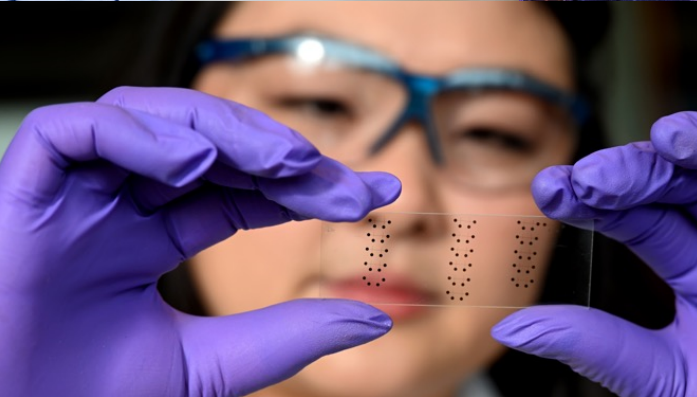


April 4, 2024

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New & Advanced Reactors: Codes & Standards

*Nuclear Regulatory Commission Headquarters
Rockville, MD*

Battelle Energy Alliance manages INL for the
U.S. Department of Energy's Office of Nuclear Energy



Idaho National Laboratory

COP28 - Countries Commit to Working together to Tripling Nuclear Capacity by 2050

- Announced by Special Presidential Envoy John Kerry at COP28
- 20+ nations part of declaration to triple nuclear energy by 2050
 - For the US, this would mean going from 100 GWe to 300 GWe
 - World-wide this would mean going from 400 GWe to 1200 GWe
- Declaration Language:
<https://www.energy.gov/articles/cop28-countries-launch-declaration-triple-nuclear-energy-capacity-2050-recognizing-key>

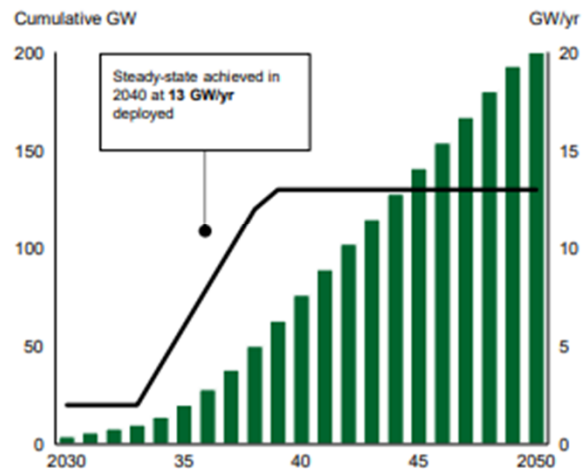


COP28
UAE

U.S. domestic nuclear capacity has the potential to scale from ~100 GW in 2023 to ~300 GW by 2050

New nuclear deployment starting in 2030

Annual deployment (GW/yr) built and Cumulative GW online



New nuclear deployment starting in 2035

Annual deployment (GW/yr) built and Cumulative GW online

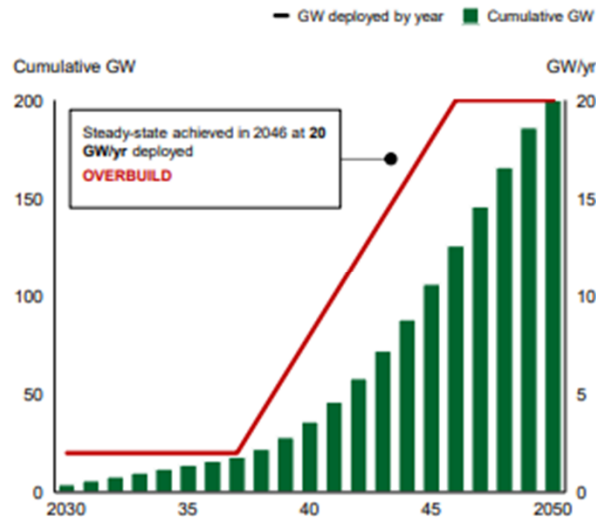


Figure 1: New nuclear build-out scenarios and implications for industrial base capacity requirements



“Power system decarbonization modeling, regardless of level of renewables deployment, suggests that the U.S. will need ~550–770 GW of additional clean, firm capacity to reach net-zero.”

U.S. nuclear industry recognizes the demand for new nuclear power projects

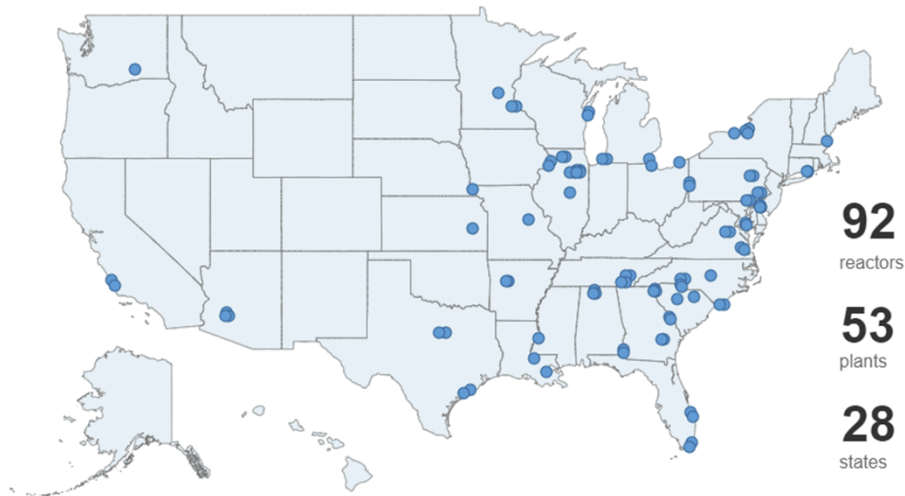
Utilities recently identify the need to add 100 gigawatts of nuclear power by 2050, more than doubling current capacity.



NUCLEAR ENERGY
FACT SHEET 2022

United States

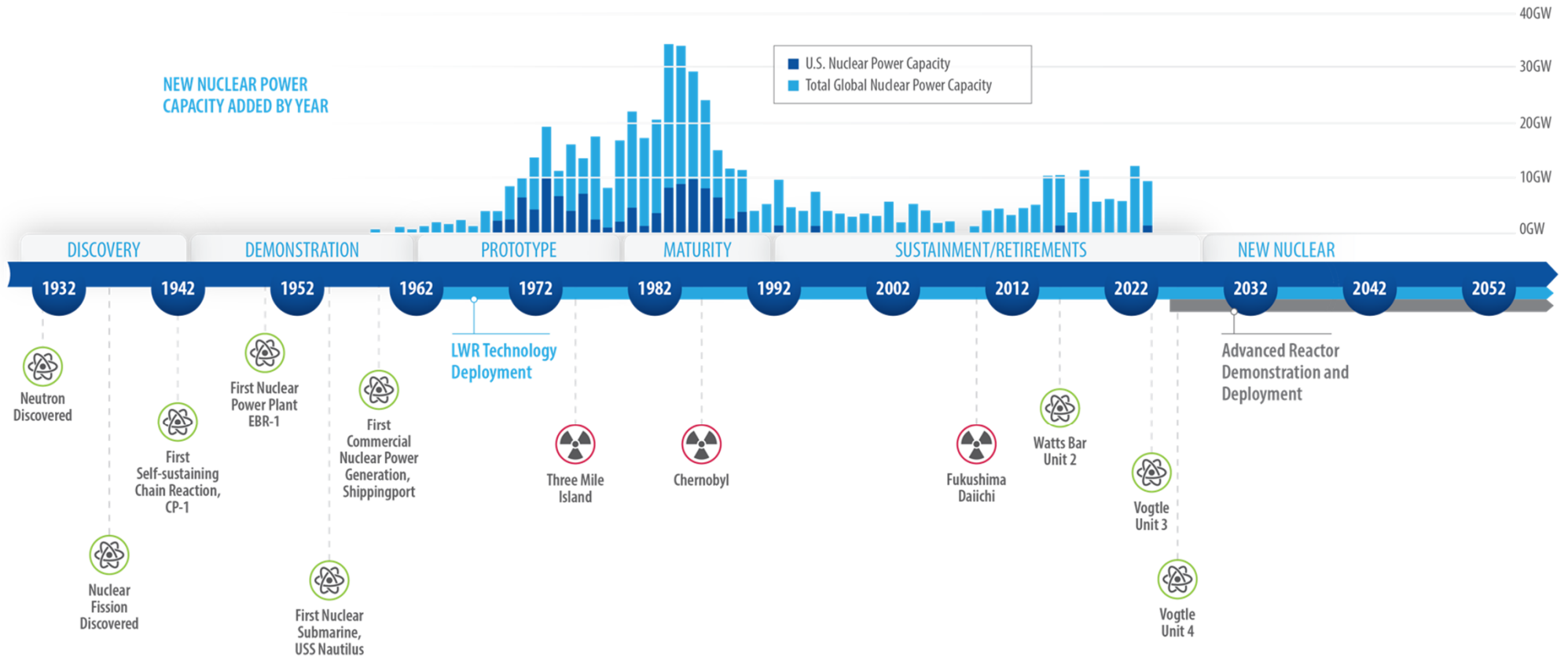
NUCLEAR POWER ACROSS THE U.S.



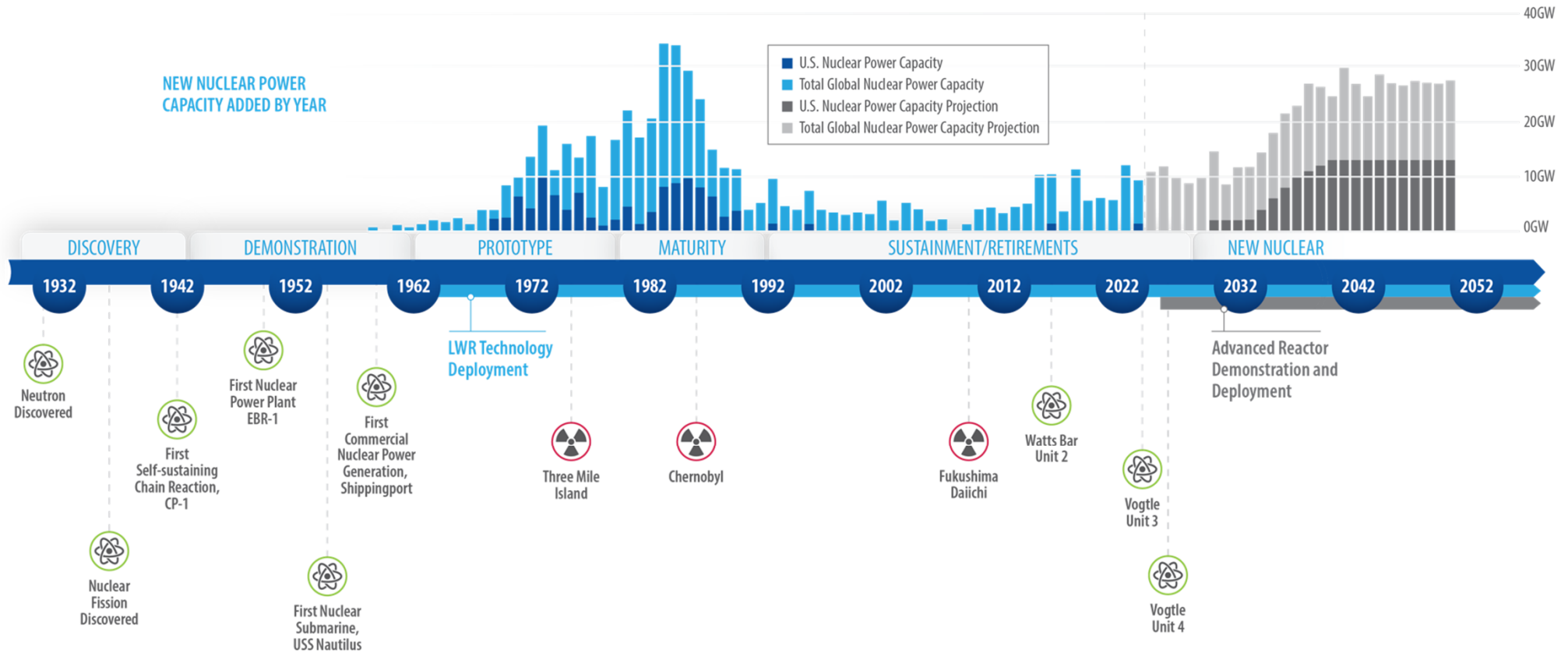
Today, 92 reactors provide nearly 20% of the electricity produced for our power grid and more than half of our carbon-free electricity – more than solar, wind, hydro, and geothermal combined.

- Utilities are prepared to invest in nuclear energy because it is a proven non-carbon-emitting solution
- New reactor designs are simpler, more versatile, and more economical at scale
- Utilities are evaluating reusing retired coal plant sites to leverage existing infrastructure and workforce
- Emissions avoided by adding 100 gigawatts of nuclear power is equivalent to taking more than 100 million cars off the road.

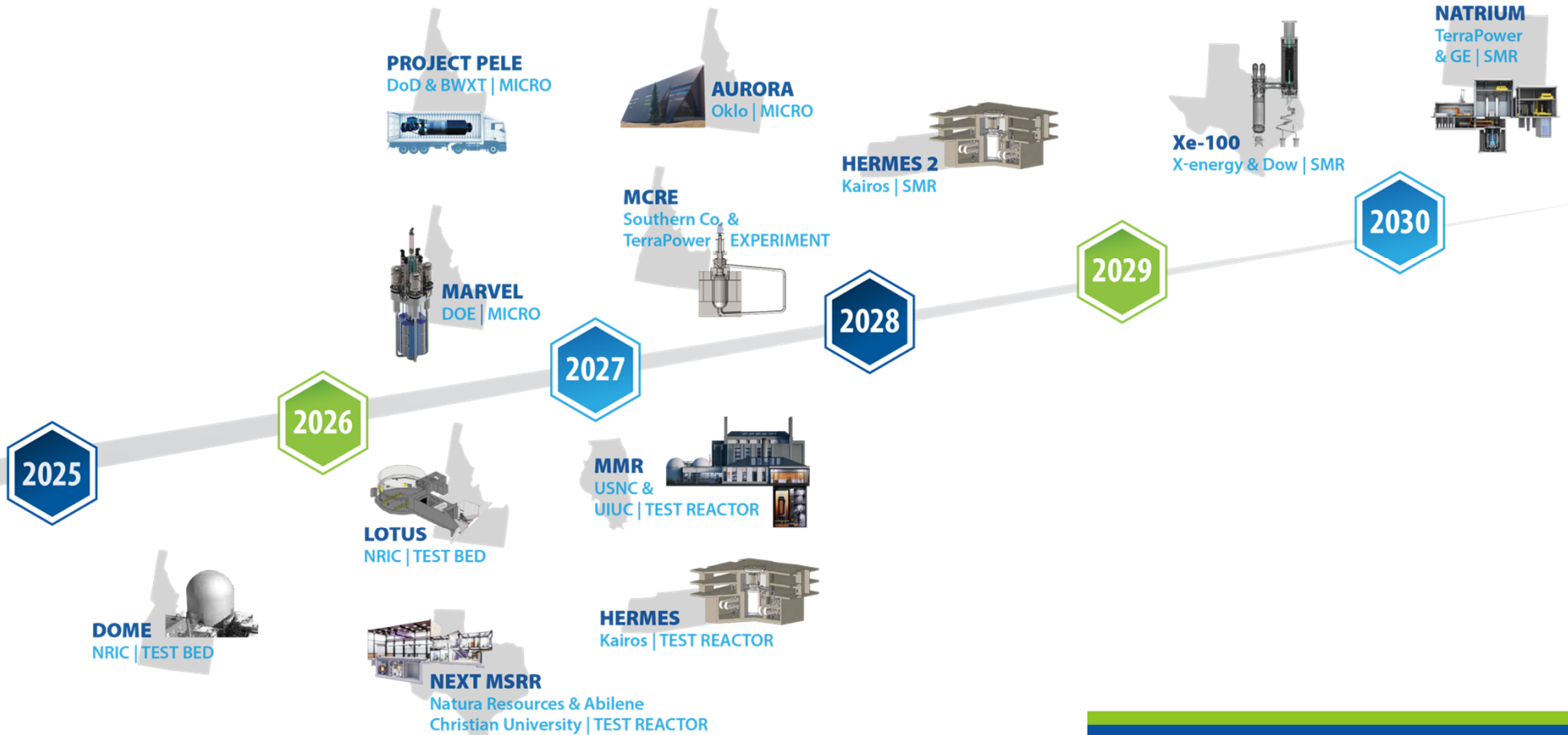
The past and future of nuclear power



The past and future of nuclear power



Accelerating advanced reactor demonstration & deployment



My ask for this workshop:

- How can we enable this nuclear future by reducing over-conservatism, including in codes and standards, to reduce cost and schedule for nuclear energy?
- How can new technologies enable this? – With improved testing and characterization, advanced modeling and simulation, artificial intelligence, sensors and instrumentation.
- What is possible regarding new, forward-looking approaches that maintains the high level of safety and performance, but offers significant advances in reducing effort, time and cost for developing and deploying reactors.



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Battelle Energy Alliance manages INL for the U.S. Department of Energy's Office of Nuclear Energy. INL is the nation's center for nuclear energy research and development, and also performs research in each of DOE's strategic goal areas: energy, national security, science and the environment.

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