Below are nine projects relevant to the development of biorefinery technologies that were initiated during the 2000 to 2003 time frame by the U.S. Department of Energy. All projects have ended, some of the project partners are now involved in new biorefinery projects, while others have abandoned their efforts in this area.

Section: BIOREFINERIES

Recently Completed U.S. Department of Energy Biorefinery Projects

Project name	Lead Partner/ Project Period	Project cost	Project Description and Status
Making Industrial Biorefining Happen	Cargill-Dow LLC FY 2003-2007	$26 million	Develop and build a pilot-scale biorefinery that produces sugars and chemicals such as lactic acid and ethanol from grain. Current Status: Cargill Dow LLC is now known as NatureWorks LLC following Cargill's acquisition of The Dow Chemical Companies interest in the venture. The NatureWorks LLC website suggests that all products are currently made from corn starch.
Integrated Corn-Based Biorefinery	E.I. du Pont de Nemours & Co., Inc. FY 2003-2007	$18.2 million	Development of a biorefinery concept that converts both starch (such as corn) and lignocellulose (such as corn stover) to fermentable sugars for production of value added chemicals (like 1,3 propanediol) and fuel ethanol. Current status. Du Pont is making major investments in bioenergy technologies. The chemical 1,3 propanediol is now being commercial produced at DuPont Tate & Lyle Bio Products, LLC. in Loudon, Tennessee. DuPont and Genencor formed a joint venture company, DuPont Danisco Cellulosic Ethanol LLC, in May 2008 and this company is now the lead partner on the biorefinery project in Vonore, TN.
Advancing Biorefining of Distillers' Grain and Corn Stover Blends: Pre-Commercialization of a Biomass-Derived Process Technology	Abengoa Bioenergy Corporation FY 2003-2007	$17.7 million	Develop a process for pretreating a blend of distillers' grain (animal feed co-product from corn ethanol production) and stover to allow ethanol production from both, while leaving a high-protein animal feed. A large-scale pilot facility will be built for integration with High Plains' ethanol plant in York, Nebraska.
Big Island Demonstration project - Black Liquor	Georgia Pacific FY 2000 - 2007	NA	The project involved the design and operation of a black liquor gasifier that was to be integrated into Georgia-Pacific's Big Island facility in Virginia. This project anticipated helping pulp and paper mills with the replacement of recovery boilers that are reaching retirement. Current Status: The gasifier was built but the design did not function as anticipated and no current information can be located regarding any further work on the gasifier.
Collection, Commercial Processing, and Utilization of Corn Stover/Making Industrial Biorefining	Cargill-Dow LLC FY 2003-2007	NA	Develop new technologies that assist in the harvesting, transport, storage, and separation of corn residues. Engineer a fermentation system that will meet the performance targets for the commercial manufacture of lactic acid and ethanol from corn stover. Current Status: See description above.
Enhancement of Co-Products from Bioconversion of Muncipal Solid Waste	Masada OxyNol, LLC FY 2001 - 2004	NA	The unit operations of the Masada OxyNol™ process were to be examined and research focused on improving conversion efficiencies, mitigating scale-up risks, and improving the co-product quality and marketability. Current Status: The company now called Pencor-Masada Oxynol signed an agreement in 2004 with the city of Middletown, New York to build a waste-to-ethanol plant with a projected completion date in 2008. As of December 2007 the company was still trying to attract investors. The companies website still indicates that the project is proceeding, though the city has taken the company to court for failing to meet deadlines.
A New Biorefinery Platform Intermediate	Cargill, Inc. FY 2003 - 2007	$6 million	Develop fermentative organisms and processes to ferment carbohydrates to 3-hydroxypropionic acid (3-HP) and then make a slate of products from the 3-HP. Current Status: Cargill does make ethanol from corn starch at multiple locations. Their website suggests that the only current involvement in cellulosic ethanol is the funding provided to Iowa State University that includes money for an economic analysis of corn stover production, harvest, handling and storage.
A Second Generation Dry Mill Biorefinery	Broin and Associates FY 2003 - 2007	$5.4 million	Separate bran, germ, and endosperm from corn kernels prior to making ethanol from the remaining starch. Investigate making high-value products, as well as ethanol and animal feed from the separated fractions. Current Status: Broin and Associates, now called POET, is pursuing "Project Liberty", a project that is constructing a cellulosic ethanol production stream at their Scotland N.D. corn to ethanol facility. This project was awarded DOE funding in February 2007 and corn cobs were harvested in 2007 as feedstock for the facility.
Separation of Corn Fiber and Conversion to Fuels and Chemicals Phase II: Pilot-Scale Operation	National Corn Growers Association FY 2003 - 2007	$2.4 million	Under a previous DOE-funded project, a process was developed for separation of hemicellulose, protein, and oil from corn fiber. This project will pilot-scale test and validate this process for commercial use. Current Status: ADM a partner in the NCGA project announced in August 2008 that it was partnering with John Deere to harvest,

Sources:

U. S. Department of Energy, Energy Efficiency and Renewable Energy, Biomass Program, October, 2011, http://www1.eere.energy.gov/biomass/factsheets.html

Websites of all companies serving as project leaders or key partners on the DOE funded projects.