

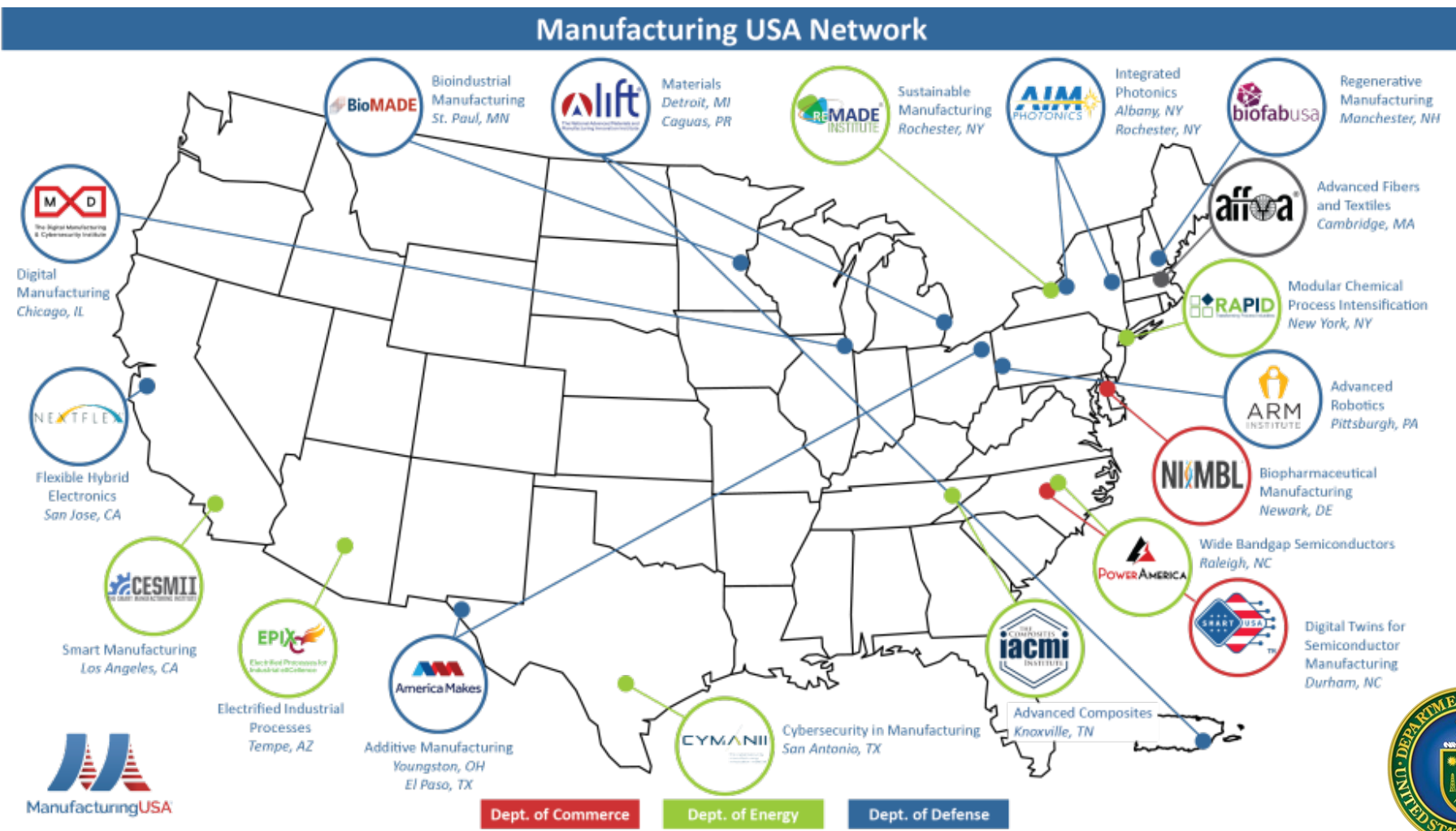


RAPID Manufacturing Institute ORAU Webinar

November 12, 2025

Dr. Julia Faeth, RAPID Technology Services Director

RAPID – Who are we?



AIChE 
The Global Home of Chemical Engineers

**U.S. DEPARTMENT
of ENERGY**



Where RAPID Has Been

Modular Chemical Process Intensification (MCPI)

Process Intensification

- Rethinking processes to dramatically **improve performance**
- Shift from **unit operations** paradigm to **integrative** paradigm
- Transition from **batch** to **continuous**

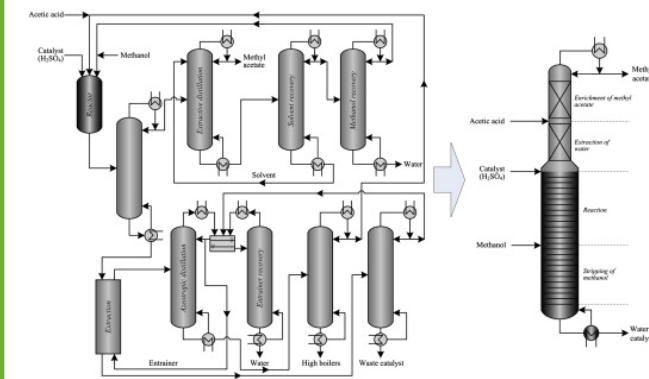
Modular Processing

- Rethinking systems to enable flexible, **distributed manufacturing**
- Shift from **bigger is better** paradigm to **small, modular** paradigm
- Transition from volume scaling to **numbering up**



RAPID's Focus

Build a community
Deliver technical tools & services
Educate students & professionals
Fund and manage R&D projects



Advanced Manufacturing for Chemical Processes

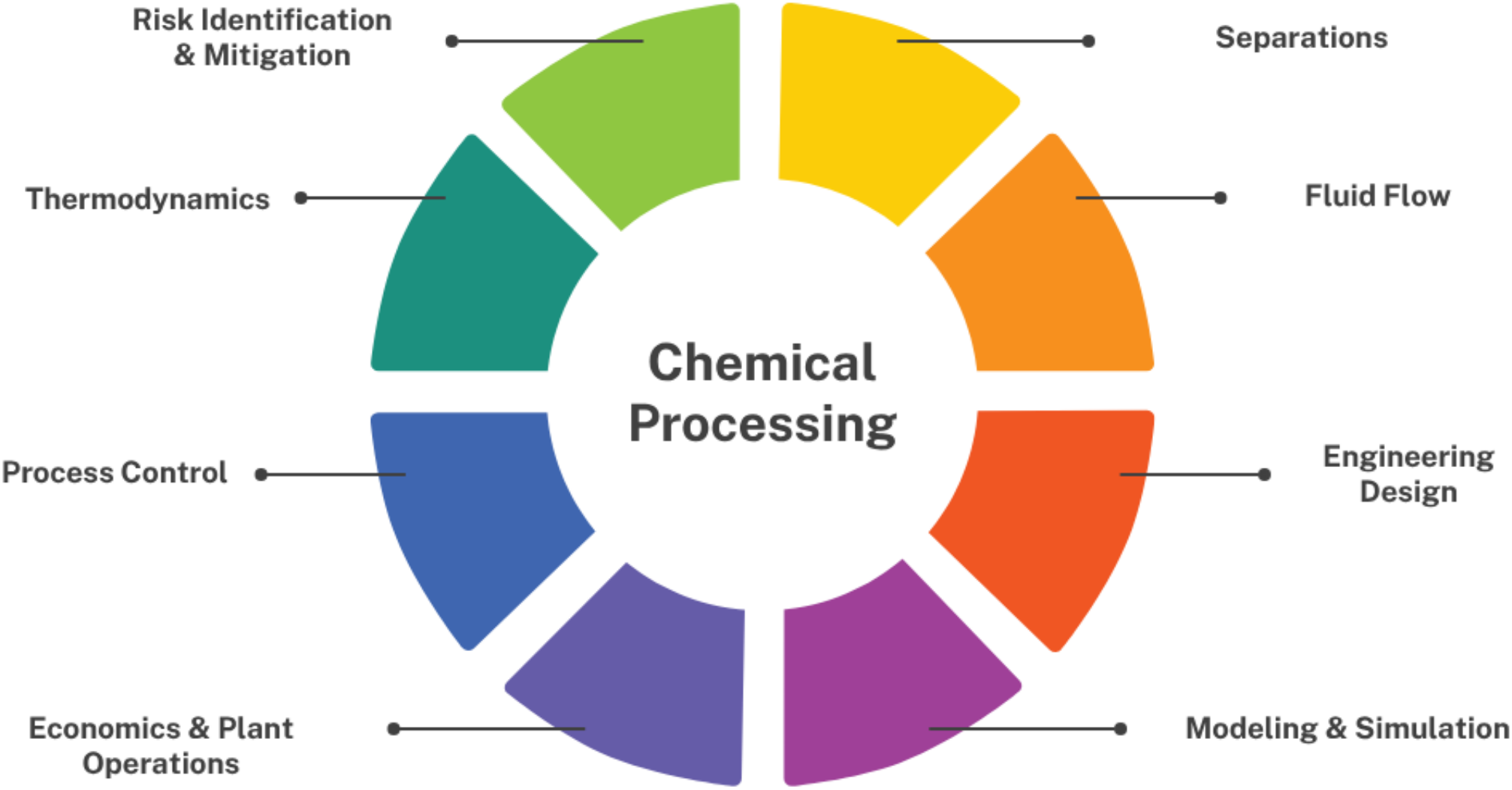
Connect – Learn – Innovate

Support and enhance the RAPID Advanced Manufacturing Community

- Technology focused discussions
- ChemE Cube
- Education and Workforce Development
- Operator & Technician Community
- Innovative new programming
- Test & Learn approach



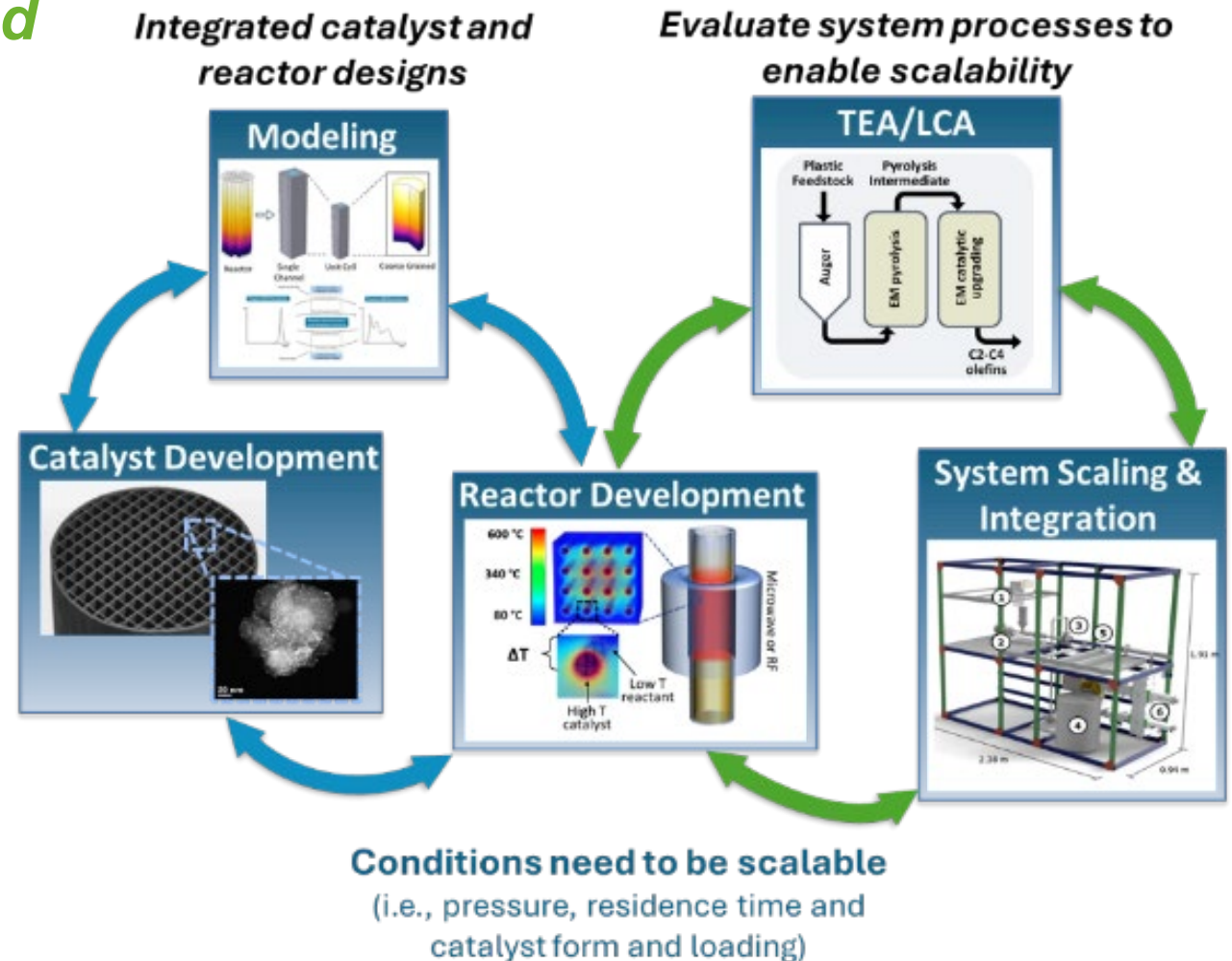
Advanced Manufacturing



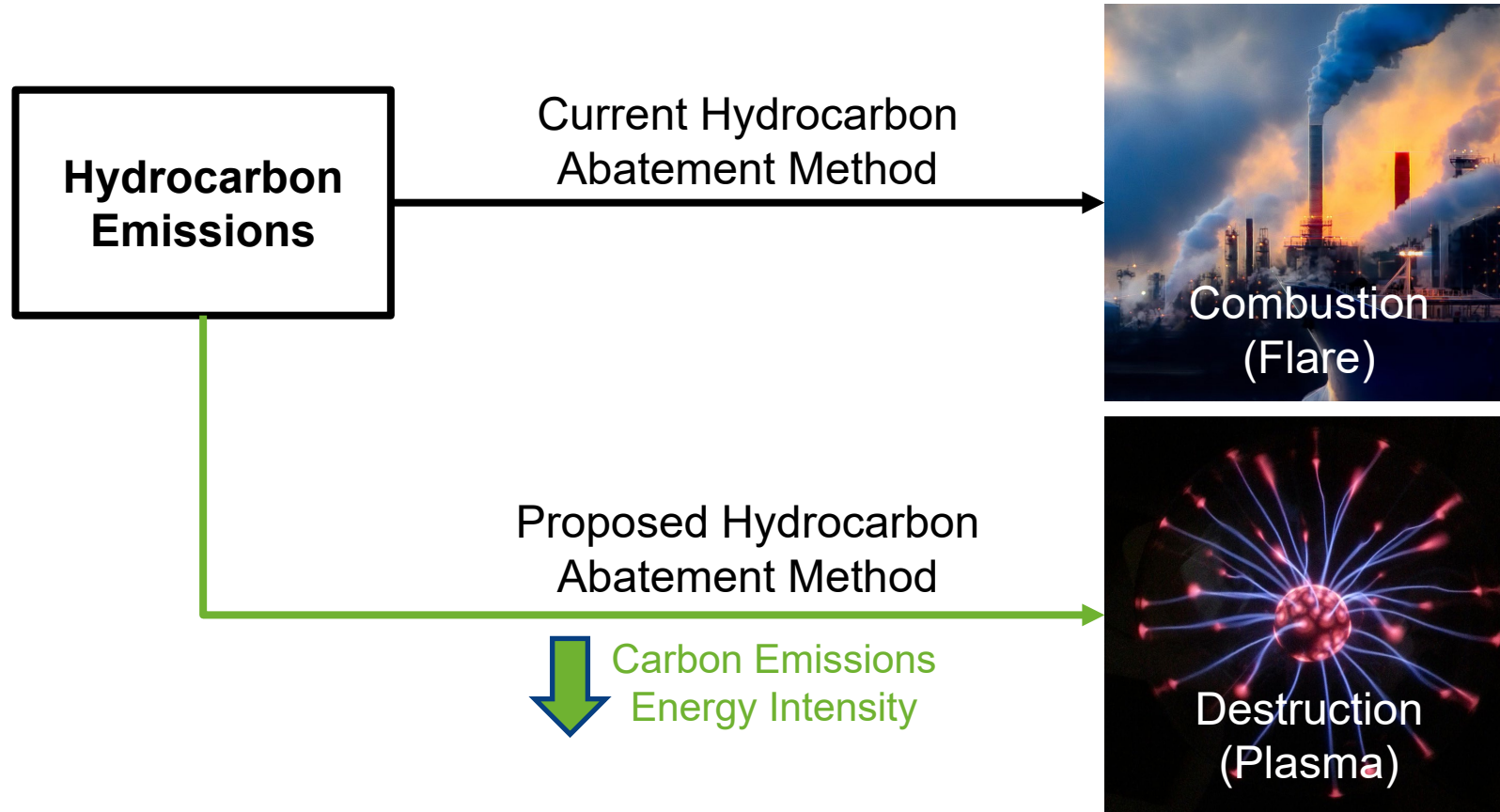
Enhanced Reaction Technology for Converting Waste Plastic to Olefins

- Next generation *Microwave (MW) and RF induction reactors*
- Continuous manufacturing of light olefins (C_2 - C_4) from waste plastic.
- 70% less energy, 25% improved catalyst life, improved selectivity and 15%+ reduction in operating costs

Project Partners



Plasma VOC Destruction Technology



Potential Partners



- Explore plasma and catalytic technologies for hydrocarbon emission destruction
- Assess economic viability, carbon footprint, and efficiency compared to combustion
- Demonstrate technical feasibility onsite for 1-3 industrial applications

ChemE Cube Competition Powered by RAPID[®] | ExxonMobil



- **Undergraduate Student Competition**
 - Held annually since 2021
 - Part of AIChE Annual Student Conference
 - Themes: Water Purification; Direct Air Capture and Regeneration
 - 23 teams participated in 2025
- **Competition Components**
 - Process Demonstration
 - Business Pitch
 - Technical Poster Presentation
 - Safety Evaluation



The RAPID Community



2025 RAPID Team



Frank van Lier
Executive Director
& CTO RAPID
(interim)



Michelle Bryner
Sr. Director, ITAs,
Business Dev, and
Publications



Julia Faeth
Technology
Services Director



Keith Joseph
Director of EWD



Natalie O'Neil
Sr. Program
Manager -
Operations



Fadhil Al-Aboosi
Sr. Technical
Program Manager



Mahir Alam
Project Manager

If you would like to connect, please check out our website at <https://rapid.aiche.org/> or email Julia Faeth at julif@aiiche.org