

# Energy 101 Course for Low Income Energy Service Providers May 10-11, 2010

## Day One

### I History of Electricity Development in the Pacific Northwest (1.5 hours)

#### A. Electric service in the region

- Private utility development and the need for public providers

#### B. The Bonneville Project Act of 1937

- The building of the hydrosystem in the NW  
job creation, flood control, irrigation, power generation

#### C. Post war development

- Publicly owned utilities in the Northwest
- The direct service industries
- More storage dams
- Big debts for power and transmission - still paying today

#### D. Nuclear Flirtation

- 9 Proposed plants, largest municipal bond default

#### E. The Pacific Northwest Power Planning and Conservation Act

- Created new resource order
- Salmon restoration responsibilities increased
- Created Northwest Power Planning Council (now called Northwest Power and Conservation Council)
- WPPSS debt now paid through BPA

#### F. Changes in the Electric System since 1980

- Integrated resource planning and conservation as a resource
- Energy codes
- Competition in electric power markets - wholesale and retail restructuring
  - Meltdown in California and the drought of 2001
  - Climate change and carbon risk

## Lunch

### II How does the Electric System Work (1.5 hours)

#### A. Basic elements of electricity

- What is a KW, kWh, MW - what can you do with this much power?
- Can't be stored, loads and supply need to be balanced
- Electrons follow the path of least resistance
- Grid is interconnected
- Become an essential service

#### B. Generation -- sizes, impacts, locations

- Hydropower
- Nuclear
- Coal and natural gas

- Wind, solar, geothermal, biomass, tidal, wave
- Efficiency

### **C. Transmission and distribution**

- High voltage power lines - AC and DC lines
- BPA's Role
- Distribution lines and local utility responsibilities
- Grid becoming interactive rather than one-way

## **III Northwest and WA resource mix (1 hour)**

### **A. Generation supplies**

- Regional mix
- Washington mix
- Today's water situation and its impact

### **B. Demand-side resources**

- Efficiency
- Load management
- Distributed generation

### **C. WA Electricity and Natural Gas Consumption and Rates**

- How do we compare to other states and regions?
- What are our consumption levels? How do they compare to other states?

## **Day Two**

## **IV Who are the Players in Electric System (2 hours)**

### **A. Public Utilities in Washington - how they are governed, no natural gas service**

- Municipal - 10 city run utilities - Seattle, Tacoma, Ellensburg, Centralia, Milton, Port Angeles, Richland, Steilacoom, Sumas, Eatonville
- Public Utility Districts - established in 1936, 27 PUDs - electric, water, wastewater, telecom
- Co-ops - 20 mutuals and co-ops in WA serves 280,000 customers

### **B. Rates and Programs for Public Utilities**

- Publicly elected governing boards - city council, PUD Commission, Co-op board
- Rates developed as cost of service
- Efficiency programs for customers seen as a energy service, bill payment programs much more challenging

### **C. Investor-Owned Utilities**

- One all electric utility - Pacific Power (PacifiCorp/Mid American)
- Two combined electric/natural gas utilities - Puget Sound Energy, Avista
- Two all natural gas utilities - Cascade Natural Gas, Northwest Natural

### **D. IOU Regulators**

- WA Utilities and Transportation Commission - 3 appointed members
- Obligation to serve - providing just and reasonable rates
- Equity across rate classes

- Traditional perspective on rates, resources, sustainability, services

**E. IOU Stakeholders**

- Office of Public Counsel - Attorney General's office
- Industrial and other large customers
- Non-profit public interest - Energy Project, NW Energy Coalition

**F. Impacting the System**

- Resource Planning process - all large utilities have a process - make it public
- Consumer advisory committees, conservation committees
- Public testimony, intervening in formal cases (rate cases, rulemakings, efficiency filings, etc)