

Objective Category	Objectives for Using Demand-side Resources <sup>1</sup>
<p><b>Improve System Economics</b></p>	<p><b>Defer Capital Expansion</b> – delaying the outlay of large capital investment in power system asset expansion through optimized utilization of existing assets. Demand-side resources can be managed to reduce peak loading (on a system-wide or facility-level) and thereby defer capital expansion, which is sized to support peak usage.</p> <p><b>Shift Load to lower cost period</b> – utilizing demand-side resources to shift load from high price periods to lower price period, and thus improve system and/or customer-level economics.</p> <p><b>Serve Isolated Remote Load</b> – deploying demand-side resources to substitute for building new lines to serve isolated or remotely located loads, especially under the obligation to serve load.</p> <p><b>Reduce Losses</b> – utilizing demand-side resource capabilities for Voltage and VAR management, as well as phase balancing, to reduce distribution system losses.</p>
<p><b>Maintain and/or Enhance System Reliability</b></p>	<p><b>Reduce Facility Loading</b> – grid facility (e.g., transformer, feeder, circuit, substations) load reduction using demand-side resources to avoid equipment overload.</p> <p><b>Provide Voltage Regulation</b> – Utilizing active demand-side resources capable of power factor adjustment (e.g., PV with adjustable voltage output) by supplying reactive power to improve voltage levels on circuits). Theoretically, can also surgically use voltage-sensitive loads to improve voltage characteristics of a circuit by changing the mix of the load.</p> <p><b>Support System Restoration</b> – utilizing demand-side resources for coordinated electric service restoration within the bounds of system operating constraints.</p> <p><b>Support System Protection</b>- maintaining system dynamic security through fast response actions capable of responding to a system disturbance or fault within milliseconds (e.g., under-frequency load shedding).</p> <p><b>Provide Ancillary Service Capacity Reserve</b> – demand-side resources with adequate direct load control, telemetry, and dispatch capabilities can provide emergency grid support and reserve services (e.g., spinning or non-spinning reserve).</p> <p><b>Provide Ramping and Balancing Energy</b> – dispatchable demand-side resources can be applied to mitigate the system impact of variable energy resources, by providing ramping response and balancing energy services.</p> <p><b>Improve Distribution Phase Balancing</b> - surgically applying demand-side resources to mitigate imbalance between the three phases of the distribution circuit.</p> <p><b>Provide for Micro-Grid Operation</b> – Provide support for local supply under intentional and unintentional islanding conditions.</p>
<p><b>Enhance Customer Choice</b></p>	<p><b>Meet Customer Need</b> – addressing growing customer demands to connect demand-side resources, with grid and tariff capabilities to connect and manage the resources, including plug-in electric vehicles (PEVs).</p> <p><b>Enhance Service Innovation</b> – offering greater levels of choice for electric service to customers (e.g., subscriptions for demand, premium power, green power, etc.)</p>
<p><b>Environmental Compliance</b></p>	<p><b>Meet Renewable Portfolio Standards (RPS)</b> – abiding by regulatory or energy policy mandates for renewable energy within a given region or jurisdiction. Customer and utility-based distributed renewable generation could be a major strategy element in meeting RPS requirements.</p> <p><b>Reduce Greenhouse Gas (GHG) Emissions</b> – achieving net reductions in carbon emissions. Environmental concerns over carbon emissions are promoting conservation, energy efficiency, renewable energy, and other cleaner alternatives to traditional fossil-fired generation.</p>

<sup>1</sup> Demand-side resources include curtailable loads, distributed generation, storage, and renewable resources located on the customer-side of the meter; and can be used to create a dynamic change in electricity consumption coordinated with grid or market needs.