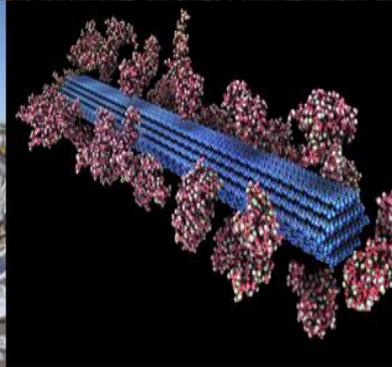




U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
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Bioenergy Technologies Office Strategic Planning Overview

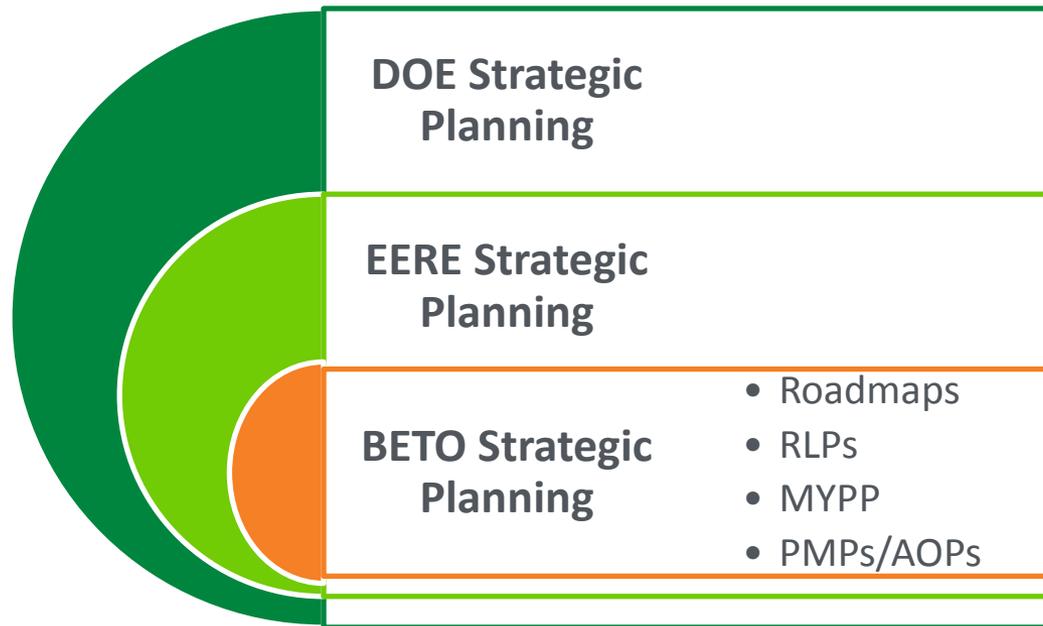
July 30, 2013

Alison Goss Eng

Analysis & Sustainability
Program Manager and
Operations Lead

Strategic Planning Overview

- Strategic planning is a continuous process
- Our planning efforts provide a framework for
 - Inter- and intra-office collaborations /discussions across technology areas
 - Interactions with stakeholders
 - Alignment with EERE/DOE/Federal goals
- Aligns Office activities from project level to multi-year goals



Context: DOE and EERE Strategic Planning

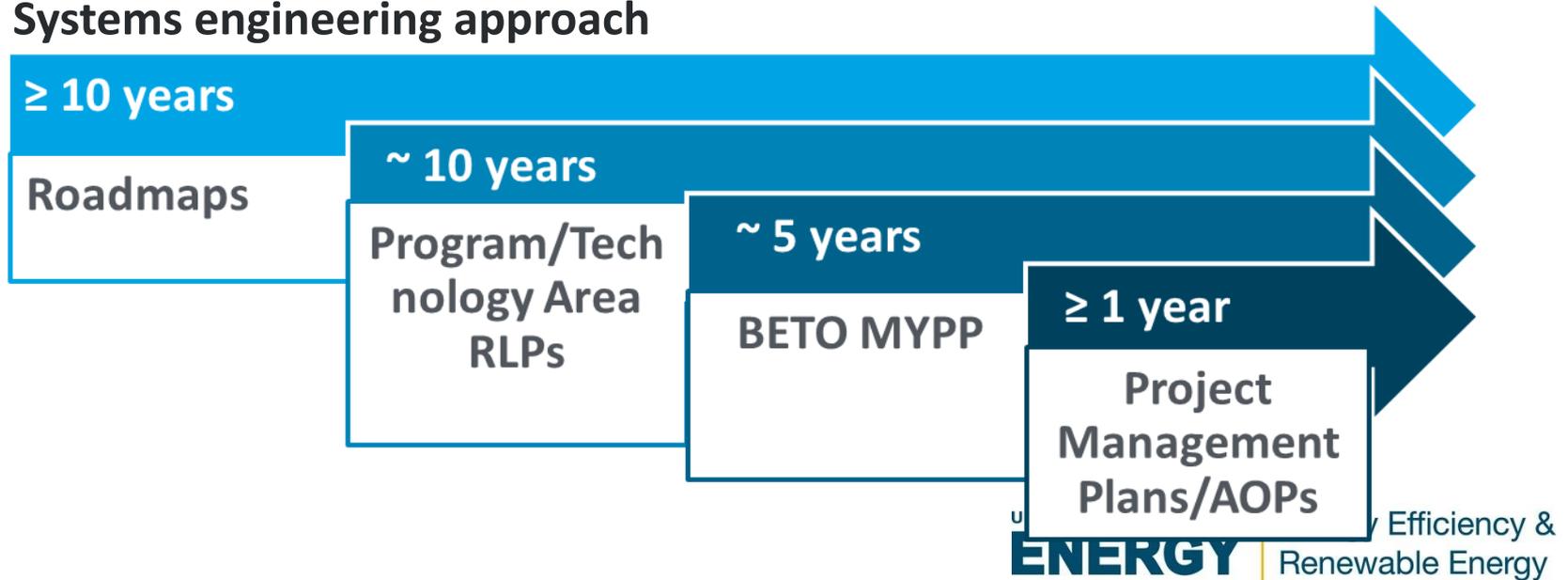
- **DOE required to update strategic plan every three years by Government Performance and Results Act (GPRA)**
 - 2014 is next update.
- **EERE has not released office-wide strategic plan in more than 10 years.**
- **EERE Strategic Plan is under development. The purpose of the plan is to:**
 - (Re)define EERE
 - Provide information that is useful for EERE staff and contractors
 - Demonstrate the logical basis for our vision and goals
 - Connect to our stakeholders
- **Offices in the Sustainable Transportation Sector are working closely together:**
 - Bioenergy Technologies Office
 - Fuel Cell Technologies Offices
 - Vehicle Technologies Office

Sustainable Transportation Sector Objectives--DRAFT

- **Reduce transportation oil use.**
- **Develop cost-competitive vehicle and fuel options.**
- **Ensure fuel and vehicle technology advancements that maintain or improve affordability, reliability, performance, safety, comfort, and environmental impact.**
- **Develop vehicle and fuel technologies needed to attain or exceed fuel economy, renewable fuels, and emissions standards.**
- **Advance development, adoption, and use of codes and standards that facilitate deployment of vehicle and fuel technologies and address our transportation energy and environmental objectives.**
- **Catalyze and accelerate at-scale market acceptance through pioneering demonstrations and strategic deployment of advanced vehicle and fuel technologies.**
- **Address key barriers associated with systems and grid integration, and infrastructure compatibility and deployment, to facilitate market acceptance.**

BETO Strategic Planning Overview

- Purpose of BETO strategic planning:
 - Align objectives and activities across multiple stakeholders and interests
 - Document goals, current state of technology, and strategic plans
 - Inform budget processes
 - Track progress
 - Integrate learning
- Based on best practices for technology R&D planning
- Systems engineering approach



BETO Integrated Planning Structure: Roadmaps

- A Technology Roadmap is a comprehensive summary of a specific technology or R&D topic of interest.
 - Provides a “state of technology” review and documents associated R&D challenges.
 - Synthesizes public comments and supporting scientific literature.
- BETO develops Technology Roadmaps that serve to guide researchers and engineers, policymakers, federal agencies, and the private sector in implementing national research, development, and deployment efforts.
- Roadmaps inform BETO’s RLP efforts and support the development of the MYPP.



≥ 10 years

Roadmaps

Roadmaps

≥ 10 years

Roadmaps

- [National Algal Biofuels Technology Roadmap \(2010\)](#)
- [Breaking the Chemical and Engineering Barriers to Lignocellulosic Biofuels: Next Generation Hydrocarbon Biorefineries \(2008\)](#)
- [Roadmap for Biomass Technologies in the United States \(2007\)](#)
- [Breaking the Biological Barriers to Cellulosic Ethanol: A Joint Research Agenda \(2006\)](#)
- [Top Value Added Chemicals from Biomass - Volume I, Results of Screening for Potential Candidates from Sugars and Synthesis Gas \(2004\)](#)



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- **Technology Roadmaps are prepared with significant input from stakeholders.**
 - **Usually stem from a workshop/meeting that convenes stakeholders from industry, academia, national laboratories, government agencies, and non-governmental organizations to explore the topic of interest.**
 - **Following the release of the initial draft of a Roadmap, a comment period is held to allow the public to evaluate the document for fidelity and incorporate new information, viewpoints, and criticisms not captured during the initial meeting.**
- **While BETO compiles and edits the Roadmap, it is not intended to represent DOE's opinion, but rather aims to assimilate inputs from experts in the field.**

BETO Integrated Planning Structure: RLPs

- **Resource Loaded Planning (RLP)**
 - 10-year scenario
 - Key activities required to reach program/technology area targets
 - Scoping, sequencing, and prioritizing
 - Actual investment dependent upon appropriations
 - Reviewed annually and updated as needed

≥ 10 years

Roadmaps

~ 10 years

**Program/Technology
Area RLPs**

Resource-Loaded Planning

≥ 10 years

Roadmaps

~ 10 years

Program/Technology
Area RLPs

- **BETO uses integrated framework to manage RDD&D activities and down-select the most promising opportunities.**
- **BETO implements this framework through a series of Resource Loaded Plans (RLPs).**
- **RLPs highlight all activities that need to be conducted over 10-year timeframe, in order for a program/technology area to meet its established goals.**
 - **Assess resource requirements over time.**
 - **Determine necessary steps in the process toward achieving goals.**
- **Longer-term context (10 years) within which shorter-term (1-3 year) activities are considered.**
- **Scenario showing links between MYPP goals, budget requests, and Annual Operating Plans (AOPs).**
- **Defines funding projections and trade-offs.**

Resource Loaded Planning

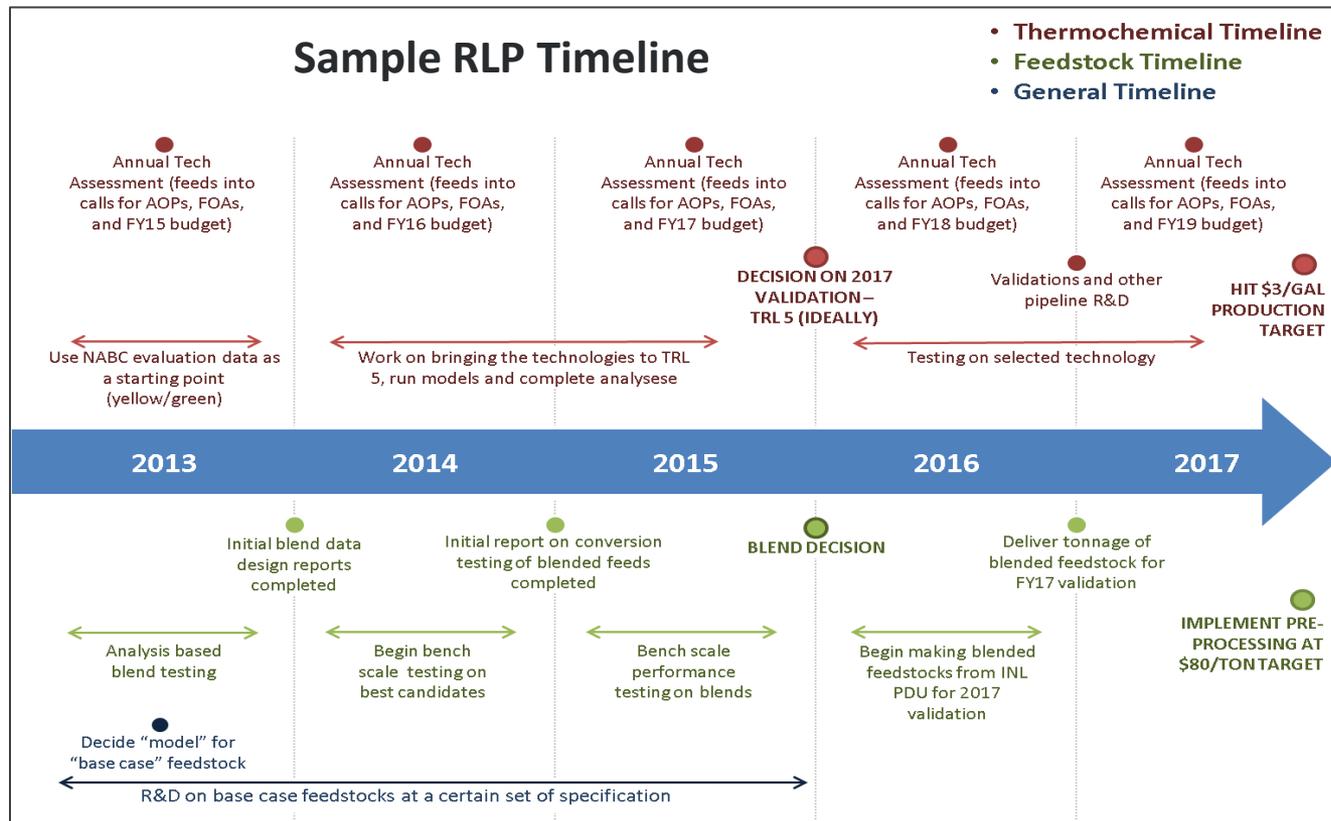
≥ 10 years

Roadmaps

~ 10 years

Program/Technology
Area RLPs

- Key program/technology area activities to reach Office goals and targets.
 - Aligned with MYPP structure, goals, and milestones
 - Scoping, sequencing, and priorities
 - Dynamic – dependent on appropriations and Administration priorities
- Provides framework for PMPs/AOPs.



BETO Integrated Planning Structure: MYPP

- **Multi-Year Program Plan (MYPP)**
 - 5-10 year planning horizon (based on 2022 goals)
 - Office goals
 - Technology Area/Program Planning
 - Coordination across BETO programs/technology areas
 - Revised as needed; subject to change control procedures



Multi Year Program Plan

≥ 10 years

Roadmaps

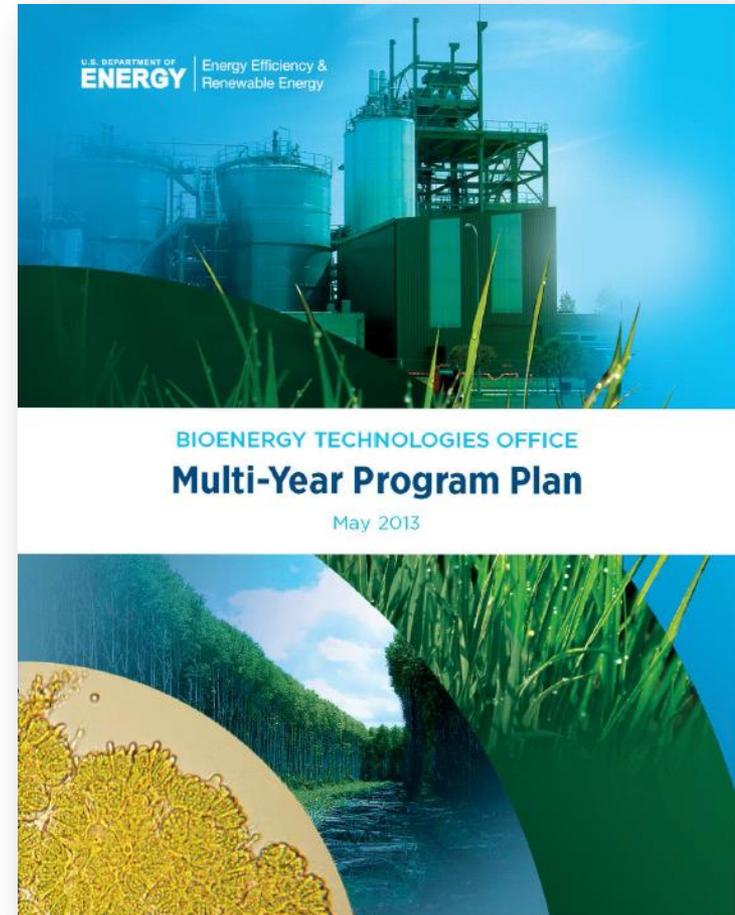
~ 10 years

Program/Technology
Area RLPs

~ 5 years

BETO MYPP

The BETO MYPP is intended for use as an operational guide to help the Office manage and coordinate its activities, as well as a resource to help articulate BETO's mission and goals to internal and external stakeholders



Available online:

http://www1.eere.energy.gov/bioenergy/pdfs/mypp_may_2013.pdf

Multi Year Program Plan

≥ 10 years

Roadmaps

~ 10 years

Program/Technology
Area RLPs

~ 5 years

BETO MYPP

- **Purpose of BETO Multi-Year Program Plan (MYPP):**
 - Sets forth Office goals and structure.
 - Identifies RDD&D activities that BETO will focus on over the next five years.
 - Outlines why these activities are important to meeting energy and sustainability challenges facing the nation.
- **Single planning document that integrates the work happening across BETO programs/technology areas and aligns goals across the Office.**

MYPP

Feedstocks

Algae

Biochemical
Conversion

Thermochemical
Conversion

Demonstration
& Deployment

Strategic
Analysis &
Crosscutting
Sustainability

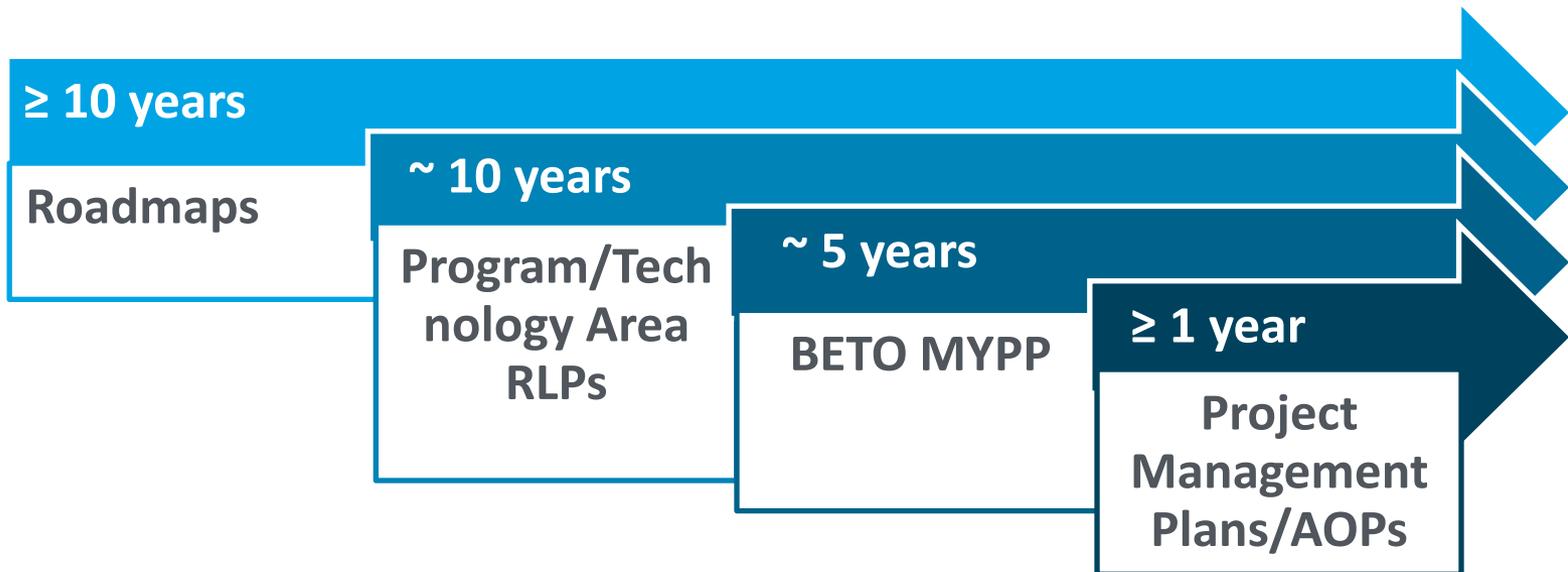
MYPP: Change Management



- **Change Management (CM) is standardized process for initiating, reviewing, and approving proposed changes to all base-lined and approved BETO documents.**
 - Maintains integrity of program planning products, specifically MYPP.
 - Includes control of changes to content, versions, and distribution of information, and focuses on disciplined control of programmatic and technical aspects of planning products.
 - Ensures that everyone is working toward, and reporting from, the same version of a BETO document.
- **CM uses the processes of change REDI**
 1. Request
 2. Evaluation
 3. Disposition
 4. Implementation

BETO Integrated Planning Structure: Project Management Plans

- **Project Management Plans (PMPs)/Annual Operating Plans (AOPs)**
 - Project-level
 - Aligned with program/technology area milestones, barriers, etc.



Strategic Planning as part of Systems Integration

Systems Level Planning:

- Establishing well-documented, focused, integrated targets and plans aligned with program objectives
- Implementing formal change control on key programmatic documents



Performance Verification

- Verifying that technology and system designs meet program requirements

Portfolio Analysis (Integrated Baseline)

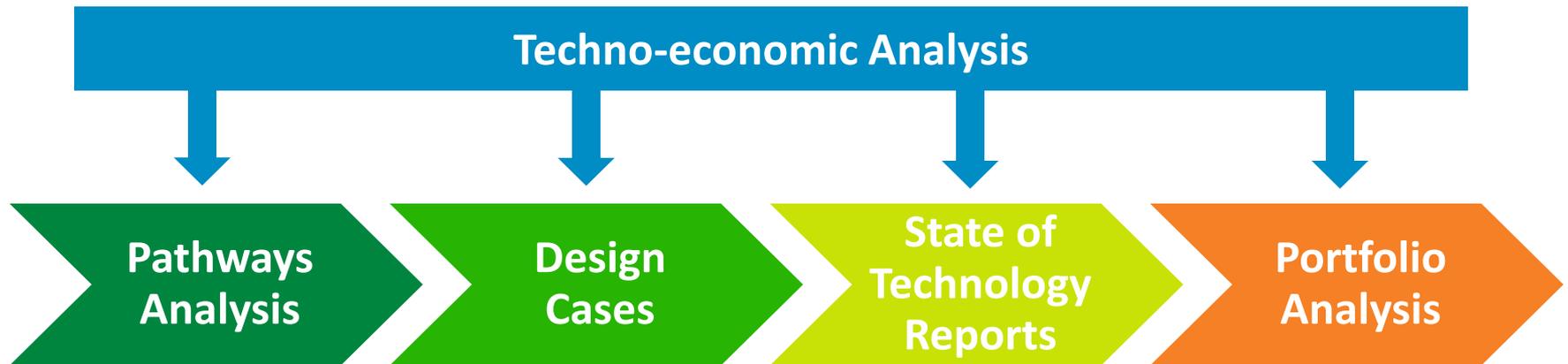
- Track technical progress of program
- Identify gaps/overlaps/strategic balance

Systems-Level Analysis

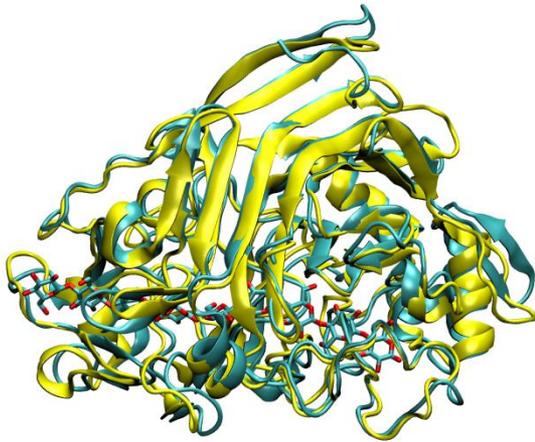
- Providing consistent systems-level analyses
- Identifying and assessing technical and programmatic risks

Strategic Analysis and Planning

- BETO's Strategic Analysis work informs strategic planning efforts.
- High level techno-economic analyses (TEAs) help identify the most promising biomass technology pathways.
- Design cases are developed to facilitate target development.
- State of technology reports document progress toward goals.



Cellulosic Ethanol Achievement Example



Artistic model of the catalytic domain of an enzyme

1999-2002

- Basic design report developed
- Provided model process and baseline cost; identified areas of R&D that would have the most impact on TEA
- Set technical targets

2002-2005

- Targeted R&D through labs and contracts for enzymes, pretreatment, and organism development

2005-2008

- Began integration and scale-up work
- Evaluated R&D and set the definition of “cost-competitive”
- Roadmapping

2008-2011

- Scale-up and targeted large scale R&D
- Ethanologen solicitation
- Cellulases solicitation
- Process integration and improvements FOA
- Roadmapping

2012

- Pilot-scale run to produce data necessary to run model – met 2012 cellulosic ethanol target

Summary

- **Strategic planning is a continuous process and focus for BETO**
- **Our planning efforts are multi-faceted and occur on multiple time-scales**
- **They provide a framework for collaboration, communication, and alignment for those within and external to our office**