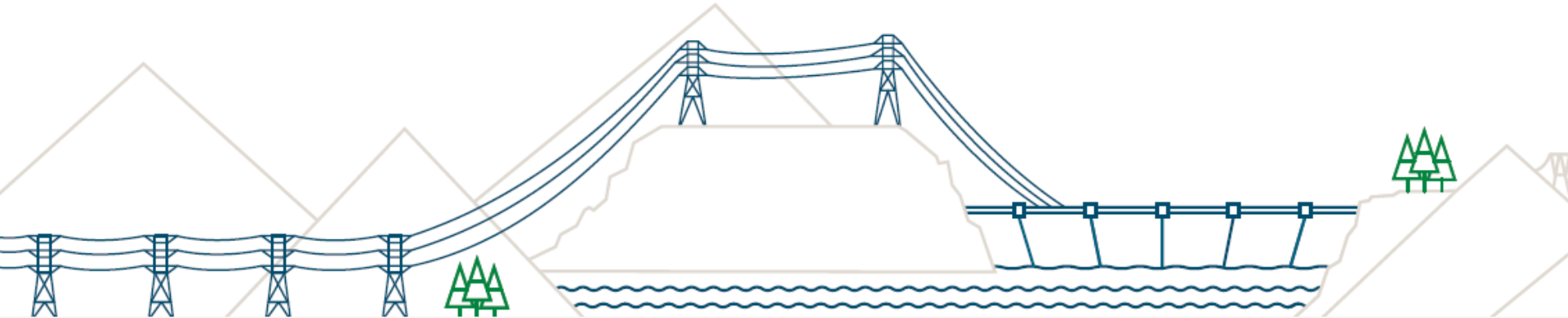


Competitive Electricity Acquisition Process (CEAP) 2024 Workshop

- ❑ Microphones have been muted during this presentation
 - If you have a question, please place it in the chat. We're going to try to get to all the questions but if we run out of time, we will do our best to compile them and get back to you.
- ❑ To save bandwidth, cameras have been turned off
- ❑ We aren't recording this session, and kindly ask that others do not record
- ❑ **Technical Issues?** Send a note in the chat

Competitive Electricity Acquisition Process (CEAP) Workshop February 21 & 27, 2024



Feb 21 & 27, 2024

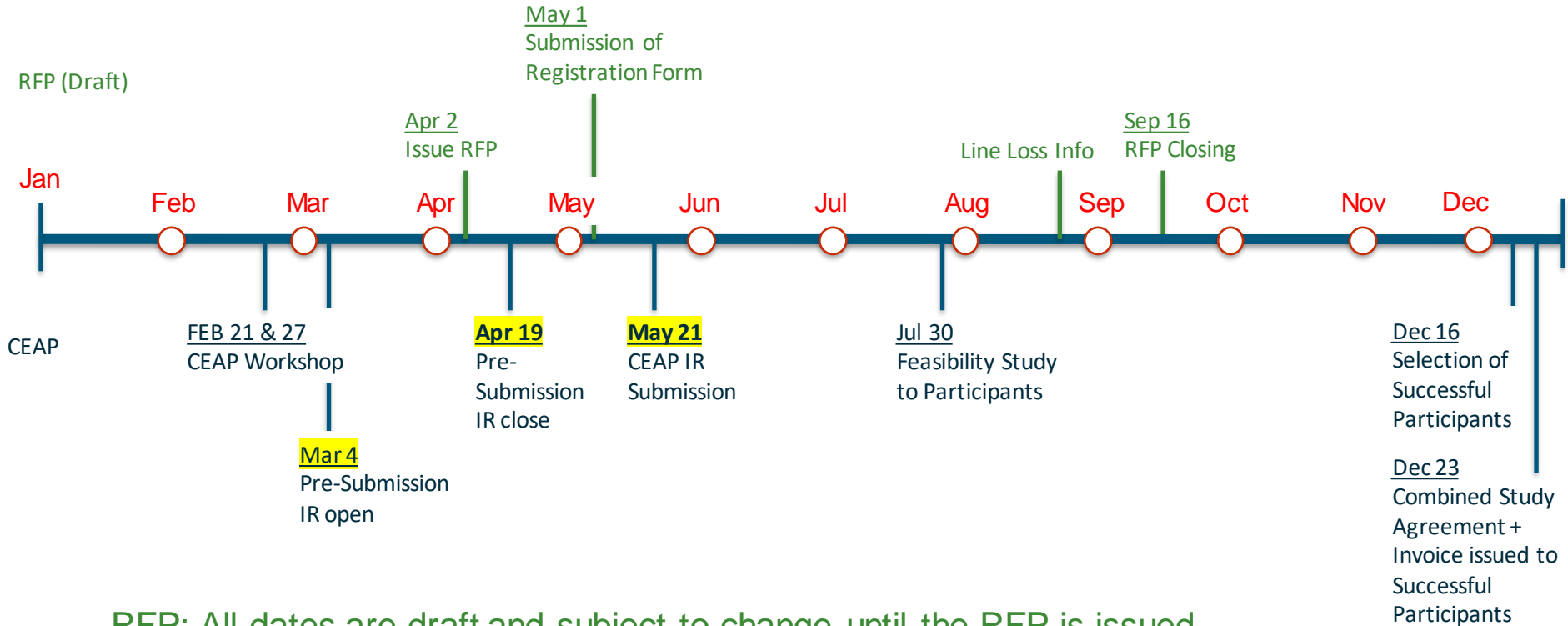
AGENDA

9 am	<ol style="list-style-type: none">1. Welcome2. Competitive Electricity Acquisition Process (CEAP) Roadmap3. Standard Generator Interconnection Procedures (SGIP) Overview
10:30 am	Coffee break
	<ol style="list-style-type: none">4. Interconnection Request (IR) & Generator Interconnection Data Form (GIDF)5. Indirect Interconnection6. Administrative Information<ul style="list-style-type: none">• CEAP IR submission• Electronic Funds Transfer (EFT) setup
12 pm	Lunch
2 pm	<ol style="list-style-type: none">6. Technical Interconnection Requirements (TIR) Updates7. Wrap Up and Next Steps

Today's Goals

- ❑ Provide information on the Competitive Electricity Acquisition Process (CEAP) – OATT Attachment M-2
- ❑ Highlight key CEAP milestones and timeline
- ❑ How to Submit an Interconnection Request
- ❑ Answer Questions

CEAP and RFP Milestones



RFP: All dates are draft and subject to change until the RFP is issued

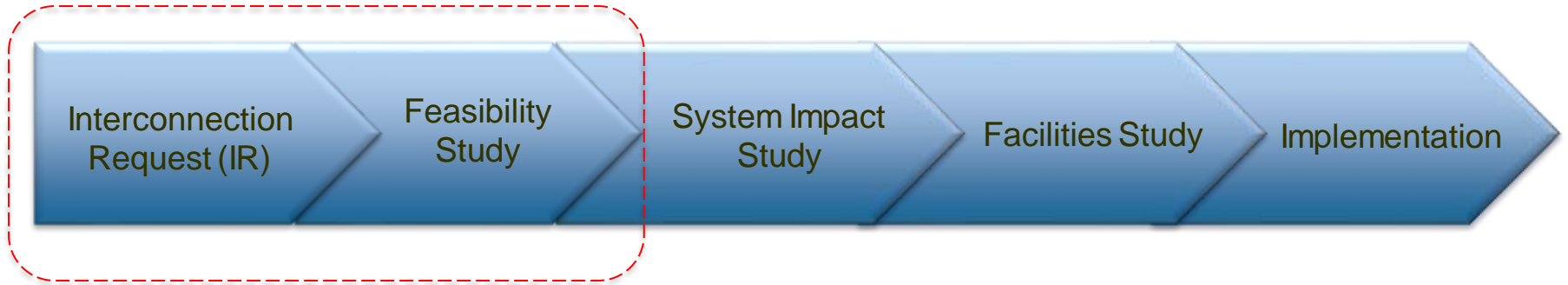
Transmission Service and Interconnection Service Procedures for CEAP

[Open Access Transmission Tariff](#)

[Transmission Generator Interconnections](#)

Tanya Thomas

Interconnection Process – High Level



Focus of this CEAP Workshop

CEAP Road Map



We are currently here

CEAP Road Map



Today's Workshop will focus on these stages



Interconnection Request must be submitted on or before April 19, 2024 @ 5pm

Interconnection Request:

- Completion of the Interconnection Request (IR) form
 - high level information about the project - Project Size, Location, POI)
- Submission of the Generator Interconnection Data Form (GIDF)
 - detailed technical information about the project and signed and sealed by a professional engineer under EGBC
 - Complete all required tabs and submit all required attachments

Within 5 Business Days (BD) from Receipt of IR: BC Hydro will acknowledge receipt, attach IR submitted, and advise of deficiencies if any

Within 10 BD from receipt of Deficiency List: Participant must cure deficiencies

- CEAP IR will be deemed withdrawn if Participant fails to cure deficiencies

Pre-Submission
of CEAP IR
April 19, 2024

CEAP IR
Submission Date
May 21, 2024

Feasibility Study
July 30, 2024

Selection of
Successful Participants
Dec 16, 2024

After 10 BD from receipt of Deficiency List by Participant: BC Hydro will send either:

1. Notice of failure to cure deficiencies and deemed withdrawal from CEAP; or
2. An acknowledgement of a Valid IR and attach:
 - Interconnection Feasibility Study Agreement
 - Invoice for CEAP IR deposit (\$15k) and Feasibility Study deposit (\$15k)

On or before May 21, 2024: Participant must deliver to BC Hydro:

1. Executed Feasibility Study Agreement
2. The required two deposits



The CEAP IR Submission Date is May 21, 2024

The Interconnection Requests that will be participating in CEAP will be those that have **completed** the following on or before May 21st:

- Valid CEAP IR + GIDF
- Executed Feasibility Study Agreement
- Paid \$15k CEAP IR deposit
- Paid \$15k Feasibility Study deposit

If any of the above items are not completed by the required dates, the CEAP IR will be deemed withdrawn.



- ❑ BC Hydro will conduct the Feasibility Studies within 10 weeks of May 21, 2024
- ❑ Feasibility Study consists of a power flow and short circuit analysis to assess the impact of the proposed interconnection on the system performance and required reinforcement to address thermal, voltage, substation, telecom, protection and control issues from a high-level perspective
- ❑ Feasibility Study report will include a non-binding good faith estimate of cost responsibility and estimated time to construct
- ❑ Participants will receive the Feasibility Study report on the same day – July 30, 2024



- ❑ **Dec 23, 2024:** BC Hydro will tender to Successful Participants:
 1. Combined Study Agreement
 2. Invoice for System Impact Study deposit (\$75k)

- ❑ **Jan 22, 2025:** Participants execute:
 1. Executed Combined Study Agreement
 2. Provide System Impact Study deposit

QUESTIONS



Standard Generator Interconnection Procedures (SGIP) Overview

[Open Access Transmission Tariff](#)

[Transmission Generator Interconnections](#)

Tanya Thomas

Interconnection Process – High Level



We are currently here



❑ **Prerequisite:**

- Executed Combined Study Agreement
- Demonstration of Site Control
- Valid SIS GIDF and required attachments – need to submit updated GIDF
- Study deposit of \$75k

❑ **System Impact Study (SIS)** evaluates the impact of the proposed interconnection on the reliability of the BC Hydro system

- Includes Power flow, transient stability, voltage stability, fault analysis, electromagnetic transient study (if required)

❑ **Deliverable:** SIS Report that includes a non-binding good faith estimate for network upgrades that would be required



Early Engineering & Procurement Agreement: enables BC Hydro to begin engineering and procurement of long lead time equipment necessary to facilitate the interconnection

- Optional
- Performed in parallel with ongoing interconnection studies
- IC shall pay all costs under the agreement



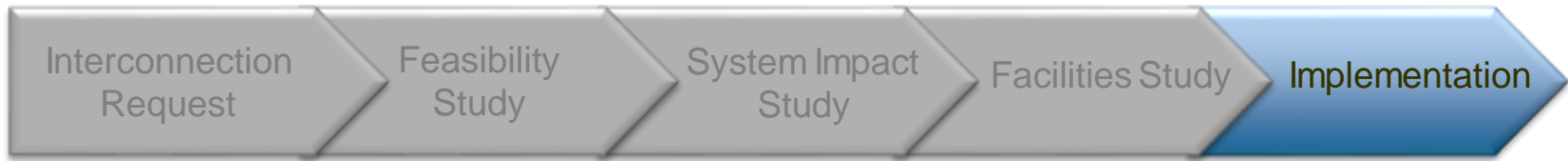
❑ **Prerequisite:**

- IC advises BC Hydro to proceed with Facilities Study
- Facilities Study deposit of \$150k

- ❑ Facilities Study shall specify and estimate the cost of equipment, engineering, procurement and construction work required to implement the conclusions of the System Impact Study

❑ **Deliverable:**

- Facilities Study report that includes the description of the interconnection facilities, project implementation schedule, and design level cost estimates
- Project Interconnection Report (PIR) that describes the specific facilities and requirements that the IC must engineer, procure, install, construct and commission for the interconnection of the facility to the BC Hydro system



❑ **Prerequisite:**

- Executed Standard Generator Interconnection Agreement (SGIA)
- Form of Security for Network Upgrade costs listed in the Facilities Study

❑ The Implementation Phase includes finalizing the designs, issuing all required drawings, and construction, installation of identified works listed in the Facilities Study. All testing and commissioning activities will also occur during this final phase of work.

❑ **Deliverable:**

- Completion of BC Hydro's Interconnection Facilities and Network Upgrades
- Interconnection of the generating facility to the BC Hydro system

QUESTIONS



BREAK



Interconnection Request Form and Generator Interconnection Data Form

Pierre Ledesma



CEAP Interconnection Request (IR) Form

Purpose:

Collect customer and general project information to initiate Interconnection Request.

Information Collected:

- Customer Information
- General Project Information – Location, Generating Capacity, Commercial Operation Date (COD), Point of Interconnection (POI)

[IR Form](#) will be available on February 28, 2024 to download from the Transmission Generator Interconnection website

Generator Interconnection Data Form (GIDF) for Feasibility Study

Purpose:

Collect technical project information and electrical data to conduct a Feasibility Study

Information Collected:

- Project Information – Point of Interconnection (POI), COD, Coordinates
- Plant Data - Capacity
- Generator Data – Hydro, Solar, Wind, Storage, etc.
- Step Up Transformer
- Other Transformers
- HV Circuit Breaker
- Transmission Line
- Protection

Generator Interconnection Data Form (GIDF) for Feasibility Study

Attachments:

- Map including POI and site location (E.g. Google kmz file)
- Single Line Diagram (SLD)
- Generator Capability Curves, Power Flow Model
- Site layout drawing (optional)

Reminders:

- Follow instructions on the form
- Complete all applicable Tabs and Sections:
 - Fill in all mandatory fields shaded **orange**. Fill N/A for fields that are not applicable
- Must be signed and sealed by EGBC Professional Engineer

[GIDF \(Feasibility\)](#) will be available on February 28, 2024 to download from the Transmission Generator Interconnection website

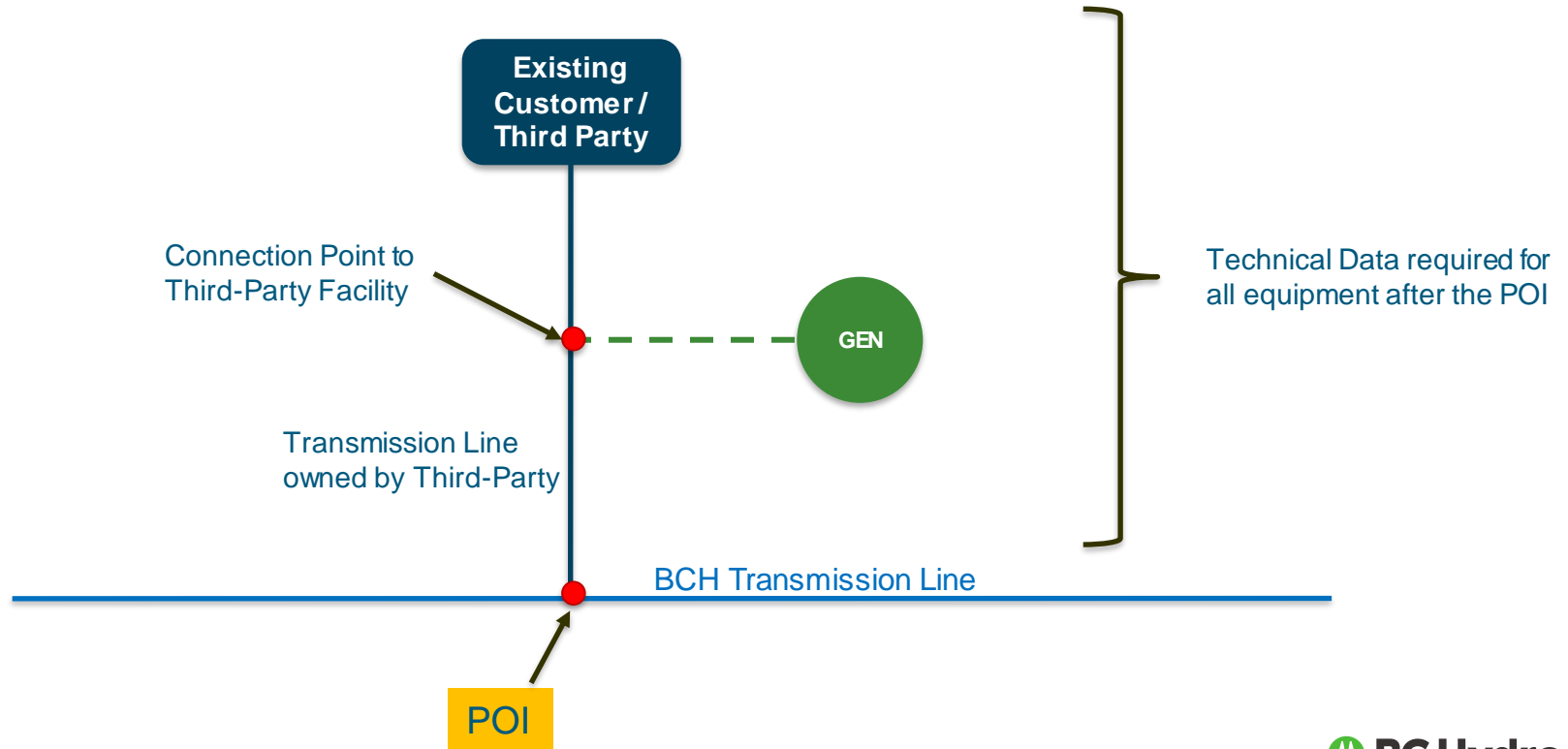
Indirect Interconnections

Indirect Interconnection is when the proposed facility will either connect through a Point of Interconnection (POI) that is:

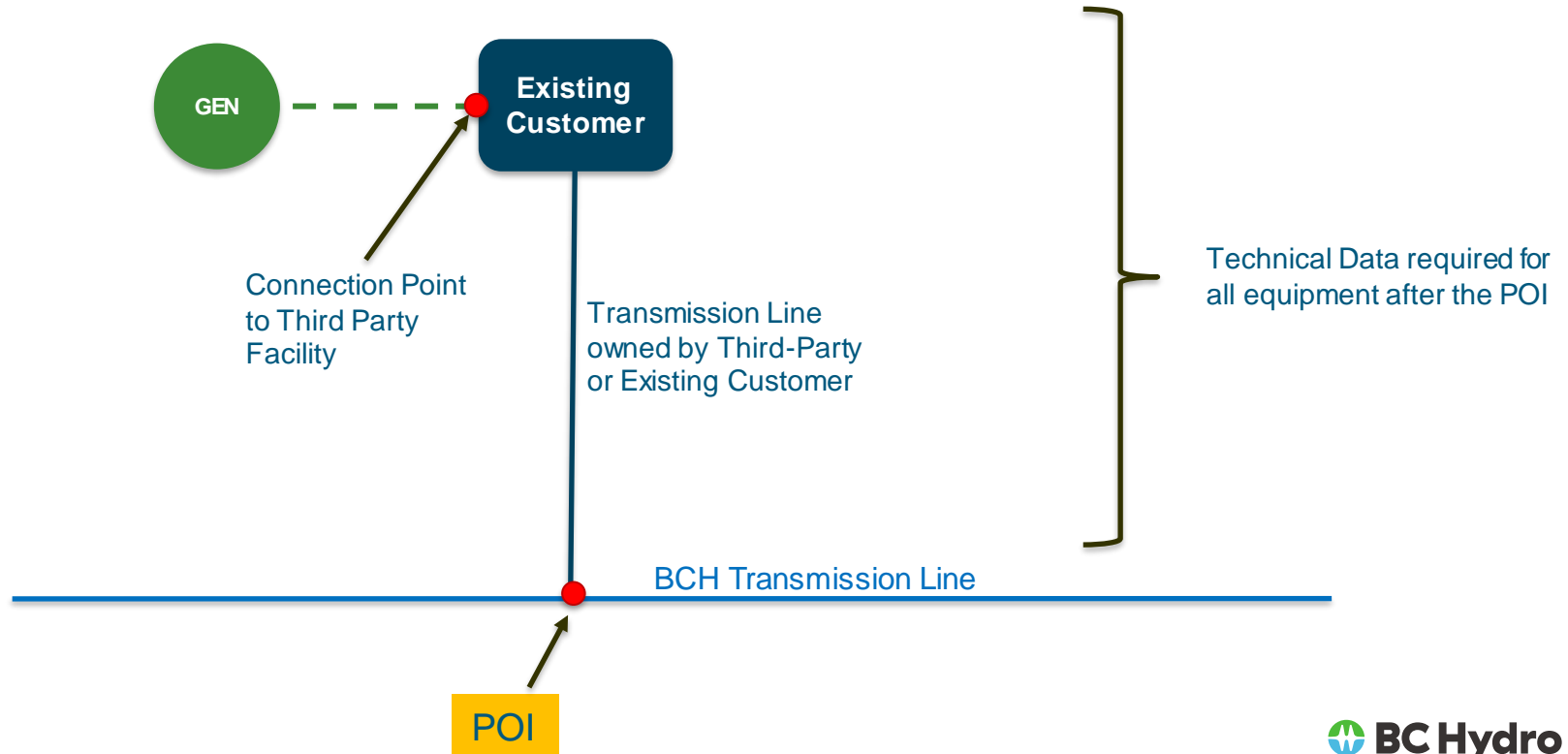
- owned by a Third-Party; or
- jointly owned with a Third-Party

POI is where the Third-Party owned system interconnects to the BC Hydro system

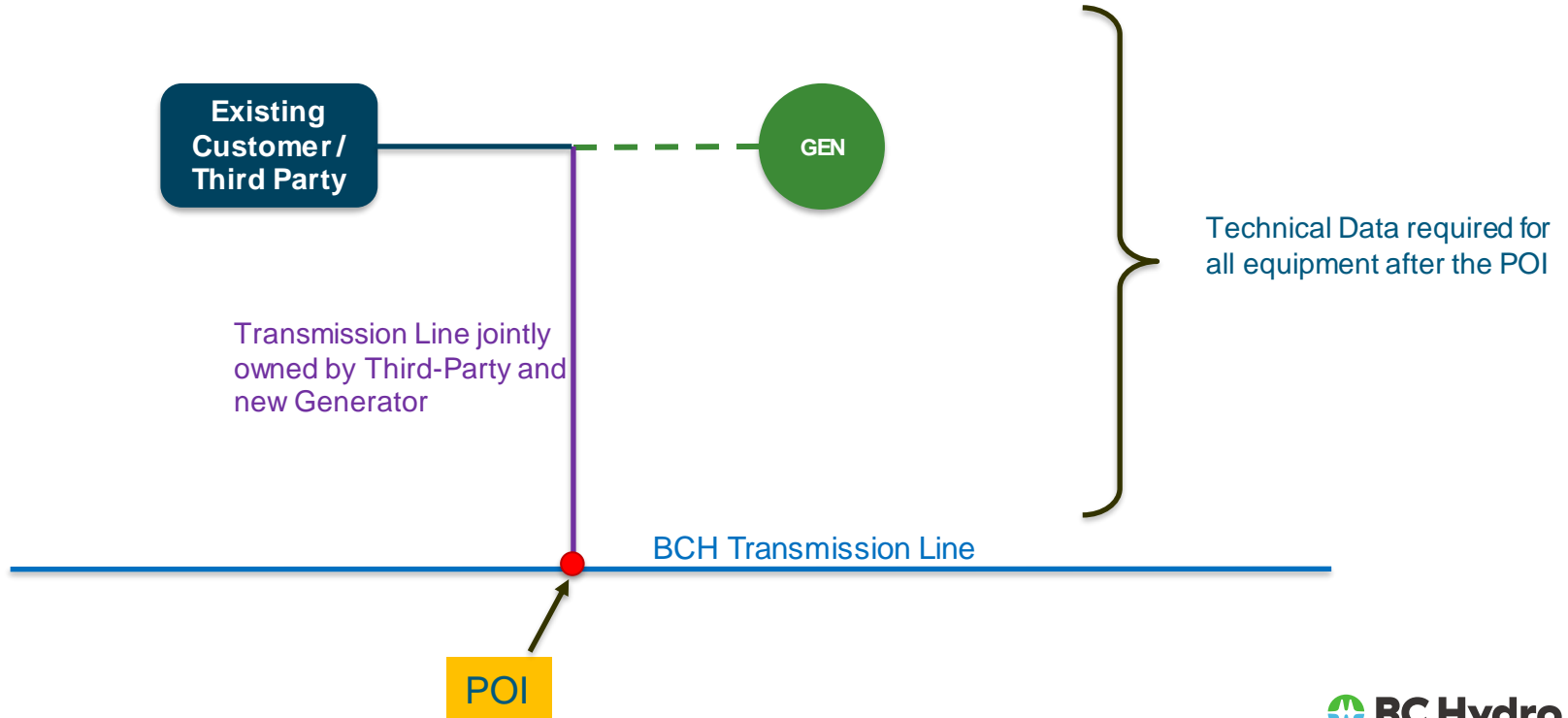
Indirect Interconnections



Indirect Interconnections



Indirect Interconnections



Indirect Interconnections

- ❑ Confirmation of third-party agreement will be required at later stage in the interconnection process
- ❑ Amendments to existing agreements the Third-Party has with BC Hydro may be required
- ❑ Depending on the size and type of the generator, and the voltage of the interconnection, a Generator may be classified as a **Bulk Electric System (BES)** element¹, and prior to commercial operation the proponent must register with the BCUC as a Generator Owner
 - If this happens on an indirect interconnection, the third party will need to register with the BCUC as a Transmission Owner & Transmission Planner, and be subject to the applicable Mandatory Reliability Standards

¹Refer to the NERC *Bulk Electric System Definition Reference Document*

Pre-Submission CEAP IR Package

Complete Pre-Submission CEAP IR Submission Package will include:

- Excel file of IR and GIDF
- PDF of IR and GIDF (signed and sealed by EGBC professional engineer)
- Applicable GIDF Attachments (e.g., Site Plan, Location Map, Power Flow, etc.)

Note: Incomplete and/or erroneous applications will result in deficiencies

QUESTIONS



Administrative Information

Pierre Ledesma



How to submit your CEAP IR Submission

- ❑ Pre-Submission CEAP IR package: IR Form and GIDF (Feasibility Study)
- ❑ Pre-Submission CEAP IR window: **March 4 to April 19, 2024 @ 5pm**
- ❑ Submit via email to: CEAP2024@bchydro.com
 - Each Interconnection Request must be submitted on a separate email (Regardless if same owner or generating facility)
 - Maximum email file size is 10MB: Documents can be sent in multiple emails (Must indicate 1 of 2, 2 of 2 in email subject line)
- ❑ No deposit required for pre-submission of CEAP IR

Payment for CEAP IR and Feasibility Study

- ❑ Instructions on the Electronic Funds Transfer (EFT) setup for CEAP IR and Feasibility Study payments will be provided
- ❑ Payment must be received on or before May 21, 2024
- ❑ EFT payment is encouraged to ensure timely receipt of deposit payment
- ❑ Submitting an EFT payment is a two-step process:
 - Customer Registration through BC Hydro Payments group
 - Fund Transfer

QUESTIONS



LUNCH



Technical Interconnection Requirements (TIR) Updates

BC Hydro Planners



Technical Interconnections Requirement (TIR)

- ❑ The TIR document is issued by BC Hydro in accordance with codes, standards and criteria applicable in BC, and with good utility practice
- ❑ Provides minimum technical interconnection requirements for connecting a Power Generator's (PG) facility to the BC Hydro system
- ❑ Valid for voltage levels between 60 kV and 500 kV – interconnection requests for 500kV will not be allowed
- ❑ Provides information on:
 - Compliance and regulatory requirements of agencies and authorities such as British Columbia Utilities Commission (BCUC), the North America Reliability Corporation (NERC) and the Western Electricity Coordinating Council (WECC)
 - Compatibility requirements at PG's facility for safe operation and to maintain a reliable transmission system
 - Planning, design, construction and commissioning requirements at the PG facility

Technical Interconnections Requirement (TIR)

- ❑ BC Hydro has an updated TIR (2024) that will be posted on the Transmission Generator Interconnections website
- ❑ Following slides will highlight some of the key changes in the latest revision of the TIR
- ❑ It is important that the proponents review the 2024 TIR in detail before proceeding with the next steps

Note: Beyond a certain threshold, additional MRS requirements may be triggered before a PG can connect to the BC Hydro transmission system

TIR Updates

Interconnection Planning

Robert Pan

Analytical Studies

Matin Rahmatian

Protection & Control Planning

Gurinder Hundal / Kenan Hadzimahovic

Stations Planning

Anthony Ho/ Anil Pradhan (Q&A only)

Telecom Planning

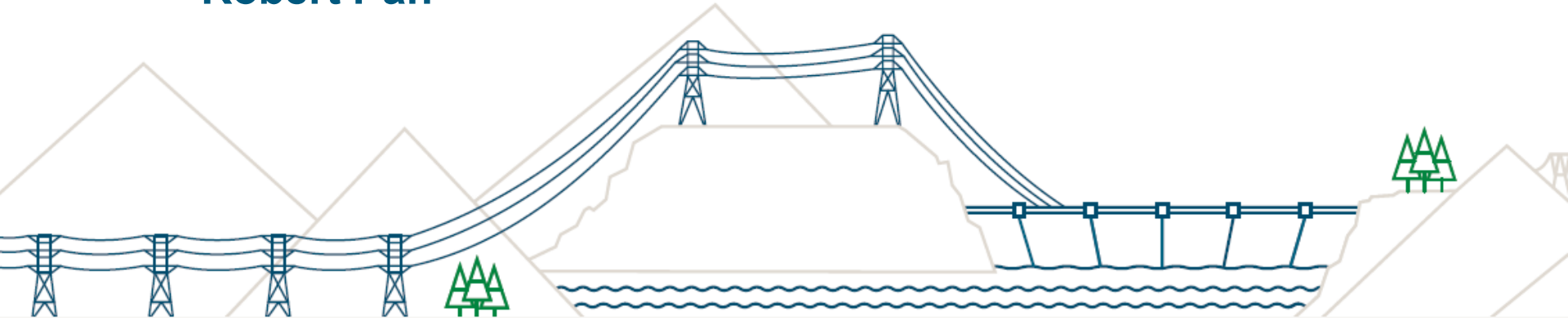
Parker Moore (Q&A only)

Revenue Metering

Colin MacIntosh (Q&A only)

TIR Updates, Interconnection Planning

Robert Pan



Power Generating Facilities (PGFs)

- ❑ The TIR has included Solar (PV) farms, Battery Energy Storage Systems (BESS), and Hybrid Power Plants (HPP) in the scope, which are the additions to conventional Synchronous Generators and Wind farms (**TIR Section 3**)

- ❑ The performance requirements for all PGFs are consolidated:
 - Requirements of Real Power injected into or absorbed from the BCH system for all PGFs (**TIR 6.4.1**)
 - Required reactive power capability as measured at a point within PGFs (**TIR 6.4.2**)
 - Participation of Primary Frequency Regulation required for all PGFs newly installed or materially modified (**TIR 6.4.5**)
 - Current injections during a fault event required for all PGFs (**TIR 6.4.6**)

Required Technical Data from Generator Owners (GOs)

TIR Section 4:

- ❑ GO's submission of the PGF technical data is essential for BCH to timely start an interconnection study or service;
- ❑ The GO's submissions shall be provided by submitting a Generator Interconnection Data Form (GIDFs) and supplements in stages:
 - Interconnection Studies (Feasibility, SIS and Facilities Study)
 - Interconnection Commissioning
 - Commercial Operation

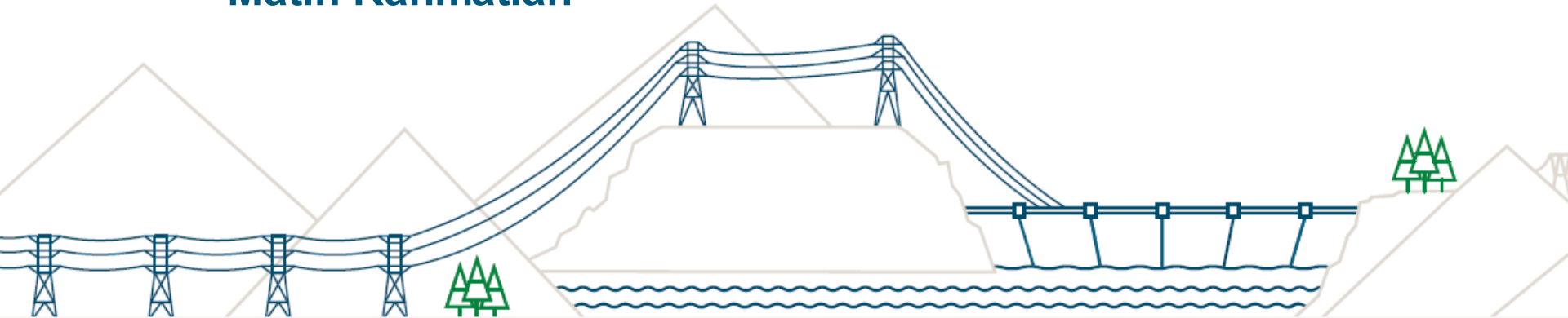
For the CEAP 2024 Feasibility studies, the Feasibility GIDF shall be used

QUESTIONS



TIR Updates, Analytical Studies

Matin Rahmatian



Power Quality

- ❑ **TIR Section “5.7.3 Temporary Over-voltages”** (Table 1 in GEN TIR)
- ❑ **TIR Section “6.2.3 Voltage Fluctuation”** (Rapid Voltage Change, Flicker)
- ❑ **TIR Section “6.2.4 Voltage and Current Harmonics”** (Individual Harmonics and Total Harmonic Distortion)
- ❑ **TIR Section “6.2.5 Phase Unbalance”** (Voltage and current unbalance)

For the CEAP 2024 Feasibility studies, the Feasibility GIDF shall be used

IBR EMT Model

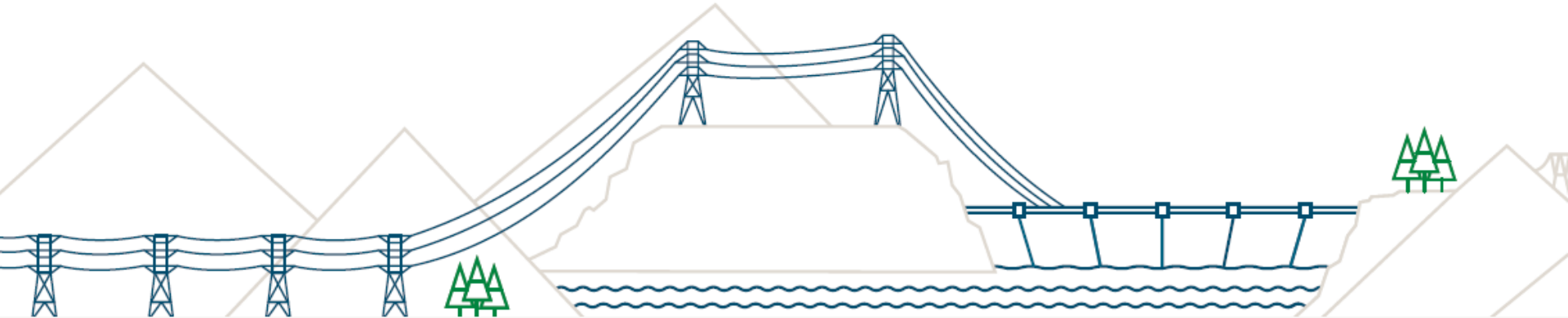
- ❑ **EMT models**, including either **PSCAD/EMTDC** or **EMTP-RV** shall be submitted representing the real power plant (WF, BESS, SF, hybrid)
- ❑ A **comprehensive integrated power plant model** shall be submitted compatible with the latest version of PSCAD or EMTP-RV
- ❑ The power plant model shall include all the components, controls and protections
- ❑ The model shall flat start in time-domain from the load-flow condition and pass compliance tests

QUESTIONS



TIR Updates, Protection & Control Planning

Gurinder Hundal / Kenan Hadzimahovic



Protection Upgrade

- System Model Requirements Updates for IBRs
- IBR negative sequence current contribution required
- Entrance Protection: Redundant protection for BES Customer
- Regulatory Requirements: Freq, voltage etc.
- BC Hydro will approve the line protection relays
- Event Recorder Requirements
- Power Quality Protection

For the CEAP 2024 Feasibility studies, the Feasibility GIDF shall be used

Control Upgrade

- Phasor Measurement Requirement for plants >75MVA
- SCADA Requirement, control and telemetry
- Requirement for Telecom signals to BC Hydro
- No Dial up connections
- Power Parameter Information System (PPIS) meter requirements to include different manufacturers

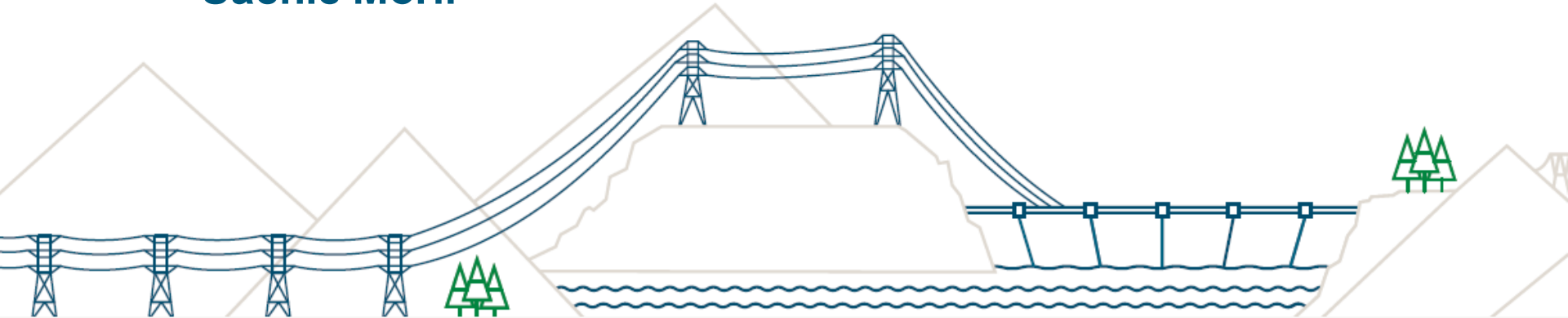
For the CEAP 2024 Feasibility studies, the Feasibility GIDF shall be used

QUESTIONS



Next Steps

Sachie Morii



CEAP Amendments

- Application to the BCUC for approval in the spring of the following amendments to OATT Attachment M-2:
 - Delay in the obligation to publicly post the Feasibility Studies on OASIS until after the completion of the CEAP; and
 - Housekeeping amendment to correct SGIP references that were omitted in the larger OATT generator interconnection amendments application completed in 2022

CEAP Key Dates

Milestone	Date
Accept Pre-Submission CEAP IR	March 4, 2024
Pre-Submission CEAP IR Date	April 19, 2024 @ <u>5pm</u>
CEAP IR Submission Date	May 21, 2024
Feasibility Study Report	July 30, 2024
Selection of Successful Participants	December 16, 2024



KEY INFORMATION

- ❑ A copy of the presentation will be posted on the [2024 Call for Power \(bchydro.com\)](https://www.bchydro.com) website after the second workshop (February 28, 2024)
- ❑ CEAP Interconnection Request and Generator Interconnection Data Form (Feasibility Study) can be found the [Transmission Generator Interconnections](#) website will be available on February 28, 2024
- ❑ Updated TIR can be found on the [Transmission Generator Interconnections](#) website
- ❑ Questions and CEAP IR Submissions: CEAP2024@bchydro.com

THANK YOU

