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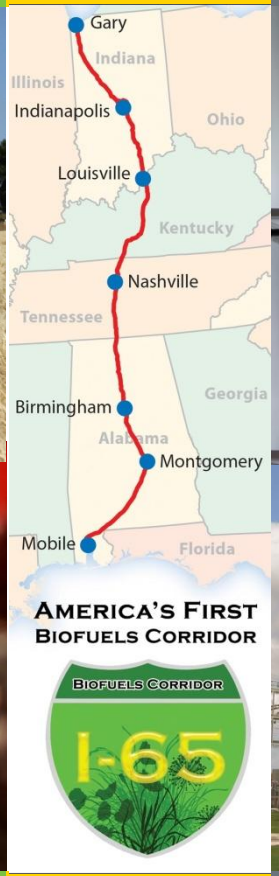
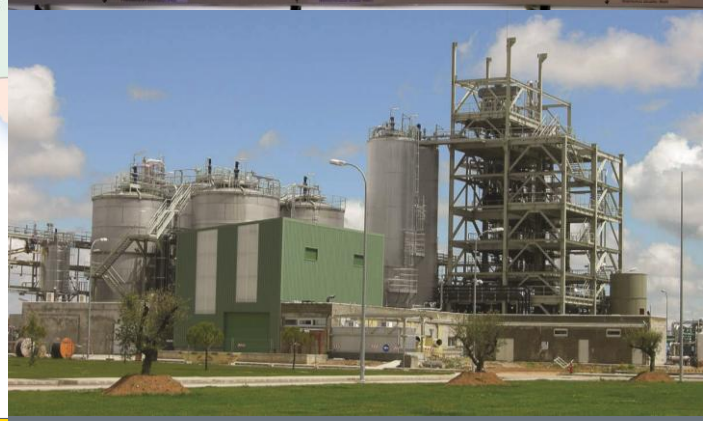




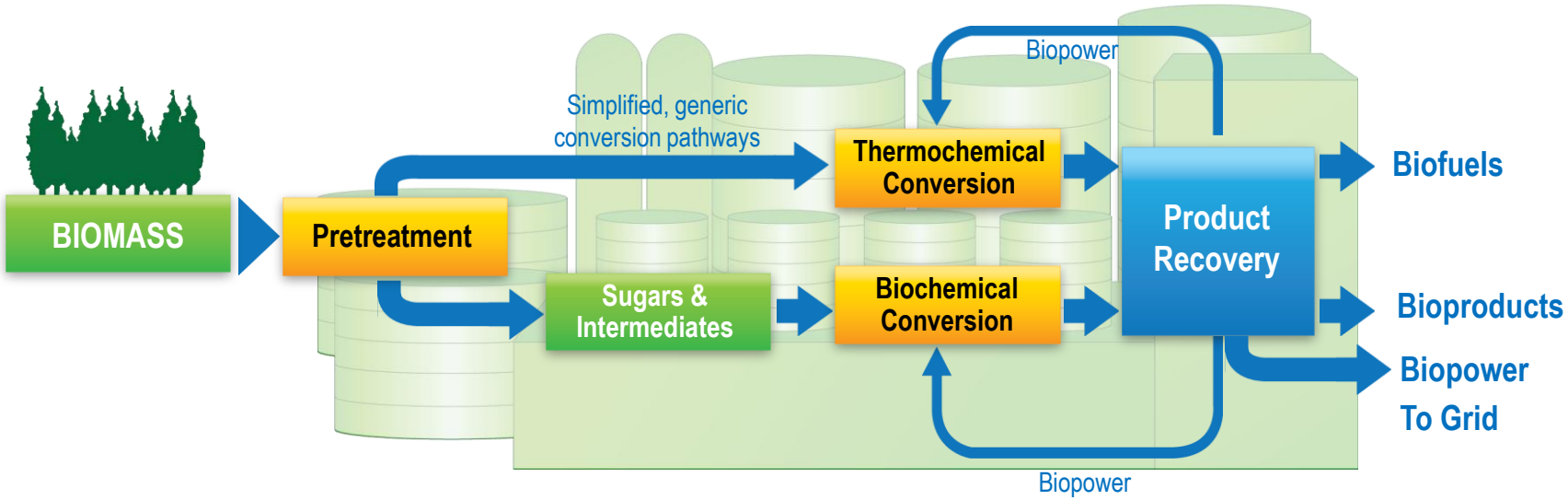
Department of Energy Biomass Deployment Program

Valerie Reed, Ph/D.

Acting Program Manager

Demonstration and Deployment

Integrated biorefinery (IBR) projects prove the viability of various feedstock and conversion pathways and reduce technical and financial risks by following a progression from pilot, to demonstration, to commercial scale.



Biomass Key Challenges	Pretreatment Key Challenges	Conversion Key Challenges	Product Key Challenges
• Reliable supply • Consistent quality • Affordable delivery	• Biomass feeding • Biomass sizing and moisture • Solids handling	• Product yields • Construction materials • Catalysts • Fermentation organisms	• Separations • Catalytic upgrading • Recycle loops

Integrated Biorefinery Projects

IBR project investments will accelerate U.S. bioindustry growth and ramp up the production of a range of biofuels and bioproducts.

ZeaChem's fermentation seed train

More than $1B in DOE investments in 29 IBR projects is helping bridge "Valley of Death"

- **Five projects have received loan guarantees to build first-of-kind commercial facilities**
- **At least three projects have IPOs that support their commercialization strategies**
- **The successful first-of-kind facilities will allow for rapid replication and expansion of capacity**

- More than $1 billion in Biomass Program investment is cost shared with more than $1.7 billion from industry
- DOE investment has enabled equity investments, initial public offers (IPOs), venture capital (VC) funding, joint ventures (JVs), and joint development agreements (JDAs)

Integrated Biorefinery Project Locations

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Approximate locations of current IBR projects at R&D, pilot, demonstration, and commercial scale