

# Commercializing Conventional and Advanced Liquid Biofuels from Biomass

**Task 39**  
IEA Bioenergy

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## From the Task

By Jim McMillan, Jack Saddler and Susan van Dyk

This issue of the newsletter highlights areas of progress in biofuels development worldwide and the work of Task 39 in particular.

A formal Task 39 business meeting was held on 22-23 January, 2014 in Berlin, Germany, in conjunction with the “[Fuels for the Future](#)” conference, January 20-21, 2014. We would like to extend our special thanks to Axel Munack and our other German colleagues for helping organize the two Task 39 sessions that were held within the conference as well as the Task 39 business meeting itself. The main conference featured a total of 10 presentations given by Task 39 members; one T39 organized session focused on the policy tools used to help develop biofuels and the other focused on technical and commercialization progress in the advanced biofuels area. A list of speakers and their respective presentation titles is provided on the last page of this Newsletter. These sessions were both well attended; each had 50-80 conference participants.

The conference was followed by Task 39’s first business meeting of 2014. We would like to thank UFOP and Dieter Bockey for providing our group (and our Task 42 colleagues) with excellent meeting facilities. The business meeting followed Task 39’s traditional format where country representatives present updates on recent biofuels developments in their respective countries, which in conjunction with follow up Q&A provides an invaluable and informative forum for exchanging perspectives. The meeting also included discussion of current and future Task deliverables for the triennium as well as a presentation by Ulrike Heckenberger from the Airbus Group.

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To encourage closer collaboration between the various Tasks within the IEA Bioenergy Implementation Agreement (IA), Task 39 had previously held a successful joint meeting with Task 42 (biorefineries) several years ago in Copenhagen. To build on this success, the second of part of our meeting was a joint workshop to explore ways for Tasks 39 and 42 to increase their collaborations. To stimulate discussion we were fortunate to have Task 39’s Gisle Johansen (Senior Vice President R&D, Borregaard) set the scene, using many excellent examples of issues, strategies and lessons learned from Borregaard’s history of commercial biorefining of primarily softwood feedstocks. Task 42’s Gerfried Jungmeier (Joanneum Research Institute) followed with an overview of the Task 42 network’s various activities, with a particular focus on the fact sheets used to summarize biorefinery coproduct slates that could be produced using specific biorefinery configurations. These two overview talks provided the combined group with a good foundation for brainstorming future joint work activities.

After the joint workshop, Task 39 members who could participated in an excellent “technical tour” of the German Bundestag (Reichstag building), and we are again indebted to Axel Munack for his not insignificant efforts arranging for this tour. This impressive and historic building derives the majority of its heat, cooling and power from renewable energy sources such as biodiesel, combined heat and power (CHP), photovoltaic cells and terrestrial underground storage of heat and cold.

The next Task 39 meeting will be 21-22 May 2014, in Copenhagen, Denmark, in conjunction with the joint IEA Bioenergy and Advanced Motor Fuels (AMF) Executive Committee’s workshop on “Infrastructure Compatible Transport” being held 20 May.

The Task 39 report on “The potential and challenges of drop-in biofuels” (T39-T4) has completed an internal review process and will be publicly available for download from the Task 39 website in May 2014 ([www.task39.org](http://www.task39.org)). To paraphrase the Executive Summary of the report, “Due primarily to the significant processing and resource requirements (e.g., sufficient hydrogen supply and effective catalysts) needed to make drop-in biofuels as compared to “conventional” oxygenated alcohols or FAME biofuels, large scale, large volume production of cost-competitive drop-in biofuels is expected to remain challenging in the near-to-midterm.



We welcome your feedback. Please direct your comments to [Susan van Dyk](#)

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- Operating Agent (Agency): **Ed Hogan** (Natural Resources Canada)
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Thus, supportive policies will likely be needed to promote the development and commercialization of these fuels if they are to become significant contributors to global biofuels production. Currently, no policies (e.g., tax breaks, subsidies, etc.) differentiate new, more fungible and infrastructure ready fully de-oxygenated drop-in type biofuels from less infrastructure compatible oxygenated biofuels. We hope that this report will contribute to ongoing discussions on the potential for drop-in biofuels, especially in sectors such as aviation where no alternatives exist.

Another report that is nearing completion is the Task's periodically updated biofuel "Implementation Agendas" report that "compares-and-contrasts" biofuels policies across Task 39 member countries and other key jurisdictions such as China and India. This report summarizes international progress on policies aimed at supporting the development of conventional and advanced liquid biofuels. The report will be available on the Task 39 website in due course, albeit access will initially be restricted to members only.

Other noteworthy developments during the first part of 2014 is continued progress in the commercialization of cellulosic ethanol and other advanced biofuels. Following on the opening of the first commercial facility in Crescentino, Italy in October 2013, three cellulosic ethanol plants in the USA will become operational in 2014. POET-DSM and Abengoa Bioenergy expect their respective facilities to start being operational by mid 2014, while DuPont projects its facility will be completed and ready to start operations by the end of 2014. You can read more about these companies in the country profile on the USA that follows in this newsletter. Outside of the USA, GranBio's Alagoas cellulosic ethanol facility in Brazil is also set for completion in 2014, and Praj also hopes to complete construction of a demonstration cellulosic ethanol plant in India by the end of 2014.

Several biobased ventures in the USA successfully raised [\\$391 million](#) in combined funding during the first quarter of 2014. In Finland, Fortum, UPM and Valmet are collaborating to find solutions for lignocellulosic biofuels, while Dong Energy and Neste Oil are focused on developing renewable aviation fuels from agricultural residues.

As will be described in more detail in Task 39's updated Implementation Agendas report, development of biofuels is currently being hindered by policy uncertainty in both the US and the EU. The proposed reduction in the targets for conventional and advanced biofuels set by the USA's EPA still has not been resolved. After a 60-day comment period where submissions could be made to the EPA, this decision will now be delayed until June 2014 while various matters are decided in [court](#). The good news is that extension of tax credits for advanced ethanol and biodiesel for another 2 years have been proposed by the USA's Senate Finance Committee (they had expired in December 2013). These extensions still have to pass by the USA Congress. You can read more about this in the feature article which follows below.

In the EU, policy uncertainty is also having a negative impact on the development of biofuels. Despite recent and extensive discussions within the EU, no agreement has been reached on biofuels targets. Alas, this issue may not be resolved until 2015 and it has been argued that this impasse has virtually "stalled" investment in biofuels. Although new targets for GHG emission reductions have been proposed by the EU, no targets for biofuels were included.

Waste-to-ethanol facilities also have been in the news as more facilities near completion. Construction on the Enerkem facility in Alberta, Canada is progressing, while new facilities are planned in Iowa (USA) and Thailand.

Several interesting reports that should be of interest to the biofuels stakeholder community have been published since the last newsletter. These include "The Outlook for Renewable Energy in America", as well as a study on the effect of biofuels on food security in developing countries and a report on feedstock assessments for advanced biofuels (See the Reports section on page 10 of this Newsletter for more details and links).

Any reader of past newsletters will know that Task 39's tradition is to profile biofuels developments occurring within one of the Task's member countries. This newsletter features a report on the latest biofuels policy, facilities, funding and research developments in the USA. As always, we appreciate your feedback and ask you to please let us know if you have ideas for how we can continue to increase the value of these Task 39 newsletters.

*Jim, Jack and Susan*

# Current Status of Biofuels Development in the USA

Jim McMillan and Susan van Dyk

## Introduction

The US remains the largest biofuels producer in the world, although a variety of factors are creating market and policy uncertainty and posing challenges to accelerating biofuels development and commercialization in the USA.

- Policy uncertainty exists about the Renewable Fuel Standard (RFS), which regulates blending mandates for biofuels. The Environmental Protection Agency (EPA) has proposed reductions in the renewable volume obligations for 2014, which if implemented will detrimentally impact future growth of the biofuels sector. This matter is currently subject to legal battles and the EPA currently expects to make a decision by June 2014.
- The USA has effectively reached a “blend wall” for ethanol, with most gasoline being an E10 blend and only a relatively small proportion of E85 blended gasoline being used. While automobiles manufactured in 2001 or more recently are approved to use higher E15 blends, few fueling stations are offering E15 blends. Thus, there is a barrier to market expansion of ethanol as a biofuel until E15 and E85 blends can find wider use. Increased exports may mitigate the effects of the blend wall, but trade with certain jurisdictions, such as the EU, is hampered by regulations.
- Increased domestic production of petroleum and natural gas has greatly reduced crude oil imports (now below 40% compared to about 60% a few years ago), mitigating energy security as the primary driver for biofuels development.
- While reduction of GHG emissions has been an important driver for biofuels development in other jurisdictions (e.g., EU), no policy to “value” mitigating CO<sub>2</sub> and GHG emissions beyond the RFS has been established yet in the USA.
- With respect to biodiesel (FAME) and renewable diesel (HEFA), policy uncertainty also exists as the biodiesel blenders’ tax credit expired at the end of 2013. Extension of this tax credit for a further 2 years was proposed by the USA Senate’s Finance Committee on 1 April 2014, but remains to be passed by the House and Senate.

USA dependence on oil imports has been declining due to increased domestic production of oil and natural gas. According to EIA data and projections, this trend will continue (see Figure 1), with imported petroleum and other liquid fuels projected to decline to about 25% of total US energy supply by 2016 (EIA Annual Energy Outlook 2013).

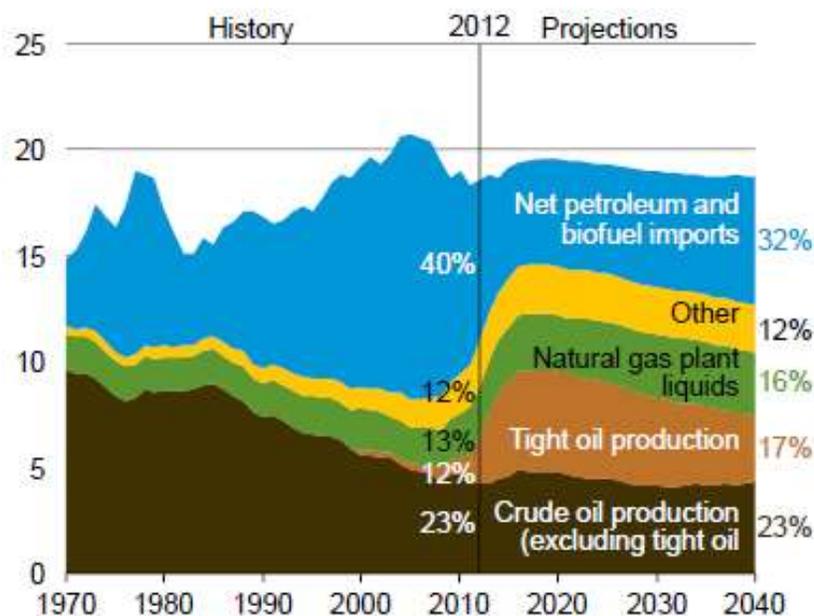


Figure 1. US petroleum and other liquid fuels supply by source, 1970-2040 (million barrels per day)  
 Source: US EIA Annual Energy Outlook 2014 Early Release Overview

The “blend wall” refers to the amount of ethanol companies are permitted/mandated to blend with petroleum-based fuel (gasoline). The blend wall effectively limits the amount of ethanol that can enter the market in the USA and thus limits bioethanol expansion. Total gasoline consumption has been declining primarily due to greater vehicle fuel efficiency. This is illustrated in Figure 2.

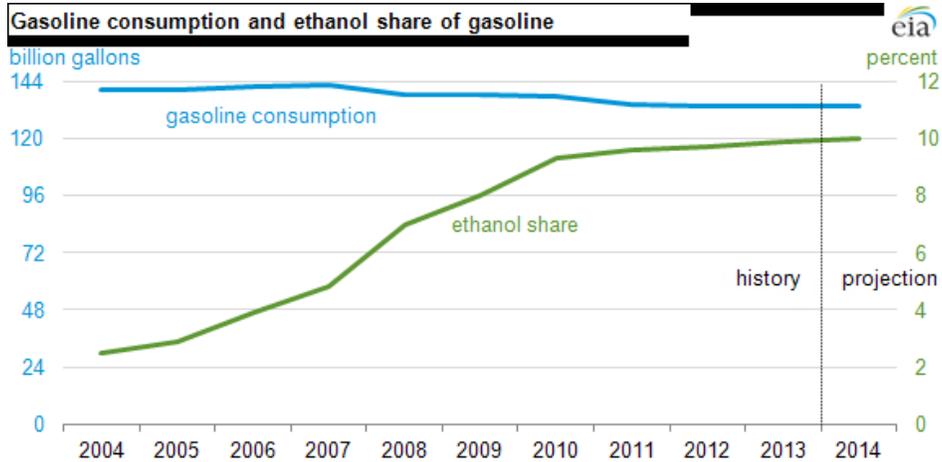


Figure 2. The “blend wall” (source: Energy Information Administration (EIA))

The blend wall can be overcome by switching from E10 to E15 for non-flex fuel vehicles as well as by expanding the use of E85 in flex fuel vehicles, although a lack of distribution infrastructure and competitive pricing limits the use of E85 fuels. Increased exports of ethanol can also overcome the limit that the blend wall imposes on production, and in 2013 USA ethanol exports increased, including to new or emerging markets such as China and India. January 2014 saw total ethanol exports reach a 25-month high, with 86.2 million gallons exported. Importing countries (and millions of gallons imported) were: Brazil (23.9), Canada (18.8), the United Arab Emirates (12.4), India (10.7), the Philippines (5.5) and Mexico (3.3) (source: RFA).

### Biofuel Production Volumes

#### Conventional Ethanol

The US produced approximately 50 billion litres of ethanol in 2013, primarily from corn grain. Production levels have remained at roughly this level since 2010 due to a combination of factors, including a recent severe drought across the USA corn belt and the *de facto* blend wall. Total USA ethanol production over the past few years demonstrates this plateau: 13,298 million gallons in 2010, 13,948 million gallons in 2011 and 13,300 million gallons in 2012.

As of February, 2014, USA fuel ethanol plant production capacity comprised a total of 211 plants with a combined nameplate capacity of 14875.4 million gallons per year (mgy), with 13681.4 mgy of operating production (92% capacity utilization). A further 167 mgy of production capacity is under construction/expansion (7 plants) (source: RFA). The location of ethanol plants across the USA is shown in Figure 3.



Figure 3. Biorefinery locations in the US (RFA) (<http://ethanolrfa.org/bio-refinery-locations/>)

*Conventional Biodiesel (FAME)*

Biodiesel production increased substantially in 2013, from 1.1 billion gallons in 2012 to almost 1.8 billion gallons in 2013. The total number of biodiesel plants in the US is 195 with a combined production capacity of 2.9 billion gallons per year (Biodiesel magazine). The location of biodiesel plants in the US is shown in Figure 4. The main feedstock for biodiesel (FAME) production is soybean oil, but other feedstocks such as canola oil, waste vegetable oils and tallow are also being used.

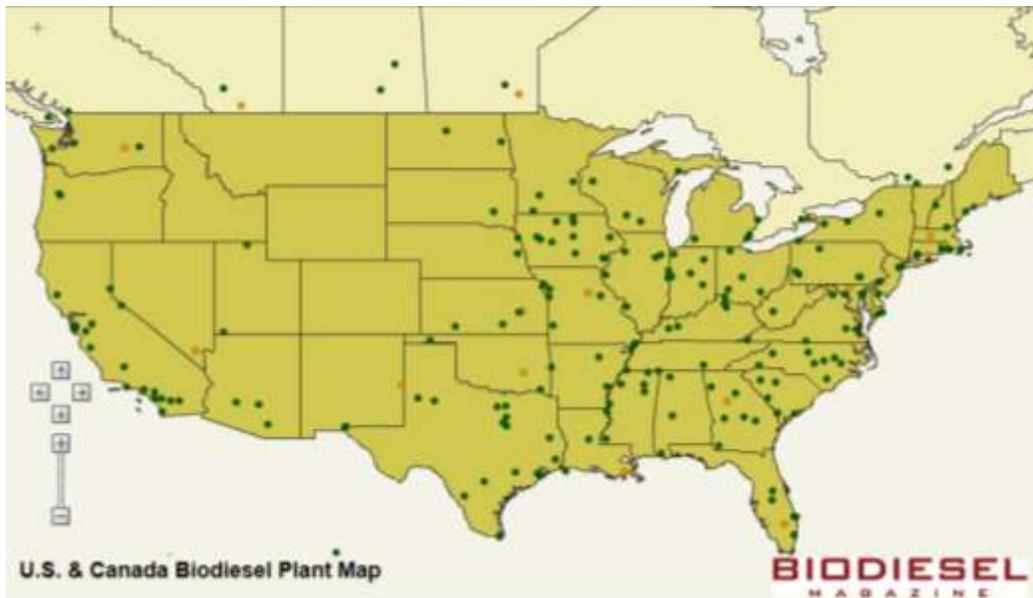


Figure 4. Location of biodiesel plants in the US (and Canada). (Source: Biodiesel magazine)

*Advanced Biofuels*

Commercialization of advanced cellulosic biofuels progressed in 2013, with construction of several commercial scale plants substantially completed. While no cellulosic ethanol was commercially produced by fermentation, Ineos Bio produced their first commercial volumes of cellulosic ethanol using their syngas fermentation technology. KiOR also commercially produced small volumes of drop-in fuels via their proprietary pyrolysis and upgrading technology (these are classified as cellulosic biofuels according to the RIN classification system). The INEOS Bio plant in Florida began production of cellulosic ethanol from the organic fraction of municipal solids waste in July 2013 using INEOS Bio’s gasification and fermentation technology for conversion of biomass waste into bioethanol and renewable

power. KiOR started producing pyrolysis-based “drop-in” biofuel from woody biomass. Production at both plants is “commercial” as products are being sold, however total production volumes remains relatively modest (below 10 mgy) in terms of large scale production (defined as  $\geq 20$ -50 mgy).

Production of cellulosic ethanol should increase substantially during 2014 as at least two plants are expected to start up commercial production during the first half of the year, Poet-DSM’s Project Liberty in Emmetsburg, Iowa and Abengoa Bioenergy’s plant in Hugoton, Kansas. DuPont is also expected to complete construction and begin commissioning of a commercial scale cellulosic ethanol facility in Iowa during 2014. All three of these facilities will produce cellulosic ethanol from agricultural residues, primarily corn stover, using proprietary variations of pretreatment, enzymatic hydrolysis and cofermentation. RIN data indicate that 14,247 gallons of cellulosic ethanol was produced in January 2014. A further 29,445 gallons of renewable gasoline was also produced during this period.

## *Overview of Main Advanced Biofuel Facilities in the USA*

### *Cellulosic Ethanol*

POET-DSM Advanced Biofuels LLC is a 50/50 joint venture between Royal DSM and POET LLC. Construction of Poet-DSM Advanced Biofuels’ first commercial cellulosic ethanol plant is nearing completion, with plant start-up scheduled to begin in Q2 of 2014 (<http://poet-dsm.com/liberty>). Poet-DSM’s Project Liberty will process bales of corn stover (comprised of cobs, leaves, husks and some stalks) to produce 20 mgy of cellulosic ethanol, with plans to eventually ramp up production to 25 mgy. This plant is located in Emmetsburg, Iowa and will share infrastructure with the adjacent POET Biorefining - Emmetsburg corn grain ethanol plant. The DOE has awarded up to \$100 million in grants to support the costs of engineering and construction, as well as biomass collection and infrastructure.

Abengoa Bioenergy (<http://www.abengoabioenergy.com/>) is constructing its first commercial scale cellulosic ethanol plant in Hugoton, Kansas, with a designed capacity to produce 25 mgy (about 100 million L) of cellulosic ethanol and 22 MW of renewable energy. Cellulosic feedstocks will comprise a mixture of agricultural residues, non-feed energy crops and wood waste, with corn stover heavy in the mix. Commissioning and start-up of commercial cellulosic ethanol operations is also expected to begin in Q2 of 2014. The company has already commenced commissioning of the power production side of the plant.

DuPont (<http://biofuels.dupont.com>) is constructing its first commercial scale cellulosic ethanol facility in Nevada, Iowa with a designed capacity of 30 mgy, also targeting corn stover and potentially other feedstocks including switchgrass. Commissioning and start-up are expected to commence late in 2014.

INEOS Bio (<http://www.ineos.com/businesses/INEOS-Bio/>) has been producing cellulosic ethanol and power via its hybrid gasification-fermentation syngas fermentation process technology at its Indian River BioEnergy Center in Vero Beach, Florida since July 2013 using the organic fraction of municipal solid waste (MSW) as feedstock. This plant is designed to produce up to 8 mgy (30 million litres/y) of ethanol plus 6 MW/y of renewable power. The company experienced several start-up issues in 2013 and in 2014 is implementing several upgrades to further improve continuous operations.

### *Isobutanol*

Gevo (<http://www.gevo.com>) has been producing renewable isobutanol by fermentation of corn-starch derived sugar at its plant in Luverne, Minnesota since May 2012, although contamination problems caused a temporarily halt in production during the second half of 2013 and it is not expected that the plant will be producing at its design capacity of 18 mgy until later in 2014. In July 2013, Gevo Inc. began supplying the U.S. Coast Guard Research & Development Center with samples of finished 16.1% isobutanol-blended gasoline for engine testing. And in December 2013, Gevo reported successful initial testing by the U.S. Army of a 50:50 blend of its isobutanol-derived ATJ-8 (Alcohol-to-Jet) fuel in a military helicopter.

### *Drop-in Hydrocarbons*

**KiOR** (<http://www.kior.com/>) uses a proprietary catalytic fast pyrolysis technology to convert biomass into renewable crude bio-oil that is subsequently processed to produce gasoline, diesel and fuel oil blendstocks. This process combines KiOR's proprietary catalyst system with existing Fluid Catalytic Cracking (FCC) technology. KiOR's first commercial scale production facility in Columbus, Mississippi, has a capacity of over 12 mgy and has been producing and shipping cellulosic fuels since early 2013. However, start-up has proved challenging and total production in 2013 only reached about 0.92 million gallons. The plant will reportedly be offline during the first quarter of 2014 to implement operational improvements.

### *Non-Biofuel Renewable Oil Products*

**Solazyme** (<http://solazyme.com>) began commercial production of microalgae-derived renewable oils for lubricant, metalworking and home and personal care applications in January 2014 using a combination of ADM's facility in Clinton, Iowa, and American Natural Products (ANP) facility in Galva, Iowa. Three oil products are currently being manufactured for distribution and sales in the USA and Brazil. Production at the ADM and ANP facilities is ramping up and expected to reach a level of 20,000 metric tonnes per year (MT/yr) within 12-18 months, with potential future expansion to 100,000 MT/yr. Although Solazyme originally used their microalgae-based renewable oil technology to produce military specification marine diesel and jet fuel in 2009, the company's focus has since switched to higher value non-biofuel products.

### *Major Advanced Biofuels Consortia*

Three major multi-institutional projects are coming to a close, two focused on improving algal biofuels and one on developing routes to higher energy density biofuels from lignocellulosic biomass. Expect to be hearing more about the outcomes of these three projects soon.

- The **Sustainable Algal Biofuels Consortium (SABC) project**, "Biochemical Conversion of Algal Biomass and Fuel Testing," is led by Dr. Gary Dirks at Arizona State University (ASU) and represents a research and development collaboration between ASU, NREL and Sandia National Laboratories (SNL), with additional contributions by Georgia Institute of Technology, Colorado Renewable Energy Collaboratory, Colorado School of Mines, SRS Energy, Lyondell Chemical Company, and Novozymes. Funding is cost-shared by the USDOE (\$6 M) and industry (\$1.5 M). The primary objective of the project is to evaluate biochemical conversion as a strategy for converting algal biomass into lipid-based and carbohydrate-based biofuels. The secondary objective is to test the acceptability of algal biofuels as replacements for petroleum-based fuels.
- The **National Alliance for Advanced Biofuels and Bioproducts (NAABB)** is a public-private partnership of 40 universities, companies and U.S. national laboratories created to develop innovative technologies that make algae-based biofuels a sustainable, commercially viable industry. Funded in 2010 by the USA Department of Energy's Biomass Programs, NAABB is investing \$49M of Federal funds along with \$20M of cost-share commitments from its partners to develop technologies spanning the entire algal biofuels value chain – biology, cultivation, harvesting, extraction of valuable precursors, conversion of these precursors to fuels, feeds and other value-added products, and economic/energy-balance modeling and resource management.
- The **National Advanced Biofuels Consortium (NABC)** is a partnership of 17 industry, national laboratory and university members that is developing technologies to produce biomass-derived hydrocarbon fuels such as gasoline, diesel and jet fuel from terrestrial biomass feedstocks (<http://www.nabcprojects.org/about.html>). The NABC has \$35 million of American Recovery and Reinvestment Act funding from the USA DOE and \$14.5 million of partner funds. Two "drop-in" biofuels technology pathways were selected for further development to pilot scale, namely Catalysis of Lignocellulosic Sugars (CLS) and Fermentation of Lignocellulosic Sugars (FLS).

### *Funding to Spur Biofuels Research, Development and Biorefinery Commercialization*

Many federal, state and local agencies have programs that in one way or another support the development and commercialization of advanced biofuels and biorefining technologies. Major federal agencies involved in funding biofuels R&D include the USA's DOE, USDA and EPA. Among these, the USA DOE's (USDOE) BioEnergy Technologies Office (BETO) arguably is the most focused on developing advanced biofuels. Through funding of cost-shared public-

private partnerships with key stakeholders, it promotes the development, demonstration and commercial deployment of new technologies for advanced biofuels production from lignocellulosic and algal biomasses.

Government funding for research, development and demonstration (RD&D) to improve and deploy economical advanced biofuels technologies in the USA remains focused on: 1) getting recently developed cellulosic ethanol technologies into the commercial marketplace; and 2) identifying and proving out new routes to cost-competitive infrastructure compatible de-oxygenated “drop in” biofuels. USDOE (and USDA and USDOD) continues to provide significant funding, much of it cost-shared, to support both cellulosic and algal/aquatic feedstock pathways to higher energy density hydrocarbon biofuels.

On February 7, 2014, President Obama signed into the law the 2014 USA “Farm Bill” (formally the Agricultural Act of 2014). Highlights include authorization of mandatory additional funding for the Biorefinery Assistance Program supporting the advanced biofuels industry (\$100 million for fiscal year 2014 (FY14) and \$50 million for each of FY15 and FY16) as well as \$75 million in discretionary funding each year FY14 through FY18.

US Government funding awarded during the past year also included:

- May 2013 - \$16m awarded by the USDOE in May 2013 to 3 drop-in biofuels projects (Emerald, Natures BioReserve and Fulcrum). Under the grants, the companies will develop plans for deploying up to 150 mgy large scale biorefineries to produce aviation and marine diesel fuels from renewable feedstocks.
- April 2013 - Up to \$17.7 million in grants announced by DOE for four pilot-scale biorefinery projects aimed at economically producing military-spec hydrocarbon fuels. Cobalt Technologies, Mercurius Biofuels, BioProcess Algae and Frontline BioEnergy were selected for negotiation of awards, with recipients required to contribute a minimum of 50% matching funds. These pilot-scale biorefinery projects use a variety of non-food biomass feedstocks, waste-based materials, and algae in innovative conversion processes to produce biofuels that meet military diesel or jet fuel specifications. The projects focus on demonstrating cost-effectively technologies for converting biomass into advanced drop-in biofuels and will assist the awarded organizations in scaling up their processes to commercial levels.
- September 2013 - DOE ARPA-E announced \$66 million in awards across 33 “transformational energy” technologies projects. Among the highlights, the Reducing Emissions using Methanotrophic Organisms for Transportation Energy (REMOTE) program is providing \$34 million to find advanced biocatalyst technologies for converting natural gas to liquid transportation fuel(s). Notably, Coskata, Inc. and LanzaTech both received awards under the REMOTE program, which together total nearly \$5 million dollars. Coskata received \$941,726 for their project to transform activated methane to butanol. LanzaTech received \$4,000,000 to design a bioreactor to improve methane transfer to microorganisms ([read more](#)).
- August 2013 - US DOE announced \$16.5 million in grants to four projects in California, Hawaii and New Mexico aimed at breaking down technical barriers and accelerating the development of sustainable, affordable algae biofuels. These projects are respectively led by Hawaii Bioenergy, Sapphire Energy, New Mexico State University and California Polytechnic State University.
- December 2013 - USDA and DOE announced \$8 million in new research funding to develop non-food feedstocks for bioenergy applications. Projects will focus on improving biomasses that can be grown for biofuels, including switchgrass, poplar, pine and other trees and grasses, by increasing their yield, quality and ability to adapt to extreme environments.
- September 2013 - Washington’s two major universities, University of Washington and Washington State University, have been awarded \$80 million in federal grants by the USDA to establish a biofuels industry in the Northwest, focusing on the use of wood (poplar) and forest residues for production of drop-in fuels. Some of the funding will go to companies such as ZeaChem (\$9.3 million), Weyerhaeuser (\$4 million) and Gevo (\$5 million).
- January 2014 - \$24 million in grants for advanced biofuel producers were announced by the California Energy Commission’s (CEC) Alternative and Renewable Fuel and Vehicle Technology Program. These grants will be for both pilot/demonstration-scale facilities and commercial-scale facilities, with \$9 million allocated for processes to produce diesel substitutes, \$9 million for processes that produce gasoline substitutes, and \$6 million for processes that produce gaseous fuel (biomethane). Funding will be awarded at up to 50% of total project costs to new facilities and/or existing facilities that increase production or lower carbon emissions of advanced

biofuels and are located and operating within California. Pilot/demonstration facility grants are capped at \$3 million and commercial facility grants at \$5 million. ([Read more](#))

### Future Outlook

Overall, tremendous technological progress is occurring in the USA to develop, demonstrate and scale up advanced biofuels technologies. Despite a number of technical, policy and financial factors detrimentally affecting the pace of biofuels development, progress continues with large scale commercialisation of technologies for cellulosic ethanol and other advanced biofuel production. In spite of the uncertainty surrounding the RFS and RVO for 2014, companies remain bullish about the future of biofuels as evidenced by the many positive remarks made at the recent RFA National Ethanol Conference held in February 2014 ([read more](#)).

## In the News

### Reports and Research

(April 8) The Overseas Development Institute (ODI) has released a new study showing that the existing evidence does not point to increased food insecurity in developing countries as a result of biofuels. ([Read study here](#))

(April 4) Report on “The Outlook for Renewable Energy in America”. Multiple renewable energy trade associations have teamed up to produce a single report that contains current market reviews, outlooks and policy recommendations for each respective sector, including biomass power, biomass thermal, waste-to-energy, ethanol, biodiesel and advanced biofuels. ([Read more](#)) [Full report](#)

(Feb 16) Report on feedstock assessments for advanced biofuels - E4 in the UK. ([Read more](#)) [Report](#)

(February 11) Report by Navigant Research, “Biofuels for Transportation Markets” forecasting a future global annual biofuel demand of 51 billion gallons by 2022. ([Read more](#))

(February 12) A Report by Merchant Research & Consulting indicates that the US, Brazil and EU will remain the top ethanol producers in the world. They also forecast that world ethanol supply will likely exceed 100 million tons in 2018. ([Read more](#))

### Policy and Regulatory Developments

(April 3) In Washington DC, USA, the Senate Finance Committee has approved the extensions to biofuel tax credits, including the \$1.01/gal production tax credit for cellulosic biofuels and the similar \$1/gal credit for biodiesel. The committee’s chairman has said that it will be the last temporary extension granted as the industry must make its case to Congress in order to secure permanent tax credits. ([Read more](#))

(March 19) In Brazil, UNICA is pushing for the ethanol blend to increase to 27.5% from the current 25%, which the industry association says is the only immediate way to support the sugar and ethanol industry. Biodiesel producers are pushing for B7, up from the current B5. ([Read more](#))

Policy uncertainty around biofuel targets in the US and the EU continues to affect biofuels development in these regions. The US EPA proposed reductions in the required volumes for various biofuel categories. After a 60-day comment period during which submissions were made to the committee ([Read some of the submissions here](#)), the situation is still unresolved, with legal questions currently in court. The EPA is now expected to make a final ruling by June 2014.

The situation in the EU is also surrounded by uncertainty as no agreement was reached on capping of conventional biofuels or establishing consensus iLUC factors or dedicated targets for advanced biofuels. This may not be resolved until 2015. In the meantime (January), the European Commission proposed new clean energy and greenhouse gas emission reduction objectives, with no specific targets proposed for biofuels. ([Read more](#))

(March 12) In Hungary, the CEO of Ethanol Europe Renewables says Europe's Renewable Energy Directive has killed off private sector investment in biofuels, and that only a clear and stable policy that guarantees certainty in the European market until 2030 will reverse this trend. He argues that what is needed is a zero-iLUC policy that focuses on crops that would not have been grown otherwise. ([Read more](#)) This sentiment is echoed by Eric Sievers, CEO of Ethanol Europe Renewables Ltd. ([read more](#))

## Sustainability

(February 23) Global Forest Watch has made available an interactive database on forests and changes from 2000 to 2013 (<http://www.globalforestwatch.org/>). This data does not appear to support the predicted outcome of iLUC on deforestation. ([Read more](#))

## Industry News

2014 is the year for cellulosic ethanol. While some articles are positive about this: "The year is here" ([Read more](#)), a recent article in Nature news was titled "Cellulosic ethanol fights for life" ([Read here](#)).

POET-DSM has stated that it will start producing cellulosic ethanol in July 2014 ([Read more](#)), while Abengoa and DuPont are also expecting construction on their facilities to be completed in 2014.

Progress in other advanced biofuels has had mixed success, with KiOR struggling to be fully operational and running into financial difficulties. ("[KiOR stumbles](#)")

Several municipal solid waste (MSW) to biofuel facilities are being developed worldwide (Read [this article](#) in Biofuels Digest). In Iowa, Fiberight is investing \$15 million to convert a former ethanol plant in Blairstown to produce fuel using its waste-to-ethanol technology. ([Read more](#)) In Thailand, Phuket's Provincial Administration Organization is seeking \$22.6 million to build a waste-to-biofuel facility that would use the island's MSW as feedstock. ([Read more](#))

(March 12) In Finland, Fortum, UPM and Valmet have joined forces to develop a new, winning technology to produce advanced high value lignocellulosic fuels, such as transportation fuels or higher value bio liquids. The idea is to develop catalytic pyrolysis technology for upgrading bio-oil and commercialise the solution. ([Read more](#))

(March 25) In Germany, biodiesel exports hit a record of just over 430 million gallons in 2013, up 20% on the year. Imports also fell during 2013 to 168.1 million gallons, from 228.1 million gallons in 2012. The Union zur Förderung von Oel- und Proteinpflanzen (UFOP) says part of the reason for increased exports and decreased imports is reduced Indonesian biodiesel imports following the EU's imposition of anti-dumping trade duties last year. ([Read more](#))

(March 18) Malaysia's B5 blending will be implemented nationwide by July 1. ([Read more](#))

(March 5) DONG Energy and Neste Oil have entered into a collaboration to develop a cost-effective technology for producing renewable diesel and aviation fuel from agricultural residues. ([Read more](#))

(March 11) USA ethanol export up 33% in January, mostly to Brazil. ([Read more](#))

(March 9) In Washington, the USDA announced \$60M worth of payments through the Advanced Biofuel Payment Program for over 195 producers across the nation. ([Read more](#))

(March 18) The USDA Farm Service Agency recently announced the expansion of its Farm Storage and Facility Loan program, which provides low-interest financing to producers. ([Read more](#))

(February 24) Iowa sales of E85 set a new record for 2013, up 20% from 2012 ([Read more](#))

(February 14) The UK Department of Energy and Climate Change published updated statistics for 2012-2013. Biofuels accounted for 3% of UK transportation fuels for this period. ([Read more](#))

(February 8) Empyro BV announced the start of construction of its pyrolysis oil production plant at the AkzoNobel site in Hengelo (Netherlands), with construction scheduled to be completed by the end of 2014. This facility will have a pyrolysis oil production capacity of over 20 million litres per year. ([Read more](#))

(January 27) Biodiesel production in Poland increased in 2013 due to local demand by 11% compared to the previous year. ([Read more](#))

(January 2014) GranBio's Alagoas cellulosic ethanol facility in Brazil set to be completed in 2014. ([Read more](#))

(January 29) In Germany, Clariant, Haltermann, and Mercedes-Benz joined forces to demonstrate the effectiveness of sunliquid® 20 with 20 % ethanol from straw as high-quality fuel for optimal driving performance. ([Read more](#))

(January 20) In India, Praj expects its 5 million liter per year cellulosic ethanol demonstration plant in Maharashtra to come online by the end of 2014. ([Read more](#))

(January 27) Reduced RFS biodiesel mandate causing a decrease in production and mothballing of some biodiesel facilities. ([Read more](#))

(January 10) In Austria, BDI Bioenergy International has been commissioned by Biodiesel Amsterdam (subsidiary of Simadan holdings) to build the largest multi-feedstock biodiesel plant in the world in the Netherlands, which is to have a total production capacity of 250,000 tons/year. ([Read more](#))

## Upcoming Meetings & Conferences

### [36th Symposium on Biotechnology for Fuels and Chemicals](#)

28 April - 1 May 2014. Clearwater Beach, Florida, USA.

### [BIO World Congress on Industrial Biotechnology](#)

12 - 15 May 2014. Philadelphia, Pennsylvania, USA.

### [International Fuel Ethanol Workshop & Expo.](#)

9 - 12 June 2014. Indianapolis, Indiana, USA.

### [EU BC&E 2014 - 22<sup>nd</sup> European Biomass Conference and Exhibition](#)

23-26 June 2014, Congress Center Hamburg, Germany

### [The 4th International Conference on Algal Biomass, Biofuels and Bioproducts](#)

15 - 18 June 2014. Santa Fe, New Mexico, USA.

The conference will cover all areas of emerging technologies in algal biology, biomass production, cultivation, harvesting, extraction, bioproducts, and econometrics.

### [7th Biofuels International conference 2014](#)

24 - 25 September 2014. Ghent, Belgium.

Focusing on the latest developments in biofuels policy, international biofuels trading, sustainability, solutions for current producers, progress in advanced biofuels and information on feedstock pricing and trends. This conference aims to update delegates on the latest changes to biofuels legislation and policy as well as recent research into sustainability, ILUC and multiple counting strategies.

### [National Advanced Biofuels Conference & Expo.](#)

13 - 15 October 2014. Minneapolis, Minnesota, USA.

For more events visit [www.task39.org](http://www.task39.org)



**LIST OF SPEAKERS AT THE IEA BIOENERGY TASK 39 SESSIONS  
AT THE BERLIN BBE/UFOP “FUELS OF THE FUTURE” CONFERENCE, 20-21 JANUARY 2014**

<b>Session Title</b>		<b>Policy tools to help the development and deployment of biofuels</b>	
<b>Session Moderator</b>	<b>Jack Saddler</b>	<b>Affiliation</b> UBC, Canada	
<b>Speaker</b>	<b>Affiliation</b>	<b>Title of the contribution</b>	
<b>11:30</b>	John Neeft	Agentschap NL, The Netherlands	"BioGrace: biofuel and 'solid biomass' GHG calculations for showing compliance with EC sustainability criteria"
<b>11:50</b>	Antti Arasto	VTT, Finland	"Policy decisions, tools and their influence on biofuel development in Finland"
<b>12:10</b>	Warren Mabee	Queen's University, Canada	"Implementation Agendas - Policy compare and contrast between countries"
<b>12:30</b>	Michael Persson	Viridemque Consulting, Denmark	"Regulatory and financial incentives to promote advanced biofuels"
<b>12:50</b>	Manfred Wörgetter	Bioenergy 2020+, Austria	"Transport Biofuels in Europe – a vision for 2030"

<b>Session Title</b>		<b>Technical and commercial progress in the development of biofuels</b>	
<b>Session Moderator</b>	<b>Jim McMillan</b>	<b>Affiliation</b> NREL, USA	
<b>Speaker</b>	<b>Affiliation</b>	<b>Title of the contribution</b>	
<b>14:30</b>	Henning Jørgensen	University of Copenhagen, Denmark	"Recent progress on biofuel commercialization activities in Denmark"
<b>14:50</b>	David Chiaramonti	University of Florence, Italy	"Chemtex: Recent progress in the first commercial cellulosic ethanol facility"
<b>15:10</b>	Dina Bacovsky	Bioenergy 2020+, Austria	"Advanced Biofuels Technologies – Research and Demonstration in Austria"
<b>15:30</b>	Gisle Johansen	Borregaard, Norway	"The Biorefinery Approach to Production of Ethanol and Chemicals from Lignocellulosic Biomass "
<b>15:50</b>	Oliver May	DSM, The Netherlands	"Poet-DSM Advanced Biofuels" Progress with Liberty and technology developments."

### IEA Bioenergy Task 39 Meetings

The following is an abbreviated tentative schedule of Task 39 events and meetings planned over the next 9 months. Please [contact us](#) for more detailed information:

- 2014 May 21/22, Copenhagen, Denmark: Informal business meeting.