication network providers similarly have to invest significant capital in physical assets before they can provide services to customers, and without an expectation of receiving a return on their investment, they would not invest additional capital into their industries. The inputs and outputs associated with refining are also subject to a fair amount of pricing volatility, therefore refiners expect a return commensurate for the risks they undertake.[206]

[206] "The Economics of Petroleum Refining," Canadian Fuels Association, December 2013, p. 4.

139. Refineries undergo scheduled maintenance events called "turnarounds." During a turnaround, entire parts of a refinery – or even the whole refinery – are taken off-line for an extended period of time. This is to allow the facility to be maintained, renovated, or upgraded. Turnarounds are expensive for refinery owners because of the capital outlay required for new equipment and also because the facility is not producing gasoline or diesel output that can be sold to customers while it is off line. A refinery turnaround that lasts eight weeks, for example, means that the plant is not producing gasoline or diesel fuel that it can sell to customers for the equivalent of over half of a calendar quarter. When operating, the refinery margin must generate sufficient returns to cover expenses when the facility is off-line for a turnaround.

140. In addition, refiners must earn enough to cover their opportunity costs. Opportunity costs are "the costs associated with opportunities that are foregone by not putting the firm's resources to their highest value use."[207] If, for example, in the long run a refinery were unable to earn sufficient profit to cover its opportunity costs, then like a gas station that is closed so that the land can be converted to a residential development, the refinery could be closed and dismantled for scrap and the land on which it sits could be converted to, for example, another type of commercial development.

141. A refinery is a substantial capital asset. To illustrate this, I summarize three recent refinery acquisitions and one refinery acquisition that has been agreed to in principal but not yet closed. On November 8, 2017, Husky acquired the 50,000 barrel per day Superior Refinery located in Wisconsin for $670 million CAD. The purchase included $108 million CAD in working capital; therefore, the net cost to Husky was $562 million CAD, which translates to about $11,000 CAD for each barrel of daily capacity.[208] On May 1, 2019, Chevron U.S.A. Inc. acquired a Pasadena, Texas refinery from Petrobras America Inc. for $350 million USD. The refinery has a capacity of 110,000 barrels per day, which translates to about $3,200 USD or about $4,300 CAD for each barrel of daily capacity.[209] On June 11, 2019, PBF Energy announced its agreement to acquire the Shell Martinez refinery in California for between $900 million and $1.0 billion USD. The 16.1 Nelson Complexity refinery has a capacity of 157,000 barrels per day, which translates to about $6,000 USD or $8,000 CAD for each barrel of daily capacity.[210] On October 1, 2017, Parkland purchased the Burnaby

[207] Pindyck, Robert S., and Daniel L. Rubinfeld, Microeconomics, Second Edition, Macmillan Publishing Company, 1992, p. 198.

[208] Husky Energy, 2018 Annual Report, p. 73.

[209] Conversion rate of 1 USD = 1.34 CAD is used, retrieved from FRED Economic Data – Canada / U.S. Foreign Exchange Rate, available at https://fred.stlouisfed.org/series/DEXCAUS. "Chevron Completes Acquisition of Pasadena Refining System, Inc." Chevron Press Release, May 1, 2019, available at https://www.chevron.com/stories/chevron-completes-acquisition-of-pasadena-refining-system-inc.

[210] Conversion rate of 1 USD = 1.33 CAD is used, retrieved from FRED Economic Data – Canada / U.S. Foreign Exchange Rate, available at https://fred.stlouisfed.org/series/DEXCAUS. "PBF Energy Creates West Coast System

refinery and other assets from Chevron in a transaction valued at nearly $1.5 billion\ CAD.[211]

142. Refineries also incur substantial investments associated with maintenance and upgrades. Because a refinery operates 24 hours per day, every three to five years it must be shut down to perform major maintenance and repair work. These turnarounds are typically planned one to two years in advance and can shut down a refinery for 20 to 60 days.[212] McKinsey & Company estimate that shutdowns, turnarounds, and outages "consume between a third and half of the overall maintenance budget and can reduce annual production volume by 5 to 10 percent."[213] Suncor's turnaround of its Edmonton refinery in 2018 required an additional 2,700 workers and 1 million hours of work.[214] In 2016, Imperial's turnaround at its Strathcona and Nanticoke refineries reduced throughput by 163,000 barrels per day.[215] Parkland's Burnaby refinery underwent a turnaround in Q1-2018. The turnaround, which Chevron began planning in 2016,[216] resulted in a substantial lost opportunity for Parkland as its capacity utilization fell to 33.2%.[217] Using Q1-2019 capacity utilization of 92.0% as a benchmark,[218] Parkland's lost opportunity from the turnaround amounted to 2.91 million barrels of oil that it was unable to process while the

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with Purchase of Shell Martinez Refinery," PFB Energy News, June 11, 2019, available at https://investors.pbfenergy.com/news/2019/06-11-2019-210941867.

[211] Parkland paid $1,460 million plus an estimated $186 million in working capital for the Burnaby refinery, 129 Chevron-branded retail service stations principally located in Metro Vancouver, 37 commercial cardlock sites, three marine fueling locations, terminals located in Burnaby, Hatch Point, and Port Hardy, British Columbia, and a wholesale business which includes aviation fuel sales to the Vancouver International Airport. "Parkland to Acquire Chevron Canada's Downstream Fuel Business," Parkland Fuel Corporation Press Release, April 18, 2017, available at https://www.globenewswire.com/news-release/2017/04/18/1324011/0/en/Parkland-to-Acquire-Chevron-Canada-s-Downstream-Fuel-Business.html; "Parkland Completes Acquisition of Chevron Canada's Downstream Fuel Business," Parkland Fuel Corporation Press Release, October 1, 2017, available at https://www.businesswire.com/news/home/20171001005041/en/Parkland-Completes-Acquisition-Chevron-Canada%E2%80%99s-Downstream-Fuel.

[212] "Refinery Outages: Description and Potential Impact on Petroleum Product Prices," U.S. Energy Information Administration, March 2007, p. 3, available at https://www.eia.gov/analysis/requests/2007/SROOG200701.pdf.

[213] Gentzel, Matt, Bill Lacivita, Alan Osan, and John Parsons, "The Upside of Downtime," *Operations Extranet*, McKinsey & Company, June 2016, p. 1.

[214] "Mission accomplished for the Edmonton refinery," Suncor Connections, June 2018, available at https://connections.suncor.com/issue/89.

[215] "Imperial Reports $181 Million Loss in Second Quarter of 2016," Imperial News Release, July 29, 2016, available at https://news.imperialoil.ca/press-release/imperial-reports-181-million-loss-second-quarter-2016.

[216] Parkland Annual Information Form for the Financial Year Ended December 31, 2017, March 9, 2018, p. 14, available at https://www.parkland.ca/application/files/3715/4238/2951/2018-AIF-EN.pdf.

[217] Parkland Q1 2019 Management's Discussion and Analysis, p. 20.

[218] Parkland Q1 2019, Management's Discussion and Analysis, p. 20.

plant was being refurbished.[219] These opportunity costs are in addition to the capital expenditures and investments made in the plant during this refurbishment. The refinery margin must cover all of these capital costs while also providing a return on investment.

143. Refinery margins are generally higher than, for example, retail gasoline and diesel margins, but they are also more volatile. Plants may be off-line for extended periods due to planned turnarounds. Additionally, the complexity of a refinery makes it more likely that an unplanned outage can take months or years to repair. Only months after Husky acquired the Superior Refinery, a fire forced its closure in April 2018, and it is not expected to reopen until 2020.[220]

144. Unplanned outages are not the only cause of volatility in refinery gross margins. Refineries also face substantial inventory devaluation risks. At 36 percent, gasoline makes up the largest portion of an average Canadian refinery's output, followed by diesel and middle distillates at 33 percent.[221] For a given refinery, the amount of gasoline and heating oil produced varies little over the course of a year. However, the demands for gasoline and heating oil are seasonal. Refineries, therefore, frequently carry inventory. In addition, refineries are positioned between two commodity markets, crude oil on the input side and refined petroleum products on the output side. Together, these factors generate volatility in refinery gross margins and create risk for a refinery. A refinery will attempt to hedge these risks through futures contracts in crude oil, gasoline, and heating oil. Research shows, however, that these hedges are imperfect.[222] As a result of this volatility, refinery operation and investment in refinery capacity are riskier propositions than gasoline retailing. Refinery margins must be expected, over time, to compensate for this volatility and the risks associated with it.

145. Margins on gasoline and diesel retailing are typically very low. Gasoline and diesel retailers sell products that are close substitutes, often in close proximity to each other. Retailers, therefore, "often add services such as a car wash or convenience store to help them meet their overheads."[223] The margins they earn on convenience store sales are

[219] 90 days * 55,000 bpd = 4,950,000 total barrels * (92.0% - 33.2%) = 2,910,600 barrels of lost opportunity.

[220] Husky Energy, 2018 Annual Report, pp. 24 and 72.

[221] "Where does Canada's gasoline come from?" National Energy Board, May 2019, available at https://www.neb-one.gc.ca/nrg/sttstc/crdlndptrlmprdct/rprt/2019gslnrprt/index-eng.html.

[222] "Optimizing the Hedging Strategy for Oil Refining Companies" Deloitte, February 2017, available at https://www2.deloitte.com/content/dam/Deloitte/in/Documents/governance-risk-compliance/in-grr-optimizing-hedging-strategy-oil-refining-companies-noexp.pdf; Lie, Pan, Dmitry Vedenov, and Gabriel J. Power, "Is Hedging the Crack Spread No Longer All It's Cracked up to Be?" *Energy Economics*, vol. 63, 2017, pages 31-40; Suenaga, Hiroaki and Aaron Smith, "Volatility Dynamics and Seasonality in Energy Prices: Implications for Crack-Spread Price Risk," *The Energy Journal*, vol. 32, no. 3, 2011, pp. 27-58.

[223] Canadian Fuels Association – What's up with the price of gasoline? available at https://www.canadianfuels.ca/Fuels-and-Transportation/Whats-up-with-the-price-of-gasoline/.

generally higher than the margins they earn on fuel sales.[224] For example, in 2018, Couche-Tard's total fuel sales at its Canadian retail locations were more than double its merchandise and services sales. However, Couche-Tard's gross profits on fuel sales were 40% lower than its gross profit on merchandise and services.[225] Retailers like Costco use low-priced fuel sales to draw customers that then purchase other products and to build customer loyalty.[226]

146. In sum, refining margins are not profit margins. Profit margins are determined after subtracting from revenue all costs. These costs include, but are not limited to, crude oil, payroll, interest on debt, utilities, feedstock, maintenance, rent, etc. Refining margins, in contrast, are determined after subtracting only one cost from revenue – that of crude oil. For a range of reasons I expect the refining margins for gasoline and diesel fuels to be substantially greater than the retail margins for these products. Both types of margins, however, need to cover various operating, investment, and capital costs, though these expenses and costs are not included in the calculation of the refining and retail margins themselves. As such, the study of these types of gross margins is insufficient to understand the economics of operating a refinery or one or more retail gas stations.

147. Finally, I note that the study of refinery margins does not capture many other factors that affect the full picture of the economics of operating a refinery. Other factors that affect the economics of a refinery include:

- Economies of scale. Refineries have large economies of scale: "Larger facilities are more efficient, better able to withstand cyclical swings in business activity and they distribute fixed costs, like those from new regulatory requirements, over a larger number of barrels."[227] The Parkland and Husky refineries in British Columbia are much smaller than the Suncor (142 kb/d) and Imperial Oil (187 kb/d) refineries in Alberta, for example. As shown in **Table 16**, the combined capacity of the British Columbia refineries (67 kb/d) is less than half of the capacity of either the Suncor or the Imperial Oil refineries in Alberta. The Parkland and Husky refineries are the smallest gasoline producing refineries in Canada.[228]

[224] Simurda, Debbie, "Convenience Store Profit Margins Get a Boost from Food Sales," *MainStreet*, March 5, 2018, viewed at https://mainstreetinc.net/2018/03/05/convenience-store-profit-margins-gets-boost-from-food-sales/.

[225] Fuel Sales and gross profit were $4819.9 million and $424.9 million (8.8%), and merchandise and service sales and gross profit were $2053.5 million and $707.7 million (34.5%). Alimentation Couche-Tard Inc., 2018 Annual Report, p. 112.

[226] "12 things about Costco that may surprise you" July 16, 2014, available at https://www.cbsnews.com/media/12-things-about-costco-that-may-surprise-you/.

[227] "The Economics of Petroleum Refining," Canadian Fuels Association, December 2013, p. 7.

[228] Ervin, Michael J. "Introduction to the Downstream Petroleum Industry - Presentation to the British Columbia Utilities Commission," BCUC Inquiry Into Gasoline and Diesel, June 20, 2019, Exhibit A2-3, Slide 21.

- Refinery Complexity. Refinery complexity refers to the ability of a refinery to extract lighter petroleum products from heavier crude oil. While there is not one way to measure refinery complexity, the Nelson Complexity Index is the most common. On the low end is simple crude distillation, which earns a complexity factor of 1.[229] A complexity factor of 7 may include "a fluid catalytic cracker, alkylation and hydro-treating units."[230] A complexity factor of 14 may include "a fluid catalytic cracker, alkylation, hydrocracking, reforming and coking units."[231] The more complex the refinery, the better is its ability to 1) extract additional value from crude oil, *e.g.,* more gasoline, 2) process heavier crude oils that are lower in cost, and 3) adjust to changes in local market conditions, such as ethanol blending or a shift between diesel and gasoline.[232] The more complex a refinery, the higher its gross margin. The higher gross margin, however, will be offset to some degree by greater capital asset costs and greater operating costs (*e.g.,* higher energy costs and larger number of inputs into the process).[233]

- Feedstock supply risks. The refineries in British Columbia have fewer sources of supply than the refineries in Alberta. Parkland's Burnaby refinery, for example, relies primarily on only one pipeline for feedstock supply – Trans Mountain. Refineries in Alberta can diversify their feedstock supply risks because they can access numerous sources of supply.

Table 16
2019 Capacity of Alberta and British Columbia Fuel Refineries

Refinery Name	Province - City	Owner	Capacity (kb/d)
Strathcona Refinery	Alberta - Edmonton	Imperial Oil	191
Edmonton Refinery	Alberta - Edmonton	Suncor Energy	142
Scotford Refinery	Alberta - Scotford	Shell Canada	92
Sturgeon Refinery	Alberta - Redwater	North West Redwater	79
Burnaby Refinery	British Columbia - Burnaby	Parkland Fuel Corporation	55
Prince George Refinery	British Columbia - Prince George	Husky Energy	12

Source: "2019 Crude Oil Forecast, Markets, and Transportation," *Canadian Association of Petroleum Producers*, 2019, available at https://www.capp.ca/publications-and-statistics/crude-oil-forecast.

[229] "The Economics of Petroleum Refining," Canadian Fuels Association, December 2013, p. 7.

[230] "The Economics of Petroleum Refining," Canadian Fuels Association, December 2013, p. 7.

[231] "The Economics of Petroleum Refining," Canadian Fuels Association, December 2013, p. 7.

[232] "The Economics of Petroleum Refining," Canadian Fuels Association, December 2013, p. 9.

[233] "The Economics of Petroleum Refining," Canadian Fuels Association, December 2013, p. 9.

G. Question (7): What would be the impact on consumers, retailers and refineries of government or regulatory intervention when it comes to gasoline or diesel prices, either at the retail level or vis-à-vis refining?

148. Government intervention with regard to the retail pricing of gasoline or diesel fuels would involve price regulation, either by setting retail prices for different grades of motor fuels directly or by setting price ceilings. I assume that any retail price ceiling or directly regulated retail price for a product would be below the retail price that would have otherwise prevailed for that product.[234] Both direct retail price regulation and the setting of retail price ceilings would have the effect of reducing the prices actually paid by consumers for the fuels they purchase, but they would also generate market distortions.

Effects of Retail Price Controls

149. Price controls such as these have been studied extensively by economists, both generally and specifically with regard to the pricing of motor fuels. By restricting prices to be below the levels that would otherwise prevail, economic theory suggests that regulation would increase the quantity of gasoline and diesel customers would desire to purchase, while at the same time reducing the amount of these fuels sellers would choose to supply to customers. This would lead to an imbalance between the amounts that customers would like to purchase and the volumes available to them to purchase. Economists call this a situation of "excess demand." Ordinarily, situations involving excess demand generate upward pressure on market prices. Increases in prices would temper demands while encouraging increased supply. Together, these effects would be expected to lead to a balanced market as prices and volumes adjust over time. With price regulation, however, prices would not be permitted to increase, and therefore economic theory suggests that consumers would not respond to product scarcity by choosing to reduce their desired level of purchases, nor would sellers respond by choosing to increase their supply of products in the market. Price regulation would lead to market shortages. In the absence of consumer and producer adjustments in response to market shortages, the supply and demand sides of the market would need to balance in some other way. In particular, there would need to be a mechanism to ration available motor fuels to consumers. In the absence of a formal rationing mechanism, consumers may need to queue to gain access to available supplies.

150. By holding prices at artificially low levels and reducing the volumes of gasoline and diesel sold, the profitability of the production and supply of gasoline and diesel to consumers would be reduced. Margin would be removed from the supply chain, and economic theory suggests that this would reduce the incentives of refiners to invest in or maintain

[234] Absent cartel behaviour, economic theory predicts that a price ceiling set above the price that would otherwise prevail would be unlikely to have an effect on the market. I note, however, that such a price ceiling may provide a target price for cartel behavior. Coordinated efforts to raise prices become more likely when market participants can agree on the terms of coordination, and a price ceiling that is above the price that would otherwise prevail may provide a focal point or target price for coordinated conduct.

their refineries, leading to reductions in refining capacity over time relative to the levels of capacity that would have otherwise prevailed. In addition, economic theory suggests that the removal of margin at the retail level would reduce incentives for retailers to invest in and maintain retail gas stations. Gas stations that are weaker financially would be expected to close, and investment in new gas stations (if any) would be reduced.

151. The United States had experience with gasoline price controls in the mid-1970s. The rationing mechanism in the market involved consumers waiting in lines for their turn to purchase fuels. Those more willing to wait in lines actually made fuel purchases. Those unwilling or unable to wait on lines are the customers whose demands went unfulfilled, or at least fulfilled at a level below the volumes they would have otherwise preferred to purchase at prevailing prices. Waiting in lines raises consumer costs in other, non-monetary ways, increasing the effective prices paid by consumers even if the cash costs are lower than they would otherwise be.

152. Four Canadian provinces have instituted retail price ceilings for gasoline (Prince Edward Island, Newfoundland and Labrador, New Brunswick, and Nova Scotia).[235] The motivation for implementing these price ceilings include "providing a 'just and reasonable price,' reducing the variance in cost at the pump across the province, and helping rural retailers stay in business."[236]

153. The formulas used in setting the price ceilings typically start with a benchmark gasoline price (*e.g.*, New York Harbor). A wholesale margin and transportation allowance is then added to the benchmark price. A specific retail margin is also added to come up with the final retail price ceiling (which includes all applicable taxes).[237]

154. By taking into account the various segments of the gasoline supply chain, these price ceilings regulations apparently are designed to mimic what regulators consider a "competitive" price as opposed to simply imposing a set retail price ceiling. Empirical research examining the effects of these provincial regulations suggest, however, that the price ceilings actually lead to higher retail gasoline prices than would have occurred absent the price ceilings. For example, Sen, *et al.* (2011) concluded the following:

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[235] Navarro-Génie, Marco, "What's *Still* Missing From Your Wallet? How Regulation Continues to Distort Gasoline Prices in Atlantic Canada," *Atlantic Institute for Market Studies*, August 2017. *See*¸ also Navius Report.

[236] Navarro-Génie, Marco, "What's *Still* Missing From Your Wallet? How Regulation Continues to Distort Gasoline Prices in Atlantic Canada," *Atlantic Institute for Market Studies*, August 2017. *See*¸ also the Navius Report.

[237] *See*, New Brunswick Energy and Utilities Board – Petroleum Prices – Questions and Answers, available at http://www.nbeub.ca/petroleum-prices-questions-answers; Newfoundland and Labrador Board of Commissioners of Public Utilities – Petroleum Pricing Questions and Answers, available at http://www.pub.nf.ca/ppoqa.htm#5; Prince Edward Island Regulatory & Appeals Commission – Retail Dealer Pump Prices, available at http://www.irac.pe.ca/infocentre/documents/Petroleum190615dealer.htm; and "Nova Scotia Utility Review Board – Gasoline and Diesel Pricing," available at https://nsuarb.novascotia.ca/mandates/gasoline-diesel-pricing.

> Available evidence suggests that the enactment of price ceilings was because of the public interest aspect of regulation. However, our empirical study suggests the possibility of regulatory capture by firms – as price ceilings act as 'focal points' allowing firms to collude and set higher prices. While we cannot confirm collusion due to the necessity of firm-level data, our results demonstrate that the actual results of price ceilings in Canada are contrary to the probable public interest objective of such regulation.[238]

155. Shortages would be exacerbated over time as retail price controls diminish the profitability of fuel suppliers and reduce their incentives to invest in their productive capacity, both with regard to maintaining existing capital and expanding their ability to supply product to the market.

156. Some of the fuel supplies in British Columbia are refined locally, and others are imported from centers of production in Alberta and Washington. Reduced retail prices in British Columbia would provide incentives for producers located outside of the region to divert to other areas fuel that would otherwise be supplied to British Columbia.

157. In sum, retail price regulation in British Columbia that held retail prices artificially low would generate excess demands for motor fuels. With an excess demand, there would need to be a mechanism to ration supply to consumers, leaving some consumer demand to go unmet while also leading consumers to bear the costs that would flow from insufficient supply, such as waiting in queues to purchase motor fuels. In addition to being inconvenient, queuing or otherwise needing to search for a gas station with available supply imposes real costs on consumers. Retailers, who already operate at relatively thin margins, would see diminished sales volumes, increased costs, and reduced revenues and profitability. Holding prices artificially low would also harm the profitability of refiners while adversely affecting their incentives to maintain their capital stock and otherwise invest in their businesses.

Effects of Wholesale Price Controls

158. An alternative to retail price regulation would be to regulate the wholesale prices charged by refiners or to regulate refiner profit margins directly. The effects of such a policy on refiners would be similar to the effects of retail price regulation, including reduced incentives to produce and supply fuels to customers in the short term and reduced incentives to maintain capital and invest in their businesses over the long term. Reductions in refinery production would lead to higher consumer prices, reduced volumes of consumer purchases, and reduced retailer sales.

159. If the Commission can only regulate refinery margins for refineries located in British Columbia, the reduction in effective refining capacity that economic theory suggests

[238] Sen, Anindya, Anthony Clemente, and Linda Jonker, "Retail Gasoline Price Ceilings and Regulatory Capture: Evidence from Canada," *American Law and Economics Review*¸ Vol. 13, No. 2, 2011, p. 534.

would result would be limited to capacity located in British Columbia. This would be expected to lead to higher prices for consumers in British Columbia and would benefit refineries located in Alberta and Washington, who would see higher prices for the refined products they ship to and sell in British Columbia. This would generate a transfer of wealth from consumers in British Columbia to refiners in Alberta and the U.S., and also from British Columbia refiners to Alberta and U.S. refiners. Therefore, the most effective way to regulate at the refining level of the production chain would be to regulate wholesale prices directly – and not to regulate the margins of British Columbia refiners only – because wholesale price regulation would apply to refiners in British Columbia, Alberta, and any other location from which British Columbia supplies are sourced.

160. Economic theory suggests that the regulation of wholesale prices would lead to reduced domestic supply either in the form of reduced production or supply diverted to outside the province. Any reduction in the volume of refined products produced and sold to consumers in British Columbia must lead to an increase in the prices paid by consumers, not a reduction in these prices. Market demand curves slope downward, and therefore reductions in supply lead to higher prices for consumers, not lower prices for consumers. Therefore, lower, regulated wholesale prices would not be passed-on as savings to consumers. Instead, with a decline in wholesale prices and an increase in retail prices, increased retail margins would result, though retailers would earn these increased margins on a reduced number of litres of gasoline and diesel actually sold.

161. Wholesale price regulation in British Columbia would also have the perverse effect of making sales in British Columbia less attractive for refiners in British Columbia, and therefore provide these refiners incentives to sell gasoline and diesel outside of the province instead of to their local customer base. Any such diversion of volumes from British Columbia would put upward pressure on the retail prices paid by consumers in British Columbia.

H. Question (8): How could government reduce the retail price of gasoline and diesel?

162. Elsewhere I have discussed the taxes paid by gasoline and diesel customers in British Columbia and compared the level of these taxes to those levied in other jurisdictions. I have also addressed provincial policies encouraging and promoting the use of low carbon and renewable fuels. Finally, I have addressed the market distortions that would result from price regulation at the wholesale or retail levels of the gasoline and diesel supply chain, including how wholesale price regulation would lead to increased prices for consumers due to the resulting decline in production predicted by economic theory. The taxes actually levied now and the low carbon and renewable fuel mandates now in place all serve to increase prices for consumers, and so too would wholesale price regulation if implemented in the province. Retail price regulation may cause the cash prices of gasoline and diesel in British Columbia to fall, but the non-cash costs of using these fuels (*e.g.,* queuing) would increase.

Current Government Policy Is to Raise Prices for Gasoline and Diesel to Discourage Their Consumption

163. The market impacts of increased gasoline and diesel prices to consumers and reduced consumption of gasoline and diesel are not unintended consequences of provincial tax and low carbon fuel policies. Indeed, the current carbon taxes of 8.89 cents/litre for clear gasoline and 10.23 cents/litre for clear diesel are designed to discourage the use of carbon-based fuels and promote the use of alternative fuels. Economic theory predicts that the quantity of a good demanded by consumers decreases as the price they pay for it increases. The Low Carbon Fuel Standard is similarly designed to reduce the consumption of carbon-based fuels.

164. British Columbia adopted these policies to address climate change and global warming. The British Columbia provincial government's website describes the carbon tax as providing "a signal across the economy to reduce emissions while encouraging sustainable economic activity and investment in low-carbon innovation" and highlights that the province's carbon tax was the first broad-based carbon tax in North America.[239] It explains that the tax increased from $35 to $40 per tonne of carbon dioxide equivalent emissions on April 1, 2019, and that the tax rate will increase a further $5 per tonne of carbon dioxide equivalent emissions in 2020 and again in 2021. Finally, it explains that the renewable and low carbon fuels requirements were introduced to:

- Reduce British Columbia's reliance on non-renewable fuels
- Help reduce the environmental impact of transportation fuels
- Contribute to a new low-carbon economy[240]

165. There also are currently and have been rebates for the purchase of battery electric vehicles, rebates for the purchase or lease of hybrid electric vehicles, rebates for scrapping old, gas-powered vehicles, and rebates for installing charging stations in single-family homes, multi-residence buildings, and workplaces.[241]

166. In sum, provincial government policy has been to discourage the use of gasoline and diesel by adopting policies to make these fuels more expensive relative to other fuel sources and also to make vehicles powered by alternative fuels less expensive. The limited evidence available suggests that these policies are working. For example, **Table 17** shows

[239] Province of British Columbia – British Columbia's Carbon Tax, available at https://www2.gov.bc.ca/gov/content/environment/climate-change/planning-and-action/carbon-tax.

[240] Province of British Columbia – Renewable & Low Carbon Fuel Requirements Regulation, available at https://www2.gov.bc.ca/gov/content/industry/electricity-alternative-energy/transportation-energies/renewable-low-carbon-fuels

[241] BC Hydro – Incentives for electric vehicles, available at https://www.bchydro.com/powersmart/electric-vehicles/owning-an-electric-vehicle/rebates-and-incentives.html

Vancouver and Montréal have the highest gasoline and diesel taxes in Canada, and Québec and British Columbia are the two provinces with the highest number of electric vehicles for every 1,000 people.

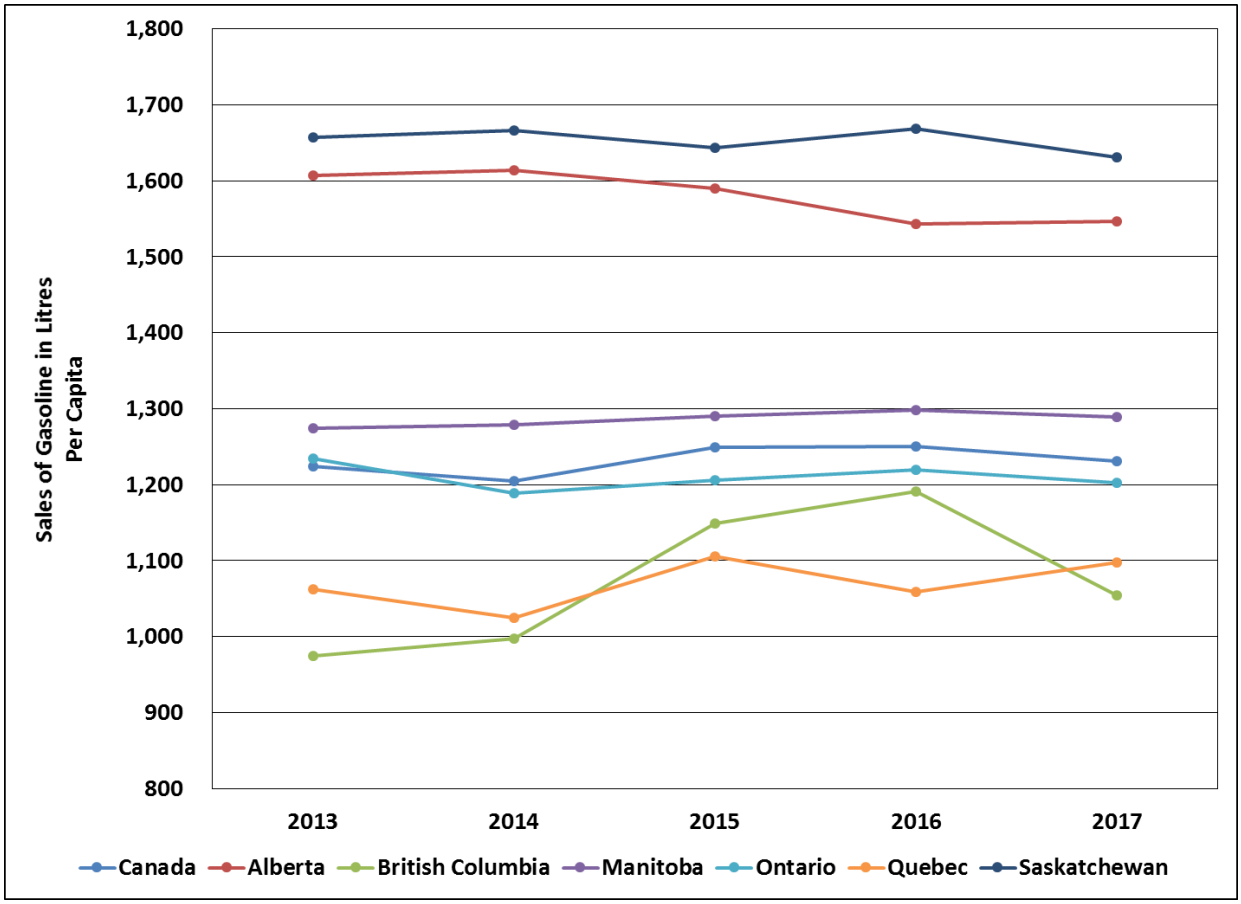
Table 17
Electric Vehicles Per Capita, by Province
Q1 2019

Province	Population	Electric Vehicles	EVs Per 1,000 Population
Quebec	8,433,301	42,551	5.04559
British Columbia	**5,020,302**	**19,893**	**3.96251**
Ontario	14,446,515	35,271	2.44149
Alberta	4,345,737	2,269	0.52212
Manitoba	1,360,396	402	0.29550
Nova Scotia	965,382	240	0.24861
New Brunswick	772,094	186	0.24090
Prince Edward Island	154,748	34	0.21971
Saskatchewan	1,168,423	208	0.17802
Newfoundland	523,790	48	0.09164

Sources: Statistics Canada – Population estimates, quarterly, available at https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=1710000901#timeframe; "Electric Vehicle Sales in Canada – Q1 2019," Electric Mobility Canada, Q1 2019, available at https://emc-mec.ca/wp-content/uploads/Sales-Report-Q1-2019.pdf.

167. Additionally, as shown in **Figure 42**, British Columbia has some of the lowest gasoline sales for road transportation per capita when compared to other provinces. In 2017 this figure has fallen to the lowest among the provinces in Central and Western Canada and since at least 2013 has remained well below the total Canadian average. British Columbia also has some of the lowest greenhouse gas emissions from road transportation per capita, and this figure has been steadily declining from 3.54 in 2013 to 3.43 in 2016 (measured in MT of CO2e per million population). See **Figure 43**.

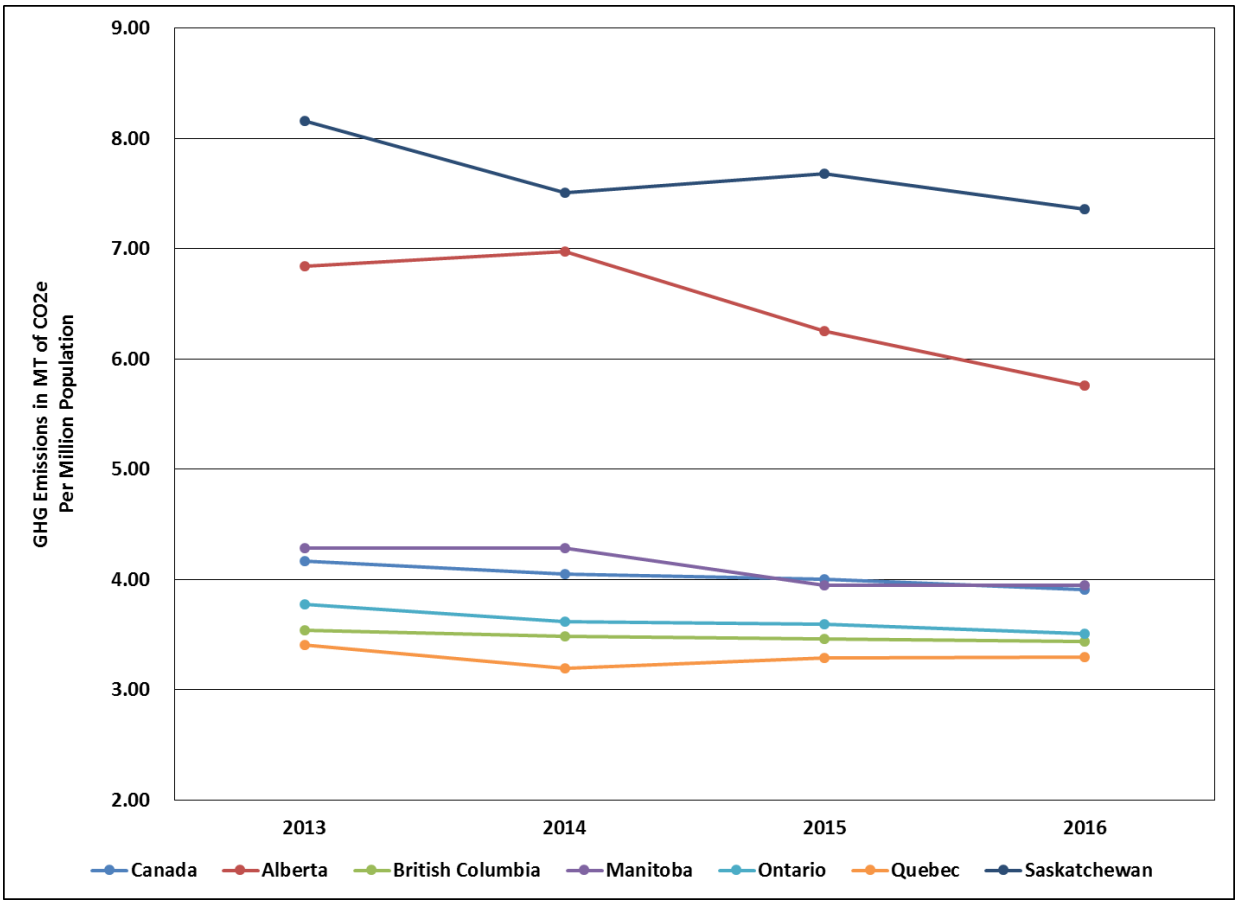
Figure 42
Gross Gasoline for Motor Vehicles Sales Per Capita
For Canada and Select Provinces
2013 – 2017



Notes: 1) As stated on Statistics Canada's website "'Gross sales of gasoline' represents total sales of all road grades of gasoline, including off-road activities such as farming, forestry, construction and mining." 2) Statistics Canada only has data available for gasoline sales up to 2017.

Sources: Statistics Canada – Population estimates, quarterly, available at https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710000901; Statistics Canada – Sales of fuel used for road motor vehicles, annual (x 1,000), available at https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=2310006601&pickMembers%5B0%5D=1.11.

Figure 43
Greenhouse Gas Emission from Road Transportation Per Million Population
For Canada and Select Provinces
2013 - 2016



Notes: 1) As noted by Natural Resources Canada, "Data on GHG emissions are presented excluding GHG emissions related to electricity production." 2) Natural Resources Canada only has data available on Greenhouse Gas Emissions up to 2016.

Sources: Statistics Canada – Population estimates, quarterly, available at https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710000901; Natural Resources Canada – Comprehensive Energy Use Database, available at http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/menus/trends/comprehensive_tables/list.cfm.

Policy Alternatives for Reducing Consumer Prices of Gasoline and Diesel

168. Several policy options would be available to the government that would have the effect of reducing the retail prices of gasoline and diesel in British Columbia if policy were to change and the government wanted instead to lower the prices of gasoline and diesel paid by consumers. These policy options range from steps that can be taken in the short

run to those that can only be implemented and see market effects over several years' time.

169. The easiest and most straight-forward policy option would be to reduce the taxes applied to the retail sales of gasoline and diesel. A consumer in British Columbia pays provincial motor fuel tax, a British Columbia carbon tax, a British Columbia Transportation Finance Authority tax, and a goods and services tax. If the consumer lives in Vancouver or Victoria, the consumer would also pay a TransLink or transit tax. In addition, there is a federal excise tax.

170. The government in British Columbia could reduce or eliminate some of the British Columbia-specific taxes, and these would have direct and immediate effects on the retail prices of gasoline and diesel paid by consumers in the province. The British Columbia carbon tax, for example, could be lowered, or future annual increases in the carbon tax could be delayed or scrapped altogether.

171. I note that policies related to fuel use are likely to have larger effects over time than in the short run. To economists, this means that the elasticity of demand – which measures the sensitivity of the quantity of a good demanded to changes in its price – is greater in the long run than in the short run. This is because it is easier for consumers to make changes in their consumption patterns over time than it is in the short run.[242] Over time, people can purchase new vehicles, develop new commuting patterns, move to a location closer to their place of employment, and make other changes that would be more difficult to make in a shorter timeframe. In addition, the evolution of the marketplace will likely make it easier for consumers to make adjustments to their fuel consumption patterns over time. For example, the government is promoting electric vehicle sales by boosting the availability of charging station locations. If there were more charging stations in British Columbia, for example, it would be easier and less risky for consumers to decide to shift to electric vehicles.

172. Another short-run policy option available to the government would be to alter the required formulation of gasoline and diesel sold in the province. British Columbia mandates gasoline and diesel formulations that reduce emissions but are also costlier to make. There is a trade-off between emissions and production costs, and British Columbia has opted to accept higher costs in order to achieve additional emissions reductions. Other provinces have opted for lower costs, but at the cost of higher emissions. As I

[242] Researchers consistently find that long term elasticities of demand for gasoline are much higher than short term elasticities. This is due to the adaptations that can be made in the long term. These long-term adaptations include consumers' choices on where to live and work, whether to buy a car (vs. using public transportation or other travel methods), or choosing a more or less fuel-efficient vehicle. Manufacturers' fleet fuel efficiency and the availability of public transportation can also be affected in the long term by fuel prices. (*See*, Goodwin, P. B., "A Review of New Demand Elasticities with Special Reference to Short and Long Run Effects of Price Changes," *Journal of Transport Economics and Policy*, May 1992, pp. 155-169; Litman, Todd, "Transit Price Elasticities and Cross-Elasticities," *Journal of Public Transportation*, Vol. 7, No. 2, 2004; Levin, Laurence, Matthew S. Lewis, and Frank A. Wolak, "High Frequency Evidence on the Demand for Gasoline," *NBER Working Paper*, June 2016.)

discussed in my answer to **Question (2)**, Québec, for example, has no renewable fuel content requirement, and British Columbia is the only province with a low carbon fuel standard.

173. Other policy options are available that would not have an immediate or short-run effect on gasoline and diesel prices but rather would cause effects that would be realized over time. Gasoline and diesel are imported into British Columbia from Alberta, but these imports are limited by the capacity of the Trans Mountain Pipeline. Trans Mountain is the only pipeline in Canada that connects British Columbia with areas in Alberta where gasoline and diesel production are concentrated. This pipeline is at capacity, and therefore sellers in Alberta cannot fully arbitrage price differentials between fuel prices in Alberta and those in British Columbia. Increases in pipeline capacity, either realized on the Trans Mountain Pipeline or a new pipeline, would enable increased volumes of motor fuels to move from Alberta to British Columbia. This would further integrate British Columbia fuel supplies with the rest of Canada – making British Columbia less of a "gasoline and diesel island." Prices would fall as arbitrage enhances the supply available in British Columbia. Of course, pipeline capacity expansion projects and new pipeline development take substantial time to complete because these expansions need to be designed, permitted, and constructed, which can take several years to accomplish. Price effects from arbitraging price differentials between areas of supply in Alberta and areas of consumption in British Columbia cannot be realized until the expanded capacity is actually available for use. Even if the effects are not immediate, the government's policy options of allowing Trans Mountain Pipeline's expansion or allowing the construction of a new pipeline would permit consumers to benefit from lower prices over time as new pipeline capacity is put into service.

174. I note that government policy in British Columbia is designed to increase prices of carbon-based fuels in the province. Indeed, a goal of the carbon tax is to elevate the price of gasoline and diesel in order to promote the adoption and use of other types of fuel. Thus, reducing taxes on gasoline and diesel or taking other steps to moderate the prices paid by consumers for gasoline and diesel would necessitate a shift in government priorities.

V. INITIAL THOUGHTS ON THE NAVIUS REPORT

175. The Navius Report includes a summary of gasoline and diesel price regulation at both the wholesale and retail levels of the value chain, a comparison of the extent to which wholesale and retail prices for gasoline and diesel in British Columbia are transparent[243] in comparison to other areas in North America, and a set of assertions regarding the market conditions that the authors claim may indicate an "uncompetitive market" either because there is an asserted lack of competition in the market or because of some (unidentified) anticompetitive conduct in the market. Ultimately, the Navius Report

[243] The Navius Report defines price transparency as "[an] availability of data that would allow a suitably skilled analyst to explain the prices observed in the market." (Navius Report, p. i.)

addresses whether such an uncompetitive market should be subject to either "price transparency regulation" or direct wholesale or retail price regulation.

Wholesale and Retail Price Regulation

176. The Navius Report's summary of wholesale and retail price regulation for gasoline and diesel is not an economic analysis of regulation but rather is a summary of the actual types of regulation that exist now or have existed previously in various jurisdictions in North America (*e.g.,* price ceilings). The Navius Report's summary of gasoline and diesel regulation is factual in nature, and for the purposes of my analysis, I assume it to be accurate. I note that, in this section, the Navius Report states that "The weight of evidence indicates that the price ceiling regulations have not resulted in lower prices for consumers, though the conclusions are not unanimous."[244]

Price Transparency in British Columbia

177. The Navius Report's discussion of price transparency in British Columbia relative to elsewhere in North America describes sources of data on fuel markets in British Columbia, such as the data available from private parties like Kent Group, and also from government sources such as the National Energy Board and the U.S. Energy Information Administration. The authors note that "There are still gaps that keep the price of gasoline and diesel in British Columbia 'opaque'."[245] They state that there may be multiple rack prices depending on the relationships between various entities in the market, that branded and unbranded prices may differ, and that distribution and marketing costs can be difficult to discern from wholesale and retail prices.[246] The Navius Report includes a list of "additional unknowns" that I reproduce below:

- The specific slate of crude oils used by refiners.
- Actual transport costs by unregulated modes. Such as boat, rail, truck; these can only be estimated based on assumed distances, volumes and typical transportation costs.
- The business costs of refining, wholesaling and retailing, aside from petroleum crude and product input costs

[244] Navius Report, p.8. Note that the Executive Summary of the Navius Report similarly states, "The evidence on the impact of the Canadian regulations mostly indicates that the price ceilings have not resulted in lower prices for consumers." Navius Report, p. i. Comparable language is used in the Navius Report's Summary and Conclusion section. (Navius Report, p. 25.)

[245] Navius Report, p. 11.

[246] Navius Report, p. 11.

- The specific supply agreements between various market players, including the durations, volumes, exclusivity and discounts in the agreements.

- Renewable fuel procurement and handling costs, including costs for ethanol, biodiesel and hydrogenated renewable diesel; these can only be estimated based on relevant market prices (*e.g.,* Vancouver spot price for ethanol) and typical transportation and handling costs.[247]

178. The Navius Report notes that Canadian price regulation does not include price transparency measures,[248] but that the State of Hawaii does collect data from the industry and some of these data are made available publicly (though in an aggregated and redacted form). Even with regard to Hawaii, however, "the data still did not provide an understanding of the overall costs of doing business for various actors within each segment of the market (*i.e.,* to calculate net margins, profits or return on capital with certainty)[.]"[249] Data collection in California and Washington State are also discussed.[250]

179. The highlighted gaps in information availability, list of unknowns, and focus on understanding returns on capital "with certainty" show the tremendous breadth of data and information the authors of the Navius Report think is required to address any issues with price transparency in wholesale and retail markets for gasoline and diesel. The authors do not point to a single market where such information is collected and analyzed. Even if certain amounts of data are collected by regulators of natural monopolists (*e.g.,* electric power distribution infrastructure), the collection of such detailed data in a market with numerous suppliers is extraordinary. In what industries are data on the discounts in supply agreements or the details of the "specific slate" of inputs used collected and analyzed? The request to understand the "business cost" of each stage in the pipeline is mentioned without any analysis of the extent of information required to meet the request, the burden on parties to collect it, the benefits from having it, or the ability of any "suitably skilled analyst" to analyze it. Information such as this is not collected and analyzed in markets for grocery items, over the counter drugs, or other consumer products.

Market Conditions Indicating an Uncompetitive Market

180. The Navius Report lists nine conditions that it states may indicate a need for price transparency and/or direct regulation. This alleged need for price transparency or direct

[247] Navius Report, p.11.

[248] Navius Report, pp. 11 – 12.

[249] Navius Report, p. 12 (citation omitted, emphasis added). Note that this relates to the Petroleum Information Monitoring and Analysis Reporting ("PIMAR") program. The subsequent program in Hawaii "requires monthly reporting of essentially the same data as PIMAR…." (Navius Report, p. 12.)

[250] Navius Report, pp. 12 – 13.

regulation arises because these conditions may, according to the authors, indicate that the market is uncompetitive. The Navius Report provides two potential reasons why a market may be uncompetitive: there is a lack of competition in the market or there is anticompetitive conduct of some sort in the market.[251] I first address these reasons for an uncompetitive market and the reasoning that the Navius Report uses to conclude that the market is uncompetitive. I then address the nine factors identified that may indicate an uncompetitive market.

181. With regard to whether the market is uncompetitive, the Navius Report does not cite to standard indicia of competition or to standard tools of competition economics and market power analysis to support its recommendations. A basic component of the analysis of whether conduct has the effect of exercising market power is to study whether the conduct causes or has any relation to restrictions in supply.[252] Market power is the ability to maintain prices above the competitive level for a significant period of time,[253] and one way to assess this is to analyze whether there is or has been a restriction in supply. To a competition economist, an increase in price and a reduction in output go hand in hand due to the downward-sloping relationship embodied in the market's demand curve.

182. To understand whether the firms active in a market have restricted supply, an analyst can look at whether the competitors in the market have unutilized productive capacity. If a firm is not able to expand production to increase its supply in the market, it cannot be exercising market power in that market. An analysis of the productive capacity of the firms allegedly behaving uncompetitively is not included in the Navius Report's nine factors, either with regard to analyzing whether there is anticompetitive conduct in the market or whether there is a lack of competition. If a firm cannot increase its production, the Navius Report does not explain how price regulation or price transparency regulation can improve market performance.

183. Another factor that is a standard part of a competition analysis is whether there are barriers to entry into the market.[254] Businesses cannot exercise significant market power in the absence of barriers to entry because any attempt to restrict supply and drive up prices would draw new entry, and that new entry would counteract or deter any attempt

[251] Navius Report, p. i.

[252] Church, Jeffrey R., and Roger Ware, Industrial Organization: A Strategic Approach, Irwin McGraw Hill, 2000, pp. 29 – 30.

[253] Trebilcock, Michael, Ralph A. Winter, Paul Collins, Edward M. Iacobucci, The Law and Economics of Canadian Competition Policy, University of Toronto Press, 2002, pp. 508-509.

[254] Church, Jeffrey R., and Roger Ware, Industrial Organization: A Strategic Approach, Irwin McGraw Hill, 2000, p 37; ; Trebilcock, Michael, Ralph A. Winter, Paul Collins, Edward M. Iacobucci, The Law and Economics of Canadian Competition Policy, University of Toronto Press, 2002, pp. 508-509.

to exercise significant market power. The presence of entry barriers and market experience with regard to entry are not included in the Navius Report's nine factors.

184. With regard to the Navius Report's nine conditions that may indicate an uncompetitive market, I note first that the Navius Report does not cite to a treatise on economic regulation to support these conditions but instead cites to experience and conditions in other jurisdictions and empirical or experimental (meaning "modelled") research on the formation of fuel prices (primarily gasoline) as the basis for them.[255] None of these materials provide support for the regulation of price or price transparency in British Columbia, nor do they address whether market conditions in British Columbia are uncompetitive. The experimental section of the Navius Report cites to two papers.[256] The first is a 1987 paper by Margaret Slade. According to the Navius Report, in her paper, Dr. Slade analyzes retail gasoline prices in Vancouver and finds that they are not the result of "perfect collusion" but are greater than what would be expected in competitive market. An analysis of prices from 1987 cannot inform decision-making regarding market performance or the need for regulation in 2019. The second paper is a summary by Andrew Eckert. The summary of Dr. Eckert's paper in the Navius Report states that "market power is low in the case of Maui and Kauai, Hawaii, and Québec City, Québec."[257] Such a conclusion cannot explain the need for price or price transparency regulation in Vancouver. The Navius Report does indicate that building a model of pricing may be informative, but it neither offers such a model nor provides an indication of what such a model should include. I address each of the Navius Report's nine factors in turn below.

185. Market Concentration and Price Leadership. The Navius Report introduces the concept of market concentration and indicates that "about 80% or 90% of fuels supplied to the Vancouver-area market is controlled by four firms."[258] The four-firm concentration ratio is the share of the market held by the four firms with the largest market shares in that market. I am aware of no economic analysis that indicates either that price regulation or price transparency regulation is appropriate in a market with a four firm concentration ratio of 80% or 90%. This is not a market with a natural monopoly or any other type of monopoly. Instead, given the four-firm concentration ratio, it is a market with at least five competitors, if not more. The Navius Report cites to a merger remedy sought by the Competition Bureau after its review of the Petro-Canada/Suncor merger.[259] The remedy involved providing access to another wholesaler at a terminal that would be "almost completely controlled" by the merged firm post-transaction.[260] The situation being remedied in Petro-Canada/Suncor bears no relation to the Vancouver-area market

[255] Navius Report, p. iii.

[256] Navius Report, pp. 23 - 24.

[257] Navius Report, p. 24.

[258] Navius Report, p. 15 (citation omitted).

[259] Navius Report, pp. 15 - 16.

[260] Navius Report, pp. 15 - 16.

described by the 80% or 90% four-firm concentration ratio, and the remedy sought by the Competition Bureau bears no relation to the price regulation and price transparency remedies addressed in the Navius Report.

186. Few or No Independent Entities in the Market. The Navius Report argues that the presence of independents increases the level of competition in the market, and that, following the example of Hawaii, the lack of independents or the presence of long-term supply contracts between independents and refiners may indicate a need for price regulation or price transparency regulation. [261] The Navius Report does not analyze the extent to which independent entities are active in the markets in British Columbia. There are independent wholesalers in British Columbia, and there are independent gas stations as well. Furthermore, the presence of long term contracts does not, in itself, indicate that there is no competition to serve independents. If some contracts expire each year, for example, then there is a steady stream of business with independents "up for grabs," and a wholesaler who tries to take advantage of dealers may develop a reputation for doing so and see its dealer business erode as contracts expire and it loses contracts with new dealers as well.

187. The Relationship Between the Price of Crude Oil and Wholesale Fuel Prices. The Navius Report generally addresses statistical tests and modeling the relationship between crude oil prices and wholesale fuel prices.[262] It does not specify or estimate a specific model even though crude oil and wholesale price information for British Columbia are available. Instead, it is general and vague with regard to the modeling effort it envisages. Other than noting that the Navius Report presents no actual empirical analyses, I am not able to further analyze or critique the Navius Report with regard to this subject.

188. The Relationship Between U.S. and Canadian Wholesale Fuel Prices and The Relationship Between Retail Prices and Wholesale Prices. As with the relationship between crude oil prices and wholesale prices, the Navius Report does not actually specify or estimate a model of either the relationship between U.S. and Canadian wholesale fuel prices or the relationship between retail and wholesale prices. [263] Therefore, I am not able to study or critique any empirical analyses of these topics. I note, however, the relationship between wholesale and retail prices is detailed in my response to **Question (3)**.

189. Price Cycling. Price cycling is an effect typically seen in retail markets for gasoline and diesel. The Navius Report explains that price cycling is viewed as indicative of competition driving down prices over time until they reset, and then the process repeats. [264] The Navius Report does not, however, analyze retail pricing data to assess empirically the

[261] Navius Report, p. 17.

[262] Navius Report, pp. 18 - 19.

[263] Navius Report, pp. 19 – 21.

[264] Navius Report, p. 21.

extent of price cycling over time in British Columbia, and therefore I cannot analyze or critique such an analysis.

190. Asymmetric Price Adjustments. The Navius Report discusses the potential for retail fuel prices to change more rapidly following a wholesale price increase than a decrease, and similarly for a wholesale price change in response to a change in the price of oil. Though it notes that such an asymmetry may not signify a lack of competition, it also notes that, even so, such conduct may still warrant a policy intervention.[265] Asymmetric price adjustments are consistent with a competitive market and therefore not a sign that policy intervention is warranted. In a setting of price cycling (which the Navius Report addresses as a sign of competition), there is no reason to think that a downstream retailer will respond to a wholesale price increase in the same manner (*e.g.,* with the same speed) as responding to a price decrease. A wholesale price increase can lead a price cycle to conclude and lead to a retail pricing reset more rapidly because the downstream retailer will reach a position of having no retail margin sooner, whereas a wholesale price decline may put off the point at which the downstream retailer feels the need to reset the market once again. Asymmetric price adjustments, therefore, need not indicate that a market is uncompetitive.

191. Returns on Capital. The Navius Report indicates that high returns may "suggest a problem with the wholesale price"[266] and therefore the need for wholesale price regulation. The Navius Report is incomplete on this point. Returns on capital may be high because the capital asset being considered is inframarginal and therefore more profitable than marginal supply sources. The Navius Report does not address this, even though an earlier report by one of its authors states:

> From 2010 through 2014, the wholesale pricing of gasoline and diesel was consistent with the supply cost of fuels from Alaskan North Slope (ANS) oil. During that time, the refineries supplying the Vancouver area fuel market that could process cheaper "landlocked" crude (*e.g.,* Canadian light and heavy oil) likely made greater profits which appeared as a rising refining margin. While these profits were a windfall resulting from constraints on the export of oil from Alberta, they were a normal outcome of a functioning fuel market.[267]

[265] Navius Report, p. 22.

[266] Navius Report, p. 23.

[267] Wollnetz, Michael, "Refining Margins in British Columbia Examining Transportation Fuel Prices and Refinery Net-Revenues in the Context of Supply costs and Provincial Liquid Fuel Policy," Navius Research, June 2018, p. 1.

In this example, the refineries processing landlocked crude are inframarginal, and their returns are a "normal outcome of a functioning fuel market."[268]

192. In general, high returns are not a justification to regulate in a market economy. Some products or investments are successes and earn a greater rate of return. That is how markets work. Regulation is justified in certain settings not by high returns but rather the structure of the market (*e.g.,* natural monopoly in certain specific industries such as local electric power distribution).

Economic Models

193. The Navius Report does not provide, specify, or estimate economic models of the wholesale or retail markets for gasoline or diesel in British Columbia. In the absence of such a model or models, I cannot analyze or critique such an analysis.[269]

Concluding Comments

194. The Navius Report addresses price transparency regulation as if it were unambiguously pro-competitive and beneficial because it would improve market performance. There is no such finding in the economic literature, and standard principles of competition suggest otherwise. The sharing of confidential information among competing entities is generally regarded in competition economics and policy as facilitating coordinated conduct. Instead of being beneficial, price transparency regulation may result in increased market prices due to coordinated conduct among competitors.

195. The Competition Bureau submitted comments to the OECD's Policy Roundtable on information sharing. In its comments, the Competition Bureau explained:

> For example, information exchanges can be pro-competitive, in that they may intensify competition through the elimination of information asymmetries and create the opportunity for significant efficiency gains through, among other things: (a) benchmarking and the development and implementation of best practices; (b) the development of more efficient means of production; and (c) the introduction of new products and services that could not be produced unilaterally. Information exchanges may also lead to enhanced transparency in the marketplace, which can, among other things, facilitate competition by allowing firms that offer lower prices or higher quality services to distinguish themselves from competitors. At the same time, information exchanges can be anti-competitive, as they may make it easier for competitors to collude or to

[268] Wollnetz, Michael, "Refining Margins in British Columbia, Examining Transportation Fuel Prices and Refinery Net-Revenues in the Context of Supply costs and Provincial Liquid Fuel Policy," Navius Research, June 2018, p. 1.

[269] Navius Report, pp. 23-24.

> tacitly coordinate their conduct, thereby reducing or even eliminating competitive rivalry.[270]

The Competition Bureau then explains when information sharing can be harmful. It states:

> As a general rule, information exchanges may raise issues under the Competition Act (the "Act") only if they involve the exchange of competitively sensitive information, such as firm-specific information regarding costs, pricing, trading terms, strategic plans, marketing strategies, market shares, levels of output or other significant competitive variables. The exchange of such information could make it easier for competitors to act in concert, particularly in markets characterized by high levels of concentration, barriers to entry and relative stability. Such exchanges could also assist competitors in monitoring one another's prices or conduct as part of an anti-competitive agreement. The risk of issues arising under the Act is further heightened when the information exchanged relates to products that are relatively homogeneous and where firms compete across a limited number of competitive variables. [271]

196. With regard to wholesale and retail gasoline and diesel prices in British Columbia, the Navius Report envisages the collection and potential disclosure (possibly with redactions) of very highly competitively sensitive information on costs, pricing, contractual terms, and levels of production, among other subjects. Gasoline and diesel are relatively homogeneous products, and wholesalers (retailers) compete with other wholesalers (retailers) on relatively few competitive variables. In short, the information gathering and dissemination exercise contemplated by the Navius Report is of the type that competition economics and policy views as having a very high potential of harming competition, as opposed to enhancing competition via benchmarking or the development of new products and services.

197. Overall, the Navius Report identifies no specific anticompetitive conduct by participants in the fuel markets in British Columbia; provides no evidence of collusion in these markets; engages in no empirical analysis of pricing, output, barriers to entry, or other characteristics of these markets; engages in no financial analysis of market participants;

[270] Submission of Canada to the 2010 OECD Policy Roundtable "Information Exchanges Between Competitors under Competition Law," p. 119, available at http://www.oecd.org/competition/cartels/48379006.pdf (citation omitted).

[271] Submission of Canada to the 2010 OECD Policy Roundtable "Information Exchanges Between Competitors under Competition Law," p. 119, available at http://www.oecd.org/competition/cartels/48379006.pdf (citation omitted).

and identifies no firm economic basis for either price transparency regulation or price regulation itself in these markets.

Appendix A

FASKEN

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June 10, 2019
File No.: 305706.00025/15275

Via Email
Privileged and Confidential

Berkeley Research Group
1800 M Street NW
Second Floor
Washington, DC 20036
USA

Attention: Henry Kahwaty

Dear Sirs/Mesdames:

Re: British Columbia Utilities Commission (the "Commission") – An Inquiry into Gasoline and Diesel Prices in British Columbia (the "Inquiry")

As you are aware, we act on behalf of Parkland Fuel Corporation ("Parkland") in the above referenced Inquiry. This letter of instruction confirms your engagement for the provision of an independent expert report to be introduced into evidence in that Inquiry. It outlines the questions to be addressed and provides some general guidance as to the format of your report.

Apart from our instructions below as to the questions to be addressed and the format of your report, the contents of your report are entirely for you in the exercise of your independent professional judgment. We are retaining you to provide independent expert evidence for the above captioned Inquiry, not as an advocate for our client. The integrity of your conclusions is dependent upon your objectivity.

Background

On May 24, 2019, the Commission established an inquiry into gasoline and diesel prices in British Columbia. The Commission is inquiring into the following:

1. the differences, if any, in refining margins among British Columbia and other jurisdictions in Canada and the reasons for any differences;

*Fasken Martineau DuMoulin LLP includes law corporations.

2. the differences, if any, in retail margins among British Columbia and other jurisdictions in Canada, and among different regions in British Columbia, and the reasons for any differences;

3. factors that have contributed to the increases in gasoline and diesel prices, both retail and wholesale, including, without limitation,

   (a) the access of refineries in British Columbia to crude oil supply and other components;

   (b) the amount of gasoline and diesel stored in British Columbia for sale in British Columbia;

   (c) usage of refinery and pipeline capacity;

   (d) wholesale and retail market sizes and demand;

   (e) methods of distribution of gasoline or diesel to retailers; and

   (f) seasonal variations in supply and demand;

4. the extent to which price changes in gasoline and diesel have been determined by market competition and the extent to which those changes have been determined by other factors; and

5. measures used in other jurisdictions in Canada and North America to enhance transparency about how gasoline and diesel fuel prices are determined.

Questions on Which Your Opinion is Requested

We ask that you address the following questions based on your experience with economics, industrial organization and the oil and gas industry, and any other information you consider necessary.

1. What, in general terms, are the components that make up the retail price of gasoline and diesel in British Columbia?

2. How does the market for gasoline and diesel in British Columbia differ from that in other parts of Canada and North America?

3. Is there currently, and has there been since 2015, a functioning retail market for gasoline and diesel in British Columbia?

4. Is there currently, and has there been since 2015, a functioning market for supply for retailers of gasoline and diesel in British Columbia?

5. What factors have contributed to increases in retail gasoline and diesel prices in British Columbia since 2015?

6. Does focussing only on retail and refining margins give a full picture of the economics of operating a gas station or refinery?

7. What would be the impact on consumers, retailers and refineries of government or regulatory intervention when it comes to gasoline or diesel prices, either at the retail level or vis-à-vis refining?

8. How could government reduce the retail price of gasoline and diesel?

Overview of the Structure of Your Report

We request that your independent expert report be set out consistently with the following structure.

A. Introduction and Summary of Opinion

Your introduction should

- reference the nature of your engagement as an independent expert as per this letter;
- identify the questions posed to you; and
- set forth, in a summary fashion, your independent objective opinions on each question.

B. Qualifications

Please state your professional qualifications, technical education, training and experience. Explain how your expertise relates to the subject matter of your opinions. Your detailed *curricula vitae* should be attached as an appendix.

C. Duty of Independence

We confirm that you have a duty to assist the Commission and are not to be an advocate for any party ("Duty of Independence"). In this section of your report, please certify the following:

- You are aware of your Duty of Independence;
- You have prepared your report in accordance with the Duty of Independence; and
- If called upon to provide further information, you will provide that information in conformity with the Duty of Independence.

D. Questions

This section should set out the questions as posed in this letter.

E. Discussion

Under this heading, you should set out in full your independent objective opinions in the same order that the questions are presented. You should provide the reasons for your opinions including reference to pertinent facts or assumptions, any research you conducted that led you to form the opinion, and any applicable technical or other documents, standards, guidelines, etc.

F. Conclusion

You may provide a conclusion if you wish.

Appendices

Please include this letter, and the *curricula vitae* of those people responsible for the content of your report, as appendices to your report. If additional instructions are required, then any supplementary letters of instruction from us should also be attached to your report. You may attach other documents or schedules that elaborate on, or are integral to your analysis.

In conclusion, if you have any questions with respect to the nature and scope of your engagement, please contact the writer at your earliest convenience.

Yours truly,

FASKEN MARTINEAU DuMOULIN LLP

[original signed by]

Matthew T. Ghikas
Personal Law Corporation

MTG/lh

Appendix B

Curriculum Vitae

HENRY J. KAHWATY, PH.D.
BERKELEY RESEARCH GROUP, LLC
1800 M Street, N.W., 2nd Floor
Washington D.C. 20036

Direct: 202.480.2651
hkahwaty@thinkbrg.com

SUMMARY

Henry Kahwaty is an economist working out of Berkeley Research Group's Washington, DC office. His areas of expertise include microeconomics, industrial organization, antitrust economics, and econometrics. He has completed numerous antitrust reviews of mergers and horizontal and vertical contractual arrangements. He has also completed studies of monopolization and abuse of dominance in the context of government investigations and private litigation. His merger work includes studies in metals, solid waste, gasoline and diesel wholesaling and retailing, industrial products, computer hardware and software, defense electronics, pharmaceuticals, electricity, consumer goods, and telecommunication services and equipment. In addition, he has analyzed competition issues in the mining, luxury goods, banking, chemicals, software development tools, and hardware emulation industries. He has completed studies of vertical restraints and vertical integration, and the impact of such vertical relationships on competition. His work also includes the study of price fixing allegations, class certification, and antitrust damages.

In addition to antitrust and competition policy, Dr. Kahwaty has completed analyses of intellectual property damages and the economic impact of changes in government policy. Dr. Kahwaty's policy work includes the analysis of issues in healthcare, including the costs associated with changes in Medicare, Medicaid, and the availability of generic drugs and biologic medicines. He has also worked on small business issues.

Dr. Kahwaty has presented analyses to the Antitrust Division of the U.S. Department of Justice, the U.S. Federal Trade Commission, the Directorate-General for Competition of the European Commission, the Canadian Competition Bureau, the Competition Tribunal of Canada, the Centers for Medicare & Medicaid Services, the Congressional Budget Office, Congressional Committee Staff, the Medicare Payment Advisory Commission, the U.S. Federal Energy Regulatory Commission, and the U.S. Small Business Administration. Dr. Kahwaty started his career as an Economist with the Antitrust Division of the U.S. Department of Justice. At the Antitrust Division, he specialized in market power analysis for merger and monopolization cases with a focus on the computer software, banking, manufacturing, and defense industries. He spent 15 years as a Senior Economist, Principal, and Director with LECG working out of LECG's offices in Washington and London. He received his Ph.D. in Economics from the University of Pennsylvania in 1991. He was selected for inclusion in the 2011 and 2013 – 2019 editions of The International Who's Who of Competition Lawyers & Economists.

EDUCATION

Ph.D. (Economics), University of Pennsylvania, 1991
M.A. (Economics), University of Pennsylvania, 1988
B.A. (Economics and Mathematics), University of Pennsylvania, 1986

PRESENT EMPLOYMENT

Berkeley Research Group, LLC, Managing Director, 2011 – present

PREVIOUS POSITIONS

Law & Economics Consulting Group, Inc. and LECG, LLC
Director, 2002 – 2010
Principal, 1999 – 2002
Senior Managing Economist, 1997 – 1999
Senior Economist, 1995 – 1996

U.S. Department of Justice, Antitrust Division, Economic Litigation Section
Economist, 1991 – 1995

- Prepared economic models and analysis for antitrust cases.
- Prepared antitrust investigation plans.
- Reviewed civil investigative demands, second requests, subpoenas, complaints, affidavits, and other documents.
- Assisted attorneys with gathering evidence, including conducting witness interviews and assisting with witness depositions.
- Recommended whether to initiate enforcement actions.

PROFESSIONAL EXPERIENCE

Consultant to Rational Software in proposed acquisition of Pure Atria, 1997.

Consultant to Aptix Corporation in Aptix Corporation v. Quickturn Design Systems, 1998.

Consultant to New England Electric System in proposed acquisition by National Grid Group plc, 1999.

Consultant to New England Electric System in proposed acquisition of Eastern Utilities Associates, 1999.

Consultant for third party in proposed acquisition of Reynolds Metals by Alcoa, 1999 – 2000.

Consultant to SmithKline Beecham in proposed merger with Glaxo Wellcome, 2000.

Consultant to De Beers in proposed acquisition of Ashton Mining, 2000.

Consultant to National Grid USA in proposed acquisition of Niagara Mohawk, 2000 – 2001.

Consultant to De Beers in proposed joint venture with LVMH Moët Hennessy - Louis Vuitton, 2001.

Consultant to Edison Electric Institute in Notice of Proposed Rulemaking on Standards of Conduct for Transmission Providers, 2001.

Consultant to De Beers in European Commission review of De Beers' Supplier of Choice strategy, 2001 – 2003.

Consultant to De Beers in European Commission review of proposed Trade Agreement with ALROSA, 2001 – 2004.

Consultant to BT Ignite in Public Consultation regarding Draft Recommendation on Relevant Product and Service Markets related to the European Commission's Guidelines on Market Analysis and the Assessment of Significant Market Power under the Community Regulatory Framework for Electronic Communications Networks and Services, 2002.

Consultant to Phelps Dodge in Phelps Dodge Corporation v. U.S. Energy Corporation, 2003.

Consultant to Alcoa Flexible Packaging in H.S. Crocker v. Alcoa Flexible Packaging, 2003 – 2004.

Consultant to the Competition Authority (Ireland) regarding its Study of Competition in the Irish Banking Sector, 2003 – 2004.

Consultant to Financial Services Authority (United Kingdom) regarding its approach to the implementation of the Capital Requirements Directive, 2004 – 2005.

Consultant to the Competition Authority (Ireland) regarding its Study of Competition in the Irish Insurance Sector, 2004 – 2005.

Consultant to De Beers in U.S gem diamond class action litigations, including Shawn Sullivan, et al. v. DB Investments, Inc., et al., 2005 – 2008.

Consultant to firm being investigated by the Antitrust Division of the U.S. Department of Justice regarding the domestic impact of alleged foreign price fixing, 2007.

Consultant to the Generic Pharmaceutical Association regarding the benefits of developing a pathway for generic biologics, 2007 – 2009.

Consultant to Tropitone Furniture in Energy Alternatives v. Tropitone Furniture, 2007 – 2008.

Consultant to the Generic Pharmaceutical Association regarding the costs associated with implementing e-pedigrees and serialization for the generic pharmaceutical industry, 2008.

Consultant to Republic Services in proposed acquisition of Allied Waste, 2008.

Consultant to Polypore International in Federal Trade Commission v. Polypore International, 2008 – 2010.

Consultant to Generic Pharmaceutical Association regarding Medicare and Medicaid reform, 2009 – 2010.

Consultant to EA Engineering, Science and Technology regarding small business size standards, 2009 – 2010.

Consultant to Watson Pharmaceuticals regarding Medicare reimbursements for certain products, 2010 – 2011.

Consultant to United HealthGroup Incorporated in United HealthGroup Incorporated v. Columbia Casualty Company, et al., 2011 – present.

Consultant to CCS Corporation, Complete Environmental Inc., and Babkirk Land Services Inc. in Commissioner of Competition v. CCS Corporation, et al., 2011 (Tervita).

Consultant to third party in various monopolization and abuse of dominance investigations of Google, 2011 – present.

Consultant to third party in investigation of the acquisition of certain assets of Viterra by CF Industries, 2012 – 2013.

Consultant to fitness benefit provider in antitrust review of issues related to the use of exclusive contracting in the provision of fitness benefits to Medicare Advantage plans, 2012 – 2013.

Consultant to Rockwell Collins in proposed acquisition of ARINC, 2013 – 2014.

Consultant to De Beers in Michelle Fairhurst v. De Beers Canada Inc., et al., 2013 – present.

Consultant to MedImpact Healthcare Systems, Inc. in Star Discount Pharmacy, Inc., et al. v. MedImpact Healthcare Systems, Inc., et al., 2014.

Consultant to De Beers in Daniel Ammazzini et al. v. Anglo American PLC, et al., 2014 – present.

Consultant to De Beers in Kirk Brant v. De Beers Canada Inc., et al., 2015 – present.

Consultant to Parkland Industries in Commissioner of Competition v. Parkland Industries Ltd., et al., 2015 – 2016.

Consultant to AMC in Cobb Theatres III, LLC, et al. v. AMC Entertainment Holdings, Inc., et al., 2016.

Consultant to third party in investigation of Microsoft's proposed acquisition of LinkedIn, 2016.

Consultant to Chemtrade in proposed acquisition of Canexus, 2016 – 2017.

Consultant to AMC in iPic-Gold Class Entertainment, LLC, et al. v. Regal Entertainment Group, et al., 2016 – 2017.

Consultant to Parkland Industries in proposed acquisition of the majority of the Canadian CST assets from Couche-Tard, 2016 – 2017.

Consultant to Parkland Industries in proposed acquisition of Canadian refinery and downstream fuel business from Chevron, 2017.

Consultant to AMC in Viva Cinemas Theaters and Entertainment LLC d/b/a Viva Cinema v. America Multi-Cinema, Inc., 2018.

Consultant to EA Engineering, Science and Technology regarding small business size standards, 2018.

Consultant to Aleris in proposed acquisition of Aleris by Novelis, 2018 – 2019.

Consultant to several pharmaceutical companies with regard to potential exposure to patent damages from at-risk launches of generic products.

Consultant to parties regarding class certification, competitive effects, and damages estimates in private antitrust litigations including class action litigations.

Consultant to parties regarding private antitrust cases and intellectual property cases.

Consultant to parties regarding merger reviews and business practice investigations.

Testimony

Provided report and deposition testimony in Aptix Corporation v. Quickturn Design Systems, Inc., C-96-20909 JF (EAI), U.S. District Court for the Northern District of California, 1998.

Provided declaration relating to the acquisition of New England Electric System by National Grid Group plc, Federal Energy Regulatory Commission, Docket No. EC99-49-000, 1999.

Provided declaration relating to acquisition of Eastern Utilities Associates by New England Electric System, Federal Energy Regulatory Commission, Docket No. EC99-70-000, 1999.

Provided declaration relating to the acquisition of Niagara Mohawk by National Grid USA, Federal Energy Regulatory Commission, Docket No. EC01-63-000, 2001.

Provided hearing testimony before the Directorate-General for Competition of the European Commission in review of De Beers' proposed Trade Agreement with ALROSA, Case COMP/E-2/38.381 – De Beers-ALROSA and Case COMP/B-2/38.381 – De Beers, 2003.

Provided report and deposition testimony in H.S. Crocker, Inc. v. Alcoa Flexible Packing, No. 02 C 50010, U.S. District Court for the Northern District of Illinois (Western Division), 2004.

Provided statement and deposition testimony in Energy Alternatives, Inc. v. Tropitone Furniture Co., Inc., 06-CVS-8782, North Carolina General Court of Justice, Superior Court Division, 2008.

Provided report, deposition testimony, and trial testimony in Federal Trade Commission v. Polypore International, Docket No. 9327, 2009.

Provided report and deposition testimony in UnitedHealth Group, Inc. v. Columbia Casualty Company, et al., 05-CV-01289, U.S. District Court for the District of Minnesota, 2011.

Provided report addressing efficiencies, report addressing the analysis of competition issues, and trial testimony in The Commissioner of Competition v. CCS Corporation, et al., Competition Tribunal (Canada), CT-2011-002, 2011 (Tervita).

Provided two affidavits addressing class certification in Michelle Fairhurst v. De Beers Canada Inc., et al., The Supreme Court of British Columbia, Vancouver Registry, No. S-071209, 2013.

Provided report and deposition testimony in Star Discount Pharmacy, Inc., et al. v. MedImpact Healthcare Systems, Inc., et al., 5:11-cv-2206-AKK, U.S. District Court for the Northern District of Alabama (Northeastern Division), 2014.

Provided affidavit addressing class certification and testimony in Questioning in Daniel Ammazzini et al. v. Anglo American PLC, et al., Court of Queen's Bench for Saskatchewan, Judicial Centre of Saskatoon, Q.B. No. 877 of 2011, 2014.

Provided affidavit addressing class certification in Kirk Brant v. De Beers Canada Inc., et al., Ontario Superior Court of Justice, Judicial Centre of Ontario, 1399/10C, 2015.

Provided report analyzing competitive effects for mediation in Commissioner of Competition v. Parkland Industries Ltd., et al., Competition Tribunal (Canada), CT-2015-003, 2016.

Provided report and deposition testimony in Cobb Theatres III, LLC, et al. v. AMC Entertainment Holdings, Inc., et al., 1:14-CV-00182-ELR, U.S. District Court for the Northern District of Georgia (Atlanta Division), 2016.

Provided disclosure and deposition testimony in iPic-Gold Class Entertainment, LLC, et al. v. Regal Entertainment Group, et al., District Court for Harris County, Texas, 234th Judicial District, No. 2015-68745, 2017.

Provided report and deposition testimony in Viva Cinemas Theaters and Entertainment LLC d/b/a Viva Cinema v. America Multi-Cinema, Inc., 4:15-cv-01015, U.S. District Court for the Southern District of Texas (Houston Division), 2018.

Reports

Provided report titled "Vertical Integration, Economic Efficiency, and Standards of Conduct Regulation of Electric and Natural Gas Transmission Providers." Notice of Proposed Rulemaking on Standard of Conduct for Transmission Providers, Federal Energy Regulatory Commission, Docket No. RM01-10-000, 2001.

Provided report titled "Market Definition and Market Power Analysis: Public Consultation on a Draft Commission Recommendation," European Commission, 2002 (joint with Richard Shin and Richard Levine).

Provided report titled "Study of Competition in the Provision of Non-investment Banking Services in Ireland: Phase 1 Report." The Competition Authority (Ireland), 2003 (joint with Andy Baziliauskas and John Evans).

Provided report titled "The Proposed EC Technology Transfer Block Exemption Regulation: An Economic Assessment." European Commission, 2003 (joint with Peter Grindley, Edward Sherry, and David Teece).

Provided report titled "Study of Competition in the Provision of Non-investment Banking Services in Ireland: Report and Recommendations." The Competition Authority (Ireland), 2004 (joint with Andy Baziliauskas).

Provided report titled "Survey of the Impacts of CRD Implementation on the UK Financial Services Industry." Financial Services Authority, 2005 (joint with Mark Tilden, Colin Lawrence, Thomas Ortenzi, and Karen Forseter).

Provided report titled "The Small Business Administration's Size Standards Methodology and the Environmental Remediation Services Industry." U.S. Small Business Administration, 2010.

Provided report titled "The Small Business Administration's Size Standards Methodology and the Environmental Remediation Services Sub-industry." U.S. Small Business Administration, 2018.

Speeches

"Antitrust Damages," Litigation Services Subcommittee of the Greater Washington Society of Certified Public Accountants, Washington, D.C., January 28, 1999.

"Unregulated Affiliates and the Market Power Problem," Forum on Electric Power Market Restructuring, Washington, D.C., February 19, 1999.

"The Analysis of Market Power," Deregulation Progress Report: Issues and Insights Conference, Vail, Colorado, August 4, 1999.

"Worldwide Convergence in Competition Enforcement," XXXV International Association of Financial Executives Institutes World Congress, Florence, Italy, October 11, 2004.

"The Potential Savings from Biogenerics," Generic Pharmaceutical Association Annual Policy Conference, Washington, D.C., September 17, 2009.

"Generic Substitution: The Savings," Generic Pharmaceutical Association Governors' Staff Briefing, March 9, 2011.

Mock Trial Testimony as Expert Witness for the Plaintiff, 2011 American Bar Association Antitrust Section Spring Meeting, Washington, D.C., March 31, 2011.

"Debating the Efficiencies Defence," 2017 Canadian Bar Association Competition Law Fall Conference, Ottawa, Canada, October 26, 2017.

Papers and Publications

United States Overview," *The Handbook of Competition Economics 2019*, Global Competition Review, 2019 (joint with Cleve Tyler).

United States Overview," *The Handbook of Competition Economics 2018*, Global Competition Review, 2018 (joint with Cleve Tyler).

United States Overview," *The Handbook of Competition Economics 2017*, Global Competition Review, 2017 (joint with Cleve Tyler).

United States Overview," *The Handbook of Competition Economics 2016*, Global Competition Review, 2016 (joint with Cleve Tyler).

"Canada High Court Breathes New Life Into M&A Efficiencies," Law360, February 6, 2015 (joint with Cleve Tyler).

"Market Definition - Achieving an Integrated Analysis," *The Antitrust Bulletin*, 59 (3): 667-685, Fall 2014 (joint with Cleve Tyler).

"Analysis of Horizontal Market Power in Transactions under the Federal Power Act." Federal Energy Regulatory Commission, 2011 (joint with Carl Danner, Keith Reuter, and Cleve Tyler).

"HHI Screening Thresholds and the U.S. Department of Justice and Federal Trade Commission Horizontal Merger Guidelines", U.S. Department of Justice and Federal Trade Commission Horizontal Merger Guidelines Review Project, Project No. P092900, 2009.

"Merger Remedies and the U.S. Department of Justice and Federal Trade Commission Horizontal Merger Guidelines", U.S. Department of Justice and Federal Trade Commission Horizontal Merger Guidelines Review Project, Project No. P092900, 2009.

"The Competition Authority's Study of the Irish Banking Sector" (joint with John Evans), *International Antitrust Bulletin*, Summer/Fall 2005, 24-31.

"The Use of Econometrics by the European Commission and the U.S. Antitrust Agencies" (joint with Mary Coleman), *International Antitrust Bulletin*, Spring/Summer 2004, 35-40.

"The Proposed EC Technology Transfer Block Exemption Regulation: An Economic Assessment" (joint with Peter Grindley, Edward Sherry, and David Teece), 2003.

"Submission to the Commission of the European Communities on Green Paper on the Review of Council Regulation (EEC) No. 4064/89" (joint with R. Shyam Khemani, David Painter, Richard Shin, and Kamil Kiljanski), 2002.

"The Analysis of Market Concentration, Market Power and the Competitive Effects of Mergers in the Electricity Industry" (joint with Richard Gilbert), June 1997.

"Unregulated Affiliates and the Market Power Problem," February 1999.

TEACHING EXPERIENCE

University of Pennsylvania, Philadelphia, Pennsylvania, 1988 – 1991

Course taught include Industrial Organization, Topics in Microeconomics, Topics in Macroeconomics, Intermediate Microeconomics, Introductory Microeconomics, Introductory Macroeconomics.

PROFESSIONAL MEMBERSHIPS

American Economic Association
American Bar Association (Associate Member)
Canadian Bar Association (Competition Law Section Affiliate)

June 2019

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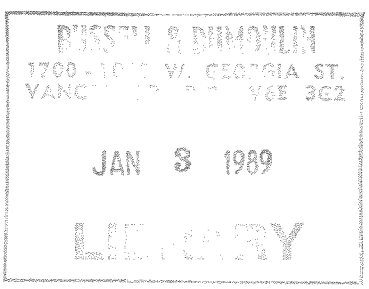
Principles of Public Utility Rates

Second Edition

by
JAMES C. BONBRIGHT
ALBERT L. DANIELSEN
DAVID R. KAMERSCHEN

with assistance of
JOHN B. LEGLER



Public Utilities Reports, Inc.
Arlington, Virginia

INTRODUCTION

There are three major explanations for why the direct regulation of public utilities has arisen. We refer to these as the public interest, private interest, and transaction cost paradigms or theories of regulation. A paradigm is a broad conceptual framework (pattern, model) or general way of studying the world. Whatever paradigm, or combination of them, one favors, it is important to recognize that there are both costs and benefits to regulation (and to competition) and therefore regulation (and competition) can be treated as alternative means of accomplishing desired ends. In either of the first two alternatives specified above, the government is viewed as supplying regulation in response to demands either in the interests of the public (or society) or in the interests of a subset, or private sector, of society. The transaction cost approach views regulation as an alternative governance structure to that of market governance which minimizes, or at least is expected to minimize, the overall costs of providing utility services, including the costs of formulating agreements, monitoring performance, and settling disputes. [The discussion of the theories in this chapter is indebted to Greer (1980), Weiss and Klass (1981), Breyer (1982), Litan and Nordhaus (1983), Scherer (1980), Danielsen and Kamerschen (1984), Asch and Seneca (1985), Peterson (1985), Phillips (1984), Shepherd (1985), Williamson (1986), and Danielsen and Kamerschen (1986).]

We classify these alternative paradigms on the basis of their methodological orientation toward regulation, either normative or positive. The normative view, which deals with the world as it "ought to be" is relevant to the public interest view, but there is also a positive strain in the public interest paradigm, although it is not always distinguished clearly. This positive methodological approach represents an attempt to explain how regulation has in fact evolved over time. Only the positive distinction is necessary with regard to the private interest and transaction cost paradigms because their methodological orientation is predominately positive.

If we were writing a book solely for the professional economist, we would proceed directly to a discussion of these three alternative paradigms and an explanation of how they relate to the regulation of public utilities. However, for the benefit of those less attuned to the technical argot and concepts of economic theory, we will first explain briefly why economists generally believe that regulation is an imperfect alternative to competition and vice versa. The salutary effects of competitive markets are developed much more fully in Chapter 4, but a brief introduction at this point is warranted. Similarly, the uninitiated

to economic jargon will find a discussion of a number of key concepts that will be helpful in understanding the discussions throughout this book under the ruberic of "supply and demand conditions." Upon clarifying these concepts, we proceed to an analysis of the alternative paradigms.

The order of presentation for these alternative world views of regulation is in accord with the broad chronological order in which they have appeared in the literature: (1) public interest; (2) private interest; and, (3) transaction cost. To be sure, there have been elements, or bits and fragments, of all three since the beginning of regulation. But prior to the 1940s, and possibly until about 1960, the normative and positive public interest views predominated. The positive public interest view was challenged during the 1960s by those who held private interest views. And finally, the transaction cost paradigm began to emerge in an intelligible form in the 1970s. In reviewing all the various paradigms, we provide numerous citations so the interested reader may, if so inclined, share some of these exciting and imaginative alternatives firsthand.

REGULATION: AN IMPERFECT SUBSTITUTE FOR COMPETITION

Regulation and Competition Compared

Most economists in the United States prefer competition to regulation based on the normative standard of allocative and internal efficiency. It is believed that competition will generally serve to minimize the private and social costs of providing service to consumers who are willing and able to pay the cost of rendition. However, there are conditions under which private and social costs diverge, and in those instances regulation may be warranted. Thus, regulatory economists probably agree with Shepherd (1974, p. 22) that: "Regulation is like growing old: we would rather not do it, but consider the alternative."

If the decision is made to substitute regulation for competition, the question then shifts to what form regulation should take. Many economists would like firms to carry production to the point where consumers at the margin are just willing to pay the costs of rendition at the margin (i.e., practice marginal-cost pricing when conditions are those of natural monopoly — see Chapters 17 and 18). But to do so would require public subsidies. Regulation designed to carry production only to the point where consumers as a whole cover costs as a whole

(i.e., average cost pricing — see Chapter 19) is a compromise solution that creates a whole range of problems, important ones to be sure, that are the primary subject of this book.

However, as will be shown later in this chapter, regulation is a questionable substitute for competition under conditions of natural monopoly and is a very poor substitute indeed when an industry is naturally competitive. Regulation carries with it the potential for anticompetitive effects even when there is a true natural monopoly, and this is why economists have such a strong bias favoring competition. Wilcox (1966, p. 476) put it this way:

> Regulation, at best, is a pallid substitute for competition. It cannot prescribe quality, force efficiency, or require innovation, because such action would invade the sphere of management. But when it leaves these matters to the discretion of industry, it denies consumers the protection that competition would afford. Regulation cannot set prices below an industry's costs however excessive they may be. Competition does so, and the high-cost company is compelled to discover means whereby its costs can be reduced. Regulation does not enlarge consumption by setting prices at the lowest level consistent with a fair return. Competition has this effect. Regulation fails to encourage performance in the public interest by offering rewards and penalties. Competition offers both.

There are many economists who continue to share Wilcox's preference for competition over regulation, when, and if, it is possible.

Supply and Demand Conditions

Let us follow Asch and Seneca (1985, Chapter 13) in examining the basic supply and demand conditions, which while not necessary and sufficient for competition, at least provide a basis for discussing and evaluating regulation. Basically the conditions that favor the abandonment of competition are those of a natural monopoly in which the unfettered competitive process would lead to the dominance and survival of only one firm.

Supply and Costs. To examine supply conditions properly, we need to distinguish several different cost concepts. *Fixed costs* are short-run costs which, in total, are insensitive to variations in output. Closely related to fixed costs are irreversible sunk costs. The essential characterics of a sunk investment is that the productive capital facilities are so specialized as to location or purpose that they cannot easily be

converted to alternative productive uses. "More precisely a 'sunk cost' is the difference between the ex ante opportunity cost and the value that could be recovered ex post after a commitment to a given project has been made" (Sharkey, 1982, p. 37). While an airplane is a fixed capital asset cost in the general sense of unfeasibility for anything but transportation, it is not a sunk capital cost in terms of serving any particular market. Of course, all costs are variable in the long run, but the long life span of the sunk capital costs in the utilities means the long run may often be thirty years or more.

Common costs are the fixed costs of producing a multiproduct set, whereby the use of the fungible capacity through the provision of one product prevents usage by another (e.g., telephone investment in switching, transmission, and terminal plant). While the variable costs of incremental changes of joint products may be determined (see Kahn, 1970, pp. 77-83), any allocation of average (total) costs is arbitrary and lacking in true economic significance.

Joint costs are the expenses involved in providing two or more products that can be *economically* produced only in fixed proportions (e.g., wool and mutton, cotton fiber and cottonseed oil, peak and off-peak telephone service). The joint supply conditions — once a service is provided to one consumer it can be provided simultaneously to others at low or zero marginal costs — in utilities are part of the regulation problem. This nonrivalness is also a characteristic of public goods in general. Also in common with public goods in general is the technological characteristic of indivisibility or lumpiness of supply which makes the provision of the service in incremental amounts inefficient.

External costs are involved if a firm's production imposes costs on third parties (i.e., neither buyer nor seller) or society that the firm does not have to pay, e.g., air, visual, or noise pollution. Because these costs are not borne by the producing unit, they are neglected in making decisions unless internalized through taxes by the government. Externalities are sometimes connected to common costs.

Economies of scale occur when average costs decline as single product output increases, a factor most commonly due to the fixed and common costs linked to an indivisibility (i.e., an unmeasured fixed input) which generates unavoidable excess capacity. *Economies of scope* are exhibited when the total costs of producing two or more products jointly is less than producing these products separately.

Learning or the broader experience *curve costs* refer to the dynamic economies of a firm, which having produced a product for a certain time period, is able to incorporate new ideas it has learned from the product experience. (see Baldwin, 1987, pp. 336-340 for the difference.)

Pecuniary costs refer to costs savings available as quantity discounts from larger purchases. These are not true technological cost reductions, but mere transfers redistributing monopoly or quasi-monopoly profits from the supplier of the input or product to the buyer.

Taken all together, any economies of size generated from all of these cost elements is not sufficient for the existence of a natural monopoly. Let us therefore turn to the demand conditions which together with cost conditions may provide a rationale for regulation.

Demand and Elasticity. The market demand facing utilities is perceived — and these perceptions have been supported in part by the empiric studies of econometricians — as relatively inelastic with respect to their own prices, as well as to the prices of alternative utility modes, over the likely output range. The *direct or own price elasticity* of demand is the proportionate change in the quantity demanded of a product relative to or divided by the proportionate change in the price of that same product. The *cross price elasticity* of demand (supply) shows the proportionate change in the quantity demanded (supplied) of some product relative to or divided by the proportionate change in the price of another product. The *income elasticity* of demand measures the proportionate change in the quantity demanded of some product relative to or divided by the proportionate change in the income of the demander(s). In all cases, it is assumed that all other things not included explicitly in the equation — such as the prices of other services, income, tastes and preferences, the number of consumers, etc., — are the same or in the infamous phraseology of economists, *ceteris paribus.*

To an economist, an inelastic demand means that the price may be raised profitably by a monopoly firm. However, own price elasticities of demand vary more among than within ratepayer classes, so the firm's ability to garner monopoly profits from some ratepayer classes is much greater than from others. Moreover, price and income elasticities are considerably greater in the long run than in the short run. Because the provision of a utility service is nonexclusionary over time, the joint demands are added vertically to establish willingness to pay at a given level of service.

Demand Variability and Peak-load Problems. The other aspect of demand of importance in assessing natural monopoly involves fluctuations in demand. When because of large fixed capital equipment, output cannot be easily altered immediately in response to the vagaries of demand, there are peak-load problems. Costs and demand varies by time of use as consumers have diurnal, periodic, and seasonal

activities. Because of storage limitations inherent in a service as compared with a good and the utilities' responsibility to provide service upon request, a fluctuating demand structure mandates peaking capacity which will be underutilized at off-peak times. While a multiproduct firm mitigates this problem because of diversity of demands, the peaking problem does not vanish. Peak-load pricing can alleviate the problem for single product and multiproduct firms. Because output swings steeply and regularly with fluctuating demand, the utilities must forecast demand (despite the fact that Sam Goldwyn warned us that: "Forecasts are dangerous, particularly those about the future.")

NORMATIVE PUBLIC INTEREST THEORY

There are several variants of the normative public interest or consumer protection theory. The goals or rationales of regulation in the public interest may be economic (to correct market failures), social (to correct social failures) and political (to correct political failures) in nature. The traditional public interest view of regulation is to protect consumers against high or discriminating prices or unreliable service. While most existing regulatory programs are based upon several different rationales, we review them individually. In all we review and briefly evaluate the merits of seven broad categories of the public interest theory recognizing that there is some overlap, duplication, and redundancy in these: (1) natural monopoly; (2) prevention of undue price discrimination; (3) externalities; (4) conservation of resources; (5) informational disparities; (6) destructive, ruinous, or cutthroat competition; and (7) other justifications.

Natural Monopoly

The Basic Theory. Certainly the most traditional and persistent economic rationale for regulation involves the case of natural monopoly, which was described in detail in Chapter 1 and about which more will be said presently (Breyer, 1982, p. 16). In a natural monopoly industry the cost, demand, and behavioral conditions are such that allowing a single firm to serve the market is most efficacious. If there are barriers to entry and demand is inelastic, the sole producer who survives the competitive struggle while efficient — in that it can produce the output demanded at a lower cost than two or more firms — could restrict output, raise prices, and reap monopoly profits. Hence, regulation may be needed to thwart this temptation.

The public interest theory warns that free competition may well lead to the survival of only one firm (and attendant potential dangers) in a natural monopoly setting (for as George Orwell said: "The trouble with competitions is that somebody wins them."). Smaller firms may go bankrupt or be acquired by the dominant company, and the consumer is feckless. For a somewhat skeptical evaluation of this possibility see the section entitled "Destructive, Ruinous, or Cutthroat Competition" later in this chapter.

It should be noted that if demand is elastic and/or barriers to entry are low, the natural monopolistic firm, if it exists, need not be regulated as it is without market power. Regulation may also not be needed if the auctioning of franchise privileges is feasible, but this point is debatable as can be seen in Hazlett's (1985) comprehensive survey. Some proponents of regulation in the public interest argue that the capital intensive nature of an industry, such as that found in electric generation, forms a barrier to entry. Many other economists argue, however, that even if the capital requirements are high, which is not clear if one is speaking in relative as opposed to absolute terms, if profits are high enough, the required financial capital will be forthcoming. Thus, many natural monopolies need not be regulated, and a regulated industry need not be a natural monopoly in certain segments or even in all of its operations. Similarly, neither the peaking or inelasticity of demand conditions, nor the supply conditions alone, necessarily imply natural monopoly and the need for regulation. These two together, in combination with behavioral conditions of potential entrants (pricing strategies), may be *sufficient* determinants of that *bête noire* called natural monopoly.

Problems of Identification. A natural monopoly is of particular interest to this study inasmuch as it is *sine qua non* of regulation according to the public interest theory of regulation. However, determining whether natural monopoly or competition characterizes a specific industry is a complicated task that depends on the supply (cost and technology) structure, the demand pattern, and the behavioral intentions (e.g., pricing strategies) between incumbent firms and potential entrants. (We draw on the Asch and Seneca, 1985, Chapter 13, format in developing this.)

Even with the best of intentions and of qualifications of the analyst, the econometric estimates of cost and demand may be challenged because of inaccurate or insufficient data or because of inadequacy of estimating techniques. Behavioral interactions are often assessed on the basis of historical performance which may not be a good surrogate for the future. Thus, the costs and benefits of a policy

of regulation, reregulation, or deregulation are subject to considerable uncertainty. (As Goethe observed: "When ideas fail, words come in very handy.") Thus, the problem of deciding when to regulate an industry is relatively easy if based strictly on theoretical grounds. But assessing whether an industry is naturally monopolistic or competitive requires much more information, skill, and judgment. This important task is beyond the scope of our assignment.

Prevention of Undue Price Discrimination

A monopolist practicing price discrimination can cause an income transfer from customers of the service to investors, and this is generally regarded as undesirable. Price discrimination involves charging prices for technically similar commodities that cannot be accounted for by the (marginal) costs of production, distribution, transportation, storage, risk, or uncertainty. The necessary conditions for a monopolist to practice price discrimination among customer classes are downward sloping demand curves that differ in their elasticity for two or more identifiable classes of buyers, and the segmentation of those markets at a low enough cost to deter resales from the low to high-price buyers. Clarkson and Miller (1982, p. 240) emphasize that the requirements posited by some economists that there must be control over other sellers and over entry appear overly restrictive.

Railroads and telephony provide the most common historical cases of successful price discrimination in that inelastic demanders have been charged higher prices than were more elastic customers. (It is ironic that railroads in the 1800s fit both the contrasting models of natural monopoly or destructive competition depending upon the route circumstances). Towns without railroad competition were charged grossly discriminately high rates to the point that noncompetitive short hauls were more expensive than competitive long hauls. Small shippers also fared poorly. Similarly business telephone users, such as stockbrokers, are charged higher prices for their inelastic demands than can be accounted for by peaking or other differential costs. The victims of price discrimination advocate regulation to stop *undue* discrimination.

The criterion for regulation here shifts from the norm of economic efficiency to that of equity. According to Dewey (1974, pp. 35-37), probably some variant of equity has motivated most regulation. The issue is what constitutes *undue* discrimination. Clearly, some price differentiation — which is not necessarily price discrimination — and even some non-undue price discrimination is acceptable. In fact, as we show in Chapter 20, discriminatory Ramsey pricing may, under

certain conditions, be the best alternative to marginal cost pricing under natural monopoly circumstances. But what is undue discrimination? "In the end, *undue discrimination* is whatever the regulatory commissions or the courts say is undue discrimination" (Peterson 1985, p. 184). This topic is too complex to deal with adequately at this point and is reserved for intensive analysis in Chapter 20.

Externalities

The "market failure" rationale for regulation involves the presence of external economies and diseconomies, or external benefits and costs. An externality or spillover occurs when there is a benefit or cost enjoyed by or imposed on other members of society by the activities of a producer or consumer that are not enjoyed or borne exclusively by the direct causer. Thus, when there is a spillover, the true social costs and/or true social benefits are different from the unregulated price. External economics arise when sellers are not paid the full value of their production or buyers do not pay the full value of their consumption. In short, when there are externalities, the market fails to do its job of securing social optimality.

External Economies or Benefits. An external economy that is particularly relevant for utilities concerns the option demand by which consumers enjoy the option to use facilities whenever they wish. While the mere availability of the service to nonusers is of value, this option may not be available under competition and as such constitutes an externality. According to Weisbrod (1964), the reasons this option may not be available are that: (1) the option is seldom if ever exercised; (2) the revenues from actual users are exceeded by the costs of continued operation; and (3) future expansion or recommencement of the operations when occasional users want to buy is difficult to impossible. To get the socially desired rate of output with external economies, producers need to be provided subsidies.

External Diseconomies or Costs. External diseconomies arise when people in society pay more than the value of the output produced. This is a justification for regulating or taxing the producer in order to restrict production. Of course, alternatively, in both cases, producers could be forced into producing the desired rate of output under the threat of nationalism or social ostracism. But this may be an economically inefficient or costly solution. The basic problem is that costs external to the individual firm are not brought into the profit maximizing calculus under competition. To keep its costs at a minimum to

survive, the firm must evaluate only its own costs, and this may impose higher costs on people in society as a whole.

Public safety is sometimes, but not always, an externality that occasions regulation. Such regulation benefits all producers by eliminating safety cutters intent on lowering costs to ride on the quality reputation of others. While this historically has not been very important except for airlines, the nuclear power age may have changed that. Safety features that benefit nonpurchasers may not be provided by a free market system, so regulation may be regarded as a means of correcting for an underproduction of safety. Critics argue that the desire to avoid higher insurance premiums provides unregulated firms the necessary incentive to maintain adequate safety levels, although these safety costs may not be entirely internalized by insurance premiums.

Evaluation. It can be and has been advanced that externalities do not call for government intervention, but merely for rearrangement of property rights (Breyer, 1982, pp. 24-26). For one thing, with low or no transaction costs, Coase (1960) points out that externalities could not exist; resources will always be used in their most highly valued use because the other party can always be bribed, if necessary, by the person so utilizing the property. Secondly, even with positive transaction costs, spillovers can be eliminated by allocating property rights to those who have the greatest probability of achieving the efficient result through, if practical, bargaining. Thirdly, if none of this worked, the government would be better off creating allocatively efficient liability rules for shouldering the burden from any harms. Fourthly, the problem can be defined away in the sense of positing that externalities could not exist if third parties were not in close proximity, so the third parties are just as much to blame. However, this argument can be criticized on several grounds.

> In sum, a spillover rationale must be phrased in terms of a particular product; it must assume that obstacles to bargaining lead to significantly greater use of a product (or production process) than would be the case if costless bargaining were possible; and it must assume that the result of intervention (taking into account the costs of intervention) will better approximate the bargained-for solution. If these assumptions are correct, then intervention will reduce allocative inefficiency (Breyer, 1982, p. 26).

While historically externalities are perhaps the second most commonly used rationale for regulation, we do not find their empirical significance

to be great, nor their logic to be persuasive, as a case for public utility regulation.

Conservation of Resources

In some cases the public rationale for regulation is conservation of scarce resources, such as in radio and television broadcasting, natural gas, oil, and water (Greer, 1980, pp. 486-487). Free market processes may lead to overproduction or underproduction relative to perceived future societal needs. In the case of overproduction, the clarion call has often gone out for regulation to preserve our resource base. This rationale is one of the hardy perennials that blossom forth whenever there are perceived shortages. The natural gas shortages and sharp price run-ups of the mid-1970s provide a classic example. The subsequent natural gas "bubble" and declining prices should serve to warn against overreaction to perceived shortages. It may simply be noted here that the arena of public utility regulation, when compared to the alternatives of government taxation and general regulation, is an ineffective place to orchestrate a program of resource conservation. Certainly in the absence of other characteristics favoring the regulation of an industry, this rationale would fail to justify regulation.

Informational Disparities

A market failure also thought avertable under regulation would occur when there are informational shortcomings in the market — e.g., "when companies withhold what might cause investors to value their securities less highly or when consumers lack the technical expertise required to recognize health or safety hazards in the products they buy" (Scherer, 1980, p. 482; also see Breyer, 1982, pp. 26-28). Accurate and relatively inexpensive information is a necessary predicate to the efficient functioning of any market.

Destructive, Ruinous, or Cutthroat Competition

In direct contrast to the natural monopoly argument where the problem is that there is a paucity of competition in some industries, there may be a problem where there is a plethora of competition. One variant of this argument involves the fact that some industries have ponderous capital intensity of a highly specialized fixed variety which become sunk costs once purchased. (Sunk costs are those which cannot be recovered, i.e., are irreversible because of specificity in purpose or

location, once the entry decision is made making exit difficult; investments in electric generating capacity are largely irreversible relative to airlines or trucking.) The fact of sunken costs, taken together with their relatively low operating costs, leads to short-run pricing decisions where firms engage in bouts of periodic, intense, and eventually destructive price cutting. Excess capacity is usually regarded as the factor triggering the cutthroat competition that eventually destroys. The railroads have been regarded as quintessential in this regard.

During the late 1880s railroads cut prices vigorously, causing price wars that were financially destructive to the railroads and disruptive to the customers. However, railroads and airlines, both on their own and later with the help of regulatory agencies, formed cartel and quasi-cartel arrangements that stabilized prices by establishing minimum prices. Critics ask: "Why is it that rational firms would enter into such self-destructive, mission-impossible markets?" Certainly firms and industries which are extensive and highly specialized users of capital, such as automobile and petroleum, have been able to survive and prosper. It is also interesting to observe that the argument cannot be used to rationalize regulation in natural monopolies which, once established, presumably face no competition (Greer, 1980, p. 487). Also in contrast to the natural monopoly argument which advocates regulation to design maximum prices, the destructive competition argument seeks to justify minimum prices. It is ironic that this argument was used to justify minimum price regulation in transportation where, with its low and shiftable capital costs relative to malleable labor costs, the argument was least valid (Weiss and Strickland, 1976, p. 6).

The strongest supporting evidence for the cutthroat competition argument comes from the studies of Phillips (1962) and Asch and Seneca (1976). The evidence taken from atypical examples of alleged conspiracies prosecuted by antitrust enforcement agencies suggests that adverse business conditions and not avarice in the form of monopolistic profits is the spur to collusion (see Baldwin, 1987, pp. 217-218). Phillips found that the most prominent Supreme Court conspiracy cases that formed the genesis of *per se* illegality dealt with industries with severe competition from high fixed to variable costs coupled with inelastic and unstable demand — bituminous coal mining, cast-iron pipe, cement, steel, and vitreous sanitary fixture. Asch and Seneca found a negatively significant relationship between collusion and profits. While chary of their sample of about 101 large manufacturing firms (51 firms were found guilty or pled *nolo contendere* to conspiracy charges and 50 firms were never charged), they concluded

that the adverse economic conditions that caused low profits, perhaps even losses, were the prime mover towards collusion.

As to cutthroat competition, Greer (1980, p. 487) concludes that in general: " . . . this argument has limited application." Few lovers of efficiency or logic would be sad to see the cutthroat competition rationale expunged from the regulatory handbooks. For more criticism of this "empty box," which is typically based on either the fear of the cyclical nature of the service or of predatory pricing, see Breyer (1982, pp. 29-32).

Other Justifications

Breyer (1982, pp. 32-34) mentions five other rationales which, while they partly overlap some of the others, merit a brief discussion:

(1) Without regulation, social or political power could be concentrated in the hands of the unregulated private monopoly (Breyer, 1982, p. 20). While it is questionable whether a firm could, in fact, do this — given accountability, fear of governmental action, corporate social responsibility, etc. — regulation has been asked for and received at least in part on the basis of power. Similarly, if there is *unequal bargaining power,* there is a rationale for regulation. Since efficient resource allocation assumes a "proper" allocation of bargaining power, extreme inequalities may call for government regulation or exemption, such as was the argument for labor unions as well as agricultural and fishing cooperatives.

(2) Intervention has also been justified on the *rationalization* grounds that the firms are too small or too unorganized to produce efficiently. Social or political factors may prevent the needed coordination from occurring naturally and hence regulation is summoned.

(3) *Moral hazard* is the failure of a person to behave in a fully responsible way *because* there are no penalties for misbehavior. If there is a moral hazard such that a buyer, unconstrained by ethics or other institutions, has his or her purchases picked up by someone else, government regulation may be called for to curtail the excessive resource costs imposed on society by the unconstrained purchases. For example, buyers who have medical care insurance under a company and/or a government subsidized program may not be as careful with their health precautions and will devote fewer resources to illness avoidance; and once sick they will consume more care than if no

insurance existed. Thus, the moral hazard is that the availability of insurance enhances the losses against which people are insured.

(4) Government regulation is sometimes advanced out of a feeling of "government knows better than thou" *paternalism* for irrational, but informed, decisionmakers.

(5) Finally, regulation has sometimes been justified for *scarcity* reasons. An unfettered marketplace may produce shortages or scarcities which society deems unacceptable and a stentorian voice goes out for regulation — e.g., licensing television stations.

ALTERNATIVES TO REGULATION IN THE PUBLIC INTEREST

Another problem that merits discussion, as it severely undercuts the classic natural monopoly argument for public interest regulation, involves contestable markets. (Our discussion draws on Danielsen and Kamerschen, 1986.) When contestable conditions prevail in an industry there may be no need for the protection provided by direct regulation. Similarly, when the terms and conditions of a contract can be specified adequately at the outset, and provided the costs of monitoring and enforcement are not too severe, franchising may be an alternative even where a natural monopoly exists. Finally, there are a variety of other qualifications to regulation in the public interest that will be discussed in this section.

Contestable Market Theory

Until recently regulatory economists and legal scholars defined a natural monopoly as existing when there were significant economics of scale relative to market size. However, a recent analysis developed by Baumol (1982) and Baumol, Panzar, and Willig (1982), called contestable market theory, emphasizes that pure competition is not necessary for economic efficiency. This represents a definite advance in economic theorizing because a contestable market requires fewer assumptions to reach an optimal solution than does perfect competition. While perfect competition requires small, numerous, and independent sellers and a homogeneous product, a contestable market does not. Of course the assumptions of contestable markets are not particularly realistic, since entry is assumed to be absolutely free and

exit absolutely costless. But the realism of assumptions is not a valid test of the usefulness and insight to be gained from a theory.

The Basic Theory. Contestable market theory emphasizes the valid point that as long as there is the threat of entry when supernormal profits are available to entrants, and the certainty of exit without cost in the absence of such profits, incumbent firms will be forced to charge prices no higher than their (marginal) costs.

More specifically, a given market is said to be an output-specific natural monopoly if that output can be produced less expensively by one firm than for any division of that output among two or more firms. Put differently, a natural monopoly market exists if the cost-minimizing structure is that of a single firm (Baumol, Panzar, and Willig, 1982, p. 351). Economies of scale are neither necessary nor sufficient for a natural monopoly, suggesting that natural monopoly markets are significantly different and smaller than formerly believed. The freedom of entry and exit is a sufficient condition for economic efficiency. In other words, while a perfectly competitive market is necessarily a contestable market, a contestable market is not necessarily perfectly competitive.

Baumol, Panzar, and Willig have shown that firms with sufficiently high fixed costs will have the necessary and sufficient (subadditive cost) conditions necessary for natural monopoly. In the technical language of economists, a local (global) subadditive cost function is a necessary and sufficient condition for a local (global) natural monopoly. Formally, subadditivity exists if the costs of joint production are less than the costs of separate production for any scale of output or combination of outputs. It should be noted that multiproduct economies of scale are neither a necessary nor a sufficient condition for the existence of subadditivity. Economies of scope are a necessary condition and economies of scope and product specific economies of scale are a sufficient condition for subadditivity (see Evans, 1983, Chapters 6, 10).

Criticism of the Theory. Shepherd (1984) has challenged the unrealistic perfect conditions (of easy entry and exit, complete access to technology, and adequate information) that will purportedly force an intimidated incumbent to reach efficient competitive results, as an entrant may quickly and entirely replace the incumbent. In fact, according to Shepherd, the incumbent can usually prevent or retard entry. If so, sagacious regulators should retain controls until competition is fully established *within* the market.

Clearly, the most common criticism of a "perfectly contestable"

market is its stringent, necessary assumptions, such as frictionless and costless entry and exit ("ultrafree" entry and exit according to Shepherd, 1984). Baumol (1982) responds to these criticisms by arguing that contestability is appropriately correct in some markets (such as airline service between various city pairs), and moreover its primary value is as a normative benchmark or standard to judge the efficiency of market performance (see Baldwin, 1987; critiques include Weitzman, 1983, Schwartz and Reynolds, 1983, Spence, 1983, Brock, 1983a, and Shepherd, 1984). (As Yogi Berra has said: "You can observe a lot just by watching.")

The behavioral conditions of potential entrants can be thought of as in Asch and Seneca (1985, p. 259, esp. fn. 3), following Faulhaber (1975) as adapted by Baumol, Panzar, and Willig (1982), who show an example of how socially inefficient entry at the fringe may cause the breakdown of an unsustainable natural monopoly. The government's only recourse to sustain the natural monopoly, when the socially efficient price pattern allows socially inefficient fringe entry, is to make entry illegal. Also see Schmalensee (1979) on Ramsey pricing.

Competitive Franchising

Demsetz (1968) and others have pointed out that even if one seller is the most efficient market structure, the seller may not be able to set a monopoly price. Demsetz opines that if there are no legal barriers to entry and if the transaction costs of negotiating contracts with prospective consumers is not high, potential competition will provide sufficient discipline for the natural monopolist. High prices will attract rivals who will undercut price and gain market shares. As a result, not all natural monopolies need to be regulated. A possible alternative is the auctioning of ownership or operation franchise privileges, but this point is debatable as can be seen in Hazlett's (1985) survey. Williamson (1976) and others have also criticized the franchise bidding idea as impractical in many industries.

Other Qualifications

A natural monopoly with steep scale economies over the whole range of market demand is rare in a multiservice utility selling to many customer groups. And if the minimum efficient scale of plant is less than total market demand, there is obviously room for competition. Moreover, in a dynamic society the presence of a natural monopoly at one time does not ensure that those same conditions will exist forever.

Even when the conditions of natural monopoly do exist, there are at least two generic problems. First, if the scale economies are slight, the cost gains from having only one supplier will be small and may easily be overcome by the more internally efficient and innovative multi-suppliers. And second, the regulatory task of determining and measuring the existence and magnitude of true technological scale economies is formidable, especially when output emanates from a central capacity or network. (See Shepherd, 1985, pp. 326-327.)

In addition, even if a firm has scale economies (or subadditive costs), this does not necessarily mean that the industry should be regulated as a natural monopoly. While subadditivity does mean that single firm production is more efficient than multifirm production, it does not mean competition should be prohibited. Several other conditions, including the identical utilization of technology, necessity of common asset ownership, regulatory efficiency, and costless regulation are also necessary to complete this connection. Similarly, although single service scale economies imply a single service natural monopoly, (1) service specific economies in both services do not necessarily imply a multiservice natural monopoly; and (2) a multi-service natural monopoly may not necessarily have service-specific scale economies in either service. Thus, product-specific economies of scale are of limited value in determining if a natural monopoly exists or not (see Evans, 1983, p. 130-133).

PRIVATE INTEREST OR INTEREST GROUP THEORY

Dissatisfaction with the traditional public interest theory arose from its predominately normative orientation and its naive assumptions about the behavior of the regulators and those they regulate. Regulators were supposed to serve the public interest, and the regulatees were supposed to prefer an unregulated status, accepting regulation only as an imposition upon them by a superior governmental authority. However, once regulated, the regulatees were to cooperate with the regulatory authorities in providing adequate and reliable service at the lowest price possible. This paradigm has been questioned seriously by those who perceive the "world as it is" quite differently from this ideal perception. The more acerbic critics, no doubt, view the public interest model as a "paradigm lost."

Two Questions

Economists question the validity of the public interest model

because of its inadequacies in answering two essential questions (Feldstein, 1979, pp. 235-236): Why were inherently competitive industries such as airlines, taxicabs, and trucking regulated if the purpose was to protect the public against monopolistic pricing? Why do unregulated firms persistently wish to enter regulated industries, if regulators are pushing profits and prices to levels consistent with competition? Private interest theories such as the capture theory (in all its various forms) can provide answers to these questions. For example, according to the monastic producer capture theory (see Breyer, 1982, Introduction), regulation is demanded by competitors to capture the benefits of monopoly power; and the continued attempts by unregulated firms to enter the regulated industries are a response to noncompetitive pricing structures set by regulators. These capture theories are discussed later in this section.

Of course, the capture theories, as well as all of the other private interest theories, leave many questions unanswered. They do not explain the paternity of regulation, nor many individual decisions of the regulators. How did environmental health, safety and even some utility regulation arise in the first place? It is not satisfactorily explained by the interest group theories. And when generalized from including only producers to all including vested interests, the capture theory becomes more tautology than theory, explaining everything and predicting nothing. Finally, there must be strong nonpolitical factors operative at times or the airline and trucking industries would never have been deregulated.

In the following sections, one may note that the private interest theory has taken many forms. After the following brief introduction and preliminary evaluation, we will examine several of the most popular of these private interest theories. We acknowledge a considerable degree of overlap, duplication, and redundancy within these theories, but they include, among others, rent seeking, stability, public choice, industry capture, regulation as taxation, government habit, bureaucracy, modern interest group, and contract.

Private Interest Paradigm

According to those people who hold public interest views, regulators do in fact, or at least ought to, strive to serve the social interest. (The section draws on Danielsen and Kamerschen, 1984.) But even where regulators do try to serve the public interest, and the public interest theory does contain at least a degree of validity — for any of the numerous reasons discussed earlier — we know regulation can and has been easily exploited under the pretense of promulgating

societal goals. As a result, there are private interest or interest group theories of regulation — see e.g., Stigler (1971), Posner (1971, 1974), Peltzman (1976), and Jarrell (1978) — which hold that regulators act to transfer wealth between interest groups in order to maximize political support.

General Nature of the Theories. These and other scholars in the 1970s (at least) became highly suspicious of the contention that regulation protected effectively the public interest. They subscribed to the view that various private interest groups have breached the public interest tilting the effects of regulation. The regulators have responded to the pressures and information emanating from the private parties who have an economic interest in the outcome of the regulators' decisions. In simple terms, the private interest theory recognizes that in the long run how well you do depends upon your own efforts. It follows the philosophy espoused in the following sign that was posted in a New York cafeteria: "Courteous and efficient self-service."

Thus, regulatory agencies such as the ICC are regarded as merely "great handicappers." The private interest theory in its original formulation — the capture theory — predicted that the regulated firms which were more concentrated, better organized, and more able to manipulate political levers would be the beneficiaries. The private interest theory has been generalized to predict that regulators will allocate the benefits among all the various private interest groups so as to equate political support and opposition at the margin.

In the private interest modeling, government is the supplier of various costly regulatory services — price stabilization, barriers to entry, subsidies, suppression of competition from substitutes, etc. Who will demand and pay for these costly and partisan services? Certainly industries, that know the problems in getting around the antitrust laws and the transaction costs (i.e., organizing and enforcing agreements) of forming a monopoly or cartel-type agreement under indirect antitrust regulation, may be willing to pay. In the political world of government suppliers and industry demanders, the *quid pro quo* may be campaign contributions, attractive consulting opportunities, votes, or volunteer work on political campaigns.

Preliminary Evaluation of the Theories. The results have been mixed in supporting either version of the private or the public interest theories. For instance, a study by Kamerschen, Kau and Paul (1982) supports a version of the private interest theory, whereas Nelson (1982) supports a Ramsey version of the public interest theory. The former study finds that both political and economic factors affect

(electric) utility rates. In light of some controversy in various states (see, e.g., *Wall Street Journal,* 1982) concerning whether utility commissioners should be elected (only 11 states do this) or appointed, it is noteworthy that the study shows that whether commissioners were elected or appointed *ceteris paribus* does not (statistically) significantly affect (electric) utility rates.

This still narrow view of regulation — envisaging the only demand is by industry interests — has its weaknesses, apart from explaining the importance of other interest groups. How does the industry resolve the public good or free rider problems involved when seeking regulation? Regulation will tend to benefit all of the regulated firms, regardless of whether they contribute to the cost of procuring it. Free or low cost riders may try to take advantage of other firms' efforts to secure regulation. Obviously if there is extensive free-riding, the collective benefits may be lost. In general, large unconcentrated groups have the biggest problem as the initial organization and ongoing maintenance costs are substantial. Small concentrated groups such as railroads in the late 1800s realized and were willing to pay for the benefits obtainable by lobbying for the formation of the ICC.

As with any rule, there are exceptions. For example, some large unconcentrated groups such as farmers have secured a high degree of government support, whereas some highly concentrated groups have not obtained direct regulation or other government favors. Perhaps the reason for this latter fact is that the cost of secrecy in developing private cartels for these highly concentrated groups, bothered only by the indirect antitrust laws, may have been lower. In addition to the fact that small unconcentrated industries' costs may be lower for regulation than cartelization, and their sheer size advantage in terms of control of voting blocks, these large-number groups may have secured favorable results from their advantages in establishing helpful trade associations.

The most recent trend has been to regard both the public and private explanations as mirroring a facet of reality. Neither one is valid standing alone. Since the sources of regulation in the real world are complex, which theory is more significant may depend upon which of the four stages an industry or commission is in at present (see Chapter 21). Moreover, these theories are not diametrically opposed as, for example, each at times, willy-nilly, promotes efficiency or inefficiency.

Rent Seeking

Rent seeking, a somewhat new but arcane subject, refers to the

wasting of resources in fighting for artificially created profits or rents, and relates to the scope of government activity in the economic system (see Krueger, 1974, pp. 291-303 and Tollison, 1982, pp. 575-601). The basic idea of rent seeking is that firms compete politically to create monopoly profits for themselves. Another form of rent seeking activity, which we may call *rent avoidance,* involves consumers or firms seeking to avoid exploitation by other would-be monopolists, by gaining favorable treatment from government for themselves. However, this process dissipates above-market returns and, when all is said and done, is socially wasteful.

General Nature of Rent Seeking. The rent seeking literature is based on the neoclassical paradigm of government involvement in market relations (adapted from DeLorme, Kamerschen, and Mbaku, 1986). When government activity in the economy deviates from that assumed by the neoclassical free market model toward one of greater involvement, opportunities for rent-seeking activities begin to appear. If the market adjustment process, which allows for dissipation of rents, is either impeded or destroyed completely by government interference, rent seeking is possible. Should government action result in the supply of a product being artificially restricted, so that its price is not allowed to move to its equilibrium level, then those who have successfully won the rights to produce the service at these supernormal prices will enjoy economic rents. Thus, government induced scarcity will invariably result in economic rent. The anticipation of rent will induce entrepreneurs to spend resources, either to obtain the monopoly rights when they are first created or to seek ways to oust the initial recipient. The profit-maximizing firms will be willing to spend, in the attempt to attain the monopoly rights, anything up to the full value of expected profit. If they inadvertently paid more than this, they would correct this by following the principles of good gin rummy managerial behavior which advocates discarding the least promising business at each turn. These artificial rents need to be distinguished sharply from natural or economic rents which are due to controlling a source of supply that permits production at a cost lower than the current market price. In addition, economic rents need to be distinguished from monopoly profits in that only the latter are inefficient and allocatively wasteful (Breyer, 1982, p. 21).

Defensive Rent Seeking. Rent seeking also occurs as a result of government action that fixes prices below competitive levels. In this type of rent seeking, rents accrue to consumers, all of whom have been awarded government or artificially created rights to enter the

market on the demand side. Free entry will drive prices up to equilibrium levels and cause a dissipation of the rents accruing to the monopoly consumers. If, however, the government effectively blocks entry, those consumers who have secured a right to transact will continue to enjoy rents. Potential demanders (consumers) will waste resources trying to have those monopoly or artificially created rights transferred to them. This activity by potential demanders, too, is rent seeking. Rent seekers, like fun seekers, come in all forms and shapes. Anyone who presently enjoys a monopoly rent must recognize that rent seeking is a treacherous business, and a wary attitude toward other potential rent seekers is essential. A rent seeker must heed Woody Allen: "While the lamb may lie down with the lion, the lamb shouldn't count on getting a whole lot of sleep."

The problem of rent seeking is certainly possible in the public utility field, even if the right to a utility franchise is supposed to be given out to firms that will use that right in the public interest. One might expect that in a democratic society the government officials would bestow the license to the firms that the voting public prefers. Those firms can use a variety of ways to improve their public image — advertising, political donations to the incumbent party, direct bribery of the allocating officials, etc. Economists predict that, in equilibrium, as always, the marginal cost will be pushed to equality with the marginal value, and the firm will spend as much getting the license as it is worth, leaving it only competitive returns on the monopoly grant. While we have discussed this with respect to first obtaining a certificate of public necessity and convenience, the same idea holds for continuing regulation. Both firms and consumers will expend resources to get the results tilted in their favor.

Other Rent Seekers. Crew and Kleindorfer (1986, pp. 104-105) list at least seven different types of rent seekers in the present regulatory process: (1) managers seek to satisfy their expense preferences (á la Williamson, 1967); (2) blue collar workers operate through their unions; (3) intervenors of all types; (4) commissioners; (5) expert witnesses; (6) suppliers and customers; and (7) stockholders. Crew and Kleindorfer (1986, p. 265) go on to say that rent seeking also " . . . provides a ready explanation for deregulation moves on the part of regulated industries, as well as the failure of regulated firms to make supernormal profits which may be completely dissipated by rent seeking."

On the other hand, despite Posner's (1969, 1974) et al. insistence that regulation has more dead-weight losses and costs than unregulated private monopoly, regulation continues. There would be windfall losses in capitalized rents if there were deregulation. McCormick, Shughart,

and Tollison (1984) argue that if these rents were fully capitalized up front, there would not be much to gain from deregulation. Moreover, as long as the market for rent seeking is not perfect, the rent seekers maintaining rents under regulation (even though the original monopoly return is gone), will push for the status quo.

Finally, while the authors are discussing telecommunications in particular, we believe that the following factors relating to the persistence of rent seeking apply in general to utility regulation. That is, Crew and Kleindorfer (1986, p.119) point out additional reasons regulation may survive in an economically inefficient environment.

> Its continued survival may be explained by a number of factors, such as a high value placed on fairness, risk aversion by all parties, any residual benefits derived by rent seekers, and the lack of interest and understanding of the effects of the process generally. Fairness may be highly valued partially since it is a commodity whose cost each member of society is not bearing directly. This combined with the risk that the consumer would be exploited by a monopoly without regulation make the prospect of deregulation of utilities not very attractive unless the costs of the regulation are perceived to be huge. As many of the costs are hidden, this perception is unlikely. Moreover, rent seekers have something to gain from the process and may take steps to influence legislators for its continuance.

We would only add that even if deregulation were desirable, because of inertia, we would not expect people to slam down the portcullis of regulation and throw up the bridge of competition immediately.

Stability Theory. The Owen and Braeutigam (1978) stability theory depends heavily upon rent seekers operating at various stages of regulation. Owen and Braeutigam believe regulation is demanded by a risk averse public seeking shelter from the positive and negative windfalls from such factors as the harsh *mistral* blowing off of technological change. This theory builds upon the stability goal of regulation, which we described earlier in this book, that includes more of an admixture of equity than efficiency.

Public Choice Theory

The central insight of public choice theory, largely due to Nobelist James M. Buchanan (see e.g., Buchanan and Tullock, 1962), is that self-interest behavior prevails in the public sector — whether voting

for political candidates or working for a governmental agency — as well as in the private sector. Public interest to a public choice theorist is a self-contractive oxymoron comparable to "spacious compact car," "lady wrestler," and "inexpensive consultant." Public choice advocates maintain that there is a political marketplace just as there is an economic marketplace in which people pursue their objectives rationally, not unlike economically and politically literate androids. It is true that the property rights in the public market are somewhat different from those in the private market and include the right of people to vote for representatives, of representatives to make laws, of government officials to enforce the laws, of judges to interpret the laws, etc.

The public sector model involves the same kind of analytical simplification as the profit maximizing assumption of neoclassical microeconomic theory (e.g., see Mansfield, 1985). The assumption is useful even though we know there are inherent conflicts as well as harmonies of interest among and between stockholders, managers, and employees within firms. For example, in all large corporations, including regulated investor-owned utilities, there is a loss in owner control that allows managers opportunities to increase their own pecuniary and nonpecuniary sources of real income (i.e., money income, enjoyment, and job satisfaction) at the expense of the shareholder. In government-owned utilities the problem is thought to be even more severe — as owner control is effectively zero, save for political oversight — where the incentives for effective monitoring are attenuated seriously as compared to private ownership and control.

Market for Legislation. The market for legislation illustrates nicely the self-seeking nature of the political process. People who perceive they will be helped or harmed by a law offer payments to the entrepreneurs (i.e., the politicians) in the form of overt cash contributions for election campaigns, covert direct payments to the politician, promises to deliver votes, etc. to slant the laws favorably (Friedman, 1986). According to Buchanan and Tullock (1962), politicians try to maximize their own long-run monetary and nonmonetary advantages, subject primarily to the necessity of maintaining their elected office.

Implications. Given that the benefits of favorable legislation and regulation to the winners are a public good — i.e., nonexcludable, indivisible, zero marginal cost (once they are produced) goods — and that there are information costs, Friedman (1986, pp. 442-443) makes three predictions about the market for legislation:

(1) legislation will tend to benefit concentrated (high individual

benefits) interest groups at the expense of dispersed (low individual benefits) interest groups;

(2) although the system frequently generates inefficient outcomes, *(ceteris paribus)* more efficient outcomes are preferred to less efficient ones; and

(3) politicians prefer transfers for which the information cost calculations are as high (low) as possible for victims (beneficiaries), with low cost preferred to high cost if the cost to victims and beneficiaries is the same.

So while *(ceteris paribus)* transfers tend to go from dispersed to concentrated interests, and are made as efficiently as possible, there is a preference for disguising the costs imposed on victims of inefficient transfers.

Applicability to Public Utilities. Does this model apply to the investor-owned public utility companies that are regulated by commissions that are appointed rather than elected? All federal agencies, including the Federal Communications Commission (FCC) and Federal Energy Regulatory Commission (FERC), and about 80 percent of state utility regulatory commissions are appointed. However, while regulating commissions are *de jure* independent, *de facto* their appointments and funding are controlled by legislative and executive politicians and they are courted extensively, although often informally, by the regulatees. But these politicians in turn need the support of the regulatees (i.e., the general populace), including their trade associations and unions, for political support and later on for attractive employment.

The conclusion that concentrated interests are favored can be used to explain the contention that producers have tended to eventually dominate public utility commissions. A greater-than-competitive rate of return ruling for the company benefits the shareholders, management, workers, and others associated with the company, while harming the consumers. Since each diverse and diffuse consumer, especially the residential customer, is harmed to a slight degree, it was difficult historically to organize a sufficient number of them into a viable self-interest seeking group. Of course, it may pay large consumers and those organized within an industry to make the effort. However, during the 1970s there were movements, aided by federal and state government funding of consumer counsels, that arose to countervail this tendency and allow consumers to speak (or whisper) for themselves.

Secondly, while anomolies have occurred, e.g., the Federal Power

Commission's regulation of wellhead natural gas prices following the *Phillips* decision, which inefficiently transferred income from producers to consumers, most income transfers in the public utility sector have been relatively efficient. Thirdly, we see inefficient transfers in the process of revenue allocation and rate design, such as lifeline rates, which purport to promote conservation and to assist the poor. The victims of lifeline rates are "all" utility consumers who must bear the burden of inefficient rates for the benefit of "deserving" individual consumers.

Other Explanations

There are a number of other models designed to explain the development or evolution of regulation, including several variants of the capture theory (Peterson, 1985, p. 187). These models emphasize the potential for income redistribution through the regulatory process, and/or the simple contention that bureaucrats enjoy power and wish to extend their jurisdiction at every opportunity. We consider these more ad hoc explanations of regulation in this section. All of these theories are predicated on the basic premise of economic doctrine that all activities involve, in varying degrees to be sure, both costs and benefits. In addition, any changes that occur are likely to alter the relative costs and benefits to various individuals and groups.

Industry Capture Theory

Kolko (1965), following Marxian analysis, contends that the early demand for regulation of railroads came from the owners and was used to protect the capitalists from the workers and consumers. A second explanation is provided by Bernstein (1955) who, following the four stage regulatory commission scheme utilized in Chapter 21 of the present book, finds the captured commission protective and promotive of the industry in the last stages. The final version comes from Stigler (1971), who opines that since regulation is a vehicle for the redistribution of wealth, the commissioners confer benefits on some segment of society. He personally believes that the regulated industry is far more adept at garnering the goodies than residential, industrial, or commercial customers in this political game.

While these three variants emphasize an overt motivation, the covert is also at work on regulatory overseers. Scherer (1980, p. 482) puts it this way.

> . . . Even when legislators have only the public interest at heart in passing regulatory laws, those who are regulated end up as important beneficiaries by "capturing" the agency regulating them. This happens *inter alia* because the regulated firms use their political influence to have friendly regulators appointed, because the regulated enterprise has superior technical knowledge upon which regulatory agency staffs come to depend, and because regulators, like most people, seek identification and approval and are more likely to find them by cultivating a community of interest with the well-organized firms they regulate than with a remote and unresponsive public.

Few economists today would support strongly the simplistic and monolithic capture theory with the rich alternatives available. But commission capture no doubt has occurred in the past and will occur again in the future at least on a limited basis.

Modern Interest Group Theory

(This section relies on the succinct and cogent analysis of Peterson, 1985, pp. 187-193.) While Stigler (1971) emphasizes that industry interests would be more likely to be represented disproportionately in the regulatory process, his seminal idea has been generalized to show how the process responds to the pressures of several vested interests. Because regulatory decisions do affect significantly the distribution of wealth, groups have an incentive to try to receive favorable treatment. "This can be accomplished by means such as lobbying, providing data, hiring expert witnesses, and conducting publicity campaigns" (Peterson, 1985, p. 188). Because of modest budgets and limited staff help, regulators in part use the information that is supplied them in the long and expensive process of regulatory proceedings. The factors that determine how well a group will be represented are: (1) degree of self-interest, (2) size, (3) homogeneity, and (4) uncertainty. In general, groups with a large interest in an outcome, small in size, relatively homogeneous in position and objectives, and most certain of the outcome, are more likely to be better represented. An electric company phasing in a new $8 billion nuclear plant will find the hearings more important than the consumer who will only be affected to the extent of his or her own yearly electric bill. Clearly, the utility will rationally devote more time and resources to influence the decision than will an individual consumer. Thus, single-issue consumer groups (e.g., senior citizens, environmentalists) can have a big impact on decisions bearing on their interest. *Ceteris paribus,* a small concentrated group has lower

transactions costs of organization and maintenance and fewer free rider problems than a large unconcentrated group. Group homogeneity usually spells group solidarity as money and effort are not needed to develop acceptable compromises. Finally, the better one can predict an outcome, the easier it is to marshall support. If there is little or no information as to how say a proposed efficient (say Ramsey) pricing scheme will affect a group, generating interest in using resources to impact that decision will be difficult. Despite all of this, it is easy to see why Stigler's narrow capture theory was developed. Large utilities have the commonality and certainty to direct vast resources to important decisions. "As a result, the theory predicts that there will be a tendency for regulatory decisions to favor the existing firms in a regulated environment" (Peterson, 1985, p. 189).

Regulation as Taxation

According to Posner (1971), regulation is also sought as a clumsy vehicle for redistributing income and serves as an indirect form of taxation to achieve certain economic or social objectives. The regulating agency compels firms to provide a service that otherwise would not be provided, or to provide it at a below-cost subsidy level. Of course, other prices must be high enough to support the low-priced, unprofitable service. In this way, the government agency can require the regulated firm to overcharge (tax) those people the agency deems "less deserving" so that "more deserving" people can be undercharged (subsidized). The regulated firm is, in turn, granted a monopoly status, attained in some cases by preventing entry. Thus, through the covert regulatory process, redistributions can be attained that would be difficult or impossible through the overt and thoroughly examined budgets of the legislature.

For many years revenues on first class mail exceeded the losses on magazines and bulk mail. Until deregulation in 1978, the airlines overcharged on long-haul flights and undercharged on short-haul flights, thereby taxing the former to subsidize the latter. The railroads, telephone, electricity, radio and television, etc., also provide examples of taxation by regulation. Of course, the cost of this subsidization must ultimately be paid for by other customers, by shareholders, or by future generations, if the low prices generate excessive resource consumption or result in an outdated technology because entry is suppressed (Peterson, 1985, pp. 186-187).

Governmental Habit

According to Scherer (1980, p. 482), following Jonathan Hughes, regulation may be imposed through well established American tradition. It is "a governmental habit" of those who hold the political reins to attempt to express displeasure with the pricing and allocation of market processes, regardless of their actual efficacy, or to consider the service too important to be left the farrago of purported advantages of free and open competition. A related version may be called a *paternalistic* rationale by which omniscient regulators seek to give people what they "really" want, even though the expressed views are different from this (Breyer, 1982, p. 34). Trumped-up claims, rationalizations, and a modicum of logic were used to extend direct governmental intervention to the wellhead price of gas in 1954 (MacAvoy, 1970).

More alarming than when the government is the demander of regulation is when other (typically well-organized) vested interests seek the perceived beneficial effects of regulation. While destructive competition mentioned earlier is probably more of a public interest concept, it too has its private interest roots. For instance, the railroads working through the law-making ability of legislators sought regulation in the late 1800s to assuage the perceived and alleged problem of cutthroat competition. Similarly, legislation to restrict excessive new entry has its private benefits. One of these more narrowly diffused private interest theories is called the bureaucracy theory. Let us examine it very briefly.

Bureaucracy Theory

Crew and Kleindorfer (1986, pp. 107-108), in addition to examining lucidly the private interest theory of stability mentioned earlier, also discuss the contract or transaction cost theory of Goldberg that we discuss later, and the bureaucracy theory that we take up now. Niskanen (1971) argues that the regulatory process gets truncated to serve the desires of bureaucrats. Bureaucracy involves an organization (i.e. a bureau) whose budget is invariant to its output and whose decisionmakers are not compensated on the basis of profitability. As a result bureaucrats will strive to maximize their total budget.

Having exhausted our analyses of public and private interest theories, we now turn to an examination of a paradigm designed specifically to analyze alternative governance structures such as the regulatory compact governing public utilities — transaction cost economics.