

METALLIC: The Minerals to Materials Supply Chain Research Facility



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VISION

Accelerate CMM RD³

Expertise, facilities,
and support for
technology
developers

Validate Emerging Technologies

Trusted partner for
funding agencies,
financiers, and
licensees

Action Oriented, Future Focused

Generate knowledge
and “know how” to
rapidly address future
CMM challenges

OUTCOME

Foundational capability for the nation to address the
CMM challenges of today and the future

METALLIC: Accelerating CMM Innovation



METALLIC

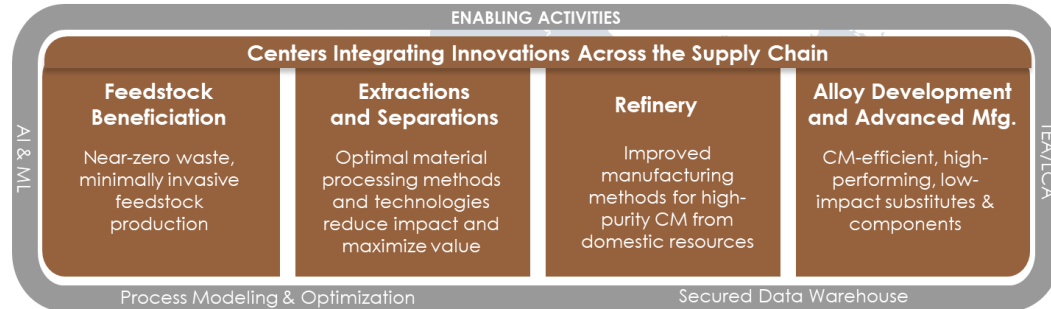
“One Stop Shop” for Faster & Cheaper CMM Technology Maturation

- **Allows Innovators to Innovate:** Pilot facilities save users time & money in procurement, learning curves, and setup
- **Provides Expertise** to mature, validate, and de-risk CMM technology adoption
- **Breaks down barriers between supply chain segments** and providing a structure for the nation's CMM experts to collaborate

By the Numbers...

- NETL-led 9 National Lab Team
- \$75 million investment to update and add needed capabilities
- 5-year build-out with substantial capabilities already on-line
- Focus on TRL 4 to 6+ (Bench to Pilot/Industry Relevant Sizes)

Four Centers of Excellence



ORE Lab



Membrane Solvent Extraction (MSX) Testbed



M-TEL



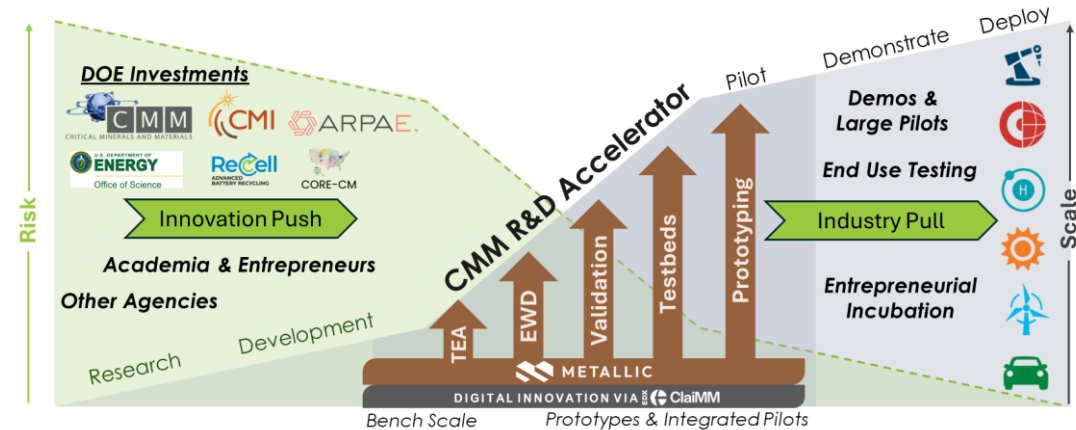
Pyrometallurgical Flagship



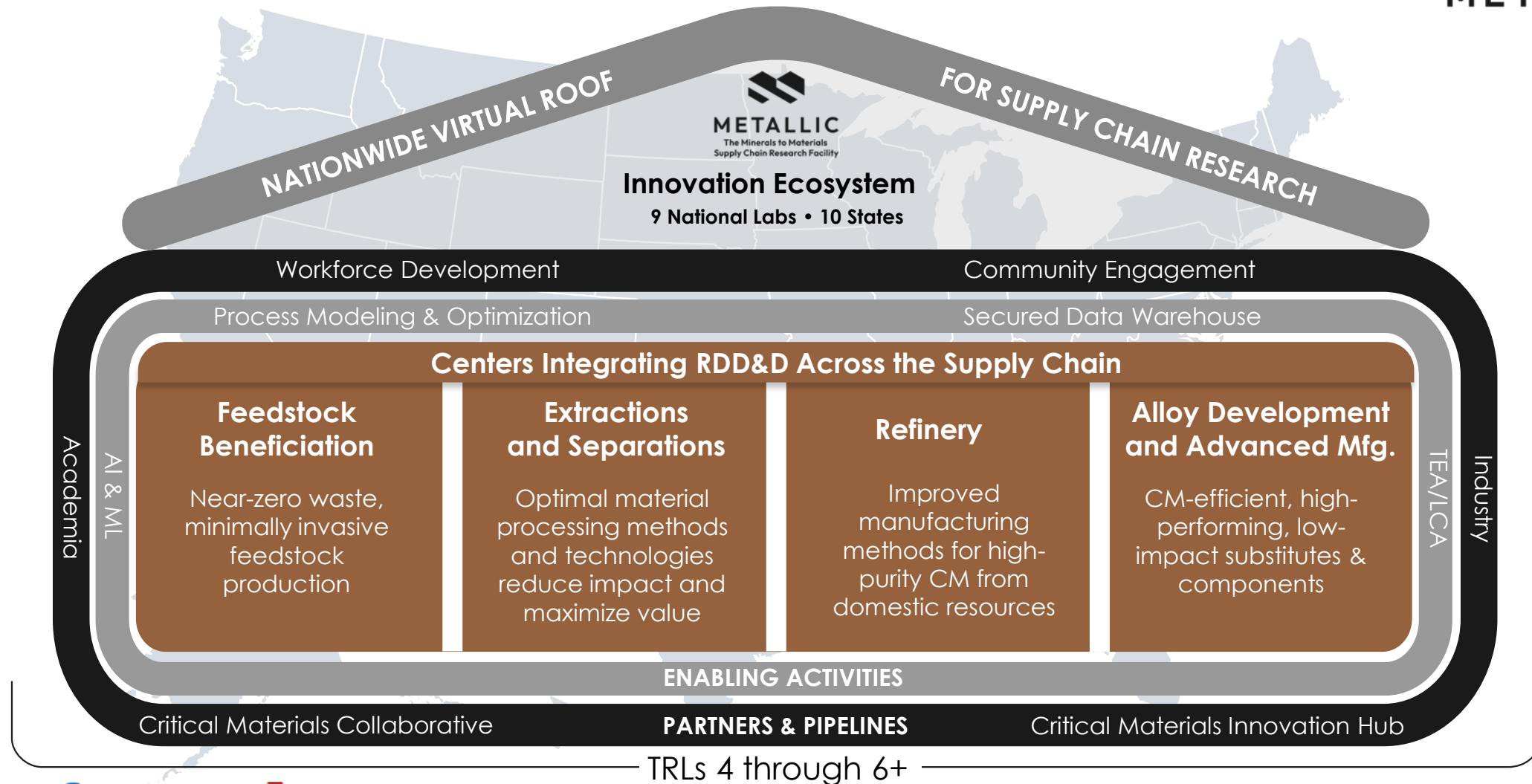
Solid Phase Processing for Advanced Alloy Production

...and more.

Integral Part of Domestic CMM “Innovation Ecosystem”



An Innovation Ecosystem



METALLIC: Organizational Structure



METALLIC

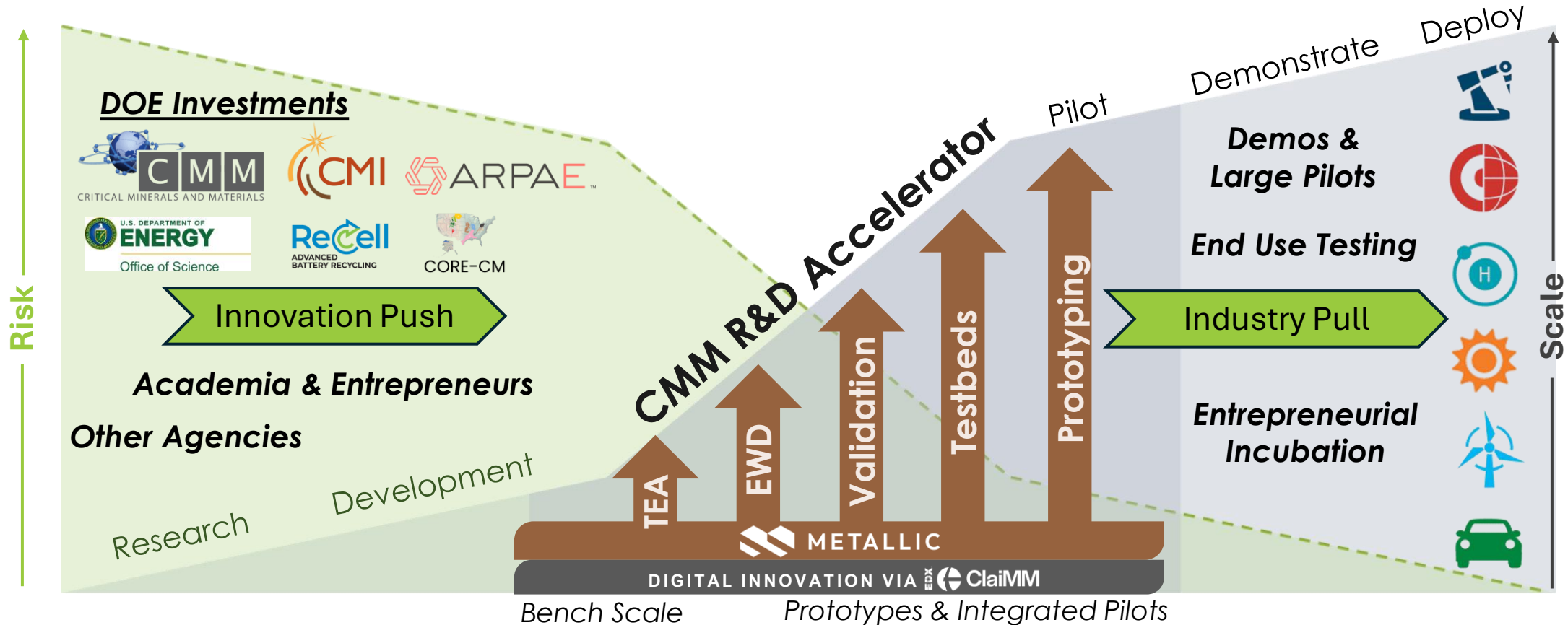


Innovation Ecosystem



METALLIC

METALLIC's Role in the CMM R&D Pipeline – The Accelerator



Flagship Activities & Participants

Potential Users

Academia • Industry
FOA Awardees • R&D Entrepreneurs
Government Agencies • Others

Alloy Development and Advanced Manufacturing

1. Solid-Phase Capability
2. Advanced Alloys
3. Advanced Semiconductors
4. Advanced Topology Prototyping Testbed

Feedstock Beneficiation

1. Feedstock Characterization
2. Ore Processing & Optimization
3. Brine Testbed(s)

Extractions and Separations

1. Integrated Testbed for Novel Unit Operations Validation/Optimization
2. Membrane Solvent Extraction Accelerator Facility
3. AI-Guided Autonomous Chemistry Testbed

Refining

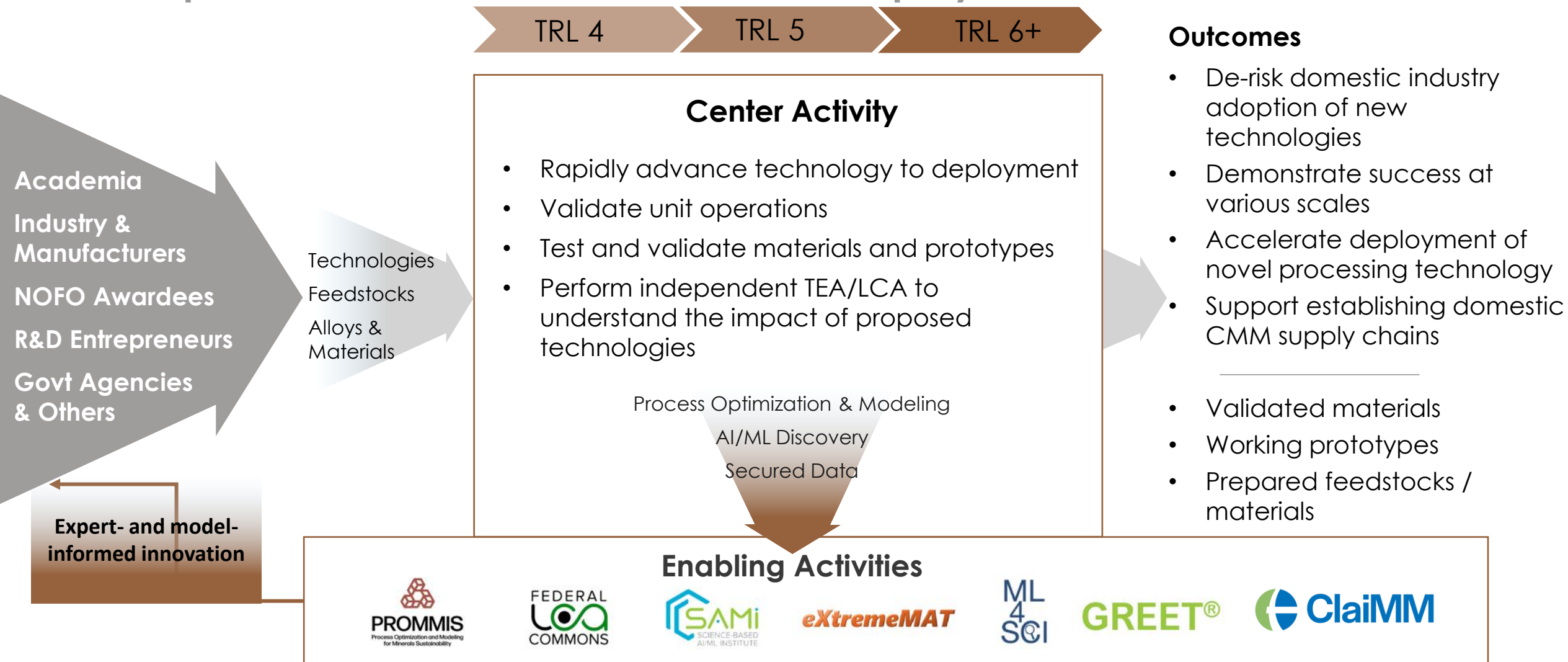
1. Pyrometallurgical
2. Electrochemical
3. Adv. Reduction Technologies
4. Metal Purification

Enabling Activities

Provide Comprehensive, Independent LCA and TEA Capabilities • Develop Data Warehouse & Interfaces • Connect Analysis with Experimentation • Convene Stakeholders • State of Technology Analysis • TRL/MRL Evaluation

Innovation Ecosystem: How it Works

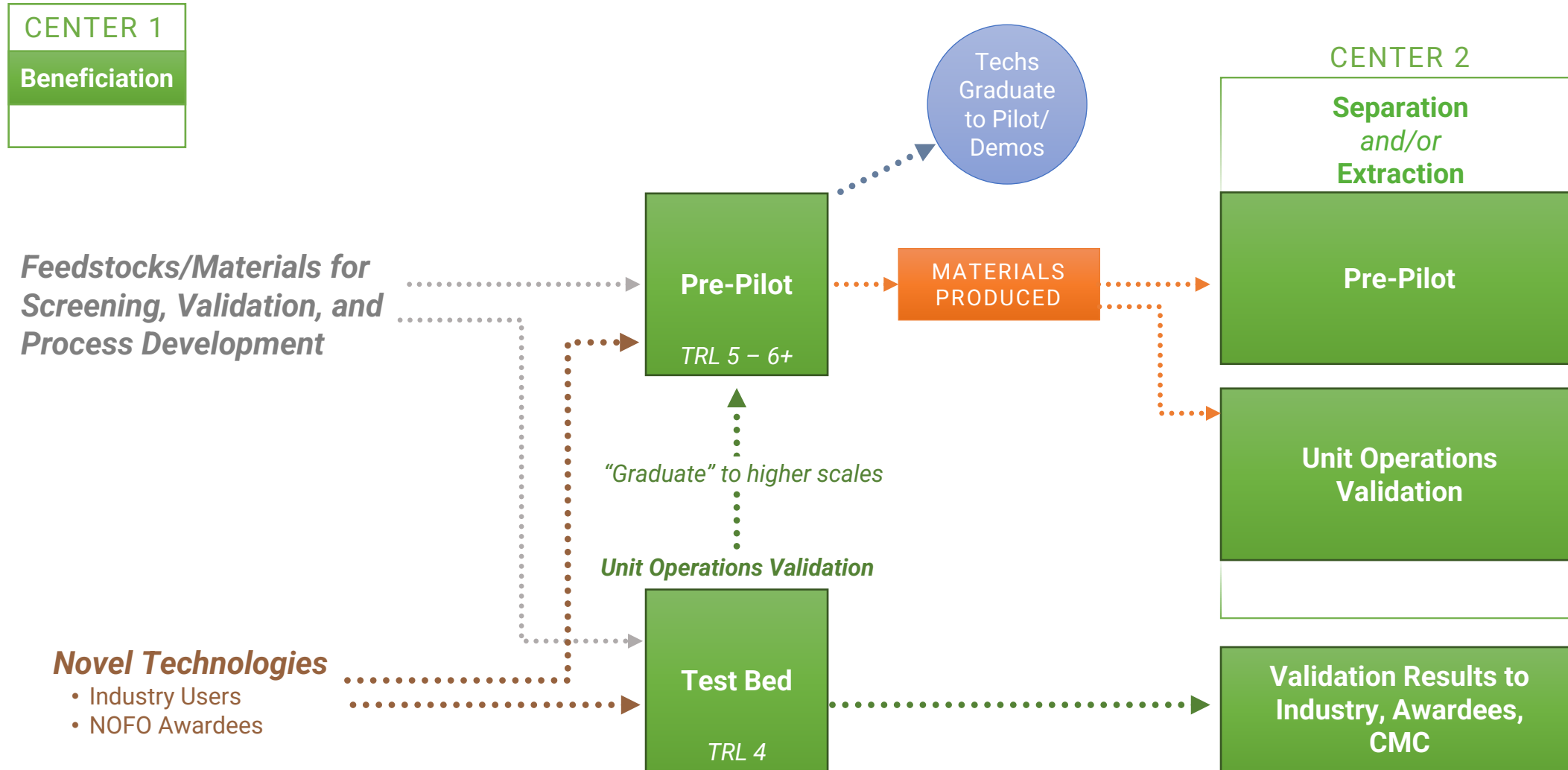
Develop, De-risk, Validate, Demonstrate, Deploy



Innovation Ecosystem: Project Flow in METALLIC



METALLIC



METALLIC is NOT:

- Does not provide funding directly to companies
- Not a place for National Labs to perform their own research
- Not a commercialization entity – we will validate, test, and help connect technology developers, technology users, and feedstock suppliers



Users & Stakeholders:

- Industry, manufacturers, and entrepreneurs looking for technology solutions
- NOFO awardees
- Entities awarded DOE-funded vouchers for access to capabilities & services
- Projects graduating from DOE R&D portfolios
- Critical Materials Collaborative (CMC)
- Other government agencies

CMI & METALLIC – An Integrated Pipeline



CMI is a project-oriented R&D enterprise:

- Funds projects focused on addressing key challenges and establishing PPP with industry
- Public-private consortium
- Matures technology from lab to bench scale
- Provides multidisciplinary project funding to NL, academia and industry researchers
- Supports the development of a CMM workforce



METALLIC is a capability-focused user facility:

- User facility providing equipment and expertise across the national laboratory complex to mature, validate, and de-risk technologies
- Focused on testing and validating CMM technology from bench to sub-pilot scale
- Structure and forum for nation's leading CMM researchers and scale-up experts to collaborate
- Provides a training platform for CMM workforce

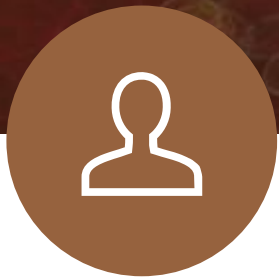
CMI & METALLIC – Furthering DOE’s Mission



DOE Mission Space	Critical Materials Innovation Hub	METALLIC
Key Role	DOE Energy Innovation Hub (est. 2013) led by Ames National Laboratory <i>Accelerates research and innovation for U.S. critical material supply chains.</i>	Federated user facility (est. 2024) led by National Energy Technology Laboratory <i>Establishing capabilities to support minerals-to-materials supply chain technology development and scale-up.</i>
Technology Focus	Early-stage applied research (TRL 2–4) translating basic science to bench-scale technologies.	Mid-stage maturation (TRL 4–6+): testing, validation, and sub-pilot demonstrations of technologies.
Impact	Develop and de-risk new technologies, address emerging critical materials challenge, and support robust workforce development.	Federated collection of capabilities, experts, and trained workforce to support scale-up and development of technologies needed to support creation of critical material supply chains.
Stakeholders	Public–private consortium across national labs, universities, and industry; integrated across supply chains.	Mid-scale capabilities across supply chain including beneficiation, extraction, separations, refining, and advanced alloy development/manufacturing that are accessible to users from industry, universities, and National Labs.



Industry can access METALLIC to mature emerging technologies in less time and at less cost by:



Single Point of Contact

Eliminates time spent trying to find the right expert and facility



Streamlined Agreements

Shortens time from first contact to starting work



Existing Equipment and Testbeds

Reduces procurement costs and avoids long lead times



Analytical Support

Accelerates feedstock data collection



Dedicated, Trained Workforce

Reduces time required to hire and train staff

VISIT US AT: www.NETL.DOE.gov/metallic

WORK WITH US:

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