

Clinch River Nuclear Project & New Nuclear Program Overview

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Clinch River Nuclear Project

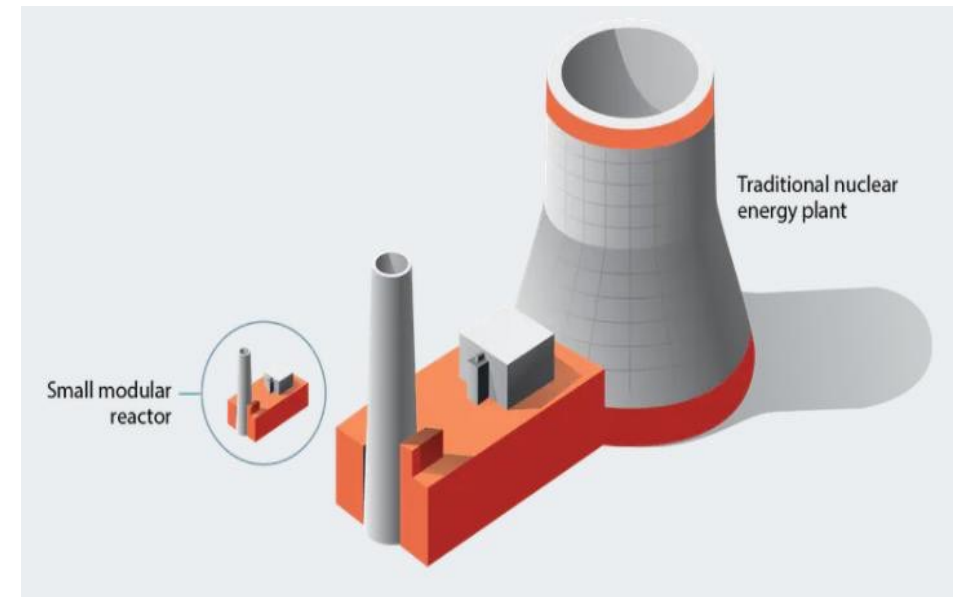
July 10, 2023

Prepared for TAEBC and ETEC

Advanced Nuclear Technologies

- Power Output ~300 MWe or less, in contrast to ~1,200 MWe reactors operating today
- Two general categories of Advanced Reactors of interest for commercial power use:
 - Light water-cooled reactors, or small modular reactors (SMRs), are most like current operating reactors but simplified.
 - Nonlight water-cooled reactors, sometimes called Generation 4 reactors, use alternative reactor coolants such as gas (helium), metal (sodium), or molten salt.

ABOUT $1/10$ TO $1/3$ THE
SIZE OF A TRADITIONAL
NUCLEAR PLANT



Graphic Source: Idaho National Laboratory Website

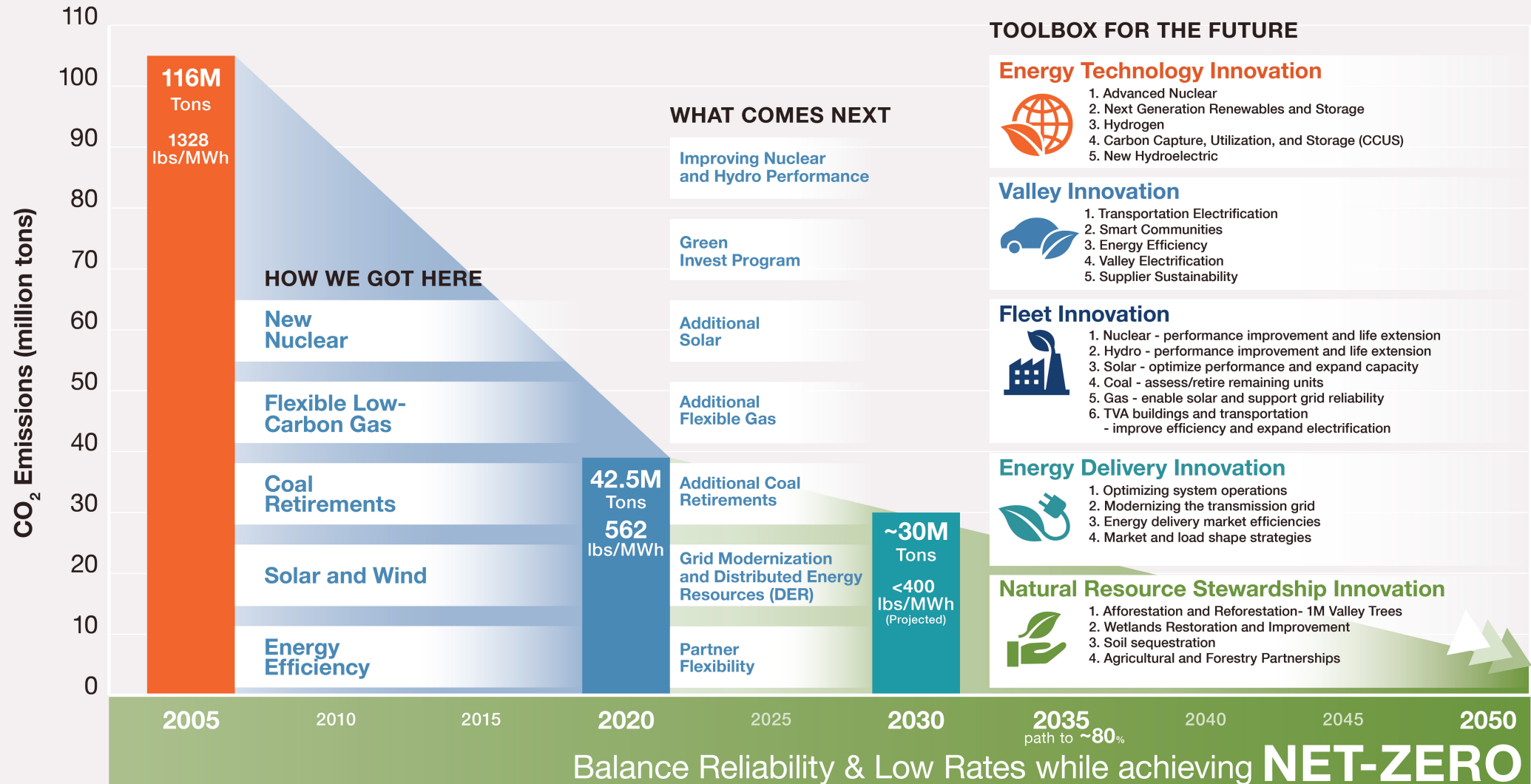
Why SMRs?

- SMR is not a new concept. Just renewed interest.
 - Climate Change: No CO2 Emissions
 - Europe – Get off Russian Oil
- Simpler Designs
- Lower cost than large reactors
- Ease of licensing
- Efficient construction
- Increased safety
- Lower O&M Costs
- High Reliability
- More efficient land utilization than wind or solar
- Longer service life

Why Gen III, BWRX-300?

- Deployable this decade
- Proven GE BWR technology with 7 decades of Experience
- 10th Generation GE BWR
- Fewer First of a Kind Features
- Based on ESBWR with 30 years of design and licensing
 - 90% less volume
 - 50% less concrete and steel
 - 50% less equipment
- Full passive safety systems
- Site Boundary EPZ
- Same fuel as BWRs in operation
- Modular Construction
- Load Follow Capability

TVA'S DECARBONIZATION JOURNEY

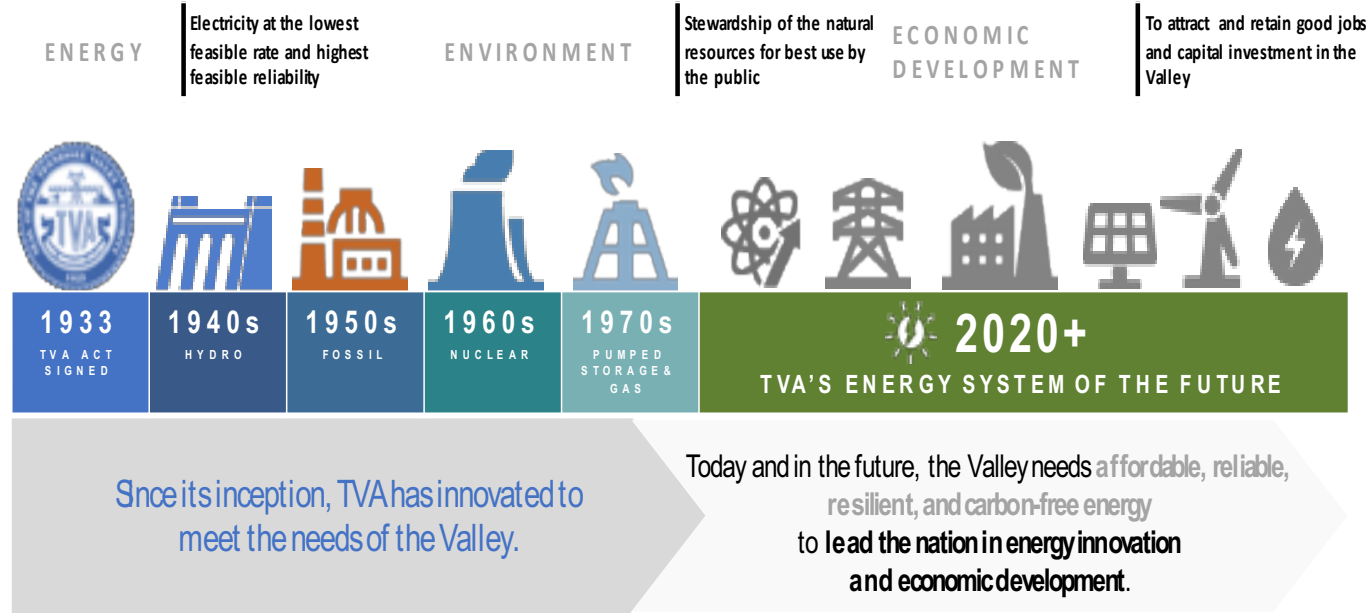


Graphic From TVA's Carbon Report – May 2021

How SMRs Fit in the Grid of the Future

TVA Mission

BUILT FOR THE PEOPLE OF THE VALLEY



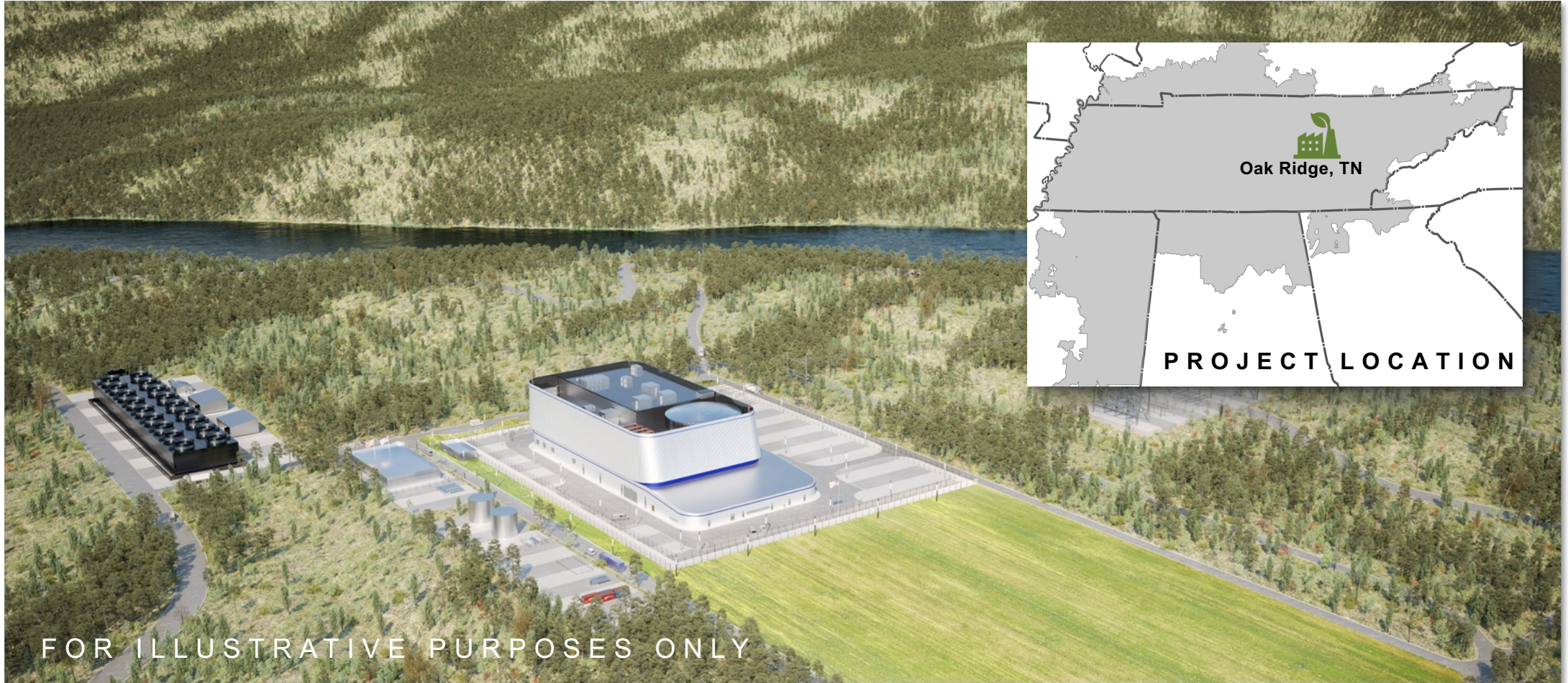
- More Renewables
 - Availability changes due to variations in wind and night / day
- Pump Storage and Nuclear with Load Follow Capability can complement Renewables absent viable Storage alternative
- Load Follow Capability allows for generation sources not dependent on external factors to maintain generation supply to meet load demand.
- Multiple SMRs allow for “fine tuning” the grid regionally to support load demand and renewable supply variability



INNOVATING FOR THE PEOPLE OF THE VALLEY

Clinch River Nuclear Project

TVA'S FIRST ADVANCED NUCLEAR SMALL MODULAR REACTOR*



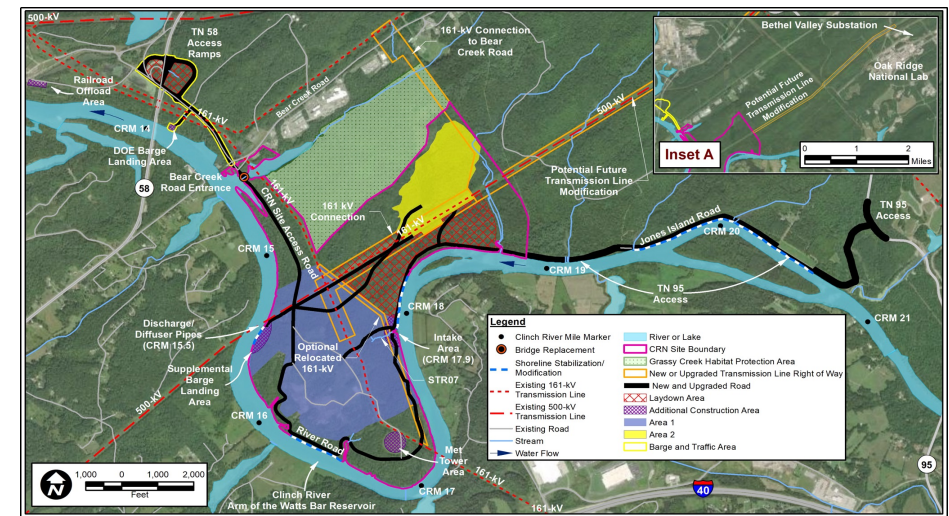
FOR ILLUSTRATIVE PURPOSES ONLY

* SUBJECT TO SUPPORT, RISK SHARING, REQUIRED INTERNAL AND EXTERNAL APPROVALS, AND COMPLETION OF ALL NECESSARY ENVIRONMENTAL AND PERMITTING REVIEWS

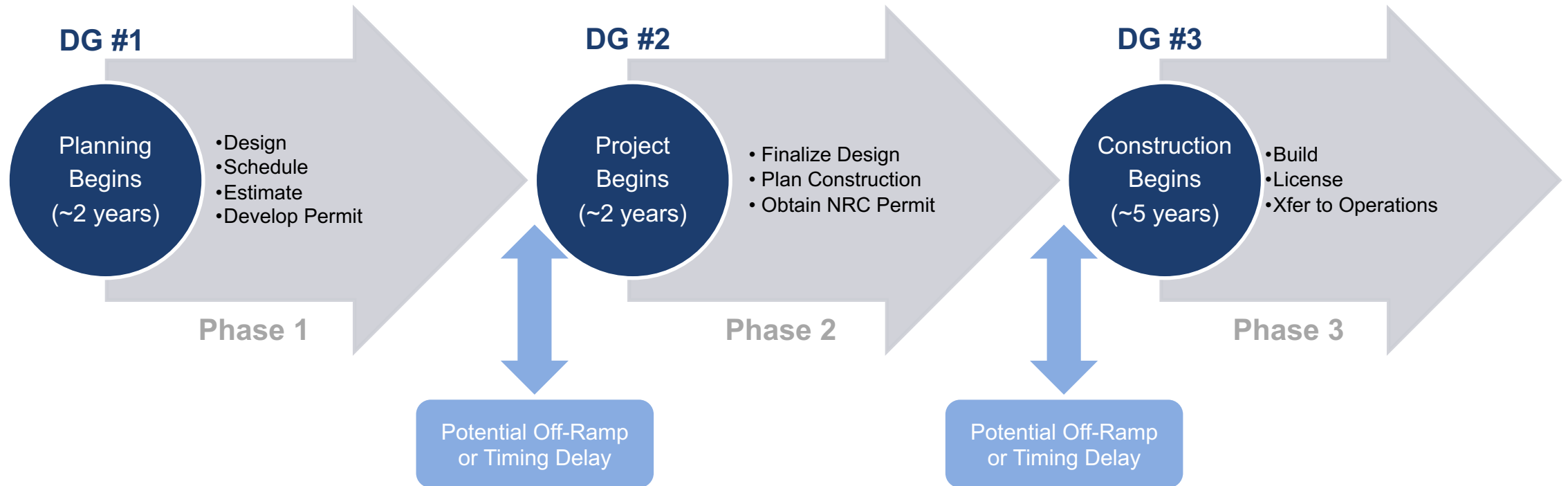
Overview of TVA's efforts to pursue a Small Modular Reactor

- Secured an NRC-approved Early Site Permit for small modular reactors in 2019
- Developed a Programmatic Environmental Impact Statement for an advanced nuclear reactor technology park at the Clinch River Site in 2022
 - More than one small modular reactor
 - More than one reactor design
- TVA's Board of Directors has authorized up to \$200 million for a program to explore technologies and potential locations for advanced nuclear reactors to support TVA's decarbonization goal as outlined in its Strategic Intent and Guiding Principles.
- The New Nuclear Program will expand TVA's planning for a potential first SMR deployment as well as deploying a fleet of SMRs
- Licensing and Design Work are Ongoing

Clinch River Site near Oak Ridge, Tennessee



Decision Gates ensure we will proceed at the right time



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

TVA's nuclear power and construction experience

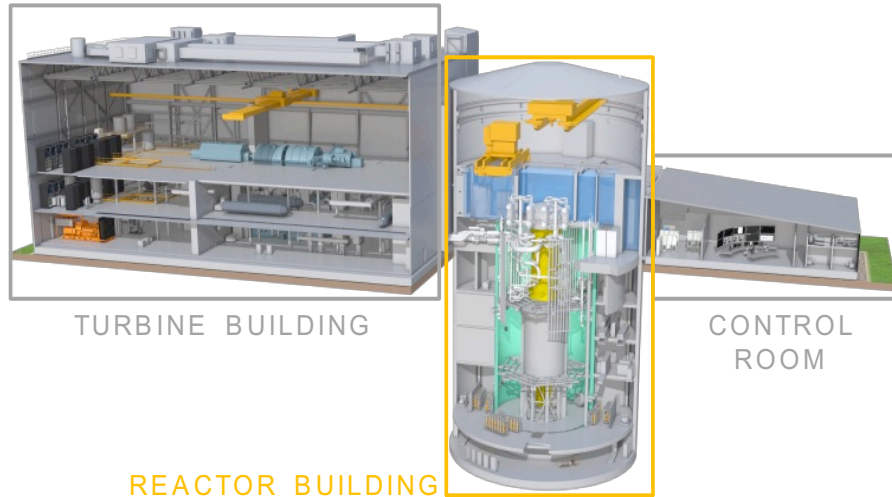


- TVA operates the third largest nuclear reactor fleet in the U.S.
- TVA's Watts Bar Unit 2, the nation's first new nuclear generation in 20 years, entered commercial operation in 2016
- At any given time, TVA has around 900 active projects totaling \$12 Billion in approved funding for construction and refurbishment projects for coal and gas plants, hydro-electric dams, and transmission infrastructure across the Tennessee Valley.

What the Clinch River Project Means

GEH BWRX-300

FIRST-OF-A-KIND & TRADITIONAL PLANT COMPONENTS



- To TVA
 - Supports the Decarbonization Journey
 - Reliable power to meet load growth demands
- To the Tennessee Valley
 - Deep carbon reductions without compromising high reliability and low rates
 - Good Jobs
- To the Nation
 - Paves the way for “Fast Followers” by demonstrating Nuclear as a viable option that can be built safely, on budget, and on schedule.

Success Factors for a Potential Clinch River Project

- **GEH BWRX-300 size and complexity compared to large nuclear projects**

- BWRX-300 power plant is smaller in size and less complex than a large nuclear plant such that there are lower capital and construction risks

- **Industry Experience**

- WBN2, VC Summer, Vogtle specific lessons as well as lessons from world New Nuclear and relevant non-nuclear projects
- Lessons Learned from BWRX-300 Lead Plant in Darlington, Ontario Canada will be available (~2 years ahead)

- **Engineering Approach**

- Based on proven BWR technology with a mature supply chain
- Constructability reviews completed early and throughout the design process
- Standard Design will be **>95% complete prior** to construction start

- **Regulatory Approach per 10 CFR Part 50 to support efficient field change process**

- **Innovation**

- Construction Planning - Virtual Reality Tools, 3D & 4D Modeling,
- Construction - Composite Technology, Modular Construction, etc.
- Innovative Contracting Strategy such as Integrated Project Delivery (IPD)