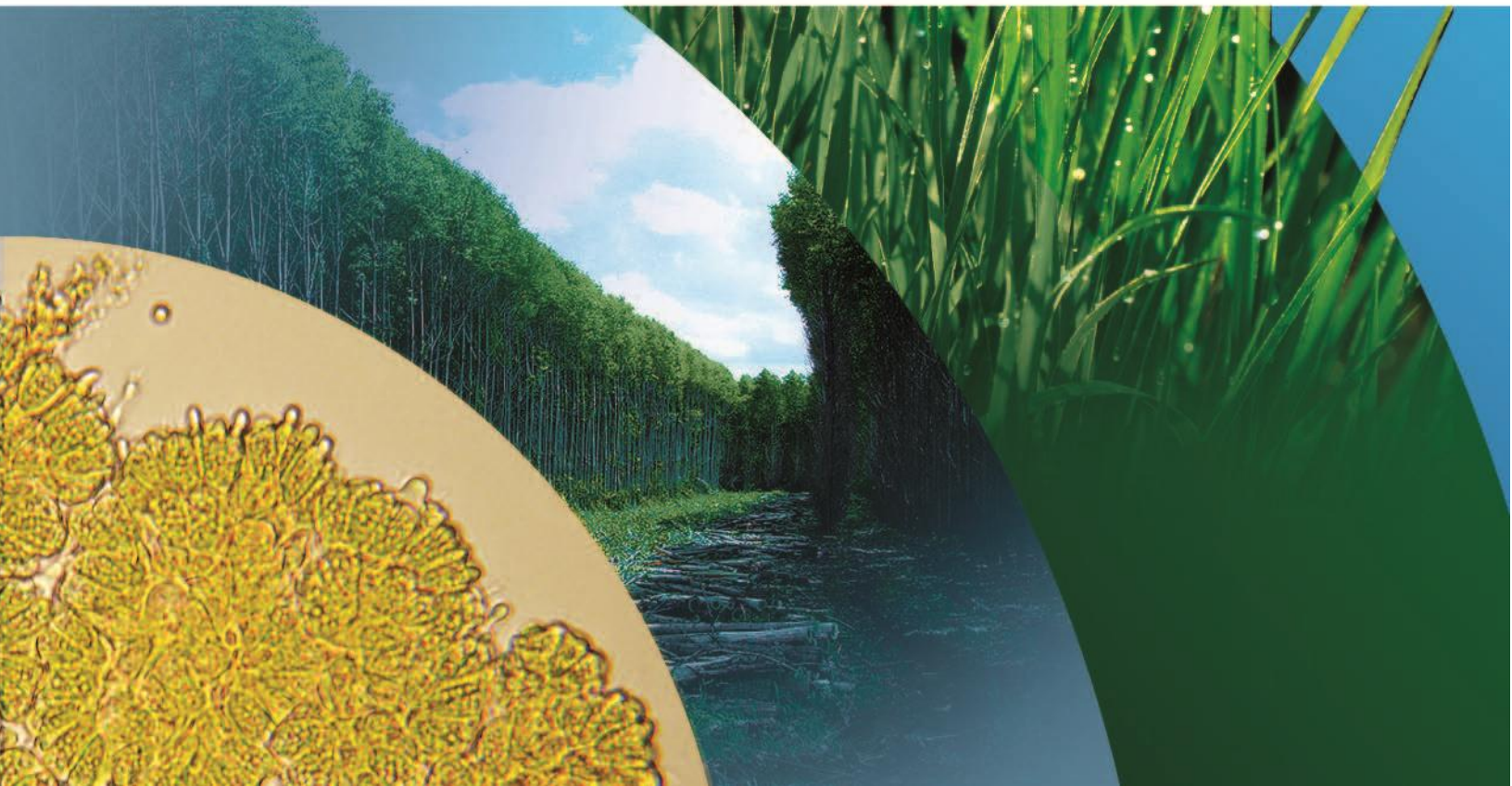


BIOMASS Multi-Year Program Plan

November 2011



EXECUTIVE SUMMARY

The Biomass Program is one of the nine technology development programs within the Office of Energy Efficiency and Renewable Energy (EERE) at the U.S. Department of Energy (DOE). This Multi-Year Program Plan (MYPP) sets forth the goals and structure of the Biomass Program. It identifies the research, development, demonstration, and deployment (RDD&D) activities the Program will focus on over the next five years and outlines why these activities are important to meeting the energy and sustainability challenges facing the nation.

This MYPP is intended for use as an operational guide to help the Biomass Program (the Program) manage and coordinate its activities, as well as a resource to help articulate the Program's mission and goals to management and the public.

Biomass Program Mission and Goals

The mission of the Program is to:

Develop and transform our renewable biomass resources into commercially viable, high-performance biofuels, bioproducts, and biopower through targeted research, development, demonstration, and deployment supported through public and private partnerships.

The goals of the Program are to develop sustainable, commercially viable biomass utilization technologies to:

- *Enable the production of biofuels nationwide and reduce dependence on oil through the creation of a new domestic bioenergy industry supporting the Energy Independence and Security Act of 2007 (EISA) goal of 36 billion gallons per year (bg/y) of renewable transportation fuels by 2022*
- *Increase biopower's contribution to national renewable energy goals through increasing biopower generating capacity.*

Technology Portfolio

The Program manages a diverse portfolio of technologies across the spectrum of applied RDD&D within the dynamic context of changing budgets and administrative priorities. The portfolio is organized to reflect the biomass-to-bioenergy supply chain—from the farmer's field to the end user (see Figure A).

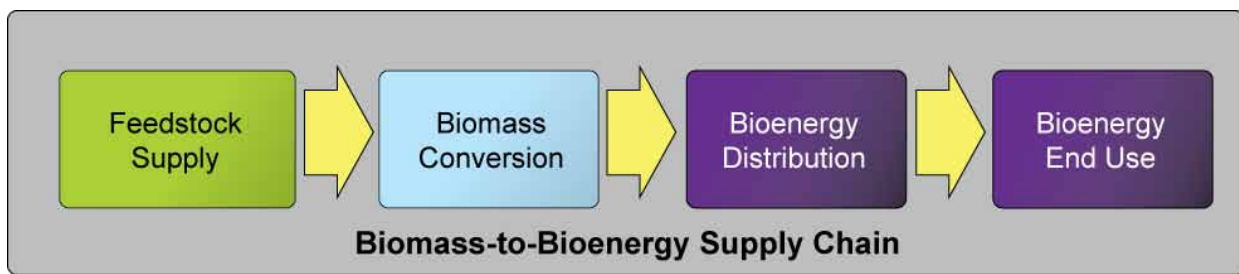


Figure A: Biomass-to-Bioenergy Supply Chain

The Program has developed a coordinated framework for managing its portfolio based on systematically investigating, evaluating, and down-selecting the most promising opportunities across a wide range of emerging technologies and technology readiness levels (TRLs). This approach is intended to support a diverse technological portfolio in applied research and development (R&D), while identifying the most promising targets for follow-on industrial-scale demonstration and deployment.

Key components of the portfolio include:

- R&D of a sustainable, high-quality feedstock supply system
- R&D of biomass conversion technologies
- Industrial-scale demonstration and validation of integrated biorefineries and biopower generation
- Cross-cutting sustainability, analysis, and market expansion activities.

Technology Development Timeline and Key Activities

In order to achieve the Program's goals, all of the challenges and barriers identified within this MYPP need to be addressed. However, the issues identified in Figure B are critical and will be emphasized within the Program's efforts over the next five years:

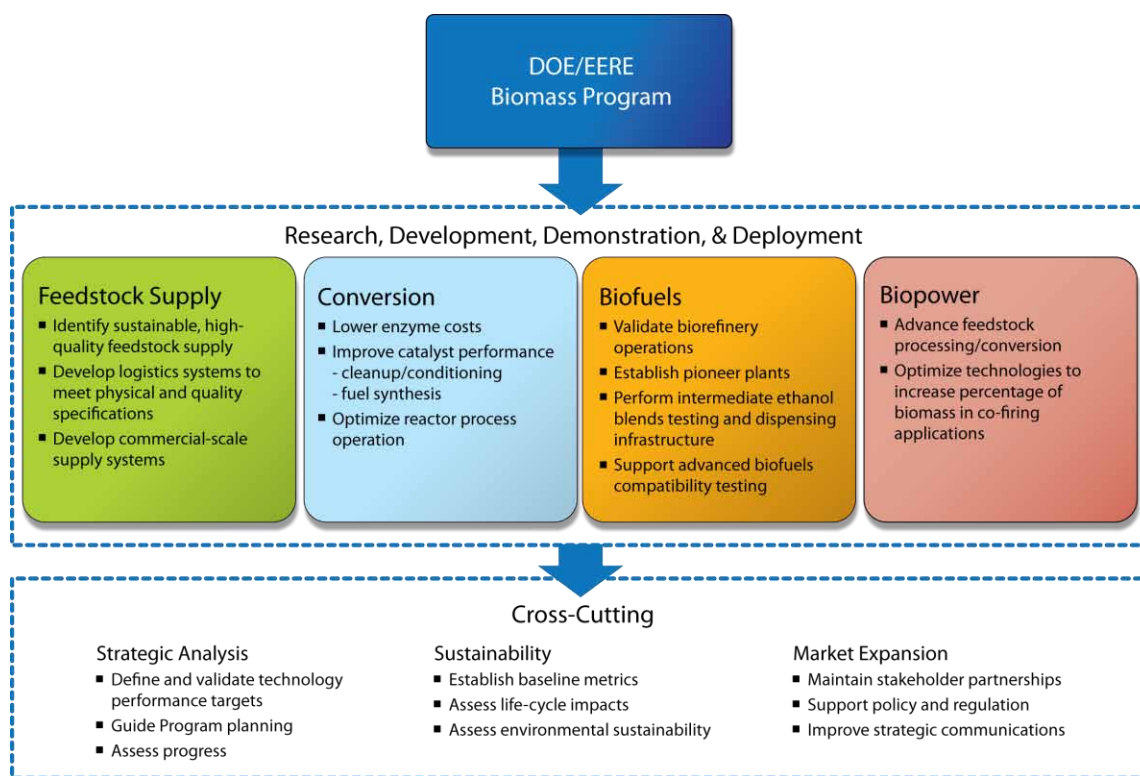


Figure B: Program Structure with High-Impact Research Areas

Figure C illustrates the near-term technology development timeline and key activities of the Program. In the longer term, the Program will continue to support basic science and RDD&D of advanced biomass utilization technologies. Detailed life-cycle analysis of environmental, economic, and social impacts, while not specifically detailed as milestones, will continue to inform decisions regarding Program activities.

This approach ensures development of required technological foundation, leaves room for pursuing solutions to technical barriers as they emerge, enables demonstration activities that are critical to proof of performance, and lays the groundwork for future commercial deployment without competing with or duplicating work in the private sector. The plan addresses important technological advances to produce biofuels, as well as the underlying infrastructure needed to ensure that feedstocks are available and products can be distributed safely with the quality and performance demanded by end consumers.

The Biomass Program’s MYPP is designed to allow the Program to progressively enable the deployment of increasing amounts of biofuels, bioproducts, and biopower across the nation from a widening array of feedstocks. This approach will not only have a significant impact on oil displacement at the earliest, but will also facilitate the shift to renewable, sustainable bioenergy technologies in the long term.

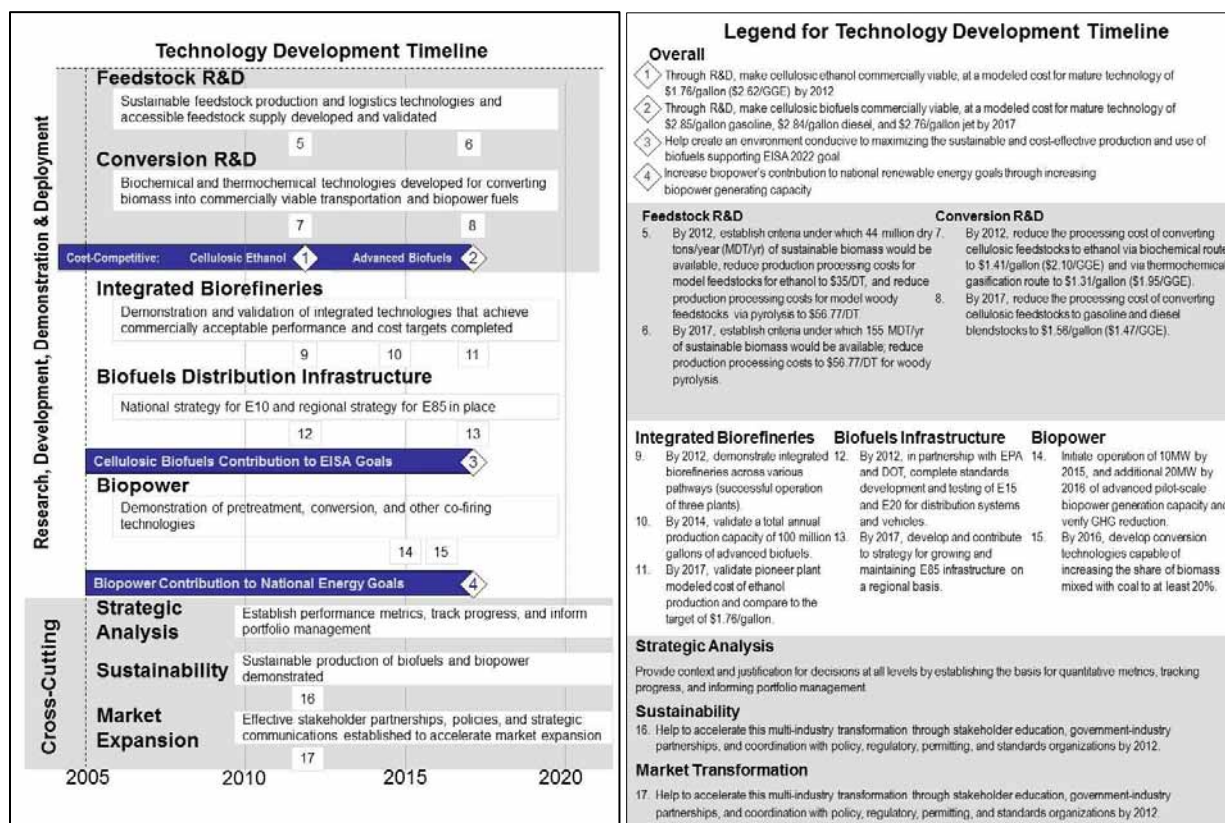


Figure C: Biomass Program Strategy and Timeline for Technology Development