
Visible Progress in Commercialization of Advanced Biofuels, Biobased Products and Renewable Chemicals

Industrial Biotechnology Companies Leading the Way



Biotechnology Industry Organization (BIO)

Abengoa Bioenergy, Hugoton, Kans.

26.5 million gallons per year, cellulosic ethanol.

Start Date: 4Q 2013.



Figure 1: Abengoa biorefinery project stack yard.

Figure 2: Abengoa Bioenergy New Technologies biorefinery construction progress, Feb. 2012.

Beta Renewables, Crescentino, Italy

20 million gallons per year cellulosic ethanol.

Start Date: 4Q 2012.



Figure 3: Beta Renewables construction progress July 2012.

BioAmber, Pomacle, France

2,000 metric tons per year biobased succinic acid.
Start Date: January 2010.



Figure 4: BioAmber Succinic Acid Biorefinery and warehoused product in operation since 2010.

BP Biofuels, Jennings, La.

1.4 million gallon per year cellulosic biofuel demonstration biorefinery.
Start Date: February 2007.



Figure 5: BP Biofuels demonstration facility and feedstock processing, in operation since 2007.

DuPont Cellulosic Biofuels, Vonore, Tenn.

250,000 gallon per year cellulosic biofuel demonstration biorefinery.

Start Date: 4Q 2009



Figure 6: DuPont Cellulosic Biofuel biorefinery in Vonore, Tenn.

DuPont Cellulosic Biofuels, Nevada, Iowa.

30 million gallon per year cellulosic biofuel commercial biorefinery.

Start Date: 3Q 2014



Figure 7: Flag-raising ceremony during DuPont Cellulosic Biofuel biorefinery groundbreaking in Nevada, Iowa, November 2012.



Figure 8: Lt. Gov. Kim Reynolds (R-Iowa), Gov. Terry Branstad (R-Iowa) and DuPont Industrial Biosciences President Jim Collins

DuPont Tate & Lyle, Loudon, Tenn.

100 million lbs. per year, 1,3 propanediol.

Start Date: November 2006.



Figure 9: DuPont Tate & Lyle PDO Biorefinery in operation since 2006.

Fibright, Blirstown, Iowa

6 million gallon per year cellulosic ethanol.

Start Date: 2Q 2013.



Figure 10: Fibright biorefinery undergoing renovation to cellulosic ethanol April 2012.

Gevo, Luverne, Minn.

22 million gallon per year biobutanol.
Start Date: 2Q 2012.



Figure 11: Gevo biorefinery retrofitted for biobutanol production opened May 2012.

INEOS New Planet BioEnergy, Vero Beach, Fla.

8 million gallon per year cellulosic ethanol; 6 MW biomass electricity.
Start Date: 4Q 2012.



Figure 12: INEOS New Planet BioEnergy August 2012. Facility is currently in commissioning and producing renewable electric energy.



Figure 13: USDA Sec. Tom Vilsack checks construction progress, August 2011.

Myriant, Lake Providence, La.

30 million lbs per year of bio-succinic acid.

Start Date: 1Q 2013.



Figure 14: Myriant construction progress March 2012.

NatureWorks, LLC, Blair, Neb.

140,000 tons per year PLA.

Start Date: 2002.



Figure 15: NatureWorks PLA biorefinery, in operation since 2002.

Novozymes, Blair, Neb.

Commercial enzyme biorefinery.

Start Date: May 2012



Figure 16: Novozymes North America enzyme biorefinery opened May 30, 2012.

POET-DSM Advanced Biofuels, Emmetsburg, Iowa

25 million gallons per year cellulosic ethanol.
Start Date: 3Q 2013.



Figure 17: POET-DSM groundbreaking March 2012.



Figure 18: POET-DSM corn stover stack yard November 2011.

Reverdia, Cassano Spinola, Italy

10 kiloton per year Biosuccinium™ sustainable succinic acid.

Start Date: End 2012.



Figure 19: Reverdia commercial plant under construction June 2012.

Sapphire Energy, Columbus, N.M.

1 million gallon per year integrated algal biorefinery.
Start Date: 1Q 2014.



Figure 20: Sapphire IABR construction progress November 2011.



Figure 21: Sapphire IABR ground preparation October 2011.

Sweetwater/BioGasol, Lyngby, Denmark

Cellulosic sugar pilot plant at the Denmark Technical University.

Start Date: 2006.



Figure 22: Pilot production of cellulosic sugars begun in 2006.

Verdezyne, Carlsbad, Calif.

1 metric ton per year diacid fermentation pilot plant.

Start Date: 4Q 2011



Figure 23: Verdezyne's fermentation pilot plant in Carlsbad, Calif., used for diacid production.

Verenium, San Diego, Calif.

Fermentation pilot plant for enzyme development.

Start Date: 3Q 2012



Figure 24: Verenium's new pilot plant within the company's new office and laboratory space in San Diego, California. Verenium moved into this new facility in June 2012.

ZeaChem, Boardman, Ore.

250,000 gallon per year acetic acid, ethyl acetate and cellulosic ethanol.
Start Date: 2012.



Figure 25: ZeaChem demonstration biorefinery, aerial view October 2012.