U.S. Cellulosic Ethanol Projects Under Development and Construction

Company	Location	Technology	Production Capacity	Feedstock	Notes
Abengoa	York, NE Hugoton, KS		11.6 mgy 11.6 mgy	corn stover, wheat straw, milo stubble, switchgrass and other biomass	The plants will produce enough energy to power the facility, with any excess being used to power the adjacent corn dry grind mill. The plants, also collocated with a grain-based ethanol facility, will test a fractionation process for breaking down biomass into ethanol.
AE Biofuels	Butte, MT	Ambient Temperature Cellulose Starch Hydrolysis	small scale	switch grass, grass seed, grass straw and corn stalks	Pilot facility began construction in February 2008. Utilizes patent-pending ambient temperature enzymes to eliminate the up-front "cooking" process that occurs in traditional starch ethanol production. Production began on August 11, 2008.
Bluefire	Corona, CA Lancaster, CA	Arkenol Process Technology (Concentrated Acid Hydrolysis Technology Process)	18 mgy 3.1 mgy	green waste, wood waste, and other cellulosic urban wastes (post-sorted municipal solid waste)	Ethanol will be produced from biorefinery facilities opportunistically constructed on or near landfills, waste collection and waste separation sites.
California Ethanol + Power, LLC (ce+p)	Brawley, CA		55 mgy	local Imperial Valley grown sugarcane; facility powered by sugarcane bagasse	Groundbreaking expected 2Q2009; in production scheduled for 2Q2011. Up to 50 MW renewable energy to power facility and sell back to CA power grid. Industrial grade CO2.
Coskata	Madison, PA	biological fermentation technology; proprietary microorganisms and efficient bioreactor designs in a three-step conversion process that can turn most carbon-based feedstock into ethanol	40,000 gal/yr	any carbon-based feedstock, including biomass, municipal solid waste, bagasse, and other agricultural waste	First plant expected online at the end of 2010. According to Argonne, which analyzed Coskata's process, for every unit of energy used, it generates up to 7.7 times that amount of energy, and it reduces CO2 emissions by up to 84 percent compared with a well-to-wheel analysis of gasoline. Coskata's process uses less than a gallon of water to make a gallon of ethanol compared with three gallons or more for other processes. The $25 million project will be located at the Westinghouse Plasma Center, the current site of a pilot-plant gasifier owned and operated by Westinghouse Plasma Corporation (WPC), a wholly owned subsidiary of Alter Nrg Corp.
DuPont Danisco Cellulosic Ethanol LLC	Vonore, TN	enzymatic hydrolysis technology	250,000 gal/yr	switchgrass, corn stover, corn fiber and corn cobs	Pilot scale facility scheduled to begin operations at the end of 2009. DuPont Danisco hopes to produce commercial volumes of cellulosic ethanol by 2012.

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					Will be located at the Niles Ferry Industrial Park.
Ecofin, LLC	Washington County, KY	Solid state fermentation process developed by Alltech	1.3 mgy	corn cobs	Estimated to be operational in 2010.
Flambeau River Biofuels LLC	Park Falls, WI	Thermo-chemical conversion of biomass using advanced gasification technologies followed by Fisher-Tropsch catalytic conversion into renewable liquid fuels and waxes ("Thermal 1" process)	6 mgy	softwood chips, wood, and forest residues	Co-produces ethanol and pulp. Co-located with an existing Flambeau River Papers pulp and paper mill. Estimated to be operational in 2010.
ICM Inc.	St. Joseph, MO	biochemical and thermochemical processing	1.5 mgy	switchgrass, forage, sorghum, stover	
Iogen Corp.	Shelley, ID	enzyme technology	18 mgy	agricultural residues including wheat straw, barley straw, corn stover, switchgrass and rice straw	Operating since 2004, Iogen's cellulose demonstration plant in Ottawa, Canada, converts wheat, oat, and barley straw into 3 million liters of ethanol per year (about 793,000 gallons).
KL Process	Upton, WY	thermal-mechanical process	1.5 mgy	soft wood, waste wood, including cardboard and paper	Demonstration scale. Operates intermittently. The plant is a culmination of development efforts between KL Process Design, the South Dakota School of Mines and Technology, the Wyoming Business Council and the Wyoming Department of Forestry. The plant is using ponderosa pine gathered from the Black Hills National Forest.
Lignol Innovations/Suncor	Grand Junction, CO	biochem-organisolve	2.5 mgy	woody biomass, agricultural residues, hardwood and softwood	"Showcase" demonstration plant. Lignol's de-lignification pre-treatment process is being integrated with recently acquired saccharification and fermentation process capabilities. Production expected to begin 2012.
Mascoma/ New York State Energy Research and	Rome, NY		5 mgy	lignocellulosic biomass, including switchgrass , paper sludge, and wood chips	The business partnership with the University of Tennessee is the result of Gov. Bredesen's Biofuels Initiative. It includes a $40 million

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Development Authority/New York State Department of Agriculture and Markets					investment in facility construction and $27 million for research and development activities.
Mascoma/Michigan Economic Development Corporation/Michigan State University/ Michigan Technological University	Chippewa County, Michigan	"consolidated bioprocessing" refinery would use genetically modified bacteria to break down and ferment local wood chips	40 mgy		$200 million in capital costs. Received grants of $26 million from the US DOE, and $23.5 million from the State of Michigan. Expected to begin production in late 2011.
NewPage Corp. (formerly Stora Enso North America)	Wisconsin Rapids, WI		5.5 mgy	woody biomass, mill residues	Will convert wood wastes to Fischer-Tropsch liquid and then into renewable diesel and renewable gasoline. NewPage Corp. is the largest printing paper manufacturer in North America.
New Planet Energy (formerly Alico)	Vero Beach, FL	INEOS Bio Ethanol process (gasification, fermentation and distillation)	1st stage 8 mgy; 2nd stage 21 mgy; 3rd stage, 100 mgy	municipal solid waste (MSW); unrecyclable paper; Construction & Demolition debris (C&D); tree, yard and vegetative waste; and energy crops	Site preparation is expected to begin at the end of 2008, with stage 1 in operation in 2010 and stage 2 in operation in 2011.
Pacific Ethanol	Boardman, OR	BioGasol	2.7 mgy	Wheat straw, stover, and poplar residuals	Co-located at the site of Pacific Ethanol's existing corn-based ethanol facility. Current plans call for the facility's completion in 4th quarter 2009.
POET	Scotland, SD Emmetsburg, IA	BFRAC™ separates the corn starch from the corn germ and corn fiber, the cellulosic casing that protects the corn kernel	20,000 gal/yr 31.25 mgy	corn fiber, corn cobs and corn stalks	Pilot-scale facility scheduled to begin production by end of 2008. The plant in Emmetsburg, IA after expansion will produce 125 mgy of ethanol, of which 25% will be cellulosic ethanol. The plant is expected to begin production in late 2011.
Range Fuels Inc.	Soperton, GA	two-step thermo-chemical process (K2)	20 mgy	wood residues and wood-based energy crops, grasses and corn stover	The Soperton facility will ramp up to full-scale operations producing up to 100 mgy.
RSE Pulp &	Old Town, ME	University of Maine	2.2 mgy	woodchips (mixed hardwood)	Co-located at RSE's existing pulp and paper

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Chemical LLC		proprietary process for pre-extracting hemicelluloses during the pulping process			mill in Old Town, Maine. Estimated to be operational in 2010.
Verenium	Jennings, LA Highlands County, FL	C5 and C6 fermentations	1.4 mgy 36 mgy	sugarcane bagasse and specially-bred energy cane high-fiber sugar cane	The purpose of the demonstration scale facility is to reduce scale-up risk and provide validation of cost models for Verenium's first generation of commercial-scale cellulosic ethanol facilities, which are slated for completion by 2010. Construction on the Highlands Country facility is likely to begin mid-year 2009.
ZeaChem	Boardman, OR		1.5 mgy	poplar trees, sugar, wood chips	ZeaChem announced January 8, 2009 it has raised $34 million to help build its first facility. Expected to be online in mid-2010.