TENNESSEE VALLEY AUTHORITY

Regional Energy Resource Council

February 24 and 25, 2025

6th Meeting – Term 6

Welcome!

The Meeting will begin at 12:00 PM Central

WIFI:
Password: TVAIRP2025

Welcome

TENNESSEE VALLEY AUTHORITY

RERC Live and Virtual Meeting

- **This is the sixth meeting of the 6th term of the RERC.**
- **We welcome members of the public attending virtually and are in listen only mode**. For those that pre-registered to make public comments, the meeting host will give you instructions for speaking to the Council at that time. Written comments are always welcomed (tva.com/rerc).
- For those wishing to ask questions, there will be a **public IRP webinar** on Thursday, **February 27** from 6 PM-7:30 PM CT. You can register at tva.com/irp
- **RERC Members who are attending virtually are able to mute and unmute their own line.** RERC Members who are attending virtually may use the raise hand function to be recognized for questions or comments.
- **RERC Members attending in person**, please turn your light bulb on and I will call on you. I will identify the person I call on so that those attending virtually will be able to identify the speaker. Please use your microphone so that those in the room and those attending virtually can hear your comments.

Safety First!

- **In case of fire or other building emergency,** exit the conference room doors you entered. Exit the building via the front doors to the parking lot. Gather outside across from the hotel.

- **In case of severe weather**, exit the doors you entered in the back of the room. You will be guided to an interior room.

Introductions

Name

Position, Organization, Location

Favorite Spring Activity

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RERC Term 6* Members

Introductions:
Name
Position, Organization, Location
Favorite Spring Activity

Jan Berry
Citizens Climate Education

Marquita Bradshaw
Sowing Justice

Ron Bunch
Bowling Green Chamber of Commerce

Monte Cooper
Jackson Energy Authority

Erin Gill, RERC Chair
Knoxville Utilities Board

Rebecca Goodman
Commonwealth of Kentucky

Rodney Goodman
Habitat for Humanity

Chassen Haynes
Ford Motor Company

Chrissy Heard
State of Mississippi

Chelsea Jenkins
Commonwealth of Virginia

Candy Johnson
Urban League of Greater Chattanooga

Sen. Steve Livingston
State of Alabama

Pete Mattheis
Tennessee Valley Industrial Committee

Dan Miller
Oak Ridge National Laboratory

Doug Peters
Tennessee Valley Public Power Association

Boyd Pettit
State of Georgia

Erik Schmidt
City of Chattanooga

Patricia Sims
Drake State Community & Technical College

Alexa Voytek
State of Tennessee

Julie Woosley
State of North Carolina

***Aug 1, 2023 – July 28, 2025

Agenda

RERC Meeting
Day 1- February 24, 2025

12:00 CT	Welcome / Call RERC Meeting to Order
12:10	Introductions and Agenda Review
12:20	DFO Briefing
12:30	Final 2025 IRP Updates • IRP Process and Schedule • IRP Stakeholder Plan • Final Modeling Updates • IRP Recommendations and Discussion
3:30	Break
3:45	Advice Question Discussion
5:00	Adjourn Day 1

Day 2 - February 25, 2025

9:00 CT	Day 1 Recap
9:15	Public Listening Session
10:15	Break
10:30	Finalize Advice Statement
11:45	Wrap Up
12:00	Adjourn Meeting

TVA Update

Melanie Farrell, Designated Federal Officer

TENNESSEE VALLEY AUTHORITY

Integrated Resource Plan (IRP) Update

Regional Energy Resource Council (RERC)
February 24, 2025

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IRP Update Agenda

IRP Process and Schedule Update

IRP Stakeholder Engagement

Final Modeling Updates

Preliminary IRP Recommendations

Next Steps and Advice Preparation Discussion

RERC Advice Discussion Preview

Candy Kelly; Sr. Manager, Resource Strategy

Advice Discussion Preview

Key discussion questions for formal advice statement:

1. Did the 2025 IRP process meet the objective of extensive, meaningful involvement of stakeholders and the public?
2. Are the boundaries of the IRP analysis sufficient to inform a strategic portfolio direction that enables TVA to provide affordable and reliable power that is increasingly cleaner and resilient?
3. What do you see as challenges and opportunities for TVA as recommended actions are implemented and signposts are monitored?

IRP Process and Schedule Update

Candy Kelly; Sr. Manager, Resource Strategy

2025 Integrated Resource Plan

The IRP is a study of how TVA could meet customer demand for electricity between now and 2050 across a variety of futures.

A programmatic Environmental Impact Statement (EIS) accompanies the IRP to evaluate its environmental effects.

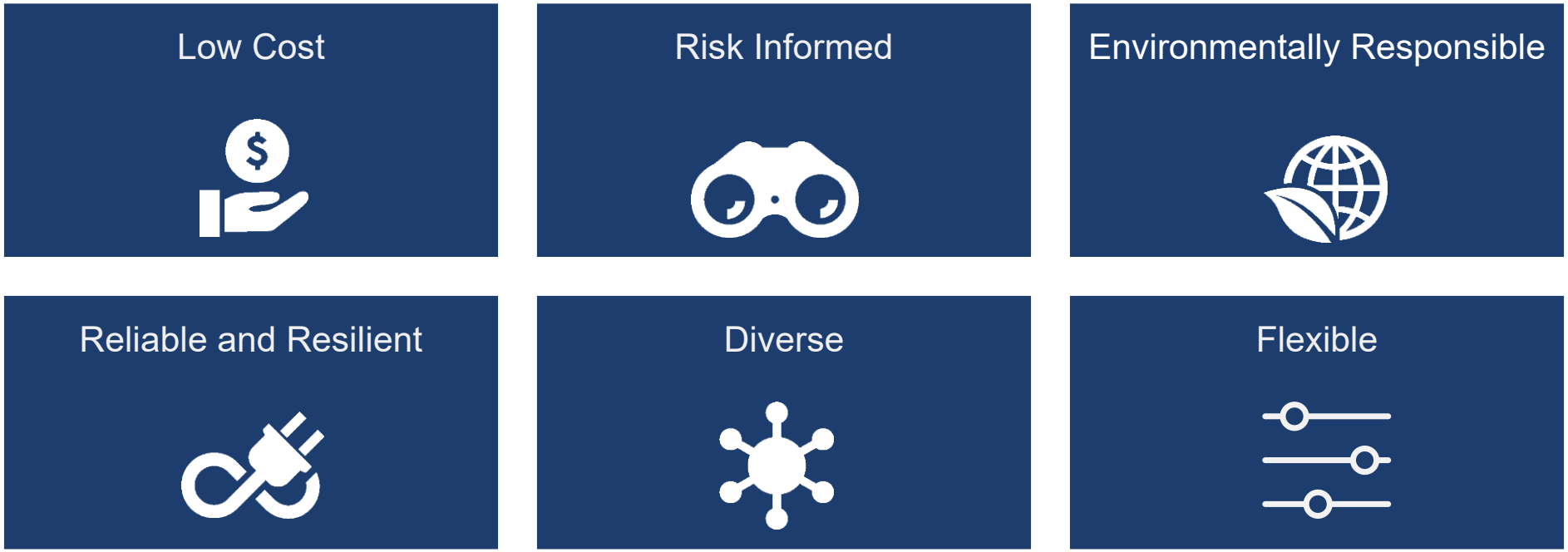
An updated IRP is needed to:

- Proactively establish a strong planning foundation for the 2030s and beyond
- Inform TVA's next long-range financial plan

The IRP provides strategic direction on how TVA will continue to provide low-cost, reliable, and increasingly cleaner electricity to the residents and businesses across the Valley region.

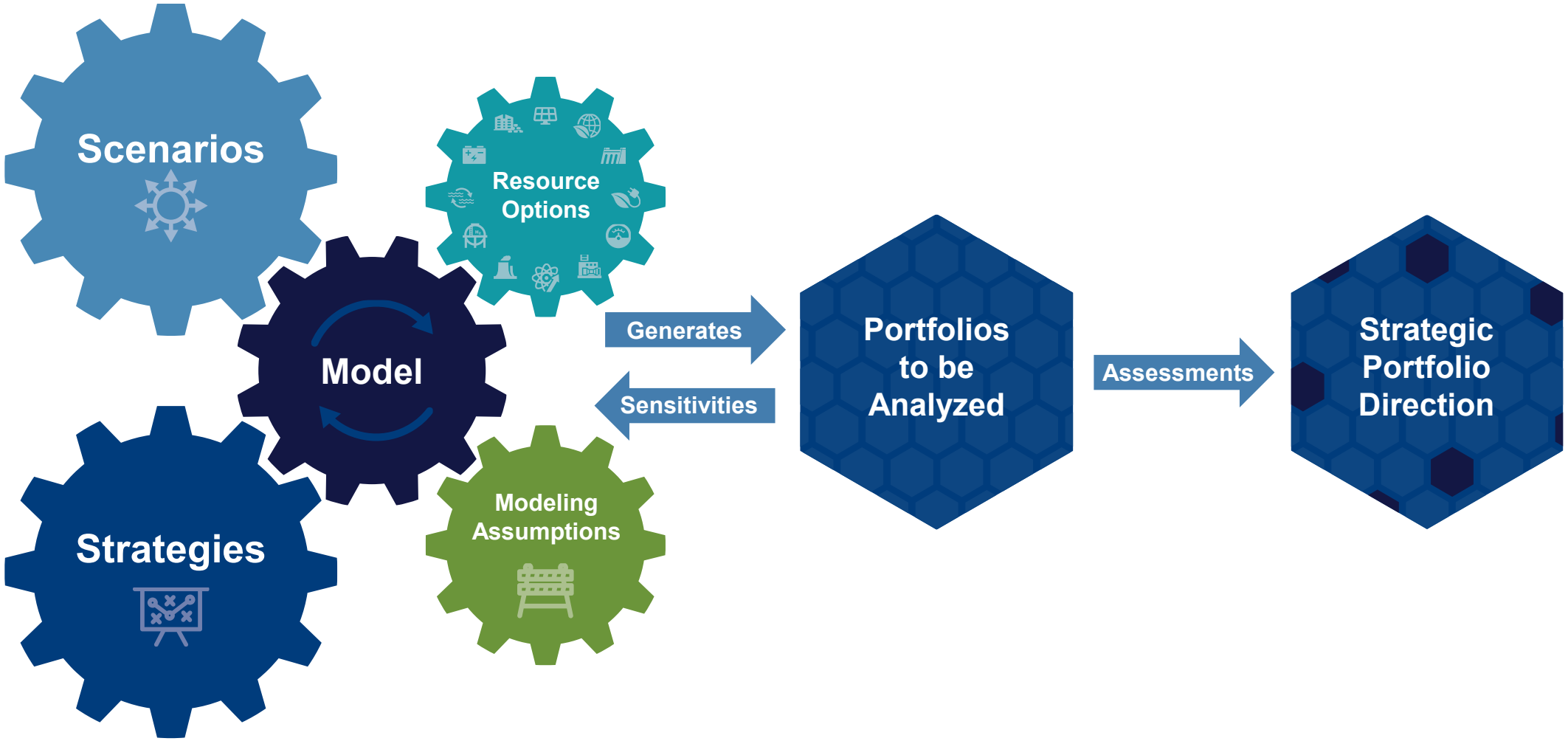
Planning is Grounded in Least-cost Principles

In resource planning, TVA applies fundamental least-cost planning principles*:



*In alignment with the Energy Policy Act of 1992

How the Integrated Resource Planning Process Works



Stakeholder feedback is a key component in the development of all model inputs.

Resource Planning for Future Capacity Needs

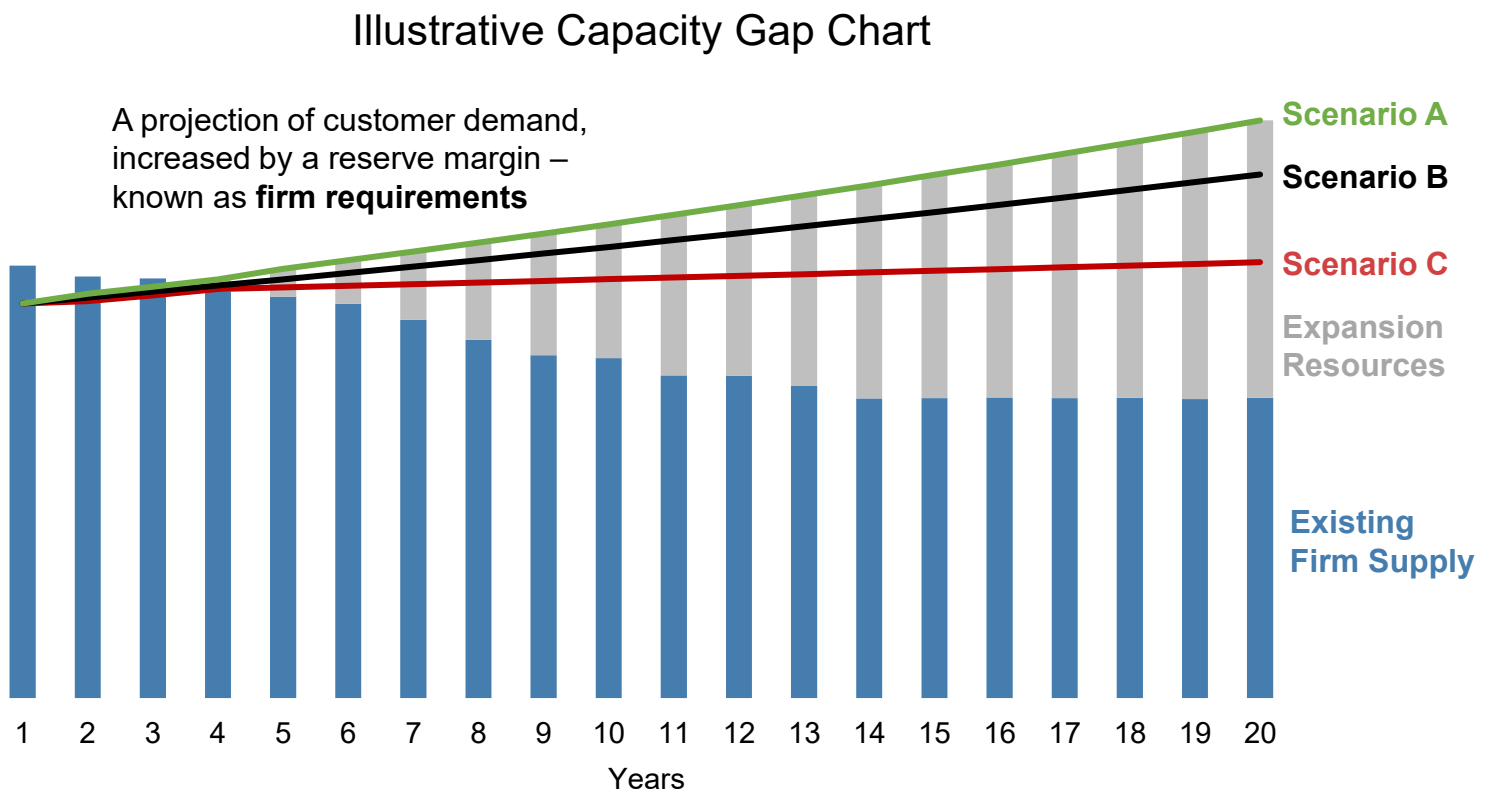
Recommended path provides low cost, reliability, diversity, and flexibility.

Resource planning is about optimizing the mix of future capacity.

Projections of new capacity needed are filled by the most cost-effective resources.

Multiple scenarios will be explored, reflecting different levels of forecasted demand.

Multiple strategies will be explored, resulting in different resource mixes to evaluate in each scenario.



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IRP Scenarios and Strategies

SCENARIOS

1 Reference (without Greenhouse Gas Rule)
Represents TVA's current forecast that reflects moderate population, employment, and industrial growth, weather-normal trends, growing electric vehicle use, and increasing efficiencies

2 Higher Growth Economy
Reflects a technology-driven increase in U.S. productivity growth that stimulates the national and regional economies, resulting in substantially higher demand for electricity

3 Stagnant Economy
Reflects rising debt and inflation that stifle consumer demand and business investment, resulting in weaker than expected economic growth and essentially flat electricity demand

4 Net-zero Regulation
Reflects the impact of the May 2023 draft Greenhouse Gas Rule that targets significant reductions in electric utility CO_2 emissions beginning in 2030 and potential future utility regulations striving for net-zero by 2050

5 Net-zero Regulation Plus Growth
Reflects the impact of the May 2023 draft Greenhouse Gas Rule and potential future utility regulations, along with substantial advancements in clean energy technologies, that spur economic growth and extensive electrification

6 Reference (with Greenhouse Gas Rule)
Reflects TVA's current forecast and incorporates the impact of the Greenhouse Gas Rule finalized in May 2024 that targets significant reductions in electric utility CO_2 emissions beginning in 2030

STRATEGIES

A 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

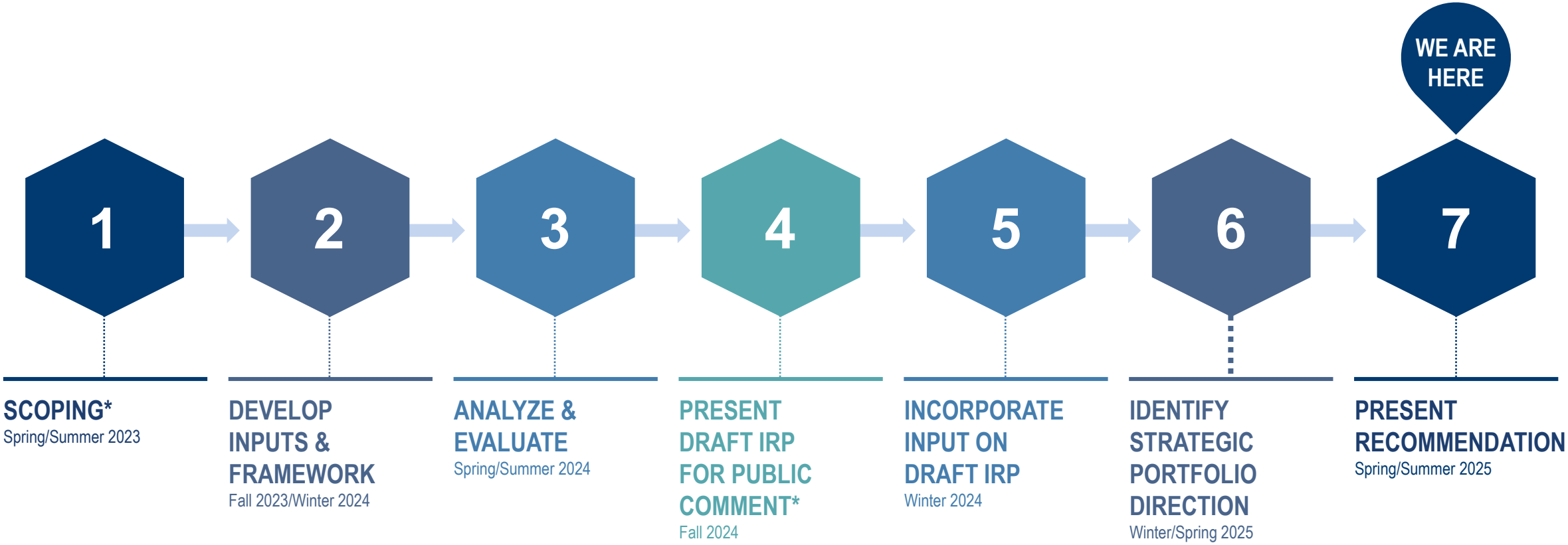
B Carbon-free Innovation Focus
Emphasizes and promotes emerging, firm and dispatchable carbon-free technologies through innovation, continued research and development, and strategic partnerships

C Carbon-free Commercial Ready Focus
Emphasizes proven carbon-free technologies like wind, solar, and storage, at both utility-scale and through customer partnerships, along with strategic transmission investment

D Distributed and Demand-side Focus
Emphasizes existing and potentially expanded customer partnerships and programmatic solutions to reduce reliance on central station generation and promote virtual power plants

E Resiliency Focus
Emphasizes smaller units and the promotion of storage, along with strategic transmission investment, to drive wider geographic resource distribution and additional resiliency across the system

IRP Timeline



**Opportunity for public feedback during 45-day scoping and 75-day draft IRP and EIS public comment periods.*

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IRP Stakeholder Engagement

Kelly Baxter; IRP NEPA Project Manager

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Stakeholder and Public Involvement

Utility of the Future Information Exchange

20 Stakeholder Reps

44 IRP Comments

Public Scoping

2 Public Webinars

115 Participants

Public Outreach and Briefings

4 Public Updates

333 Participants

Board Public Listening Sessions

6 Listening Sessions

27 IRP Comments

Regional Energy Resource Council

20 Stakeholder Reps

6 IRP Discussions

IRP Working Group

24 Stakeholder Reps

24 Working Meetings

Regional Engagements

5 Regions

840 Touchpoints

Public Review of Draft IRP and EIS

12 Open Houses

2,500 Comments

2025 IRP Public Open Houses

Virtual Meetings

- Oct 30 — After Business Hours
  6:00pm Central
- Nov 22 — During Lunch Hour
  11:00am Central

Unable to make it to a virtual or in-person meeting?

- Visit TVA's IRP website at: www.tva.com/irp for registration information
- Taped webinars will be available as well

In-person Meetings *at 6 PM Local Time*

- Oct 28 — Antioch, TN
  Southeast Community Center
- Nov 4 — Oak Ridge, TN
  East Tennessee Economic Council
- Nov 7 — Hopkinsville, KY
  The Bruce Center
- Nov 12 — Huntsville, AL
  Calhoun Community College
- Nov 13 — Starkville, MS
  The Gathering Starkville
- Nov 14 — Memphis, TN
  Museum of Science & History
- Nov 20 — Rossville, GA
  Rossville Middle School
- Nov 21 — Chattanooga, TN
  Kingdom Center
- Dec 3 — Murphy, NC
  Tri-County Community College
- Dec 5 — Bristol, VA
  Virginia High School

Public comment period began on September 23, 2024, and ended on December 11, 2024

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Draft 2025 IRP Public Comments Received

Almost 2,500 total comments were submitted on the Draft IRP and EIS

- About 900 comments were submitted through the online portal, at least 300 of these have "form-letter" language encouraging the use of clean energy generation sources
- In total, about 1,900 email and online submittals containing “form” letters – all are pro-renewables and urge TVA toward decarbonization (76 percent)
    - Included in this total were a large number (400+) of comments regarding TVA’s Illinois coal mineral rights, which is outside of the scope of the IRP
- Non-form submittals account for about 600 comments (24 percent)
    - About 70 discrete emails and letters were submitted
    - Several letters are from agencies, a government representative, and about 20 NGOs and other organizations

Final Modeling Updates

Hunter Reed; IRP Project Manager

Analysis Tools within the IRP

Scenarios

Describe potential outcomes due to a combination of factors outside TVA's control

Strategies

Test various business options within TVA's control

Stochastics

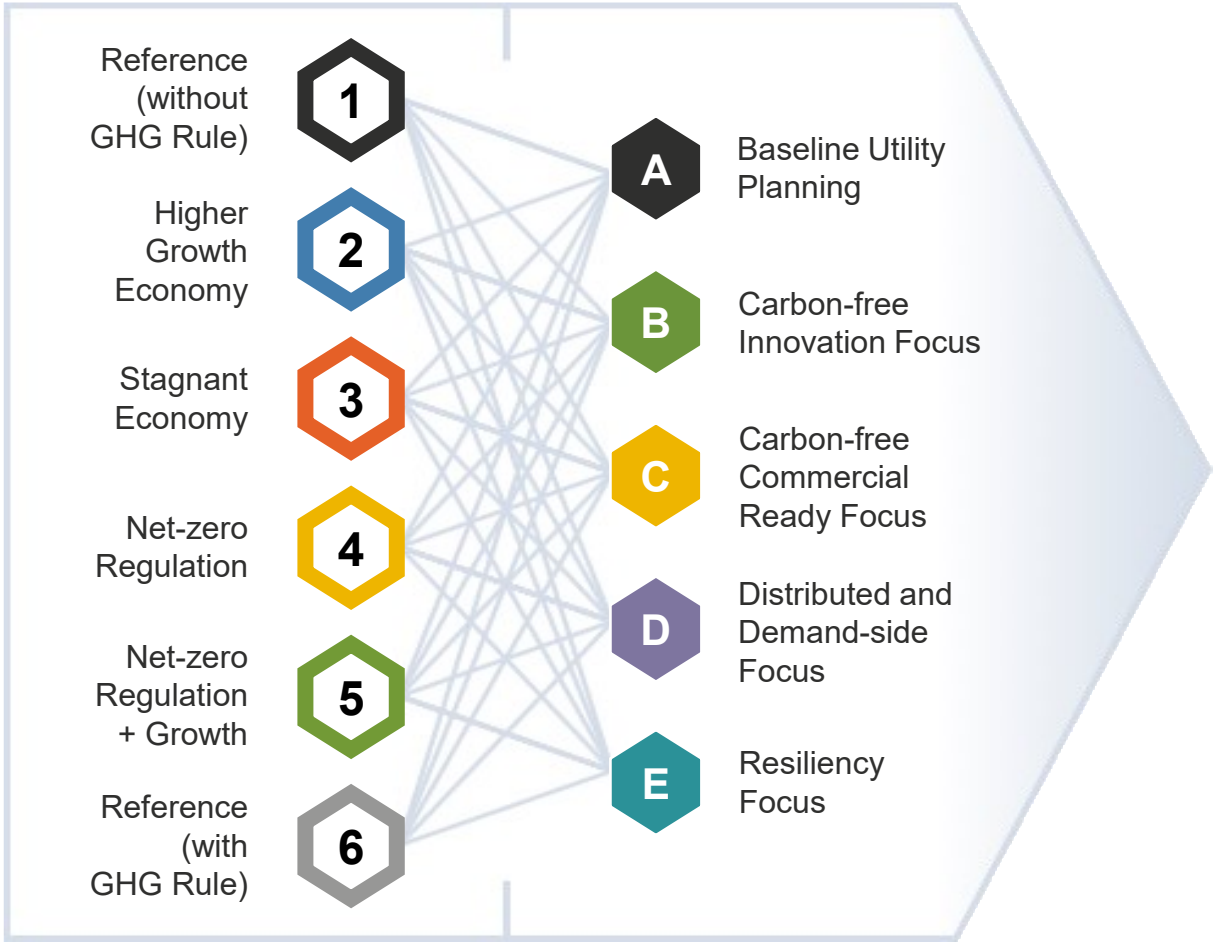
Evaluate risk of uncertainties around key planning assumptions within each portfolio

Sensitivities

Test a change in a key assumption for a particular portfolio to isolate its impact

IRP Utilizes a Rigorous Analytical Process

6 SCENARIOS x 5 STRATEGIES



30 PORTFOLIOS

Stakeholder feedback and public comments informed the development of scenarios and strategies that combine to form 30 unique, core portfolios.

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Draft IRP Results Suggest by 2035…

Between now and 2035
9 to 26 GW
Incremental firm capacity needs

3 to 20 GW
Solar nameplate additions

4 to 19 GW
Natural gas, hydrogen, and CCS additions

1 to 4 GW
Energy Efficiency and Demand Response additions

In all scenarios, TVA will continue to provide AFFORDABLE, RELIABLE, RESILIENT, and increasingly CLEANER energy for the region for decades to come.

Up to 6 GW
Storage nameplate additions

Up to 4 GW
Wind nameplate additions

Up to 1 GW
Nuclear additions

Projected
75 to 90%
Reductions in CO_2 intensity from 2005 baseline

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

The Purpose of Sensitivity Analysis

Sensitivity analyses are performed to help answer questions meriting further evaluation (“What if…?”).

Suggested sensitivities can come from TVA Staff, IRP Working Group stakeholders, or public comments.

Sensitivity analyses are run as variations from a core portfolio, typically the Reference case scenarios with Baseline Utility Planning strategy, to isolate the impact of a change in one key assumption.

Sensitivities will be included in the Final IRP and considered, along with the balance of portfolio results and the EIS, when developing the IRP recommendations.

Final IRP Sensitivity List by Focus Area

Net-zero Trajectories

- TVA net-zero by 2050 (+2A)
- Accelerated TVA net-zero (faster than 2050)

Regulatory Environment

- Regulations on existing gas plants (6A)
- Regional gas build constraints
- Coal/gas cofiring option (6A)
- Extended coal operation (1A)

Variation in Climate

- More extreme weather trends
- Increasing winter risk

Electricity Demand Changes

- Rapid near-term industrial growth
- Optimized EV charging (+5A)

Resource Costs and Availability

- Higher/lower clean energy resource costs
- Higher gas resource costs
- Increased solar and storage market depth
- Increased EE market depth

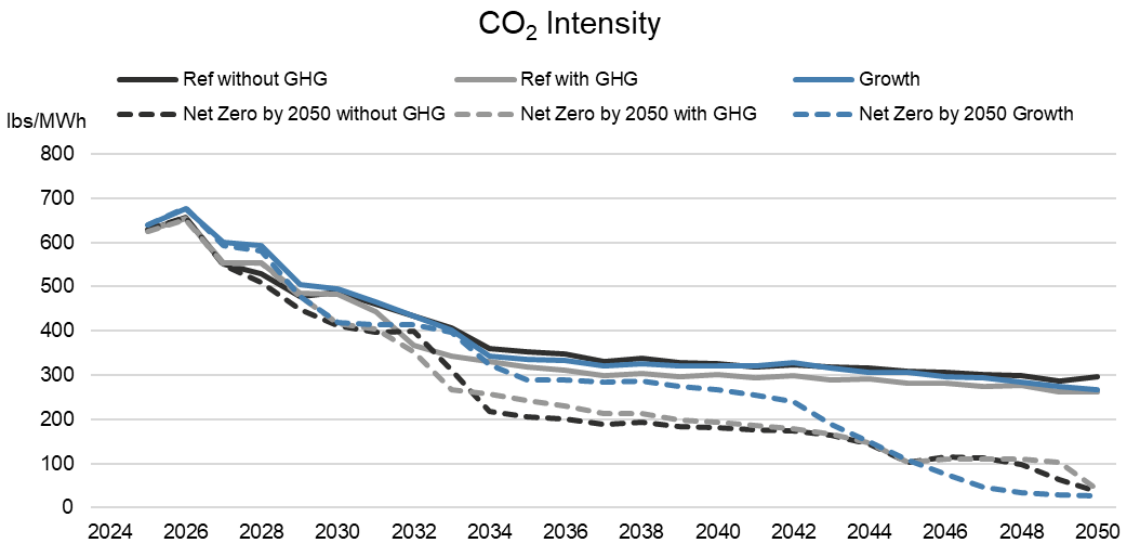
Natural Gas Commodity Prices

- Higher/lower natural gas prices

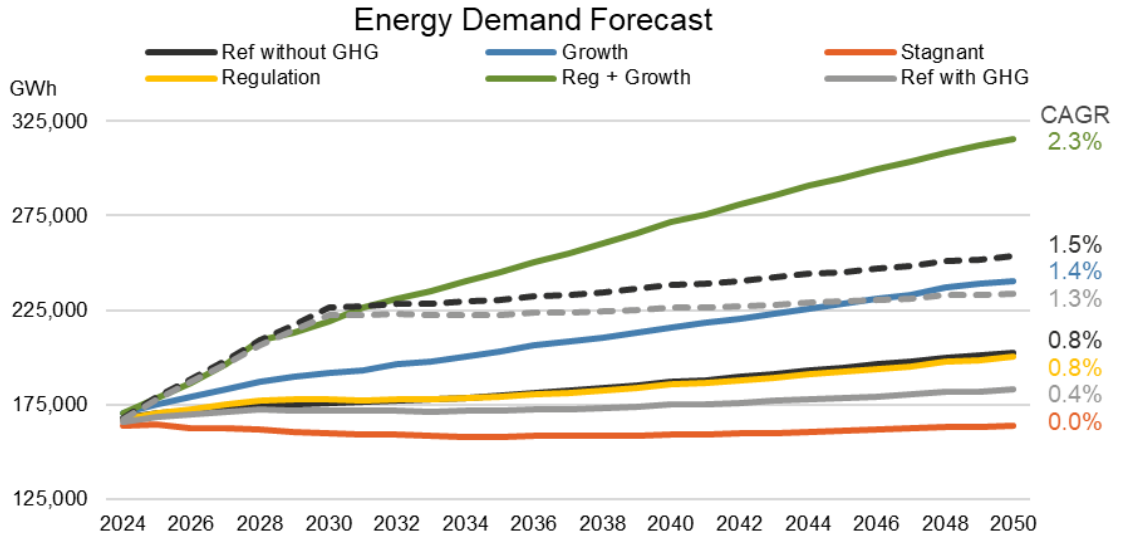
Each sensitivity was run off Reference cases (1A and 6A) unless noted

Sensitivities Push the Boundaries of IRP Analysis…

Net-zero trajectory cases evaluate impacts of achieving net-zero carbon emissions without regulatory drivers.



Rapid near-term industrial growth case evaluates impacts of substantial growth in data centers and other electricity-intensive industries in the near term.



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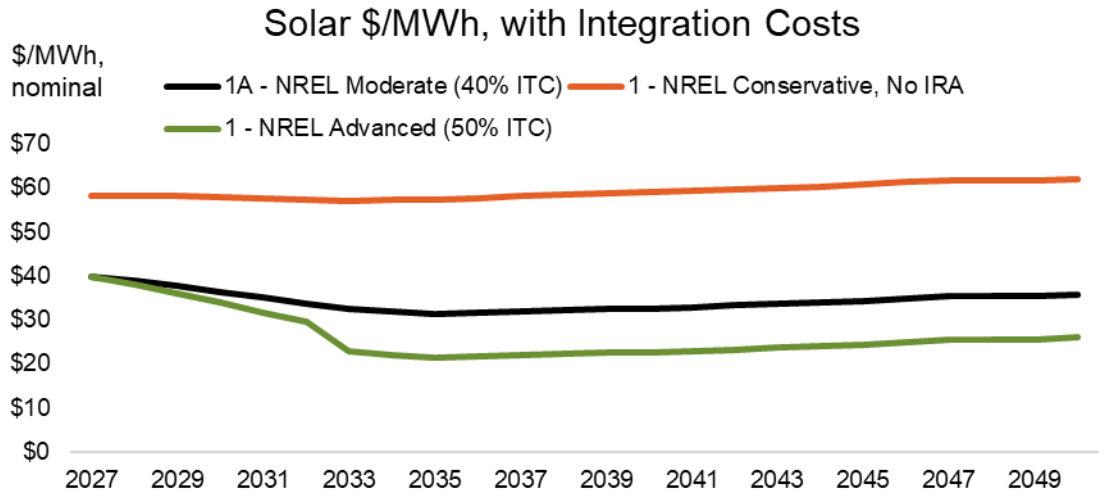
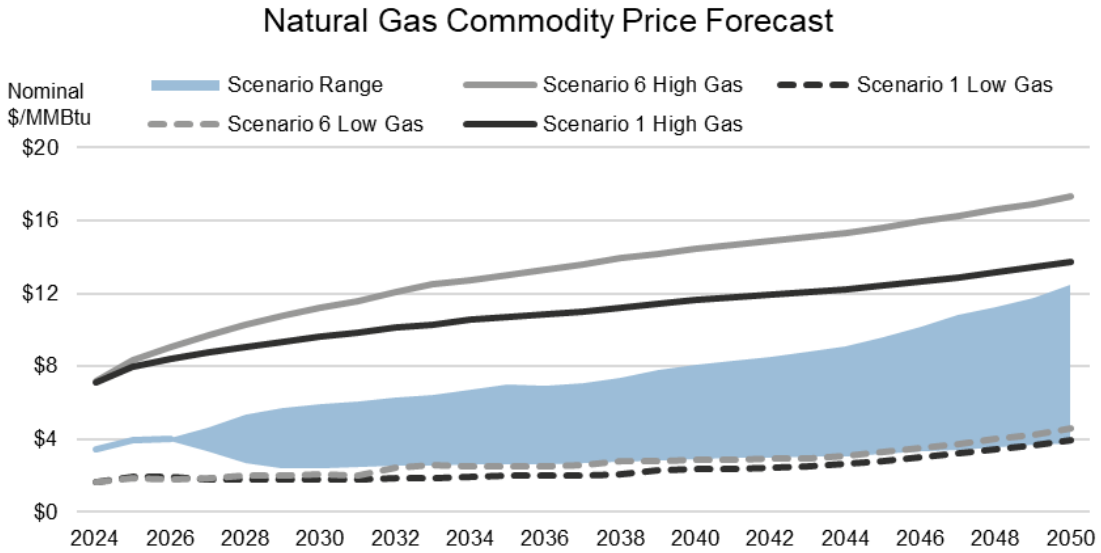
Sensitivities Push the Boundaries of IRP Analysis…

Higher and lower clean energy resource cost cases explore the impacts of higher or lower costs for solar, storage, and wind resources driven by market factors or tax credit availability.



Higher and lower natural gas price cases explore the impacts of higher or lower long-term trajectories for natural gas fuel.



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Sensitivity Results Summary

In general, sensitivity results fall within the boundaries of the 30 core portfolios presented in the draft IRP.

Scenario 5 (Net-zero Regulation plus Growth) typically sets the high end of clean energy resource additions, providing broad coverage including the additions seen in the net-zero carbon aspiration sensitivities.

A few sensitivities expanded the bounds of the final IRP results by 2035:

- Extended coal operations
- Coal/gas cofiring option
- Increased energy efficiency market depth

IRP Sensitivity Results by 2035 (1 of 2)

SENSITIVITY ANALYSIS Reference cases 1A and 6A are the baselines unless otherwise noted	CAPACITY EXPANSION IMPACTS BY 2035 (GW) INCREASE / DECREASE							
	Nuclear	Gas CC[1]	Gas CT[2]	Gas w/ CCS[3]	Solar	Wind	Storage	EEDR[4]
Net-zero Trajectories								
TVA net-zero by 2050 aspiration		0.0 to -1.4	-1.5 to -3.1	+1.4 to +2.9	+0.8 to +3.3		+0.8 to +1.6	Minor impacts
TVA net-zero by 2050 aspiration (2A)		-1.4	-0.4		+0.9	+1.4	+3.4	Minor impacts
Accelerated TVA net-zero	+0.6	-4.3 to -5.0	-3.3 to -4.4	+4.3	+1.9 to +3.4	+4.2	+3.6 to +5.0	+0.6 to +0.9
Regulatory Environment								
Regulations on existing gas plants (6A)		+2.1	-3.3	+1.4	+1.7	+0.8	-0.6	-0.2
Regional gas build constraints		0.0 to +1.4	-2.4 to -3.5		-0.5 to +1.5		+1.2 to +3.3	+0.1 to +0.6
Coal/gas cofiring option (6A)		+2.0 coal/gas	-0.7		-0.8		-0.9	-0.2
Extended coal operations (1A)		-1.4	-1.1		+0.4		Minor impacts	Minor impacts
Variation in Climate								
More extreme weather trends	-1.2 derates		0.0 to +0.7		+1.3 to +2.1		+0.2 to +0.4	0.0 to -0.3
Increasing winter risk			+1.3 to +1.8		-0.8 to -1.0		0.0 to -0.2	

[1]Combined Cycle (CC)
[2]Combustion Turbine (CT)
[3]Carbon Capture and Sequestration (CCS)
[4]Energy Efficiency and Demand Response (EEDR)

Data as of 01/22/2025

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IRP Sensitivity Results by 2050 (1 of 2)

SENSITIVITY ANALYSIS Reference cases 1A and 6A are the baselines unless otherwise noted	CAPACITY EXPANSION IMPACTS BY 2050 (GW) INCREASE / DECREASE								COST and CO_2 FAVORABLE / UNFAVORABLE	
	Nuclear	Gas CC	Gas CT	Gas w/ CCS	Solar	Wind	Storage	EEDR	PVRR* ($B)	Avg. CO_2 Intensity (lbs/MWh)
Net-zero Trajectories										
TVA net-zero by 2050 aspiration	+1.7 to +5.5	-2.1 to -6.4	-3.4 to -3.8	+1.4 to +2.9	+7.4 to +8.1	+3.8 to +4.2	+7.3 to + 7.7	+0.2 to +0.3	+$10 to +$13	-92 to -124
TVA net-zero by 2050 aspiration (2A)	+13.8	-7.9	-4.1		+6.5	+1.2	+19.6	-1.3	+$27	-90
Accelerated TVA net-zero	+1.1 to +5.2	-2.1 to -6.4	-4.7 to -5.5	+4.3	+7.5 to +9.1	+3.8 to +4.2	+8.0 to +9.4	+0.6 to +0.9	+$28 to +$41	-189 to -222
Regulatory Environment										
Regulations on existing gas plants (6A)		+2.1	-5.1	+1.4	+2.3	+1.6	+2.1		+$4	-71
Regional gas build constraints		-2.9 to +1.4	-3.8 to -4.7		+3.8 to +5.6	+0.6 to +2.0	+5.1 to +9.0	+0.4 to +1.7	+$3 to +$6	-19 to -38
Coal/gas cofiring option (6A)			+0.4		-0.7	-0.4	-0.9		+$1	+11
Extended Coal Operations (1A)			-0.2		+0.3		-0.2	Minor Impacts	+$1	+26
Variation in Climate										
More extreme weather trends	-1.2 derates	0.0 to -0.7	0.0 to +1.5		+1.4 to +1.7	0.0 to -0.4	+0.7 to +1.0		+$2	-3 to +3
Increasing winter risk		0.0 to -1.4	+2.0 to +2.4		-0.6 to +0.8	0.0 to -0.4	-0.6 to +0.6	Minor impacts	+$1	+5 to +9

*Present Value of Revenue Requirements (PVRR) for Reference cases 1A and 6A are $154B and $156B, respectively.

Data as of 01/22/2025

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IRP Sensitivity Results by 2035 (2 of 2)

SENSITIVITY ANALYSIS Reference cases 1A and 6A are the baselines unless otherwise noted	CAPACITY EXPANSION IMPACTS BY 2035 (GW) INCREASE / DECREASE							
	Nuclear	Gas CC	Gas CT	Gas w/ CCS	Solar	Wind	Storage	EEDR
Electricity Demand Changes								
Rapid near-term industrial growth		+2.9 to +5.7	+1.1 to +2.7	0 .0 to +2.9	+1.9 to +3.0		-0.1 to -0.6	Minor impacts
Optimized EV charging (+5A)		0.0 to -0.7	0.0 to -0.2		+0.2 to +0.5	0.0 to +0.2	+0.1 to +0.7	0.0 to +0.5
Resource Costs and Availability								
Higher clean energy resource costs		0.0 to +1.4	-1.8 to +1.1		-4.3 to –4.9		0.0 to -0.9	0.0 to -0.3
Lower clean energy resource costs		0.0 to -1.4	-1.1 to -1.8	0.0 to +1.4	+0.4 to +1.2	0.0 to +0.2	+1.7 to +1.8	0.0 to +0.3
Higher gas resource costs			-0.2 to -0.9		+0.3 to +0.8		+0.3 to +0.8	Minor impacts
Increased solar and storage market depth			-0.7 to +0.4		+1.0 to +2.2		-0.5 to +0.4	Minor impacts
Increased EE market depth		0.0 to -0.7	-0.7 to -1.1		-1.2 to +0.2		-0.6 to +0.5	+1.3 to +1.5
Natural Gas Commodity Prices								
Higher natural gas prices			-2.4 to -2.7		+1.9 to +3.4	+3.0 to +4.2	+2.0	+0.3 to +0.5
Lower natural gas prices		0.0 to -1.4	-0.9 to +1.1	0.0 to +2.9	-4.7 to -6.2		-0.1 to -0.9	-0.2 to -0.3

Data as of 01/22/2025

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IRP Sensitivity Results by 2050 (2 of 2)

SENSITIVITY ANALYSIS Reference cases 1A and 6A are the baselines unless otherwise noted	CAPACITY EXPANSION IMPACTS BY 2050 (GW) INCREASE / DECREASE								COST and CO_2 FAVORABLE / UNFAVORABLE	
	Nuclear	Gas CC	Gas CT	Gas w/ CCS	Solar	Wind	Storage	EEDR	PVRR* ($B)	Avg. CO_2 Intensity (lbs/MWh)
Electricity Demand Changes										
Rapid near-term industrial growth		+2.9 to +4.3	+0.5 to +2.4	0.0 to +2.9	+6.3 to +7.9	0.0 to +1.6	-0.6 to +0.2		+$31 to +$38	+49 to +87
Optimized EV charging (+5A)	0.0 to -1.2	0.0 to -0.7	-0.5 to -2.2		+0.2 to +2.6	-0.4 to +0.8	-1.4 to +0.1		$0 to -$2	-4 to +3
Resource Costs and Availability										
Higher clean energy resource costs		+1.4 to +3.6	+0.6 to +1.8		-6.8 to -12.0	0.0 to -0.2	-5.2 to -5.6	Minor impacts	+$1	+46 to +53
Lower clean energy resource costs		0.0 to -3.6	-2.8 to +1.1	0.0 to +1.4	+5.3 to +7.1	-0.2 to +0.2	+4.2 to +6.2		$0 to -$1	-31 to -49
Higher gas resource costs		0.0 to -1.4	+0.2 to +1.3		+0.9 to +1.7	0.0 to -0.4	+0.6 to +1.2		+$2 to +$3	-4 to -8
Increased solar and storage market depth			0.0 to -0.2		+0.8 to +2.0	0.0 to -0.4	+0.2 to +2.0		Minor Impacts	-4 to +1
Increased EE market depth		0.0 to -1.4	-0.7 to -1.1		-0.7 to -1.9	0.0 to -0.4	-0.3 to -1.4	+2.3 to +2.4	+$6 to +$7	-10 To -14
Natural Gas Commodity Prices										
Higher natural gas prices		0.0 to -2.9	-0.4 to -3.6		+7.5 to +9.2	+3.8 to +4.0	+5.5 to +7.3	+0.1 to +0.2	+$28 to +$30	-61 to -81
Lower natural gas prices		0.0 to -2.9	+1.5 to +1.8	0.0 to +2.9	-5.2 to -8.4	0.0 to -0.4	-2.9 to -3.4	-0.2 to -0.4	-$17 to -$20	-15 to +46

*PVRR for Reference cases 1A and 6A are $154B and $156B, respectively.

Data as of 01/22/2025

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Final IRP Results Suggest by 2035…

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Incremental firm capacity needs

3 to 20 GW
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4 to 19 GW
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1 to 4 GW
Energy Efficiency and Demand Response additions

In all scenarios, TVA will continue to provide AFFORDABLE, RELIABLE, RESILIENT, and increasingly CLEANER energy for the region for decades to come.

Up to 6 GW
Storage nameplate additions

Up to 4 GW
Wind nameplate additions

Up to 1 GW
Nuclear additions

Projected
70 to 90%
Reductions in CO_2 intensity from 2005 baseline

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

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Preliminary IRP Recommendations

Hunter Reed; IRP Project Manager

Purpose and Key Components

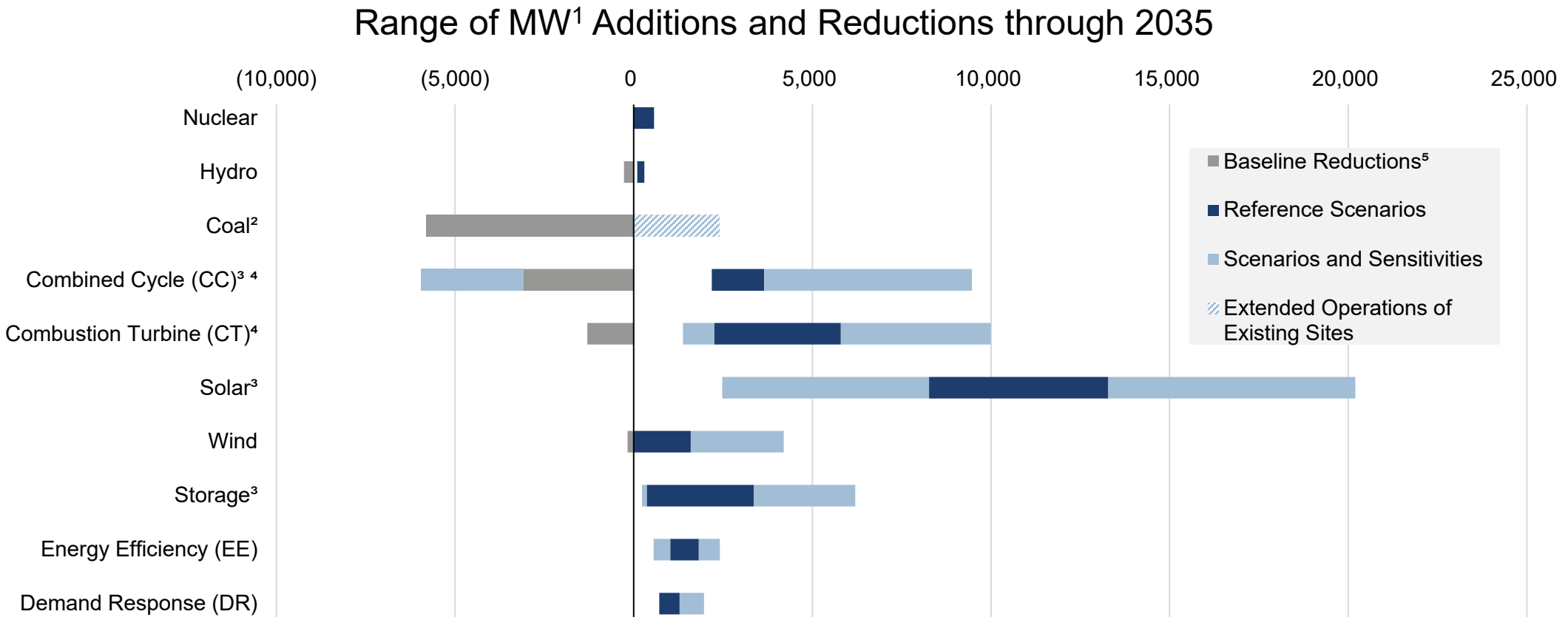
Purpose of the IRP recommendations:

- Board-approved guidance based on least-cost planning principles
- Guardrails for future resource additions over the next 10- to 20-plus years
- Planned actions over the next five to 10 years

Key components of 2025 IRP recommendations:

1. Power supply mix ranges by resource type (by 2035 and 2050)
2. Strategic portfolio direction through 2035
   - Recommended actions
   - Planned actions for existing and commercial ready resources
   - Planned actions to advance emerging technologies and to enhance integrated system planning
3. Key signposts and planning implications

Power Supply Mix Ranges (2035)



[1]Additions are shown in summer net dependable capacity, except for solar, wind, and storage that are shown in nameplate capacity.
[2]Coal additions represent potential to delay existing unit retirements and/or cofire with natural gas.
[3]CC, solar, and storage include utility-scale and distributed resource additions.
[4]CC additions could include CCS; CC and CT additions could include alternative fuel co-firing (e.g., hydrogen).
[5]The full amount of retirements and expirations, shown as baseline reductions, are present in all 30 core portfolios.

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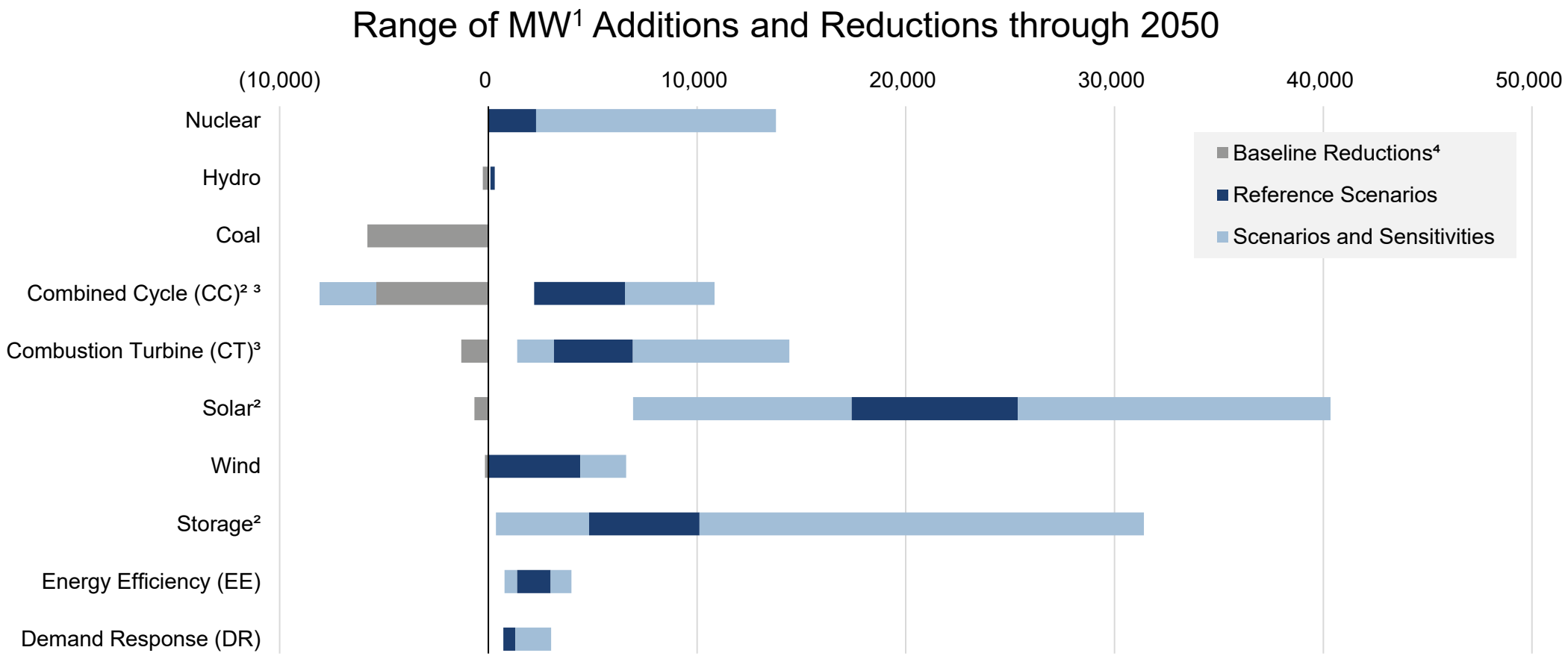
Power Supply Mix Ranges (2050)



[1]Additions are shown in summer net dependable capacity, except for solar, wind, and storage that are shown in nameplate capacity.
[2]CC, solar, and storage include utility-scale and distributed resource additions.
[3]CC additions could include CCS; CC and CT additions could include alternative fuel co-firing (e.g., hydrogen).
[4]The full amount of retirements and expirations, shown as baseline reductions, are present in all 30 core portfolios.

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Strategic Portfolio Direction through 2035

TVA will continue to provide affordable and reliable power that is increasingly cleaner and resilient.

A focus on least-cost planning and a diverse portfolio that balances renewable and dispatchable additions is fundamental to achieving this.

Between now and 2035, TVA will emphasize commercial ready carbon-free and distributed and demand-side resource additions complemented with gas and storage, along with enhancements in integrated system planning.

To support load growth, an American energy future, and TVA's environmental aspirations, TVA will continue working with strategic partners to advance the potential deployment of promising emerging technologies like advanced nuclear, storage, and carbon capture.

Strategic Portfolio Direction – Recommended Actions

Commercial Ready Resources

Existing Resources

- Invest in the low-cost, carbon-free hydro and nuclear fleets
- Pursue nuclear license extensions
- Invest in the gas fleet to maintain reliability
- Operate coal plants until replacement resources are online

Renewable Resources

- Add solar to the resource mix, providing economic carbon-free energy
- Invest in transmission upgrades that enable renewables
- Evaluate wind options to enhance renewable diversity

Firm, Dispatchable Resources

- Add firm, dispatchable gas to enable coal retirements and ensure reliability and flexibility
- Add storage for reliability and to complement renewables

Demand-side Resources

- Partner with customers to leverage achievable energy efficiency and demand response potential
- Collaborate with local power companies on the evolution of distributed resources programs

Emerging Technologies

- Continue evaluating the option to deploy advanced nuclear to support the growing U.S. energy sector
- Evaluate opportunities to enable long-duration storage and carbon capture technologies to further decarbonize

Integrated System Planning

- Incorporate additional elements of transmission planning in future IRPs
- Collaborate with local power companies to further integrate planning capabilities

Planned Actions for Existing and Commercial Ready Resources (1 of 2)

This section outlines the IRP ranges, current actions in progress, and planned actions by 2035 for existing and commercial ready resources.

Resource Type	GW by 2035	Actions in Progress	Planned Actions by 2035
Nuclear	Up to 1 GW	Pursuing license extensions for and investing in the existing nuclear fleet; evaluating advanced nuclear options	Continue investing in the existing nuclear fleet and cost-effective opportunities to increase output; potential for advanced nuclear deployment
Hydro	Up to 1 GW	Ongoing investments in the Hydro Life Extension (HLE) program, leveraging cost-effective ways to increase output	Continue investing in the existing hydro fleet, realize at least 0.2 GW of uprates, and evaluate market opportunities
Coal	Potential to retire by 2035	Renewable, storage, and gas expansion in progress to enable Cumberland and Kingston coal plant retirements	Operate Gallatin and Shawnee coal plants until replaced with expansion resources and evaluate potential for extended operation
Gas Combined Cycle (CC)	2 to 9 GW	2 GW of CC capacity being added by 2028 to enable coal retirements and provide grid support (hydrogen capable)	Continue investing in the existing fleet and evaluate future CC additions and market opportunities for system reliability needs
Gas Combustion Turbine (CT)	2 to 10 GW	2 GW of Frame and Aero capacity being added by 2028 to support reliability and solar expansion (hydrogen capable)	Continue investing in the existing fleet and evaluate future CT additions and market opportunities for system reliability, flexibility, and resiliency needs

Planned Actions for Existing and Commercial Ready Resources (2 of 2)

This section outlines the IRP ranges, current actions in progress, and planned actions by 2035 for existing and commercial ready resources.

Resource Type	GW by 2035	Actions in Progress	Planned Actions by 2035
Solar	3 to 20 GW	3 GW of Green Invest, self-directed, and Partner Flexibility solar projects contracted to come online by 2028	Add solar through regular procurement cycles, supported by strategic transmission investments
Wind	Up to 3 GW	Soliciting wind options through renewable request for proposal processes	Evaluate opportunities to add wind generation to enhance renewable and overall portfolio diversity
Storage	Up to 6 GW	0.4 GW of Green Invest, self-directed, and Partner Flexibility battery projects contracted to come online by 2029	Add storage to support reliability, resiliency, and a growing mix of renewables; evaluate pumped storage
Energy Efficiency (EE)	1 to 2 GW	Ramping up investments in residential, commercial, and industrial EE programs using insights from the potential study	Partner with TVA customers to realize achievable EE program potential, reducing power generation resource needs
Demand Response (DR)	1 to 2 GW	Ramping up investments in residential, commercial, and industrial DR programs using insights from the potential study	Collaborate with TVA customers to realize achievable DR program potential, reducing power generation resource needs

Planned Actions to Advance Emerging Technologies

Based on insights from the IRP analysis, this section provides general direction on actions to advance the potential deployment of emerging clean energy technologies by 2035 and beyond to support load growth, and American energy future, and TVA's environmental aspirations.

Emerging Technology	Actions in Progress	Planned Actions by 2035
Advanced Nuclear	Collaborating with industry partners to advance light water SMR design at Clinch River Site for next milestone evaluation	Potential deployment of light water SMR if future milestones are met, leveraging industry partnerships that reduce cost and risk
	Partnering with Oak Ridge National Laboratory (ORNL) and Kairos Power to accelerate the next generation of cost-effective nuclear power	Continue industry partnerships to advance the development of next-generation nuclear technology
	Analyzing lessons learned from advanced large reactor deployment at Plant Vogtle (Georgia Power) and recent technology advancements	Evaluate the potential option for future deployment of advanced large reactors to support long-term growth and further decarbonization
Advanced Storage	Sponsoring promising startup companies through ORNL, Electric Power Research Institute (EPRI), and other innovation programs	Evaluate additional opportunities to enable future advanced storage deployment
Carbon Capture	Participating in industry partnerships led by EPRI and the National Carbon Capture Center	Evaluate additional opportunities to enable future carbon capture deployment

Planned Actions to Advance Integrated System Planning

Based on insights from the IRP analysis, this section provides general direction on actions to enhance integrated system planning that enables the efficient evolution of the power system, including details on in-progress and proposed actions.

Planning Element	Actions in Progress	Planned Actions by 2035
Integrated Transmission Plan	Conducting stakeholder engagement effort on integrated transmission planning, leveraging IRP analysis and recommendations	Incorporate additional elements of transmission planning into future IRPs to more fully integrate system planning
Transmission System Capability and Processes	Investing in the transmission system for anticipated needs and streamlining processes for interconnecting new resources	Realize benefits from ongoing investments and streamlined processes and expand regional ties where cost-competitive
Partner Program Evolution	Collaborating with local power companies on a strategic plan for evolving the public power model in the TVA region	Incorporate relevant outcomes and insights from collaboration with local power companies into future integrated system planning
Enhanced Integrated Planning Tools	Collaborating with several local power companies to develop recommendations for enhanced integrated planning tools	Implement recommendations from joint effort and leverage tools going forward to further enhance distribution planning processes

Key Signpost Themes

Based on the IRP analysis, this section will provide insights to the potential planning implications of movement in key signposts.

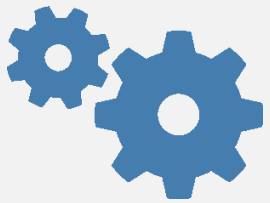
Changing Market Conditions

- Electricity demand
- Natural gas prices
- Customer expectations
- Solar and storage costs

Evolving Policy and Regulations

- Shifts in U.S. energy policy
- Policy and regulatory requirements
- Regulatory hurdles and challenges

Technology Advancements



- Advanced nuclear technologies
- Advanced storage technologies
- Carbon capture technologies

Ensuring Reliability as the System Evolves

- Impacts of changing market conditions
- Pace that new resources can be brought online to meet system needs
- Operating realities with growing mix of renewables and storage

Signposts and Implications: Changing Market Conditions

Signpost	2035 Trajectory vs. Reference Cases	Implications to Reference Cases through 2035
Electricity Demand	Higher electricity demand	More firm capacity additions, likely a mix of renewables, gas, and storage
	Lower electricity demand	Less firm capacity additions, likely a mix of renewables, gas, and storage
	Note: 10% increase in 2035 electricity demand requires 4 GW increase in firm capacity need	
Natural Gas Prices	Higher natural gas prices (long-term fundamentals)	More renewable and storage expansion and less gas expansion (particularly combined cycle)
	Lower natural gas prices (long-term fundamentals)	Less renewable and storage expansion and more gas expansion
Customer Expectations	Higher clean energy program demand	More renewable and storage expansion and less gas expansion; increased impetus for emerging clean energy technology development
Solar and Storage Costs	Higher annual capability and/or lower than forecasted costs	More renewable and storage expansion and less gas expansion (particularly combined cycle)
	Lower annual capability and/or higher than forecasted costs	Less renewable and storage expansion and more gas expansion

Signposts and Implications: Evolving Policy and Regulations

Signpost	2035 Trajectory vs. Reference Cases	Implications to Reference Cases through 2035
Policy and Regulatory Requirements	Increasing clean energy incentives, policies, and regulations	More renewable and storage expansion and less gas expansion; increased impetus for emerging clean energy technology development
	Relaxed clean energy incentives, policies, and regulations	Less renewable and storage expansion and more gas expansion; reduced impetus for emerging clean energy technology development
Regulatory Hurdles and Challenges	Increasing hurdles and challenges	Potential for slower pace of resource additions, especially gas-fired resources, along with delays in expected coal plant retirements
	Relaxed hurdles and challenges	Potential for faster pace of resource additions of all types, along with associated economic development benefits

Signposts and Implications: Technology Advancements

Signpost	2035 Trajectory vs. Reference Cases	Implications to Reference Cases through 2050
Advanced Nuclear Technologies	Faster progress in technology and adoption readiness	Increased probability of adding nuclear over the long term, likely offsetting a mix of renewables, storage, and gas
	Slower progress in technology and adoption readiness	Decreased probability of adding nuclear over the long term, potentially increasing the need for renewables, storage and gas
Advanced Storage Technologies	Faster progress in technology and adoption readiness	Increased mix of renewables and storage over the long term, likely offsetting some gas additions
	Slower progress in technology and adoption readiness	Decreased mix of renewables and storage over the long term, offset by more gas and/or emerging clean energy resources
Carbon Capture Technologies	Faster progress in adoption readiness	Increased probability of adding and retrofitting gas with carbon capture over the long term, likely offsetting some renewables and storage and potentially also some advanced nuclear additions
	Slower progress in adoption readiness	Decreased probability of adding and retrofitting gas with carbon capture over the long term and increased reliance on renewables, storage, and potentially also some advanced nuclear additions

Next Steps and Advice Preparation Discussion

RERC 2019 IRP Advice Statement (1 of 2)

The RERC affirms that:

1. *The IRP covers an appropriate range of future possible conditions. This allows TVA to proactively plan for the future, considering a number of scenarios and strategies in order to prepare a risk based, flexible, and reliable plan. The development of the 2019 IRP was a comprehensive and thorough process that provided multiple levels of engagement and transparency for the public. The RERC recognizes that TVA's IRP process sets a high standard and is a model for the industry.*
2. *Further, the RERC recognizes this plan builds on the significant carbon reduction achieved by TVA in recent years. Regional Energy Resource Council Minutes June 26-27,2019 63*
3. *The development of the IRP was strengthened by the iterative process where a diverse group of stakeholders was engaged with TVA to shape the study inputs and refinements along the way. In particular the comprehensive work completed by the IRP Working Group, as well as the public outreach, provided a variety of ways for members of the public to receive information and participate in the process.*
4. *The RERC commends TVA for dedicating the appropriate level of resources to this process and the rigorous analysis that underlies this plan. The RERC recognizes that while the IRP has a 20-year planning horizon, refreshes should occur as needed based on TVA's review of the signposts looking for changes in the evolving marketplace.*

(Above excerpt from the advice provided by the TVA Regional Energy Resource Council on June 27, 2019. See www.tva.gov/rerc for the full advice statement).

IRP Implementation Considerations

In finalizing the IRP and EIS and developing the IRP recommendations, TVA is considering the input received during the comment period, as well as from the IRP-WG and Regional Energy Resource Council (RERC).

Following final IRP publication and Board direction on the IRP recommendations, a key next step in implementing the IRP recommendations is translating the IRP's strategic direction by 2035 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.

The Final IRP will include a sub-section in Chapter 5, following the IRP Recommendations, which outlines specific implementation considerations recommended by the RERC and IRP-WG.

RERC 2019 IRP Advice Statement (2 of 2)

The RERC further recognizes that TVA has a leadership role to play in addressing poverty by building on a collaborative approach with local power companies and other stakeholders across the Valley to achieve energy efficiency for low income residents. The RERC recommends the following regarding implementation of the IRP:

1. *TVA should monitor federal and state regulations, legal challenges, and industry changes that may alter the broader energy environment and take appropriate actions to mitigate risks to the power system's reliability and costs.*
2. *TVA should continue to work with local power companies, directly served customers, and stakeholders to collaborate on Distributed Energy Resources (DER) and distribution planning; build greater visibility into customer needs; and prepare for associated data management. Standardization of cost-effective DER smart technologies will enable the system to efficiently utilize distributed resources.*
3. *TVA should continue engaging with stakeholders early in any decision process on the site selection for solar, gas power generation, and utility-scale energy storage to avoid land-use conflicts, encourage the utilization of existing infrastructure assets, and maximize system benefits. In addition, TVA should continue to analyze small-scale, flexible, carbon-free nuclear resources for their potential inclusion in a diverse portfolio.*
4. *TVA should continue evaluating gaps in data, including customer needs and desires, the speed of technology advancement, locational value, flexibility value, etc., in order to inform and be prepared for future IRPs. TVA should also explore advanced data tools to support the analysis.*

(Above excerpt from the advice provided by the TVA Regional Energy Resource Council on June 27, 2019. See www.tva.gov/rerc for the full advice statement).

Next Steps and Advice Preparation Discussion

Next steps

- Finalize responses to public comments
- Finalize IRP and EIS documents in preparation for planned Spring 2025 release

Key discussion questions for formal advice statement:

1. Did the 2025 IRP process meet the objective of extensive, meaningful involvement of stakeholders and the public?
2. Are the boundaries of the IRP analysis sufficient to inform a strategic portfolio direction that enables TVA to provide affordable and reliable power that is increasingly cleaner and resilient?
3. What do you see as challenges and opportunities for TVA as recommended actions are implemented and signposts are monitored?

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Advice Questions Discussion

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Advice Questions

Key discussion questions for formal advice statement:

1. Did the 2025 IRP process meet the objective of extensive, meaningful involvement of stakeholders and the public?
2. Are the boundaries of the IRP analysis sufficient to inform a strategic portfolio direction that enables TVA to provide affordable and reliable power that is increasingly cleaner and resilient?
3. What do you see as challenges and opportunities for TVA as recommended actions are implemented and signposts are monitored?

Adjourn Day 1

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Welcome!

The Meeting will begin at 9:00 AM Central

WIFI

Password: TVAIRP2025

Welcome

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Agenda

RERC Meeting
Day 2
Feb, 25, 2025

9:00 CT	Day 1 Recap
9:15	Public Listening Session
10:15	Break
10:30	Finalize Advice Statement
11:45	Wrap Up
12:00	Adjourn Meeting

Public Listening Session

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Public Comment

This is a listening session; responses are typically not provided

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Finalize Advice Statement

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Advice Questions

Key discussion questions for formal advice statement:

1. Did the 2025 IRP process meet the objective of extensive, meaningful involvement of stakeholders and the public?
2. Are the boundaries of the IRP analysis sufficient to inform a strategic portfolio direction that enables TVA to provide affordable and reliable power that is increasingly cleaner and resilient?
3. What do you see as challenges and opportunities for TVA as recommended actions are implemented and signposts are monitored?

Closing Remarks

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Next IRP Public Webinar

February 27
6PM to 7:30PM CT

Please Register at
www.tva.com/irp
or
https://forms.office.com/pages/responsepage.aspx?id=zZlJJwOQcUmE3tFkDAv_xcBrH-UxTx1Co-iWpxVjYH1UQ0YyVzFTUktLU1dQWDI4MDVTOUxQTUlGSC4u&route=shorturl

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Adjourn

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