TVA & Advanced Nuclear

Clinch River Nuclear Project & New Nuclear Program

March 13, 2024

Prepared for the Central Tennessee Section of IEEE

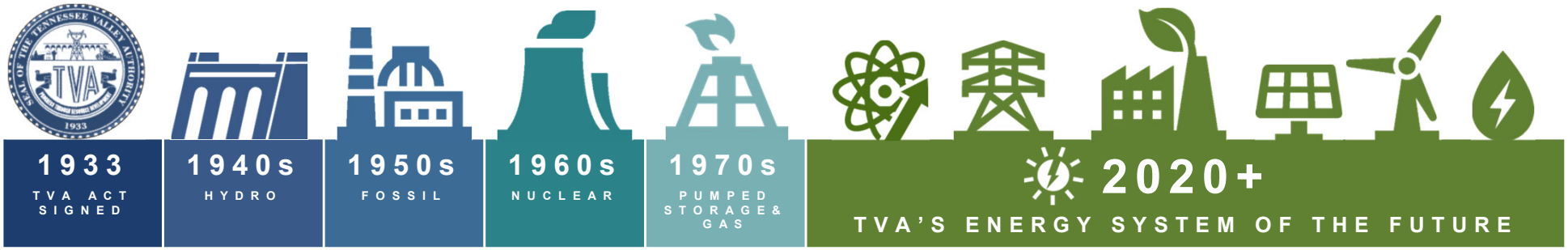
Delivering on TVA's Mission – Past, Present, and Future

SERVING THE PEOPLE TO MAKE LIFE BETTER

ENERGY — Electricity at the lowest feasible rate and highest feasible reliability

ENVIRONMENTAL STEWARDSHIP — 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



TVA has led the nation in energy innovation from our inception.

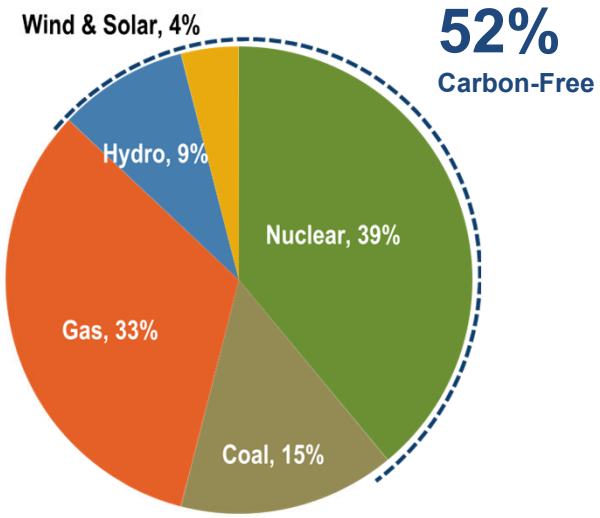
Over the next several decades, **the energy needs of the TVA region could potentially double as our nation transitions toward a net-zero carbon economy**.

Today and in the future, the Valley needs **affordable, reliable, resilient, and carbon-free energy** to support and facilitate economy-wide decarbonization and for TVA to continue to lead the nation in energy innovation.

TVA TENNESSEE VALLEY AUTHORITY

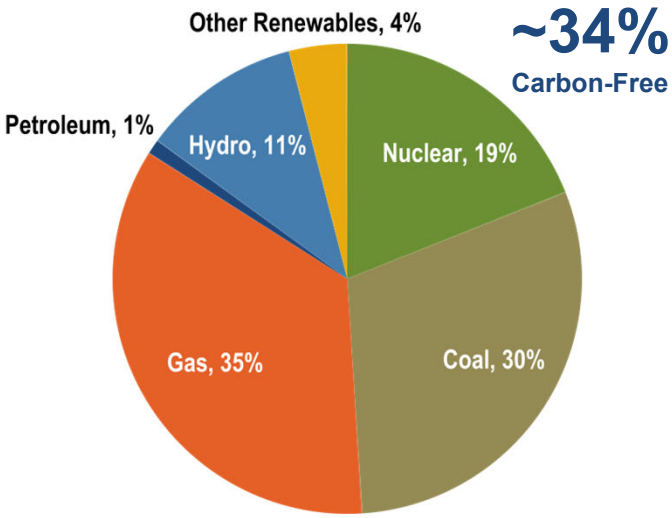
The Benefits of a Cleaner and More Diverse Power System

TVA
Total Power Supply
FY2022



52%
Carbon-Free

National
Average



~34%
Carbon-Free

Data from U.S. EIA Electric Power Annual Report (2021)

Chart depicts both generated and purchased power within respective resource types. For additional information, please see Total Power Supply by Generating Source in TVA's Annual Report on Form 10-K.

TVA TENNESSEE VALLEY AUTHORITY

Browns Ferry Nuclear Plant Overview

- Located about 30 miles southwest of Huntsville, AL, near Athens, AL
- Three General Electric BWR Units, generating more than 3,400 MWe
- Largest BWR facility in the U.S.
- Supplies electricity to more than 1.8 million homes
- Supports about 1,400 full-time jobs
- ~20 percent of TVA's total net generation
- ~45 percent of TVA's nuclear net generation
- One of the top two nuclear generating stations in the United States – only Palo Verde, a three-unit site in Arizona, generates more electricity.

TVA TENNESSEE VALLEY AUTHORITY

Sequoyah Nuclear Plant Overview

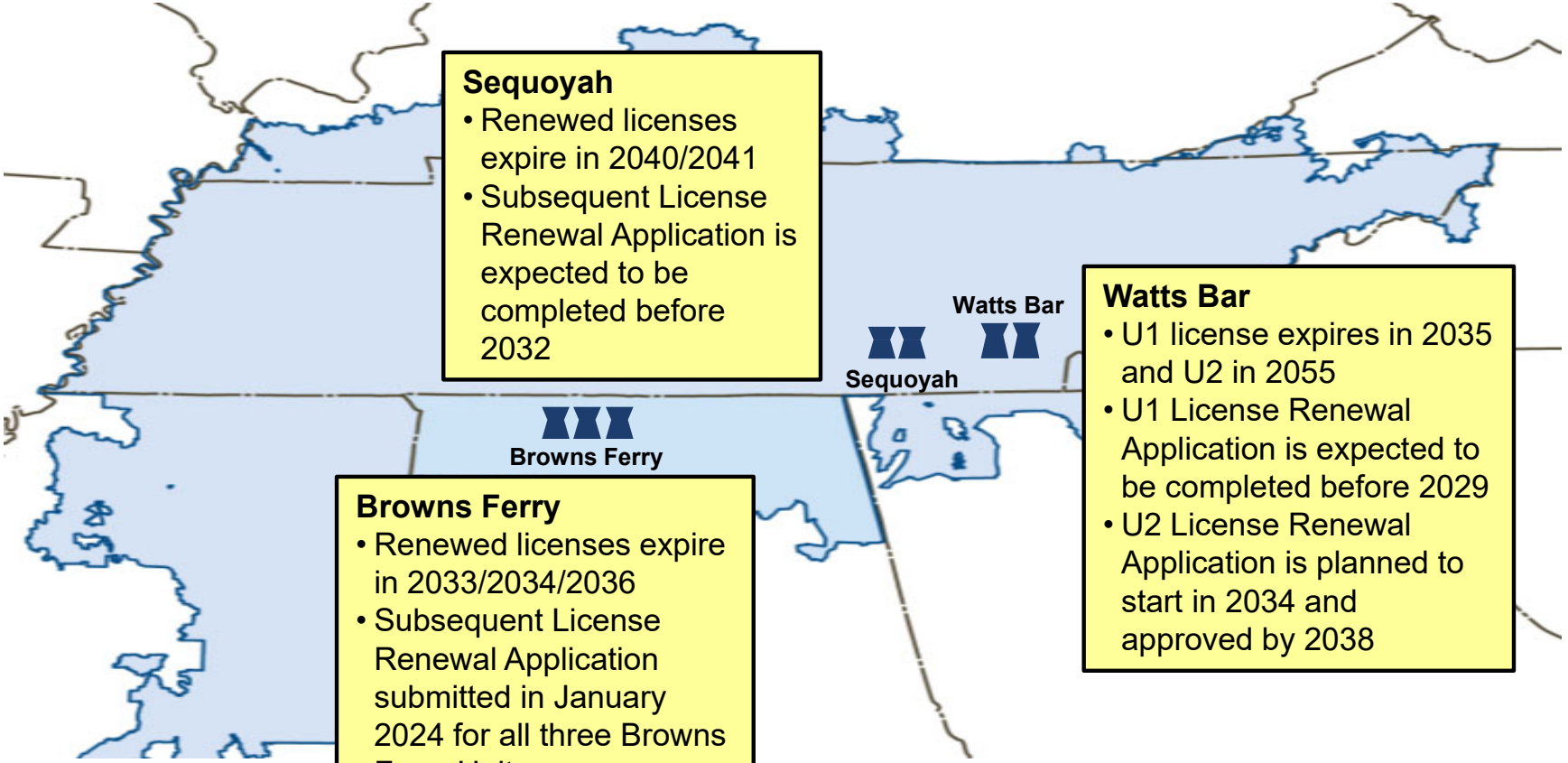
- Located 18 miles northeast of Chattanooga, TN
- Two Westinghouse PWR Units, generating about 2,400 MWe
- Supplies electricity to approximately 1.3 million homes
- Supports about 1,000 full-time jobs

TVA TENNESSEE VALLEY AUTHORITY

Watts Bar Nuclear Plant Overview

- Located about half-way between Knoxville and Chattanooga, near Spring City, TN
- Two Westinghouse PWR Units, generating about 2,400 MWe
- Supplies electricity to approximately 1.3 million homes
- Supports about 1,000 full-time jobs
- Unit 2 began operation in October 2016

Fleet Nuclear Asset



Sequoyah
- Renewed licenses expire in 2040/2041
- Subsequent License Renewal Application is expected to be completed before 2032

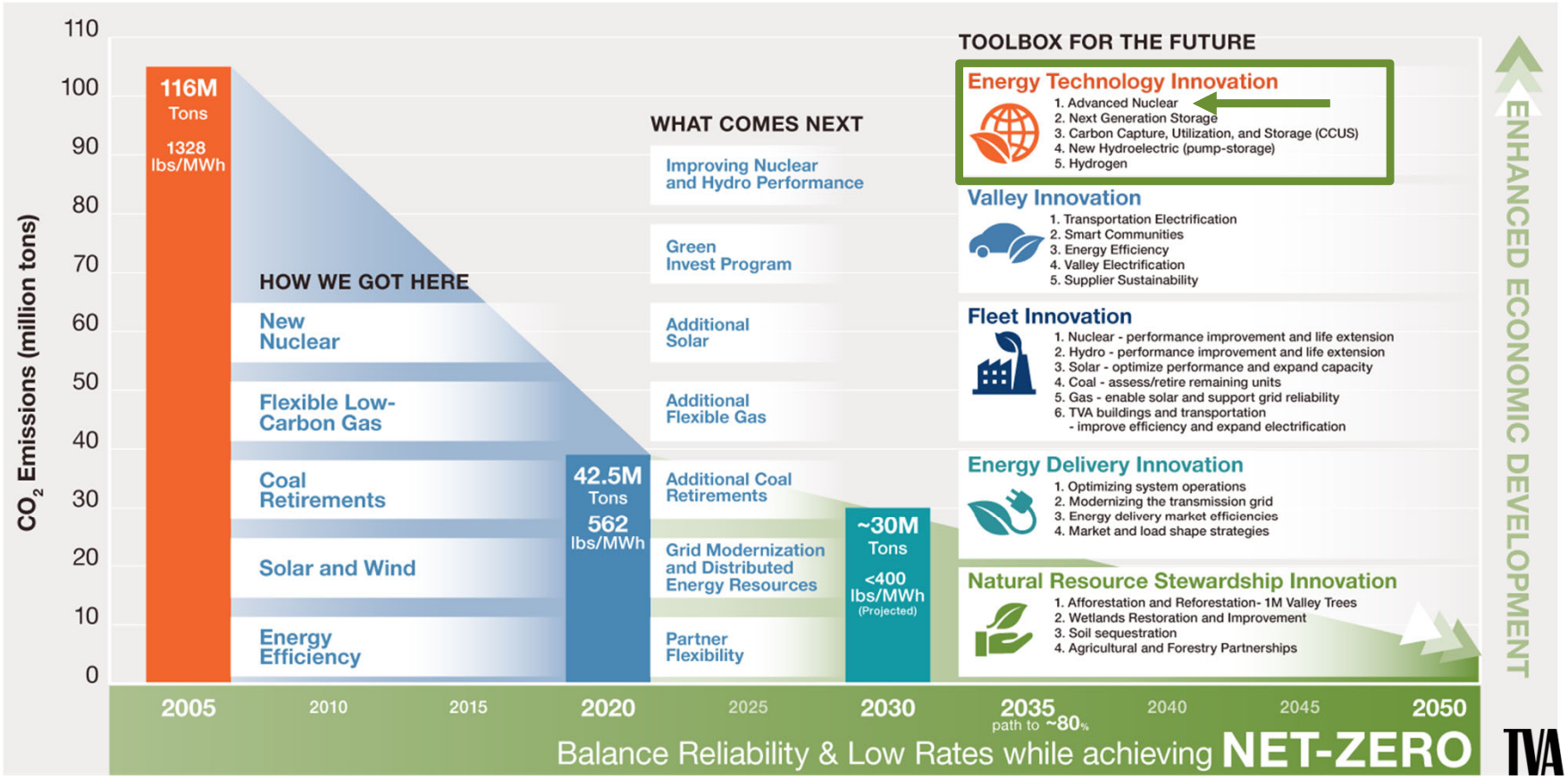
Watts Bar
- U1 license expires in 2035 and U2 in 2055
- U1 License Renewal Application is expected to be completed before 2029
- U2 License Renewal Application is planned to start in 2034 and approved by 2038

Browns Ferry
- Renewed licenses expire in 2033/2034/2036
- Subsequent License Renewal Application submitted in January 2024 for all three Browns Ferry Units

TVA TENNESSEE VALLEY AUTHORITY

TVA's Clean Energy Leadership

ENERGY TECHNOLOGY INNOVATION THAT CAN SUPPORT CARBON GOALS



TENNESSEE VALLEY AUTHORITY

TVA & New Nuclear Technology

FEBRUARY 2022 TVA BOARD DIRECTION

Approved funding up to $200 million for a program to:

1. Perform design engineering, scoping, estimating, and planning associated with potential future deployment of an advanced reactor at Clinch River
2. Develop new nuclear license applications
3. Continue to study potential, future advanced reactor technologies
4. Study potential for advanced nuclear deployments at other sites

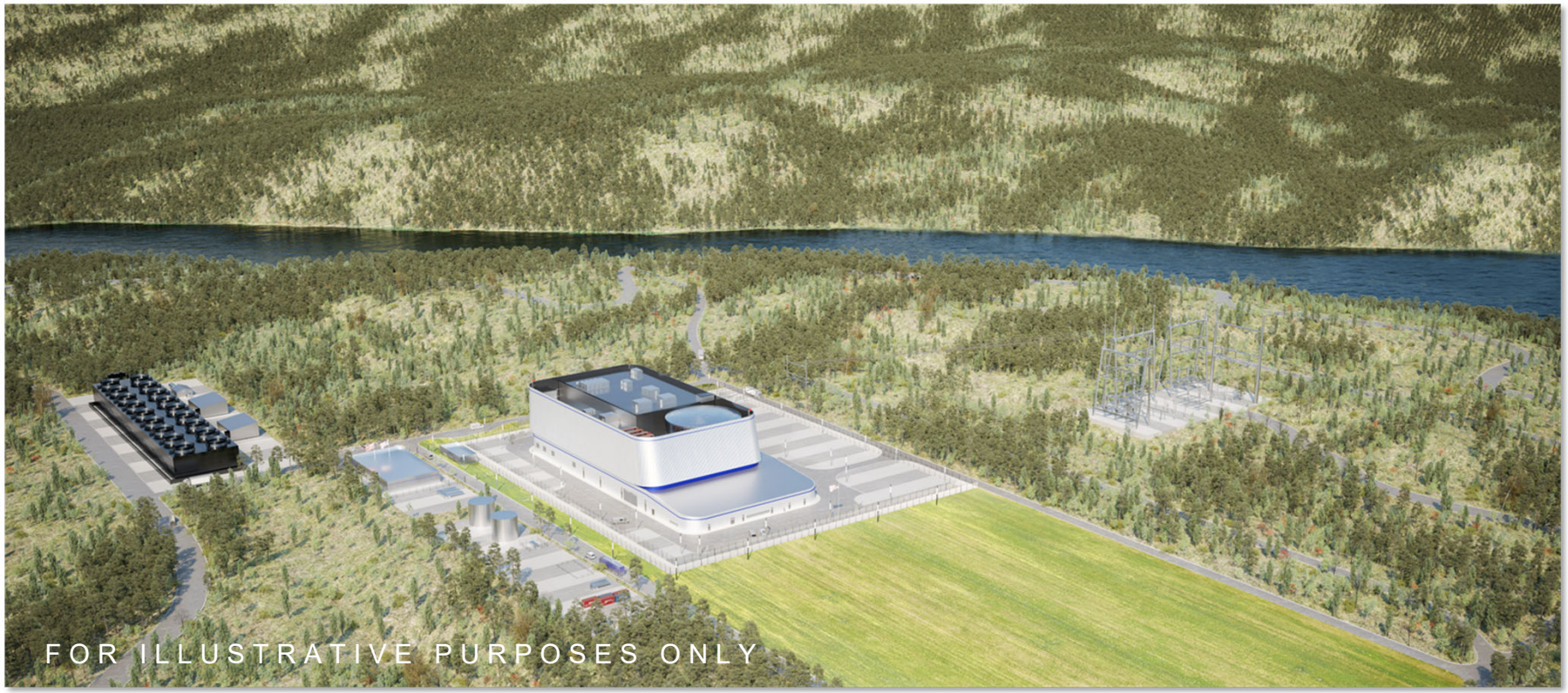
CLINCH RIVER NUCLEAR PROJECT INFORMS POTENTIAL FLEET DEPLOYMENTS

NEW NUCLEAR PROGRAM PLANNING FOR POTENTIAL FLEET DEPLOYMENT

TVA TENNESSEE VALLEY AUTHORITY

Clinch River Nuclear Project

TVA'S POTENTIAL FIRST ADVANCED NUCLEAR SMALL MODULAR REACTOR*



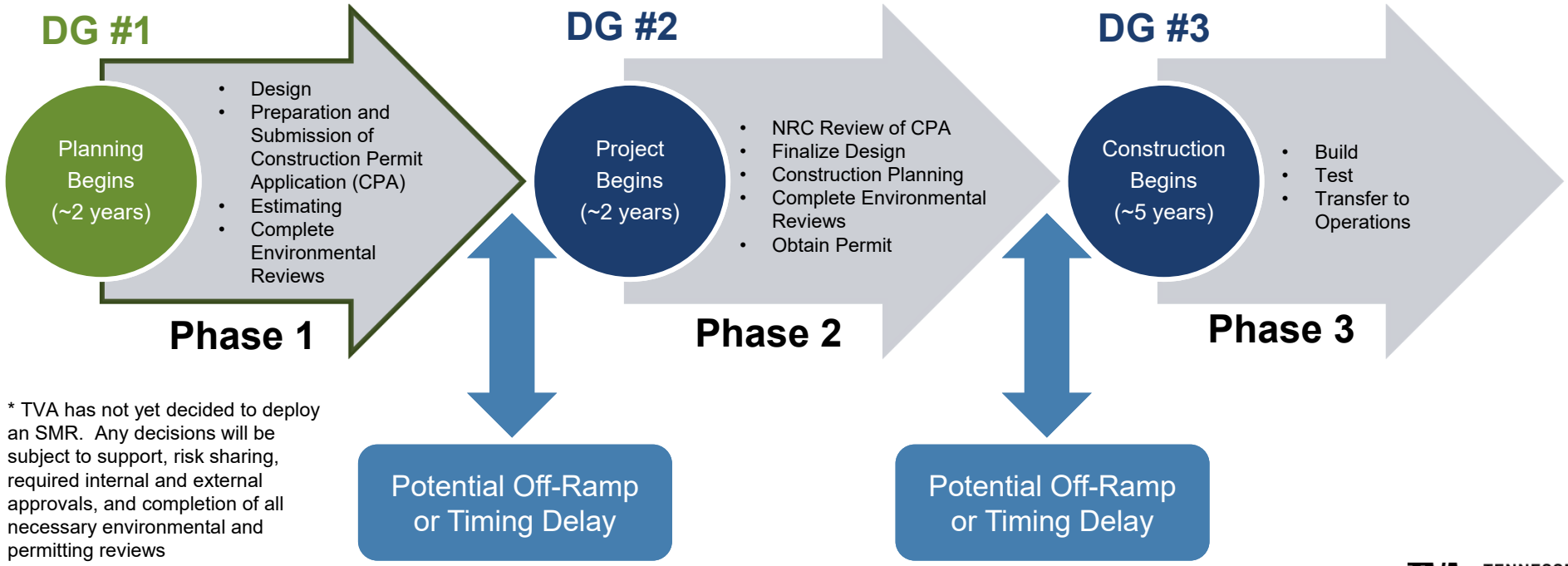
* TVA has not yet decided to deploy an SMR. Any decisions will be subject to support, risk sharing, required internal and external approvals, and completion of all necessary environmental and permitting reviews.

TVA TENNESSEE VALLEY AUTHORITY

Clinch River Nuclear Decision Gate Process*

PHASED DECISION APPROACH TO REDUCE RISK AND COSTS

Board Authorization required to proceed beyond Decision Gate (DG) for each phase.
Enterprise evaluation criteria to support recommendation to the CEO and Board.



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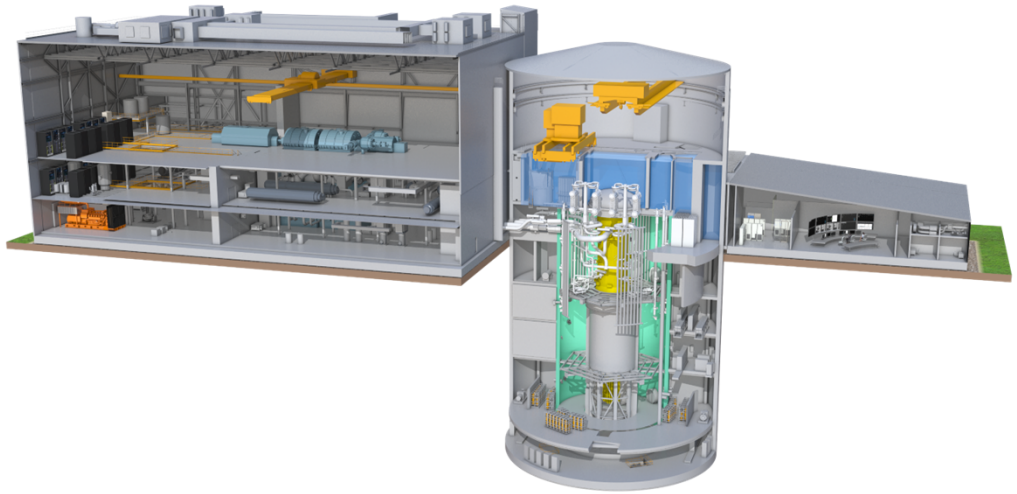
GE-Hitachi BWRX-300

BUILT ON EXISTING 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
- NRC LICENSING PATHWAY



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

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TVA TENNESSEE VALLEY AUTHORITY

Technology Collaboration Agreement

COLLABORATION | COST SHARING | STANDARDIZATION | O&M SUPPORT

ONTARIO POWER GENERATION

Participating in the BWRX-300 SMR design for deployment in Canada. Two years ahead of TVA proposed deployment timeframe.*

TVA

Participating in the BWRX-300 SMR design being evaluated for deployment in the Valley.

OSGE
ORLEN SYNTHOS GREEN ENERGY

Participating in the BWRX-300 SMR design being evaluated for deployment in Poland.

March 23 Technology Collaboration Agreement Signing in Washington, DC

GE HITACHI

Developer of the BWRX-300 design being evaluated for deployment.

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Nuclear Support in Tennessee

VISION TO MAKE THE STATE A NATIONAL LEADER IN ADVANCED NUCLEAR

- Governor Bill Lee & US Representative Chuck Fleischmann visited the CRN site in March 2023 and discussed Tennessee's leadership role in the development and deployment of new nuclear power generation
- Later that month, the State of Tennessee committed $50 million to a nuclear energy fund
- In May, Governor Lee signed an executive order to create the Tennessee Nuclear Energy Advisory Council
- TVA is actively working to engage in these opportunities to support the efforts of the Clinch River Nuclear Project & New Nuclear Program

Federal Interest in the Clinch River Project

VISION FOR THE US TO LEAD IN ADVANCED NUCLEAR

- TVA hosted Secretary of Energy, Jennifer Granholm, at the Clinch River Nuclear site on December 5.
- The discussion focused on TVA's leadership and the need to bring down the cost of first-of-a-kind reactors.
- "TVA is leading on small modular reactors with this site. Everybody's looking to TVA to make sure that this can actually happen." – Jennifer Granholm

Advanced Nuclear Technology Evaluation

LIGHT WATER VS. NONLIGHT WATER

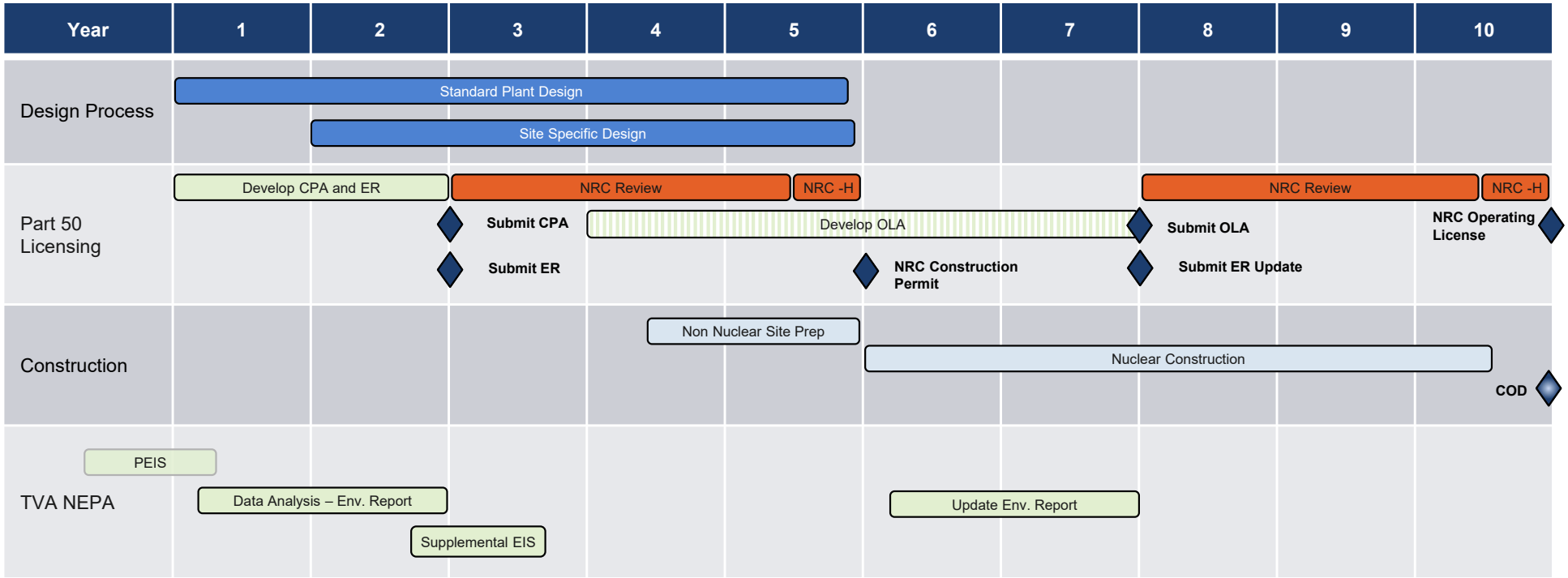
Technologies and their potential for commercial scale deployment were assessed:

- ✓ Technology – evaluates subsystem development / maturity
- ✓ Licensing – progress towards and probability of regulatory approval
- ✓ Economic – estimated levelized cost of electricity (LCOE)
- ✓ Manufacturing – maturity and viability of fabricating the plant / subsystems / major components
- ✓ Risk – combination of safety, implementation and operability risks

	Light Water Reactors	Nonlight Water Reactor – Gen IV (sodium, gas, salt coolants)
Nuclear Fuel	Same as operating nuclear fleet	Need supply chain, testing, and licensing
Supply Chain	Ready; quickly scalable	Need suppliers and component testing
Operational Characteristics	High availability; compatible with renewables	Unproven availability; compatible with renewables; industrial process heat capable, improved efficiency
Timeframes	First commercial deployments by 2028 (OPG)	First commercial deployments from late 2030s to early 2040s

CRN1* Design, Licensing, and Environmental

SCHEDULE FOR ILLUSTRATION ONLY



CPA	Construction Permit Application	NEPA	National Environmental Protection Act	OLA	Operating License Application
COD	Commercial Operation Date	NRC	Nuclear Regulatory Commission	PEIS	Programmatic Environmental Impact Statement (NEPA), CRN ROD issued 9/22
ER	Environmental Report	NRC- H	Nuclear Regulatory Commission Hearing Process	ROD	Record Of Decision (NEPA)

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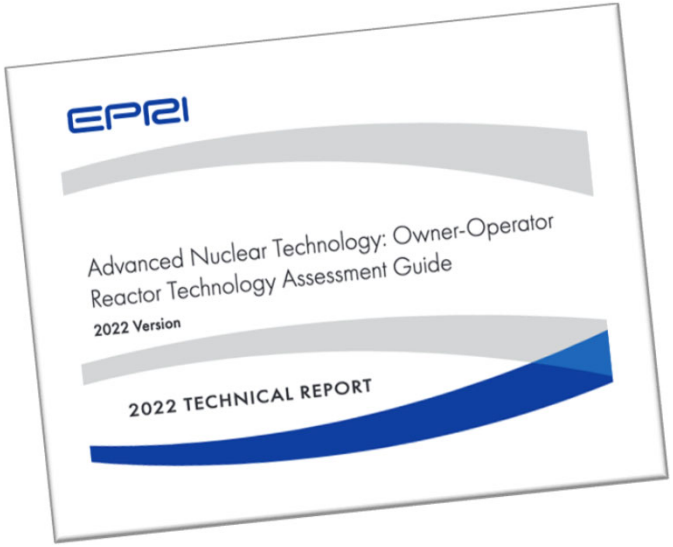
TENNESSEE VALLEY AUTHORITY

Planning For Potential Future SMR Deployments

SCREENING OF EXISTING TVA PROPERTIES FOR POTENTIAL SMR USE

- EPRI Advanced Nuclear Siting Guideline methodology
- TVA properties with at least 75 acres
- Conducted with available site information
  - Seismic
  - Flooding
  - Water Access
  - Generation Needs
  - Transmission Favorability
  - Energy Communities
  - Population Density
  - Rail Access
  - Barge Access
  - Highway Access
  - Emergency Planning
  - Environmental Considerations



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TVA Vision for Advanced Nuclear

STRATEGIC PATH FORWARD FOR THE PEOPLE OF THE VALLEY

Leadership	TVA's leadership in technology innovation provides a pathway to net-zero carbon emissions.
Experience	TVA has the nuclear and construction experience and talent to support small modular reactor (SMR) development and deployment.
Approved Site	The Nuclear Regulatory Commission approved an Early Site Permit for TVA's Clinch River site, meaning that it is suitable for SMRs.
Strategic Approach	TVA's Decision Gates will ensure the timing of deployment is right.
Future-Looking	TVA's New Nuclear Program will inform future SMR decisions and potential deployment locations across the Tennessee Valley.


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