Hydropower Impacts on Electrical System Production Costs in the Southwest United States

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Objectives are to understand:

• the value and impact of hydropower on electrical system operations and costs
• how the value is changed by the amount of water available, and with renewable energy additions
# Value of Hydropower

## Method
- Production cost modelling of power system operation
- Energy Exemplar software PLEXOS, Western Interconnect

## Key Results
- Annual mean locational marginal price (LMP) of energy: \( \sim \$33/MWh \)
- Price paid to replace hydropower in case of drought

<table>
<thead>
<tr>
<th>Drought Case-</th>
<th>BAU ($/MWh)</th>
<th>Retire ($/MWh)</th>
<th>Solar ($/MWH)</th>
<th>Retire + Solar ($/MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate Drought</td>
<td>73.63</td>
<td>73.88</td>
<td>73.56</td>
<td>73.83</td>
</tr>
<tr>
<td>Extreme Drought</td>
<td>75.65</td>
<td>77.10</td>
<td>57.77</td>
<td>75.76</td>
</tr>
</tbody>
</table>

- Value of hydropower \( \approx \) double the average LMP