



**HITACHI**

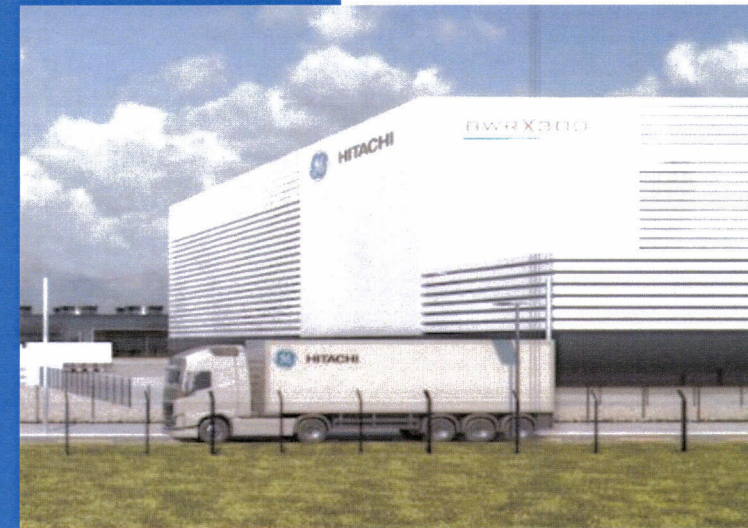
# GE Hitachi Nuclear Energy: *A leader on nuclear power*



# Agenda



- GE Overview
- Technology Overview
  - BWRX-300
  - Natrium
- Questions and Answers





● Only partner with a proven track record

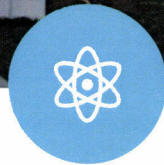


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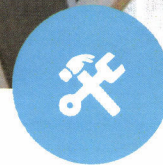
### Advanced Nuclear

Small Modular Reactor  
(BWRX-300)  
Sodium Fast Reactor  
(Versatile Test Reactor &  
Natrium)



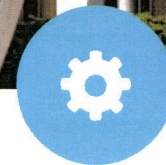
### Fuels

Advanced BWR fuel  
Accident Tolerant Fuel  
Engineering Services  
Uranium Management



### Field Services

Outage Services  
Inspections  
Plant & Reactor  
Modifications  
Fuel Inspections  
Decommissioning Services



### Plant Solutions

Digital/Software Solutions  
Instrumentation & Controls  
Asset Enhancement Services  
Mechanical Parts  
Electrical/Electronic Parts  
Refurbishment Services

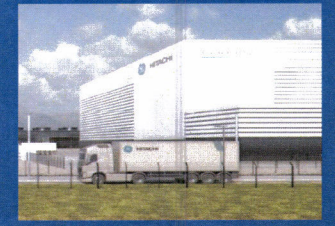
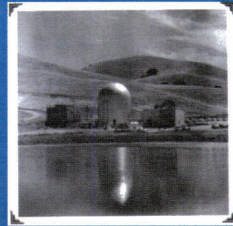
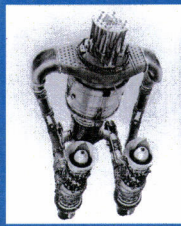
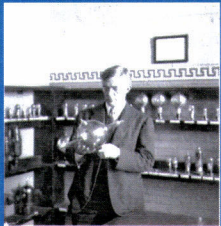
>60 years delivering customer solutions that have modernized the world



# Rich history of nuclear innovation ready to support advanced reactor market



**Proven success turning vision into commercial-scale reality, on time and on budget**



**OVER 80 YEARS OF NUCLEAR EXPERIENCE AND INNOVATION**

**1939**

First GE involvement in nuclear physics

**1955**

GE Atomic Division established

**1957**

Vallecitos BWR AEC License #1

**1962**

NPD (Canada) achieves full power

**1974**

25<sup>th</sup> BWR Peach Bottom 3

**1986**

50<sup>th</sup> BWR River Bend

**1996**

1<sup>st</sup> ABWR built on time on budget

**2014**

ESBWR NRC License

**2017**

BWRX-300 launched

**67 reactors licensed in 10 countries**

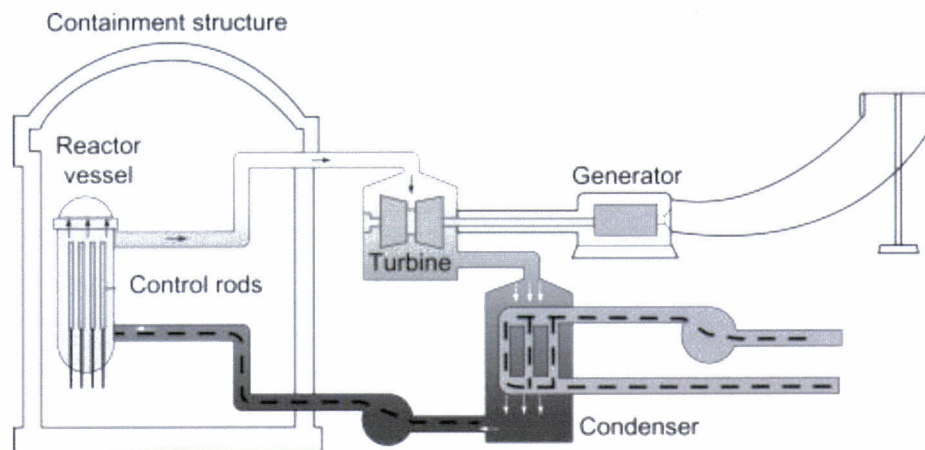


# BWRX-300 Technology Overview





## Boiling Water Reactors (BWR) ... the simplest way to make steam



INHERENTLY  
SIMPLE  
REACTOR  
DESIGNS

- Direct cycle design with no secondary steam generator and pressurizer
- Traditional balance of plant for electricity generation
- Low enriched (3-5% U-235) oxide fuel in metal cladding

- Water coolant that also serves as “moderator” to slow down fast neutrons
- Coolant circulated through core with natural circulation (forced circulation in legacy designs)

BWRX-300 Small Modular Reactor

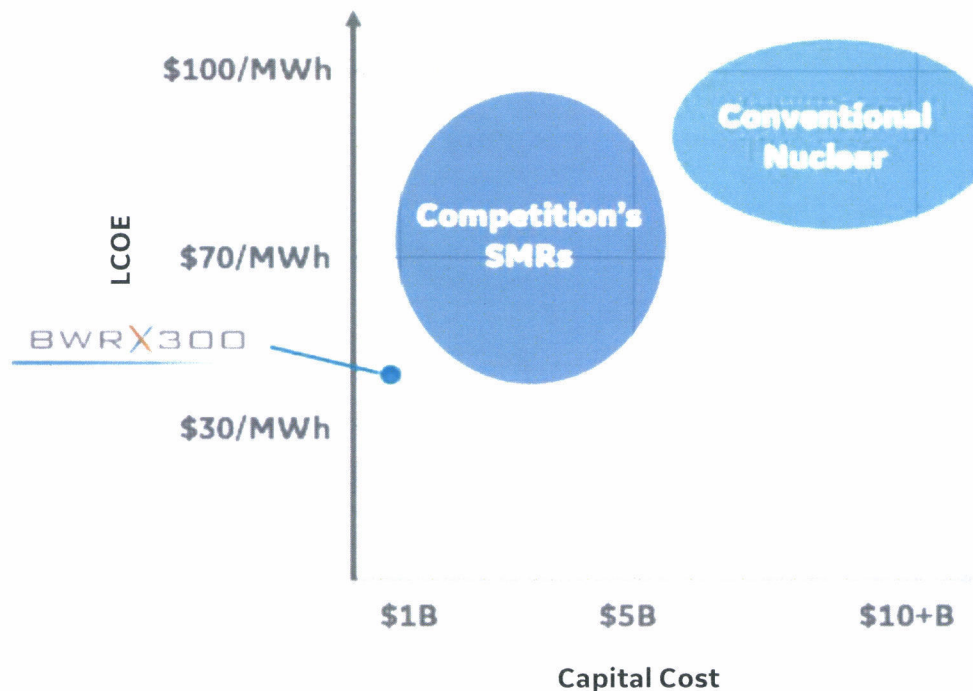
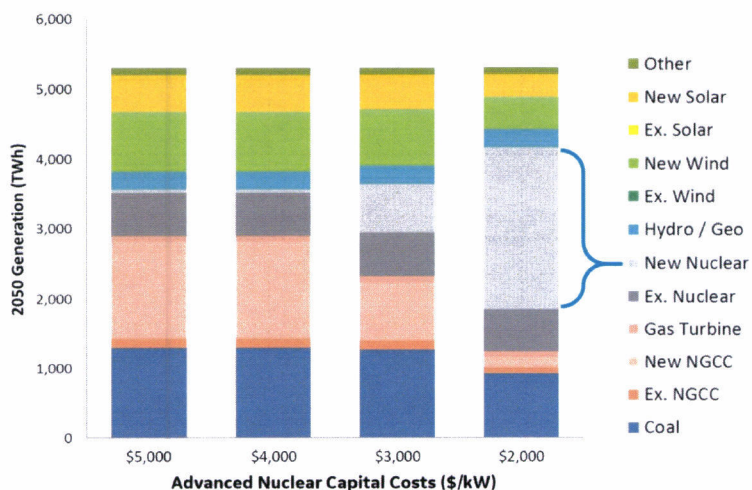
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# Our competitive position in new nuclear



The Future of Nuclear Energy in a Carbon-Constrained World



**Competitively** positioned  
both on cost and time to  
market

BWRX-300 Small Modular Reactor

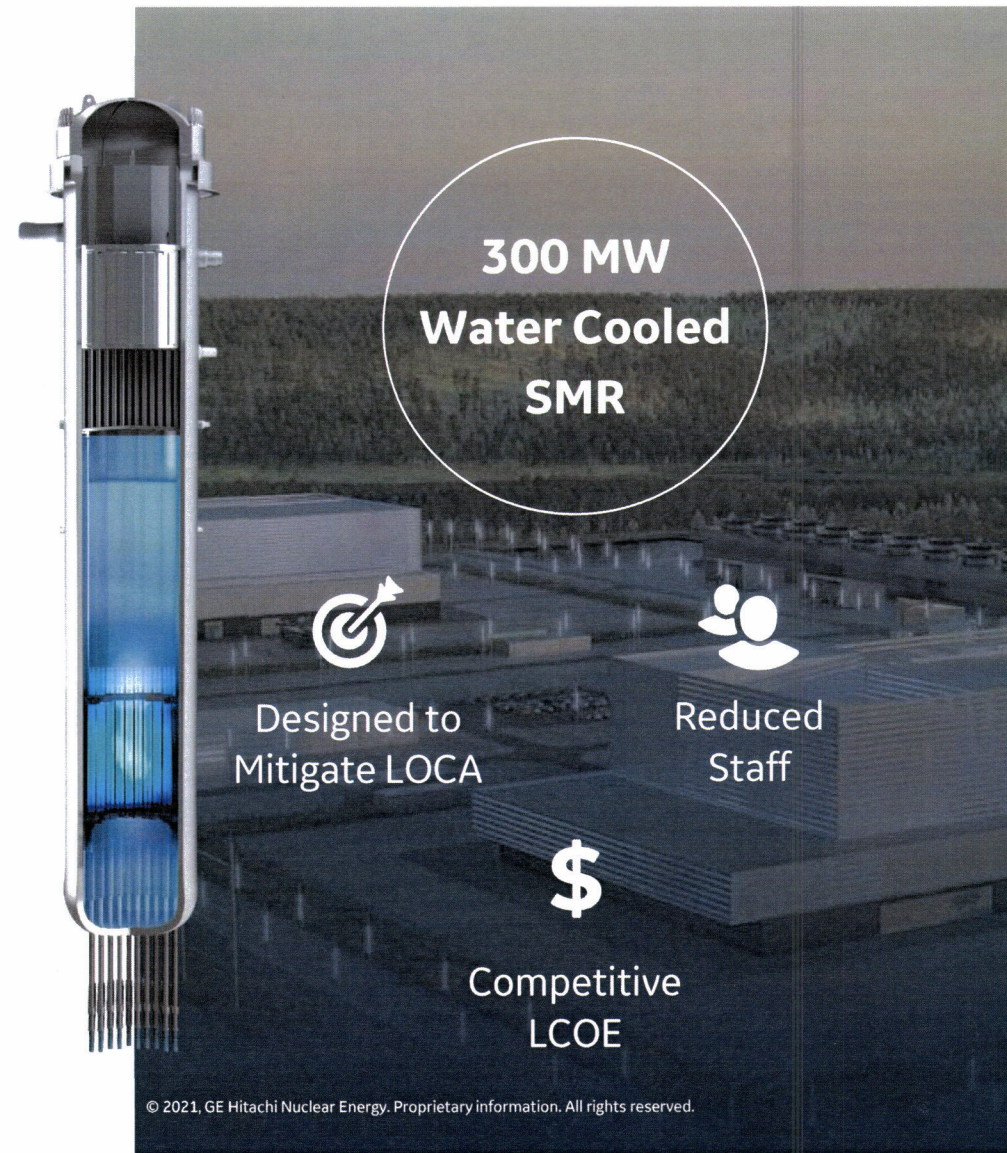


## BWRX-300 small modular reactor

- 10<sup>th</sup> generation Boiling Water Reactor
- Scaled from U.S. NRC licensed ESBWR
- Design-to-cost approach
- Significant capital cost reduction per MW
- World class safety
- Capable of load following
- Ideal for electricity generation and industrial applications, including hydrogen production
- Constructability integrated into design
- Initiated licensing in the U.S. and Canada
- Operational by 2028

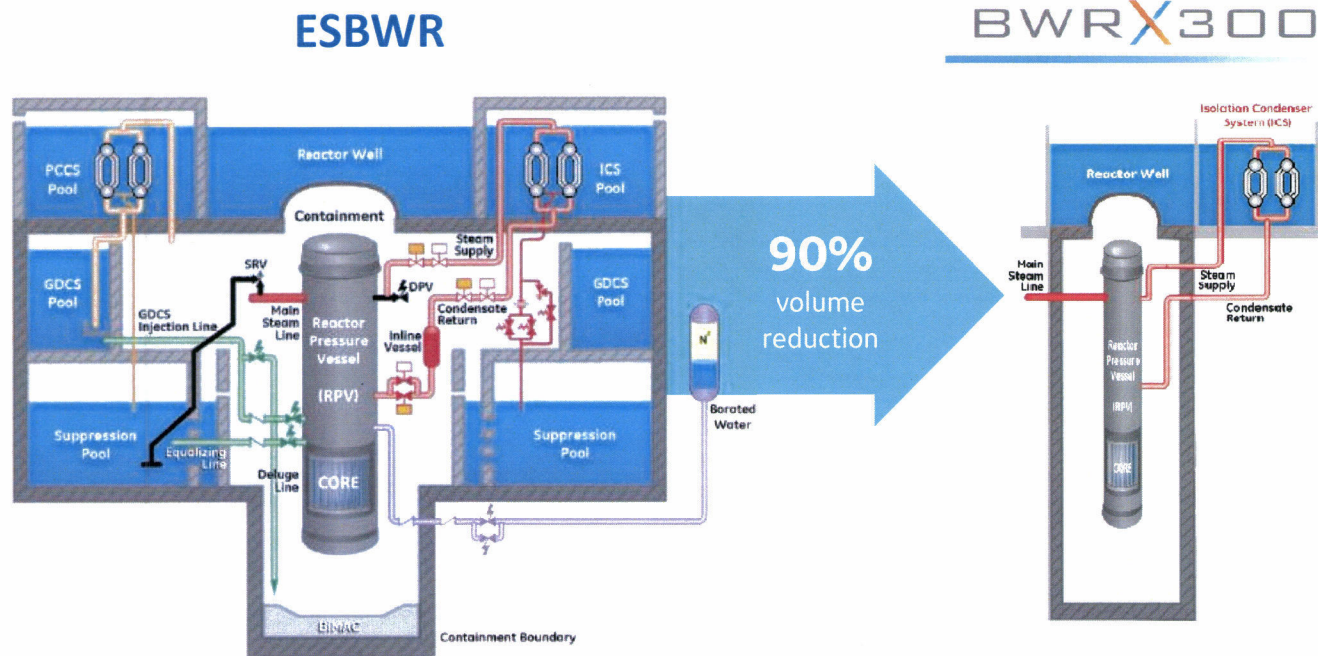
**MOST**  
COMPETITIVE SMR

BWRX-300 Small Modular Reactor





# Simplicity drives cost reduction



## Systems/components eliminated:

- Suppression Pool
- GDCS Pool
- Safety Relieve Valves & Spargers
- Depressurization Valves
- BiMac (core catcher)

## Systems/components simplified:

- Passive Containment Cooling (PCCS)
- Containment (use of SC)
- Boron injection
- Security (built into design)
- Turbine
- Generator (air cooled)

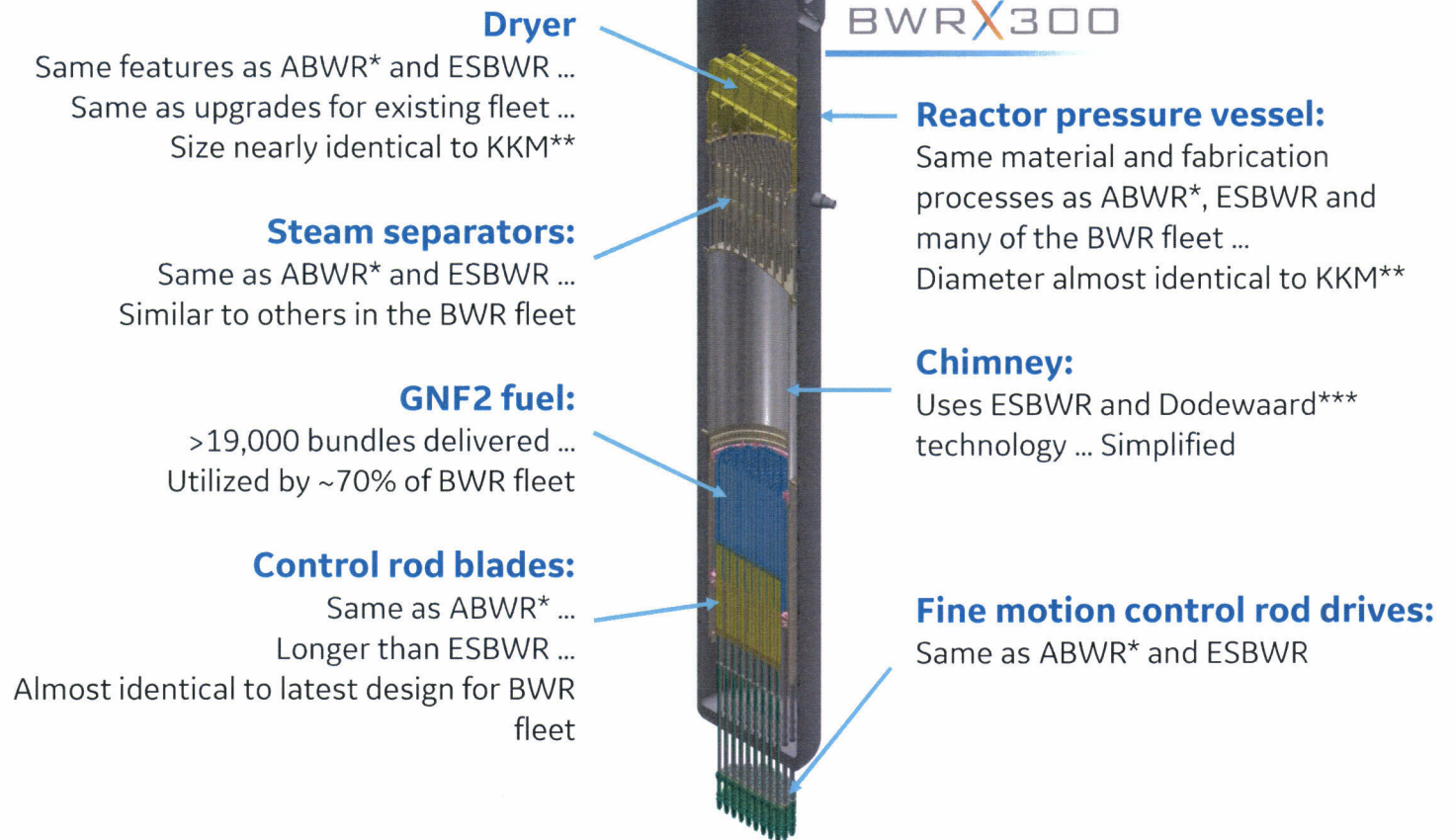
**>50% building volume reduction/MW**  
**>50% less concrete/MW**



## Utilizing proven technology



PROVEN  
COMPONENTS,  
PRIOR TESTING,  
AND  
OPERATIONAL  
HISTORY  
GREATLY  
ACCELERATE  
DEPLOYMENT



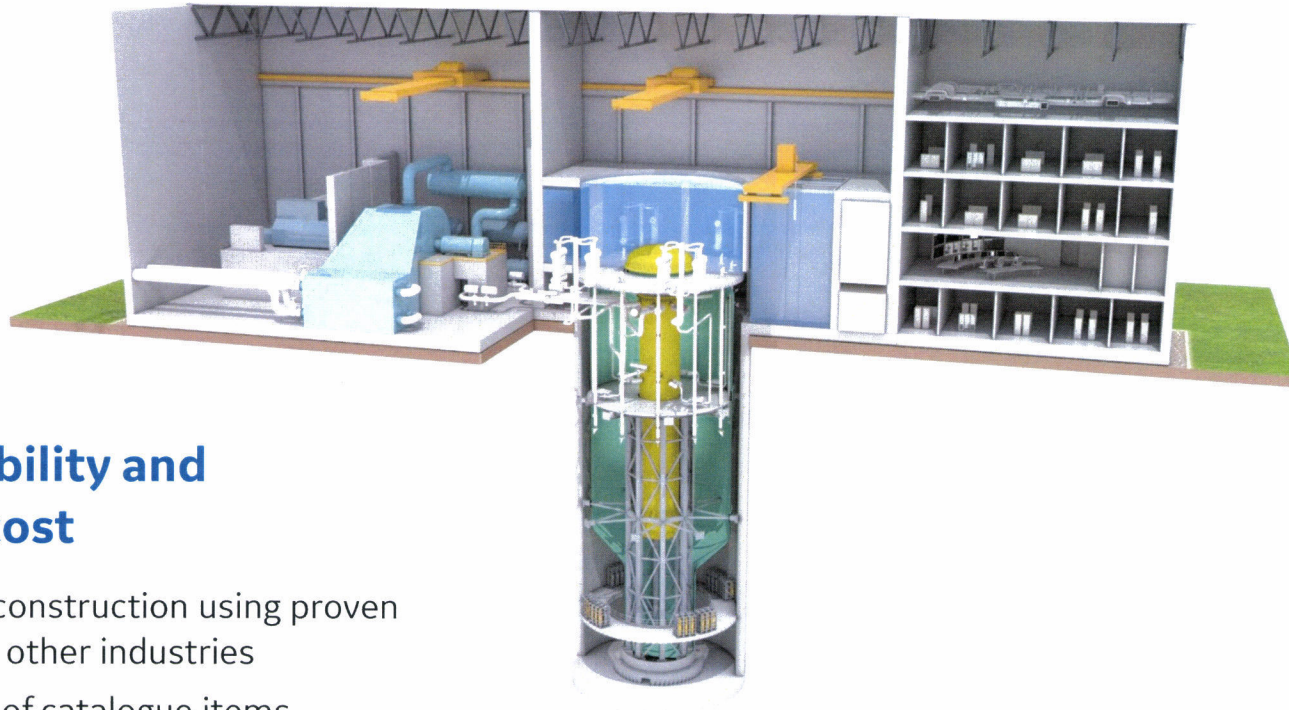
\* ABWR fleet has combined 22+ years of operating experience | \*\* Kernkraftwerk Mühleberg (KKM): 355 MWe BWR/4 in operation since 1972 | \*\*\* Dodewaard: 58MWe natural circulation BWR, 1969 ~ 1997

**BWRX-300 Small Modular Reactor**

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Optimized for cost and ease of construction



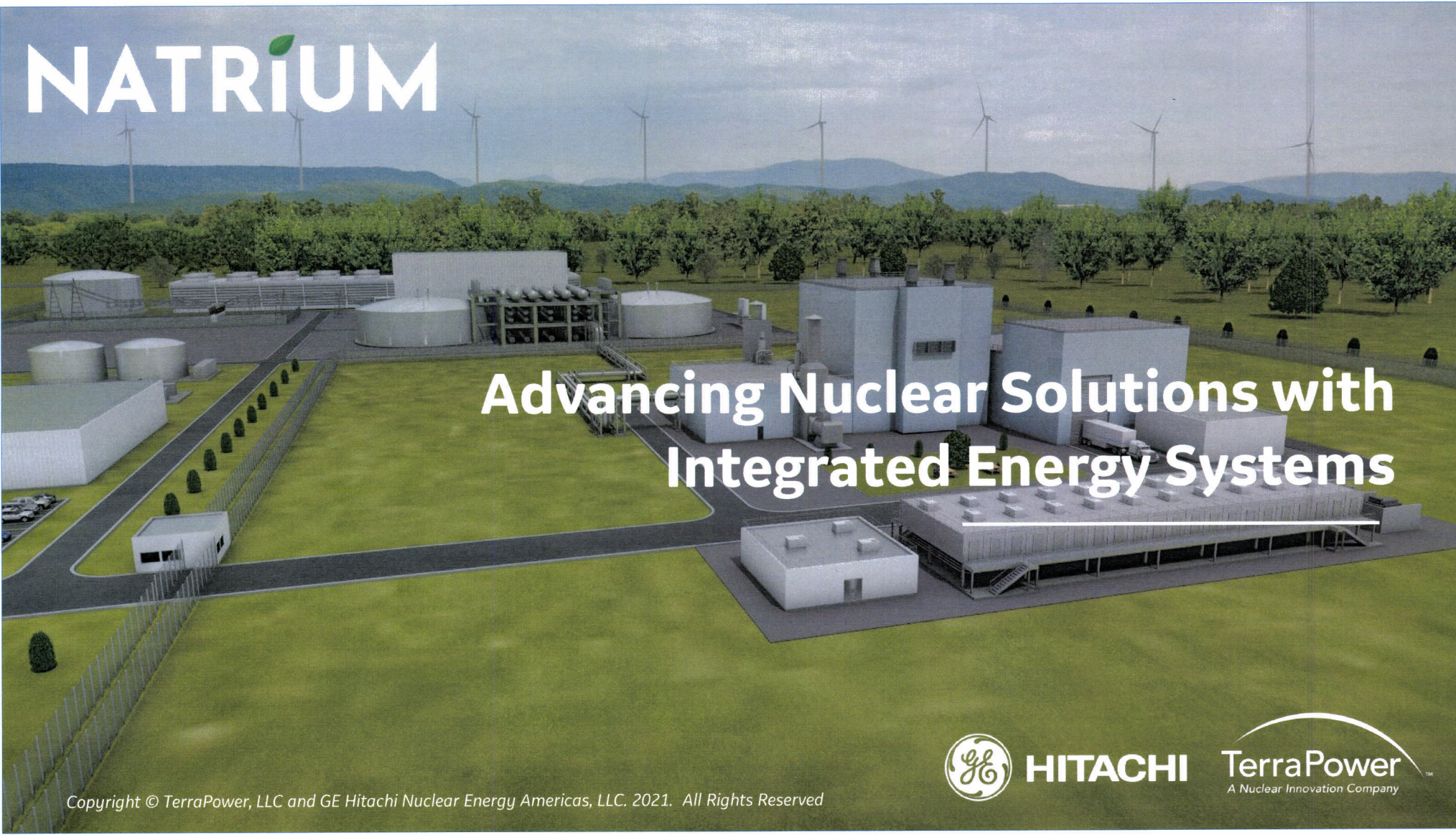
## Constructability and Design-to-cost

- Underground construction using proven methods from other industries
- Maximum use of catalogue items
- “Off the shelf” turbine/generator





# NATRIUM



## Advancing Nuclear Solutions with Integrated Energy Systems

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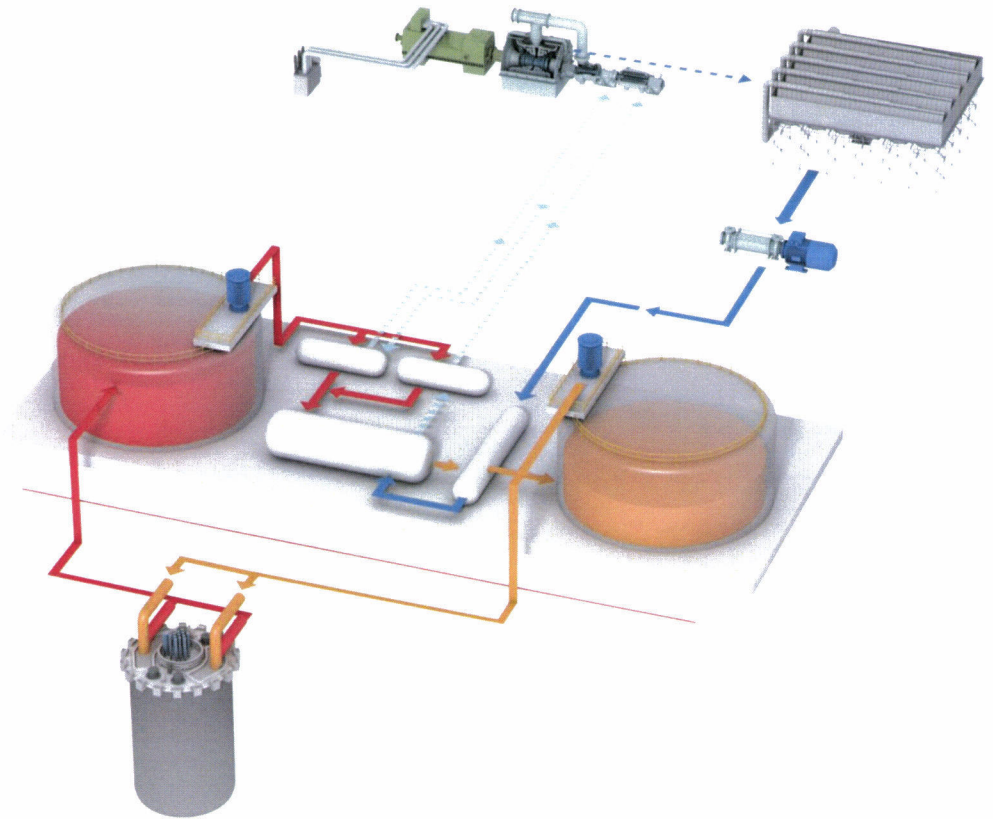
**TerraPower**  
A Nuclear Innovation Company



# Introducing the Natrium™ Technology



- Developed through close collaboration between TerraPower and GE Hitachi
- Builds on PRISM, TWR and concentrated solar-power technologies with a focus on cost competitiveness
- Integrates on and fortifies grids with high-renewables penetrations
- 345MWe reactor that can flex to 500MWe for 5.5 hours when needed

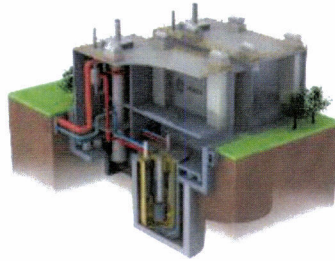




# Strong Team with Complementary Expertise



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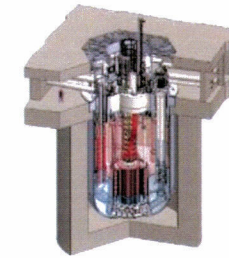


- Nuclear design experience
- Involved in delivering more than 80 nuclear power plants globally
- Fuel fabricator and nuclear services provider for those plants
- Original equipment manufacturer supplier and supply chain
- Established presence in international markets
- GE corporate experience



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**TerraPower**™



- Nuclear design experience
- Technology development, component and system testing
- SFR fuel development and qualification
- Advanced computational tools for integrated design of nuclear reactors
- Strong mission-driven and innovation culture
- Access to partners and private capital



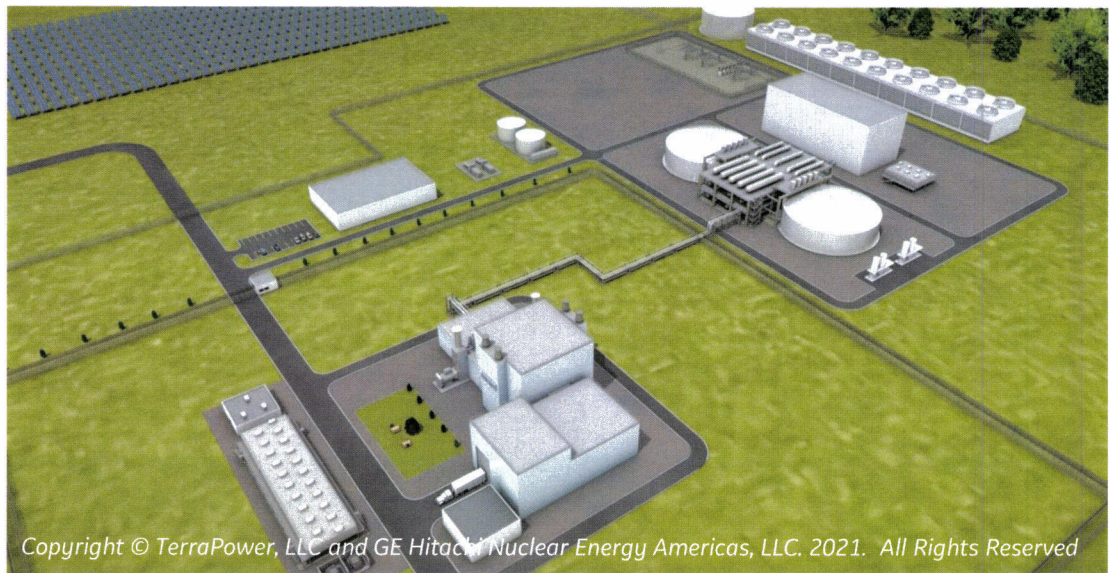
# Rethinking What Nuclear Can Be

## Nuclear redefined

- Eliminates nuclear “sprawl”
  - Design to cost
  - Simplicity
  - Rapid construction
  - Design-specific staffing
- ~41% net thermal efficiency

## Integrating with renewables

- Zero-emission, dispatchable resource
- Price follower with reactor at 100% power 24/7
- **345 MWe nominal**
- **Flex to 500 MWe for 5.5 hours with energy storage**



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Thank You!