

IRP Modeling Helps Shape Optimal Mix of Resource Options

With feedback from stakeholders and the public, TVA is currently working on its 2026 Integrated Resource Plan (IRP), which will provide strategic direction for the region’s future power system.

A critical step in the planning process is the development of a set of power-generation resource options to be considered in the IRP analysis.

The IRP’s robust analytical process begins with a scenario and strategy-based framework. Scenarios explore possible futures, or worlds, that TVA may find itself operating over the next 20 or more years. Strategies reflect alternative business approaches TVA could employ to meet electricity demand in those worlds.

Next, a comprehensive set of mature and emerging resource options was prepared for consideration in the IRP analysis.

The resource options include mature, proven technologies: nuclear, hydro, coal, gas, renewables, storage, energy efficiency (EE) and demand response (DR).








They also include emerging technologies with reasonable prospects of becoming commercially available between now and 2050, such as small modular reactors, carbon capture and sequestration, and advanced chemistry batteries.

When evaluating resource types, the analysis considers factors such as the cost to build and operate, system fit, and ability to be dispatched when needed.

Power-generation resources serve different needs – from those that run continually to meet constant energy needs, to those that help meet fluctuating needs, to those that are used for a few hours when energy demand is at its highest.

IRP modeling helps shape the optimal mix of resources to meet the region’s future energy needs. Maintaining resource mix diversity is fundamental to TVA’s ability to provide affordable, reliable, and resilient energy to the residents, businesses, and industries in the region.

IRP Resource Options

 <p>Nuclear</p> <ul style="list-style-type: none"> • Advanced pressurized water reactor (APWR) • Light water small modular reactor (LW SMR) • Generation IV small modular reactor (Gen IV SMR) 	 <p>Hydro</p> <ul style="list-style-type: none"> • Hydro uprates 	 <p>Coal</p> <ul style="list-style-type: none"> • Supercritical pulverized coal • Supercritical pulverized coal w/carbon capture 	 <p>Gas</p> <ul style="list-style-type: none"> • Combined cycle (CC) • CC w/ carbon capture • Combustion turbine (CT) • Aeroderivative • Reciprocating engine (RICE) 	 <p>Renewables</p> <ul style="list-style-type: none"> • Utility-scale solar • Distributed solar • Midwest wind • Southeast high-hub wind 	 <p>Storage</p> <ul style="list-style-type: none"> • Pumped storage • Lithium-ion battery (4-hour) • Advanced chemistry battery (8-hour) • Distributed storage 	 <p>EE and DR</p> <ul style="list-style-type: none"> • Energy efficiency (EE) • Demand response (DR)
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