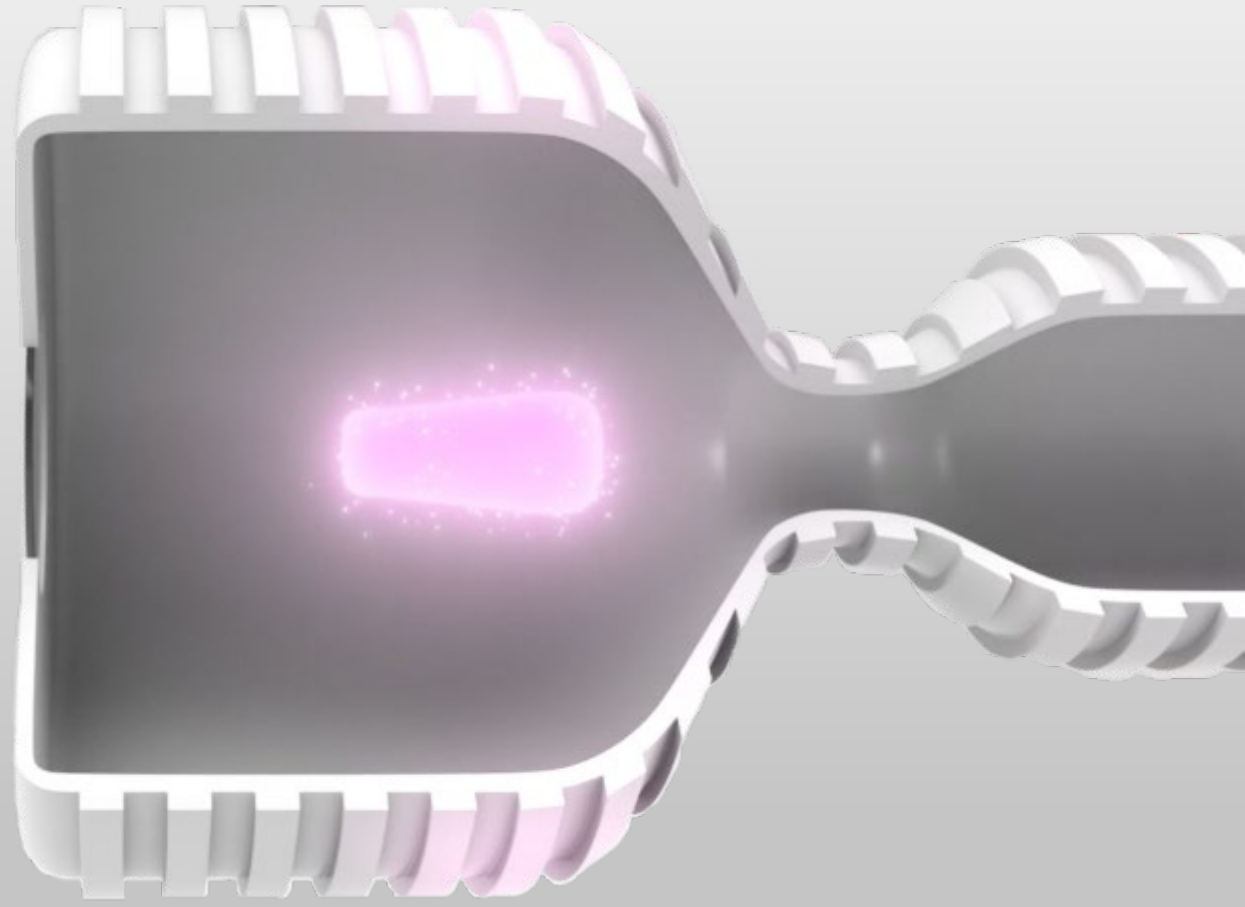
HELION

Perspectives on an Appropriate Regulatory Framework for Fusion



NRC Commission Briefing on Regulatory Approaches for Fusion Energy Devices

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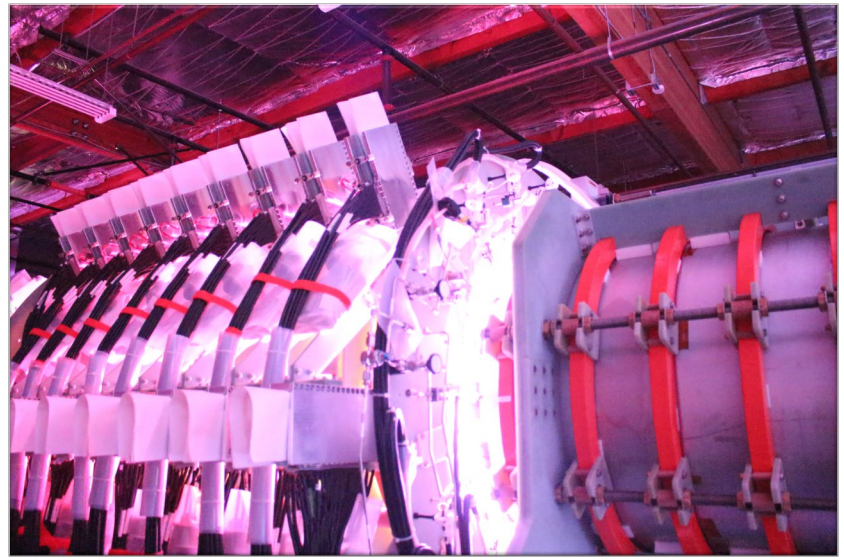
The Private Sector Fusion Community

Private Fusion Community

- 20+ US companies, collectively raised around $4 billion
- Seeking to prove technology by 2024/25, deploy in 2030s

An Example – Helion Energy

- Built working protypes that reached fusion conditions
- 6th and 7th gen devices regulated by WA State



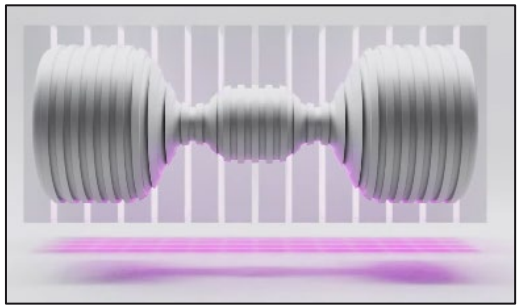
Trenta, Helion's 6th gen fusion prototype

Why Fusion?

- Winning the fight against climate change requires 1GW a day
- Fusion eliminates energy insecurity

Fusion's Safety Case – Within Scope of Materials Framework

Hazard	Comparison
Operational	
Neutron/photon radiation	• Commercial particle accelerators (e.g., medical cyclotrons)
Rad-material input/output	• Commercial accelerators
Activated material & LLRW	• Commercial accelerators; irradiators; general industrial users
Off-Normal	
Release of in-device material	• Commercial accelerators; irradiators
Release of out-of-device material	• Commercial accelerators; irradiators; general industrial users



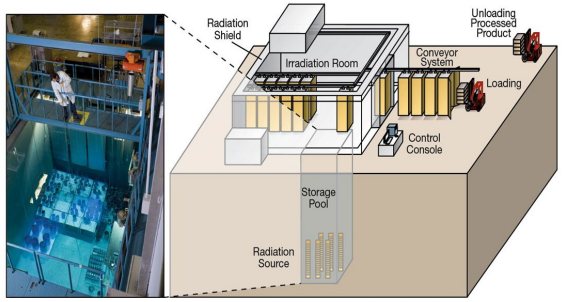


Image Sources: Helion Energy website (www.helionenergy.com); Image of IBA Cyclone 70 (70 MeV) Medical Cyclotron (www.IBA-radiopharmasolutions.com/cyclotrons); NRC website (www.nrc.gov).

Fusion's Legal Classification – Particle Accelerators

General Definition (72 Fed. Reg. 55,868)

- A "device that **imparts kinetic energy** to **subatomic particles** by increasing their speed through **electromagnetic interactions**."

☑ All fusion devices satisfy

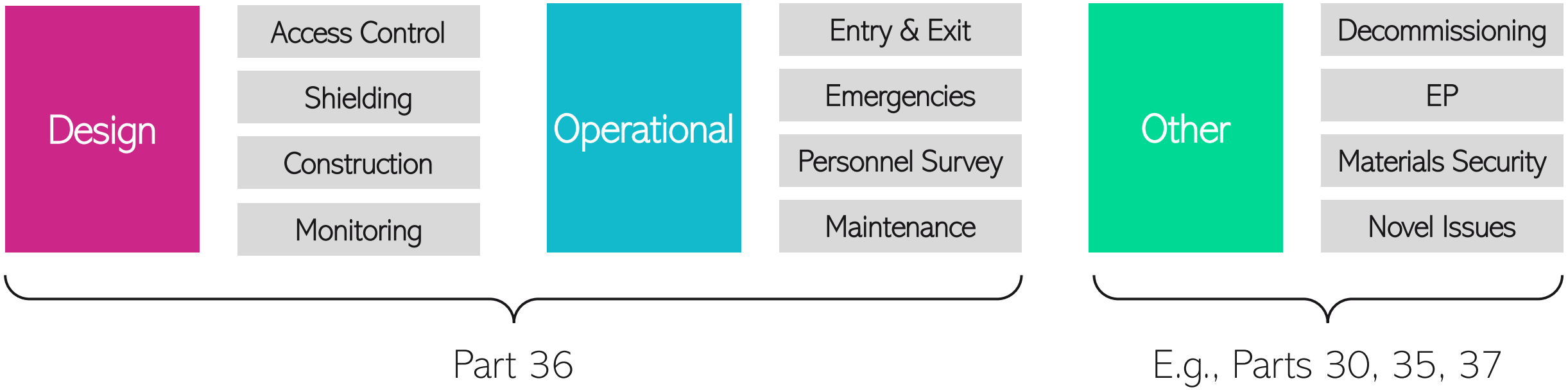
Part 30 Definition (10 CFR 30.4)

- Any machine capable of:
  - **accelerating … charged particles**
  - **in a vacuum**
  - and of discharging the resultant particulate or other radiation **into a medium**
  - at energies usually in excess of 1 megaelectron volt.

☑ All fusion devices satisfy

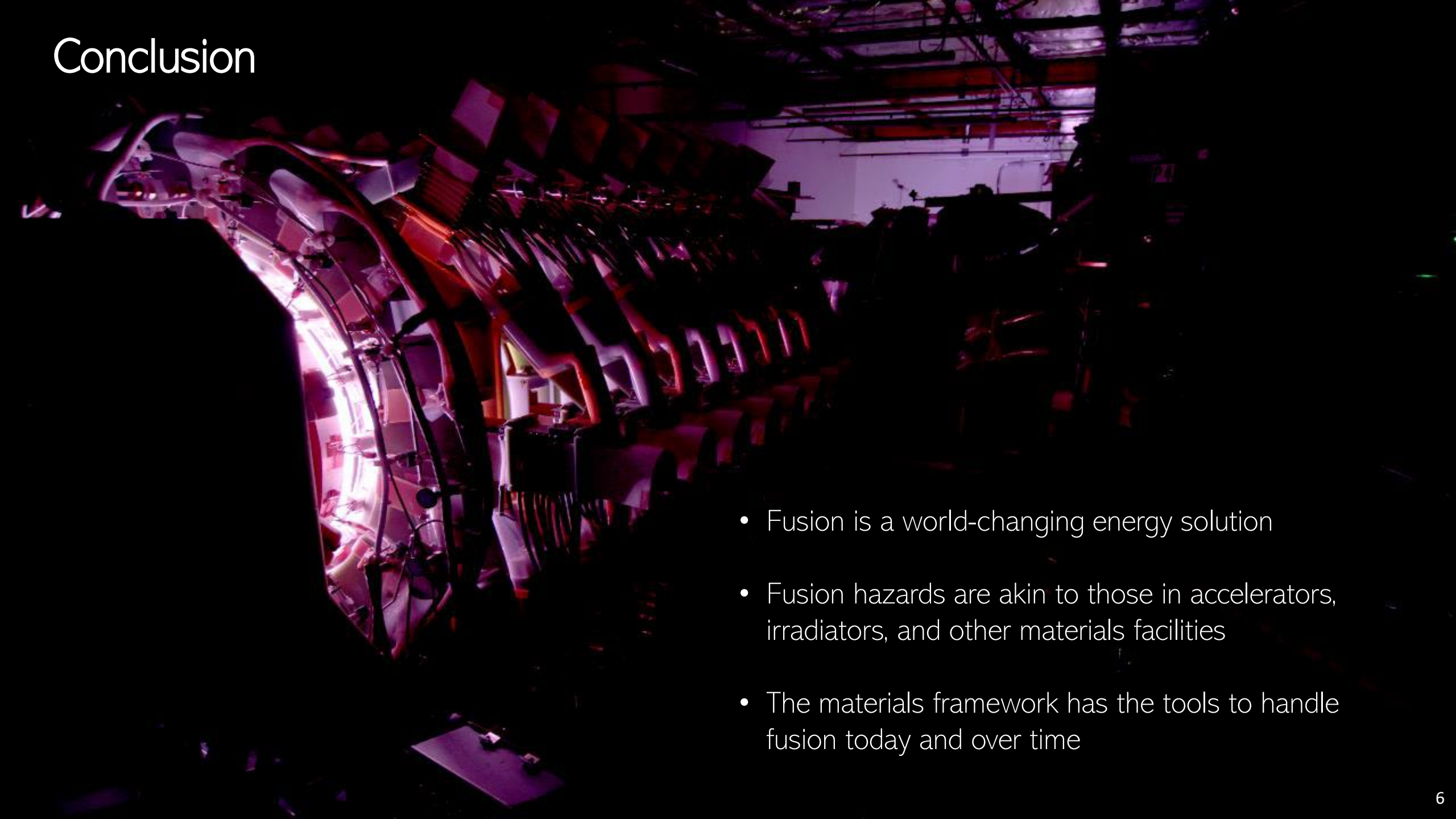
☑ States use this classification today

Materials Framework is Uniquely Capable of Addressing Fusion



- Materials framework can handle **diversity** (e.g., Part 35, Part 37)
- Materials framework can handle **novelty** (e.g., Part 35.1000)
- Materials framework can handle **facilities** (e.g., Part 36)

Conclusion



- Fusion is a world-changing energy solution
- Fusion hazards are akin to those in accelerators, irradiators, and other materials facilities
- The materials framework has the tools to handle fusion today and over time