2024 IRP Working Group

Meeting 1: July 17-18, 2023
Franklin, TN
Welcome and Safety Moment

Brian Child; Vice President, Enterprise Planning
Melanie Farrell; Vice President, External Strategy and Regulatory Oversight
Jo Anne Lavender; IRP Facilitator
TVA’s 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 future environments.

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

An updated IRP is needed in order 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 10 million residents of the Tennessee Valley.
IRP Working Group (IRP-WG)

A key engagement mechanism for TVA and diverse stakeholders.

Members represent a diverse group of stakeholders, including local power companies (LPCs), industrial customers, customer associations, state government, environmental NGOs, academia and research associations, special interest groups, and community stakeholders.

Provide in-depth ongoing discussion and feedback on the IRP process, approach and assumptions.

Validate the assumptions behind the analysis and the recommendations.

Real time stakeholder input results in greater efficiency.
# Customer and Stakeholder Engagement

<table>
<thead>
<tr>
<th>Engagement</th>
<th>Purpose</th>
<th>FY22</th>
<th>FY23</th>
<th>FY24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valley Vision 2035</td>
<td>Leveraging the strengths of the public power model to lead innovation and transformation in the energy industry</td>
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<tr>
<td>Valley Pathways Study</td>
<td>Understanding what economic sectors might do throughout the Valley to reduce carbon emissions and grow the economy</td>
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</tr>
<tr>
<td>Utility of the Future Information Exchange (UFIX)</td>
<td>Providing input for consideration on the Integrated Resource Plan and helping TVA become the utility of the future</td>
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<tr>
<td>Integrated Resource Plan</td>
<td>Guiding TVA to meet future electricity demands with affordable, reliable, resilient, and clean energy generation</td>
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</table>
Overarching Objective of the IRP-WG

To provide stakeholder input to the framing and evaluation included in TVA’s next IRP, which establishes TVA’s resource strategy in developing the energy system of the future.
TVA Staff Introductions

Name

Organization

Role in the IRP
<table>
<thead>
<tr>
<th>Topic</th>
<th>Time (CT)</th>
<th>Presenter(s)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lunch, including executive welcome, agenda review</td>
<td>11:00-12:35</td>
<td>Brian Child; Melanie Farrell; Jo Anne Lavender</td>
<td>Welcome, safety moment, and TVA staff introduction</td>
</tr>
<tr>
<td>IRP-WG introductions and orientation</td>
<td>12:35-1:45</td>
<td>Jo Anne Lavender</td>
<td>Including roles and responsibilities and IRP-WG objectives</td>
</tr>
<tr>
<td>Break</td>
<td>1:45-2:00</td>
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<tr>
<td>TVA 101</td>
<td>2:00-2:30</td>
<td>Brian Child</td>
<td>TVA introduction, overview of current resource portfolio</td>
</tr>
<tr>
<td>IRP and resource planning overview</td>
<td>2:30-3:45</td>
<td>Clifton Lowry; Candy Kelly</td>
<td>IRP 101, resource planning 101, and 2019 IRP results overview</td>
</tr>
<tr>
<td>Break</td>
<td>3:45-4:00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2024 IRP schedule and key considerations</td>
<td>4:00-4:25</td>
<td>Candy Kelly</td>
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</tr>
<tr>
<td>Non-disclosure agreement (NDA)</td>
<td>4:25-4:40</td>
<td>Jarom Smartt</td>
<td>NDA review</td>
</tr>
<tr>
<td>Wrap-up and day two preview</td>
<td>4:40-5:00</td>
<td>Jo Anne Lavender</td>
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<tr>
<td>Gather for transport to dinner</td>
<td>5:50</td>
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<tr>
<td>Off-site dinner</td>
<td>6:30-8:00</td>
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</table>
Safety Moment

EMERGENCY EXITS

• In case of Building Emergency ....
• In case of Severe Weather ....
IRP-WG Introductions and Orientation

Jo Anne Lavender, IRP Facilitator
IRP-WG Member Introductions

Name

Organization and Role

Interest in the Energy Sector

What interests you most about being a member the IRP Working Group?
IRP-WG Meeting Ground Rules

To make a comment or ask a question, turn on your lightbulb. The presenter will call on you. Turn off your lightbulb when you are called upon.

One person speak at a time; be respectful of others; refrain from interrupting while someone is speaking.

Be succinct so that everyone has the opportunity to speak.

Try to offer alternatives that accommodate your interests and the interests of others.

Members reserve the right to disagree with any position.

ELMO (Enough Let’s Move On).
IRP-WG Meeting Protocols

TVA will prepare each meeting agenda and logistics.

Meeting materials will be sent to IRP-WG members ahead of time using a Microsoft Teams site.

TVA will maintain meeting notes and running action items and responses.

Meeting location is expected to primarily be Franklin, TN, with some limited exceptions (e.g., August 2023).

The IRP-WG is expected to meet most months for one-to-two days in-person, with some months including a mid-month, two-hour virtual session.

Only the member or a pre-selected alternate may attend IRP-WG meetings.
Break
TVA Overview

Brian Child; Vice President, Enterprise Planning
May 18, 1933, the TVA Act was signed.
Our Mission

To serve the people of the Tennessee Valley to make life better.
Delivering on Our Mission to You

Energy | Environment | Economic Development

Provide affordable, reliable power.

Steward the Valley's natural resources.

Partner for economic growth.
Partnering to Serve You & Your Community

Partnering with
153 Local Power Companies
To serve
10 Million People
700,000 Businesses in Parts of 7 States
58 Large Industries & Federal Installations
The Value of Public Power

People are first – Accountable to stakeholders, not stockholders

Rates are set to recover costs and reinvest in facilities – Not maximize profits

Low-cost, reliable service are the focus – Not shareholders

Collaborative regulatory process with a clear focus on serving energy consumers
The TVA Power System
Today’s Resource Portfolio

**FY22 Capacity**
39,553 MW

- **Nuclear**: 7 Units at 3 Nuclear Sites
- **Coal**: 5 Coal Plants and PPA
- **Gas**: 8 CC Plants, 9 CT Plants, 1 Diesel Plant, and PPAs
- **Hydro**: 29 Hydroelectric Plants, 1 Pumped Storage Plant, and PPA
- **Renewables**: 14 Solar Sites, 1 Wind Site, and PPAs
- **Demand Response Programs**

**FY22 Energy**
165 TWh

- **Gas**: 33%
- **Coal**: 14%
- **Hydro**: 10%
- **Wind & Solar**: 4%
- **Nuclear**: 39%

In addition to power supply sources included here, TVA offers energy efficiency programs that effectively reduced 2022 energy needs by about 2,200 GWh or 1.3% (Net Cumulative Realized at System basis, 2007 base year).

Capacity aligns to FY22 10-K Net Summer Capability, adjusted to include demand response programs. Planning capacity is lower, as it accounts for Hydro and Renewable expected generation at peak, fuel blend derates, and other factors.
Providing Flood Control

49 Dams
Hydroelectric & non-power

Flood damage averted

$9.7 Billion Since 1936

$300 Million Annually
Partnering to Manage Our Resources

Water source for over 5 Million People

10 Billion Gallons of Water are used in the valley every day

95.6% is Recycled and returned to the river

Our 14 locks move 50 million tons Saving $500 Million Per Year in shipping costs
Bringing Businesses & Jobs to the Valley

Fiscal year 2022
Attracted | Retained 66,500 Jobs
$10.2 Billion Invested

17th year
Top 10 Utility
Investing in the Valley

Entirely self-funded since 1999

Tax-equivalent payments
$500 Million

Integrated Management of Natural Resources
Partner for Economic Growth
TVA Governance

Corporate Agency of the United States, receives no tax dollars and is self financing

Nine-member, part-time Board of Directors, nominated by the President, confirmed by the Senate

CEO, appointed by the TVA Board

Regional Energy Resource Council (RERC) provides advice to the TVA Board
IRP and Resource Planning Overview

Clifton Lowry; Director, Resource Planning & Strategy
Candy Kelly; Sr. Manager, Resource Strategy
IRP Overview

Clifton Lowry; Director, Resource Planning & Strategy
TVA's Integrated Resource Planning

Collaboration with stakeholders to envision the generation needs of the future.

Based on a least-cost planning framework.

Provides foundation for developing long-range financial plans.

Considers a number of potential futures to help predict changes in the marketplace.

The IRP functions like a compass, not a GPS
Planning is Grounded in Least-Cost Principles

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

- Low Cost
- Risk Informed
- Environmentally Responsible
- Reliable and Resilient
- Diverse
- Flexible

*In alignment with the Energy Policy Act of 1992
Resource Planning Is About Solving Puzzles

By asking a lot of questions, like …

How much energy will our customers use in the future?

What alternatives do we have to meet our resource needs?

Are there strategic considerations that will limit the alternatives we can consider?

How do we properly evaluate these resource alternatives?

How do we find the best solution?

Which plan (portfolio) do we select?
Resource Planning Addresses Future Capacity Needs

Resource planning is about optimizing the mix of future capacity.

Projections of capacity needed are filled by the most cost-effective resources that meet system needs.
The TVA Resource Planning Process

Resource Planning is a common practice in the utility industry to identify the least cost solution to meet customer demand and system operational requirements over a long horizon (typically 20-30 years)

- Project customer demand for electricity in the future
- Define the resources currently available to meet customer demand and how that will change in the future
- Compare future customer demand with existing resources and system operational requirements
- Identify all resources (supply- and demand-side) that will be considered to meet future need and system operational requirements
- Test different resource combinations (portfolios) to evaluate performance
- Select the preferred combination of resources
A Maze of Future Possible Paths

• Our industry is facing rapid, difficult to predict change, driven by:
  - Uncertainty in growth rates
  - Evolving regulatory future
  - Maturity of new, low-carbon, generation technologies
  - Fluctuating fuel costs
  - Uncertainty over nuclear extensions
  - Growth of distributed energy resources

• Drivers interact and new drivers may emerge that can change the future path

• Considering only the most likely path is risky

• Commitment to a single forecast could discourage strategic thinking and ignore significant business risks

Adopting this single path forward could be the right choice, but if the future evolves along one of the other paths, we will be locked in with few alternatives
How the Integrated Resource Planning Process Works

Scenarios

Modeling Assumptions

Model

Portfolios

Strategies

Candidate Technologies

Analyze Portfolios

Select Preferred Portfolio

Stakeholder feedback is a key component in the development of all model inputs
### Scenarios and Strategies Establish a Framework

**Scenarios**  
*Outside TVA’s Control*

- Describe potential outcomes of factors (uncertainties) outside of TVA’s control
- Represent possible conditions and are not predictions of the future
- Include uncertainties that could significantly impact operations, such as:
  - Load forecasts
  - Commodity prices
  - Environmental regulations
- Lends insight to riskiness of portfolio choices

**Strategies**  
*Within TVA’s Control*

- Test various business options within TVA’s control
- Defined by a combination of resource assumptions, such as:
  - DER portfolio
  - Nuclear expansion
  - Energy storage
- Consider multiple viewpoints
  - Public scoping period comments
  - Assumptions that would have the greatest impact on TVA long-term

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*A well-designed strategy will perform well in many possible scenarios*
Results from multiple case runs are scored using metrics that capture multiple aspects of TVA’s mission.

Preferred resource plans can then be identified based on trade-off analysis across metrics categories and stakeholder input.
What TVA’s IRP Does

The IRP will:

• Use least-cost planning criteria
• Incorporate resource capital, operating, fuel, and environmental compliance costs
• Include Valley economics as key criteria to evaluate strategies
• Evaluate socioeconomic and climate impacts of alternative strategies in the associated EIS

The IRP will not:

• Establish wholesale or retail electricity rates
• Identify specific sites for new resources
• Be a Distribution Integrated Resource Plan (DIRP)
Overview of the 2019 IRP

Clifton Lowry; Director, Resource Planning & Strategy
Evolution of TVA IRPs

2019 IRP Focus Areas:
- Distributed Energy Resources
- System Flexibility
- Portfolio Diversity

2011: Balanced Portfolio
2015: Energy Efficiency & Renewables
2019: Portfolio Diversity
2019 IRP Utilized a Rigorous Analytical Process

Stakeholder and public comments informed additional sensitivity analyses to test the impact of changes in key assumptions.
In addition to providing the strategic direction for TVA’s future energy supply, the 2019 IRP recommended near-term actions that have been integrated into TVA’s asset strategy.
2019 IRP Near-Term Actions

Renewables & Flexibility
- Add solar based on economics and to meet customer demand
- Enhance system flexibility to integrate renewables and distributed resources
- Evaluate demonstration battery storage to gain operational experience

Existing Fleet
- Pursue option for license renewal for TVA’s nuclear fleet
- Evaluate engineering end-of-life dates for aging fossil units to inform long-term planning

Energy Usage
- Conduct market potential study for energy efficiency and demand response
- Collaborate with states and local stakeholders to address low-income energy efficiency
- Collaboratively deploy initiatives to stimulate the local electric vehicle market

Distribution Planning
- Support development of Distribution Resource Planning for integration into TVA’s planning process
2019 IRP Key Signposts

- Demand for Electricity
- Operating Costs for Existing Units
- Natural Gas Prices
- Solar and Wind Costs
- Stakeholder Expectations
- Emerging and Developmental Technologies
- Regulatory Requirements
2019 IRP - TVA Board Action and Direction*

Approved the planning direction in the 2019 IRP.

Directed TVA staff to monitor signposts to appropriately consider possible adjustments to the planning direction:

- Changing market conditions
- More stringent regulations
- Technology advancements

Directed TVA staff to initiate the next IRP no later than 2024.

*August 22, 2019, TVA Board Meeting
Asset Strategy

TVA's asset strategy was developed based on 2019 IRP strategic direction, near-term actions, and key signposts, grounded in least-cost planning, and includes the following initiatives:

- **Coal**
- Modernize the combustion turbine fleet
- Enable coal retirements and solar integration
- Retire Bull Run in 2023 and Cumberland in 2026/2028
- Retire remaining coal units as they reach the end of life, expected by 2035
- **Natural Gas**
- Invest to improve and sustain fleet performance
- Renew nuclear fleet licenses
- Explore advanced technologies
- **Nuclear**
- Invest to sustain fleet performance
- Optimize flexibility
- Continue evaluation of market options
- Evaluate pump-storage options
- **Hydro**
- Add 10 GW of solar by 2035 to meet customer and system needs
- Optimize location and procurement
- Continue to enable partner flexibility to add renewables
- **Solar/Wind**
- Demonstrate use cases to support system needs and solar integration
- Explore emerging technologies
- **Storage**
- Continue to invest in low-income programs
- Expand economic EE programs to offset system costs
- Support integrated planning efforts
- **EE & DR**

**Transmission**

- Reliable and Integrated Grid
- Expansion for Economic Development and Local Load Growth
- Regulatory Compliance
Continued Carbon Reduction

52% Accomplished

70% Plan by 2030

~80% Path by 2035

Net-Zero Aspiration by 2050

All reductions are based on a Calendar Year 2005 baseline.
Resource Planning 101

Candy Kelly; Sr. Manager, Resource Strategy
Planning Horizons and Uncertainty

To test and implement strategy, TVA uses a variety of plans with different time horizons and methodologies to address uncertainty.

<table>
<thead>
<tr>
<th>Timeframe</th>
<th>Purpose</th>
<th>Uncertainty</th>
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<tbody>
<tr>
<td>1-5 years</td>
<td>Outline initiatives to meet near-term targets</td>
<td>Conservatism, contingencies and reserves</td>
</tr>
<tr>
<td>4-10 years</td>
<td>Establish strategic objectives</td>
<td>Stochastics and planning confidence analysis</td>
</tr>
<tr>
<td>10-20+ years</td>
<td>Guidance on long-term direction and no-regrets near/mid-term actions</td>
<td>Scenarios and strategies</td>
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## Resource Planning Continuum

<table>
<thead>
<tr>
<th></th>
<th>MORE “TACTICAL”</th>
<th></th>
<th>MORE “STRATEGIC”</th>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>Now</strong></td>
<td></td>
<td>+5 Years</td>
<td></td>
<td>+10</td>
</tr>
<tr>
<td>More certainty in forecasts and available technologies</td>
<td></td>
<td></td>
<td>Less certainty in forecasts and evolving technologies</td>
<td></td>
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<tr>
<td>Activities are underway for approved actions</td>
<td></td>
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<td>Analysis provides indications of future system needs and risks</td>
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<tr>
<td>Long-lead time activities will begin to help meet system needs in the next 5-10 years</td>
<td></td>
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<td>Plan will evolve with signposts and as we gain experience operating a changing fleet</td>
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<tr>
<td>More tactical plan is needed for the first 10 years, as timing is more critical</td>
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<td></td>
<td>Runway to explore and develop options in the first 10 years to enable future paths</td>
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Planning is an iterative process, evolving with tactical experience and evolving signposts.
Definitions of Capacity and Energy

Capacity is the maximum electric output an electricity generator can produce under specific conditions.

Energy (or generation) is the amount of electricity a generator produces over a specific period of time.

**Variations**

- **Nameplate Capacity** – Manufacturer-defined output under standard conditions.
- **Summer Net Dependable Capacity (NDC)** – Expected unit output during specific summer conditions (e.g., temperature).

**Variations**

- **Capacity Factor** – Energy produced divided by total theoretical output for a given time period (tells you what percentage of hours it ran).
Winter and Summer Have Distinct Profiles

**Winter peak** is typically right before dawn, with a smaller peak in the early evening.

**Summer peak** is generally around 5:00 PM when heat drives peak air conditioning load.

Absent the need for space conditioning, usage profile is similar.
Expansion Resource Technologies

Earliest Deployment Year for Additional Resources

| 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 + |

--------------- Technologies Deployable by 2030 ---------------

Energy Efficiency and Demand Response Programs

- Natural Gas
- Solar
- Wind
- Lithium-Ion Battery Storage

--------------- Technologies Deployable after 2030 ---------------

- Pumped Storage
- Advanced Storage
- Carbon Capture Combined Cycle
- Small Modular Reactors

Emerging technology timelines have more uncertainty
Resource fit is complex and considers the current portfolio and transmission system when evaluating expansion options, but some general rules of thumb apply as illustrated here.

- **A** 32,800 – 25,300 = 7,500 MW of peaking (e.g., combustion turbine gas)
- **B** 25,300 – 15,700 = 9,600 MW of Intermediate (e.g., combined cycle gas)
- **C** 15,700 MW of base load resources (e.g., nuclear)
Daily Load Shape and Resource Dispatch

Summer Day Load Shape

- **Total Available Capacity > Peak Load** (reflects required reserve margin)
- **Represents surplus capacity (used for pumping or off-system sales)**
- **Peaking Resources**
- **Intermediate Resources**
- **Base Load Resources**

Hour Ending

1  2  3  4  5  6  7  8  9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24
Load Dispatch on Typical Summer Day

Peak ~30,000 MW

- Gas CT's
- Purchases
- Gas CC's
- Renewables
- Hydro
- Coal
- Nuclear
- Raccoon Mountain Pump Generate
TVA Carries Reserves to Ensure Reliability

TVA carries reserves for unplanned events related to weather, load forecast error, and system performance, targeting an industry best-practice of one loss of load event (LOLE) in 10 years or 0.1 LOLE per year.

Weather-driven variability
- Temperatures / Load
- Hydrology
- Solar and wind patterns
- Cold weather impact on unit performance

Non-weather variability
- Economic cycles
- Customer mix
- Consumer behavior

System performance
- Planned outages
- Forced outages
- Renewable generation
- Import capability
Break
2024 IRP Schedule and Key Considerations

Candy Kelly; Sr. Manager, Resource Strategy
Key IRP Dates

The 2024 IRP study approach is intended to enable stakeholder involvement and ensure transparency

- Spring ‘23 – Publication of Notice of Intent (NOI) and public scoping initiation
- Summer ‘23 – IRP Working Group commences
- Fall ‘23 – Public scoping report published
- Fall/Winter ‘23 – Modeling and environmental study
- Spring ‘24 – Publish Draft IRP and EIS, public comment period begins
- Spring/Summer ‘24 – Respond to Draft comments and develop Final documents
- Summer ‘24 – Publication and TVA Board adoption of Final IRP and EIS
What is Public Scoping?

As TVA updates its power generation strategy, the first step is to understand the environment we’re planning in, which is referred to as scoping.

We ask the general public, our customers, and our partners and regulators about their ideas regarding the generation needs of the future.

With this information, we develop key assumptions to study which are transformed into candidate resource plans to be evaluated for viability and environmental impact.

We also ask the public to comment on potential environmental issues and concerns that should be addressed in the EIS.
2024 IRP Key Considerations

Reliability, affordability, and resiliency
Dispatchability
Electrification and load growth
Carbon reductions and net zero
Renewables and storage
Climate impacts
Environmental justice
Other Risks
Wrap-Up and Day 2 Preview

Jo Anne Lavender; IRP Facilitator
## Agenda – July 18, 2023

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<tr>
<td>Breakfast</td>
<td>8:00-8:30</td>
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<tr>
<td>Agenda and welcome</td>
<td>8:30-8:40</td>
<td>Jo Anne Lavender</td>
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</tr>
<tr>
<td>Prior IRP-WG member reflections</td>
<td>8:40-9:00</td>
<td>Jo Anne Lavender</td>
<td>Allow former WG members a chance to speak about the WG experience</td>
</tr>
<tr>
<td>Introduction to scenarios &amp; strategies</td>
<td>9:00-9:15</td>
<td>Candy Kelly</td>
<td>Scenario and strategy overview</td>
</tr>
<tr>
<td>Scenarios deep-dive, breakout, and discussion (break included)</td>
<td>9:15-11:45</td>
<td>Daniel Woolley; Jo Anne Lavender</td>
<td>Scenario development, potential 2024 scenarios, and breakout groups</td>
</tr>
<tr>
<td>Lunch, including environmental review overview</td>
<td>11:45-12:45</td>
<td>Kelly Baxter</td>
<td>NEPA team review of EIS analysis for the IRP</td>
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<tr>
<td>Strategies deep-dive, breakout, and discussion (break included)</td>
<td>12:45-3:10</td>
<td>Daniel Woolley; Jo Anne Lavender</td>
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<tr>
<td>Stakeholder Engagement Strategy</td>
<td>3:10-3:40</td>
<td>Amy Edge</td>
<td>External relations engagement strategy</td>
</tr>
<tr>
<td>Wrap-up</td>
<td>3:40-4:00</td>
<td>Jo Anne Lavender</td>
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Prior IRP-WG Member Reflections

Jo Anne Lavender; IRP Facilitator
Introduction to Scenarios and Strategies

Candy Kelly; Sr. Manager, Resource Strategy

The IRP is a risk-informed study of future needs and how TVA could meet customer demands.

The IRP is:

• A collaborative, stakeholder-focused effort
• Based on least-cost planning principles
• A risk-informed study that assesses a wide range of potential futures
• The basis for TVA’s asset strategy

The TVA board approves the strategic planning direction set forth in the IRP.

To meet regulatory requirements, an Environmental Impact Statement (EIS) accompanies the IRP to analyze the impacts to the Valley.

The IRP functions like a compass, not a GPS
Planning is Grounded in Least-Cost Principles

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

- Low Cost
- Risk Informed
- Environmentally Responsible
- Reliable and Resilient
- Diverse
- Flexible

*In alignment with the Energy Policy Act of 1992
The 2019 IRP evaluated 6 Scenarios (Likely Futures) and 5 Strategies (How TVA Responds) for a total of 30 core portfolios, as well as multiple sensitivity cases, all informed by internal and external stakeholders.
Scenarios and Strategies Establish a Framework

### Scenarios

**Outside TVA’s Control**

- Describe potential outcomes of factors (uncertainties) outside of TVA’s control
- Represent possible conditions and are not predictions of the future
- Include uncertainties that could significantly impact operations, such as:
  - Load forecasts
  - Commodity prices
  - Environmental regulations
- Lends insight to riskiness of portfolio choices

### Strategies

**Within TVA’s Control**

- Test various business options within TVA’s control
- Defined by a combination of resource assumptions, such as:
  - DER portfolio
  - Nuclear expansion
  - Energy storage
- Consider multiple viewpoints
  - Public scoping period comments
  - Assumptions that would have the greatest impact on TVA long-term

A well-designed strategy will perform well in many possible scenarios
How the Resource Planning Process Works

Outside of TVA’s Control

Design Concepts → Uncertainties → Scenarios → Modeling Assumptions → Portfolio → Analyze Portfolio → Select Preferred Portfolio

Within TVA’s Control

Resource Options → Attributes + Constraints → Strategies → Candidate Technologies → Model → Portfolios
Scenarios Breakout and Discussion

Daniel Woolley; Sr. Specialist, Resource Strategy
Jo Anne Lavender; IRP Facilitator
Lunch
Environmental Review
Overview

Kelly Baxter
NEPA Project Manager
IRP Environmental Impact Statement (EIS)
Purpose and Approach

Required per the National Environmental Policy Act (NEPA)  Public involvement
NEPA is part of the planning process  System-wide study of environmental impacts
Decision-makers informed of environmental impacts  Programmatic EIS
EIS Process and Milestones

The NEPA review of a proposed action must consider all aspects of the proposed action and all of the individual steps necessary to implement the proposed action.

*Opportunity for public feedback
EIS Analyzes Key Environmental Factors

The EIS will assess broad region-wide impacts of the next IRP on environmental factors such as:

- Air quality and climate impacts
- Water resources
- Fuel requirements
- Waste production
- Land requirements
- Socioeconomics and Environmental Justice
Example IRP EIS Analysis

Table 5-4: Average CO₂ emissions and emissions rates, percent emissions changes, and percent emission rate changes by alternative strategy and the Target Power Supply Mix.

<table>
<thead>
<tr>
<th>Alternative Strategy</th>
<th>A – No Action</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>Target Power Supply Mix</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total CO₂ emissions 2019-2038, million tons</td>
<td>772</td>
<td>766</td>
<td>758</td>
<td>758</td>
<td>759</td>
</tr>
<tr>
<td></td>
<td>Annual CO₂ emissions, thousand tons</td>
<td>38,610</td>
<td>38,310</td>
<td>37,915</td>
<td>37,923</td>
<td>37,945</td>
</tr>
<tr>
<td></td>
<td>Percent CO₂ emissions change, 2019-2038</td>
<td>-21.4</td>
<td>-22.4</td>
<td>-24.4</td>
<td>-24.8</td>
<td>-24.1</td>
</tr>
<tr>
<td></td>
<td>CO₂ emissions rate, lbs/MWh</td>
<td>486</td>
<td>485</td>
<td>479</td>
<td>480</td>
<td>480</td>
</tr>
<tr>
<td></td>
<td>Percent CO₂ change reduction, 2019-2038</td>
<td>-26.2</td>
<td>-27.0</td>
<td>-29.4</td>
<td>-26.0</td>
<td>-28.4</td>
</tr>
</tbody>
</table>

Figure 5-7: Trends in emissions of CO₂ by alternative strategy based on averages of the six scenarios.
Strategies Breakout and Discussion

Daniel Woolley; Sr. Specialist, Resource Strategy
Jo Anne Lavender; IRP Facilitator
Stakeholder Engagement Strategy

Amy Edge; Director, External Relations
TVA Customer & Stakeholder Engagement

• Seeking input from and listening to our customers and stakeholders is foundational to our mission – serving the people of the Tennessee Valley to make life better

• TVA seeks customer and stakeholder input and feedback on an ongoing basis through forums such as:
  - Federal Advisory Committees – Regional Energy Resource Council (RERC) and Regional Resource Stewardship Council (RRSC)
  - Quarterly TVA Board Listening Sessions
  - Powerful Partnership and Voice of the Customer Surveys
  - Environmental Impact Studies (EIS) – public comments and public meetings
  - Regional Field Teams

• A key element of TVA’s IRP process is to ensure active public involvement and direct engagement with a diverse group of stakeholders
Stakeholder Engagement and the IRP

The 2024 IRP process will leverage both past effective engagement venues as well as input from several additional avenues:

- IRP Working Group (IRPWG)
- Regional Energy Resource Council (RERC)
- Public Scoping Meetings / Public Meetings on Draft IRP Report
- Periodic Informational Webinars
- Dedicated IRP Public Website

Enhanced stakeholder engagement mechanisms:

- Valley Vision 2035, Valley Pathways Study, Utility of the Future Information Exchange outputs leveraged to inform the IRP process
- Regional Field Teams
- Environmental Justice focus applied to all engagements with the objective of advancing improvements in reaching and involving environmental justice populations
Meeting Wrap-Up

Jo Anne Lavender; IRP Facilitator