Sarah Walsh
Director, Regulatory Affairs

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

Electric Regulatory Affairs Correspondence
Email: electricity.regulatory.affairs@fortisbc.com

FortisBC
16705 Fraser Highway
Surrey, B.C. V4N 0E8
Tel: (778) 578-3861
Cell: (604) 230-7874
Fax: (604) 576-7074
www.fortisbc.com

December 22, 2023

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

Attention: Patrick Wruck, Commission Secretary

Dear Patrick Wruck:

Re: FortisBC Inc. (FBC)

Application for Approval of Electric Vehicle (EV) Energy-Based Direct Current Fast Charging (DCFC) Service Rate Design and Rates

---

FBC attaches for review by the British Columbia Utilities Commission, FBC's Application for Approval of EV Energy-Based DCFC Service Rate Design and Rates.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC INC.

Original signed:

Sarah Walsh

Attachments

cc (email only): Registered Interveners in the FBC Annual Review for 2024 Rates and FBC EV DCFC Charging Service proceedings

FORTIS BC™

FORTISBC INC.

Application for Approval of Electric Vehicle Energy-Based Direct Current Fast Charging Service Rate Design and Rates

December 22, 2023

Table of Contents

Index of Tables

Index of Figures

List of Appendices

1. INTRODUCTION

FortisBC Inc. (FBC) files this application with the British Columbia Utilities Commission (BCUC) for approval of an energy-based rate design and rates and related approvals on a permanent basis for FBC's electric vehicle (EV) Direct Current Fast Charging (DCFC) station service (Application). FBC proposes an energy-based rate of $0.42 per kWh for charging service at both its 50 kW and 100 kW EV DCFC stations.

Currently, the rates at FBC's EV DCFC stations are approved under Rate Schedule (RS) 96 on a permanent basis pursuant to BCUC Order G-350-21, dated November 30, 2021. The current time-based charging rates are $0.26 per minute for the 50 kW stations and $0.54 per minute for the 100 kW stations.

In addition to an energy-based rate, FBC is proposing to include in RS 96 an idling charge (Idling Charge) of $0.40 per minute that begins 5 minutes after the end of a charging session.

The regulatory history leading to this Application is summarized below.

1.1 *BACKGROUND*

1.1.1 Regulatory Context

In December 2017, FBC applied to the BCUC for Approval of a Rate Design and Rates for EV DCFC Service and RS 96 (Original Application). By Order G-9-18 dated January 12, 2018, the BCUC approved a time-based rate of $9.00 per 30-minute period (or $0.30 per minute) for FBC-owned DCFC 50 kW stations as set out in RS 96, on an interim basis, effective January 12, 2018. The BCUC also directed FBC to separately track and account for all costs associated with FBC's EV DCFC stations and exclude all such costs from its utility rate base until the BCUC directed otherwise and adjourned the review of the Original Application until further notice.

Subsequently, by Order G-10-18 dated January 12, 2018, the BCUC established an inquiry into the regulation of EV charging service in British Columbia (EV Inquiry). Further to the EV Inquiry, the BCUC issued its Phase One Report and Phase Two Report on November 26, 2018 and June 24, 2019, respectively.

On June 22, 2020, by Order in Council (OIC) No. 339 (OIC 339/20), the Lieutenant Governor in Council amended the *Greenhouse Gas Reduction (Clean Energy) Regulation* (GGRR) by adding a new prescribed undertaking in section 5 for electric vehicle charging stations.

Following the conclusion of the EV Inquiry and the amendment of the GGRR, on September 30, 2020, FBC filed a revised and updated application (Revised Application) for its EV DCFC Service and RS 96.

On July 14, 2021, the BCUC issued Order G-215-21 concluding, among other things, that FBC's EV DCFC stations met the definition in section 5 of the GGRR to be considered prescribed

undertakings. Order G-215-21 also approved the inclusion of all assets associated with FBC's EV DCFC stations in rate base. Further, by its Decision and Order G-341-21 dated November 24, 2021, the BCUC approved the depreciation rate for FBC's EV DCFC stations and approved the inclusion of related revenues and expenses associated with the EV DCFC stations in FBC's regulated accounts, with variances between annual forecast and actual revenues/costs to be subject to flow-through treatment in FBC's revenue requirement. Order G-341-21 also approved the RS 96 rate design and directed FBC to submit a compliance filing clarifying the electricity input costs. Following FBC's compliance filing submitted on November 29, 2021, by Order G-350-21 dated November 30, 2021, the BCUC approved RS 96 on a permanent basis effective the date of the order, including the time-based rates of $0.26 per minute for FBC's owned 50 kW EV DCFC stations and $0.54 per minute for FBC's owned 100 kW EV DCFC stations.

As part of Order G-341-21, FBC was directed to file a detailed assessment of its EV DCFC service by the earliest of either December 31, 2022 or within six months of Measurement Canada's approval of DCFC energy-based metering for FBC.[1] The assessment report was filed on December 29, 2022 (RS 96 Assessment Report) as Measurement Canada had not yet approved energy-based metering in Canada at that time. The RS 96 Assessment Report provided information as of December 2022, and included:

- an overview of FBC's EV DCFC service;
- a market review of the EV charging service across Canada and the United States;
- an updated financial evaluation; and
- an updated forecast of FBC's EV DCFC stations at the current approved rates.

As part of the RS 96 Assessment Report, FBC committed to providing an updated assessment report or an application for energy-based rates by December 31, 2023. The BCUC accepted the RS 96 Assessment Report by Letter L-33-23 dated June 19, 2023, including FBC's proposal to apply an expected service life of 10 years to EV DCFC charging stations. A copy of the RS 96 Assessment Report is included as Appendix A to this Application.

On February 20, 2023, Measurement Canada announced a temporary dispensation program for commercial level 3+ EV charging devices that permits energy-based (i.e., kWh) meters to be used at level 3+ EV charging stations that are in-service prior to July 1, 2024 without verification and sealing, subject to the terms and conditions of the temporary dispensation program.[2] On December 18, 2023, FBC applied to Measurement Canada's temporary dispensation program for its existing EV DCFC charging stations and expects to receive approval early in 2024. FBC's

[1] Decision accompanying Order G-341-21, p. 29.

[2] To be legal for use in trade measurement, meters and other measuring devices must be subject to an approval process to confirm that they meet type specifications and must be issued a Notice of Approval before they are used in the marketplace. The only way to circumvent this requirement is to obtain a temporary dispensation for putting a meter into service without verification and sealing, under the terms and conditions stipulated by Measurement Canada. Information on Measurement Canada's temporary dispensation program can be found at: https://ised-isde.canada.ca/site/measurement-canada/en/consultations/temporary-dispensation-level-3-electric-vehicle-supply-equipment

ability to implement the energy-based rates applied for in this Application is contingent on FBC receiving approval for temporary dispensation from Measurement Canada.

1.1.2 EV DCFC Energy-Based Charging Rates

Prior to Measurement Canada's announcement of the temporary dispensation program on February 20, 2023, most public charging operators, including FBC, used time-based rates for EV DCFC charging service as there were no Measurement Canada approved meters that would enable metering based on kWh energy use. Use of metering devices not accredited by Measurement Canada for customer billing purposes would be in violation of section 9 of the *Electricity and Gas Inspection Act*, R.S.C., 1985, c. E-4. Therefore, the current time-based rates approved by Order G-350-21 remain in effect at FBC's DCFC stations.

In Decision and Order G-341-21 on FBC's Revised Application, the BCUC noted the desirability of energy-based rates and the challenges of time-based rates for EV DCFC service:[3]

> Participants acknowledge that energy-based rates for EV fast charging is desirable, which the Panel agrees with. Using time as the billing determinant of electricity sales may lead to varying amounts of energy being delivered to the customer depending on the circumstances. In the case of EV charging, the amount of electricity delivered in a charging session depends on several factors including the vehicle's charging capabilities, state-of-charge of the battery and temperature.
>
> Different EV models can consume significantly different amounts of electricity in a charging session of equal time. The Panel calculates, based on the evidence in the proceeding, that a 30-minute charge for an older Nissan Leaf at 50 kW maximum DC charging would deliver approximately 25 kWh of electricity. The same 30-minute charge for a 2016 Hyundai IONIQ at 100 kW maximum DC charging rate would deliver approximately 50 kWh of electricity. This comparison assumes that the two EVs are at a similar battery state-of-charge using a 100 kW charging station.

Further, the BCUC stated in its Decision and Order G-18-22 regarding the BC Hydro Public Electric Vehicle Fast Charging Service Rates Application that "time-based EV charging rates clearly amount to a discriminatory rate". However, the BCUC also concurred with the Panel's statement in the FBC EV DCFC Rates and Rate Design Decision and Order G-341-21 that at that time there was no alternative to time-based rates other than to provide the service for free, which would result in even greater discrimination as it would result in considerably more subsidization by other ratepayers.[4]

The temporary dispensation for commercial level 3+ EV charging devices made available by Measurement Canada on February 20, 2023, enables FBC to apply to the BCUC for the use of energy-based meters at its EV DCFC stations without verification and sealing, subject to the terms

[3] Decision and Order G-341-21, pp. 9-10.
[4] Decision and Order G-18-22, p. 9.

and conditions of the temporary dispensation program. Further, and in consideration of the strong desire by interveners for energy-based rates noted in Decision and Order G-341-21, the letters of comment received from the public in FBC's Revised Application, BC Hydro's Application for Public Electric Fast Charging Service Rates in 2021 and BC Hydro's current renewed application that was filed on July 28, 2023, as well as the stated view of the BCUC that time-based EV charging rates are discriminatory, FBC seeks approval to establish an energy-based rate design and rates for EV charging service at its EV DCFC stations.

1.2 *APPROVALS SOUGHT*

FBC seeks approval, pursuant to sections 59 to 61 of the *Utilities Commission Act* (UCA), of the following:

1. Amendments to RS 96 to implement an energy-based EV charging rate of $0.42 per kWh for service at FBC-owned DCFC 50 kW and 100 kW stations, which will replace the existing time-based rates.
2. Approval that the energy-based EV charging rate for RS 96 not be subject to general rate increases, unless otherwise directed by the BCUC.
3. An Idling Charge for RS 96 of $0.40 per minute that begins 5 minutes after the end of a charging session for service at FBC-owned DCFC 50 kW and 100 kW stations; and
4. The establishment of a new rate base deferral account, titled the RS 96 Energy-Based Rate Application Cost deferral account, to record the costs associated with the regulatory review of the Application, with the amortization period to be determined in a future rate-setting proceeding.

Due to the point-of-sale nature of the service, FBC is not requesting interim approval of its proposed rates.

A draft form of order sought is included in Appendix B-2, and a blacklined version of the RS 96 electric tariff with the proposed amendments is included in Appendix C of this Application.

As discussed further in Section 4 of the Application, there are a number of steps that need to take place prior to FBC being able to implement the proposed energy-based rates. These steps include receipt of approval from Measurement Canada of FBC's application for the temporary dispensation program, approval of this Application for energy-based rates from the BCUC, and once those approvals are obtained, FBC will require FLO Services Inc. (FLO) to implement changes to FBC's EV DCFC stations and network to support energy-based rates.[5] It is FBC's understanding that FLO requires at least 4 weeks for implementation. Given that the timing for each step is not within FBC's control, FBC proposes that the effective date of its energy-based rates be provided in a compliance filing with the BCUC for endorsement of the revised RS 96 tariff reflecting its energy-based rates, to be submitted at least 15 days prior to the effective date. Once

[5] Provider of maintenance and network management services to FBC's EV DCFC stations.

the proposed energy-based rates are implemented, FBC would no longer provide EV DCFC charging service at time-based rates.

Further, while FBC is also seeking approval of an Idling Charge of $0.40 per minute at its EV DCFC stations, FBC is not seeking an effective date for implementation of the Idling Charge at this time, as implementation is contingent on FLO performing an additional upgrade to its system to accommodate an Idling Charge, which is expected sometime in late 2024. As such, FBC proposes to file a further compliance filing with the revised RS 96 tariff reflecting the Idling Charge, for endorsement by the BCUC, at least 15 days prior to the Idling Charge becoming effective.

As noted above, FBC is seeking approval to establish a rate base deferral account, titled the RS 96 Energy-Based Rate Application Cost deferral account, to capture the costs associated with the regulatory process for this Application, including BCUC costs, Participant Cost Award funding, and external legal fees. FBC estimates the total regulatory process costs to be $150 thousand in 2024 based on the proposed regulatory timetable provided in Table 1-1 below. Actual costs will vary depending on how the Application progresses and will be confirmed after the regulatory process is complete. Please refer to Appendix D which addresses the considerations identified in the BCUC's Regulatory Account Filing Checklist as they pertain to the proposed new deferral account. FBC is not proposing an amortization period for the deferral account as part of this Application. FBC will propose an amortization period for this deferral account in a future rate-setting application, once the regulatory process for this Application is complete.

1.3 *PROPOSED REGULATORY PROCESS*

FBC proposes a written public hearing process with one round of information requests (IRs) as an appropriate and efficient review process for this Application. FBC's existing EV DCFC stations are prescribed undertakings under section 5 of the GGRR. Given that FBC is not proposing any new stations in this Application, FBC submits that the scope of review of this Application should be limited to the changes related to the proposed rate design and rates applied for to enable energy-based billing for FBC's EV DCFC station service. FBC notes that the general rate design of its EV DCFC service, i.e., full cost-of-service recovery on a levelized basis, and the regulatory treatment for the related revenue and costs, have already undergone a thorough public review process and were approved by the BCUC.[6] FBC's general rate design remains the same under the proposed rates and no changes are being sought as part of this Application.

Therefore, in consideration of the limited scope of this Application, FBC proposes that notice of the Application be provided electronically where possible to registered interveners in FBC's Annual Review for 2024 Rates proceeding (2024 Annual Review) and FBC's EV DCFC Original and Revised Applications. FBC will also post notice of the Application on social media platforms.

FBC proposes the following regulatory timetable for the review of the Application. A draft procedural order is also provided in Appendix B-1.

[6] Decision and Order G-341-21.

Table 1-1: Proposed Regulatory Timetable

Action	Date (2024)
FBC provides Notice by	Friday, January 26
Intervener Registration Deadline	Thursday, February 1
BCUC IR No. 1	Tuesday, February 6
Intervener IR No. 1	Tuesday, February 13
FBC Response to IR No. 1	Tuesday, March 5
FBC Written Final Argument	Thursday, March 21
Intervener Written Final Argument	Monday, April 8
FBC Written Reply Argument	Monday, April 22

1.4 *ORGANIZATION OF THE APPLICATION*

The remainder of this Application is organized as follows:

- Section 2 provides an overview of FBC's current EV DCFC services, including the utilization and financial performance to date, and a jurisdictional review of current time-based and energy-based rates;
- Section 3 sets out FBC's proposed energy-based rates for its EV DCFC stations, providing an updated forecast of utilization and cost of service of the DCFC stations as well as a rate impact assessment of the proposed rates;
- Section 4 discusses the implementation of the energy-based rates under RS 96 as well as reporting; and
- Section 5 provides the conclusion.

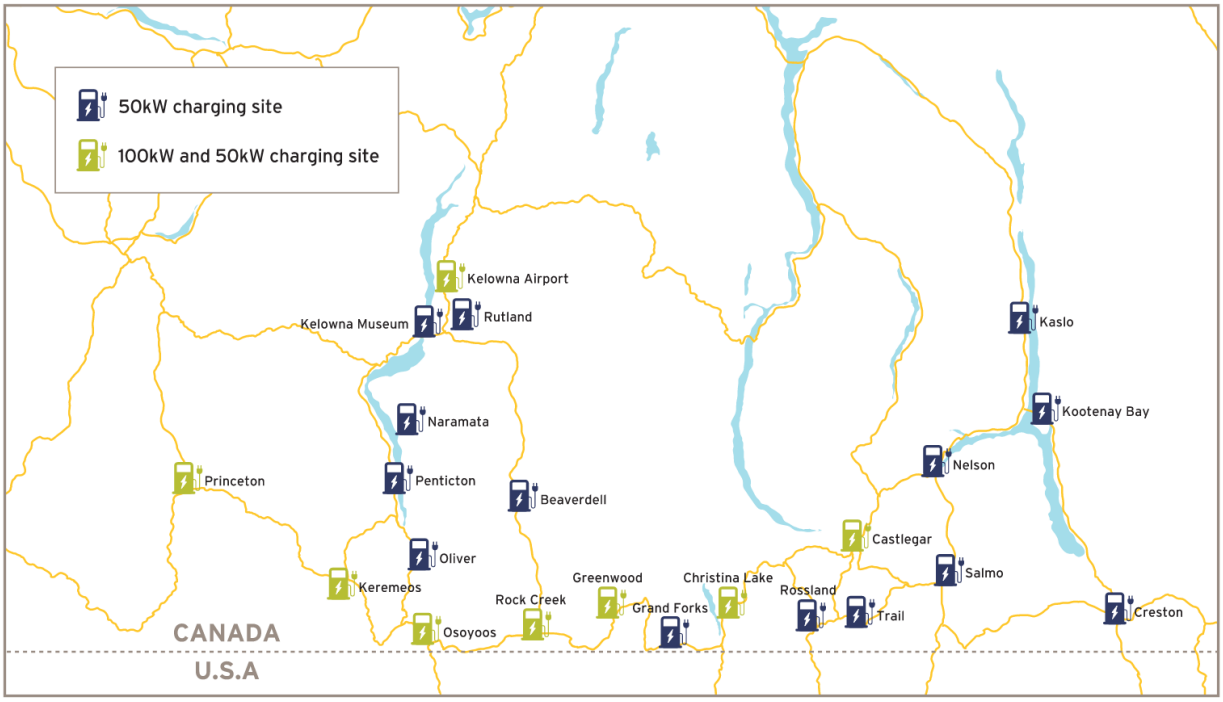
2. OVERVIEW OF FBC'S EV DCFC SERVICE

The following section provide details on FBC's existing EV DCFC stations, a description of notable developments, and a market rate comparison.

2.1 *FBC'S OWNED EV DCFC STATIONS*

FBC currently has 42 stations across 22 sites within the electric service territory, 34 of which are 50 kW, and eight of which are 100 kW. Figure 2-1 below provides the geographic location of FBC's EV DCFC network in BC and Table 2-1 provides a breakdown of FBC-owned EV DCFC stations between 50 kW and 100 kW.[7] The list of FBC-owned EV DCFC stations in Table 2-1 below includes the 50 kW stations in Naramata and Grand Forks installed in 2021, both of which were identified in FBC's Annual Review for 2023 Rates proceeding (2023 Annual Review) and were found by the BCUC to meet the requirements of the GGRR to be prescribed undertakings.[8] Table 2-1 below also includes the two new 100 kW stations at Keremeos and Princeton that were placed in-service at the end of 2022 (both were originally identified in the Revised Application).

Figure 2-1: FBC DCFC Network



[7] Does not include the 50 kW stations at New Denver and Nakusp which were identified in the Revised Application but were transferred to BC Hydro in November 2022, as approved by Order G-215-21.

[8] Decision and Order G-382-22, pp. 30-31.

Table 2-1: List of FBC's Current 50 kW and 100 kW EV DCFC Stations

Station Name	50 kW Station	100 kW Station
Beaverdell	2	-
Castlegar	1	1
Christina Lake	1	1
Creston	2	-
Grand Forks	2	-
Greenwood	1	1
Kaslo	1	-
Kelowna Airport	1	1
Kelowna Museum	2	-
Keremeos	1	1
Kootenay Bay	2	-
Naramata	2	-
Nelson	2	-
Oliver	2	-
Osoyoos	1	1
Penticton	2	-
Princeton	1	1
Rock Creek	1	1
Rossland	2	-
Rutland	2	-
Salmo	1	-
Trail	2	-
Total	**34**	**8**

2.2 *ASSESSMENT OF FBC'S RS 96 DCFC SERVICE TO-DATE*

2.2.1 Utilization of FBC's EV DCFC Stations

FBC's 50 kW DCFC stations were first placed into service in 2018 and the 100 kW DCFC stations were first placed into service in 2021. Table 2-2 below provides the total charging minutes as well as the utilization in percentage for the 50 kW and 100 kW stations (calculated based on the total number of charging minutes divided by the total number of minutes that FBC's EV DCFC stations are available to the public throughout the year, which is 24 hours for 365 days per year). As shown in Table 2-2 below, the utilization of FBC's 50 kW EV DCFC stations has been growing steadily since 2018 despite reduced utilization in 2020. FBC's 100 kW EV DCFC stations have seen strong growth in utilization since inception in 2021.

Table 2-2: Charging Minutes, Utilization % and Year-over-Year Growth Rates for 50 kW and 100 kW EV DCFC Stations (2018 Actual to 2022 Actual and 2023 Projected)

	50 kW			100 kW		
Year	Charging Minutes	Utilization %	Year-over-Year Growth Rates	Charging Minutes	Utilization %	Year-over-Year Growth Rates
2018	15,309	0.6%				
2019	94,386	1.6%	180%			
2020	110,504	0.8%	(54%)			
2021	231,942	1.3%	73%	16,539	0.5%	
2022	410,783	2.2%	67%	54,933	1.3%	149%
2023	531,009	3.0%	37%	127,815	3.0%	133%

The reduced utilization in 2020 for FBC's 50 kW stations was primarily due to the lack of EV deliveries to Canada, as well as the COVID-19 pandemic which led to travel restrictions beginning in the Fall of 2020. FBC believes the COVID-19 pandemic and the subsequent global supply chain issues limited the growth of EV adoption and utilization in 2020 and also impacted growth in 2021 and 2022.

FBC also notes the following factors that further limited the utilization and year-over-year growth for 2023:

1. The 50 kW stations in New Denver and Nakusup were transferred to BC Hydro in November 2022 as approved by Order G-215-21. As such, the total charging minutes in 2023 were reduced as a result of excluding these two stations.

2. The charging stations in Castlegar (50 kW and 100 kW) have been out of service since May 2023 due to the construction of the new building for the Castlegar Chamber of Commerce.[9] The stations recently re-opened in December 2023 with limited access only, but FBC expects the stations will return to full service in early 2024 after construction is complete.[10]

FBC expects the utilization of its EV DCFC stations will continue to grow. The CleanBC Roadmap to 2030[11] commits to amend the BC Zero-Emission Vehicles (ZEV) Act to reach ZEV sales of 26 percent by 2026, 90 percent by 2030, and 100 percent by 2035, which is accelerated from the current target in the ZEV Act of 10 percent by 2025, 30 percent by 2030, and 100 percent by 2040. Please refer to Section 3.2.1.2 of the Application for the updated assumptions and forecasts of EV sales in FBC's service area and growth in utilization for FBC-owned DCFC stations.

2.2.2 Financial Performance To-Date of FBC's RS 96 DCFC Service

Table 2-3 below summarizes the cost of service and revenue of FBC's RS 96 EV DCFC stations with actuals from 2018 to 2022 and projected results for 2023 (including actual results up to and

[9] https://www.castlegarnews.com/news/castlegar-chamber-receives-2-million-for-new-building-4759894.
[10] https://www.castlegarnews.com/local-news/castlegar-chamber-receives-200000-towards-new-building-6517708.
[11] https://news.gov.bc.ca/releases/2023EMLI0043-001640.

including November 2023).[12] The cost of service shown in Table 2-3 below also includes the updated 2023 earned return and income tax expense resulting from the BCUC's Decision and Order G-236-23 on Stage 1 of the Generic Cost of Capital (GCOC) proceeding (GCOC Decision), dated September 5, 2023.

To-date since 2018, FBC's RS 96 service has an accumulated deficiency of approximately $15 thousand. When compared to FBC's approved 2024 revenue requirement,[13] this accumulated deficiency is equivalent to a negligible rate impact of 0.003 percent.[14] FBC notes that as approved by Order G-215-21, the cost of service of FBC's EV DCFC stations is subjected to flow-through treatment, with the annual surplus or deficiency returned to or recovered from all customers.

Although there is a cumulative deficiency to-date and, therefore, a negligible rate impact to FBC's other customers, the current approved time-based rates were set on a 10-year levelized basis; as such, a deficiency in the early years is expected. Based on the original approved forecast in the Revised Application, FBC was not expecting its EV DCFC stations to be in a surplus position until 2025 or later. FBC also notes that, as part of the proposed energy-based rates discussed in Section 3 below, FBC is expecting to recover the full cost of service over the expected life of the EV DCFC Stations.

Table 2-3: Costs and Revenue of FBC's DCFC Service To-date (2018-2022 Actual and 2023 Projected; $000s)[15,16]

Line	Particulars	2018 Actual	2019 Actual	2020 Actual	2021 Actual	2022 Acutal	2023 Projected (Actuals up to Nov 2023)	Cumulative
1	Cost of Energy	2	7	7	13	136	190	
2	Less: Power Purchase Expense	(2)	(7)	(7)	(13)	-	-	
3	O&M	0	2	46	101	213	181	
4	Depreciation	-	60	197	307	456	551	
5	Amortization of CIAC	-	(35)	(70)	(150)	(190)	(236)	
6	Other Revenue - Carbon Credits	-	-	-	-	(744)	(544)	
7	Income Tax	(9)	(361)	(72)	(299)	(6)	51	
8	Earned Return	6	53	95	124	170	199	
9	Total Cost of Service ($000s)	(2)	(282)	196	83	35	393	**423**
10	RS 96 Revenue ($000s)	(4)	(24)	(28)	(60)	(116)	(176)	**(408)**
11	**(Surplus) / Deficiency**	**(6)**	**(306)**	**168**	**23**	**(81)**	**217**	**15**

[12] The 2023 Projected cost of service and revenue provided as part of FBC's 2024 Annual Review were based on actuals up to and including May 2023.

[13] FBC Annual Review for 2024 Rates Decision and Order G-340-23.

[14] $15 thousand / $457,247 thousand = 0.003 percent.

[15] The actuals for 2018 to 2022 are as presented in FBC's Annual Review for 2024 Rates Application (Table 3-1), including a $2 thousand increase to 2021 revenue as explained in the response to BCSEA IR1 13.3. The 2023 Projected numbers include actuals up to November 2023, while Table 3-1 of FBC's 2024 Annual Review included actuals up to May 2023.

[16] The cost of electricity from 2018 to 2021 embedded in the interim rate for the 50 kW stations as approved by Order G-9-18 was based on BC Hydro's RS 3808. As explained in FBC's 2022 Annual Review, these amounts are already embedded in FBC's power purchase expense as part of the revenue requirement for recovery from all customers,

2.3 *MARKET COMPARISON*

2.3.1 Time-Based Charging Rates

Table 2-4 below provides a comparison of current/proposed time-based charging rates from EV DCFC service providers in BC. While Table 2-4 is not an exhaustive list of all service providers of EV DCFC stations in BC, it includes service providers with publicly available information.

As shown in the table below, except for the free charging currently offered by the BC Ministry of Transportation and Infrastructure (MOTI),[17] FBC's current rate of $0.26 per minute for the 50 kW stations is comparable to the time-based rates of other providers of 50 kW stations in BC (or stations with output approximating 50 kW as well as higher capacity stations that are capable of providing 50 kW charging):

- BC Hydro's time-based rate for its 50 kW stations is $0.2142 per minute, approved on an interim basis by Order G-354-23;
- Municipally operated stations, including the City of North Vancouver,[18] City of Vancouver,[19] City of Chilliwack,[20] Metro Vancouver,[21] and Nanaimo Airport,[22] which range from $0.20 per minute to $0.30 per minute; and
- Electrify Canada's rate for its 1-90 kW charging ranges from $0.21 to $0.27 per minute.[23]

For the 100 kW stations, FBC's current rate of $0.54 per minute remains the highest when compared to other providers in BC with similar 100 kW service (or stations with output approximating 100 kW as well as higher capacity stations that are also capable of providing 100 kW charging):

- BC Hydro's time-based rate for its 100 kW stations is $0.2753 per minute, approved on an interim basis by Order G-354-23;
- Electrify Canada's rate is $0.21 to $0.27 per minute for up to 90 kW charging. Electrify Canada also offers 100 kW charging at its 11-350 kW stations at $0.44 per minute with membership ($0.57 per minute without membership);
- Shell's rate is $0.44 to $0.50 per minute for up to 180 kW charging;

and the interim RS 96 rates were not set to include recovery of these amounts; thus, the amounts are not included in the evaluation of RS 96.

[17] BC MOTI: https://www2.gov.bc.ca/gov/content/transportation/driving-and-cycling/traveller-information/ev-station.
[18] City of North Vancouver: https://www.cnv.org/Streets-Transportation/Traffic/Electric-Vehicles/Where-to-Charge-Your-Electric-Vehicle.
[19] City of Vancouver: https://vancouver.ca/streets-transportation/electric-vehicles.aspx.
[20] City of Chilliwack: https://www.chilliwack.com/main/page.cfm?id=2950.
[21] Metropolis at Metrotown: https://www.metropolisatmetrotown.com/services/.
[22] Nanaimo Airport: https://ycd.ca/parking/electric-vehicle-charging/.
[23] Electrify Canada: https://www.electrify-canada.ca/pricing/.

- Suncor's (Petro Canada) 100-350 kW stations are at $0.50 per minute;[24] and
- Parkland Fuels (Chevron) is currently offering free charging at its stations up to 150 kW.[25]

Table 2-4: DCFC Service Provider Time Based Rate Comparison in British Columbia and Canada

Service Provider	Rates ($CAD)			
	~25 kW	~50 kW	~100kW	Up to 350 kW
Available in British Columbia Only				
FBC	n/a	$0.26/min	$0.54/min	n/a
BC Hydro (Interim)	$0.1223/min	$0.2142/min	$0.2753/min	$0.4040/min (Up to 200 kW); $0.5050/min (Greater than 200 kW)
BC Ministry of Transportation	Free	Free	n/a	n/a
City of North Vancouver	n/a	$0.20/min	n/a	n/a
City of Vancouver	n/a	$0.26/min plus any applicable parking fee	n/a	n/a
City of Chilliwack	n/a	$0.30/min	n/a	n/a
Metropolis at Metrotown (Operated by Metro Vancouver)	n/a	$0.30/min (< 30 min); $0.50/min (> 30 min)	n/a	n/a
Nanaimo Airport	n/a	$0.22/min	n/a	n/a
Available Across Canada				
Parkland Fuels (Chevron)	n/a	n/a	Free Introductory Price	n/a
Suncor (Petro Canada)	n/a	n/a	$0.50/min (100-350 kW)	$0.50/min (100-350 kW)
Shell	n/a	n/a	$0.44/min to $0.55/min (up to 180 kW)	n/a
Electrify Canada	n/a	1-90 kW: • Pass+ ($4/month): $0.21/min • Pass (No Monthly Fee): $0.27/min	1-90 kW: • Pass+ ($4/month): $0.21/min • Pass (No Monthly Fee): $0.27/min	1-350 kW: • Pass+ ($4/month): $0.44/min • Pass (No Monthly Fee): $0.57/min

[24] Petro Canada: https://www.petro-canada.ca/en/personal/fuel/canadas-electric-highway
[25] Parkland (Chevron) free EV fast charging through the Journie Reward App: https://www.journie.ca/en-CA/FAQ

2.3.2 Energy-Based Charging Rates

Table 2-5 below provides a comparison of current or proposed energy-based charging rates from EV DCFC service providers in BC with information publicly available. Given Measurement Canada's temporary dispensation program was announced in early 2023, only a limited number of service providers are offering energy-based charging at the time of filing this Application. Both Electrify Canada and Parkland (Chevron) have announced conversions to energy-based charging in early 2024 but no rate information is publicly available at this time.

FBC's proposed energy-based rate of $0.42 per kWh for both 50 kW and 100 kW DCFC stations is higher than the energy-based rates of BC Hydro and Tesla, but is generally comparable to other service providers in BC such as Shell, Couche-Tard, and Charger Quest. Depending on the location, FBC's proposed energy-based rate is comparable to Tesla's offering of $0.42 per kWh.

Additionally, FBC notes that Tesla is currently offering a variety of rates based on region as well as utilization rates for each individual charging station. For example, Tesla superchargers in Vancouver and the Lower Mainland are based on Time of Use (TOU) and, depending on the utilization of the station, the charging rates can be as low as $0.13 per kWh in the evening hours. In contrast, Tesla currently does not offer TOU charging rates in FBC's service area, but their rates vary by region and range from $0.26 per kWh to $0.42 per kWh.

Excluding Tesla, all other service providers, including FBC, with energy-based rates have (or propose to have) the same $ per kWh rate for all power levels of their DCFC stations.

Table 2-5: DCFC Service Provider Energy-Based Rate Comparison in British Columbia

Service Provider	Rates ($CAD) ~25 kW	~50 kW	~100kW	Up to 350 kW
Available in British Columbia				
BC Hydro (Proposed)[26]	$0.34/kWh	$0.34/kWh	$0.34/kWh	$0.34/kWh (Up to 200 kW)
Tesla (Lower Mainland)[27]	n/a	$0.13 to $0.40/kWh (TOU rates in high traffic areas and/or evening)	$0.13 to $0.40/kWh (TOU rates in high traffic areas and/or evening)	$0.13 to $0.40/kWh (TOU rates in high traffic areas and/or evening)
Shell[28]	$0.50/kWh	$0.50/kWh	$0.50/kWh	$0.50/kWh
Couche Tard / Circle K[29]	n/a	$0.43/kWh	$0.43/kWh	$0.43/kWh
Available in FBC Service Area Only				
FBC (Proposed)	n/a	$0.42/kWh	$0.42/kWh	n/a
Charger Quest[30]	n/a	n/a	$0.40 to $0.45/kWh	n/a
Tesla (FBC Service Area)	n/a	$0.26 to $0.42/kWh	$0.26 to $0.42/kWh	$0.26 to $0.42/kWh

2.3.3 Idling Charge

With the adoption of energy-based rates, most EV DCFC service providers are also introducing Idling Charges to encourage customers to move-on once charged in order to discourage unnecessary congestion at charging stations. Table 2-6 below provides a comparison of current and proposed Idling Charges from providers of EV DCFC service in BC.

FBC has proposed an Idling Charge of $0.40 per minute which is comparable to most other service providers' Idling Charges, with the approach of including a grace period (i.e., if the vehicle is moved after 5 or 10 minutes after the end of charging) being generally consistent with other service providers, including Tesla.

FBC also notes that Tesla has implemented congestion fees at certain superchargers in the United States which replace the Idling Charges which are currently active in BC and shown in Table 2-6. The congestion charge is $1.00 per minute and applies if the supercharger is fully occupied and if the vehicle's battery level is at or above 90 percent. Tesla has not announced a congestion charge for Canada at the time of filing this Application.[31] FBC notes that its

[26] Order G-354-23 approved BC Hydro's time-based rates on an interim basis. BC Hydro's energy-based rates remain proposed pending the BCUC's decision on BC Hydro's Public Electric Vehicle Charging Service Rates application.
[27] Obtained from Tesla mobile app.
[28] Obtained from Shell Recharge App: https://shellrecharge.com/en-ca/solutions/ev-drivers.
[29] Obtained from Couche-Tard App: https://www.couche-tard.com/recharge?lang=en.
[30] Charger Quest: https://chargerquest.com/ev-drivers/.
[31] Tesla Idle Fee and Congestion Fee: https://www.tesla.com/support/charging/supercharger/fees.

understanding from FLO is that their system is not able to implement a similar congestion charge at this time.

Table 2-6: DCFC Service Provider Idling Charge Comparison in British Columbia

Service Provider	Idling Charge ($CAD)
FBC (Proposed)	$0.40 / minute (5 minutes after end of charge)
BC Hydro (Proposed)	$0.40 / minute (5 minutes after end of charge)
Tesla	$0.50 to 1.00 / minute (Waived if moved within 5 minutes. $0.50/min applied if station is 50% occupied or more; $1.00/min if station is 100% occupied)
Electric Canada	$0.40 / minute (10 minutes after end of charge)

2.3.4 EV DCFC Charging Rates in United States

Table 2-7 below provides a comparison of major service providers and relevant utilities in the United States. The majority of states permit energy-based billing. FBC also notes that a number of service providers have TOU rates for their EV charging stations. FBC's proposed energy-based rates as well as other EV DCFC service providers in BC, including BC Hydro, Tesla, Electrify Canada, are generally lower than the rates of providers in the United States, after consideration of the exchange rate.

Table 2-7: DCFC Service Provider Rate Comparisons across the United States

Service Provider	Rates ($USD)			Power Level (kW)
Electrify America[32]	Time-based (17 States)	Pass + ($4/month) 1-90 kW: $0.12/min 1-350 kW: $0.44/min	Pass (No monthly fee) 1-90 kW: $0.16/min 1-350 kW: $0.51/min	350
	Energy-based (30 States)	Pass + ($4/month) $0.46 - $0.56/kWh	Pass (No monthly fee) $0.51 - $0.62/kWh	
Tesla	11 a.m. to 9 p.m.: $0.48/kWh Idle Charge: $0.50-$1.00/min		9 p.m. to 11 a.m.: $0.24/kWh Idle Charge: $0.50-$1.00/min	250

[32] Electrify America: https://www.electrifyamerica.com/pricing/.

Service Provider	Rates ($USD)				Power Level (kW)
Evgo[33]	Evgo PlusMax ($12.99/month) $0.21-$0.30/kWh in CA ($0.20-$0.26/min outside of CA)	Evgo Plus ($6.99/month) $0.25-$0.35/kWh in CA ($0.22-$0.28/min outside of CA)	Evgo Basic ($0.99/month) $0.32-$0.47/kWh in CA ($0.27-$0.32/min outside of CA)	Pay as You Go (Free) $0.32-$0.47/kWh in CA ($0.29-$0.35/min outside of CA)	50
Blink	Blink Members $6.99/charge or $0.59/kWh		Blink Guests $9.99 per charge or $0.69 per kWh		50
Puget Sound Energy[34]	$0.42/kWh $0.40/min idle charge (10 min grace period)				50
Seattle City Light[35]	Monday-Saturday 7 a.m. to 7 p.m.: $0.34/kWh 7 p.m. to 7 a.m.: $0.21/kWh		Sunday $0.21/kWh		62.5

2.4 SUMMARY OF FBC'S EV DCFC SERVICE

FBC's DCFC station utilization has continued growing since the stations were placed in service in 2018, despite a reduction in 2020 due to travel restrictions resulting from the COVID-19 pandemic and a lack of EV deliveries to Canada. Financially, FBC's EV DCFC service currently has a small accumulated deficiency of approximately $15 thousand with a negligible rate impact to FBC's other customers. Given the current time-based rates were set on a 10-year levelized basis, an accumulated deficiency in the early years of the EV DCFC service is expected. FBC notes that under-recovery in the early years is a common approach used by other service providers through providing free charging as an introductory or co-branding offer.[36]

With regard to the market comparison, FBC's current time-based rate for its 50 kW stations is comparable to most service providers across Canada (including higher capacity stations that are also capable of providing 50 kW charging). However, the market comparison shows that FBC's time-based rate for its 100 kW stations remain the highest compared to all other providers in British Columba.

Currently, only a limited number of service providers in BC have implemented energy-based charging rates and FBC's proposed energy-based rate of $0.42 per kWh is generally comparable

[33] EVgo Fast Charging Pricing: https://www.evgo.com/pricing/.
[34] Puget Sound Energy Up & Go FAQs: PSE | Charging with Up & Go Electric.
[35] Seattle City Light EV FAQs: https://seattle.gov/documents/Departments/CityLight/EV_FAQ.pdf.
[36] For example, Petro-Canada was offering $100 of free charging when paired with an RBC credit card; Parkland (Chevron) continues to be free as an introductory offer through the Journie App.

with other service providers that either have already implemented energy-based rates or are awaiting approval. With the exception of Tesla, which has implemented TOU and location pricing ranging from $0.13 per kWh to $0.42 per kWh, the energy-based rates for other service providers range from $0.34 per kWh for BC Hydro to $0.50 per kWh for Shell. FBC notes that both Parkland (Chevron) and Electrify Canada have announced energy-based charging to be implemented in January 2024 with no rates publicly available yet.

Only Tesla and Electrify Canada have implemented Idling Charges at present, with Tesla's Idling Charge being set between $0.50 to $1.00 per minute depending on location and time of use, while Electrify Canada's Idling Charge is set at $0.40 per minute. BC Hydro has also applied to the BCUC for approval of an extended stay charge of $0.40 per minute.

FBC discusses its proposed energy-based rates and rate design in the following sections.

3. ENERGY-BASED RATE AND RATE DESIGN

3.1 *INTRODUCTION*

FBC is proposing to amend RS 96 for EV DCFC Service to energy-based rates from the existing time-based rates. The proposed energy-based rate will be $0.42 per kWh for both FBC-owned 50 kW and 100 kW DCFC stations. FBC's currently approved[37] EV DCFC station rates are time-based rates at $0.26 per minute for the 50 kW stations and $0.54 per minute for the 100 kW stations.

As discussed in Section 1.1, the BCUC has previously stated that using time as the billing determinant for electricity sales generally does not reflect the actual amount of energy being delivered to a customer, stating in Decision and Order G-18-22 (page 9) that "time-based EV charging rates clearly amount to a discriminatory rate".

Based on the comments from the BCUC and interveners, as well as the letters of comments in FBC's Revised Application, BC Hydro's Application for Public Electric Fast Charging Service Rates in 2021 and BC Hydro's current renewed application that was filed on July 28, 2023, FBC considers that there is general support for energy-based metering for EV DCFC stations. Further, in recognition of Measurement Canada's announcement of the temporary dispensation program for commercial level 3+ EV charging devices which occurred on February 20, 2023, FBC considers it is reasonable to establish an energy-based rate for its EV DCFC service.

FBC applied to Measurement Canada's temporary dispensation program on December 18, 2023 for all of its existing EV DCFC charging stations and expects to receive approval in early 2024. Once approved, the temporary dispensation program will enable energy-based (i.e., kWh) metering for stations that were in-service prior to July 1, 2024 without verification and sealing, subject to the terms and conditions of the temporary dispensation program.

Consistent with the existing time-based rates, the proposed energy-based rate continues to be based on the forecast cost-of-service of the EV DCFC stations (including actual costs and revenue from 2018 to 2023) and projected growth in sales of EVs in FBC's service area. Furthermore, using the same approved approach for its existing time-based rates, the proposed energy-based rate is set on a 10-year levelized basis to fully recover the forecast cost of service from 2024 to 2033 (including any accumulated surplus or deficiency from prior years from 2018 to 2023).

The following section discusses the key inputs and assumptions of the cost-of-service analysis for FBC's EV DCFC service, including an updated forecast of the EV sales growth rate in FBC's service area over the evaluation period from 2024 to 2033 and an assessment of the potential rate impact to FBC's other customers. This section also includes FBC's proposed Idling Charge to prevent unnecessary congestion at its stations.

[37] Order G-350-21.

3.2 *UPDATED RS 96 COST OF SERVICE ANALYSIS WITH NEW FORECASTS*

3.2.1 Key Inputs and Assumptions

The following subsections discuss the individual components of the cost of service of FBC's RS 96 DCFC service, including updated assumptions for forecasting the cost of service over the remaining years of the evaluation period, which will be the basis for the proposed 10-year levelized energy-based rate of $0.42 per kWh.

The financial schedules as well as the live excel models for the cost-of-service analysis of the 50 kW and 100 kW stations are provided in Appendices E-1 and E-2, respectively. Please also refer to Appendix E-3 for the financial schedules for the overall EV DCFC service (i.e., 50 kW and 100 kW combined) and the calculation of the common energy-based rate of $0.42 per kWh.

3.2.1.1 Levelization Period

FBC's RS 96 EV charging rates were originally set on a levelized-cost basis from 2018 to 2030 for the 50 kW stations (13 years) and from 2021 to 2030 for the 100 kW stations (10 years). The levelized costs were based on the original planned installation schedule of all stations to be complete in 2021 with an expected service life of 10 years for the DCFC stations.

FBC is proposing to reset the rates for its EV DCFC service starting in 2024 over a 10-year levelization period (i.e., 2024 to 2033). For clarity, the cost-of-service analysis over the 10-year period includes the actual accumulated deficiency of approximately $15 thousand discussed in Section 2.2 as a cost in 2024. As such, the proposed energy-based rate is designed to fully recover the cost-of-service of FBC's EV DCFC service since inception to 2033, including past surpluses/deficiencies from 2018 to 2023, and the forecast cost-of-service from 2024 to 2033.

3.2.1.2 Station Utilization Forecast

The utilization of FBC's EV DCFC stations is the number of minutes per year that EV customers will use the stations to charge their vehicles. Consistent with the approach used in FBC's Revised Application that set the existing approved time-based rates, the forecast of station utilization will be based on the historical charging minutes in each station escalated by the growth rates of EV sales from 2024 to 2033.

In order to develop the growth rates for FBC's owned EV DCFC stations, FBC engaged Dunsky Energy + Climate Advisors (Dunsky) to provide a forecast of light duty EV sales in the FBC service area from 2023 to 2040 based on three growth scenarios, i.e., low growth, medium growth, and high growth, depending on various factors such as public charging infrastructure, existing building charging infrastructure retrofits, availability of vehicle incentives, government policy, and local availability of EV stock. Table 3-1 below summarizes Dunsky's three growth scenarios for light duty EVs, and Table 3-2 provides the growth rates for the three scenarios. The Dunsky analysis is included as Appendix F.

Table 3-1: Dunsky's Three Growth Scenarios for EV Sales in FBC Service Area

Parameter	Scenario 1: Low Growth	Scenario 2: Medium Growth	Scenario 3: High Growth
Public Charging Infrastructure Expansion	Limited (Planned Investments + Current Growth Trajectory)	Moderate (Planned Investments + Accelerated Growth Trajectory)	Significant (Does not Constrain Adoption)
Vehicle Incentives (Provincial and Federal)	Current Incentives: BEVs: $4,000 PHEVs: $2,000 (Ramped down + Phased-out by 2026)	Current Incentives, Extended: BEVs: $4,000 PHEVs: $2,000 (Ramped down + Phased-out by 2030)	Expanded Incentives: BEVs: $8,000 PHEVs: $4,000 (Ramped down + Phased-out by 2035)
Zero-emission Vehicle (ZEV) Mandates	None	100% by 2040 In alignment with current provincial regulations (ZEV Act)	100% by 2035 In alignment with proposed provincial regulation (CleanBC Roadmap to 2030)
Local Availability	Limited 50% of dealerships have EVs for sale by 2040	Moderate 100% of dealerships have EVs for sale by 2040	Significant 100% of dealerships have EVs for sale by 2035

Table 3-2: Growth Rates for Dunsky's Three Growth Scenarios for EV Sales in FBC Service Area

	Growth Scenario		
Year	Low	Medium	High
2024	44%	47%	54%
2025	36%	39%	45%
2026	32%	36%	42%
2027	32%	38%	43%
2028	31%	37%	38%
2029	30%	35%	33%
2030	30%	32%	30%
2031	29%	28%	26%
2032	26%	25%	23%
2033	23%	22%	20%
2034	21%	19%	18%
2035	18%	17%	17%
2036	16%	15%	15%
2037	14%	14%	13%
2038	13%	13%	12%
2039	12%	12%	11%
2040	11%	12%	10%

In setting the energy-based rates from 2024 to 2033 as part of this Application, FBC applied the medium scenario growth rates from Dunsky's analysis to all of FBC's EV DCFC stations with a

cap of maximum utilization at 54 percent at each station. The maximum utilization of 54 percent is based on FBC's estimates of historical utilization on an hourly basis at its own EV DCFC stations, which showed approximately 90 percent of the public EV charging activities occurred between 8 am and 7 pm each day. FBC notes that it used the low and high growth scenarios from the Dunsky analysis as part of the rate impact assessment in Section 3.3.3 below.

3.2.1.3 Electric Consumption and Cost of Electricity Forecast

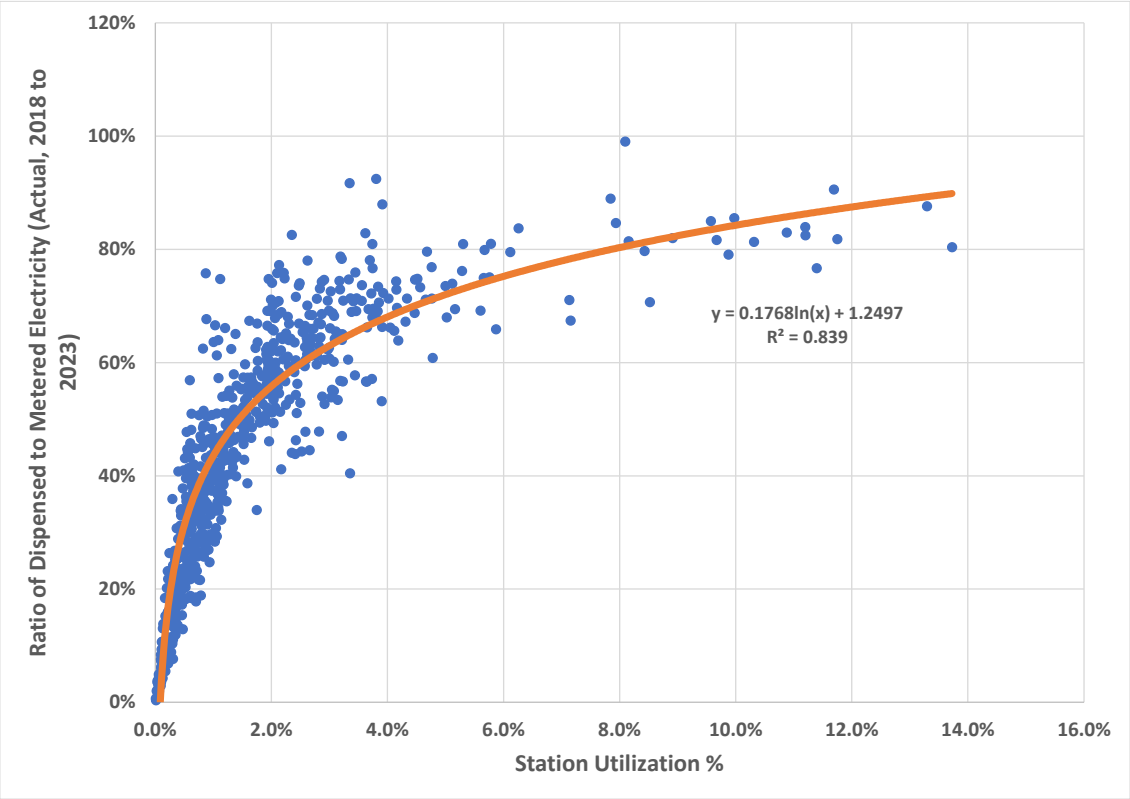
The dispensed electricity is the amount of electricity taken by the EV during charging and will be used to determine the total cost of each EV charging event by the customer based on the proposed energy-based $ per kWh rate. For the purpose of forecasting the dispensed electricity from 2024 to 2033 over the 10-year levelized period, FBC assumed there is a direct correlation between the number of charging minutes and dispensed electricity in kWh. Thus, based on the same approach for forecasting station utilization described in Section 3.2.1.2 above, FBC applied the same annual growth rates of forecast EV sales in FBC's service area from Table 3-2 above under the medium growth scenario from the Dunsky analysis to the historical dispensed electricity in kWh recorded in 2023 as the base year. The forecast dispensed electricity is used for the revenue forecast from 2024 to 2033 as well as to estimate the metered electricity as discussed below.

The metered electricity is the total amount of electricity consumed by the EV DCFC station, which includes the amount of electricity dispensed into the EV during charging as well as all other ancillary electric consumption at the station such as electronic equipment, fans, display screen, telecommunication, etc. It also includes the amount of electric consumption during stand-by (i.e., when there is no EV charging event occurring). All of the ancillary electric consumption is based on the commercial electric service of RS 21 and forms part of the cost of electricity calculation included in RS 96 for the proposed energy-based rate, consistent with the existing approved time-based rate.

For the purpose of forecasting the cost of electricity at FBC's stations, which is based on the metered electricity, FBC used the forecast of dispensed electricity as described above and the regression of the actual ratio of monthly dispensed electricity over metered electricity vs. the actual monthly station utilization (i.e., total charging minutes over the total number of minutes available) of each FBC owned DCFC station from 2018 to 2023, as shown in Figure 3-1 below, to forecast the metered electricity. As shown in Figure 3-1, as the utilization of the station increases, the ratio of dispensed electricity over metered electricity increases. This is expected, as more EV charging will increase the dispensed electricity, which will reduce the amount of standby electricity while the consumption by the ancillary electronic or telecommunication equipment should remain relatively constant. FBC notes this observation is also consistent with BC Hydro's experience with their EV DCFC stations.[38]

[38] BC Hydro's 2023 Public Electric Vehicle Charging Service Rates Application, Exhibit B-5, BCUC IR 1.26.1: https://docs.bcuc.com/documents/proceedings/2023/doc_74838_b-5-bch-bcuc-ir1-responses-public.pdf

Figure 3-1: Ratio of Dispensed Electricity over Metered Electricity vs. Station Utilization



As part of the forecast cost of electricity under FBC's commercial service RS 21, FBC included the approved 2024 rate increase of 6.74 percent[39] and assumed a further annual rate increase of 4 percent starting from 2025 onward.

FBC also notes that six of its 50 kW stations take electricity service from third-party utilities (i.e., two from Nelson Hydro, two from the City of Penticton, and two from the City of Grand Forks). The cost of third-party electricity use is included in the O&M costs related to FBC's DCFC service, as discussed in Section 3.2.1.5 below, and is not included as part of FBC's cost of electricity.

3.2.1.4 Capital Expenditures and Contributions

FBC's total capital expenditures (before contributions from third parties) for the 42 EV charging stations (as listed in Table 2-1 in Section 2.1 above) are now estimated to be approximately $7.361 million. This includes approximately $6.281 million of actual capital expenditures from 2018 to 2022, approximately $0.580 million of projected capital in 2023, and approximately $0.500 million of forecast capital in 2024. Table 3-3 below provides the actual/forecast capital expenditures from 2018 to 2024.

[39] Approved pursuant to the FBC Annual Review for 2024 Rates Decision and Order G-340-23.

Table 3-3: Actual/Forecast Capital Expenditures (2018-2024)

Capital Expenditures	2018	2019	2020	2021	2022	2023	2024	Total
Actual (2018-2022), 2023 Projected, and 2024 Forecast ($ million)	0.599	1.644	1.164	1.489	1.385	0.580	0.500	7.361

As discussed in the 2024 Annual Review[40], the 2023 Projected capital expenditures are primarily due to unbilled charges of approximately $0.363 million from 2022 construction activities related to the planned DCFC stations in Keremeos and Princeton, which were originally identified in the Revised Application approved by Order G-215-21.[41] The construction was completed in 2022 but FBC did not receive all invoices for the work until 2023.

The remaining capital expenditures in 2023 Projected and the 2024 Forecast capital expenditures are related to the accessibility improvement work at FBC's existing EV DCFC sites which was started in 2023. As identified in the RS 96 Assessment Report, FBC worked with a focus group on accessibility improvements to its existing EV DCFC sites. As a result, FBC is modifying its existing sites for accessibility improvements in 2023 and 2024, including new or additional lighting (as the stations are available for use 24 hours a day) and paving for wheelchair access to the chargers. Currently, FBC has completed improvements at two sites with the remaining sites anticipated to be completed in 2024. Figure 3-2 below provides an illustration of FBC's Naramata EV DCFC site which contains these accessibility considerations.

Figure 3-2: FBC's Naramata DCFC Site with Accessibility Considerations

Currently, FBC is not forecasting construction of any new additional stations between 2024 and 2033, as such FBC did not include capital expenditures or new revenue for new stations in the forecast cost-of-service analysis to 2033. However, FBC will continue to monitor the station utilization and customer demand to determine if additional stations are warranted. As directed by Order G-341-21, if FBC introduces additional EV charging stations that were not originally

[40] Exhibit B-2, Section 7.2.2.1.
[41] FBC Revised Application, Table 2-2, pp. 10-11.

identified in the Revised Application, FBC will include the evaluation of these additional stations as part of its Annual Review or revenue requirement proceedings.

With regard to contributions that were available from a number of partners including Natural Resources Canada (NRCan) and the Provincial Government of BC, FBC has received total contributions of $3.123 million for its EV DCFC stations. These contributions are included as part of the cost-of-service analysis for FBC's 50 kW and 100 kW stations.

As part of the forecast cost of service from 2024 to 2033, FBC has included an estimate of $25 thousand in 2023 dollars plus annual inflation for future sustainment capital expenditures within the evaluation period, as minor repairs or parts replacement such as power electronics or charging connectors/cables are expected to occur from time to time. Furthermore, given the expected 10-year service life of the EV chargers, FBC included future like-for-like replacement costs at the end of the 10-year expected service life of each charger, estimated based on the costs of the EV chargers in today's dollars escalated annually by the inflation assumption discussed in Section 3.2.1.6.

3.2.1.5 Operating and Maintenance Costs

Table 3-4 below provides the actual O&M expenses from 2018 to 2022 and projected O&M in 2023.

Table 3-4: Actual/Projected O&M Expense (2018-2023)

O&M	2018	2019	2020	2021	2022	2023
Actual/Projected O&M						
50 kW ($000s)	0.5	1.8	39.5	67.3	151.1	120.6
100 kW ($000s)	-	-	-	15.1	33.6	28.4
Subtotal	**$ 0.5**	**$ 1.8**	**$ 39.5**	**$ 82.4**	**$ 184.7**	**$ 149.0**
Third-Party Utility - 50 kW ($000s)	-	-	6.4	18.1	28.2	32.4
Total O&M	**$ 0.5**	**$ 1.8**	**$ 45.9**	**$ 100.5**	**$ 212.9**	**$ 181.4**

During the period from 2018 to 2022, FBC was still installing 50 kW and 100 kW EV DCFC stations. As such, the O&M expenses have been trending upwards as FBC was working on developing the necessary O&M expenses for all completed and in-service stations, including repairs and maintenance, contractor inspection and cleaning, network management fees, and FBC internal labour to ensure a reliable EV DCFC service.

As discussed in the 2024 Annual Review,[42] the 2023 Projected O&M expense for the EV DCFC service has been reduced primarily due to reduced FBC labour costs as a result of a vacancy as well as lower inspection fees, as the new inspection contract did not commence until mid-2023. These decreases were partially offset by an increase in repairs and maintenance costs for stations

[42] Exhibit B-2, Section 6.3.4.

where the warranty periods have expired, as well as the increase in third-party utilities costs for stations located in Grand Forks, Nelson, and Penticton.

Table 3-5 below provides the 2024 O&M forecast for FBC's EV DCFC stations. The increase from 2023 Projected is primarily due to increased inspection fees due to the full year impact of the inspection contract and higher FBC labour costs as FBC is expecting to fill the vacancy in 2024. Other increases include higher FLO Global Management Service fees for network management as well as an increase in third-party utilities costs resulting from increased utilization of the stations and rate increases from third-party utilities. FBC notes that the direct O&M forecast remains consistent with the forecast included in the 2024 Annual Review. The forecast third-party electricity costs, however, were updated based on the forecast growth of these stations discussed in Section 3.2.1.2.

Table 3-5: 2024 Forecast of FBC's O&M Expense for EV DCFC Service

O&M		2024 Forecast
Network Management		50.0
Repairs and Maintenance		50.0
Inspection Fees		96.0
FBC Labour Costs		70.0
Subtotal Direct O&M ($000s)	**$**	**266.0**
Third-Party Utilities (50 kW)		40.4
Total ($000s)	**$**	**306.4**
Allocation		
50 kW (34 Stations) + Third-Party Utilities		255.7
100 kW (8 Stations)		50.7
Total ($000s)	**$**	**306.4**

FBC expects the direct O&M costs (i.e., network management, repair & maintenance, inspection fees, and FBC internal labour) will become more stable (except for annual inflation) as all planned stations have been completed and are in-service. As such, for the purpose of forecasting direct O&M expense from 2025 to 2033, FBC used the 2024 direct O&M forecast plus annual inflation of two percent. For discussion of the inflation assumption, please refer to Section 3.2.1.6.

For the 2024 forecast of electricity costs from third-party utilities, FBC used the actual 2023 effective rates plus the proposed 2024 rate increases from these individual utilities (i.e., $ per total kWh). For 2025 to 2033, FBC applied an annual 4 percent rate increase from these utilities, multiplied by the forecast of meter electricity consumption for these stations, as discussed in Section 3.2.1.3. The assumption of a 4 percent annual rate increase is consistent with the annual rate increase FBC applied to RS 21 for the cost of electricity of the EV DCFC stations located within FBC's service area. FBC believes this is an appropriate assumption as these third-party

utilities are FBC's wholesale customers and thus would be subject to the same rate increase as RS 21.

3.2.1.6 Inflation Rates

Inflation rates are used for forecasting O&M, electricity rates from third-party utilities (as discussed in Section 3.2.1.5), and future replacement costs of chargers (as discussed in Section 3.2.1.4). For 2018 to 2024, FBC used the same inflation (CPI) information provided in FBC's annual reviews over the same period. For 2025 and beyond, FBC used an annual inflation of 2 percent for its analysis. The long-term inflation of 2 percent (i.e., 2025 and beyond) is in line with the Bank of Canada inflation target of 2 percent as well as their forecast of returning to the target by 2025.[43]

3.2.1.7 Depreciation Rate

Pursuant to Order G-341-21, FBC was approved to use a straight-line 10 percent (10-year) depreciation rate for its EV DCFC stations. The expected service life of 10 years (for both 50 kW and 100 kW stations) remains reasonable and continues to be supported by FBC's EV charger vendor (i.e., AddEnergie, operator of the FLO EV charging network) which has EV charging stations installed since 2015. The 10-year expected service life also remains consistent with a number of jurisdictions, as follows:

- Pacific Gas and Electric Company (PG&E) used a 10-year depreciable life for its electric charging stations application,[44] which was approved by the California Public Utilities Commission by Decision 22-12-054;
- The Vancouver EV Ecosystem Strategy assumes a 10-year linear depreciation of EV fast charging station assets; [45]
- The Public Utilities Commission of the State of Colorado approved the Public Service Company of Colorado by Decision C21-0017 to use a 10-year depreciable life for DCFCs;[46]
- The Southwestern Public Service Company provided evidence supporting its Transportation Electrification Plan which cited two cases where a 10 percent depreciation rate was accepted by state regulators;[47]
- The Oregon Public Utilities Commission approved multiple EV charging pilot programs proposed by Portland General Electric that specified a 10-year useful life for utility owned EV chargers by Order 18-054;[48] and

[43] Bank of Canada Monetary Policy Report – October 2023: https://www.bankofcanada.ca/2023/10/mpr-2023-10-25/
[44] https://docs.cpuc.ca.gov/PublishedDocs/SupDoc/A2110010/4240/417398449.pdf; Table 7-5.
[45] https://vancouver.ca/files/cov/EV-Ecosystem-Strategy.pdf; page 38.
[46] https://www.xcelenergy.com/staticfiles/xe-responsive/Company/Rates%20&%20Regulations/Regulatory%20Filings/final-decision-TEP.pdf; page 59.
[47] https://www.xcelenergy.com/staticfiles/xe-responsive/Company/Rates%20&%20Regulations/Regulatory%20Filings/New%20Mexico/NM-TEP-2020-Arthur-P-Freitas.pdf; page 9.
[48] https://apps.puc.state.or.us/orders/2018ords/18-054.pdf; Appendix A, page 4, item 11.

- The Government of New Zealand issued Determination DEP100 setting the useful life of Rapid DC car charging stations at 10 years.[49]

FBC notes that in BC Hydro's Public Electric Vehicle Fast Charging Service Rate Application, dated July 28, 2023, a 7-year amortization period was used for charging station capital costs based on an average between 5 and 10 years, as recommended by BC Hydro's consultant Concentric and approved by Order G-91-23.[50] Despite BC Hydro's use of a 7-year amortization period for its charging station assets, FBC continues to believe that an expected service life of 10 years for its DCFC stations is reasonable and appropriate. First, FBC has been exclusively using one manufacturer (AddEnergie), who continues to support the use of a 10-year expected service life for their EV charging stations, whereas, to FBC's knowledge, BC Hydro has used a mix of different manufacturers of EV charging stations. Second, the use of a 10-year depreciation rate is consistent with various utilities in other jurisdictions as highlighted above. Finally, FBC's oldest stations were first installed and placed in-service in 2018 and will therefore be reaching six years in 2024. FBC has not experienced any major failures to its stations that required a complete replacement and there has been no sign that any of its oldest stations will require replacement within the next year (i.e., when reaching 7 years old). As such, FBC continues to expect its DCFC stations will reach the expected service life of 10 years and does not propose a new depreciation rate, nor does FBC have information to support an expected service life other than 10 years.

3.2.1.8 Carbon Credits

Pursuant to Order G-341-21, the monetized value of the carbon credits related to EV stations that FBC earns under the BC-LCFS is recorded in Other Revenue and is subject to flow-through treatment (i.e., variances between forecast and actual amounts are captured in the Flow-through deferral account and are recovered from/returned to customers through rates in subsequent years). Also approved as part of the rates and rate design of the existing time-based rates under Order G-341-21, an estimate of $200 per credit was included for FBC's 50 kW and 100 kW stations which was close to the average market price in 2019 and 2020 when the time-based rates were developed.

FBC monetized a total of 1,337 credits related to its EV DCFC service in 2022 at a price of $450 per credit, and as part of the 2024 Annual Review[51], FBC projected to monetize 1,210 credits at a price of $449.20 per credit in 2023. FBC also notes that the November 2023 update of the BC-LCFS Credit Market Data shows that the current market price (November 2023) is $496.83 per credit.[52]

FBC expects there will continue to be revenue generated through the monetization of carbon credits. However, based on the recent price of monetized carbon credits and the current BC-

[49] https://www.taxtechnical.ird.govt.nz/determinations/depreciation/general/dep100-depreciation-rate-for-rapid-dc-car-charging-stations
[50] doc_72805_b1bchpublicevchargingserviceratesapplicationpublic.pdf (bcuc.com), page 5-26.
[51] Exhibit B-2, Section 5.8.
[52] https://www2.gov.bc.ca/gov/content/industry/electricity-alternative-energy/transportation-energies/renewable-low-carbon-fuels/credits-market

LCFS Credit Market Data, the original assumption of $200 per credit from the Revised Application is no longer consistent with the current credit market.

While FBC expects that the market price will remain close to the $500 per credit level until 2025, FBC does not believe it will remain at this level over the next 10 years, as climate actions undertaken by fuel suppliers will continue to grow in response to various Federal and Provincial policies and/or targets of GHG emission reductions should reduce the demand of the credit market for these suppliers to achieve compliance with the low carbon fuel requirements. As such, FBC assumes the market price of carbon credits will begin to decline starting in 2026. For the purpose of forecasting the carbon credit revenue from 2026 to 2033, FBC assumed a 10 percent annual decline from the $500 per credit level starting in 2026. While the BC carbon credit market is still relatively new and there is no publicly available forecast of market prices, FBC considers the 10 percent annual decline to be a reasonable and conservative assumption. Further, as discussed previously, any variance between forecast and actual carbon credit monetization will be captured in the Flow-through deferral account and will be recovered from or returned to all other FBC customers through rates in the subsequent years.

3.2.1.9 Transaction Fees

Consistent with the currently approved time-based rate, a transaction fee of 15 percent to FLO was included as part of the energy-based rate. There is no change related to this transaction fee, which remains at 15 percent. This fee covers the network management services provided by FLO (station status monitoring, remote diagnostics/upgrades, etc.), 24/7 telephone support for customers using the DCFC stations, as well as payment collection and processing.

3.2.1.10 Property Tax

There are no changes in property tax for FBC's EV stations. There is no property tax as the stations are on third-party land.

3.2.1.11 Income Taxes

There is no change to the calculation of income tax or the capital cost allowance (CCA) deduction, including the Accelerated Investment Incentive available from the Federal government for all qualifying expenditures made after November 20, 2018 and before January 1, 2028.

3.2.1.12 Earned Return

For the years 2018 to 2022 in the cost-of-service analysis, FBC used its approved capital structure from the annual reviews of each year with the approved equity thickness and return on equity (ROE) set at 40 percent and 9.15 percent, respectively, when determining the earned return.

On September 5, 2023, the BCUC issued the GCOC Decision which approved a deemed equity component and allowed ROE for FBC of 41 percent and 9.65 percent, respectively. This is an

increase of 1 percent to FBC's deemed equity component and an increase of 0.50 percent to FBC's ROE from the previous approved levels.

As a result of the GCOC Decision, FBC has updated the deemed equity component and allowed ROE in the cost-of-service analysis to 41 percent and 9.65 percent, respectively, for 2023 and onwards. For the 2023 Projected earned return shown in Table 2-3 in Section 2.2.2 above, FBC used the capital structure included in 2023 rates, approved on a permanent basis by Order G-276-23. For the forecast earned return from 2024 to 2033, FBC used the capital structure included in the approved 2024 rates,[53] with the weighted average cost of capital set at 6.01 percent.

3.3 *PROPOSED ENERGY-BASED RATE*

Consistent with the existing approved time-based rate for FBC's EV DCFC stations, the proposed energy-based rate is calculated based on the levelized cost of service incorporating the assumptions and cost-of-service inputs described in the previous sections. Using a levelized approach allows FBC to set an energy-based rate that remains flat over the evaluation period and collects the cost-of-service associated with the EV DCFC stations over that period. A levelized cost-of-service rate that remains flat is easy to understand and provides rate stability for customers, as opposed to having rates that vary each year with the cost of service and forecast usage.

The proposed energy-based rate of $0.42 per kWh is set to recover, on a forecast present value basis, the cost-of-service of both the 50 kW and 100 kW stations over the 10-year period from 2024 to 2033. The forecast cost of service also includes the actual accumulated deficiency of approximately $15 thousand from 2018 to 2023 as shown in Table 2-3 of Section 2.2.2 above. Please refer to Appendix E-3 which provides the detailed calculation of the proposed energy-based rate in $ per kWh.

In the subsections that follow, FBC provides:

- A comparison of FBC's proposed energy-based rate of $0.42 per kWh to the market;
- An explanation of FBC's proposed approach of establishing a common energy-based rate between 50 kW and 100 kW EV DCFC stations; and
- A rate impact assessment for FBC's other customers.

3.3.1 Proposed Energy-Based Rate does not undermine the Competitive Market

In its Decision and Order G-341-21 approving FBC's existing EV DCFC time-based rates, the BCUC stated:

[53] Annual Review for 2024 Rates Decision and Order G-340-23.

> The Panel considers the appropriate rate design principle should be an aim to minimize any recovery from FBC's other ratepayers for this service regardless of whether that results in an over-or under collection of the cost of service in any given year, providing that the resulting rate isn't set at a rate that will undermine the competitive market.

As shown in Table 2-5 of Section 2.3.2, FBC's proposed energy-based rate at $0.42 per kWh for both 50 kW and 100 kW DCFC stations is higher than BC Hydro, but is generally comparable to other service providers in BC, such as Shell, Couche-Tard, and Charger Quest. Also, depending on the location, FBC's proposed energy-based rate is comparable to Tesla's offering of $0.42 per kWh.[54] As such, FBC considers its energy-based rate at $0.42 per kWh to be reasonable because it does not undermine the competitive market and is designed to recover the cost of service over the 10-year period on a levelized basis.

3.3.2 Common Energy-Based Rate for both 50 kW and 100 kW Stations

FBC is proposing a common energy-based rate for its 50 kW and 100 kW EV DCFC stations rather than different rates for the different power levels. FBC's proposed common energy-based rate is based on a number of considerations, including cost-based recovery, the impact to the utilization of the lower powered DCFC stations under common rates, as well as the offerings available in the market.

3.3.2.1 Cost-Based Recovery

The current BCUC-approved approach for setting FBC's EV DCFC service rates is cost-based (or cost-of-service based) recovery. Although the average levelized annual cost of service for a 50 kW station is less than a 100 kW station, it can be seen from Table 3-6 below that the energy-based rates for both station types are essentially the same, even if they are set separately to recover their individual cost of service on a levelized basis over the 10-year period from 2024 to 2033. This is because the overall consumption in kWh by the 50 kW station (i.e., the amount of electricity that can be dispensed into an EV) is less than the 100 kW station. Thus, under the approach of cost-based recovery, the less expensive 50 kW stations do not translate into lower energy-based rates because the amount of electricity dispensed by the stations is also less in the same amount time compared to the 100 kW stations.

[54] Tesla Mobile App, obtained December 10, 2023; $0.42/kWh for Supercharger at 250 kW Max in Creston, BC.

Table 3-6: Individual Levelized Energy-based Rate for 50 kW and 100 kW

Line	Particular	Reference	50 kW	100 kW	Common 50 kW and 100 kW
1	Average Levelized Annual Cost of Service per Station ($000s)	Appendix C, Schedule 4	20.725	33.738	23.204
2	Average Levelilzed Annual Dispensed MWh per Station	Appendix C, Schedule 4	57.295	95.717	64.613
3	**Levelized $/KWh (2024 - 2033) to recover Cost of Service**	**Line 1 / Line 2**	**0.362**	**0.352**	**0.359**
4	Transaction Fee	15%	15%	15%	15%
5	**Levelized $/KWh (2024 - 2033) w/ Transaction Fee (Rounded to Two Decimal Places)**	**Line 3 / (1 - Line 4)**	**0.430**	**0.410**	**0.420**

As such, unless FBC were to deviate from the approved cost-of-service based recovery approach and set the 50 kW EV DCFC stations below cost (whereby the under-recovery would become a rate impact to FBC's other customers), setting individual energy-based rates for the 50 kW and 100 kW stations will not differ materially from the proposed common energy-based rate. Please refer to Schedule 4 of Appendix E-1 and Appendix E-2 for the detailed calculations of the individual energy-based rates for FBC's 50 kW and 100 kW stations, respectively.

3.3.2.2 Utilization Between 50 kW and 100 kW EV DCFC Stations

Based on the actual utilization data of FBC's EV DCFC service from the eight sites where both 50 kW and 100 kW stations are available, the higher time-based rate for the 100 kW stations did not lead to reduced usage or promote more use of the 50 kW stations. Using 2023 as an example, the average utilization of the 100 kW stations at the eight sites where both 50 kW and 100 kW stations are available is almost 20 percent higher than the 50 kW stations at the same site[55], even considering that the current time-based rate for the 100 kW stations is $0.54 per minute compared to the 50 kW stations at $0.26 per minute.

FBC's utilization information demonstrates that the price differential did not help to promote more utilization of the lower power level stations. EV charging customers are choosing the higher-powered EV DCFC stations for reasons other than price, such as the duration of charging time over the price differential, and it is likely that the 50 kW stations are typically used at times when the 100 kW stations are occupied, or the EV is limited by the charging speed depending on the brand/model of the vehicle. As such, FBC believes a common energy-based rate for both the 50 kW and 100 kW stations is reasonable and avoids under-recovering of costs as discussed in Section 3.3.2.1 above.

[55] Excludes Castlegar as the station was out-of-service since May 2023 due to construction by the Chamber of Commerce as discussed in Section 2.2.1.

3.3.2.3 Market Offerings

As shown in Table 2-5 in Section 2.3.2, except for Tesla, all other service providers in BC with energy-based rates currently have or are proposing to have common rates between different charging powers. Therefore, a common energy-based rate approach would be consistent with the market. FBC notes that for Tesla, the variations in rates are also dictated by their TOU rates at different locations and regions.

3.3.2.4 Common Energy-Based Rate for all Power Levels is Reasonable

FBC believes that setting a common energy-based rate for both 50 kW and 100 kW stations is reasonable. Given that the average cost per kWh for the 50 kW stations is essentially the same as the 100 kW stations over the 10-year forecast period from 2024 to 2033, setting the energy-based rate for the 50 kW stations lower than the levelized cost of service in order to create a price differential between the 50 kW and 100 kW stations would not be reasonable, as it would cause an under-recovery for the 50 kW stations and a resulting rate impact for FBC's other customers.

Having common energy-based rates for all power levels is also consistent with the general concept of energy-based rates, i.e., EV charging customers will pay for the actual energy dispensed into their vehicle which would be the same regardless of the different power of the EV DCFC stations. Since there is no difference in terms of the energy that the EV charging customers receive from the different power levels, it is reasonable that, regardless of whether a 50 kW or 100 kW station is used, the premium EV model with a bigger battery capacity and capability of faster charging ultimately pays more in total because it consumes more energy (more electricity is dispensed into this EV) during a charging session than a regular EV model with a smaller battery capacity and lower charging speed.

Therefore, based on the reasons discussed above, FBC considers setting a common energy-based rate (the same $ per kWh rate) for both 50 kW and 100 kW stations to be the most reasonable and appropriate approach, and not unduly discriminatory or unduly preferential.

3.3.3 Rate Impact Assessment

As discussed in Section 3.2.1.2 above, FBC engaged Dunsky to develop three growth scenarios (i.e., low, medium, and high) for light duty EV sales in the FBC service area from 2023 to 2040. FBC used the growth rates from the medium growth scenario to forecast its station utilization and to forecast the EV DCFC cost-of-service.

FBC considers the low growth and high growth scenarios from the Dunsky analysis to be the lower and upper bounds of forecast EV sales in FBC's service area. Table 3-7 below provides a rate impact sensitivity analysis for FBC's other customers if the low or high growth scenarios materialize instead of the medium growth scenario. The rate impact to FBC's other customers due to the varying station utilization scenarios is minor, with the bill impact for an average residential customer ranging from a charge of $0.28 per year to a credit of $0.33 per year.

Table 3-7: Individual Levelized Energy-based Rate for 50 kW and 100 kW

$000s	Low Growth Scenario	Medium Growth Scenario (As proposed)	High Growth Scenario
PV of Deficit / (Surplus) - 10 years	571	-	(669)
Levelized Deficit / (Surplus) per year	78	-	(91)
Levelized Rate Impact - when compare to 2024 Approved (%)	0.02%	0.00%	-0.02%
Avg. Residential Bill Impact ($ per year)	0.28	-	(0.33)

3.4 *PROPOSED IDLING CHARGE*

FBC is proposing an Idling Charge of $0.40 per minute for its DCFC stations. As shown in Section 2.3.3, an Idling Charge of $0.40 per minute after the end of a charging session, with a 5-minute grace period, is consistent with other service providers in BC that have also implemented an Idling Charge.

FBC has not received any complaints to date about idling or congestion at its EV DCFC stations; however, FBC expects the issue of congestion is likely to arise in the near future with the increase in EV sales and as the utilization of FBC's stations continues to grow, especially at high traffic stations such as the Kelowna Museum and Princeton.

Currently, FLO has indicated that their system is not capable of accommodating both an energy-based rate and a time-based Idling Charge. FLO has communicated to FBC that upgrading their system to accommodate an Idling Charge is part of their development plan but not expected to be implemented until late 2024.

Therefore, while FBC is seeking approval of an Idling Charge of $0.40 per minute at its DCFC stations in this Application for regulatory efficiency, at this time FBC is not requesting approval of an effective date to implement the Idling Charge. As such, FBC has not included the Idling Charge as part of the proposed revised RS 96 tariff included in Appendix C. Rather, once FLO has upgraded its system and an Idling Charge can be implemented, if approved, FBC will file a compliance filing with a revised RS 96 tariff for BCUC endorsement at least 15 days prior to the effective date. Please refer to Section 4 for further details on the implementation of the Idling Charge.

3.5 *SUMMARY OF PROPOSED RS 96 ENERGY-BASED RATE*

FBC is seeking approval of an energy-based rate of $0.42 per kWh at its EV DCFC stations under RS 96. The energy-based rate is set to fully recover the forecast cost of service on a 10-year levelized basis and also includes recovery of the actual accumulated deficiency of approximately $15 thousand from 2018 to 2023. As the rate is set on a 10-year levelized basis, it will remain the same from 2024 to 2033 (i.e., it will not be subject to FBC's general rate increases).

FBC engaged Dunsky to provide a forecast of light-duty EV sales in the FBC service area to 2040 and applied the growth rate to FBC's existing DCFC stations to forecast the utilization over the 10-year period from 2024 to 2033, which FBC in turn used to forecast the number of charging minutes as well as dispensed electricity for each station, the result of which formed the basis of the 10-year forecast cost-of-service.

The proposed energy-based rate set on a levelized basis is consistent with the approach approved under the current time-based rates. A levelized rate that remains flat over a period of time is easy to understand and allows customers to have stability in their EV charging costs.

FBC's proposed energy-based rate of $0.42 per kWh is comparable to the market and the potential rate impact due to a reduced forecast of utilization is small. If the low growth scenario of EV sales materializes, the potential rate impact to the average residential customer is minor at approximately 28 cents per year over the 10-year period. FBC's proposed energy-based rate is also set on a common basis between the 50 kW and 100 kW EV DCFC stations. Based on FBC's actual experience with its current time-based rate, the price differential between the 50 kW and 100 kW stations did not help to promote more utilization in the lower-powered 50 kW stations, as customers are choosing the higher-powered EV DCFC stations for reasons other than price, such as the charging time duration. Further, the cost of service per kWh for the 50 kW stations is almost the same as the 100 kW stations on a levelized basis, thus there would not be a material difference even if the energy-based rates were set separately.

Finally, FBC is proposing an Idling Charge of $0.40 per minute after the end of a charging session, with a 5-minute grace period. This approach is consistent with other service providers in BC that have implemented Idling Charges.

4. IMPLEMENTATION AND REPORTING

4.1 *IMPLEMENTATION OF PROPOSED RATES*

4.1.1 Energy-Based Rate

There are a number of steps required before FBC can implement the proposed energy-based rate, if approved by the BCUC:

1. As mentioned previously in this Application, FBC applied to Measurement Canada's temporary dispensation program on December 18, 2023. FBC expects to receive approval from Measurement Canada in early 2024.

2. Approval of this Application by the BCUC is required in addition to Measurement Canada's approval, irrespective of which approval is obtained first.

3. Once FBC receives approval from Measurement Canada and the BCUC, FBC will then request FLO to implement changes to FBC's EV DCFC stations and network to support energy-based rates. It is FBC's understanding that FLO will require approximately 4 weeks to implement these changes.

4. While FLO undertakes these changes, FBC will undertake a number of communication activities to advise FBC's EV DCFC station customers that rates will be changing to an energy-based rate. Communication is expected to be completed through multiple channels, including physically at the charging station/site, digitally through social media, and through third-party channels such as Plugshare.

As noted in Section 1.2 of the Application, if the proposed energy-based rate is approved, FBC proposes to file a compliance filing with the BCUC at least 15 days prior to the effective date of the energy-based rates for endorsement of the revised RS 96 tariff. FBC will continue to charge the currently approved time-based rate at its EV DCFC stations under RS 96 until implementation of the energy-based rate is complete and effective.

4.1.2 Idling Charge

As noted in Section 3.4 of the Application, FLO's system is currently unable to implement an Idling Charge. FBC has been in active discussions with FLO and FBC's understanding is that FLO will be developing their system to accommodate an Idling Charge but does not expect it can be implemented until late 2024. If the proposed Idling Charge of $0.40 per minute is approved, FBC will implement the Idling Charge once FLO has completed the system upgrades. FBC will also file a revised RS 96 tariff with the BCUC for endorsement including the Idling Charge of $0.40 per minute, if approved, 15 days prior to it becoming effective.

4.2 REPORTING OF FBC'S RS 96 EV DCFC SERVICE

Currently, FBC has been providing annual updates to its RS 96 EV DCFC service as part of FBC's annual review process, including discussions on utilization in terms of charging minutes, revenue, carbon credits, and O&M and capital expenditure forecasts. FBC proposes to continue this reporting in its rate setting proceedings.

Furthermore, as discussed in Section 3.2.1.4, FBC will continue with the approach regarding new stations that was directed by Order G-341-21, i.e., if FBC is to introduce additional EV charging stations that were not originally identified in the Revised Application, FBC will include the evaluation of these additional stations as part of FBC's annual review or revenue requirement proceedings. The evaluation will include a review of whether the additional stations meet the criteria to be a prescribed undertaking under the GGRR and assessment of whether the levelized rate under RS 96 EV DCFC service will need to be recalculated as a result of the additional EV charging stations.

5. CONCLUSION

FBC is seeking approval of an energy-based rate of $0.42 per kWh for its EV DCFC service under RS 96 for both the 50 kW and 100 kW stations. The proposed energy-based rate will replace the existing approved time-based rates for both the 50 kW and 100 kW stations. The energy-based rate is set to fully recover the forecast cost of service on a 10-year levelized basis and also includes recovery of the actual accumulated deficiency of approximately $15 thousand from 2018 to 2023. As the rate is set on a 10-year levelized basis, it will remain unchanged from 2024 to 2033 (i.e., will not be subject to FBC's general rate increases) unless otherwise directed by the BCUC. The proposed energy-based rate set on a levelized basis is consistent with the approach approved under the current time-based rates. A levelized rate that remains flat over a period of time is easy to understand and allows customers to have stability in their EV charging costs.

FBC's proposed energy-based rate of $0.42 per kWh is comparable to the market and the potential rate impact is small if the actual utilization of FBC's EV DCFC stations is less than the forecast utilization level in this Application. The potential rate impact for the average residential customer is approximately 28 cents per year over the 10-year period from 2024 to 2033 if a low EV growth environment materializes.

As a temporary dispensation program for commercial level 3+ EV charging devices has now been made available by Measurement Canada, FBC considers it reasonable to establish an energy-based rate for its EV DCFC service given the strong desire by the public as well as interveners for energy-based rates and the fact that time-based EV charging rates are considered to be discriminatory by the BCUC.

FBC is also proposing an Idling Charge of $0.40 per minute after the end of charging, with a 5-minute grace period. This approach is consistent with other service providers in BC that have implemented Idling Charges.

Appendix A

FBC EV DCFC SERVICE RS 96 ASSESSMENT REPORT
G-341-21 COMPLIANCE FILING

Diane Roy
Vice President, Regulatory Affairs

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

Electric Regulatory Affairs Correspondence
Email: electricity.regulatory.affairs@fortisbc.com

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

December 29, 2022

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

Attention: Ms. Sara Hardgrave, Acting Commission Secretary

Dear Ms. Hardgrave:

Re: FortisBC Inc. (FBC)

Rate Design and Rates for Electric Vehicle (EV) Direct Current Fast Charging (DCFC) Service - British Columbia Utilities Commission (BCUC) Decision and Order G-341-21 Compliance Filing

Rate Schedule 96 Detailed Assessment Report

On December 22, 2017, FBC submitted an application for approval of rate design and rates for EV DCFC service, and on January 12, 2018, the BCUC issued Order G-9-18 approving interim rates and adjourning the proceeding. On September 30, 2020, FBC submitted a revised application for approval of rate design and rates for EV DCFC service to allow FBC to offer EV charging service at FBC-owned DCFC stations (Revised Application). On November 24, 2021, the BCUC issued its Decision and Order G-341-21 (Decision) granting approval of the Revised Application subject to a number of conditions, including a requirement that FBC file a detailed assessment report on Rate Schedule 96 (RS 96)[1] no later than December 31, 2022, or within six-months of Measurement Canada's approval of DCFC energy-based metering for FBC, whichever is earlier. Such detailed assessment must include:

- An update of the financial models presented in this proceeding with actual and forecast information and updated assumptions;
- A detailed assessment of RS 96 and alternative rate design options;
- An overview of the current EV fast charging service market and rates across Canada and the United States;
- A proposal for a depreciation rate for its EV DCFC charging stations and information to support its proposal; and
- An assessment as to whether idling fees are warranted.

[1] Decision, pp. 29 to 30.

In accordance with the Decision, FBC respectfully submits the attached RS 96 Detailed Assessment Report.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC INC.

Original signed:

Diane Roy

Attachments

cc (Email only): Registered Interveners in the FBC Rate Design and Rates for Electric Vehicle Direct Current Fast Charging Service proceeding.

FORTIS BC™

FORTISBC INC.

Rate Design and Rates for Electric Vehicle Direct Current Fast Charging Service Application

Rate Schedule 96 Detailed Assessment Report

in Compliance with British Columbia Utilities Commission Order G-341-21

December 29, 2022

Table of Contents

List of Appendices

Index of Tables and Figures

1. INTRODUCTION

FortisBC Inc. (FBC) files this EV DCFC Service Assessment Report (Assessment Report) in compliance with British Columbia Utilities Commission (BCUC) Order G-341-21. The regulatory history leading to this Assessment Report is summarized below.

In December 2017, FBC applied to the BCUC for Approval of a Rate Design and Rates for Electric Vehicle (EV) Direct Current Fast Charging (DCFC) Service and Tariff Rate Schedule 96 (RS 96) (Original Application). By Order G-9-18, the BCUC approved a time-based rate of $9.00 per 30-minute period (or $0.30 per minute) for FBC-owned DCFC 50 kW stations, on an interim basis, effective January 12, 2018. The BCUC also directed FBC to separately track and account for all costs associated with FBC's EV DCFC stations and exclude all such costs from its rate base until further directions from the BCUC and adjourned the review of the Original Application at that time.

Subsequently, by Order G-10-18 dated January 12, 2018, the BCUC established an inquiry (EV Inquiry) into the regulation of EV charging service in British Columbia before undertaking a full review of FBC's Original Application. On June 22, 2020, by Order in Council (OIC) No. 339 (OIC 339/20), the Lieutenant Governor in Council amended the *Greenhouse Gas Reduction (Clean Energy) Regulation* (GGRR) which included a new Section 5 regarding prescribed undertaking – electric vehicle charging stations.

Following the amendment of the GGRR, FBC filed a revised and updated application (Revised Application) for its EV DCFC Service and Tariff RS 96 on September 30, 2020. On July 14, 2021, the BCUC issued Order G-215-21 which concluded that FBC's EV DCFC stations are prescribed undertakings under Section 5 of the GGRR, approved the inclusion of the associated assets in FBC's rate base, and determined that the cost of service of FBC's EV DCFC stations is subject to flow-through treatment in FBC's revenue requirement. By Order G-341-21 dated November 24, 2021, the BCUC approved the depreciation rate for FBC's EV DCFC stations, the inclusion of related revenues and expenses associated with FBC's EV DCFC stations in FBC's regulated accounts, and the RS 96 rate design. Following FBC's compliance filing, by Order G-350-21 dated November 30, 2021, the BCUC approved RS 96 on a permanent basis, including a time-based rate of $0.26 per minute for FBC's owned 50 kW EV DCFC stations and $0.54 per minute for FBC's owned 100 kW EV DCFC stations.

As part of Order G-341-21, FBC was directed to file a detailed assessment of its EV DCFC service by no later than December 31, 2022 or within six months of Measurement Canada's approval of DCFC energy-based metering for FBC, whichever is earlier. As of the date of this Assessment Report, Measurement Canada has not approved energy-based metering in Canada and FBC is not expecting to receive a decision from Measurement Canada before December 31, 2022. As such, this Assessment Report does not include an evaluation of an energy-based RS 96 rate for FBC's owned EV DCFC stations.

As directed by the BCUC, this Assessment Report provides the following:

- An overview of the current EV fast charging service market and rates across Canada and the United States;
- An update of the financial models with actual and forecast information and updated assumptions;
- A proposal for a depreciation rate for its EV DCFC stations and information to support its proposal;
- A detailed assessment of RS 96 and alternative rate design options; and
- An assessment as to whether idling fees are warranted.

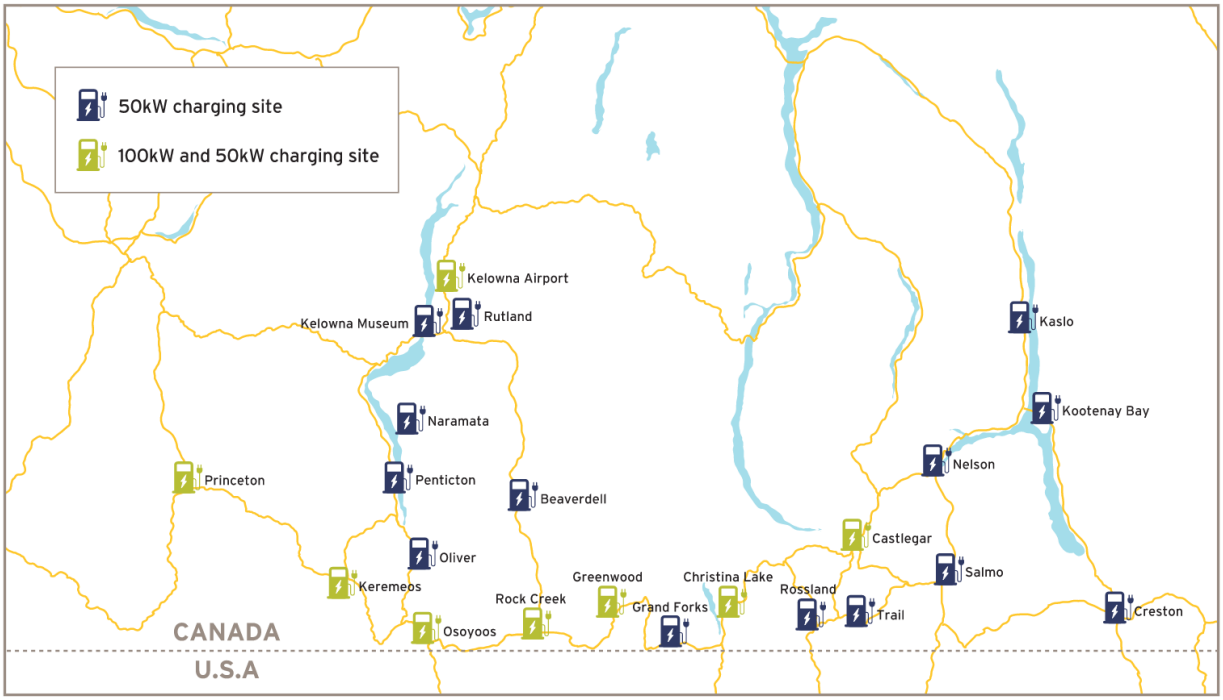
2. OVERVIEW OF FBC'S EV DCFC SERVICE

The following sections provide details on the stations constructed, a description of notable developments, and a market rate comparison.

2.1 *FBC'S OWNED EV DCFC STATIONS*

FBC currently has 42 stations across 22 sites within the electric service territory, 34 of which are 50 kW, and eight of which are 100 kW. Figure 2-1 below provides the geographical location of FBC's EV DCFC network in BC and Table 2-1 provides a breakdown of FBC-owned EV DCFC Stations between 50 kW and 100 kW.[1] The list of FBC-owned EV DCFC stations in Table 2-1 below includes the 50 kW stations in Naramata and Grand Forks installed in 2021, both of which were identified in FBC's Annual Review for 2023 Rates (2023 Annual Review) and were found by the BCUC to meet the requirements of the GGRR to be prescribed undertakings.[2] Table 2-1 below also includes the two new 100 kW stations at Keremeos and Princeton that were placed in-service at the end of 2022 (both were originally identified in the Revised Application).

Figure 2-1: FBC DCFC Network



[1] Does not include the 50 kW stations at New Denver and Nakusp which were identified in the Revised Application but have been transferred to BC Hydro in November 2022, as approved by Order G-215-21.

[2] Decision and Order G-382-22, pp. 30-31.

Table 2-1: List of FBC's Current 50 kW and 100 kW EV DCFC Stations

Station Name	50 kW Station	100 kW Station
Beaverdell	2	-
Castlegar	1	1
Christina Lake	1	1
Creston	2	-
Grand Forks	2	-
Greenwood	1	1
Kaslo	1	-
Kelowna Airport	1	1
Kelowna Museum	2	-
Keremeos	1	1
Kootenay Bay	2	-
Naramata	2	-
Nelson	2	-
Oliver	2	-
Osoyoos	1	1
Penticton	2	-
Princeton	1	1
Rock Creek	1	1
Rossland	2	-
Rutland	2	-
Salmo	1	-
Trail	2	-
Total	**34**	**8**

2.2 *FBC's EV DCFC DEVELOPMENTS*

2.2.1 Utilization of FBC's EV DCFC Stations

FBC's 50 kW DCFC stations were first placed in service in 2018 while the 100 kW DCFC stations were first placed in service in 2021. In 2018 and 2019, the first two years of FBC's 50 kW DCFC service, the growth in utilization (i.e., charging minutes) was trending upwards as expected and the overall utilization exceeded the original forecast. However, starting from 2020, the growth in utilization has slowed, resulting in the overall utilization being lower than the original forecast. FBC believes this is primarily due to the lack of EV deliveries to Canada over the last couple of years, as well as the COVID-19 pandemic which led to travel restrictions beginning in fall 2020 and has resulted in global supply chain issues since 2021. The original utilization forecasts that were included in the Revised Application were completed in summer 2020 and did not account for these factors that began later in 2020 and continued through 2021.

As shown in Tables 2-2 and 2-3 below, the actual charging minutes have been growing each year since 2018 with the total minutes in 2018 and 2019 exceeding the original forecasts;[3] however, the growth has been lower than forecast starting in 2020, which coincides with the timing of the COVID-19 pandemic, despite BC consistently leading the country in EV sales.[4]

As supply chain issues related to the COVID-19 pandemic and shortages of EV deliveries are gradually beginning to resolve and people are now permitted to travel throughout the Province, FBC expects the usage of its EV DCFC stations will return to the forecasts outlined in the Revised Application.

FBC also notes that the utilization in the forecasts from the Revised Application were based on growth rates[5] that were developed to meet British Columbia's Zero Emissions Vehicles (ZEV) Act at that time.[6] These growth rates included reaching 10 percent of ZEV sales by 2025, 30 percent by 2030, and 100 percent by 2040. However, in the CleanBC Roadmap to 2030, BC is now committed to increase the target of the ZEV Act, with targets for ZEV sales reaching 26 percent by 2026, 90 percent by 2030, and 100 percent by 2035.[7] Therefore, there is also the potential for usage to exceed the original forecast given the expectation that the updated 2030 target in the ZEV Act will be three times higher (from 30 percent to 90 percent), and the updated target for 100 percent ZEV sales will be moved up by five years (from 2040 to 2035). Please refer to Section 3.2 of this Assessment Report for the updated assumptions and forecasts for FBC-owned DCFC Stations usage.

Table 2-2: 50 kW Forecast vs. Actual Usage

Year	Forecast (Mins)	Actual/Projected (Mins)	Difference (%)
2018	10,950	15,309	40%
2019	13,440	94,386	602%
2020	393,881	110,504	(72%)
2021	762,328	229,342	(70%)
2022	1,017,534	405,423	(60%)

Table 2-3: 100 kW Forecast vs. Actual Usage

Year	Forecast (Mins)	Actual/Projected (Mins)	Difference (%)
2021	71,953	16,539	(77%)
2022	104,393	53,016	(49%)

[3] For 2018 and 2019, the forecasts were from the Original Application filed with the BCUC in December 2017.
[4] See, https://electricautonomy.ca/2022/02/15/ihs-markit-zev-adoption-canada-2021/
[5] 2020 Revised Application, BCUC IR1 8.4 and CEC IR1 8.2.
[6] https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/electricity-alternative-energy/transportation/zev_act_regulations_intentions_paper-1-final_-_updated_29oct2019.pdf
[7] https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/electricity-alternative-energy/energy-efficiency/zeva_formal_review_intentions_paper_28july2022.pdf

2.2.2 Reliability of FBC's DCFC Stations

Reliability is a key consideration for operating DCFC stations. FBC stations have proven to be very reliable, with minimal downtime. On the rare occasion when a station experiences an outage, FBC works with the equipment manufacturer to complete any required repairs. FBC is refining this process for faster response times by identifying and training local contracting crews to work on the stations. FBC has also established a regular inspection process that will ensure the customer experience is acceptable and reliable. The inspections will include cleaning, removal of trash, examination of the charging equipment and supporting electrical infrastructure, test charge sessions, as well as a general review of the site condition.

Each site is serviced by a power kiosk, which contains an autotransformer that converts the utility supply voltage to 480V, which is required by the DCFC equipment. The original design of the autotransformer in the power kiosk was prone to a specific failure during single-phase events, when one or two phases of a three-phase system is de-energized while the other(s) remain energized. To resolve this issue, the 16 sites designed with this type of power kiosk were retrofitted with a protection relay that will automatically disconnect the service until three-phase power is restored.

2.2.3 Accessibility Improvements

In 2021, FBC worked with a focus group to learn how best to improve accessibility. A total of 15 people participated in the research; 14 participated in one of two virtual focus groups and one participated by completing a questionnaire. The group all use wheelchairs and operate motor vehicles. The participants reside in a variety of regions across BC including the Lower Mainland, Kelowna, Prince George, Fort St. John and Victoria. The recommendation from this group resulted in modifications to FBC's stations, including installation of lighting for evening charging, widening parking stalls with wheelchair lanes for entering/exiting a vehicle, and removal of curbs to provide a barrier free design. All new sites created since the findings of the focus group include these accessibility considerations, including Naramata as seen below in Figure 2-2. In 2023, existing sites will be modified with accessibility improvements.

Figure 2-2: Naramata DCFC Site with Accessibility Considerations

2.2.4 Carbon Credits

As discussed in FBC's 2023 Annual Review, FBC has a total of 1,337 carbon credits, accumulated in 2019 and 2020, that were validated by the Ministry of Energy, Mines and Petroleum Resources (MEMPR) under the British Columbia Low Carbon Fuel Standard (BC-LCFS)[8] as of Summer of 2022. As approved by Order G-341-21, the value of the carbon credits related to EV stations earned under the BC-LCFS are recorded in FBC's Other Revenue and subject to flow-through treatment. FBC monetized these credits in 2022 for $450 per credit,[9] which FBC has flowed through as a reduction to 2023 rates in the 2023 Annual Review. FBC has accumulated a further 1,210 credits in 2021 which were included in FBC's 2021 compliance report to MEMPR, submitted in March 2022. FBC expects to monetize these credits once they are validated by MEMPR under the BC-LCFS. As the BC-LCFS compliance report is submitted in March of each subsequent year, the compliance report for the 2022 credits is not available at the time of filing this Assessment Report.

Table 2-4 below provides the breakdown of carbon credits accumulated and validated, as well as the value of the credits sold per year.

[8] The *Greenhouse Gas Reduction (Renewable & Low Carbon Fuel Requirements) Act* and the *Renewable & Low Carbon Fuel Requirements Regulation (RLCFRR)*, are known collectively as BC's low carbon fuel standard (BC-LCFS): https://www2.gov.bc.ca/gov/content/industry/electricity-alternative-energy/transportation-energies/renewable-low-carbon-fuels

[9] As part of FBC's 2023 Annual Review, FBC forecast a selling price of $467 per credit. Any variance between the forecast and actual selling price will be captured in the Flow-through deferral account and will be recovered from/returned to customers through rates in subsequent years.

Table 2-4: Carbon Credits Earned, Validated, and Sold per Year

	2019	2020	2021	2022
Validated/Submitted	587	750	1,210	n/a
Validated Credits Sold	-	-	-	1,337
Selling Price ($ per Credit)	n/a	n/a	n/a	$450
Total Value of Credit Sold ($000s)	$ -	$ -	$ -	$ 602

As noted in FBC's 2023 Annual Review, the 1,337 credits validated include both public charging stations owned by FBC as well as public stations owned by other entities (metered commercial accounts). However, for credits that are earned in years 2022 and forward, only the final supplier[10] who owns the electricity going through the final supply equipment[10] (i.e., charging equipment) is eligible to claim the carbon credits earned. As such, public charging infrastructure operators such as Tesla will receive the credits rather than FBC, resulting in a reduction in the total number of carbon credits that FBC will be eligible to earn from its EV DCFC service. For clarity, this does not impact the DCFC stations owned by FBC, as listed in Table 2-1. FBC continues to expect to earn carbon credits for the DCFC stations that it owns.

2.3 *MARKET RATE COMPARISON*

As directed by Order G-341-21, FBC is to provide an overview of the current EV fast charging service market and rates across Canada and the United States. Table 2-5 below provides a rate comparison of EV DCFC service in British Columbia as well as the major service providers across Canada.

As shown in Table 2-5, FBC's current rate of $0.26 per minute for the 50 kW DCFC stations is comparable to other providers' 50 kW DCFC stations (or stations with output approximating 50 kW as well as higher capacity stations that are capable of providing 50 kW charging) in BC:

- BC Hydro at $0.2113 per minute approved by the BCUC on an interim basis;
- Electrify Canada at $0.21 to $0.27 per minute for 1-90 kW charging; and
- Tesla at approximately $0.20 per minute for ≤ 60 kW.

FBC's current rate of $0.54 per minute for its 100 kW DCFC stations is the most expensive compared to the other providers in BC with a similar 100 kW service (or stations with output approximating 100 kW as well as higher capacity stations that are capable of providing 100 kW charging), and only slightly less expensive than Electric Circuit (Quebec only) at $0.5965 per minute for their service between 90 kW to 100 kW. For example:

- BC Hydro's interim approved rate for its 100 kW stations is $0.2717 per minute;

[10] Section 6.11, Definition of "supply" in the Renewable and Low Carbon Fuel Requirements Regulation (gov.bc.ca).

- Parkland Fuels' rate for its 125 kW stations is $0.30 per minute;
- Electrify Canada's rate is $0.21 to $0.27 per minute for up to 90 kW charging. Electrify Canada also offers 100 kW charging at its 11-350 kW stations at $0.44 with membership ($0.57 per minute without membership);
- Petro Canada's 100-350 kW stations at $0.50 per minute; and
- Tesla's rate for 60-100 kW charging is approximately $0.52 per minute.

FBC also notes that only Electrify Canada and Tesla currently have idling fees in their rates as shown in Table 2-5 below.

Table 2-5: DCFC Service Provider Rate Comparison in British Columbia and Canada

Service Provider	Rates ($CAD) ~25 kW	~50 kW	~100kW	Up to 350 kW	Idle Fees
Available within British Columbia only					
FBC	n/a	$0.26/min	$0.54/min	n/a	n/a
BC Hydro	$0.1207/min (Interim)	$0.2113/min (Interim)	$0.2717/min (Interim)	n/a	n/a
Available across Canada					
Parkland Fuels (Chevron)	n/a	n/a	$0.30/min (125 kW)	n/a	n/a
Petro Canada	n/a	n/a	Available under 350 kW Stations	$0.50/min (100-350 kW)	n/a
Shell Recharge	n/a	$0.44/min	n/a	n/a	n/a
Electrify Canada[11]	n/a	Available under ~100 kW Stations	1-90 kW: • Pass+ ($4/mth): $0.21/min • Pass (Free): $0.27/min	1-350 kW: • Pass+ ($4/mth): $0.44/min • Pass (Free): $0.57/min	$0.40/min
Tesla	Available under ~50 kW Stations	~$0.20/min (≤60 kW)	~$0.52/min (60-100 kW)	~$0.98/min (100-180 kW) ~$1.55/min (≥180 kW)	$0.50 to $1.00/min
Available within Quebec only					
Electric Circuit[12]	$0.12183/min	50 kW Below 90% SOC[13]: $0.2065/min 50 kW Above 90% SOC: $0.413/min	Depends on capacity drawn at 100 kW station: • ≤50 kW below 90% SOC: $0.2545 • ≤50 kW above 90% SOC: $0.509 • 50-60 kW: $0.32283/min • 60-70 kW: $0.39133/min • 70-80 kW: $0.45967/min	$0.5965/min (>100 kW)	n/a

[11] Electrify Canada Pricing and membership for EV charging | Electrify Canada (electrify-canada.ca).
[12] Electric Circuit Cost of charging (lecircuitelectrique.com).
[13] SOC (State of Charge), the level of charge relative to its capacity.

Service Provider	Rates ($CAD) ~25 kW	~50 kW	~100kW	Up to 350 kW	Idle Fees
			• 80-90 kW: $0.52817/min • 90-100 kW: $0.5965/min		

Notes to Table:

- BC Hydro's current rates are approved on an interim basis by Order G-89-21. BC Hydro was denied approval to establish the existing rates on a permanent basis[14] and was directed to file a new application for a permanent EV fast charging rate by no later than December 31, 2022.
- Parkland Fuels is currently replacing existing DCFC stations, as well as deploying new sites. The upgrades will result in a newly developed rate. Until that time, new stations will be free to use by customers.
- Electrify Canada offers a monthly subscription model of $4 per month, known as "Pass+", that reduces the cost per minute to use their stations.
- Tesla rates vary between sites, rates listed are approximate pricing across Canada.

Table 2-6 below provides a comparison of major service providers and relevant utilities in the United States. The majority of states permit energy-based billing, making direct comparisons to FBC's rates difficult. The only direct comparison is Electrify America, which currently has time-based billing in 17 states. Their rates are comparable to FBC's 50 kW DCFC stations once converted to Canadian dollars; however, their stations offer output up to 90 kW instead of 50 kW. FBC also notes that a number of service providers had time of use rates for their EV charging stations.

Table 2-6: DCFC Service Provider Rate Comparisons across the United States

Service Provider	Rates ($USD)				Power Level (kW)
Electrify America[15]	Time-based (17 States)	Pass + ($4/month) 1-90 kW: $0.12/min 1-350 kW: $0.24/min		Pass (Free) 1-90 kW: $0.16/min 1-350 kW: $0.32/min	350
	Energy-based (30 States)	Pass + ($4/month) $0.31/kWh		Pass (Free) $0.43/kWh	
Tesla	11 a.m. to 9 p.m.: $0.48/kWh Idle Fee: $0.50-$1.00/min		9 p.m. to 11 a.m.: $0.24/kWh Idle Fee: $0.50-$1.00/min		250
EVgo[16]	EVgo PlusMax ($12.99/month) $0.15-$0.26/kWh	EVgo Plus ($6.99/month) $0.19-$0.33/kWh	EVgo Basic ($0.99/month) $0.23-$0.43/kWh	Pay as You Go (Free) $0.23-$0.43/kWh	50

[14] Decision and Order G-18-22, January 26, 2022: DOC_65431_G-18-22-BCH-EV-Fast-Charging-Rates-Decision.pdf (bcuc.com).
[15] Electrify America Pricing Pricing and Plans for EV Charging | Electrify America.
[16] EVgo Fast Charging Pricing EV Charging Costs: Pricing and Plan for EV Charging (evgo.com).

Service Provider	Rates ($USD)		Power Level (kW)
Blink	Blink Members $6.99/charge or $0.59/kWh	Blink Guests $9.99 per charge or $0.69 per kWh	50
Puget Sound Energy[17]	$0.42/kWh $0.40/min idle fee (10 min grace period)		50
Seattle City Light[18]	Monday-Saturday 7 a.m. to 7 p.m.: $0.34/kWh 7 p.m. to 7 a.m.: $0.21/kWh	Sunday $0.21/kWh	62.5

2.4 *SUMMARY OF FBC'S EV DCFC SERVICE*

The utilization of FBC's DCFC stations has been increasing each year since being placed in service in 2018, however the growth in utilization slowed beginning in 2020 due to travel restrictions resulting from the COVID-19 pandemic and a lack of EV deliveries to Canada. Despite less growth than forecast in the Revised Application, FBC expects usage of DCFC stations will begin to grow at an increasing pace as the global supply chain issues are gradually resolved and the supply of EVs begins to increase with more EV models from more manufacturers, combined with a more aggressive updated ZEV sales target and renewed investments from provincial and federal governments. Please refer to Section 3 for a discussion on FBC's updated utilization forecast from 2023 onward.

FBC continues to invest in existing DCFC sites, with a focus on monitoring station usage and customer feedback to determine if there is a need to deploy additional stations in the future, as well as investments to improve accessibility and ensure the reliability of its stations.

With respect to the market comparison, FBC's current rate for its 50 kW stations is comparable to most service providers across Canada (including higher capacity stations that are also capable of providing 50 kW charging). However, the market comparison shows that FBC's rate for its 100 kW stations is amongst the most expensive offering out of all providers across British Columba and only slightly less expensive than the offering available from Electric Circuit from Quebec if compared across Canada.

[17] Puget Sound Energy Up & Go FAQs PSE | Charging with Up & Go Electric.
[18] Seattle City Light EV FAQs ev_faqs (seattle.gov).

3. DETAILED ASSESSMENT OF CURRENT RS 96 RATES AND RATE DESIGN

In this section, FBC summarizes the financial performance of its RS 96 DCFC service to-date with actuals from 2018 to 2021 and 2022 projected results (including actual results up to and including November 2022). FBC also provides an updated forecast of RS 96 cost of service over the expected life of the assets and an evaluation of the RS 96 rates using actual information from 2018 to November 2022 as well as updated forecast information based on new assumptions. As directed by Order G-341-21, FBC also discusses the depreciation rate used for its EV DCFC stations in the financial analysis, and alternative rate design options.

3.1 *FINANCIAL PERFORMANCE TO-DATE OF FBC'S RS 96 DCFC SERVICE*

Table 3-1 below summarizes the costs and revenues of FBC's RS 96 DCFC service with actuals from 2018 to 2021 and projected results for 2022 (including actual results up to and including November 2022). Despite the lower than expected usage of FBC's DCFC stations due to the COVID-19 pandemic as discussed in Section 2.2.1 above, FBC's RS 96 DCFC service to-date has provided an accumulated surplus of approximately $210 thousand, primarily due to the monetization of the carbon credits in 2022 (from credits earned from 2019 and 2020) for $602 thousand as discussed in Section 2.2.4.

When comparing to the original forecast in the Revised Application, FBC was expecting a deficiency of $911 thousand at the end of 2022 given the RS 96 rates were set on a levelized basis over the expected life of the assets, i.e., 10 years. Although the actual surplus of $210 thousand was primarily due to the monetization of the carbon credits in 2022, however, even after removing this additional revenue from the calculation, the accumulated deficiency, which would be approximately $392 thousand, is still lower than the originally forecast of $911 thousand. Please refer to Section 3.2.1.5 below for further discussion on the forecast of carbon credits eligible for FBC's DCFC stations. FBC notes that any surplus or deficiency is approved to be returned to or recovered from all of FBC's customers; as such, with an actual surplus of $210 thousand to the end of 2022 (actuals up to the end of November 2022 and one month of projected results), FBC's customers have seen a reduction in their rates as a result of FBC's RS 96 DCFC service. Given the overall surplus position to-date, FBC considers its RS 96 DCFC service has been successful financially with the existing RS 96 rates. Please refer to Section 3.2 below for further discussion on the forecast financial performance of FBC's DCFC service over the remaining years of the expected service life (i.e., to 2032) with updated assumptions based on actual results to-date.

Table 3-1: Costs and Revenues of FBC's DCFC Service to-date (2018-2021 Actual and 2022 Projected)[19]

Line	Particulars	2018 Actual	2019 Actual	2020 Actual	2021 Actual	2022 Projected (As of Nov 2022)	Cumulative
1	Cost of Energy	2	7	7	13	210	
2	Less: Power Purchase Expense	(2)	(7)	(7)	(13)	-	
3	O&M	0	2	46	101	187	
4	Property Tax	-	-	(0)	(0)	2	
5	Depreciation	-	60	197	307	456	
6	Amortization of CIAC	-	(35)	(70)	(150)	(195)	
7	Other Revenue - Carbon Credits	-	-	-	-	(602)	
8	Income Tax	(9)	(361)	(72)	(299)	(201)	
9	Earned Return	6	53	95	124	165	
10	Total Cost of Service ($000s)	(2)	(282)	196	83	24	
11	RS 96 Revenue ($000s)	(4)	(24)	(28)	(58)	(114)	
12	**(Surplus) / Deficiency**	**(6)**	**(306)**	**168**	**25**	**(90)**	**(210)**
13							
14	**Original Forecast of (Surplus) / Deficiency**	**(2)**	**(303)**	**166**	**509**	**541**	**911**

3.2 *UPDATED RS 96 COST OF SERVICE ANALYSIS WITH NEW FORECASTS*

3.2.1 Key Inputs and Assumptions

The following sections discuss the individual components of the cost of service of FBC's RS 96 DCFC service. The sections also provide a discussion on updated assumptions for forecasting the cost of service over the remaining years of the evaluation period for the current RS 96 rates.

3.2.1.1 Capital Expenditures and Contributions

FBC's total capital expenditures (before contributions from third parties) for the 42 EV charging stations as listed in Table 2-1 in Section 2.1 above are now estimated to be approximately $6.704 million. This includes approximately $4.896 million of actual capital expenditures from 2018 to 2021, approximately $1.560 million of projected capital in 2022, and approximately $0.248 million of forecast capital in 2023. Table 3-2 below compares the actual/forecast capital expenditures and the original forecast of capital expenditures as provided in the Revised Application from 2018 to 2023 for FBC's EV DCFC service.

[19] The actuals for 2018 to 2021 are as presented in BCOAPO IR1 24.1 in FBC's 2023 Annual Review. FBC updated the 2022 Projected numbers from BCOAPO IR1 24.1 with actuals up to November 2022.

Table 3-2: Comparison of FBC EV DCFC Capital Expenditures between Original Forecast in Revised Application and Actual/Forecast from 2018 to 2023

Capital Expenditures	2018	2019	2020	2021	2022	2023	Total
Original Forecast in Revised Application ($million)	0.599	1.644	1.238	1.711	-	-	**5.191**
Actual (2018-2021), Updated 2022 Projected and 2023 Forecast ($million)	0.599	1.644	1.164	1.489	1.560	0.248	**6.704**

The difference between the capital expenditures forecast provided in the Revised Application and the current Actual/Forecast of capital expenditures from 2018 to 2023 is due to a number of factors, as follows:

- The average capital cost per station is approximately $0.142 million, which is approximately 10 percent higher than the original forecast. The average capital cost per station in the original forecast was approximately $0.129 million. The actual construction costs were higher than originally anticipated primarily due to higher than expected inflation which impacted the contractor costs, especially since early 2021, and higher than expected complexity for distribution upgrades due to some sites being in highly developed urban areas which required specialized construction techniques such as directional drilling.
- The addition of two new 50 kW stations installed in 2021 at Naramata and Grand Forks as identified in FBC's 2023 Annual Review, which resulted in total incremental capital expenditures of approximately $0.221 million in 2021. These incremental capital expenditures in 2021 were offset by lower than forecast capital expenditures due to stations at Keremeos and Princeton being delayed to 2022, as discussed below. The net impact of these events resulted in the total actual 2021 capital expenditures shown in Table 3-2 above being lower than the original forecast.
- Four stations (two at each of Keremeos and Princeton) were originally planned to be installed in 2021, but were delayed to 2022 due to the significant flooding event that occurred in late 2021. The total costs for these stations are approximately $0.639 million and are reflected in the 2022 Projected amount in Table 3-2 above.
- As identified in Section 2.2.2 of this Assessment Report, FBC was required to complete safety retrofits for 16 of its DCFC sites which included a new protection relay to the power kiosk that will automatically disconnect the service until three-phase power is restored. These safety retrofits led to the increased capital in 2022. The total costs of these retrofits were approximately $0.333 million. These capital expenditures were not identified in the original forecast in the Revised Application.
- As identified in Section 2.2.3 of this Assessment Report, FBC worked with a focus group on accessibility improvement to its existing EV DCFC sites. As a result of the recommendations of the focus group, FBC has planned to modify its existing sites for accessibility improvements with the total capital costs estimated to be $0.248 million in

2023. These capital expenditures were not identified in the original forecast in the Revised Application.

With respect to contributions, which were available from a number of partners including Natural Resources Canada (NRCan) and the Provincial Government of BC, FBC is currently expecting a total contribution of $3.127 million ($2.280 million in actual from 2018 to 2021 and forecast of approximately $0.847 million in 2022 and 2023) for its EV DCFC stations. The original forecast contributions from the Revised Application were approximately $2.973 million.

As part of the updated costs and revenues for evaluating RS 96 in Section 3.2.2 below, the actual capital expenditures and contributions from 2018 to 2021 with updated projected/forecast amounts for 2022 and 2023 were used. FBC also included a proxy of future sustainment capital expenditures in future years within the evaluation period as minor repair/replacement of station components such as power electronics or charging connectors/cables are expected to occur from time to time. Furthermore, given the expected service life of the EV charger of 10 years, for the purpose of a complete financial evaluation, FBC included future replacement costs of the charger at the end of the 10-year expected service life, estimated based on the costs of the EV chargers in today's dollars escalated annually by the inflation assumption discussed in Section 3.2.1.6.

3.2.1.2 Evaluation Period of RS 96 Cost of Service

FBC's RS 96 EV charging rates were originally set on a levelized-cost basis from 2018 to 2030 for the 50 kW DCFC stations (13 years) and from 2021 to 2030 for the 100 kW DCFC stations (10 years). The levelized costs were based on the original planned installation schedule of all stations to be complete in 2021 with an expected service life of 10 years for the DCFC stations. However, due to delays in construction of some stations as well as the safety retrofits completed in 2022 as discussed in Section 2.2.2, the evaluation period is now extended to 2032 for both 50 kW and 100 kW stations. This reflects all 50 kW and 100 kW assets entering FBC's rate base in 2022, plus 10 years of expected service life.

3.2.1.3 Station Usage Assumptions

The usage at FBC's EV DCFC stations are the minutes per year that EV customers will use the stations to charge their vehicles. As explained in Section 2.2.1, the forecast of station usage in the Revised Application was based on historical data (i.e., 2018 and 2019 actual charging minutes at that time) with growth rates that were developed based on the target of ZEV sales in the BC ZEV Act, which was 10 percent of ZEV sales by 2025, 30 percent by 2030, and 100 percent by 2040[20]. However, due to the general lack of EV delivery until recently, combined with the COVID-19 pandemic which led to global supply chain issues and travel restrictions within the Province, the actual charging minutes for FBC's EV DCFC stations were significantly lower than the forecasts in the Revised Application, as shown in Tables 2-2 and 2-3 in Section 2.2.1.

[20] Revised Application, BCUC IR1 8.4 and CEC IR1 8.2.

Table 3-3 below provides the growth rates used in the original forecast of charging minutes for FBC's 50 kW and 100 kW DCFC stations as well as the updated forecast of growth rates, which is applied to the 2022 projected charging minutes as shown in Tables 2-2 and 2-3 to develop the forecast of charging minutes from 2023 to 2032. For the updated forecast of growth rates, FBC assumed that growth rates remained the same as what was included in the Revised Application but delayed by one year. For example, the 2023 growth rates for the updated forecast are based on the 2022 growth rates from the Revised Application. As travel restrictions throughout the Province have lifted, EV deliveries by manufacturers to Canada are slowly increasing, and the global supply chain issues related to the COVID-19 pandemic are beginning to resolve, FBC expects that growth rates will begin to realign with the original forecast in the Revised Application. Table 3-3 also includes a new upper bound forecast of growth rates developed based on the new ZEV Act target of reaching ZEV sales of 26 percent by 2026, 90 percent by 2030, and 100 percent by 2035.

Table 3-3: Original Forecast, Updated Forecast, and Upper Bound Forecast of Growth Rates for Stations' Charging Minutes

Year	Original Forecast in 2020 Revised Application	Updated Forecast (Delayed Growth Rates)	Upper Bound Forecast (Updated ZEV Target)
2023	34%	45%	78%
2024	28%	34%	50%
2025	24%	28%	37%
2026	27%	24%	30%
2027	28%	27%	38%
2028	27%	28%	39%
2029	26%	27%	36%
2030	24%	26%	33%
2031	24%	24%	25%
2032	23%	24%	21%

3.2.1.4 Electric Consumption and Cost of Electricity

In the Revised Application, FBC assumed consumption of 20 kWh per charge event with each charging event assumed to be approximately 30 minutes. This is equivalent to approximately 0.67 kWh per charging minute.

The actual kWh per charging minute has been higher than the assumption used in the original forecast, with the 50 kW stations averaged to approximately 0.97 kWh per charging minute in 2022 and the 100 kW stations averaged to approximately 1.32 kWh per charging minute in 2022, which resulted in higher electric consumption and electricity costs per stations than the original forecast. As part of the updated forecast for 2023 to 2032, FBC is now using the most recent average kWh per charging minutes in 2022, which reflect the actual data from FBC's owned

stations, to forecast the total electricity consumption of each stations as well as the cost of electricity. For clarity, FBC is forecasting the electric consumption of each station from 2023 to 2032 using the 2022 average kWh per charging minute (i.e., 0.97 kWh per minute for the 50 kW stations and 1.32 kWh per minute for the 100 kW stations) and multiplying by the forecast of charging minutes for each station, which is based on the updated forecast of growth rates as discussed in Section 3.2.1.3.

For the cost of electricity included in the RS 96 rates, FBC continues to assume the DCFC stations are taking metered electric service under RS 21, FBC's commercial service. For the updated forecast of electricity costs from 2023 to 2032, FBC included the 3.98 percent rate increase for 2023 (approved on a permanent basis by Order G-382-22[21]), and assumed a further rate increase of 3.5 percent in 2024 with an annual increase of 2 percent starting from 2025 onward.

FBC notes that the cost of electricity embedded in the interim rate for the 50 kW DCFC stations as approved by Order G-9-18 was based on BC Hydro's Rate Schedule (RS) 3808. As explained in FBC's 2022 Annual Review,[22] these amounts are already embedded in FBC's power purchase expense as part of the revenue requirement for recovery from all customers; thus, the amounts are not included in the evaluation of RS 96. FBC also notes that eight 50 kW DCFC stations take electricity service from third-party utilities (i.e., two from Nelson Hydro, two from the City of Penticton, two from Grand Forks, and two from BC Hydro[23]). The cost of third-party electricity use is included in the O&M costs related to FBC's DCFC service as discussed in Section 3.2.1.8 below and is not part of FBC's cost of electricity.

3.2.1.5 Carbon Credits

As discussed in Section 2.2.4, pursuant to Order G-341-21, the monetized value of the carbon credits related to EV stations that FBC earns under the BC-LCFS is recorded in FBC's Other Revenue and is subject to flow-through treatment (i.e., variances between forecast and actual will be captured in the Flow-through deferral account and will be recovered from/returned to customers through rates in subsequent years). FBC is also approved to include an estimate of $200 per credit in the rate design of RS 96 rates for 50 kW and 100 kW stations. As shown in Table 2-4 of this Assessment Report, FBC has monetized a total of 1,337 validated credits in 2022 for a price of $450 per credit.

FBC expects there will continue to be revenue generated through the monetization of carbon credits from FBC's EV stations. However, based on the recent average price of carbon credits[24], the assumption of $200 per credit is no longer consistent with the current credit market. As part

[21] Subject to the changes identified in Decision and Order G-382-22.
[22] FBC's 2022 Annual Review, BCUC IR1 16.1.
[23] The 50 kW stations in New Denver and Nakusp are approved to transfer to BC Hydro pursuant to Order G-215-21. The transfer to BC Hydro was complete in November 2022.
[24] RLCFRR Low Carbon Fuel Credit Market Report – Q3 2022, Available at: https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/electricity-alternative-energy/transportation/renewable-low-carbon-fuels/low_carbon_fuel_credit_market_quarterly_report_q3.pdf.

of this Assessment Report, FBC is forecasting a credit pricing of $325 per credit, which is based on the average of $450 per credit and the original estimate of $200 per credit. FBC considers that an average of $325 per credit is reasonable, as FBC expects that $450 per credit is near the peak, but that credit pricing will not return to the level of $200 per credit last seen in 2019.

3.2.1.6 Inflation Rates

Inflation rates are used for forecasting O&M and the electricity rates from third-party utilities (for stations that take service from third-party utilities). In the Revised Application, FBC used an annual inflation of 2 percent for its analysis. As part of the updated forecast in this Assessment Report, FBC used the same inflation (CPI) information provided in FBC's annual reviews from 2018 to 2023. For 2024, FBC assumed inflation will be 3.5 percent and, for 2025 and beyond, FBC assumed the annual inflation will be 2 percent. The long-term inflation of 2 percent (i.e., 2025 and beyond) is in line with the Bank of Canada historical inflation target of 2 percent.

3.2.1.7 Depreciation Rate

Pursuant to Order G-341-21, FBC was approved to use a straight-line 10 percent (10 year) depreciation rate for its EV DCFC stations. As directed by the BCUC in Order G-341-21, FBC is to review the depreciation rate for its EV DCFC stations as part of the RS 96 Assessment Report.

The expected service life of 10 years for EV DCFC stations (for both 50 kW and 100 kW) remains reasonable and continues to be supported by FBC's EV charger vendor (i.e., AddEnergie, operator of the FLO EV charging network) which has EV charging stations installed since 2015. The 10-year expected service life is also consistent with a number of jurisdictions, as follows:

- In an application dated October 26, 2021, Pacific Gas and Electric Company (PG&E) used a 10-year useful life for its electric charging stations;[25]
- The Vancouver EV Ecosystem Strategy[26] assumes a 10-year linear depreciation of EV assets;
- The Public Utilities Commission of the State of Colorado approved the Public Service Company of Colorado as part of its Transportation Electrification Plan to use a 10-year depreciable life as it is appropriate and based on current industry practice;[27]
- In a recent application by the Southwestern Public Service Company as part of its Transportation Electrification Plan,[28] the company provided evidence supporting its proposed rate which cited two cases where a 10 percent depreciation rate was accepted by state regulators[29];

[25] https://docs.cpuc.ca.gov/PublishedDocs/SupDoc/A2110010/4240/417398449.pdf.
[26] https://vancouver.ca/files/cov/EV-Ecosystem-Strategy.pdf; page 38.
[27] https://www.xcelenergy.com/staticfiles/xe-responsive/Company/Rates%20&%20Regulations/Regulatory%20Filings/final-decision-TEP.pdf.
[28] See https://www.xcelenergy.com/company/rates_and_regulations/filings/transportation_electrification_plan
[29] Direct Testimony of Arthur P. Freitus, at p. 11. Available at:

- The Oregon Public Utilities Commission approved multiple EV charging pilot programs proposed by Portland General Electric that specified a 10-year useful life for utility owned EV chargers;[30] and
- The Government of New Zealand issued Tax Depreciation 1 Rates General Determination Number 100 (Determination DEP100) setting the useful life of Rapid DC car charging stations at 10 years.[31]

FBC notes that in BC Hydro's Public Electric Vehicle Fast Charging Service Rate Application, dated March 5, 2021, a 10-year amortization period was used for charging station capital costs.[32] However, FBC is aware that as part of BC Hydro's F2023-2025 RRA, filed on August 31, 2021, BC Hydro is proposing to change the amortization period for its charging station assets to 7 years based on a depreciation study completed by Concentric for BC Hydro in August 2021[33]. As part of the F2023-2025 RRA proceeding, Concentric explained that 7 years was based on an average between 5 and 10 years.[34]

Despite BC Hydro's proposal to change the amortization period for its charging station assets to 7 years, FBC continues to believe that an expected service life of 10 years for its DCFC stations is reasonable and more appropriate. First, FBC has been exclusively using one manufacturer (AddEnergie), who continues to support the use of a 10-year expected service life for their EV charging stations, whereas, to FBC's knowledge, BC Hydro has used a mix of different manufacturers of EV charging stations. Second, the use of a 10-year depreciation rate is consistent with various utilities in other jurisdictions as highlighted above. Finally, FBC's oldest stations were first installed and placed in-service in 2018 and will therefore be reaching five years in 2023. FBC has not experienced any major failures to its stations that required a complete replacement and there has been no sign that any of its oldest stations will require replacement within 2 years (i.e., when reaching 7 years old). As such, FBC continues to expect its DCFC stations will reach the expected service life of 10 years and does not propose a new depreciation rate, nor does FBC have information to support an expected service life other than 10 years.

3.2.1.8 Operating and Maintenance Costs

In the Revised Application, FBC estimated O&M costs to be approximately $5,193 annually per station for both 50 kW and 100 kW DCFC stations with annual escalation of 2 percent based on inflation (as discussed in Section 3.2.1.6 above). Table 3-4 below provides the original forecast O&M expenses from 2018 to 2022 and compares the original forecasts against the

https://www.xcelenergy.com/staticfiles/xe-responsive/Company/Rates%20&%20Regulations/Regulatory%20Filings/CO%20Recent%20Filings/05%20Direct%20Testimony%20of%20Arthur%20P.%20Freitas.pdf.

[30] See Order 18-054 in Proceeding UM-1811, Stipulation Agreement, item 13. Available at: https://apps.puc.state.or.us/orders/2018ords/18-054.pdf.

[31] https://www.taxtechnical.ird.govt.nz/determinations/depreciation/general/dep100-depreciation-rate-for-rapid-dc-car-charging-stations

[32] https://docs.bcuc.com/Documents/Proceedings/2021/DOC_61620_B-1-BCH-EV-FC-Rate-Application.pdf; page 30.

[33] BC Hydro F2023-2025 RRA, Exhibit B-2-1 Appendix T, page 24.

[34] BC Hydro F2023-2025 RRA, Exhibit B-7, BCUC IR 1.103.17.

actual/projected O&M expenses from 2018 to 2022. FBC notes the 2022 projected O&M includes all of FBC's 50 kW stations and actual data from six of FBC's 100 kW stations.

Table 3-4: Comparison of Original Forecast O&M used in the Revised Application and Actual/Projected O&M from 2018 to 2020

O&M	2018	2019	2020	2021	2022
Original Forecast in Revised Application ($000s)					
50 kW ($000s)	0.5	1.8	26.3	153.6	186.9
100 kW ($000s)	-	-	-	16.2	33.0
Total O&M ($000s)	**$ 0.5**	**$ 1.8**	**$ 26.3**	**$ 169.8**	**$ 219.9**
Actual/Projected O&M					
50 kW ($000s)	0.5	1.8	39.5	67.3	130.4
100 kW ($000s)	-	-	-	15.1	23.0
Subtotal	**$ 0.5**	**$ 1.8**	**$ 39.5**	**$ 82.4**	**$ 153.4**
Third-Party Utility - 50 kW ($000s)	-	-	6.4	18.1	34.0
Total O&M	**$ 0.5**	**$ 1.8**	**$ 45.9**	**$ 100.5**	**$ 187.5**

As shown in Table 3-4 above, the actual O&M costs were higher than the original forecast in 2020 but were lower than forecast in 2021 and 2022. The higher actual O&M costs in 2020 were primarily due to higher than expected network management costs since the number of stations more than doubled from 2019 to 2020, as well as the inclusion of PlugShare fees in 2020, which is the web-based portal that allows EV users to monitor availability of EV charging stations, including FBC's DCFC stations[35].

For 2021 and 2022, the savings in actual O&M costs compared to the original forecast in the Revised Application were mainly due to the reduced maintenance resulting from reduced usage during the COVID-19 pandemic. These savings were partially offset by the inclusion of electricity costs payable to third-party utilities (i.e., electricity bills for DCFC sites located in the service areas of third-party utilities such as Nelson Hydro, City of Penticton, Grand Forks, and BC Hydro).

Table 3-5 below is an updated 2023 O&M forecast for FBC's EV DCFC stations, which was also provided as part of FBC's 2023 Annual Review[36] and was developed based on the 2022 projected O&M level plus inflation. For the forecast of direct O&M costs (i.e., network management, repairs & maintenance, inspection fees and FBC internal labour) from 2024 and onward, FBC applied the inflation assumption as discussed in Section 3.2.1.6 to the 2023 forecast of direct O&M costs. For the forecasts of electricity costs from third-party utilities, FBC used the current effective rates from these individual utilities (i.e., $ per total kWh) plus 2 percent annual effective rate escalation,

[35] PlugShare (https://www.plugshare.com/). The original forecast in the Revised Application assumed the PlugShare costs would begin in 2021. However, the contract with PlugShare was executed in 2020, resulting in PlugShare costs for 2020 of $12.7 thousand.

[36] FBC 2023 Annual Review, BCUC IR1 12.1.

multiplied by the charging minutes forecasts for these stations as discussed in Section 3.2.1.3. Please also refer to Appendices A-1 to A-2 for the forecast O&M expenses to 2032 for both the 50 kW and 100 kW stations.

Table 3-5: 2023 Forecast of FBC's EV DCFC Service[37]

O&M	2023 Forecast
Network Management	47.2
Repairs and Maintenance	9.0
Inspection Fees	67.3
FBC Labour Costs	70.3
Subtotal Direct O&M ($000s)	**$ 193.8**
Third-Party Utilities (50 kW)	43.9
Total ($000s)	**$ 237.7**
Allocation	
50 kW (34 Stations) + Third-Party Utilities	200.8
100 kW (8 Stations)	36.9
Total ($000s)	**$ 237.7**

3.2.1.9 Transaction Fees

In the Revised Application, a transaction fee of 15 percent to FLO was included as part of the RS 96 rate design. There is no change related to this transaction fee, which remains at 15 percent. This fee covers the network management services provided by FLO (station status monitoring, remote diagnostics/upgrades, etc.), 24/7 telephone support for customers using the DCFC stations, as well as payment collection and processing.

3.2.1.10 Property Tax

There are no changes in property tax for FBC's EV stations. FBC EV charging revenues continue to be subject to the 1% in lieu property taxes. There is no property tax as the stations are on third-party land.

[37] FBC further updated the 2023 forecast of third-party utilities costs in Table 3-5 from the information provided in FBC's 2023 Annual Review. The third-party utilities costs provided during FBC's 2023 Annual Review inadvertently excluded the utility costs from BC Hydro for the New Denver and Nakusp sites as they were expected to transfer to BC Hydro earlier in 2022, however, the transfer happened in November 2022.

3.2.1.11 Income Taxes

There is no change to the calculation of income tax or the capital cost allowance (CCA) deduction, including the Accelerated Investment Incentive available from the Federal government for all qualifying expenditures made after November 20, 2018 and before January 1, 2028.

3.2.1.12 Earned Return

There is no change to the calculation of the earned return. In the financial models FBC used its approved capital structure for the years 2018 to 2022 when determining the earned return. In all periods, the equity thickness and return on equity (ROE) equalled 40 percent and 9.15 percent, respectively. For the years 2023 and onwards, FBC used the current approved capital structure and ROE, which is unchanged from 2018 to 2022, and the 2023 weighted average cost of capital of 5.73 percent[38].

FBC is currently participating in the BCUC-initiated Generic Cost of Capital (GCOC) proceeding and has filed evidence on its recommended capital structure and ROE as part of Stage 1 of the proceeding. In Order G-156-21 and accompanying Reasons for Decision, the BCUC found that the effective date to implement a new cost of capital will depend on the timing and progress of the GCOC proceeding. As there is no change to FBC's capital structure at the time of this Assessment Report, FBC continues to use the currently approved capital structure in its forecasts to 2032. However, as discussed in Section 3.2.2 below, the impact on the percentage recovery of costs from FBC's DCFC service due to FBC's proposed capital structure and ROE in the GCOC proceeding is small, at approximately 2 percent.

3.2.2 RS 96 Assessment with Updated EV DCFC Service Cost and Revenue Forecasts

Based on the updated inputs and assumptions, including actuals from 2018 to 2021, projected results for 2022 (with actuals up to and including November 2022 and one month of forecast), and an updated forecast for 2023, as discussed in Section 3.2.1 above, Table 3-6 below provides the forecast present value (PV) of FBC's 50 kW and 100 kW DCFC service over the evaluation period from 2018 to 2032. At the current RS 96 rates, the expected percentage recovery for the 50 kW stations is now approximately 82 percent and the expected percentage recovery for the 100 kW stations is approximately 73 percent over the evaluation period of 15 years (2018 to 2032). The overall percentage recovery for FBC's EV DCFC service based on current RS 96 rates is forecast to be approximately 80 percent over the 15-year period. Please refer to Appendices A-1 and A-2 for the updated financial schedules for the 50 kW and 100 kW stations, respectively. Please also refer to Appendix B for the financial schedules for the overall EV DCFC service (i.e., 50 kW and 100 kW combined). FBC notes that in a scenario where its proposed

[38] Approved on a permanent basis by Order G-382-22.

equity thickness and ROE in the GCOC proceeding is approved effective January 1, 2023[39], the percentage recovery of FBC's DCFC service will be reduced slightly by 2 percent to 78 percent.

The current RS 96 rates are set on a levelized basis and are designed to fully recover the cost of service of the 50 kW and 100 kW stations on a forecast basis over the evaluation period. However, as discussed in Section 2.2.1, the actual EV station usage has been less than expected between late 2020 and 2022 primarily due to the COVID-19 pandemic, which led to travel restrictions throughout the Province as well as a lack of EV vehicles being delivered. These circumstances were not factored into the original forecasts in the Revised Application, and it would not be reasonable for EV charging customers to pay for higher rates due to these unusual circumstances, which is consistent with the BCUC's determination regarding the recovery of FBC's COVID-19 Customer Recovery Fund Deferral Account:[40]

> The deferral account should be recovered from all customers because the impacts of COVID-19 were felt across the economy and in principle, should not be constrained to individual rate classes.

As such, FBC considers that it is reasonable to expect that the current RS 96 rates for both 50 kW and 100 kW stations will recover less than 100 percent of the forecast cost of service over the expected life of the assets from 2018 to 2032.

Table 3-6: Financial Assessment of RS 96 with Updated Costs and Revenues Forecast

($000s)	50 kW	100 kW	TOTAL
PV of Revenue Requirement (2018-2032)	3,213	1,239	4,452
PV of RS 96 Revenue (Exisitng Rates)	2,633	907	3,540
PV of Deficiency/(Surplus)	**581**	**331**	**912**
% Recovery	**82%**	**73%**	**80%**
Levelized Rate Impact (15 yrs)	**0.01%**	**0.01%**	**0.02%**

The levelized rate impact to FBC customers due to this under recovery is approximately 0.02 percent over the 15-year analysis period when compared to the forecast 2023 revenue requirement.[41] For an average residential customer, this levelized rate impact over 15 years is equivalent to an annual bill impact of 26 cents per year over the 15-year analysis period.

3.2.3 Upper Bound Scenario with Updated ZEV Sales Target

As discussed in Sections 2.2.1 and 3.2.1.3, the station usage growth rates in the Revised Application were developed based on the ZEV sales target from the ZEV Act at that time (i.e.,

[39] Equity thickness at 40 percent and ROE at 10 percent.
[40] Decision and Order G-382-22, p. 23.
[41] Approved on a permanent basis pursuant to Decision and Order G-382-22 dated December 22, 2022, subject to the changes identified in the Decision.

reaching 10 percent by 2025, 30 percent by 2030, and 100 percent by 2040). However, in the CleanBC Roadmap to 2030, the Province has now committed to increase the target of the ZEV Act with sales reaching 26 percent by 2026, 90 percent by 2030, and 100 percent by 2035. This increase is significant, as it is three times higher for the target by 2030 and has moved the timing of reaching 100 percent of ZEV sales to five years earlier.

Table 3-7 below provides an assessment of RS 96 if the growth rates of station usage are based on the updated ZEV target as shown in Table 3-3 of Section 3.2.1.3. It can be seen that at the existing RS 96 rates for both 50 kW and 100 kW stations, FBC's EV DCFC service will result in an overall PV surplus of approximately $1.690 million or recovery of 136 percent over the 15-year evaluation period, which will be a benefit to all FBC customers. FBC considers this to be an upper bound scenario for the current RS 96 rates if the updated targets under the ZEV Act materialize.

Table 3-7: Upper Bound Scenario of RS 96 Financial Assessment with Updated ZEV Target

($000s)	50 kW	100 kW	TOTAL
PV of Revenue Requirement (2018-2032)	3,400	1,277	4,677
PV of RS 96 Revenue (Exisitng Rates)	4,712	1,655	6,367
PV of Deficiency/(Surplus)	**(1,312)**	**(378)**	**(1,690)**
% Recovery	**139%**	**130%**	**136%**
Levelized Rate Impact (15 yrs)	**-0.03%**	**-0.01%**	**-0.04%**

3.3 *RS 96 RATES PROPOSED TO REMAIN UNCHANGED*

FBC is proposing to keep the RS 96 rates unchanged at $0.26 per minute for the 50 kW DCFC stations, and at $0.54 per minute for the 100 kW DCFC stations at this time.

First, FBC's RS 96 DCFC service has an accumulated surplus to-date based on actual/projected results from 2018 to 2022 primarily due to the monetization of the carbon credits in 2022 (for credits earned and validated in 2019 and 2020), which was discussed in Section 3.2.1.5 above. FBC expects to continue to monetize the carbon credits earned by its DCFC stations over the expected life of the assets and has included a forecast for these revenues in its updated forecast to 2032.

Second, as explained previously, while the current forecast of cost recovery over the 15-year evaluation period is less than 100 percent, this was primarily caused by the impact of the COVID-19 pandemic-related travel restrictions and the lack of EV deliveries on the EV DCFC growth rates between 2020 and 2022. Despite these events, the overall market conditions remain positive for FBC's EV DCFC services. For instance, the higher gas prices have helped to increase demand for electric vehicles which aligns well with the Province's more aggressive target of ZEV sales to be 90 percent by 2030 and 100 percent by 2035. Furthermore, usage of FBC's EV DCFC stations will improve as travel across the Province continues to increase after the lifting of COVID-19

pandemic travel restrictions and the lack of EV deliveries begins to resolve. FBC expects with all these factors combined, it is possible the usage of its stations could be higher than anticipated with the potential to be closer to the upper bound scenario discussed in Section 3.2.3 above, which will result in an overall surplus with benefits to all of FBC's customers.

Third, keeping the RS 96 rates unchanged ensures FBC's 50 kW DCFC rates remain relatively competitive with the existing market rates while preventing FBC's 100 kW DCFC stations, which are already currently the most expensive rates for 100 kW charging in BC, becoming even less competitive. Table 3-8 below shows that if the RS 96 rates are increased to ensure 100 percent cost recovery, on a forecast basis over the 15-year evaluation period, the rate for the 50 kW stations will have to be increased by approximately 24 percent and the 100 kW stations will have to be increased by approximately 37 percent starting in 2023. The higher rates will result in FBC's DCFC stations being significantly less competitive when compared to other providers. Further, expensive charging rates could reduce the attractiveness of EVs which might potentially limit sales and adoption of ZEV, thus making it more difficult for BC to reach the provincial target of ZEV sales in the ZEV Act.

Table 3-8: RS 96 Rates (Effective 2023) for 100 percent Cost Recovery

	Existing RS 96 Rates ($/min)	RS 96 Rates for 100% Recovery - Effective 2023 ($/min)	% Increase
50 kW	0.26	0.32	24%
100 kW	0.54	0.74	37%

Fourth, increasing the RS 96 rates to attempt to achieve 100 percent cost recovery on a forecast basis will not guarantee 100 percent actual cost recovery, as high and uncompetitive rates will likely result in reduced usage at FBC's stations relative to other DCFC service providers. Therefore, higher rates might still lead to an overall under recovery.

Fifth, the rate impact to FBC customers based on the current forecast of under recovery is small, at a levelized rate impact of 0.02 percent over a 15-year period, as discussed in Section 3.2.2.

Finally, as discussed in Section 4.1.2 below, FBC is likely to transition to some form of energy-based rate for its EV DCFC service once Measurement Canada approves energy-based metering and after FBC determines that it is compatible with its stations. As such, increasing the RS 96 rates now and changing the rates again, for example in 2023 or 2024 if Measurement Canada approves energy-based metering in 2023 (provided FBC's stations are compatible), to some form of energy-based rate could create confusion to customers who use FBC's DCFC stations.

For these reasons, FBC considers that it is not appropriate to increase the RS 96 rates in an attempt to achieve 100 percent cost recovery on a forecast basis.

3.4 *SUMMARY OF RS 96 DETAILED ASSESSMENT*

The RS 96 rates have been set at a reasonable level to recover FBC's cost of service for the EV DCFC stations. FBC's RS 96 DCFC service currently has an accumulated surplus projected to the end of 2022 (with actuals up to and including November 2022 plus one month of forecast). And over the expected service life of the assets the current rates are now forecast to recover approximately 80 percent of the overall forecast costs for EV DCFC service. Given the small rate impact to FBC customers over the expected life of the assets (to 2032) and potential to transition to an energy-based rate in a relatively short time frame as discussed in Section 4 below, FBC is proposing to keep the existing RS 96 rates unchanged at this time to ensure FBC's DCFC rates remain relatively competitive with other service providers.

4. ALTERNATIVE RS 96 RATE DESIGNS

In this section, FBC provides an assessment of alternative rate design options and a discussion of idling fees.

4.1 *ALTERNATIVE RATE DESIGN OPTIONS*

4.1.1 Time-Based Rates

FBC's current RS 96 rates are set on a time-based approach as there are currently no Measurement Canada approved meters for DCFC stations. The main disadvantage of time-based rates is that it assumes all EVs will charge at the same rate over the same time-period. However, depending on the make of the EVs as well as the conditions at the time of charging (e.g., temperatures, SOC[42] of the EV, etc.), some EVs might be drawing more kWh consumption than others within the same time-period. This might result in some customers being charged more or less than the electricity they actually consume.

4.1.2 Energy-Based Rates

Energy-based rates, i.e., a $ per kWh rate for the consumption of the EV during a charge (or partial energy-based rate) is a common rate design for DCFC service in the United States and other jurisdictions. However, an energy-based rate for FBC's DCFC service is not feasible at this time because there are currently no Measurement Canada approved meters for DCFC stations (Level 3+ EV charging device).

As discussed in FBC's 2023 Annual Review,[43] FBC filed a Dispensation Request from the *Electricity and Gas Inspection Act* with Measurement Canada on December 21, 2021 for an option to charge energy-based rates, to which FBC received a reply from Measurement Canada on February 10, 2022 stating temporary dispensation is not an option. Measurement Canada launched consultations in October 2022 to support the finalization of a framework that will allow kWh billing for Level 3+ EV charging devices already existing in the marketplace[44]. At the time of filing this Assessment Report, FBC does not have further information regarding the timing of the Measurement Canada consultation process, the timing for temporary dispensation for existing Level 3+ EV charging devices already in the marketplace, or the timing of Measurement Canada approved meters for Level 3+ EV charging devices.

FBC will consider energy-based rates for its EV DCFC stations after Measurement Canada approval. However, FBC notes that there will be a number of steps required before FBC can consider this rate design option even after Measurement Canada approval, including customer feedback and ensuring compatibility with FBC's stations. If FBC determines its stations are

[42] State of Charge, i.e., the level of charge relative to its capacity.
[43] FBC 2023 Annual Review, BCSEA IR1 8.1 and 8.2.
[44] https://www.ic.gc.ca/eic/site/mc-mc.nsf/eng/lm04949.html#Section2.0.

compatible and an energy-based rate (wholly or partially) is the preferred option for both FBC and its customers after Measurement Canada approval, FBC will apply to the BCUC to amend the rates under RS 96 to energy-based (or to incorporate some form of energy-based rates).

4.1.3 Cost-of-Service Based Rates

Cost-of-service based rates are set to recover the full cost-of-service (i.e., O&M, depreciation, electricity costs, income tax, earned return, etc.) of the assets. Rates can be set annual revenue requirements or on a levelized basis.

4.1.3.1 Annual Cost-of-Service Rates

An annual cost-of-service rate would typically be calculated through a revenue requirement application based on the forecast cost-of-service of FBC's DCFC stations in the following year. The rate is designed to recover the cost-of-service of the stations for that year and can be set based on time or energy; therefore, the rate will vary annually according to the cost-of-service profile of the stations, resulting in annual deficiencies or surpluses. This type of rate would increase rate volatility, and FBC believes this approach would create unnecessary confusion for customers that use FBC's DCFC stations. Furthermore, an annual cost-of-service rate will require all costs and demand to be forecast each year, which would increase administration and regulatory costs while decreasing regulatory efficiency.

A key feature of an annual cost-of-service rate is its potential to be uncompetitive in any given year. This is more likely to happen in the early years when the cost-of-service of the assets tends to be higher when compared to the later years, which is of particular concern when a rate is being designed to encourage adoption. It is also possible that an annual cost-of-service rate could be negative in any given year based on the forecast costs/credits each year as well as due to the timing of income tax recovery. Negative rates would not be something that FBC would consider reasonable or appropriate. Ultimately, a volatile and difficult to understand rate design has a significant potential to result in reduced usage of FBC's stations, particularly when compared to the stable rates being offered by other EV DCFC service providers.

4.1.3.2 Levelized Cost-of-Service Rates (Existing RS 96 Rate Design)

The existing RS 96 rates are currently approved to be set on a flat (levelized) basis. A levelized cost-of-service rate is a flat rate that is set to recover, on a forecast basis, the cost of service over the expected life of an asset, in this case the DCFC stations (i.e., 10 years). As with annual cost-of-service rates, there will be differences between the actual cost of service and the forecast cost of service, resulting in annual surpluses or deficiencies. Any surplus or deficiency between the actual cost of service and the flat levelized rates can be trued-up when setting the flat levelized rate again over the next period or can be recovered from or returned to FBC's other customers each year (which is the current RS 96 rate design). Having a flat levelized rate over the analysis period promotes rate stability and consistency for EV charging customers, which ultimately

promotes ease of understanding for customers. FBC notes that although its current levelized RS 96 rates are time-based, a levelized approach could also be used with energy-based rates.

One potential disadvantage of levelized rates is that there is greater potential for variances due to the longer time period over which the rates are forecast. Although variances are to be expected each year (since the rates are not set to match the annual cost of service profile), periodic review of the accumulated surplus or deficiency compared to the forecast will help to monitor if changes are required.

4.1.4 Market-Based Rates

A market-based rate is a rate that is set at or below competitors' pricing, which can be set based on time or energy. Market based rates would require regular review and monitoring. Such a rate design could increase the usage of the stations over other service providers; however, it could also increase risk for FBC's non-EV customers if the rate design requires further lowering of rates in order to be competitive with other providers. In such a case, the rate may not sufficiently recover the cost of service of the stations. A market-based rate could also potentially undermine the competitive market of EV DCFC service. As noted in the BCUC's Decision and Order G-341-21:[45]

> the Panel considers the appropriate rate design principle should be an aim to minimize any recovery from FBC's other ratepayers for this service regardless of whether that results in an over-or under collection of the cost of service in any given year, providing that the resulting rate isn't set at a rate that will undermine the competitive market. Given this and the developing nature of the EV charging market, the rates should be re-evaluated in the future to determine whether they are still appropriate.
>
> That said, we recognize the challenges of evaluating and comparing rates in a competitive market, in particular, how to determine what the equilibrium market price would be in the absence of a competitor with a subsidized rate. To be clear, we do not consider it inappropriate that FBC be the leader in setting an equilibrium market price – provided there is no subsidization, by customers of FBC's regulated services, of the fully allocated cost of the EV fast charging service. However, if there is subsidization, we must exercise caution in approving the rate exclusively on a cost-of-service basis. In that circumstance, we find that the approved rate must not undermine the ability of a competitive market to operate and continue to grow, as that would be a rate that is not unjust, unreasonable, unduly discriminatory or unduly preferential.

As discussed in Section 2.3, the current rate of FBC's 50 kW stations at $0.26 per minute is reasonably comparable with other service providers that offer 50 kW charging. However, the current rate for FBC's 100 kW stations at $0.54 per minute is amongst the most expensive out of

[45] Decision and Order G-341-21, pp. 16-17.

all service providers in BC (including stations with higher capacity that are also capable of providing 100 kW charging), suggesting that if FBC were to set its rates based on the market, FBC's rate for its 100 kW stations could be set lower and be closer to other service providers; however, it may increase the risk of further under-recovering the costs of the 100 kW stations.

4.1.5 Common RS 96 Rates for All Output Capacity Stations

FBC considered combining the 50 kW and 100 kW station rates into one common rate for all stations. There are some small administrative benefits when combining the rates for the 50 kW and 100 kW stations, as FBC would not have to track the 50 kW and 100 kW stations separately in order to calculate the cost of service.

FBC chose not to combine the 50 kW and 100 kW rates because such an approach does not adhere to the rate-setting principles identified by Dr. Bonbright,[46] e.g., Principle 2 (Fair Apportionment of Costs among Customers) and Principle 3 (Price signals that encourage efficient use and discourage inefficient use). The 100 kW stations are generally more expensive than 50 kW stations and have a higher electricity cost over the same amount of charging time due to the higher output capacity (i.e., higher consumption costs as well as demand charge). FBC's current rate for the 100 kW stations is higher than the 50 kW stations, reflecting the higher capital and electricity costs. Having a common rate for both 50 kW and 100 kW stations will also result in cross-subsidization from the users of the 50 kW stations to the users of the 100 kW stations.

FBC may consider the potential of a common energy-based (either wholly or partially) rate for both 50 kW and 100 kW station rates if energy-based metering is available. The issue of cross-subsidization could be limited if the common rate between 50 kW and 100 kW stations is energy-based (i.e., $ per kWh). This is because the users of 100 kW stations will continue to pay more than the users of 50 kW stations due to the 100 kW stations having a higher kWh load than the 50 kW stations over the same period of charging time.

4.2 *COMPARISON BETWEEN ALTERNATIVE RATE DESIGN OPTIONS*

Table 4-1 below summarizes the different rate design options for FBC's EV DCFC service. As discussed in Section 3.3, FBC proposes to keep the RS 96 rates for both 50 kW and 100 kW stations unchanged as it offers the best balance between cost recovery and competitiveness when compared to other service providers within the Province.

[46] James C. Bonbright, *Principles of Public Utility Rates,* 2nd Edition (Public Utility Reports, Inc., 1961) March 1988.

Table 4-1: Pros and Cons of Alternative Rate Design Options for RS 96

Rate Design Options	Pros	Cons
Time-Based	- Only option at the moment as there is no Measurement Canada approved energy-based metering for DCFC	- Customers are not charged for the amount of electricity they have consumed - It assumes all EVs are the same in terms of charging speed
Energy-Based (Wholly or Partially)	- Customer will be charged for the amount of electricity they have consumed - Best alignment between costs by the customer and recovery in rates	- Not feasible at the moment as there is no Measurement Canada approved energy-based metering for DCFC stations
Annual Cost-of-Service Rates (Time-based or Energy-Based)	- Aligns with annual cost of service profile thus improving the cost recovery in each year	- Increase rate volatility and inconsistent rates - Increase confusion with customers - Maybe not be competitive in any given year - Increase administration and regulatory costs as it requires forecasts annually in Revenue Requirement Applications
Levelized Cost-of-Service Rates – (Time-based or Energy-Based)	- Promote rate stability and consistency - Easy to understand - Will recover the cost of service, on a forecast basis, over a period of time - Relatively competitive based on current RS 96 rates (50 kW stations)	- Does not follow the annual cost of service profile, therefore will result in deficiency/surplus in any given year which will be recovered or returned to FBC's other customers - Subject to forecast uncertainty
Market-Based (Time-based or Energy-Based)	- Potential to increase usage of FBC's stations at the expense of other providers' station	- Increase risk of not recovering the cost of service of the stations if market rate is below cost-of-service rate - Would require periodic review, market research, and monitoring
Common Rates for all Output (Time-based or Energy-Based)	- Reduce administrative costs - Works well with energy-based rates - If under common time-based rate, it might increase utilization of the 100 kW stations	- Increase cross subsidization between 50 kW users and 100 kW users

4.3 *IDLING FEES*

FBC considered, but dismissed, the option of adding an idling fee. FBC considers it unnecessary at this time as it has not experienced idling issues to date based on FBC's observation at its stations and so far, there has been a lack of complaints from customers about this issue. Although FBC does not believe an idling fee is currently required, any future idling fees would be subject to BCUC review and approval as amendments to RS 96. FBC will continue to monitor its stations and customer feedback and may consider implementing an idling fee in the future if it receives feedback or complaints on this issue.

4.4 *SUMMARY*

Given an energy-based rate design is not currently feasible without Measurement Canada approved meters for DCFC, FBC considers the preferred rate design for its EV DCFC service continues to be a time-based, levelized rate design and is proposing to keep the current RS 96 rates and rate design unchanged at this time. A flat, time-based levelized rate over the analysis period promotes rate stability and consistency for customers and offers the best balance between cost recovery and competitiveness when compared to other service providers within the Province.

5. CONCLUSION

As directed by Order G-341-21, this Assessment Report provides an assessment of FBC's EV DCFC service under RS 96 based on actuals from 2018 to November 2022 and updated forecasts and assumptions over the expected life of the stations.

FBC's RS 96 DCFC service currently has an accumulated surplus projected to the end of 2022 despite the COVID-19 pandemic which was not anticipated at the time of the Revised Application and resulted in significant reduced usage at FBC's DCFC stations. With updated assumptions using actual information and experience to-date, FBC is now forecasting to recover approximately 82 percent of the cost of service for its 50 kW stations and 73 percent for its 100 kW stations over a 15-year analysis period (2018 to 2032), based on existing RS 96 rates. The overall recovery of FBC's DCFC service is forecast to be 80 percent over the 15-year analysis period. The levelized rate impact to FBC customers of this under recovery is small at 0.02 percent per year over a 15-year analysis period. If using the upper bound scenario of station usage growth rates based on the new ZEV target, the existing RS 96 rates would be forecast to recover approximately 136 percent of the cost of service of FBC's DCFC service over a 15-year period.

Given the reasonable level of recovery despite the COVID-19 pandemic and the small levelized rate impact to FBC's customers, FBC is proposing to keep the RS 96 rates unchanged at $0.26 per minute for the 50 kW DCFC stations, and $0.54 per minute for the 100 kW DCFC stations.

Appendix A-1
50 KW FINANCIAL SCHEDULE

FortisBC Inc.
EV Charging Stations Review - 50 kW Stations
Schedule 1
November 2022
($000s), unless otherwise stated

Line	Particulars	Reference	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
1	**Cost of Service**																
2	Cost of Energy		-	-	-	-	134	158	175	191	209	233	264	303	350	404	470
3	Operation & Maintenance	Line 20	0	2	46	85	164	201	220	242	266	299	342	396	461	539	636
4	Property Taxes	Line 25	-	-	(0)	(0)	2	2	(1)	4	7	7	7	7	6	6	6
5	Depreciation Expense	Line 48	-	60	197	307	386	461	465	465	468	470	473	492	532	570	600
6	Amortization Expense on CIAC	Line 61	-	(35)	(70)	(150)	(171)	(201)	(206)	(206)	(206)	(206)	(206)	(206)	(206)	(170)	(135)
7	Other Revenue - Carbon Credits	-Line 113	-	-	-	-	(602)	(495)	(160)	(212)	(267)	(327)	(411)	(519)	(650)	(805)	(982)
8	NRCan Repayment	Schedule 2, Line 21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Income Taxes	Line 99	(9)	(361)	(72)	(128)	(117)	109	110	107	103	101	61	(41)	(130)	(147)	(373)
10	Earned Return	Line 84	6	53	95	109	127	136	123	107	92	76	85	148	229	269	302
11	**Incremental Annual Revenue Requirement**	Sum of Line 2 to Line 10	**(2)**	**(282)**	**196**	**224**	**(76)**	**370**	**728**	**699**	**672**	**654**	**616**	**580**	**593**	**665**	**(65)**
12	PV of Revenue Requirement	Line 11 / (1 + Line 86)^Yr	(2)	(251)	165	179	(58)	265	493	447	407	374	333	297	287	305	(28)
13	**Total PV of Annual Revenue Requirement**	Sum of Line 12	***3,213***														
14																	
15	**Operation & Maintenance**																
16	Labour Costs		0	2	39	67	130	157	160	163	166	170	173	177	180	184	187
17	Non-Labour Costs		-	-	6	18	34	44	60	79	99	129	169	219	281	355	449
18	Total Gross O&M Expenses	Line 16 + Line 17	0	2	46	85	164	201	220	242	266	299	342	396	461	539	636
19	Less: Capitalized Overhead	Overhead Rate of 0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	**Net O&M Expenses**	Line 18 + Line 19	0	2	46	85	164	201	220	242	266	299	342	396	461	539	636
21																	
22	**Property Taxes**																
23	General, School and Other		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	1% in Lieu of General Municipal Tax[1]	1% of Line 11	-	-	(0)	(0)	2	2	(1)	4	7	7	7	7	6	6	6
25	**Total Property Taxes**	Line 23 + Line 24	-	-	(0)	(0)	2	2	(1)	4	7	7	7	7	6	6	6
26	1 - Calculation is based on the second preceding year, e.g. 2020 is based on 2018 revenue																
27																	
28	**Capital Spending**																
29	Project Capital Spending[2]		599	1,644	1,164	783	1,075	176	-	25	26	26	788	1,677	1,448	1,084	1,507
30	Cost of Removal		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31	Contributions in Aid of Construction (CIAC)		(423)	(415)	(950)	(259)	(503)	(54)	-	-	-	-	-	-	-	-	-
32	Total Annual Project Cost - Capital	Line 29 + Line 30	176	1,229	214	524	571	122	-	25	26	26	788	1,677	1,448	1,084	1,507
33																	
34	**Total Project Cost (incl. AFUDC)**	**Sum of Line 29**	**12,020**														
35	**Net Project Cost (incl. Removal and/or CIAC)**	**Sum of Line 32**	**9,416**														
36	2 - Excluding capitalized overhead																
37																	

FortisBC Inc.
EV Charging Stations Review - 50 kW Stations
Schedule 1
November 2022
($000s), unless otherwise stated

Line	Particulars	Reference	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
38	**Gross Plant in Service (GPIS)**																
39	GPIS - Beginning	Preceding Year, Line 43	-	599	2,243	3,406	4,189	4,939	5,115	5,115	5,140	5,165	5,191	5,380	5,785	6,159	6,460
40	Additions to Plant[3]		599	1,644	1,164	783	1,075	176	-	25	26	26	788	1,677	1,448	1,084	1,507
41	Retirements		-	-	-	-	(325)	-	-	-	-	-	(599)	(1,272)	(1,073)	(783)	(1,075)
42	Net Addition to Plant	Sum of Line 40 to 41	599	1,644	1,164	783	749	176	-	25	26	26	189	405	374	302	433
43	GPIS - Ending	Line 39 + Line 42	599	2,243	3,406	4,189	4,939	5,115	5,115	5,140	5,165	5,191	5,380	5,785	6,159	6,460	6,893
44	3 - Includes capitalized overhead																
45																	
46	**Accumulated Depreciation**																
47	Accumulated Depreciation - Beginning	Preceding Year, Line 50	-	-	(60)	(257)	(565)	(670)	(1,130)	(1,596)	(2,061)	(2,529)	(2,999)	(2,873)	(2,093)	(1,552)	(1,338)
48	Depreciation Expense[4]	Line 39 @ 8.37%	-	(60)	(197)	(307)	(386)	(461)	(465)	(465)	(468)	(470)	(473)	(492)	(532)	(570)	(600)
49	Retirements		-	-	-	-	281	-	-	-	-	-	599	1,272	1,073	783	1,075
50	Accumulated Depreciation - Ending	Sum of Line 47 to 49	-	(60)	(257)	(565)	(670)	(1,130)	(1,596)	(2,061)	(2,529)	(2,999)	(2,873)	(2,093)	(1,552)	(1,338)	(864)
51	4 - Depreciation & Amortization Expense calculation is based on opening balance x composite depreciation rate; The weighted-avg. rate of all assets addition to plant is 8.37%																
52																	
53	**Contributions in Aid of Construction (CIAC)**																
54	CIAC - Beginning	Preceding Year, Line 57	-	(423)	(838)	(1,788)	(2,047)	(2,402)	(2,456)	(2,456)	(2,456)	(2,456)	(2,456)	(2,456)	(2,456)	(2,033)	(1,618)
55	Additions		(423)	(415)	(950)	(259)	(503)	(54)	-	-	-	-	-	-	-	-	-
56	Retirements		-	-	-	-	149	-	-	-	-	-	-	-	423	415	950
57	CIAC - Ending	Sum of Line 54 to 56	(423)	(838)	(1,788)	(2,047)	(2,402)	(2,456)	(2,456)	(2,456)	(2,456)	(2,456)	(2,456)	(2,456)	(2,033)	(1,618)	(668)
58																	
59	**Accumulated Amortization of Contributions in Aid of Construction (CIAC)**																
60	Accumulated Amortization of CIAC - Beginning	Preceding Year, Line 63	-	-	35	105	255	278	479	685	890	1,096	1,301	1,507	1,712	1,495	1,251
61	Amortization (over 12 yrs)	Line 54 @ 8.37%	-	35	70	150	171	201	206	206	206	206	206	206	206	170	135
62	Retirements		-	-	-	-	(149)	-	-	-	-	-	-	-	(423)	(415)	(950)
63	Accumulated Amortization of CIAC - Ending	Sum of Line 60 to 62	-	35	105	255	278	479	685	890	1,096	1,301	1,507	1,712	1,495	1,251	436
64																	
65	**Rate Base and Earned Return**																
66	Gross Plant in Service - Beginning	Line 39	-	599	2,243	3,406	4,189	4,939	5,115	5,115	5,140	5,165	5,191	5,380	5,785	6,159	6,460
67	Gross Plant in Service - Ending	Line 43	599	2,243	3,406	4,189	4,939	5,115	5,115	5,140	5,165	5,191	5,380	5,785	6,159	6,460	6,893
68																	
69	Accumulated Depreciation - Beginning	Line 47	-	-	(60)	(257)	(565)	(670)	(1,130)	(1,596)	(2,061)	(2,529)	(2,999)	(2,873)	(2,093)	(1,552)	(1,338)
70	Accumulated Depreciation - Ending	Line 50	-	(60)	(257)	(565)	(670)	(1,130)	(1,596)	(2,061)	(2,529)	(2,999)	(2,873)	(2,093)	(1,552)	(1,338)	(864)
71																	
72	CIAC - Beginning	Line 54	-	(423)	(838)	(1,788)	(2,047)	(2,402)	(2,456)	(2,456)	(2,456)	(2,456)	(2,456)	(2,456)	(2,456)	(2,033)	(1,618)
73	CIAC - Ending	Line 57	(423)	(838)	(1,788)	(2,047)	(2,402)	(2,456)	(2,456)	(2,456)	(2,456)	(2,456)	(2,456)	(2,456)	(2,033)	(1,618)	(668)
74																	
75	Accumulated Amortization of CIAC - Beginning	Line 60	-	-	35	105	255	278	479	685	890	1,096	1,301	1,507	1,712	1,495	1,251
76	Accumulated Amortization of CIAC - Ending	Line 63	-	35	105	255	278	479	685	890	1,096	1,301	1,507	1,712	1,495	1,251	436
77																	
78	Net Plant in Service, Mid-Year	(Sum of Lines 66 to Line 76) / 2	88	778	1,423	1,650	1,989	2,076	1,877	1,630	1,394	1,157	1,298	2,253	3,509	4,412	5,276
79	Cash Working Capital	Line 43 x FBC CWC/Closing GPIS %	2	7	10	12	15	15	15	15	15	15	16	17	18	19	20
80	**Total Rate Base**	**Sum of Line 78 to 79**	**90**	**785**	**1,433**	**1,662**	**2,003**	**2,091**	**1,892**	**1,645**	**1,410**	**1,172**	**1,314**	**2,270**	**3,527**	**4,137**	**4,644**
81																	
82	Equity Return	Line 80 x ROE x Equity %	3	29	52	61	73	77	69	60	52	43	48	83	129	151	170
83	Debt Component	[5]	3	24	42	48	54	59	54	47	40	33	37	64	100	117	132
84	**Total Earned Return**	**Line 82 + Line 83**	**6**	**53**	**95**	**109**	**127**	**136**	**123**	**107**	**92**	**76**	**85**	**148**	**229**	**269**	**302**
85	Return on Rate Base %	Line 84 / Line 80	6.69%	6.71%	6.60%	6.54%	6.35%	6.50%	6.50%	6.50%	6.50%	6.50%	6.50%	6.50%	6.50%	6.50%	6.50%
86	After- Tax Weighted Average Cost of Capital (WACC)	[6]	5.87%	5.89%	5.77%	5.76%	5.62%	5.73%	5.73%	5.73%	5.73%	5.73%	5.73%	5.73%	5.73%	5.73%	5.73%
87	5 - Line 80 x (LTD Rate x LTD% + STD Rate x STD %)																
88	6 - ROE Rate x Equity Component + [(STD Rate x STD Portion) + (LTD Rate x LTD Portion)] x (1- Income Tax Rate)]																
89																	

FortisBC Inc.
EV Charging Stations Review - 50 kW Stations
Schedule 1
November 2022
($000s), unless otherwise stated

Line	Particulars	Reference	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
90	**Income Tax Expense**																
91	Earned Return	Line 84	6	53	95	109	127	136	123	107	92	76	85	148	229	269	302
92	Deduct: Interest on debt	Line 83	(3)	(24)	(42)	(48)	(54)	(59)	(54)	(47)	(40)	(33)	(37)	(64)	(100)	(117)	(132)
93	Add: Depreciation Expense	Line 48	-	60	197	307	386	461	465	465	468	470	473	492	532	570	600
94	Deduct: CIAC Amortization	Line 61	-	(35)	(70)	(150)	(171)	(201)	(206)	(206)	(206)	(206)	(206)	(206)	(206)	(170)	(135)
95	Deduct: Capital Cost Allowance	Line 107 (Include CCA from 2018)	(26)	(1,028)	(375)	(565)	(604)	(42)	(31)	(31)	(34)	(36)	(151)	(479)	(808)	(948)	(1,055)
96	Taxable Income After Tax	Sum of Line 91 to 95	(23)	(975)	(195)	(346)	(316)	294	298	289	280	272	164	(110)	(352)	(397)	(1,009)
97	Income Tax Rate		27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%
98																	
99	**Total Income Tax Expense**	Line 96 / (1 - Line 97) x Line 97	**(9)**	**(361)**	**(72)**	**(128)**	**(117)**	**109**	**110**	**107**	**103**	**101**	**61**	**(41)**	**(130)**	**(147)**	**(373)**
100																	
101	**Capital Cost Allowance**																
102	Opening Balance	Proceeding Year, Line 108	-	150	350	315	274	241	320	289	283	275	265	902	2,099	2,739	2,875
103	Additions to Plant	Line 29	599	1,644	1,164	783	1,075	176	-	25	26	26	788	1,677	1,448	1,084	1,507
104	Less: AFUDC	Line 29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
105	Less: CIAC	Line 31	(423)	(415)	(824)	(259)	(503)	(54)	-	-	-	-	-	-	-	-	-
106	Net Addition for CCA	Sum of Line 103 through 105	176	1,229	339	524	571	122	-	25	26	26	788	1,677	1,448	1,084	1,507
107	**CCA**	**[Line 102 + (Line 106/2)] x CCA Rate**	**(26)**	**(1,028)**	**(375)**	**(565)**	**(604)**	**(42)**	**(31)**	**(31)**	**(34)**	**(36)**	**(151)**	**(479)**	**(808)**	**(948)**	**(1,055)**
108	Closing Balance	Line 102 + Line 106 + Line 107	150	350	315	274	241	320	289	283	275	265	902	2,099	2,739	2,875	3,327
109																	
110	**Carbon Credit**																
111	Credit Monetized		-	-	-	-	1,337	1,525	491	651	823	1,006	1,264	1,597	2,001	2,477	3,022
112	Carbon Price ($/tonne)		-	-	-	-	450	325	325	325	325	325	325	325	325	325	325
113	Carbon Credit Revenue ($000s)	Line 111 x Line 112	-	-	-	-	602	495	160	212	267	327	411	519	650	805	982
114																	

FortisBC Inc.
EV Charging Stations Review - 50 kW Stations
Schedule 2
November 2022
($000s), unless otherwise stated

Line	Particulars	Reference	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
1	Revenue (Rate from this model)		4	24	28	58	90	128	172	220	273	348	446	567	712	882	1,094
2																	
3	**Expenses**																
4	Carbon Credits	Schedule 1 , Line 7	-	-	-	-	(602)	(495)	(160)	(212)	(267)	(327)	(411)	(519)	(650)	(805)	(982)
5	Cost of Energy Sold	Schedule 1 , Line 2	-	-	-	-	134	158	175	191	209	233	264	303	350	404	470
6	Operation and Maintenance	Schedule 1 , Line 3	0	2	46	85	164	201	220	242	266	299	342	396	461	539	636
7	Property Taxes	Schedule 1 , Line 4	-	-	(0)	(0)	2	2	(1)	4	7	7	7	7	6	6	6
8	Depreciation Expense	Schedule 1 , Line 5	-	60	197	307	386	461	465	465	468	470	473	492	532	570	600
9	Amortization Expense	Schedule 1 , Line 6	-	(35)	(70)	(150)	(171)	(201)	(206)	(206)	(206)	(206)	(206)	(206)	(206)	(170)	(135)
10	Total Expenses	Sum of Lines 5 through 9	0	26	173	243	(86)	126	495	485	477	477	470	473	494	543	594
11																	
12	Operating Income	Line 1 - Line 10	3	(2)	(145)	(185)	176	2	(323)	(265)	(204)	(129)	(24)	94	218	339	500
13	Interest	Schedule 1 , Line 83	3	24	42	48	54	59	54	47	40	33	37	64	100	117	132
14	Earnings Before income taxes	Line 12 - Line 13	1	(26)	(187)	(232)	122	(57)	(377)	(311)	(244)	(162)	(61)	30	118	222	368
15	Income tax (recovery)	Line 36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	Net Earnings	Line 14 - Line 15	1	(26)	(187)	(232)	122	(57)	(377)	(311)	(244)	(162)	(61)	30	118	222	368
17	Cumulative Net Earnings	Cumulative Sum of Line 16	1	(25)	(213)	(445)	(323)	(380)	(757)	(1,068)	(1,312)	(1,474)	(1,535)	(1,505)	(1,387)	(1,165)	(797)
18	Repayment to Canada (True/False)	If Cumulative Sum of Line 17 Positive Than True, if Negative Than False	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
19																	
20	Repayment Ratio	Schedule 6, - Line 20 / Line 26	48%	48%	48%	48%	48%	48%	48%	48%	48%	48%	48%	48%	48%	48%	48%
21	Repayment Amount	If Line 17 Positive Than, Line 17 x Line 20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	Remaining Amount to be repaid	-(Schedule 1 , Line 54) - Line 21	-	423	838	1,788	2,047	2,402	2,456	2,456	2,456	2,456	2,456	2,456	2,456	2,033	1,618
23																	
24	Year		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
25																	
26	Income Tax Calculations																
27																	
28	Income before Tax	Line 14	1	(26)	(187)	(232)	122	(57)	(377)	(311)	(244)	(162)	(61)	30	118	222	368
29	Add: Depreciation (Net of CIAC Amortizartion)	Line 8	-	25	127	158	214	260	260	260	262	265	267	286	327	399	464
30	Taxable Income before CCA	Line 28 + Line 29	1	(2)	(60)	(75)	337	202	(117)	(52)	18	103	206	316	445	621	832
31	Deduct: CCA	Schedule 1 , Line 107	(26)	(1,028)	(375)	(565)	(604)	(42)	(31)	(31)	(34)	(36)	(151)	(479)	(808)	(948)	(1,055)
32	Net income/(loss) for tax purposes	Line 30 + Line 31	(26)	(1,030)	(435)	(640)	(267)	160	(148)	(82)	(16)	67	55	(163)	(363)	(327)	(223)
33	Non-capital loss applied	If Line 32 Positive Than Apply Available Non-capital loss from Line 39	-	-	-	-	-	(160)	-	-	-	(67)	(55)	-	-	-	-
34	Taxable income/(loss)	Line 32 + Line 33	(26)	(1,030)	(435)	(640)	(267)	-	(148)	(82)	(16)	-	-	(163)	(363)	(327)	(223)
35	Tax Rate	Schedule 1 , Line 97	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%
36	Income Tax Expense	If Line 34 Positive Than, Line 34 x Line 35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37																	
38	Non-capital Loss Continuity																
39	Opening Balance	Prior Year Closing Balance, Line 42	-	26	1,056	1,490	2,130	2,398	2,237	2,385	2,468	2,483	2,417	2,362	2,525	2,888	3,215
40	Additions	Net (loss) -Line 32	26	1,030	435	640	267	-	148	82	16	-	-	163	363	327	223
41	Loss applied	Line 33	-	-	-	-	-	(160)	-	-	-	(67)	(55)	-	-	-	-
42	Closing Balance	Sum of Lines 39 through 41	26	1,056	1,490	2,130	2,398	2,237	2,385	2,468	2,483	2,417	2,362	2,525	2,888	3,215	3,438

FortisBC Inc.
EV Charging Stations Review - 50 kW Stations
Schedule 3
November 2022
($000s), unless otherwise stated

Line	Particulars	Reference	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
1																	
2	Incremental Annual Revenue Requirement	Schedule 1, Line 11	(2)	(282)	196	224	(76)	370	728	699	672	654	616	580	593	665	(65)
3	PV of Revenue Requirement (After-tax WACC of 5.87%)	Line 2 / (1 + Line 38)^Yr	(2)	(251)	165	179	(58)	265	493	447	407	374	333	297	287	305	(28)
4	**Total PV of Annual Revenue Requirement**	Sum of Line 3	***3,213***														
5																	
6			Interim	Interim	Interim	Interim	Permanent	Permanent	Permanent	Permanent	Permanent	Permanent	Permanent	Permanent	Permanent	Permanent	Permanent
7	RS 96 Rate - 50 kW ($/min)		0.30	0.30	0.30	0.30	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
8	Less: 15% Transaction Fee	-Line 7 x 15%	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0)	(0)
9	RS 96 Rate (50 kW) - Revenue Requirement ($/min)	Line 7 + Line 8	0.26	0.26	0.26	0.26	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
10																	
11	Number of Charging Minutes per Year		15,309	94,386	110,504	229,342	405,423	578,530	777,551	996,389	1,235,471	1,575,062	2,017,870	2,566,462	3,223,260	3,990,690	4,948,729
12	RS 96 Revenue - 50 kW	Line 9 x Line 11 / 1,000	4	24	28	58	90	128	172	220	273	348	446	567	712	882	1,094
13	PV of RS 96 Revenue - 50 kW	Line 9 / (1 + Line 38)^Yr	4	21	24	47	68	92	116	141	165	199	242	291	345	404	474
14	Total PV of RS 96 Revenue - 50 kW	Sum of Line 13	**2,633**														
15	**% Recovery - 50 kW**	**Line 14 / Line 4**	**82%**														
16																	
17	Deficiency / (Surplus)	Line 2 - Line 12	(6)	(306)	168	165	(166)	242	556	478	399	305	170	13	(119)	(217)	(1,158)
18	PV of Deficiency / (Surplus) - 50 kW	Line 14 / (1 + Line 38)^Yr	(6)	(273)	142	132	(126)	173	376	306	241	175	92	6	(58)	(99)	(502)
19	Total PV of Deficiency / (Surplus) - 50 kW	Sum of Line 18	**581**														
20																	
21	2023 Revenue Requirement (Interim)	G-349-22	426,073	426,073	426,073	426,073	426,073	426,073	426,073	426,073	426,073	426,073	426,073	426,073	426,073	426,073	426,073
22	PV of 2023 Revenue Requirement (Interim)	Line 21 / (1 + Line 38)^Yr	402,435	380,003	360,119	340,523	324,121	304,958	288,425	272,788	257,999	244,012	230,783	218,271	206,438	195,246	184,661
23	Total PV of 2023 Revenue Requirement (Interim)	Sum of Line 22	**4,210,785**														
24	**Levelized % Increase (15 yrs) on 2023 Rate**	**Line 19 / Line 23**	**0.014%**														
25																	
26	***Levelized $ per Minute Rate - Recalculation***																
27	Number of Charging Minutes per Year	Line 11	15,309	94,386	110,504	229,342	405,423	578,530	777,551	996,389	1,235,471	1,575,062	2,017,870	2,566,462	3,223,260	3,990,690	4,948,729
28	RS 96 Rate - 50 kW ($/min) - Interim/Permanent	Line 9	0.26	0.26	0.26	0.26	0.22										
29	RS 96 Rate - 50 kW ($/min) - Update Jan 1, 2023	**Excel Solver resulting Line 32 = Line 4**	-	-	-	-	-	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27
30	RS 96 Revenue - 50 kW Recalculated	**(Line 28 + Line 29) x Line 27 / 1,000**	4	24	28	58	90	158	212	272	337	430	551	700	880	1,089	1,351
31	PV of RS 96 Revenue - 50 kW Recalculated	Line 30 / (1 + Line 38)^Yr	4	21	24	47	68	113	144	174	204	246	298	359	426	499	585
32	Total PV of RS 96 Revenue - 50 kW Recalculated	Sum of Line 31	**3,213**														
33																	
34	Levelized $ per minute rate to recover Cost of Service (2023 to 2030)	Line 4 x 1,000 / Line 29	0.27														
35	Transaction Fee Percentage		15%														
36	Levelized $ per minute rate - 50 kW (incl. Trans Fee)	Line 34 / (1 - Line 35)	**0.32**														
37																	
38	After- Tax Weighted Average Cost of Capital (WACC)	[1]	5.87%	5.89%	5.77%	5.76%	5.62%	5.73%	5.73%	5.73%	5.73%	5.73%	5.73%	5.73%	5.73%	5.73%	5.73%
39	1 - ROE Rate x Equity Component + [(STD Rate x STD Portion) + (LTD Rate x LTD Portion)] x (1- Income Tax Rate)]																

Appendix A-2
100 KW FINANCIAL SCHEDULE

FortisBC Inc.
EV Charging Stations Review - 100 kW Stations
Schedule 3
November 2022
($000s), unless otherwise stated

Line	Particulars	Reference	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
1																	
2	Incremental Annual Revenue Requirement	Schedule 1, Line 11	-	-	-	(141)	100	272	258	249	238	228	218	206	191	160	189
3	PV of Revenue Requirement (After-tax WACC of 5.76%)	Line 2 / (1 + Line 38)^Yr	-	-	-	(112)	76	195	175	159	144	131	118	105	93	73	82
4	**Total PV of Annual Revenue Requirement**	Sum of Line 3	***1,239***														
5																	
6							Permanent	Permanent	Permanent	Permanent	Permanent	Permanent	Permanent	Permanent	Permanent	Permanent	Permanent
7	RS 96 Rate - 100 kW ($/min)		-	-	-	-	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54
8	Less: 15% Transaction Fee	-Line 7 x 15%	-	-	-	-	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
9	RS 96 Rate (100 kW) - Revenue Requirement ($/min)	Line 7 + Line 8	-	-	-	-	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
10																	
11	Number of Charging Minutes per Year		-	-	-	16,539	53,016	100,266	134,759	172,686	214,122	272,977	349,720	444,798	558,629	691,633	857,672
12	RS 96 Revenue - 100 kW	Line 9 x Line 11 / 1,000	-	-	-	-	24	46	62	79	98	125	161	204	256	317	394
13	PV of RS 96 Revenue - 100 kW	Line 9 / (1 + Line 38)^Yr	-	-	-	-	19	33	42	51	60	72	87	105	124	145	171
14	Total PV of RS 96 Revenue - 100 kW	Sum of Line 13	**907**														
15	**% Recovery - 100 kW**	**Line 14 / Line 4**	**73%**														
16																	
17	Deficiency / (Surplus)	Line 2 - Line 12	-	-	-	(141)	76	226	196	170	140	103	58	2	(65)	(158)	(205)
18	PV of Deficiency / (Surplus) - 100 kW	Line 14 / (1 + Line 38)^Yr	-	-	-	(112)	58	162	133	109	85	59	31	1	(32)	(72)	(89)
19	Total PV of Deficiency / (Surplus) - 100 kW	Sum of Line 18	**331**														
20																	
21	2023 Revenue Requirement (Interim)	G-349-22	426,073	426,073	426,073	426,073	426,073	426,073	426,073	426,073	426,073	426,073	426,073	426,073	426,073	426,073	426,073
22	PV of 2023 Revenue Requirement (Interim)	Line 21 / (1 + Line 38)^Yr	402,435	380,003	360,119	340,523	324,121	304,958	288,425	272,788	257,999	244,012	230,783	218,271	206,438	195,246	184,661
23	Total PV of 2023 Revenue Requirement (Interim)	Sum of Line 22	4,210,785														
24	**Levelized % Increase (13 yrs) on 2023 Rate**	**Line 19 / Line 23**	**0.008%**														
25																	
26	***Levelized $ per Minute Rate - Recalculation***																
27	Number of Charging Minutes per Year	Line 11	-	-	-	16,539	53,016	100,266	134,759	172,686	214,122	272,977	349,720	444,798	558,629	691,633	857,672
28	RS 96 Rate - 100 kW ($/min) - Interim/Permanent	Line 9	-	-	-	-	0.46										
29	RS 96 Rate - 100 kW ($/min) - Update Jan 1, 2023	**Excel Solver resulting Line 32 = Line 4**	-	-	-	-	-	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
30	RS 96 Revenue - 100 kW Recalculated	**(Line 28 + Line 29) x Line 27 / 1,000**	-	-	-	-	24	63	85	109	135	172	220	280	352	436	541
31	PV of RS 96 Revenue - 100 kW Recalculated	Line 30 / (1 + Line 38)^Yr	-	-	-	-	19	45	58	70	82	99	119	144	171	200	234
32	Total PV of RS 96 Revenue - 100 kW Recalculated	Sum of Line 31	**1,239**														
33																	
34	Levelized $ per minute rate to recover Cost of Service (2023 to 2032)	Line 4 x 1,000 / Line 29	0.63														
35	Transaction Fee Percentage		15%														
36	Levelized $ per minute rate - 100 kW (incl. Trans Fee)	Line 34 / (1 - Line 35)	**0.74**														
37																	
38	After- Tax Weighted Average Cost of Capital (WACC)	[1]	5.87%	5.89%	5.77%	5.76%	5.62%	5.73%	5.73%	5.73%	5.73%	5.73%	5.73%	5.73%	5.73%	5.73%	5.73%
39	1 - ROE Rate x Equity Component + [(STD Rate x STD Portion) + (LTD Rate x LTD Portion)] x (1- Income Tax Rate)]																

Appendix B

RS 96 SUMMARY (50 KW & 100 KW)

FortisBC Inc.
EV Charging Stations Review - 50 kW & 100 kW Stations (Summary)
Schedule 1
November 2022
($000s), unless otherwise stated

Line	Particulars	Reference	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
1	**Cost of Service (50 kW & 100 kW)**																
2	Cost of Energy		-	-	-	-	210	267	291	313	338	372	415	468	532	606	696
3	Operation & Maintenance		0	2	46	101	187	238	258	280	305	339	383	438	504	582	680
4	Property Taxes		-	-	(0)	(0)	2	1	0	6	10	9	9	9	8	8	8
5	Depreciation Expense		-	60	197	307	456	580	586	586	589	591	597	618	661	702	753
6	Amortization Expense on CIAC		-	(35)	(70)	(150)	(195)	(243)	(258)	(258)	(258)	(258)	(258)	(258)	(258)	(222)	(164)
7	Other Revenue - Carbon Credits		-	-	-	-	(602)	(527)	(197)	(261)	(330)	(404)	(508)	(642)	(804)	(995)	(1,214)
8	NRCan Repayment		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Income Taxes		(9)	(361)	(72)	(299)	(201)	147	144	140	136	130	88	(14)	(105)	(166)	(436)
10	Earned Return		6	53	95	124	165	180	161	141	121	102	108	167	246	311	389
11	**Incremental Annual Revenue Requirement**	Sum of Line 2 to Line 10	**(2)**	**(282)**	**196**	**83**	**24**	**642**	**986**	**948**	**910**	**882**	**834**	**786**	**784**	**825**	**124**
12	PV of Revenue Requirement	Line 11 / (1 + Line 15)^Yr	(2)	(251)	165	66	18	460	667	607	551	505	452	403	380	378	54
13	**Total PV of Annual Revenue Requirement**	Sum of Line 12	***4,452***														
14																	
15	After- Tax Weighted Average Cost of Capital (WACC)		5.87%	5.89%	5.77%	5.76%	5.62%	5.73%	5.73%	5.73%	5.73%	5.73%	5.73%	5.73%	5.73%	5.73%	5.73%
16																	
17	RS 96 Revenue - 50 kW		4	24	28	58	90	128	172	220	273	348	446	567	712	882	1,094
18	RS 96 Revenue - 100 kW		-	-	-	-	24	46	62	79	98	125	161	204	256	317	394
19	Total RS 96 Revenue	Line 17 + Line 18	4	24	28	58	114	174	234	299	371	473	606	771	969	1,199	1,487
20	PV of RS 96 Revenue	Line 19 / (1 + Line 15)^Yr	4	21	24	47	87	124	158	192	225	271	328	395	469	550	645
21	Total PV of RS 96 Revenue	Sum of Line 20	***3,540***														
22																	
23	**% Recovery - 50 kW & 100 kW Combined**	**Line 21 / Line 13**	**80%**														
24																	
25	Deficiency / (Surplus)	Line 11 - Line 19	(6)	(306)	168	25	(90)	468	752	648	539	408	227	14	(184)	(375)	(1,363)
26	PV of Deficiency / (Surplus) - 50 kW & 100 kW	Line 25 / (1 + Line 15)^Yr	(6)	(273)	142	20	(68)	335	509	415	326	234	123	7	(89)	(172)	(591)
27	Total PV of Deficiency / (Surplus) - 50 kW & 100 kW	Sum of Line 26	**912**														
28																	
29	2023 Revenue Requirement (Interim)	G-349-22	426,208	426,208	426,208	426,208	426,208	426,208	426,208	426,208	426,208	426,208	426,208	426,208	426,208	426,208	426,208
30	PV of 2023 Revenue Requirement (Interim)	Line 29 / (1 + Line)^Yr	402,563	380,124	360,233	340,631	324,223	305,055	288,517	272,875	258,081	244,089	230,856	218,341	206,503	195,308	184,720
31	Total PV of 2023 Revenue Requirement (Interim)	Sum of Line 30	**4,212,120**														
32	**Levelized % Increase (15 yrs) on 2023 Rate**	**Line 27 / Line 31**	**0.02%**														

Appendix B
DRAFT ORDERS

bcuc
British Columbia
Utilities Commission

Suite 410, 900 Howe Street
Vancouver, BC Canada V6Z 2N3
bcuc.com

P: 604.660.4700
TF: 1.800.663.1385
F: 604.660.1102

ORDER NUMBER
G-xx-xx

IN THE MATTER OF
the *Utilities Commission Act*, RSBC 1996, Chapter 473

and

FortisBC Inc.
Application for Approval of Electric Vehicle Energy-Based Direct Current Fast Charging Service Rate Design and Rates

BEFORE:
[Panel Chair]
Commissioner
Commissioner

on Date

ORDER

WHEREAS:

A. On December 22, 2023, FortisBC Inc. (FBC) filed an Application with the British Columbia Utilities Commission (BCUC) for the approval of an energy-based rate design and rates for Electric Vehicle (EV) Direct Current Fast Charging (DCFC) Service and amendments to Rate Schedule 96 (RS 96), pursuant to sections 59 to 61 of the *Utilities Commission Act* (Application);

B. By Decision and Order G-350-21, dated November 30, 2021, the BCUC approved RS 96 on a permanent basis with time-based charging service rates at FBC-owned EV DCFC stations at $0.26 per minute for 50 kW stations and $0.54 per minute at 100 kW stations. The BCUC also directed, among other things, for FBC to file a detailed assessment of its DCFC service by the earliest of either December 31, 2022 or within six months of Measurement Canada's approval of DCFC energy-based metering for FBC;

C. On December 29, 2022, FBC filed the assessment report (RS 96 Assessment Report) as Measurement Canada had not yet approved energy-based metering in Canada at that time. On June 19, 2023, the BCUC accepted the RS 96 Assessment Report by Letter L-33-23 and accepted FBC's proposal to provide an updated RS 96 Assessment Report by December 31, 2023, or file an application for energy-based rates;

D. On February 20, 2023, Measurement Canada announced a temporary dispensation program for commercial level 3+ EV charging devices that permits energy-based meters to be used at level 3+ EV charging stations that are in-service prior to July 1, 2024, without verification and sealing, subject to the terms and conditions of the temporary dispensation program;

E. In the Application, FBC requests the following:

1. Approval of amendments to RS 96 to implement an energy-based EV charging rate of $0.42 per kWh for service at FBC-owned DCFC 50 kW and 100 kW stations, which will replace the existing time-based rates;

2. Approval that the energy-based EV charging rate for RS 96 not be subject to general rate increases, unless otherwise directed by the BCUC;

3. Approval of an Idling Charge for RS 96 of $0.40 per minute that begins 5 minutes after the end of a charging session for service at FBC-owned DCFC 50 kW and 100 kW stations; and

4. The establishment of a new rate base deferral account, titled the RS 96 Energy-Based Rate Application Cost deferral account, to record the costs associated with the regulatory review of the Application, with the amortization period to be determined in a future rate-setting proceeding; and

F. The BCUC has commenced review of the Application and finds that the following determinations are warranted.

NOW THEREFORE the BCUC orders as follows:

1. The regulatory timetable for review of the Application is established as set out in Appendix A to this order.

2. FBC must publish this Application and a copy of this order on its website on or before [Day/DATE].

3. FBC must provide a copy of the Application and this order on or before [Day/DATE], electronically where possible, to registered interveners in the following proceedings:

   a. FBC's 2020 Public EV DCFC Service Rate and Tariff RS 96 Application; and

   b. FBC's Annual Review for 2024 Rates.

4. FBC must share the Public Notice on FBC's Twitter and Facebook social media platforms and FBC must also publish weekly reminder notices on each platform until the conclusion of the intervener registration period on [Day/DATE].

5. FBC is directed to provide confirmation of compliance with Directives 2, 3 and 4 by DATE. Such confirmation shall include confirmation of the Public Notice published on FBC's website, including a list of the social media platforms on which the Public Notice was shared, as well as a list of all parties notified.

6. In accordance with BCUC's Rules of Practice and Procedure, parties who wish to actively participate in this proceeding must submit a Request to Intervene Form, available on the Get Involved in a Proceeding section of the BCUC's website at https://www.bcuc.com/GetInvolved/GetInvolvedProceeding, by the date established in the regulatory timetable.

DATED at the City of Vancouver, in the Province of British Columbia, this (XX) day of (Month Year).

BY ORDER

(X. X. last name)
Commissioner

Attachment

FortisBC Inc.
Application for Approval of Electric Vehicle Energy-Based Direct Current Fast Charging Service
Rate Design and Rates

REGULATORY TIMETABLE

Action	Date (2024)
FBC provides Notice by	Friday, January 26
Registration of Interveners	Thursday, February 1
BCUC Information Request (IR) No. 1	Tuesday, February 6
Intervener IR No. 1	Tuesday, February 13
FBC Response to IR No. 1	Tuesday, March 5
FBC Written Final Argument	Thursday, March 21
Intervener Written Final Arguments	Monday, April 8
FBC Written Reply Argument	Monday, April 22

bcuc
British Columbia Utilities Commission

We want to hear from you

FBC Electric Vehicle Energy-Based Fast Charging Service Rate Design and Rates

On December 22, 2023, FortisBC Inc. applied to the BCUC for approval of an energy-based rate design and rates for its Electric Vehicle (EV) Direct Current Fast Charging (DCFC) Service (Application). The proposed energy-based rate of $0.42 per kilowatt-hour (kWh) will replace the existing time-based rate at FBC-owned EV DCFC stations. FBC is also requesting approval of an Idling Charge of $0.40 per minute which would be effective after a 5-minute grace period once a charging session has completed.

The BCUC has established an open and transparent public proceeding, which includes an opportunity for public comment and participation, to review FBC's Application and determine rates for FBC's public EV DCFC service.

Parties who wish to participate in the BCUC's regulatory review process are invited to request intervener status or submit letters of comment. All submissions will be considered by the Panel in its review of the Application. For more information about the Application, please visit the [proceeding webpage link] on bcuc.com under "Our Work" to learn more.

To participate in the proceeding, visit the Get Involved in a Proceeding section of the BCUC's website at **www.bcuc.com/GetInvolved**.

GET INVOLVED

- **Request intervener status**
- **Submit a letter of comment**

IMPORTANT DATES

1. **[date]** – Deadline to register as an intervener with the BCUC

Subscribe to a Proceeding - BCUC on bcuc.com under "Get Involved" to receive email notifications when public documents are added to the proceeding.

GET MORE INFORMATION

FortisBC Energy Inc. Regulatory Affairs

16705 Fraser Highway
Surrey, BC Canada V4N 0E8

E: gas.regulatory.affairs@fortisbc.com

P: 604.592.7664

British Columbia Utilities Commission

Suite 410, 900 Howe Street
Vancouver, BC Canada V6Z 2N3

E: Commission.Secretary@bcuc.com

P: 604.660.4700

bcuc
British Columbia
Utilities Commission

Suite 410, 900 Howe Street
Vancouver, BC Canada V6Z 2N3
bcuc.com

P: 604.660.4700
TF: 1.800.663.1385
F: 604.660.1102

ORDER NUMBER
G-xx-xx

IN THE MATTER OF
the *Utilities Commission Act*, RSBC 1996, Chapter 473

and

FortisBC Inc.
Application for Approval of Electric Vehicle Energy-Based Direct Current Fast Charging Service Rate Design and Rates

BEFORE:
[Panel Chair]
Commissioner
Commissioner

on Date

ORDER

WHEREAS:

A. On December 22, 2023, FortisBC Inc. (FBC) filed an Application with the British Columbia Utilities Commission (BCUC) for the approval of an energy-based rate design and rates for Electric Vehicle (EV) Direct Current Fast Charging (DCFC) Service and amendments to Rate Schedule 96 (RS 96), pursuant to sections 59 to 61 of the *Utilities Commission Act* (Application);

B. By Decision and Order G-350-21, dated November 30, 2021, the BCUC approved RS 96 on a permanent basis with time-based charging service rates at FBC-owned EV DCFC stations at $0.26 per minute for 50 kW stations and $0.54 per minute at 100 kW stations. The BCUC also directed, among other things, for FBC to file a detailed assessment of its DCFC service by the earliest of either December 31, 2022 or within six months of Measurement Canada's approval of DCFC energy-based metering for FBC;

C. On December 29, 2022, FBC filed the assessment report (RS 96 Assessment Report) as Measurement Canada had not yet approved energy-based metering in Canada at that time. On June 19, 2023, the BCUC accepted the RS 96 Assessment Report by Letter L-33-23 and accepted FBC's proposal to provide an updated RS 96 Assessment Report by December 31, 2023, or file an application for energy-based rates;

D. On February 20, 2023, Measurement Canada announced a temporary dispensation program for commercial level 3+ EV charging devices that permits energy-based meters to be used at level 3+ EV charging stations that were in-service prior to July 1, 2024, without verification and sealing, subject to the terms and conditions of the temporary dispensation program; and

E. The BCUC has reviewed the Application and makes the following determinations.

NOW THEREFORE pursuant to section 59 to 61 of the *Utilities Commission Act*, the BCUC orders as follows:

1. FBC is approved to amend RS 96 to implement an energy-based EV charging rate of $0.42 per kWh for service at FBC-owned DCFC 50 kW and 100 kW stations, which will replace the existing time-based rates. The energy-based EV charging rate for RS 96 shall not be subject to FBC's general rate increases, unless otherwise directed by the BCUC.

2. FBC is approved to implement an Idling Charge of $0.40 per minute that begins 5 minutes after the end of a charging session for service at FBC-owned DCFC 50 kW and 100 kW stations.

3. FBC is approved to establish a new rate base deferral account, titled the RS 96 Energy-Based Rate Application Cost deferral account, to record the costs associated with the regulatory review of the Application, with the amortization period to be determined in a future rate-setting proceeding.

4. FBC is directed to file the revised RS 96 tariff to enable an energy-based EV charging rate with the BCUC for endorsement at least 15 days prior to the effective date.

5. FBC is directed to file the revised RS 96 tariff to enable the Idling Charge with the BCUC for endorsement at least 15 days prior to the effective date.

DATED at the City of Vancouver, in the Province of British Columbia, this (XX) day of (Month Year).

BY ORDER

(X. X. last name)
Commissioner

Appendix C

RS 96 TARIFF PROPOSED AMENDMENTS BLACKLINED

RATE SCHEDULE 96 – ELECTRIC VEHICLE CHARGING

APPLICABLE: Available for electric vehicle charging at FortisBC-owned Direct Current Fast Charging stations.

RATE: For 50 kW and 100 kW charging stations:

$0.42 per kW.h

NOTE: Customers taking service under this Rate Schedule will be billed and make payment at the time of charging.

The rate for electric vehicle charging will be reviewed on a periodic basis.

PERMANENT RATE ESTABLISHMENT: Pursuant to the British Columbia Utilities Commission Order G-xx-xx, rates under this schedule are set on a permanent basis for consumption on and after [DATE].

Deleted: 26

Deleted: minute

Deleted: .

Deleted: For 100 kW charging stations:¶
$0.54 per minute.

Deleted: The rate is pro-rated on a per-second basis based on the time that a vehicle is plugged in.

Deleted: 350

Deleted: 21

Deleted: December

Deleted: 30, 2021

Appendix D
REGULATORY ACCOUNT FILING CHECKLIST

Item	Consideration	RS 96 Energy-Based Rate Application Cost Deferral Account
I.	Indicate if the request is: (a) for a modification or a change in scope to an existing Commission approved regulatory account; or (b) to establish a new regulatory account.	FBC requests the establishment of one new deferral account to capture the actual regulatory proceeding costs associated with the Application.
a)	If the request is for a modification or change in scope to an existing regulatory account, explain why the existing regulatory account is an appropriate account to use (specifically addressing the existing account's intended and approved purpose, mechanism for recovery, timeline for recovery and carrying costs).	N/A
b)	If the request is for approval of a new regulatory account, state the purpose of the regulatory account and explain its intended use.	The requested account is a regulatory proceeding cost account, which is routinely sought by utilities to capture external costs related to the preparation filing and regulatory review of the Application. It typically includes BCUC costs, participant funding costs, external legal fees, notice publication costs, and miscellaneous facilities, stationary, and supplies costs.
II.	Propose a term (i.e. length of time) that the regulatory account should be approved for and explain why that term is appropriate.	The term of the account encompasses the preparation as well as the filing of the relevant regulatory application and its review by the BCUC.
III.	Identify any alternate treatments that were considered, including an overview of what the accounting treatment would be in the absence of approval of the request to establish a regulatory account, and explain why these alternate treatments may not be appropriate.	In the absence of deferral accounts for regulatory proceedings, the costs of regulatory proceedings would have to be forecast as an O&M expense (outside of the MRP index-based O&M, as regulatory proceeding costs are not included in Base O&M Expense) and trued up annually by way of the Flow-through deferral account. FBC considers this to be a more cumbersome and less efficient means of accounting for regulatory proceeding costs. It is accepted regulatory practice to defer the costs of regulatory applications for review and recovery following the regulatory review of the application itself. Review and recovery after the completion of the regulatory process allows for more transparency as the history of the costs is simpler to track and report.

Item	Consideration	RS 96 Energy-Based Rate Application Cost Deferral Account
IV a)	Address: whether, or to what extent, the item is outside of management's control;	Regulatory proceeding cost accounts are necessary because the number and type of regulatory proceedings can vary significantly by year. Further, once a regulatory proceeding is identified, the costs of that proceeding cannot be accurately forecast by the utility given that they can vary substantially, are not known at the time of making the regulatory account request, are unique to the circumstances for each application, may change as the regulatory review process unfolds, and are dependent on factors not within the utility's control. Factors not within the control of the utility include the regulatory process determined by the BCUC and the degree of involvement of interveners.
b)	the degree of forecast uncertainty associated with the item;	Refer to IV. a). FBC forecasts additions to the deferral account based on the expected type of review process and degree of intervener involvement. Actual costs are recorded in the account so that actual, not forecast, costs are recovered in rates.
c)	the materiality of the costs	FBC estimates the total regulatory costs for this proceeding to be approximately $150,000.
d)	any impact on intergenerational equity	Generally, FBC recovers the costs of regulatory proceedings over the period of time related to the application, which serves to match the costs and benefits. There are no intergenerational inequities inherent in this practice.
V.	Classify the regulatory account as either: (a) forecast variance account; (b) rate smoothing account; (c) benefit matching account; (d) retroactive expense account; or (e) other.	FBC generally classifies regulatory proceeding accounts as benefit matching accounts since the costs are recovered over the period of time related to the application, which serves to match the costs and benefits of the application.
VI.	Identify if the regulatory account is a cash or non-cash account.	Regulatory proceeding cost accounts are cash account.
VII.	Specify what additions to the regulatory account are being requested (i.e. type and amount of additions), including whether the account is intended to capture additions for a specific period of time or on an ongoing basis.	Eligible costs include the BCUC's direct costs, notice publication costs, fees for consultants or experts, external legal counsel fees, courier and miscellaneous administrative costs, and participant assistance cost awards incurred in the preparation, filing and regulatory review of the applications. Regular labour and staff expenses related to regulatory applications are included in FBC's index-based O&M expense.

Item	Consideration	RS 96 Energy-Based Rate Application Cost Deferral Account
VIII.	Propose a mechanism for recovery (e.g. how the balance in the regulatory account will be recovered or refunded to ratepayers) and explain why it is appropriate.	Costs are recovered in revenue requirements by way of amortization expense.
IX.	Propose a timeline for recovery (e.g. the period over which the regulatory account balance is either collected or refunded; also referred to as the amortization period) and explain why it is appropriate.	Generally, FBC proposes to amortize the costs of regulatory proceedings over a period of time that balance between rate impacts and the timeframe of the application, which serves to match the timing of costs and benefits. Please refer to Section 1.2 of the Application where FBC explains that it is not proposing an amortization period as part of the Application. FBC will instead propose an amortization period for this deferral account in a future rate-setting application.
X.	Propose a carrying cost for the balance in the regulatory account and explain why it is appropriate.	Rate base deferral accounts are included in rate base and therefore, implicitly financed using the weighted average cost of capital (WACC).
XI.	Outline a recommended regulatory process for the Commission's review of the application.	The proposed deferral account can be reviewed as part of this Application.

1

Appendix E

FINANCIAL SCHEDULES AND COST OF SERVICE MODELS

REFER TO LIVE SPREADSHEET MODELS

Provided in electronic format only

(accessible by opening the Attachments Tab in Adobe)

FortisBC Inc.
EV Charging Stations Review - 50 kW Stations
Schedule 1
November 2023
($000s), unless otherwise stated

Line	Particulars	Reference	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
1	**Cost of Service**																	
2	Cost of Energy		-	-	-	-	66	85	110	134	161	197	241	287	338	377	413	448
3	Operation & Maintenance	Line 18	0	2	46	85	179	153	256	274	296	326	364	412	471	524	552	569
4	Property Taxes	Line 23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Depreciation Expense	Line 46	-	60	197	307	385	457	479	489	492	494	497	518	562	603	636	671
6	Amortization Expense on CIAC	Line 59	-	(35)	(70)	(150)	(169)	(203)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	(173)	(139)	(59)
7	Other Revenue - Carbon Credits	-Line 110	-	-	-	-	(744)	(461)	(398)	(277)	(310)	(343)	(386)	(432)	(1,015)	(582)	(585)	(575)
8	NRCan Repayment	Schedule 2, Line 23	-	-	-	-	-	-	-	-	-	-	-	-	358	204	152	-
9	Income Taxes	Line 97	(9)	(361)	(72)	(128)	(10)	65	103	103	104	102	67	(35)	(124)	(138)	(281)	(203)
10	Earned Return	Line 82	6	53	95	109	137	159	165	161	144	126	135	200	286	333	363	373
11	**Incremental Annual Revenue Requirement**	Sum of Line 2 to Line 10	**(2)**	**(282)**	**196**	**224**	**(155)**	**256**	**506**	**675**	**678**	**694**	**709**	**741**	**668**	**1,148**	**686**	**797**
12																		
13	**Operation & Maintenance**																	
14	Labour Costs		0	2	39	67	151	121	215	220	224	229	233	238	242	247	252	257
15	Non-Labour Costs		-	-	6	18	28	32	40	54	72	97	131	174	229	277	300	312
16	Total Gross O&M Expenses	Line 14 + Line 15	0	2	46	85	179	153	256	274	296	326	364	412	471	524	552	569
17	Less: Capitalized Overhead	Overhead Rate of 0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	**Net O&M Expenses**	Line 16 + Line 17	0	2	46	85	179	153	256	274	296	326	364	412	471	524	552	569
19																		
20	**Property Taxes**																	
21	General, School and Other		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	1% in Lieu of General Municipal Tax[1]	1% of Line 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	**Total Property Taxes**	Line 21 + Line 22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	1 - Calculation based on revenue from second preceding year, e.g. 2020 is based on 2018																	
25																		
26	**Capital Spending**																	
27	Project Capital Spending[2]		599	1,644	1,164	783	1,078	348	405	25	26	26	807	1,717	1,482	1,110	1,126	277
28	Cost of Removal		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	Contributions in Aid of Construction (CIAC)		(423)	(415)	(950)	(259)	(503)	(71)	-	-	-	-	-	-	-	-	-	-
30	Total Annual Project Cost - Capital	Line 27 + Line 28	176	1,229	214	524	575	277	405	25	26	26	807	1,717	1,482	1,110	1,126	277
31																		
32	**Total Project Cost (incl. AFUDC)**	**Sum of Line 27**	**12,615**															
33	**Net Project Cost (incl. Removal and/or CIAC)**	**Sum of Line 30**	**9,994**															
34	2 - Excluding capitalized overhead																	
35																		

FortisBC Inc.
EV Charging Stations Review - 50 kW Stations
Schedule 1
November 2023
($000s), unless otherwise stated

Line	Particulars	Reference	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
36	**Gross Plant in Service (GPIS)**																	
37	GPIS - Beginning	Preceding Year, Line 41	-	599	2,243	3,406	4,061	5,116	5,464	5,868	5,893	5,919	5,945	6,153	6,598	7,007	7,334	7,682
38	Additions to Plant[3]		599	1,644	1,164	783	1,078	348	405	25	26	26	807	1,717	1,482	1,110	1,126	277
39	Retirements		-	-	-	-	(23)	-	-	-	-	-	(599)	(1,272)	(1,073)	(783)	(778)	(172)
40	Net Addition to Plant	Sum of Line 38 to 39	599	1,644	1,164	783	1,055	348	405	25	26	26	208	445	409	327	348	105
41	GPIS - Ending	Line 37 + Line 40	599	2,243	3,406	4,189	5,116	5,464	5,868	5,893	5,919	5,945	6,153	6,598	7,007	7,334	7,682	7,786
42	3 - Includes capitalized overhead																	
43																		
44	**Accumulated Depreciation**																	
45	Accumulated Depreciation - Beginning	Preceding Year, Line 48	-	-	(60)	(257)	(468)	(830)	(1,286)	(1,765)	(2,254)	(2,746)	(3,241)	(3,139)	(2,385)	(1,874)	(1,694)	(1,552)
46	Depreciation Expense[4]	Line 37 @ 8.37%	-	(60)	(197)	(307)	(385)	(457)	(479)	(489)	(492)	(494)	(497)	(518)	(562)	(603)	(636)	(671)
47	Retirements		-	-	-	-	23	-	-	-	-	-	599	1,272	1,073	783	778	172
48	Accumulated Depreciation - Ending	Sum of Line 45 to 47	-	(60)	(257)	(565)	(830)	(1,286)	(1,765)	(2,254)	(2,746)	(3,241)	(3,139)	(2,385)	(1,874)	(1,694)	(1,552)	(2,050)
49	4 - Depreciation & Amortization Expense calculation is based on opening balance x composite depreciation rate; The weighted-avg. rate of all assets addition to plant is 8.37%																	
50																		
51	**Contributions in Aid of Construction (CIAC)**																	
52	CIAC - Beginning	Preceding Year, Line 55	-	(423)	(838)	(1,788)	(1,919)	(2,422)	(2,493)	(2,493)	(2,493)	(2,493)	(2,493)	(2,493)	(2,493)	(2,071)	(1,656)	(705)
53	Additions		(423)	(415)	(950)	(259)	(503)	(71)	-	-	-	-	-	-	-	-	-	-
54	Retirements		-	-	-	-	-	-	-	-	-	-	-	-	423	415	950	259
55	CIAC - Ending	Sum of Line 52 to 54	(423)	(838)	(1,788)	(2,047)	(2,422)	(2,493)	(2,493)	(2,493)	(2,493)	(2,493)	(2,493)	(2,493)	(2,071)	(1,656)	(705)	(446)
56																		
57	**Accumulated Amortization of Contributions in Aid of Construction (CIAC)**																	
58	Accumulated Amortization of CIAC - Beginning	Preceding Year, Line 61	-	-	35	105	296	465	668	877	1,085	1,294	1,503	1,712	1,920	1,706	1,465	653
59	Amortization (over 12 yrs)	Line 52 @ 8.37%	-	35	70	150	169	203	209	209	209	209	209	209	209	173	139	59
60	Retirements		-	-	-	-	-	-	-	-	-	-	-	-	(423)	(415)	(950)	(259)
61	Accumulated Amortization of CIAC - Ending	Sum of Line 58 to 60	-	35	105	255	465	668	877	1,085	1,294	1,503	1,712	1,920	1,706	1,465	653	453
62																		
63	**Rate Base and Earned Return**																	
64	Gross Plant in Service - Beginning	Line 37	-	599	2,243	3,406	4,061	5,116	5,464	5,868	5,893	5,919	5,945	6,153	6,598	7,007	7,334	7,682
65	Gross Plant in Service - Ending	Line 41	599	2,243	3,406	4,189	5,116	5,464	5,868	5,893	5,919	5,945	6,153	6,598	7,007	7,334	7,682	7,786
66																		
67	Accumulated Depreciation - Beginning	Line 45	-	-	(60)	(257)	(468)	(830)	(1,286)	(1,765)	(2,254)	(2,746)	(3,241)	(3,139)	(2,385)	(1,874)	(1,694)	(1,552)
68	Accumulated Depreciation - Ending	Line 48	-	(60)	(257)	(565)	(830)	(1,286)	(1,765)	(2,254)	(2,746)	(3,241)	(3,139)	(2,385)	(1,874)	(1,694)	(1,552)	(2,050)
69																		
70	CIAC - Beginning	Line 52	-	(423)	(838)	(1,788)	(1,919)	(2,422)	(2,493)	(2,493)	(2,493)	(2,493)	(2,493)	(2,493)	(2,493)	(2,071)	(1,656)	(705)
71	CIAC - Ending	Line 55	(423)	(838)	(1,788)	(2,047)	(2,422)	(2,493)	(2,493)	(2,493)	(2,493)	(2,493)	(2,493)	(2,493)	(2,071)	(1,656)	(705)	(446)
72																		
73	Accumulated Amortization of CIAC - Beginning	Line 58	-	-	35	105	296	465	668	877	1,085	1,294	1,503	1,712	1,920	1,706	1,465	653
74	Accumulated Amortization of CIAC - Ending	Line 61	-	35	105	255	465	668	877	1,085	1,294	1,503	1,712	1,920	1,706	1,465	653	453
75																		
76	Net Plant in Service, Mid-Year	(Sum of Lines 64 to Line 74) / 2	88	778	1,423	1,650	2,150	2,341	2,420	2,359	2,102	1,844	1,973	2,936	4,204	5,109	5,763	5,910
77	Cash Working Capital	Line 41 x FBC CWC/Closing GPIS %	2	7	10	12	15	16	17	17	17	17	18	19	21	22	23	23
78	**Total Rate Base**	**Sum of Line 76 to 77**	**90**	**785**	**1,433**	**1,662**	**2,165**	**2,357**	**2,437**	**2,376**	**2,120**	**1,861**	**1,991**	**2,955**	**4,225**	**4,918**	**5,360**	**5,510**
79																		
80	Equity Return	Line 78 x ROE x Equity %	3	29	52	61	79	93	96	94	84	74	79	117	167	195	212	218
81	Debt Component	[5]	3	24	42	48	58	66	69	67	60	52	56	83	119	138	151	155
82	**Total Earned Return**	**Line 80 + Line 81**	**6**	**53**	**95**	**109**	**137**	**159**	**165**	**161**	**144**	**126**	**135**	**200**	**286**	**333**	**363**	**373**
83	Return on Rate Base %	Line 82 / Line 78	6.69%	6.71%	6.60%	6.54%	6.35%	6.75%	6.77%	6.77%	6.77%	6.77%	6.77%	6.77%	6.77%	6.77%	6.77%	6.77%
84	After- Tax Weighted Average Cost of Capital (WACC)	[6]	5.87%	5.89%	5.77%	5.76%	5.62%	6.00%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%
85	5 - Line 78 x (LTD Rate x LTD% + STD Rate x STD %)																	
86	6 - ROE Rate x Equity Component + [(STD Rate x STD Portion) + (LTD Rate x LTD Portion)] x (1- Income Tax Rate)]																	
87																		

FortisBC Inc.
EV Charging Stations Review - 50 kW Stations
Schedule 1
November 2023
($000s), unless otherwise stated

Line	Particulars	Reference	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
88	**Income Tax Expense**																	
89	Earned Return	Line 82	6	53	95	109	137	159	165	161	144	126	135	200	286	333	363	373
90	Deduct: Interest on debt	Line 81	(3)	(24)	(42)	(48)	(58)	(66)	(69)	(67)	(60)	(52)	(56)	(83)	(119)	(138)	(151)	(155)
91	Add: Depreciation Expense	Line 46	-	60	197	307	385	457	479	489	492	494	497	518	562	603	636	671
92	Deduct: CIAC Amortization	Line 59	-	(35)	(70)	(150)	(169)	(203)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	(173)	(139)	(59)
93	Deduct: Capital Cost Allowance	Line 104 (Include CCA from 2018)	(26)	(1,028)	(375)	(565)	(321)	(171)	(87)	(97)	(87)	(83)	(186)	(522)	(856)	(999)	(1,044)	(950)
94	Taxable Income After Tax	Sum of Line 89 to 93	(23)	(975)	(195)	(346)	(26)	177	279	278	280	276	181	(95)	(336)	(374)	(760)	(548)
95	Income Tax Rate		27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%
96																		
97	**Total Income Tax Expense**	Line 94 / (1 - Line 95) x Line 95	**(9)**	**(361)**	**(72)**	**(128)**	**(10)**	**65**	**103**	**103**	**104**	**102**	**67**	**(35)**	**(124)**	**(138)**	**(281)**	**(203)**
98																		
99	**Capital Cost Allowance**																	
100	Opening Balance	Proceeding Year, Line 105	-	150	350	315	274	504	610	928	856	795	738	1,358	2,553	3,179	3,291	3,372
101	Additions to Plant	Line 27	599	1,644	1,164	783	1,055	348	405	25	26	26	807	1,717	1,482	1,110	1,126	277
102	Less: CIAC	Line 29	(423)	(415)	(824)	(259)	(503)	(71)	-	-	-	-	-	-	-	-	-	-
103	Net Addition for CCA	Sum of Line 101 through 102	176	1,229	339	524	552	277	405	25	26	26	807	1,717	1,482	1,110	1,126	277
104	**CCA**	**[Line 100 + (Line 103/2)] x CCA Rate**	**(26)**	**(1,028)**	**(375)**	**(565)**	**(321)**	**(171)**	**(87)**	**(97)**	**(87)**	**(83)**	**(186)**	**(522)**	**(856)**	**(999)**	**(1,044)**	**(950)**
105	Closing Balance	Line 100 + Line 103 + Line 104	150	350	315	274	504	610	928	856	795	738	1,358	2,553	3,179	3,291	3,372	2,699
106																		
107	**Carbon Credit**																	
108	Credit Monetized		-	-	-	-	1,653	1,026	795	554	689	848	1,060	1,317	3,438	2,189	2,448	2,669
109	Carbon Price ($/tonne)		-	-	-	-	450	449	500	500	450	405	365	328	295	266	239	215
110	Carbon Credit Revenue ($000s)	Line 108 x Line 109	-	-	-	-	744	461	398	277	310	343	386	432	1,015	582	585	575
111																		

FortisBC Inc.
EV Charging Stations Review - 50 kW Stations
Schedule 2
November 2023
($000s), unless otherwise stated

Line	Particulars	Reference	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
1	Revenue (Rate from this model)	2018-2023: Sch. 3, Line 12; 2024-2033: Sch. 4, Line 11	4	24	28	56	91	117	172	239	325	449	613	794	1,011	1,225	1,396	1,543
2																		
3	**Expenses**																	
4	Carbon Credits	Schedule 1 , Line 7	-	-	-	-	(744)	(461)	(398)	(277)	(310)	(343)	(386)	(432)	(1,015)	(582)	(585)	(575)
5	Cost of Energy Sold	Schedule 1 , Line 2	-	-	-	-	66	85	110	134	161	197	241	287	338	377	413	448
6	Operation and Maintenance	Schedule 1 , Line 3	0	2	46	85	179	153	256	274	296	326	364	412	471	524	552	569
7	Property Taxes	Schedule 1 , Line 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Depreciation Expense	Schedule 1 , Line 5	-	60	197	307	385	457	479	489	492	494	497	518	562	603	636	671
9	Amortization Expense	Schedule 1 , Line 6	-	(35)	(70)	(150)	(169)	(203)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	(173)	(139)	(59)
10	Total Expenses	Sum of Lines 5 through 9	0	26	173	243	(282)	31	238	411	431	466	507	576	148	749	877	1,054
11																		
12	Operating Income	Line 1 - Line 10	3	(2)	(145)	(187)	373	86	(66)	(172)	(106)	(17)	106	218	864	476	520	489
13	Interest	Schedule 1 , Line 81	3	24	42	48	58	66	69	67	60	52	56	83	119	138	151	155
14	Earnings Before income taxes	Line 12 - Line 13	1	(26)	(187)	(235)	315	20	(135)	(239)	(166)	(69)	50	135	745	338	369	334
15	Income tax (recovery)	Line 38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	Net Earnings	Line 14 - Line 15	1	(26)	(187)	(235)	315	20	(135)	(239)	(166)	(69)	50	135	745	338	369	334
17	Cumulative Net Earnings	Cumulative Sum of Line 16	1	(25)	(213)	(448)	(133)	(113)	(248)	(487)	(653)	(722)	(672)	(538)	207	545	913	1,247
18	Repayment to Canada (True/False)	If Cumulative Sum of Line 17 Positive Than True, if Negative Than False	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE
19																		
20	Cumulative Capital Expenditure (EV Charger Only)		599	1,871	2,944	3,727	4,506	4,678	4,678	4,678	4,678	4,678	4,079	2,807	1,733	950	172	-
21	Cumulative NRCan CIAC	Cumulative for 10 Years Only (No repayment after 10 years)	(423)	(838)	(1,788)	(2,047)	(2,550)	(2,621)	(2,621)	(2,621)	(2,621)	(2,621)	(2,198)	(1,783)	(833)	(574)	(71)	-
22	Repayment Ratio	-Line 21 / Line 20	71%	45%	61%	55%	57%	56%	56%	56%	56%	56%	54%	64%	48%	60%	41%	0%
23	Repayment Amount	If Line 17 Positive Than, Line 17 x Line 22	-	-	-	-	-	-	-	-	-	-	-	-	**358**	**204**	**152**	-
24	Remaining Amount to be repaid	-(Schedule 1 , Line 52) - Line 23	-	423	838	1,788	1,919	2,422	2,493	2,493	2,493	2,493	2,493	2,493	2,135	1,866	1,503	705
25																		
26	Year		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
27																		
28	Income Tax Calculations																	
29																		
30	Income before Tax	Line 14	1	(26)	(187)	(235)	315	20	(135)	(239)	(166)	(69)	50	135	745	338	369	334
31	Add: Depreciation (Net of CIAC Amortizartion)	Line 8	-	25	127	158	216	254	270	281	283	286	288	309	354	430	497	612
32	Taxable Income before CCA	Line 30 + Line 31	1	(2)	(60)	(78)	531	274	135	41	118	216	338	444	1,098	768	866	945
33	Deduct: CCA	Schedule 1 , Line 104	(26)	(1,028)	(375)	(565)	(321)	(171)	(87)	(97)	(87)	(83)	(186)	(522)	(856)	(999)	(1,044)	(950)
34	Net income/(loss) for tax purposes	Line 32 + Line 33	(26)	(1,030)	(435)	(643)	209	104	48	(56)	31	133	152	(78)	242	(231)	(178)	(5)
35	Non-capital loss applied	If Line 34 Positive Than Apply Available Non-capital loss from Line 41	-	-	-	-	(209)	(104)	(48)	-	(31)	(133)	(152)	-	(242)	-	-	-
36	Taxable income/(loss)	Line 34 + Line 35	(26)	(1,030)	(435)	(643)	-	-	-	(56)	-	-	-	(78)	-	(231)	(178)	(5)
37	Tax Rate	Schedule 1 , Line 95	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%
38	Income Tax Expense	If Line 36 Positive Than, Line 36 x Line 37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39																		
40	Non-capital Loss Continuity																	
41	Opening Balance	Prior Year Closing Balance, Line 44	-	26	1,056	1,490	2,133	1,924	1,820	1,772	1,828	1,797	1,664	1,512	1,589	1,348	1,579	1,757
42	Additions	Net (loss) -Line 34	26	1,030	435	643	-	-	-	56	-	-	-	78	-	231	178	5
43	Loss applied	Line 35	-	-	-	-	(209)	(104)	(48)	-	(31)	(133)	(152)	-	(242)	-	-	-
44	Closing Balance	Sum of Lines 41 through 43	26	1,056	1,490	2,133	1,924	1,820	1,772	1,828	1,797	1,664	1,512	1,589	1,348	1,579	1,757	1,762

FortisBC Inc.
EV Charging Stations Review - 50 kW Stations
Schedule 3
November 2023
($000s), unless otherwise stated

Line	Particulars	Reference	2018	2019	2020	2021	2022	2023
1								
2	Incremental Annual Revenue Requirement	Schedule 1, Line 11	(2)	(282)	196	224	(155)	256
3	PV of Revenue Requirement (After-tax WACC of 5.87%)	Line 2 / (1 + Line 31)^Yr	(2)	(251)	165	179	(118)	180
4	**Total PV of Annual Revenue Requirement**	Sum of Line 3	***154***					
5								
6			Interim	Interim	Interim	Interim	Permanent	Permanent
7	RS 96 Rate - 50 kW ($/min)		0.30	0.30	0.30	0.30	0.26	0.26
8	Less: 15% Transaction Fee	-Line 7 x 15%	(0.05)	(0.05)	(0.05)	(0.06)	(0.04)	(0.04)
9	RS 96 Rate (50 kW) - Revenue Requirement ($/min)	Line 7 + Line 8	0.26	0.26	0.26	0.24	0.22	0.22
10								
11	Number of Charging Minutes per Year		15,309	94,386	110,504	231,942	410,783	531,009
12	RS 96 Revenue - 50 kW	Line 9 x Line 11 / 1,000	4	24	28	56	91	117
13	PV of RS 96 Revenue - 50 kW	Line 9 / (1 + Line 31)^Yr	4	21	24	44	69	83
14	Total PV of RS 96 Revenue - 50 kW	Sum of Line 13	**245**					
15	**% Recovery - 50 kW**	**Line 14 / Line 4**	**159%**					
16								
17	Deficiency / (Surplus)	Line 2 - Line 12	(6)	(306)	168	168	(245)	138
18	PV of Deficiency / (Surplus) - 50 kW	Line 14 / (1 + Line 31)^Yr	(6)	(273)	142	134	(187)	98
19	**Total PV of Deficiency / (Surplus) - 50 kW**	**Sum of Line 18**	**(91)**					
20								
21	2024 Revenue Requirement	2024 Annual Review (Evid Update)	457,247	457,247	457,247	457,247	457,247	457,247
22	PV of 2024 Revenue Requirement (Interim)	Line 21 / (1 + Line 31)^Yr	431,880	407,807	386,468	365,438	347,816	322,382
23	Total PV of 2024 Revenue Requirement (Interim)	Sum of Line 22	**2,261,790**					
24	**Levelized % Increase (6 yrs) on 2024 Rate**	**Line 19 / Line 23**	**-0.004%**					
25								
26	***Cumulative Deficiency / (Surplus) Continuity***							
27	Opening Balance	Prior Yr; Line 29	-	(6)	(312)	(144)	24	(221)
28	Additions	Line 17	(6)	(306)	168	168	(245)	138
29	**Closing**	**Line 27 + Line 28**	**(6)**	**(312)**	**(144)**	**24**	**(221)**	**(83)**
30								
31	After- Tax Weighted Average Cost of Capital (WACC)	[1]	5.87%	5.89%	5.77%	5.76%	5.62%	6.00%
32	1 - ROE Rate x Equity Component + [(STD Rate x STD Portion) + (LTD Rate x LTD Portion)] x (1- Income Tax Rate)]							

FortisBC Inc.
EV Charging Stations Review - 50 kW Stations
Schedule 4
November 2023
($000s), unless otherwise stated

Line	Particulars	Reference	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
1												
2	2018-2023 Cumulative Deficiency / (Surplus)	Schedule 3, Line 29	(83)									
3	Incremental Annual Revenue Requirement	Schedule 1, Line 11	506	675	678	694	709	741	668	1,148	686	797
4	Total Annual Revenue Requirement from EV Customer	Sum of Line 2 to Line 3	423	675	678	694	709	741	668	1,148	686	797
5	PV of Revenue Requirement (After-tax WACC of 5.87%)	Line 2 / (1 + Line 20)^Yr	399	600	569	549	529	522	444	719	406	445
6	**Total PV of Annual Revenue Requirement**	Sum of Line 5	***5,183***									
7												
8	***Levelized $ per kWh Rate - New***											
9	Annual Dispensing kWh		478,327	664,678	904,189	1,248,927	1,707,055	2,211,576	2,816,495	3,412,328	3,887,791	4,297,067
10	RS 96 Rate - 50 kW ($/kWh) - Update Jan 1, 2024	**Excel Solver resulting Line 13 = Line 6**	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36
11	RS 96 Revenue - 50 kW	**Line 9 x Line 10 / 1,000**	173	240	327	452	617	800	1,019	1,234	1,406	1,554
12	PV of RS 96 Revenue - 50 kW	Line 11 / (1 + Line 20)^Yr	163	214	275	358	461	564	677	774	832	867
13	Total PV of RS 96 Revenue - 50 kW	Sum of Line 12	**5,183**									
14	Deficit / (Surpllus)	Line 13 - Line 6	-									
15												
16	Levelized $ per kWh rate to recover Cost of Service (2024 to 2033)	Line 6 x 1,000 / Line 10	0.36									
17	Transaction Fee Percentage		15%									
18	Levelized $ per kWh rate - 50 kW (incl. Trans Fee)	Line 16 / (1 - Line 17)	**0.43**									
19												
20	After- Tax Weighted Average Cost of Capital (WACC)	[1]	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%
21	1 - ROE Rate x Equity Component + [(STD Rate x STD Portion) + (LTD Rate x LTD Portion)] x (1- Income Tax Rate)]											

FortisBC Inc.
EV Charging Stations Review - 100 kW Stations
Schedule 1
November 2023
($000s), unless otherwise stated

Line	Particulars	Reference	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
1	**Cost of Service**																	
2	Cost of Energy		-	-	-	-	70	105	128	151	173	191	211	237	264	296	331	366
3	Operation & Maintenance	Line 18	-	-	-	15	34	28	51	52	53	54	55	56	57	58	59	61
4	Property Taxes	Line 23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Depreciation Expense	Line 46	-	-	-	-	71	95	115	117	117	117	120	123	125	128	152	162
6	Amortization Expense on CIAC	Line 59	-	-	-	-	(21)	(34)	(40)	(40)	(40)	(40)	(40)	(40)	(40)	(40)	(40)	(40)
7	Other Revenue - Carbon Credits	-Line 110	-	-	-	-	-	(83)	(115)	(109)	(121)	(134)	(151)	(168)	(401)	(228)	(239)	(241)
8	NRCan Repayment	Line 134	-	-	-	-	-	-	-	-	-	-	-	-	-	121	103	-
9	Income Taxes	Line 97	-	-	-	(171)	3	(14)	32	32	32	26	29	27	26	(18)	(56)	(50)
10	Earned Return	Line 82	-	-	-	16	32	40	44	42	37	32	29	25	21	48	85	99
11	**Incremental Annual Revenue Requirement**	Sum of Line 2 to Line 10	**-**	**-**	**-**	**(141)**	**189**	**138**	**214**	**245**	**250**	**246**	**253**	**260**	**53**	**365**	**396**	**356**
12																		
13	**Operation & Maintenance**																	
14	Labour Costs		-	-	-	15	34	28	51	52	53	54	55	56	57	58	59	61
15	Non-Labour Costs		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	Total Gross O&M Expenses	Line 14 + Line 15	-	-	-	15	34	28	51	52	53	54	55	56	57	58	59	61
17	Less: Capitalized Overhead	Overhead Rate of 0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	**Net O&M Expenses**	Line 16 + Line 17	-	-	-	15	34	28	51	52	53	54	55	56	57	58	59	61
19																		
20	**Property Taxes**																	
21	General, School and Other		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	1% in Lieu of General Municipal Tax[1]	1% of Line 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	**Total Property Taxes**	Line 21 + Line 22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	1 - Calculation based on revenue from second preceding year, e.g. 2020 is based on 2018																	
25																		
26	**Capital Spending**																	
27	Project Capital Spending[2]		-	-	-	706	307	232	95	-	-	26	27	27	28	942	347	286
28	Cost of Removal		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	Contributions in Aid of Construction (CIAC)		-	-	-	(234)	(189)	(79)	-	-	-	-	-	-	-	-	-	-
30	Total Annual Project Cost - Capital	Line 27 + Line 28	-	-	-	472	118	153	95	-	-	26	27	27	28	942	347	286
31																		
32	**Total Project Cost (incl. AFUDC)**	**Sum of Line 27**	**3,023**															
33	**Net Project Cost (incl. Removal and/or CIAC)**	**Sum of Line 30**	**2,522**															
34	2 - Excluding capitalized overhead																	
35																		

FortisBC Inc.
EV Charging Stations Review - 100 kW Stations
Schedule 1
November 2023
($000s), unless otherwise stated

Line	Particulars	Reference	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
36	**Gross Plant in Service (GPIS)**																	
37	GPIS - Beginning	Preceding Year, Line 41	-	-	-	-	686	993	1,226	1,321	1,321	1,321	1,347	1,373	1,401	1,428	1,664	1,770
38	Additions to Plant[3]		-	-	-	706	307	232	95	-	-	26	27	27	28	942	347	286
39	Retirements		-	-	-	-	-	-	-	-	-	-	-	-	-	(706)	(241)	(191)
40	Net Addition to Plant	Sum of Line 38 to 39	-	-	-	706	307	232	95	-	-	26	27	27	28	236	106	95
41	GPIS - Ending	Line 37 + Line 40	-	-	-	706	993	1,226	1,321	1,321	1,321	1,347	1,373	1,401	1,428	1,664	1,770	1,866
42	3 - Includes capitalized overhead																	
43																		
44	**Accumulated Depreciation**																	
45	Accumulated Depreciation - Beginning	Preceding Year, Line 48	-	-	-	-	-	(71)	(166)	(280)	(398)	(515)	(632)	(752)	(875)	(1,000)	(422)	(333)
46	Depreciation Expense[4]	Line 37 @ 8.37%	-	-	-	-	(71)	(95)	(115)	(117)	(117)	(117)	(120)	(123)	(125)	(128)	(152)	(162)
47	Retirements		-	-	-	-	-	-	-	-	-	-	-	-	-	706	241	191
48	Accumulated Depreciation - Ending	Sum of Line 45 to 47	-	-	-	-	(71)	(166)	(280)	(398)	(515)	(632)	(752)	(875)	(1,000)	(422)	(333)	(304)
49	4 - Depreciation & Amortization Expense calculation is based on opening balance x composite depreciation rate; The weighted-avg. rate of all assets addition to plant is 8.37%																	
50																		
51	**Contributions in Aid of Construction (CIAC)**																	
52	CIAC - Beginning	Preceding Year, Line 55	-	-	-	-	(213)	(402)	(481)	(481)	(481)	(481)	(481)	(481)	(481)	(481)	(481)	(481)
53	Additions		-	-	-	(234)	(189)	(79)	-	-	-	-	-	-	-	-	-	-
54	Retirements		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	234
55	CIAC - Ending	Sum of Line 52 to 54	-	-	-	(234)	(402)	(481)	(481)	(481)	(481)	(481)	(481)	(481)	(481)	(481)	(481)	(248)
56																		
57	**Accumulated Amortization of Contributions in Aid of Construction (CIAC)**																	
58	Accumulated Amortization of CIAC - Beginning	Preceding Year, Line 61	-	-	-	-	-	21	55	95	135	175	216	256	296	337	377	417
59	Amortization (over 12 yrs)	Line 52 @ 8.37%	-	-	-	-	21	34	40	40	40	40	40	40	40	40	40	40
60	Retirements		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(234)
61	Accumulated Amortization of CIAC - Ending	Sum of Line 58 to 60	-	-	-	-	21	55	95	135	175	216	256	296	337	377	417	224
62																		
63	**Rate Base and Earned Return**																	
64	Gross Plant in Service - Beginning	Line 37	-	-	-	-	686	993	1,226	1,321	1,321	1,321	1,347	1,373	1,401	1,428	1,664	1,770
65	Gross Plant in Service - Ending	Line 41	-	-	-	706	993	1,226	1,321	1,321	1,321	1,347	1,373	1,401	1,428	1,664	1,770	1,866
66																		
67	Accumulated Depreciation - Beginning	Line 45	-	-	-	-	-	(71)	(166)	(280)	(398)	(515)	(632)	(752)	(875)	(1,000)	(422)	(333)
68	Accumulated Depreciation - Ending	Line 48	-	-	-	-	(71)	(166)	(280)	(398)	(515)	(632)	(752)	(875)	(1,000)	(422)	(333)	(304)
69																		
70	CIAC - Beginning	Line 52	-	-	-	-	(213)	(402)	(481)	(481)	(481)	(481)	(481)	(481)	(481)	(481)	(481)	(481)
71	CIAC - Ending	Line 55	-	-	-	(234)	(402)	(481)	(481)	(481)	(481)	(481)	(481)	(481)	(481)	(481)	(481)	(248)
72																		
73	Accumulated Amortization of CIAC - Beginning	Line 58	-	-	-	-	-	21	55	95	135	175	216	256	296	337	377	417
74	Accumulated Amortization of CIAC - Ending	Line 61	-	-	-	-	21	55	95	135	175	216	256	296	337	377	417	224
75																		
76	Net Plant in Service, Mid-Year	(Sum of Lines 64 to Line 74) / 2	-	-	-	236	507	588	644	616	539	475	423	369	313	711	1,256	1,456
77	Cash Working Capital	Line 41 x FBC CWC/Closing GPIS %	-	-	-	2	3	4	4	4	4	4	4	4	4	5	5	5
78	**Total Rate Base**	**Sum of Line 76 to 77**	**-**	**-**	**-**	**238**	**510**	**591**	**648**	**620**	**543**	**479**	**427**	**373**	**317**	**716**	**1,261**	**1,461**
79																		
80	Equity Return	Line 78 x ROE x Equity %	-	-	-	9	19	23	26	25	21	19	17	15	13	28	50	58
81	Debt Component	[5]	-	-	-	7	14	17	18	17	15	13	12	11	9	20	36	41
82	**Total Earned Return**	**Line 80 + Line 81**	**-**	**-**	**-**	**16**	**32**	**40**	**44**	**42**	**37**	**32**	**29**	**25**	**21**	**48**	**85**	**99**
83	Return on Rate Base %	Line 82 / Line 78	0.00%	0.00%	0.00%	6.54%	6.35%	6.75%	6.77%	6.77%	6.77%	6.77%	6.77%	6.77%	6.77%	6.77%	6.77%	6.77%
84	After- Tax Weighted Average Cost of Capital (WACC)	[6]	5.87%	5.89%	5.77%	5.76%	5.62%	6.00%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%
85	5 - Line 78 x (LTD Rate x LTD% + STD Rate x STD %)																	
86	6 - ROE Rate x Equity Component + [(STD Rate x STD Portion) + (LTD Rate x LTD Portion)] x (1- Income Tax Rate)]																	
87																		

FortisBC Inc.
EV Charging Stations Review - 100 kW Stations
Schedule 1
November 2023
($000s), unless otherwise stated

Line	Particulars	Reference	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
88	**Income Tax Expense**																	
89	Earned Return	Line 82	-	-	-	16	32	40	44	42	37	32	29	25	21	48	85	99
90	Deduct: Interest on debt	Line 81	-	-	-	(7)	(14)	(17)	(18)	(17)	(15)	(13)	(12)	(11)	(9)	(20)	(36)	(41)
91	Add: Depreciation Expense	Line 46	-	-	-	-	71	95	115	117	117	117	120	123	125	128	152	162
92	Deduct: CIAC Amortization	Line 59	-	-	-	-	(21)	(34)	(40)	(40)	(40)	(40)	(40)	(40)	(40)	(40)	(40)	(40)
93	Deduct: Capital Cost Allowance	Line 104 (Include CCA from 2018)	-	-	-	(472)	(60)	(122)	(15)	(14)	(13)	(26)	(18)	(23)	(27)	(166)	(311)	(315)
94	Taxable Income After Tax	Sum of Line 89 to 93	-	-	-	(463)	9	(37)	85	88	86	70	78	74	71	(50)	(150)	(135)
95	Income Tax Rate		27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%
96																		
97	**Total Income Tax Expense**	Line 94 / (1 - Line 95) x Line 95	**-**	**-**	**-**	**(171)**	**3**	**(14)**	**32**	**32**	**32**	**26**	**29**	**27**	**26**	**(18)**	**(56)**	**(50)**
98																		
99	**Capital Cost Allowance**																	
100	Opening Balance	Proceeding Year, Line 105	-	-	-	-	0	59	91	171	157	145	145	153	157	158	934	970
101	Additions to Plant	Line 27	-	-	-	706	307	232	95	-	-	26	27	27	28	942	347	286
102	Less: CIAC	Line 29	-	-	-	(234)	(189)	(79)	-	-	-	-	-	-	-	-	-	-
103	Net Addition for CCA	Sum of Line 101 through 102	-	-	-	472	118	153	95	-	-	26	27	27	28	942	347	286
104	**CCA**	**[Line 100 + (Line 103/2)] x CCA Rate**	**-**	**-**	**-**	**(472)**	**(60)**	**(122)**	**(15)**	**(14)**	**(13)**	**(26)**	**(18)**	**(23)**	**(27)**	**(166)**	**(311)**	**(315)**
105	Closing Balance	Line 100 + Line 103 + Line 104	-	-	-	0	59	91	171	157	145	145	153	157	158	934	970	941
106																		
107	**Carbon Credit**																	
108	Credit Monetized		-	-	-	-	-	184	230	217	270	331	413	513	1,358	857	1,000	1,122
109	Carbon Price ($/tonne)		-	-	-	-	-	449	500	500	450	405	365	328	295	266	239	215
110	Carbon Credit Revenue ($000s)	Line 108 x Line 109	-	-	-	-	-	83	115	109	121	134	151	168	401	228	239	241
111																		

FortisBC Inc.
EV Charging Stations Review - 100 kW Stations
Schedule 2
November 2023
($000s), unless otherwise stated

Line	Particulars	Reference	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
1	Revenue (Rate from this model)	2018-2023: Sch. 3, Line 12; 2024-2033: Sch. 4, Line 11	-	-	-	4	25	59	65	90	123	169	232	313	388	472	566	650
2																		
3	**Expenses**																	
4	Carbon Credits	Schedule 1 , Line 7	-	-	-	-	-	(83)	(115)	(109)	(121)	(134)	(151)	(168)	(401)	(228)	(239)	(241)
5	Cost of Energy Sold	Schedule 1 , Line 2	-	-	-	-	70	105	128	151	173	191	211	237	264	296	331	366
6	Operation and Maintenance	Schedule 1 , Line 3	-	-	-	15	34	28	51	52	53	54	55	56	57	58	59	61
7	Property Taxes	Schedule 1 , Line 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Depreciation Expense	Schedule 1 , Line 5	-	-	-	-	71	95	115	117	117	117	120	123	125	128	152	162
9	Amortization Expense	Schedule 1 , Line 6	-	-	-	-	(21)	(34)	(40)	(40)	(40)	(40)	(40)	(40)	(40)	(40)	(40)	(40)
10	Total Expenses	Sum of Lines 5 through 9	-	-	-	15	154	112	139	171	181	188	195	207	5	214	263	307
11																		
12	Operating Income	Line 1 - Line 10	-	-	-	(11)	(128)	(53)	(74)	(81)	(59)	(18)	37	106	383	258	303	343
13	Interest	Schedule 1 , Line 81	-	-	-	7	14	17	18	17	15	13	12	11	9	20	36	41
14	Earnings Before income taxes	Line 12 - Line 13	-	-	-	(18)	(142)	(69)	(92)	(98)	(74)	(32)	25	95	374	238	267	302
15	Income tax (recovery)	Line 38	-	-	-	-	-	-	-	-	-	-	-	-	-	43	18	30
16	Net Earnings	Line 14 - Line 15	-	-	-	(18)	(142)	(69)	(92)	(98)	(74)	(32)	25	95	374	195	249	272
17	Cumulative Net Earnings	Cumulative Sum of Line 16	(18)	(18)	(18)	(18)	(160)	(230)	(321)	(419)	(493)	(525)	(501)	(405)	(31)	164	413	686
18	Repayment to Canada (True/False)	If Cumulative Sum of Line 17 Positive Than True, if Negative Than False	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	TRUE
19																		
20	Cumulative Capital Expenditure (EV Charger Only)		-	-	-	706	947	1,138	1,138	1,138	1,138	1,138	1,138	1,138	1,138	432	191	-
21	Cumulative NRCan CIAC	Cumulative for 10 Years Only (No repayment after 10 years)	-	-	-	(234)	(423)	(502)	(502)	(502)	(502)	(502)	(502)	(502)	(502)	(268)	(79)	-
22	Repayment Ratio	-Line 21 / Line 20	0%	0%	0%	33%	45%	44%	44%	44%	44%	44%	44%	44%	44%	62%	41%	0%
23	Repayment Amount	If Line 17 Positive Than, Line 17 x Line 22	-	-	-	-	-	-	-	-	-	-	-	-	-	**121**	**103**	-
24	Remaining Amount to be repaid	-(Schedule 1 , Line 52) - Line 23	-	-	-	-	213	402	481	481	481	481	481	481	481	360	378	481
25																		
26	Year		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
27																		
28	Income Tax Calculations																	
29																		
30	Income before Tax	Line 14	-	-	-	(18)	(142)	(69)	(92)	(98)	(74)	(32)	25	95	374	238	267	302
31	Add: Depreciation (Net of CIAC Amortizartion)	Line 8	-	-	-	-	50	61	74	77	77	77	80	82	85	88	111	122
32	Taxable Income before CCA	Line 30 + Line 31	-	-	-	(18)	(92)	(9)	(17)	(21)	3	45	104	178	459	326	379	424
33	Deduct: CCA	Schedule 1 , Line 104	-	-	-	(472)	(60)	(122)	(15)	(14)	(13)	(26)	(18)	(23)	(27)	(166)	(311)	(315)
34	Net income/(loss) for tax purposes	Line 32 + Line 33	-	-	-	(490)	(152)	(130)	(32)	(35)	(10)	19	86	154	433	160	67	109
35	Non-capital loss applied	If Line 34 Positive Than Apply Available Non-capital loss from Line 41	-	-	-	-	-	-	-	-	-	(19)	(86)	(154)	(433)	(156)	-	-
36	Taxable income/(loss)	Line 34 + Line 35	-	-	-	(490)	(152)	(130)	(32)	(35)	(10)	-	-	-	-	4	67	109
37	Tax Rate	Schedule 1 , Line 95	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%
38	Income Tax Expense	If Line 36 Positive Than, Line 36 x Line 37	-	-	-	-	-	-	-	-	-	-	-	-	-	43	18	30
39																		
40	Non-capital Loss Continuity																	
41	Opening Balance	Prior Year Closing Balance, Line 44	-	-	-	-	490	642	772	805	839	849	830	743	589	156	-	-
42	Additions	Net (loss) -Line 34	-	-	-	490	152	130	32	35	10	-	-	-	-	-	-	-
43	Loss applied	Line 35	-	-	-	-	-	-	-	-	-	(19)	(86)	(154)	(433)	(156)	-	-
44	Closing Balance	Sum of Lines 41 through 43	-	-	-	490	642	772	805	839	849	830	743	589	156	-	-	-

FortisBC Inc.
EV Charging Stations Review - 100 kW Stations
Schedule 3
November 2023
($000s), unless otherwise stated

Line	Particulars	Reference	2018	2019	2020	2021	2022	2023
1								
2	Incremental Annual Revenue Requirement	Schedule 1, Line 11	-	-	-	(141)	189	138
3	PV of Revenue Requirement (After-tax WACC of 5.76%)	Line 2 / (1 + Line 31)^Yr	-	-	-	(112)	144	97
4	**Total PV of Annual Revenue Requirement**	Sum of Line 3	***129***					
5								
6						Interim	Permanent	Permanent
7	RS 96 Rate - 100 kW ($/min)		-	-	-	0.30	0.54	0.54
8	Less: 15% Transaction Fee	-Line 7 x 15%	-	-	-	(0.06)	(0.08)	(0.08)
9	RS 96 Rate (100 kW) - Revenue Requirement ($/min)	Line 7 + Line 8	-	-	-	0.24	0.46	0.46
10								
11	Number of Charging Minutes per Year		-	-	-	16,539	54,933	127,815
12	RS 96 Revenue - 100 kW	Line 9 x Line 11 / 1,000	-	-	-	4	25	59
13	PV of RS 96 Revenue - 100 kW	Line 9 / (1 + Line 31)^Yr	-	-	-	3	19	41
14	Total PV of RS 96 Revenue - 100 kW	Sum of Line 13	**64**					
15	**% Recovery - 100 kW**	**Line 14 / Line 4**	**50%**					
16								
17	Deficiency / (Surplus)	Line 2 - Line 12	-	-	-	(145)	164	79
18	PV of Deficiency / (Surplus) - 100 kW	Line 14 / (1 + Line 31)^Yr	-	-	-	(116)	125	56
19	**Total PV of Deficiency / (Surplus) - 100 kW**	**Sum of Line 18**	**65**					
20								
21	2024 Revenue Requirement	2024 Annual Review (Evid Update)	457,247	457,247	457,247	457,247	457,247	457,247
22	PV of 2024 Revenue Requirement (Interim)	Line 21 / (1 + Line 31)^Yr	431,880	407,807	386,468	365,438	347,816	322,382
23	Total PV of 2024 Revenue Requirement (Interim)	Sum of Line 22	**2,261,790**					
24	**Levelized % Increase (6 yrs) on 2024 Rate**	**Line 19 / Line 23**	**0.003%**					
25								
26	***Cumulative Deficiency / (Surplus) Continuity***							
27	Opening Balance	Prior Yr; Line 29	-	-	-	-	(145)	19
28	Additions	Line 17	-	-	-	(145)	164	79
29	**Closing**	**Line 27 + Line 28**	**-**	**-**	**-**	**(145)**	**19**	**98**
30								
31	After- Tax Weighted Average Cost of Capital (WACC)	[1]	5.87%	5.89%	5.77%	5.76%	5.62%	6.00%
32	1 - ROE Rate x Equity Component + [(STD Rate x STD Portion) + (LTD Rate x LTD Portion)] x (1- Income Tax Rate)]							

FortisBC Inc.
EV Charging Stations Review - 100 kW Stations
Schedule 4
November 2023
($000s), unless otherwise stated

Line	Particulars	Reference	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
1												
2	2018-2023 Cumulative Deficiency / (Surplus)	Schedule 3, Line 29	98									
3	Incremental Annual Revenue Requirement	Schedule 1, Line 11	214	245	250	246	253	260	53	365	396	356
4	Total Annual Revenue Requirement from EV Customer	Sum of Line 2 to Line 3	312	245	250	246	253	260	53	365	396	356
5	PV of Revenue Requirement (After-tax WACC of 5.76%)	Line 2 / (1 + Line 20)^Yr	295	218	210	195	189	183	35	229	234	198
6	**Total PV of Annual Revenue Requirement**	Sum of Line 5	***1,985***									
7												
8	***Levelized $ per kWh Rate - New***											
9	Annual Dispensing kWh		180,713	251,117	341,604	471,847	644,929	871,102	1,080,293	1,315,114	1,575,489	1,809,617
10	RS 96 Rate - 100 kW ($/kWh) - Update Jan 1, 2024	**Excel Solver resulting Line 13 = Line 6**	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
11	RS 96 Revenue - 100 kW	**Line 9 x Line 10 / 1,000**	64	89	120	166	227	307	381	464	555	638
12	PV of RS 96 Revenue - 100 kW	Line 11 / (1 + Line 20)^Yr	60	79	101	132	170	216	253	291	328	356
13	Total PV of RS 96 Revenue - 100 kW	Sum of Line 12	**1,985**									
14	Deficit / (Surpllus)	Line 13 - Line 6	-									
15												
16	Levelized $ per kWh rate to recover Cost of Service (2024 to 2033)	Line 6 x 1,000 / Line 10	0.35									
17	Transaction Fee Percentage		15%									
18	Levelized $ per kWh rate - 100 kW (incl. Trans Fee)	Line 16 / (1 - Line 17)	**0.41**									
19												
20	After- Tax Weighted Average Cost of Capital (WACC)	[1]	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%

21 1 - ROE Rate x Equity Component + [(STD Rate x STD Portion) + (LTD Rate x LTD Portion)] x (1- Income Tax Rate)]

FortisBC Inc.
EV Charging Stations Review - 50 kW & 100 kW Stations (Summary)
Schedule 1
November 2023
($000s), unless otherwise stated

Line	Particulars	Reference	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
1	**Cost of Service (50 kW & 100 kW)**																	
2	Cost of Energy		-	-	-	-	136	190	239	284	334	389	452	524	602	672	744	814
3	Operation & Maintenance		0	2	46	101	213	181	306	326	349	380	419	468	528	583	611	630
4	Property Taxes		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Depreciation Expense		-	60	197	307	456	551	593	607	609	612	617	640	688	731	788	833
6	Amortization Expense on CIAC		-	(35)	(70)	(150)	(190)	(236)	(249)	(249)	(249)	(249)	(249)	(249)	(249)	(214)	(179)	(99)
7	Other Revenue - Carbon Credits		-	-	-	-	(744)	(544)	(513)	(386)	(432)	(478)	(537)	(601)	(1,416)	(809)	(825)	(816)
8	NRCan Repayment		-	-	-	-	-	-	-	-	-	-	-	-	358	325	255	-
9	Income Taxes		(9)	(361)	(72)	(299)	(6)	51	135	135	135	128	96	(8)	(98)	(157)	(336)	(253)
10	Earned Return		6	53	95	124	170	199	209	203	180	158	164	225	308	382	448	472
11	**Incremental Annual Revenue Requirement**	Sum of Line 2 to Line 10	**(2)**	**(282)**	**196**	**83**	**35**	**393**	**721**	**920**	**928**	**940**	**962**	**1,001**	**720**	**1,513**	**1,082**	**1,153**
12	PV of Revenue Requirement	Line 11 / (1 + Line 15)^Yr	(2)	(251)	165	66	26	277	479	577	549	524	506	497	337	668	451	453
13	**Total PV of Annual Revenue Requirement**	Sum of Line 12	***5,322***															
14																		
15	After- Tax Weighted Average Cost of Capital (WACC)		5.87%	5.89%	5.77%	5.76%	5.62%	6.00%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%
16																		
17	RS 96 Revenue - 50 kW ($/min)		4	24	28	56	91	117										
18	RS 96 Revenue - 100 kW ($/min)		-	-	-	4	25	59										
19	RS 96 Revenue - $ / kWh		-	-	-	-	-	-	237	329	447	618	845	1,107	1,399	1,698	1,962	2,193
20	Total RS 96 Revenue	Line 17 + Line 18	4	24	28	60	116	176	237	329	447	618	845	1,107	1,399	1,698	1,962	2,193
21	PV of RS 96 Revenue	Line 20 / (1 + Line 15)^Yr	4	21	24	48	88	124	157	206	265	345	444	549	655	750	817	862
22	Total PV of RS 96 Revenue	Sum of Line 21	***5,359***															
23																		
24	**% Recovery - 50 kW & 100 kW Combined**	**Line 22 / Line 13**	**101%**															
25																		
26	Deficiency / (Surplus)	Line 11 - Line 20	(6)	(306)	168	23	(81)	217	484	591	480	322	117	(106)	(679)	(185)	(880)	(1,040)
27	PV of Deficiency / (Surplus) - 50 kW & 100 kW	Line 26 / (1 + Line 15)^Yr	(6)	(273)	142	19	(62)	153	322	371	284	180	62	(53)	(318)	(82)	(366)	(409)
28	Total PV of Deficiency / (Surplus) - 50 kW & 100 kW	Sum of Line 27	**(37)**															
29																		
30	2024 Revenue Requirement	2024 Annual Review (Evid Update)	457,247	457,247	457,247	457,247	457,247	457,247	457,247	457,247	457,247	457,247	457,247	457,247	457,247	457,247	457,247	457,247
31	PV of 2024 Revenue Requirement (Interim)	Line 30 / (1 + Line 15)^Yr	431,880	407,807	386,468	365,438	347,816	322,382	303,851	286,619	270,364	255,031	240,567	226,924	214,055	201,915	190,464	179,663
32	Total PV of 2024 Revenue Requirement (Interim)	Sum of Line 31	**4,631,242**															
33	**Levelized % Increase on 2024 Rate**	**Line 28 / Line 32**	**0.00%**															
34																		

FortisBC Inc.
EV Charging Stations Review - 50 kW & 100 kW Stations (Summary)
Schedule 2
November 2023
($000s), unless otherwise stated

Line	Particulars	Reference	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
1												
2	2018-2023 Cumulative Deficiency / (Surplus)	Schedule 3, Line 29	15									
3	Incremental Annual Revenue Requirement	Schedule 1, Line 11	721	920	928	940	962	1,001	720	1,513	1,082	1,153
4	Total Annual Revenue Requirement from EV Customer	Sum of Line 2 to Line 3	736	920	928	940	962	1,001	720	1,513	1,082	1,153
5	PV of Revenue Requirement (After-tax WACC of 5.87%)	Line 2 / (1 + Line 20)^Yr	694	819	779	744	718	705	479	948	640	643
6	**Total PV of Annual Revenue Requirement**	Sum of Line 5	***7,169***									
7												
8	***Levelized $ per kWh Rate - New***											
9	Annual Dispensing kWh		659,040	915,794	1,245,793	1,720,774	2,351,984	3,082,678	3,896,789	4,727,441	5,463,280	6,106,684
10	RS 96 Rate - 50 kW & 100 kW ($/kWh) - Update Jan 1, 2024	**Excel Solver resulting Line 13 = Line 6**	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36
11	RS 96 Revenue - 50 kW & 100 kW	**Line 9 x Line 10 / 1,000**	237	329	447	618	845	1,107	1,399	1,698	1,962	2,193
12	PV of RS 96 Revenue - 50 kW & 100 kW	Line 11 / (1 + Line 20)^Yr	223	293	376	489	631	780	930	1,064	1,160	1,223
13	Total PV of RS 96 Revenue - 50 kW & 100 kW	Sum of Line 12	**7,169**									
14	Deficit / (Surpllus)	Line 13 - Line 6	-									
15												
16	Levelized $ per kWh rate to recover Cost of Service (2024 to 2033)	Line 6 x 1,000 / Line 10	0.36									
17	Transaction Fee Percentage		15%									
18	Levelized $ per kWh rate - 50 kW & 100 kW (incl. Trans Fee)	Line 16 / (1 - Line 17)	**0.42**									
19												
20	After- Tax Weighted Average Cost of Capital (WACC)	[1]	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%	6.01%

21 1 - ROE Rate x Equity Component + [(STD Rate x STD Portion) + (LTD Rate x LTD Portion)] x (1- Income Tax Rate)]

Appendix F

DUNSKY ENERGY + CLIMATE ADVISORS METHODOLOGY & MARKET OVERVIEW ANALYSIS

dunsky
Energy + Climate

ACCELERATING THE CLEAN ENERGY TRANSITION

ANALYSIS + STRATEGY

BUILDINGS | **MOBILITY** | **INDUSTRY** | **ENERGY**

dunsky
Energy + Climate

ACCELERATING THE CLEAN ENERGY TRANSITION

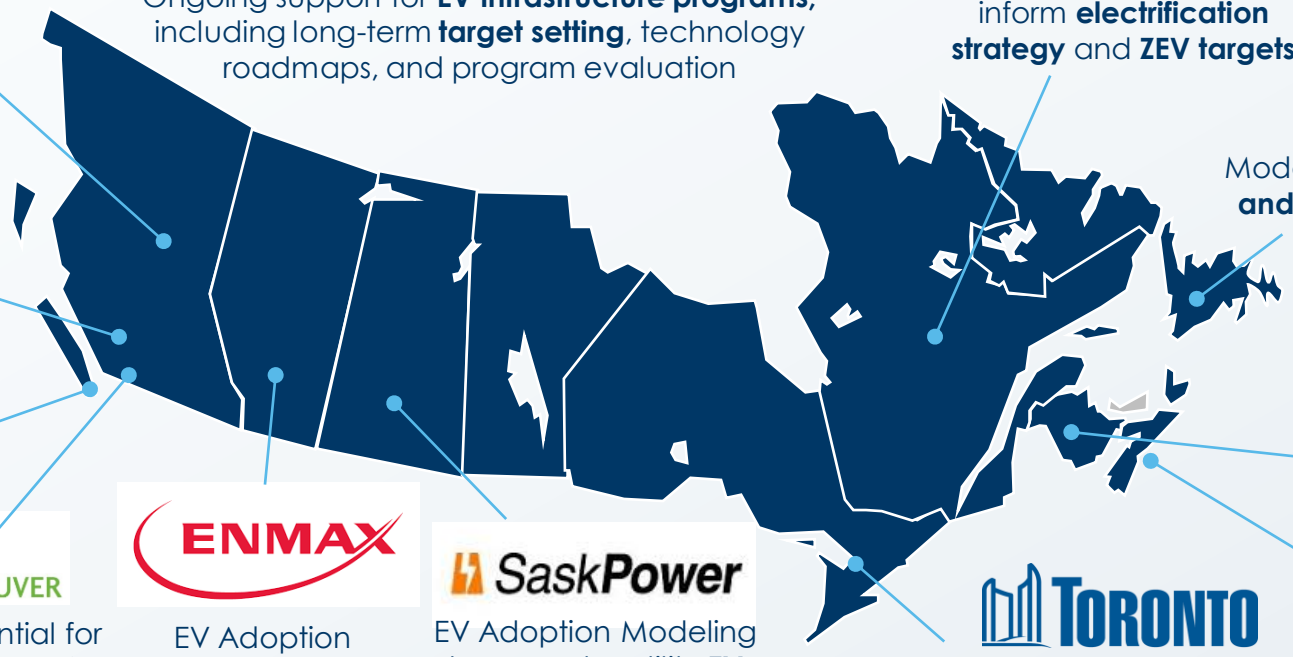
ANALYSIS + STRATEGY

BUILDINGS | **MOBILITY** | **INDUSTRY** | **ENERGY**

GOVERNMENTS | UTILITIES | CORPORATE + NON-PROFIT

Sample of recent EV projects in Canada

Among more than **150 recent EV projects**



Analysis of regional needs for **charging infrastructure** by 2040

Strategic and analytical support on **Smart-Charging** and **V2G**

EV adoption **modeling** and **strategy development**

Assessing potential for **private investment** in charging infrastructure

EV Adoption Modeling to inform **utility EV strategy**

EV Adoption Modeling to support a utility **EV business plan**

Ongoing support for **EV infrastructure programs,** including long-term **target setting**, technology roadmaps, and program evaluation

EV Adoption modeling to inform **electrification strategy** and **ZEV targets**

Municipal EV strategy development + TPA charging strategy

Modeling adoption of **light, medium and heavy-duty EVs** under several investment scenarios

Modeling adoption of **light, medium and heavy-duty EVs** and developing a **beneficial electrification strategy**

Strategic and analytical support on **Smart-Charging** and **V2G.**

EVA

Dunsky's Electric Vehicle Adoption Model

- **Forecasts EV adoption** for personal and commercial vehicles and fleets, in client-defined regions
- **Supports strategy development** by projecting impact of policy, program and infrastructure options
- **Assesses sensitivity** to key global and local parameters
- **Assesses and optimizes** energy, peak demand, cost and revenue impacts

EVA

powered by dunsky

Methodology & Market Overview

Introduction

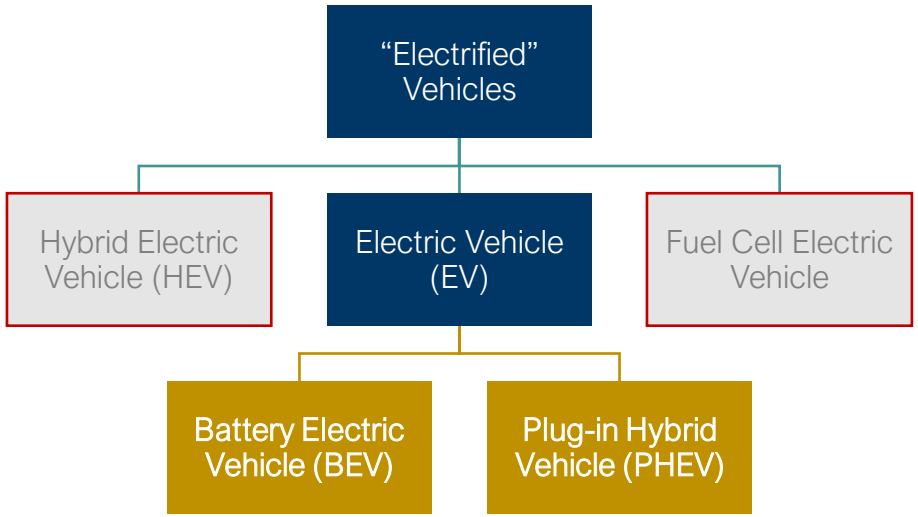
Overview

The EV analysis considers *plug-in* electric vehicles. Specifically, it considers the following vehicle types:

- **Battery electric vehicles (BEV):** "pure" electric vehicles that only have an electric powertrain and that must be plugged into an electric source to charge (*e.g.*, Tesla Model 3, Chevy Bolt, Nissan Leaf).
- **Plug-in hybrid electric vehicles (PHEV):** vehicles that can plug in to charge and operate in electric mode for short distances (*e.g.*, 30 to 80 km), but that also include a combustion powertrain for longer trips. (*e.g.*, Chevy Volt, Toyota Prius Prime).

The following vehicle types are excluded from the analysis:

- **Hybrid electric vehicles** that do not plug in to charge and are considered internal combustion engine (ICE) vehicles.
- **Fuel cell electric vehicles** such as hydrogen vehicles where the market is assumed to be minimal in the timeframe of the study.



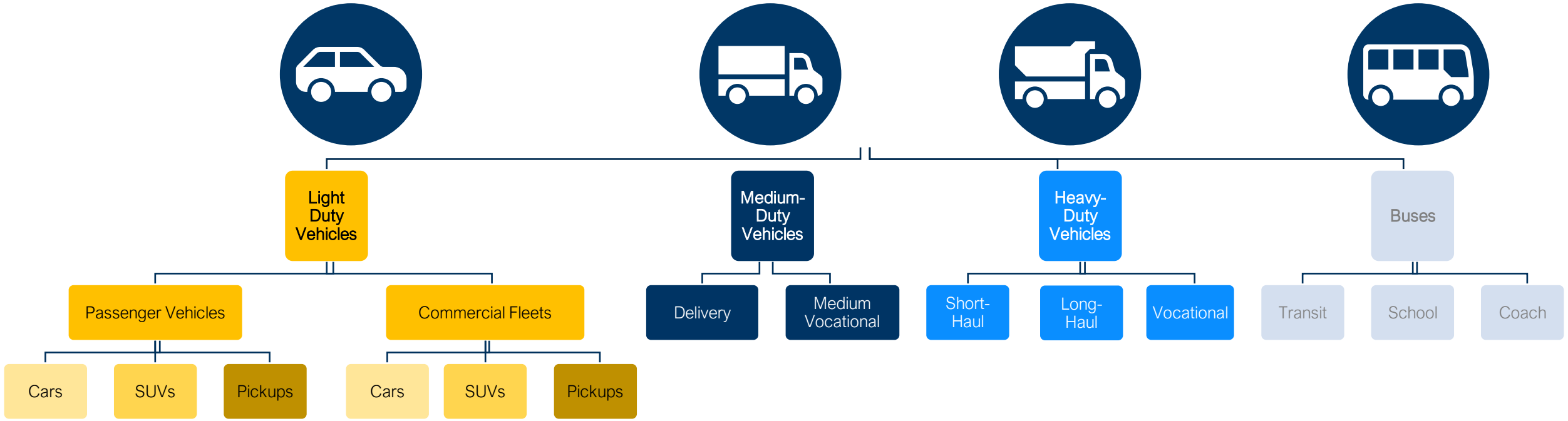
Chevrolet Bolt, a BEV with 417 km of range.

Toyota Prius Prime, a PHEV with 40 km of EV range

Characterize Vehicle Segments

Multiple vehicle classification systems exist. However, for the purpose of this study, we break down the on-road vehicle market into several key segments that share common characteristics

- Results are broken down into for light-, medium-, heavy- duty vehicles and buses
- More granular vehicle sub-segments were used in the modelling to capture vehicle segments with distinct factors that may impact EV adoption (e.g. limited availability of EV model, unique driving patterns or technical needs, etc.)



Vehicle Market

Approximately 292,000 vehicles on the road in FortisBC's service territory

- Light-duty vehicles (LDVs), both personal and commercial, represent 97% of vehicles (284,000 vehicles on the road).
- 8,000 medium-and heavy-duty vehicles (MHDVs) are estimated to be on the road, representing 3% of all vehicles.

Approximately 16,200 new LDVs estimated to be registered annually in the region

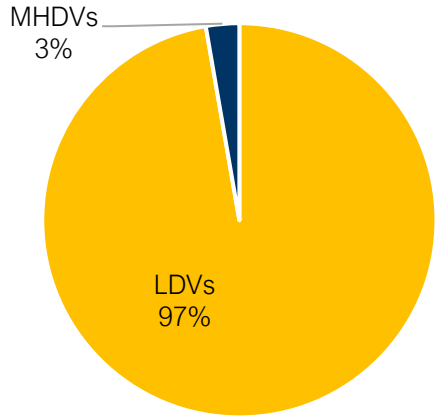
- Majority (90%) of LDVs assumed predominantly passenger/personal use, with the remaining being commercial/institutional fleets
- SUVs and Pickups make up 82% of new vehicle sales in FortisBC's territory, and 68% of vehicles currently in circulation, reflecting an ongoing trend towards light-duty trucks.

Approximately 600 new MHDVs estimated to be registered annually

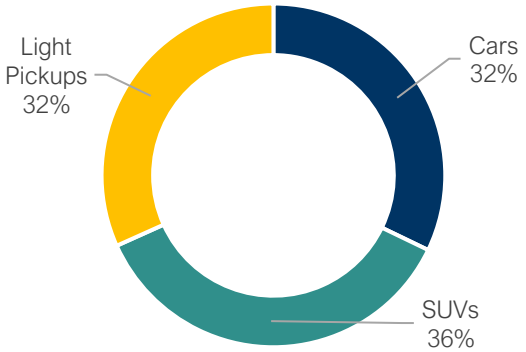
- Medium-Duty Vehicles make up 49% of vehicles in circulation

Available data on annual vehicle sales and total number of vehicles registered in FortisBC'S territory was limited. The estimated vehicle market sizes used in the study represent the project team's best judgement based on analysis of data from NRCan's Comprehensive Energy Use Database and the ICBC vehicle database..

Total Vehicles (2021)

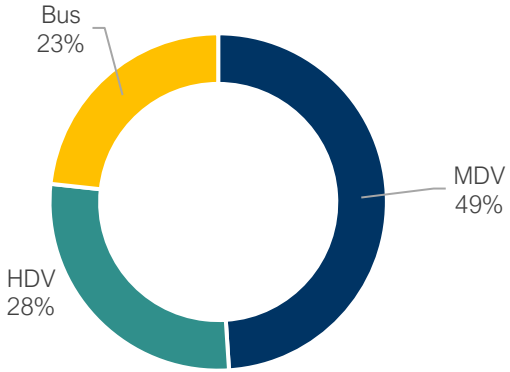


LDV Segment Split



% of Total Vehicles 2021

MHDV Segment Split



% of Total Vehicles 2021

Electric Vehicle Market

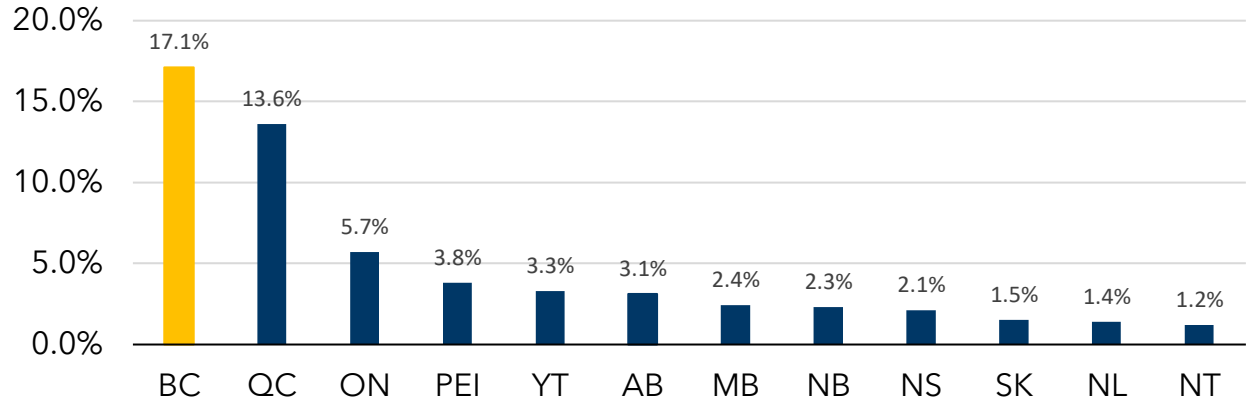
British Columbia is a leader in Canada's EV markets (QC, ON, BC), and is 1st in terms of market share.

- EVs represented 17.1% of new vehicle sales in the province as of Q1 2022.

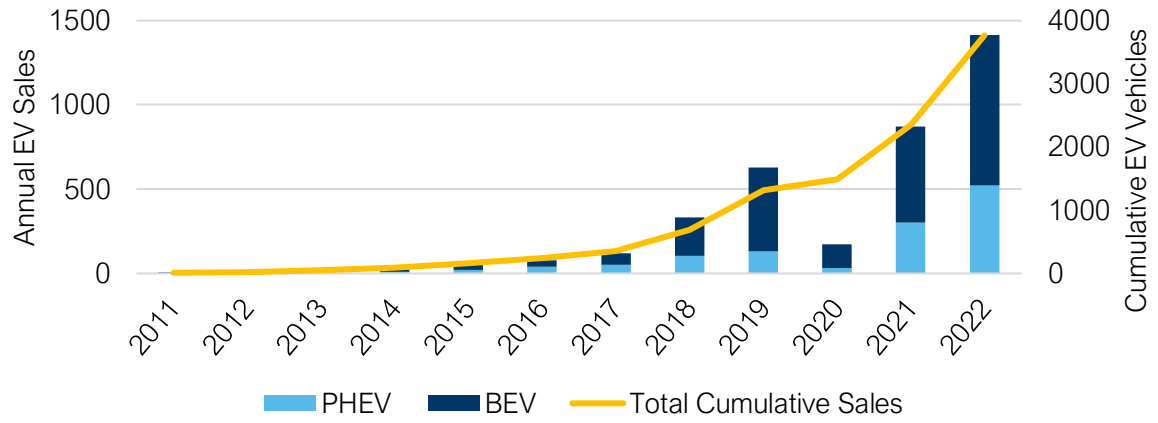
In FortisBC's service territory, approximately 3,800 EVs are estimated to be on the road in 2022.

- Significant increase in uptake observed in 2018/2019 (coincident with federal ZEV incentives)
- Drop in sales in 2020 due to COVID

Share of ZEV New Vehicle in Q1 '22 by Province and Territories[1]



FortisBC EV Sales (2011 – 2021) [2]



[1] IHS Markit – Automotive Insights: A curated collection of Canadian EV information, analysis and insights from S&P Global Mobility Q1 2022

[2] Historical EV sales in FortisBC's service territory were estimated based on data obtained from several sources, including ICBC Registration data and Statistics Canada provincial data.

EVA Model

The study leverages Dunsky's Electric Vehicle Adoption (EVA) Model to forecast the uptake of EVs.

EVA powered by dunsky

TECHNICAL

Assess the maximum theoretical potential for deployment

- Market size and composition by vehicle class (e.g. cars, trucks, buses)[1]
- Model availability for each vehicle powertrain (e.g. ICE, PHEV, BEV)

ECONOMIC

Calculate unconstrained economic potential uptake

- Incremental purchase cost of PHEV/BEV over ICE vehicles
- Total Cost of Ownership (TCO) (personal) or Internal Rate of Return (IRR) (commercial) based on operational and fuel costs

CONSTRAINTS

Account for jurisdiction-specific barriers and constraints

- Range anxiety or range requirements
- Public charging coverage, availability, and charging time
- Home charging access

MARKET

Incorporate market dynamics and non-quantifiable market constraints

- Use of technology diffusion theory to determine rate of adoption
- Market competition between vehicles types (PHEV vs. BEV)

1. Market size growth is calculated by assessing annual sales by vehicle segment and average vehicle lifetime to determine number of vehicles retired.

EV Modeling Approach

1. **Market Characterization:** Divide the market into three vehicle archetypes (cars, SUVs, trucks), develop representative characteristics for each segment and collect data on annual vehicle sales, fleet size and other key market inputs.

2. **Model Calibration:** Using historical inputs on vehicle sales, energy prices, vehicle costs, incentive programs and infrastructure deployment to benchmark the model to historical adoption and calibrate key model parameters to local market conditions.

3. **Scenario Analysis:** Forecast service territory-wide EV adoption under scenarios reflecting different program/policy interventions (e.g. infrastructure deployment, incentives) as well as market and technology conditions (e.g. battery costs, energy prices).

EV Modeling Approach

Consideration and treatment of key barriers in the model for personal vehicles and commercial fleets reflects key differences in decision-making between the segments.

Barrier	Personal LDV	Commercial LDV	Commercial MHDV
Technical	Base vehicle assumed to be **gasoline ICEV**		Base vehicle assumed to be **diesel ICEV**
Economic	**Upfront cost and Total Cost of Ownership (TCO) as a simple payback function**	Based **on Internal Rate of Return (IRR)** of the vehicle's upfront and operational costs over its lifetime.	
Constraints	• Range Anxiety • Charging Time • Public Charging Coverage • **Public Charging Availability** • **Home Charging Access**	• Range Requirement • Charging Time Requirement • Public Charging Coverage	• Range Requirement • Charging Time Requirement
Market	**Competition** between PHEV and BEVs		**No competition** between PHEVs and BEVs (i.e. all assumed to be BEVs)

Note: Bolded text highlight key differences in barrier considerations between vehicle segments.

Scenario Descriptions: LDVs

The adoption rate of electric vehicles will be assessed under three scenarios that vary policy factors as described below.

Low Growth

Minimal efforts to support EV adoption.

- Limited new policies and programs are put in place to support or incentivize electric vehicle adoption and
- Existing ZEV mandates are rescinded
- Public charging infrastructure expands at current growth trajectory and multi-unit residential building charging retrofits remain limited

Medium Growth

Some support to enable EV adoption.

- Stronger policies/programs are implemented that increase the adoption of electric vehicle include
- Current ZEV mandates are maintained
- Additional investment in both public and multi-unit residential building charging infrastructure

High Growth

Strong policy pathway to reach proposed provincial ZEV targets.

- Stringent policies/programs are put in place to support or incentivize electric vehicle adoption
- Proposed ZEV mandates are implemented
- Investments in charging infrastructure support eliminate charging-related barriers to EV adoption

Scenarios: Light Duty Vehicles

Parameter	Scenario 1: **Low Growth**	Scenario 2: **Medium Growth**	Scenario 3: **High Growth**
Policy/Program Interventions			
Public charging infrastructure expansion	Limited *Planned investments + current growth trajectory*	Moderate *Planned investments + accelerated growth trajectory*	Significant *Does not constrain adoption*
Vehicle incentives[1]	Current incentives ***BEVs:** $4,000* ***PHEVs:** $2,000* *(Ramped down + phased-out by 2026)*	Current incentives, extended ***BEVs:** $4,000* ***PHEVs:** $2,000* *(Ramped down + phased-out by 2030)*	Expanded incentives ***BEVs:** $8,000* ***PHEVs:** $4,000* *(Ramped down + phased-out by 2035)*
Existing building charging infrastructure retrofits	Limited *15% of multi-unit buildings with access to charging by 2035*	Moderate *40% of multi-unit buildings with access to charging by 2035*	Significant *90% of multi-unit buildings with access to charging by 2035*
Zero-emission Vehicle (ZEV) Mandates[4]	None	100% by 2040 *In alignment with current provincial regulations[2]*	100% by 2035 *In alignment with proposed provincial regulations[3]*
Local Availability	Limited 50% of dealerships have EVs for sale by 2040	Moderate 100% of dealerships have EVs for sale by 2040	Significant 100% of dealerships have EVs for sale by 2035

[1] Scenario incentives are based upon a mix of provincial and federal incentives.
[2] See the Zero-Emission Vehicles Act (ZEV Act) and accompanying ZEV Regulation.
[3] See B.C. Zero-Emission Vehicles Act and Regulation: 2022 Formal Review Intentions Paper.
[4] The study assumes that light-duty ZEV mandates will be achieved entirely with BEVs.

Scenario Descriptions: MHDVs

The adoption rate of electric vehicles will be assessed under three scenarios that vary policy and long-haul charging technology factors as described below.

Low Growth	**Maintains the status quo.** • No new policies and programs are put in place to support or incentivize electric vehicle adoption • Charging technology improvements and deployment for long haul vehicle segments are slower than anticipated
Medium Growth	**Moderate push for MDHV electric vehicle adoption.** • Some policies/programs are implemented/maintained that increase the adoption of electric vehicles (additional investment in infrastructure and incentives compared to the low growth scenario) • Charging technology improvements and deployment for long haul vehicle segments align with baseline forecasts today
High Growth	**Strong policy pathway for MDHV electric vehicle adoption.** • More stringent policies/programs are put in place to support or incentivize infrastructure and vehicles • Charging technology improvements and deployment for long haul vehicle segments are faster than anticipated

Scenarios: Medium and Heavy Duty Vehicles

Parameter	Scenario 1: **Low Growth**	Scenario 2: **Medium Growth**	Scenario 3: **High Growth**
Policy/Program Interventions			
Vehicle incentives[1]	$100,000 (Ramped down + phased-out by 2026)	$100,000 (Ramped down + phased-out by 2030)	$200,000 (Ramped down + phased-out by 2035)
Public procurement targets	None	100% of new transit and school buses by 2030	100% of new transit and school buses by 2025
Technology Uncertainties			
Charging power for long haul segments	Up to 350 kW charging (Varies by vehicle segment)	Up to 1 MW charging (Varies by vehicle segment)	Up to 2 MW charging (Varies by vehicle segment)

[1] Scenario incentives are based upon a mix of provincial and federal incentives.

Sensitivities: All Vehicles

In addition to policy and program interventions, forecasted EV adoption is also sensitive to uncertainties around key market and technology factors such as electricity rates, fuel prices, battery costs, vehicle sales and EV model availability.

To understand the influence of these factors, the study will conduct sensitivity analyses.

Parameter	Low Sensitivity (Most Conservative)	Base Case	High Sensitivity (Most Optimistic)
Technology Uncertainties			
Battery Costs	Limited cost declines	Moderate cost declines	Aggressive cost declines
EV Model Availability	Limited availability	Moderate availability	High availability
Market Factors			
Vehicle Sales	No growth in vehicle sales	Increase in vehicle sales at current pace	Higher growth than current pace
Electricity Price Escalation	1% higher than historical	Historical levels	1% lower than historical
Fuel Price Escalation	Historical escalation without carbon tax	Historical escalation (≈ 1% per year) + $170/ton carbon tax by 2030	1% higher than historical + $170/ton carbon tax by 2030

Note: The narrative report will illustrate the impact of sensitivity factors around the Medium Growth scenario. The detailed results dashboard will enable exploration of sensitivity factors on all scenarios.

Light-Duty Vehicle Forecast

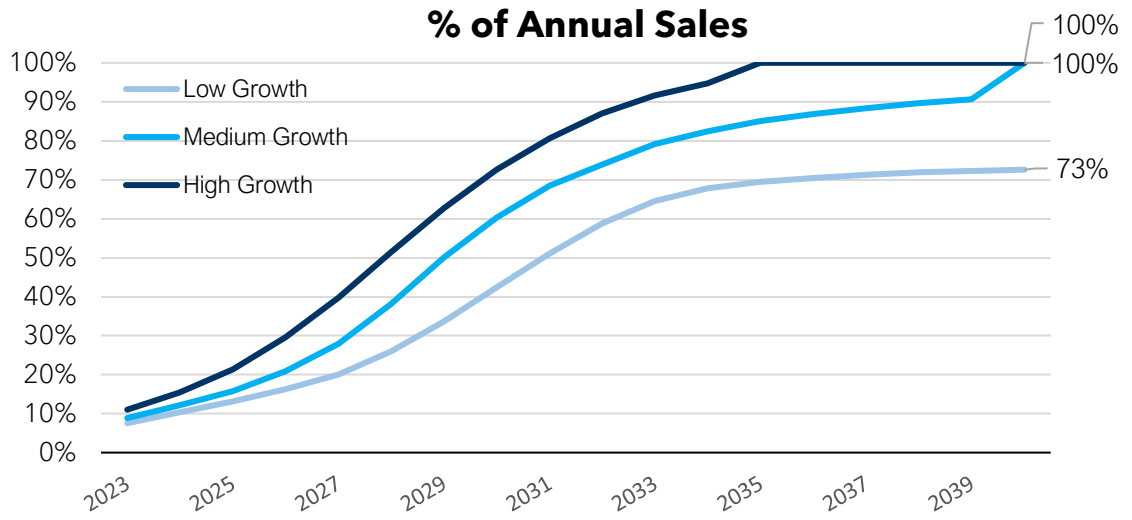
Results

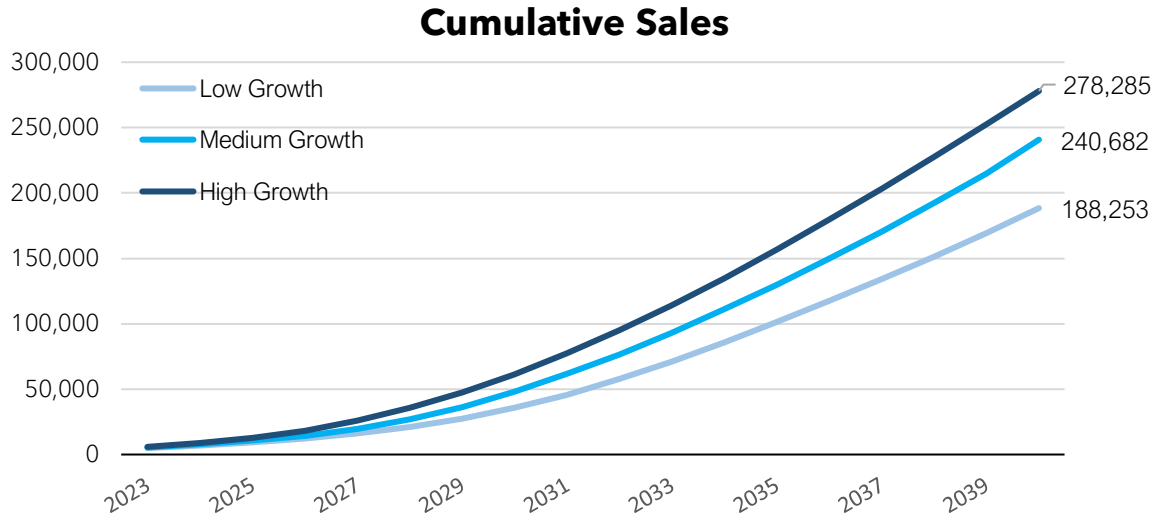
LDVs: Summary

The adoption of passenger EVs in FortisBC's service territory is forecasted to increase rapidly over the study period

While the degree of adoption will depend on the level of policy and program interventions in place to accelerate EV adoption, we expect the majority of new vehicle sales to be electric by 2030 across all three scenarios.

- Even if supportive policies and measures are scaled back, we expect EV adoption in the Low Growth scenario to reach over 188,000 EVs by 2040.
- Under the Medium and High scenarios, total EV sales reach 241,000 and 278,000, respectively, thanks to a range of supportive policies and measures, including sustained financial incentives, public infrastructure deployment, improved home charging access, and ZEV mandates that force sales to 100% by 2040 or 2035.



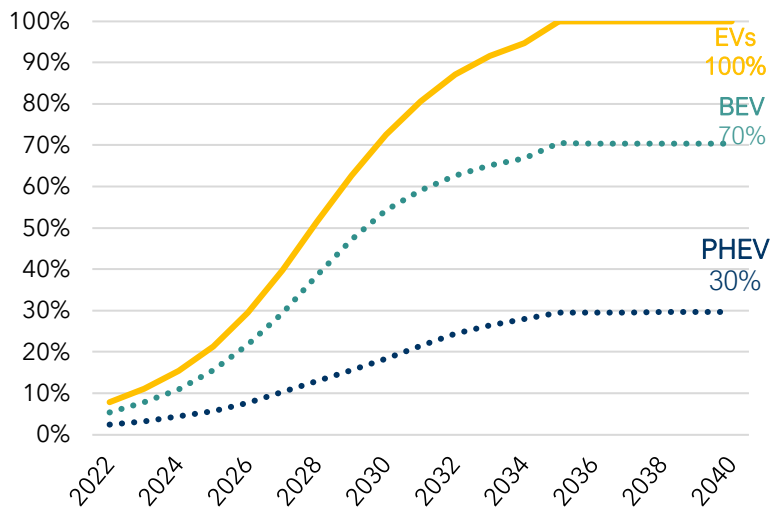


LDVs: Annual Sales Targets

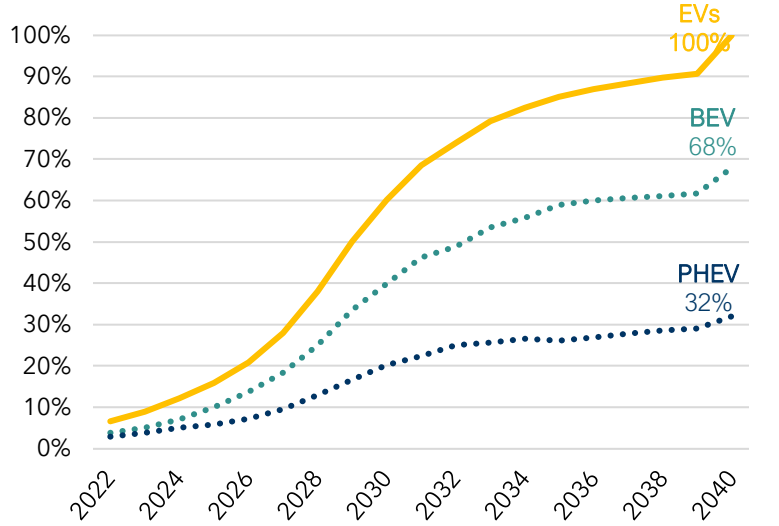
EV adoption in FortisBC's service territory reaches the proposed BC and Federal ZEV Target of 100% of sales by 2035 under the High Growth scenario. Under the Medium scenario, we assume the proposed targets are not locked in or are repealed, achieving the currently BC target of 100% of sales by 2040.

The Low scenario includes very limited public charging infrastructure deployment, leading to constrained adoption of BEVs in favour of PHEVs that largely do not require public chargers to enable adoption.

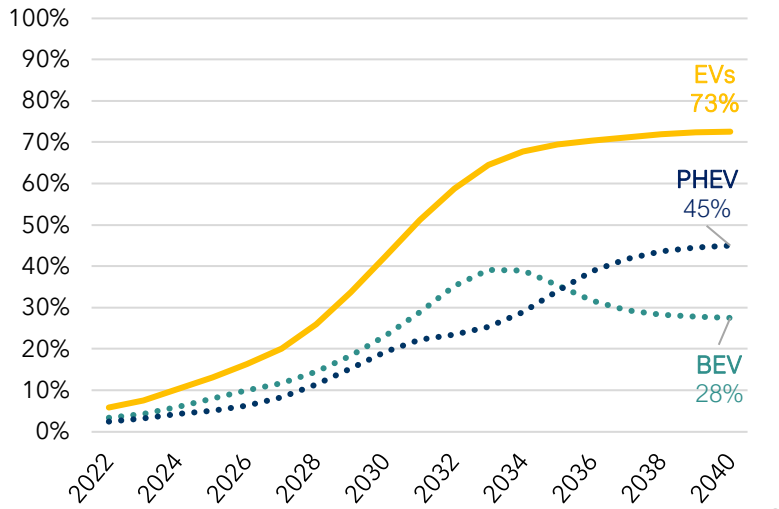
High Growth (% of sales)



Medium Growth (% of sales)



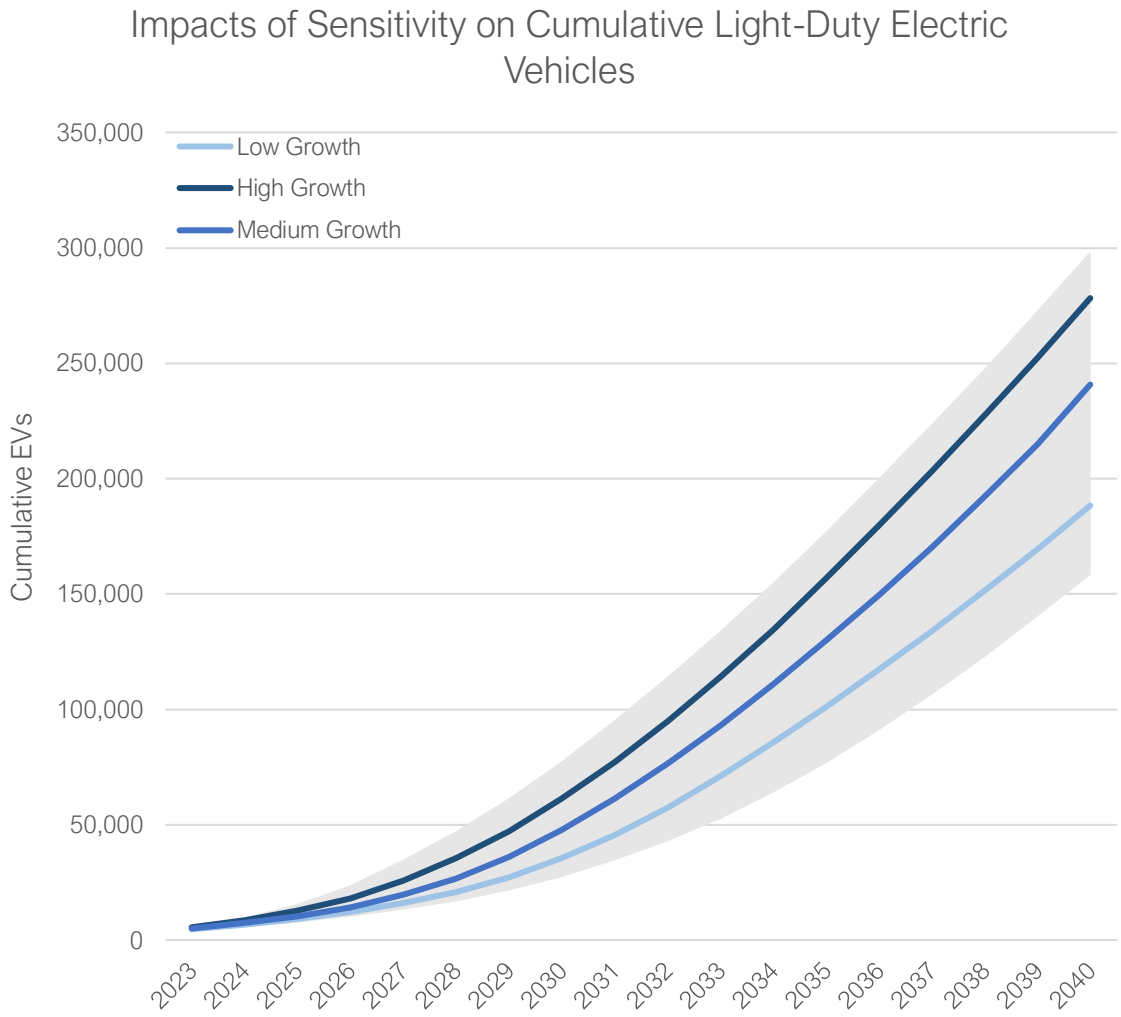
Low Growth (% of sales)



LDVs: Sensitivity

Uncertainties around, availability, battery, fuel and electricity costs will have a moderate impact on EV adoption as declining battery costs and financial incentives are likely to be key drivers in improving the business case for upfront costs of EVs .

- Low fuel costs and high electricity rates have the potential to slightly limit adoption below scenario levels as this would reduce the total cost of ownership of an EV.
- High fuel costs and low electricity rates would improve the total cost of ownership of an EV, but this would have a limited impact on adoption as the benefits of total cost of ownership are already quite substantial.



Medium and Heavy-Duty Vehicle Forecast

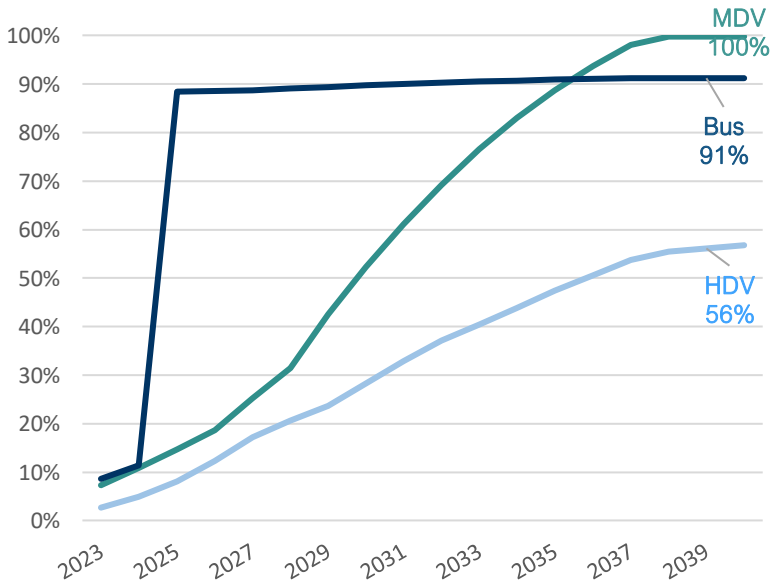
Results

MHDVs: Annual Sales

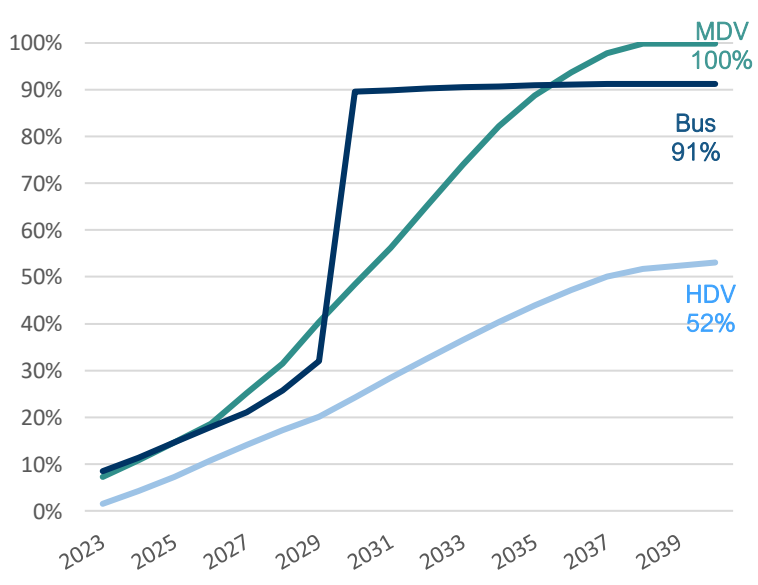
MHDV EV sales are expected to grow substantially after 2030.

- MDV trucks will lead the MHDV market, with the highest market share. This segment is largely comprised of delivery vehicles that benefit from a strong business case for electrification due to consistent daily usage with high overall annual driving distances.
- For the bus segment, the impact of setting "100% EV" procurement targets for transit and school bus fleets shows a sudden jump in market share in 2025 and 2030 for the High and Medium Growth scenarios, respectively. Coach buses make up the remaining proportion of ICE buses in these scenarios.
- The HDV truck segment is expected to experience the lowest EV demand, especially due to a portion of the HDV truck market focused on either long-haul or vocational applications (e.g. dump trucks) with greater technical challenges (range requirements, payload capacity) and weaker economics in the case of vocational trucks (due to lower annual driving distances and fuel savings potential).

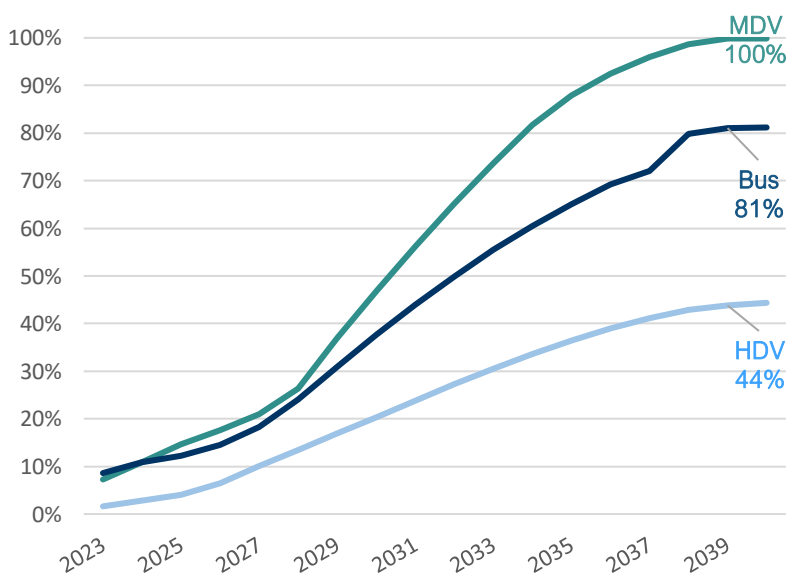
High Growth (% of sales)



Medium Growth (% of sales)



Low Growth (% of sales)



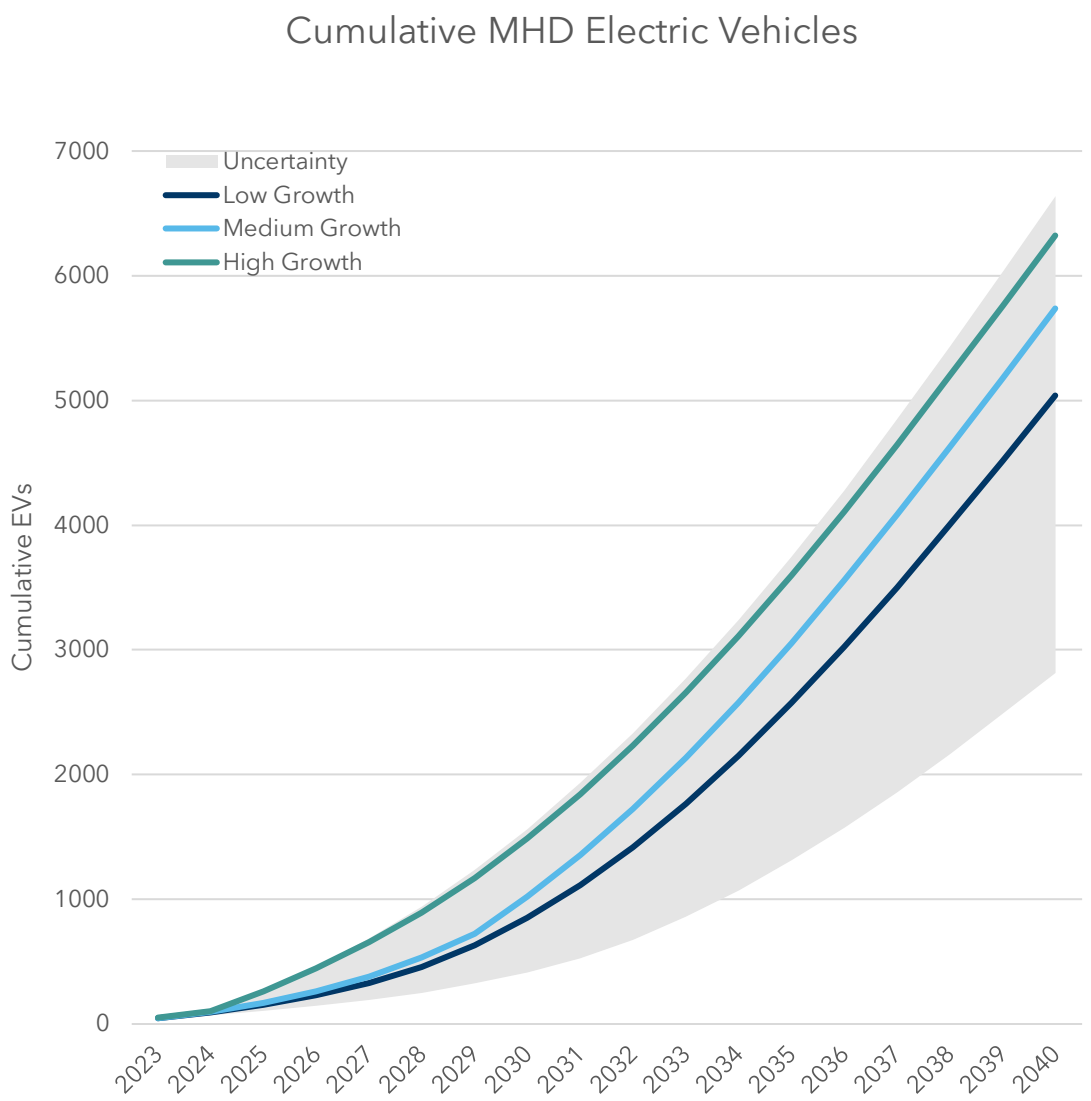
MHDVs: Cumulative EVs

Technology and market uncertainties have a significant impact on MHDV adoption.

- Battery costs, vehicle stock, long-haul charging access, and model availability are all important drivers for MHD electric vehicle adoption

Energy cost uncertainty has potential to drop adoption to below 3,000 MHD vehicles by 2040 if electricity rates climb and gas and diesel costs don't grow significantly.

However, more beneficial energy costs for EV adoption (i.e., high gas and diesel costs, lower electricity rates) is unlikely to increase adoption significantly higher that estimated in the High Growth scenario as customer economics are no longer the limiting factor.



Locational Disaggregation

Results

Methodology

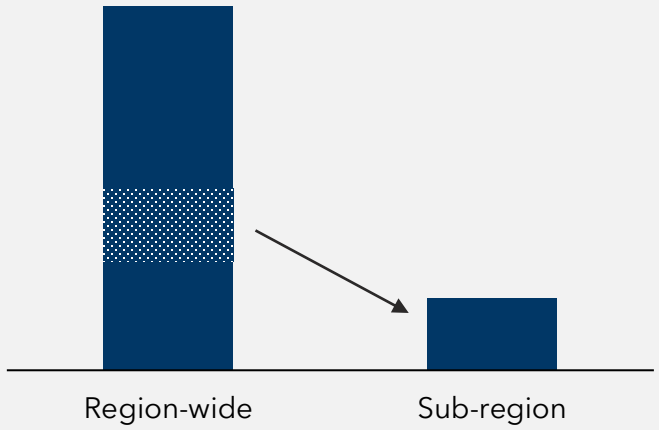
Jurisdiction Wide Forecast

- Estimates the **total number** and **pace** of EV adoption over time across the entire jurisdiction based on technology diffusion theory.

Locational Disaggregation

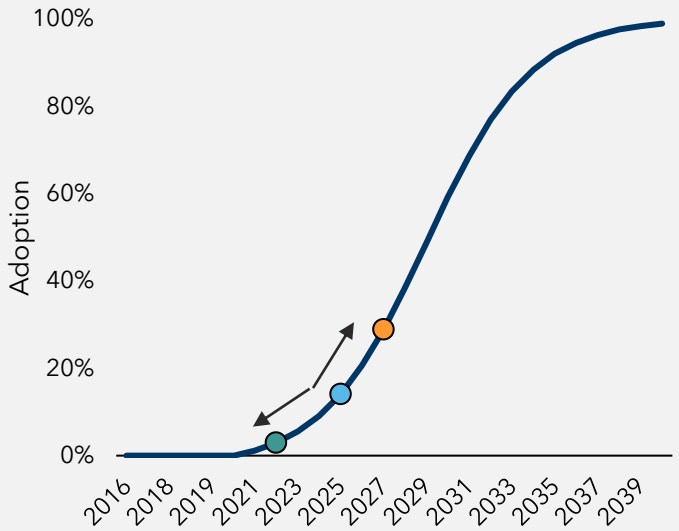
- Apportions the jurisdiction-wide adoption estimates to discrete geographic locations based on a multiple types of variables.
  - **Market size** (e.g., number of customers, number of vehicles, etc.)
  - **Market saturation** (e.g., existing electric vehicles)
  - **Market characteristics** correlated with adoption propensity (e.g., income levels, housing composition, etc.)

Disaggregation Variables



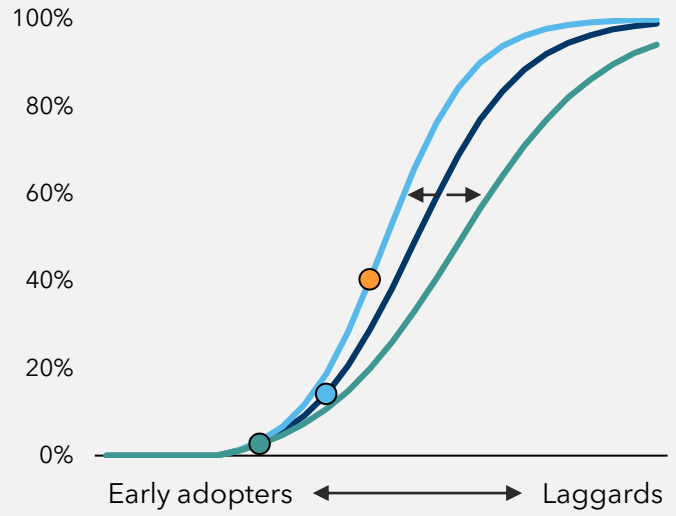
Market Size

- Scales region-wide adoption rate to match the applicable market in the sub-region



Market Penetration

- Impacts progress on technology diffusion curve
- Accounts for market maturity and network effects



Market Characteristics

- Modulates the shape of technology diffusion curve
- *e.g.*, to account for sub-regions that may have different proportions of "early adopters" or "laggards"

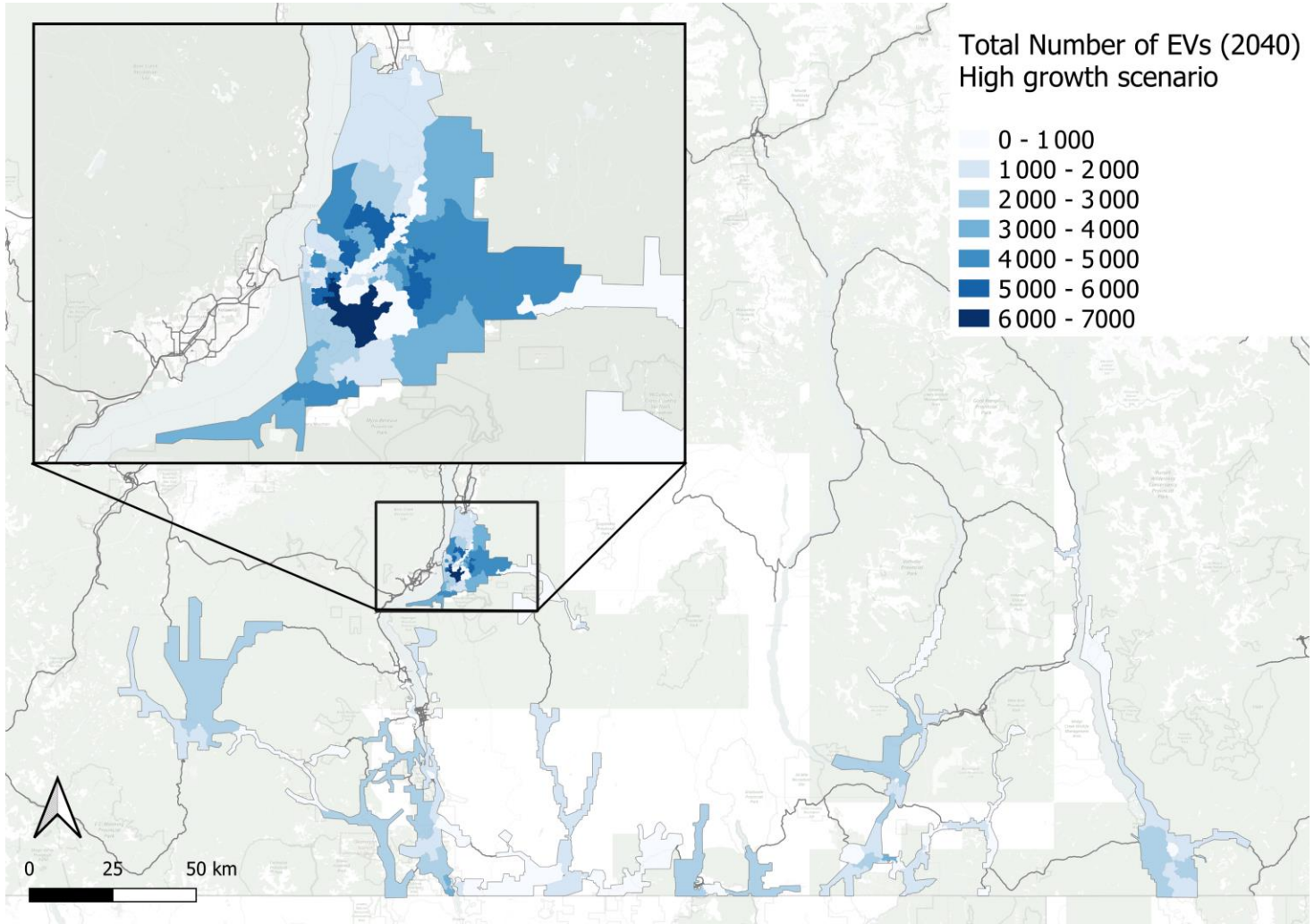
Key Variables: EV Adoption

Variable	Influence on Forecast	Data Source
Number of Vehicles	Establishes applicable market size	Assumption on feeder based on residential and commercial customer counts (Feeder shapefile)
Historical EV Adoption[1]	Establishes market saturation	2021 Census (Subdivision level)
Housing Composition[2,3]	Areas with greater proportions of single-family homes with access to home charging are more likely see higher adoption	2021 Census (DA level)
Income Levels[2,3,4]	Areas with higher average income levels are more likely to see higher adoption	2021 Census (DA level)
Driving Distance[2,4]	Areas with higher average driving distances are more likely to see higher adoption	2021 Census (DA level)

1. Gropp, Albin and Ohlsson, Fredrik. (2017). *What Drives Electric Vehicle Diffusion?*
2. Fuels Institute. (2021). *EV Consumer Behavior Report*
3. Clean Vehicle Rebate Project (CVRP). (2013 – 2017). *EV Consumer Survey Dashboard*
4. Shin, Hyeonshic , Farkas, Za and Nickkar, Amirreza. (2019). *An Analysis of Attributes of Electric Vehicle Owners' Travel and Purchasing Behavior: The Case of Maryland*

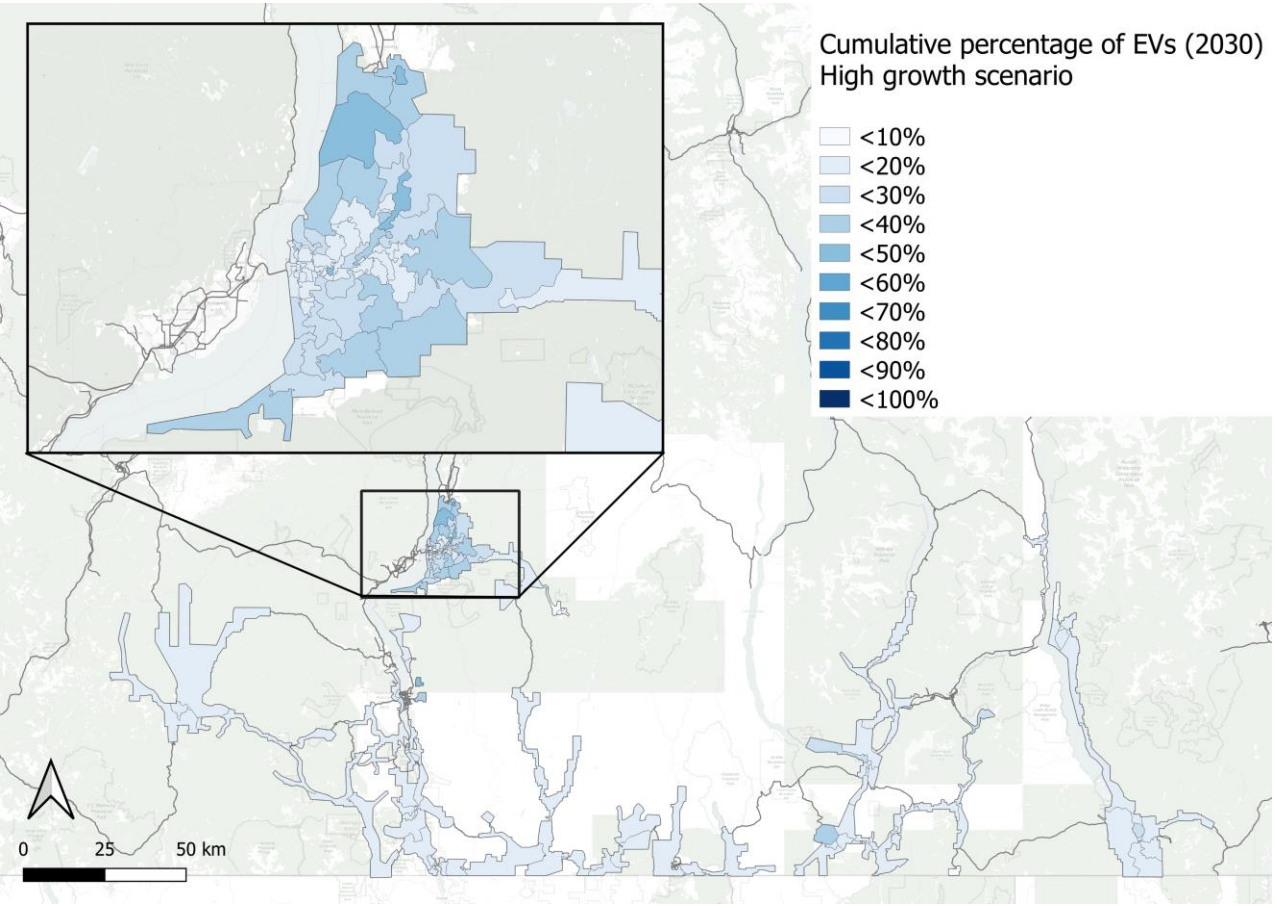
Electric Vehicle Forecast – Vehicles in Operation

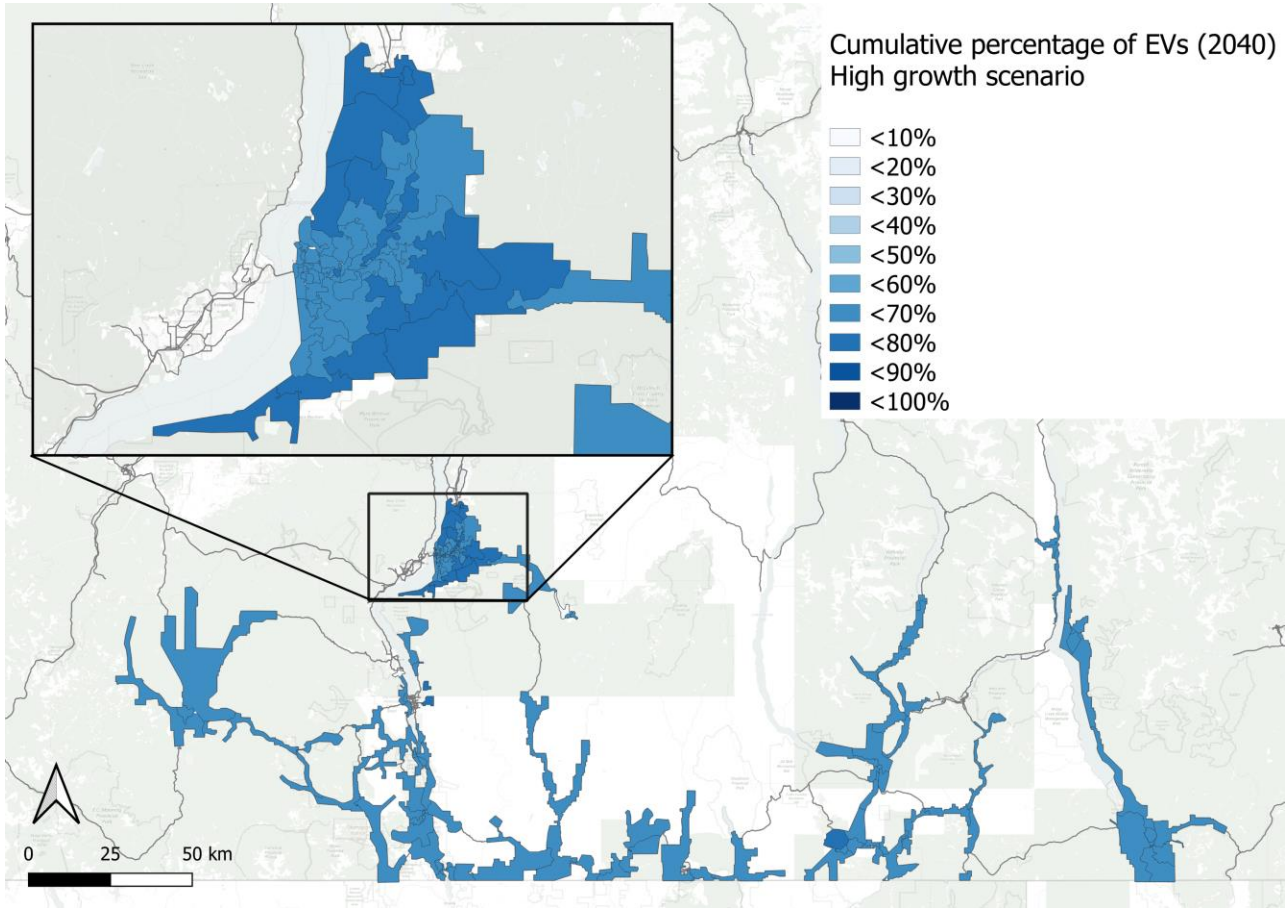
Large populations in dense urban areas will drive a higher sales of Electric Vehicles, with over ~6,000 EVs on one feeder in the high growth scenario by 2040.



Electric Vehicle Forecast – % of Vehicles in Operation

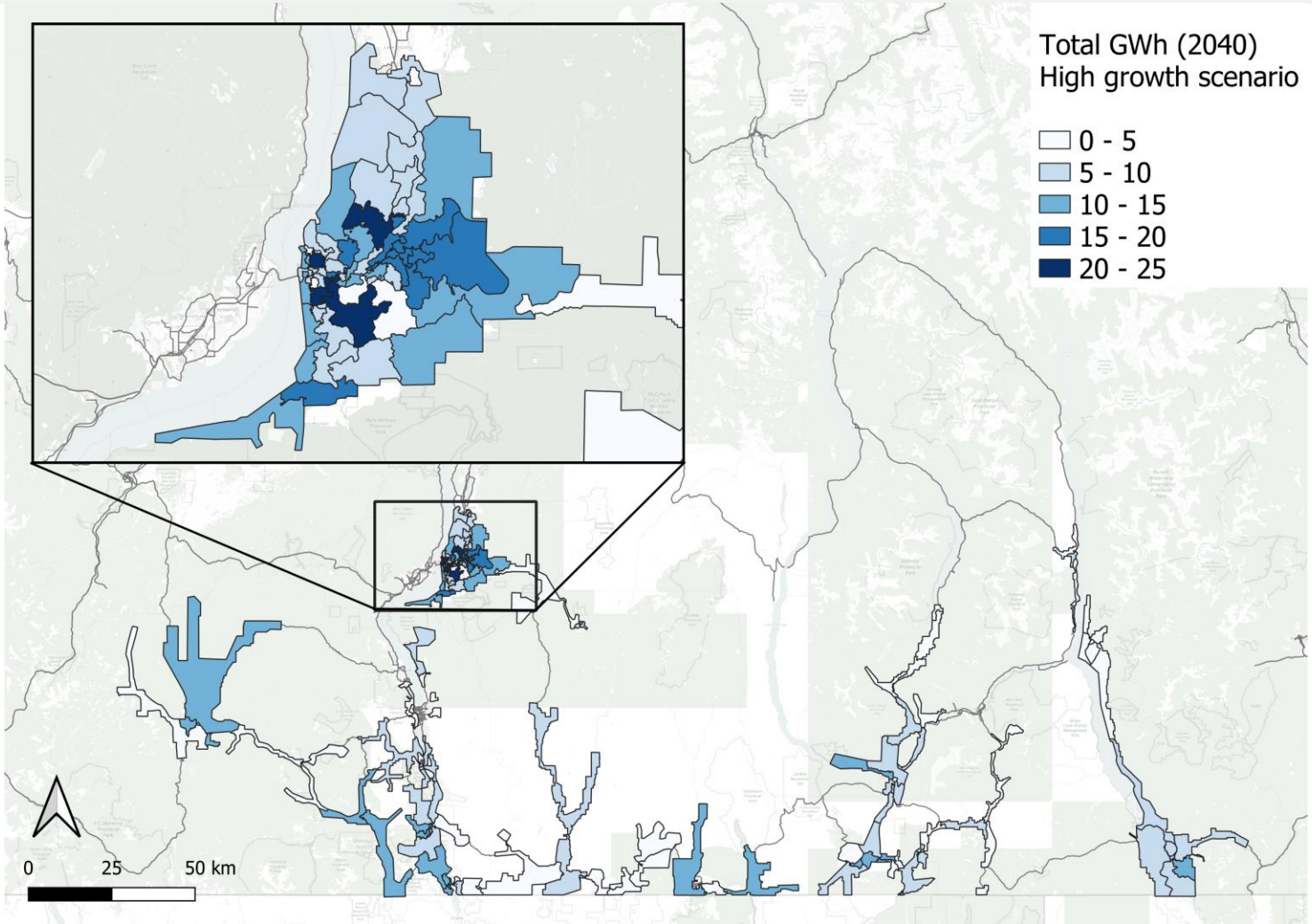
Percent of fleet that are electric vehicles converges more in later years (2040) as electric vehicle adoption becomes more evenly distributed. In 2030 early adopter regions are more apparent.





Increase in Annual Electricity Sales (GWh)

Large populations in dense urban areas will see the highest EV load impacts, mirroring cumulative adoption. A maximum increase in annual electricity consumption of ~24GWh on a single feeder is seen in the high growth scenario by 2040.



Contact

info@dunsky.com
Tel: 514-504-9030 or 416-947-8599

Appendix

EVA Model Details and Inputs

EVA Model

The study leverages Dunsky's Electric Vehicle Adoption (EVA) Model to forecast the uptake of EVs.

EVA powered by dunsky

TECHNICAL

Assess the maximum theoretical potential for deployment

- Market size and composition by vehicle class (e.g. cars, trucks, buses)
- Model availability for each vehicle powertrain (e.g. ICE, PHEV, BEV)

ECONOMIC

Calculate unconstrained economic potential uptake

- Incremental purchase cost of PHEV/BEV over ICE vehicles
- Total Cost of Ownership (TCO) (personal) or Internal Rate of Return (IRR) (commercial) based on operational and fuel costs

CONSTRAINTS

Account for jurisdiction-specific barriers and constraints

- Range anxiety or range requirements
- Public charging coverage, availability, and charging time
- Home charging access

MARKET

Incorporate market dynamics and non-quantifiable market constraints

- Use of technology diffusion theory to determine rate of adoption
- Market competition between vehicles types (PHEV vs. BEV)

Note: Alternatives to lithium ion batteries were not considered and the reuse of batteries is not assessed.

EVA Technology Parameters

TECHNICAL

ECONOMIC

CONSTRAINTS

MARKET

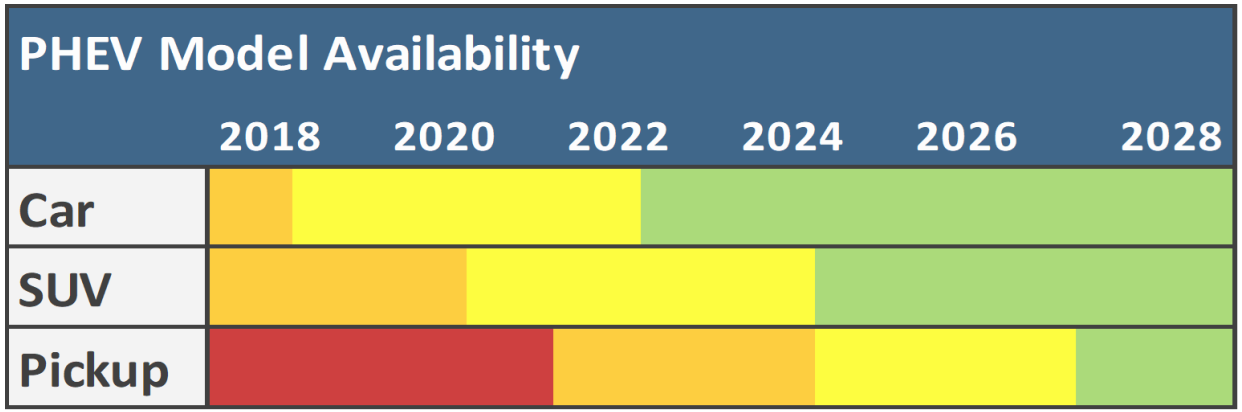
Assess the maximum theoretical potential for deployment

The model breaks down vehicles by segments (i.e. cars, SUVs, trucks, etc.) **and powertrain** (ICE, PHEV, BEV) with each class-powertrain being represented by an ***average*** vehicle option

Annual sales for each vehicle class represents 100% of attainable market

- Capture growth in forecasted vehicle sales and changing trends between vehicle segments

Model availability for each vehicle powertrain in each vehicle class is key



EVA Market Parameters

TECHNICAL

ECONOMIC

CONSTRAINTS

MARKET

Calculate unconstrained economic potential uptake

For each vehicle class and powertrain, vehicle cost is assessed bottom-up:

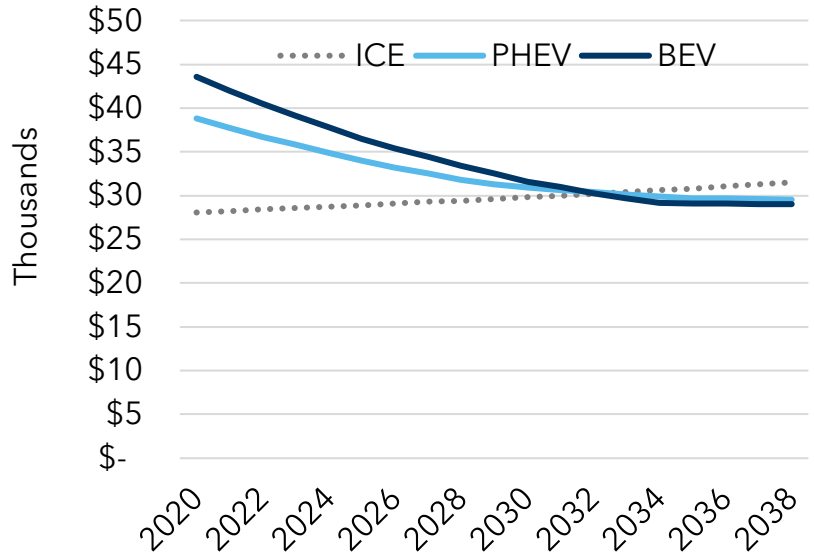
- Baseline vehicle cost
- ICE Powertrain cost
- Electric Powertrain Cost
- Battery Cost – based on BNEF and EIA forecasts[1]

For each vehicle class, Total Cost of Ownership (TCO) is based on

- Incremental Upfront cost of PHEV/BEV over ICE
- Lifetime operational cost savings incremental to ICE

Estimate unconstrained economic market potential based on identified willingness-to-pay from survey and research results

Sample EV cost decline scenario based on BNEF battery cost forecast



1. Bloomberg New Energy Finance "EV Outlook 2020" and U.S. Energy Information Administration "Annual Energy Outlook 2020"

EVA Constraints

Account for jurisdiction-specific barriers and constraints

Market Constraining Factors include:

- **Range anxiety:** Capture the portion of the market that is constrained by the limited range of BEVs (does not apply to PHEVs)

- **Home Charging Availability:**
  - Given the importance of access to charging at home, EV adoption is constrained to the portion of the market where charging stations can readily be installed.
    - Building type (i.e. single-family vs. multi-family)
    - Percentage of each building type with access to charging (or driveways/dedicated parking)

  - Constraint can be reduced over time through targeted incentive programs and building code changes.

EVA Constraints

TECHNICAL

ECONOMIC

CONSTRAINTS

MARKET

… *(cont'd)* Account for jurisdiction-specific barriers and constraints

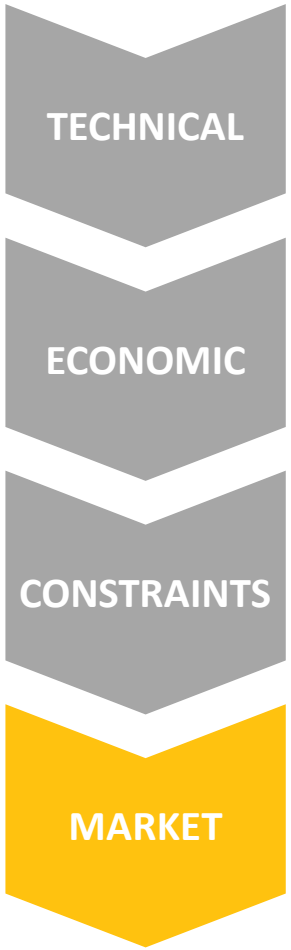
Public Charging constraints are captured in two ways:

- **Coverage** captures the geographical coverage of charging infrastructure by contrasting the number of stations deployed to the required number of stations regionally considering:
  - *Number of stations required along key **highway corridors** across the region to alleviate charging barriers for potential EV adopters based on highway lengths and typical station spacing.*
  - *Number of stations required in **population clusters** (defined as population centers with > 10,000 people) to achieve at least one charging station per cluster and ensure that drivers have access to a charger within a reasonable radial distance.*
- **Charging Availability** captures the availability and power of charging ports and corresponding charging time
  - *Captured as EVs per Port ratio (for L2 and DCFC)*
  - *"Ideal" ratio calculated based on*
    - Population density in key population centers across the region
    - EV Density in key population centers across the region
    - Annual average temperatures
    - Home charging access
  - *Dynamic relationship with EVs of the road*

Station

Port

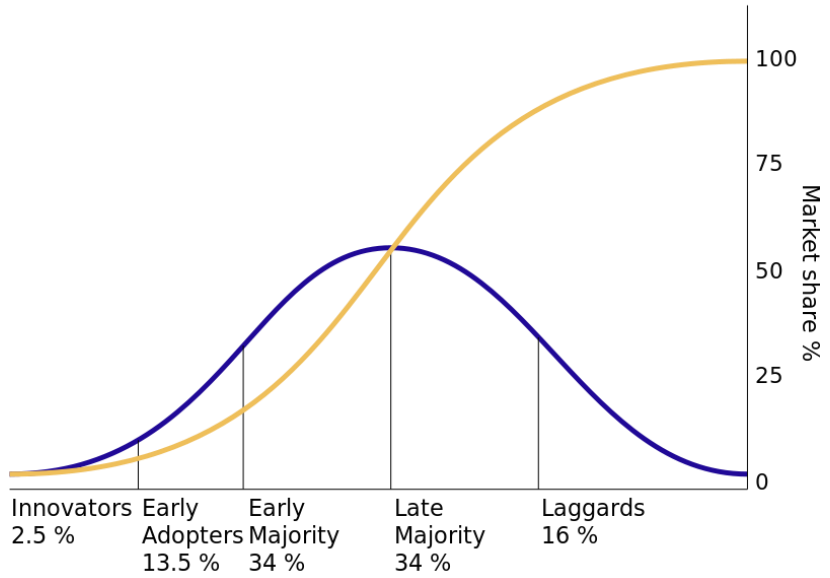
EVA Market



Incorporate market dynamics and non-quantifiable market constraints

Estimate rate of market adoption using technology diffusion theory

- Captures the degree to which the market adopts new innovative technologies over time
- Accounts for the demographics and composition of market through segmenting potential adopters into five categories that vary by motivation for adoption (environmental, economic, etc.), willingness to take risks, technology understanding and other factors.
- Accounts for social interactions and public awareness (or lack of) and impact of programs on increasing awareness.



EVA Market

TECHNICAL

ECONOMIC

CONSTRAINTS

MARKET

… *(cont'd)* Incorporate market dynamics and non-quantifiable market constraints

PHEVs and BEVs are assumed to compete for the same market

- After comparing technical, economic, constrained and market potential of both technologies, a probabilistic function is used to assume a portion of the market will not be rational and will adopt the inferior of the two options, considering historical trends in the market.
- Certain policies/programs can have the effect of shifting the market from one technology to the other without necessarily impacting overall EV market share.

Key Data Sources

Key Data Source	Use
Natural Resource Canada (NRCan) Comprehensive Energy Use Database (CEUD)[1]	Province-wide vehicle sales and registrations, segment split (Car, Truck, SUV), driving distance
ICBC – Vehicle Population Data [2]	
Statistics Canada[3]	Population, area of population centers, housing composition, fuel prices
FortisBC Historic Rate Schedule	Baseline Electricity rates
Natural Resource Canada (NRCan) [4]	Retail gas and diesel costs
Natural Resource Canada (NRCan) - Electric Charging and Alternative Fueling Stations Locator[5]	Charging station deployment
Internal Dunsky Database	Historic vehicle cost, vehicle characteristics & projected EV model availability, battery costs

1. https://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/menus/trends/comprehensive/trends_tran_bct.cfm
2. https://public.tableau.com/app/profile/icbc/viz/VehiclePopulation-PassengerVehicles-2021/2021PassengerVehicles
3. https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E
4. https://www2.nrcan.gc.ca/eneene/sources/pripri/prices_bycity_e.cfm?productID=5&locationID=6&frequency=M&priceYear=2022&Redisplay=
5. https://natural-resources.canada.ca/energy-efficiency/transportation-alternative-fuels/electric-charging-alternative-fuelling-stationslocator-map/20487#/find/nearest

LDV: Key Inputs and Sensitivities

Battery Costs ($/kWh)[1]

	2021	2025	2030	2035	2040
Low	$296	$160	$80	$62	$48
Mid	$296	$217	$147	$99	$75
High	$296	$270	$209	$161	$121

Other Inputs

	Value (2021)
FortisBC Population	338,196
Population sum of urban centres with >1,000 people in province of BC[2]	3,612,000
Number of Population centres with >1,000 people (Province)	100
Estimated Land area of Population centres (sq. km)	5,000
Highway length (km)[3]	7,040
BEV electric powertrain usage	100%
PHEV electric powertrain usage	75%

Annual New Vehicle Sales (Rounded to Nearest 10)

(Included both passenger and commercial LDVs, with commercial fleets assumed to make up 10% of sales)

		Low	Medium	High
Car	2021	2,936	2,936	2,936
	2025	3,346	2,752	2,752
	2030	3,399	2,225	2,246
	2035	3,399	1,947	2,064
	2040	3,399	1,692	1,882
SUV	2021	7,073	7,073	7,073
	2025	8,061	8,378	8,378
	2030	8,189	9,077	9,165
	2035	8,189	10,644	11,281
	2040	8,189	12,395	13,790
Truck	2021	6,209	6,209	6,209
	2025	7,077	7,354	7,354
	2030	7,189	7,968	8,046
	2035	7,189	9,343	9,903
	2040	7,189	10,881	12,105

1. Bloomberg New Energy Finance "EV Outlook 2022" and U.S. Energy Information Administration "Annual Energy Outlook 2022".
2. Population center inputs of the province are needed to determine the charging infrastructure needs to reach geographic coverage in the province.
3. The value represents an estimate of the length of highways within the province that need to be covered by charging infrastructure deployment based on data on length of key highways, freeways, expressways and principal arterial roads.

LDV: Incentives

Scenario	Vehicle Type	2023	2025	2030	2035	2040
Low Scenario	PHEV	$2,000	$2,000	$2,000	$850	$275
	BEV	$4,000	$4,000	$4,000	$1,850	$775
Mid Scenario	PHEV	$2,000	$2,000	$2,000	$2,000	$2,000
	BEV	$4,000	$4,000	$4,000	$4,000	$4,000
High Scenario	PHEV	$4,000	$4,000	$4,000	$4,000	$4,000
	BEV	$8,000	$8,000	$8,000	$8,000	$8,000

LDV: Public Charging Ports

DCFC Public Charging Ports

Scenario	Metric	2023	2025	2030	2035	2040
Low Scenario	Number of Sites	40	58	76	94	112
	Number of Ports	97	116	116	168	258
Mid Scenario	Number of Sites	40	80	155	230	305
	Number of Ports	97	160	620	920	1220
High Scenario	Number of Sites	40	110	235	360	485
	Number of Ports	97	220	940	1,800	2,425

L2 Public Charging Ports

Scenario	Metric	2023	2025	2030	2035	2040
Low Scenario	Number of Sites	81	120	190	260	330
	Number of Ports	156	360	570	780	990
Mid Scenario	Number of Sites	81	144	254	364	474
	Number of Ports	156	432	762	1092	1896
High Scenario	Number of Sites	81	190	390	590	790
	Number of Ports	156	760	1560	2950	3950

LDV: Charging Access

Scenario	Building Segment	Metric	2023	2025	2030	2035	2040
Low Scenario	Single-Family Homes	% of Population	72%	72%	73%	73%	74%
		% Home Charging Access	100%	100%	100%	100%	100%
	Multi-Family Homes	% of Population	28%	28%	27%	27%	26%
		% Home Charging Access	5%	6%	10%	15%	20%
Mid Scenario	Single-Family Homes	% of Population	72%	72%	73%	73%	74%
		% Home Charging Access	100%	100%	100%	100%	100%
	Multi-Family Homes	% of Population	28%	28%	27%	27%	26%
		% Home Charging Access	6%	9%	22.%	41%	61%
High Scenario	Single-Family Homes	% of Population	72%	72%	73%	73%	74%
		% Home Charging Access	100%	100%	100%	100%	100%
	Multi-Family Homes	% of Population	28%	28%	27%	27%	26%
		% Home Charging Access	6%	9%	63%	90%	92%

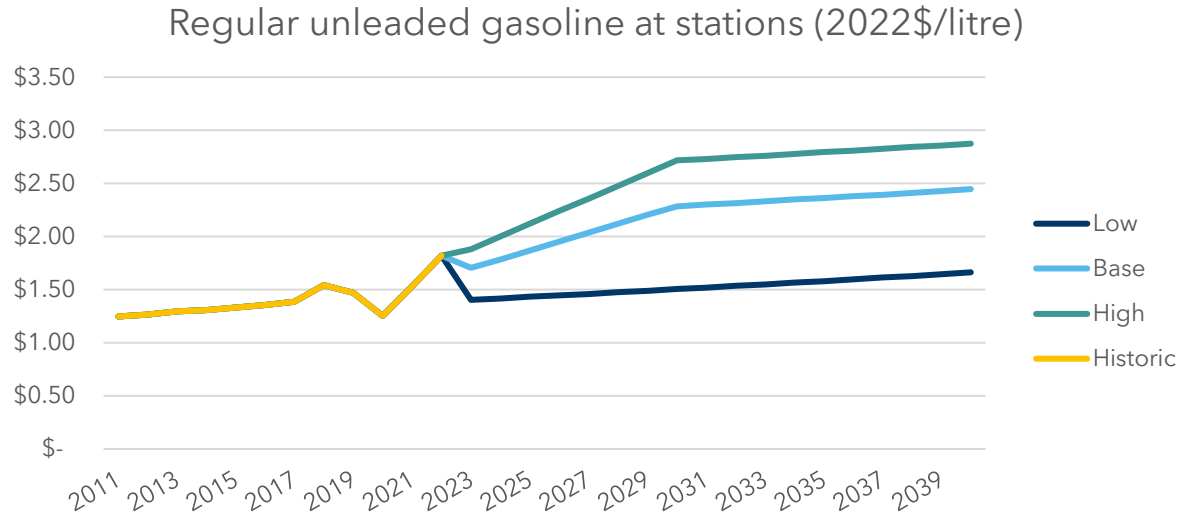
Gasoline and Diesel Rates

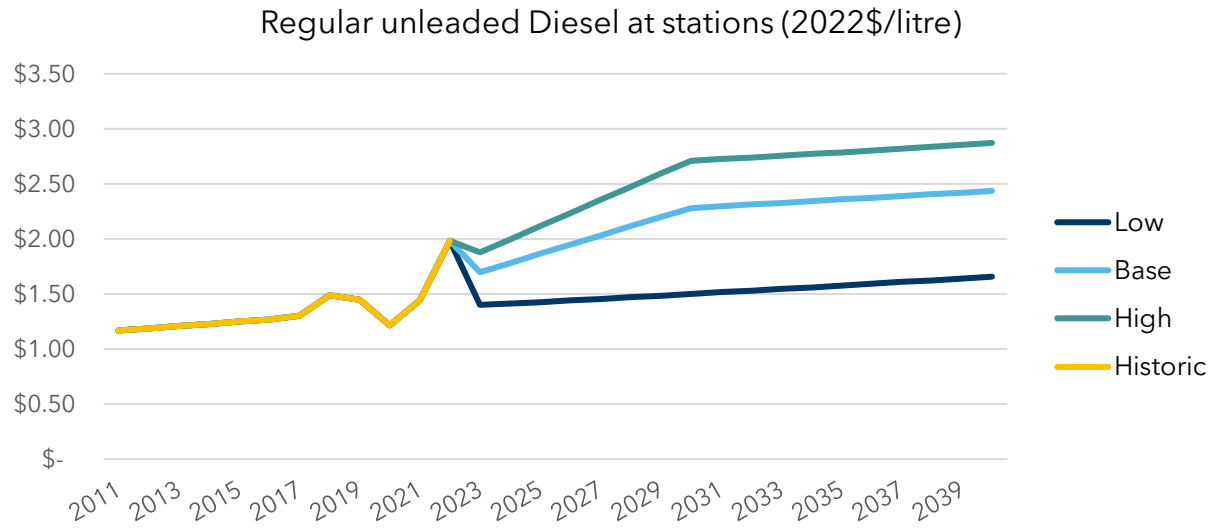
Historical retail gasoline and diesel rates have been volatile with rapid increases in the past

The three rate scenarios attempt to capture the wide uncertainty in future prices.

Component	Lower Bound Sensitivity	Base Case	Upper Bound Sensitivity
Fuel Cost[1]	2023 price reverts to 5-year average; 1% real increase thereafter	2023 price reverts to 5-year average; 1% real increase thereafter	2023 price reverts to 2-year average; 2% real increase thereafter
Carbon tax	Historical escalation without carbon tax	$170/ton carbon tax by 2030	$170/ton carbon tax by 2030

[1] Historic rates from Statistics Canada *Monthly average retail prices for gasoline and fuel oil*





MHDV: Key Inputs and Sensitivities

Battery Costs ($/kWh)[1]

	2021	2025	2030	2035	2040
Low	$296	$160	$80	$62	$48
Mid	$296	$217	$147	$99	$75
High	$296	$270	$209	$161	$121

Annual New Vehicle Sales (Rounded to Nearest 10) – MHDV Medium Growth

	Segment	2021	2025	2030	2035	2040
MDV	Urban Delivery	250	192	202	214	226
	Utility Vehicle	83	64	67	71	75
HDV	Short-Haul	50	60	64	67	71
	Long-Haul	57	69	72	76	81
	Other	63	76	80	84	89
Bus	Transit	37	39	41	44	46
	School	64	67	71	75	79
	Coach	14	15	16	17	17

1. Bloomberg New Energy Finance "EV Outlook 2020" and U.S. Energy Information Administration "Annual Energy Outlook 2020".