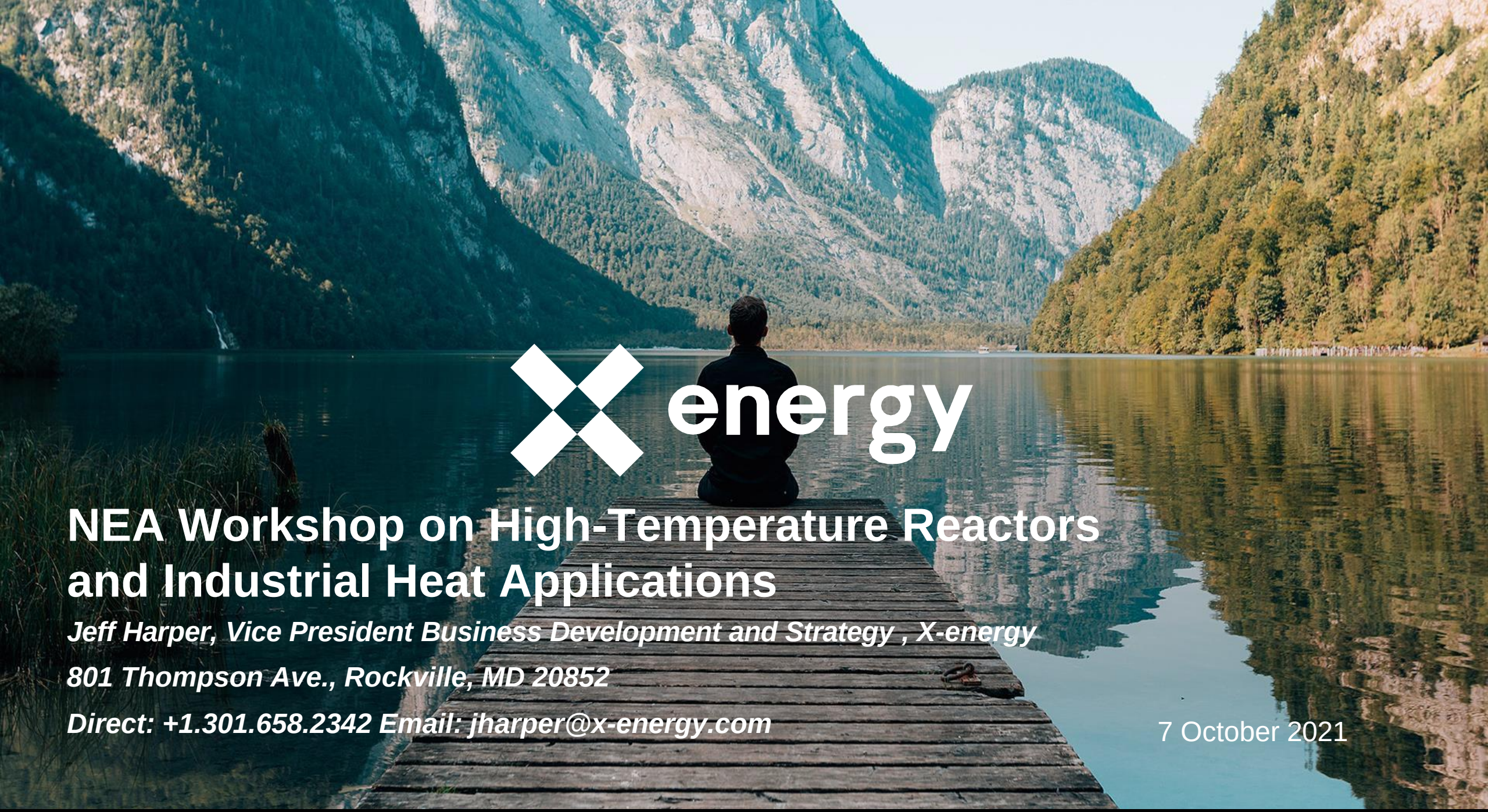

NEA Workshop on High-Temperature Reactors and Industrial Heat Applications

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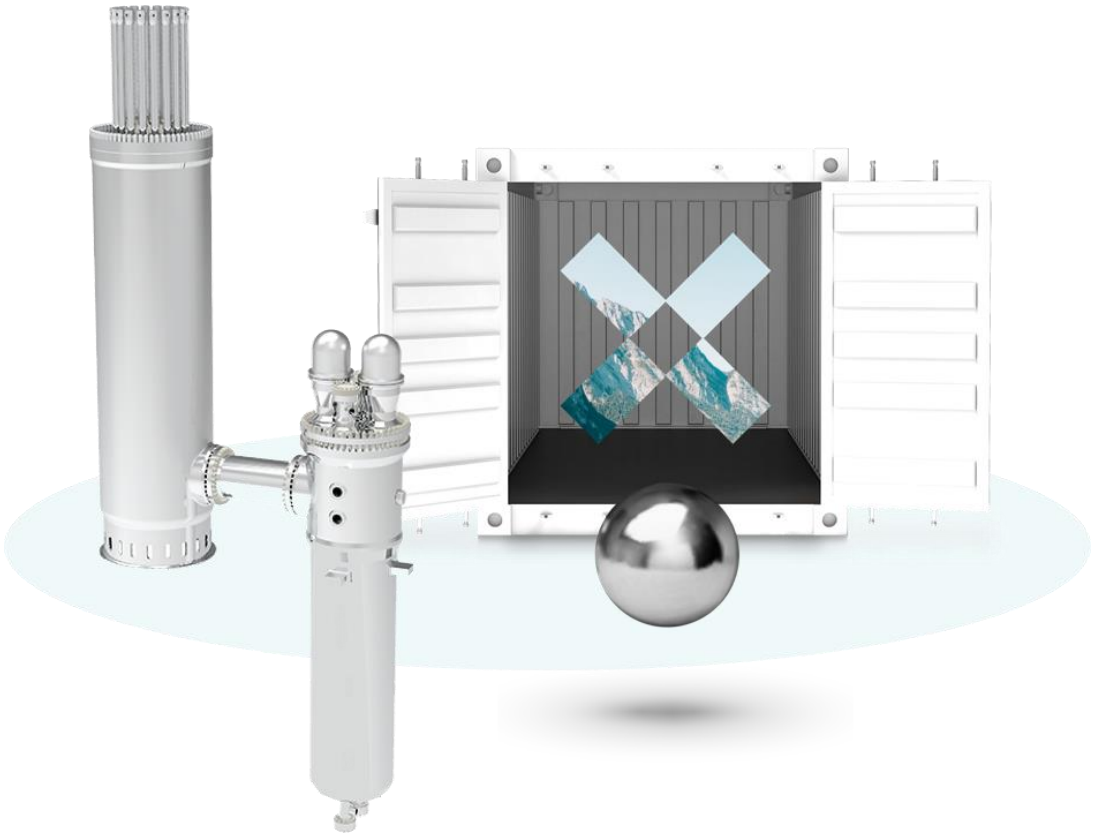
We Design and Build Reactors and the Fuel That Powers Them



Reactor: Xe-100

We're focused on Gen-IV High-Temperature Gas-cooled Reactors (HTGR) as the technology of choice, with advantages in sustainability, economics, reliability and safety.

Reactor: Xe-Mobile

To address the need for ground, sea and air transportable small power production. We've developed reactor concepts with potential civilian government, remote community and critical infrastructure applications.

Fuel: TRISO-X

Our reactors use tri-structural isotropic (TRISO) particle fuel, developed and improved over 60 years. We manufacture our own proprietary version (TRISO-X) to ensure supply and quality control.

Space Applications

NASA, DOE, and DOD are exploring our technology and fuel for nuclear thermal propulsion and fission power for the lunar surface.

The “Xe-100“- Innovative and Flexible

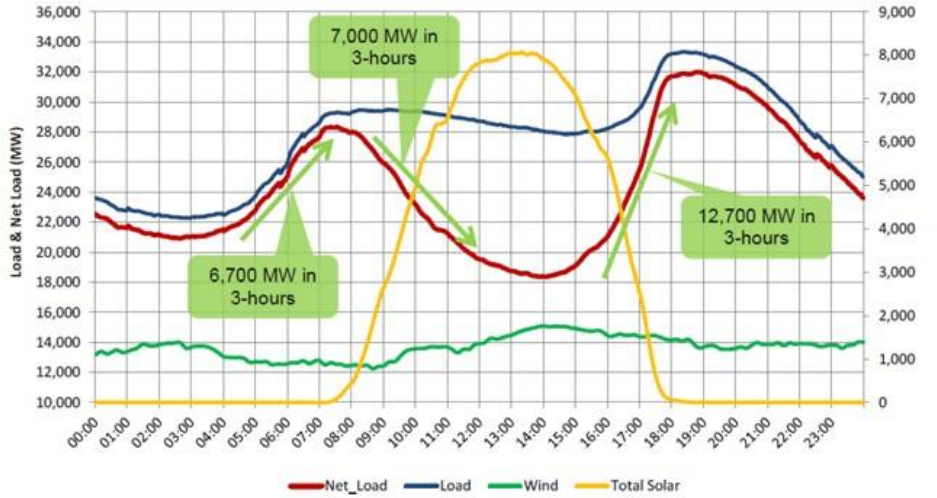
(1) Right size

The reactor size of 200MWt (80MWe) has been designed to address the largest possible market providing a good fit for replacement of existing carbon-based heat sources such as coal and gas.

(2) Broad range of applications

The nuclear island has been designed to be independent of the end use making our solution deployable for electricity and many other applications that require process heat to replace carbon-based fuels

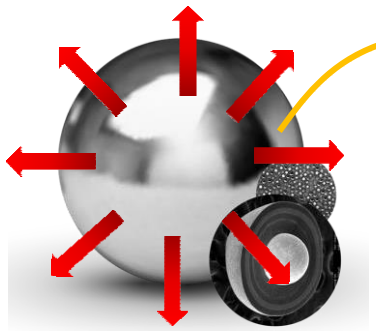
- Hydrogen production
- Desalination
- Petrochemical industries
- District heating ….

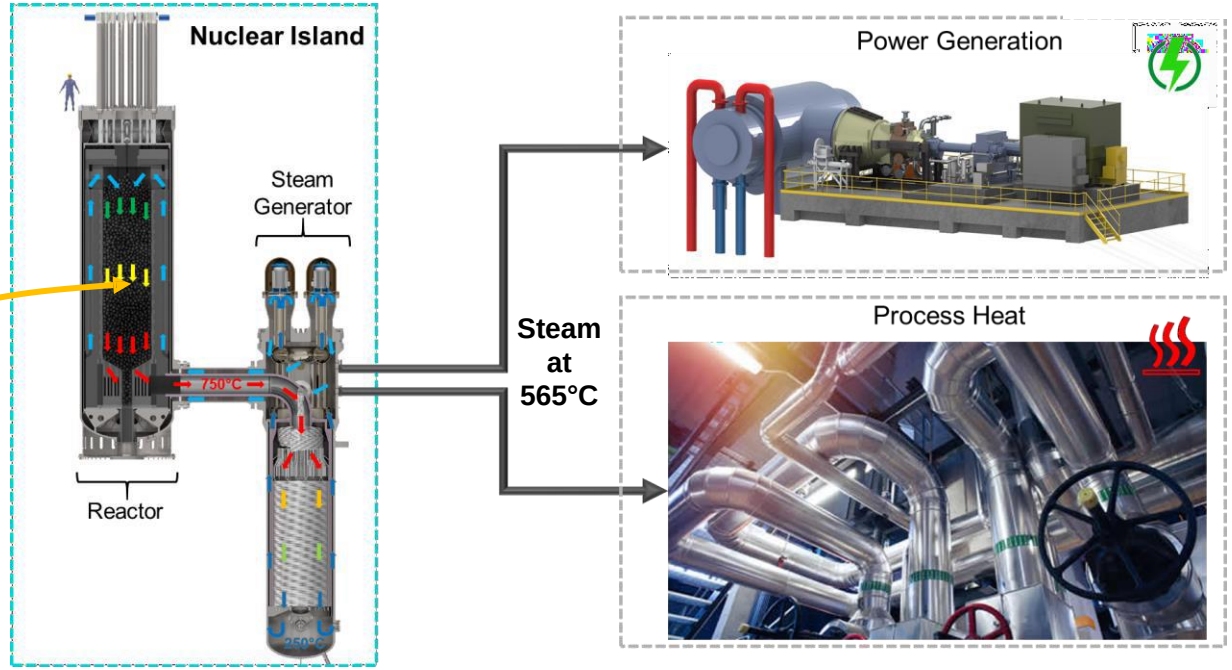


(3) Flexible power delivery

Designed to be capable of fast and efficient load following thus supporting the intermittency of solar and wind

Heat is generated in the pebble fuel through fission and transferred to the steam generator using helium that cannot be activated





Energy Density for Nuclear Makes It a Desirable Choice

1 pebble:
7g with 15.5% wt Low Enriched Uranium,
27.4 MWh

2.66 metric tons of coal

8.0 metric tons of CO_2

about 0.8 metric tons of ash

Reference: https://www.eia.gov/tools/faqs/faq.cfm?id=667&t=2

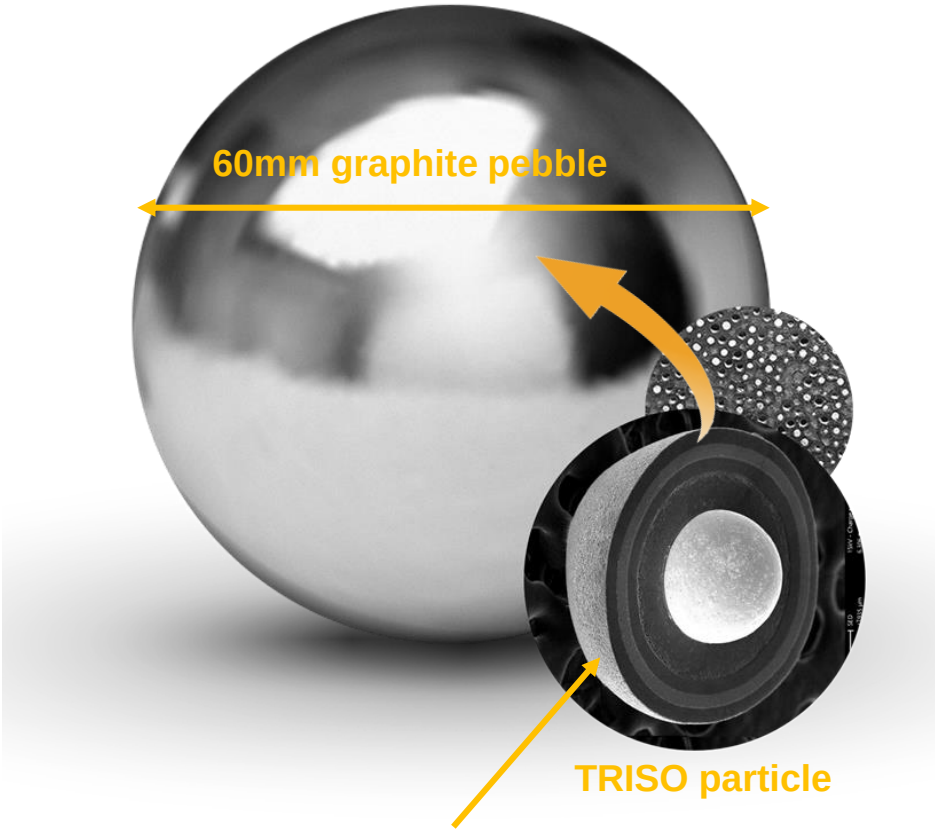
What makes our design Special?

It All Starts With The Fuel!

TRISO particle fuel has a proven pedigree – more that 30 years of operational and fuel fabrication experience
Tested to 1,800°C – remains safe and cannot melt even without active cooling
Burnup to 167,000 MW/t – this is 4 times higher than existing reactors and significantly improves overall economics
Each pebble contains approximately 18,000 TRISO fuel particles – This is equivalent to 18,000 independent miniature containment vessels – these particles replace the need for many complex safety systems that are required in traditional reactors
Excellent long-term robustness (thousands of years) which provides excellent spent fuel containment after use

How is this different ?

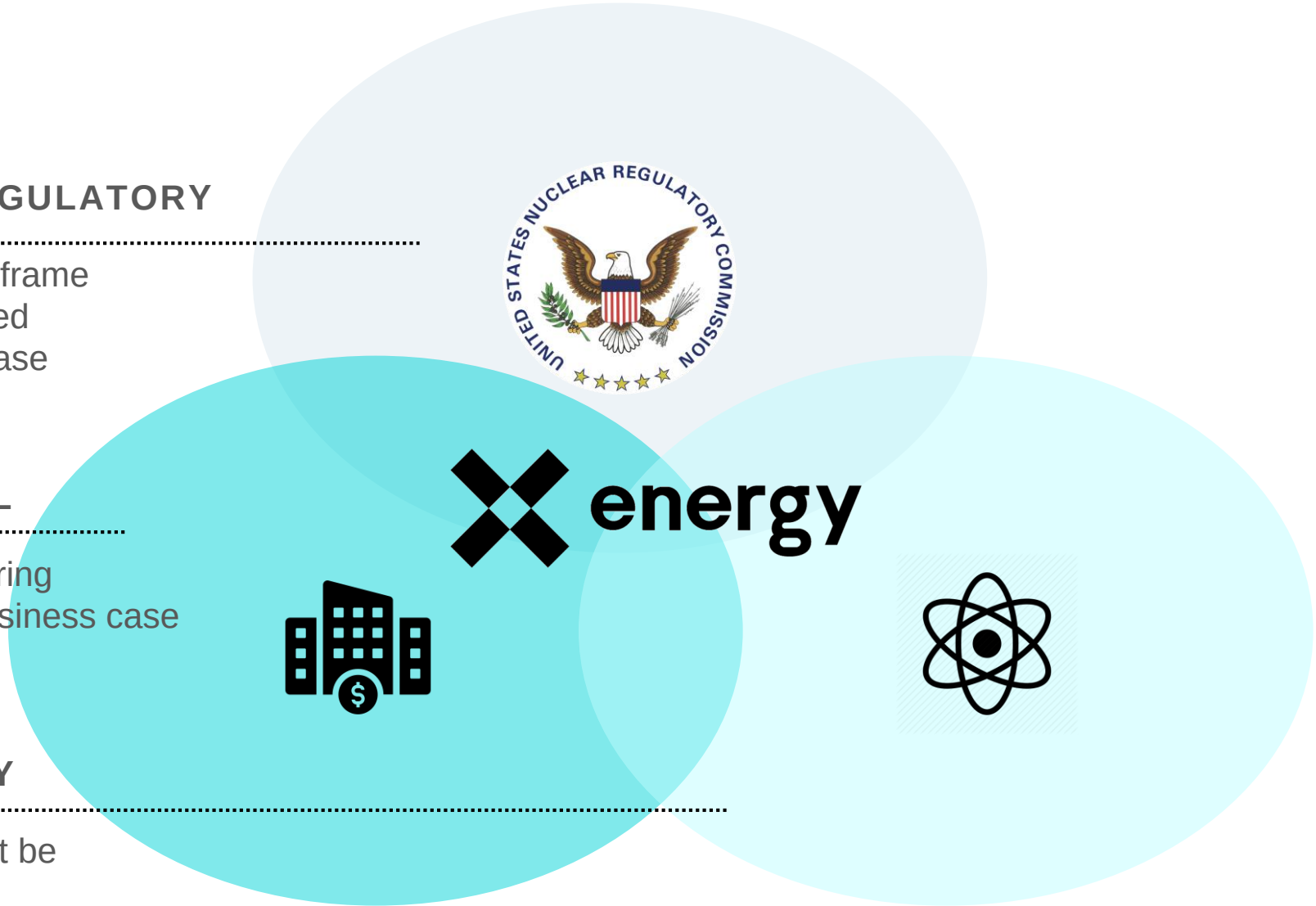
Retaining the fission products within the fuel without requiring complex safety systems helps engineers to simply the design, this reduces licensing complexity, system cost and construction times.



These ~ 1mm particles retain 99.999% of the radionuclides

This fuel allows engineers to think differently about reactor design, ultimate safety and rugged predictable long-term storage

X-energy SMR Deployment Canon



X-energy is Ready to Deploy Reactors this Decade

Program	Entrants	Status and Award	Down-Selection
U.S. DOD Mobile Microreactor Program	9	• DOD will make final down-selection March 2022 • Winners will benefit from ~300 MW of DOD demand through 2040	X-energy, BWXT
OPG SMR Deployment	10	• OPG will make a final down-selection to a single winner no later than Q4'21 • Winner will build reactor at Darlington site • Consortium of Canadian utilities has stated desire to build a *fleet*	X-energy, GE Hitachi, Terrestrial Energy
U.S. DOE Advanced Reactor Demonstration Program	37	• Final two winners selected • DOE cost contribution of $1.2 bn to X-energy Project	X-energy, TerraPower

X-energy typical Impact on the Local economy

Xe-100 Standard Plant

Construction: Creates approximately 800 – 1200 jobs

Operations: Creates approximately 100-200 jobs


energy
empowering earth
Clean • Safe • Secure • Affordable