

Unleashing American Energy

Overview of TVA's 2026 Integrated Resource Plan

What is the Integrated Resource Plan?

The Tennessee Valley Authority's (TVA) Integrated Resource Plan (IRP) evaluates the long-term demand for power in the TVA region, the resource options available for meeting that demand, and the potential economic, operating, and environmental impacts of these options. Consideration of stakeholder input is integral to TVA's IRP process. The IRP will provide strategic direction for meeting the region's energy needs between now and 2050, establishing a strong planning foundation and informing TVA's next long-range financial plan.

Why update the IRP now?

The IRP is being updated to reflect changes in the Valley region and utility industry, including increasing demand for electricity, evolving U.S. energy policy, and advancements in emerging energy technologies. The IRP recommendations, which are based on statutory least-cost planning principles, will shape the future power system, ensuring that the region has affordable, reliable, and resilient energy for years to come.

The IRP Planning Approach

Objectives of Resource Planning

TVA applies the following least-cost principles, aligned with Section 113 of the Energy Policy Act of 1992, to develop plans for providing affordable, reliable, and resilient energy over the long term: low cost, risk informed, environmentally responsible, reliable and resilient, diverse, and flexible. Least-cost planning evaluates these factors with an objective of providing reliable electric service at the lowest system cost.

Scenarios

TVA's IRP is based on a "scenario" planning approach. The scenarios explore potential future worlds which TVA may find itself operating in driven by factors outside of TVA's control. These include key uncertainties related to electricity demand, macro-economic trends, commodity prices, U.S. energy policy, and other factors.

Strategies

The IRP then explores potential strategies, or business approaches, which TVA could employ to meet future energy demand. Baseline Utility Planning represents fundamental least-cost planning, while alternative strategies emphasize specific themes, such as an emphasis on innovative technologies like advanced nuclear.

SCENARIOS

	Reference Represents TVA's current forecast that reflects moderate population, employment, and industrial (primarily data center) growth, weather-normal trends, growing electrification, and increasing efficiencies
	High Growth Reflects a technology-driven increase in U.S. productivity growth that stimulates the national and regional economies, resulting in substantially higher demand for electricity
	Carbon Legislation Reflects the impact of potential future carbon legislation designed to reduce power sector emissions.

STRATEGIES

	Baseline Utility Planning Represents TVA's current outlook based on least-cost planning, incorporating existing programs and a planning reserve margin target. This reserve margin target applies in all strategies
	Innovation Emphasizes emerging, firm and dispatchable technologies such as advanced nuclear and long-duration storage through innovation, continued R&D, and partnerships.
	Distributed Emphasizes distributed technologies such as batteries, renewables, and demand-side programs to reduce reliance on central station generation and utilize virtual power plants

Resource Options

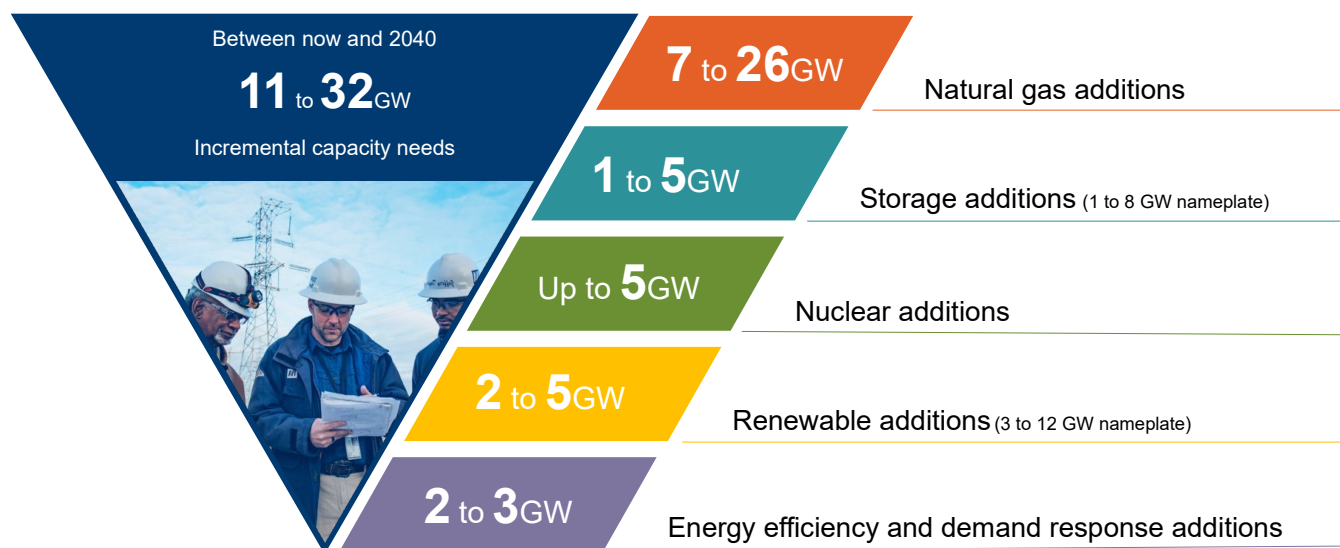
The IRP considered a wide range of supply-side, distributed, and demand-side resources, including the following fuel types: nuclear, hydro, coal, natural gas, renewables, storage, and energy efficiency and demand response (EE and DR). All resource types were available for selection in all IRP portfolios.

IRP Modeling

TVA used an industry-standard model that applied a planning reserve margin and other key assumptions. For each unique scenario and strategy combination, the planning model solved for the lowest-cost resource portfolio. Applying the three strategies in the three scenarios generated nine potential resource portfolios which were analyzed using metrics that reflect least-cost planning principles. Finally, sensitivity analysis was performed to answer key “what if?” questions focused on electricity demand changes, resource costs and availability, and natural gas commodity prices to gain additional insights and inform IRP recommendations.

Portfolio Results

Looking across all portfolios, including sensitivity analysis, through 2040, IRP results suggest:



Power supply mix ranges, summarized in gigawatts (GW) above, vary based on energy demand, market conditions, policy and regulations, and technology advancements.

- New capacity is needed in all scenarios to support load growth or replace expiring and end of life capacity.
- Firm, dispatchable technologies are needed to ensure system reliability throughout the year.
- Gas expansion serves broad system needs, with the ability to provide firm, dispatchable capacity, economic energy, and system flexibility.
- Storage expansion continues, driven by both battery storage and the potential for additional pumped storage.
- New nuclear technologies, with continued advancements, can support load growth and reduce fuel volatility and regulatory risks.
- Solar expansion plays a complementary role, meeting customer needs and providing economic energy.
- Energy efficiency deployment reduces energy needs, particularly between now and 2040, and demand response programs grow with the system and the use of smart technologies

Strategy Performance

Reflecting least-cost planning principles, TVA developed a set of metrics to assess the performance of the nine core portfolios. Metrics were used to evaluate tradeoffs between each strategy.

Strategy	Low Cost	Risk Informed	Environmentally Responsible			Diverse, Reliable, and Flexible
			Land	Water	Air	
A Baseline Utility Planning						
B Innovation						
C Distributed						

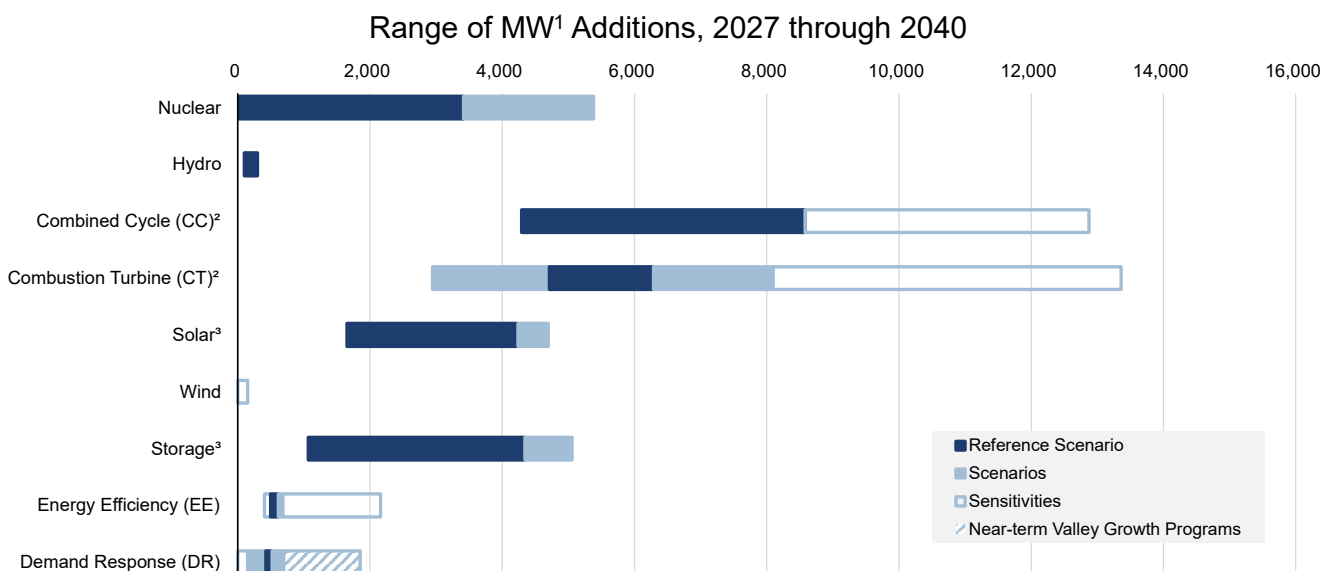
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IRP Recommendations

The IRP results provide robust analysis that offers insights into the potential power supply mix and impacts to the customer priorities of power cost, reliability, resiliency, and environmental responsibility. The IRP recommendations include power supply mix ranges through 2040 and 2050, strategic portfolio direction, and key signposts to monitor over the long term.

Power Supply Mix Ranges through 2040

The chart below shows the power supply mix ranges – or incremental additions – from now through 2040. The ranges encompass the full set of results, with reference scenario results shown in the dark blue bars, and alternative scenario and sensitivity results outside of the reference ranges shown in the light blue bars and outline-only bars, respectively.



¹ MW capacity expressed in summer net dependable capacity.

² CC and CT additions could include control technologies, such as carbon capture and sequestration, alternative fuel co-firing (e.g., hydrogen), or gas re-firing of existing coal burners.

³ Solar and storage include utility-scale and distributed resource additions.

Strategic Portfolio Direction

The 2026 IRP’s strategic portfolio direction includes the following recommended actions:

Existing Resources

- Invest in the hydro and nuclear fleets and pursue nuclear license extensions to maintain low-cost generation
- Invest in the gas and storage fleets to maintain reliability
- Continue operation of the coal fleet, subject to regulatory requirements, to reduce total system cost and reliability risk

Supply-side Resource Additions

- Add firm, dispatchable gas to maintain system reliability and enhance flexibility
- Add firm, dispatchable storage to maintain system reliability and improve system efficiency
- Pursue solar to reduce total system costs or meet customer needs
- Suspend wind additions given cost and portfolio fit challenges

Demand-side Resource Additions

- Utilize demand response and behind-the-meter resources to enable near-term interconnection of new industrial loads
- Partner with customers to leverage cost-effective energy efficiency and demand response
- Collaborate with local power companies on the evolution of distributed generation programs

Grid and Innovation Enablement

- Prepare for Gen III+ and Gen IV nuclear to support load growth and reduce fuel volatility and regulatory risks while pursuing external funding opportunities
- Pursue transmission system enhancements to deliver low-cost generation resources
- Collaborate with industry partners to evaluate emerging technologies, such as fusion and long-duration storage

Key Signposts and Implications

TVA identified key signposts to monitor that will provide insights into potential impacts to recommended actions between now and 2040 and will ultimately guide future portfolio decisions. Movement in key signposts can signal potential shifts in the portfolio mix and indicate the appropriate timing for the next IRP.

Theme	Signpost
 Changing Market Conditions	Electricity demand
	Natural gas prices
	Customer needs
	Resource costs
 Evolving Policy and Regulations	Shifts in U.S. energy policy
	Tax credits and incentives
	Regulatory requirements
	Permitting and siting challenges
 Emerging Technologies	Advanced nuclear technologies
	Advanced storage technologies

Implementation

A key next step in implementing the IRP recommendations is translating the IRP’s strategic direction into an executable asset strategy from an operational, commercial, and financial perspective. A successful asset strategy also relies on partnering with TVA customers, especially on the distributed and demand-side aspects of the plan, and with other key stakeholders. Site-specific aspects of actions that are later proposed to implement the IRP strategic direction will be addressed and considered in tiered environmental reviews and subject to any required TVA Board approvals.

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