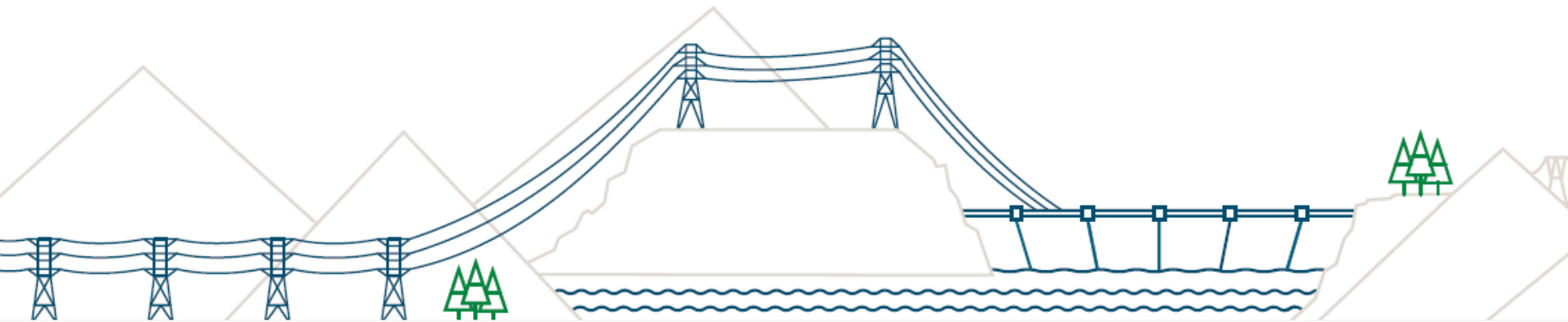


Kootenay System Overview

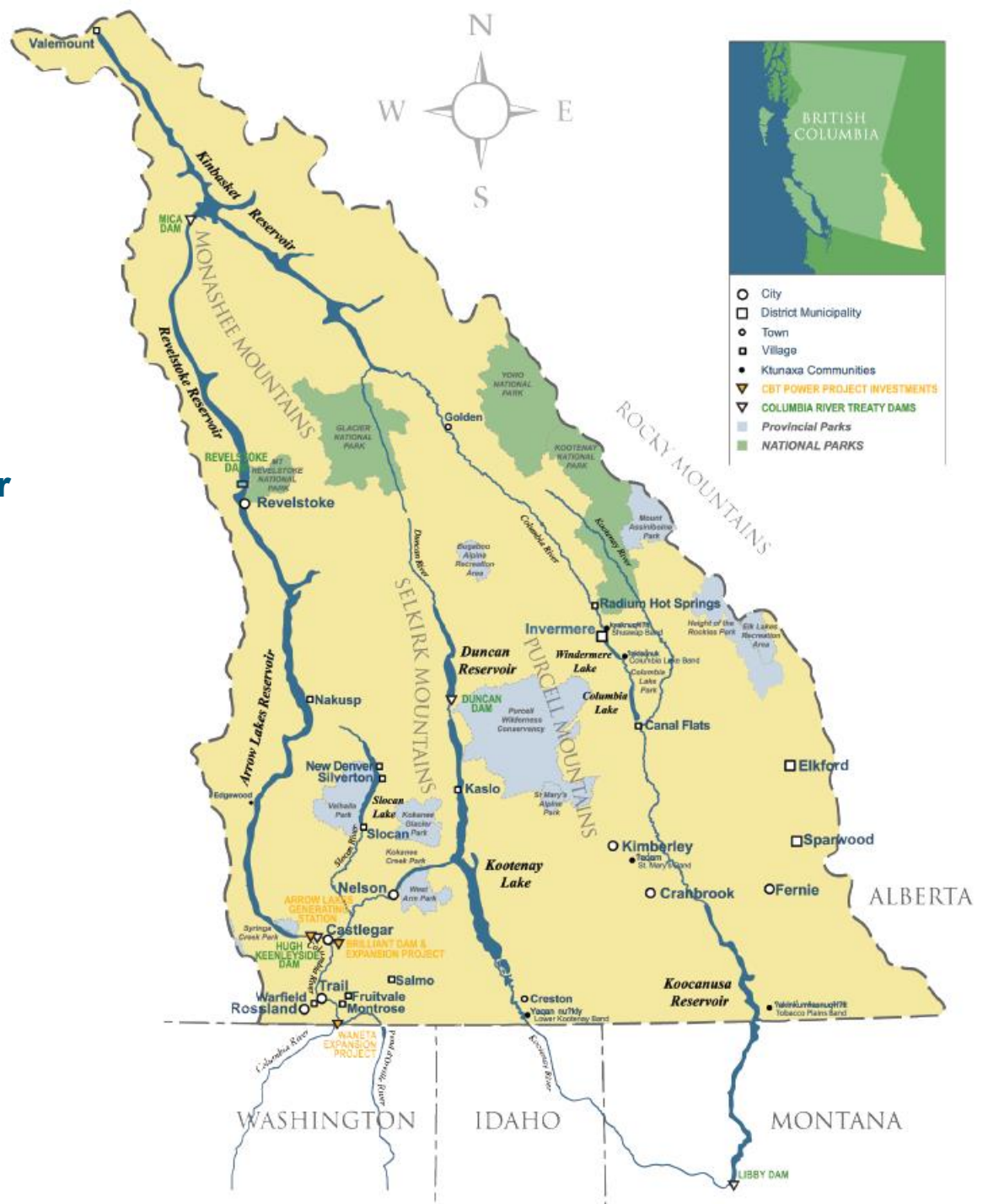
Heather Matthews



March 2016

Kootenay System Storage

- Kooconusa Reservoir
- Duncan Reservoir
- Kootenay Lake

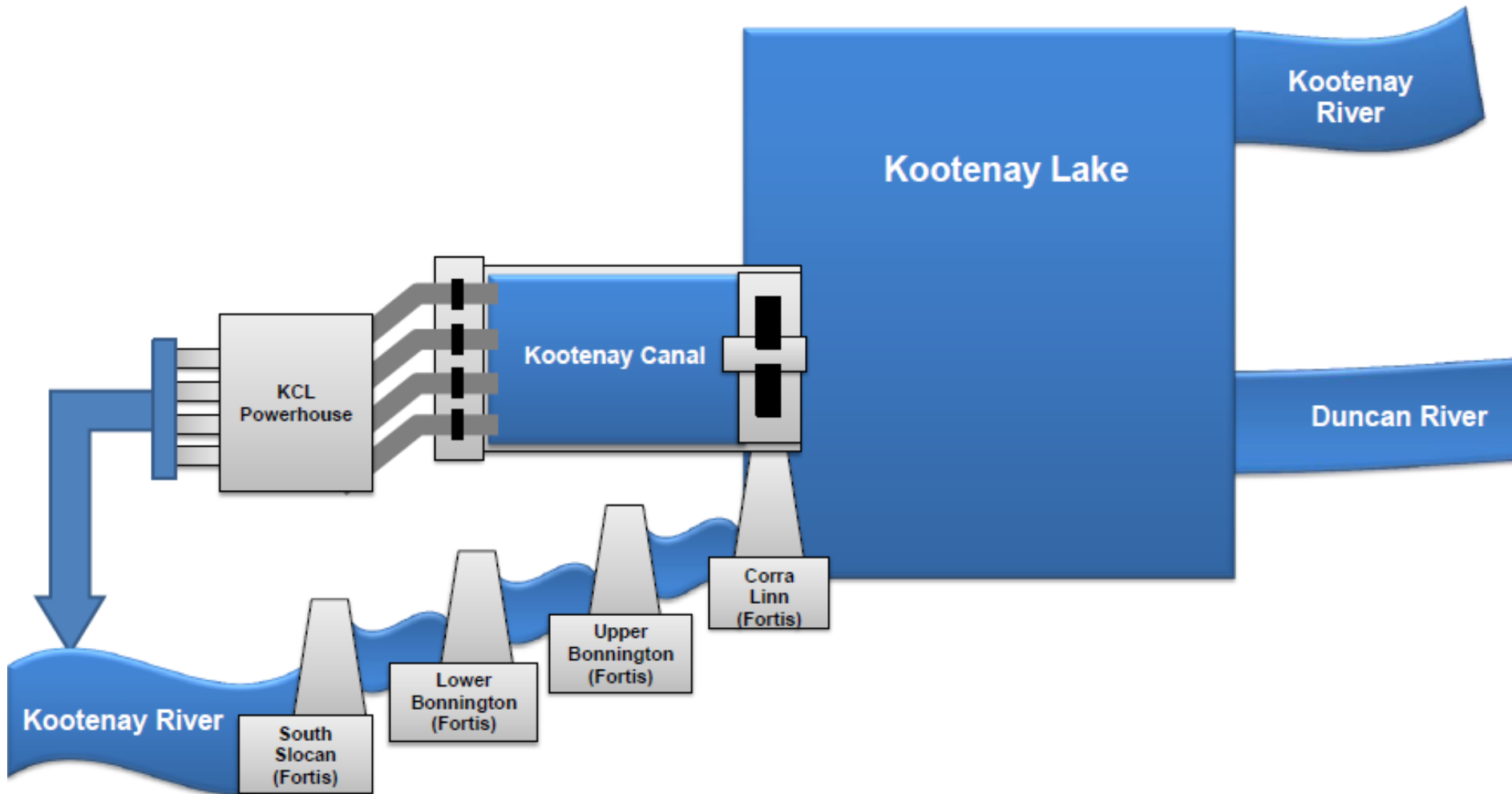


Dams

- Libby Dam (USACE)
- Duncan Dam (BC Hydro)
- Kootenay Canal Plant (BC Hydro)
- River Plants (Fortis)
 - Corra Linn
 - Upper Bonnington / [City of Nelson]
 - Lower Bonnington
 - South Slocan
- Brilliant & Expansion (CPC)



River Plants



Agreements & Regulatory

- Columbia River Treaty
 - Duncan Reservoir
 - Kootenusa Reservoir
- International Joint Commission
 - Kootenay Lake
- BC Water Licenses
 - Storage and diversion for power purposes
- Canal Plant Agreement
 - Operate like one owner



Libby and the Treaty

Columbia River Treaty:

- Provide the US with the option to build Libby Dam
- Kootenay reservoir floods 42 miles into Canada
- Libby Dam provides flood and power benefits for Canada.
- Power generated at Libby belongs to the US
- Power benefits downstream in Canada on the Kootenay river stay in Canada
- Coordination on Libby operation continues even if Treaty is terminated.
 - Canada can request a change in operation. If it is not to the US disadvantage the US shall agree



Canal Plant Agreement History

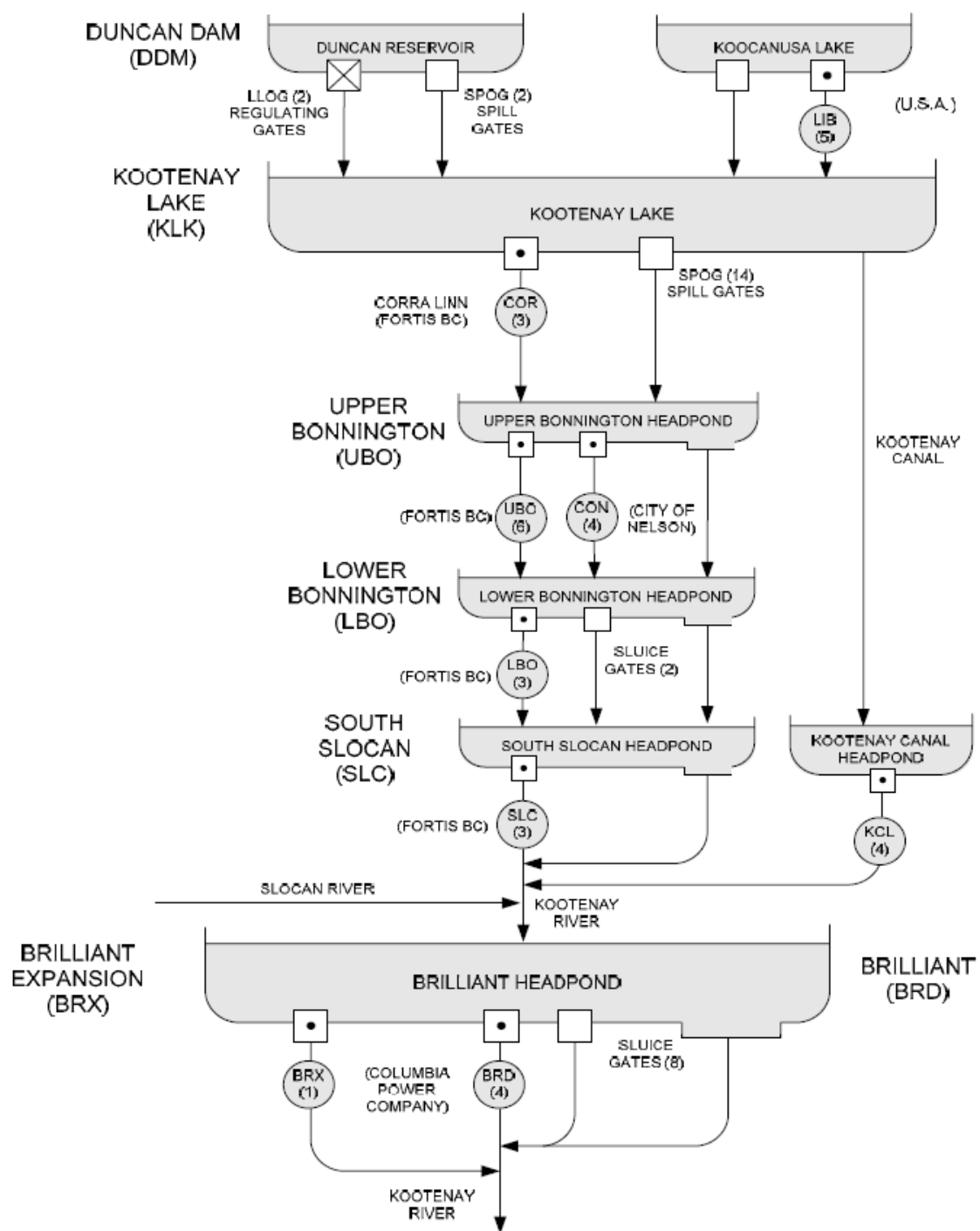
- 1964: Columbia River Treaty was ratified
- River plants and Brilliant already existed on the Kootenay River
- Regulation of Kootenay River flows by Duncan Dam (1967) and Libby Dam (1973) made the Kootenay Canal Plant economic
- In 1972 BC Hydro, West Kootenay Power and Cominco entered into the Canal Plant Agreement “**cooperate in the operation of their available storages and generating facilities in British Columbia for the purpose of obtaining optimum generation**”



Kootenay River System

An Engineer's View

Since KCL is more efficient than the River Plants, water is diverted to Kootenay Canal instead of through river plants.



Entitlement Parties

The CPA was re-negotiated in 2005, 2009 and 2011 after various changes. Current Parties:

- FortisBC (COR, UBO, LBO, SLC)
- Teck (2/3 WAN)
- Brilliant Power Corporation (CPC/CBT)
- Brilliant Expansion Power Corporation (CPC/CBT)
- Waneta Expansion Limited Partnership (CPC/CBT/Fortis)



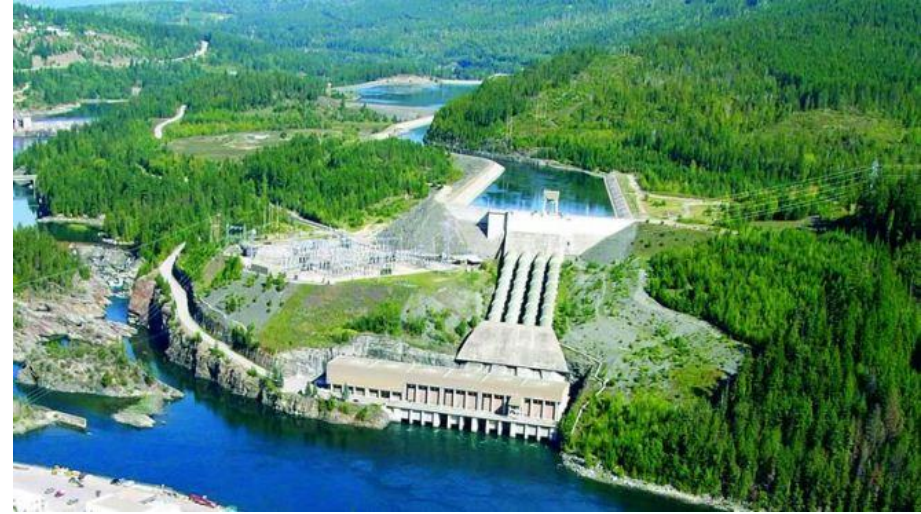
Teck

COLUMBIA
POWER

Columbia
Basin **trust**

FORTIS INC.

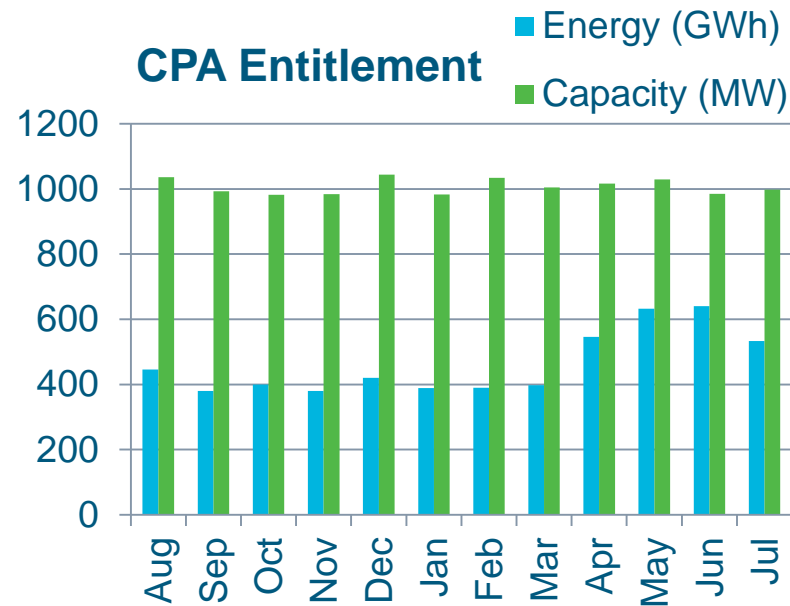
CPA Basics



- The CPA is a "one-operator" coordination agreement.
- BC Hydro instructs the dispatch of the units
- Each owner is responsible for setting the constraints of their plan
- BC Hydro retains the actual generation of all the Plants.
- In return the owner receives fixed amounts of electricity: **CPA Entitlement.**
 - CPA Entitlement Energy: 5554 GWh/yr
 - CPA Entitlement Capacity: 1007 MW average
- Unit outages reduce the available CPA Entitlement.

CPA Entitlement Calculation

- CPA Entitlement is the expected monthly generation without KCL, less an agreed 'firming factor'
- Simulated over 50-year stream flow record: 1938-1988
- Actual monthly generation varies with stream flow conditions
- Redetermined whenever there is a change to the base system – e.g., unit upgrades, changes to expected upstream regulation, or new constraints





BC Hydro

Power smart