EWEB’s Electricity Future

February 5, 2020
Frank Lawson, CEO/General Manager
EWEB Update Presentation
- Energy Overview
- Regional Priorities
- EWEB’s Climate Policy/Actions
- Electricity Supply Planning (IRP)
- Customer Programs (Conservation/Efficiency)
- Strategic Plan – Future New Products

350 Eugene / Facilitated Questions
1. Electric power portfolio utilizing low-carbon, renewable resources

2. Mitigate carbon emissions – energy sector

3. EWEB Operations – reduce GHG emissions

4. Assist customers with carbon reductions

5. Prepare for impacts – EWEB’s water/electric supply

**Five Key Decarbonization Strategies**

Transitioning the Northwest to a low-carbon energy system relies on five decarbonization strategies:

1. **Energy Efficiency**: reducing energy consumed to provide an energy service

2. **Electricity Decarbonization**: reducing the emissions intensity of electricity generation

3. **Fuel Decarbonization**: reducing the emissions intensity of liquid and gaseous fuels

4. **Electrification**: switching end uses from fuel to electricity

5. **Carbon Capture**: capturing CO₂ from a facility or removing CO₂ from the atmosphere

Source: 2019, Clean Energy Transition Institute
Decarbonization Strategy

**Liquid Fuels** emissions reductions achieved with electrification and biofuels

**Pipeline Gas** emissions reductions achieved through electrification and electric fuels

**Electricity** emissions reductions achieved through coal retirement and deployment of renewables

Liquid fuels for transportation largely replaced by efficient electricity and some biofuels


Electricity goes from 79% clean to 96% clean
Estimated U.S. Energy Consumption in 2018: 101.2 Quads

Electricity Generation 38.2

Solar 0.949
Nuclear 8.44
Hydro 2.68
Wind 2.53
Geothermal 0.217
Natural Gas 31
Coal 13.3
Biomass 6.12
Petroleum 36.6

Energy Services 32.7
Industrial 26.3
Transportation 28.3
Commercial 9.45
Residential 11.9

Rejected Energy 68.5

Energy Flows Diagram

Eugene Water & Electric Board
U.S. Electricity Generation by Type

- Solar
- Geothermal
- Waste
- Petroleum
- Wind
- Hydroelectric
- Nuclear
- Coal
- Natural Gas

Eugene Water & Electric Board
Regional Priorities

Legislation/Policy
SB 1530 (Oregon)
CETA Rule Making (Washington)
Green New Deal (H.Res.109)

Resource Adequacy
Market Development
Columbia River System Operation (EIS)
Western Electricity Policy

Assumed RPS and Clean Energy Policies for Western States:
Modeling western policies to help investigate system flexibility needs

Clean/Renewable Penetration Requirements in Baseline Case

Key
Existing policy
Recently enacted policy
Conceptual policy

Study year
2020
2026
2035

Assumed coordinated cap-and-trade in 2026

Clean Energy Target Based on Assumed Policies

33% 64%
2026 2035

Eugene Water & Electric Board
NW Power & Conservation Council
- Simulation(s):
  - Possible Futures (Hourly Resources v. loads)
  - <5 Years
  - LOLP – Loss of Load Probability

https://www.nwpp.org/adequacy
Price Formation: Unique Resource Attributes; Fast-Start, Dispatchable, Shortage Pricing

Reliability: Capacity, Sufficiency, Transmission Management

GHG Accounting: Dispatch and account correctly
Columbia River System Operation (CRSO)

Columbia River System Operations EIS Process

- September 2016
- September 2016 – February 2017
- February 2017 – December 2018
- WE ARE HERE: February 2020
- June 2020
- September 30, 2020

- NOTICE OF INTENT
- SCOPING
- DEVELOP ALTERNATIVES FOR DETAILED EVALUATION
- DETAILED ANALYSIS
- ISSUE DRAFT EIS WITH PREFERRED ALTERNATIVE
- PUBLIC COMMENT REVIEW AND SYNTHESIS
- PREPARE FINAL EIS
- ISSUE FINAL EIS
- RECORDS OF DECISION
- TRIBAL ENGAGEMENT
- FINALIZE EIA SECTION 7 CONSULTATION WITH NMFS AND USFWS
EWEB Climate Change Policy

1. Electric power portfolio utilizing low-carbon, renewable resources
2. Mitigate carbon emissions – energy sector
3. EWEB Operations – reduce GHG emissions
4. Assist customers with carbon reductions
5. Prepare for impacts – EWEB’s water/electric supply
Electricity Supply Planning

- Resource Mix
- Integrated Resource Plan
- Leaburg/Walterville Analysis
- Impacts of Electrification
  - Impacts of Legislation/Ordinances
- Products & Services
- Costs of Service
- Individual Resource Valuation

Electricity Supply Planning
1. Electric power portfolio utilizing low-carbon, renewable resources

2. Mitigate carbon emissions – energy sector

3. EWEB Operations – reduce GHG emissions

4. Assist customers with carbon reductions

5. Prepare for impacts – EWEB’s water/electric supply
EWEB Mission

EWEB’s Mission

Our mission is to enhance our community's vitality by delivering drinking water and electric services consistent with the values of our customer-owners.

1. Drinking water quality
2. Ensure safe, reliable delivery of drinking water
3. Water service reliability
4. Electric service reliability & restoration
5. Responsiveness
6. Efforts to protect the environment
7. Efforts to control cost
8. Efforts to help customers reduce energy use
9. Increase customer & community emergency preparedness
10. Keep customers informed
11. Help customers reduce water use
12. Involvement in community events & activities

Safety
Reliability
Affordability
Responsibility
Community
EWEB’s Mission

*Our mission is to enhance our community's vitality by delivering drinking water and electric services consistent with the values of our customer-owners.*

1. Drinking water quality
2. Ensure safe, reliable delivery of drinking water
3. Water service reliability
4. Electric service reliability & restoration
5. Responsiveness
6. Efforts to protect the environment
7. Efforts to control cost
8. Efforts to help customers reduce energy use
9. Increase customer & community emergency preparedness
10. Keep customers informed
11. Help customers reduce water use
12. Involvement in community events & activities

Most Popular Products of Interest

- Financial rewards for shifting energy use
- Reduce carbon footprint by using less & cleaner energy

**EWEB Mission**

Eugene Water & Electric Board
10-Year Strategic Priorities

1. Emergency Preparedness & Disaster Recovery
2. Electric Resource Choices

Methods to Enhance Customer Confidence: 2017-2020+

1. Consistent Performance (Safe & Reliable)
2. Cost Improvement
3. Service/Responsiveness
4. Open and Transparent Communications

Integrate Sources with Flexible Delivery; Microgrid(s) & Water Systems

Niche/Segment-Specific Products; Consumption & Infrastructure Flexibility
Ingredients: Whole grain oat, modified corn starch, corn starch, sugar, salt, trisodium phosphate, calcium carbonate, monoglycerides, tocopherols, wheat starch, annatto.

Vitamins & minerals: niacinamide, calcium pantothenate, pyridoxine hydrochloride (vitamin b6), folate, iron.

Contains wheat ingredients.
# Future Electricity Products

## Electricity Facts

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Generation Resource(s)</strong></td>
<td>Coal 2%</td>
</tr>
<tr>
<td></td>
<td>Gas 1%</td>
</tr>
<tr>
<td></td>
<td>Nuclear 77%</td>
</tr>
<tr>
<td></td>
<td>Hydro 6%</td>
</tr>
<tr>
<td></td>
<td>Biomass (Renewable) 6%</td>
</tr>
<tr>
<td></td>
<td>Solar 0.5%</td>
</tr>
<tr>
<td></td>
<td>Other 0.5%</td>
</tr>
<tr>
<td><strong>Carbon Intensity (MTCO2e/kWh)</strong></td>
<td>Average 0.016</td>
</tr>
<tr>
<td></td>
<td>Peak 0.022</td>
</tr>
<tr>
<td><strong>Pricing (Residential)</strong></td>
<td>Basic (per month) $20.50</td>
</tr>
<tr>
<td></td>
<td>Delivery/Demand (cents) 2.624/kWh</td>
</tr>
<tr>
<td></td>
<td>Energy credits 2.524/kWh</td>
</tr>
<tr>
<td><strong>Consumption</strong></td>
<td>Peak Reduction Credit 10 A</td>
</tr>
<tr>
<td></td>
<td>Off-Peak Credit 10 A</td>
</tr>
<tr>
<td></td>
<td>Delivery Credit 10 A</td>
</tr>
<tr>
<td><strong>Demand Response</strong></td>
<td>Periodic 10 A</td>
</tr>
<tr>
<td></td>
<td>Programmatic N/A</td>
</tr>
<tr>
<td><strong>Resiliency Add-Ons</strong></td>
<td>Battery Storage Incentive N/A</td>
</tr>
<tr>
<td></td>
<td>EV Charging Incentive N/A</td>
</tr>
<tr>
<td><strong>Metering Requirements</strong></td>
<td>Advanced Time-of-Use N/A</td>
</tr>
<tr>
<td></td>
<td>Sub Metering N/A</td>
</tr>
<tr>
<td></td>
<td>Load Monitoring N/A</td>
</tr>
</tbody>
</table>

## “100% Clean Energy”

**Environmentally-Forward**

### Carbon Intensity (MTCO2e/kWh)
- Average: 0.016
- Peak: 0.022

### Pricing (Residential)
- Basic (per month): $20.50
- Delivery/Demand: 2.624/kWh
- Energy credits: 2.524/kWh

### Consumption
- Peak Reduction Credit: 10 A
- Off-Peak Credit: 10 A
- Delivery Credit: 10 A

### Demand Response
- Periodic: 10 A
- Programmatic: N/A

### Resiliency Add-Ons
- Battery Storage Incentive: N/A
- EV Charging Incentive: N/A

### Metering Requirements
- Advanced Time-of-Use: N/A
- Sub Metering: N/A
- Load Monitoring: N/A

## “Customer-Optimized”

**Allows customers to control cost/carbon**

### 2023-2025

Synchronize consumption and generating resources that will minimize environmental impacts, while maintaining reliability

### 2025-2028

Encourages customers to control consumption to optimize cost, environment, and reliability

---

EWEB

**“Northwest Mix”**

Available Today

An electricity mix assembled and managed to meet forecasted consumption

---

Eugene Water & Electric Board
Carbon Intensity Trends

Carbon Intensity (MTCO2e/MWh)

- WECC
- WECC_NWPP_US
- BPA_OR
Future Electricity Products

- EWEB/PNW Energy Blend
- Pre-Pay Option
- 100% Clean Energy
- Customer-Optimized
- Enhanced Options/Add-Ons

Enhanced Metering
Enhanced Cost-of-Service
Time-Based Consumption
Demand Response
Supply Chain
Electricity/Climate Strategy

1. Influence Policy
2. Regional Market Development
3. Conservation/Efficiency
4. Expand Consumption Choice(s)
Questions