Transmission Load Service Workshop

ATC Calculation Background and Proposed Changes

October 28, 2015

Pre-decisional. For Discussion Purposes Only.

Agenda

- Review the long-term firm ATC processes currently in use on the BPA Internal Network
- Review changes to the method that BPA plans to make within the coming year
  - Identify implementation decisions necessary to make these changes, and
  - Where we'll be seeking your input
- We want you to be well-versed in the existing processes when we ask for your feedback on changes, so please ask questions!

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Glossary

- ALIS = All Lines in Service
- AMM = ATC Methodology Margin
- ATC = Available Transfer Capability
- CGS = Columbia Generating Station
- DNR = Designated Network Resource
- ETC = Existing Transmission Commitments
- FCRPS = Federal Columbia River Power System
- GF = Grandfathered, pre-Open Access Transmission Tariff, service
- GTA = General Transfer Agreement
- LT = Long-Term (transmission service with term of >1 year)
- NCP = Non-Coincidental Peak
- NT = Network Integration Transmission Service
- POD = Point of Delivery
- POR = Point of Receipt
- PTDF = Power Transfer Distribution Factor
- PTP = Point-to-Point Transmission Service
- TSR = Transmission Service Request
- TTC = Total Transfer Capability

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Current State LT Calculations

- Current "hybrid" method in use on BPA's Internal Network was largely developed in 2002
- Method merges a "Contract Accounting" calculation with a Powerflow for calculation of Existing Transmission Commitments (ETC):
  - Contract Accounting ETC calculation uses PTDFs (derived from powerflows) to approximate the impact on flowgates resulting from a summing of the GF and LT PTP contract demands*, NT load forecasts, LTF non-Federal generation rights, and an assumed FCRPS dispatch
  - Planning ETC calculation uses a powerflow to approximate the impact on flowgates resulting from inputs of load forecasts (for all GF, NT, and PTP loads), LTF non-Fed generation rights and an assumed FCRPS dispatch which is then "backed off" to ensure load/resource balance

* GF transmission contracts are generally modeled as PTP, with a few exceptions.

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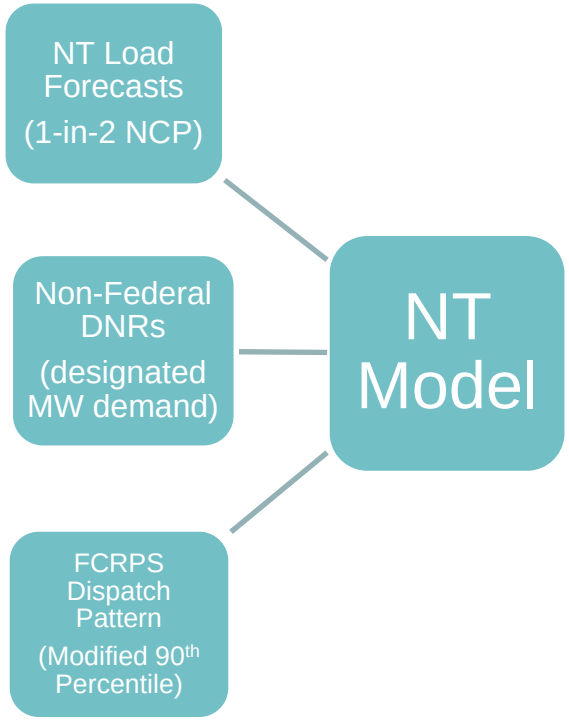
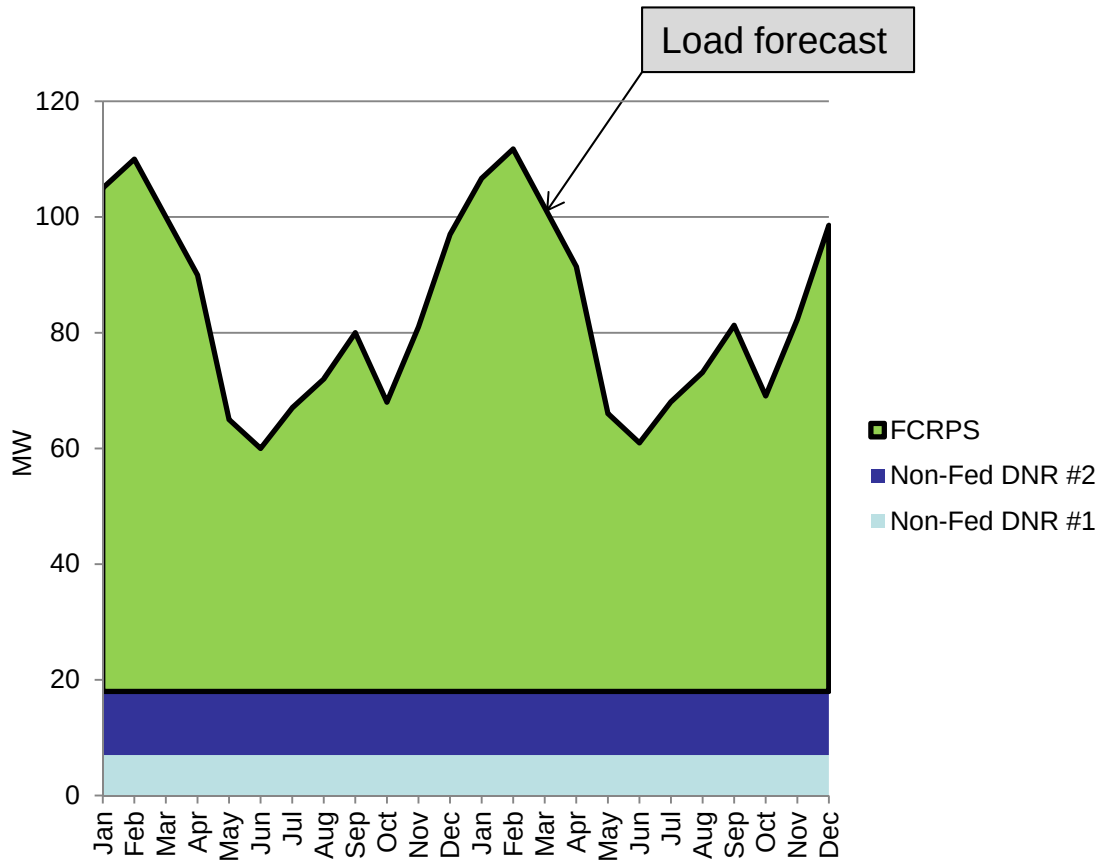
NT Modeling Assumptions





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Modified 90th Percentile FCRPS Dispatch Pattern

		Albeni Falls	Bonneville	Chief Joseph	Dworshak	Grand Coulee	Hungry Horse	Ice Harbor	John Day	Libby	Little Goose	Lower Granite	Lower Monum.	McNary	The Dalles	CGS
Odd Years	January	0%	5%	13%	5%	26%	2%	3%	11%	5%	3%	3%	3%	6%	8%	7%
	February	0%	5%	13%	5%	25%	2%	3%	11%	4%	4%	3%	4%	6%	8%	7%
	March	0%	5%	12%	5%	22%	3%	3%	12%	2%	4%	4%	4%	6%	9%	8%
	April	0%	6%	15%	6%	24%	3%	3%	14%	0%	5%	5%	5%	6%	10%	0%
	May	0%	5%	14%	6%	25%	2%	3%	13%	5%	5%	5%	5%	5%	7%	0%
	June	0%	4%	11%	6%	23%	4%	3%	10%	8%	4%	4%	4%	4%	6%	9%
	July	0%	4%	13%	6%	26%	4%	2%	10%	7%	3%	3%	3%	5%	5%	9%
	August	0%	3%	15%	6%	29%	3%	1%	10%	7%	2%	2%	3%	6%	4%	8%
	September	0%	6%	15%	4%	27%	2%	2%	10%	4%	2%	2%	2%	6%	8%	9%
	October	0%	6%	14%	4%	28%	0%	2%	10%	6%	2%	2%	2%	6%	8%	8%
	November	0%	6%	15%	2%	30%	3%	2%	10%	5%	2%	2%	2%	6%	8%	7%
	December	0%	6%	14%	5%	28%	3%	2%	10%	6%	2%	2%	2%	6%	8%	7%
Even Years	January	0%	5%	13%	5%	27%	2%	3%	11%	5%	3%	3%	3%	6%	8%	7%
	February	0%	5%	13%	5%	25%	2%	3%	11%	4%	4%	3%	4%	6%	8%	7%
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	August	0%	3%	15%	6%	29%	3%	1%	10%	7%	2%	2%	3%	6%	4%	8%
	September	0%	6%	15%	4%	27%	2%	2%	10%	4%	2%	2%	2%	6%	8%	9%
	October	0%	6%	14%	4%	28%	0%	2%	10%	5%	2%	2%	2%	6%	8%	8%
	November	0%	6%	15%	2%	30%	3%	2%	10%	5%	2%	2%	2%	6%	8%	7%
	December	0%	6%	14%	5%	28%	3%	2%	10%	6%	2%	2%	2%	6%	8%	7%

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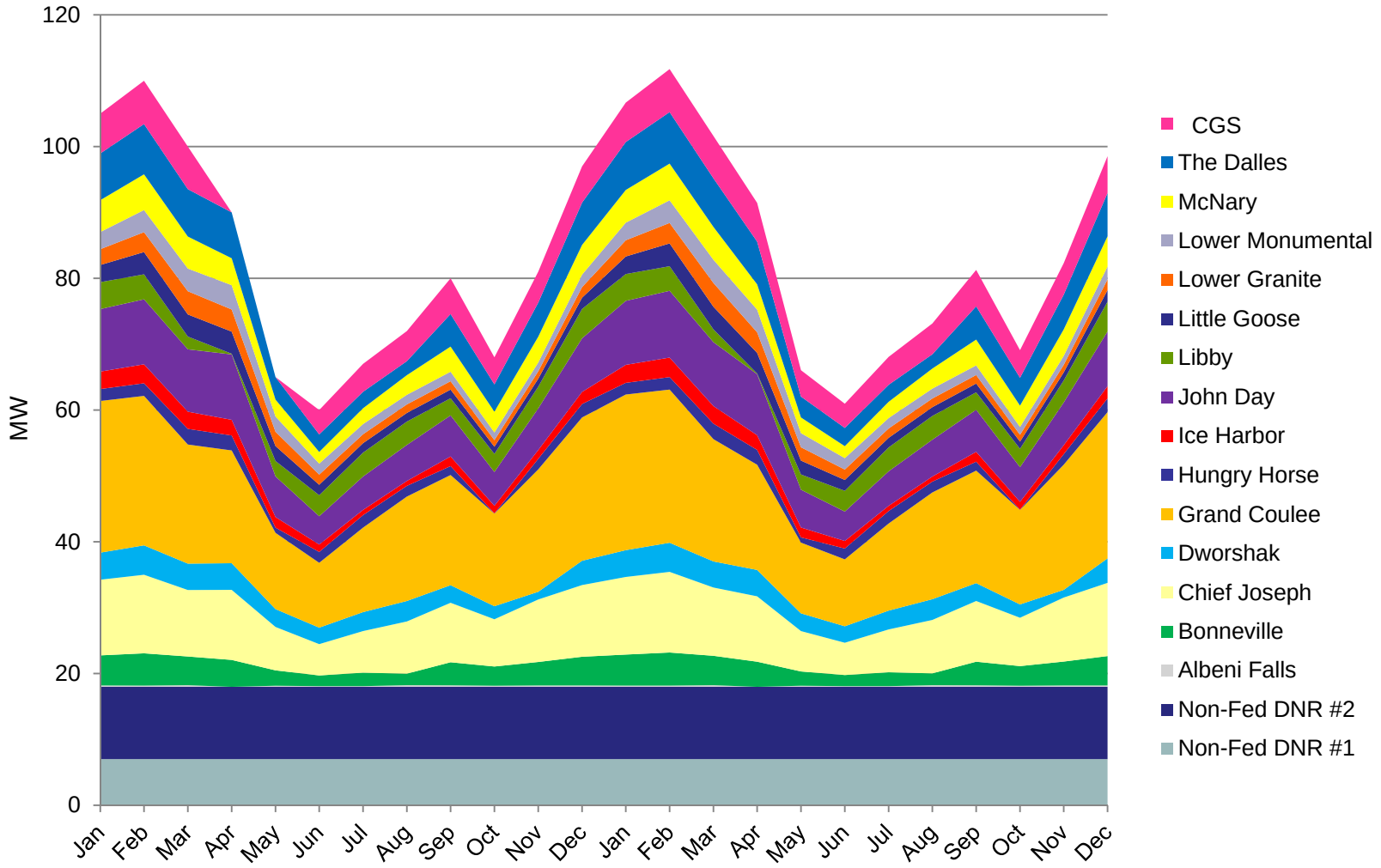
NT Modeling Assumptions
(90th Percentile Pattern for FCRPS Detail)



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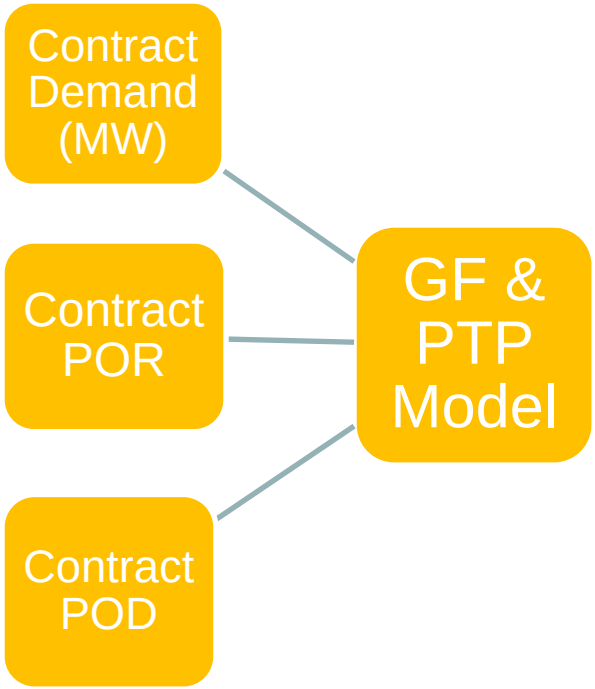
GF & PTP Modeling Assumptions



Multiple-to-Multiple Contract Modeling (MW)

			PODs			
			X	Y	Z	
			1,200	300	500	SUM
PORs	A	1,000	600	150	250	1,000
	B	650	390	98	163	650
	C	50	30	8	13	50
	D	300	180	45	75	300
		SUM	1,200	300	500	2,000

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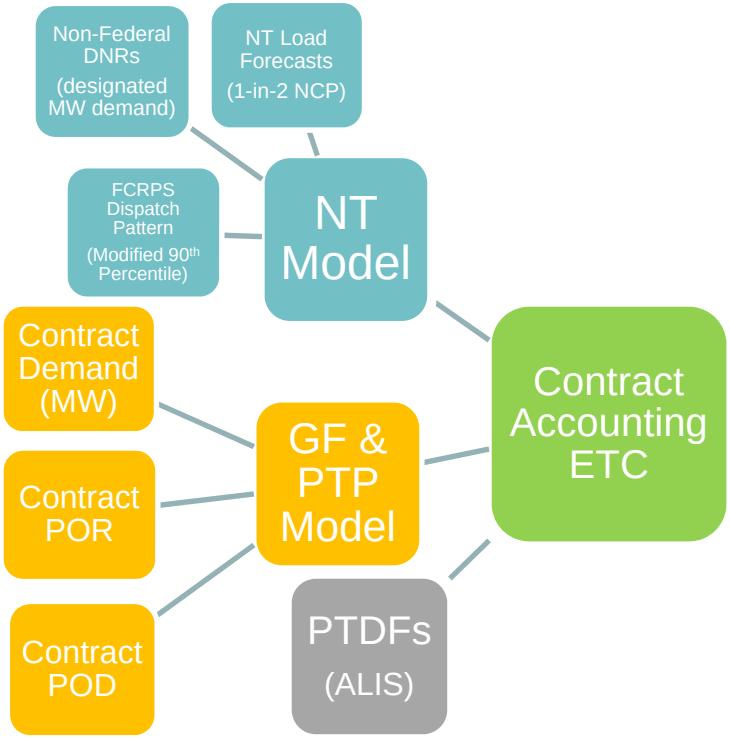
Contract Accounting ETC

Contract Accounting ETC = Sum of all (POR-to-POD MW demand x PTDF)

This calculation is performed once per year and, since each POR-to-POD pair has a unique PTDF for each Flowgate, is done for each Flowgate.

The Long-Term PTDF Calculator is posted at:
http://www.bpa.gov/transmission/Reports/TransmissionAvailability/Pages/default.aspx



LTF PTP and NT PTDF Calculator

Analyzed POR: CUSTER W_230.00

Analyzed POD: JOHN DAY 500.00

Demand: 100 MW

Flowgate	PTDF	Impact
CROSS CASCADES NORTH FLOWGATE E>W	-63.3%	-63.3 MW
CROSS CASCADES SOUTH FLOWGATE E>W	-18.5%	-18.5 MW
NORTH OF ECHO LAKE S>N	-46.9%	-46.9 MW
NORTH OF HANFORD FLOWGATE N>S	54.5%	54.5 MW
NORTH OF JOHN DAY FLOWGATE N>S	78.2%	78.2 MW
PAUL TO ALLSTON FLOWGATE N>S	18.7%	18.7 MW
RAVER TO PAUL FLOWGATE N>S	14.9%	14.9 MW
SOUTH OF ALLSTON N>S	23.1%	23.1 MW
SOUTH OF CUSTER N>S	84.4%	84.4 MW
WEST OF JOHN DAY E>W	-28.1%	-28.1 MW
WEST OF LOWER MONUMENTAL	8.8%	8.8 MW
WEST OF MCNARY FLOWGATE E>W	17.4%	17.4 MW
WEST OF SLATT FLOWGATE E>W	22.1%	22.1 MW

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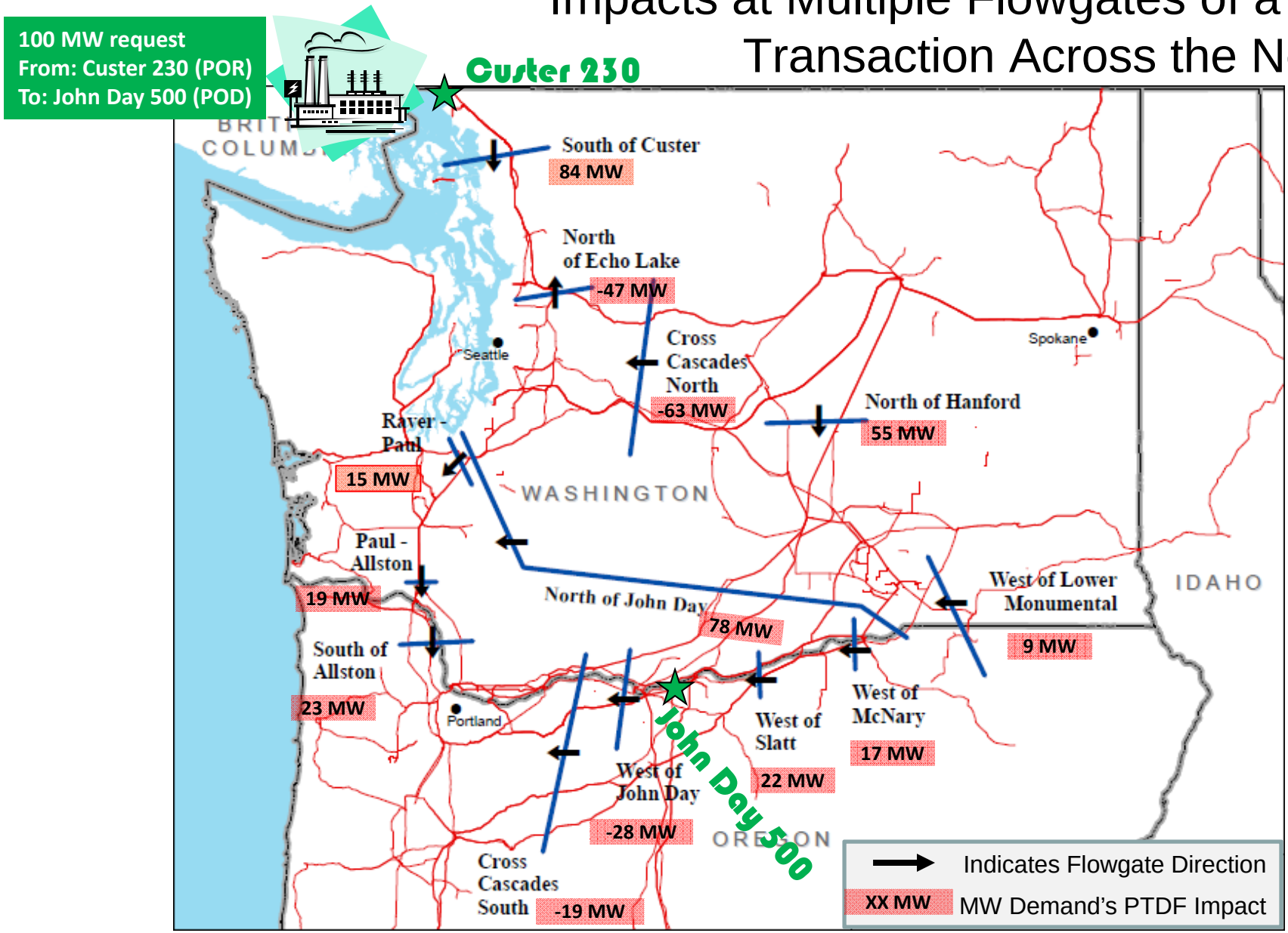
Impacts at Multiple Flowgates of a Single Transaction Across the Network



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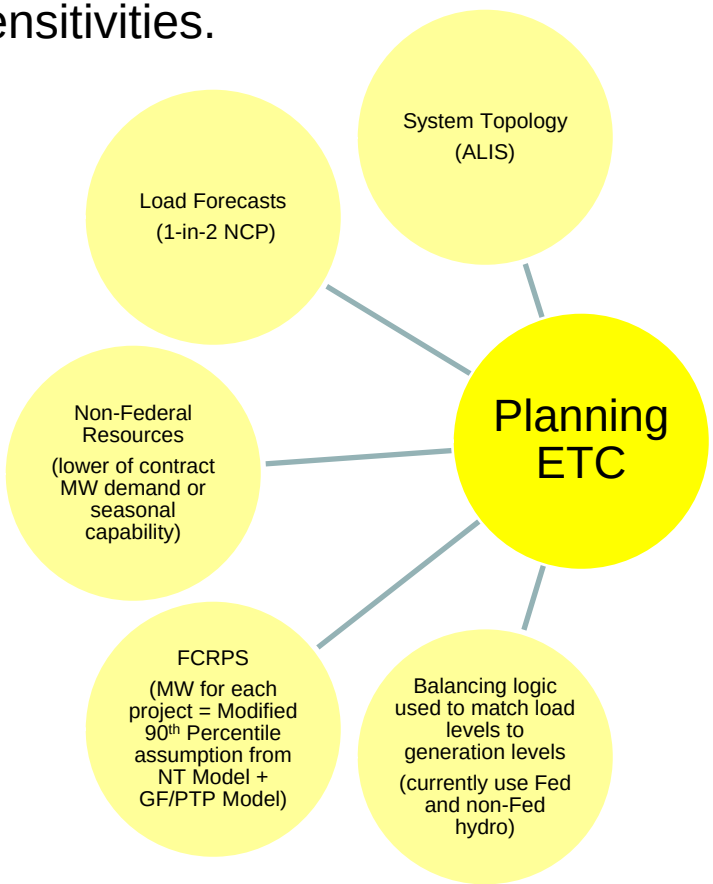
Planning ETC

Planning ETC is the result of a powerflow model with the provided transmission system topology, load levels, and generation levels.

This calculation is performed once per year, for four seasons, using four sensitivities.



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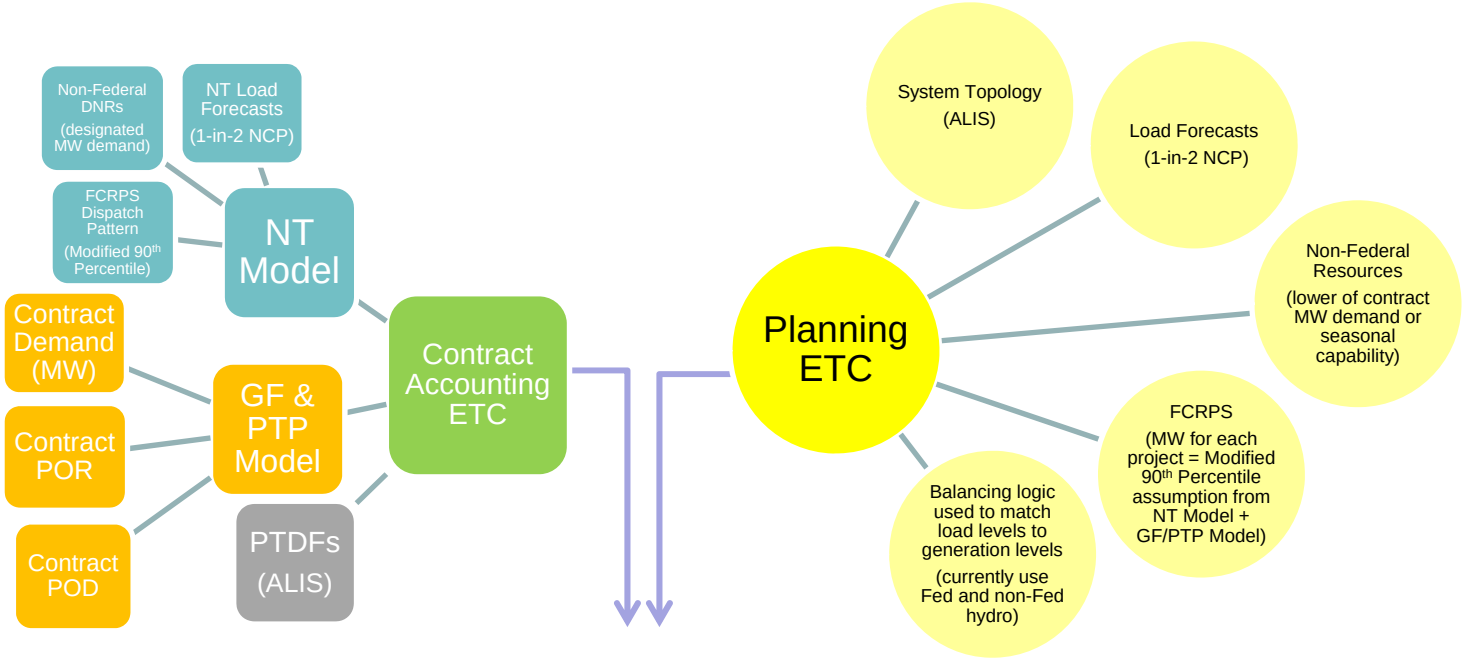
Current "Hybrid" LT ETC Calculation



Delta = Contract Accounting ETC – Planning ETC

Since: a) AMM ≅ 25% of Delta and b) ETC ≅ Contract Accounting ETC – Delta + AMM… **ETC ≅ Planning ETC + 25% of Delta**

This calculation is performed once per year and updates to the baseline ATC are referred to as the "LT Base Case Update".

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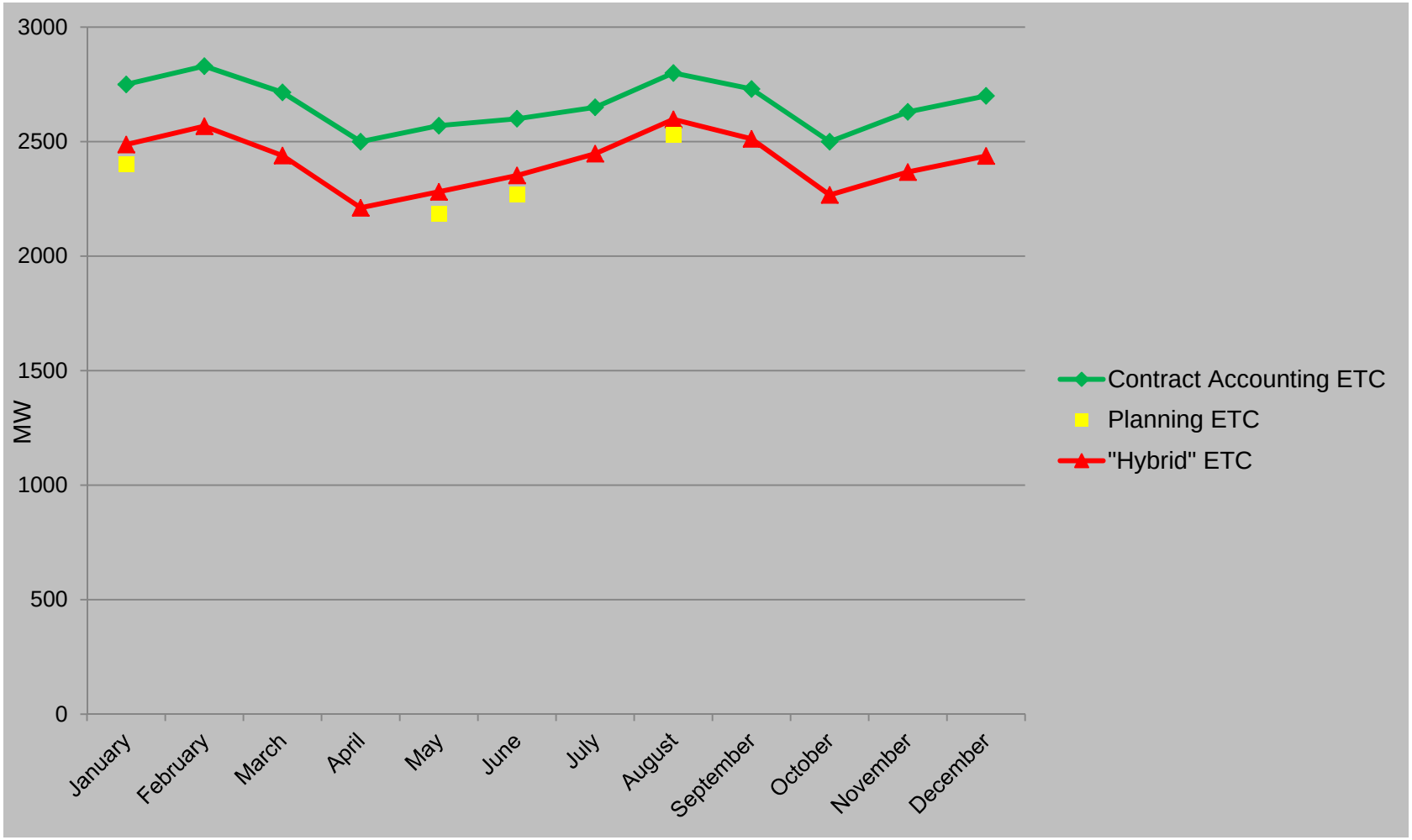
Example “Hybrid” ETC Calculation



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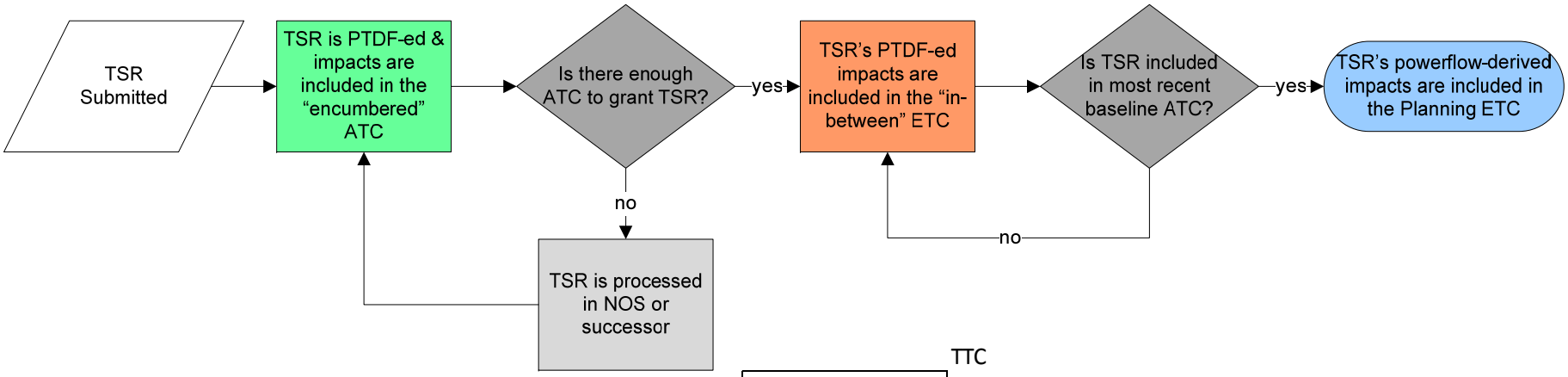
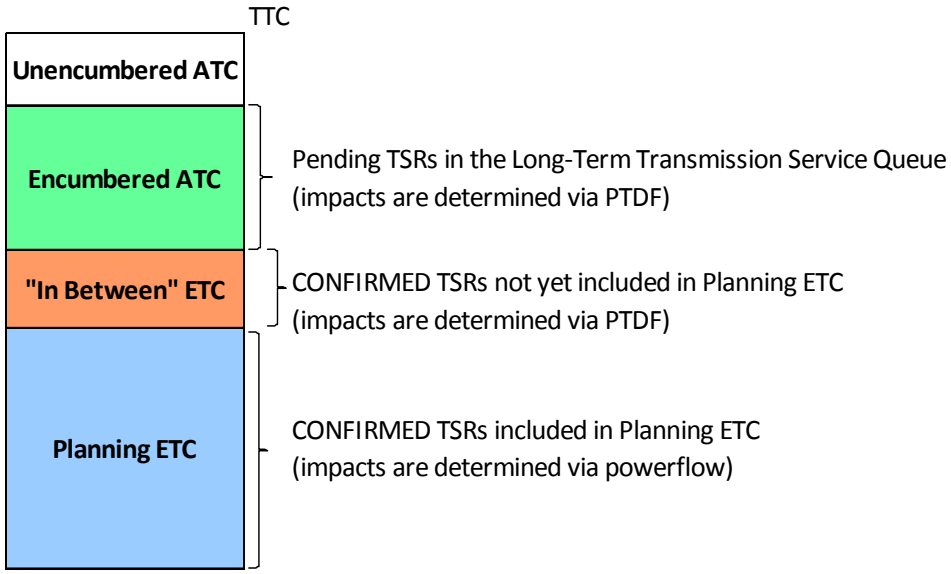
Current LT Encumbrance Process





Both unencumbered and encumbered ATC values are posted by Flowgate at:
http://www.bpa.gov/transmission/Reports/TransmissionAvailability/Pages/default.aspx

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Current ATC Methodology Documents

- BPA's current "hybrid" long-term ATC method is described in detail in the posted documents:
  - High-level description of the processes: Available Transfer Capability (ATC) and Available Flowgate Capability (AFC) Methodologies for the Planning Time Period
  - Contract Accounting ETC calculation: Contract Accounting Methodology for the Planning Time Period
  - Planning ETC calculation: Power Flow Base Case for the Planning Time Period
  - AMM calculation: ATC Methodology Margin (AMM) for the Planning Time Period
  - PTDF assessment for "in between" and pending Long-Term Firm TSRs: Impacts of Long-Term Firm Requests

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LT ATC Method Changes

- To streamline the Long-Term Firm Internal Network ATC calculation and align with other studies, BPA has decided to cease use of the Contract Accounting ETC, Delta, and AMM – instead, BPA will use the Planning ETC calculation and a more transparent uncertainty margin.
  - BPA plans to calculate a range of Planning ETC values, based on varying scenarios of generation dispatch and load levels.
  - These scenarios will be developed with customer and other external stakeholder input.
  - Variation in ETC outputs may inform the uncertainty margin selected for each time horizon.
  - BPA's initial scenario selection and development of the uncertainty margin calculation process will take place this fall and winter, for implementation in the LT Base Case Update currently planned for Summer 2016.
- To meet tariff obligations to plan for NT customer needs, BPA will include resource forecasts, for non-Federal resources delivered using NT service, in ATC calculations.

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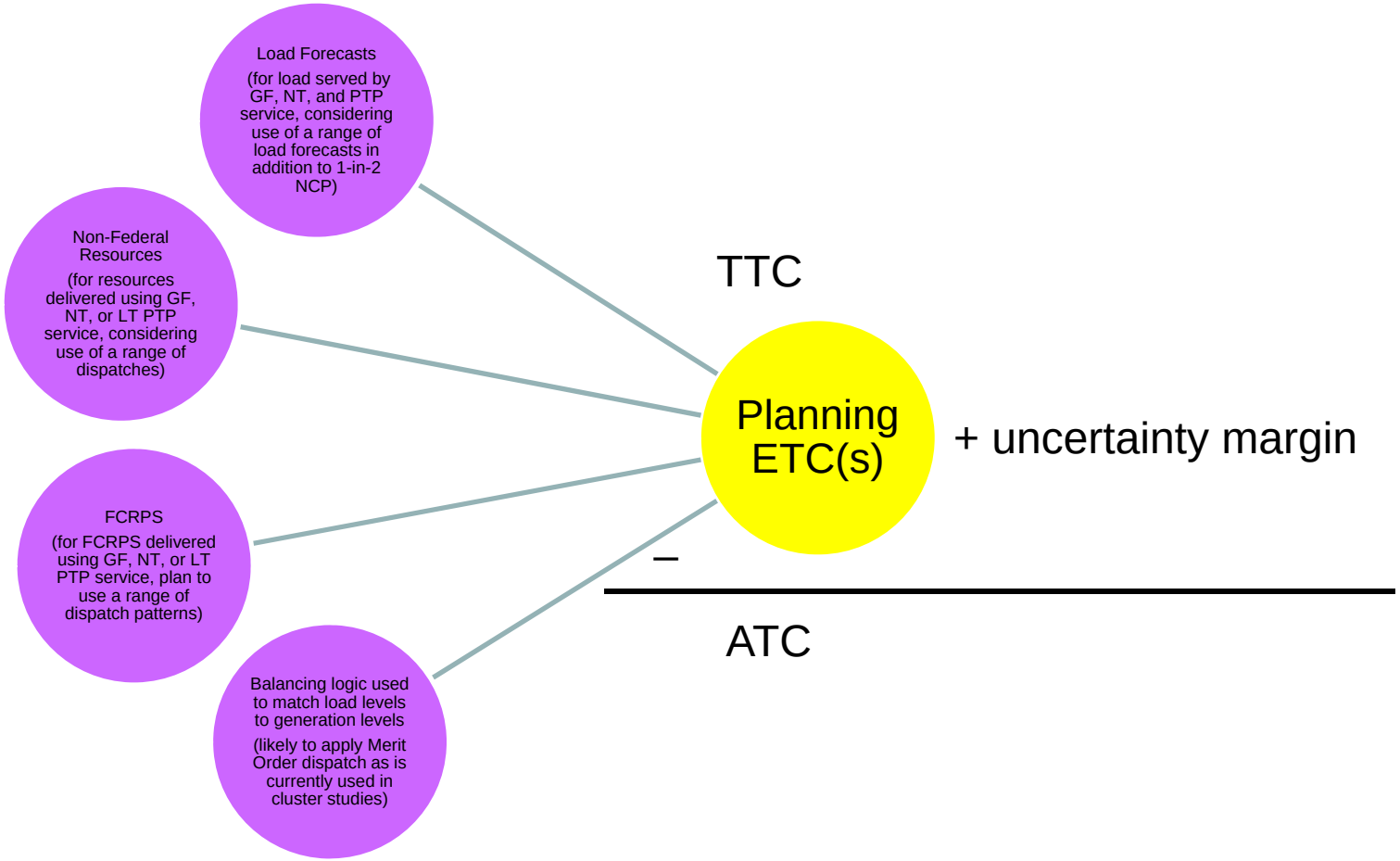
Future LT ATC Calculation



BPA will include resource forecasts, for resources delivered using NT service, in the future LT ATC calculations. How and where in the calculation this will be done is still under development.

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Public Process

- Where Your Feedback Will Be Needed:
  - Load forecasts: BPA is considering use of a range of forecasts in addition to 1-in-2 NCP load forecast for loads served by GF, NT, and PTP service
  - Dispatch of generation utilizing GF, NT, and PTP service:
    - Non-Federal resource dispatches: BPA is considering use of a range of dispatches beyond the currently used contract rights/seasonal capability
    - FCRPS dispatch: BPA plans to model a range of FCRPS generation including a high upper river, a high lower river, and a high Snake generation pattern
  - Balancing logic used to match load levels to generation levels: BPA is likely to apply Merit Order dispatch as is currently used in cluster studies
  - Calculation of an uncertainty margin: BPA will replace the currently used AMM with another process

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Timeline for LT ATC Changes

- November 2015: workshop on alternatives for ATC changes and written comment period
- January-February 2016: decision(s) for ATC changes
- March-April 2016: updated ATC Methodology documents posted for written comment period
- May 2016: updated ATC Methodology documents finalized
- July-August 2016: ATC process changes incorporated into LT Base Case Update
- TBD: incorporation of resource forecasts, for non-Federal resources delivered using NT service, into ATC calculations

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Follow Up

- If you have any comments or questions regarding this presentation, prior to the 17th, please:
  - Submit them to the Tech Forum e-mail box, with "TLS-ATC comment" as the subject line, at: techforum@bpa.gov or
  - Call Lauren Nichols-Kinas at: (360) 619-6421

- Other ATC-related questions should be submitted using the usual process:
  - Submit them to the Reservation Desk e-mail box at: tblresdesk@bpa.gov or
  - Call the Reservation Desk at: (360) 418-8499

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