ARPA-E | Innovation in Nuclear

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Meet the ARPA-E Fission Team

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Program Director

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Tech SETA

Gene Carpenter,
Tech SETA

Curt Nehrkorn,
Tech SETA

Gideon Bass,
Tech SETA

Harry
Andreades,
Tech-to-Market

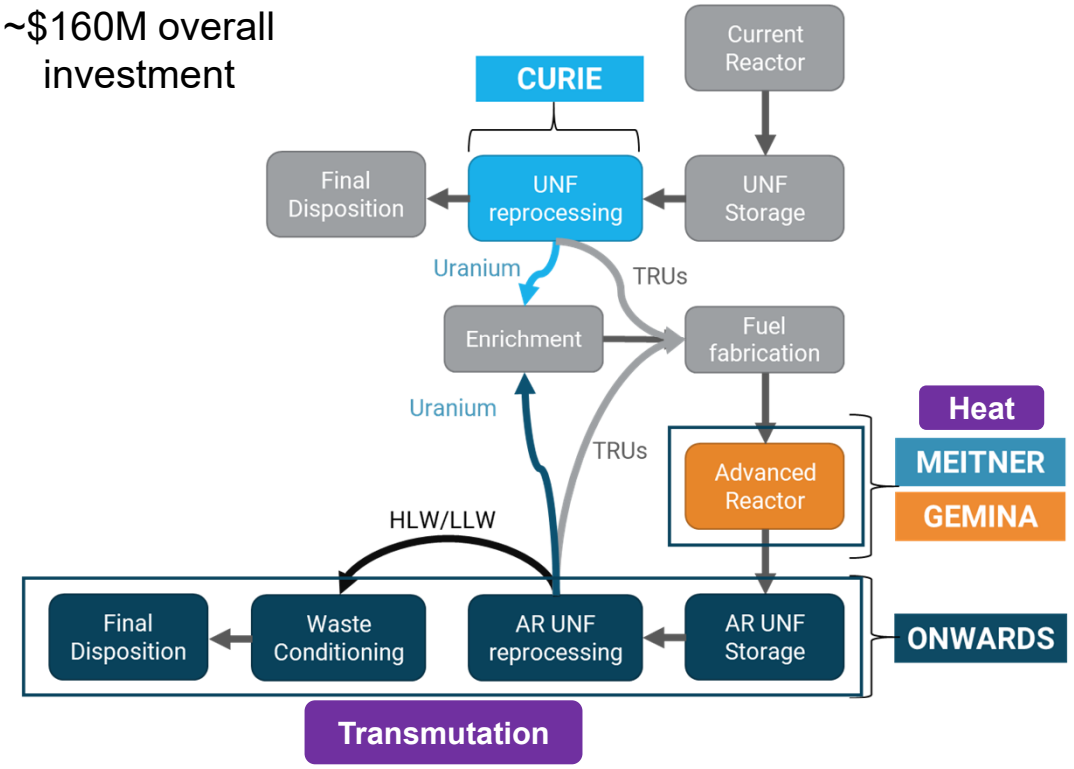
ARPA-E Advanced Nuclear Fission Portfolio

- Fission
  - **MEITNER (2018)**
    - Can we greatly reduce AR CapEx?
  - **GEMINA (2020)**
    - Can we greatly reduce AR OpEx?
  - **ONWARDS (2021)**
    - Can we greatly minimize the disposal impact of AR wastes?
  - **CURIE (2022)**
    - Can we improve the cost and monitoring of UNF reprocessing?
  - **Transmutation & Heat**
    - Active areas of program development

Current Fleet

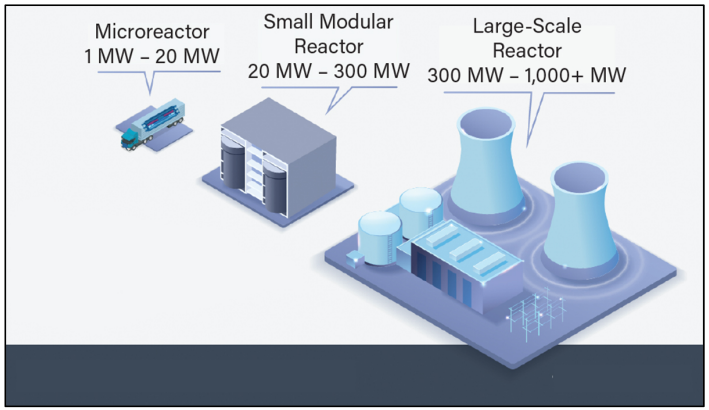
Advanced Reactor Fleet

~$160M overall investment



Attentive to commercialization & deployment

General Demo and Deployment Timelines



Digitization

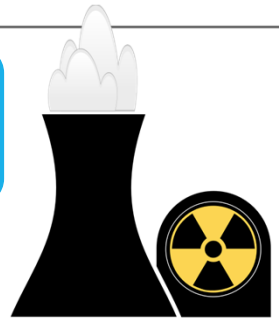
Recycling of SNF

AR Fuel Cycles

2 GWe Installed Capacity?

TerraPower

2030



6 GWe Installed Capacity?

2033

HITACHI

Kairos Power

OKLO

energy

2021

~2025

~2026

~2028

~2029

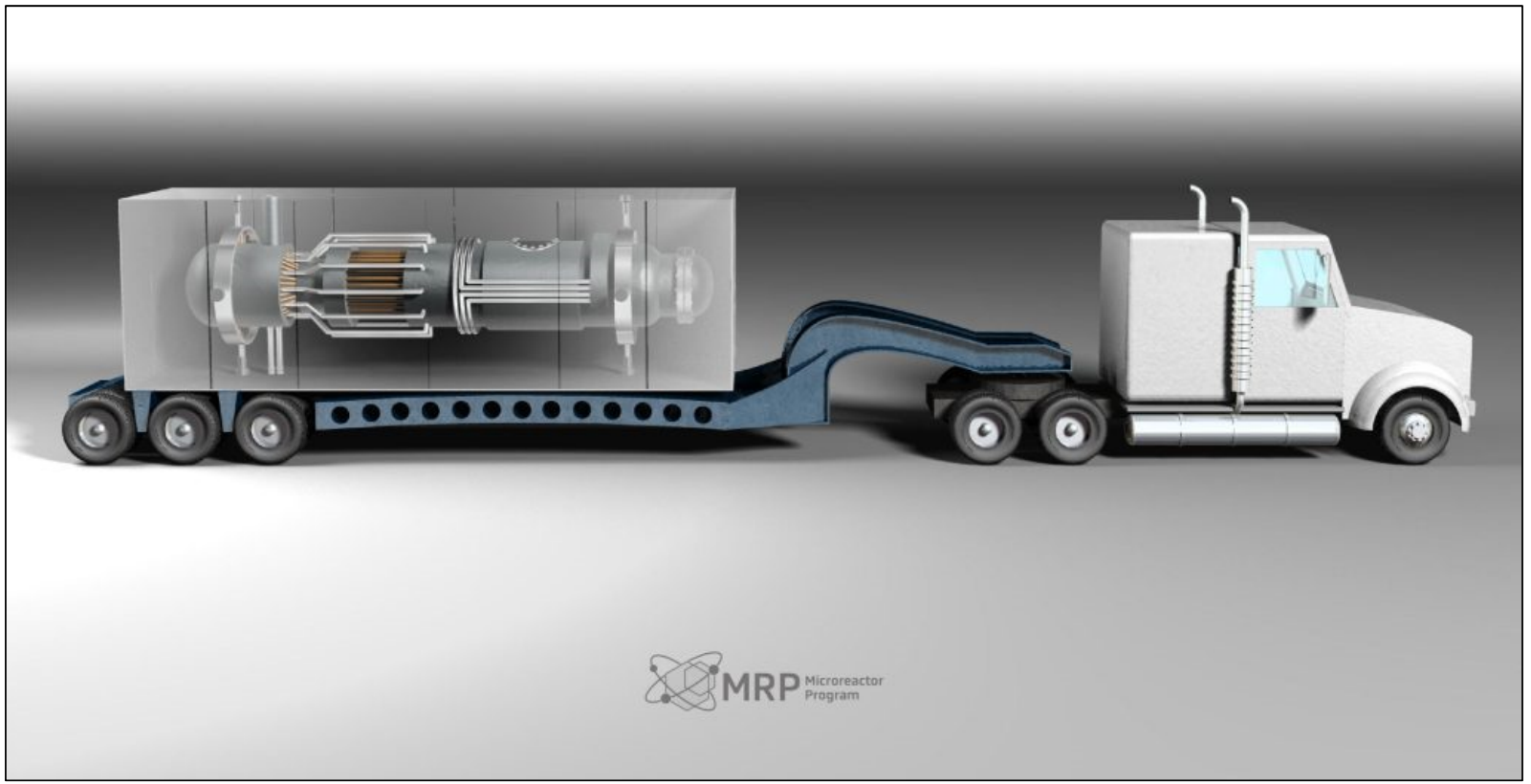
Emerging Market Dynamics

Policy

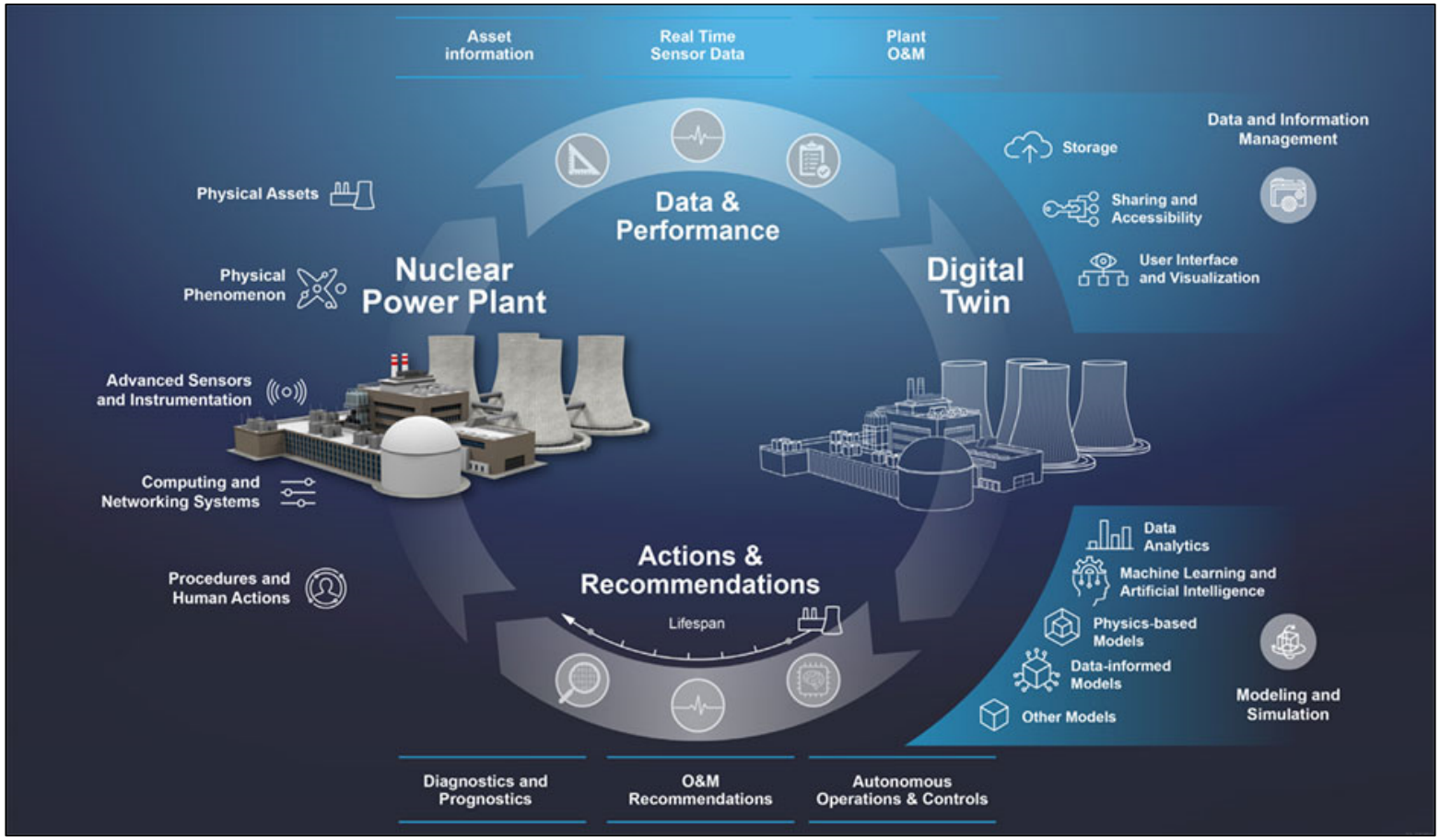
Artificial Intelligence

Industrials

Microreactors



Digital Twins and Control



Innovation & Safety Alignment

- Digital technologies will not roll into nuclear "**overnight**"

- Smaller reactor designs present an opportunity for **decreased hazard** and **improved safety**
  - Considerations will have to be made regarding the balance of staffing plants consistent with classic guidelines versus leveraging human-in-the-loop digital technologies

- Resources will need to be dedicated to **increasing familiarity** with digital technologies

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CHANGING WHAT'S POSSIBLE