



## Role of Hydropower to Meet Regional Needs

+ Hydropower resources provide unique system benefits to support system needs in the region

System Benefit	Hydropower Capabilities	Value Over Time
Capacity for Resource Adequacy	<ul style="list-style-type: none"><li>Hydropower provides significant RA capacity through its maximum expected generation (CA) or sustained peaking capability (NW)</li></ul>	<ul style="list-style-type: none"><li>RA will be <b>highly valuable across the planning horizon</b></li></ul>
Carbon Free Energy	<ul style="list-style-type: none"><li>Hydropower's carbon-free energy comes at low-cost without any new transmission needs or development risk</li><li>Hydro energy also provides the financial benefit of avoiding natural gas fuel costs</li></ul>	<ul style="list-style-type: none"><li>Carbon-free energy will be <b>increasingly valuable</b> to both CA and the NW as clean energy policy targets become more stringent</li></ul>
Reserves and Flexibility	<ul style="list-style-type: none"><li>Hydro provides a zero-emissions source of ancillary services (spin, regulation, etc.) and ramping capabilities to integrate variable renewable energy</li><li>Flexibility may change as a function of time of year and water availability</li></ul>	<ul style="list-style-type: none"><li>Renewable integration value will be <b>increasingly valuable</b>, though batteries can provide some similar services</li></ul>
Other Essential Reliability Services (ERS)	<ul style="list-style-type: none"><li>Hydro also provides key reliability services (reactive power, inertia, blackstart, etc.), including some that cannot currently be provided by asynchronous generators</li></ul>	<ul style="list-style-type: none"><li>ERS will be <b>increasingly valuable</b> as other synchronous generators retire</li></ul>

Not calculated in RESOLVE but will be described qualitatively in project report