

Advancing Biomanufacturing: The SynBio Foundry

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and Development
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The Opportunity Space

The U.S. has ~billion tons of renewable biomass available annually that is a strategic national resource for the bioeconomy

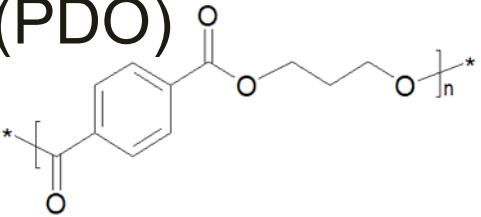
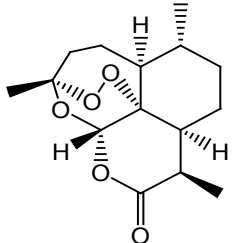
U.S. bioeconomy is estimated to be \$250B/yr and expected to grow significantly over the next decade



Mobilizing and valorizing this resource through biomanufacturing could rapidly expand the U.S. bioeconomy

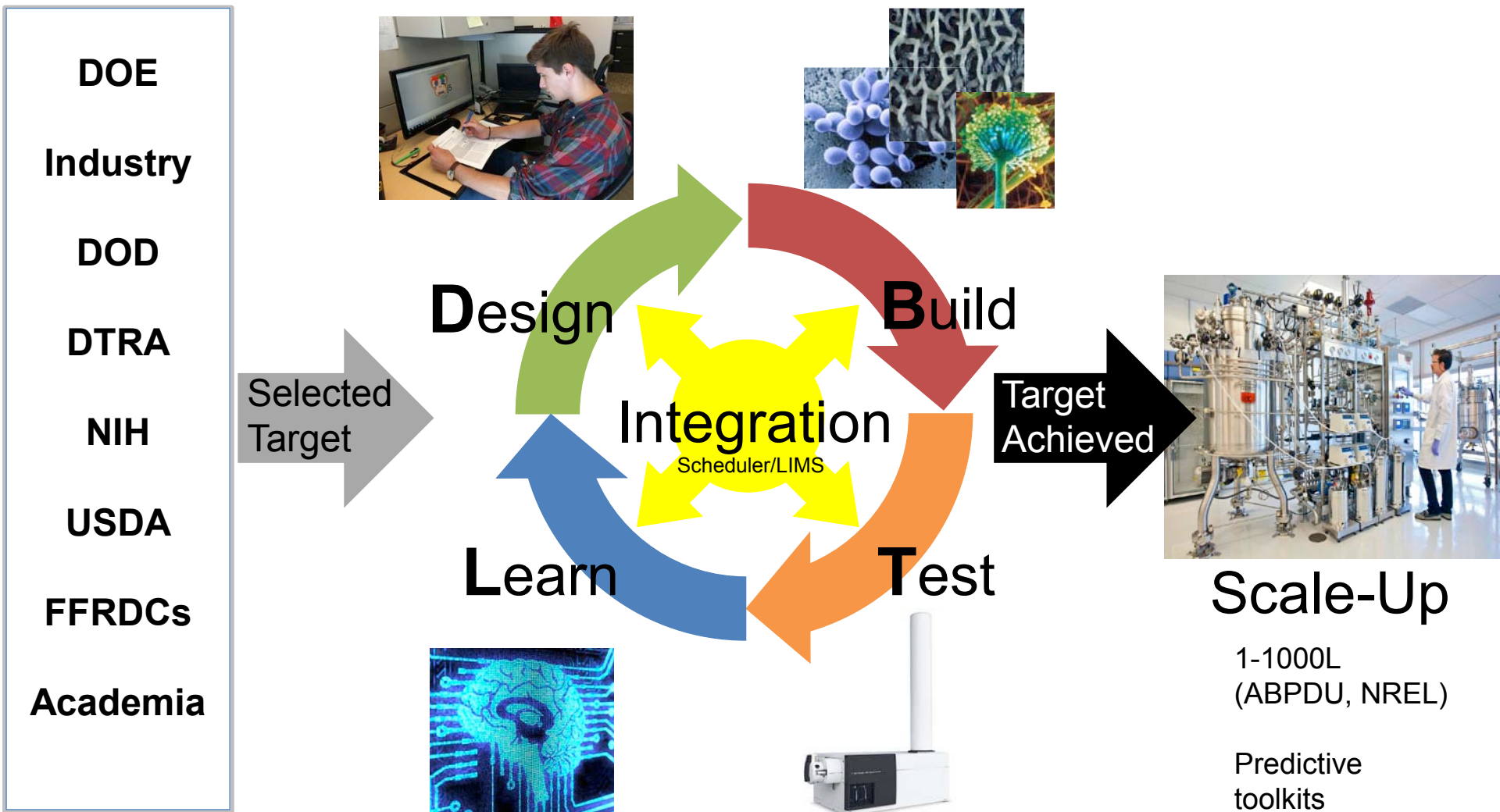
Biomanufacturing remains nascent in terms of robustness, scale and standardization

The Challenge

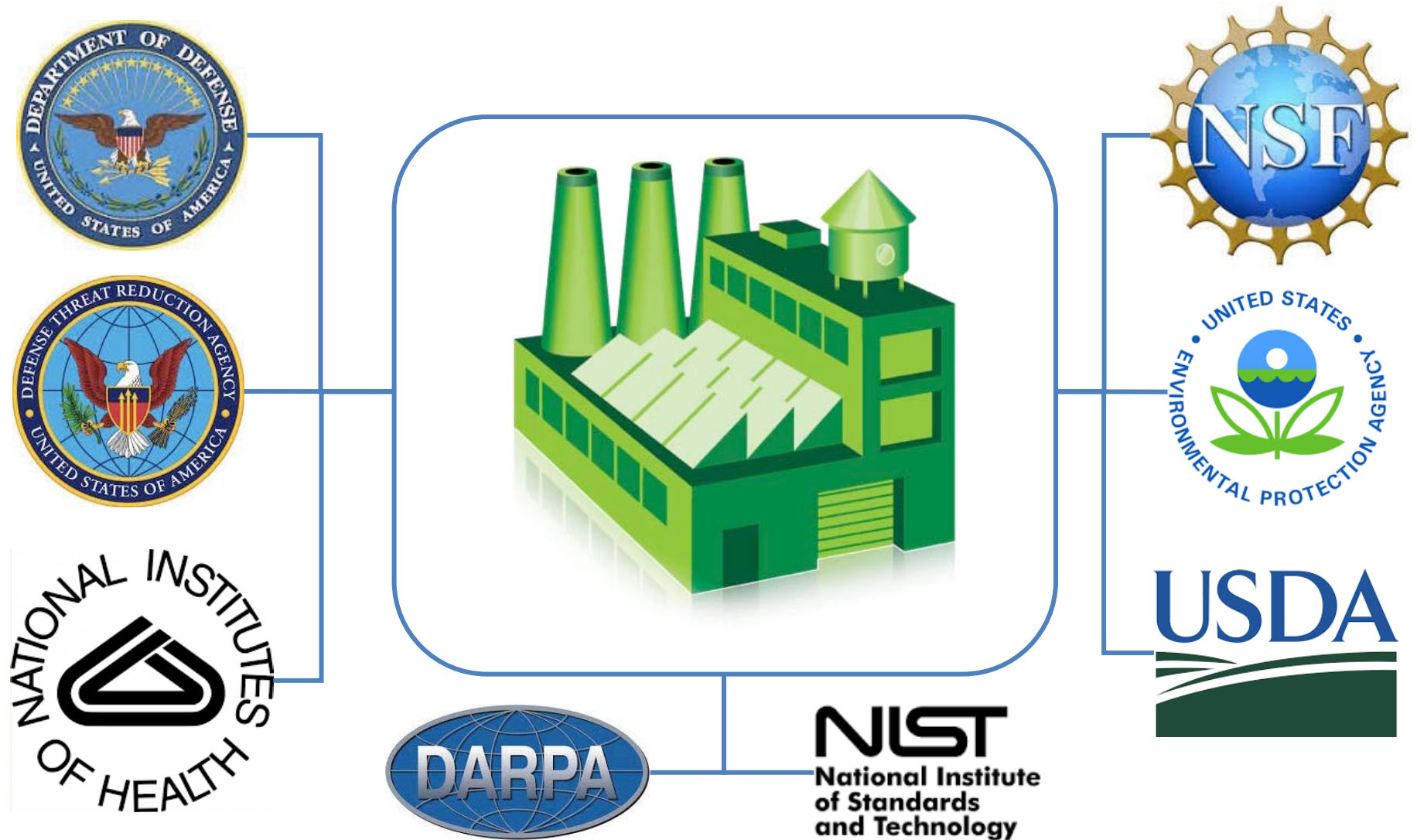
Molecule	Company	Cost	Time
1,3-Propanediol (PDO) 	DuPont - Tate & Lyle	>\$200M	15 years
Artemisinin 	UC Berkeley, Amyris, Sanofi	>\$150M	10 years

Possible savings of *billions* of dollars by reducing development time of products from 10 years to 2 years and reducing energy intensity and carbon efficiency

Breaking the Paradigm: The SynBio Foundry Approach

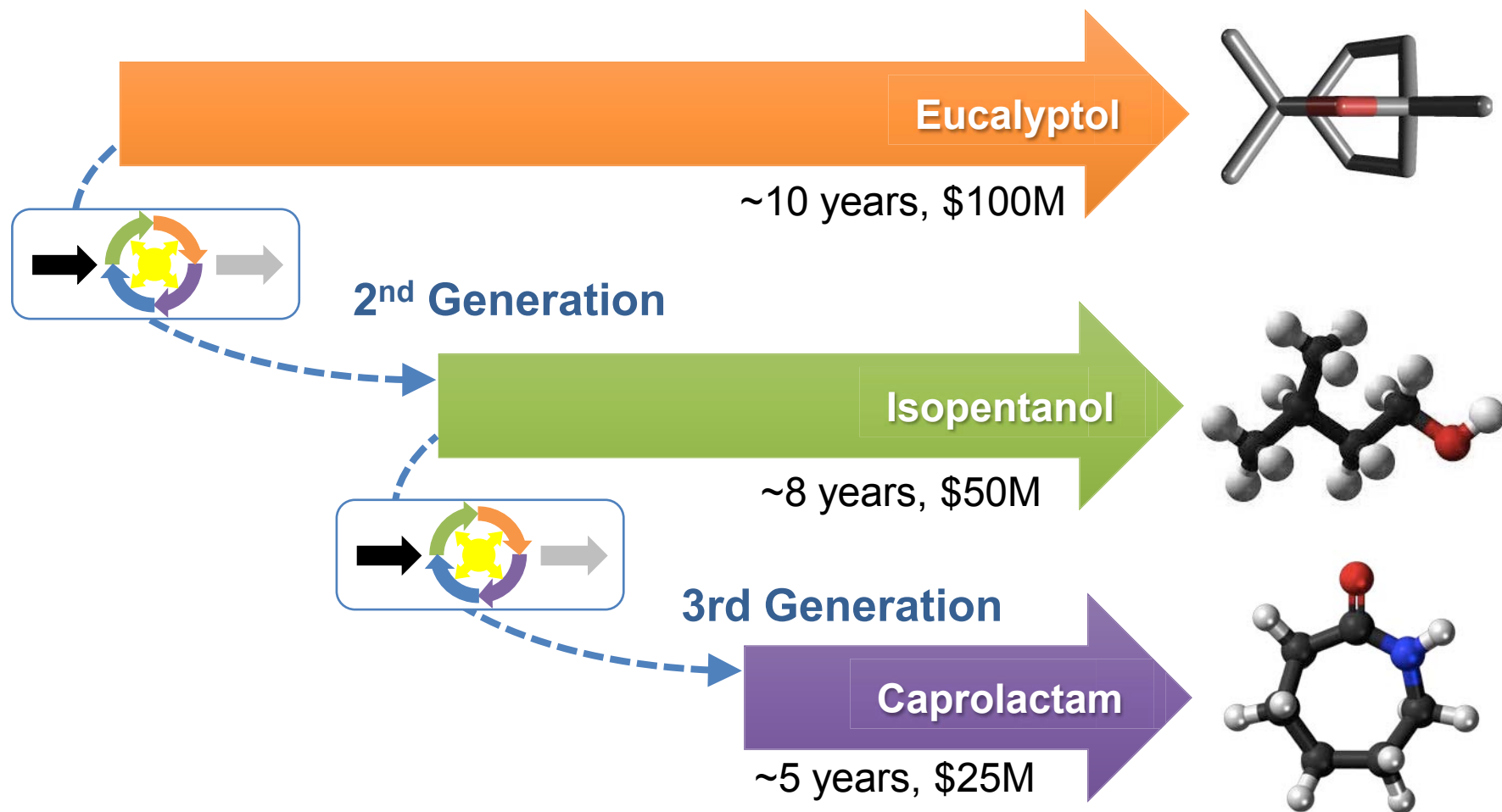


SynBio Foundry Crosscuts Across DOE and Intersects with Several Federal Agencies

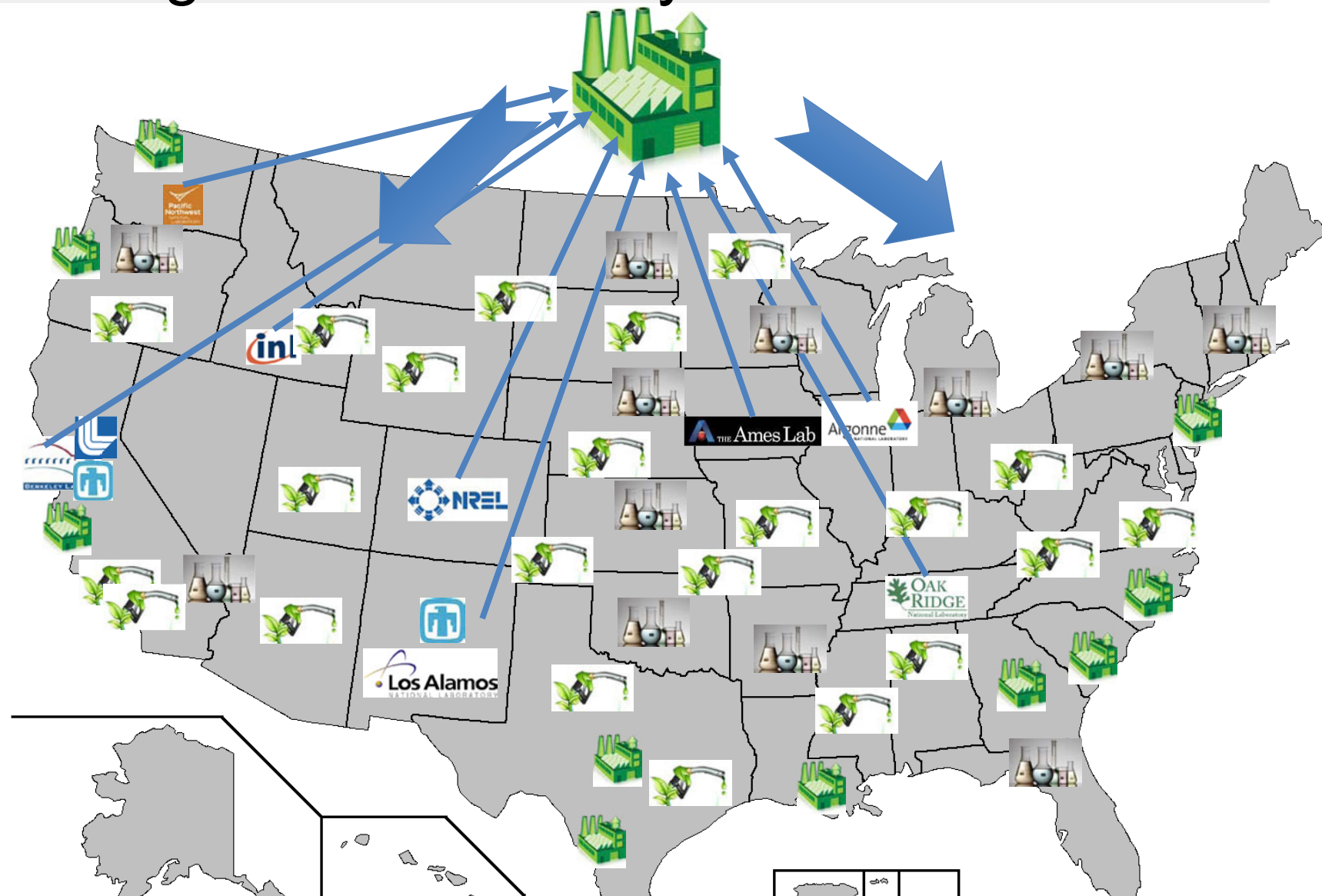


SynBio Foundry Approach will Improve Cycle Times and Reduce Costs

1st Generation



The SynBio Foundry: Enabling the Bioeconomy



Industry Interest in the SynBio Foundry

novozymes

BOEING

DU PONT

AMY

"I feel like your idea of a biotech foundry could be invaluable to [our company] and I'm looking forward to it."

YSTA

LYGO

"We are very interested in helping build the bio foundry and using it."

uufri



iINDUSTRIAL MiCRO

"The bio foundry would be of strategic benefit and help us in terms of open access tools and strain optimization."

nbiobeta

cellana

heliae

SRI
International

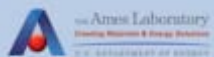
teselagen
BIOTECHNOLOGY

The Impact

- Distributed, integrated capability operated as a collaboration facility
- Decrease the energy intensity of current manufacturing processes by 40% over status quo by 2025
- Decrease the carbon intensity of current manufacturing processes by 60% over status quo by 2025
- Increase biomanufacturing cycle efficiency (cost, time) >40% by 2025
- Increase US industry competitiveness, and create new opportunities for private sector growth and jobs



The Lab Network



**Igor Slowing,
Marit Nilson-Hamilton,
Cynthia Jenks**



**Jennifer Dunn,
Phil Laible,
Felix Odom**



**Dave Thompson,
Erin Searcy, Chenlin
Li,
Rachel Emerson**



**Taraka Dale,
Babs Marrone**



**Jay Keasling, Blake
Simmons, Adam Arkin,
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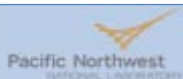
Ken Turteltaub



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Adam Guss,
Brian Davison**



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