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The Potential for Small Modular Reactors in Alaska

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Alaska Electricity Landscape

- Largest state in area but with low population density
  - Extensive use of micro grids and distributed generation sources to power remote communities
- Desire for a clean electricity generation portfolio to support pristine nature of state
- High prices for electricity
  - 2nd highest electricity prices in the nation
- Home to national defense facilities
  - Need highly reliable and resilient generation

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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 had been 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.
- In 2013, NuScale won $226M in matching funds in a competitive U.S. DOE Funding Opportunity.
- >350 patents granted or pending in 20 countries.
- >800 people have worked on the project with 6 offices in U.S. and 1 office in London.
- Making substantial progress with a rigorous design review by the U.S. Nuclear Regulatory Commission (NRC).
- Phase 1 of NRC Review completed ahead of schedule.
- Additional DOE cost-share awards of $47M in 2018.
- On track for first plant operation in 2026 in the U.S.

NuScale Engineering Offices Corvallis

One-third scale NIST-1 Test Facility

NuScale Control Room Simulator

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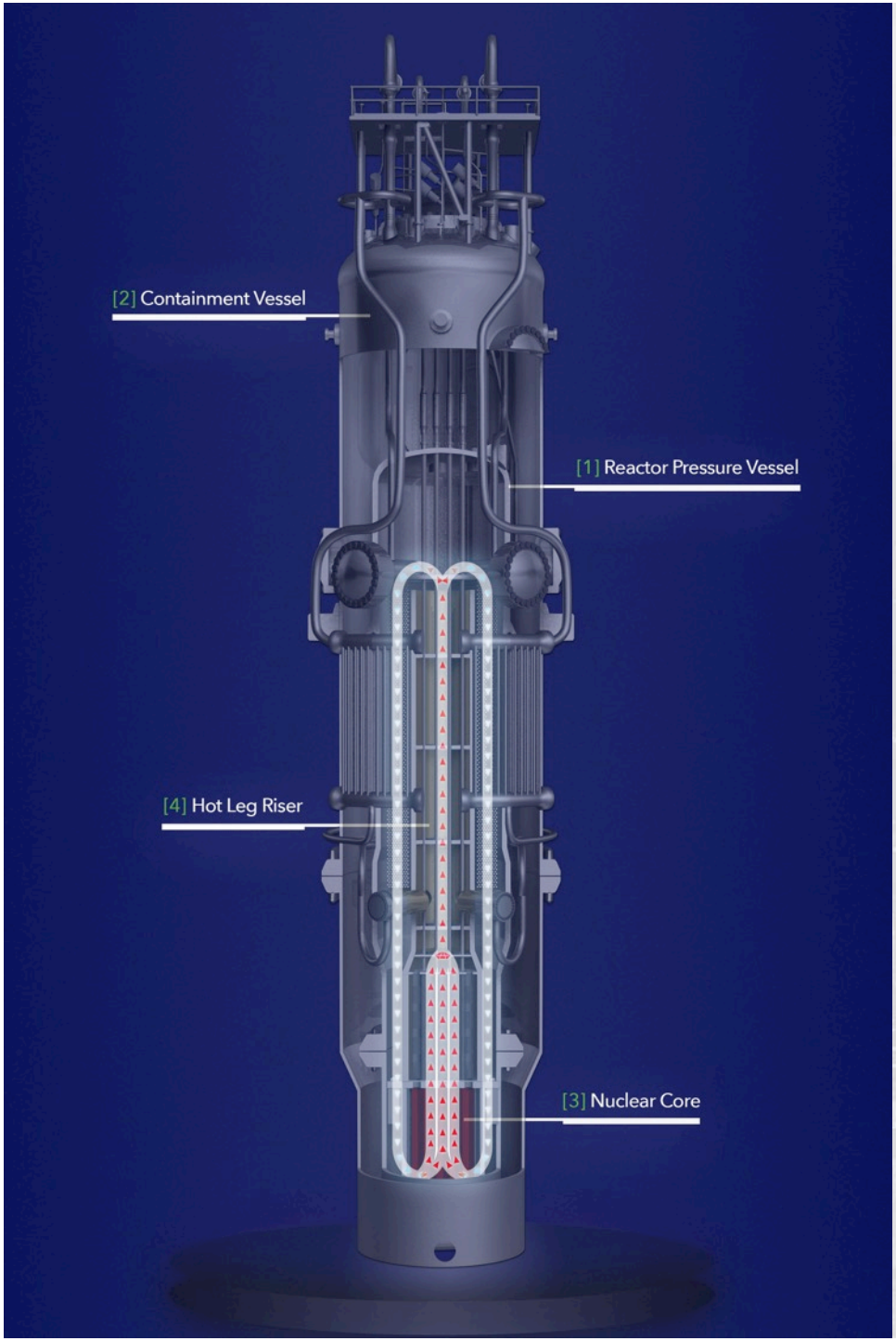

Core Technology: NuScale Power Module

- 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 60 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
    - up to **12 modules for 720 MWe** gross (684 MWe net) total output

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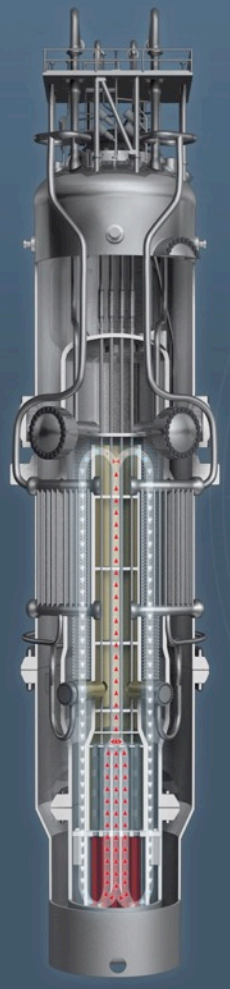
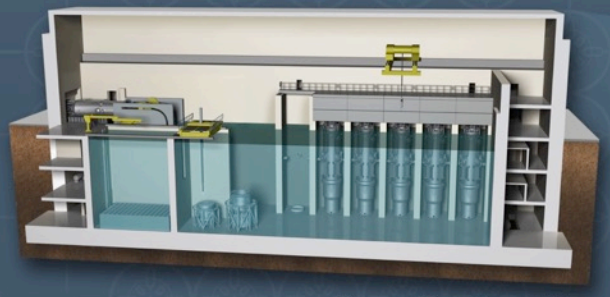
A New Approach to Construction and Operation



Factory Fabrication

Low carbon, secure electricity



Housed in a 12 module reactor building

To the plant site

NuScale Power Module™ including containment and reactor vessel

Shipped by truck, rail or barge

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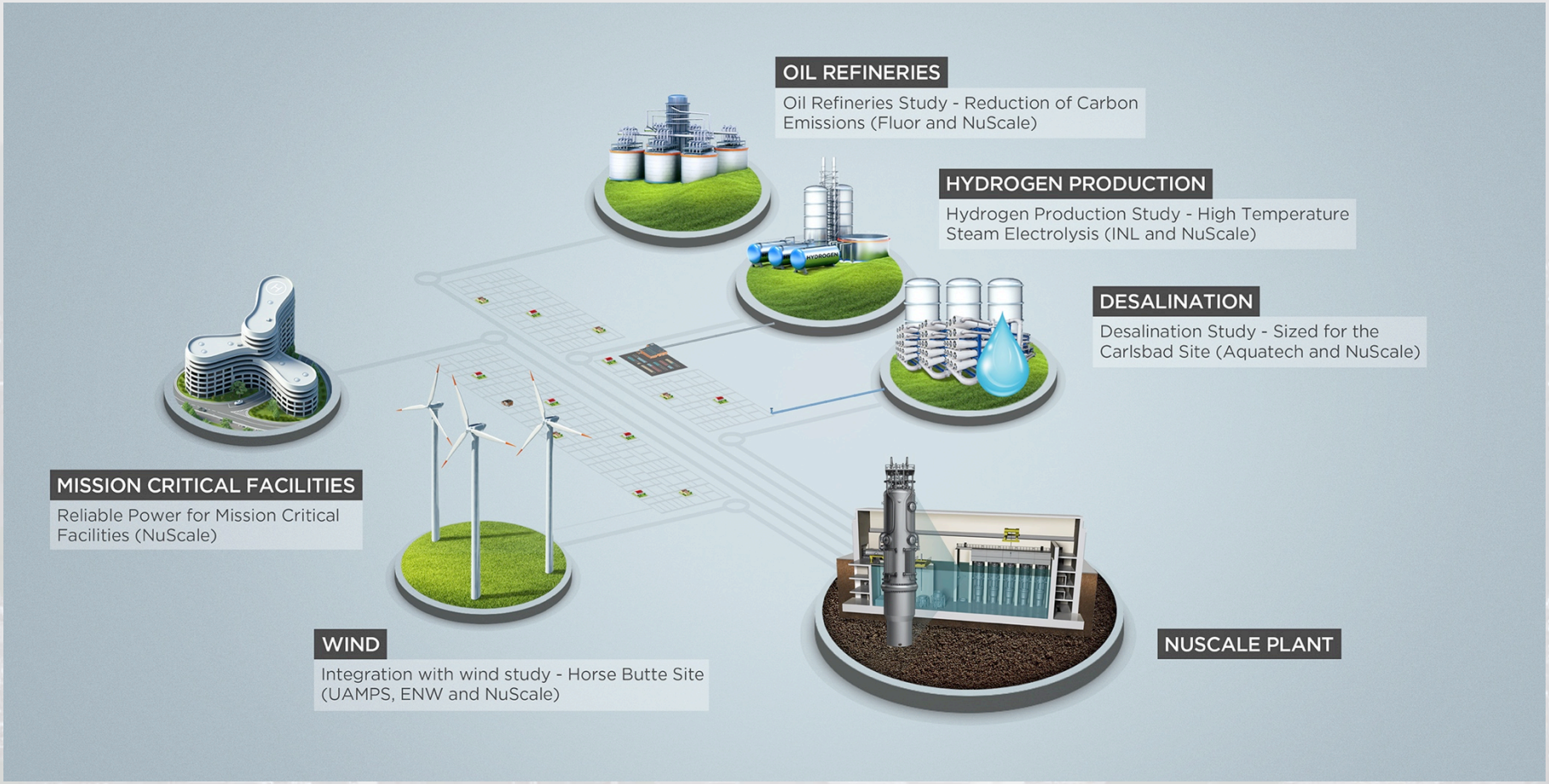
Beyond Baseload: NuScale Diverse Energy Platform



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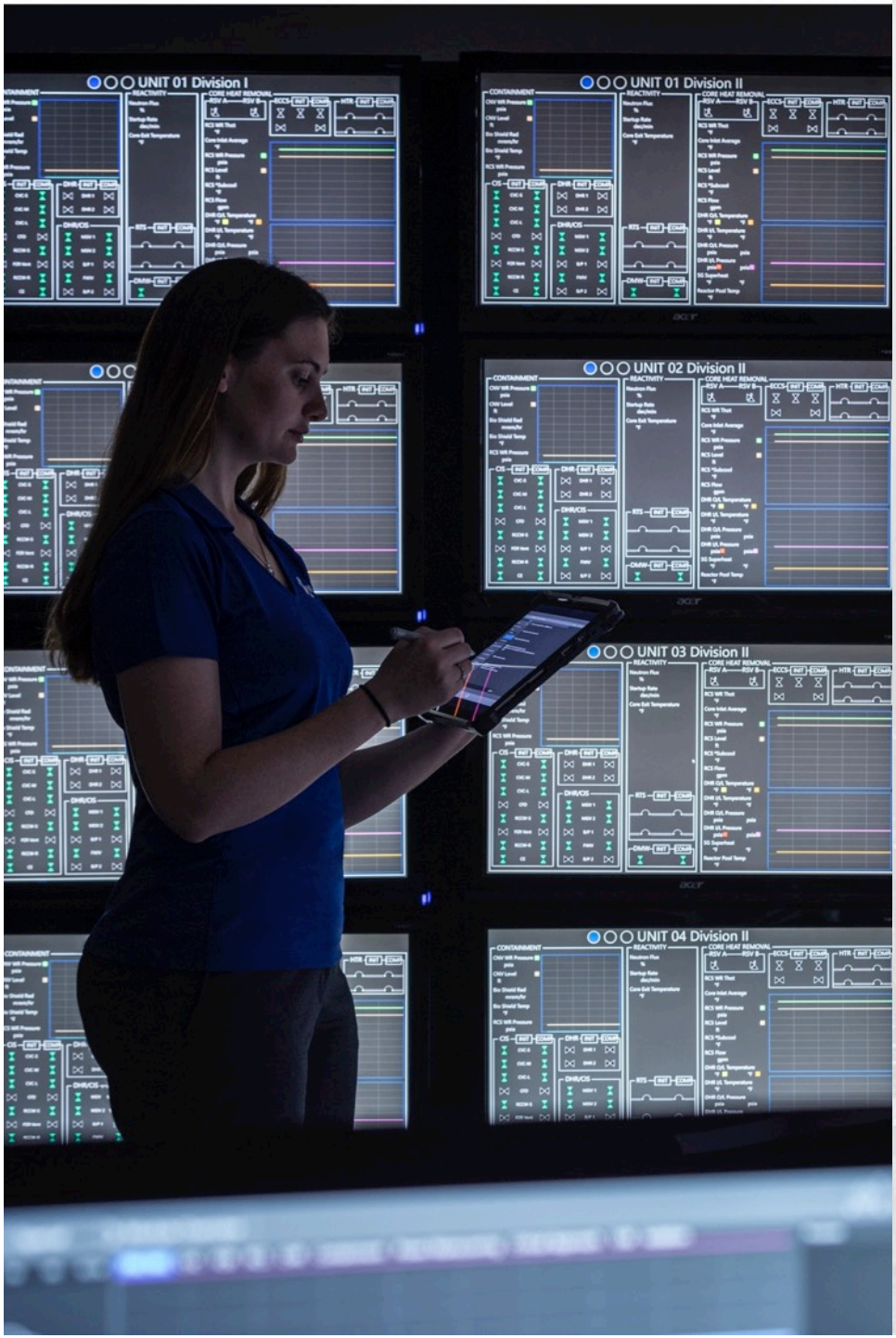

A New Level of Plant Resiliency

- **Island Mode/Loss of Offsite Power** – a single module can power the entire plant in case of loss of the grid; no operator or computer actions, AC/DC power or additional water required to keep the reactors safe
- **First Responder Power/Black-Start Capability** – on loss of the offsite grid, through variable (0% to 100%) steam bypass, all 12 modules can remain at power and be available to provide electricity to the grid as soon as the grid is restored
- **Resilience to Natural Events** – reactor modules and fuel pool located below grade in a Seismic Category 1 Building
  - Capable of withstanding a Fukushima type seismic event
  - Capable of withstanding hurricanes, tornados, and floods
- **Resilience to Air-Craft Impact** – reactor building is able to withstand aircraft impact as specified by the NRC aircraft impact rule
- **Cybersecurity** – module and plant protection systems are non-microprocessor based using field programmable gate arrays that do not use software and are therefore not vulnerable to internet cyber-attacks
- **High Altitude Electromagnetic Pulse (EMP)** – standard plant design has features that provide EMP hardening beyond current nuclear fleet

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Reliable Power for Mission Critical Facilities

UTILITY MACROGRID

684 MWe (net)
> 95% Capacity

- Connection to a micro-grid, island mode capability, and the ability for 100% turbine bypass allows a 720 MWe (gross) NuScale plant to assure **120 MWe net power at 99.95% reliability over a 60 year lifetime**
  - 60 MWe at 99.98% availability
- Using highly robust power modules and a multi-module plant design can provide **clean, abundant, and highly reliable power** to customers
- Working with utilities and customers to achieve “Five 9s”

NuScale 12-Module Plant

DEDICATED MICROGRID
120 MWe (net)
> 99.95% Availability

MISSION CRITICAL FACILITY

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Current Status in Commercialization

- Design Certification Application (DCA) completed in December 2016, docketed and review commenced **by U.S. Nuclear Regulatory Commission (NRC)** in March 2017.
  - Review progressing well and on schedule; to be approved in September 2020.
- Announced September 2018: **BWX Technologies, Inc. (BWXT)** will start the engineering work to manufacture the NuScale Power Modules™.
- Utah Associated Municipal Power Systems (UAMPS) Carbon Free Power Project (CFPP) will be first deployment of 12-module plant (720 MWe) with **commercial operation in 2026** in Idaho.

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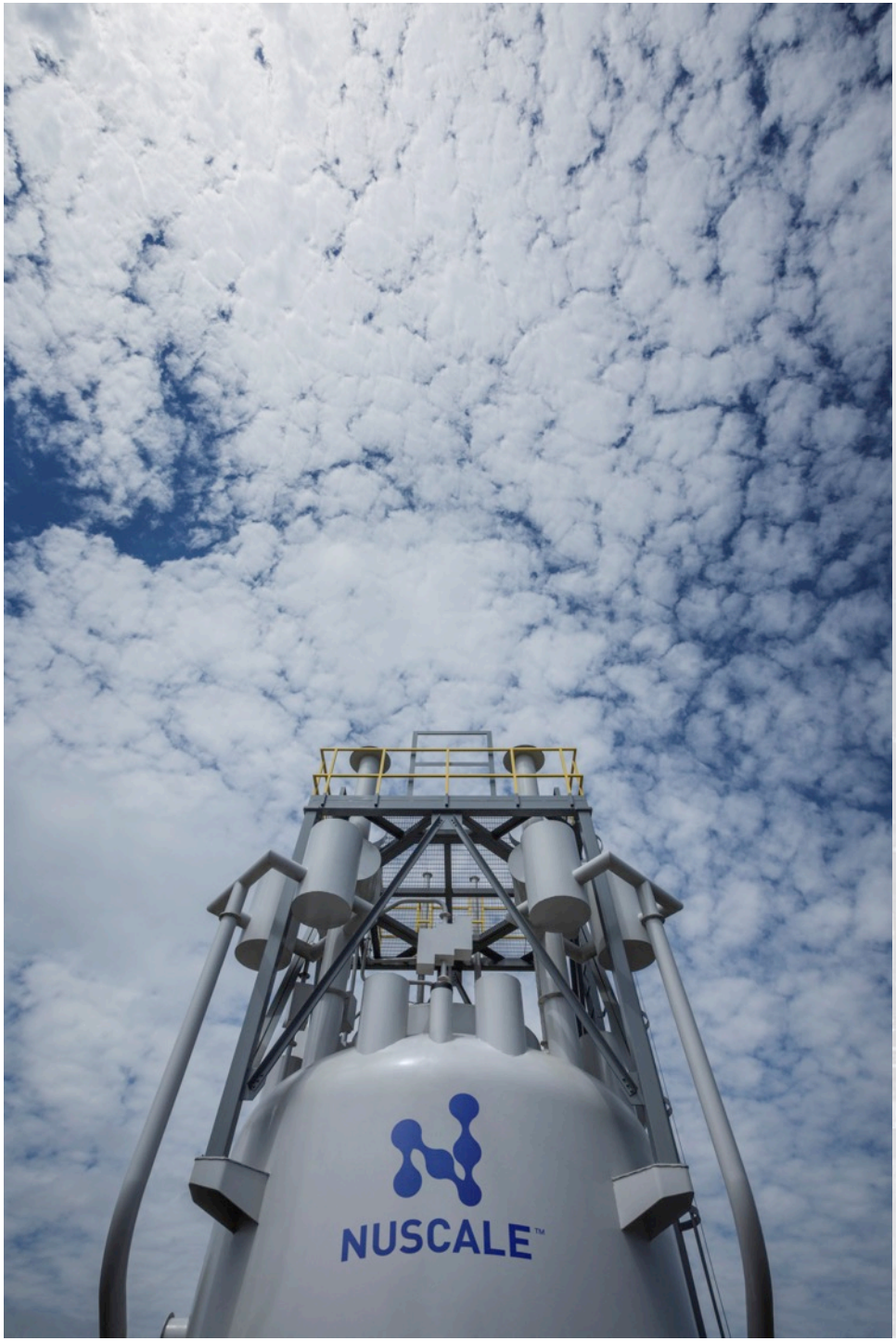

NuScale's Value Proposition for Alaska

- **Smarter energy** – flexible design can support multiple applications, integrate with renewables resources, provide highly reliable power to mission critical facilities, and serve as clean baseload power.
- **Cleaner Energy** – 100% carbon-free energy – as clean as wind or solar – with a small land footprint.
- **Safer Energy** – should it become necessary, NuScale's SMR shuts itself down and self-cools for an indefinite period of time, with no operator action required, no additional water, and no AC or DC power needed.
- **Cost Competitive –** the NuScale SMR is far less complex than other designs. Off-site fabrication and assembly reduce cost. Components are delivered to the site in ready-to-install form. All of this results in construction occurring in a shorter, more predicable period of time.

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