



TVA and Winter Storm Elliott

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Director

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Our Mission

To serve the people
of the Tennessee Valley
to make life better.

Energy | Environmental Stewardship | Economic Development



Partnering to Serve You & Your Community

Partnering with

153 Local Power Companies

To serve

10 Million People

700,000 Businesses in Parts of 7 States

57 Large Industries & Federal Installations

Delivering on Our Mission to You

Energy | Environment | Economic Development



**Provide affordable,
reliable power.**



**Steward the Valley's
natural resources.**



**Partner for
economic growth.**

Building the Energy System of the Future

Significant investments to ensure a more resilient system in a cleaner energy future

Reliable



Investment in Existing Fleets

Increasing reliability and resiliency to TVA's system

Resilient



New System Operations Center

Keeping reliability high, costs low, and improving resiliency and flexibility

Responsible



Portfolio Diversity

Expanding clean energy generation while maintaining flexibility and reliability

Diverse Generation



Renewable



Hydro



Nuclear

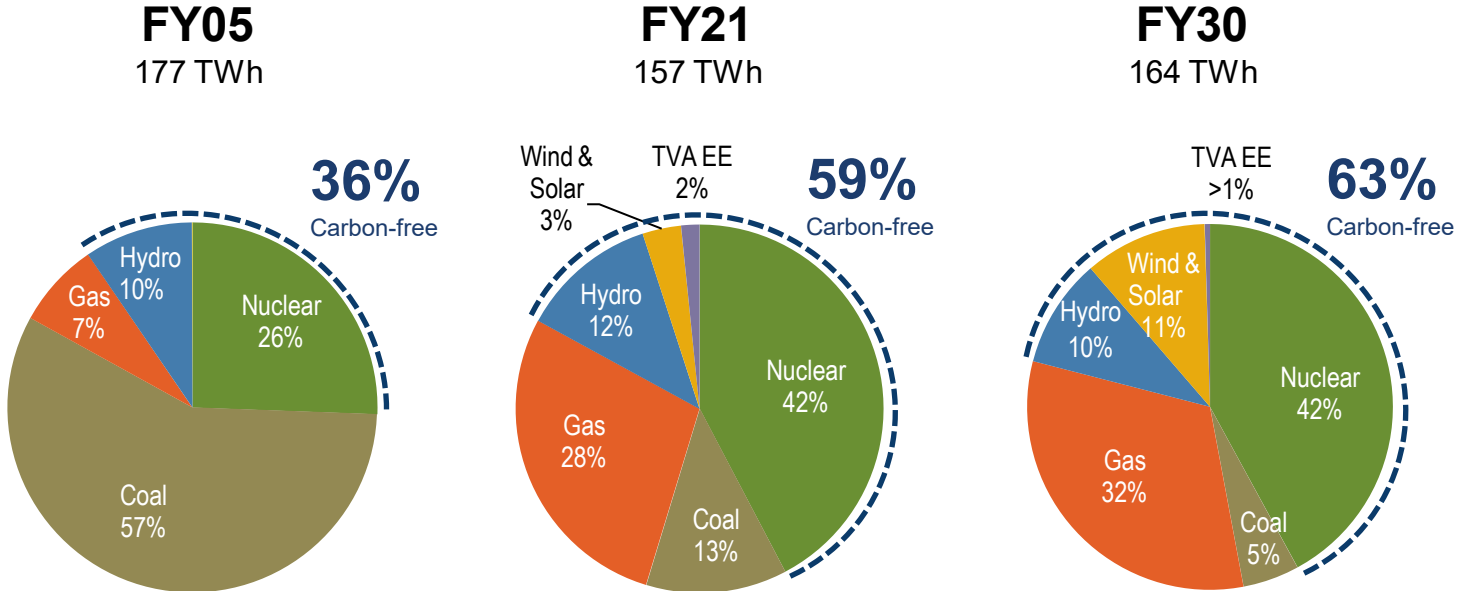


Coal



Natural Gas

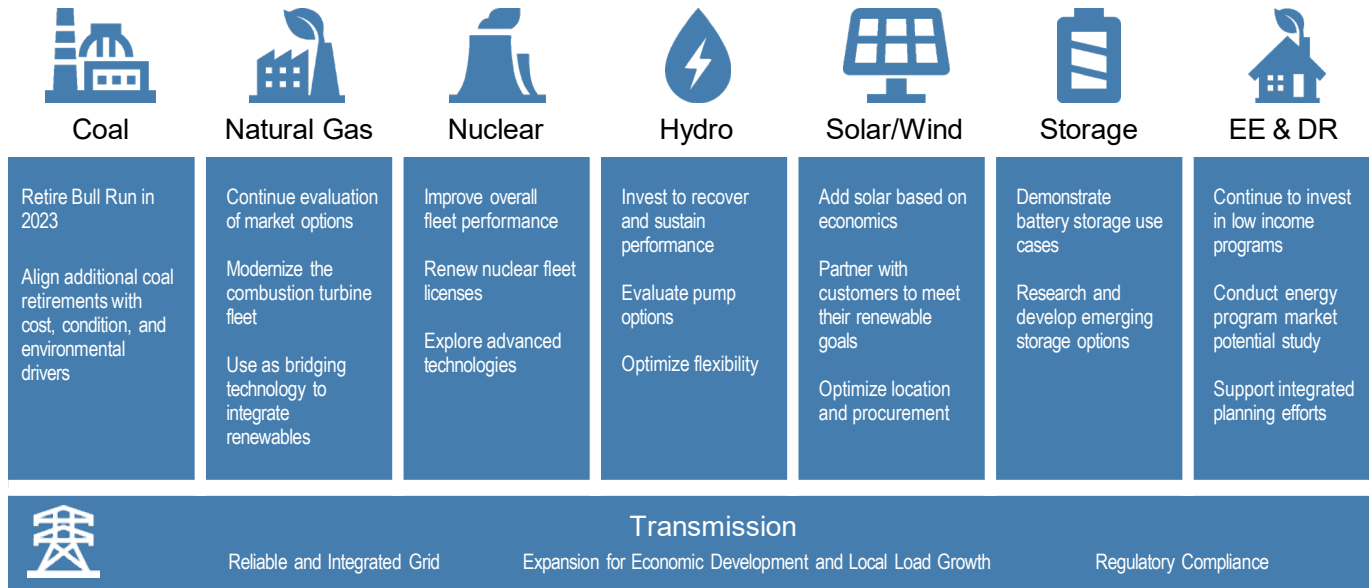
Diverse and Cleaner Energy Mix

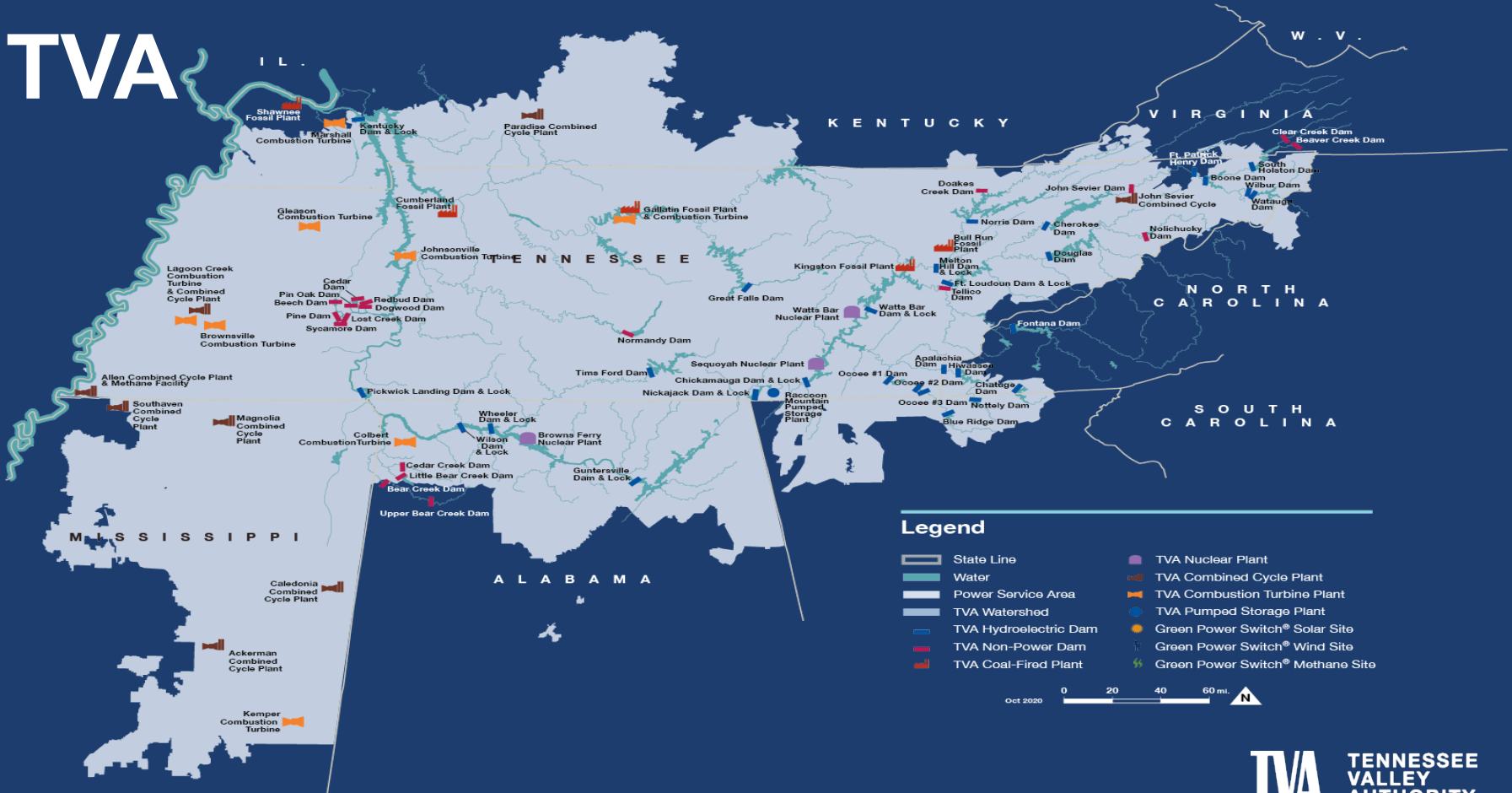


Graph represents energy. FY21 and FY30 forecasts are based on current planning assumptions in the FY21 Trajectory. EE includes TVA Energy Efficiency Program impacts on a Net Cumulative Realized at System basis, 2007 base year, and excludes energy efficiency effects from external factors.

Asset Strategy Initiatives

TVA's asset strategy was developed based on 2019 Integrated Resource Plan (IRP) strategic direction and key signposts, grounded in least-cost planning, and includes the following initiatives:





Legend

- State Line
- Water
- Power Service Area
- TVA Watershed
- TVA Hydroelectric Dam
- TVA Non-Power Dam
- TVA Coal-Fired Plant
- TVA Nuclear Plant
- TVA Combined Cycle Plant
- TVA Combustion Turbine Plant
- TVA Pumped Storage Plant
- Green Power Switch® Solar Site
- Green Power Switch® Wind Site
- Green Power Switch® Methano Site

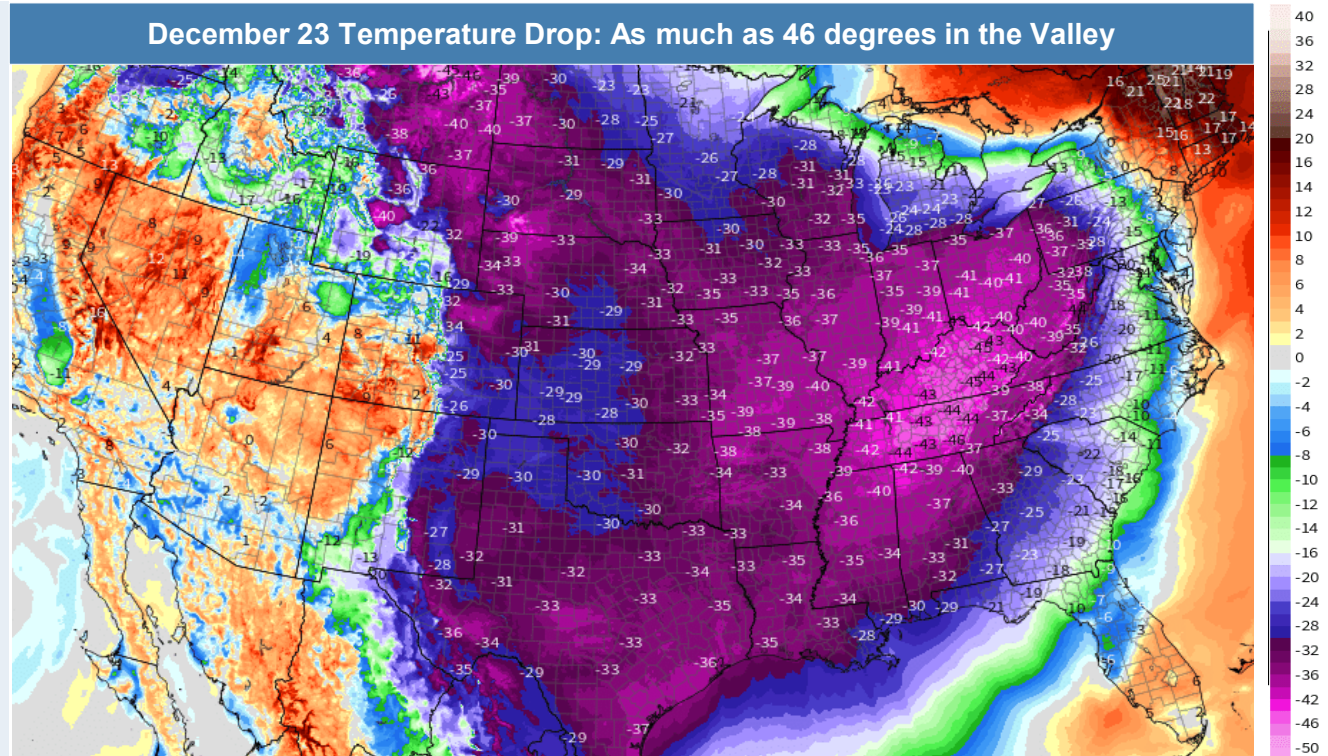


System Operator Notes

- **Realtime Balance of Generation and Load**
- **Economic Dispatch**
- **Limited by Laws of Physics (Losses and Overloads)**
- **Contingency Planning**
 - **Reserves**
 - **Market**
 - **Emergency Load Curtailment Plan**
 - **Black Starts**

Winter Storm Elliott: An Unprecedented National Event

- Approximately 2,000 miles wide;¹ affected eastern 2/3 of lower 48 states²
- Over 60% of U.S. population under winter weather alert and wind chill alerts²
- Heavy precipitation in the Valley on December 23
- Temperatures dropped as much as 46 degrees in 5 hours
- Wind gusts over 40 mph in some areas³
- Conditions created unanticipated impacts to generation, transmission, distribution, and water systems



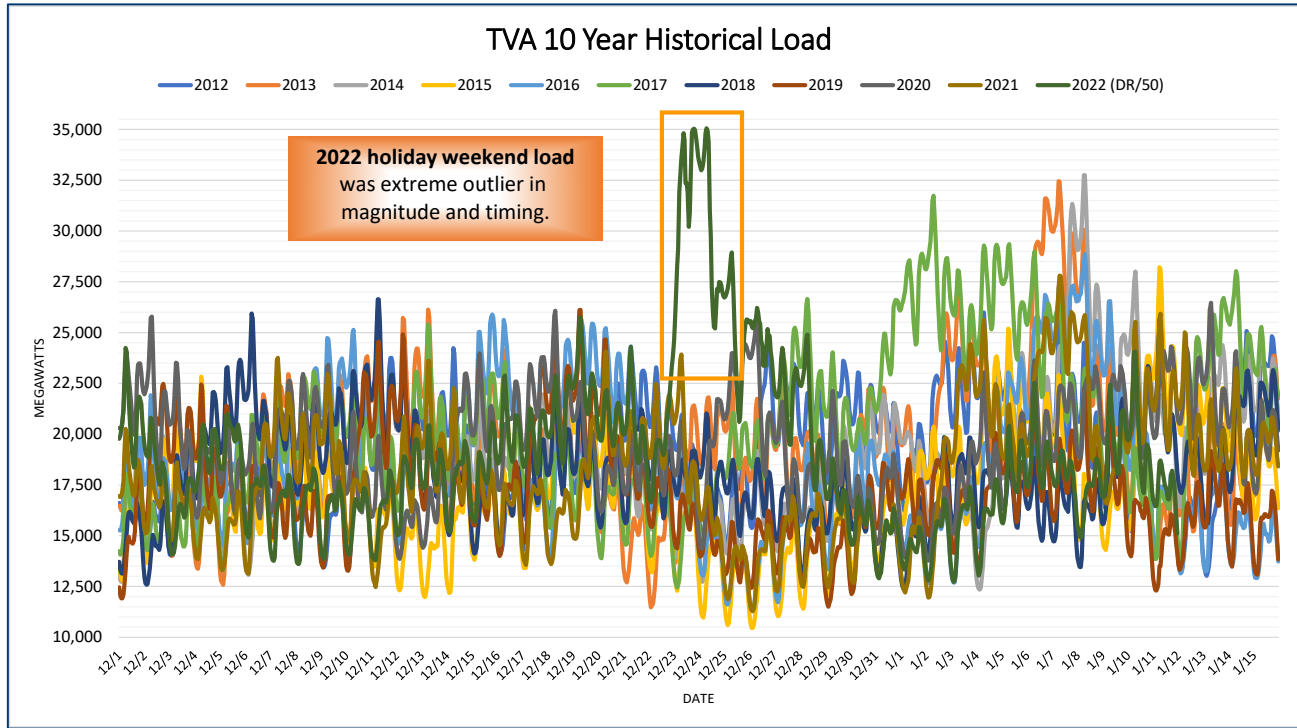
1. <https://www.theguardian.com/us-news/2022/dec/23/us-weather-bomb-cyclone-us-christmas-latest>

2. <https://www.wunderground.com/article/storms/winter/news/2022-12-23-winter-storm-elliott-bomb-cyclone-midwest-northeast-winds-snow>

3. <https://www.wunderground.com/history/daily/us/tn/nashville/KBNA/date/2022-12-22>

All data/information is approximate as of 1/13/23 and subject to change based on ongoing data analysis.

The Storm Resulted in Dramatic Increases in Demand



Extreme Storm Created Extreme Conditions

Magnolia Combined Cycle Gas Plant Ashland, MS



CC Technician thawing a sensing line on a control device

CC Technician inspecting drum instrumentation at the top of the Heat Recovery Steam Generator

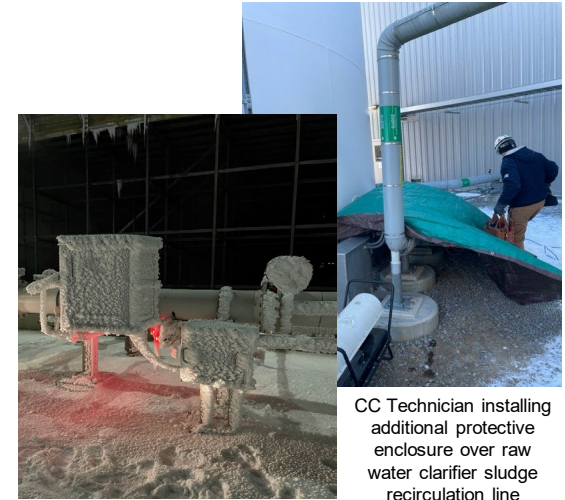
Allen Combined Cycle Gas Plant Memphis, TN



CC Technician adding additional heat to an instrumentation enclosure

CC Technician operating manual isolation valve on cooling tower

Paradise Combined Cycle Plant Drakesboro, KY



Cooling tower make-up valve control instrumentation box

CC Technician installing additional protective enclosure over raw water clarifier sludge recirculation line

What We Learned

Key drivers

- Conditions exceeded the design of the units
- Insufficient energy was available from neighboring regions

Improvement opportunities

- Forecasting tools to more accurately predict load and increase preparedness
- Coordination and visibility related to gas supply
- Coordination and implementation of emergency procedures
- Flow of information internally and externally

TVA is committed to improving our performance by addressing the drivers and opportunities and leveraging our strengths.

Summer Investment for Winter 2023

TVA invested more than \$8 million over the summer to prepare the coal, gas and hydro fleet for extreme cold weather.

- Including, adding or upgrading insulation,
- building enclosures around equipment exposed to the elements, and
- modernizing heat trace technology to prevent pipe contents and instrumentation from freezing.

In FY2024, TVA will invest another \$35 million for long-term sustainability of the winterization of the Power Operations fleet.

- Long-term Goal: Operate in extreme weather conditions of up to minus 20 degrees Fahrenheit in 20 mph winds for at least 48 hours



Capacity Additions

Approximately 3,800 MWs of new generation

750 MWs

**Simple cycle CTs
at Colbert**
(3 – 250 MWs)
Commercial CY 2023

750 MWs

**Simple cycle CTs
at Paradise**
(3 – 250 MWs)
Commercial CY 2023

1,500 MWs

**Combined Cycle
at Cumberland**
Commercial CY 2026

500 MWs

**Peaking aero-derivative
CTs at Johnsonville**
Commercial CY 2024

200 MWs

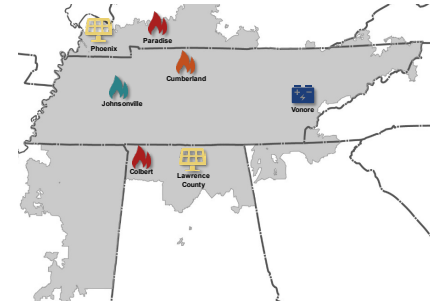
**Solar at
Lawrence County**
Commercial CY 2025

20 MWs

Battery at Vonore
Commercial CY 2023

100 MWs

**Solar at Shawnee **pending
environmental reviews***
Commercial CY 2027






GE-Hitachi BWRX-300


CLINCH RIVER NUCLEAR PROJECT'S POTENTIAL SMR TECHNOLOGY

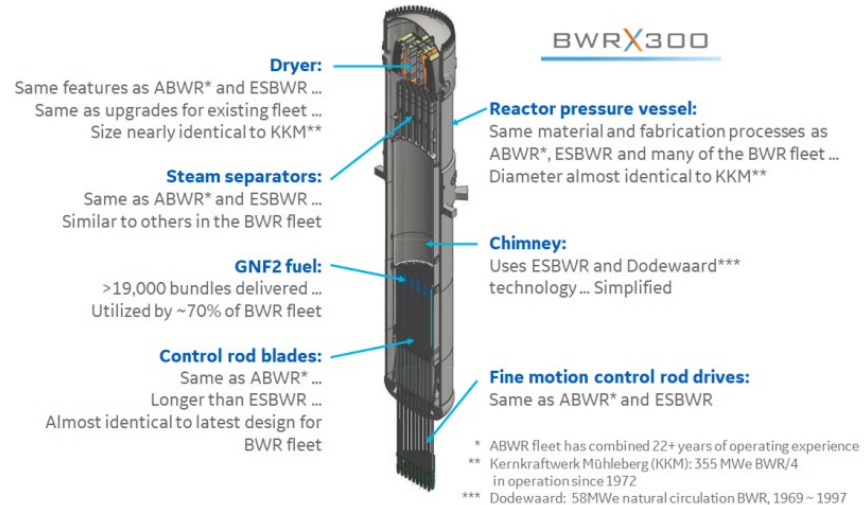
TVA identified GEH's innovative BWRX-300* reactor design as the most promising for near-term deployment.

BENEFITS OF THIS DESIGN INCLUDE

10 GENERATIONS OF DESIGN HISTORY 

 **EXISTING SUPPLY CHAINS**  **AMERICAN FUEL**

 **CLEAR NRC LICENSING PATHWAY**



This provides confidence the technology can be **rapidly deployed on a predictable schedule with acceptable risk.**

Delivering Reliable Energy that Powers Your Life

Always Investing in New Lines

99.999% Reliability Since 2000

powering your life 24/7



Powered By People You Know



Questions?



TVA

**TENNESSEE
VALLEY
AUTHORITY**

Appendix