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NuScale Response to NASEM Questionnaire

Laying the Foundation for New and Advanced Reactors in the United States

July 14, 2021

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Co-founder and Chief Technology Officer

Acknowledgement and Disclaimer

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Who is NuScale Power?

- NuScale Power was formed in 2007 for the sole purpose of completing the design and commercializing a small modular reactor (SMR) – the NuScale Power Module.™
- Initial concept was in development and testing since the 2000 U.S. Department of Energy (DOE) MASLWR program.
- Fluor, global engineering and construction company, became lead investor in 2011
- 2013 - NuScale won a competitive U.S. DOE Funding Opportunity for matching funds, and has been awarded over $400M in DOE funding since then.
- >400 employees in 5 offices in the U.S. and 1 office in the U.K.
- Total investment in NuScale to date is greater than (US) $1.1B. Over 560 patents granted or pending in 20 countries; ASME N-Stamp.
- First project in Idaho (2029 COD); MOU's with several potential customers worldwide.
    - Potential projects being pursued in U.S., UK, Canada, eastern Europe, Middle East, southeast Asia, and Africa.

NuScale Engineering Offices Corvallis

One-third scale NIST-1 Test Facility

NuScale Control Room Simulator

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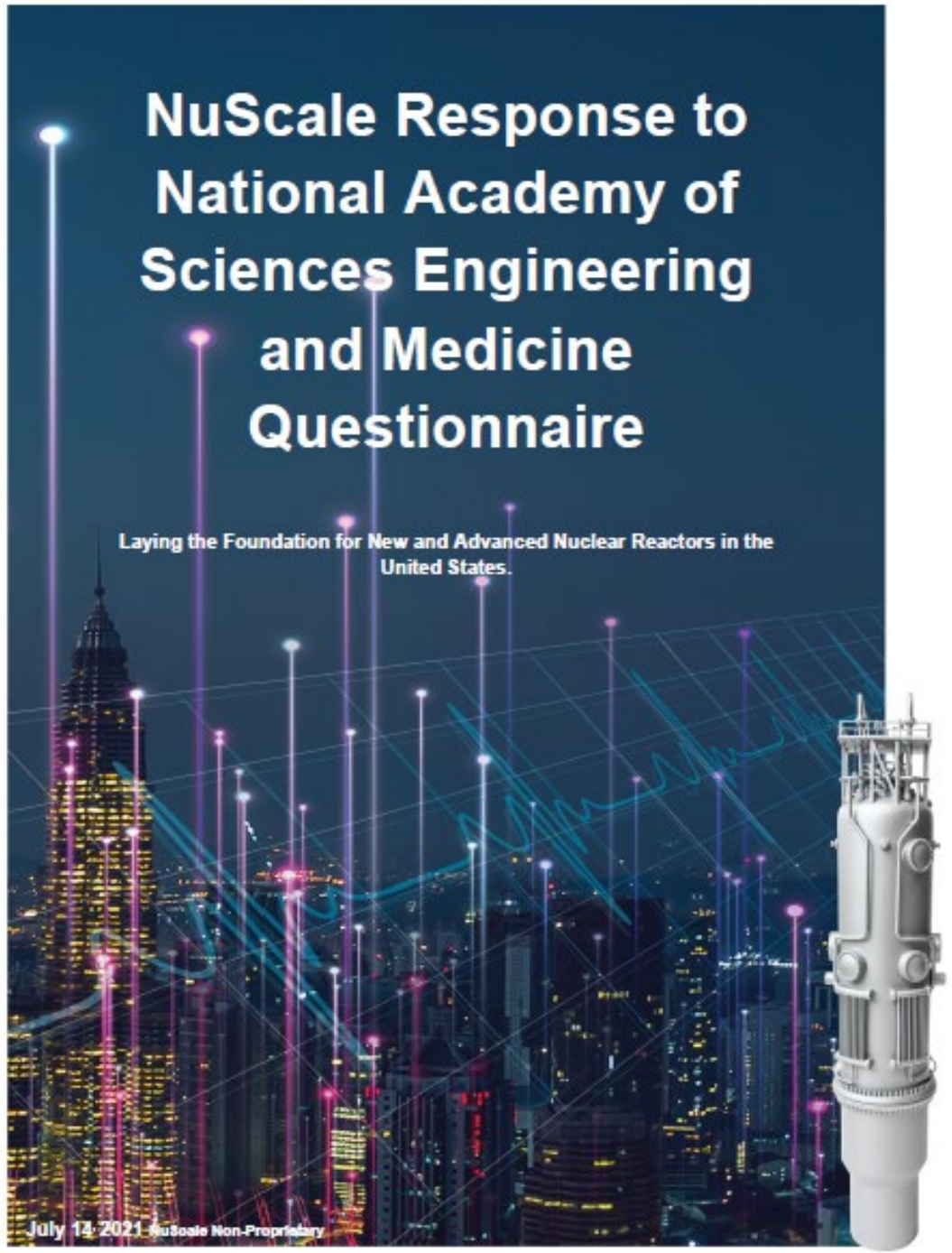

- **NuScale submitted responses to an earlier NASEM questionnaire on January 29, 2021**
  - Merits and Viability of Different Nuclear Fuel Cycles and Technology Options and the Waste Aspects of Advanced Nuclear Reactors
- **Laying the Foundation for New and Advanced Nuclear Reactors in the United States - Questionnaire Categories:**
  - Reactor Technology (5 questions)
  - Licensing (2 questions)
  - Business Plans (6 questions)

Reactor Technology

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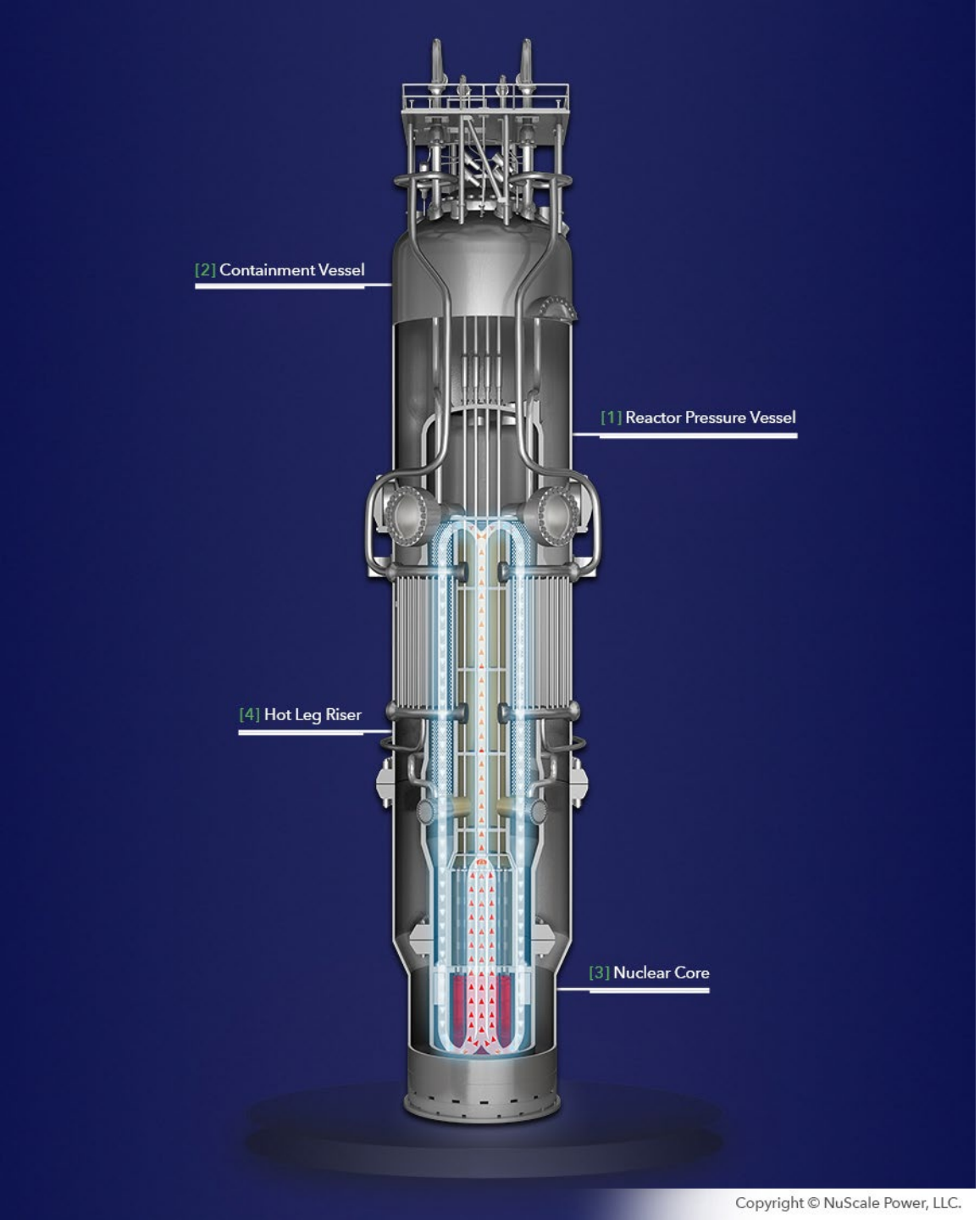

Core Technology: NuScale Power Module™

- A NuScale Power Module™ (NPM) includes the reactor vessel, steam generators, pressurizer, and containment in an integral package
- Simple design that eliminates reactor coolant pumps, large bore piping and other systems and components found in large conventional reactors
- Each module produces up to 77 MWe
  - Small enough to be factory built for easy transport and installation
  - Dedicated power conversion system for flexible, independent operation
- Incrementally added to match load growth
  - 12 module plant – up to 924 MWe gross
  - 6 module plant – up to 462 MWe gross
  - 4 module plant – up to 308 MWe gross

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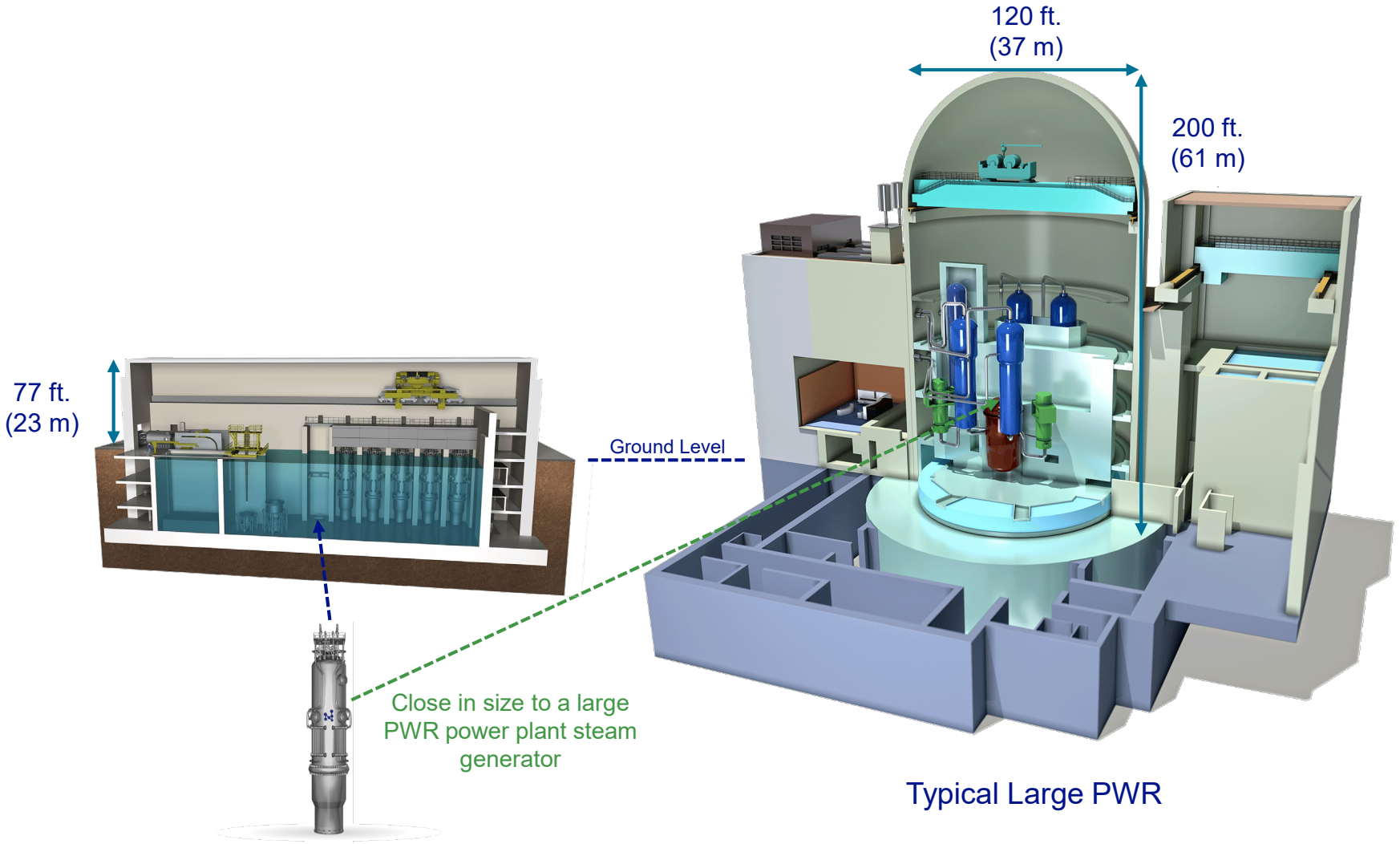
Comparison to a Large Pressurized Water Reactor (PWR)



Images not to scale

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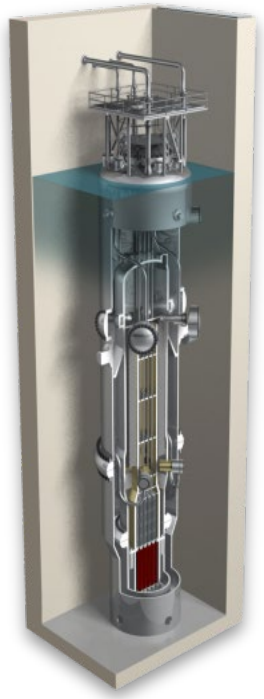
A New Approach to Construction and Operation

NuScale has revolutionized the nuclear supply chain with modular manufacturing of NPM units in-house that are shipped to sites



1

Factory fabrication

2

NuScale Power Module including containment and reactor vessel

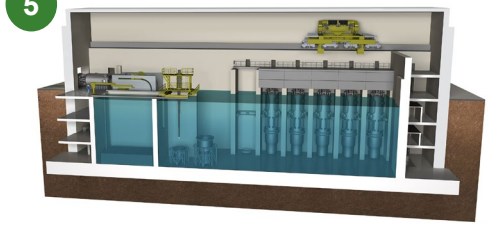
3

Shipped by truck, rail, or barge

4

To the plant site

5



Housed in a 12-module reactor building

Low carbon, secure electricity

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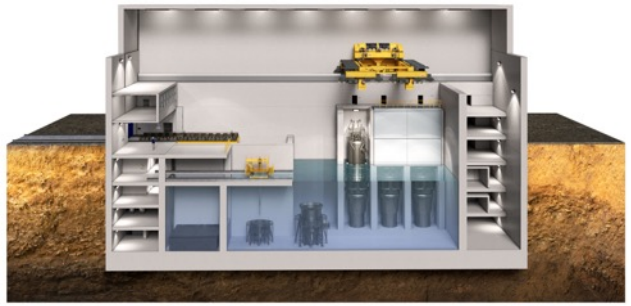
Providing Identical Technology for Every Implementation

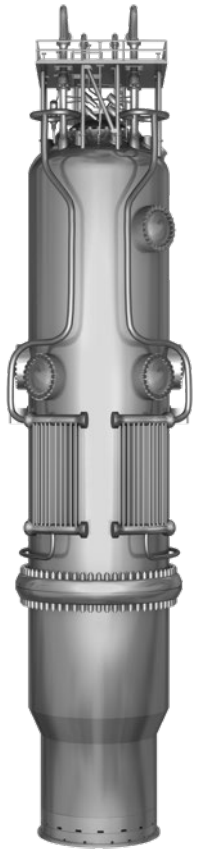
6-module plant



462 MWe (gross)

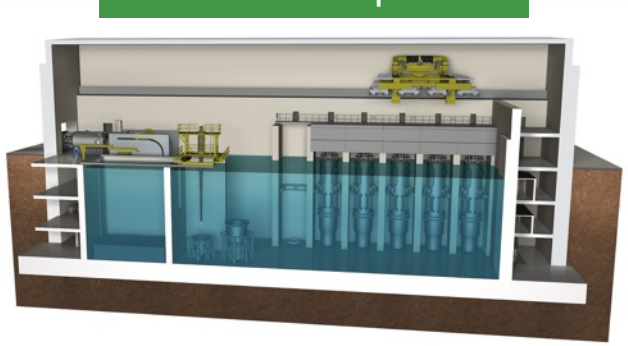
4-module plant

308 MWe (gross)



NuScale Power Module™
77 MWe (gross)

12-module plant



924 MWe (gross)

- Flexibility in size and cost advantages, with the same operational flexibility and unparalleled safety case.
- Each module feeds one turbine generator train, eliminating single-shaft risk.
- Demonstrated resiliency for every configuration (black-start, island mode, seismically robust, cyber secure, etc.)
- Air Cooled or Water Cooled Condensers

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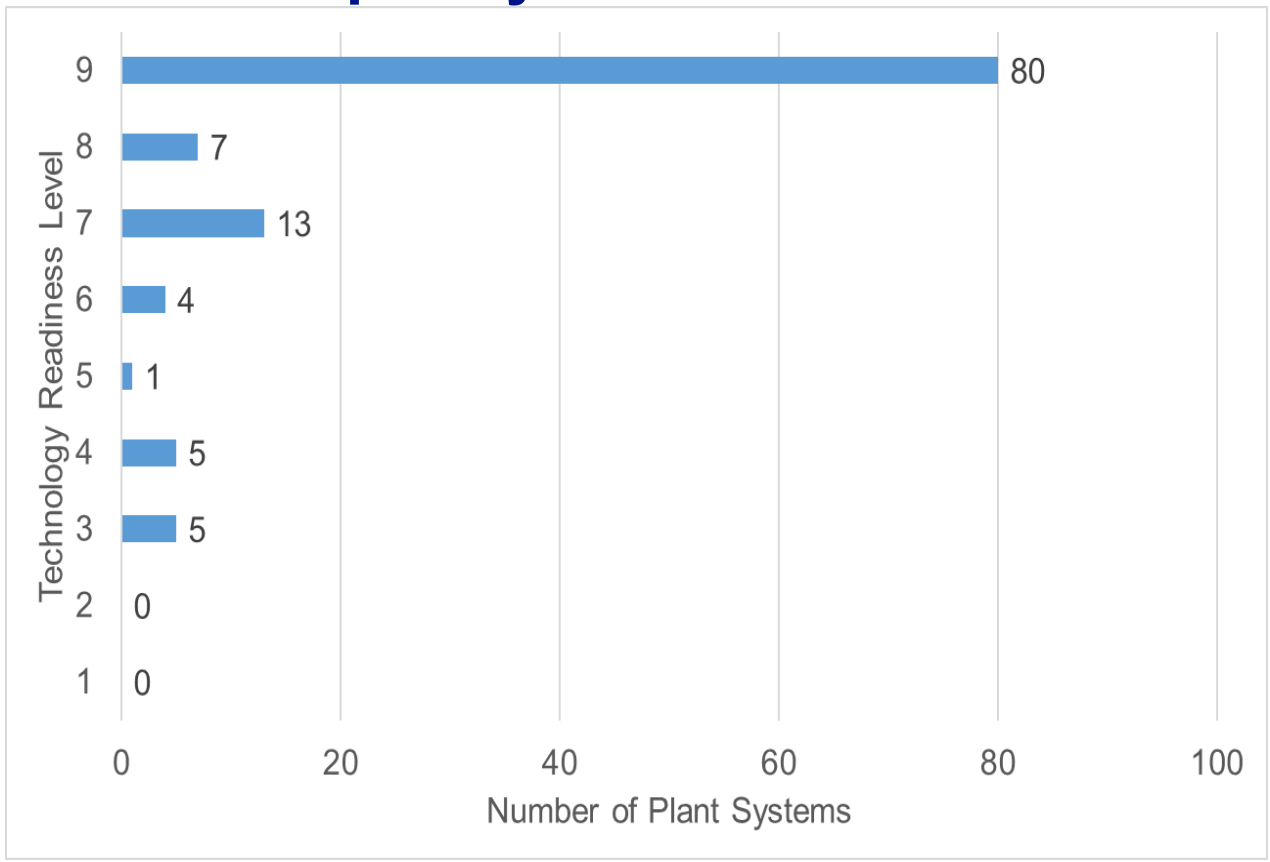
Assessment of Plant Systems

- 104 Plant Systems are at TRL 6 or above.
- For a given plant system, the minimum TRL of its components or subsystems is reported as the overall system TRL.
- TRL 6 is the minimum target TRL for all systems prior to the start of construction of the first plant. Systems with a TRL 6 or higher have demonstrated compatibility with the intended application in a relevant environment suitable for industrial deployment.
- The 11 plant systems with TRL 5 or lower are tracked as Critical Technology Elements (CTEs) using the standard DOE process as a guide.

Minimum Technology Readiness Levels per System



Licensing

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First SMR to Receive US Design Approval

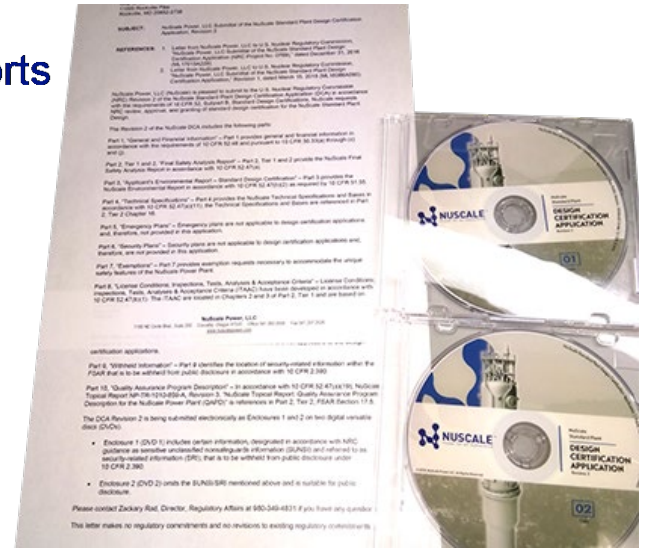
- Design Certification Application (DCA) completed in December 2016.
- Docketed and review commenced by U.S. Nuclear Regulatory Commission (NRC) in March 2017.
- NuScale received standard design approval in September 2020.
- Final Rule Currently Out for Public Comment

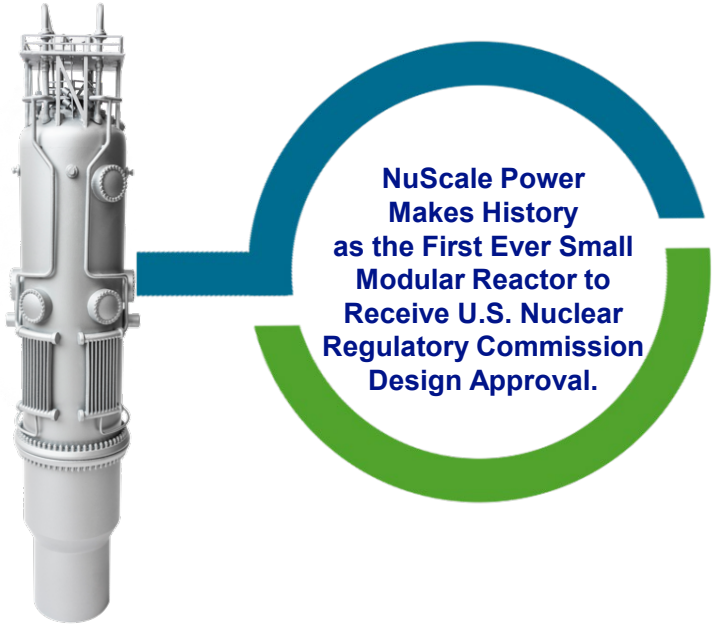
DCA Statistics

- 12,000+ pages
- >2 million labor hours
- >50 supplier/partners
- 14 Topical Reports
- >800 people
- Over $500M

DCA Review Statistics

- 42 month review
- ~2 Million pages of supporting information
- > $70M in NRC fees
- > $200M NuScale in-house costs





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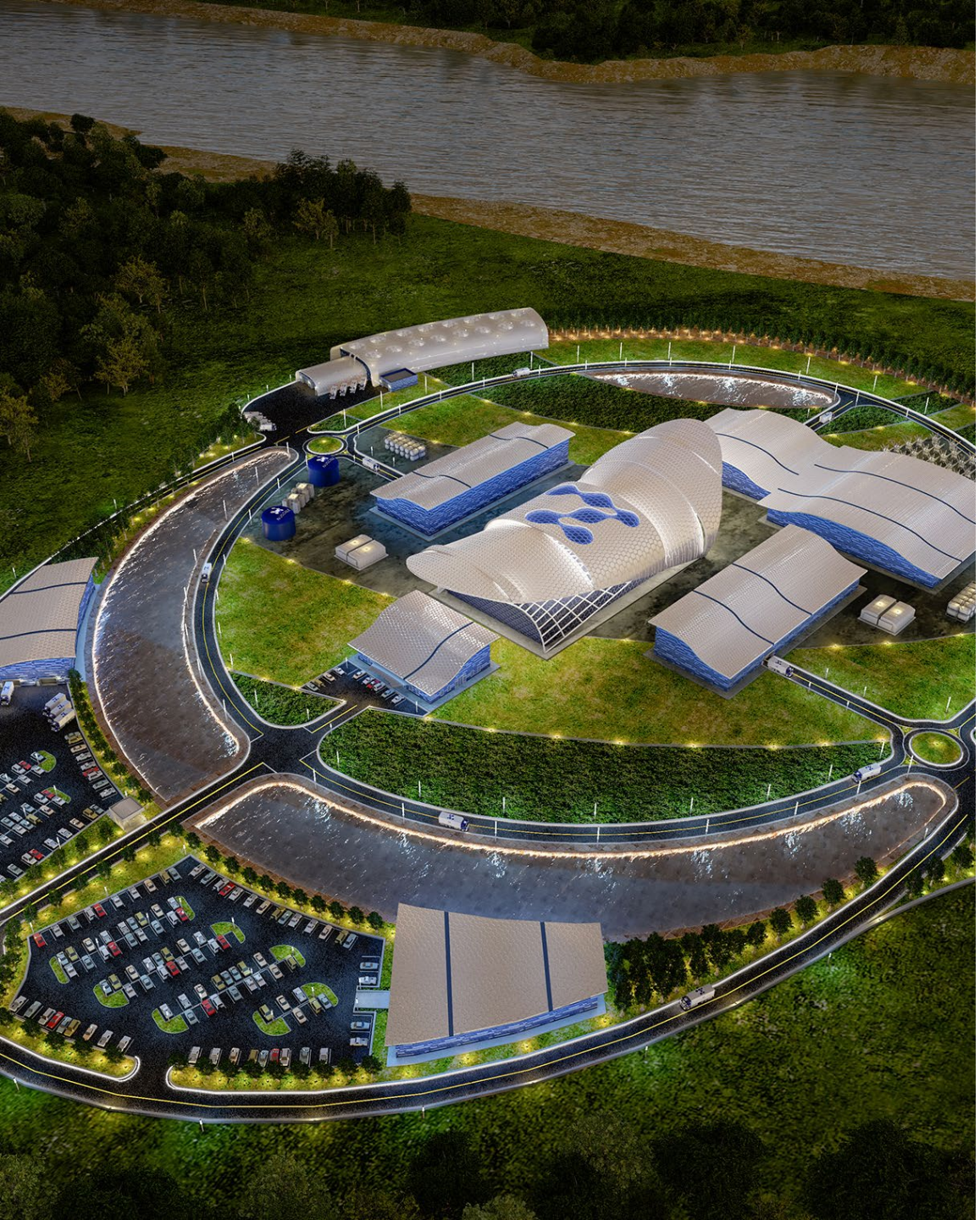

NuScale's technology is the only U.S. NRC approved design with the following features

- No Operator Action, or AC/DC power needed to shut down reactors and no need to add water to keep reactors safe for an unlimited time.
- No connection to the grid required for safety.
  - Permits siting at "end of line"; distributed generation applications, coal plant repowering; and for district heating.
- Island Mode Operation -
  - Regulations permits "off-grid" operation - A very important feature for providing reliable power and process heat to industrial applications.
  - First Responder Power for Severe Weather Events
- Black-start Capability
- 3 Modes of Load Following
- Capable of achieving Site Boundary EPZ.
- 3 Operator Control Room Staff for 12 reactors/No Shift Technical Advisor

Business Plans

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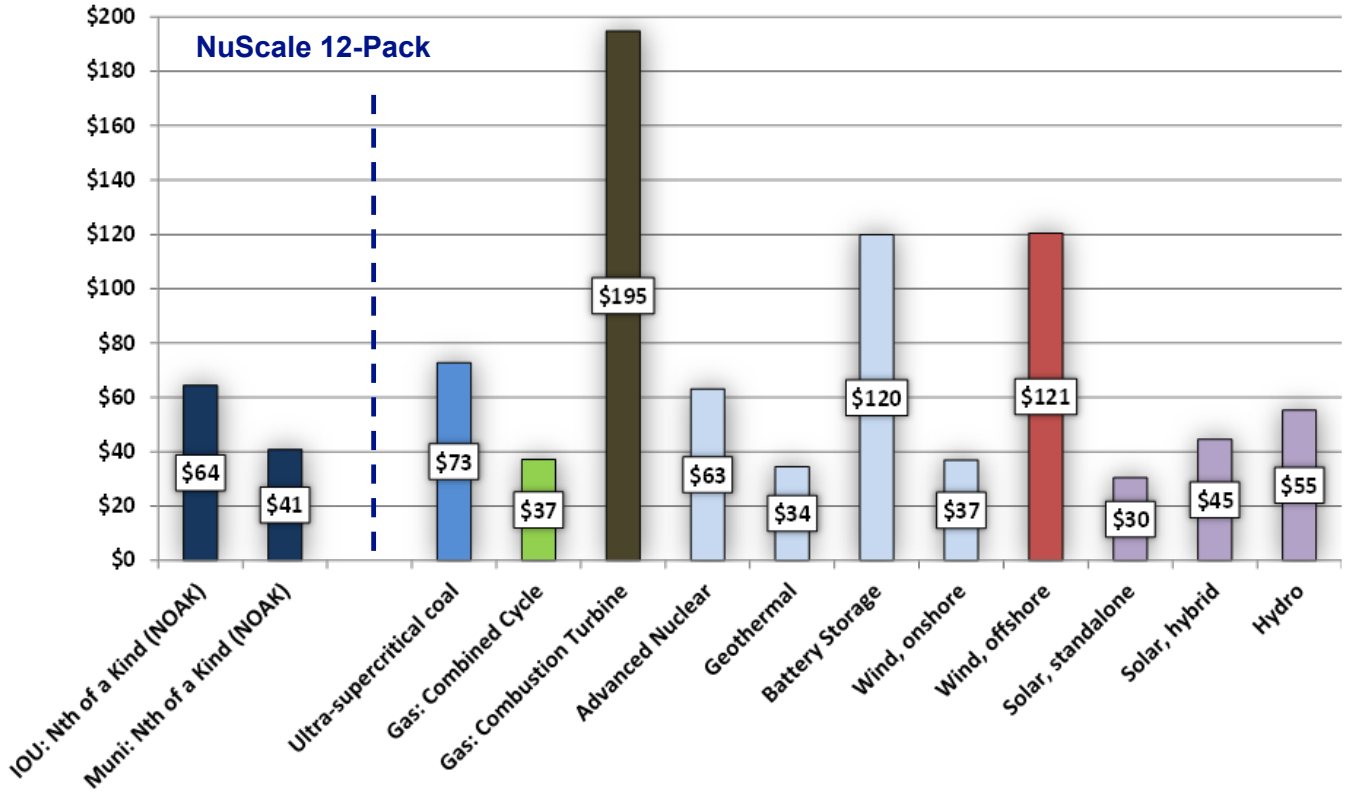
Competitive NOAK Economics

- Competitive economics with reduced production cost volatility
- Lower capital at risk in financeable bite sizes
- High capacity factor, baseload and non-carbon emitting power source with extensive load-following capability
- Flexible and safe design meets power needs at competitive cost
- Non-fuel, operational costs much lower than current U.S. fleet top quartile

Estimated Average U.S. Levelized Cost of New Generation Resources



Assumptions for EIA and NuScale 12-Pack
WACC of 4.0% to 7.0%; 30 yr cost recovery; 4.0% WACC only for NuScale Muni
NuScale 12-Pack FOAK and Nth LCOE include Owner's Cost of $3.00/MWh. EIA includes transmission investment from $1.00/MWh (Advanced Nuclear) to $4.10.MWh (Solar Thermal).
NuScale included $1.00/MWh for transmission investment in FOAK and Nth LCOE values.

Source: U.S. Energy Information Administration, Levelized Cost and Levelized Avoided Cost of New Generation Resources in the Annual Energy Outlook 2021, Feb 2021, except NuScale (12-Pack); NuScale Model.
EIA analysis assumes a $2.07/MMBtu natural gas spot price ($2020)

Simplicity of design provides competitive levelized cost of electricity (LCOE) compared to other low carbon options.

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NuScale's "Bottoms up" Approach for Estimating Cost

Conforms with Association for the Advancement of Cost Engineering (AACE) International 18R-97

NOAK Plant Overnight Capital Cost – ACEE Class 4	NuScale Power Module™ – ACEE Class 3
• > 14,000 line items (equipment, material, etc.) priced using Fluor's current proprietary cost data or actual vendor quotes. • Based on constructing NuScale 12-module plant at generic greenfield soil site in Southeastern U.S. and accessible for water delivery of modules. • **Excludes**: Warranty, fee, contingency, escalation, interest, and owner's costs, as these items vary by project, customer, and site location. • Labor costs and productivity data from recent U.S. new build projects or applicable Fluor engineering, procurement, and construction (EPC) experience and industry data were included in the estimate. • NuScale performed the detailed estimate in 2017 and adjustments were made to account for design changes in 2020. Customer specific cost estimates are based on this estimate.	• Performed by experienced large nuclear component manufacturer Includes: ○ Manufacturing bill of material. ○ Welding, machining, and non-destructive examination processes developed. • Transportation costs developed by expert heavy load transport engineering team.

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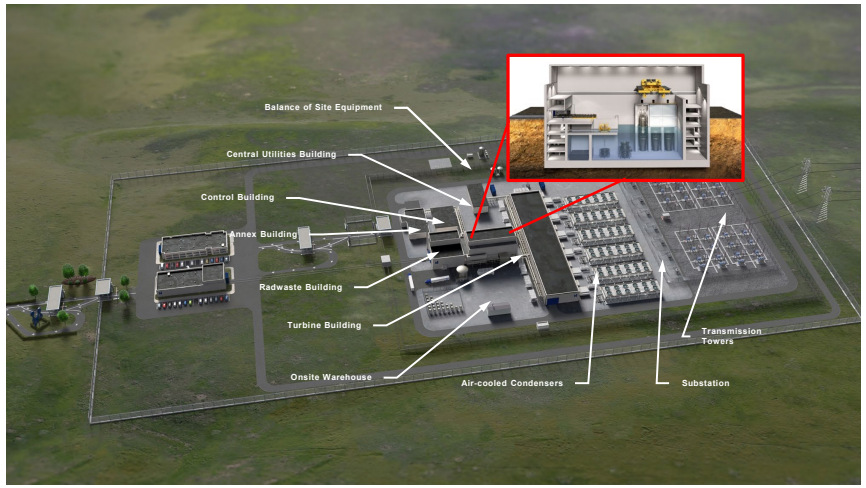
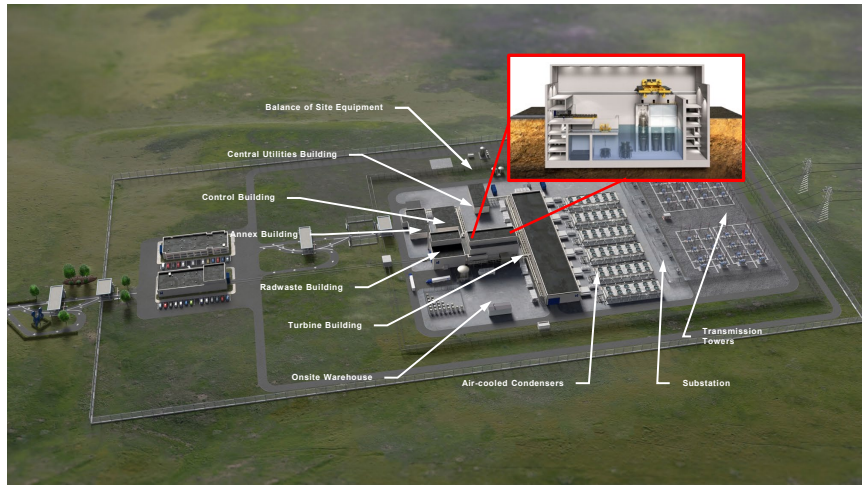
New Level of Financial Flexibility for Nuclear Power

- Customer specifies the schedule based on their needs
- Overnight Capital Cost a component of Plant Project Cost
- No Longer “One Size Fits All”
  - Clients can optimize on Capital Cost and Levelized Cost of Electricity (LCOE) specific to their financial needs.
  - Cost of water in certain regions make air-cooled plants a more economic choice. Slightly higher capital cost but lower LCOE.
  - Flexibility to add modules as modules are needed.



Site Layout 6 NPM Plant with Air-Cooled Condensers



Site Layout 4-NPM Plant with Direct Lake Cooling

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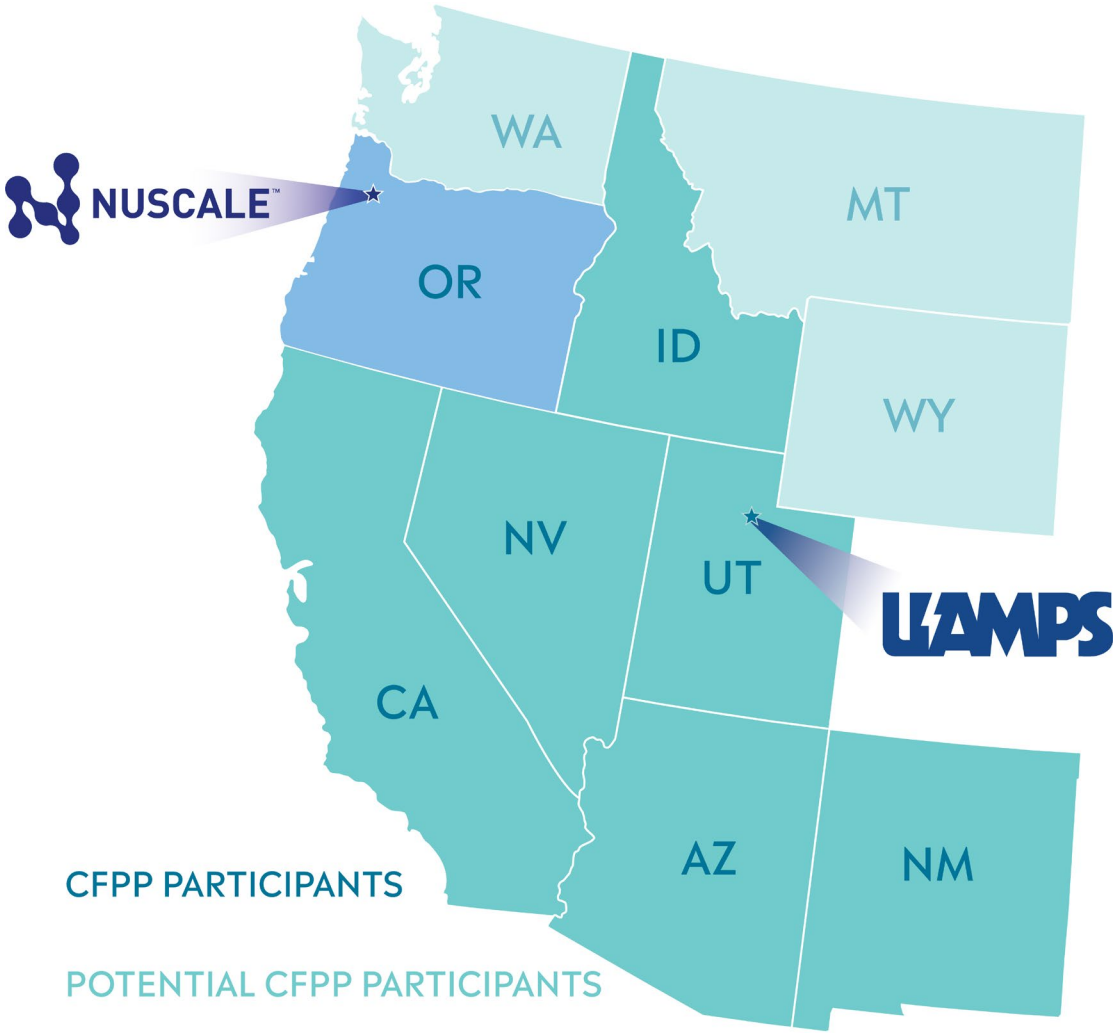
First Deployment: UAMPS Carbon Free Power Project



- Utah Associated Municipal Power Systems (UAMPS) provides energy services to community-owned power systems throughout the Intermountain West
- On January 11, 2021, NuScale Power and UAMPS Executed Agreements to Progress Carbon Free Power Project
  - The Development Cost Reimbursement Agreement (DCRA) between UAMPS and NuScale.
  - $1.355 billion multi-year Financial Assistance Award from the U.S. Department of Energy to CFPP LLC, a wholly-owned subsidiary of UAMPS established to develop, own and operate the CFPP.
  - UAMPS and Fluor Corporation have signed a cost-reimbursable development agreement to provide estimating, development, design and engineering services to develop the site-specific cost estimates for deployment of the NuScale technology at the INL site.

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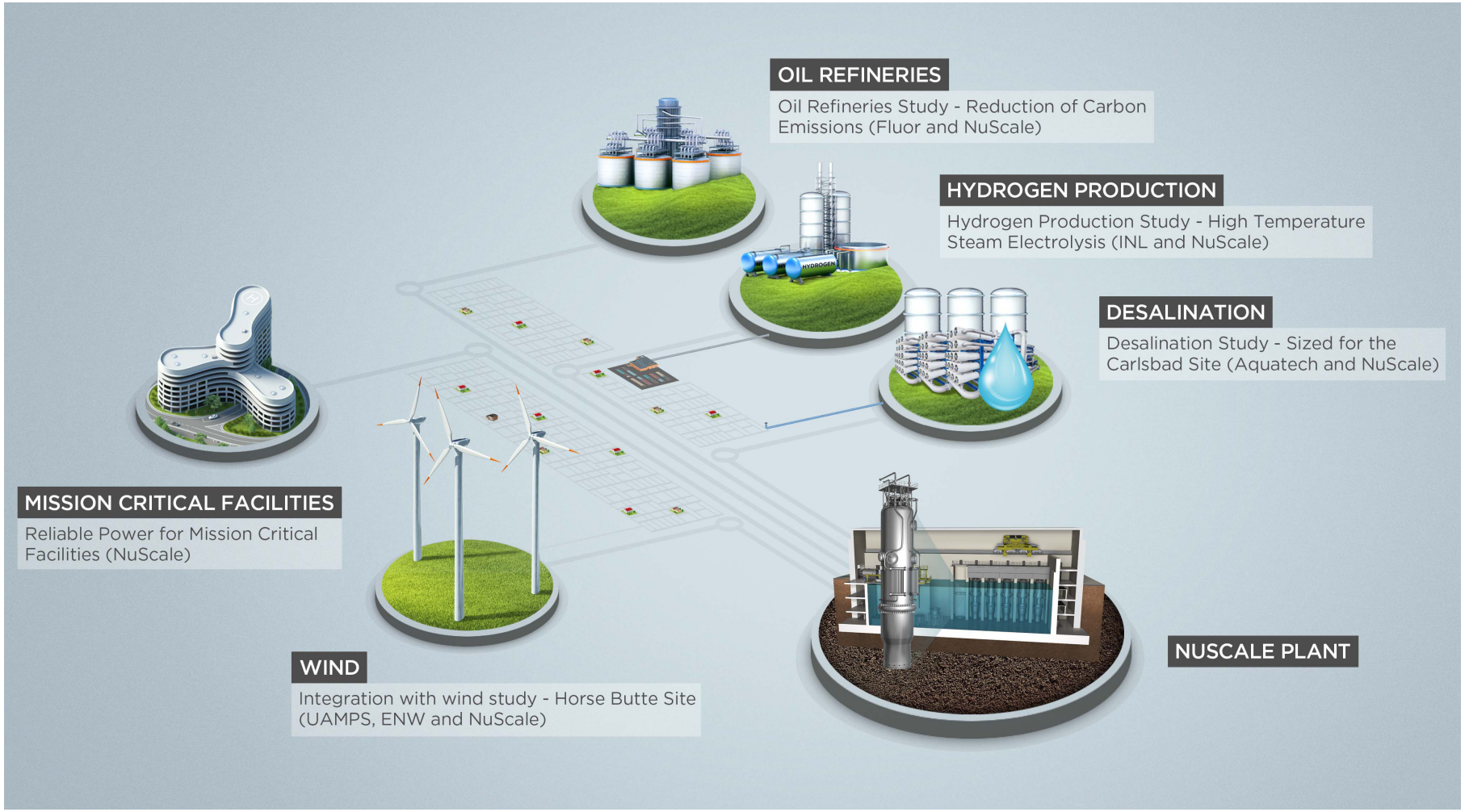
Progress on the UAMPS CFPP

- The major module subcomponents will be manufactured at multiple manufacturer locations and shipped to a single location for assembly (bolting, no welding) prior to installing into the facility. NuScale is currently contracted with both BWX Technologies (BWXT) and Doosan Heavy Industries and Construction (DHIC) to assist NuScale with its final design for manufacturing, assembly, and transport.
- NuScale has completed preliminary supply chain strategies for approximately 40 equipment packages for the NuScale scope of supply. Long lead engineering equipment procurements for the first plan will commence in 2022.
- Site characterization activities necessary for licensing and construction already started in 2020 at the UAMPS CFPP site.
  - Erection of metrology towers, deployment of associated equipment housing, establishment of inclement weather and meeting trailers, parking, deep bore drilling for seismic assessment and construction planning.
- The UAMPS Combined Operating License Application (COLA) for the Carbon Free Power Project (CFPP) in Idaho is expected to be submitted to the Nuclear Regulatory Commission (NRC) by April of 2023. NRC review of the COLA is expected to be completed by November of 2025, with construction of the project beginning in December 2025. The first NPM is expected to be operational by mid-2029, with other modules coming on-line in 2030.

Beyond Baseload: NuScale Diverse Energy Platform

MORE THAN RELIABLE BASELOAD AND LOAD-FOLLOWING ELECTRICITY GENERATION



Reports for associated technical studies are available at: www.nuscalepower.com/technology/technical-publications

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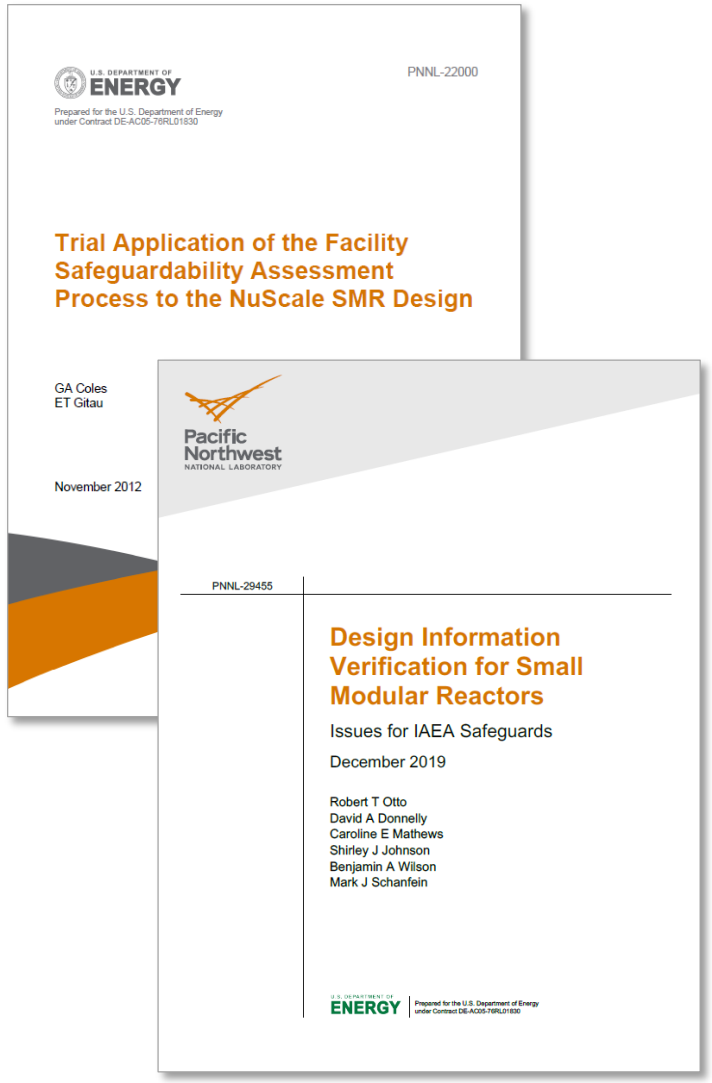
Physical Security, Cybersecurity and Safeguards

- NuScale has embraced a “by design” approach to physical security, cyber security and safeguards.
- A physical security subject matter expert (SME) has been embedded in the NuScale design process for structures, systems and components (SSCs).
  - Each building design has incorporated physical security features that provide a future licensee with justification for a reduced security force.
  - The physical security SME has provided input on the site plan layout, limiting access points and enforcing clear lines of sight to enable successful security strategies.
  - Proposed SSC design changes are scrutinized by the SME to prevent erosion of security by design features.
- Regarding counterfeit, fraudulent, or suspect items (CFSI), NuScale is in the process of developing a program which guides how NuScale flows appropriate requirements to its sub-suppliers via procurement documentation.
  - This program incorporates EPRI and other industry guidance, including IAEA consideration. NuScale’s sub-suppliers are subject to the CFSI program as NuScale qualifies them.
  - Additionally, NuScale participates in industry forums to remain current on discussions and new guidance relative to CFSI.

NuScale Safeguards by Design Program underway since 2010



- PNNL Study, Trial Application of the Facility Safeguardability Assessment Process to the NuScale SMR Design, PNNL-22000, November 2012.
- PNNL Study, Design Information Verification for Small Modular Reactors, PNNL-29455, December 2019.
  - PNNL Reaffirmed that the NuScale design is safeguardable.
  - Many standard International Safeguards methods can be applied to the NuScale design.
  - NuScale was commended for accepting and acting upon feedback from prior PNNL interactions.
  - PNNL and NuScale already sharing information with IAEA regarding Design Information Verification (DIV) inspection activities in the NuScale NPM manufacturing and site construction phase.

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