

# PAC-EIM Best Practices for Energy Transfer System Resources (ETSR)

March 11, 2019



# Terminology

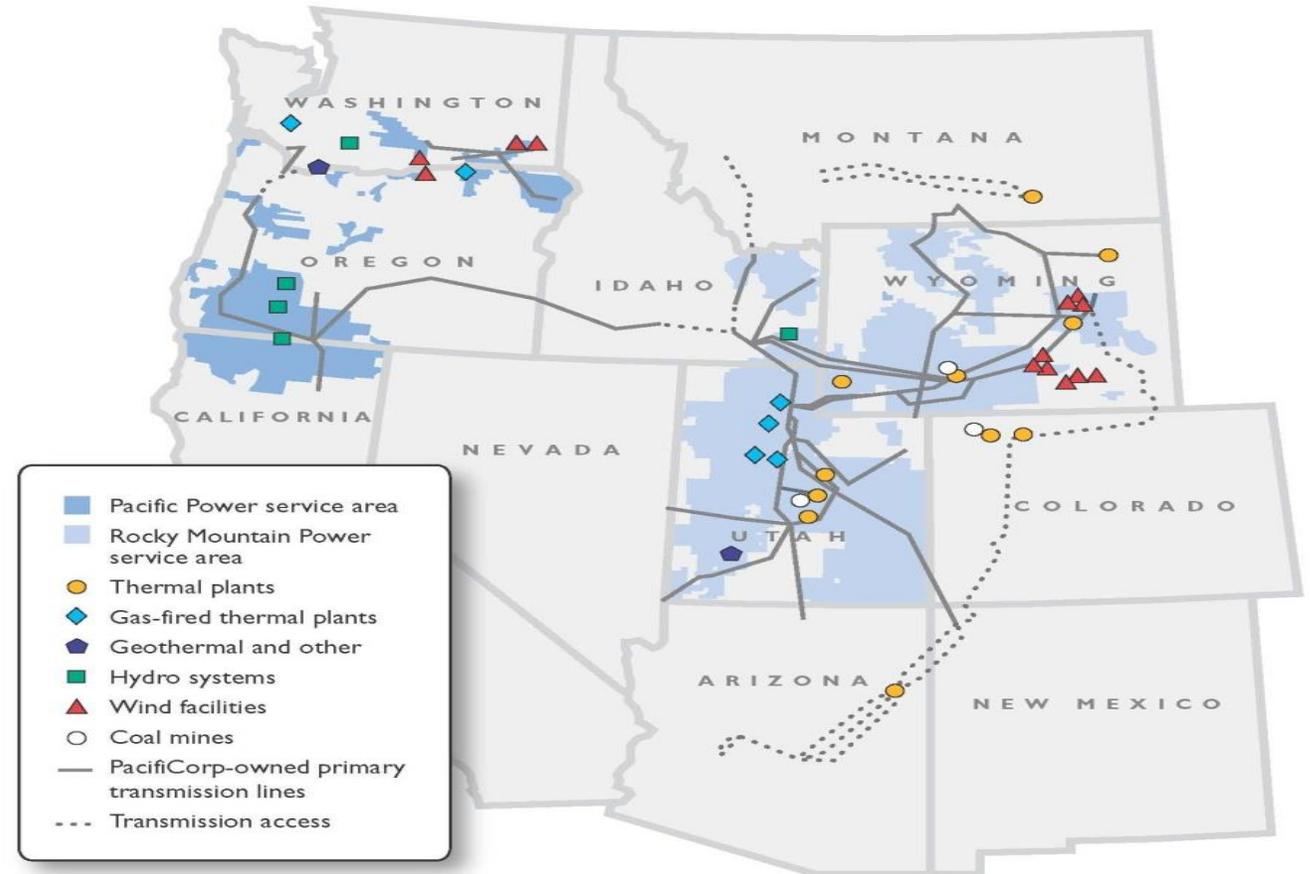
- Energy Transfer System Resource (ETSR)
- Real-Time Schedule Interchange (RTSI)
- Real-Time Base Schedule [Test] (RTBS)
- Real-Time Dispatch/Real-Time Pre-Dispatch (RTD/RTPD)
- Balancing Authority Area Operations Portal (BAAOP)
- Base Schedule Aggregation Portal (BSAP)
- Base Schedule (BS), Dispatch Operating Target (DOT), Supplemental Energy (SUPP)

# Roadmap

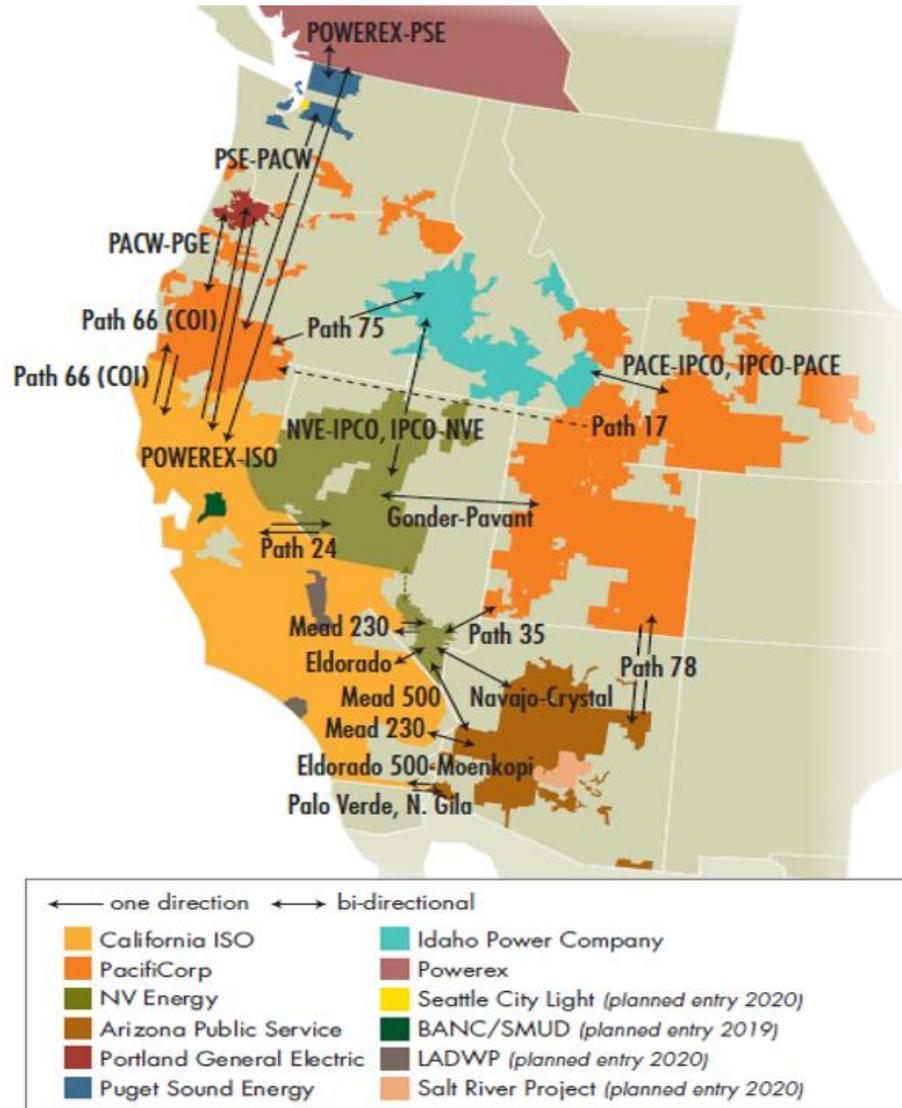
- PacifiCorp System Overview
- PacifiCorp's experience with existing ETSRs and future ETSRs
- ETSR High-Level Considerations
- ETSR Design Considerations
  - ETSR Types and Methods
  - Tie-line / OASIS / Ownership
  - ETSR Business Rules
- Harmonization of rules
- Summary

# System Overview - PacifiCorp

- One of the largest privately held transmission systems in the United States
  - 16,500 miles of transmission lines spanning 10 states
  - 64,000 miles of distribution lines
  - Over 900 substations – transmission & distribution
  - 10,894 MW of power generation capacity (net capacity)
  - 70 million megawatt-hours of electricity delivered annually
- Two balancing authority areas (PACE and PACW)
- Operated as an integrated system through agreements and scheduling practices
- Interconnected with:
  - Over 80 generating plants
  - 13 adjacent balancing authority areas at over 170 interconnection points



PacifiCorp is connected to many existing EIM entities and future EIM entities



Current as of April 2018

## Why are we here?

- Existing ETSRs:
  - PACE: AZPS, NEVP, IPCO, PACW
  - PACW: PGE, PSEI, CISO
- Future ETSRs:
  - PACE: LADWP, SRP, PNM, NWMT
  - PACW: BPAT\*, AVAT\*
- Different ETSR Types
- Different Dynamic ETSR methods
- Each ETSR implementation has had unique implementation needs, and unique problems

# High-level ETSR Considerations

- New EIM entities need to seek agreement with existing adjacent EIM Entities, not just agreement between new Entity and CAISO
- Seek agreement with your adjacent EIM Entity on ETSR design before you have vendors move forward on implementation
- Start early: Even a single tie-line between the two EIM BAAs, at least a year of time is recommended
- Discuss with adjacent EIM entities to understand remaining capacity on tie-lines where a dynamic ETSR might be established
- Entities should discuss operational expectations of ETSRs prior to activation
- Include Transmission Settlements/Finance/Billing early on in the ETSR design

# ETSR Design – ETSR Types and Methods

- Types of ETSRs

- Base:

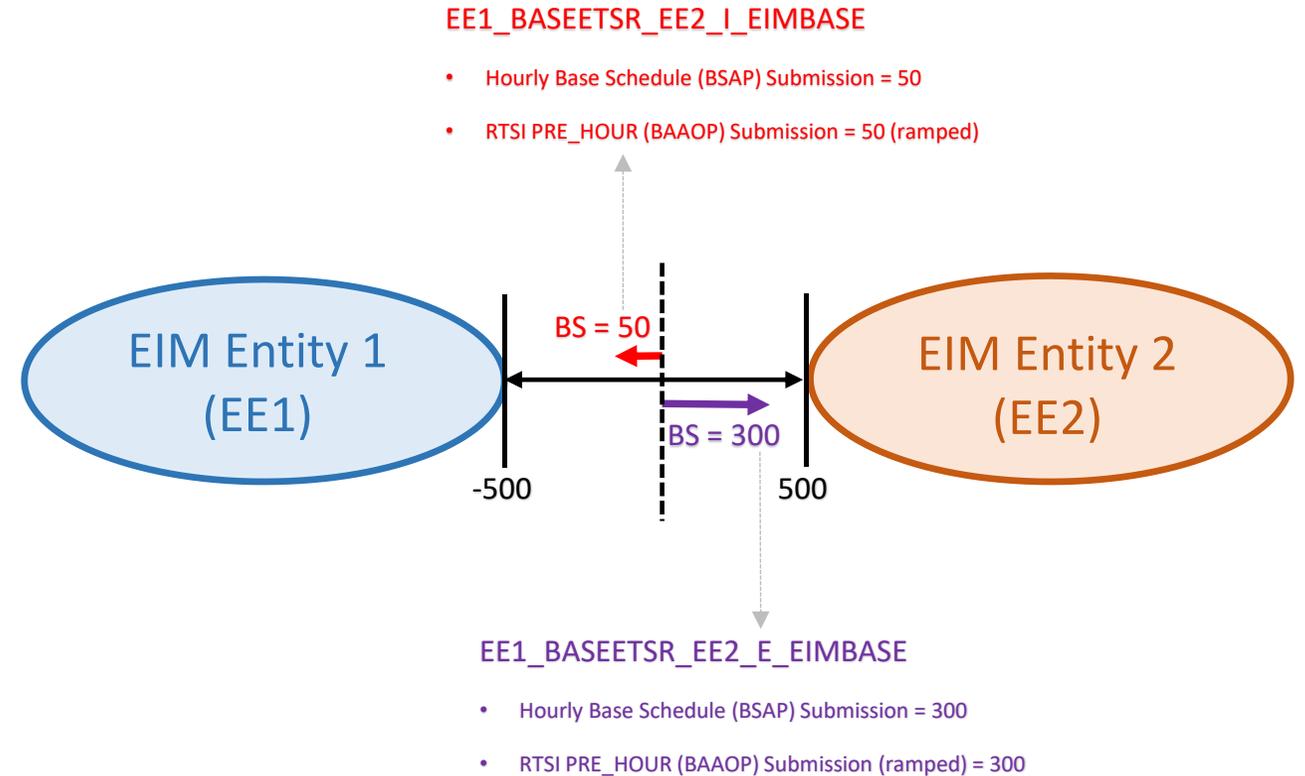
- Non-optimizable base transfers between two EIM entities

- Dynamic:

- Capacity between two EIM Entities that can be optimized dynamically

- Dynamic ETSR Methods:

- Interchange Rights Holder Method
    - Available Transmission Capacity Method



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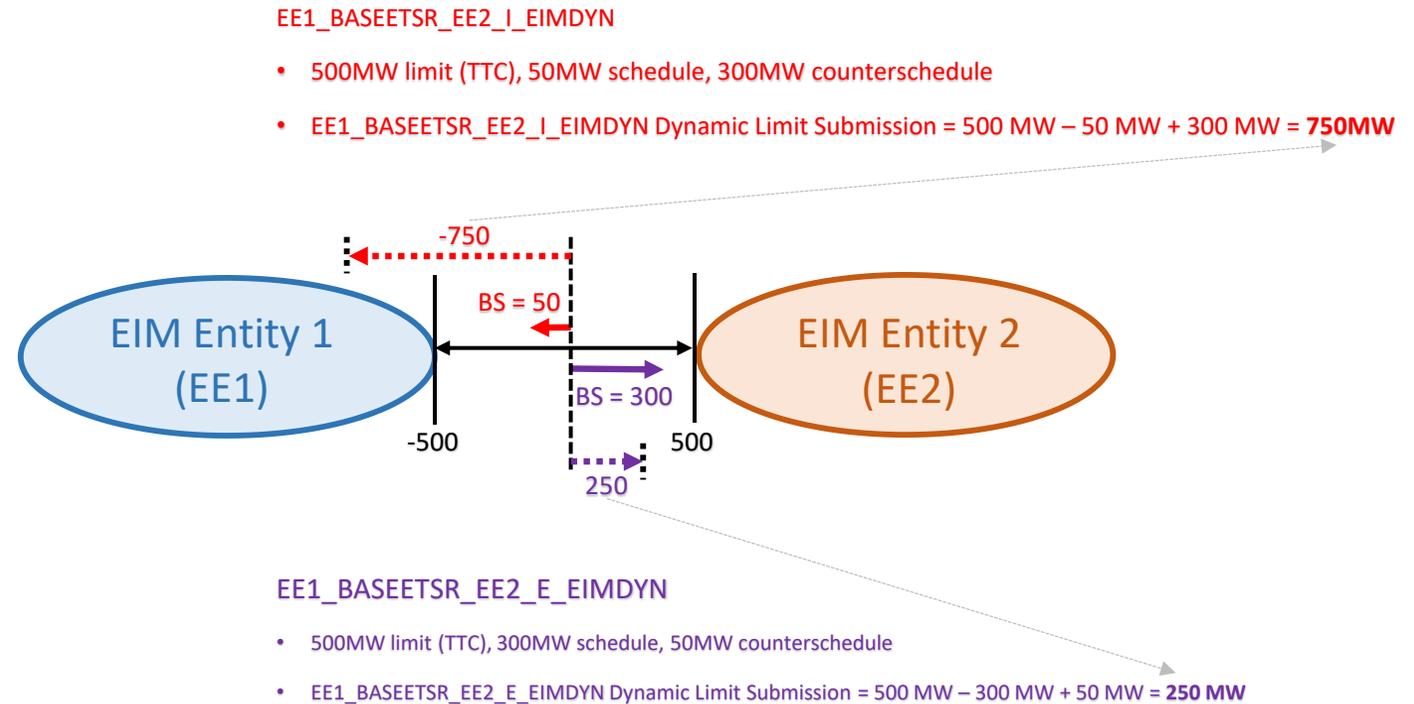
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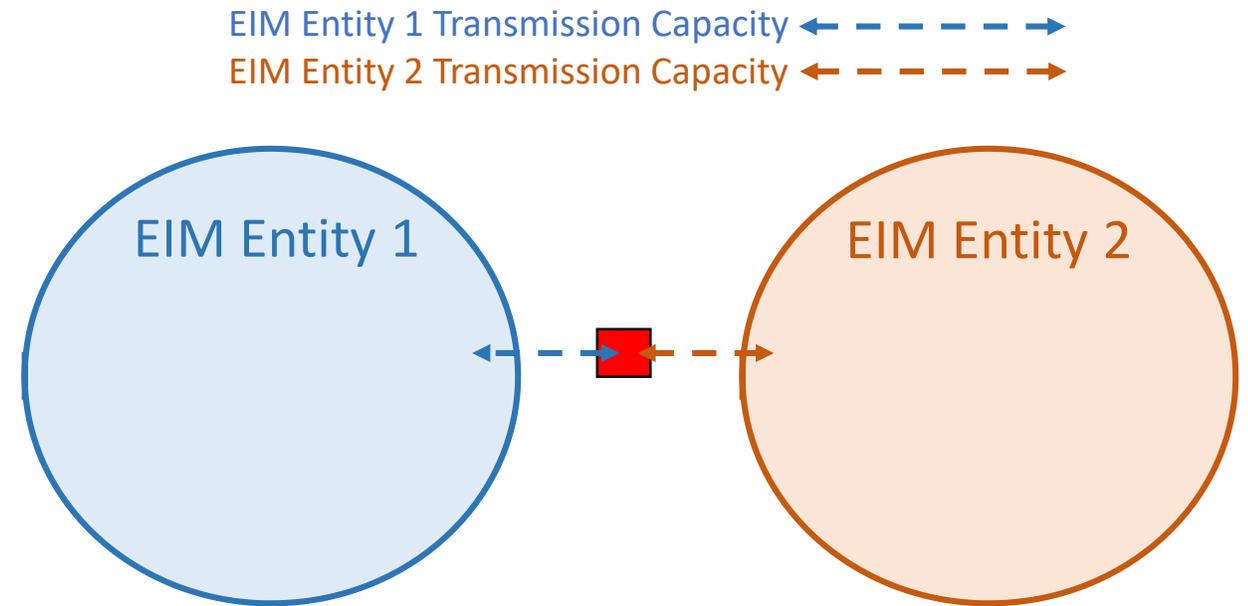
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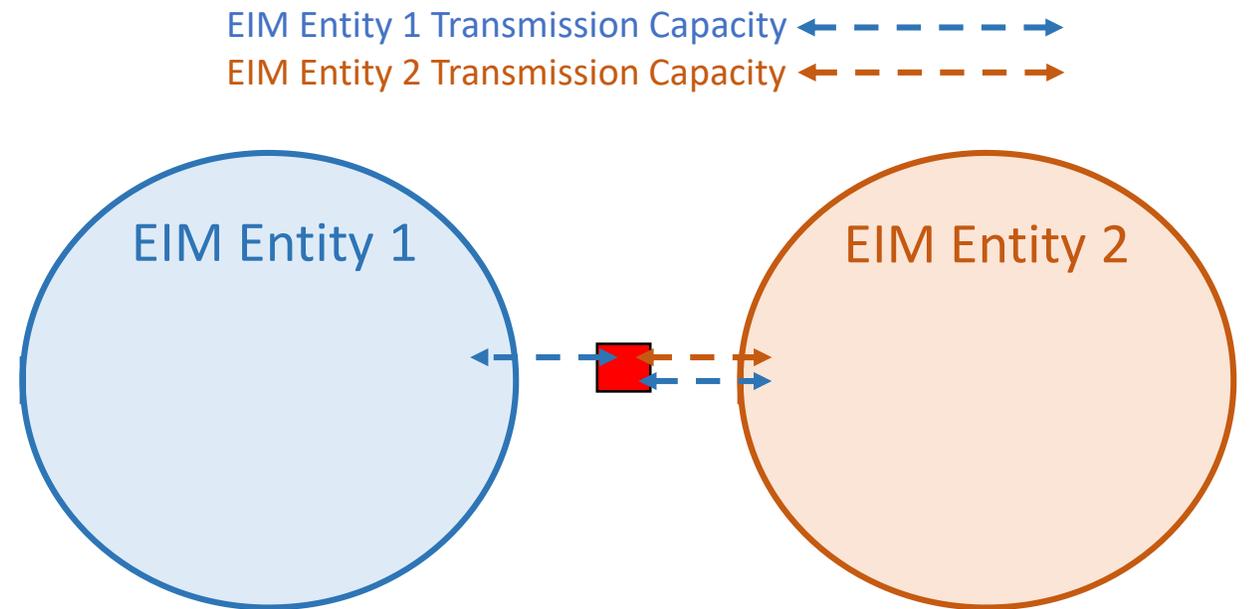
# ETSR Design – Tie-Line / OASIS / Ownership Issues

- Do I have single tie-line with adjacent EIM entity, or multiple tie-lines?
- Are multiple tie-lines electrically equivalent?
- Do TTC studies of tie-line / path represent accurate capacity that could be optimized?
- How is tie-line represented in OASIS?
- Capacity ownership of tie-line:
  - Single owner on each side
  - Joint Ownership
  - Non-EIM Ownership
  - Multiple Terminal / Three Terminal



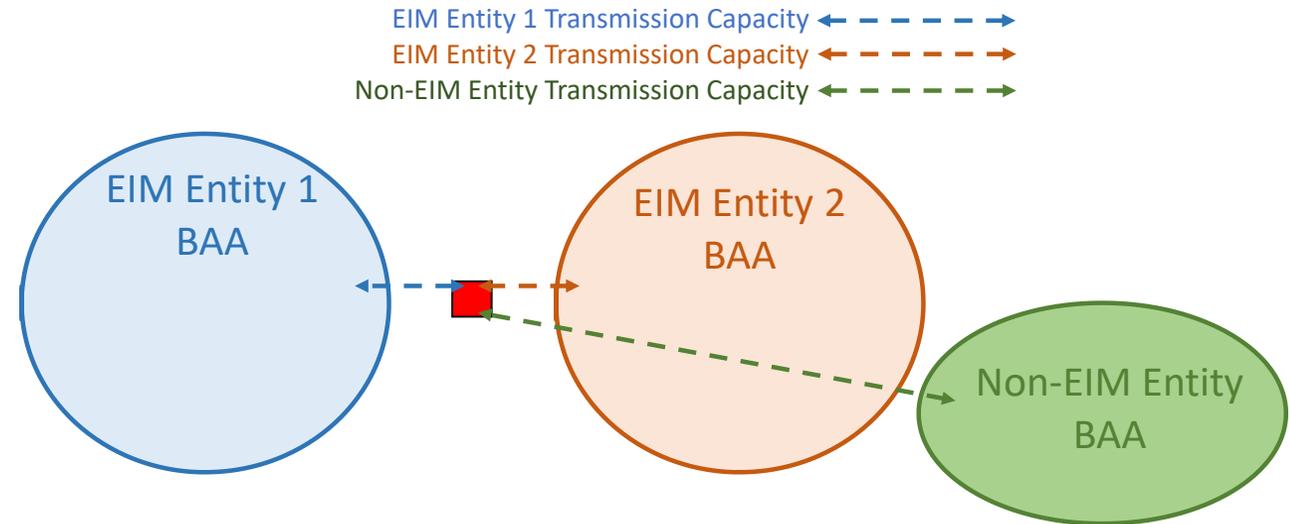
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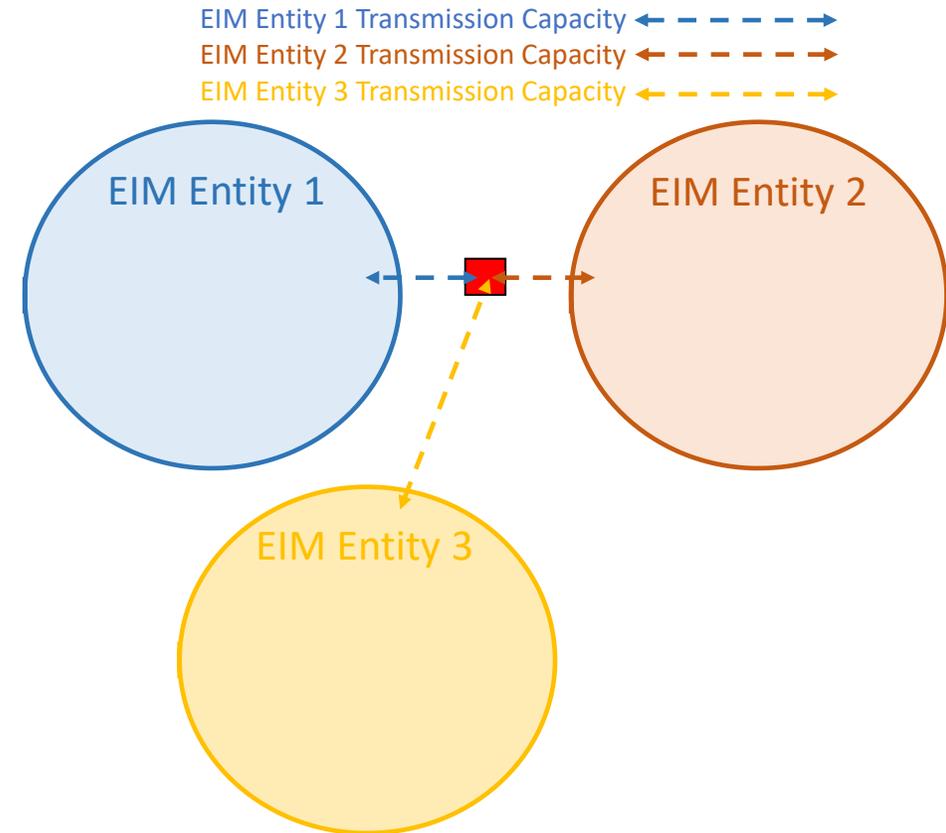
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# ETSR Design – Business Rules

- Some rules may seem standard - *experience shows otherwise*
- Base ETSR Business Rules
  - Responsible EIM Entity making submissions
  - Schedule attribute (POR/POD/SE) definition
  - Schedule/Tag Type definition
  - Submission Timing
  - Rules for Hourly Base Schedules (BSAP) vs. RTSI (BAAOP/RTM)
- Dynamic ETSR Business Rules
  - Capacity on one side does not need to represent capacity on another
  - ATC Method on one side / Interchange Rights Holder on another
  - Tag Treatment driving ATC calculation
  - ATF Dynamic e-Tag responsibility

# Operator Considerations Regarding Market Response

1. Understand that your actions can effect your BAA, adjacent BAA's and the EIM Footprint
2. Communication with the RTMO and other EIM Entities
3. Understanding of ETSR functionality
4. Determine guidelines and best practices
5. Redundancy and Alternate data sources
6. Distribute contact numbers e-mail addresses for EIM Operators and Staff

# Inconsistencies in EIM Entity and Vendor Rules

- Tag types treatment in ETSR Base Schedules
- T-57 Base Schedule cutoff implementation
- Pending e-Tag treatment
- Post T-55 e-Tag denial
- BSAP Submission timing
- RTSI Pre-Hour Ramping Profile
- RTSI ATF Submission Times

# Summary

- ETSR implementation is complex – there are many details to work through
- New EIM entities should consider their entrance more than a formal agreement between the new EIM Entity and CAISO – agreement with all adjacent EIM entities
- New EIM entities (and existing EIM entities) should consider both design and operational aspects of establishing new ETSRs
- Harmonization between different vendors and more specificity on data submissions is necessary
- PacifiCorp is looking forward to active discussions with new EIM entities (LDWP, SRP, PNM, NWMT) in the near future