ETSRs and Third Party Transmission

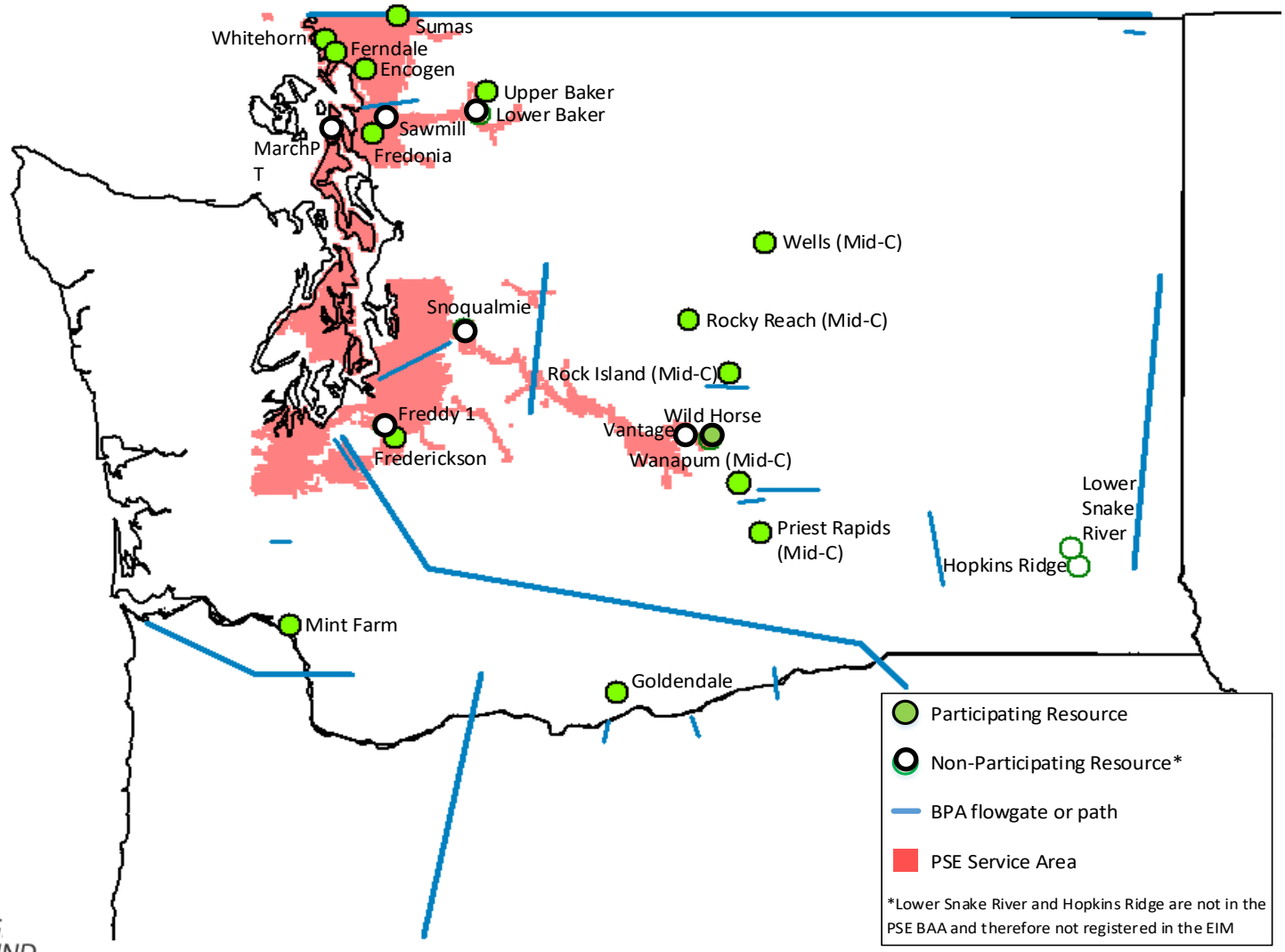
Regional Issues Forum
March 11, 2019

Puget Sound Energy Overview

- Gas & electric utility in Western Washington
- 1.1 million electric customers
- 800k natural gas customers
- Winter peaking – 4746 MWh, HE09 on Feb. 6, 2019
- Physical interconnections:
  - BPA 500, 230, and 115 kV 34 meters
  - SCL 230 and 115 kV 5 meters
  - TPWR 115 kV 1 meter
  - GCPD 230 kV 1 meter
  - CHPD 230 kV and 115 kV 2 meters

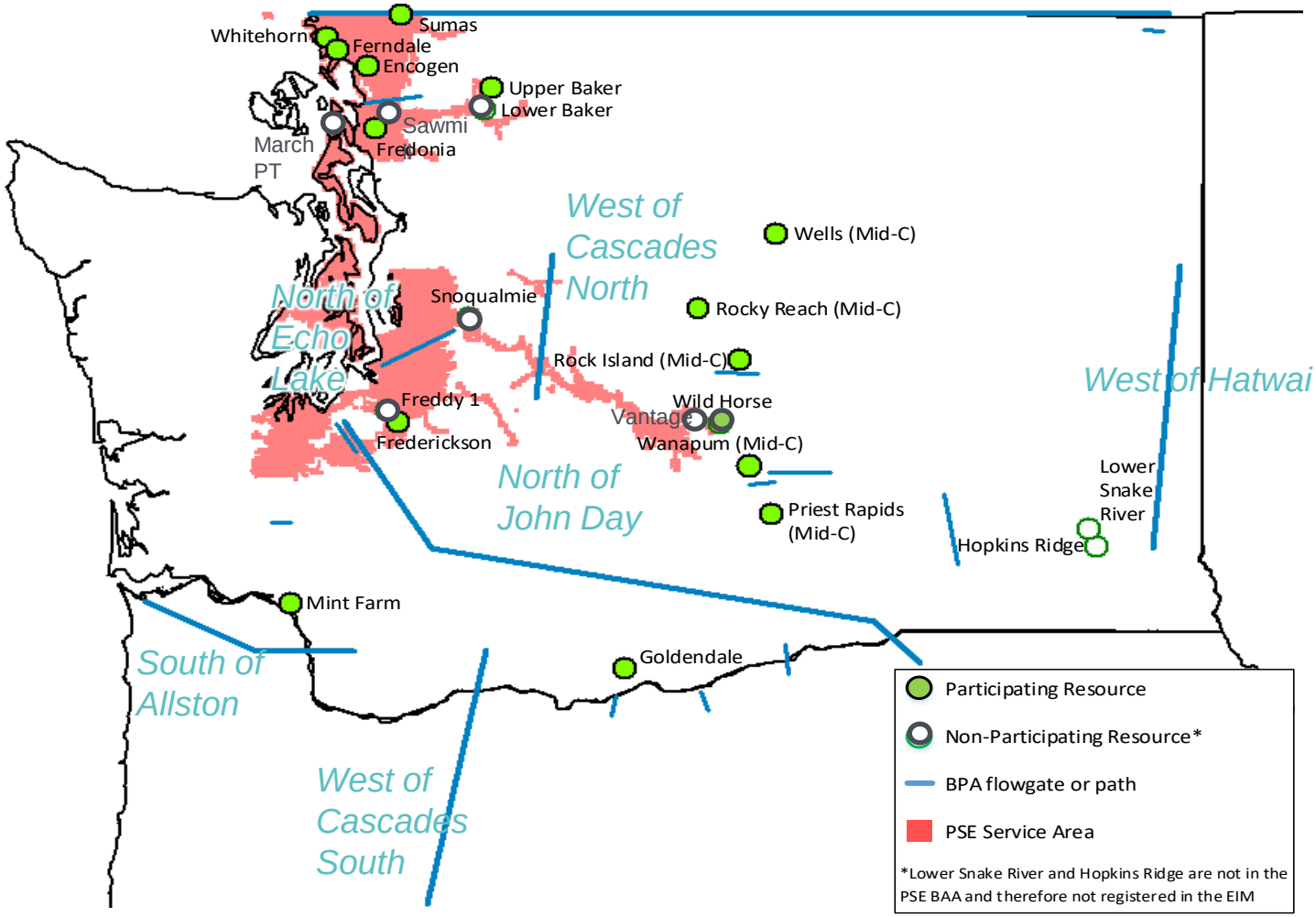
PSE PUGET SOUND ENERGY

Puget Sound Energy BAA & Resources



PUG SOUND ENERGY

Washington Area Flow Gates



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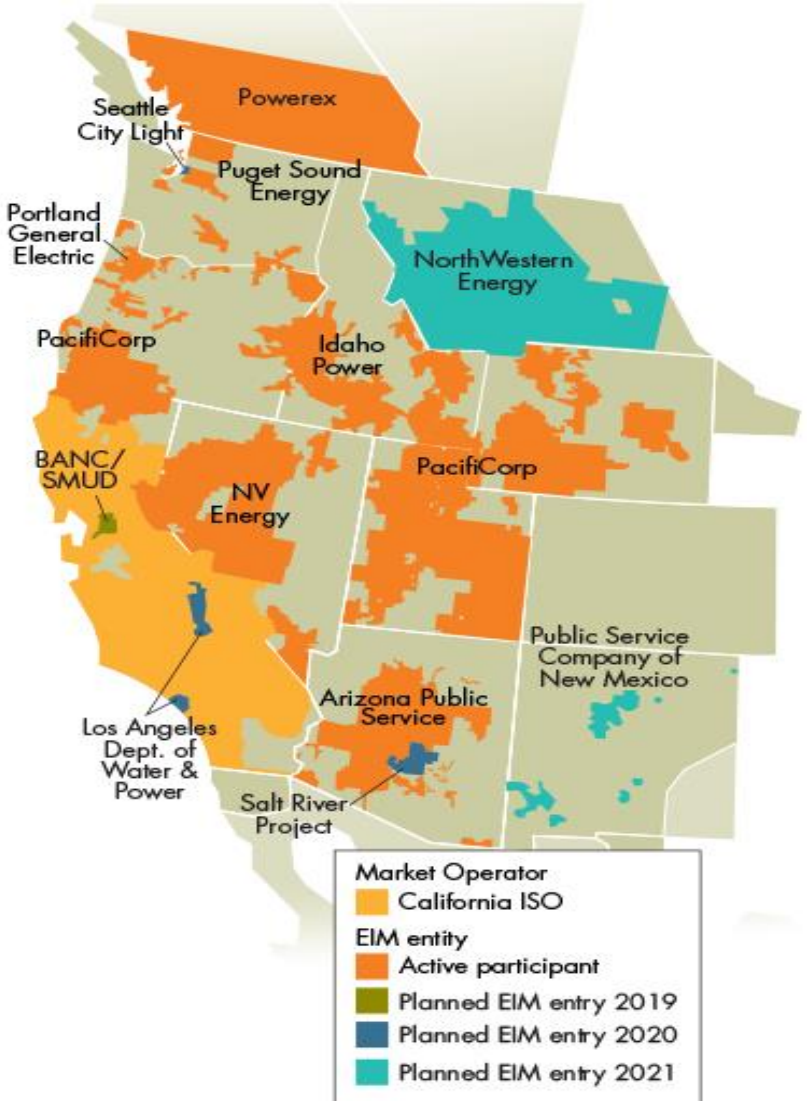
Current and future EIM Entities and CAISO



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Very Basic CAISO EIM Operations

- Each EIM Entity submits their “plan” for the next trade hour – includes load, generation, and interchange
- Two real-time markets
  - Fifteen Minute – RTPD; executes 37.5 minute before binding interval start; includes commitment; also 18 advisory intervals
  - Five Minute – RTD; executes 7.5 minutes before binding interval start; energy only, no commitment; also 13 advisory intervals
- Solves entire footprint for lowest production cost
- Some EIM Entities (BAs) will be deficient some will be oversupplied
- This where Energy Transfer System Resources come into play, they provide a path(s) to help resolve the deficient and the oversupplied

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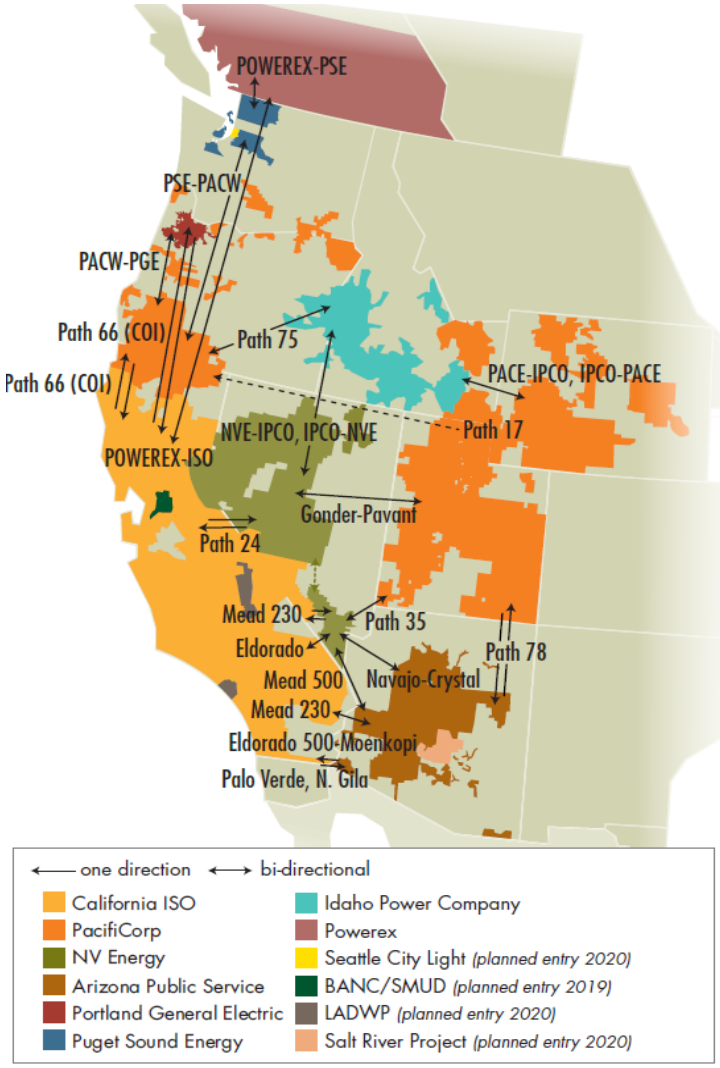
EIM Transfer Paths (ETSRs) Connect EIM Entities to Each Other and to CAISO



Current as of April 2018

Path	Estimated Max Capacity (MW)
Path 24 *(west to east)*	100
Path 24 *(east to west)*	35-90
Eldorado	797
Path 35 *(west to east)*	580
Path 35 *(east to west)*	538
Gonder-Pavant	130
PACW to PGE	320
Path 66 *(ISO to PGE)*	627
Path 66 *(PGE to ISO)*	296
Path 66 *(ISO to PACW)*	331
Path 66 *(PACW to ISO)*	432
Path 17	0-400* **
PSE to PACW	300
Eldorado 500-Moenkopi	732
Palo Verde, N. Gila	3,151
Path 78 *(PACE to APS)*	625
Path 78 *(APS to PACE)*	660
Navajo-Crystal	522
Mead 500	349
Mead 230 *(APS <–> ISO)*	236
Mead 230 *(ISO to NVE)*	3,443
Mead 230 *(NVE to ISO)*	3,476
IPCO to PACW (Path 75)	1,500
PACW to IPCO (Path 75)	400-510
PACE to IPCO	2,557
IPCO to PACE	1,550
NVE to IPCO	262
IPCO to NVE	390-478
Powerex <–> PSE	150
Powerex <–> ISO	150

** Is an optional path available for PACE-PACW EIM transfers and the capacity is a subset of PACE-IPCO/IPCO-PACE and Path 75 capacity.*

*** When in use, the available capacity on PACE-IPCO/IPCO-PACE and Path 75 will be subsequently reduced by the used amount on Path 17, and not double counted.*

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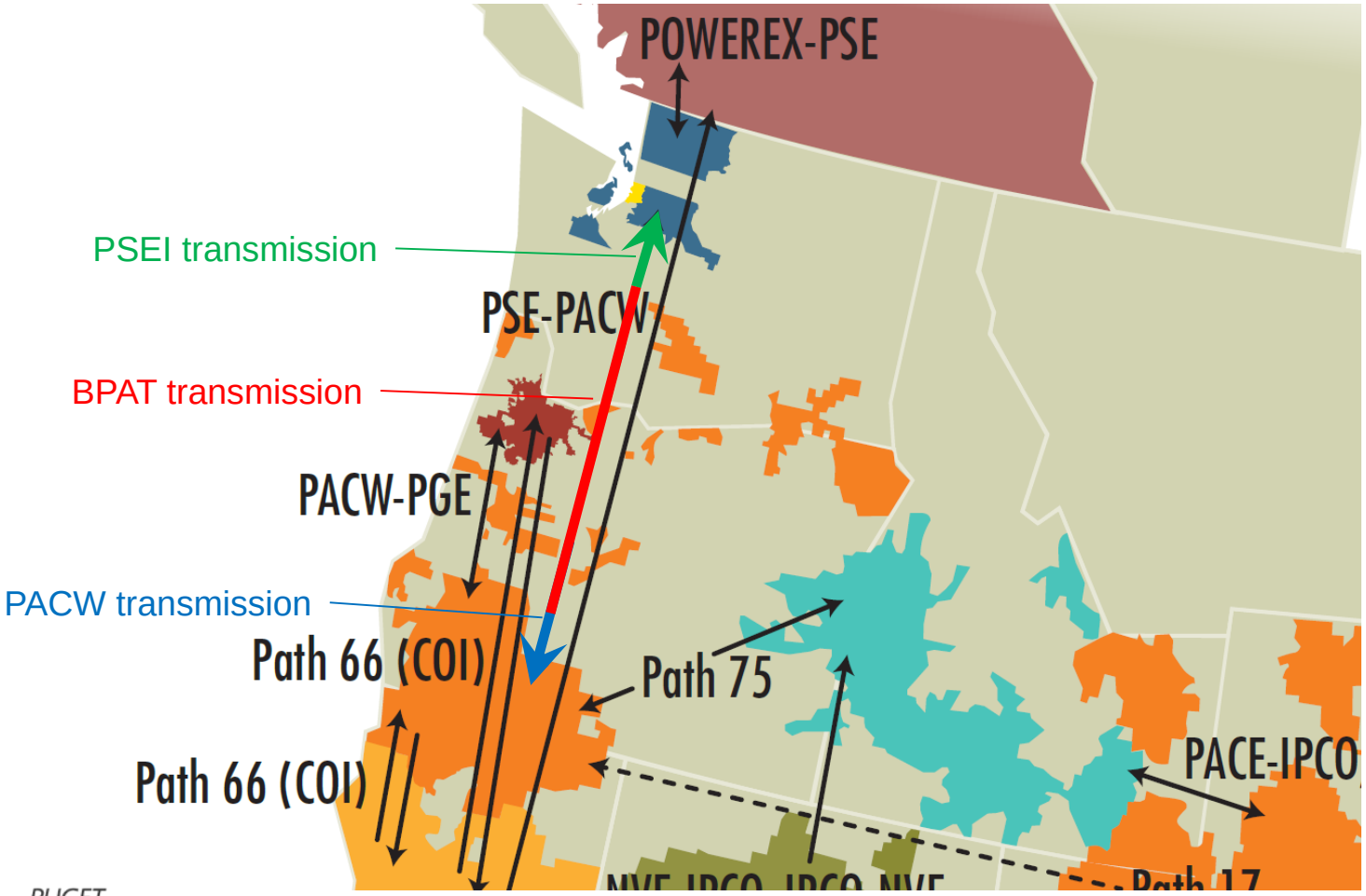
Existing PSEI-PACW ETSR



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PACW – PSE ETSR

- Represented as interchange via dynamic e-Tag
  - North to south

BA	TSP	PSE	POR	POD	Scheduling Entities	Priority
PSEI		PUG1	PSEI-EIM			
	PSEI	PUG1	PSEI.SYSTEM	BPAT.PSEI	PSEI	0-NX
	BPAT	PSEMKT	BPAT.PSEI	BPAT.PACW	BPAT	7-F
	PPW	PACW	BPAT.PACW	PACW	PACW	0-NX
PACW		PUG1	PACW-EIM			

  - South to north is the same expect “reversed”

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PACW – PSE ETSR

- As the third-party transmission provider, BPAT wants to be informed of how their system is being used
  - Current and future ETSR limits
  - Current and future dispatch targets
  - Exchanged via ICCP
- BPA and CAISO have developed Rate of Change constraints which can limit dispatches
  - Implemented on specified flowgates
  - Based on historical usage

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BCHA – PSE ETSR

- This ETSR utilizes a portion of PSEI's share of the Westside Northern Intertie
- Since this interchange is between BCHA and BPAT BAs, BPAT is the path operator for south of the border.
- BCHA, BPAT, and PSEI implemented an additional ICCP exchange of ETSR limits where any of the three parties can change their limit and the other two are immediately notified and flow is reduced.

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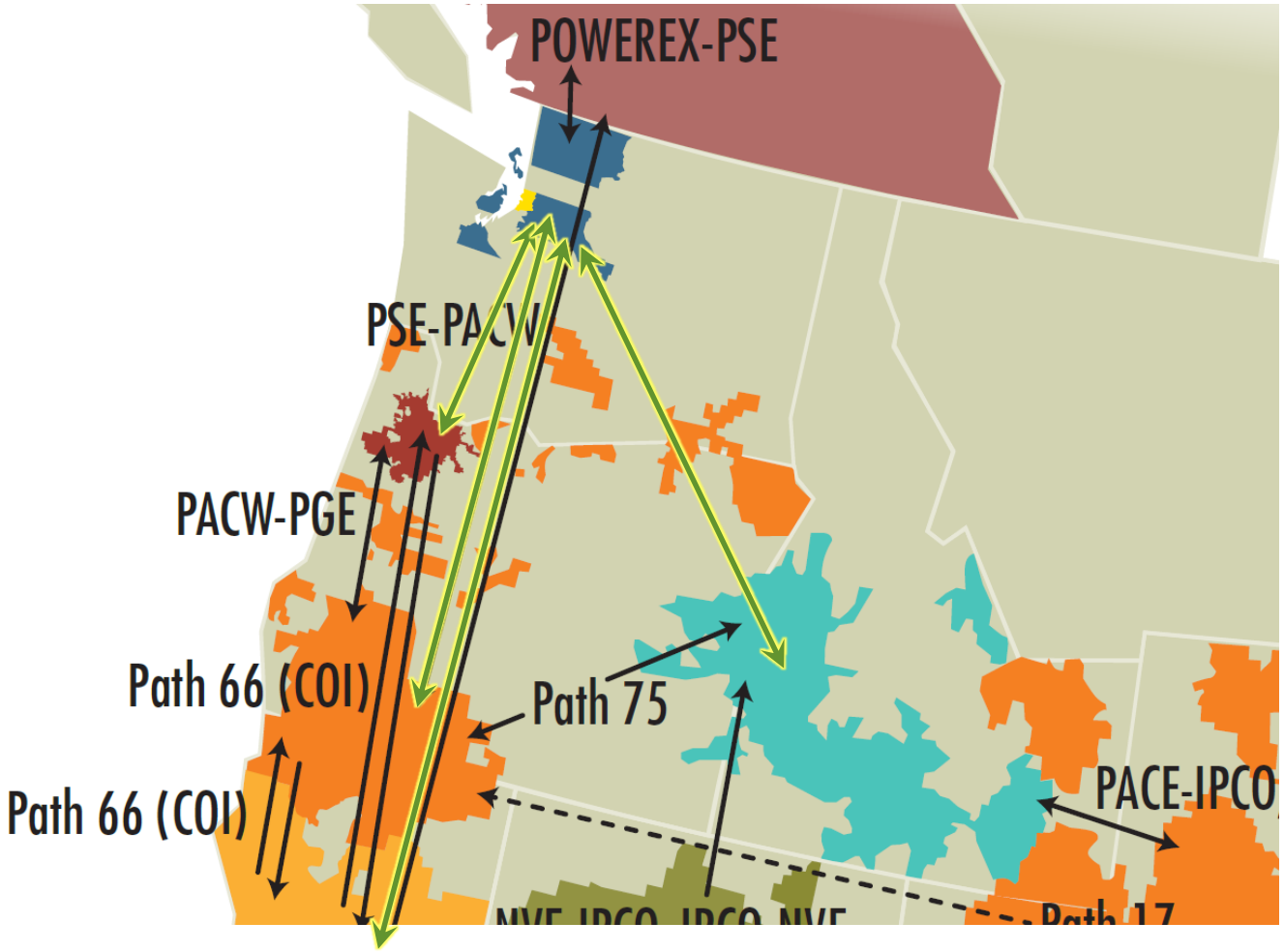
New ETSRs PGE, IPCO, and CAISO



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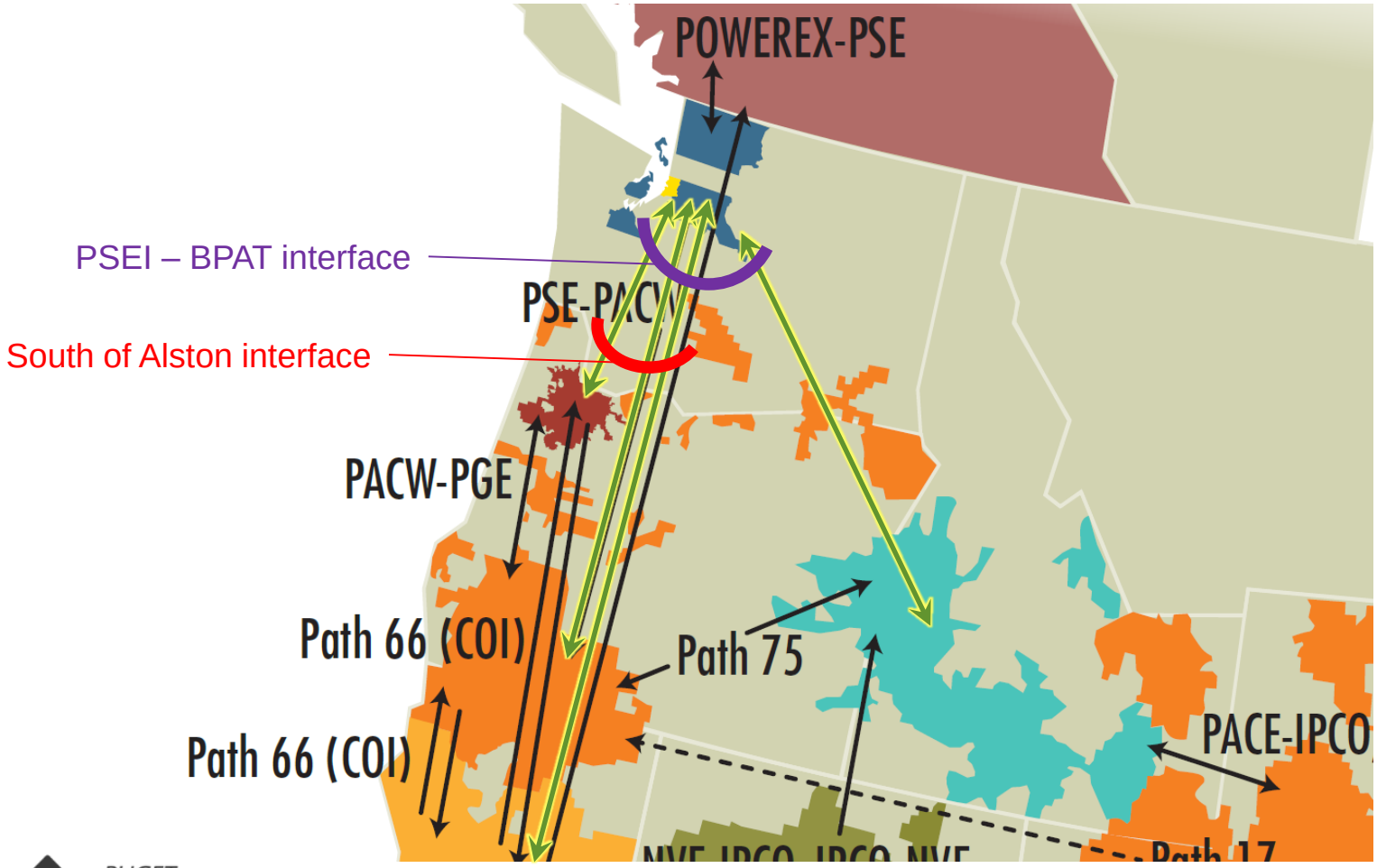
Use of the ITC ETSR Feature?



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