Drought Impacts on Hydropower in Arizona

Drought Interagency Coordinating Group

Jack Murray
May 4, 2022
What is WAPA?

• Power Marketing Administration under Department of Energy
• Wholesale electricity supplier
• 15-state footprint
• 17,000 miles of transmission lines
• 700 customers who, in turn, serve 40 million Americans
• Power from Glen Canyon Dam, Hoover Dam, Davis Dam, and Parker Dam
Parker-Davis Project – FY 2022

1,325 GWh of Generation, 108 GWh of Purchases

- Actual
  - OCT: 95
  - NOV: 78
  - DEC: 66
  - JAN: 77
  - FEB: 89
  - MAR: 141
  - APR: 147
  - MAY: 153
  - JUN: 135
  - JUL: 124
  - AUG: 114
  - SEP: 107

- Forecasted
  - OCT: 7
  - NOV: 4
  - DEC: 13
  - JAN: 6
  - FEB: 0
  - MAR: 2
  - APR: 7
  - MAY: 7
  - JUN: 10
  - JUL: 16
  - AUG: 19
  - SEP: 19

- Purchases
- Generation
Price of Purchases
## Cost of Purchases

<table>
<thead>
<tr>
<th>Year</th>
<th>GWh</th>
<th>Purchase Cost (millions)</th>
<th>% of Typical Operating Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>2022</td>
<td>108</td>
<td>$13.3</td>
<td>72%</td>
</tr>
<tr>
<td>2023</td>
<td>114</td>
<td>$12.5</td>
<td>68%</td>
</tr>
<tr>
<td>2024</td>
<td>121</td>
<td>$8.7</td>
<td>47%</td>
</tr>
<tr>
<td>2025</td>
<td>139</td>
<td>$9.9</td>
<td>54%</td>
</tr>
<tr>
<td>2026</td>
<td>145</td>
<td>$8.9</td>
<td>48%</td>
</tr>
<tr>
<td>2027</td>
<td>166</td>
<td>$9.9</td>
<td>54%</td>
</tr>
<tr>
<td>2028</td>
<td>177</td>
<td>$10.3</td>
<td>56%</td>
</tr>
<tr>
<td>2029</td>
<td>178</td>
<td>$10.2</td>
<td>55%</td>
</tr>
<tr>
<td>2030</td>
<td>174</td>
<td>$9.9</td>
<td>54%</td>
</tr>
</tbody>
</table>
# Drought Cost Estimate (2022 – 2030)

<table>
<thead>
<tr>
<th>Boulder Canyon Project (Hoover)</th>
<th>Millions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Rate Impact</td>
<td>$196</td>
</tr>
<tr>
<td>Replacement Power</td>
<td>548</td>
</tr>
<tr>
<td>Renewable Energy Certificates (NV)</td>
<td>5</td>
</tr>
<tr>
<td>Green House Gas (CA)</td>
<td>31</td>
</tr>
<tr>
<td>Ancillary Services</td>
<td>145</td>
</tr>
<tr>
<td>Resource Adequacy (CA)</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$939</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parker-Davis Project</th>
<th>Millions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replacement Power</td>
<td>$41</td>
</tr>
<tr>
<td>Renewable Energy Certificates (NV)</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$42</strong></td>
</tr>
</tbody>
</table>
Directly Affected Arizona Customers

Arizona Electric Power Cooperative
Arizona Power Authority
City of Mesa
City of Williams
Colorado River Agency
Electrical District No. 3
Fort Mohave Indian Tribe
Hohokam Irrigation and Drainage District
Luke Air Force Base
Marine Corps Air Station Yuma
Salt River Project
San Carlos Irrigation and Drainage District

Tohono O'odham Utility Authority
Town of Fredonia
Town of Gilbert
Town of Marana
Town of Thatcher
Town of Wickenburg
Wellton-Mohawk Irrigation and Drainage District
Yuma County Water Users Association
Yuma Irrigation District
Yuma Proving Grounds
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