



# The Leading Edge: Where is the Industry Headed?

## **Public Power Forward Summit**

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# Topics

- Overview of the Pacific Northwest system
- Regional electric utilities and Balancing Authorities
- Federal law that governs the four states
- Regional market and Energy Imbalance Market
- Distribution systems and the customer interface
- Technology adoption and our customer relationship
- Seattle City Light – How are we adapting?



# Pacific Northwest Electric Utilities

- **Bonneville Power Administration (BPA)**
  - 59,300 Gigawatt Hours
  - 133 Wholesale Customers
- **136 Public Power Utilities**
  - 78,800 Gigawatt Hours (includes power from BPA)
  - 2.4 Million Customers
- **Six Investor-Owned Utilities**
  - 84,900 Gigawatt Hours
  - 3.9 Million Customers

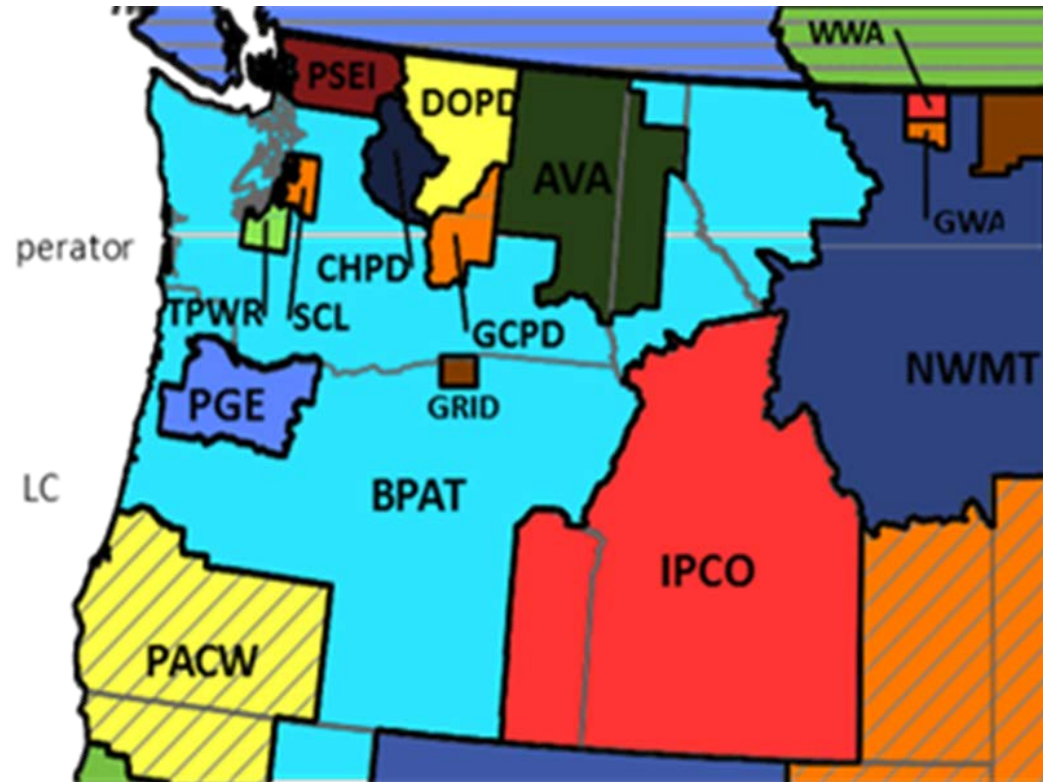


# Northwest Balancing Authorities

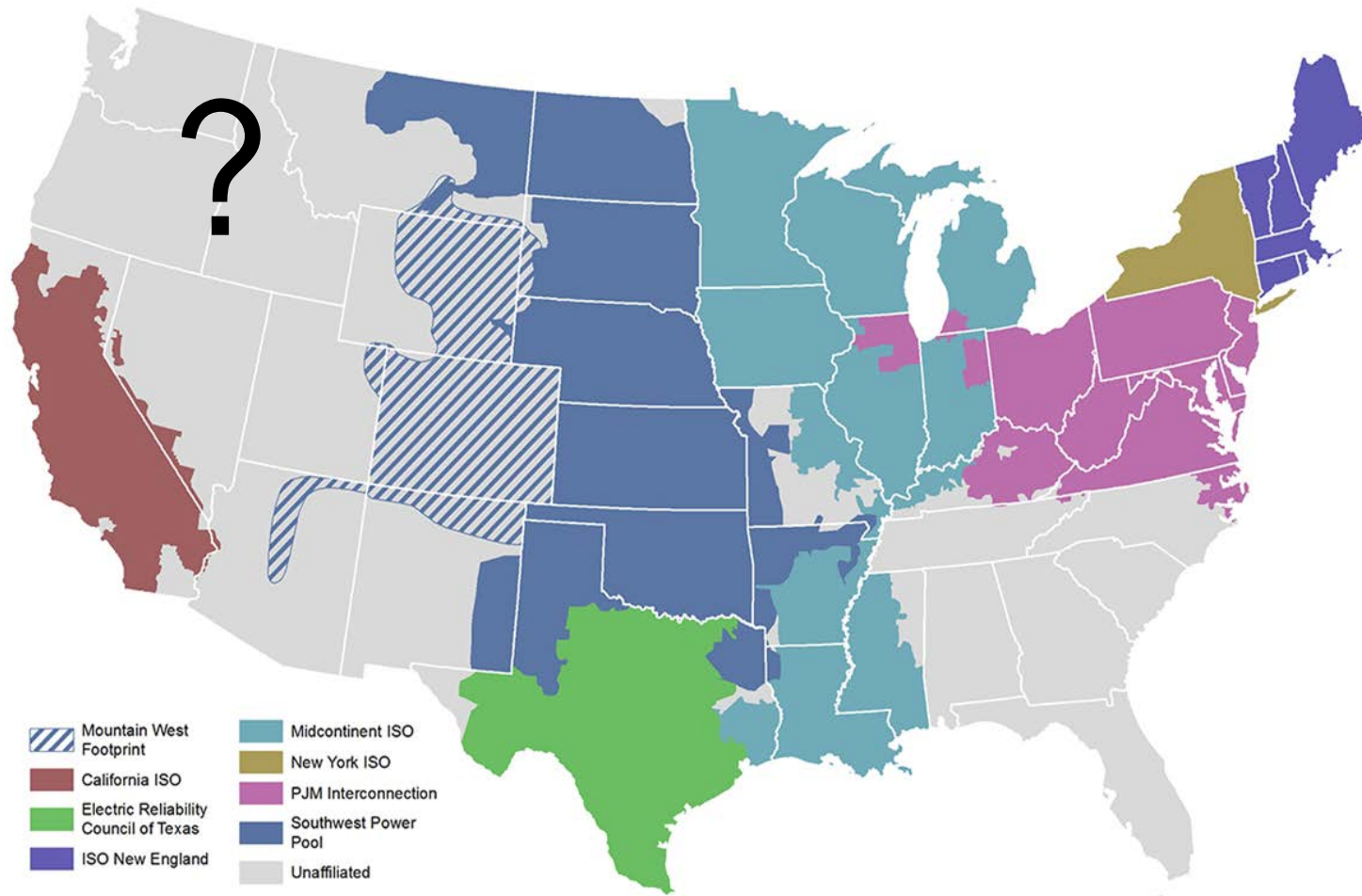
Utility/Organization	Retail Sales*	Customers	Generation*
BPA	59,300	165	79,619
PAC	54,318	1,800,000	60,959
Idaho Power	14,196	534,000	12,175
PSE	20,445	1,128,000	24,607
Avista	8,497	377,000	11,495
PGE	18,971	860,000	22,323
Seattle City Light	9,400	500,000	5,971
Mid-Columbia PUD's	7,920	103,000	20,347
Tacoma Power	4,581	176,000	2,417

\*Gigawatt hours

# Northwest Balancing Authorities



# Regional Energy Markets



# Market Ideas and Discussions

- Market Creation for the Future
  - Attempts at Regional Transmission Organizations
  - Complications to the Idea
  - BPA and Public Power Utilities
    - West Coast or Northwest only
    - Day Ahead Markets
    - Hydro Only System
- Voluntary or Legislated



# The Distribution System Evolves

- Focusing on the wires business at a time of change
- Customer usage changes – LED and energy efficiency penetration
- Energy efficiency and conservation role
  - Do we still need to buy it or just promote it?
- Distributed generation
  - What is the utility's role?
- Meeting customer power quality reliability expectations
- Environmental goals and carbon reduction





# Advanced Metering Integration

- Resources move from the field to the office
- The development of data to better understand our customers
- The business relationship with self generation and storage customers will be transformed
- The third party interface through product integration and interaction for comfort, security, and efficiency
- Customer information and billing system overhaul
- Social media and portals

**REGULATED**



**NOT REGULATED**

Utility Models					Consumer Interface	
Market Driven	Generation	Power Supply	Transmission	Transmission Distribution	Meter	Advanced Metering Infrastructure
	Market	Market	Regional Transmission Organization	Load Serving Entity		Distributed Energy Resources ←
Current Northwest	BPA/ Seattle City Light	BPA/ Seattle City Light	BPA/ Seattle City Light	Seattle City Light		Seattle City Light Money to Consumers →
					Value of service	
					Value of reliability	



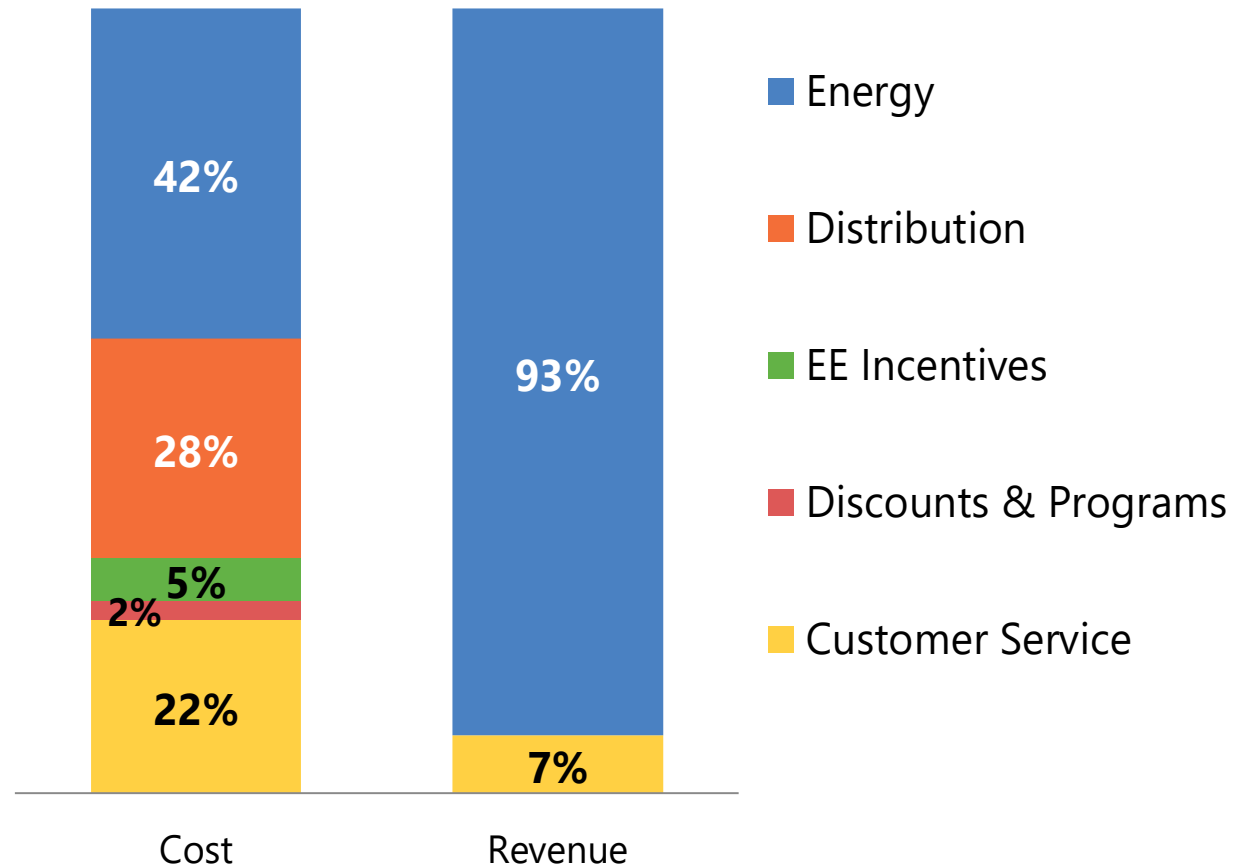
# Business Challenges – Electric Rates

- The retail interface and technological advancements need to be preceded by new billing systems and rates design
- We have not yet created rates for the future of deep EE and high EV / Solar PV penetration
- Difficult to embrace a 21<sup>st</sup> century model of customer interaction with 20<sup>th</sup> century rate design
- We will have to interface with energy production behind the power interface of our systems and cost recovery structures
- If we don't change, our customers will
- System growth costs need to be allocated fairly and provide customers accurate price signals

# Costs vs. Revenue

## Out of Balance

### Residential Service Cost vs. Rate Revenue





# Technology Deployment at Seattle City Light

- Automation on feeder circuits
- State-of-the-art network operations and protection
- Network growth – new Denny Substation
- Non-wires alternatives to capacity adds (DERs)
- Electric vehicle systems and support
- Mass transit electric vehicles
- NeighborGrids

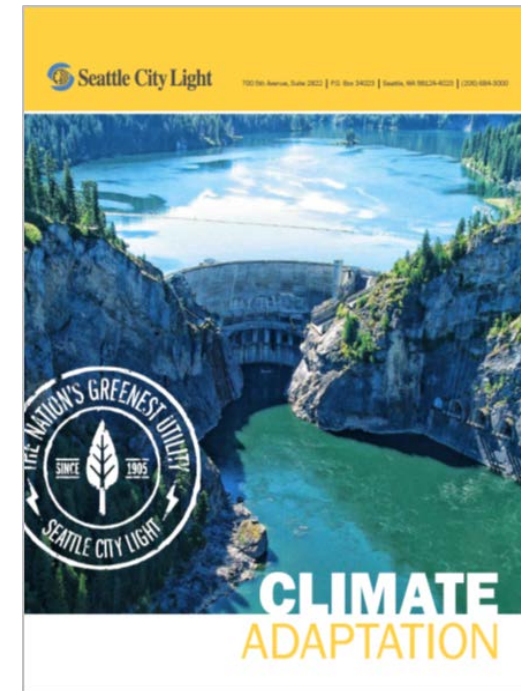
# Electric Vehicle Systems and Support



- City of Seattle Drive Clean Initiative
- Seattle City Light Public DC Fast Charging Stations Pilot Program

# Climate Change Adaptation Plan

- Ensure that Seattle City Light can continue to deliver reliable power
- Assess vulnerabilities of infrastructure and operations
- Identify critical actions to increase climate resilience
- Implement near-term actions to adapt to a changing climate



# Actions to Address Key Climate Vulnerabilities

- Get Informed: Assess seasonal changes in energy demand and water availability
- Get Prepared: Harden infrastructure and enhance emergency response to floods, landslides, and wildfires
- Take Action: Department of Energy *Partnership for Energy Sector Climate Resilience* participant







Seattle City Light