

# Clean Power 2040

Powering the future



# Indigenous Engagement on the 2021 Integrated Resource Plan

North regional workshop

December 2, 2020

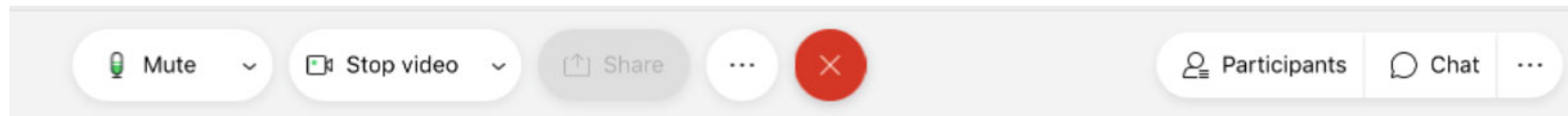
 **BC Hydro**  
Power smart

# Welcome and Introduction

# Cisco Webex reminders

We'll be using a few basic tools, which you can find if you hover your mouse over the bottom of the screen

Mute/unmute your mic  
& turn your video on/off



Audio connection trouble?  
See the alternative options here



Open the chat panel:

- to ask questions
- to provide feedback

# Virtual meeting etiquette



- Be respectful by listening to others and sharing time so that everyone gets heard
- Stay curious about new ideas
- Minimize distractions by “muting” when not speaking
- Use the chat function to seek input and ask questions
- We are not recording these sessions, and kindly ask that others do not record

# Agenda

- Overview: Integrated Resource Plan
- **Discussion:** Planning objectives guiding the IRP – what's important to you?
- **Discussion:** Applying those objectives to key planning topics
- Wrap up and next steps

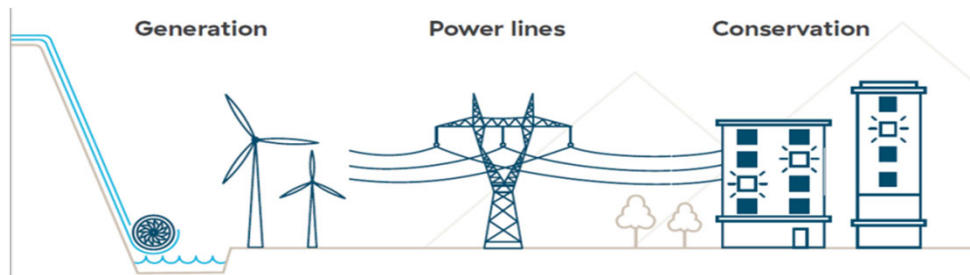
# Why this matters to BC Hydro?

We want your input into our long-term strategic plan

- Early engagement
- Understand your values and what matters to you
- Building and strengthening relationships
- Enhance transparency
- Make a better plan
- The UN Declaration on the Rights of Indigenous Peoples (UNDRIP)

# What is the Integrated Resource Plan (IRP)?

Actions we need to take now to meet future electricity needs



- BC Hydro's 20-year plan to meet future customer electricity needs
- Province-wide plan for our integrated system
- Considers the Clean Energy Act and the CleanBC Plan
- Submitted to the BC Utilities Commission
- Projects are subject to separate consultation and approval processes

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# What does the plan include?

An assessment of future customer needs and actions to meet that need

- Conservation
- Investment in infrastructure – preparation actions
  - Power lines
  - Generation stations
- Power acquisitions that may be needed and when

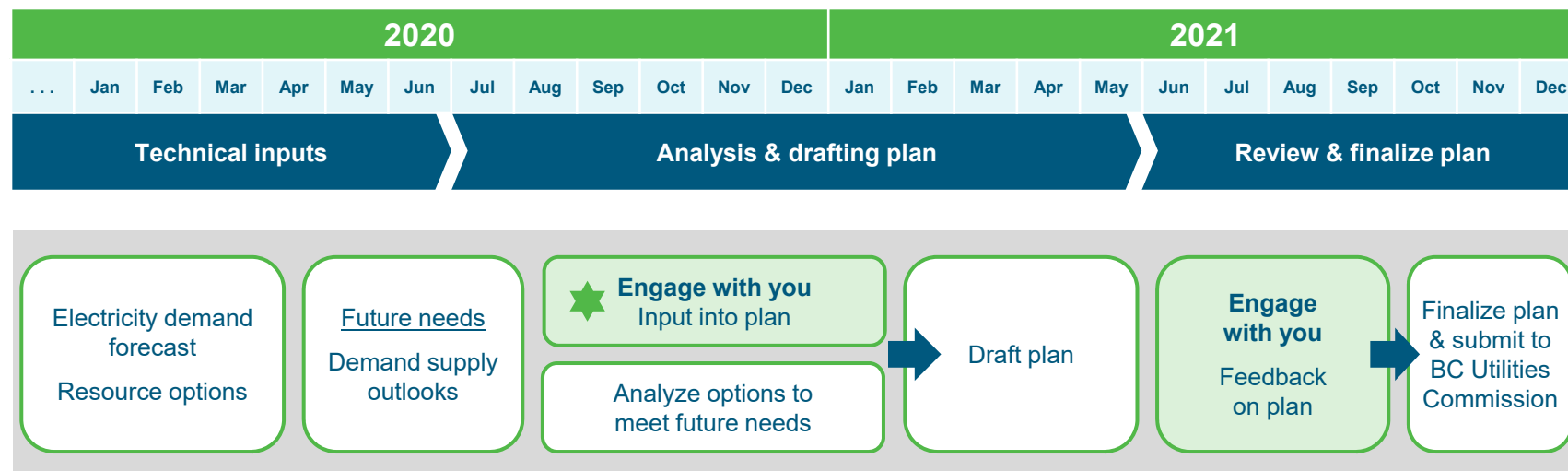


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# Where are we in the schedule?

Filing date to be determined



# Planning objectives

What should we consider when comparing options?

# Planning objectives

Providing clean, reliable power are key priorities. As we plan, we look at the lowest cost options to meet new demand, and we also consider other objectives:



- Keep costs down for customers



- Limit land and water impacts
- Reduce greenhouse gas emissions through clean electricity



- Support reconciliation with Indigenous people



- Support the growth of B.C.'s economy

# Planning objectives - discussion

- Are we missing any objectives?
- What advice do you have for us as we use these objectives to compare options?
- Which objectives are most important to you and why?

# Two important terms to know

## Energy

The amount of electricity we produce and consume throughout the year.

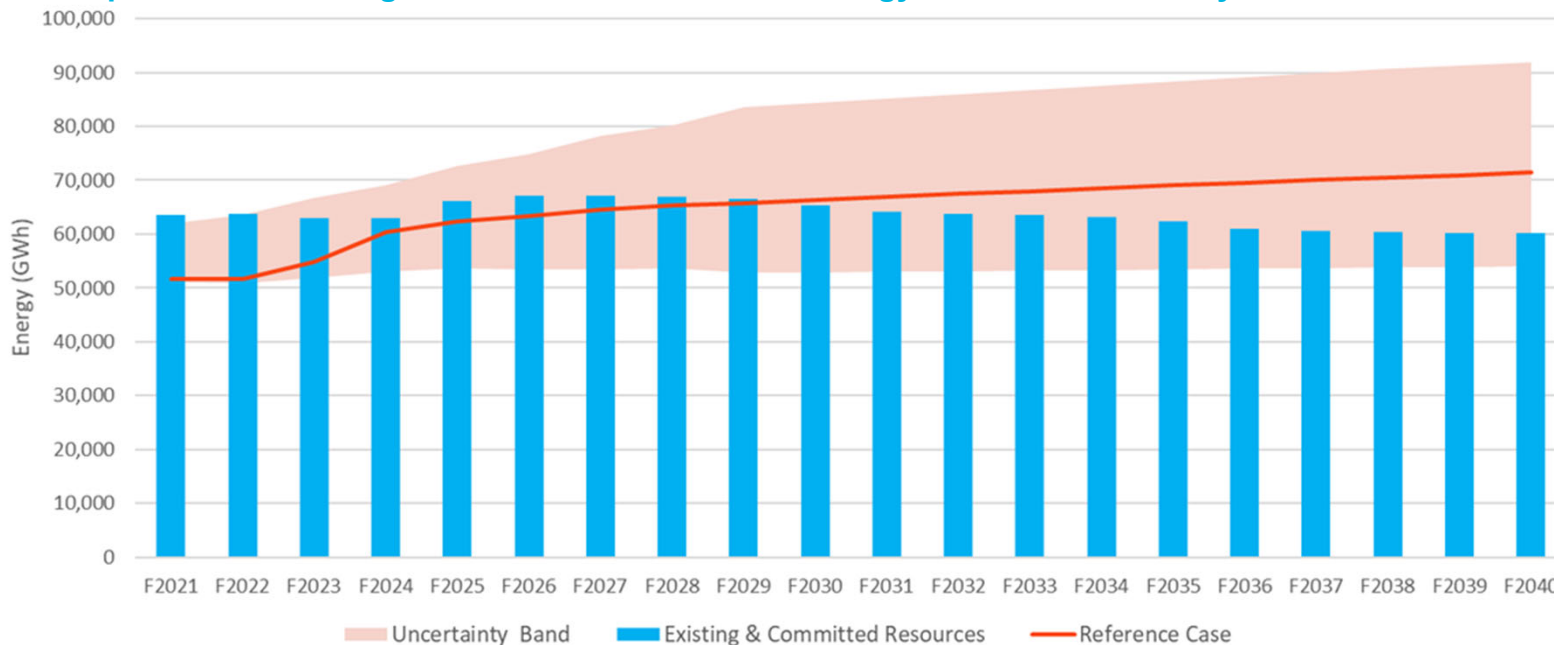


## Capacity

The maximum amount of electricity that can be provided at any moment. Also known as “**peak demand**” from a customer electricity use perspective.

# Energy 20-year outlook of supply and demand

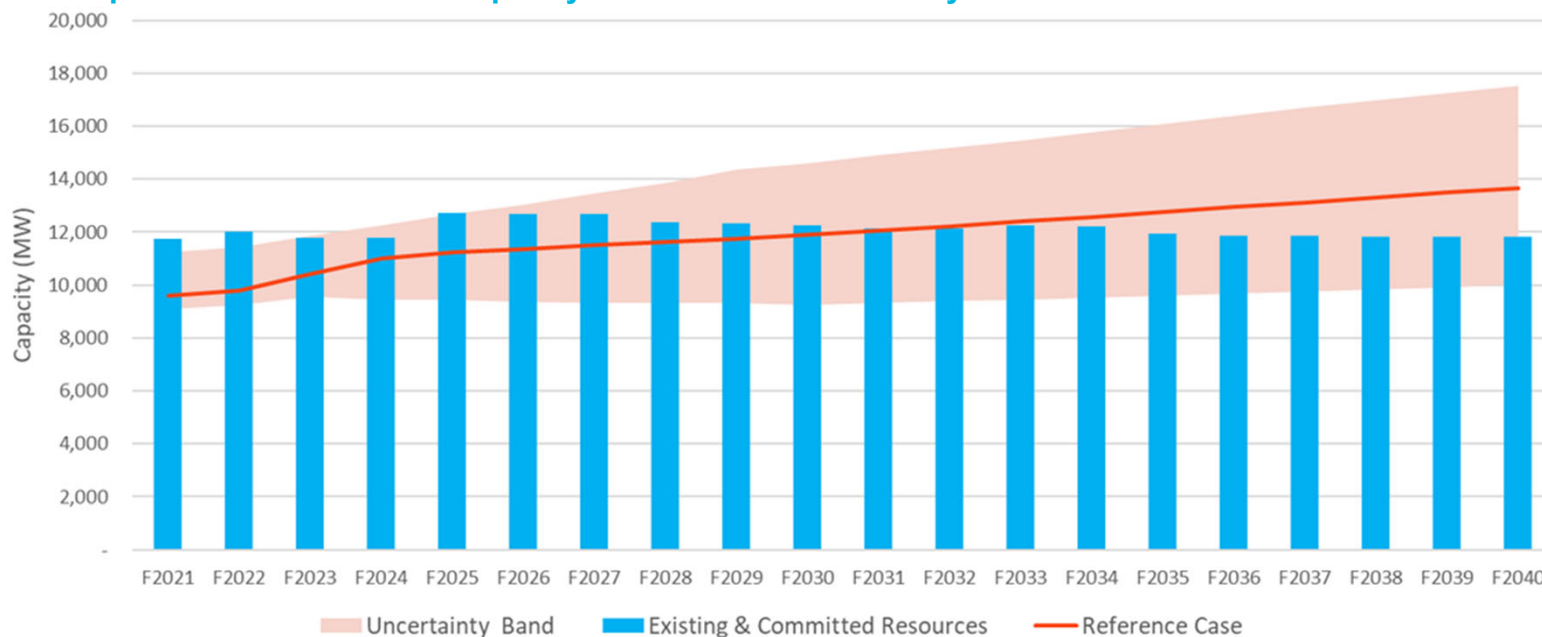
We expect to have enough resources to meet B.C.'s energy needs for about 10 years



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# Capacity 20-year outlook of supply and demand

We expect to have sufficient capacity resources for about 10 years



*THIS SLIDE PROVIDES BACKGROUND INFORMATION – NOT PRESENTED*

## **A note about demand supply outlooks**

**Includes existing and committed resources only**

What is not included are current resources that have an upcoming decision point, including:

- Conservation program activities and associated savings
- Electricity Purchase Agreements that will be expiring and may be renewed

These are considered options as part of the planning process and will be discussed today

Including these activities pushes out need for new power into the future by several years



# Future choices 2020 to 2030

1. Conservation and Energy Management
2. Expiring Electricity Purchase Agreements (EPA)
3. Small generation plants approaching end of life

Are there other choices we should consider?

# Conservation and energy management

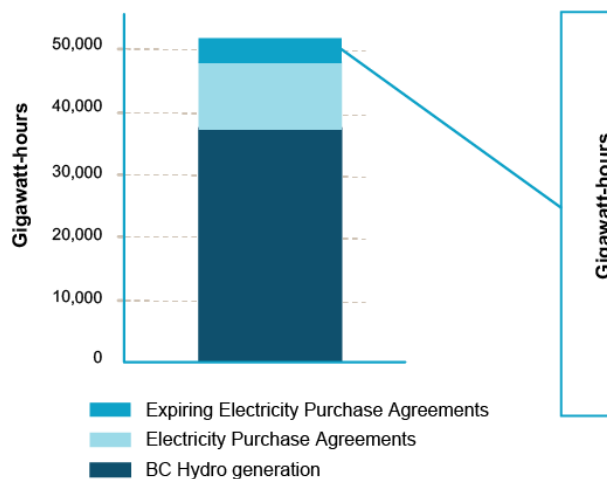
Conservation initiatives can address regional capacity constraints and prepare us for higher demand

Energy efficiency	Capacity focused (reduces peak demand)	
	Voluntary time varying rates (time of use)	Demand response (smart home technology)
<ul style="list-style-type: none"> <li>Investment in conservation</li> </ul>	<ul style="list-style-type: none"> <li>Shifts electricity use patterns through rates</li> </ul>	<ul style="list-style-type: none"> <li>shift the time when some activities occur</li> </ul>

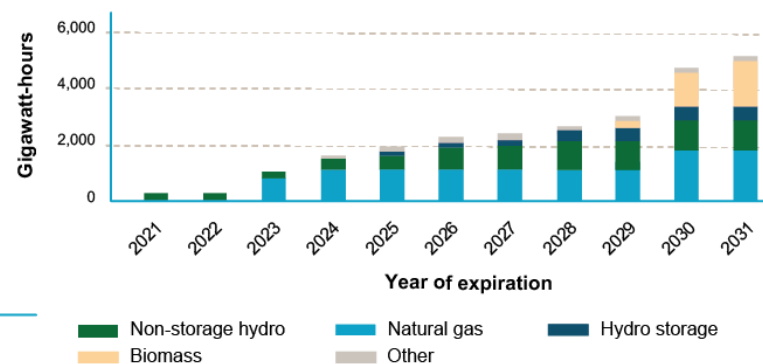
# Electricity Purchase Agreement (EPA) renewals

Around 40 agreements expire in the next 10 years (5000 GWh/yr or 750 MW); 70 agreements expire in the next 20 years (9000 GWh or 1200 MW)

## BC Hydro electricity supply



## Expiring Electricity Purchase Agreements by generating type (cumulative)



# Choices around EPA renewals

The Plan will guide our approach to expiring EPAs

Considerations:

- Cost
- Dependable capacity
- Environmental impacts
- Indigenous Nations' interests
- Location, e.g. near load centres
- Need for energy and capacity

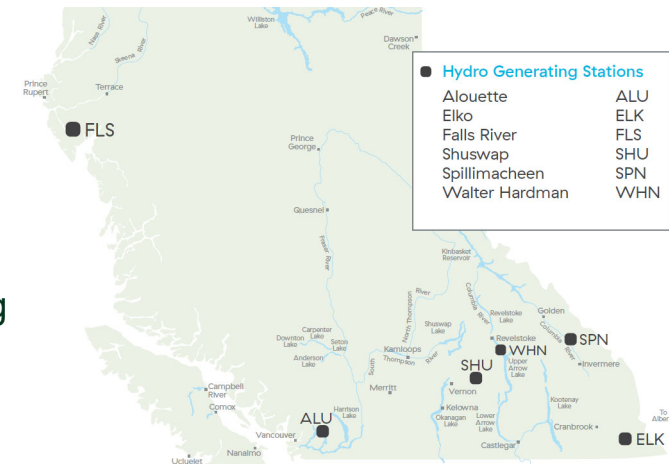
## INPUT

What should we consider as we design our approach around renewals when we have enough energy and capacity?

# Small hydro plants reaching end of life

The Plan will lay out our approach to the future of some small hydro plants

- Six small plants either near or at end of life
- Some of the choices:
  - Redevelop – replace with new dams and equipment
  - Shut Down – temporary shutdown or decommissioning
  - Divest – pass ownership to others

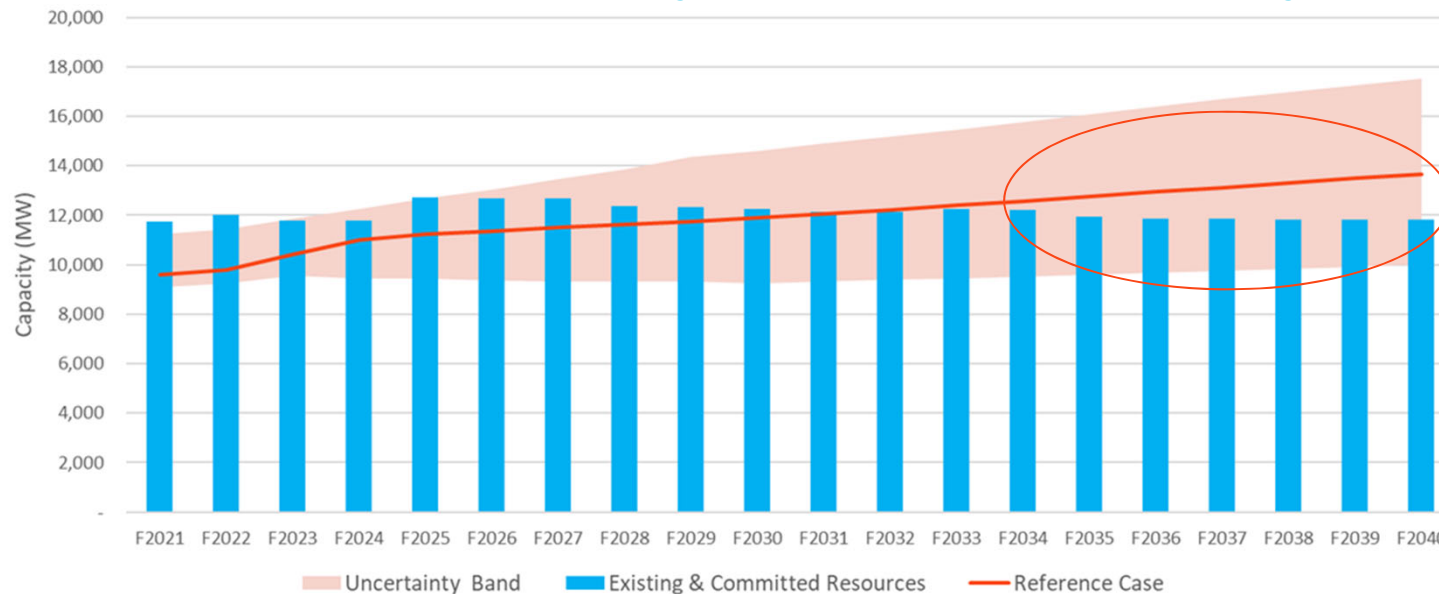


# New supply choices 2030 to 2040

1. Greater Conservation and Customer Involvement
2. Local Power Sources
3. Upgrades to Existing BC Hydro Infrastructure

# 20-year outlook of supply and demand

We expect to start seeing a gap in supply and demand in the second half of the plan, which is dependent on the supply choices made in the first 10 years



## 2030 to 2040: Getting ready to explore new resources

We're looking at ways to address future capacity needs



	Greater conservation and customer involvement	New or renewed local power sources	Upgrades to existing BC Hydro system
<b>Capacity</b>	<ul style="list-style-type: none"> <li>Demand response</li> <li>Time varying rates</li> </ul>	<ul style="list-style-type: none"> <li>Utility scale batteries</li> <li>Pumped storage</li> </ul>	<ul style="list-style-type: none"> <li>Revelstoke Unit 6</li> <li>Transmission upgrades</li> </ul>
<b>Energy</b>	<ul style="list-style-type: none"> <li>Expanded energy efficiency programs</li> <li>Customer generation</li> </ul>	<ul style="list-style-type: none"> <li>Local renewable e.g. wind and solar</li> <li>Could be EPA renewals and/or new EPAs</li> </ul>	<ul style="list-style-type: none"> <li>Renewable from most cost effective sources e.g. wind and solar</li> <li>Could be EPA renewals and/or new EPAs</li> </ul>



THIS SLIDE PROVIDES BACKGROUND INFORMATION – NOT PRESENTED

## Greater conservation & customer involvement

More choices through conservation initiatives and self-generation

Greater conservation			Self-generation
Energy Efficiency	Voluntary Time Varying Rates (e.g. time of use)	Demand Response (Smart Home Technology)	
Energy conservation programs.	Shifts electricity use to different times of the day	Devices control when some activities use electricity (e.g. laundry at night, electric vehicle charging)	Customers provide supply to the system

THIS SLIDE PROVIDES BACKGROUND INFORMATION – NOT PRESENTED

## Greater conservation & customer involvement

	Things to consider
Cost	<p>Investment would be required to expand:</p> <ul style="list-style-type: none"> <li>- energy efficiency programs</li> <li>- customer participation in time varying rates</li> <li>- smart home technology</li> <li>- self-generation of electricity</li> </ul> <p>Avoid or delay the cost to build new, costly electricity infrastructure</p>
Environment	Could avoid or delay impacts of new electricity infrastructure
Socio-economic	New jobs throughout the province

THIS SLIDE PROVIDES BACKGROUND INFORMATION – NOT PRESENTED

## New, local power sources

Batteries • Pumped storage • Local, renewable power

Batteries	Pumped storage	Local, renewable power
<ul style="list-style-type: none"> <li>• Connect directly to the power grid</li> <li>• Start up when customer demand is high</li> <li>• Re-charge when customer demand is low, like overnight</li> </ul>	<ul style="list-style-type: none"> <li>• Two reservoirs at different elevations</li> <li>• When customer demand increases, water is released through a turbine that generates electricity to meet short-term demand</li> <li>• When customer demand is low, water is pumped into the higher reservoir and stored</li> </ul>	<ul style="list-style-type: none"> <li>• Acquire renewable power, like wind and solar, close to customer load</li> </ul>

THIS SLIDE PROVIDES BACKGROUND INFORMATION – NOT PRESENTED

## New, local power sources

Batteries • Pumped storage • Local, renewable power

	Things to consider	
	Batteries with renewables	Pumped storage with renewables
Cost	<ul style="list-style-type: none"> <li>• Currently very expensive, however, may be on par with pumped storage by 2030.</li> <li>• shorter lead time to deploy than pumped storage</li> <li>• Local renewables avoid power line upgrade costs</li> </ul>	<ul style="list-style-type: none"> <li>• The next cheapest capacity source after upgrades to our system</li> <li>• Longer lead times to deploy than batteries</li> <li>• Local renewables avoid power line upgrade costs</li> </ul>
Environment	<ul style="list-style-type: none"> <li>• Battery: smaller environmental footprint</li> <li>• Concerns over battery creation and disposal</li> <li>• Renewables have some environmental impacts but may avoid power line upgrades</li> </ul>	<ul style="list-style-type: none"> <li>• Larger environmental footprint</li> <li>• Renewables have some environmental impacts but may avoid power line upgrades</li> </ul>
Socio-economic	<ul style="list-style-type: none"> <li>• Construction jobs</li> <li>• Potential opportunities to advance reconciliation with Indigenous Nations located near costs effective clean resources</li> </ul>	<ul style="list-style-type: none"> <li>• Construction jobs</li> <li>• Potential opportunities to advance reconciliation with Indigenous Nations located near costs effective clean resources</li> </ul>

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# Upgrades to existing BC Hydro system

Upgrade to Revelstoke Generating Station	Provincial renewable energy sources	Transmission system upgrades
<ul style="list-style-type: none"> <li>• Adds a sixth generating unit</li> </ul>	<ul style="list-style-type: none"> <li>• New sources acquired from around the province</li> </ul>	<ul style="list-style-type: none"> <li>• Bring power from both Revelstoke Generating Station and renewable energy sources around the province to our major load centres in the Lower Mainland and Vancouver Island</li> </ul>

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# Upgrades to existing BC Hydro system

Things to consider	
Cost	<ul style="list-style-type: none"> <li>• Adding a sixth generating unit to Revelstoke Generating Station is likely the lower cost option for new capacity.</li> <li>• Acquiring new, renewable electricity supply from around the province is likely more cost effective than only acquiring supply that is close to load</li> <li>• Potential power line upgrades can increase costs</li> </ul>
Environment	<ul style="list-style-type: none"> <li>• Revelstoke Generating Station is already designed to accommodate six units</li> <li>• Environmental impacts of potential power line upgrades or additions</li> </ul>
Socio-economic	<ul style="list-style-type: none"> <li>• Economic development opportunities through construction and upgrades.</li> <li>• Renewable energy projects provide potential opportunities to advance reconciliation with Indigenous Nations close to costs effective clean resources</li> </ul>

# 2030 to 2040: New Power Supply Choices

We'd like to hear your interests and concerns



Greater conservation &  
Customer involvement



New local  
power sources



Upgrades to  
existing BC hydro system

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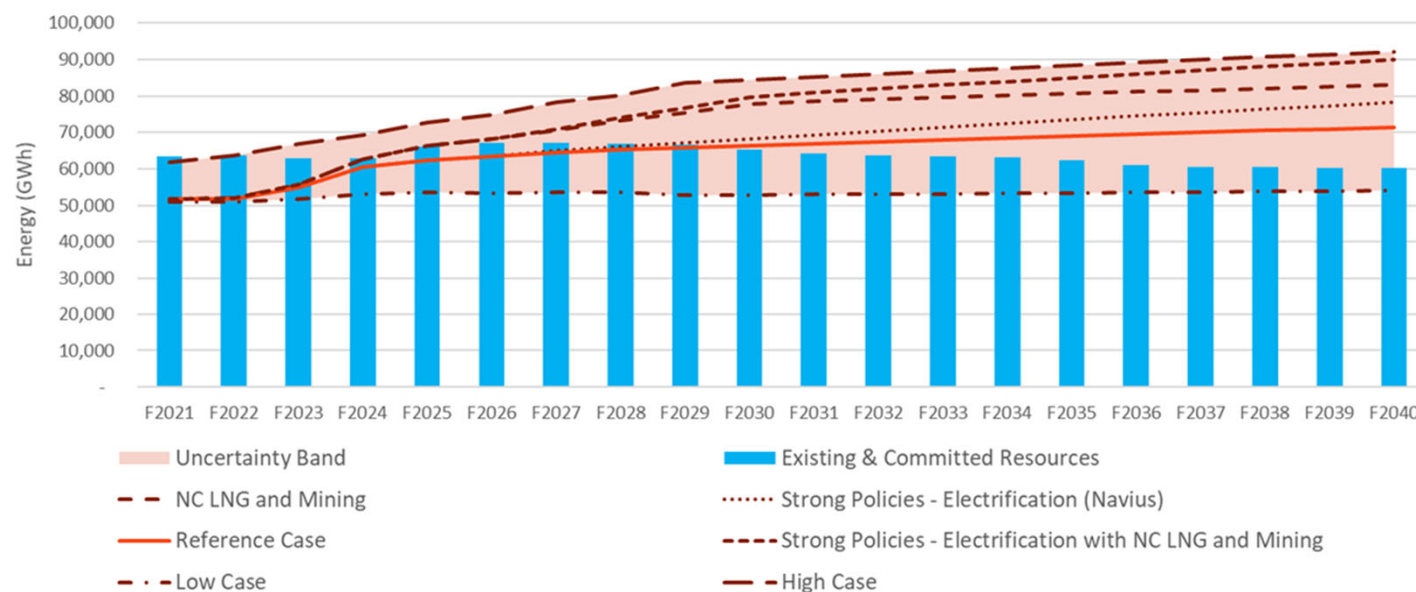
**INPUT** After looking at all three broad options, is there anything you'd like to add?

# Planning for uncertainty



# Planning for uncertainty – Scenarios

The Plan considers uncertainty when comparing our options



# Planning for uncertainty – Regions

IRP considers regional implication of scenarios



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# Region specific

The following slides include projects and initiatives that we may be contemplating. As the strategy for the power system, the IRP will influence future decisions on whether these are advanced. Projects are subject to separate consultation and approval processes.

# North Coast region

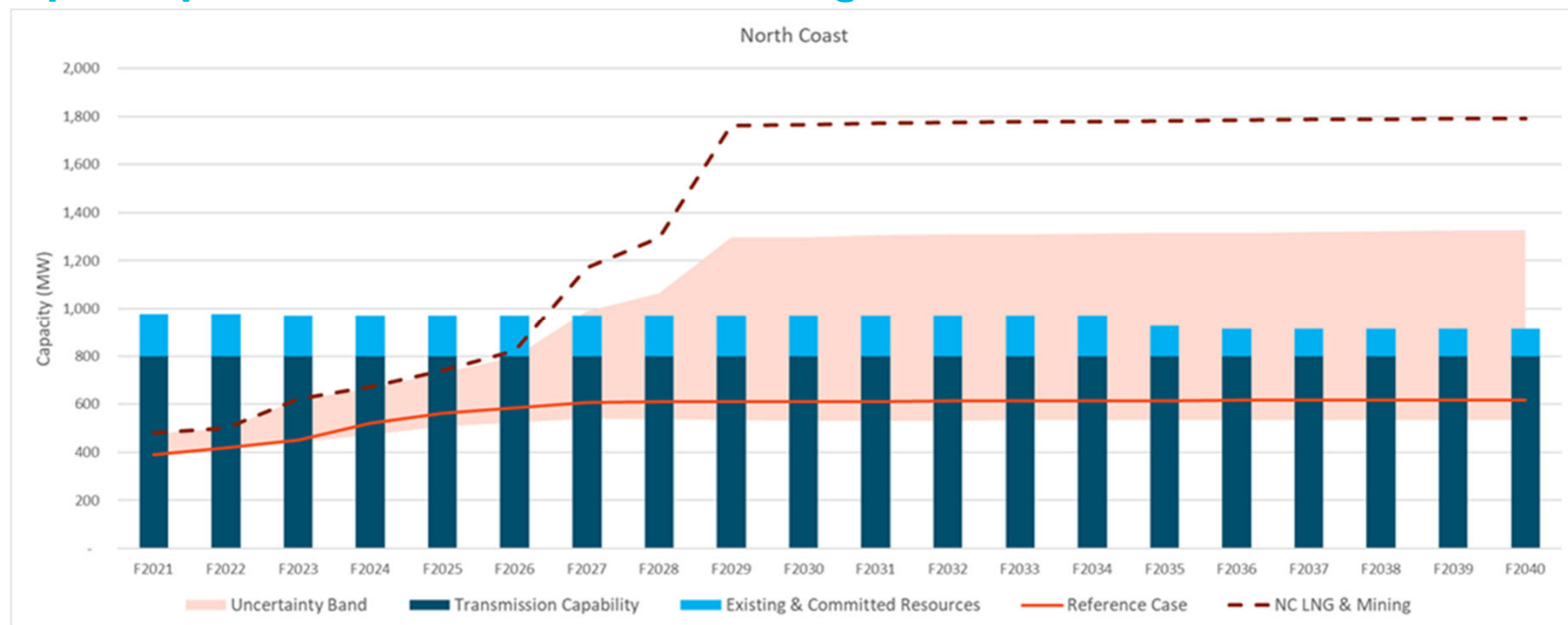
The region is served by one long radial line



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# North Coast region supply demand outlook

Upside potential from LNG and mining loads



# North Coast region

## Options available to meet higher demand scenarios envisioning more LNG and more mines

Preparing new transmission (consultation underway)

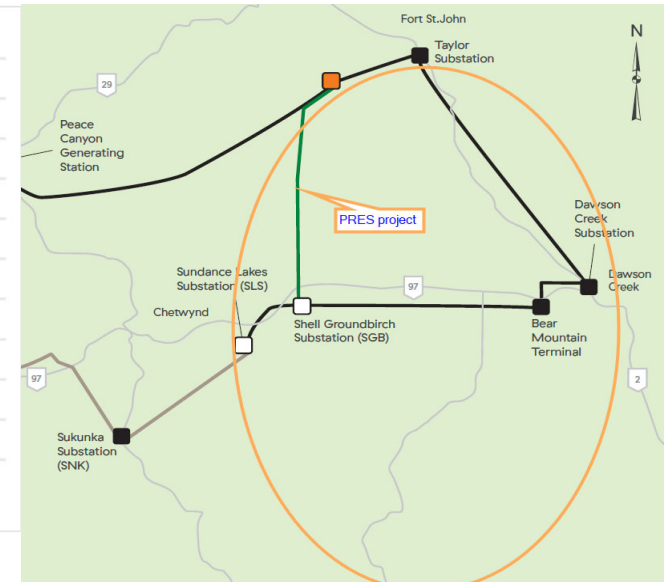
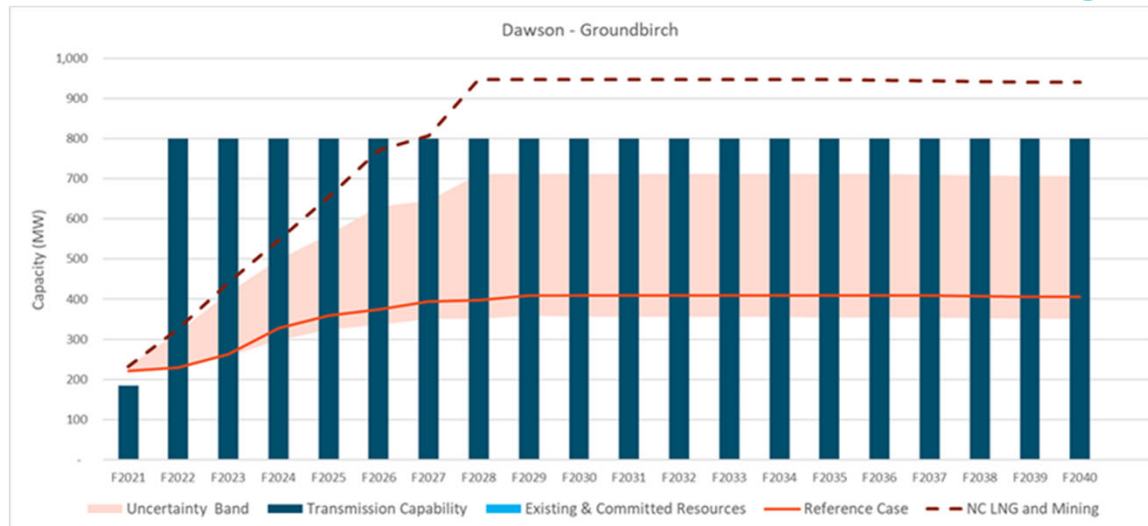
- Prince George to Terrace Capacitors project
- Twinning 287 kV (SKA to MIN) from Terrace to Kitimat

Future potential system need (if additional customer commitments with higher electrification)

- Twinning the transmission line from Prince George to Terrace
- Renewables:
  - Falls River (BC hydro facility)
  - Geothermal, storage hydro
  - Pumped storage combined with local renewables (e.g. off-shore wind, run-of-river hydro)

# Dawson Creek – Groundbirch area

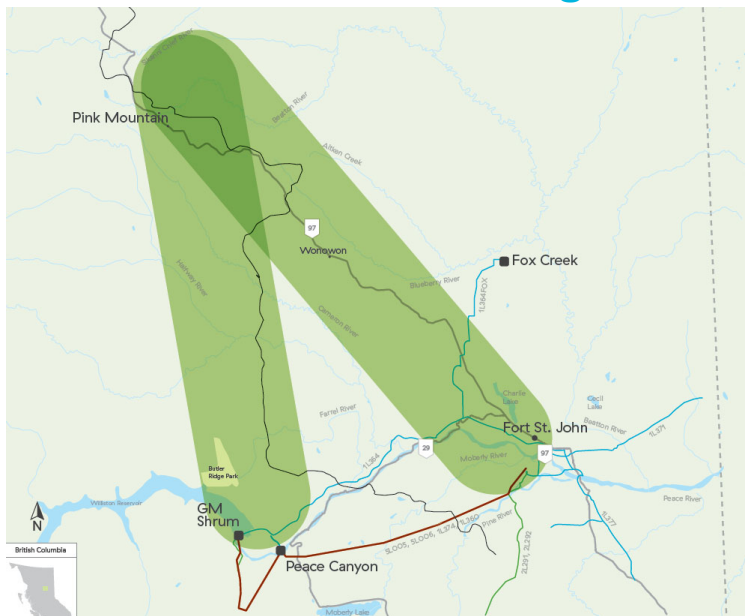
The demand supply outlook shows enough capacity in reference case but potential need for more reinforcement in higher scenario



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# North Montney area

This area has no existing transmission line, but potential for electrification



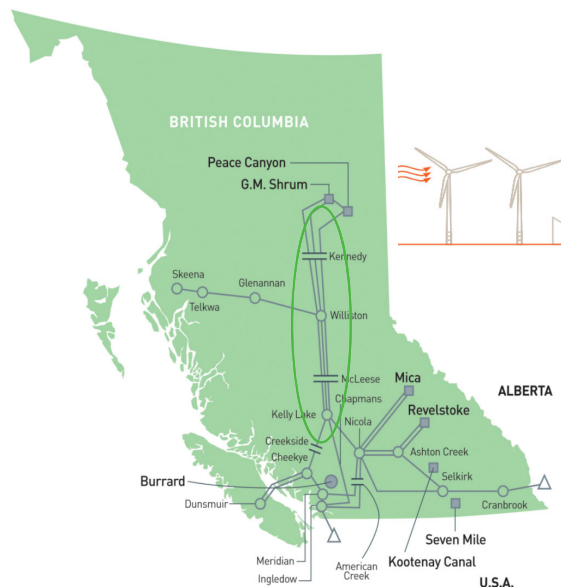
- No customer commitments yet
- Preparing for new transmission if/when customer commitments occur

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# North – potential projects

## Generation and transmission options in the North



### Potential future options (beyond 10 years)

- GMS units 1-5 capacity increase (~100 MW)
- Renewables: wind resources in Peace are among lowest cost energy resources within British Columbia
- Upgrades to Peace to Williston or Peace to Kelly Lake Transmission lines to power North Coast or Lower Mainland / Vancouver Island

# Next steps and thank you

## Next Steps

- We will circulate meeting summary for your review and comment
- We ask for your comments and input for this phase of consultation by Jan 31, 2021
- Your input will inform Draft Actions
- We will release the Consultation Summary Report in winter/spring 2021
- Consultation on Draft Actions to take place in spring/summer 2021

# Thanks for participating

- Please take the survey: <https://bchydro.civilspace.io/en/projects/clean-power-2040/engagements/clean-power-2040-indigenous-input>
- Provide input by email at [CP2040.Indigenous@bchydro.com](mailto:CP2040.Indigenous@bchydro.com)
- Call us at 1-877-461-0161 (extension 3) if you have any questions

