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# 2024 IRP Working Group

Meeting 5: November 13-14, 2023  
Franklin, TN

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# Welcome and Safety Moment

Jo Anne Lavender; IRP Facilitator  
Hunter Reed, IRP Project Manager

# Agenda – November 13, 2023

Topic	Time (CT)	Presenter(s)	Notes
Lunch	11:00-12:00		
Welcome	12:00-12:15	Jo Anne Lavender; Hunter Reed	Welcome, safety moment, agenda review
Carbon Regulation plus Growth Scenario Forecasts	12:15-1:45	Nathan Donahoe; John Collins; Bob Roth; Nathan Mathis	
Break	1:45-2:00		
Modeling Updates	2:00-3:30	Preeth Srinivasaraghavan; Roger Pierce	Review Cases 1A, 2A, 3A, and 4A
Break	3:30-3:45		
Document Outline Discussion	3:45-4:30	Jane Elliott	
TVA Initiatives Overview	4:30-4:45	Melanie Farrell	
Wrap-up	4:45-5:00	Jo Anne Lavender	
Off-site dinner	6:00-8:00		

# TVA's Integrated Resource Plan

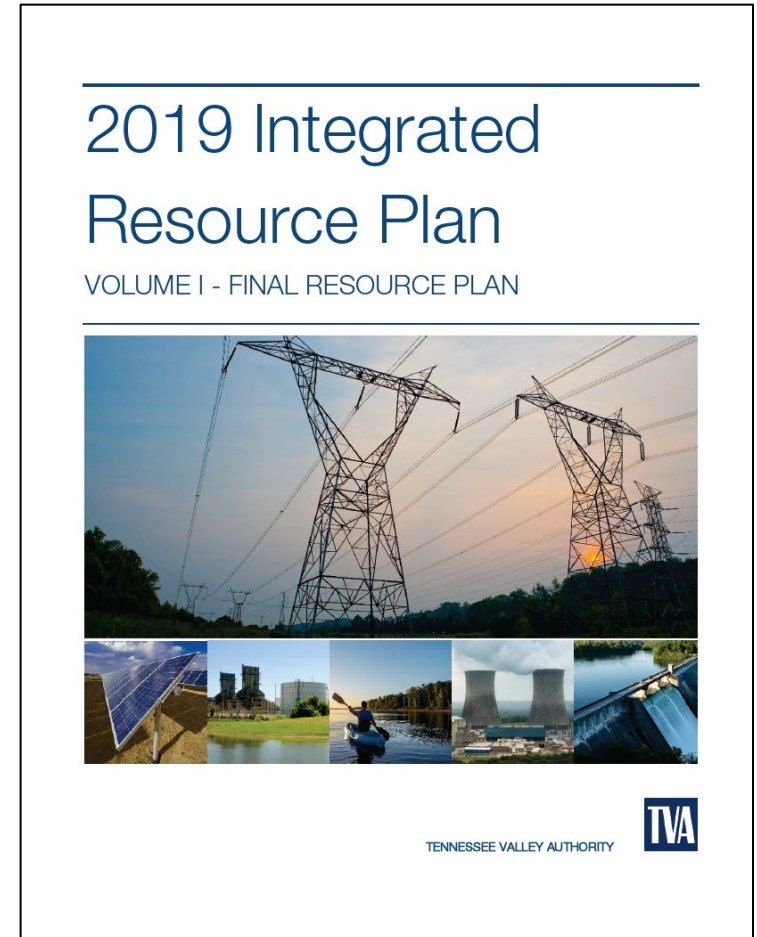
The IRP is a study of how TVA could meet customer demand for electricity between now and 2050 across a variety of possible futures.

A programmatic Environmental Impact Statement (EIS) accompanies the IRP to address 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 10 million residents of the Tennessee Valley.



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# 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.*

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# Carbon Regulation plus Growth Scenario Forecasts

Nathan Donahoe; Sr. Manager, Enterprise Forecasting

John Collins; Sr. Specialist, Enterprise Forecasting

Bob Roth; Sr. Specialist, Enterprise Forecasting

Nathan Mathis; Manager, Load Forecasting

# Break



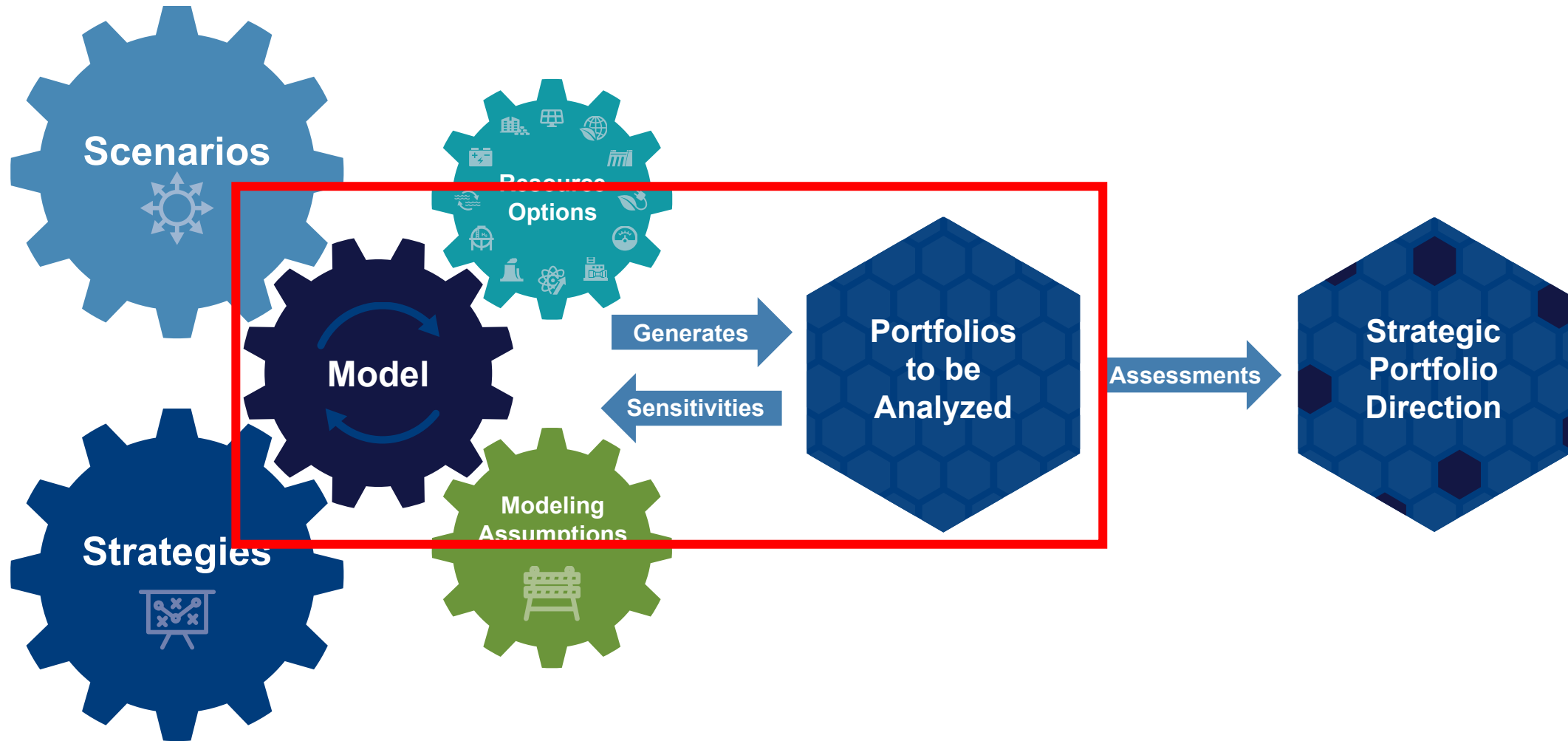
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# Modeling Updates

Preeth Srinivasaraghavan; Specialist III, Resource Strategy  
Roger Pierce; Sr. Specialist, Resource Strategy



# How the Integrated Resource Planning Process Works



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





# 1A Updates (Reference Case x Baseline Utility Planning)

Preeth Srinivasaraghavan; Specialist III, Resource  
Strategy







# 2A Updates (Higher Growth Economy x Baseline Utility Planning)

Preeth Srinivasaraghavan; Specialist III, Resource  
Strategy





# Break



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# Document Outline Discussion

Jane Elliott; Sr. Consultant, 2024 IRP

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# Preparing to Tell the IRP Story

- IRP WG impressions on the 2019 IRP
- Objectives for telling the 2024 IRP story
- Proposed 2024 IRP document outline
- Timeline for developing the document
- Recap and final thoughts

# Discussion – IRP WG Impressions on the 2019 IRP



## Executive Summary:

- Did the summary generally tell the 2019 IRP story in an effective way?
- What ideas do you have for how it could have been more effective?

## Table of Contents (TOC):

- Did the TOC lay out the details of the 2019 IRP study in a useful way?
- What ideas do you have to improve the clarity and flow of the document?

## Stakeholder Perspective:

- From your stakeholder perspective, are there aspects you would like to see explored further or differently in the 2024 IRP document?

# Main Objectives for Telling the 2024 IRP Story





# Proposed 2024 IRP Outline

## 2019 IRP Outline

Executive Summary

- Chapter 1 – Introduction
- Chapter 2 – IRP Process
- Chapter 3 – Public Participation
- Chapter 4 – Need for Power Analysis
- Chapter 5 – Energy Resource Options
- Chapter 6 – Resource Plan Development and Analysis

- Chapter 7 – Study Results
- Chapter 8 – Strategy Assessments and Next Steps

- Chapter 9 – Recommendations
- Chapter 10 – Implementation

Appendices

## Proposed 2024 IRP Outline

Executive Summary

Chapter 1 – Planning the Energy System of the Future (NEW)

Chapter 2 – Process and Methodology

Chapter 3 – Portfolio Results and Assessments

Chapter 4 – Recommendations and Implementation

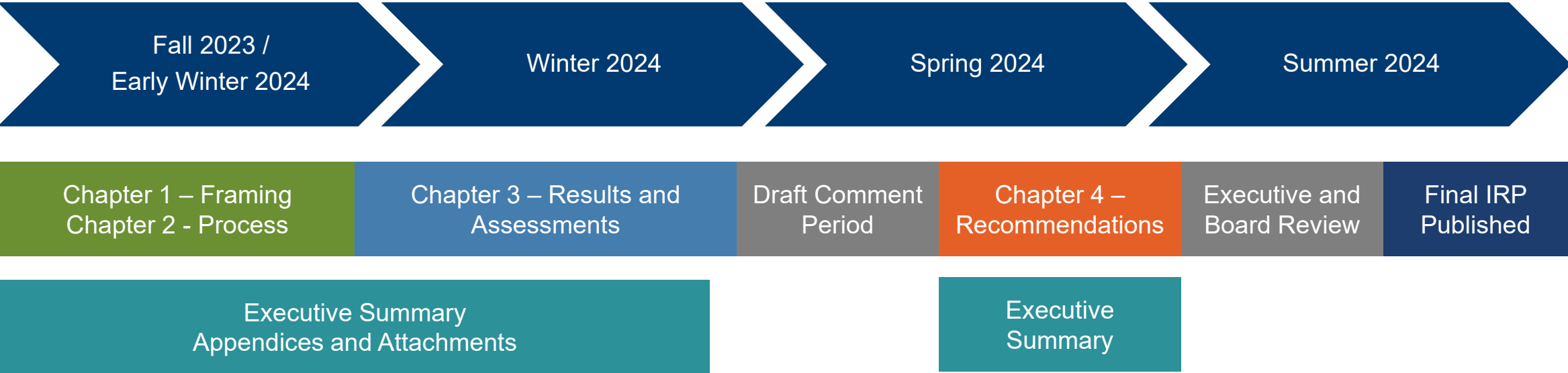
Appendices

Attachments (NEW)

Note: See the following slides for high-level outlines of each section.

# General Timeline for Developing the 2024 IRP Document

The process for developing the IRP document generally follows and lags the study process itself. Key language for the document is reviewed with the IRP-WG during the study process.



# Recap and Final Thoughts

## Proposed 2024 IRP Outline

Executive Summary

Chapter 1 – Planning the Energy System of the Future (NEW)

Chapter 2 – Process and Methodology

Chapter 3 – Portfolio Results and Assessments

Chapter 4 – Recommendations and Implementation

Appendices

Attachments (NEW)

## IRP WG Final Thoughts

- Reactions to the proposed 2024 IRP theme – Planning the Energy System of the Future?
- Reactions to the proposed outline and flow of the document?
- Other final thoughts on the document approach?

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# TVA Initiatives Overview

Melanie Farrell; Vice President, External Strategy and Regulatory Oversight

# Initiatives Underway in Positioning for the Future

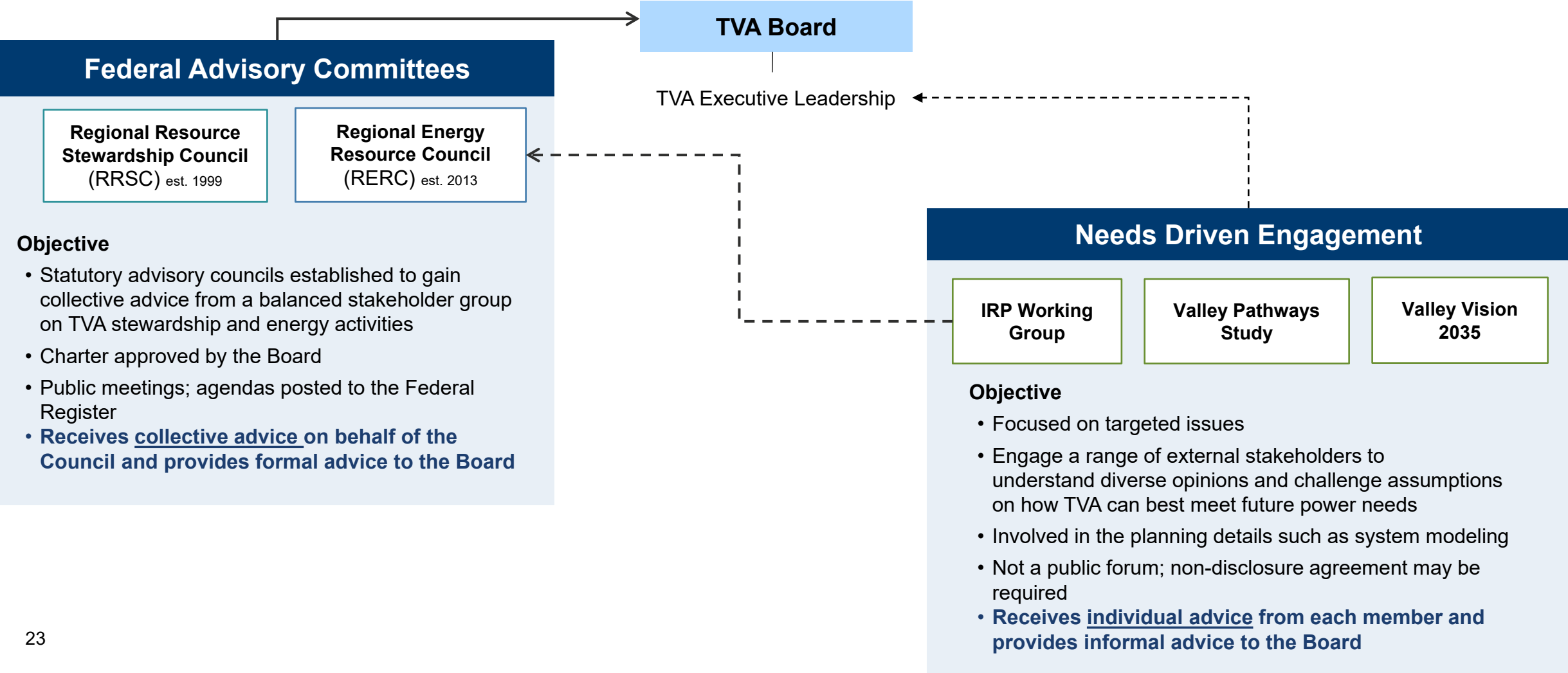
Initiative/Plan	Purpose	FY22	FY23	FY24
Valley Vision 2035	<p>Leveraging the strengths of the public power model to lead innovation and transformation in the energy industry / discovery related to how our business model might need to evolve</p> <p><i>Report target date of late November 2023</i></p>			
Valley Pathways Study	<p>Understanding what economic sectors might do throughout the Valley to reduce carbon emissions &amp; grow the economy</p> <p><i>Report target date of mid February 2024</i></p>			
Utility of the Future Information Exchange	<p>Providing recommendations for consideration on the 2024 Integrated Resource Plan</p> <p><i>Report published October 2023</i></p>			
Integrated Resource Plan	<p>Guiding TVA to meet future electricity demands with low-cost, reliable, and increasingly cleaner generation</p> <p><i>Draft Report target date of mid March 2024</i>  <i>Final Report target date of August 2024</i></p>			

# Additional Programs Serving the Valley’s Evolving Needs

Initiative/Program	Purpose	FY22	FY23	FY24
Flexibility 2.0	<p>TVA continues to evolve the flexibility component of the long-term agreement with our LPCs / Flexibility 2.0 offers three new project frameworks in support of enabling more LPCs to leverage the offering</p> <p><i>Implemented August 2023</i></p>			<div> <div>Program launched</div> <div>Nov 2023</div> </div>
Regional Grid Transformation	<p>Working with our LPCs to transforming the Valley’s existing power grids into a flexible, resilient and integrated system to meet evolving customer expectations &amp; changing world conditions</p> <p><i>Launched 2022 / multi-year implementation</i></p>		<div> <div>Multi-year implementation</div> </div>	
Resiliency 360	<p>TVA and LPCs piloting a backup generation offer that seeks to leverage distributed generation to meet near-term system capacity needs</p> <p><i>Launched November 2023</i></p>			<div> <div>Program launched</div> </div>
Development of New Growth/ED Program Offerings	<p>TVA, LPCs and ED partners working together to establish impactful programs to adequately address the elevated growth happening across the Valley</p> <p><i>Launched August 2023 / on-going</i></p>			<div> <div>Development Underway</div> </div>

# Role of the Regional Energy Resource Council

The following describes the objectives of TVA’s Federal Advisory Committees versus other needs driven stakeholder engagements and the respective differences in advisement to TVA Executive Leadership and the TVA Board of Directors.



# RERC Term 6\* Members

## Organization

### Local Power Companies & Customer Associations (4 members)

- Knoxville Utilities Board – Erin Gill (Chair)
- Jackson Energy Authority – Monte Cooper
- Tennessee Valley Public Power Association (TVPPA) – Doug Peters
- Tennessee Valley Industrial Committee (TVIC) – Pete Mattheis

### Business Leaders (1 member)

- Ford Motor Company – Adam Benshoff

### Community Stakeholders (5 members)

- Bowling Green Chamber of Commerce – Ron Bunch
- Urban League of Greater Chattanooga – Candy Johnson
- Habitat for Humanity – Rodney Goodman
- Sowing Justice – Marquita Bradshaw
- Citizens Climate Education – Jan Berry

*\*Term 6 runs August 1, 2023 – July 31, 2025*

## Organization

### Government/Elected Officials (8 members)

- State of Tennessee – Alexa Voytek
- State of North Carolina – Julie Woosley
- State of Georgia – Boyd Pettit
- State of Mississippi – Chrissy Heard
- State of Alabama – Senator Steve Livingston
- Commonwealth of Virginia – Chelsea Jenkins
- Commonwealth of Kentucky – Rebecca Goodman
- City of Chattanooga – Erik Schmidt

### Academia / Research (2 members)

- Oak Ridge National Lab – Dan Miller
- Drake State Community Technical College – Patricia Sims



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# Wrap-up and Day Two Preview

Jo Anne Lavender; IRP Facilitator

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# 2024 IRP Working Group

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# Welcome

Jo Anne Lavender; IRP Facilitator

# Agenda – November 14, 2023

Topic	Time (CT)	Presenter(s)	Notes
Breakfast	8:00-8:45		
Agenda and welcome	8:45-9:00	Jo Anne Lavender	
Valley Pathways Study Update	9:00-9:30	Laura Duncan	
Break	9:30-9:45		
Environment Regulatory Outlook and Environmental Justice Discussion	9:45-11:30	Rebecca Tolene; Amy Edge	
Lunch	11:30-12:30		
Transformative Innovation Initiatives and Federal Funding Overview	12:30-2:30	Joe Hoagland	
Break	2:30-2:45		
Modeling Updates (cont., if needed)	2:45-3:45	Preeth Srinivasaraghavan; Roger Pierce	Review Cases 1A, 2A, 3A, and 4A
Wrap-up	3:45-4:00		

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# Valley Pathways Study:

## Building a Competitive, Clean Economy

Laura Duncan; Sr. Project Manager, Environment & Energy Policy



# What is a Pathways Study?

A Pathways Study uses scenario-based analysis to compare several possible visions of the future to help determine the timing, scale, and effects of achieving greenhouse gas targets.

What paths are most feasible for the Valley to get to net zero by 2050?



What impacts will these paths have on the Valley as a whole?



# Study Partnership & Support



Mission is to address *critical energy and environmental challenges* by creating policy-relevant research and educational opportunities that integrate natural, physical, and social science.



Mission is to serve the people of the Tennessee Valley to make life better, with a focus on Energy, Environment, and Economic Development.



Significant, ongoing TVA experience working on major initiatives & engaging stakeholders

Guidehouse and VEIC are uniquely positioned to understand decarbonization pathways for the Valley and drive stakeholder alignment.



Experience conducting economy-wide decarbonization pathways modeling

[Massachusetts 2050 Decarbonization Roadmap](#)  
[Duke Energy Carolinas Carbon Plan](#)

# Valley Pathways Study

A study to understand what economic sectors, such as transportation, industry, agriculture and buildings, might do throughout the Valley in the coming years to reduce carbon emissions and grow the economy.



Community



Residential



Commercial



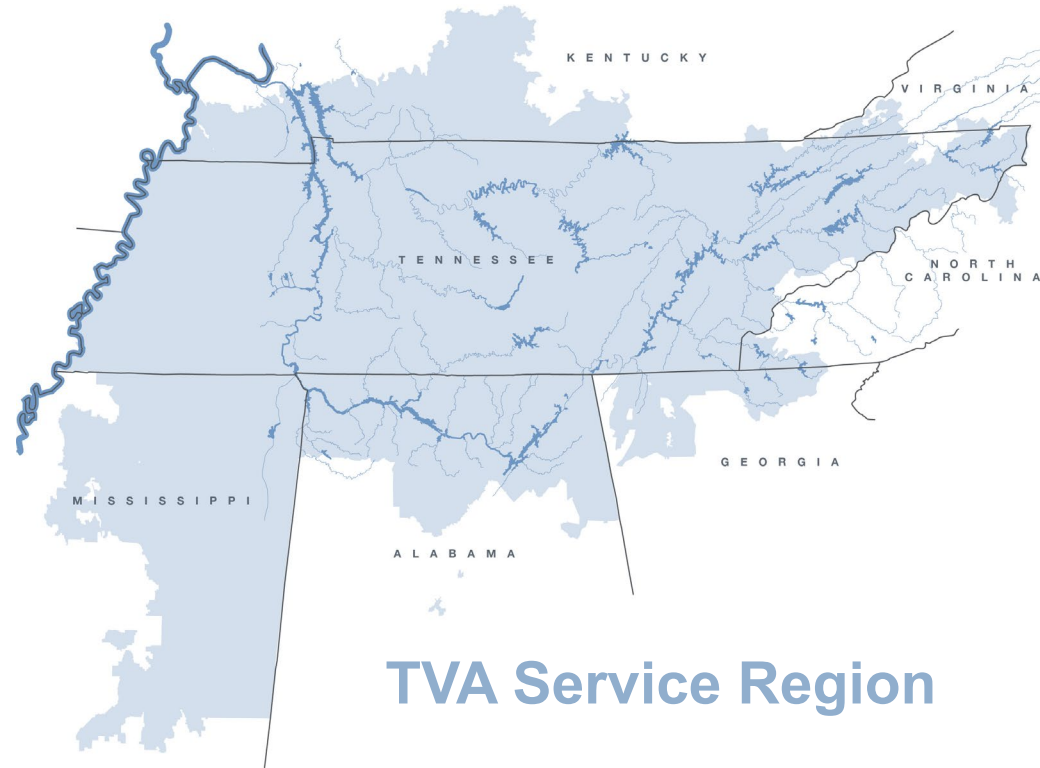
Industrial



Agricultural



Transportation



# TVA's Integrated Resource Plan

Sets strategic direction for how TVA will meet the electricity load needed in the future in a least cost, reliable and responsible manner.



Gas



Carbon Capture



Hydrogen



Hydro



Utility-Scale Solar



Energy Storage



Utility-Scale Wind



Nuclear/SMRs



Energy Efficiency



Demand Response





# Key Components

### Valley Stakeholders



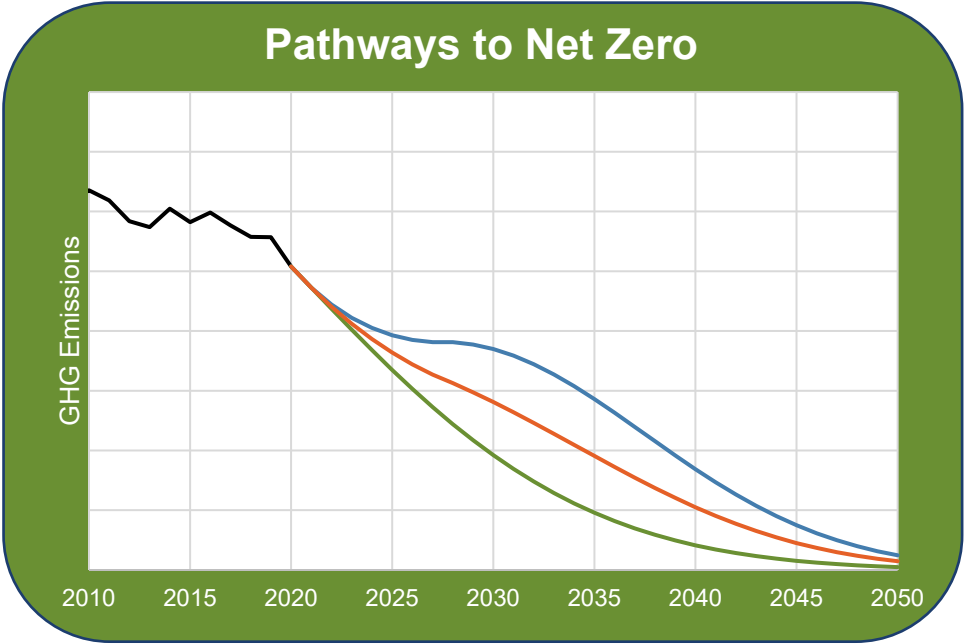
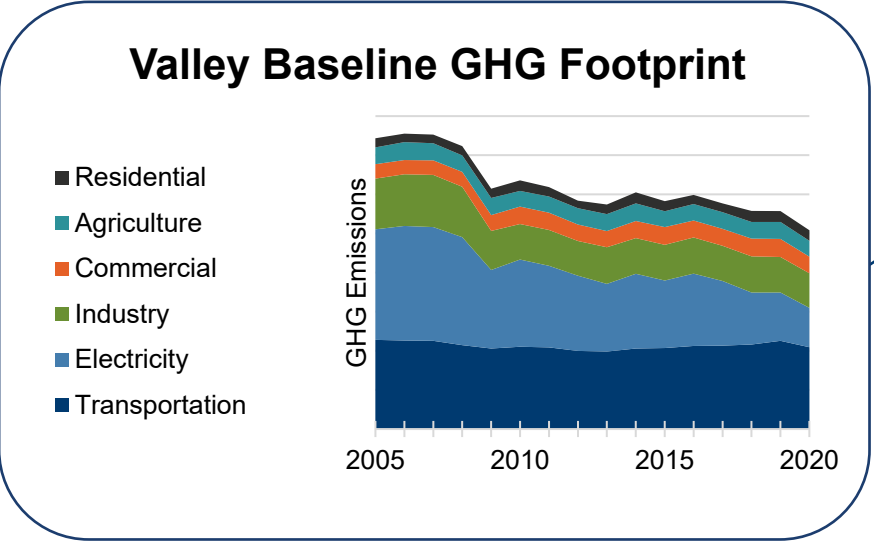
Geographic & economic sector reps



Key issue advocates



State, municipal, and local power company officials

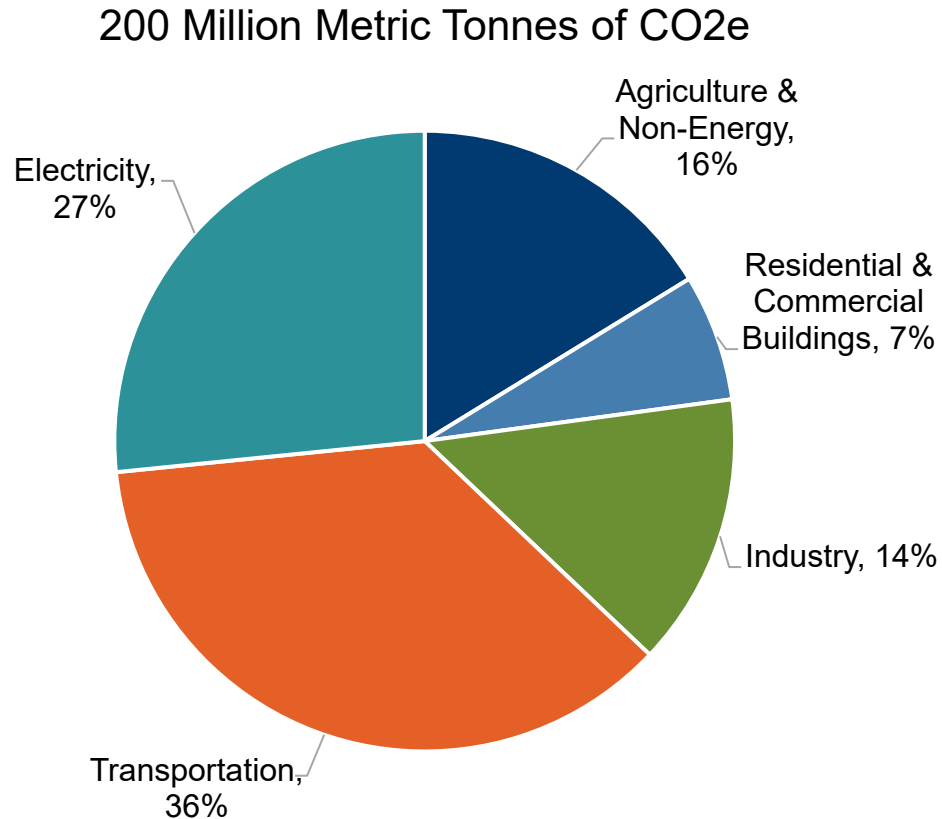


# Economy-Wide Study, Economy-Wide Stakeholders

1. Ford Motor Company
2. City of Knoxville
3. Oak Ridge National Laboratory
4. Southeast Energy Efficiency Alliance
5. WestRock
6. BrightRidge
7. Tennessee State University
8. University of Tennessee Chattanooga
9. The Nature Conservancy
10. Redstone Arsenal
11. Tennessee Farm Bureau Federation
12. Tennessee Interfaith Power and Light
13. Tennessee Advanced Energy Business Council
14. Tennessee Department of Economic Development
15. Nashville Electric Service
16. City of Chattanooga
17. Tennessee Valley Public Power Association
18. Middle Tennessee Natural Gas Utility District
19. City of Florence Electricity
20. UT Center for Transportation Research
21. Tennessee Valley Industrial Committee
22. Tennessee Department of Environment and Conservation
23. Commonwealth of Kentucky Energy and Environment Cabinet
24. Memphis and Shelby County Division of Planning and Development



# GHG Baseline for the Valley



Tennessee Valley 2019 Greenhouse Gas Emissions (estimated). Commissioned by TVA and UTK Baker Center. Prepared by Guidehouse and VEIC. Draft, Nov. 2023.

## Key Insights

- 200 MMTCO<sub>2</sub>e is ~3% of US GHG emissions – the Tennessee Valley is home to about 10 million people, or about 3% of US population.
- Transportation is, by far, the largest source of greenhouse gas emissions in the Valley.
- Emissions from Buildings and Industry look small, but these sectors demand nearly 100% of the electricity that is generated for the Valley.
- Agriculture represents only energy consumed; methane emissions related to agriculture are in Non-Energy alongside refrigerants and flame retardants.

# Pathways to Net Zero – Scenarios

## Scenarios align to “Pillars of Decarbonization”

Initial pathways scenarios focused on three critical strategies, often referred to as “pillars of decarbonization” – **efficiency**, **electrification**, and **low-carbon fuels**. A fourth pathway tests the synergies of combining those levers.

### Community Resiliency



A future where more demands – for energy, goods, and services – throughout the economy are met and funded locally. Denser communities, both urban and rural, allow for less driving.

### Accelerated Electrification



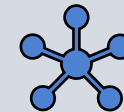
A future where almost everything in the Valley is electrified. This scenario explores the upper bound of how much electricity demand growth might be expected in a Net Zero economy.

### Low-Carbon Breakthrough



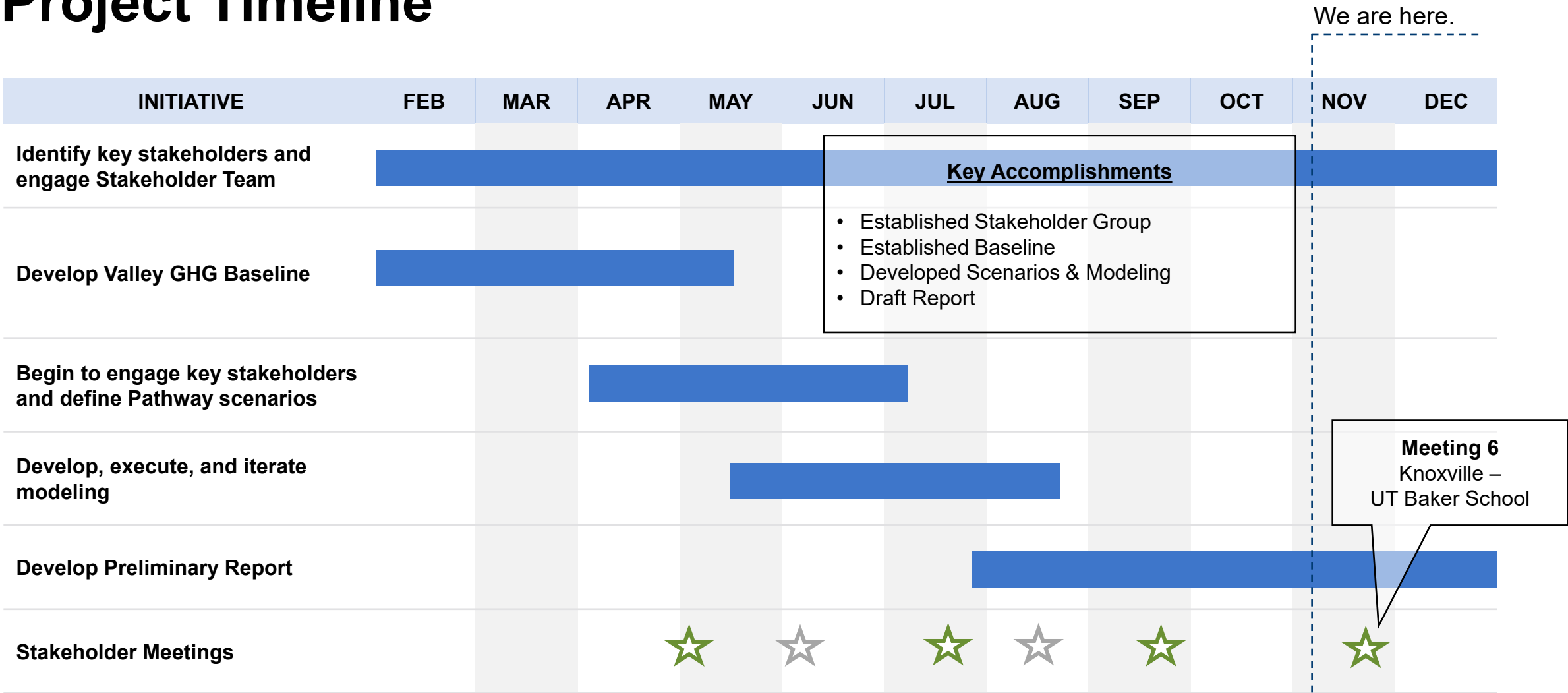
A future in which the pace and magnitude of electrification is more limited. Instead, innovation allows new low-carbon fuel alternatives to be deployed beyond just niche applications.

### Combined Scenario




A future where the Valley strives for a combination of the three strategies. This scenario takes an “all of the above” approach matching decarbonization strategies to their most impactful sectors.

# Project Timeline



# What's next?



YOU ARE HERE: [HOME](#) / [ENVIRONMENT](#) / [VALLEY PATHWAYS STUDY](#)

## Valley Pathways Study

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### Building a Competitive, Clean Economy

The Tennessee Valley Authority is partnering with the University of Tennessee Baker Center for Public Policy on a study to develop a roadmap for a Net Zero greenhouse gas (GHG) emission economy by 2050. Building on the foundation of TVA's reliable, resilient, low-cost, and increasingly clean electricity future, this study is a key component of advancing TVA's Strategic Intent to Decarbonize. The study will look beyond just TVA's electricity service. Throughout the study, partnerships with stakeholders from across the Valley will provide a holistic view of the entire economy and support the economic competitiveness of the region.

The project will commence with the development of a Valley-wide inventory of current GHG emissions and analysis of economy-wide decarbonization pathways, including stakeholder engagement and examination of multiple scenarios. Collaborating with stakeholders, TVA and the project team will build insights, perspectives, and ambitions from every sector of the Valley's economy to build out potential pathways to Net Zero. Highlighting key areas of commonality will help bring the Valley toward consensus next steps, while arming the valley with optionality as it journeys to Net Zero. Ultimately, the project will enhance TVA's position as a leader in decarbonization and develop an actionable plan to accelerate the transition to a clean energy economy throughout the Valley.

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### Vision & Benefits

In order to foster an inclusive and productive stakeholder process and develop robust, durable outcomes for the Valley, the project team is focusing on a vision supported by the four pillars outlined below.

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#### Public Webinars

[Public Webinar 1](#)

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#### Stakeholder Meetings

[Stakeholder Meeting #1](#)  
[Stakeholder Meeting #2](#)  
[Stakeholder Meeting #3](#)  
[Stakeholder Meeting #4](#)  
[Stakeholder Meeting #5](#)

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#### Join the Study

[JOIN OUR MAILING LIST](#)

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#### Share Your Thoughts

We want to hear from you! If you have comments or thoughts on the Valley Pathways Study, [click here](#) to let us know.

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#### Related Documents

[Valley Pathways Study Fact Sheet](#)

- Present Preliminary Report Findings
  - Joint RERC & RRSC Meeting
- Publish Preliminary Report 2024
- Public Webinar
- Information Sharing
- Support Initiatives and Plans

View notes & submit comments at:  
[tva.com/valleypathways](https://tva.com/valleypathways)



# Break



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# Environment Regulatory Outlook and Environmental Justice

Rebecca Tolene, Chief Sustainability Officer and Vice President, Environment



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# Environment Regulatory Outlook

Rebecca Tolene, Chief Sustainability Officer and Vice President, Environment  
November 14, 2023

# Changing Regulations



## Air

- Greenhouse Gas Rule (ACE Replacement)
- Mercury Air Toxics Rule (MATS)
- Cross State Air Pollution Rule (NOx)
- Non-attainment areas (Particulate)
- Regional Haze Rule (SO2)



## Waste:

- Coal Combustion Residuals
- Carbon Capture and Storage
- PFAS
- Sourcing and End of Life for components (Solar, Batteries, etc.)
- Future unknown liabilities



## Env Justice / Community:

- Meaningful Engagement
- Proactive Opportunities
- Fair Treatment



## Water:

- Effluent Limitation Guidelines
- 316(a) Temperature
- 316(b) Fish Impingement
- Consumptive Use



## Natural Resources

- Migratory Birds
- Bats
- Invasive Species
- NEPA Updates



## Federally Recognized Tribes

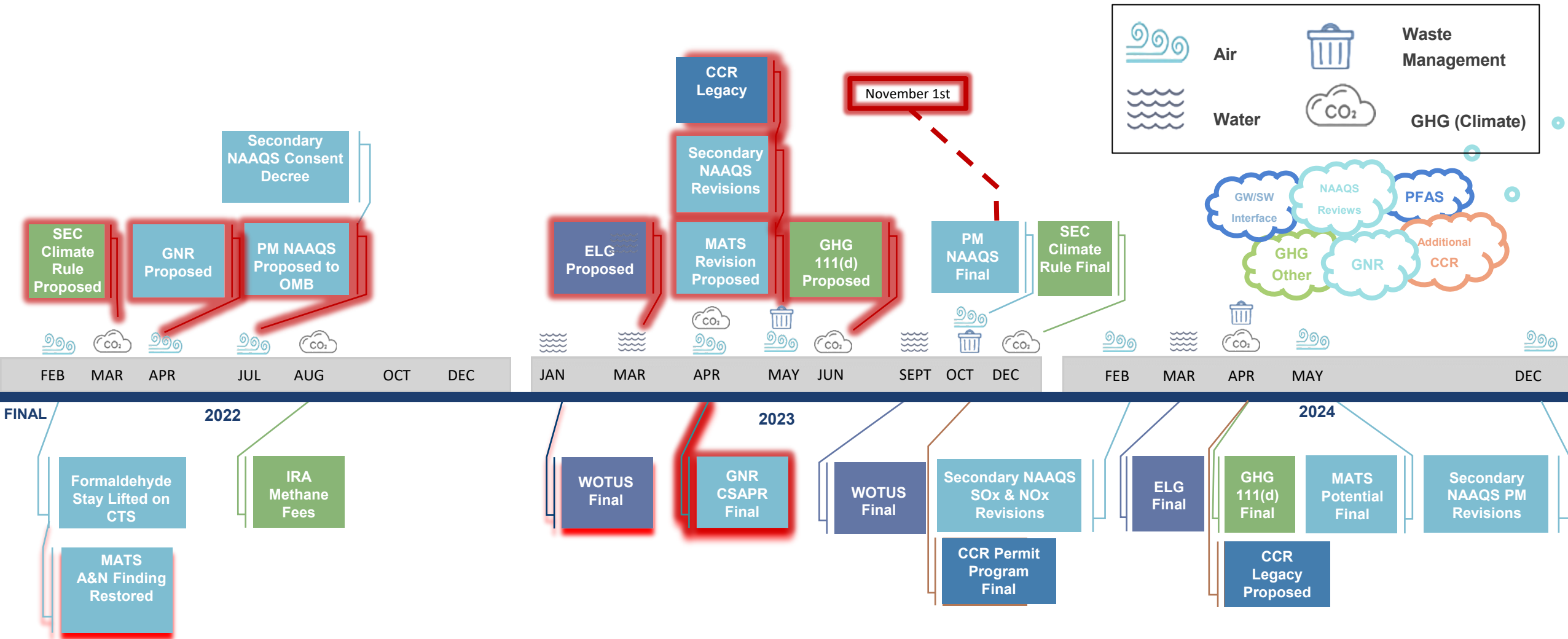
- Consultation
- Native American Graves and Repatriation Act



## Fuel:

- Transportation Infrastructure
- Methane Lifecycle Impacts
- Hydrogen

# Environmental Regulation Timeline



# Environmental Regulatory Landscape

## Proposed Effluent Limitation (ELG) Guidelines

- Applies to TVA's Coal Generation
- Compliance by December 31, 2028
- Cost of compliance (capital and O&M) and technological uncertainties



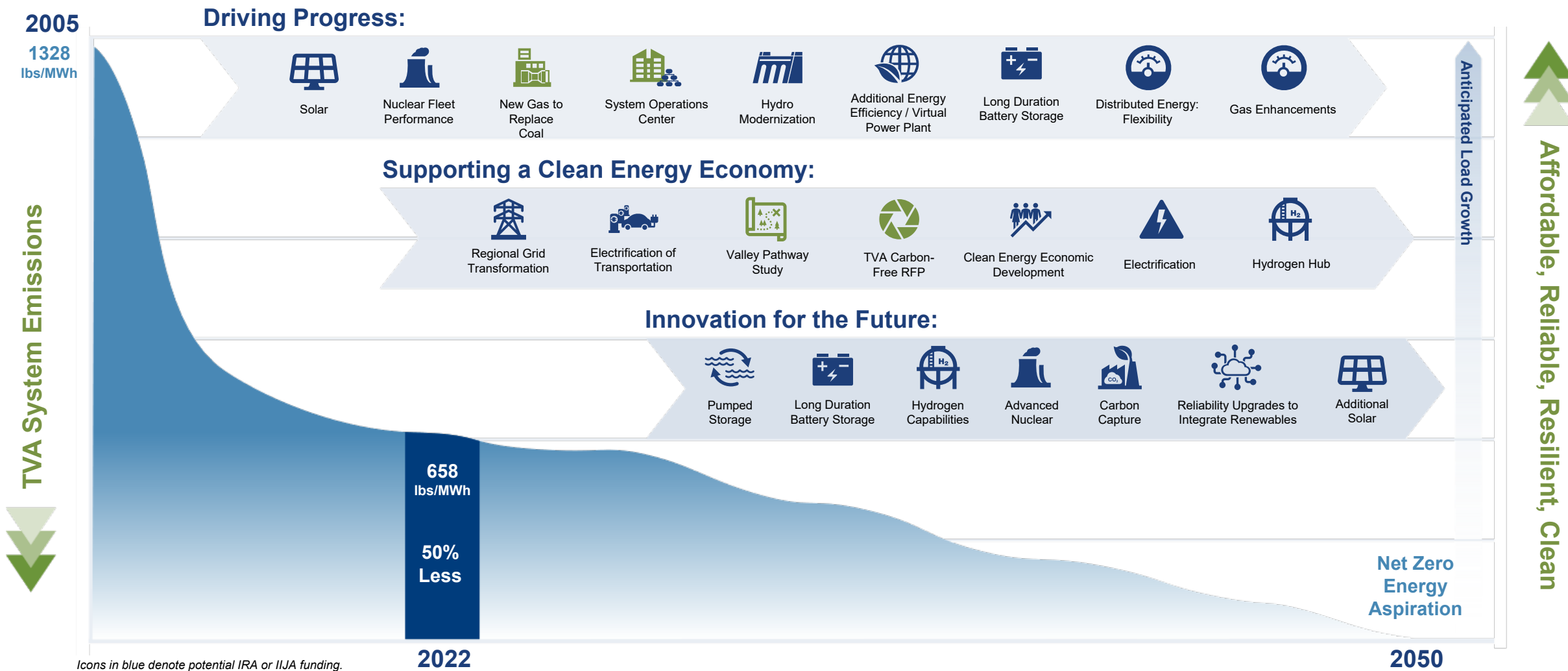
## Proposed Carbon Emissions (Greenhouse Gas) Rules

- Applies to both Coal and Gas Generation
- Compliance by January 1, 2030
- Cost of compliance (capital and O&M) and technological uncertainties (hydrogen and Carbon Capture)
- Significant infrastructure requirements (Green hydrogen production, transportation, and carbon injection)



# Building the Energy System of the Future

AFFORDABLE / RELIABLE / RESILIENT / CLEAN



National Leader in Carbon Reduction

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# TVA Environmental Justice Program

# Historic Roots



# TVA's Mission to Serve

- Founded in 1933 as part of the New Deal
- Non-profit Federal Corporation, the nation's largest Public Power provider
- Since its inception, TVA has worked to make life better for the people of the Tennessee Valley region.



**PARTNERING**  
with **153**  
**Local Power**  
**COMPANIES**

**TO SERVE**  
**10** **MILLION**  
**PEOPLE**

**700,000**  
**Businesses**  
IN  
PARTS  
OF **7** **STATES**

**Directly Serve**  
**57**  
**LARGE industries &**  
**federal installations**



# What is environmental justice?

- “Environmental justice” means the just treatment and meaningful involvement of all people, regardless of income, race, color, national origin, Tribal affiliation, or disability, in agency decision-making and other Federal activities that affect human health and the environment so that people:
  1. Are fully protected from disproportionate and adverse human health and environmental effects (including risks) and hazards, including those related to climate change, the cumulative impacts of environmental and other burdens, and the legacy of racism or other structural or systemic barriers; and
  2. Have equitable access to a healthy, sustainable, and resilient environment in which to live, play, work, learn, grow, worship, and engage in cultural and subsistence practices (EO 14096, 2023).

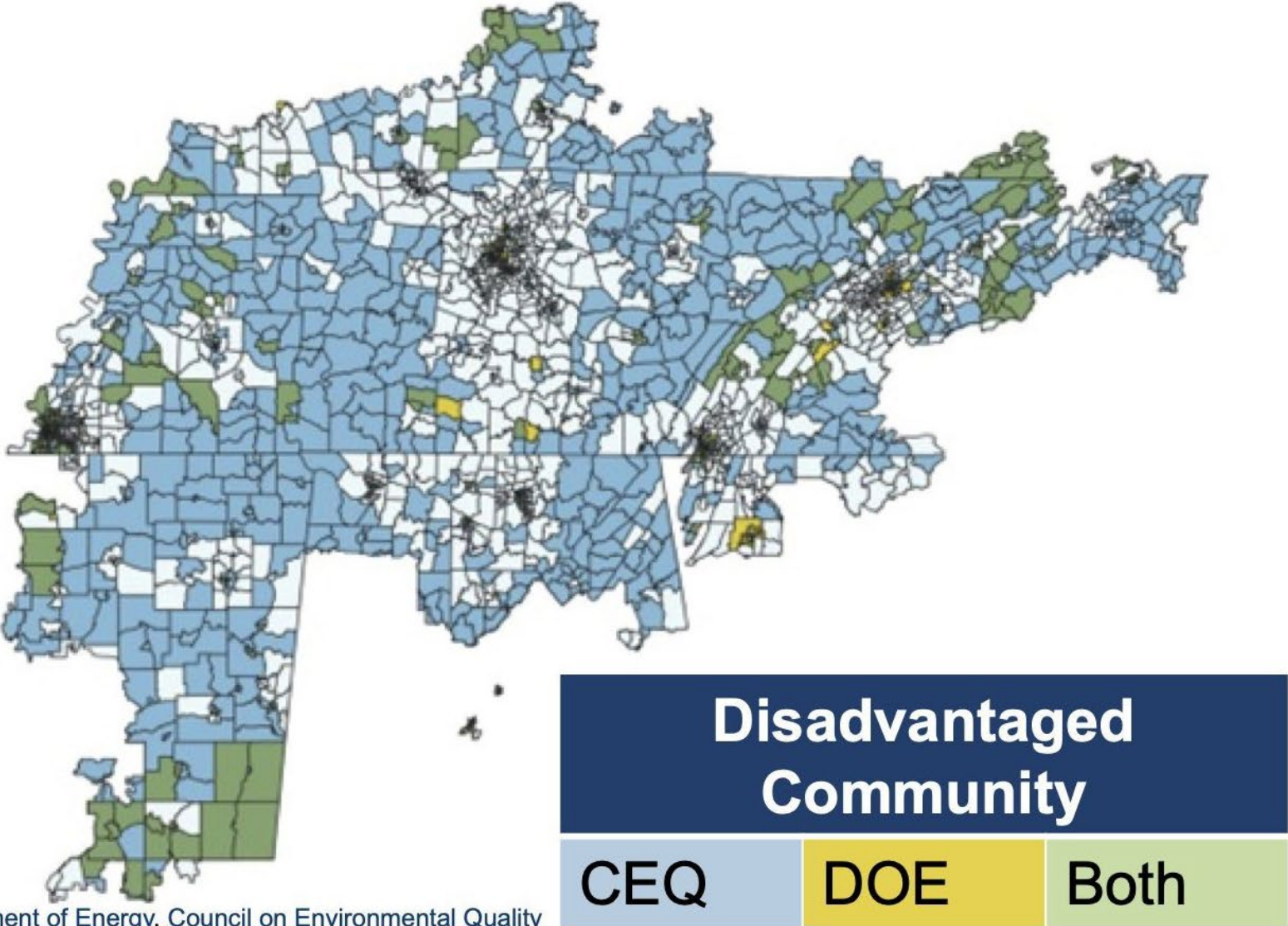
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# What is a disadvantaged community?

A disadvantaged community may include one or more of the following variables:

- Low income; high persistent poverty
- High unemployment or underemployment
- High housing cost burden and/or substandard housing
- High transportation burden and/or low transportation access
- High energy cost burden and low energy access
- Disproportionate impacts from climate change
- Limited access to healthcare
- Job lost through the energy transition

# Disadvantaged Communities in our Region



# Equality – Equity – Justice

## Equality



The assumption is that **everyone benefits from the same supports**. This is equal treatment.

## Equity



**Everyone gets the supports they need** (this is the concept of "affirmative action"), thus producing equity.

## Justice



All 3 can see the game without supports or accommodations because **the cause(s) of the inequity was addressed**. The systemic barrier has been removed.

# Just Treatment & Meaningful Involvement

## Just Treatment

- No group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental and commercial operations or policies ([EPA 2022a](#)).

## Meaningful Involvement

- Decision makers will seek out and facilitate the involvement of those potentially affected;
- People have an opportunity to participate in decisions about activities that may affect their environment and/or health;
- Community concerns will be considered in the decision-making process;
- The public's contribution can influence the regulatory agency's decision ([EPA 2022a](#)).

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# Executive Orders Regarding Environmental Justice

- **E.O. 14096** (Apr. 21, 2023) Revitalizing Our Nation's Commitment to Environmental Justice for All
- **E.O. 14091** (Feb. 16, 2023) Further Advancing Racial Equity and Support for Underserved Communities Through the Federal Government
- **E.O. 14008** (Jan. 27, 2021) Tackling the Climate Crisis at Home and Abroad
- **E.O. 13985** (Jan. 20, 2021) Advancing Racial Equity and Support for Underserved Communities Through the Federal Government
- **E.O. 12898** (Feb. 16, 1994) Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

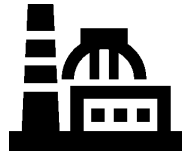


# Examples of how TVA supports communities



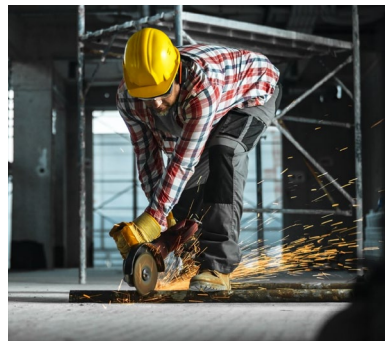
## Home Uplift

Provides home weatherization upgrades free of charge to qualified households to reduce energy costs and improve household conditions.



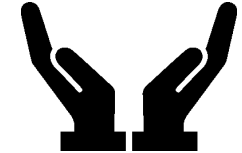
## Workforce Development

Creates learning opportunities for skilled green jobs and increases minority participation in TVA's Quality Contractor Network



## School Uplift

Offers energy efficiency training and grants that reduce energy costs and improve the quality of the learning environment



## Small Business Uplift

Helps local businesses in underserved communities make smart energy choices that save money and lead to decreased energy use, improved facilities, and reduced carbon emissions

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# EPA Power Plant Environmental Justice Screening Methodology

- Methodology, using AEROMOD and HYSPLIT modeling, to estimate how air pollutants disperse around power plants
- Ranks fossil EGUs in contiguous United States based on relative potential to affect areas of concern
- Does not evaluate other aspects of pollution from these facilities, including type and magnitude
- Two key components:
  - Identifies areas potentially affected by each EGU
  - Gauges relative potential for EJ concern in those areas from cumulative impact and vulnerability perspectives



# How does TVA engage with communities?

## Suggestions for Engaging with Communities

- Hosting in-person meeting with communities
- Meeting with local leaders and community action groups
- Distributing fact sheets and information to local schools and local community action agencies
- Partnering with our Local Power Companies to distribute information
- Providing targeted direct mailings to households near the Project
- Providing phone numbers in lieu of website addresses
- Sending hardcopy materials directly to homes when requested



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# TVA IRP Engagement Opportunities

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# IRP EIS Public Engagement Opportunities & Milestones

May 19, 2023 – Public scoping period (45 days)

- May 23, 2024 – Virtual public meeting
- June 7, 2023 – Virtual public meeting

Spring 2024 – Public comment period for Draft EIS (45 days) with public meetings

Summer 2024 – Publication of Final EIS with 30-day cooling off period

Summer 2024 – Board adoption of the IRP followed by the Record of Decision

This is a list of engagement requirements per NEPA regulations. TVA also seeks other opportunities to routinely engage with local, state, and federal government agencies, local power companies, community organizations, and other stakeholders. Two examples include monthly IRP Working Group meetings and quarterly IRP virtual webinars.

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# IRP EIS – Record of Decision

The ROD will:

- Document TVA's decision on Power Supply Mix Ranges, which establishes a general direction for future asset planning
- Be approved by TVA's Board of Directors

The ROD will not:

- Include decision-making on specific assets at discrete sites. Projects proposing tangible changes to generation and transmission assets, such as retirements, upgrades, and new builds, will be studied in future environmental reviews.

# Environmental Justice Approach for IRP Process

TVA has developed several public outreach and stakeholder engagement opportunities for all communities throughout the IRP process. The IRP process is not focused on site specific identification but rather a valley wide study to determine the preferred portfolio in order to ensure TVA provides reliable, resilient, affordable and ever cleaner energy for the Valley for decades to come.

## **Pre-draft IRP (May 2023-February 2024)**

- Utilize various channels to communicate 2024 IRP process (social, online, media, regional relations team, LPCs, community days, programmatic workshops)
- Fact Sheets and IRP process video available in both English and Spanish
- Leverage direct mailings and partner with LPCs for bill inserts
- Leverage Regional Relations Field Teams to work with community and business leaders as well as internal partners to identify EJ communities and identify engagement opportunities

## **Post-draft (March 2024 – August 2024)**

- Continue to utilize various channels of communication
- Draft IRP Report to be made accessible in several locations (both electronically and housed as hard copies in various locations accessible to disadvantaged communities across the Valley)
- Draft EIS cost and environmental metrics will provide directional insight into potential impacts to EJ communities
- Public Informational Open Houses held in locations that are accessible to EJ communities
- Ensure communication style is conducive to being digestible to all stakeholder sectors

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# Environmental Justice Approach Post IRP Process

TVA will utilize that strategic direction outlined in the 2024 IRP to adjust the asset strategy and refine the long-range financial plan while providing meaningful engagement opportunities for communities with EJ concerns that may be affected by those decisions.

## Post 2024 IRP Adoption

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- After the asset strategy is refined and specific sites are identified, TVA will follow the NEPA process as well as leverage both EJ Screening (EPA) tool and known disadvantages communities to reach EJ population
- Regional Relations Field Teams and Site Teams will work with both internal SMEs and community leaders to implement the EJ principles as site-specific outreach and engagement plans are developed
- Provide timely opportunities for communities to share information, concerns, and participate in decision-making process
- Build relationships on an on-going basis in order to establish trust and transparency before an operational need arises



# Lunch



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# Transformative Innovation Initiatives and Federal Funding Overview

Joe Hoagland; Vice President, Innovation and Research

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# Transformative Innovation Initiatives

Joe Hoagland, Ph.D.  
Vice President, Innovation and Research  
Tennessee Valley Authority

November 2023

IRP Working Group



# 1920s: Hard Times in the Tennessee Valley



# Improve Standards of Living



“ Power is really a secondary matter...TVA is primarily intended to **change** and to **improve** the standards of living of the people... ”

*-President Franklin D. Roosevelt*



# TVA Mission

BUILT FOR THE PEOPLE OF THE VALLEY

**ENERGY**

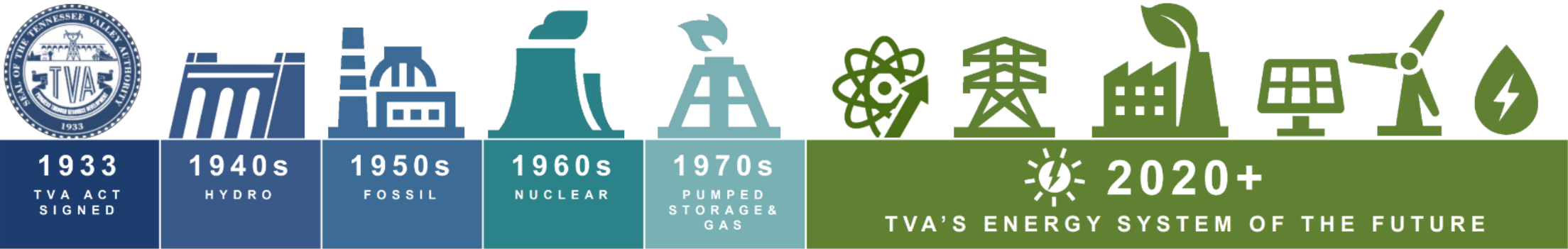
Electricity at the lowest feasible rate and highest feasible reliability

**ENVIRONMENT**

Stewardship of the natural resources for best use by the public

**ECONOMIC DEVELOPMENT**

To attract and retain good jobs and capital investment in the Valley



Since its inception, TVA has innovated to meet the needs of the Valley.

Today and in the future, the Valley needs **affordable, reliable, resilient, and carbon-free energy** to lead the nation in energy innovation and economic development.

 INNOVATING FOR THE PEOPLE OF THE VALLEY



# A Rich History of Innovation and Catalyst for Change



## **Agriculture** Pre-1940

- Agriculture (Fertilizer)
- Rural Electrification
- River Management
- Hydro Production



## **Manufacturing** 1940s – 1990s

- WWII Support
- Manufacturing
- Coal Generation
- Nuclear



## **Information** 2000s - Current

- Advanced Nuclear
- Connected Communities
- Decarbonization
- Electric Vehicles
- Energy Efficiency
- Future Grid Performance
- Gas Generation
- Regional Grid Transformation
- Renewables/Wind
- Storage Integration



## **Energy Economy** Future

- Advanced Nuclear
- Virtual Power Plants
- Widespread Electrification
- Hydrogen Economy
- Low/No Carbon Generation
- Digitization
- Cybersecurity
- Augmented/Virtual Reality
- Artificial Intelligence
- Machine Learning

# TVA System Today



Partnering with 153 local power companies that supply electricity to approximately 10 million people across seven Southeastern states with 57 directly served customers, including 50 industrial customers and 7 military and federal installations.

## Generating Assets

- 3 Nuclear Sites (7 Units)
- 5 Coal-Fired Sites (25 Units)
- 29 Hydroelectric Sites (109 Units)
- 1 Pumped-Storage Site (4 Units)
- 9 Combustion Turbine Gas Sites (86 Units)
- 8 Combined Cycle Gas Sites (14 Units)
- 1 Co-Generation Unit
- 14 Solar Energy Sites

## Largest Public Power Provider

In the United States

## 3rd Largest Electricity Generator in the Nation

Based on Total Electric Generation in 2020

## One of the Nation's Largest Transmission Systems

In high voltage lines among United States Utilities  
16,400 miles of high voltage lines and  
69 interconnections with neighboring electric systems

## 3rd Largest Nuclear Fleet

In the United States, providing over 40% of TVA's energy

## 99.999% Reliability Since 2000

Top-decile industry performance

Over

## 40,000 Miles of Rivers, Streams and Tributaries

Including the 652-mile Tennessee River

## Approximately 350,000 Jobs & Almost \$46 Billion

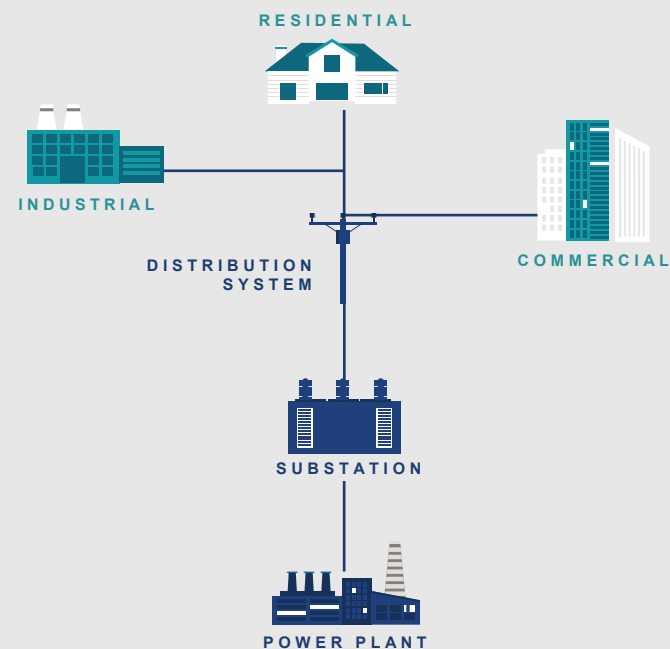
Capital investment in the Tennessee Valley generated by TVA economic development activity over the past five years



# Energy System of the Future

Increasing energy system complexity requires planning, integration, and innovation

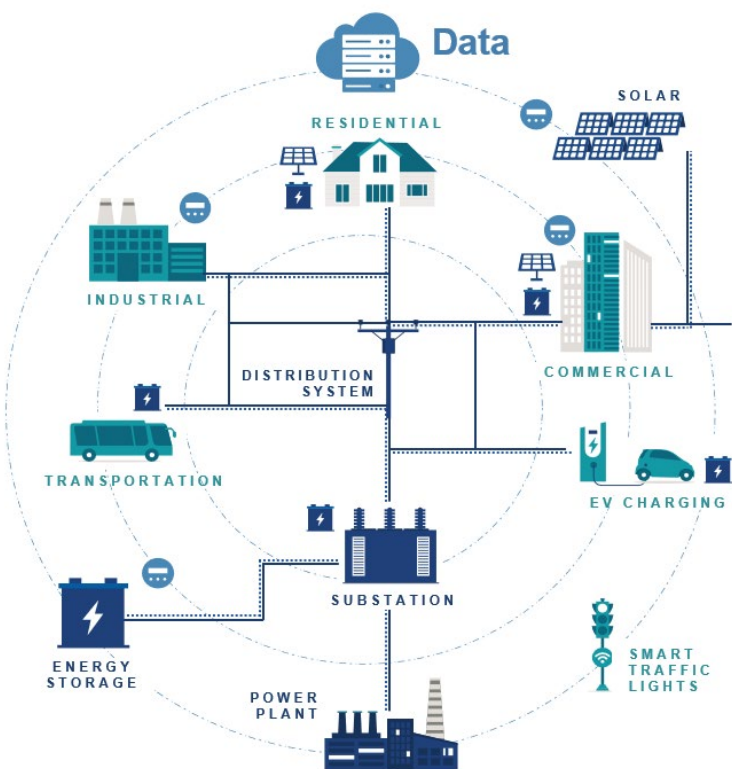
## Legacy Energy Grid



## Emerging Drivers

- Electric Vehicles
- Valley Electrification
- Economic Development
- DERs / Storage
- Demand Response
- Variable Renewable Energy

## Energy System of the Future





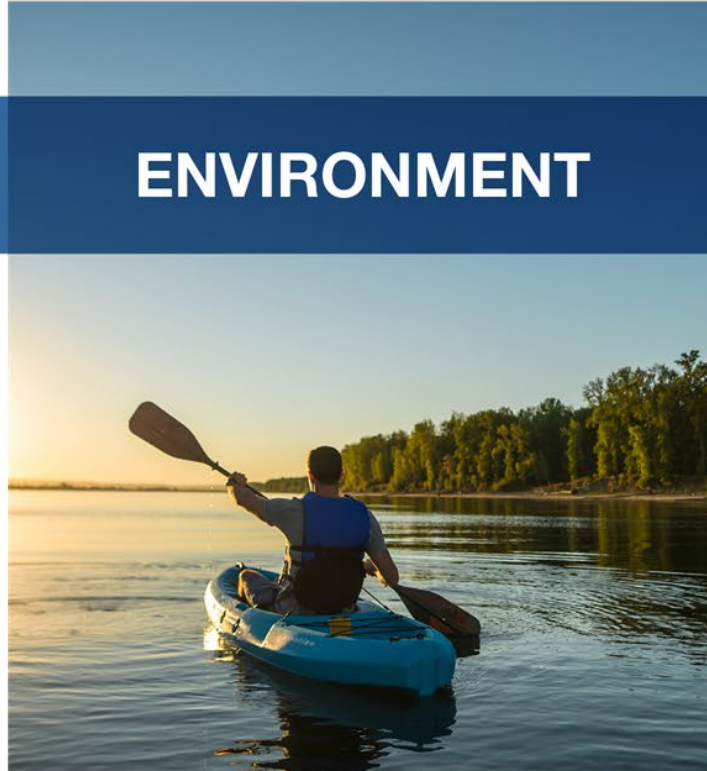
# Delivering Our Mission to You

## ENERGY



Provide *affordable,*  
*reliable* power.

## ENVIRONMENT



Steward the Valley's  
*natural resources.*

## ECONOMIC DEVELOPMENT



Partner for  
*economic growth.*

# Energy System of the Future

## Reinforce Reliability



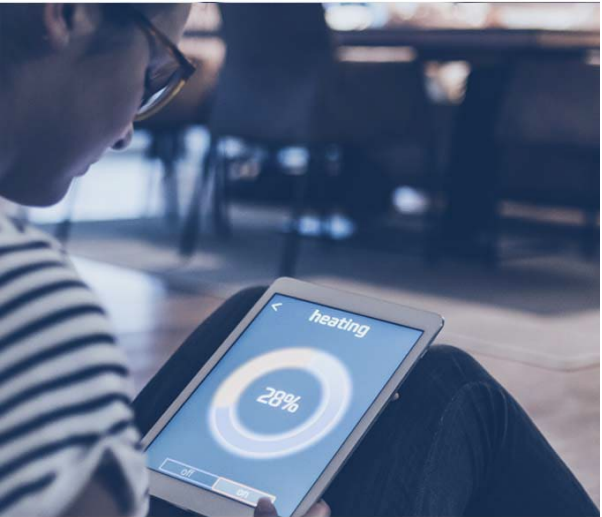
Provide efficient, reliable, resilient power

## Protect the Environment



Integrate clean, renewable energy sources

## Keep Power Costs Low

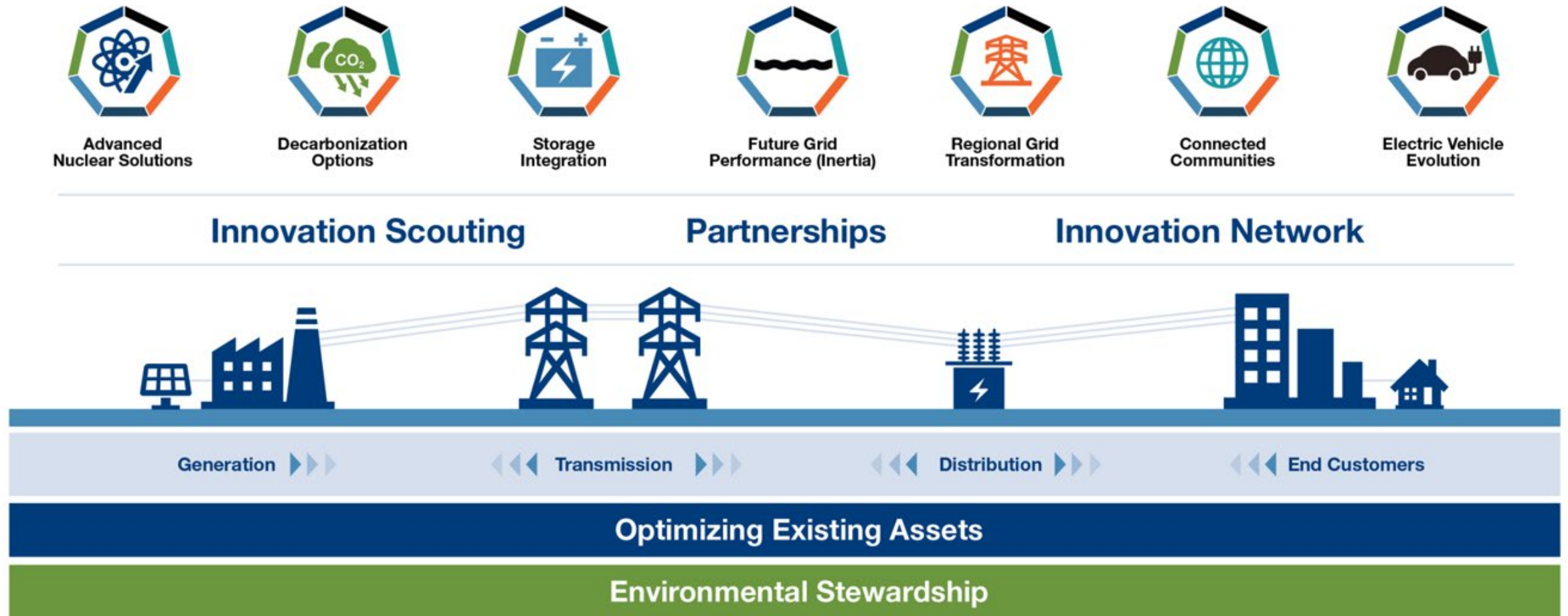


You are in control of your energy dollar

[Grid of Tomorrow](#) | [System Operations Center](#) | [Advanced Nuclear Solutions](#) | [Clean Energy](#)



# The Role of Innovation and Research





# Innovation and Research Strategy

Accelerates TVA's Strategic Imperatives



## People Advantage

**Foster** an **innovative workforce** and provide the **tools and framework** to create the energy system of the future



## Operational Excellence

**Develop advanced operational capabilities** to enable affordable, reliable, and resilient energy in the face of unprecedented growth and change



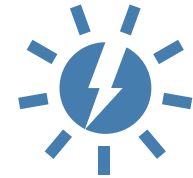
## Financial Strength

Enable cost effective **options** for new generation, grid modernization, and demand-side technologies



## Powerful Partnerships

**Collaborate** with Local Power Companies and communities to **address community energy burden** and **meet evolving customer needs**



## Igniting Innovation

**Innovate practical solutions at scale** to enable a clean, flexible, diverse, and relentlessly evolving energy system of the future

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# Federal Funding Overview

Joe Hoagland, Ph.D.  
Vice President, Innovation and Research  
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# Bipartisan Infrastructure Law (BIL)

November 2021



## Total of \$1.2 trillion

Existing \$650 billion infrastructure legislative authorizations with \$550 billion in new program spending

### Opportunities in the law will fund:

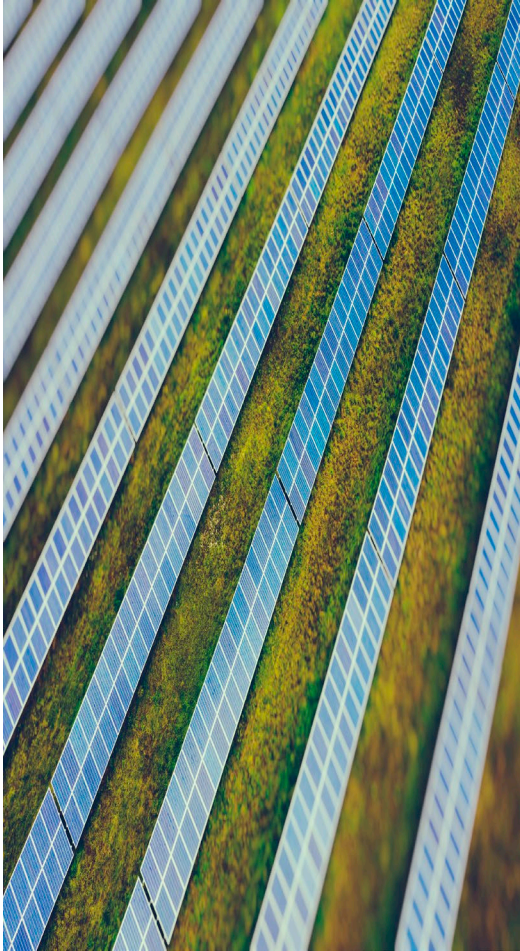
- Grants to enhance the resilience of the electric infrastructure against disruptive events such as extreme weather and cyber attacks
- Expansion of the Smart Grid Investment Matching Grant Program, focusing on investments that improve the flexibility of the grid
- Upgrading existing transmission and distribution systems and other actions like deploying energy storage
- Clean energy demonstrations and research hubs

## Key Priorities

- Transportation infrastructure
- Power infrastructure
- Broadband
- Public transit and EVs
- Cyber, climate resiliency
- Environmental justice

# Inflation Reduction Act (IRA)

August 2022



## Total of \$369 billion

### Opportunities in the law will fund:

- Multiple efforts to on-shore clean energy manufacturing in the U.S. across the full supply chain of clean energy and transportation technologies
- Competitive grants aimed at enabling low-income and disadvantaged communities to deploy or benefit from zero-emission technologies, including distributed technologies, and to carry out other greenhouse gas emission reduction activities
- New and existing tax credits for hydrogen, vehicles, clean electricity, low-carbon fuels, and manufacturing
- Targeted grant and loan programs for states and electric utilities to accelerate the transition to clean electricity

## Key Priorities

- Reducing emissions
- Clean energy infrastructure
- Clean vehicles and buildings
- Domestic manufacturing
- Environmental justice

# Types of Federal Funding

	Competitive Grants	Tax Credits*	Formula Grants	Loans	Rebates
<b>Application Process</b>	Must apply through funding agency	Tax Refund Process	Automatically awarded to eligible entities	Must apply through funding agency	Awarded as grants to distribution entities like states
<b>Timing</b>	Feasible project plan required prior to application	Projects must be in-service or construction started	Projects can be developed after funding awarded	Feasible project plan required prior to application	Assets must be in-service or purchased
<b>Amount</b>	Up to <b>50%</b> Cost Share (varies by grant)	Up to <b>60%</b> of capital costs	Up to <b>100%</b> cost share	Up to <b>100%</b> cost share	Variable based on asset
<b>TVA Eligibility</b>	Yes	Yes	Yes	Yes	No
<b>BIL</b>	✓		✓	✓	
<b>IRA</b>	✓	✓	✓	✓	✓

\*Non-tax paying entities can access tax credits via the direct pay method

# Federal Funding Project Management Office (FFPMO)

Exists to help the Valley secure funding

## Mission

The TVA Federal Funding Project Management Office's (FFPMO) Mission is to **leverage federal funding** to align with TVA's Strategic Priorities and bring additional resources to the Valley.



Powerful Partnerships



Operational Excellence



Financial Strength



People Advantage

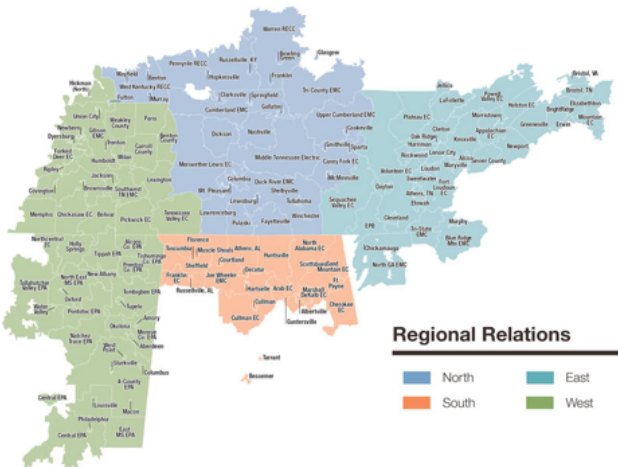


Igniting Innovation



## Vision

Our Vision is for the FFPMO to be the **enabler to secure federal funding** for TVA and the Valley to create the energy system of the future.








## Goals

- **Capture significant federal dollars for the Valley**
- Capture funding for TVA and Valley stakeholders
- **Advance energy capabilities**, regardless of current capabilities, to enable the Energy System of Future – for communities, LPCs, and TVA.
- **Significantly change TVA processes and planning approach** to incorporate tax credits and federal funding.
- Grow into a **go-to resource for external funding**.



# FFPMO Near-Term Focus

Base resources				Additional, targeted resources
1 Strategy and Management	2 Monitoring and Tracking	3 Stakeholder Engagement (Internal)	4 Common App Prep & Analysis	★ GRIP Grants Pursuit
				
Identify and prioritize funding opportunities while providing general coordination	Update data and reports as guidance is released; track pursuits	Identify, plan, execute, and track engagement with stakeholders, develop interest and facilitate pursuit matching	Prepare common materials and guidance to leverage across multiple applications	Coordinate the development of a project portfolio(s) for TVA and/or an LPC coalition to use in pursuit of funding

# Break



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# Modeling Updates (cont.)

Preeth Srinivasaraghavan; Specialist III, Resource Strategy  
Roger Pierce; Sr. Specialist, Resource Strategy





# 3A Updates (Stagnant Economy x Baseline Utility Planning)

Preeth Srinivasaraghavan; Specialist III, Resource  
Strategy







# 4A Updates (Carbon Regulation x Baseline Utility Planning)

Roger Pierce; Sr. Specialist, Resource Strategy





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# Meeting Wrap-Up

Jo Anne Lavender; IRP Facilitator