

Improving customer connections for a cleaner future

February 2023

INTRODUCTION

We have an important role to play in meeting the province's climate and electrification goals. After reading this document, we're confident that you'll have a better understanding of our ability to support the Carbon Pollution Standard and other future electrification through our plentiful clean electricity resources. You'll also learn more about the changes we're actively working on to improve our customer connections process, including:

- Improving the end-to-end customer experience, including better communication, more cost certainty, and reduced project timelines.
- Advancing our infrastructure so we are ready for connection requests.
- Increasing our capacity to support higher number of connections each year.

1. OUR ROLE IN MEETING THE PROVINCE'S CLIMATE GOALS

In B.C., we're seeing clear evidence of the impacts of a changing climate, including more intense storms, more alternating periods of drought and floods, and more forest fires. A key driver of climate change is energy use, specifically the burning of fossil fuels.

B.C. has legislated targets for reducing greenhouse gas emissions: 40% below 2007 levels by 2030, 60% by 2040, and 80% by 2050. BC Hydro has a key role to play in meeting these ambitious and necessary climate change goals. The electricity we generate is 98% clean and renewable, however, it represents less than 20% of the energy used in B.C., with 10% coming from biomass and the remaining 70% from fossil fuels.

In fall 2021, we released our Electrification Plan that outlines how we plan to invest over \$260 million to advance electrification in the building, transportation, and industrial sectors to help meet the province's climate targets.

Electrification means replacing technologies that are powered by fossil fuels like gasoline, diesel, and natural gas with alternatives that use electricity. This includes switching to an electric vehicle, replacing gas furnaces with electric heat pumps, and replacing diesel equipment used by industries with electric equipment.

At the same time, we need to continue to encourage energy efficiency so that we make smart use of our clean electricity and grid. Combining the Energy Step Code and Carbon Pollution Standard is a great example of this integrated approach.

2. SUFFICIENT SUPPLY

We have 30 hydroelectric plants in the province and in the coming years, we'll be adding another large hydroelectric facility to our system.

When it comes online, Site C will provide British Columbians with an additional 1,100 megawatts of firm capacity and produce about 5,100 gigawatt hours of clean electricity each year. That's about 8% of our current supply, or enough to power nearly half a million homes or 1.7 million electric vehicles per year.

While we're confident that we have enough power to meet the medium-term electrification needs of the province, we're carefully monitoring demand trends to understand when new clean electricity generation resources will be needed. Fortunately, B.C. has excellent potential for generating more clean electricity through wind and solar, while having our hydroelectric facilities continue to serve as the backbone of our system.

Our hydroelectric facilities can ramp up or ramp down quickly in response to changing demand and act like big batteries by storing potential energy (water) behind the dam. This is particularly important as we consider a future with more wind and solar, which are not always available when you need them. We anticipate that batteries will also be an important part of our future grid to manage peak demands at the utility, distribution, and customer level.

3. DISTRIBUTION EXTENSION POLICY

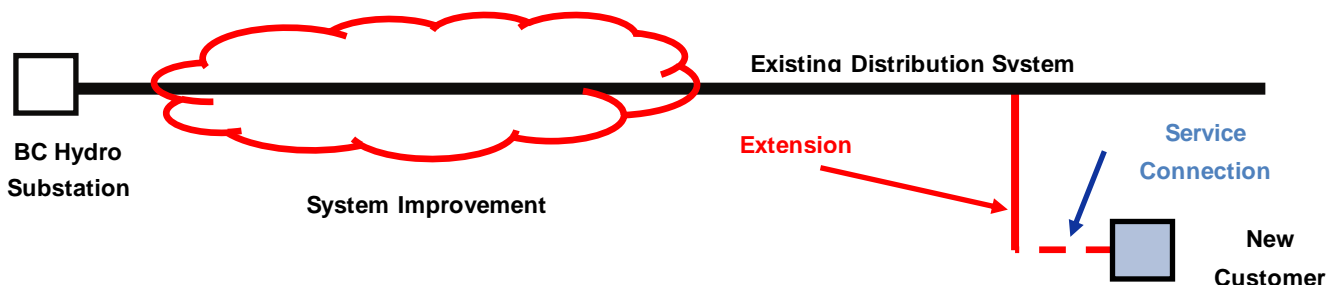
Our current Distribution Extension Policy has been in place since 2008 and outlines the responsibilities of both the customer and BC Hydro when it comes to connecting new or increased load on our distribution system. We're currently reviewing the policy and assessing options for updating it to ensure it best meets the needs of us and our customers. Over the coming months, we'll be engaging more broadly with customers to gather feedback on potential updates to the policy.

The following section provides background information on our existing extension policy, issues raised by customers about the policy, and three potential options we're considering for updating it.

3.1 Extension Policy 101

Our current Extension Policy is outlined in Section 8 of our [Electric Tariff](#). The Tariff describes the responsibilities of BC Hydro and our customers when a distribution extension is required to serve new or increased customer load. Our current policy is based on the principle of cost causation, i.e., allocating the costs of new or upgraded infrastructure to those who first initiate them.

An example of a distribution extension is illustrated below:



As per Section 8, infrastructure requirements to facilitate new connections are defined into three main categories:

- **Service connection:** This is typically the last section of wire or cable that connects a customer to the distribution system.
- **Extension:** An “extension” is an addition to, or the increased capacity, of BC Hydro's electric distribution system that's required to serve a new or increased customer load. The extension is generally the infrastructure required to connect a customer with the closest point of the distribution system that will serve the load. Loads far away from the existing system will have higher extension costs as more infrastructure has to be constructed to connect the customer.
- **System improvement costs:** These system upgrades are typically upstream from the extension and address local capacity constraints on the distribution system. System improvement needs are assessed when service is requested by the customer and, if applicable, are only allocated for load requests that are larger than 500 kVA. Since each assessment depends on the state of the existing system at the time of request, any load can trigger the need for system improvement. However, the larger the load being requested, the higher the probability that it will trigger the immediate need for a system improvement because each distribution feeder has a finite capacity.

As discussed above, a customer that requests new load or an addition to an existing load, is allocated the cost of their service connection, extension, and any applicable system improvement costs that are required to service this request. In recognition of the incremental future revenue to BC Hydro of the new or increased load and to help offset customer connection costs, we contribute \$1,475 per single-family dwelling added, and \$200 per kilowatt of the estimated billed demand from a commercial customer on the General Service Rate.

the current policy outlines that the “pioneer customer” can apply to contributions of subsequent connecting customers. A more detailed explanation and illustration can be found in [this brochure](#) [PDF].

The policy outlines that if the pioneer customer pays for the distribution system extension and then a subsequent customer(s) connects to that extension within five years, the pioneer customer can apply for a partial [extension fee refund](#).

3.2 Feedback on our current Extension Policy

Over the years, we've received feedback from customers about our current Extension Policy. The two main concerns we've heard are around the cost uncertainty and "free riders", which we discuss in more detail in this section.

Free riders

The current policy assigns the costs related to extensions and system improvements to the pioneer customer, i.e., the customer who's project first initiates the required upgrades, offset by BC Hydro contributions. To the extent these upgrades result in additional capacity, subsequent customers can benefit from the expanded system capacity without paying for it. While the extension policy allows the pioneer customer to recover some costs from future customers, in practice, this hasn't been effective in addressing this issue.

Cost uncertainty

Customers applying to connect to our system want more upfront certainty of the costs associated with their connection. The issue of cost uncertainty can be broken down into the following areas:

- **Unpredictable extension costs:** In general, greenfield developments far from existing infrastructure will cost more than brownfield developments or greenfield developments adjacent to existing loads because the distribution system must be extended further to reach these development sites.
- **Unpredictable system improvement costs:** It's difficult for any customer to predict associated system improvement costs. These costs depend on many factors such as size of load, types of upgrades required, and area capacity, which aren't directly visible to the customer and are highly location dependent.
- **Non-connection-related costs:** Costs to comply with municipal requirements or the conditions of a development permit, such as undergrounding existing overhead infrastructure can also add to costs. If the overhead infrastructure being converted to underground also serves adjacent customers, costs can escalate quickly because additional system changes may be needed for us to continue to serve existing adjacent customers. As this additional infrastructure is over and above what we require to provide service to the location, the added cost isn't eligible to be offset by the Extension Tariff's revenue contribution provision.

3.3 Alternative Extension Policy options

Given the issues identified above, we're in the process of reviewing our existing Extension Policy and assessing options to update it. Based on feedback received to date and the results of our jurisdictional review, we've explored and modelled the following four options:

1. Update our maximum contribution towards an extension.
2. Update our contribution and simplify the recovery of system improvement costs.
3. Update our contribution and simplify the recovery of all connection costs (extension and system improvements).
4. No connection fees.

Option 1: Increasing BC Hydro's financial contribution

BC Hydro's contribution towards customer connection costs is currently set at \$1,475 per single-family dwelling and \$200 per kilowatt of estimated billing demand for commercial customers on the General Service Rate. We're in the process of updating our cost assumptions and expect that this will result in an increase to our financial contribution. A higher financial contribution from us would then increase the number of customers whose extension fees are covered, and reduce the amount paid by those customers that don't have their costs completely covered.

This option will decrease customer connection costs by providing all new customers with an increased utility contribution to the overall project cost. However, it doesn't address the free rider and the cost unpredictability issues discussed above.

Option 2: Increasing BC Hydro's contribution and introducing average system improvement costs

In addition to updating our financial contribution, this option recognizes that all customers contribute towards the need for system improvements and includes an averaged system improvement cost recovery approach that would spread these costs more evenly across all new customers.

As a first step, we'd aggregate the cost of all system improvement costs incurred over a predefined period. It would then calculate an average customer system improvement fee. For residential loads, the fee would be on a per single-family dwelling basis. For general service customers, the fee would be on a kilowatt basis. A new customer would then be charged a fee proportional to the load being requested by that customer (i.e., small customer loads would be assessed smaller fees and larger loads would be assessed proportionally larger fees). In addition, we'd provide a financial contribution that's proportional to the customer load.

An added benefit to customers of this averaged system improvement cost recovery structure is that we'd have greater flexibility to pre-build infrastructure in regions of high growth to help speed up customer connections in those regions.

Option 2 will result in a higher financial contribution from us and help address the free rider and cost predictability issues for the system improvement component. However, these issues would still persist for the extension cost component.

Key question: Through upcoming customer engagement, we'll be asking for customer input on a reasonable and acceptable limit to the scope of infrastructure eligible under this option. For example, in a scenario where a small load requires several million dollars of system improvement costs, is it appropriate to only recover the \$/kW system improvement fee which, when the fee is reviewed and recalculated, will cause the overall fee to increase.

Option 3: Increasing BC Hydro's contribution and introducing average system improvement and extensions costs

Building on Option 2, rather than charging each customer their own individual extension cost, all customers that request new or increased service are instead assessed and charged a unitized connection fee based on requested load (per single-family dwelling for residential and per kilowatt for commercial loads).

Option 3 embraces a more postage stamp approach to customer connections. A unitized connection fee would help to provide more predictable costs for customers, allowing them to better estimate their overall costs. This option also addresses the free rider issue as it removes the cost causation principle.

Key question: Through upcoming customer engagement, we'll ask for customer input on reasonable and acceptable limits to the scope of infrastructure eligible under this option. Similar to Option 2, we want customer feedback on whether thresholds for participation in this option should be established based on factors such as the distance and/or load of an extension request. For example, if this option incents increased quantities of high-cost connections to proceed, the unitized connection fee will need to be increased to recover those costs.

Option 4: No connection fees

This option would have our existing ratepayers pay for all fees related to new connections. We strongly believe in keeping our rates low for our existing customers is important and the principle of cost causation at a high level is appropriate and reasonable. Therefore, this option isn't under serious consideration.

4. CAPACITY

We have around 1,500 distribution feeders and about 230 substations serving our distribution customers. In most areas we have sufficient capacity to connect new customers in a reasonable timeframe. However, there are certain high growth areas where load is increasing faster than the time required to complete distribution capital projects to add capacity. Depending on load, location, and timing of a customer project, distribution system capacity may not be immediately available.

We've undertaken a number of measures to reduce potential delays caused by localized capacity constraints, including:

- Updating our feeder loading planning criteria in high growth areas to increase the capacity available for new customers and advance the construction of new feeders. In the past five years, we have constructed 35 new distribution feeders and have 18 new distribution feeders under construction.
- Advancing major underground egress corridors projects to establish the underground infrastructure required to serve upcoming load growth. There are approximately 130 km of new major underground distribution civil infrastructure under construction. Building this infrastructure in advance will help to reduce the timeline to connect new customer projects.
- Ensuring spare feeder positions are available in high growth area substations to enable quick deployment of new feeders for large customers. We have increased our distribution capital budget by \$100 million for Fiscal 2024 to help accelerate construction of new distribution feeders and duct banks.
- Implementing feeder level Demand Side Management to make expanded use of our existing available capacity.
- Advancing voltage conversion work to 25 kV in 12 kV areas. This doubles feeder capacity and enables larger secondary services by increasing the largest pad mount transformer size available for secondary services from 500 kVA to 1,500 kVA. Voltage conversion projects in Richmond, Surrey, Port Coquitlam, and Langley are nearing completion. There are also voltage conversion projects underway in Victoria, North Vancouver (Capilano), North Burnaby, Coquitlam, and Downtown Vancouver.
- Offering capacity feasibility reviews for major customers to provide early indication to our customers on the availability of capacity and the expected work scope and timelines.

Even with all these activities, customers and developers are always encouraged to engage with us early us to provide more time to plan and build the required infrastructure. The earlier a customer applies for service, the better chance we have of meeting customer expectations for timelines.

5. CONNECTION TIMELINES

We complete around 27,000 connections each year that don't require design work. In these cases, we have very fast connection times, averaging seven days once permits are received. The ability to apply for these fast service connections and to check their status using an online portal has been welcomed by contractors and customers.

Despite these improvements, we've heard from some customers that our connection timelines need to improve. More specifically, connection delays are creating frustration and challenges for customer projects and a general lack of consistent communication from us makes it difficult for customers to plan accordingly.

The timeline challenges we're experiencing are with more complex projects that require the work of our designers in 29 local district offices around the province. We complete around 4,800 of these types of connections each year.

Over the last two years, an increase in the number of connection requests for high-complexity projects, and staffing challenges have contributed to longer timelines.

We're committed to making connection timelines shorter and improving our communications with customers to make it easier for them to plan the critical steps of their projects that rely on the timing of these connections. To do this, we're making changes to our policies and procedures, which we provide more detail on below.

5.1 Resourcing and training

Achieving a more appropriate staffing level and the continued strategic use of our contractor resources will improve our ability to meet our customers' connection needs in a timely manner.

Over the past year, we've increased our designers and customer connections staffing at local offices across the province by over 50 people. We're focusing on training a high number of new hires.

5.2 Improving our end-to-end process

We're committed to making our end-to-end design process more efficient. Our analysis of the design process and the prioritization of recommended solutions was completed in December 2022. The implementation of these solutions has been ongoing since January 2023.

Design Lite was one of the key streamlined processes identified through our design services strategic review. The program reduces design effort for simple projects, helping to free up time for our designers to focus on more complex, higher risk projects thereby reducing customer connection timelines. The streamlined process for these less complex projects is already resulting in shorter design timelines for projects that meet the criteria and are able to be included. Provincial rollout for the Design Lite process has started and will be complete by the end of this year.

For specialized connection requests we're creating a new work delivery model with specialized teams and project managers. For example, we now have a specialized team in place for telecom carrier connections and are expanding the scope of our EV connection delivery team provincially. These new delivery models will reduce customer connection timelines and improve customer service for specialized connection requests.

5.3 Communications and customer experience

We recently implemented a new customer intake process, including customer onboarding and technical information gathering. By improving the quality of project and technical information we receive through this process, our designers can initiate and complete design work sooner. Experienced customers and contractors who are familiar with the process and the project information requirements will move through the intake process more quickly without additional wait times. Customers requiring a technical discussion with a designer will be referred to a local design office without delay. Our provincial rollout of our new customer intake process will be complete by the end of March 2023.

We're also actively updating available information and guidance for customers on our website. Increasing the availability of self-serve information on our website will help customers to find the information they need for their projects more easily and, in many instances, will answer their questions without the need to contact their designer. These web-based improvements and information packages are being developed in parallel and are planned to be in use starting in September 2023.

Starting in April 2023, we'll begin a pilot to introduce scheduled communication with our customers. Through this service, a representative will proactively reach out to customers if there's a change in planned field work. This will better inform customers of impacts to their schedules without them having to reach out to a field crew or designer. We're aiming to roll this out province wide by the end of the year.

6. DISTRIBUTION STANDARDS

Another concern customers have raised related to customers connections is our use of specific distribution standards. More specifically, customers have told us that our requirements should align more with industry standards where practical, and that we need to listen more to the ideas that customers bring forward for improving our existing standards.

We know that clear service connection requirements make it easier to get the job done right the first time. This is why we're continually reviewing and updating our standards to make it easier for customers to advance their projects. For example, last year we introduced several new standards, including:

- Standards for underground service connections that align the requirements for trench base and cover on private property with the BC Electrical Code. Customers can now use the same base and cover material for BC Hydro and BC Electrical Code work done on private property.
- Improved details for standalone kiosks and pedestals in response to growing customer demand.
- Standards for large secondary services align with industry products and CSA C22.2 standards.

As for upcoming updates and standards, these include the new 320 A service to support growing loads. This service will serve a 200 A panel plus a 125 A panel. The 320 A service is planned for release by summer 2023, subject to the availability of 320 A meters and sockets. The new 320 A service size will support customers to connect growing loads.

Many of the changes in standards listed above are the direct result of customer feedback we've received. We're committed to continuing to engage with customers, act on feedback, and communicate when our standards are updated. For example, we're currently seeking customer feedback on other topics, including gravel requirements on public property and our impact on boulevard allowances/widths.

Customers can also opt in to be notified when new or revised standards are released. Recently updated standards can also be found at bchydro.com/distributionstandards.

Finally, in addition to hearing and sharing information directly with our customers, we're actively engaging with industry groups including the Canadian Home Builders Association of BC, the Electrical Contractors Association of BC, municipalities, Technical Safety BC, and equipment manufacturers.