



Regional Energy Resource Council

June 23, 2020
Virtual Meeting

Welcome

- RERC Chair, Jennifer Mundt
 - Moment of Silence
 - Introduce new RERC Member: David Salyers
- TVA Designated Federal Officer, Joe Hoagland
- RERC Meeting Facilitator, Jo Anne Lavender

RERC Virtual Meeting

- **This is the second meeting of the 4th term of the RERC**
- **This meeting is being recorded.** A link will be provided on the TVA RERC Website (tva.gov/rerc).
- **Members of the public are welcomed to attend and are in listen only mode.** For those that pre-registered to make public comments, the meeting host will unmute your line at that time. Written comments are always welcomed (tva.gov/rerc)
- **RERC Members are able to mute and unmute their own line.** Please keep yourself on mute until you wish to speak. RERC Members may use the raise hand function to be recognized for questions or comments.

Safety Moment - Summer Heat



Stay Hydrated

Drink more water than usual - and don't wait until you're thirsty!

BEAT THE HEAT

 Centers for Disease Control and Prevention
National Center for Environmental Health



Stay Cool

Pace yourself while working or exercising in hot weather.

BEAT THE HEAT

 Centers for Disease Control and Prevention
National Center for Environmental Health




Protect Others

Keep an eye on people most likely to become ill from heat:

- Babies and young children
- Older Adults
- People who live alone
- People with a disability, disease, or mental illness

BEAT THE HEAT


 Centers for Disease Control and Prevention
National Center for Environmental Health



Protect Your Skin

- Use sunscreen with SPF 15 or higher
- Cover up with a wide-brimmed hat
- Wear light-colored clothing

BEAT THE HEAT

 Centers for Disease Control and Prevention
National Center for Environmental Health

Virtual Meeting Agenda – June 23, 2020

10:30 **Welcome, Safety Moment, Introductions, TVA Update**

10:50 **Valley Partner Update**

11:00 **TVA Energy Outlook**

12:00 ***Break – 60 minutes***

1:00 **Public Comments**

1:30 **RERC Perspectives**

2:00 **Recap and Next Steps**

2:15 **Adjourn**

Term 4 RERC Members – Roll Call

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 Lagen

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

David Salyers

State of Tennessee

Charles Snively

Commonwealth of Kentucky

Clay Walker

NETWORKS Sullivan Partnership

John Warren

Commonwealth of Virginia

Lloyd Webb

Olin Chlor Alkali

*RERC Chair

Recap of Meeting 1 – Dec 11 and 12, 2019

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

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



- TVA Introduction
 - Energy
 - Environment
 - Economic Development
- Overview of Coal Ash Management
 - Key Outreach and Engagement Strategies
- Public Listening Session
- RERC Advice

Today's Meeting Purpose

- **Provide an update on TVA and COVID-19 impacts and responses**
 - Update RERC and the public on TVA COVID Response and other relevant business items
 - Discuss and gain input on what a 'New Normal' for TVA and the electricity sector could look like.
- **Host a Virtual Public Listening Session**
- **Hear RERC views:**
 - Challenges faced by many sectors due to COVID and considerations for TVA as we adjust to a 'new normal'.



TVA Update

Joe Hoagland, Designated Federal Officer

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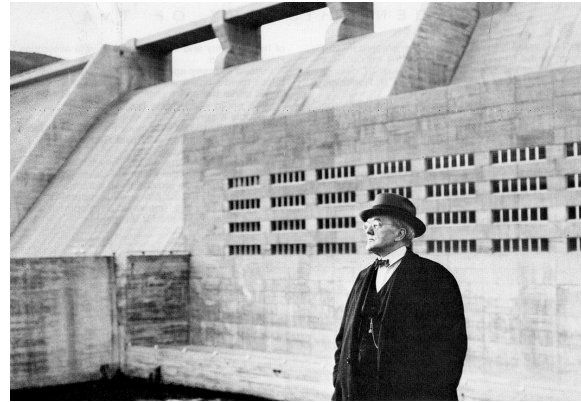
President Franklin D. Roosevelt

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



Partnering to Serve You & Your Community

PARTNERING

with **154**

Local Power
COMPANIES

TO SERVE

10 MILLION
PEOPLE

700,000
Businesses

IN
PARTS
OF

7 STATES

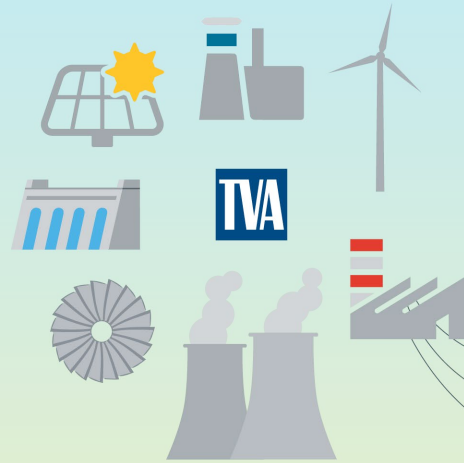
Directly Serve

58

LARGE industries &
federal installations



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

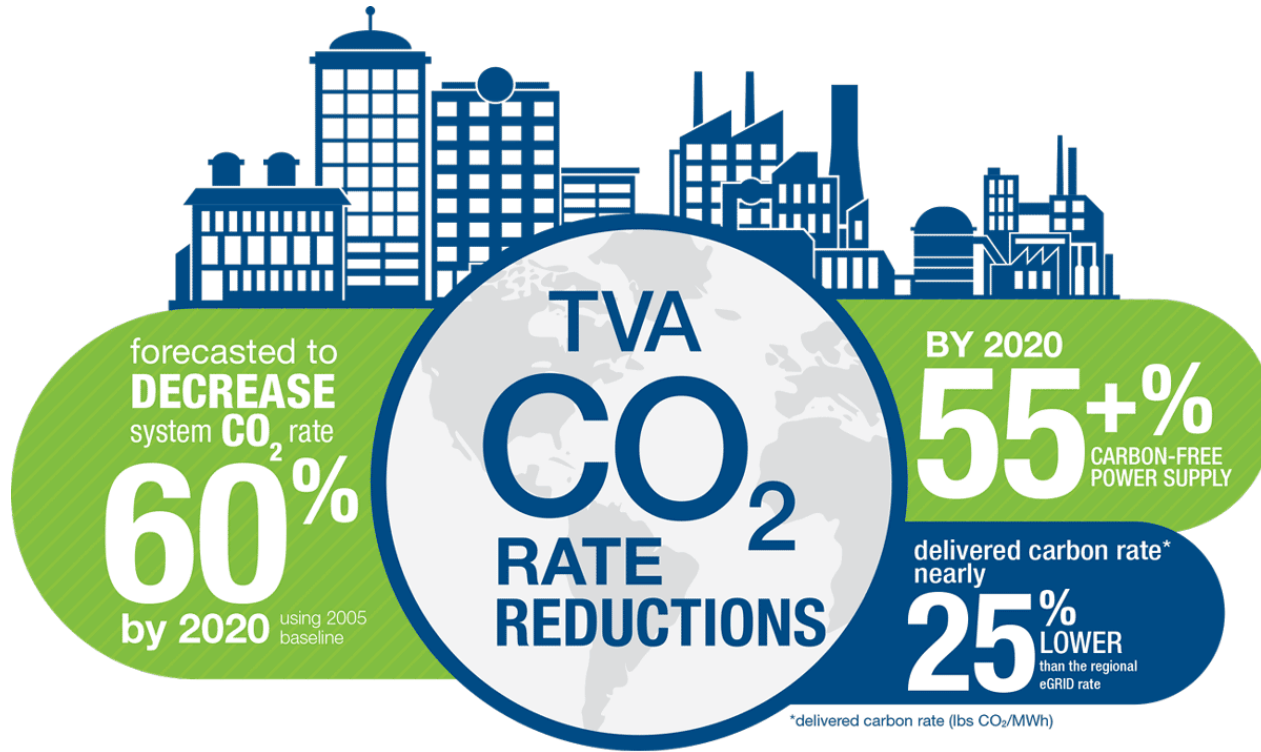


Local Power Company
Distributes it.



You Use it
in your home.

Cleaner and Greener Energy



TVA Update

- TVA COVID 19 Response
 - <https://www.tva.com/coronavirus>
 - TVA Operations / Employees
- TVA Board Meetings Feb and May, 2020
 - Board Nominees



TVA Valley Partner Update

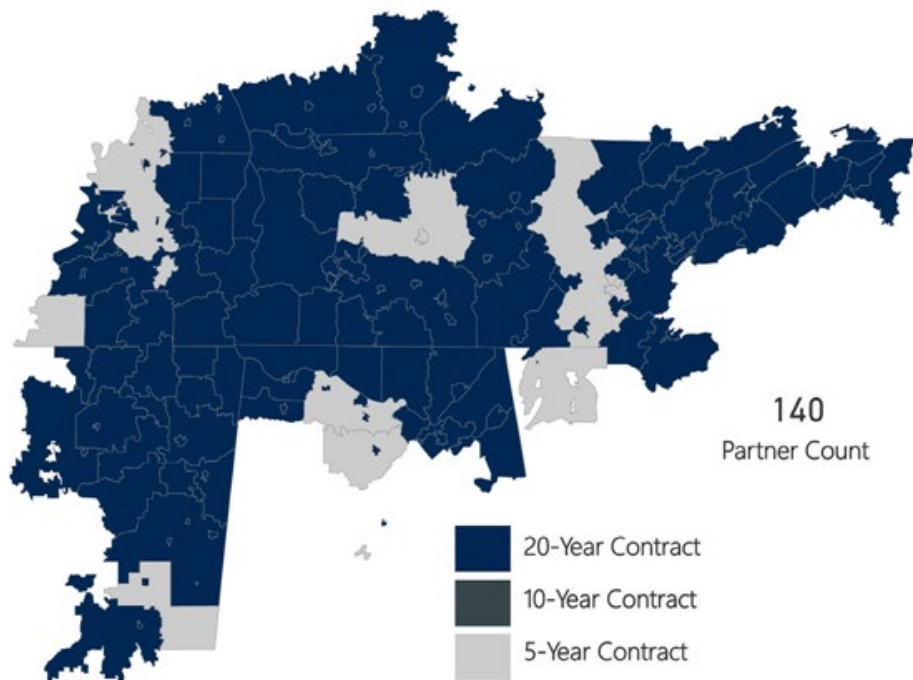
Dan Pratt, Vice President
Customer Delivery

Long-Term Agreement Benefits

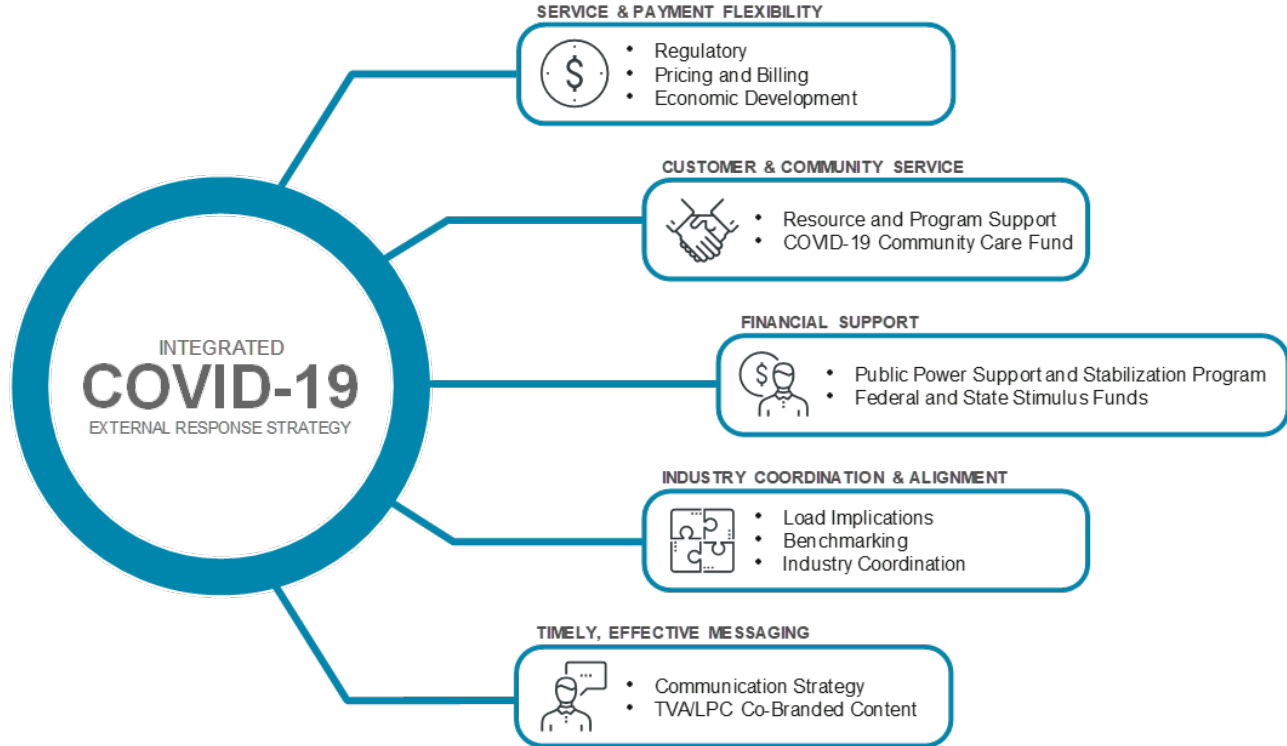
- Gives Valley Partners a stronger voice in TVA's long-term planning
- Supports renewable energy initiatives through the power supply flexibility option
- Helps Valley Partners keep rates stable for a decade (TVA plans to keep wholesale rates flat for 10 years)
- Provides each Valley Partner with a 3.1% annual credit
- Guarantees cost-based rates for 20 years

TVA Service Territory

140 of 154 LPCs have signed the Long Term Agreement as of June 23, 2020



COVID-19 External Response Strategy

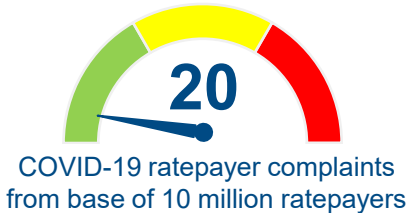


COVID-19 Metrics

Regulatory

41%
of LPCs are currently suspending
disconnects for **standard residential
customers***
as of 6/5

Customer
Engagement on **56** Policies & FAQs
Local Rate
Adjustments** **9**



Pricing & Billing

Back-to-Business Credits
81  **203**
LPCs participating Large customer
requests


\$2.9M April/May
credits

COVID-19 Community Care Fund

254 **\$1.9M**
Approved applications TVA funds approved
119 **\$3.9M*** **2.09x**
LPCs participating

*Includes \$100k Oak Ridge commitment

Resource & Program Support

CSP Billing Waivers
\$490k 
of **\$735k** utilized of waivers applied
on June 1 bills

Public Power Support & Stabilization

1  **\$1M**
LPC approved

Economic Development

Incentive Programs Flexibility
\$2.3M **8**
Annual award benefits Customers
from relaxed criteria impacted

*Based on 80% of LPCs reporting as of June 5; among the 94 LPCs, 50 suspended standard residential disconnects, 17 suspended prepay residential disconnects, and 44 suspended non-residential disconnects

**LRAs not COVID-19 related or fast-tracked

Data as of June 18 except where noted.



TVA Outlook for Energy

Tim Sorrell, Senior Manager, Enterprise Forecasting

Jane Elliott, Senior Manager, Resource Strategy

TVA Outlook for Energy

- 2019 Integrated Resource Plan (IRP) Refresh
- COVID Impact on Load Forecast and Operations
- Update on Fleet Strategy

IRP Evaluates Scenarios and Options to Meet the Valley's Future Electricity Needs

THE IRP STRIVES TO ACHIEVE SIX KEY GOALS:

Low Cost

Risk Informed

Environmentally
Responsible

Reliable

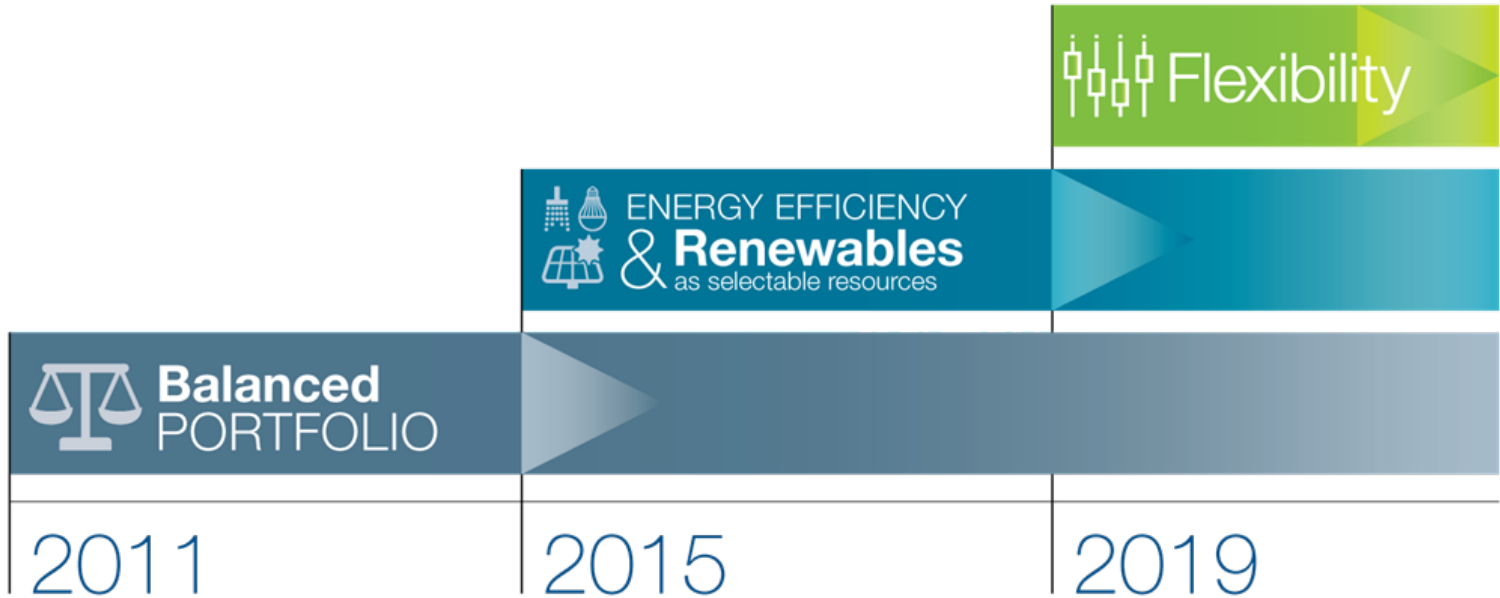
Diverse

Flexible

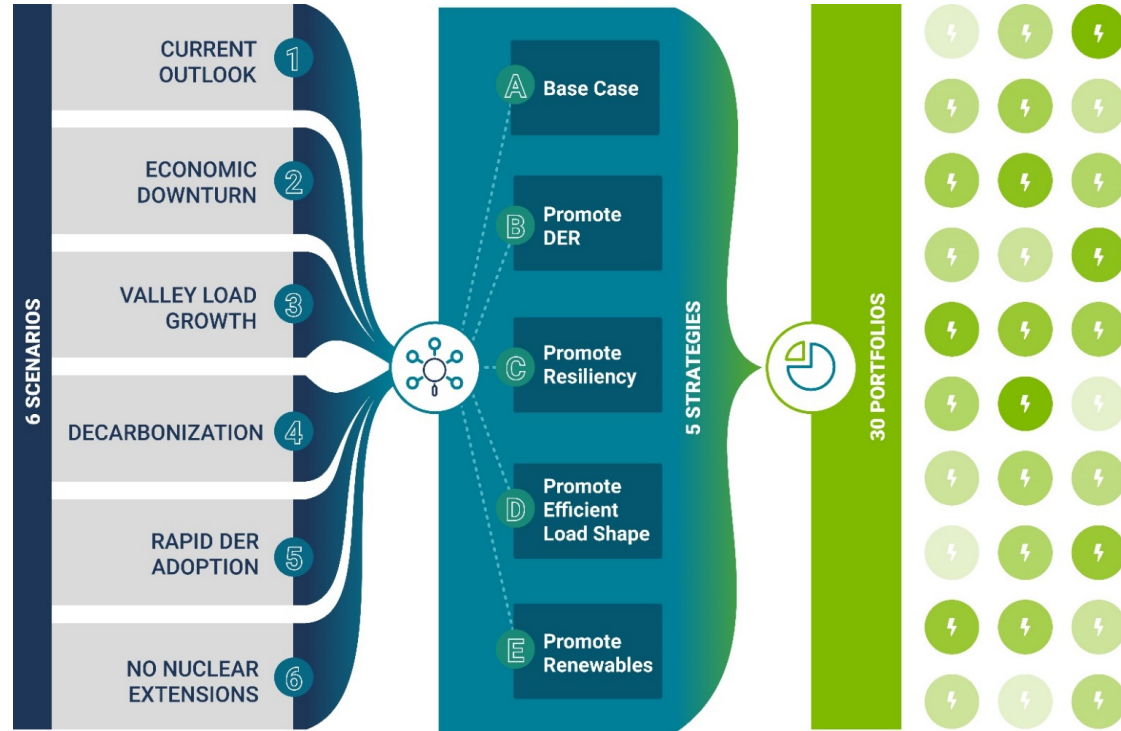
2019 IRP Focused on Flexibility

Focus Areas:

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



Utilized Rigorous Analytical Process



Stakeholder and public comments informed the scope, as well as the additional sensitivity analyses to test the impact of changes in key assumptions

2019 IRP Results Indicate:

Over the next

20



Up to

14



GW solar additions (nameplate)

Up to

5



GW storage additions

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



2 to 17

GW Natural Gas
Additions

Evaluation of
additional
coal and gas
retirements



Projected

70%

reduction in
CO₂ Intensity

Average results from 2005 baseline (lbs/MWh)

Signposts to Guide Long-Term Actions

Portfolio shifts will be driven by changing market conditions, more stringent regulations, and technology advancements.

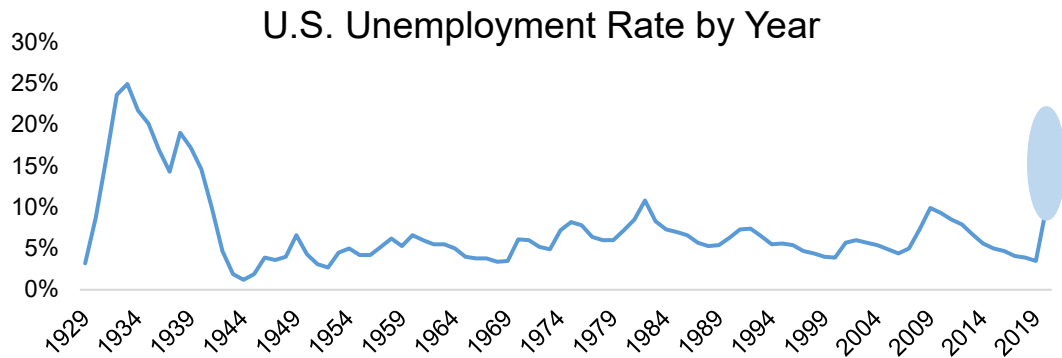


- Demand for electricity
- Natural gas prices
- Customer expectations
- Regulatory requirements
- Operating costs for existing units
- Solar and wind costs
- Emerging and developmental technologies

Unprecedented Economic Decline

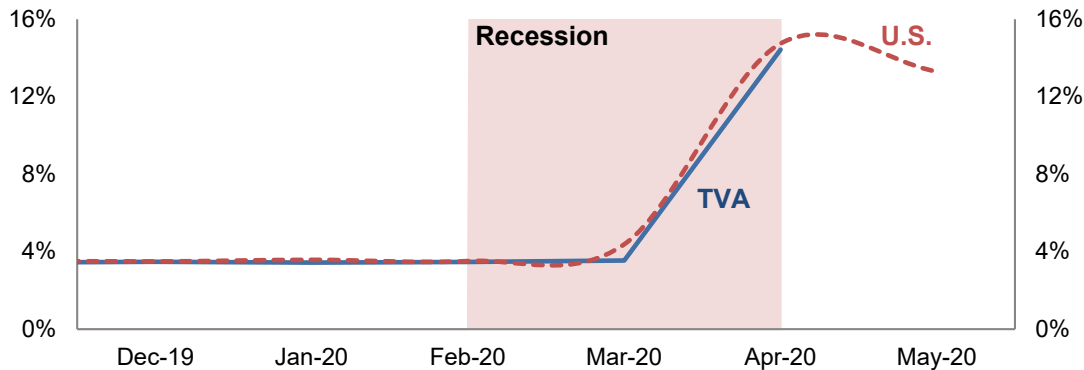
U.S. Unemployment Surged

- April U.S. spiked to 14.7% (**19.5%**), highest rate in over 80 years
- U.S. rate for May eased to 13.3% (**16.4%**)



TVA Slightly Better

- April TVA region hit 14.4%
- Estimate overall TVA rate in May below U.S. average (state & county data lag by one month)



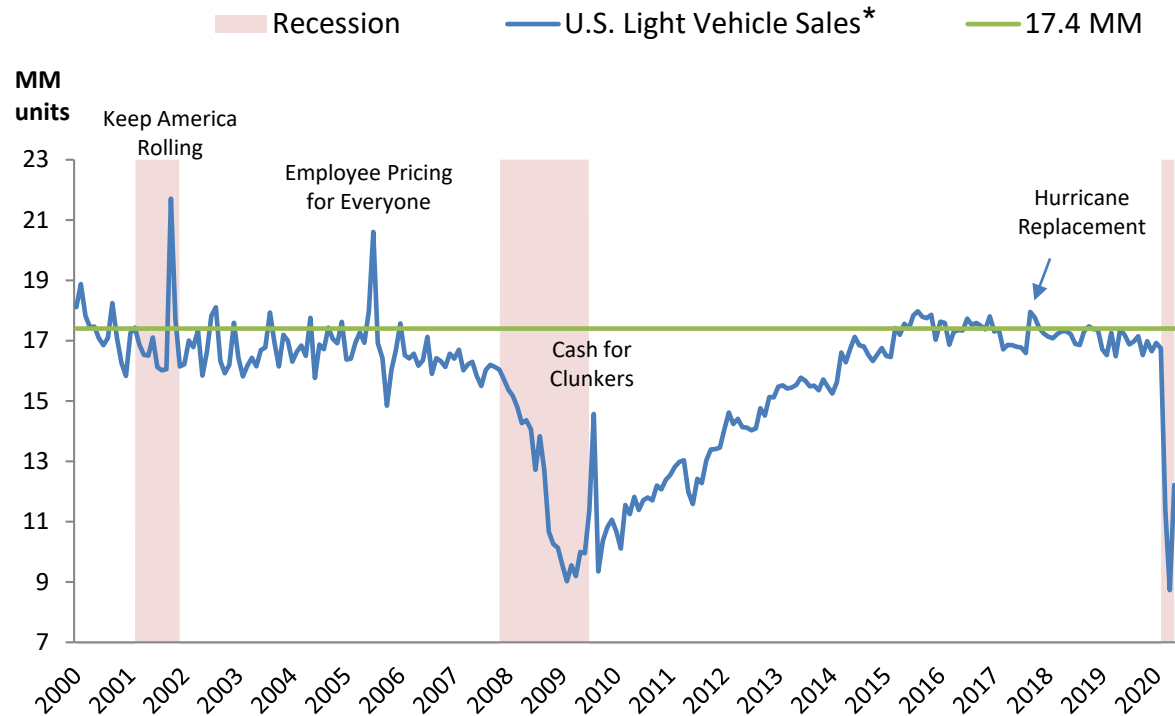
U.S. Domestic Light Vehicle Sales Fell

Vehicle sales down 22% YTD through May

Less than 1,000 cars produced in April; normally 200,000

EV sales have held up, #1 in CA

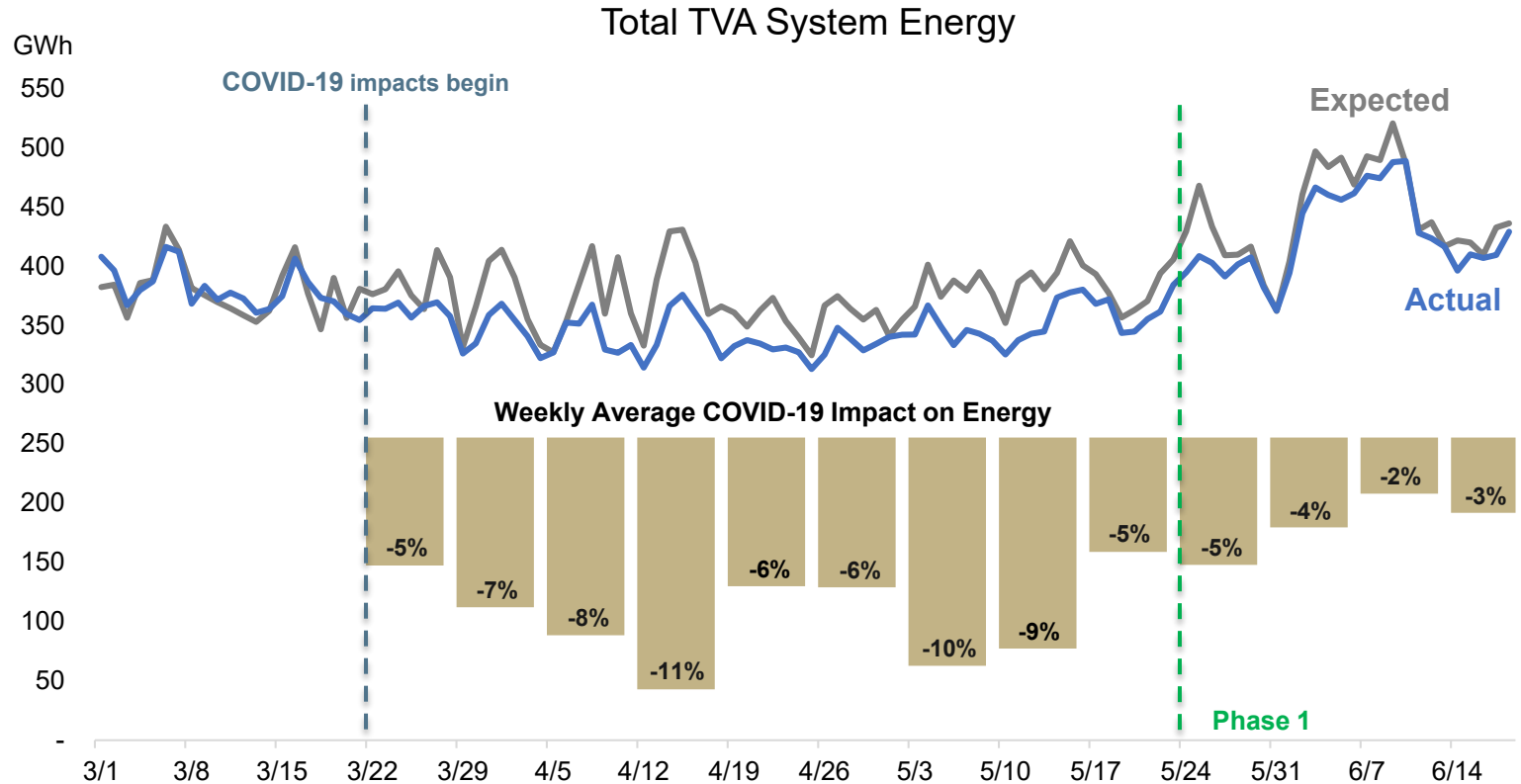
Impacts roughly 5% of TVA load



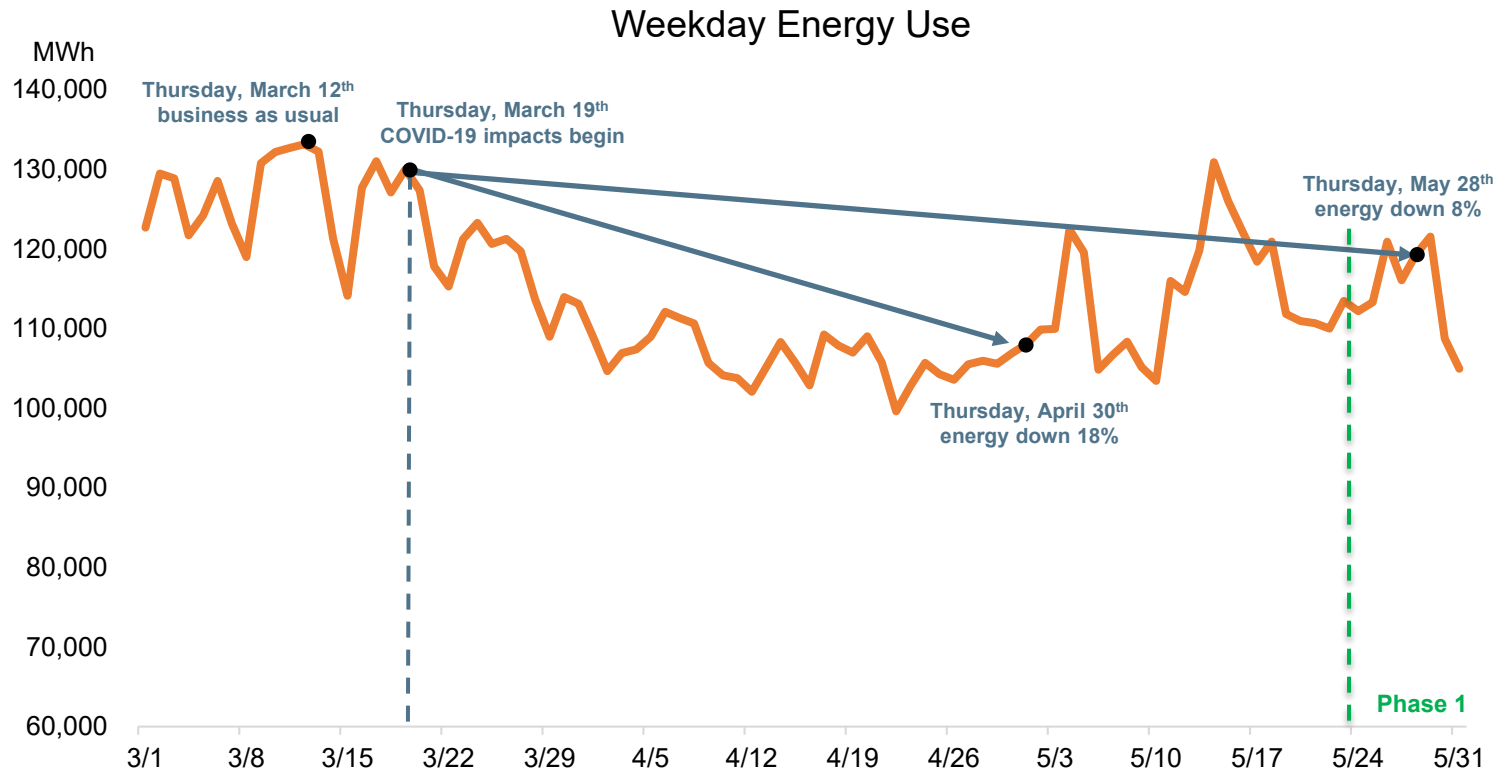
*Shown as annualized rates

Source: FRED (Federal Reserve economic data); values reflect seasonally-adjusted sales at an annual rate

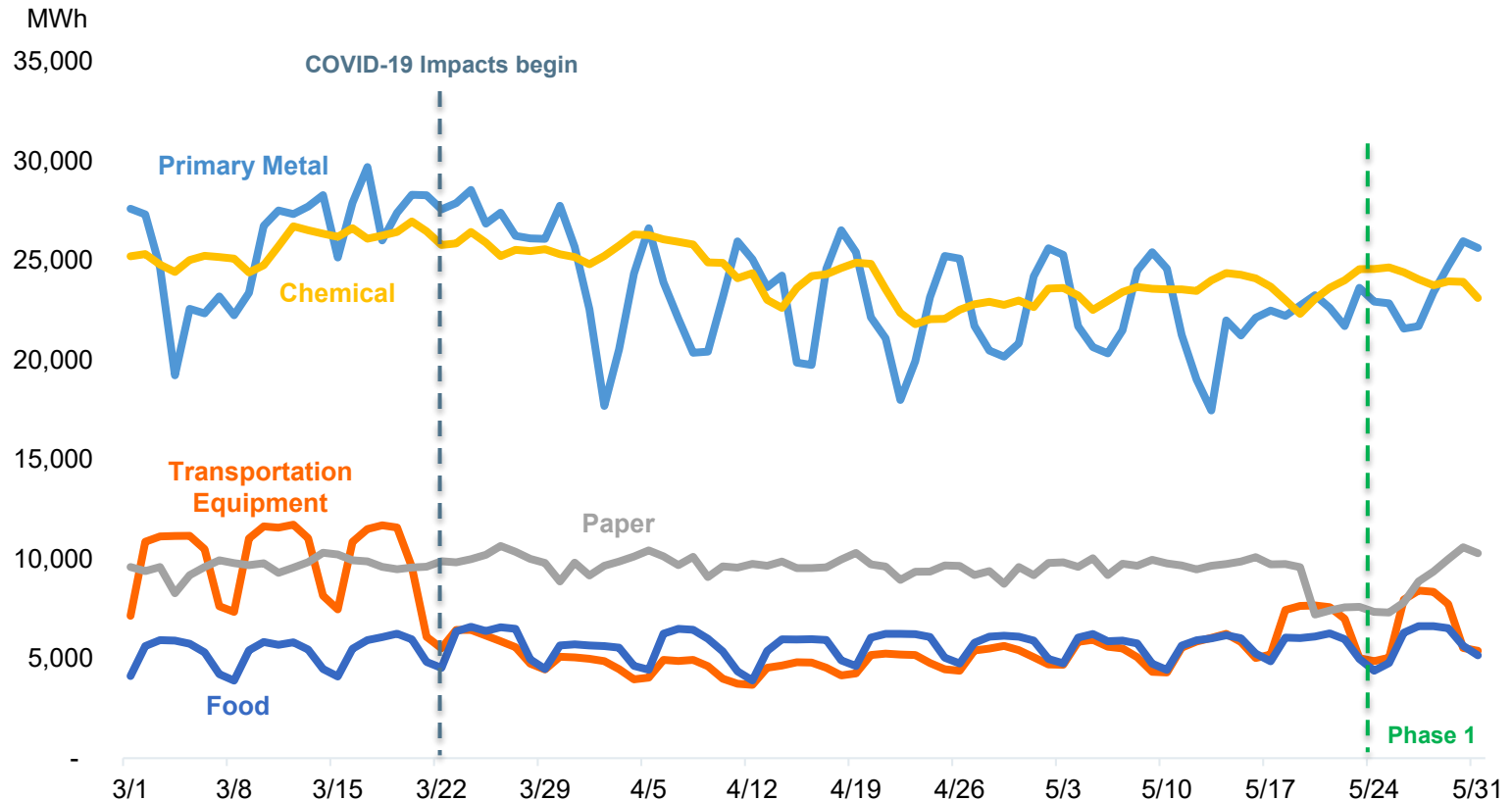
Weekly Energy Recovering



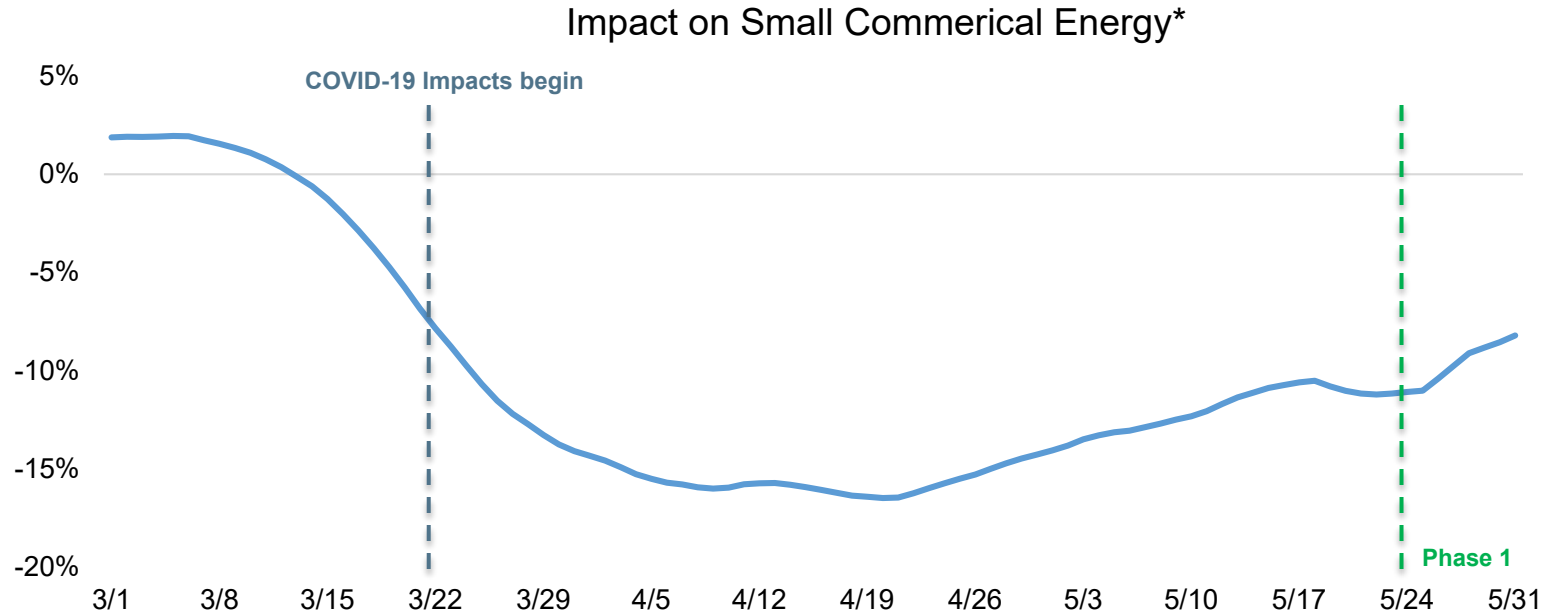
Large Industrial Energy Down 8% in May



Some Sectors Hit Harder Than Others



Small Commercial Dropped Significantly

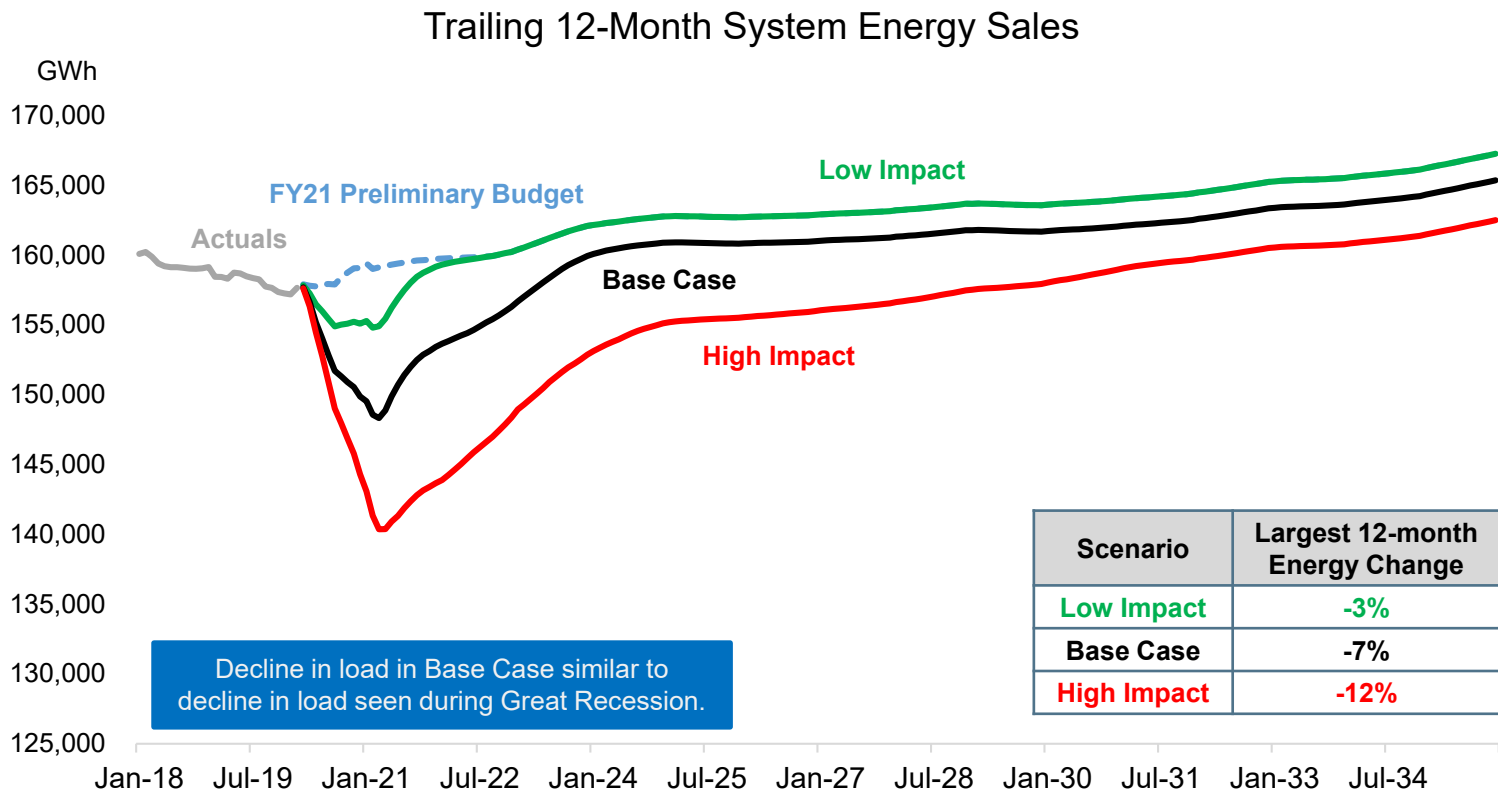


Includes restaurants, small retail shops, schools, malls, etc.

Based on updated and refined AMI models

*Based on end-user data from eight Local Power Companies

COVID-19 Causing Energy Declines

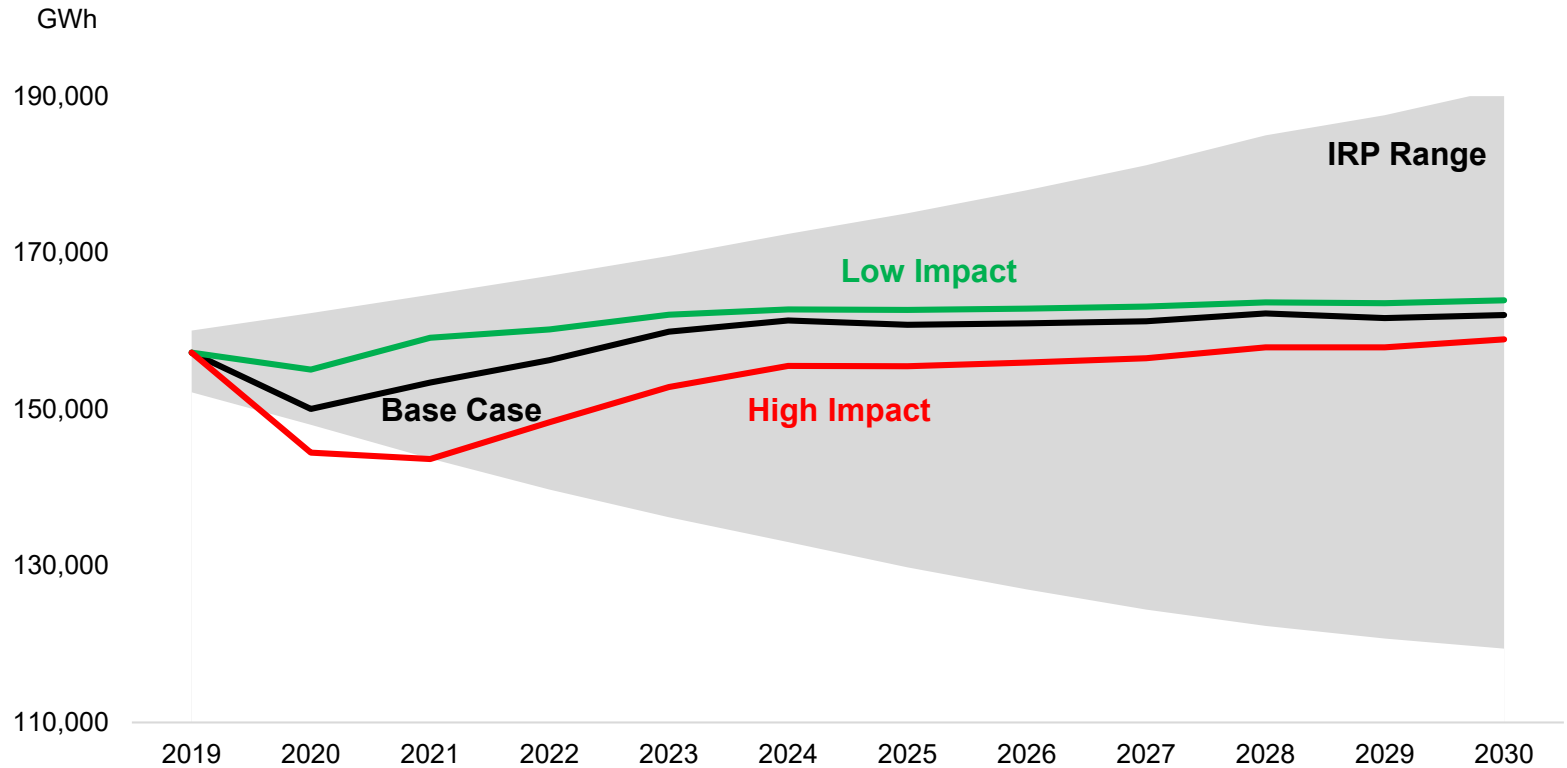


Questions to Consider

Tremendous amount of uncertainty...

- Now
 - Will reopening be successful?
 - Will people be cautious and take their time, or jump in?
 - Will COVID-19 cases spike and stay-at-home be mandated again?
- Over the Next Year
 - Will the U.S. economy stabilize?
 - Will the virus be seasonal?
 - When will people travel again especially with air travel?
- Longer term
 - Will vaccines be effective?
 - Will urban growth slow?
 - Will businesses shorten supply chains, i.e., more manufacturing in the U.S.?
 - How will the geopolitical climate change?

COVID-19 Scenarios Within IRP Ranges



Near-Term Actions Recommended in the IRP

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

Renewables & Flexibility: Solar Fleet Strategy

MARKET FORCES DRIVE
RENEWABLE NEEDS

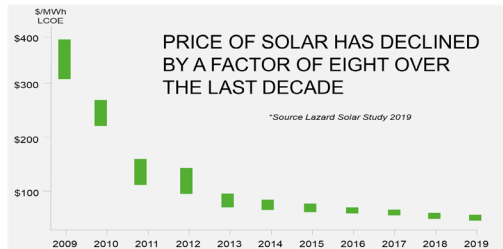
LAND REQUIREMENTS ARE
KEY CONSTRAINT

STRATEGIC APPROACH TO
IMPLEMENTATION

CUSTOMER DEMAND

RE 100

COST-COMPETITIVENESS



LAND REQUIREMENTS

7+ Acres per MW

COMPETING LAND USES

- Economic Development
- Agricultural
- Power Generation

SITE DEVELOPMENT

- Proactive Land Strategy Considering Competing Uses
- Site Development and Connectivity

BUILDING & OPERATING

- Power Purchase Agreements
- TVA Build to Learn
- Ownership / Financing
- Operational Strategies

Renewables & Flexibility: Solar Expansion

PARTNER FLEXIBILITY

To provide flexibility for Valley Partners to meet local customer solar needs

Up to 2,000 MW if all LPCs were to become partners and added max amount of solar

GREEN INVEST

To meet customer needs for utility-scale solar beyond Partner Flexibility

1,300 MW already contracted; 2020 RFP underway to meet additional customer needs

TVA BUILDS

To gain direct experience with solar builds to inform future builds or PPAs

First TVA solar site of ~200 MW planned in Lawrence County, AL (online by Dec 2023)

FUTURE SOLAR

Balance of additions to meet system needs, which could be a mix of PPAs and TVA builds

Additional solar expansion expected beyond those noted above, consistent with the IRP

Renewables & Flexibility: Integrating Solar



Aeroderivative Combustion Turbine

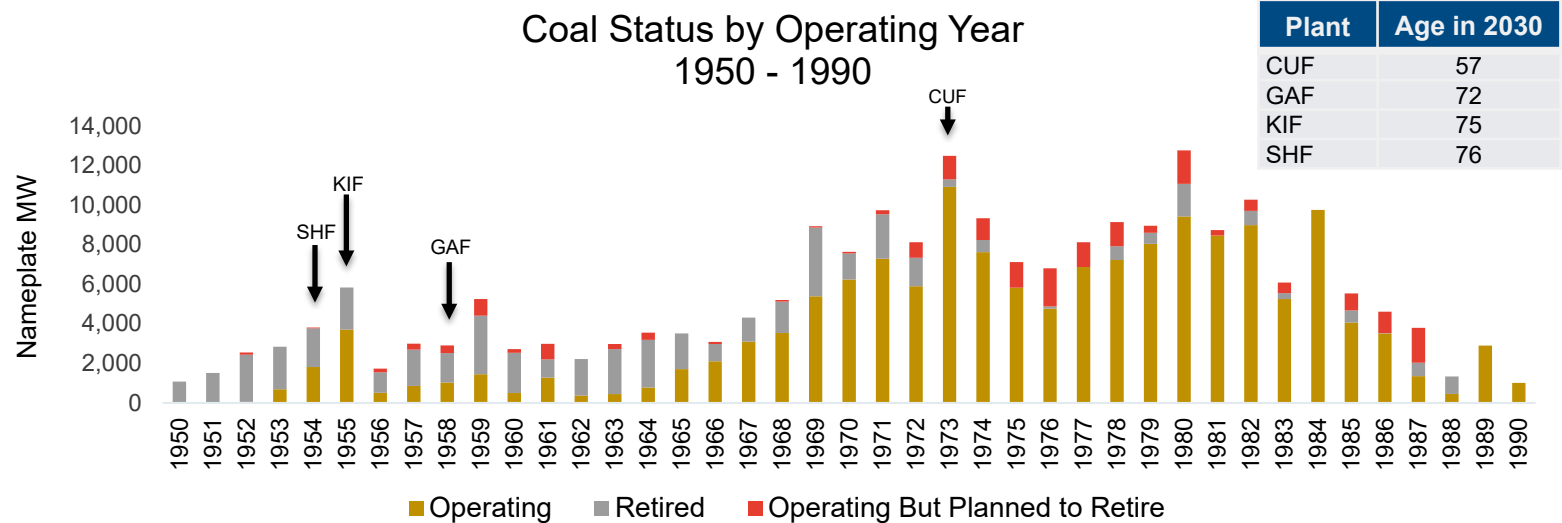
- Highly flexible gas units with non-start based maintenance
- Efficient heat rate and full power in 10 minutes
- **TVA Board approved 500-600 MW of Aeroderivatives expected to come online by the end of 2024**



Utility-scale Battery Storage

- Efficient movement within operating range to store or generate across and within hours
- Pursuing initial battery projects to demonstrate on the system
- **50 MW 4-hour battery contracted in recent RFP to come online by 2023; exploring non-wires alternative use case**

Existing Fleet: Most Coal Built in 1950-65 is Retired



- Cumberland Fossil Plant is 15-20 years younger than the other coal plants, but frequent cycling present reliability challenges that are difficult to anticipate and very expensive to mitigate
- The Cumberland silo failure and the Kingston and Gallatin mud drum issues are symptomatic of age-driven material condition issues that are difficult to proactively address

Existing Fleet: Evaluating Coal Fleet Risks



How have age and cycling impacted the **material condition** of each plant?



How is **plant performance** being impacted by material condition and use?



How do plants contribute to **system flexibility** now and with more renewables?



What are the anticipated **carbon and other environmental impacts** or risks?



What **grid support** do these plants provide compared to other alternatives?



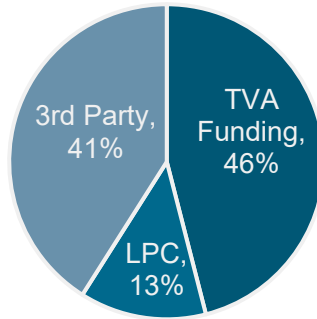
Energy Usage – Low Income Energy Efficiency

Home Uplift Program

1,500+ Homes Upgraded

Pilot Funding Sources

(Leveraged \$9M through partnerships with LPCs and non-profits)

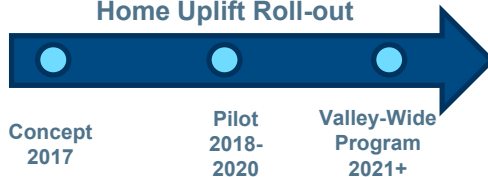


4,300 kWh savings
per home
(\$430 per year)



Pathway Lending
Home Uplift Fund
established Feb 2020
for matching funds

Home Uplift Roll-out



Energy Efficiency Education

- Expanded Energy Education options
- Energy Monsters – Kid-focused workshops
- Partnerships with schools, libraries, and non-profits



Distribution Planning: DRP/IRP Optimization



- TVA is supporting development of Distribution Resource Planning for Integration into TVA's planning process
- Flexibility opportunities available to long-term partners will also factor into Distribution Resource Plans
- Distribution Resource Plans will feed into TVA's next Integrated Resource Plan
- Distribution-sited resources would also have the opportunity to bid into a potential future Distribution System Operator desk and provide additional value

Next Steps

- Continue to monitor COVID impacts
- Continue work on IRP near-term actions
- Develop business plans that reflect these elements for Board approval

Meeting Adjourned

Meeting will reconvene
at 1:00 PM EDT



Public Listening Session

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



Preregistered Public Speakers

3 minutes per speaker

1. Kent Minault



RERC Q&A



RERC Discussion

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Dr. Bill Carswell

University of Alabama, Huntsville (ret'd)

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*RERC Chair

RERC Discussion

RERC Members will be called on in alphabetical order to provide up to 2 minutes of comments on:

1. What are the top challenges faced by your sector due to COVID-19?
2. How should TVA best prepare for the potential changes in energy usage in a post COVID-19 world?



Wrap Up / Adjourn

Next Steps:

- Next RERC Meeting: *Tentative* October 14-15, 2020
- To provide comments or find more RERC information, visit: www.tva.gov/merc
- Stay up to date on TVA public comment periods and meetings at <https://www.tva.com/about-tva/get-involved-stay-involved>

