



# Regional Energy Resource Council

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Dec 11-12, 2019  
Knoxville, Tennessee







# Term 4 RERC Members

**Michael Butler**

Tennessee Wildlife Federation

**Dr. Bill Carswell**

University of Alabama, Huntsville (ret'd)

**Erin Gill**

City of Knoxville

**Rodney Goodman**

Habitat for Humanity

**Dana Jeanes**

Memphis Light, Gas, and Water

**Matt Largen**

Williamson, Inc.

**Jonathan Levenshus**

Sierra Club

**Peter J. Mattheis**

Tennessee Valley Industrial Committee

**Jennifer Mundt\***

State of North Carolina

**Alice Perry**

State of Mississippi

**Doug Peters**

Tennessee Valley Public Power  
Association

**Dr. Kari Babski-Reeves**

Mississippi State University

**Patrice Robinson**

Memphis City Council

**Charles Snaveley**

Commonwealth of Kentucky

**Clay Walker**

NETWORKS Sullivan Partnership

**John Warren**

Commonwealth of Virginia

**Lloyd Webb**

Olin Chlor Alkali

\*RERC Chair



# Introductions



- Name
- Organization and Role
- Something you hope to learn more about, or contribute, as a member of the RERC



# Safety Moment



## Building Emergency Plan





# RERC Overview

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## Welcome to Term 4 of the RERC

- **Term 4: August 1, 2019 – July 31, 2021**
- **Typically Meet 2-4 times a year**
- **Tentative topics:**
  - **Implementation of the 2019 Integrated Resource Plan**
  - **Energy Resource Activities and Priorities**
  - **Coal Ash Outreach and Management**



# Recap Prior RERC Terms

- **Term 1 (2013 – 2015)**
  - **8 Meetings**
    - > **2015 Integrated Resource Plan; Priorities in Energy Decisions**
- **Term 2 (2015 – 2017)**
  - **4 Meetings**
    - > **Rates; Research and Development; Coal Ash Management**
- **Term 3: (2017 – 2019)**
  - **8 Meetings**
    - > **2019 Integrated Resource Plan**



# Today's Meeting Purpose

- **Provide an introduction to TVA**
  - Mission and Region Served
  - Public Power Model
  - Large Initiatives: Grid 2023 and Coal Ash Management
- **Host a Public Listening Session**
- **Hear RERC views:**
  - On efforts to achieve transparency and engagement
  - On outreach efforts related to coal ash management





# Agenda and Meeting Protocols

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## Agenda – Dec 11, 2019

<b>8:30</b>	<b>Welcome, Safety Moment, Term 4 Overview</b>
<b>9:15</b>	<b>RERC Overview and Meeting Protocols</b>
<b>9:20</b>	<b>FACA Training</b> Khurshid Mehta
<b>9:30</b>	<b>Break</b>
<b>9:45</b>	<b>Introduction to TVA</b>  <b>Energy</b>
<b>10:45</b>	<b>Break</b>
<b>11:00</b>	<b>Economic Development</b>  <b>Environment</b>
<b>12:00</b>	<b>Meeting Adjourned and Lunch</b>
<b>4:30 – 5:30</b>	<b>Public Listening Session (4:30 – 5:30)</b>



## Agenda – Dec 12, 2019

<b>8:30</b>	<b>Welcome / Recap and Observations</b>
<b>9:00</b>	<b>TVA Challenges and Opportunities: Coal Ash Management – Introduction and Overview</b>
<b>10:15</b>	<b>Break</b>
<b>10:30</b>	<b>RERC Discussion</b>
<b>11:15</b>	<b>Break</b>
<b>11:30</b>	<b>Form Advisory Statement / Vote</b>
<b>12:00</b>	<b>Wrap Up / Adjourn RERC Meeting</b>



# RERC Meeting Protocols

## Agenda

- ◆ Prepared and approved by the Designated Federal Officer (DFO) in consultation with Council Chair
- ◆ Distributed to Council and published in the Federal Register prior to each meeting
- ◆ Topics may be submitted to the DFO by any member of the Council, or non-members, including members of the public

## Meeting Minutes

- ◆ DFO will ensure that minutes are prepared for each meeting, approved by the Chair, and made available to Council members

## Voting

- ◆ Any member of the Council may make a motion for a vote
- ◆ Recommendations to TVA Board shall require an affirmative vote of at least a simple majority of the total Council members present on that date
- ◆ Council members may include minority or dissenting views

## Discussion

- ◆ DFO (or his designee) will facilitate and ensure good order during all open discussions
- ◆ Only one speaker or attendee is permitted to comment at a time
- ◆ To be recognized by the Chair (or meeting facilitator) in order to provide comment, please turn your name card on its side





# FACA Training

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Khurshid Mehta, Office of the General Counsel



# Historical Background on Advisory Committees

- ❖ Growth in advisory committees occurred after WWII
- ❖ Congressional concerns:
  - Proliferation of committees
  - Domination by special interest groups
  - Lack of transparency and accountability
  - Waste of federal funds



# Federal Advisory Committee Act of 1972

- ❖ U.S. Congress formally recognized the merits of seeking advice and assistance
- ❖ The Act assures that advisory committees provide advice that is relevant, objective and open to the public, and comply with record keeping requirements



# Key Elements of the Federal Advisory Committee Act

## Public access and transparency

- ❖ Meetings (reasonably accessible and timely notice required—generally open to the public)
- ❖ Records (available for public inspection, subject to limitations)

## Structured management

- ❖ Filed charters
- ❖ Expiration after two years
- ❖ Attendance of a federal officer



# Advisory Committees Today

- ❖ Play an important role in shaping programs and policies of the federal government
- ❖ Approximately 1000 committees with more than 60,000 members
- ❖ Advise the President of the United States and the executive branch
- ❖ Subject to FACA and General Services Administration (GSA) Regulations



# TVA's Regional Energy Resource Council

- ❖ Created by TVA in 2013 “to provide advice on its energy resource activities and the priorities among competing objectives and values”
- ❖ TVA's energy resource activities include:
  - Constructing and operating various supply-side resources, including fossil-fueled power plants, nuclear plants, hydroelectric dams, and renewable resources
  - The development and management of demand-side resources, including energy efficiency
  - The design, construction, and operation of power delivery systems
  - The integration of all of these energy resources into plans for meeting future demands for electricity in the TVA region



# Key Provisions of RERC Charter

- ❖ Council provides advice only
  - Advice reported to the TVA Board's External Relations Committee
- ❖ Term of Council is two years
  - Fourth term expires July 31, 2021
- ❖ Approximately two meetings per year
- ❖ Designated Federal Officer (DFO): Joe Hoagland, Vice President, Innovation and Research
- ❖ Balanced Membership









# Introduction to TVA

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Joe Hoagland, Vice President  
Innovation and Research



# What We Are

- Provider of low-cost, reliable power
- Steward of the Valley's natural resources
- Partner for economic growth



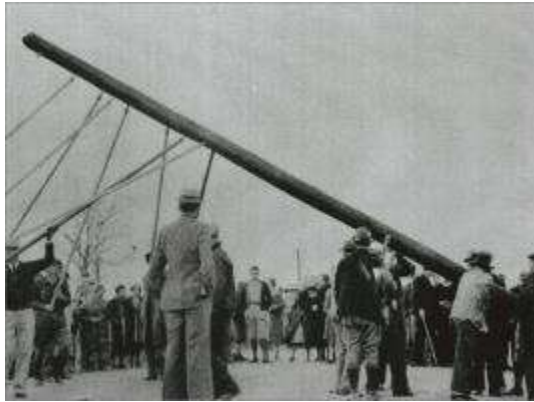
*“Power is really a secondary matter.... TVA is primarily intended to change and to improve the standards of living of the people of that valley. Power is, as I said, a secondary consideration. Of course, it is an important one because, if you can get cheap power to those people, you hasten the process of raising the standard of living.”*

President Franklin D. Roosevelt

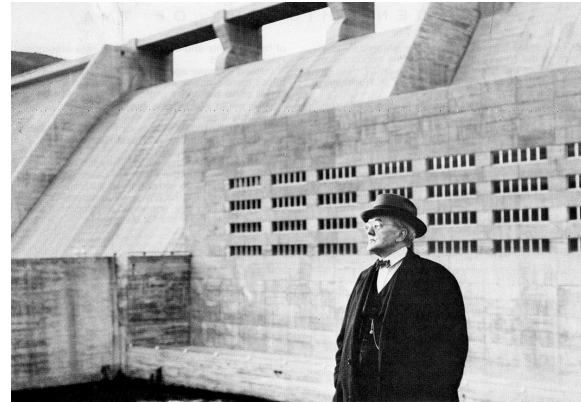


# What We Do

- Serve 7 states, 154 local power companies, 58 directly served customers and 80,000 square miles
- Generate \$10.9 billion annual revenue
- Manage the Valley's river systems and environmental resources.



**First power pole erected in 1934 in Pontotoc, Miss.**



**“Father of TVA,” Senator George Norris**



# Our Mission and Strategic Imperatives

## Why We Are Here

## How We Achieve Sustainability

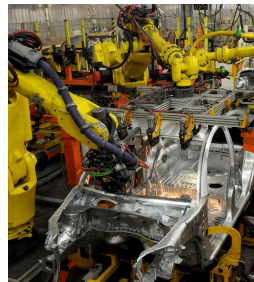
### TVA Mission



Energy



Environment



Economic  
Development

### Strategic Imperatives





# TVA Governance

- Corporate Agency of the United States, receives no tax dollars / self financing
- Nine-member Board of Directors, nominated by the President, confirmed by the Senate
- CEO, appointed by the TVA Board
- RERC provides advice to the TVA Board





# 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



*More than 25% of our nation's electricity consumers receive their energy from public power*

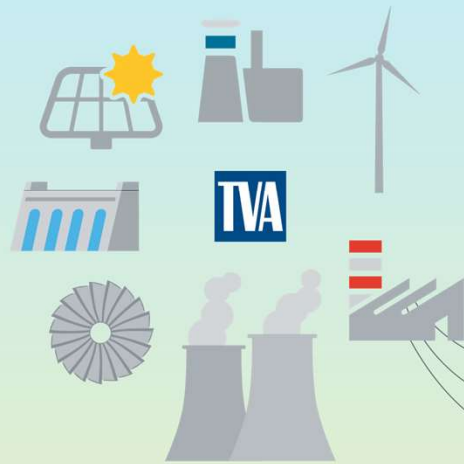


## Partnering to Serve You & Your Community





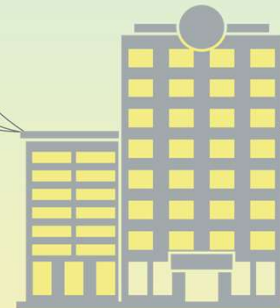
# Delivering Reliable Energy that Powers Your Life



TVA Generates Power.

**ALWAYS  
INVESTING**  
In New Lines

SINCE 2000 **99.999%**  
**RELIABILITY**  
**POWERING YOUR LIFE 24/7**



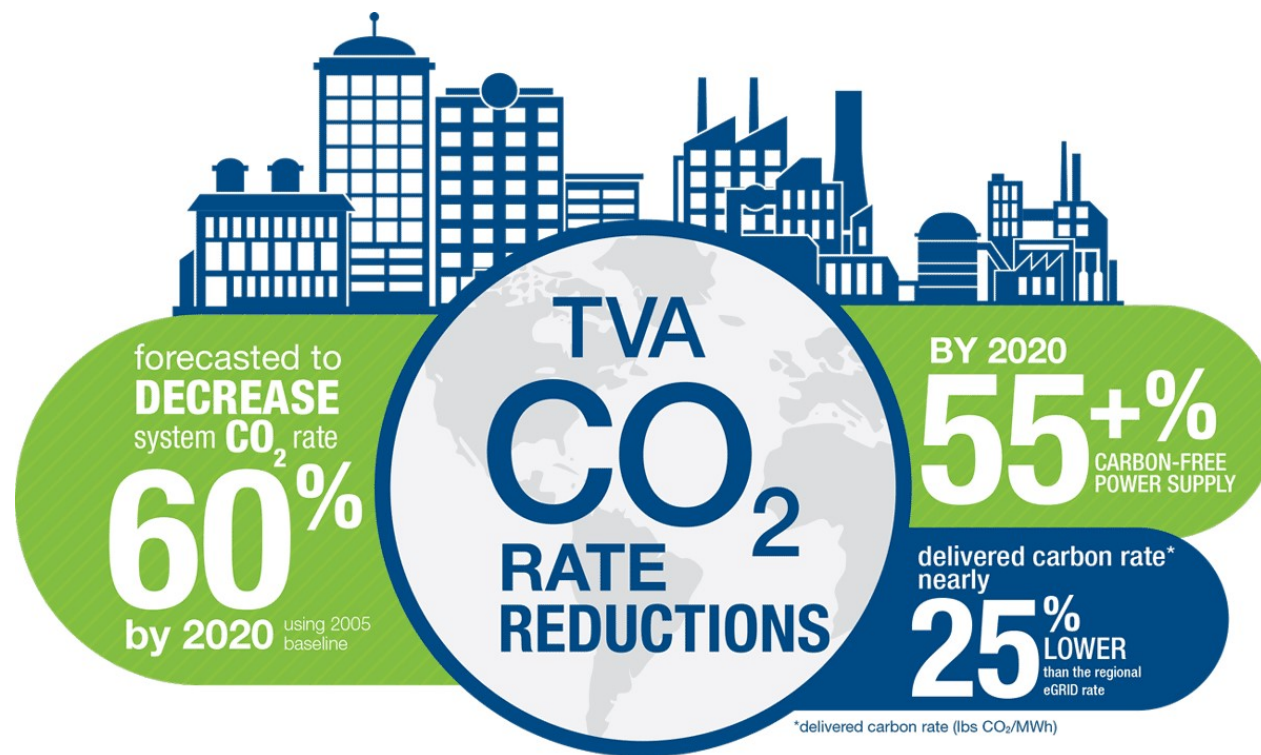
Local Power Company  
Distributes it.



You Use it  
in your home.



# Cleaner and Greener Energy





# TVA's Integrated Resource Plan

The IRP is a comprehensive study that provides direction on how to best meet future electricity demand.

A programmatic Environmental Impact Statement (EIS) accompanies the IRP to analyze the impacts associated with an updated IRP to the Valley.

## 2019 Integrated Resource Plan

VOLUME I - FINAL RESOURCE PLAN



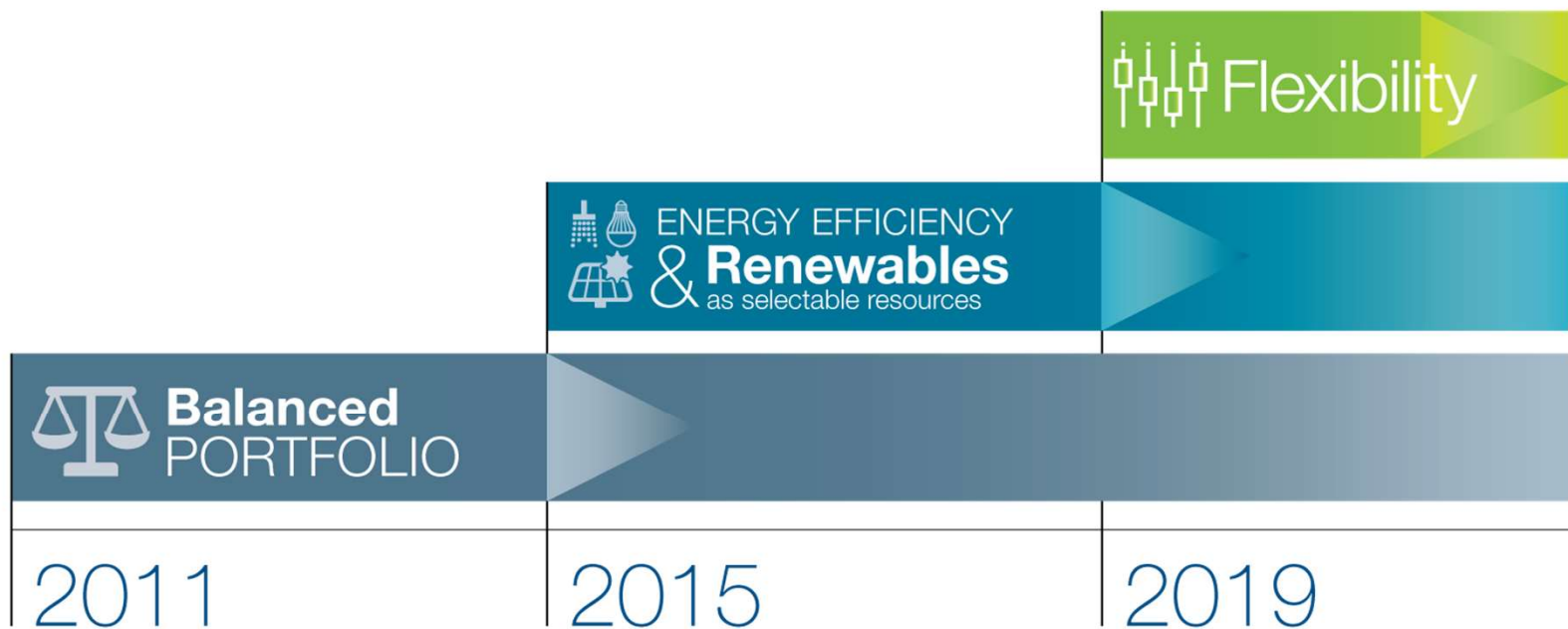
TENNESSEE VALLEY AUTHORITY 



# INTEGRATED Resource Plan 2019

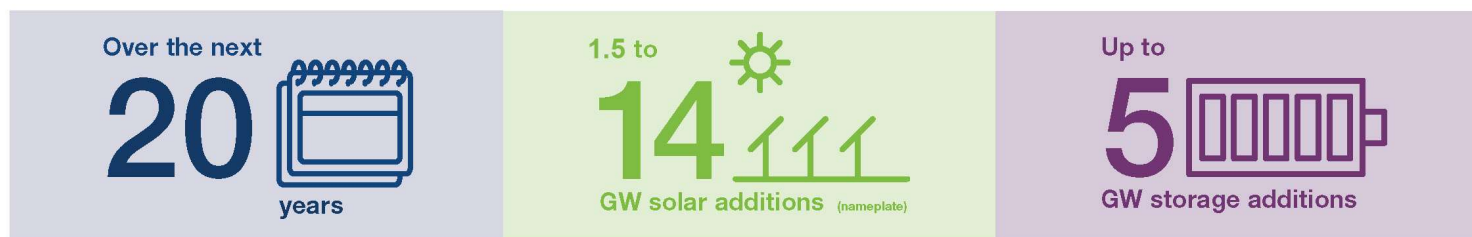
## Focus Areas:

- *Distributed Energy Resources*
- *System Flexibility*
- *Portfolio Diversity*





## 2019 IRP Results Indicate:



All portfolios point to a TVA power system that will be LOW-COST, RELIABLE, and CLEAN





# Signposts to Guide Long-Term Actions



Portfolio shifts will be driven by:

- Changing market conditions,
- More stringent regulations, and
- Technology advancements.





# TVA Mission: Energy

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# Generation

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Kris Edmondson, Vice President  
Power Operations





# Generation

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Kris Edmondson, Vice President  
Power Operations



# The TVA Power System





# Current Portfolio Mix to Meet Operational Needs



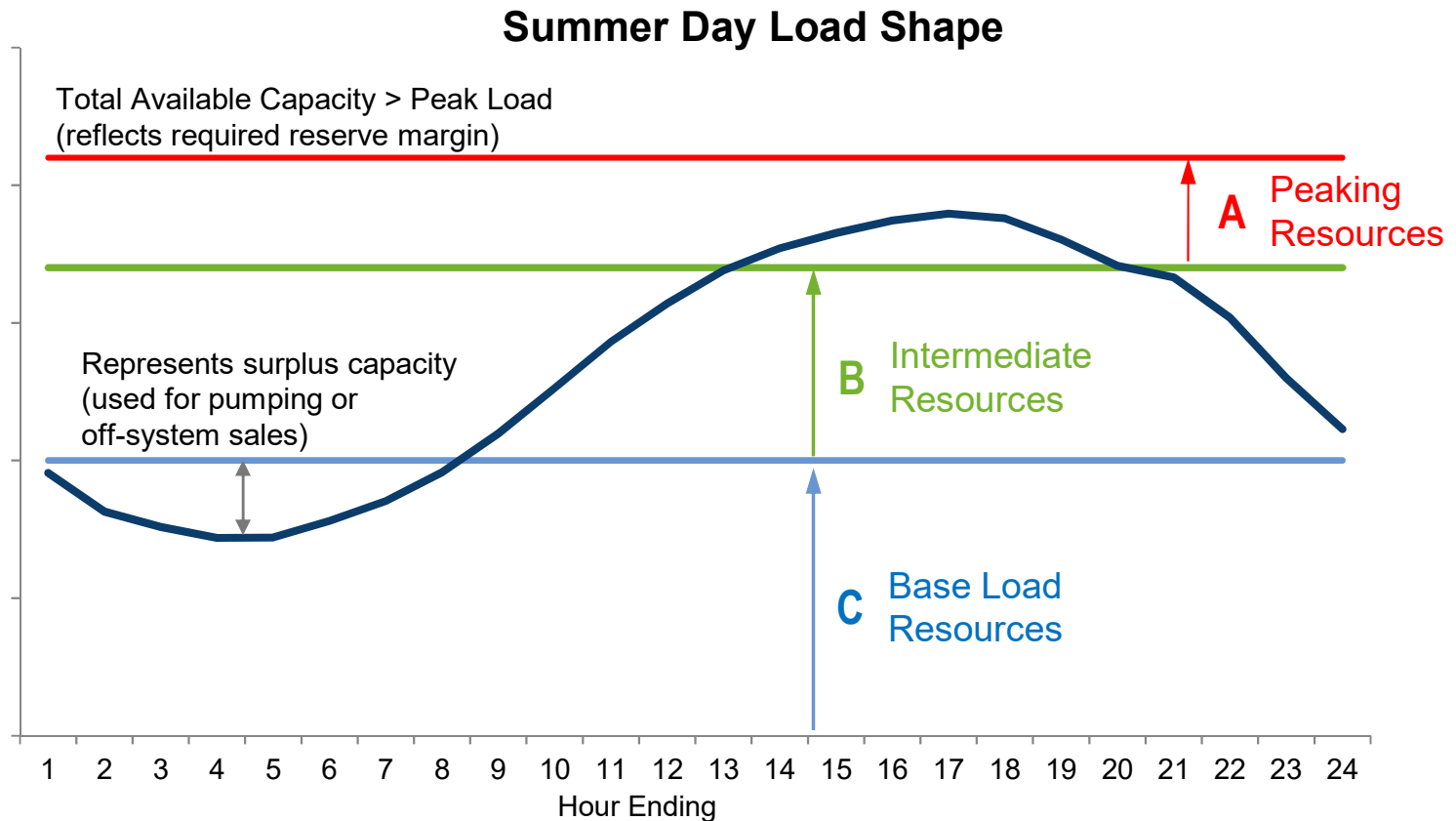
Hydro	Nuclear	Renewables	EEDR	Gas	Coal
4,100 MW conventional  1,600 MW pumped storage	8,400 MW	1,200 MW wind  130 MW utility-scale solar  400 MW programmatic solar/biomass	1,700 MW interruptible load	5,900 MW CT and diesels  8,100 MW CC	7,400 MW
Approximately 45 percent of TVA's capacity is carbon-free					

Capacity values are consistent with the 2019 10-K report, rounded to nearest 100 MW, with updates for Browns Ferry uprates and Paradise 3 retirement (January 2020)



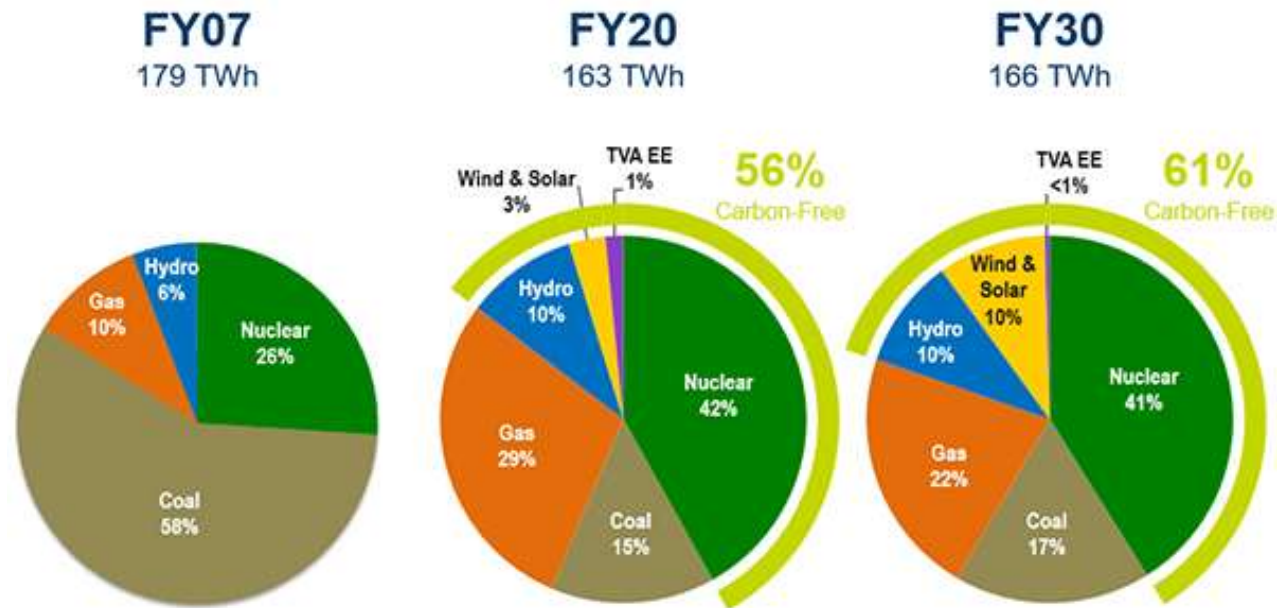


# Understanding Resource Needs





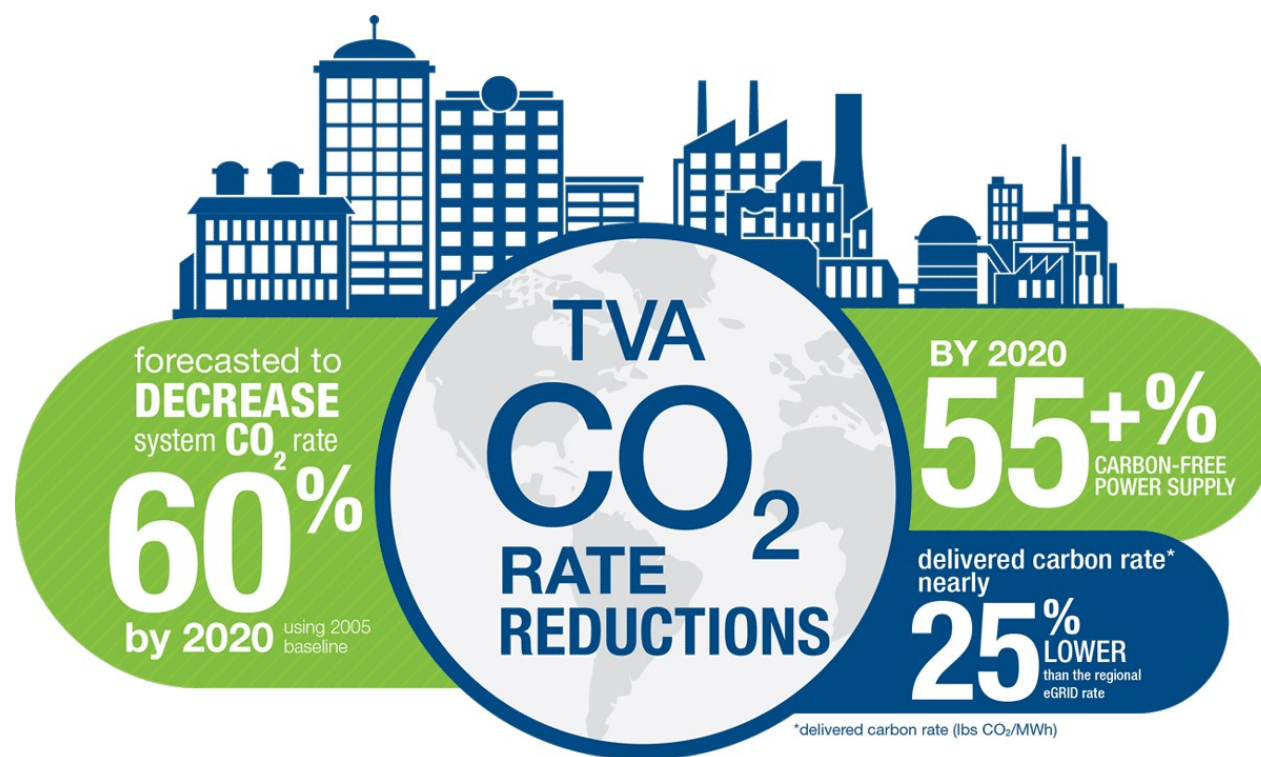
# TVA's Changing Portfolio



NOTE: 2018 and 2027 figures are based on FY18 budget.



# Cleaner and Greener Energy





# Operational Excellence

## Operational Imperatives

Safety

Reliability

Cost

Compliance





# TVA Transmission Overview

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Mark Smith, Director,  
Transmission Planning & Asset Management



# Transmission Strategic Alignment

Integrate planning and asset replacement strategies to create optimized solutions and meet the challenges of tomorrow

**TVA  
Mission**

**Transmission  
Focus Areas**

Energy



Environment



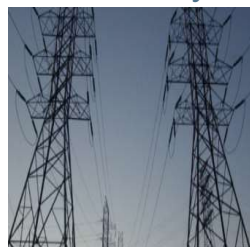
Economic Development



Safety



Reliability



Cost Effectiveness

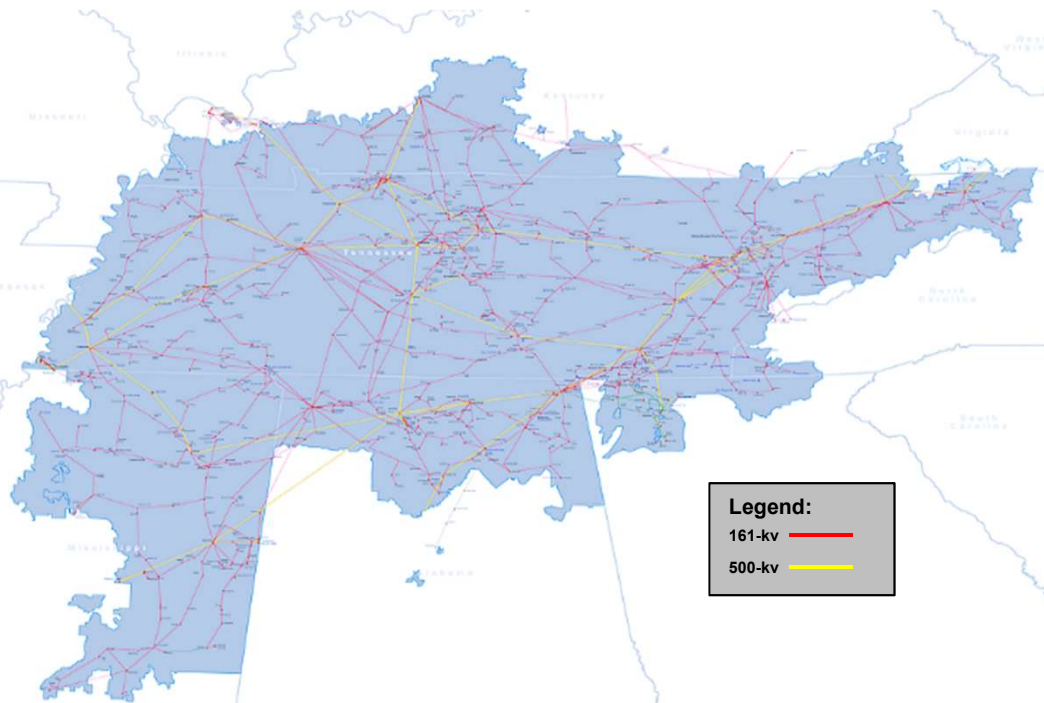




# Transmission Overview

## Balance Interrelated Demands:

Bulk System Capacity | Generation | Regulation | Asset Performance | Customer Delivery | Economic Development | Interregional Impacts  
16,239 Circuit Miles | 104,864 Structures | 510 Substations | 1,314 Customer Connection Points | 239,633 Acres ROW | 3,900 miles Backbone Telecom Fiber





# Transmission Strategy

## TVA's Grid of the Future

### Reliable

- Keep the Lights On! – Core responsibility to our customers

### Flexible

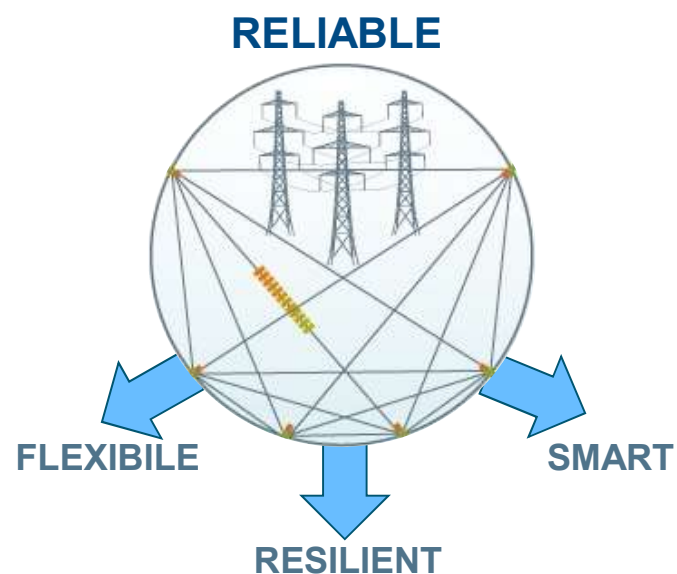
- Maintain reliability by responding to events in real-time

### Resilient

- Minimize Impacts & Recover Quickly

### Smart

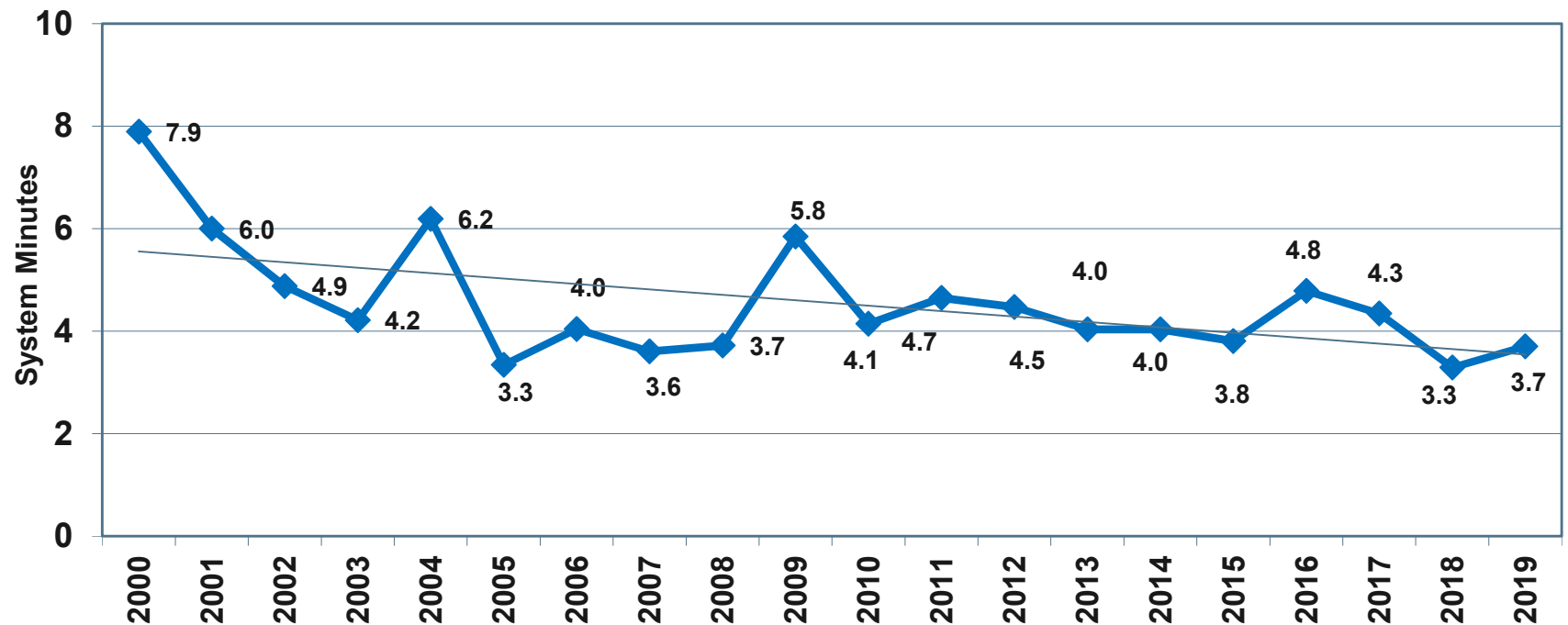
- Integration & Automation of New Technology



Supporting the 3E Mission



# Load Not Served (LNS)



Note: Excludes Major events and Variances



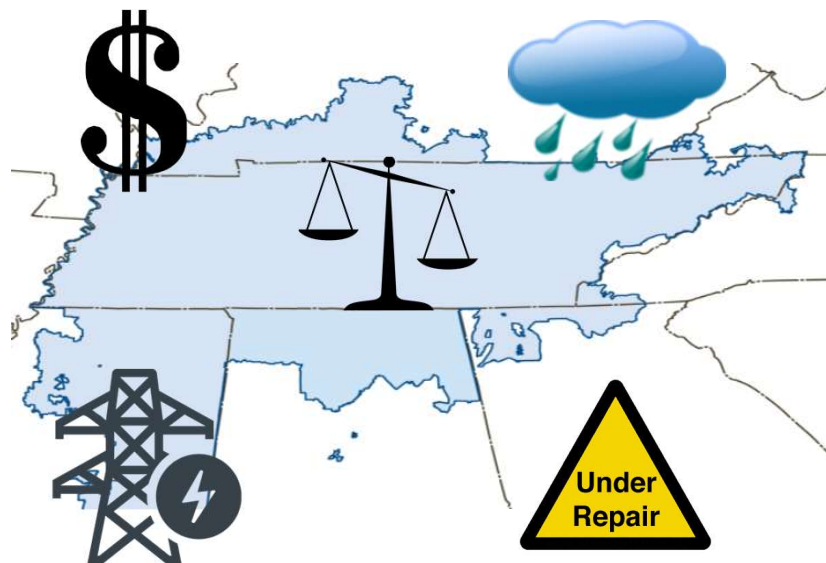
# TVA System Operations

## “Keep the Lights On”

- Real-time system monitoring, analysis, and response
- Balance generation, load, and interchanges
- Purchase of economical and reliable power

## Dynamically adjust to system changes:

- Respond to system events
- Evaluate and correct safety issues
- Last line of defense before blackout

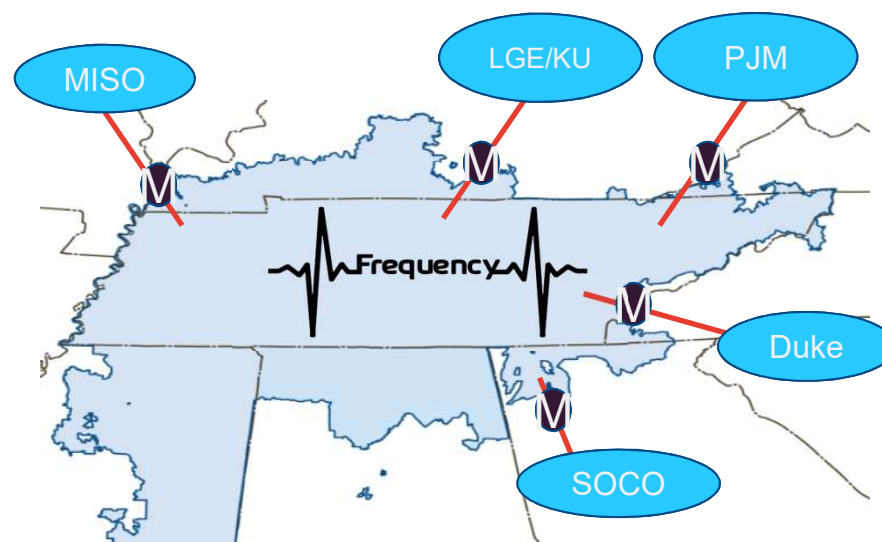




# TVA Balancing Authority

Balances generation, load, and interchanges to help maintain Eastern Interconnect frequency

- Follow the projected plan
- Dispatch generation to meet the changing demand
- Make hourly purchase decisions
- Respond to emergencies





# Resiliency

## **Robust | Responsive | Rapid Recovery**

- Weather Events
- Cybersecurity Events
- Geomagnetic Disturbance (GMD)
- Electromagnetic Pulses (EMP)
- Improved Inventory Strategy
- Telecom Resiliency

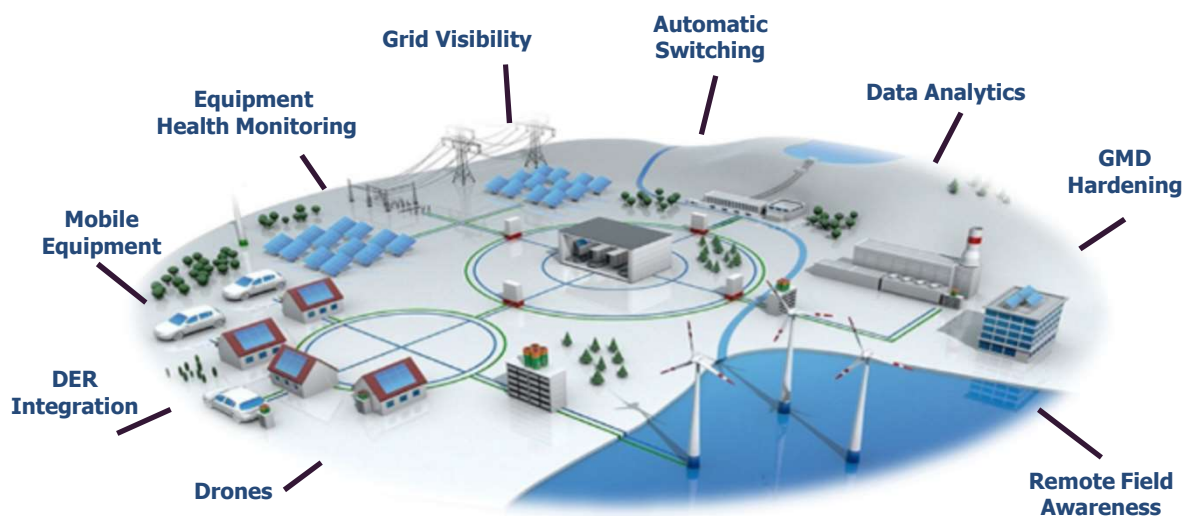
**Minimize Impacts & Accelerate Recovery**

### *Evaluating Risks & Planning Responses*





# Building the Grid of the Future – Grid 2023



Investing in a Dynamic, Multi-Directional Grid

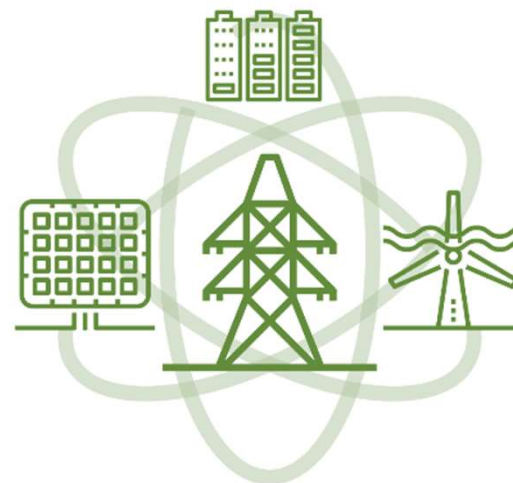
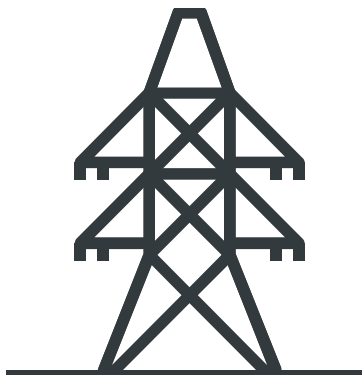


# Transmission Focus Areas

Continue providing reliable power  
to the Valley



Embrace ownership of safety for  
employees, contractors, and the  
public



Prepare for the grid of the  
future









# Commercial Energy Solutions

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Chris Hansen, Director  
Origination and Renewables



# TVA Commercial Focus Areas



**ATTRACT | RETAIN | GROW**

MAKE THE TENNESSEE VALLEY THE PLACE TO DO BUSINESS



# National Trends

**Value Propositions  
are Changing**

Sustainability & Resiliency



**More Competition**

Traditional utility  
competitive landscape is  
evolving



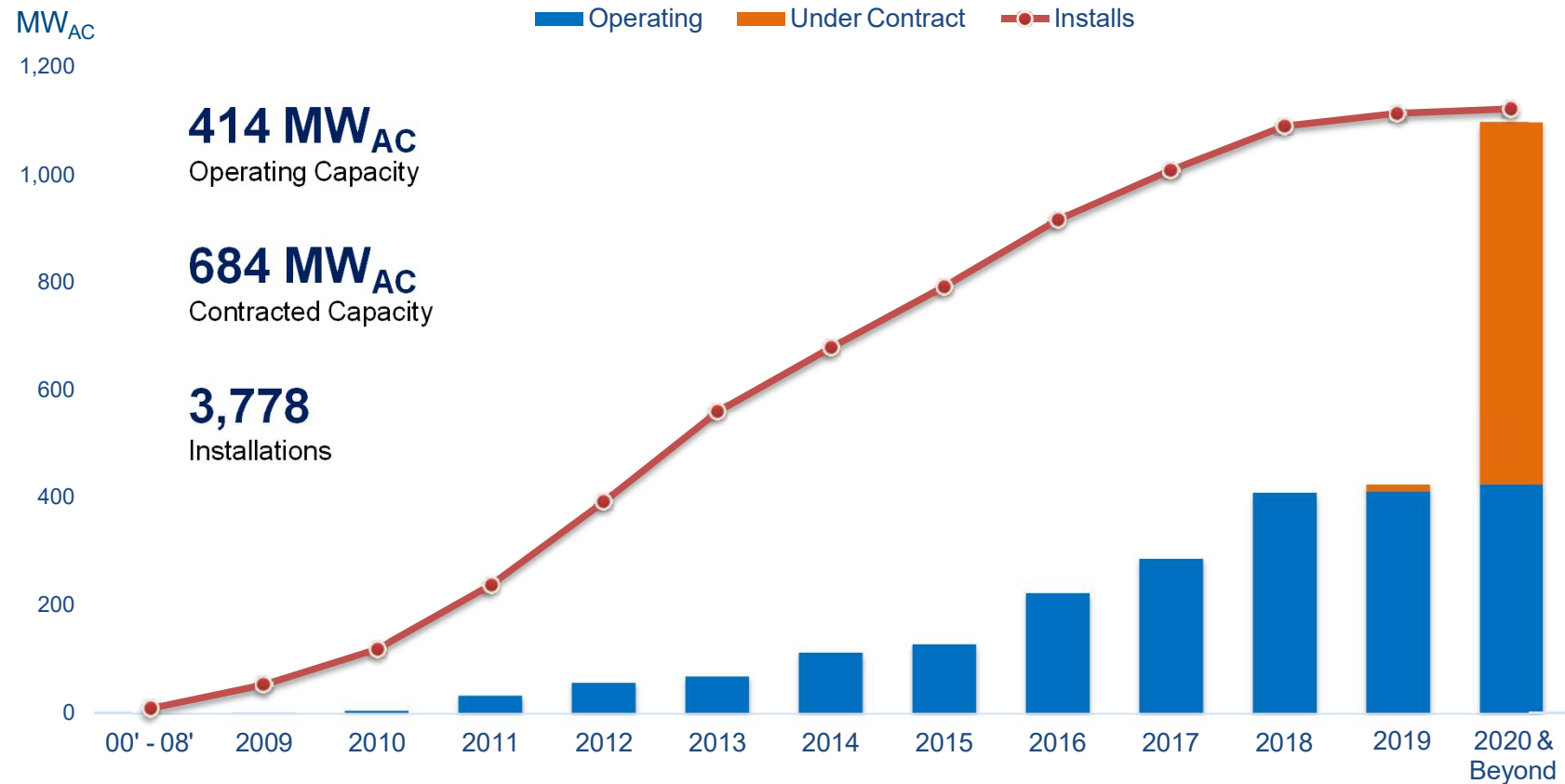
**More & Cheaper  
Technology**

Greater choice &  
technology cost declining





# Tennessee Valley Solar Growth



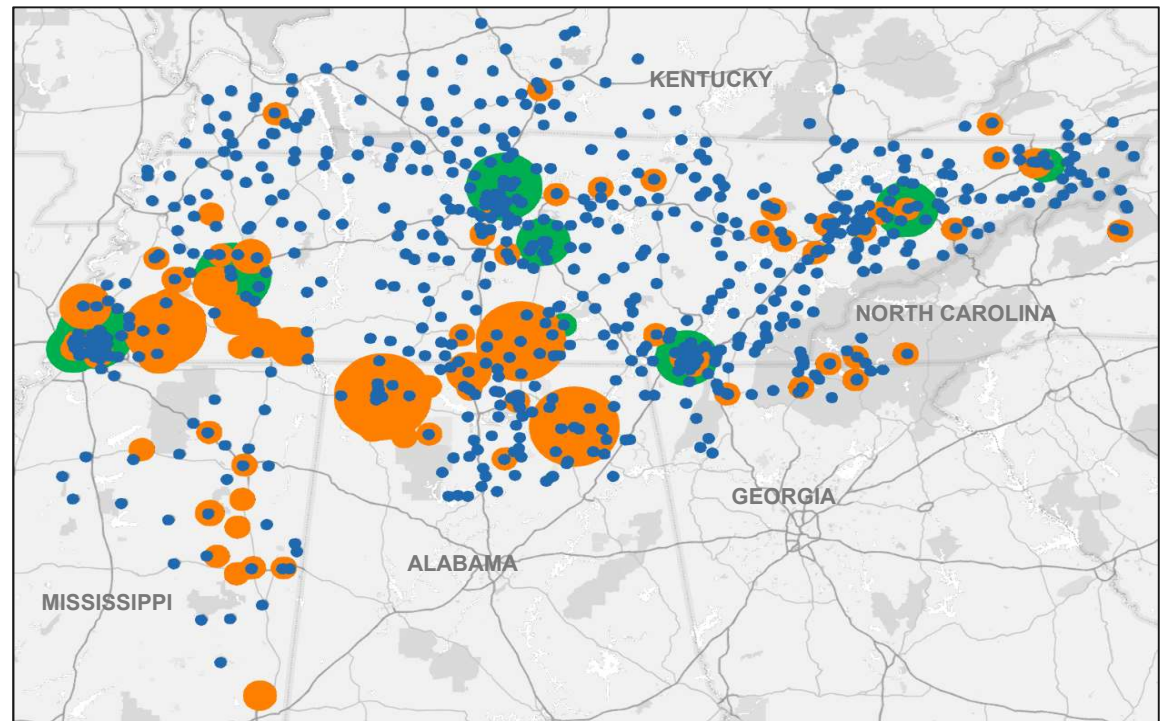
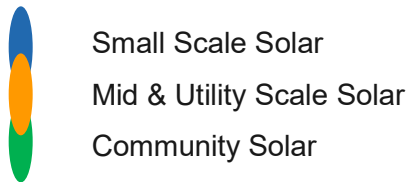
\* Data updated December 2019



# Tennessee Valley Solar

**1,099 MW<sub>AC</sub>**  
Total Capacity

**3,778**  
Total Installs



\* Data updated December 2019

\* Includes both operating and contacted sites

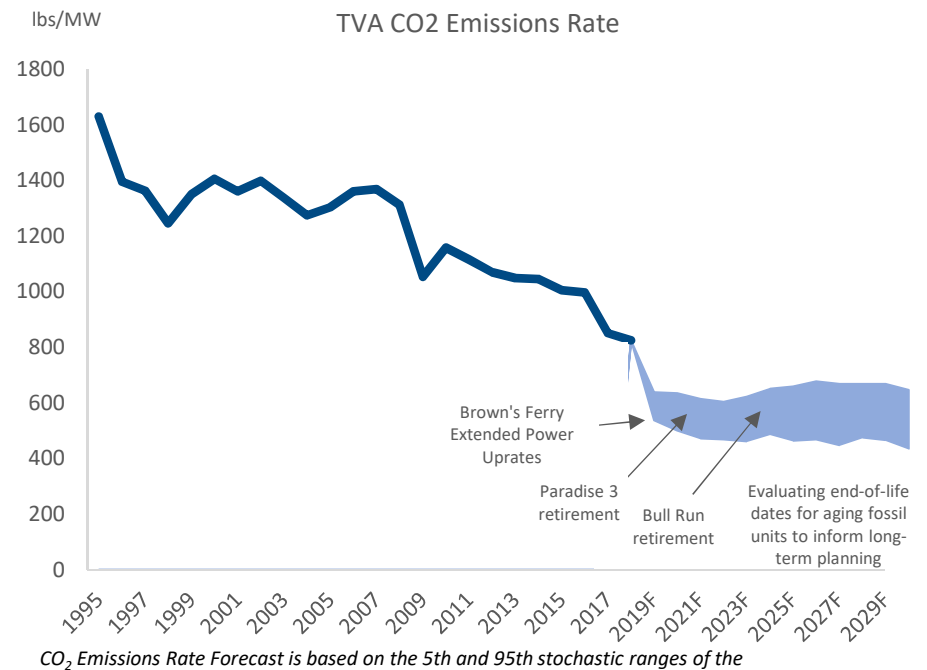


# TVA & LPC – Delivering a Cleaner Energy Grid



As of 2018, TVA has reduced its carbon dioxide emissions by over 50%.

TVA system carbon emissions rate is forecasted to approach a **60% reduction by 2020** and a **70% reduction by 2030** from a 2005 baseline.





# Onsite Renewable Generation Solutions

## GREEN POWER PROVIDERS (GPP)\*



\*Available through December 31, 2019

### FY19 OVERVIEW

- 134 LPC's Enrolled
- 3,700+ Participants

## DISPERSED POWER PRODUCTION (DPP)



### FY19 OVERVIEW

- 63 LPC Customer Participants

ONSITE | NEW TO THE WORLD | IN-VALLEY | AVAILABLE IMMEDIATELY



# Offsite Renewable Generation Solutions

## GREEN POWER SWITCH (GPS)



### FY19 OVERVIEW

- 118 LPCs Enrolled
- 9,000+ Residential Participants
- 400+ Business Participants

## SOUTHEASTERN RECS (SE RECS)



### FY19 OVERVIEW

- 10 LPCs Enrolled
- 1 Direct-Served Participant
- 11 LPC Customer Participants

## RENEWABLE INVESTMENT AGREEMENT (RIA)



### FY19 OVERVIEW

- 2 Direct-Served Participants



# EnergyRight Portfolio

## DEMAND RESPONSE



### FY19 OVERVIEW

- 21 Directly-Served Participants
- 1,160 LPC Customer Participants
- 127 LPC's Served

## ELECTRIFICATION



### FY19 OVERVIEW

- 19,911 Residential Participants
- 185 Business and Industry Participants
- 13 Direct-Served Customer Participants
- 137 LPC's Served

## ENERGY EFFICIENCY



### FY19 OVERVIEW

- 83,169 Residential Participants
- 82 Business and Industry Participants
- 9 Direct-Served Participants
- 149 LPC's Served









# TVA Mission: Economic Development

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Heidi Smith  
General Manager, Economic Development







# Why & How

## Why

- Jobs
- Investment
- Prosperity
- Pride
- Security

## How

- Quantifiable, lengthy, difficult process
- Competitive
- Challenging
- Complicated
- Often unreasonable
- Rewarding





# What We Do



site selection



community livability



young talent &  
workforce development



training and facilitation



rural development



technical services



# Measuring Success

		Jobs	Capital Investment	
FY 2015	●	76,200	\$7.8 billion	●
FY 2016	●	72,100	\$8.3 billion	●
FY 2017	●	70,000	\$8.3 billion	●
FY 2018	●	65,400	\$11.3 billion	●
FY 2019	●	66,500	\$8.9 billion	●
TOTAL	●	350,200	\$44.6 billion	●



# Strategies to Win

## InvestPrep

Clear market-driven need  
Matching financial participation  
High potential for ROI

## Megasites

Toyota | Blue Springs, MS  
PACCAR | Columbus, MS  
Steel Dynamics | Columbus, MS  
Google | Clarksville, TN  
Mazda – Toyota | Huntsville, AL  
Volkswagen | Chattanooga, TN

## Legacy Sites

Google | Jackson County, AL

## InvestReady





# Engage

## Valley Sustainable Communities

Assists communities in identifying and cataloging their sustainable assets and increasing their sustainability commitments.

The economic development focus is to increase the community's competitiveness when companies are looking to invest in new or expanded locations in the Valley.





# Serve

## Teamwork with Partners

- Local Power Companies
- Regional Partners
- Federal Partners
- State Agencies
- Local Economic Development Agencies











# TVA Mission: Environment

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Rebecca Tolene  
Vice President, Environmental



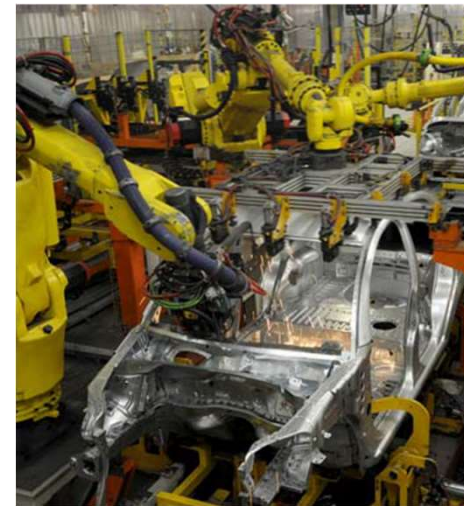
# TVA's Mission of Service - Improving Quality of Life in the Valley



**Energy**



**Environment**



**Economic  
Development**



## In our DNA... history of integrated resource planning



Built for





# Environment- Today

Scientists  
and  
Technicians

Policy  
Planners and  
Thinkers

Clean  
Energy

Project  
Support

River  
Management

Recreation

Water  
Quality

Biodiversity

Cultural  
Resources







# TVA Environmental Policy



## Environmental Policy Areas

- Climate Change Mitigation
- Air Quality Improvement
- Water Resource Protection and Improvement
- Waste Minimization
- Sustainable Land Use
- Natural Resource Management

## TVA's Environmental Policy Statement

*TVA's overarching Environmental Policy objective is to provide cleaner, reliable, and still-affordable energy, support sustainable economic growth in the Tennessee Valley, and engage in proactive environmental stewardship in a balanced and ecologically sound manner.*





# Environmental Performance Under Policy Areas



## Climate Change

- Carbon dioxide emissions are down 51 percent and are on track to be about 60 percent below 2005 levels before 2020.
- The TVA system, which has an as-delivered carbon dioxide rate for calendar year 2018 of 825.09 pounds per MWh, will improve to less than 600 pounds per MWh by the end of 2020.

## Air Quality Improvement

- Through Calendar Year 2018, TVA-reduced sulfur-dioxide (SO<sub>2</sub>) emissions are 99 percent below peak 1977 levels, and nitrogen-oxide (NO<sub>x</sub>) emissions are 96 percent below peak 1995 levels.
- Mercury emissions have been reduced approximately 97 percent since 2005.

## Water Resource

- 11,898 million gallons of water were withdrawn daily from the Tennessee River Watershed in CY 2018. 99 percent of that water is returned back to the river system.
- In an average year, TVA prevents about \$272 million in flood damage in the TVA region and along the Ohio and Mississippi rivers through the operation of its dams.





# Environmental Performance Under Policy Areas



## Waste Minimization

- 38 percent of TVA's coal combustion products in 2018 were repurposed. Currently on path to reach 43 percent in FY19.
- TVA reduced its hazardous waste disposal from 117 metric tons/year in 2017 to 52 metric/tons in 2018. FY19 is on path for 66 metric/tons.

## Sustainable Land Use

- TVA manages over 245,000 acres of land for natural habitat and biodiversity.
- Recreational opportunities provided by Valley lakes bring approximately \$20 billion to our local communities each year.

## Natural Resource Management

- Each year, TVA develops a stewardship plan that includes biodiversity, cultural, recreation, and education projects and programs. In FY18, 99 percent of projects were completed.
- Many of TVA's public lands include sites once inhabited by Native American tribes. TVA plays an active role in protecting more than 9,000 archaeological sites.



# Environment – Why?

- Safety and health of the public
- Ensure environment is protected as we make decisions and changes in our business
- Cleaner air, land water
  - Affordable power
  - Better jobs
  - Stewardship
  - Quality of life





# River System Management



Flood Damage  
Reduction



Power  
Generation



Water Supply



Navigation



Water Quality



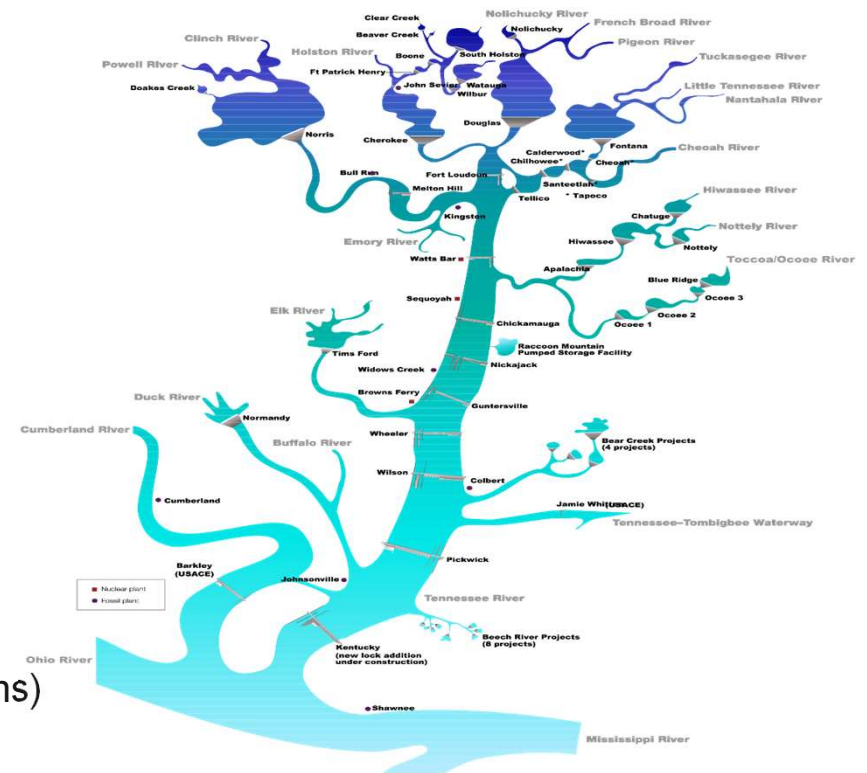
Recreation



# TVA Dam Safety Program

Protect lives and property by ensuring that TVA-owned dams are designed, constructed, operated, and maintained as safely and as reliably as is practicable.

121 TVA dams and impoundments (87 river dams)





# Natural Resources Stewardship

## TVA Mission

The Natural Resources organization is central to meeting one of the primary missions of TVA: acting as a steward of the Valley's natural resources.

## Natural Resources Strategy

We will continue to execute our strategy of serving the people of the TVA region by remaining agile, balancing competing demands, and being a catalyst for collaboration in resource stewardship.

## How We Get There

We make real improvements each year, set and meet higher goals, and make progress toward the desired future state.



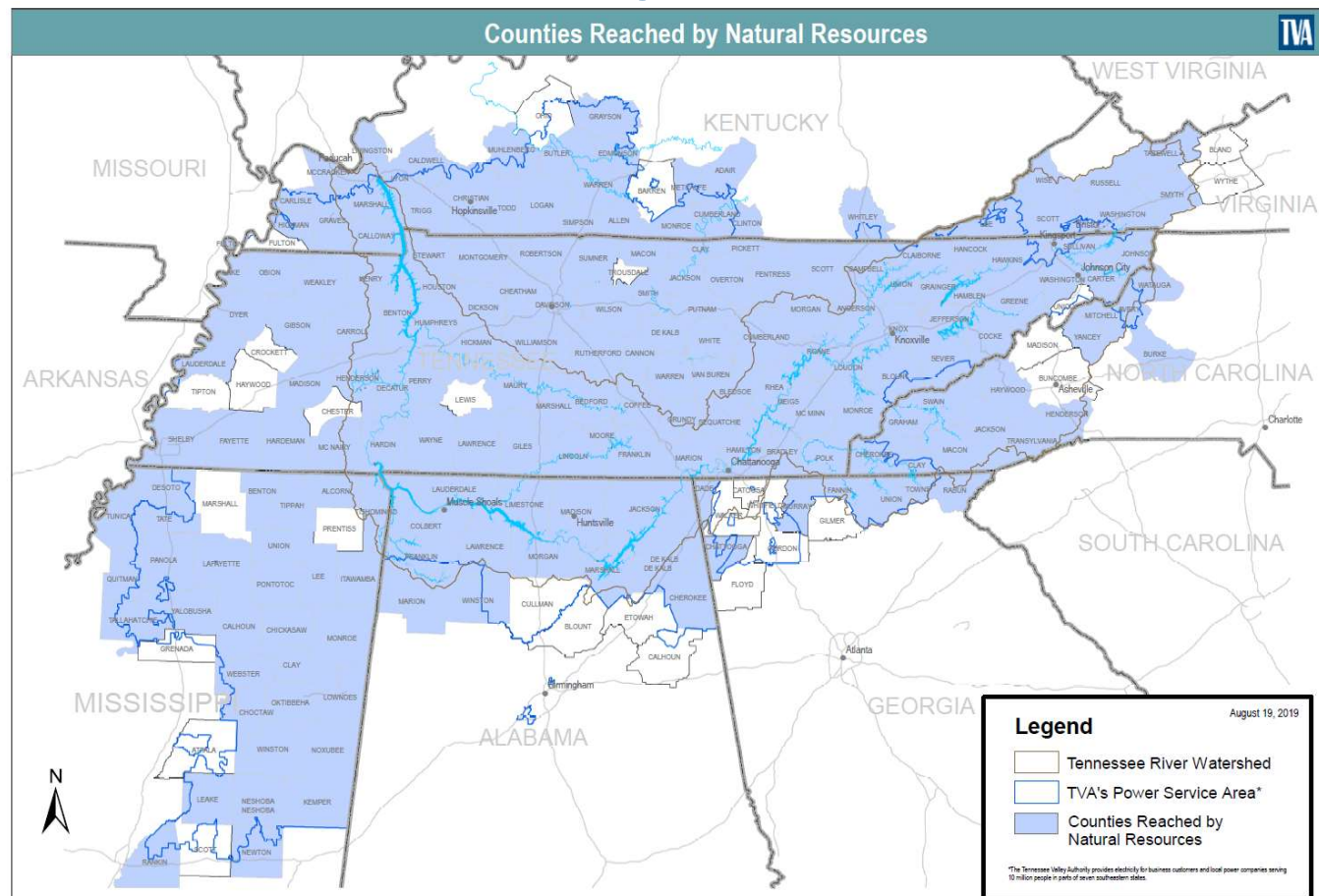


# TVA Natural Resources Focus Areas



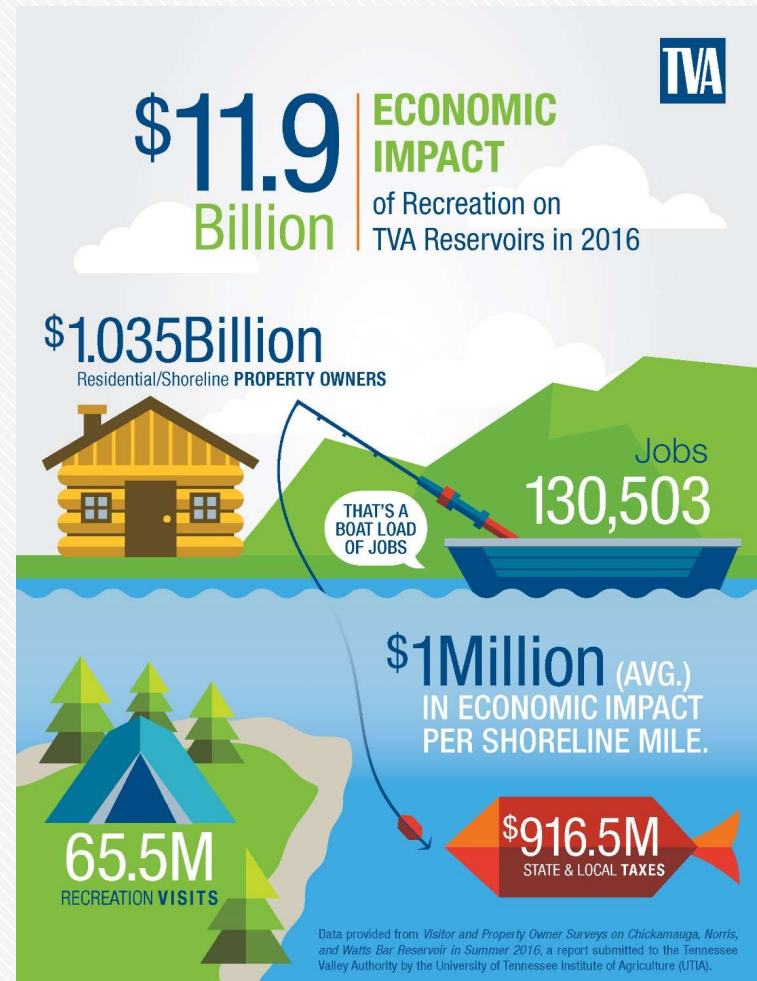


# Counties Reached Through Stewardship Efforts





# Environmental Stewardship







# Corporate Responsibility/Sustainability

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*Sustainability for TVA means ensuring our ability to provide the people of the Tennessee Valley with low-cost and reliable electricity, a healthy environment and a prosperous economy—without compromising the ability of future generations to do the same.*

## Sustainability

### A growing topic of discussion

- Businesses, customers, investors, community activists
- Environmental performance is a large part of sustainability for a utility, but not the only part
- Always been a part of our mission to improve quality of life

### Strengthens Economic Development retention and recruitment

- Example: Amazon requested TVA sustainability information to assist with feasibility study (5000 new jobs in Nashville)

### Increases Valley competitiveness

- TVA sustainability information drives retention or expansion decisions for local power company customers. Examples: Resolute, Steel Dynamics, and Naval Air Station Meridian

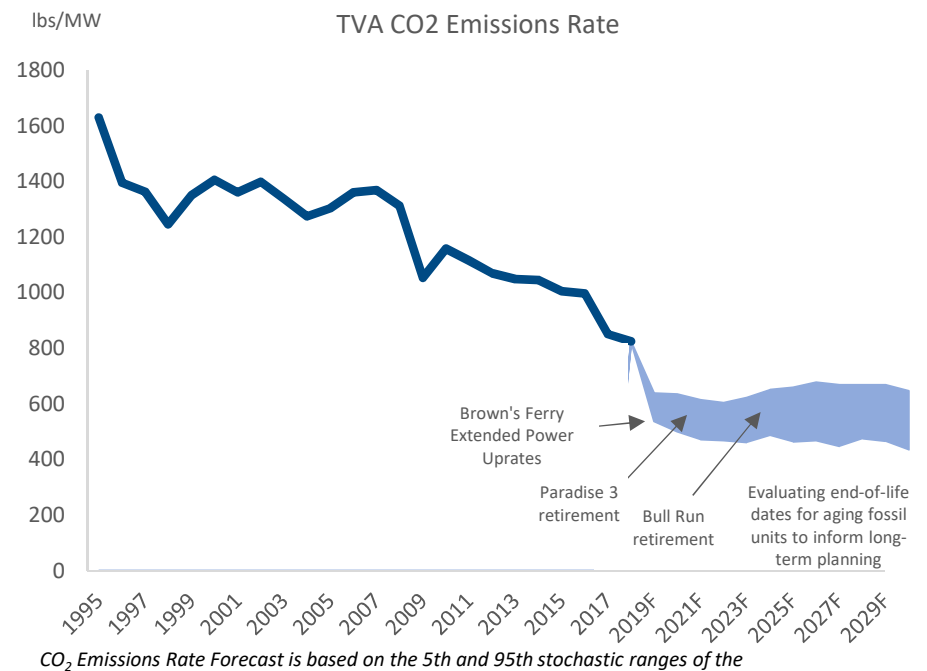


# TVA & LPC – Delivering a Cleaner Energy Grid



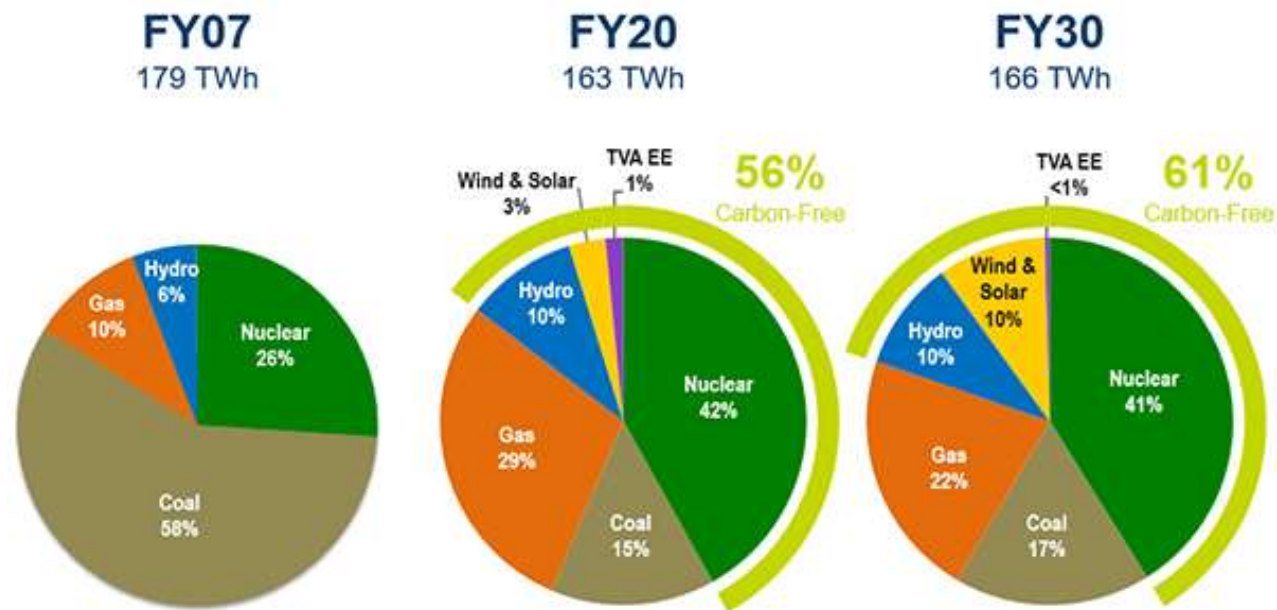
As of 2018, TVA has reduced its carbon dioxide emissions by over 50%.

TVA system carbon emissions rate is forecasted to approach a **60% reduction by 2020** and a **70% reduction by 2030** from a 2005 baseline.





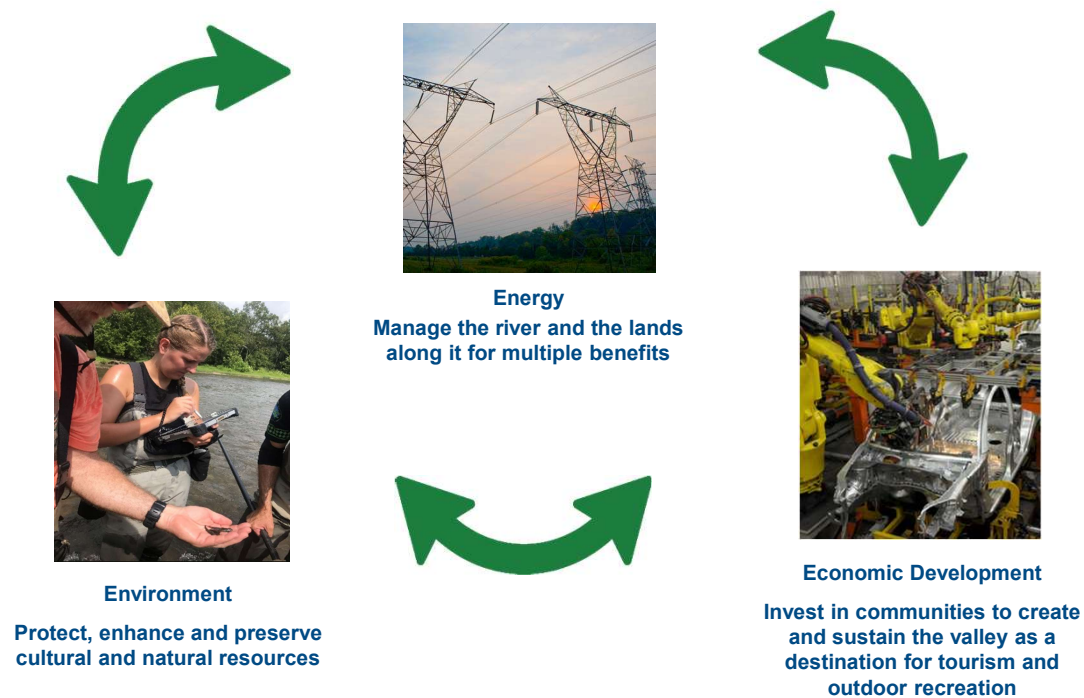
# A Cleaner Portfolio



NOTE: 2018 and 2027 figures are based on FY18 budget.



# TVA: Serving to make life better for those who live, work and recreate in the Tennessee Valley







# Partnering for Progress in the Valley







# Meeting Adjourned

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Meeting will reconvene  
at 4:30 PM EST  
for a public listening session



## Public Listening Session



- RERC Public Listening Session begins at 4:30 PM



# Public Listening Session

- **Public participation is appreciated**
- **This is a listening session; responses are typically not provided**







# Regional Energy Resource Council

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Dec 11-12, 2019  
Knoxville, Tennessee









# Recap and RERC Observations from Day 1

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# Recap RERC Meeting Day 1

## What We Are

- Provider of low-cost, reliable power
- Steward of the Valley's natural resources
- Partner for economic growth



*"Power is really a secondary matter... TVA is primarily intended to change and to improve the standards of living of the people of that valley. Power is, as I said, a secondary consideration. Of course, it is an important one because, if you can get cheap power to those people, you hasten the process of raising the standard of living."*  
President Franklin D. Roosevelt

Regional Energy Resource Council | 91

## Public Listening Session

- **Public participation is appreciated**
- **This is a listening session; responses are typically not provided**



Regional Energy Resource Council | 92





# Coal Ash Management Overview

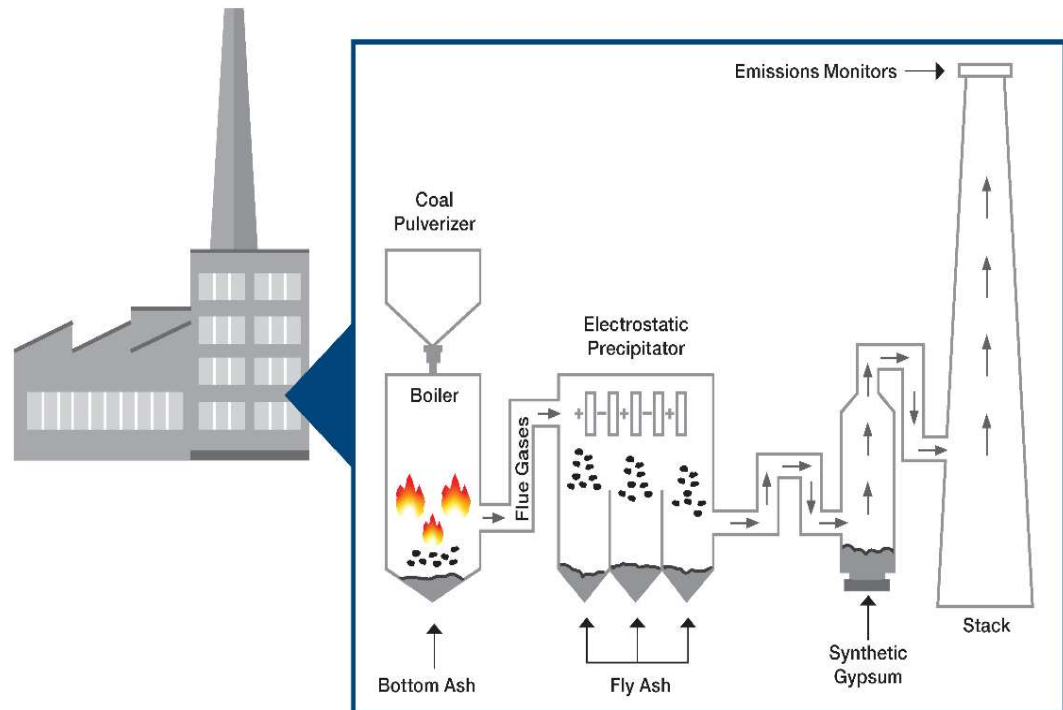
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Scott Turnbow, Vice President



# What are Coal Combustion Residuals?

- **Fly or flue ash** – Fine particle ash that rises up with the flue gases.
- **Bottom ash** – Heavier particles that remain at the bottom of the furnace.
- **Synthetic gypsum** – Created through a slurry of limestone and calcium carbonate used to remove sulfur from flue gases.



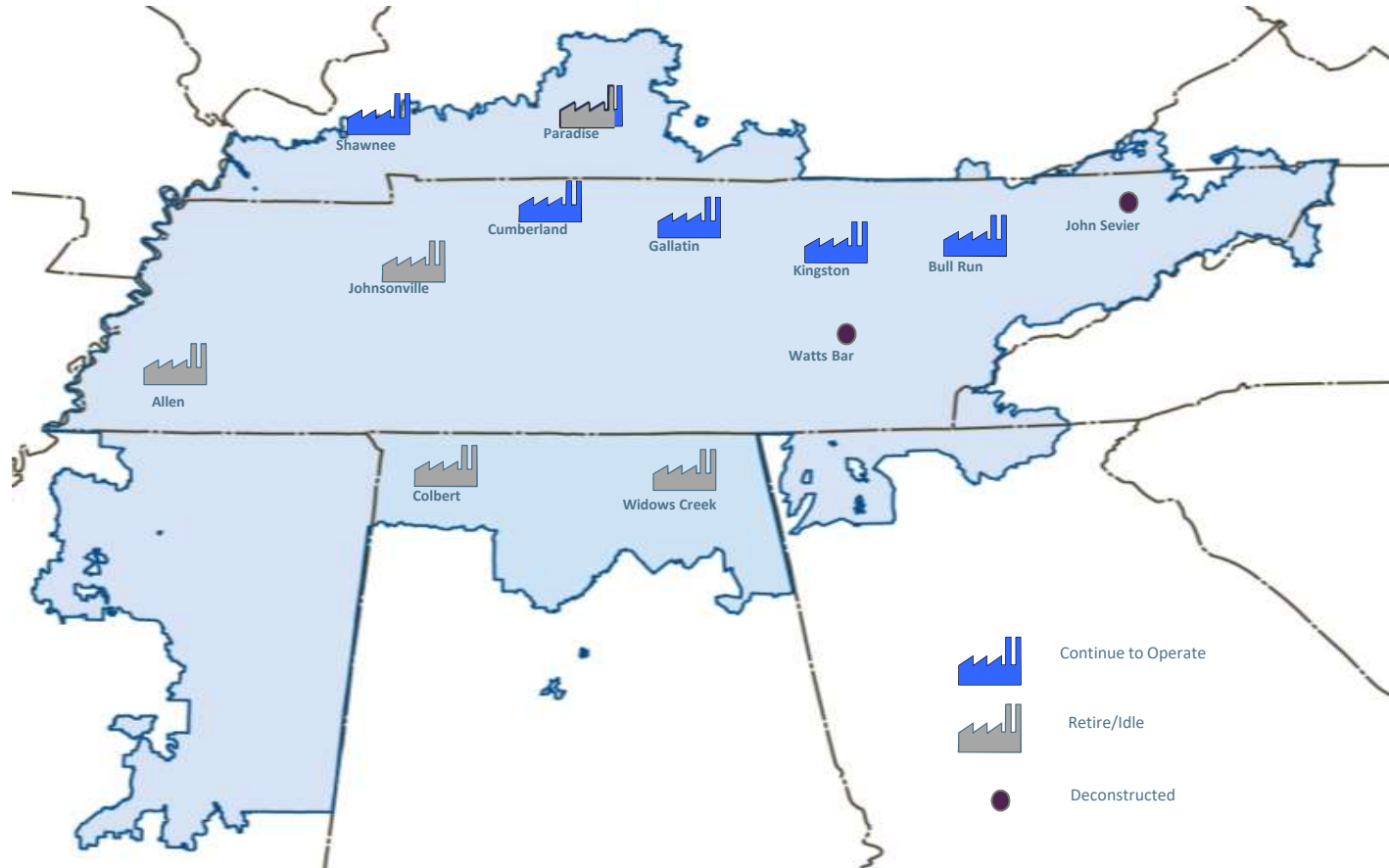


# What are Coal Combustion Residuals?





# Historic CCR Production





# Five Areas of Focus for CCR

**1** ENSURE ALL  
DIKES MEET MODERN  
dam safety  
standards

**2** CONVERT ALL  
WET SYSTEMS TO  
dry handling &  
storage

**3** SAFELY  
MANAGE  
PROCESS  
water

**4** EVALUATE  
FUTURE STORAGE  
on site-by-site  
basis

**5** STUDY &  
MONITOR  
GROUNDWATER  
at all sites



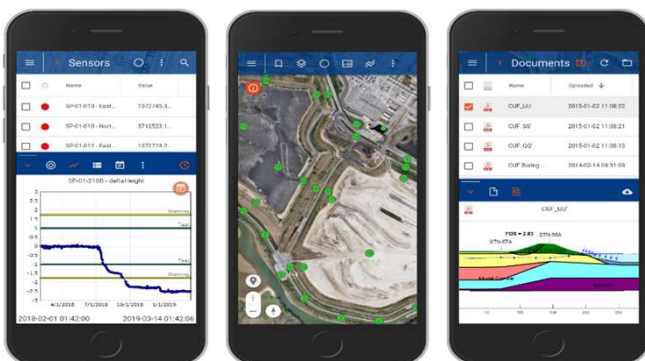
# World Class CCR Program



**TVA has closed all CCR impoundments at 5 of the 12 coal plants**



**TVA has completed wet to dry CCR conversion at 4 out of 5 operating coal plants**



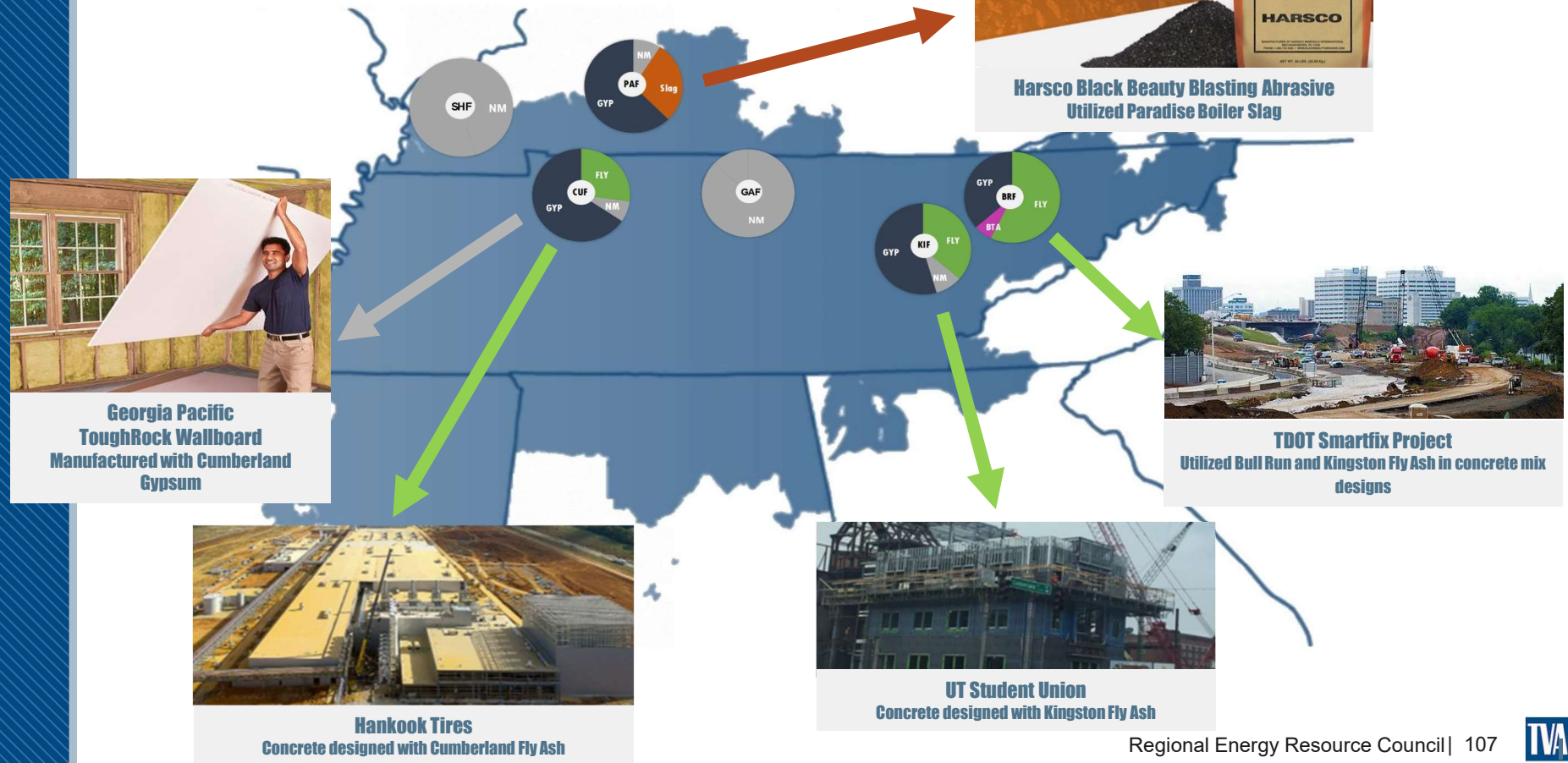
**Over 16,000 sensors, monitored real time to ensure stability of TVA's CCR facilities**



**Robust groundwater monitoring and Quality Assurance program**



# Current Marketing Mix







# CCR Environmental Management and Compliance

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Anna Fisher, Manager  
Waste Permits, Compliance, and Monitoring



# Overview

- Key Considerations for Protection of Human Health and the Environment
  - Unit stability
  - Groundwater quality
  - Surface water quality
- How Coal Combustion Residuals (CCR) are regulated by Federal and State Regulations

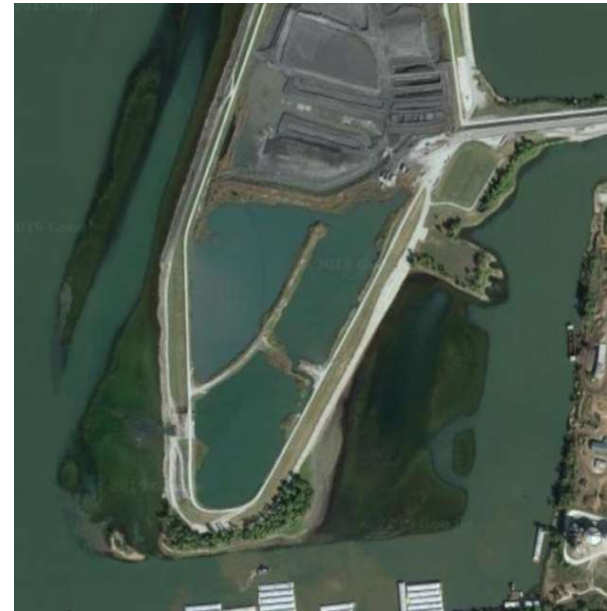


Regional Energy Resource Council 109





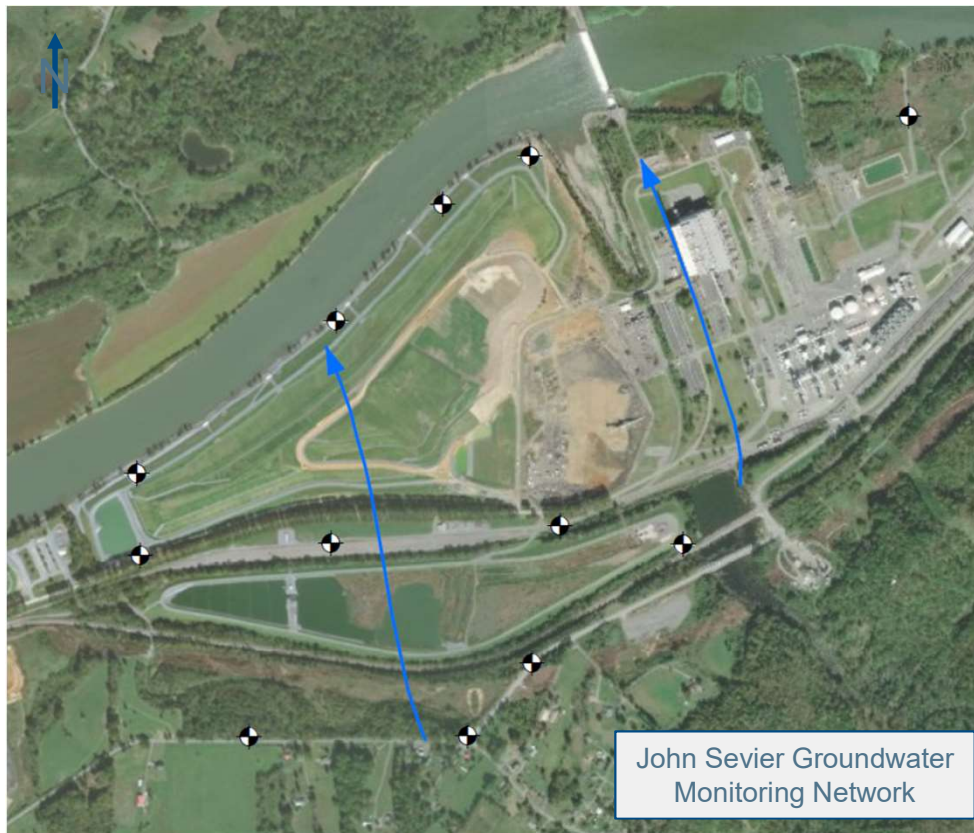
# How is TVA CCR regulated?



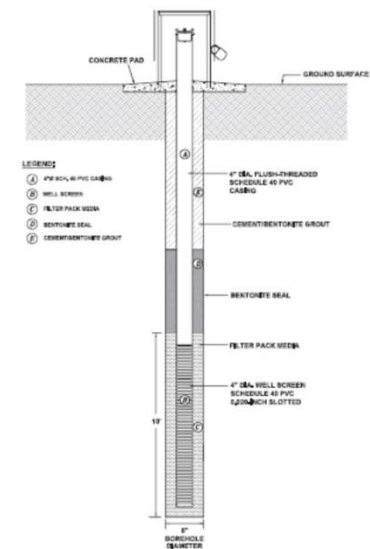
<https://www.tva.gov/Environment/Environmental-Stewardship/Coal-Combustion-Residuals>



# Groundwater monitoring

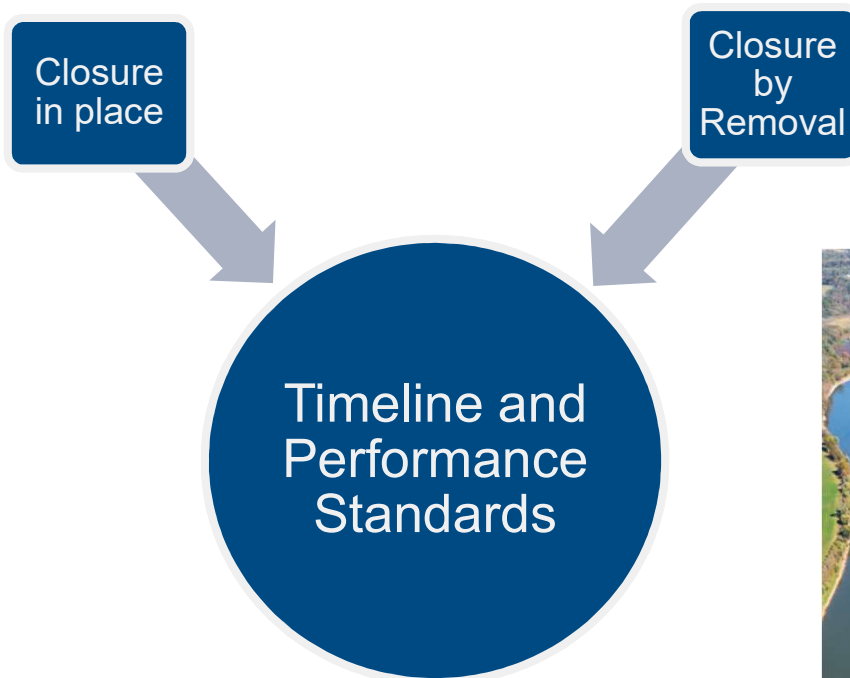


Groundwater Monitoring Well





# Closure of CCR Impoundments





# Permitting for New Landfills

## Landfill Permits

- States issue solid waste landfill permits
- Application process includes numerous regulatory specifications

## Ancillary Permits

- Construction storm water
- Water resource alterations

## Landfill Permit Public Involvement

- Permitting processes includes public notice, opportunity for public comment, and public hearing



Compacted clay liner



Geomembrane Liner



Leachate Collection Pipe



# Landfill Reporting Requirements

Construction  
quality  
assurance

Groundwater  
reporting

Stability  
monitoring

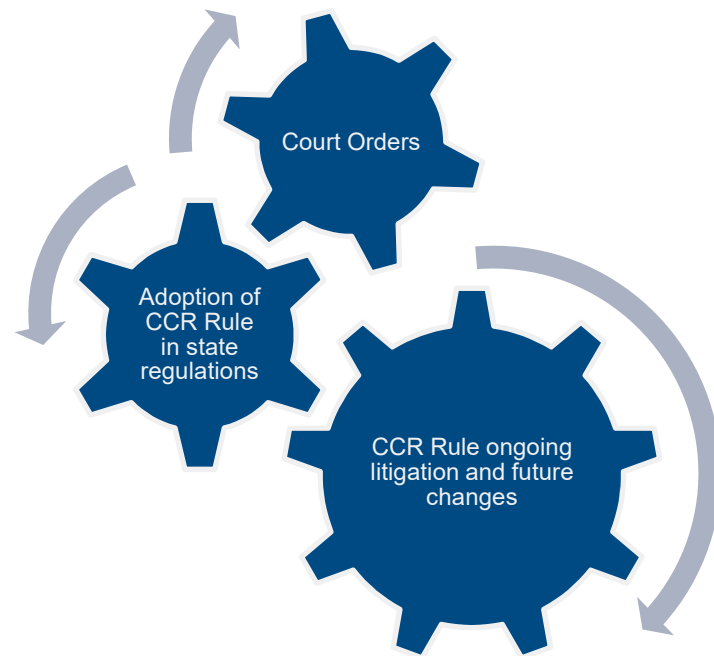
Operations and  
maintenance  
records

Other





# Regulatory Environment











# Outreach and Engagement

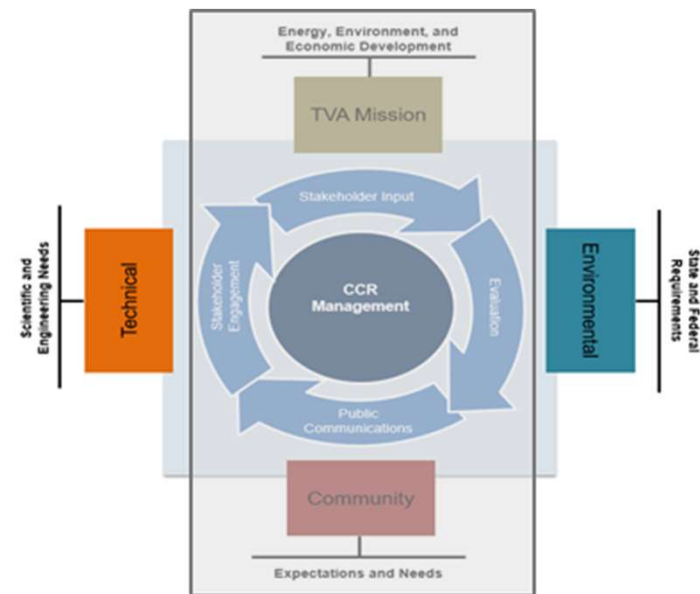
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Liz Upchurch, Senior Program Manager  
Enterprise Relations and Strategic Partnerships



# Goals for Stakeholder Engagement

- **Educate** various audiences with facts about Coal Ash Management at TVA
- **Engage** communities throughout the process to build trust
- **Explain** technical concepts in a way that people understand
- **Gather** input and gain buy-in from stakeholders





# Community Outreach and Engagement





# Educate

- Kick-Off Event
  - Elected Officials / Local Leaders
  - Media Information and Availability
  - Open House for General Public
  - Attend Neighborhood Meetings
- Phased approach to conduct at all sites
- Builds on prior technical outreach





# Engage

- Community Action Group (CAG)
  - Interested local citizens apply
  - Phased approach to all sites
  - Allows sustained engagement
  - Info tailored to CAG interests
- TVA Speakers Bureau
  - Present to community groups in plant communities

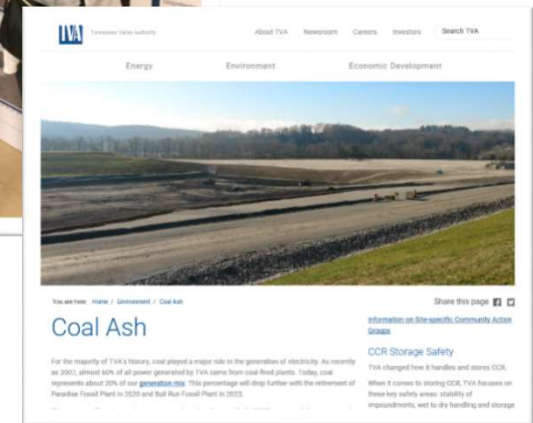


CAG website: <https://tvacommittees.mpf.com/>



# Explain

- Information provided:
  - Open houses
  - Community Action Groups
  - TVA website
- [TVA.com/coalash](https://www.tva.com/coalash)
  - Fact Sheets
  - Clear descriptions
  - Full technical data still available
  - Videos



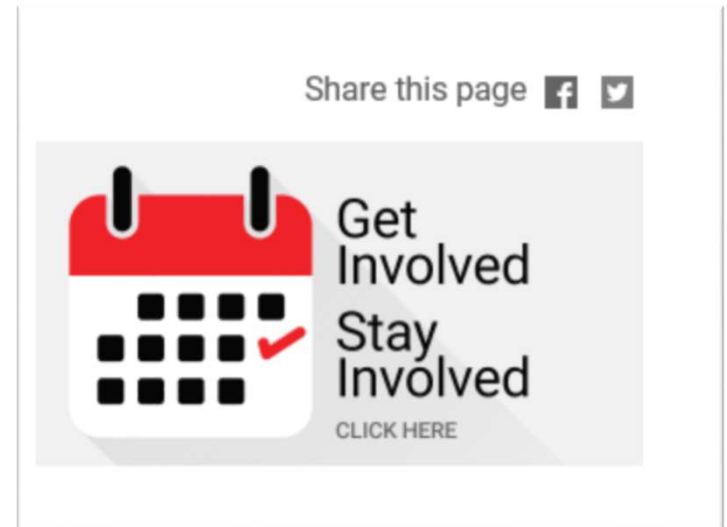






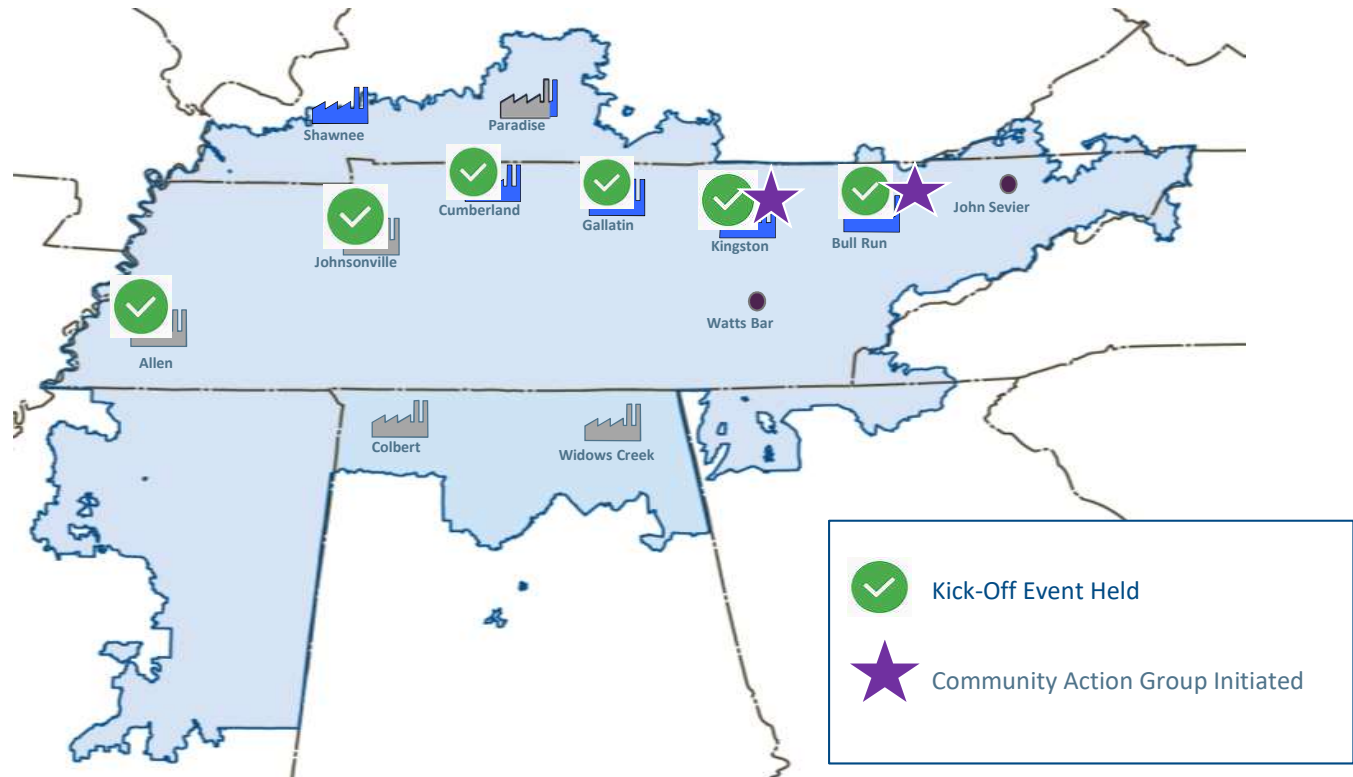
# Gather Input

- TVA Board Listening Sessions
- TVA RERC
- TVA Individual Experts
- Community Action Groups
- Public Comments / NEPA
- TVA 'Get Involved – Stay Involved'





# Outreach Status



Phased outreach approach underway



## Next Steps:

- Continue to build local approaches
  - Local staff
  - Site specific newsletters
  - TVA - 'People You Know'
  - Speakers Bureau
  - Community Involvement activities
- Kick off additional outreach efforts and Community Action Groups
- Develop metrics to measure progress















# Q&A / RERC Discussion

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## RERC Discussion

1. What aspects of coal ash management do you want to understand more fully?
2. What should TVA consider in our outreach about coal ash?





Break





# RERC Discussion (cont'd)

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## RERC Discussion

1. What aspects of coal ash management do you want to understand more fully?
2. What should TVA consider in our outreach about coal ash?





# Wrap Up / Lunch

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*Thank you and please travel safely!*

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