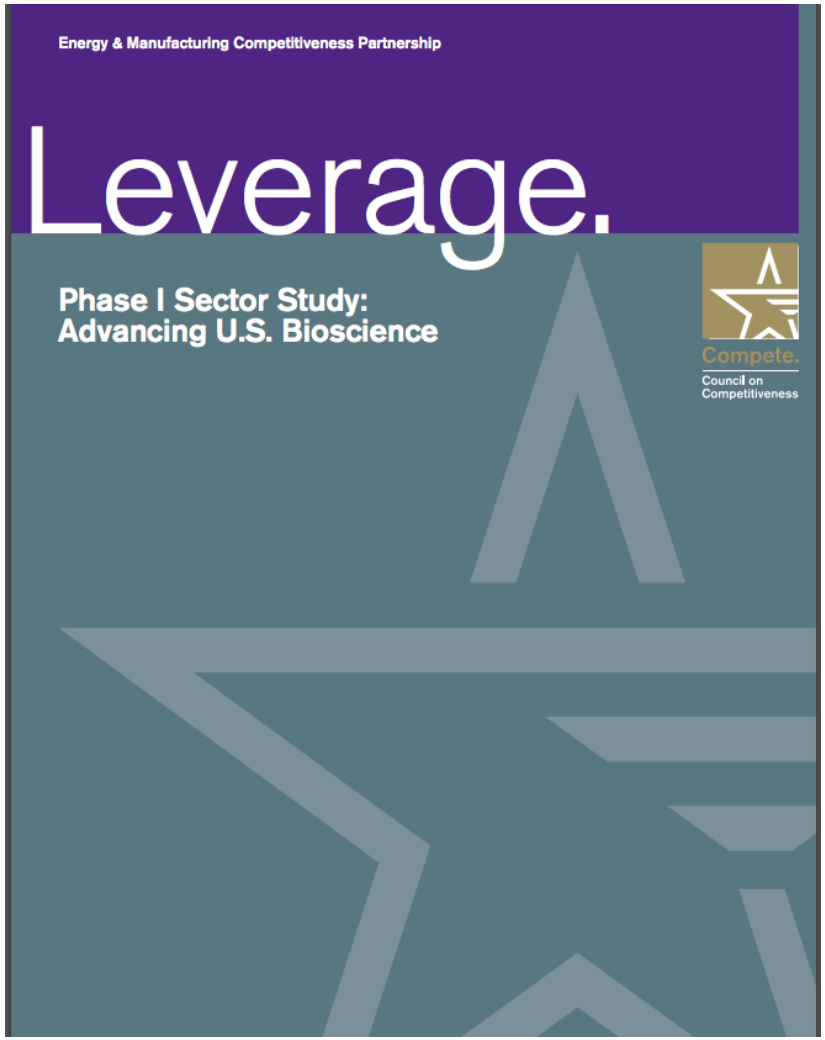


Advancing US Bioscience

Mary Maxon, Ph.D.

Associate Laboratory Director for Biosciences

November 3, 2017

Council on Competitiveness

Goal: Increase the US economic competitiveness in the global marketplace.
Members: non-partisan group of CEOs, university presidents, labor leaders, national lab directors
Strategies:

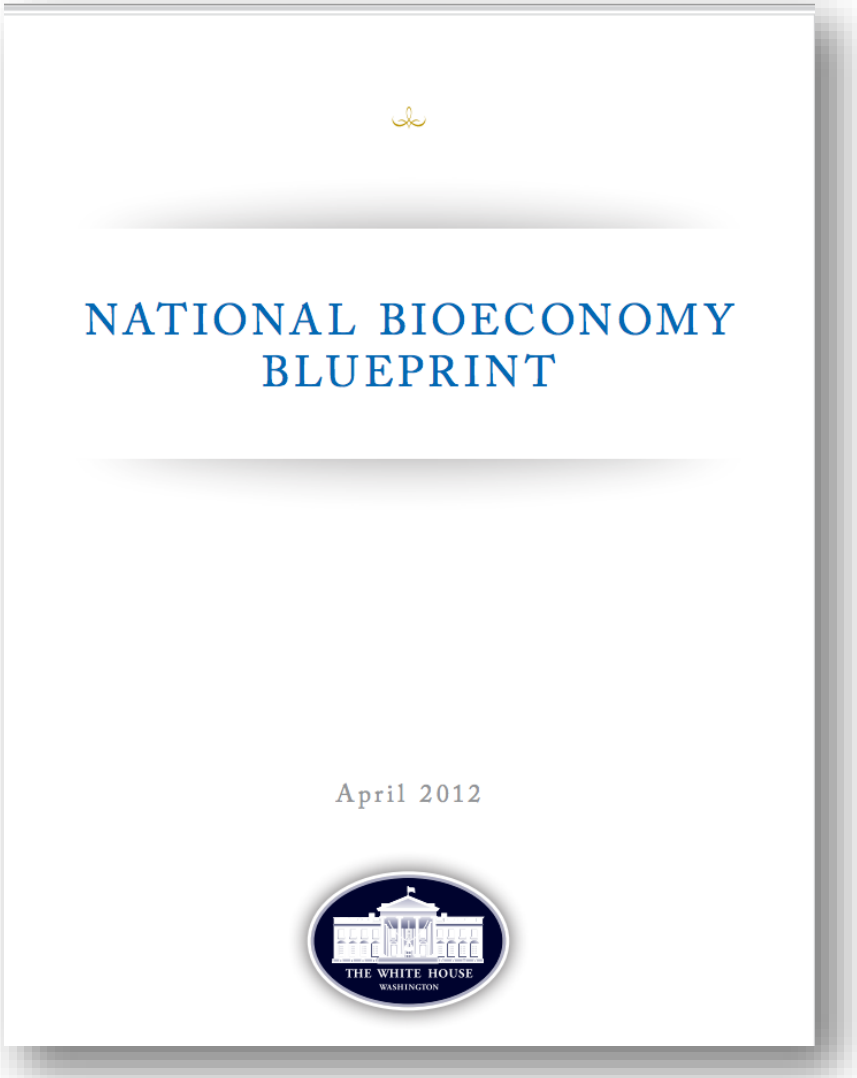
- Bring together business, labor, academic, and government leaders to evaluate economic challenges and opportunities
- Shape policies and run programs to stimulate productivity and grow the US economy

Energy & Manufacturing Competitiveness Partnership (EMCP)

- Purpose: analyze sectors of the economy shaped by altered energy landscape, primarily energy productivity & an emergent advanced manufacturing sector
- Membership: industry, academia, labor, national laboratories
- Sector studies:
  - –Water & Manufacturing
  - –Advanced Materials
  - –Advancing US Biosciences
  - –Agricultural & Consumer Water Use
  - –Energy
  - –Aerospace

Context: US Bioeconomy

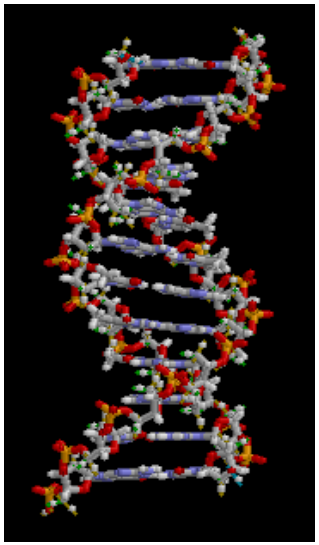
"Economic activities relating to the invention, development, production and use of biological products and processes."



Biosciences for the US Bioeconomy

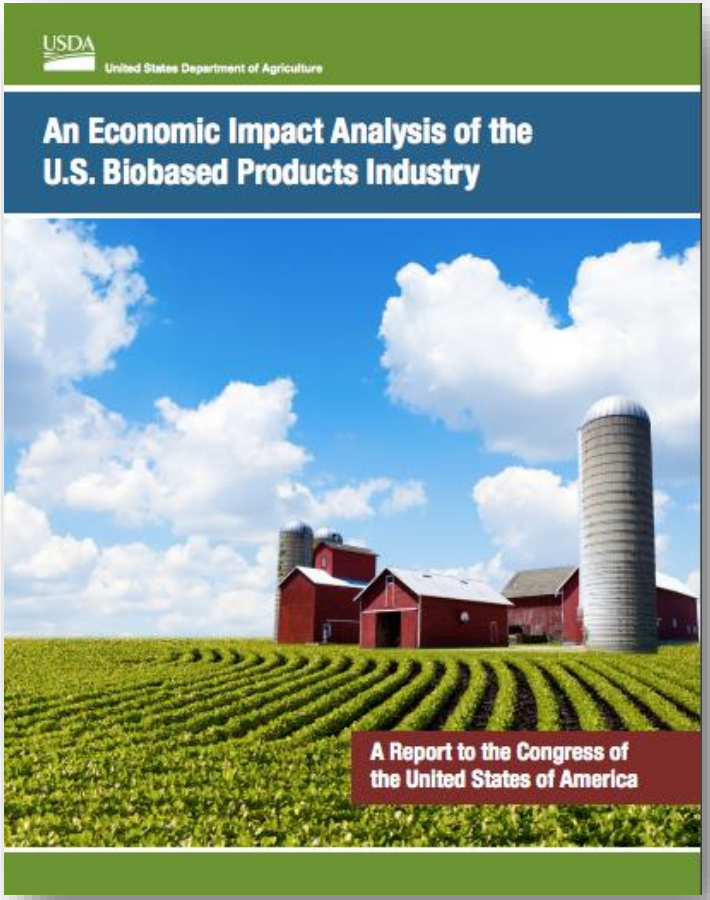
BIOMASS

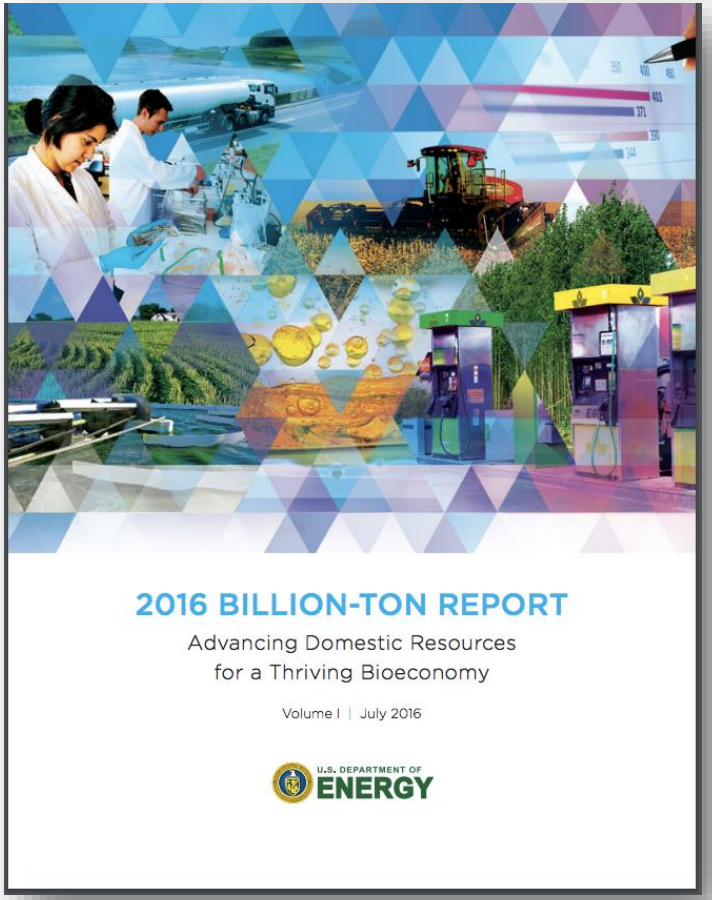
BIOTECHNOLOGY



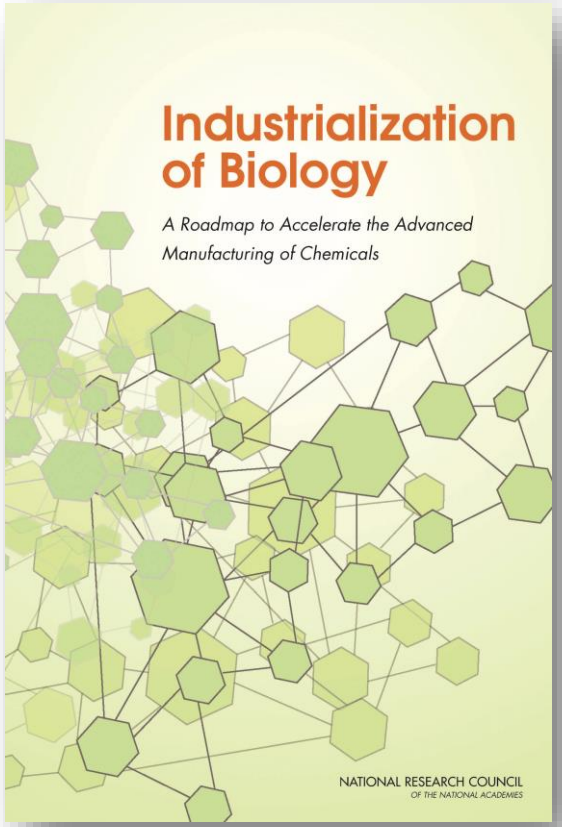
Biosciences for the U.S. Bioeconomy

$369 Billion 4 million jobs





Context: Industrialization of Biology 2015



- Relevant government agencies establish an on-going road-mapping mechanism to provide direction to technology development, translation and commercialization at scale.

- NSF, DOE, NIH, NIST, DOD, should support research and foundational technologies to advance and to integrate the areas of feedstocks, organismal chassis and pathway development, fermentation, and processing.

Advancing US Biosciences: July 27, 2016

- US Council on Competitiveness in partnership with:
  - –Lawrence Berkeley National Lab
  - –Lawrence Livermore National Lab
  - –Pacific Northwest National Lab
  - –Sandia National Labs

- Dialogue to examine the national ecosystem to leverage physical, engineering and life sciences to advance national leadership from human health to energy and agriculture

Discussion topics

- Roadblocks, gaps, bottlenecks
- Expectations of industry, policy makers and consumers in driving the bioeconomy
- Needed platform technologies
- Opportunities to leverage existing federal resources
- Social, ethical, regulatory, and economic issues surrounding manufacture of “biosynthetic” products
- US international standing in biosciences and its impact on economic development

Biomanufacturing Hill Day: July 28, 2017

ASME NEWS

ASME Congressional Briefing Explores Advanced Biosciences for Manufacturing

ASME NEWS

- Newsmakers
- Obituaries
- Future Engineers Launch Events Celebrate 3D Design and Creativity
- Members' and Students' Luncheon to Feature Awards Presentation
- Your Invitation to the Honors Assembly
- Honors Assembly Highlights the Achievements of the Profession's Finest
- Applications Now Being Accepted for the 2018 WISE Internship

Sept. 9, 2016

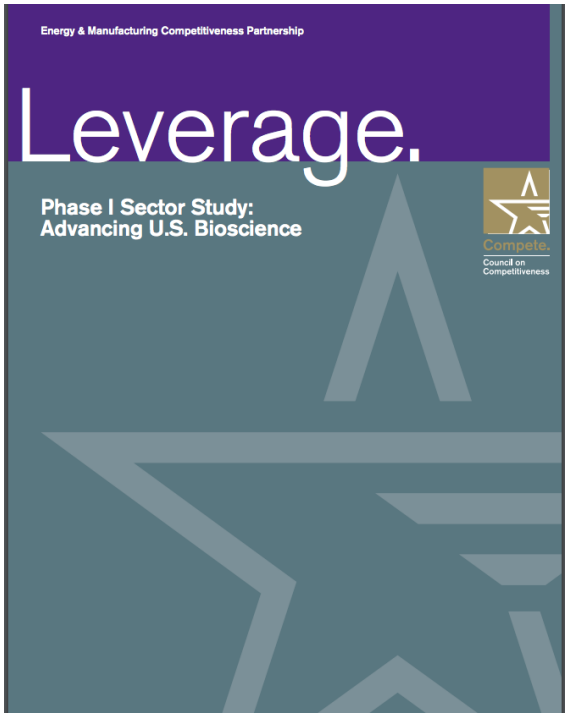
(Left to right) ASME Past President Bob Sims, Mary Maxon from Lawrence Berkeley National Laboratory, Steve Evans from Dow AgroSciences, Malin Young of Pacific Northwest National Laboratory, Anup Singh from Sandia National Laboratories, and Rina Singh from Biotechnology Innovation Organization (BIO) at the "Advanced Biosciences for Manufacturing" Congressional briefing.

ASME recently sponsored a Congressional briefing, "Advanced Biosciences for Manufacturing: Driving Solution in Energy, Health, and the Environment," in Washington, D.C. The briefing, which was attended by more than 100 members of Congress, Congressional staff, agency officials and thought leaders, focused on how advances in biosciences can improve the nation's biomanufacturing competitiveness and address grand scientific challenges for energy, the environment, human health and agriculture.

The event was convened on July 28 in conjunction with the House Manufacturing Caucus as part of a series of manufacturing briefings being held throughout the year. J. Robert Sims, past president of ASME, welcomed the audience and acknowledged the co-chairs of the Manufacturing Caucus, Congressmen Tim Ryan (D-OH) and Tom Reed (R-NY), and introduced a distinguished panel of speakers from the bioscience and biotechnology industry.

Report Release: July 25, 2017

Russell Senate Building:



- Senator Jerry Moran (R-KS)
- Senator Chris Van Hollen (D-MD)
- Congressman Randy Hultgren (IL-14)

- Bill Bates (CoC)
- Jay Keasling (LBNL)
- Alison Campbell (PNNL)
- Gene Block (UCLA)
- Tom Reed (Intrexon)

Advancing US Bioscience

- Infrastructure
  - Innovation pipeline = disconnected
- Technology
  - Slow development cycles
  - Lack of sens[illegible]e-up technologi[illegible]
- Investme[illegible]
  - Lack of coordination, platform technology underinvestment
- Talent
  - Multidisciplinary training gap

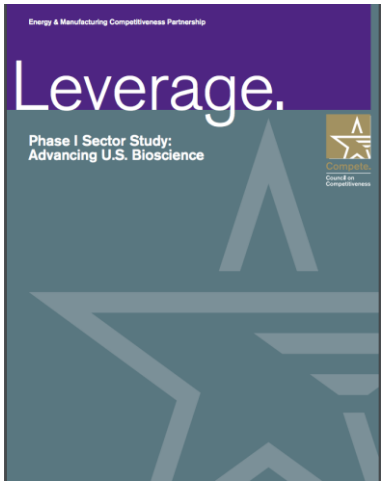
Bioethics

Recommendations

- Develop a strategic roadmap to meet national goals
- Coordinate investments across agencies, broaden to include cross-disciplinary fields, focus on platform technologies
- Address public distrust of science and regulation by increasing outreach efforts
- Focus on multidisciplinary bioscience/computing/engineering training

Future Outlook

Global Federation of Competitiveness Councils meeting in Malaysia, Nov. 2017



Future COC partnership with DOE/national labs to implement recommendations/develop strategic roadmap?

Thank you!