California Bioresources Economy Summit

Panel 2: Current and Future Technologies and Strategies

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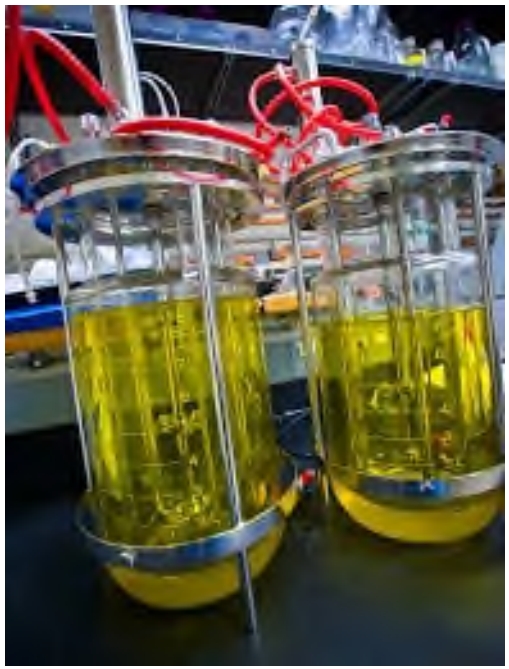
Session Goals

- **Provide information on current and future technologies capable of efficiently converting CA waste biomass resources into biofuels and bioproducts**

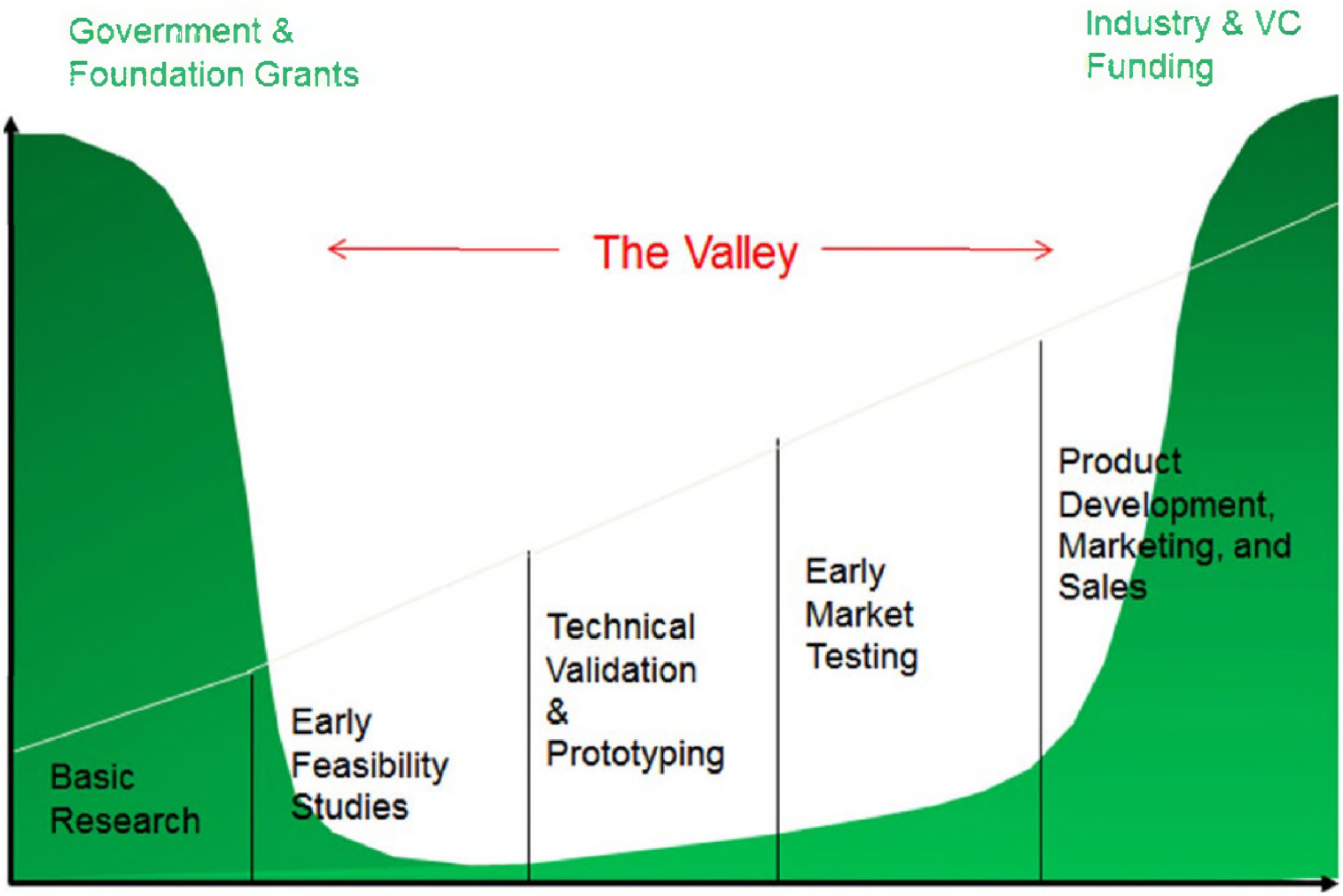
- **Diverse perspectives from key stakeholders**
  - **Federal - DOE**
  - **Universities and National Laboratories**
  - **Industry**



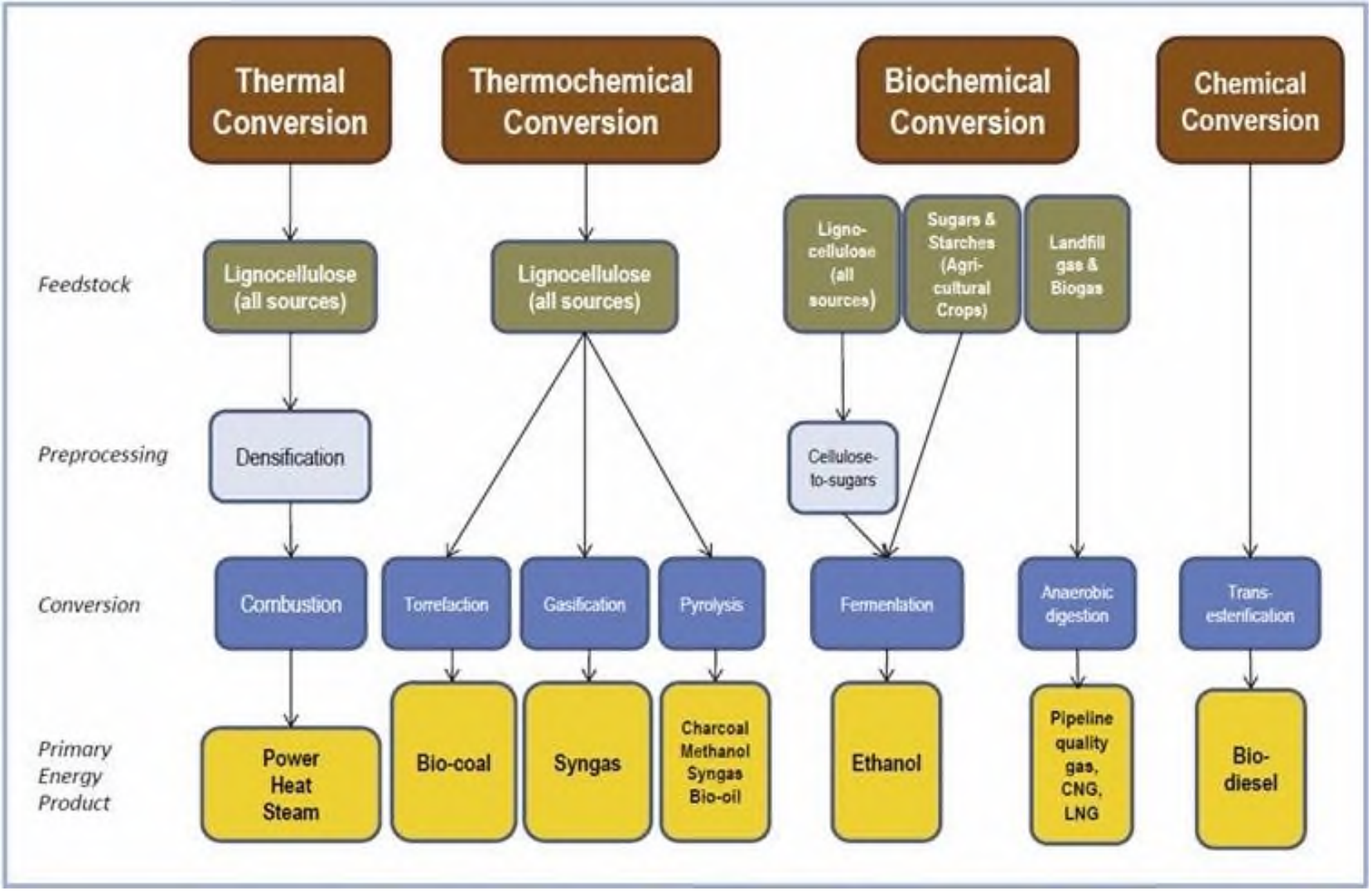
- **Highlight importance of public-private partnerships in transitioning new technologies from the laboratory to the marketplace**

- **Identify opportunities that enable the deployment of advanced technologies in the marketplace**

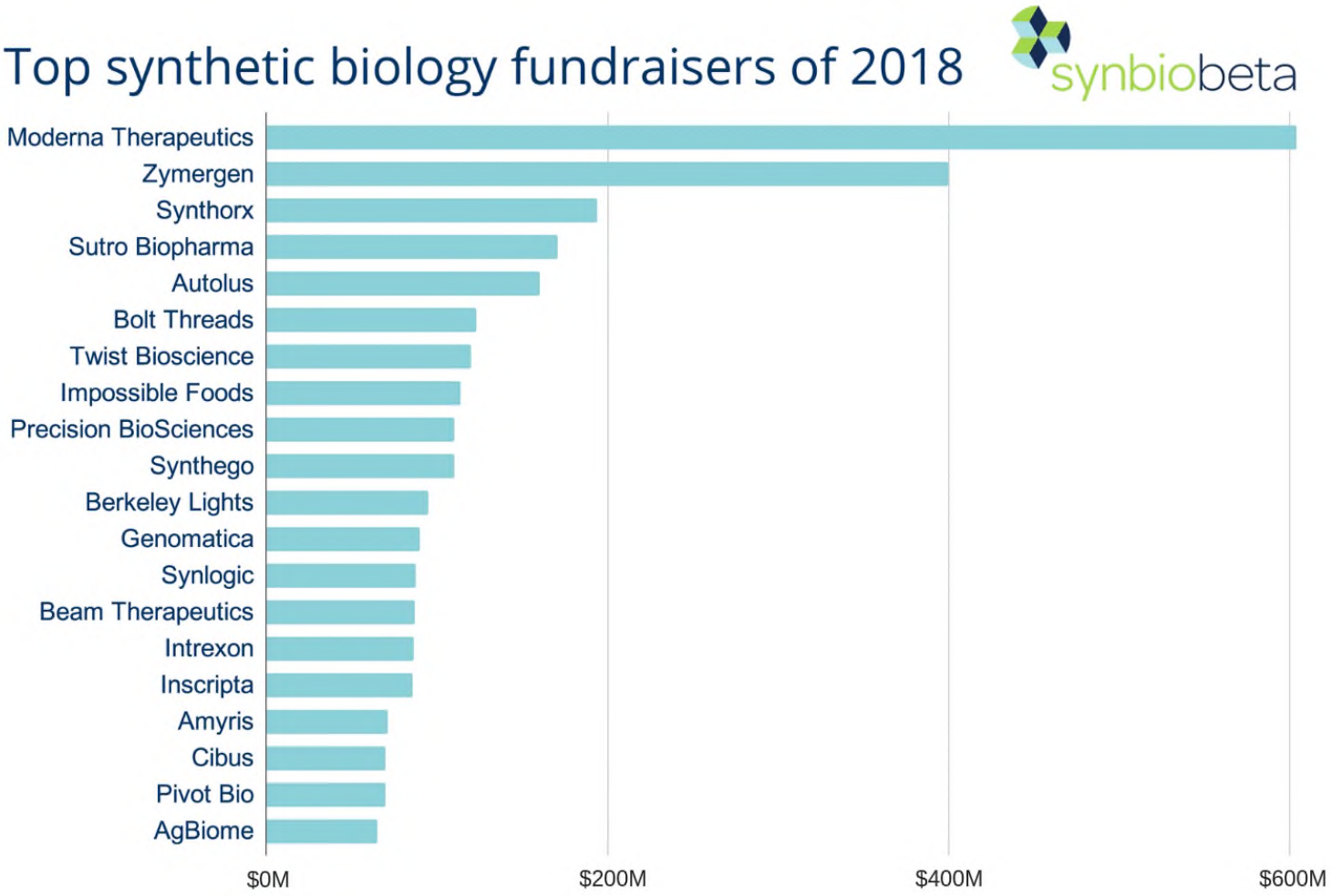
Overcoming the Valley of Death



Multiple Conversion Technologies Exist



2018 Investments in Synthetic Biology



98 synthetic biology companies raised $3.8 billion in 2018

The Speakers

Mark Philbrick, Waste-to-Energy Coordinator,
Bioenergy Technologies Office, U.S. Department of Energy (DOE)

Dr. Philbrick's work at the DOE focuses on targeting the production of drop-in biofuels from food waste, municipal sludges, and similar feedstocks. He was the lead author of the technological portions of the DOE's 2014 Water-Energy Nexus report, and led the development of a 2017 document on Biofuels and Bioproducts from Wet and Gaseous Waste Streams. Dr. Philbrick received his graduate degree from UC Berkeley in Environmental Science, Policy, and Management.

Jay Keasling, CEO, Joint Bioenergy Institute (JBEI)

Dr. Keasling is also the Philomathia Professor of Alternative Energy at UC Berkeley in the Departments of Bioengineering and Chemical and Biomolecular Engineering, and senior faculty scientist at Lawrence Berkeley National Laboratory. Dr. Keasling's research focuses on the metabolic engineering of microorganisms for degradation of environmental contaminants or for environmentally friendly synthesis of drugs, chemicals, and fuels. He received M.S. and Ph.D. degrees in Chemical Engineering from the University of Michigan.

Eric McAfee, Chairman and CEO, Aemetis, Inc.

Mr. McAfee is Founder, Chairman and CEO of Aemetis, Inc., a Cupertino-based low carbon biofuels company with $150 million in revenues and plants in California and India. Mr. McAfee is a Silicon Valley entrepreneur and venture capitalist with a lifelong commitment to agriculture, technology and renewable energy. He has been listed in the "Top 50 People in the Bioeconomy" for five years by Biofuels Digest. His 2018 TEDx talk in Chandigarh, India describes his motivation to build the Aemetis projects.

Eric Steen, Founder and CEO, Lygos

Dr. Steen is an expert in optimizing sugar to product conversion efficiency, and prior to co-founding Lygos he led efforts to engineer yeast for the conversion of sugars into fuels and chemicals at the DOE's Joint BioEnergy Institute. He earned a B.S. in Biomedical Engineering from Brown University and a Ph.D. in Bioengineering from UC Berkeley and UC San Francisco. While in graduate school, Dr. Steen completed a program in Management of Technology at UC Berkeley's Haas School of Business.