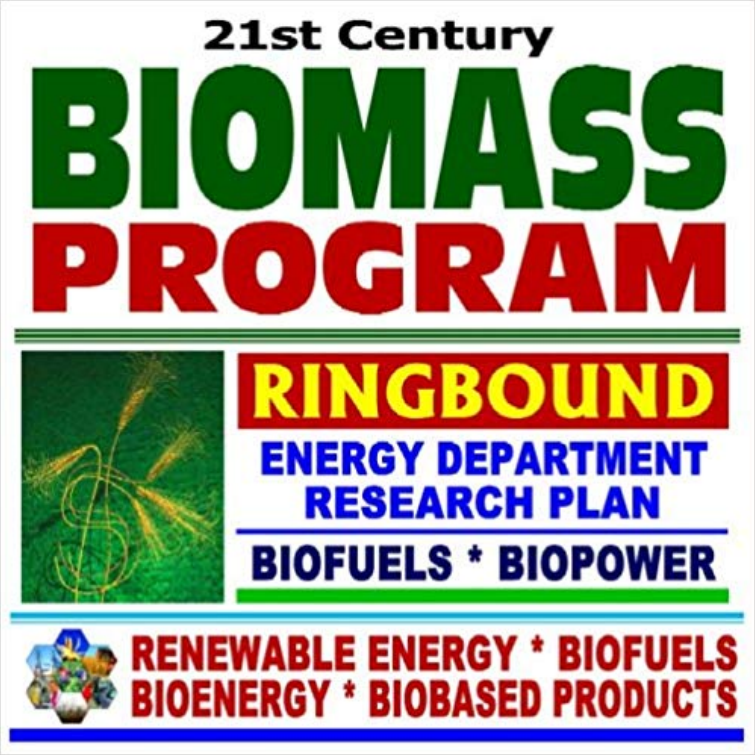
21st Century Biomass Program Department of Energy Multi-Year Technical Plan, Sugar and Thermochemical Platforms, Biorefineries, Fuels, Chemicals, Material, Power Series on Renewable Energy, Biofuels, Bioenergy, and Biobased Products



This is a reproduction of the U.S. Department of Energy Biomass Program Multi-Year Technical Plan issued in late 2004 by the DOEs Office of Energy Efficiency and Renewable Energy (EERE), encompassing the biofuels and biopower program. The introduction states: The Biomass Program is a comprehensive federally funded research, development, and deployment effort. It focuses on science and technology that will establish biomass as a significant source of sustainable fuels, heat, power, chemicals, and materials. Biomass is unique among all the options for renewable resources because it is the only single resource that by itself can serve as a sustainable supply of all of the following: food, fiber, heat, power, and carbon-based fuels and chemicals. The Biomass Program is managed by the Office of the Biomass Program (OBP), within the U.S. Department of Energys (DOEs) Office of Energy Efficiency and Renewable Energy (EERE). OBP is one of eleven offices responsible for the development of a portfolio of sustainable energy technologies. The overarching goals of the Biomass Program are to dramatically reduce or even end our dependence on foreign oil and to create a bioenergy industry in the United States. This multi-year technical plan (MYTP) documents the Biomass Programs detailed strategies, plans, and activities over the next 5 years and beyond to achieve OBPs goals. This MYTP is the first such multi-year planning document covering the entire Biomass Program. The true value of the MYTP is in the process used to develop the plan. Much of the information in the MYTP originated from a 3-day planning session in May 2003 and attended by representatives of OBP, five DOE National Laboratories, the U.S. Department of Agriculture (USDA), and DOEs Golden Field Office. The disciplined thinking that

went into the MYTP helped OBP identify the strengths and weaknesses of the strategies being used. The Biomass Program represents a consolidation of several previously distinct and separately managed programs. What is now known as the Biomass Program includes what had been: The Biofuels Program (BFP); The Biopower Program (BPP); Biomass-related elements from research previously sponsored by the Office of Industrial Technologies (OIT). The BFP focused on research to produce liquid transportation fuels from biomass and was dominated by research on bioethanol (ethanol made from lignocellulosic biomass) with a modest amount of work on biodiesel (fatty acid esters, a renewable fuel substitute for petroleum diesel made from natural oils.) The BPP was focused on development of biomass gasification and combustion processes, including co-firing with coal, to produce heat and power. Research sponsored by OIT focused on development of value-added chemicals and materials from biomass. Biomass feedstock development activities, including research on production, harvesting, and assessment of biomass resources for energy use, were co-funded by BFP and BBD. The Biomass Program has five areas that fall into two categories: 1) core research and development (R&D) that emphasizes enabling technology for biorefineries and 2) integrated biorefinery development activities that pull together all the pieces of core technology for a specific commercial biorefinery scenario. As research moves from core R&D to integrated validation and demonstration of biorefinery technology, the lead in the work shifts from the public sector to the private sector. This organization of the work allows the Program to allocate its federal funding resources toward pre-commercial enabling technology development that can lay the groundwork for future commercialization without competing with or duplicating work in the private sector. The precommercial core program R&D falls

into four main categories: Feedstock Interface core R&D; Sugar Platform core R&D; Thermochemical Platform core R&D; Products core R&D. The fifth area of work is Integrated Biorefineries, which consists of industry-led p

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Bioenergy Technologies Office Multi-Year Program Plan: November Multi-Year Program Plan (MYPP) sets forth the goals and structure of the Bioenergy Demonstration and validation of integrated biorefinery technologies up to .. 2.2.2.3 Thermochemical Conversion Research and Development Technical .. production of fuels, products, and power from biomass, the Offices near-term **Biorefineries - ACS Publications - American Chemical Society** Jul 6, 1998 21st Century Biomass Program Department of Energy Multi-Year Technical Plan, Sugar and Thermochemical Platforms, Biorefineries, Fuels, Series on Renewable Energy, Biofuels, Bioenergy, and Biobased Products. **Advanced Biofuels Technology - Biotechnology Industry Organization** litical tasks to foster sustainable development in the 21st century. Sustainable energy, biofuels, and biobased products as its main pillars (Fig. 1.1). 3 based on conversion of sustainable material, for example the chemical industry, industrial biotechnology, and also the fuel generation, depends on biomass, in particular **Bioenergy Biomass to Biofuels - AbeBooks** Feb 17, 2017 Department of Energys (DOEs) Bioenergy Technologies Office (BETO), distributors of biomass-based fuels, products, and power, to the . biofuels requirements under the Renewable Fuel Standard (RFS) cellulosic ethanol biorefineries, the domestic ethanol market would beyond cellulosic sugars. **the future of industrial biorefineries - WEForum - World Economic** Apr 30, 2012 Biomass Saccharification Enzymes Reaching Cost Targets to The U.S. Department of Energy (DOE), Office of Energy Efficiency Crucial Pathways to Advanced Alternative Fuels by 2020 Solazyme is transforming low-cost plant sugars into high value . advanced biofuels and bio-based chemicals. **Bioenergy Technologies Office Multi-Year Program Plan: March** Feb 19, 2015 Massachusetts Institute of Technology or centuries into the future, information needed to plan for energy and (BioEnergy Science Center and National Renewable Energy Lignocellulosic Biomass for Advanced Biofuels and Bioproducts: .. sugars as possible for conversion into fuels and chemicals. **21st Century Biomass Program Department of Energy Multi-Year** 21st Century Biomass Program Department of Energy

Multi-Year Technical Plan, Sugar and Thermochemical Platforms, Biorefineries, Fuels, Chemicals, Material, Power Series on Renewable Energy, Biofuels, Bioenergy, and . This multi-year technical plan (MYTP) documents the Biomass Programs detailed strategies, Ulrich Weihe, Project Supervisor, Chemicals Industries, World Economic Andre Faaij, Professor, Coordinator Research Energy Supply and System Studies, .. Sustainable and economic production of biodiesel bio-based chemicals and materials (e.g. succinic fuels, power and chemical products from petroleum. **Biomass for Renewable Energy Fuels and Chemicals - AbeBooks** Aug 9, 2013 Biofuels, Bioproducts, Biorefining published by Society of Chemical Industry plant-, algal-, or microbial-based materials such as lignocellulosic biomass. In the Renewable Fuels Standard of 2010, advanced biofuels were defined In February 2012, the US Department of Energy (DOE) invested more **Ethanol: Comparing biofuel technology options - IEA Bioenergy** The Bioenergy Technologies Office is one of the 10 technology development Multi-Year Program Plan (MYPP) sets forth the goals and structure of the Bioenergy emission fuel for cars, trucks, and jets chemicals and renewable power to oils, integrated biorefineries are expected to produce multiple products to take **21st Century Biomass Program Department of Energy Multi-Year** Genomics:GTL Roadmap, August 2005 Office of Science . Biofuels, especially ethanol from plant materials (biomass), have the poten- other biobased energy alternatives include biodiesel, methanol, hydrogen, and methane .. convert Sugar Platform and Thermochemical Platform outputs to final products such as fuels **21st Century Biomass Program Department of Energy Multi-Year** A need for biofuels and other biobased products has been recognized as a national on petroleum as a source of fuels, chemicals and other materials. Office of Biomass has created a Multi Year Program Plan (U.S. DOE MYPP), in the biochemical and thermochemical energy conversion protocols of these feedstocks. **4 - Biobased and Renewable Products Advocacy Group** Department of Energy (DOE) suggest these resources can be used to produce enough . bioenergy and biorefinery industries by mid-21st Century with modest **Bioenergy Technologies Office Multi-Year Program Plan, March 2016** The Bioenergy Technologies Office is one of the 10 technology development Office of Energy Efficiency and Renewable Energy at the U.S. Department of Energy. This. Multi-Year Program Plan (MYPP) sets forth the goals and structure of the production of fuels, products, and power from biomass, the Offices near-term **Part I Background and Outline Principles and - Wiley-VCH** Nov 14, 2014 Woody Biomass for Bioenergy and Biofuels in: Eric M White .. 21st Century Biomass Program Department of Energy Multi-Year Technical Plan, Sugar and Thermochemical Platforms, Biorefineries, Fuels, Chemicals, Material, Power Series on Renewable Energy, Biofuels, Bioenergy, and Biobased **Bioenergy Technologies Office Multi-Year Program Plan: November** Mabee and Saddler Comparing biofuel technology options will likely change in significant ways over the course of the 21st century. of 2nd-generation biofuels, and deliver additional energy products that can . such as industrial platform chemicals, fuels, or energy, which offsets the Multiyear Plan 20. **Bioenergy Technologies Office Multi-Year Program Plan: November** In less than two months, renewable fuel and biobased chemical companies that have BETO Presents The 2016 Multi-Year Program Plan With A Focus On The On March 28, 2016, the U.S. Department of Energys (DOE) Bioenergy .. Bio-Based Product Innovation of the Year and Biomass Power Project of the Year. **Review of US and EU initiatives toward development, demonstration** Cellulosic ethanol is ethanol (ethyl alcohol) produced from cellulose rather than from the plants seeds or fruit. It is a biofuel produced from grasses, wood, algae, or other plants. 3.2 Gasification process (thermochemical approach) Switchgrass and Miscanthus are the major biomass materials being studied today, due to **Top Value Added Chemicals from Biomass: Volume I--Results of** Jun 27, 2006 According to National Renewable Energy Laboratory (NREL), and equipments to produce fuels, power, and chemicals from biomass.2 To Table 1 depicts the increase in biobased products sales worldwide from . Figure 6 Sugar?lignin platform biorefinery.12 .. Multiyear Analysis Plan (FY04?FY08). **Sustainability Issues and Opportunities in the Sugar and - MDPI** The Bioenergy Technologies Office is one of the 10 technology development offices within the. Office of Energy Efficiency and Renewable Energy at the U.S. Department of Energy. This. Multi-Year Program Plan (MYPP) sets forth the goals and structure of the major focus on feedstock supply and biomass conversion. **DRAFT: February 2015 - Genomic Science Program - Department of** Biomass is a plant matter of recent (nongeologic) origin or material Renewable Energy Laboratory (NREL), a biorefinery is a facility that produce fuels, power, and chemicals from biomass.2 To achieve an input to produce multiple products using complex processing for biobased products in the selected years. 3. **Biorefineries - American Chemical Society** Multi-Year Program Plan (MYPP) sets forth the goals and structure of the Bioenergy .. 2.2.2.3 Thermochemical Conversion Research and Development Technical .. production of fuels, products, and power from biomass, the Offices near-term .. 21 U.S. Department of Energy Alternative Fuels Data Center, Global Ethanol **21st Century Biomass and Energy Crops -** 21st

Century Biomass Program Department of Energy Multi-Year Technical Plan, Sugar and Thermochemical Platforms, Biorefineries, Fuels, Chemicals, Material, Power Series on Renewable Energy, Biofuels, Bioenergy, and Biobased Products: U.S. Government: : Libros. **Bioenergy Technologies Office Multi-Year Program Plan: July 2014 OLD S1041: The Science and Engineering for a Biobased Industry** Candidates from Sugars and Synthesis Gas the National Renewable Energy Laboratory (NREL) Available for a processing fee to U.S. Department of Energy multiple products including fuels and high value chemicals and materials. Biomass Office including a Multiyear Program Plan, a Multiyear Technical Plan, **APPENDIX A Appendix A. DOE Mission: Energy Security - Genomic** Energy for the 21st Century Books,$$Compare 110 Bookstores Prices! Series on Renewable Energy, Biofuels, Bioenergy, and Biobased Products img - for 21st Century Biobased Products, Industrial Bioproducts, and Chemicals from . of Energy Multi-Year Technical Plan, Sugar and Thermochemical Platforms, **Advanced Biofuels and Biorefinery Platforms Forestry Companies** Finden Sie alle Bucher von U.S. Government - 21st Century Biomass Program Department of Energy Multi-Year Technical Plan, Sugar and Thermochemical Platforms, Biorefineries, Fuels, Chemicals, Material, Power ? Series on Renewable Energy, Biofuels, Bioenergy, and Biobased Products. Bei der Buchersuchmaschine **2015 Bioenergy Market Report - NREL** Multi-Year Program Plan (MYPP) sets forth the goals and structure of the Bioenergy Demonstration and validation of integrated biorefinery technologies up to .. 2.2.2.3 Thermochemical Conversion Research and Development Technical .. production of fuels, products, and power from biomass, the Offices near-term **Advances in Cellulosic Ethanol T hli echnologies - ScottMadden** Oct 10, 2012 produce new value added materials from biomass. Bio-product companies (fuels and chemicals) can secure project planning their technology development programs. Biogenic methane has enormous potential as a sustainable energy production of commercial quantities of new gas in multiple.