REINVigorating Hydropower

A cornerstone of our clean, affordable, reliable electric future

Prepared by
National Hydropower Association and
Chelan County Public Utility District
Between 2019 and 2030, the federal operating licenses of 325 hydropower projects will expire (an installed capacity of over 16 gigawatts).

Licensees are evaluating whether and how to relicense projects, and at what acceptable cost.

- Markets that do not value hydropower grid services
- State renewable portfolio policies limit hydropower eligibility and tax policy disfavors hydropower
- Corporate purchasing policies favor “new” wind and solar
- Hydropower has the longest licensing process of any generating resource
- Research budgets underfund hydropower compared to other resources
- Quality and contracting issues are affecting equipment longevity
Wind and solar power have grown exponentially over the last decade. Hydropower has remained fairly steady, depending on water availability.
## Comparison of Electric Power Resource Characteristics

<table>
<thead>
<tr>
<th>Flexible Capacity</th>
<th>Firm capacity</th>
<th>Annual energy</th>
<th>Regulation</th>
<th>Spin reserves</th>
<th>Non-spin reserves</th>
<th>Long-Term Storage</th>
<th>Inertia</th>
<th>Black Start</th>
<th>Carbon-Free</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydroelectric (large project)</td>
<td>yes</td>
<td>yes, water dependent</td>
<td>yes, water dependent</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Gas (CCCT)</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes, could be limited</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Gas (SSCT)</td>
<td>limited</td>
<td>yes</td>
<td>yes, could be limited</td>
<td>yes</td>
<td>yes</td>
<td>yes, could be limited</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Coal</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>limited</td>
<td>limited</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Nuclear</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td>no</td>
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<tr>
<td>Biomass</td>
<td>limited</td>
<td>yes</td>
<td>yes</td>
<td>yes, could be limited</td>
<td>yes, could be limited</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>limited</td>
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<tr>
<td>Geothermal</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Solar, PV</td>
<td>no</td>
<td>location dependent</td>
<td>yes, location dependent</td>
<td>yes, limited by energy potential</td>
<td>yes, limited by energy potential</td>
<td>yes, limited by energy potential</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Solar, thermal</td>
<td>no</td>
<td>limited to yes</td>
<td>yes, location dependent</td>
<td>yes, limited by energy potential</td>
<td>yes, limited by energy potential</td>
<td>yes, limited by energy potential</td>
<td>yes</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Wind</td>
<td>no</td>
<td>location dependent</td>
<td>yes, limited by energy potential</td>
<td>yes, limited by energy potential</td>
<td>yes, limited by energy potential</td>
<td>yes, limited by energy potential</td>
<td>no</td>
<td>possibly, using synthetic product</td>
<td>no</td>
</tr>
</tbody>
</table>
The Northwest: A Case Study

U.S. hydropower (80 GW) and pumped storage hydropower (20 GW) annual capacity additions and cumulative capacity from 1890–2015 (GW)

How to Reinvigorate Hydropower

- Recognize market value for hydropower’s attributes (e.g. capacity, flexible capacity, operating reserves, inertia, frequency response).

- Choose technology neutral policies for carbon reduction and ensure incentives treat hydropower equitably.

- Allow reinvestment in existing hydropower to meet “additionality” criteria.
How to Reinvigorate Hydropower

- Shorten and simplify the licensing process
- Expand research and development budgets and support hydropower’s digital transformation
- Improve contracting and quality control practices to encourage long-term investments
Recent Developments

- Washington’s clean energy transformation bill
  - Hydropower recognized as a renewable
  - Tax parity?

- America’s Water Infrastructure Act
  - Incentivizes early investments at hydropower projects before relicensing

- Corporate purchaser outlook: Microsoft power supply contract

- Hydropower Research Institute
Highlighted: Congressional Areas of Focus

- Recognize market value of hydropower’s attributes
- Include hydropower in new energy and climate policies and provide equitable incentives
- Improve contracting and quality practices to ensure long-term investment grid
- Shorten and simplify the licensing process
- Revisit “additionality” limitations in renewable policies
- Expand research and development budgets and support hydropower’s digital transformation

Improved Investment in Hydropower
Questions?

Suzanne Grassell
Government Affairs Program Manager
Chelan County Public Utility District
(509) 264-1010
► Suzanne.Grassell@chelanpud.org