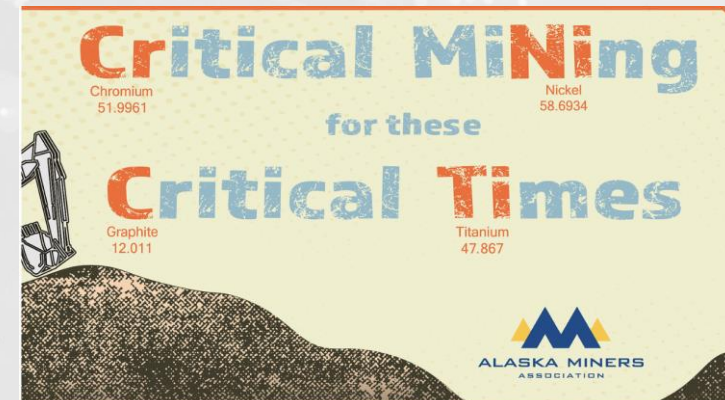




Westinghouse

Alaska Mining Association Convention
November 5, 2024

Mary Ann Pease
Westinghouse Business Development for Alaska
LDES and eVinci microreactor

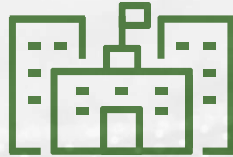




Westinghouse



Founded:
1886



Headquarters:
Cranberry
Township,
Pennsylvania (USA)



~10,000
employees worldwide



~50%
of the global nuclear
reactor fleet is based on
Westinghouse technology



90+
global facilities



~190,000
carbon-free MWe
delivered annually



~3,400
U.S. suppliers



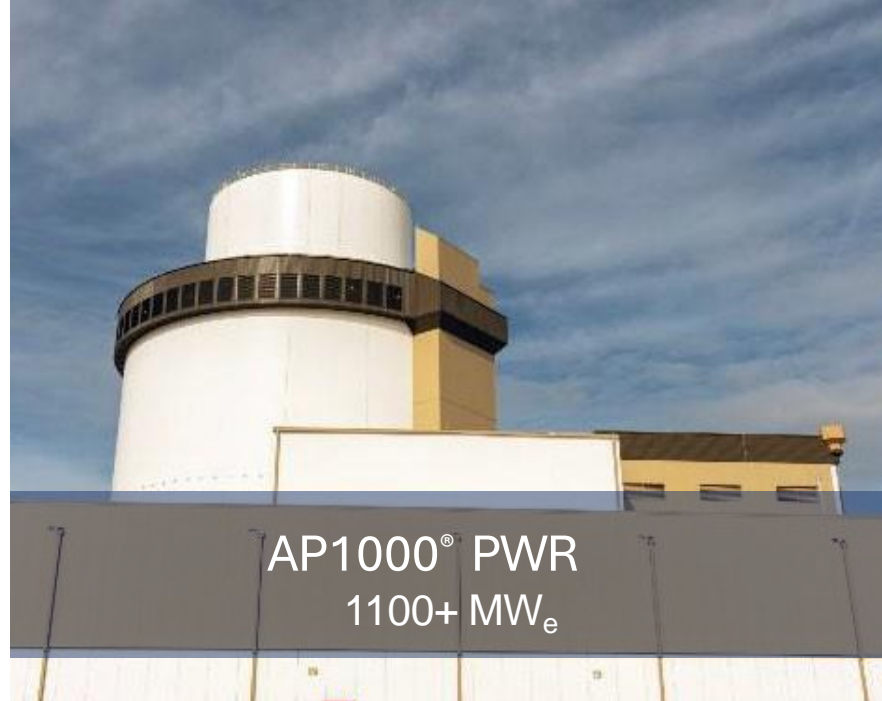
~270
qualified nuclear
suppliers



Westinghouse

Energy Systems

A portfolio of innovative nuclear solutions



AP1000[®] PWR
1100+ MW_e



eVinci[™] Microreactor
5MW_e



AP300[™]
300 MW



Pumped thermal
energy storage

Introducing the eVinci Microreactor

The Most Advanced Microreactor In Design Maturity, Regulatory & Manufacturing Readiness

Carbon-Free Energy

Just 1 eVinci Microreactor Reduces Up To 55,000 Tons of CO₂ Per Year



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eVinci microreactor

A 'nuclear battery' that will make safe & reliable, carbon-free energy accessible like never before



5MWe and 15MWth core design



Uninterrupted, emission-free power for 8+ years without refueling



Installation to operation in <30 days



Constructed above ground with small site footprint



Autonomous controls enable light-touch, safe operations



Factory built and deployable across the globe



Highly transportable



No water or pressurized gas needed for cooling

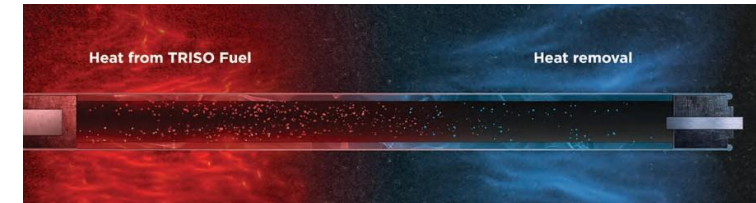
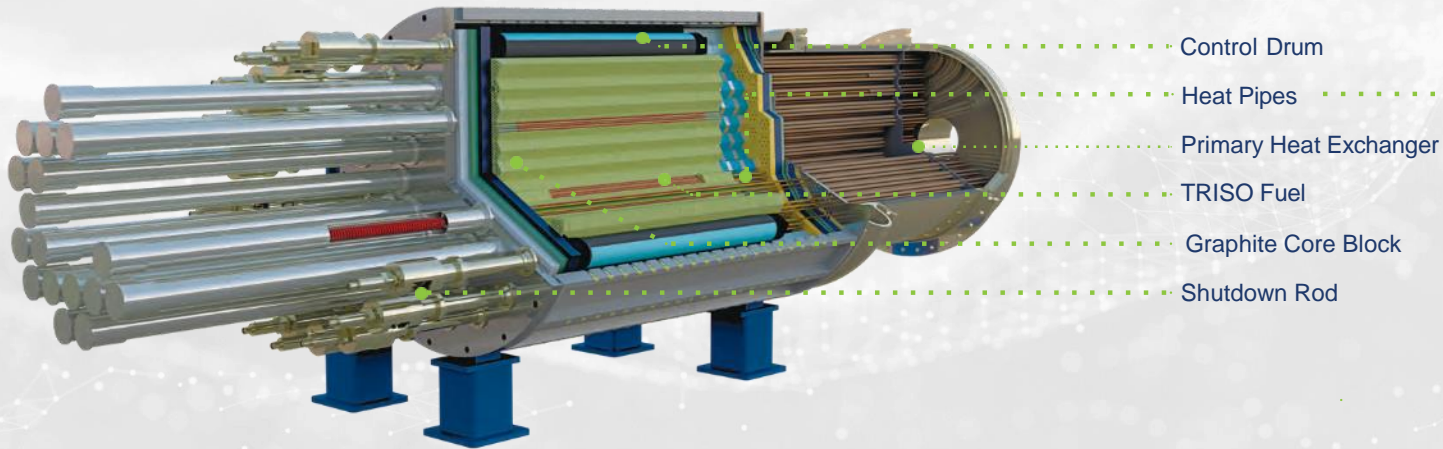
The eVinci microreactor at a glance

5 MWe | 15 MWth

A high-reliability, carbon-free nuclear battery.

The eVinci Advantage

- Location versatility without need for deep excavation or cooling water
- Microgrid enabled with a behind the meter approach; deployable to locations with grid instability/capacity/scarcity issues
- Economies of scale for multi-unit deployments
- Black start capable



Up Close With eVinci Heat Pipes

Advantages:

- No Pressurization
- Fault-Tolerant
- No Active Cooling (Pumps)

eVinci Microreactor Market Applications



Data Centers



Critical Infrastructure



Defense



Remote Communities



Remote Industry (Oil & Gas, Mining)



Expanded Industry



Maritime



Universities & Research

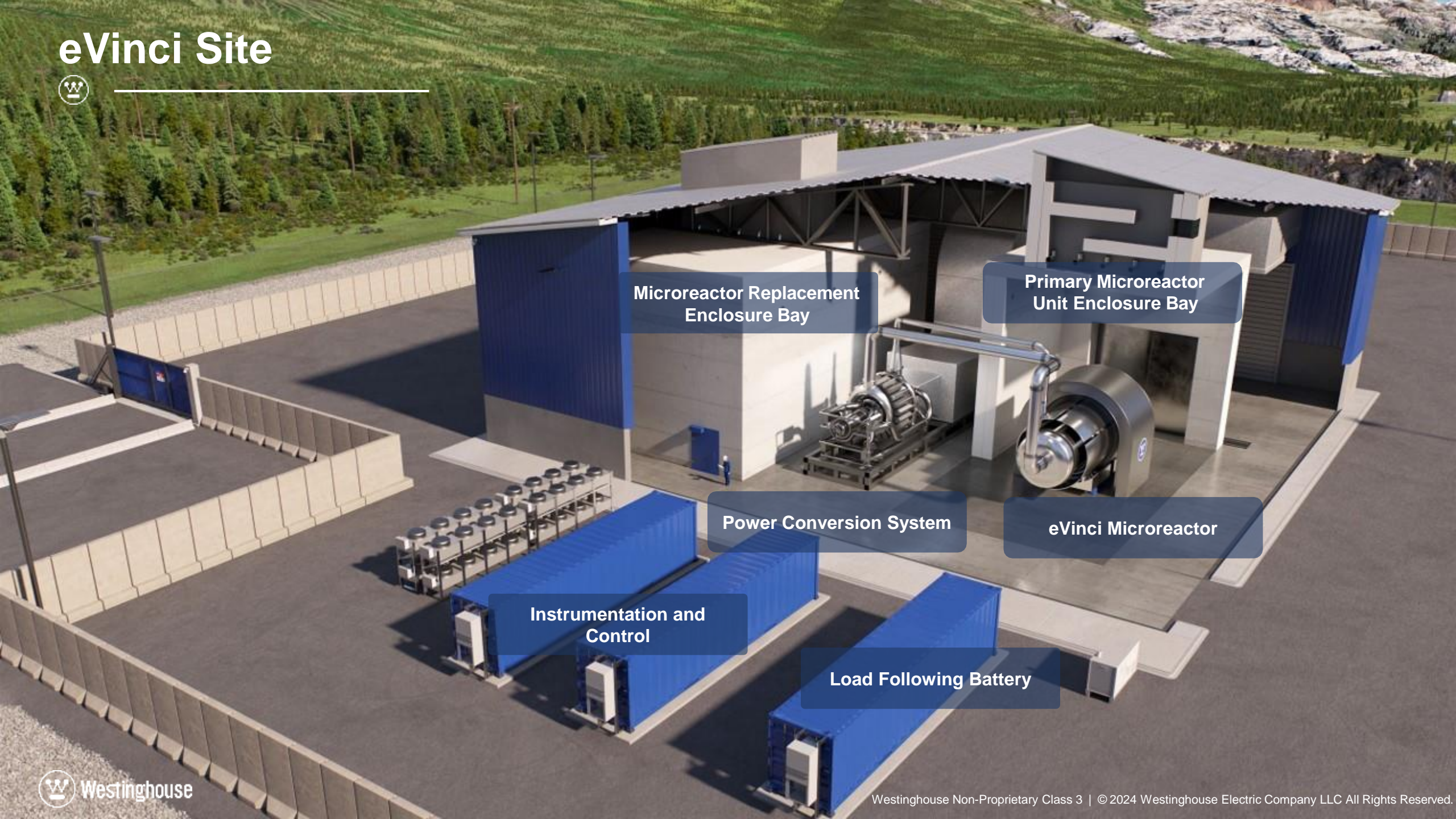


Disaster Relief & Recovery



Space Missions

eVinci Site



Microreactor Replacement
Enclosure Bay

Primary Microreactor
Unit Enclosure Bay

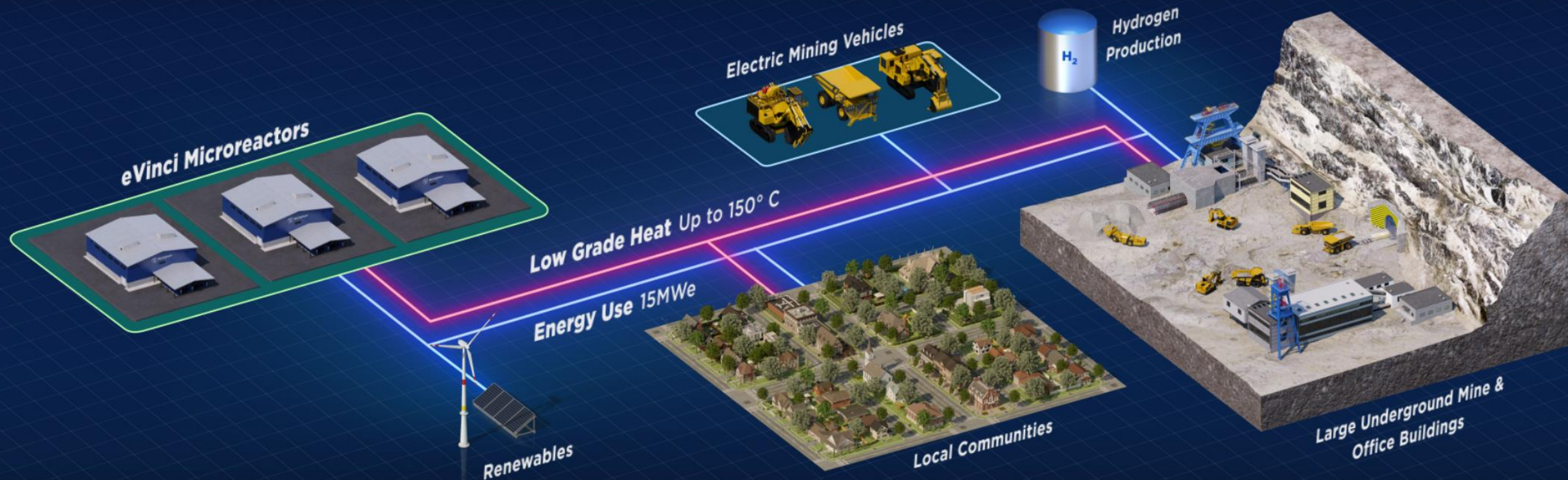
Power Conversion System

eVinci Microreactor

Instrumentation and
Control

Load Following Battery

Mining Operations Supported by the eVinci Microreactor



Headlines From eVinci Technologies in 2024



Opened eVinci
Microreactor
Accelerator
at 51 Bridge St.
Pittsburgh, PA



March 4



Completed
second phase of
electrical
demonstration
testing



March 28



NTR Preliminary Safety
Design Report (PSDR)
completed and
transmitted to the Idaho
National Laboratory



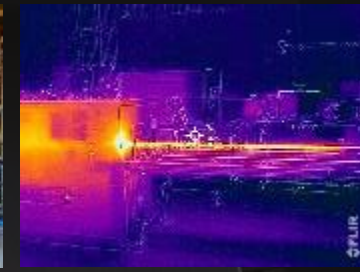
April 12



Full Diameter Reactor
Manufacturing
Demonstration Unit



July 25



Successfully Tested
12' Heat Pipe



July 29



NRC Approves eVinci
Principal Design
Criteria &
Instrumentation and
Control Platform TR



October 16

51 Bridge Street: The Home of eVinci Manufacturing



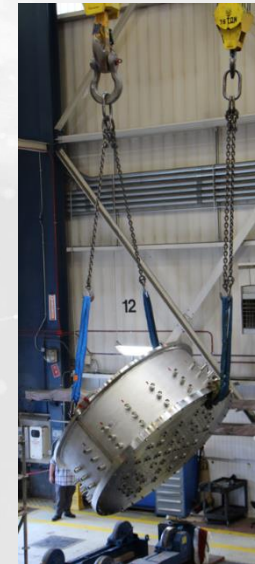
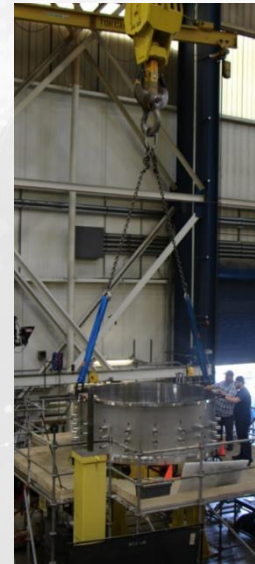
Meet Matt and Our Manufacturing Demonstration Unit



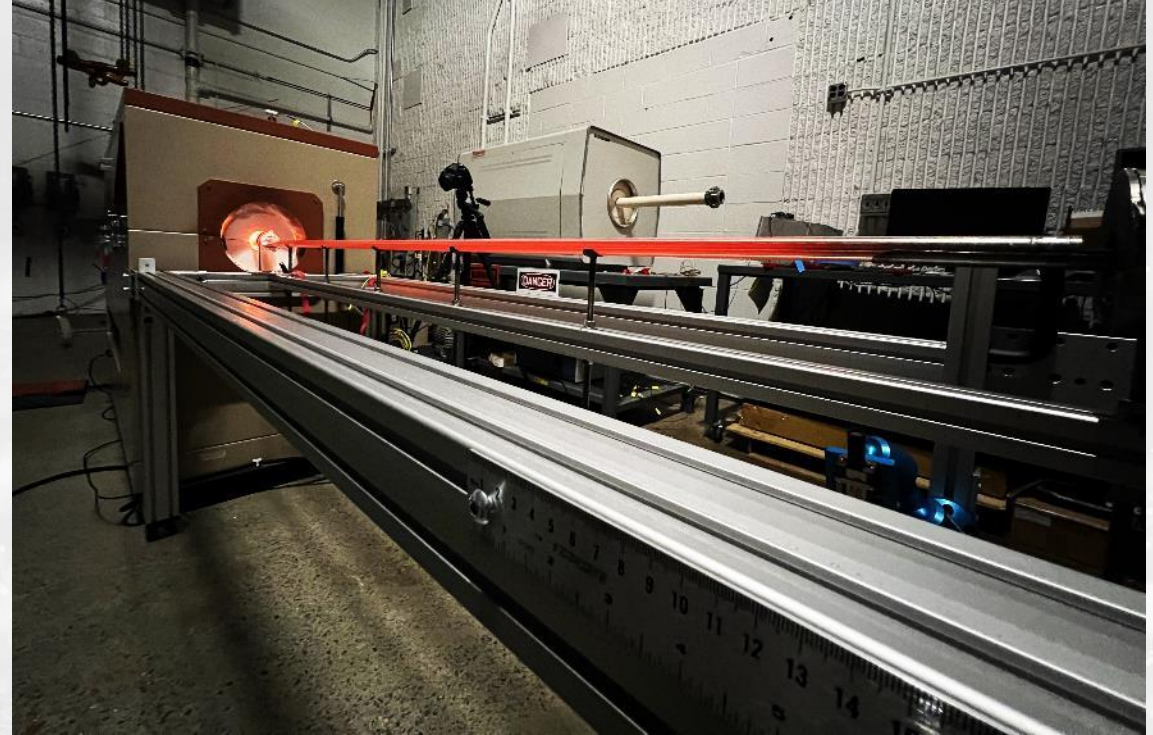
Matt is 6'2" and this is an inside look at the core of an eVinci microreactor.

The demonstration unit behind him weighs in at more than 32,000 lbs with a diameter of more than 3 meters.

It uses the same high-grade materials that will be in every eVinci microreactor and was assembled in exactly the same way.



One step closer to powering our future: 12' Heat Pipe Test



- Westinghouse engineers successfully tested 12' heat pipes, a key demonstration milestone
- Heat pipes are designed to operate at temperatures exceeding 850C, that's about 10x hotter than the coffee from the drive-thru

Westinghouse & Echogen LDES

Grid-Scale Long Duration Energy Storage with unmatched application flexibility



Cost-Effective

~65% LCOS compared to li-ion batteries

Low cost of capacity across longer duration applications



Ultra Long-Life

Targeting **60** years of technology lifespan with the capability for unlimited cycles

Maintains capacity over time without augmentation.



Safe & Sustainable

100% non-toxic with no hazardous materials in an inherently safer design

Low carbon footprint and fully recyclable end of life

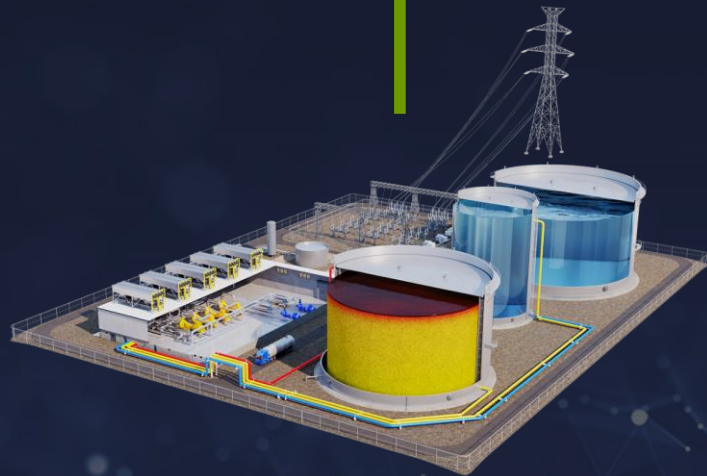


How It Works

Storing electrical energy as a differential of temperature.

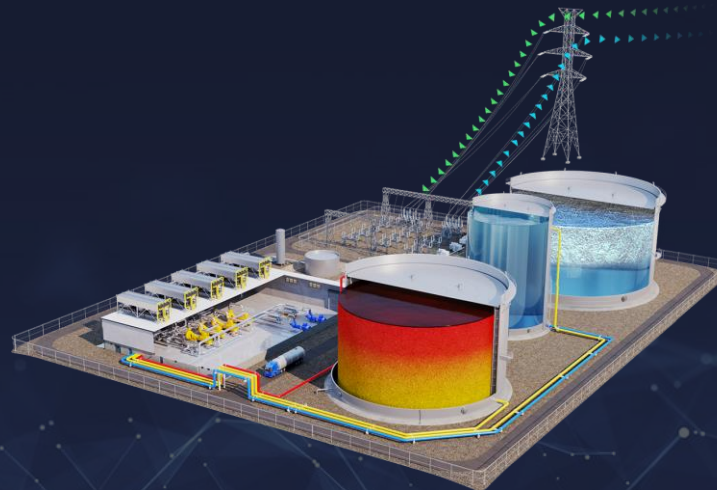
Charging

sCO₂ heat pump cycle consumes grid power to move heat from freezing of water in LTR to heating oil/media in HTR.



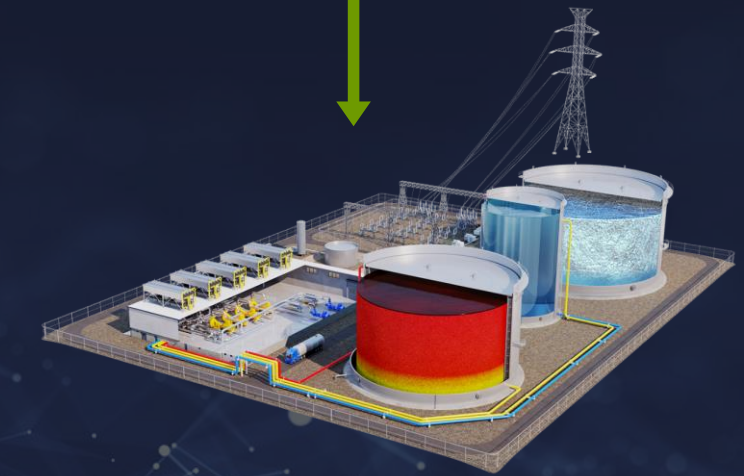
Zero Charge

System at a fully discharged state where LTR has chilled water and HTR has warm oil/media.



Discharging

sCO₂ heat engine cycle utilizes stored temperature difference to produce electricity, melting ice & cooling the oil/media.



Full Charge

System at a fully charged state where LTR has ice and HTR has hot oil/media.

Proven Technology

Balancing innovation with proven components to deliver a reliable system

Systems

Generation

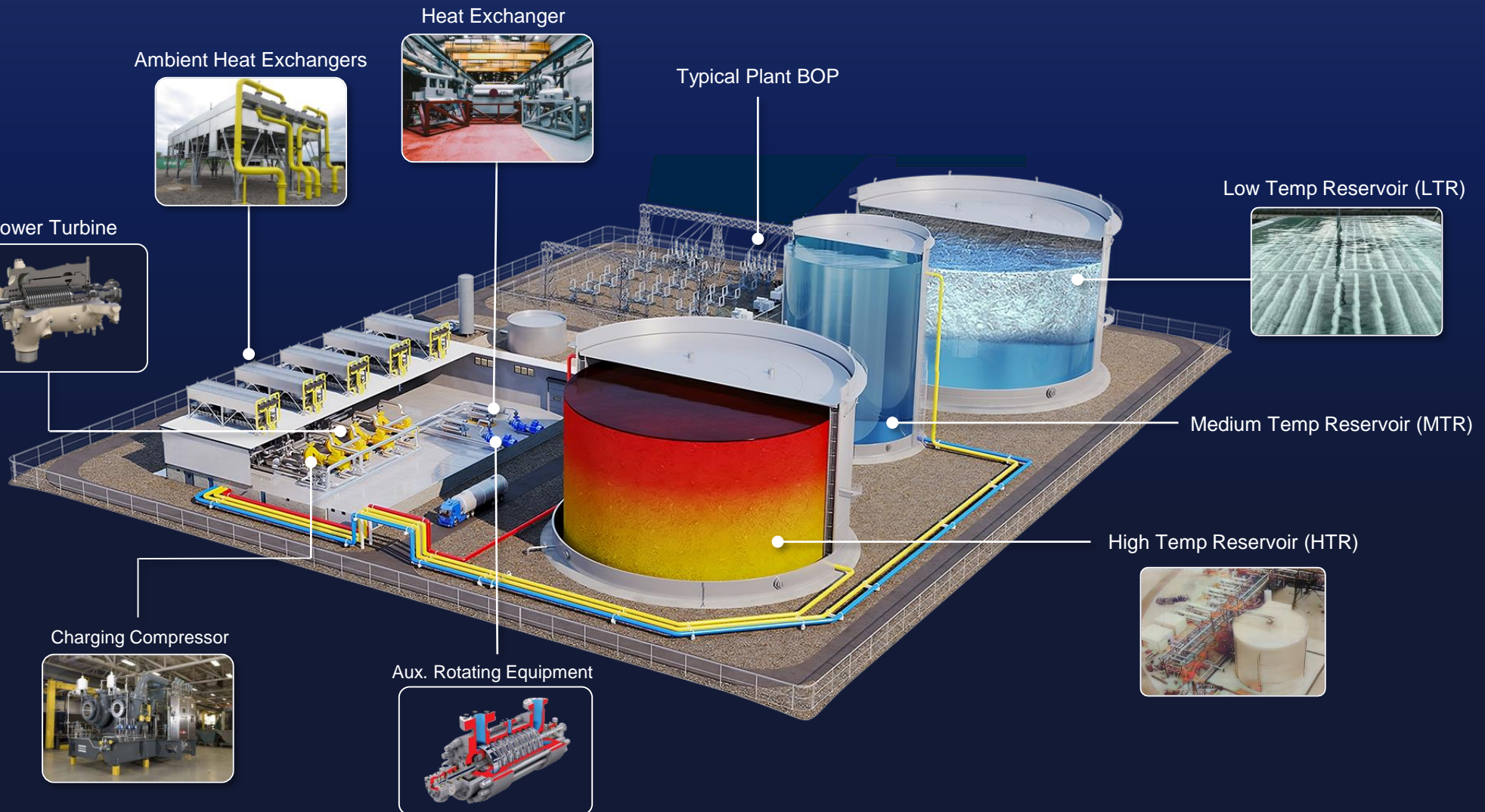


The EPS100 is a commercially available generating system with over 330 hours of operation

Heat Pump



Large pilot scale system used to validate models



Heat Exchanger

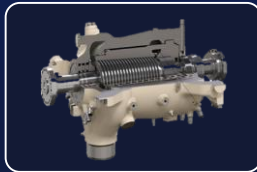


Ambient Heat Exchangers

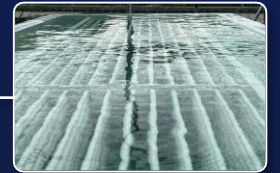


Typical Plant BOP

Power Turbine

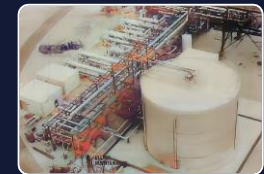


Low Temp Reservoir (LTR)



Medium Temp Reservoir (MTR)

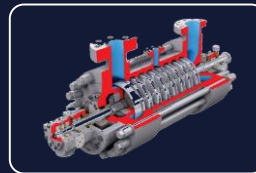
High Temp Reservoir (HTR)



Charging Compressor

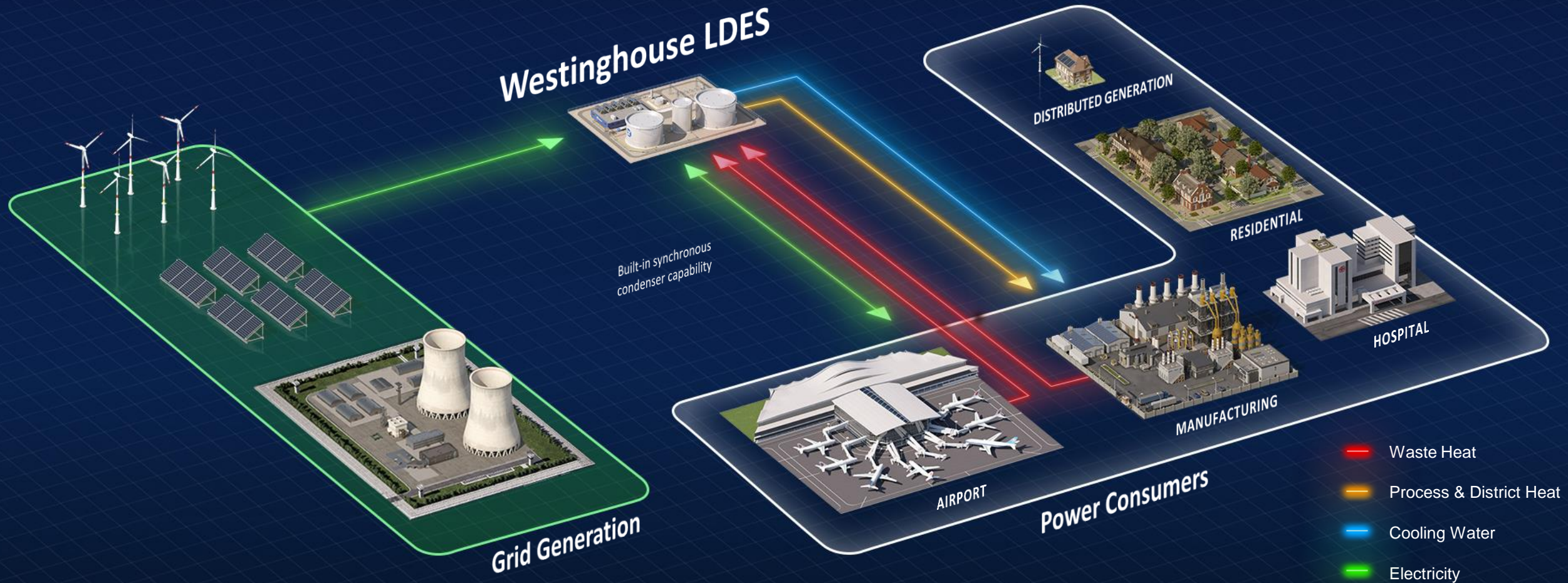


Aux. Rotating Equipment



Grid Level Support

From 8 hours to multiple days of stored capacity & other ancillary services to enable Net Zero Goals



POLAR Project in Healy, AK

One of the largest, planned installations of long-duration energy storage in the United States



- US Department of Energy awards project to deploy 50MW, 1.2 GWh utility-scale long-duration energy storage
- Built to support new deployment wind to replace decommissioning fossil units
- Minimizes challenges associated with transmission limitation & low-sulfur distillate fuel costs
- Provides significant benefits to local community in air quality and utility pricing
- Will employ portion of existing staff – similar skillset

Submission to DOE

March 2023

Award Date

Sept. 2023

Contract Signed

July 2024

Phase 1 Feed Study

July 2024

Design Completed

Q4 2025

Construction Started

Q1 2026

COD

Q1 2029

Westinghouse LDES

Grid-Scale Long Duration Energy Storage with unmatched application flexibility



Cost-Effective



Ultra Long-Life



Safe & Sustainable

