



Avista's **Tacoma Power's** Decision to Join the EIM

RIF Meeting ~~8/27/2019~~ **12/3/2019**

~~Scott Kinney~~ **Clay Norris**

Who is Tacoma Power?

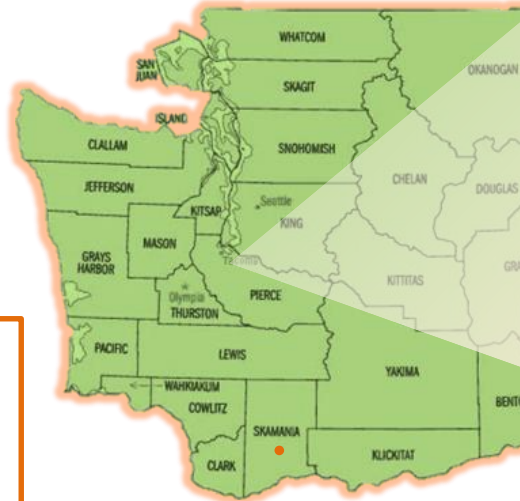
Municipal utility formed in 1893 providing retail electric and telecommunications services to the greater Tacoma area.

One division of **Tacoma Public Utilities**

- Tacoma Power
- Tacoma Water
- Tacoma Rail

Quick Facts

- Service Area: 180 square miles
- Customers Served: 176,784
(54% in city limits and 46% outside)
- Fourth largest public power utility in WA
- Approximately 850 Employees
- Average residential cost: \$.0844/kWh



How we serve our customers

Virtually Carbon-free Portfolio

HYDROELECTRIC POWER



{ 40% from our facilities }

60% Contracted Generation

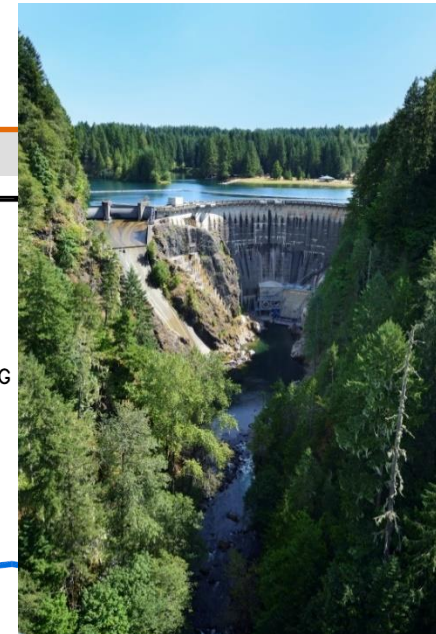
- The long-term power supply contract with Bonneville Power Administration is largest source and extends through 2028

40% Owned Generation

- 7 hydro developments on 4 rivers in Western Washington

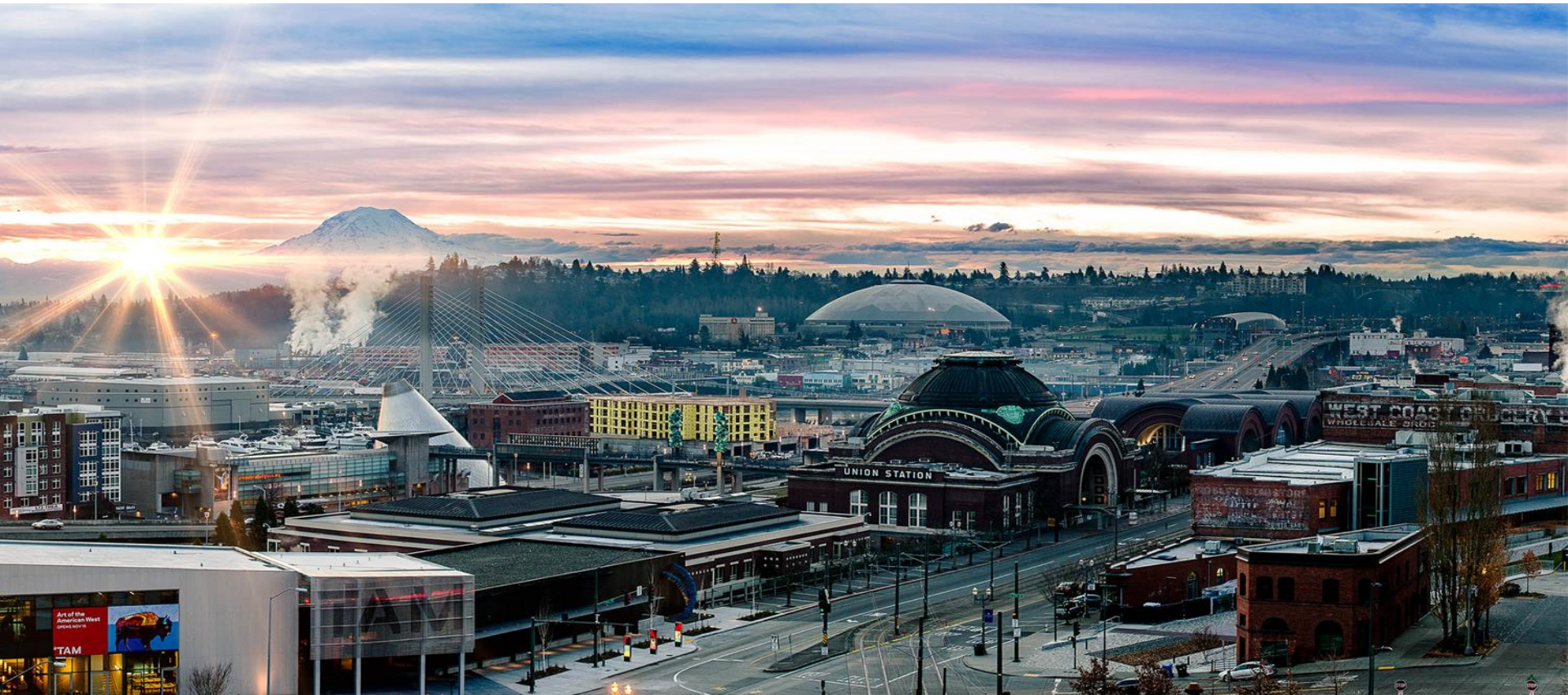
Quick Facts

- 5 transmission substations and 351 miles of transmission lines
- 49 distribution substations and 2,014 miles of distribution lines
- 23 BPA customer substations
- 8 generation switchyards



Tacoma Power

Decision to Join the Energy Imbalance Market



Introduction

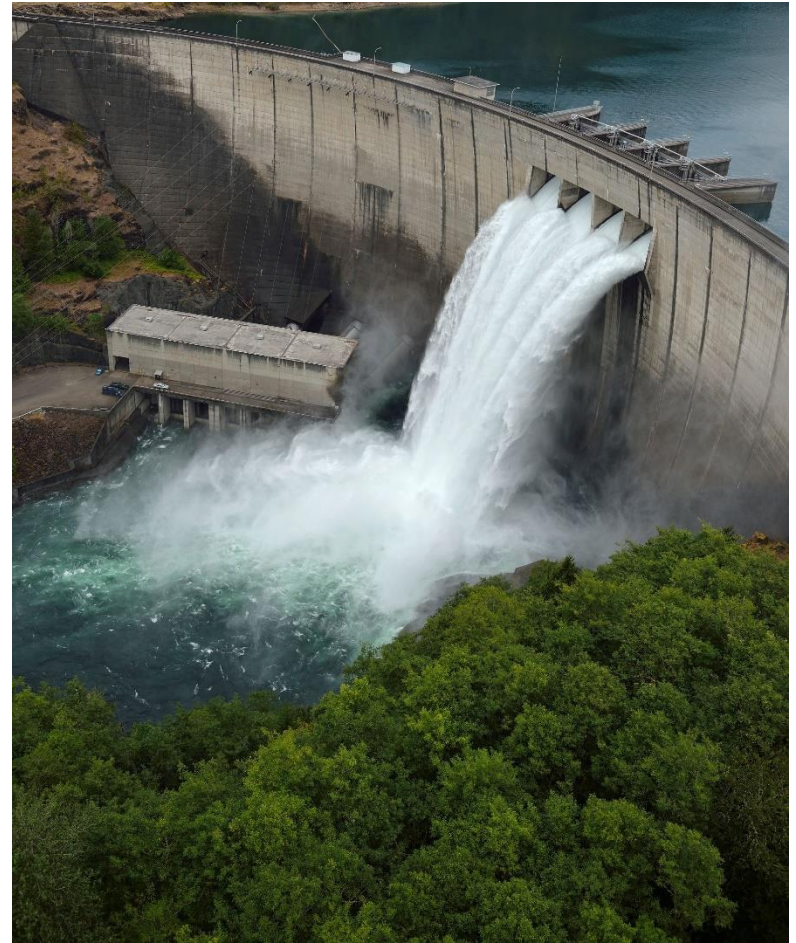
Markets Are Evolving

- **1980s** somewhat limited trading between utility neighbors
- **1990s** FERC opened up wholesale markets by making transmission available to third party marketers
- **2000s** robust bilateral markets in the Northwest; centralized markets in most of the Eastern U.S.
- **2010s** CAISO begins Energy Imbalance Market (EIM) and begins discussions about creating an Extended Day-Ahead Market (EDAM)
- **2020s** EDAM? West-wide Regional Transmission Organization (RTO)?

Introduction

Hydro Value in EIM

The EIM provides a real-time market and a potential opportunity to use the flexibility of Tacoma Power's hydro system to better integrate solar and wind generation



Mick Klass Photography

Risks of Status Quo

The status quo carries significant risks for Tacoma Power

Ability to balance our system in real-time is diminishing
Bilateral real-time trading partners are getting harder to find

Risks of Status Quo

Risks

Loss of Liquidity in Real-Time Market

- Real-time trading volumes with our historically largest real-time counterparties are dramatically lower
- More real-time transactions are with wind counterparties. These counterparties may elect to join EIM
- Real-time transactions taking place earlier with EIM entities than non-EIM entities; once EIM bids are in, no need to make bilateral trades
- Liquidity of “later” transactions significantly reduced or even eliminated if wind generators enter the EIM

EIM Cost Estimates

EIM Implementation Costs Summary

EIM Implementation will require a significant investment of \$14 to \$18 million over 3 years (from June 2019 until April 2022)

Implementation costs include new staff, consulting services, software and metering

Based on an evaluation of Tacoma Power's needs and a comparison with other EIM entities, the range of costs for 3-year implementation:

- | | |
|---|------------------|
| ▪ New Staff for Implementation (10 to 11 FTE) | \$5.9M to \$6.5M |
| ▪ Consulting Services | \$3.5M |
| ▪ Software Systems | \$2.3M to \$4.3M |
| ▪ Metering | \$400k to \$1.2M |
| ▪ Contingency | 20% |

EIM Cost Estimates

EIM On-going Costs Summary

EIM on-going costs are expected to range from \$2.1 to \$4 million per year

On-going costs include staff, CAISO administrative fees, and license fees of software systems

The expected range of annual on-going EIM costs include:

- Staff for on-going operations (7 to 10 FTE) \$1.7M to \$2.4M
- CAISO Administrative Fees \$400k
- Software Licensing \$380k to \$950k
- Contingency 10%

2019 EIM Benefit/Cost/Risk Analysis Discussion

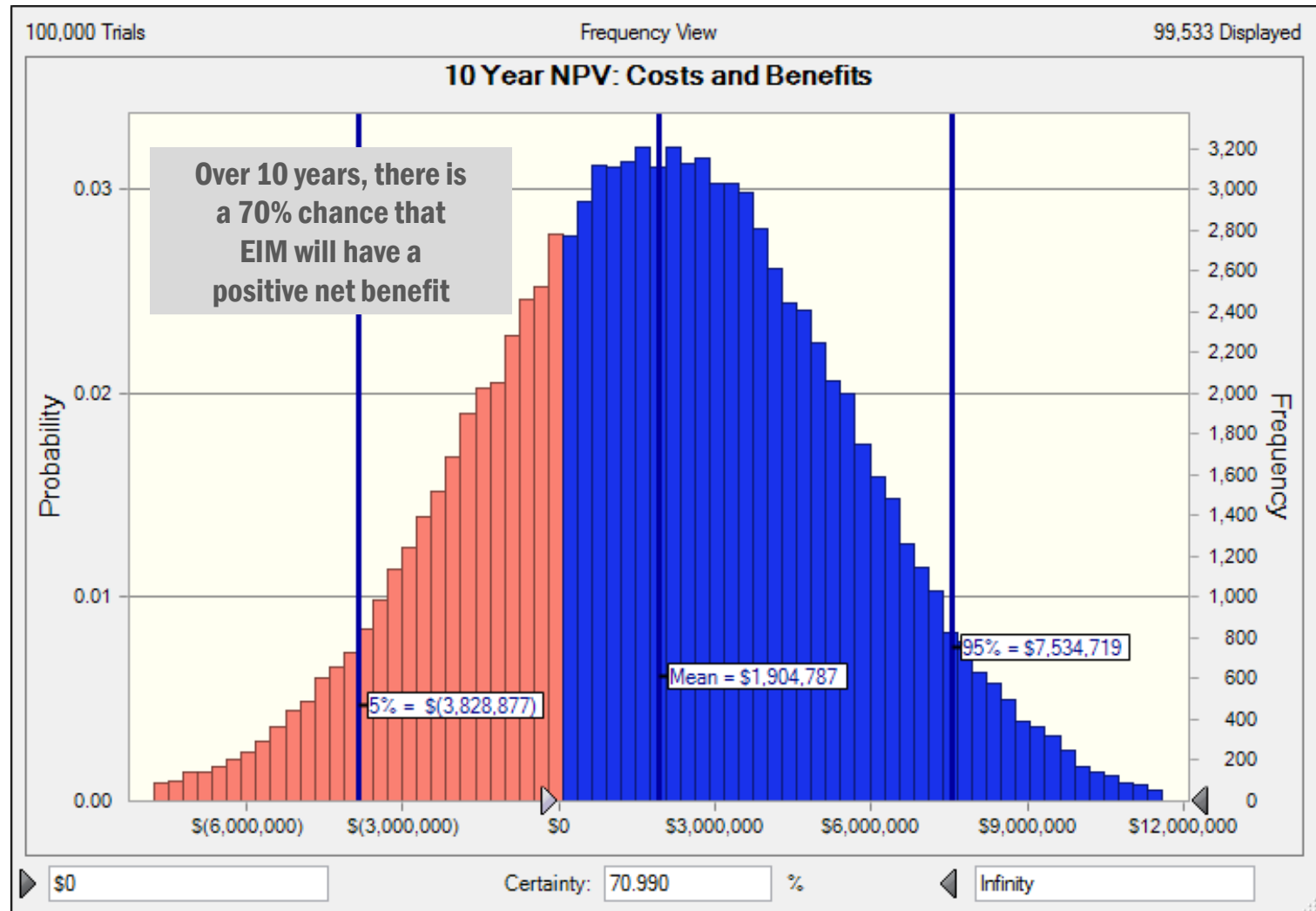
Model Design

Tacoma Power's Modeling

- We built a model that dispatches Tacoma's flexible hydro generation using historical EIM prices in order to see how much value would be gained or lost from joining the EIM historically.
- The model uses:
 - Historical data and system conditions
 - Considers the opportunity cost of water at each project
 - Doesn't start or stop dispatchable units or modify the discharge of regulated projects
- The model "bids in" the available flexibility of Tacoma's generation into the EIM
- The generation is then dispatched based on the historical EIM prices resulting in Tacoma either buying from or selling to the Market
- This process is repeated in the model for every 15-min and 5-min interval throughout the year (~140,000 intervals/yr)

EIM Cost-Benefit Simulation

Costs & Benefits



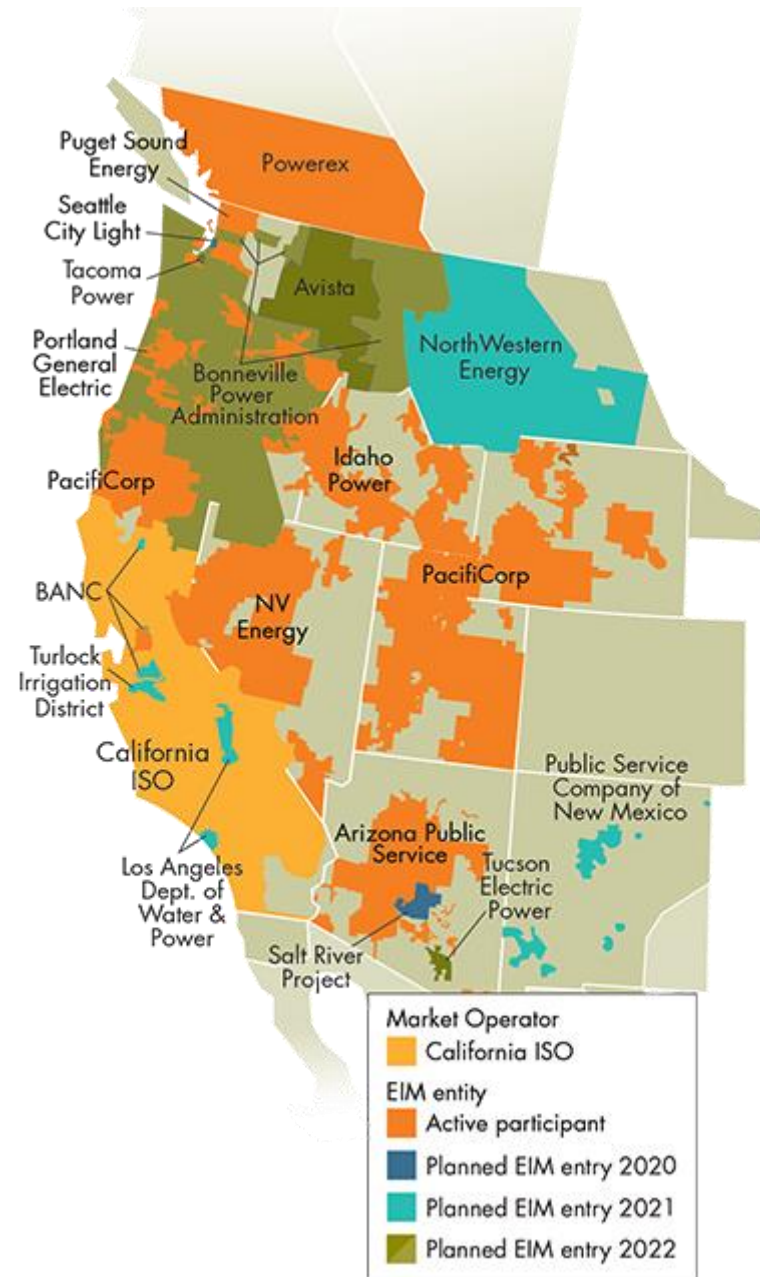
Tacoma Power EIM Business Case

Recommendations to the Board

- Staff recommends that Tacoma Power join the EIM because:
 - ✓ Modernizes wholesale trading practices
 - ✓ Prepares Tacoma Power for likely evolution of markets
 - ✓ Reduces risk of reduced trading partners
 - ✓ Improves reliability on pathway to 100% clean grid
 - ✓ Expected benefits exceed expected costs

Recent Milestones

- CAISO Scheduling Coordinator Certification in February 2018
- Cost/Benefit and Risk Analysis in Spring 2019
 - Small but Positive NPV
 - Real-Time Market Liquidity Concerns
- Approval for Executive Team and Public Utility Board in Spring 2019
- Implementation Agreement Signed with CAISO in August 2019
- Utilicast Hired as System Integrator in November 2019
- RFP for EIM Software Currently in Progress with Vendor Selection Scheduled for December 2019



Questions?