

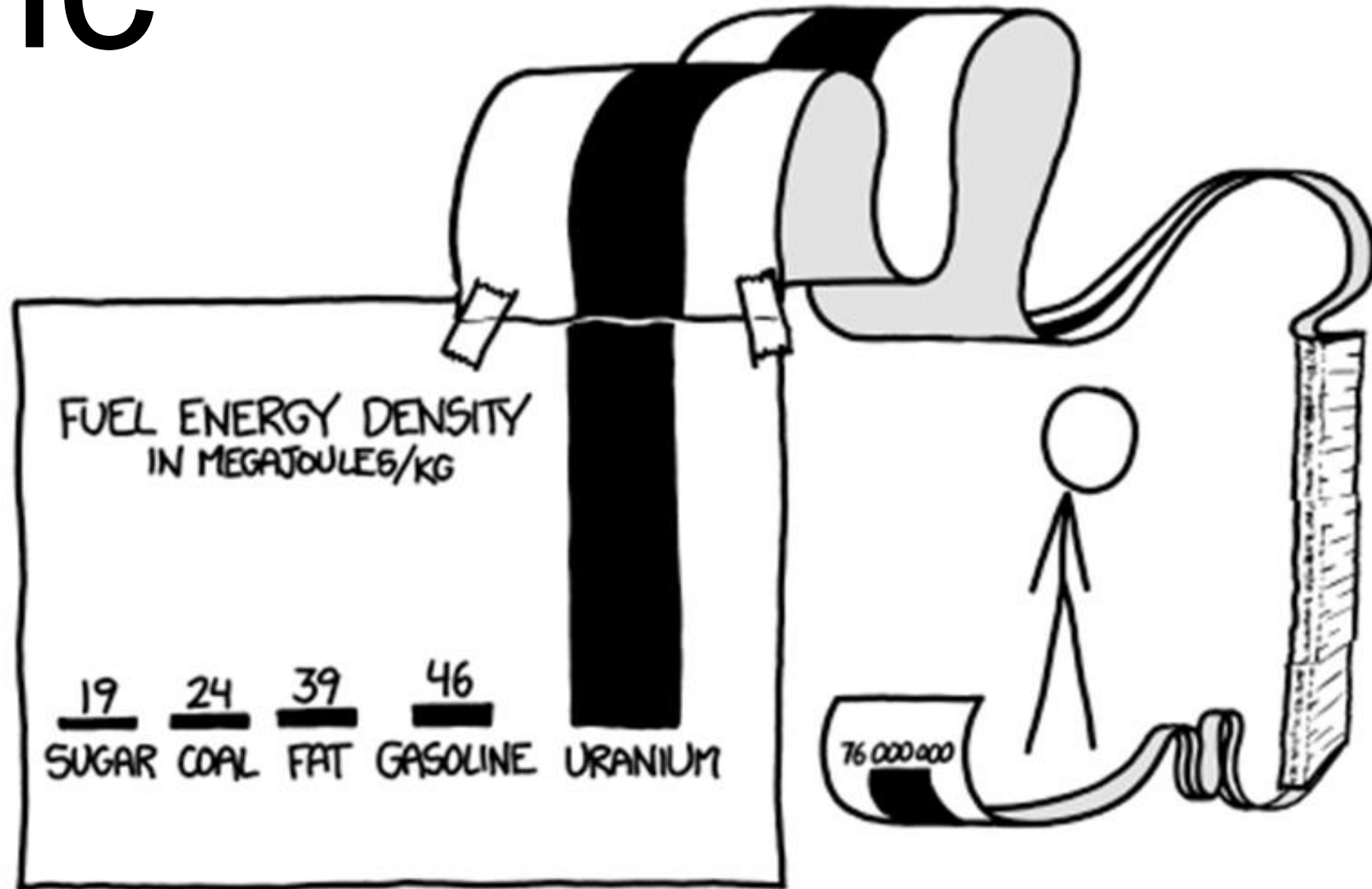
EPRI Perspective on Utility Needs

Cristian Marciulescu

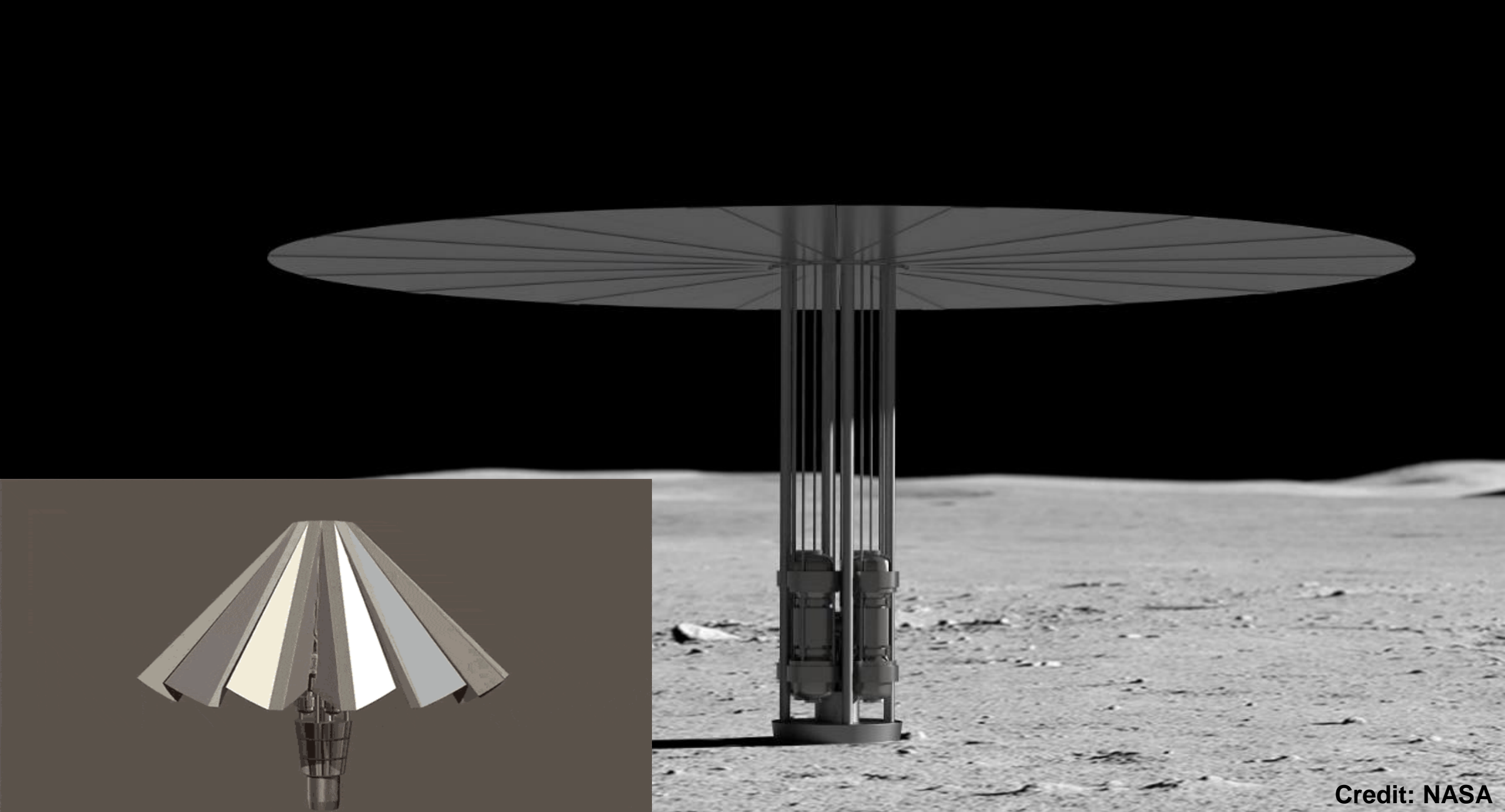
Principal Technical Leader,
Advanced Nuclear Technologies
(ANT), EPRI



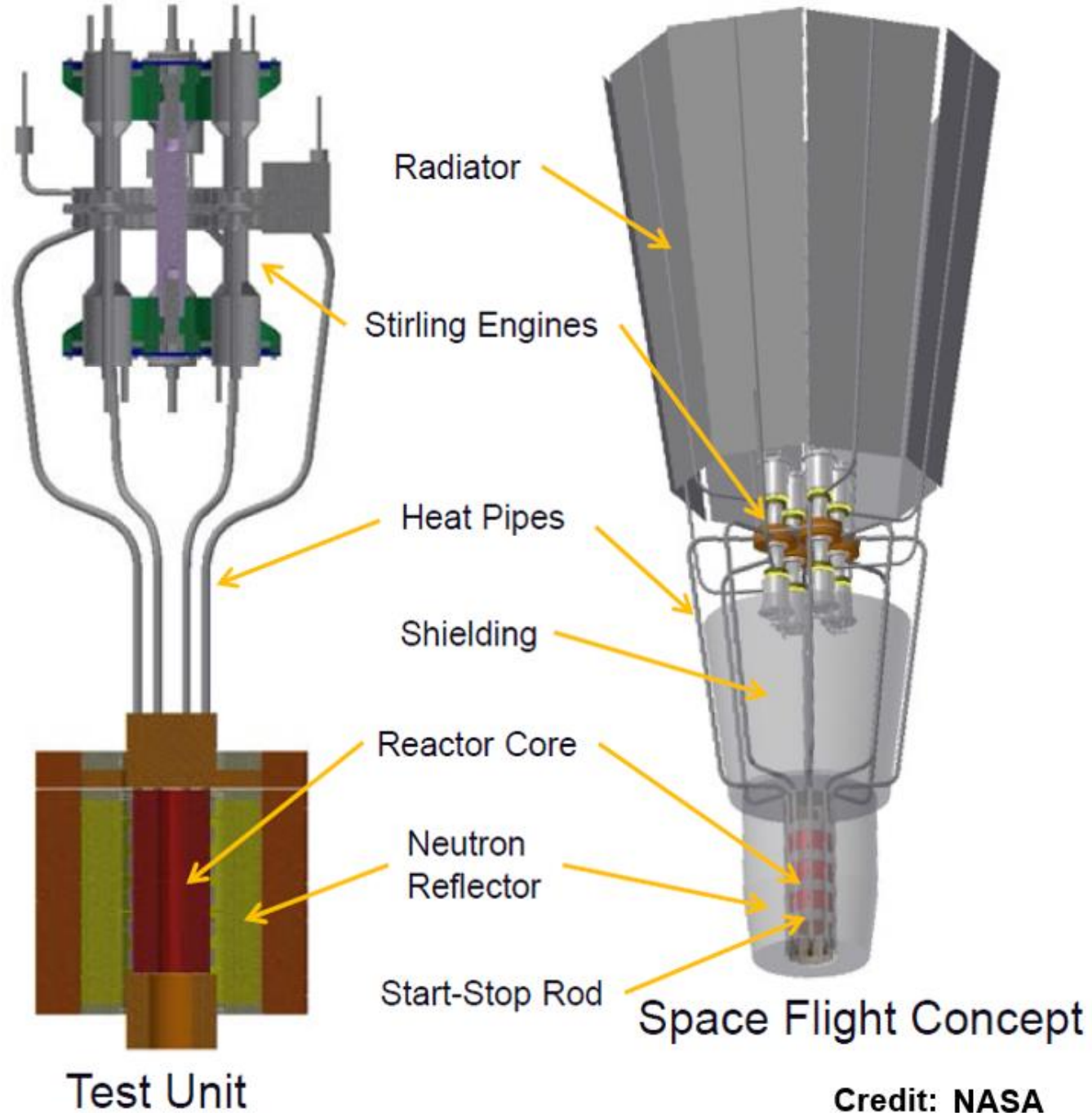
$$E = mc^2$$



Source: <https://xkcd.com/1162/>
This work is licensed under a [Creative Commons Attribution-NonCommercial 2.5 License](#)



Credit: NASA

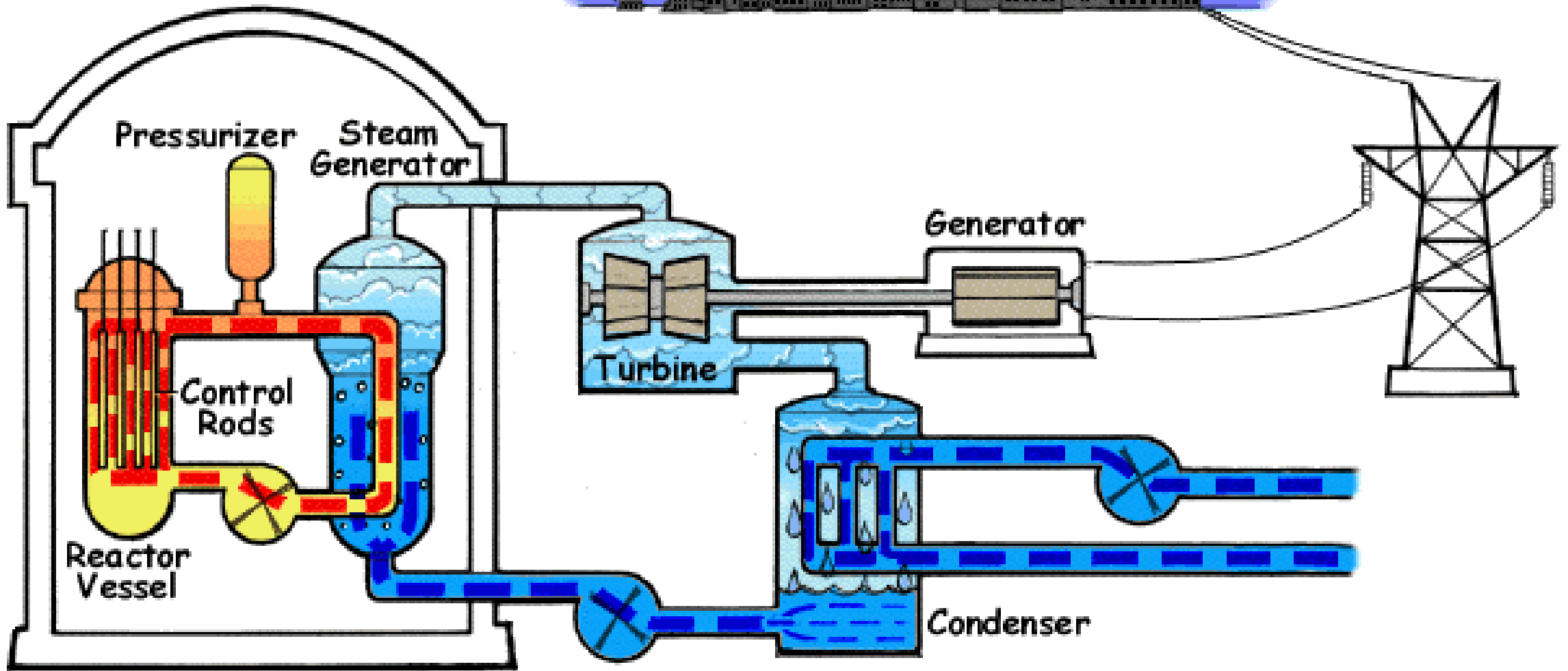
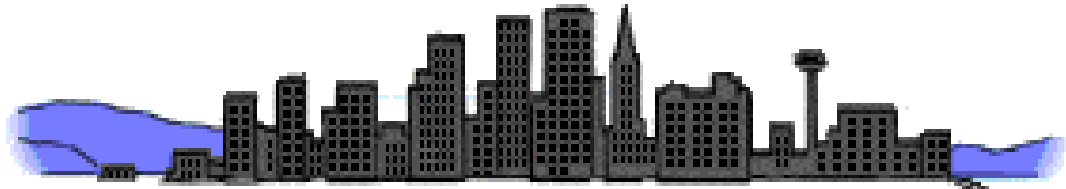


Credit: NASA



McMurdo Station, Antarctica

Containment Structure



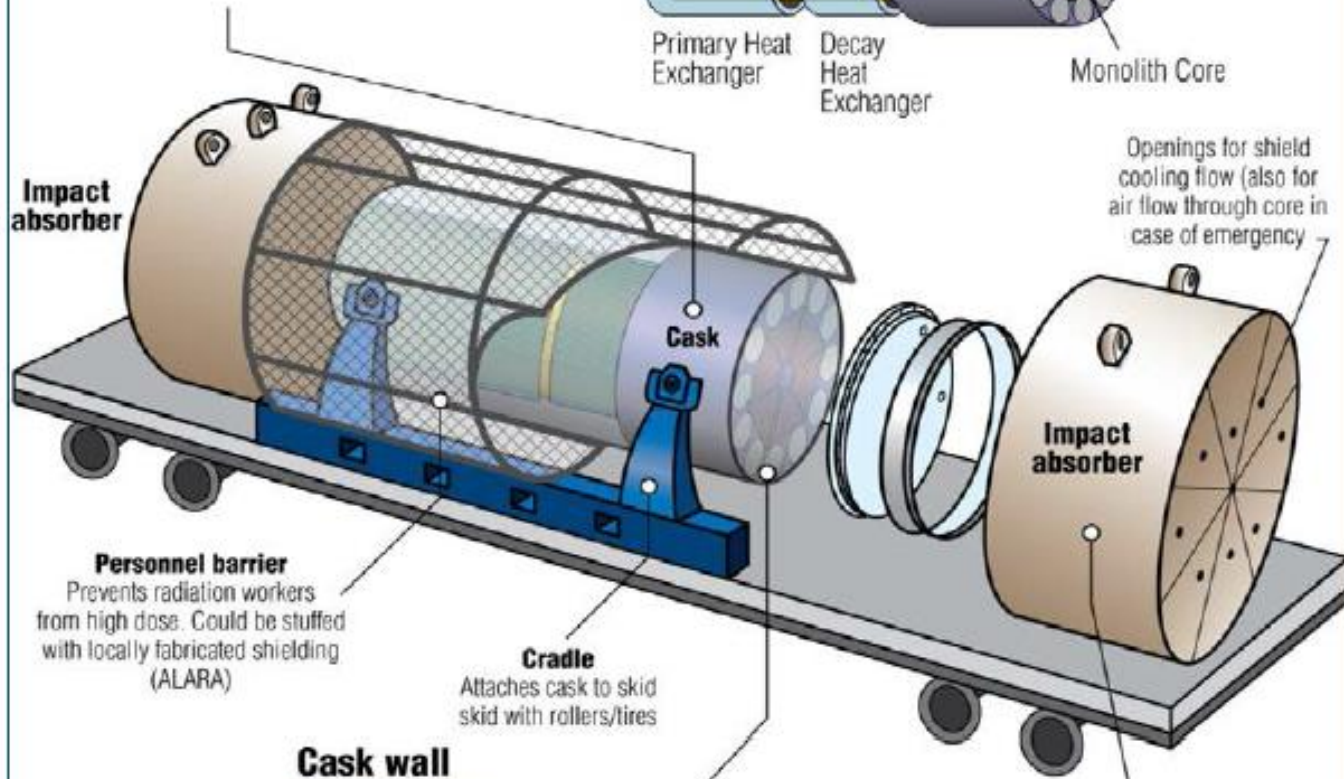
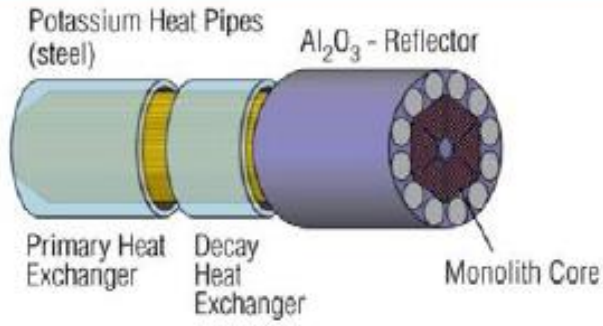
Credit: U.S. NRC

FEATURES:

- ⦿ *Factory Fabricated*
- ⦿ *Transportable*
- ⦿ *Self-Regulating*

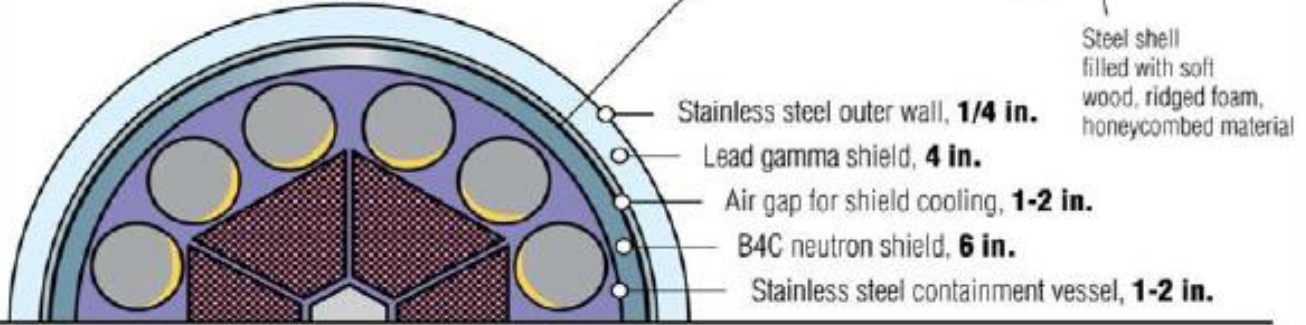


Weighs about 35-45 tons loaded
 Holds 3 tons of fuel in 5 tons of steel monolith
 About 12 ft. long; 6 ft. diameter
 Metallic grill about 10-12 ft. diameter

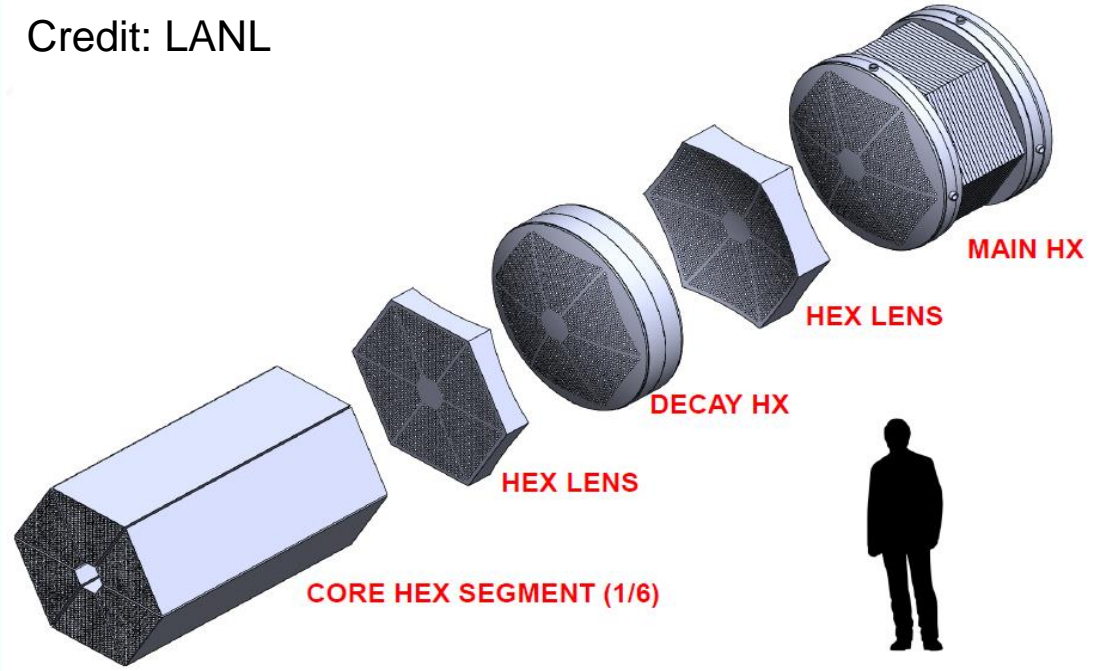


Personnel barrier
 Prevents radiation workers from high dose. Could be stuffed with locally fabricated shielding (ALARA)

Cask wall



Steel shell filled with soft wood, ridged foam, honeycombed material



Credit: LANL

Source: Los Alamos National Laboratory



Credit: GE



Transportable		Civilian	National Security/ Defense	Grid Connection
	Fixed	<ul style="list-style-type: none"> hospitals data centers industrial parks airports communication infrastructure fuel terminals and pipelines water, wastewater treatment 	<ul style="list-style-type: none"> domestic military bases national laboratories government centers other critical installations and infrastructure 	<p>YES</p> <p>grid connected but islandable to support microgrid applications</p>
		<ul style="list-style-type: none"> remote villages remote mining, oil recovery, and other industrial activities 	<ul style="list-style-type: none"> remote military installations 	<p>NO</p> <p>off-grid or microgrid applications</p>
Portable	<ul style="list-style-type: none"> disaster response and recovery 	<ul style="list-style-type: none"> forward and remote operating bases 	<p>off-grid or microgrid applications</p>	

Utqiagvik (Barrow), Alaska



Credit: Galen Rowell/Corbis



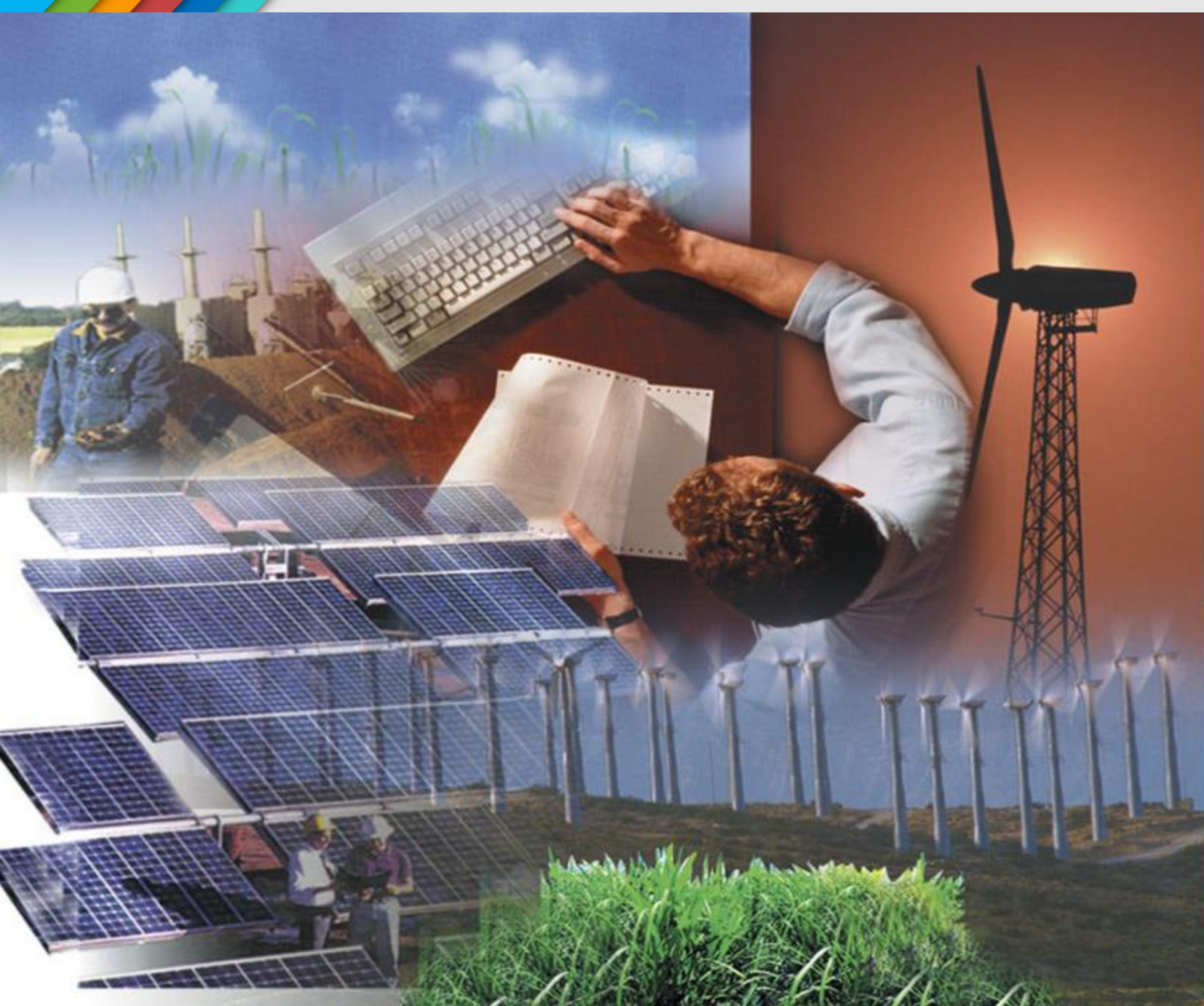
Post-Katrina New Orleans, Louisiana

Credit: The Times-Picayune

Credit: Third Way



Attribute	Sub-Attribute	Benefits
Operational Flexibility	Maneuverability	Load following
	Compatibility with Hybrid Energy Systems and Polygeneration	Support economic operation with increasing penetration of intermittent generation, alternative missions
	Diversified Fuel Use	Economics and security of fuel supply
	Island Operation	Support grid restart, microgrid applications
Deployment Flexibility	Scalability	Ability to deploy at scale needed
	Siting	Ability to deploy where needed
	Constructability	Ability to deploy on schedule and on budget
Product Flexibility	Electricity	Traditional electricity generation mission
	Process Heat	Co- and polygeneration for superior economics
	Radioisotopes	Supply unique or high demand isotopes



Credit: Third Way

