

Commercializing Liquid Biofuels from Biomass

Task 39
IEA Bioenergy

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From the Task

By Jack Saddler, Jim McMillan and Jana Hanova

Welcome to the first, recently redesigned, Task 39 Newsletter of 2011. The year got off to a great start for IEA Bioenergy Task 39 with lots of feedback and comments on the Task 39 commissioned report entitled, "The current and future lifecycle GHG emissions of biodiesel". One of the highlights of the report described how emissions have decreased with technological improvement at all points along the process value chain. We continue to receive complimentary remarks on all of commissioned reports that have been published in the last few months. Task 39 has also contributed a feature article to the IEA Bioenergy Annual Report, which is available for your viewing at www.task39.org, along with the Biodiesel GHG Emissions report.

We want to thank our network colleagues who contributed to Task 39's successful Business Meeting in Manly, Australia in December 2010! Many of our Country Representatives also participated in the Annual **Bioenergy Australia** Conference, which was held immediately after the Task business meeting. The organisers allowed us to have a Task 39 session within the main conference where our colleagues described their nation's progress in the development of biofuels. We would like to express our thanks to our colleagues Les Edey and Steve Schuck, who made us all feel very welcome and who also provided a great venue for a successful business meeting and conference. We also saw the start of yet another event, extreme flooding in eastern Australia and Queensland in particular, which suggests that climate patterns continue to change. This again emphasised that there is a need for the sustainable production and use of biofuels that reduce carbon emissions while ensuring that their overall environmental footprint remains minimal!

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*We welcome your
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One of the great strengths of the IEA Bioenergy Task 39 network is the collective experience and expertise that we gain from our member countries. In this coming year we will continue to share the information coming out of our network meetings. As will be described later in the newsletter, this year our meetings will be held in Seattle (USA), Brazil and Italy. We will also continue to commission reports in key areas such as “comparing policies that countries have used to aid in the commercialisation of biofuels”, and the “future development of “drop-in biofuels”. Our Task 39 website, newsletter and frequent meetings will remain our main means of communication and we appreciate receiving any feedback on how you think we can continue to improve.

Country Feature

In this issue of the Task 39 Newsletter we are fortunate to be able to feature Sweden’s activities in the Biofuels area. Sweden has been very much a pioneer in the use of bioenergy and biofuels, actively supporting commercialisation of the technology as well as fundamental research in biofuel production and use. We would like to thank our colleagues Jonas Lindmark and Maria Gillgren for detailing the progress and growth of the Swedish biofuel sector. The report below discusses conventional and advanced biofuels (including ethanol, biogas as well as FAME), as well as important policy and biofuel mandate updates, that have made Sweden a leader in the development and commercialisation of biofuels.

About IEA Bioenergy Task 39

The goal of Task 39 is to provide participants with comprehensive information to assist with the development and deployment of transportation biofuels. The Task coordinates both technical and the infrastructure issues related to biofuels and helps facilitate collaboration between country member, biofuels stakeholders and industry. Task 39 has the following objectives:

1. Provide information and analyses on policy, markets and implementation
2. Catalyze cooperative research and development projects
3. Provide information dissemination, outreach to stakeholders, and coordination

Please direct feedback and material for future Newsletters to the [editor](#).

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Sweden - Recent Progress in Transport Biofuels

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Introduction and Future Goals

Energy is a key factor in the development of any society. One of the major questions dominating the world's political agenda is how do we combat climate change while at the same time as providing energy for a growing population? At the end of 2008, the EU decided to put in place mandates to reduce GHG emissions with goals of reducing 20% of CO₂ emissions by 2020, (or 30% within an international framework), as well as setting binding targets for energy efficiency and renewable energy (Directive 2009/28/EC) [1]. It was also recommended that greenhouse gas emissions must continue to be reduced even after 2020, which will require both increased energy efficiency and greater use of carbon-neutral energy.

As is the case with numerous other national energy policies, the overall goal of the Swedish energy policy is to reduce the impact of energy use on the global climate, while creating favourable conditions for economic growth and a secure energy supply. To meet EU objectives and to demonstrate action on climate and energy, the Swedish government presented a new comprehensive climate and energy policy in March, 2009. The government proposed a 40% GHG emission reduction and that at least 50% of the country's energy production be obtained from renewable sources. A 20% increase in energy efficiency by 2020 was also recommended. Sweden's overall vision is to achieve net zero GHG emissions by 2050, which includes a 10% renewable transportation energy sector requirement by 2020. [1]

To reach the transport sector goal, Sweden has to continue its efforts to reduce the use of petroleum-based products, in addition to encouraging increased fuel efficiency and by promoting alternatives energy sources for personal and transport use.

The Current Situation in Sweden - Biofuels

Advanced biofuels are one of the mechanisms through which Sweden hopes to increase energy efficiency and decrease the country's reliance on carbon-intensive fuels. The country's primary biofuel strategy includes conversion of forest raw materials and short-rotation crops. It also involves the use of advanced technologies with the goal of increasing the energy yield that can be obtained from biomass. For example, gasification of biomass permits the flexible choice of raw materials and can yield a diverse suite of end products. Furthermore, advanced biofuels deliver a significantly higher energy yield throughout the production chain than do traditionally produced biofuels.

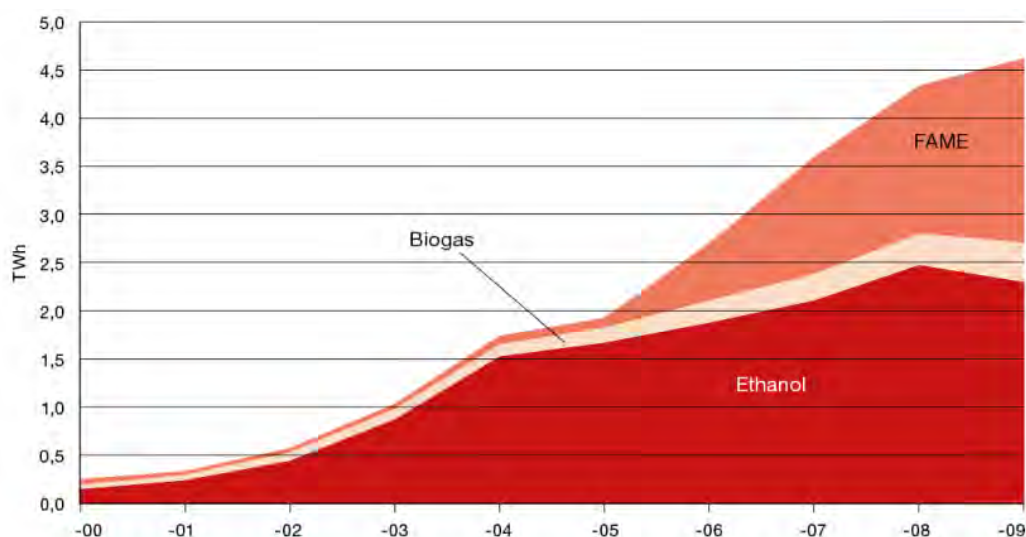
The domestic transport sector contributed up to 25% of Sweden's total energy use in 2009 (93 TWh) primarily through road traffic, rail traffic, aviation and shipping modes of transport. When foreign transport (imports/exports) is taken into account, the total transportation-related energy use raises to 127 TWh. Transport-related energy requirements are almost derived from oil products, namely, petrol and diesel oil. In 2009, these two fuels met 88% of the country's domestic transport energy requirements.

Substantial Increase in the Use of Biofuel

In recent years, the proportion of biofuels used by road vehicles has increased substantially in Sweden. In 2009, the proportion of biofuels amounted to 5.4%, while the corresponding proportion for 2008 was 4.9% [2]. Biofuels presently used for vehicles are mainly ethanol, natural gas/biogas and Fatty Acid Methyl Esters (FAME). Natural gas and biogas are known as motor fuel gas and are used mainly as a fuel for buses and private cars. Low amounts of ethanol can be blended with gasoline, but is also the main constituent in fuels such as E85 and ED95. FAME can be used in either an undiluted (100% FAME) form as well as being blended with regular diesel fuel.

Motor fuel gas consists either of pure biogas, pure natural gas or a mixture of the two. The ratio of natural gas in motor fuel gas varies with location, with the proportion of gaseous fuel vehicles tending to be higher in the parts of Sweden that are more extensively covered by the natural gas grid. In 2009, the proportion of biogas in gaseous motor fuels reached almost 65% [2].

Figure 1. Total Energy Use of Major Biofuels, 2000-2009



Source: Statistics Sweden, the Swedish Energy Agency and the Swedish Gas Association.

Production and Use of Biofuels in Sweden

Ethanol

The greatest ethanol producer in Sweden is Lantmännen Agroetanol who is located in Norrköping [3]. The factory has a production capacity of 210 000 m³ ethanol per year. Another big producer in Sweden is SEKAB in Örnköldsvik [4], which produces about 15 000 m³ ethanol per year.

Blending ratios of ethanol and petrol have increased progressively since the beginning of 2000. In 2005, ethanol blends reached 5% throughout Sweden. Sweden's annual ethanol consumption in low Ethanol blends is around 250 000 m³ per year. Additionally, the use of ethanol for E85, E95 and pure ethanol fuel have a market share of 100 000 m³/a. Sweden's ethanol production capacity allows for 60% of the fuel to be produced within the country, with substantial self-sufficiency benefits. Discussions are underway in Sweden to try to further increase the fuel standard from the current E5 to E6.5 [3].

Since E85 prices from the current E5 were higher than the price of petrol over much of 2009 (based on energy content equivalence), the consumption of E85 during the year fell sharply relative to the previous year (Figure 1). Since personal vehicles running on E85 can also run on petrol, there was an immediate effect on the use of E85 when its price rose above that of petrol. [2]

FAME and RME

FAME is a general name for Fatty Acid Methyl Esters, of which the motor fuel RME (Rapeseed Methyl Ester) is the most common. Low proportion blending of FAME with diesel was permitted as of August 1st 2006, and since then the blending proportion has steadily increased. 2009 data suggests that 5% FAME was mixed into 80% of all diesel fuel delivered to the Swedish market [2].

Local Production of Biogas

Today, Swedish biogas is produced primarily from indigenous raw materials such as waste or sewage sludge. A proportion of waste is also anaerobically digested along with plant material. However, in response to increased demand, other raw materials such as straw or waste have been imported for anaerobic digestion. 227 biogas production plants were in operation in 2008, producing a total of 1.4 TWh per year.

Table 1. Energy quantities of biogas produced in 2009[5]

Type of Digestion Plant	Biogas Production (GWh)	Percent (%)
Sewage	605	44
Co-digestion plants	299	22
Small fertilizer plants	18	1
Industrial digestion plants	106	8
Landfill gas	335	25
Total	1 363	100

In the process, raw materials are first digested to produce a crude gas, but the gas must be scrubbed (its quality must first be upgraded) before it can be used as gaseous fuel, or before it can be blended with natural gas. Biogas is upgraded to natural gas-equivalent quality at about 30 plants throughout Sweden. Biogas is sold both as pure biogas and as a blend with natural gas. The existing natural gas network in southern Sweden offers users the option to purchase pure biogas. Biogas can be distributed either by road tanker or via a network of pipes. Presently, Sweden has 107 public gaseous motor fuel refilling stations. However, there are substantial variations in density of the fuelling stations throughout Sweden, as most of the gas refuelling stations are in the south of the country and in major urban areas [5].



Figure 1 A biogas bus for public transportations with the biogas tank in the cargo area (Photo: Kalle Svensson, Sweden Energy Agency)

Research and Development

Since environmental and energy supply considerations are a greater challenge for the transport sector, priority has been given to energy efficient vehicles and renewable energy technologies suitable for replacing fossil motor fuels.

The government has prioritized support for biofuel production projects that [1]:

- Achieve substantial GHG emission reductions and have low emission levels of other regulated substances/emissions (e.g. particulate matter, etc.)
- Can reach high system efficiencies and have the potential for scale-up (with a potential to generate export revenues)
- Have the potential to achieve production costs equivalent to, or less than, the price of fossil fuels

Renewable biofuels or energy carriers are of particular interest if they are suitable for use in the existing infrastructure (e.g. ethanol and electricity), if they can be integrated with existing motor fuels and replace diesel, and/or have synergistic effects with other important export industries, e.g. the pulp and paper manufacturing.

Biofuel research in Sweden has focused on finding production routes with high total efficiencies. Most of the funding is directed towards cellulose based ethanol or gasification-based processes that produce synthesis gas for motor fuels. Biofuels research is supported by several funding bodies, including the Swedish Energy Agency. Several Swedish research institutes and universities are participating in both national and international programs related to bio-based motor fuels. To strengthen Swedish biofuels research, a knowledge centre for renewable fuels called f3 ("fossil free fuels") has been created. The goal of the centre is to provide scientific support for policy makers, industry authorities, and other stakeholder organisations in the renewable fuels space. The centre will fund research projects which are complementary to current research and will include comparative system studies of different bio-based motor fuels, processes, feedstocks and plant designs. The centre is funded by the Swedish Energy Agency in cooperation with universities and industry.

The Energy Technology Centre in Piteå coordinates research focusing on gasification-based processes; this builds on the centre's previous black liquor gasification expertise [6]. The Energy Technology Centre is active in the BioDME program (described later in this article) and currently has research activities on: (1) entrained flow gasification of biomass in cooperation with IVAB AB, and (2) cyclone gasification for small scale CHPs in cooperation with Meva Innovation AB.

The program "Ethanol from Cellulose" is a four year program that ends in April 2011. The aim of the program was to facilitate a cost effective introduction of cellulosic ethanol in the Swedish biofuels market. The program consisted of activities ranging from fundamental laboratory projects, through pilot studies to process modelling and system studies. The program was recently evaluated and, although it was generally considered to be successful, the program was not renewed due to shifting priorities.

Conversion of biogas to liquid biogas is a relatively new fuel upgrading method. During the process, biogas is compressed and subsequently cooled to a suitable temperature. The CO₂ in the gas condenses to a liquid phase while the methane remains in a gaseous form. The liquid-phase

CO₂ is removed and can be sold and used as preservative or for food refrigeration uses. When the CO₂ is sold as a by-product it can significantly improve the economic feasibility of biogas upgrading processes.

Between 2010 and 2011, the Swedish government allocated €15 million to the Swedish Energy Agency for investment grants aimed at promoting expanded production, distribution and use of renewable gases (including biogas).

So far €10 million has been distributed to twelve projects that together represent the majority of biogas value-chain. One of the main objectives was to promote energy technologies that have favourable climate benefits but are not yet commercially competitive.

Demonstration Activities

NBE Sweden AB is planning to build a test plant in Sveg where ethanol production will be integrated with a biofuel pellet plant, a CHP plant, and a greenhouse to maximize the total efficiency of the operation. The company has recently started production and 70% of the plant is owned by two Chinese companies.

Another company, BioEnDev AB is planning to construct an industrial commercialization plant for wood torrefaction [7] with a capacity of about 4 tonnes per hour. The process includes heat treating the wood in an inert atmosphere so that the resulting material has a higher energy density. One of the benefits identified is that a torrefied chip will require much less energy for grinding relative to ordinary wood chips. The torrefied material may either be pelletized, or combusted in a gasifier. Torrefied wood has similar properties to coal and be feed into a gasifier with greater ease than untreated wood.

Large Facilities - Intensification Program

In September 2009, the Swedish Energy Agency announced €87 million in support of three demonstration facilities. A review was performed by the European Union Commission and support for the projects was approved at the beginning of 2011. The two largest projects funded in the program focus on biofuel production via the syngas route.

Chemrec AB was granted €54 million for a project with a total budget of around €300 million. Chemrec aims to extract biofuels from black liquor via gasification at a facility in Domsjö, Örnsköldsvik. The plant will have the capacity to produce 100 000 tons of biomethanol and bioDME motor fuels [8].

Another company, **Göteborg Energi AB** was granted €24 million to build and run a facility for the transformation of low-quality forestry materials into biomethane via gasification. The methane will be distributed on the existing natural gas grid and, according to Göteborg Energi AB, in 2020 the plant will produce approximately 1 TWh/year which is the equivalent amount of fuel for 100 000 cars [9].

Cellulosic Ethanol

The company SEKAB in Örnsköldsvik has been operating a pilot plant since 2004, where about 150 tonnes of cellulose based ethanol is produced per year [4]. Most of the R&D is focused on spruce chip feedstock, but other raw materials are also being tested. The plant runs continuously and

research findings provide valuable insights into machine wear, clogging, and other processes which are important for cost-effective operation of a commercial-scale plant. SEKAB are currently working on developing scalable projects that can successfully operate at commercial production volumes.

Green Diesel from Tall Oil

In 2010, the company Sunpine [10] in Piteå started production of renewable diesel from crude tall oil, a by-product from the pulp and paper industry. In the Piteå plant, crude tall oil is fractionated into raw tall diesel and tall oil pitch. Approximately 65-70% of crude tall oil is used for diesel fraction and the nominal capacity of the plant is about 80 000 tonnes of raw tall diesel per year.

The raw tall diesel is shipped to the Preem oil refinery in Gothenburg on the Swedish west coast, where it is further upgraded via a hydrogen treatment and is then mixed with fossil diesel. On the 4th of April 2011, Preem will market its new “Evolution diesel” which contains 15% tall diesel and 5% RME at 270 Preem fuelling stations, distributed throughout most of Sweden [11]. According to a well-to-wheel study, the fuel achieves 16% CO₂ emissions reductions relative to its fossil-based diesel counterpart.

BioDME

The European 7th framework programme (FP7) and The Swedish Energy Agency support an effort known as the BioDME project [12], which demonstrates the production and use of the synthetic biofuel DME (dimethylether). DME is a gas that is handled in liquid form at relatively low pressures and therefore its use can have significant advantages. Partners of this project include Chemrec, Delphi Diesel Systems, Energy Technology Centre in Piteå (ETC), Haldor Topsøe, Preem, Total, and Volvo.

The project covers the complete value-chain of DME production from black liquor to the use of DME as a transportation fuel. Downstream from Chemrec’s existing black liquor gasification demonstration plant, Chemrec and Haldor Topsøe will construct a DME plant using novel synthesis technology from Haldor Topsøe. The plant is designed to produce 4 tonnes of DME per day. In order to verify technical standards, commercial possibilities, and engine compatibility, the bio-DME will be tested in a fleet of ten Volvo trucks that will be used in commercial service. The Stockholm Preem BioDME fuelling station and the Piteå BioDME plant were inaugurated in September 2010.



Figure 3 The BioDME filling station in Stockholm (Source: Chemrec)

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Reports and Research

Policy and Standards

IEA Bioenergy Annual Report 2010

The IEA Bioenergy 2010 Annual Report includes a special feature article 'Algal Biofuels Status and Prospects' prepared by Task 39. The report includes detailed progress reports on each of the Tasks and lists of reports and papers produced by the Implementing Agreement. [More...](#)



Transportation biofuels Research in Austria

The workshop provided an overview of Austrian research activities on transportation biofuels. Lignocellulosic biomass and biofuels, innovative technologies, developments for PPO, biodiesel and biogas and sustainability were discussed. Participants included Austrian representatives of IEA Bioenergy, IEA AMF, Ministry of Traffic, Innovation and Technology (BMVIT) and other biofuels stakeholders. [More...](#)

Renewable Fuels: Regulations & Standards

EPA is finalizing amendments to the RFS program regulations. In 2010, EPA published a notice to withdraw several amendments to the regulations that were issued via direct final rule and parallel proposal on May 10, 2010. EPA addresses comments received on the withdrawn provisions and is taking final action. [More...](#)

Clean Transport Systems

Decarbonizing transport is a core theme of the EU 2020 strategy and of the common transport policy. The long-term transport objectives are laid out in the Commission Communication on the Future of Transport of 2009. The long-term objective of the EU is overall reductions of 80-95% by 2050. [More...](#)

Sustainability

Biodiesel GHG Emissions, Past, Present and Future

The energy balance and GHG emissions of biofuels remain a controversial topic in the popular press, with government policy makers, and within the academic community. Most of the discussion is based on past performance of biofuel technologies and therefore may not be representative of future developments in the industry. This project addresses important details on current and future use of biodiesel. [More...](#)

Water Footprint of Biofuels

This study carried out by researchers in the Netherlands provides a comprehensive account of the global green, blue and grey water footprints of different sorts of farm animals and animal products, distinguishing between different production systems and considering the conditions in all countries of the world separately. The green, blue and grey water footprint of crops and derived crop products: [More...](#)

Challenges for Biofuels - New Life Cycle Assessment Report from Energy Biosciences Institute

Scientific studies have shown the most promising alternatives to be liquid fuels derived from cellulosic biomass. Some advanced biofuels could also be delivered through existing pipelines and used in today's engines, replacing with no loss of performance. Advanced biofuels have the potential to be renewable, but important social, economic and environmental issues must be addressed. [More...](#)

Biorenewables, the bio-based economy and sustainability

Royal Society Publishing has released a special issue of *Interface Focus*, which introduces readers to research into the use of plants to supply mankind with renewable energy and material resources. Biofuels research lies at a complex set of interfaces, where the worlds of research and innovation meet those of business and politics. [More...](#)

Technical / Innovation / Other

USDA Announces Sustainable bioenergy Grant Winners

Agriculture Secretary Tom Vilsack today announced research grants awarded to spur production of bioenergy and biobased products that will lead to the development of sustainable regional systems and help create jobs. [Article...](#) [Winners...](#)



The Ethics of Biofuels

Concerns over energy security, economic development and climate change are driving the development of biofuels as one of a number of possible alternatives to fossil fuels. Current methods of biofuel production have been associated with harms to the environment, threats to food security and human rights violations in countries where they are grown. The Nuffield Council on Bioethics published a report setting out an ethical framework to guide policy making for biofuels; it provides recommendations since previously UK and European policies encourage unethical practices. [More...](#)



Vision Scenario for the EU 2011 Update for the EU-27 Project

The Öko-Institut eV believes the EU could source 80% of transport fuel from biofuels by 2050 while addressing sustainability. The Scenario represents a pathway that consistently combines short- and medium-term objectives with long-term objectives. The quantitative scenario analysis of energy and GHGs (except land use, land-use change and forestry) yield significantly different pathways for future energy and climate policies. [More...](#)

Technical evaluation of the use of biofuels and other renewable fuels in transport

This report details progress towards 2020 targets for renewables in the EU member states, including electricity production and biofuels. It shows that the 2020 renewable energy policy goals are likely to be met and exceeded if Member States fully implement their national renewable energy action plans and if financing instruments are improved. [More...](#)

Japanese officials see potential to double ethanol imports from Brazil

Projections indicate Japan will consume 500 million liters of ethanol per year by 2017, and Brazil, a country which currently exports 264 million liters of ethanol per year to the country, is an ideal partner. The potential partnership was on the agenda during a visit to the Brazilian Sugarcane Industry Association by a delegation from Japan’s Ministry of Agriculture, Forestry, and Fisheries. [More...](#)

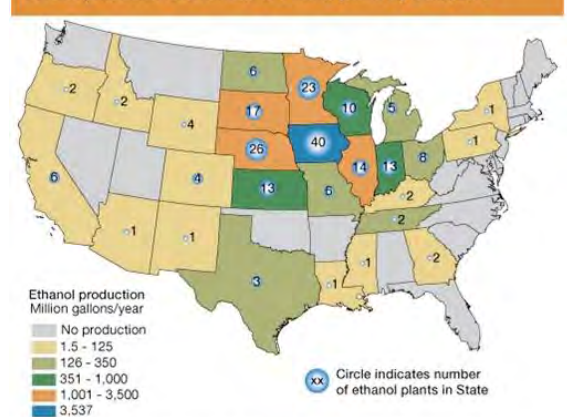
Who’s winning the clean energy race?

Leaders around the world increasingly recognize that safe, reliable, solar, wind, geothermal, and bioenergy, can be harnessed to create jobs and businesses, enhance national security and reduce GHGs. Nations seeking to compete effectively for clean energy jobs and manufacturing would do well to evaluate the array of policy mechanisms to stimulate clean energy investment. [More...](#)

Ethanol refineries locate near feedstock sources

Corn is the feedstock for 97% of the ethanol produced in the United States; refineries are concentrated in the Corn Belt. Ethanol is shipped long distances by rail, to reach major fuel markets on the coasts. Refineries also locate near markets for co-products such as DDGS, which is sold as cattle feed. [More...](#)

Ethanol production and number of ethanol plants by State, 2010



Source: USDA, Economic Research Service using data from OilIntel.com, U.S. Ethanol Plants: Operational & Under Expansion.

In the News

Policy and Standards News

Biofuel skepticism prompts German summit

The German government called an emergency fuel summit to prevent a consumer backlash against biofuels from snowballing into a full-scale petrol shortage. Growing skepticism about the new biofuel mix E10, has resulted in consumers queuing up for standard petrol, leading to supply shortages. BP, the main producer of E10 in Germany, has decided to delay production of the fuel but risks penalties if it does not meet the new biofuel quota. [More...](#)

USDA announces changes to bioenergy programs

The USDA has announced interim rule changes to three renewable energy programs authorized by the 2008 Farm Bill, including the Biorefinery Assistance Program, the Repowering Assistance Program and the Bioenergy Program for Advanced Biofuels. The programs are intended to create jobs in rural areas and increase the production and use of renewable energy. [More...](#)

Obama visit to Brazil yields encouraging renewable fuels cooperation

Two important announcements involving renewable energy made on the opening day of U.S. President Barack Obama's official visit to Brazil, both directly relevant to Brazil's successful sugarcane ethanol industry, are encouraging signs that Brazil and the U.S. are on a path to achieve free, unobstructed trade for clean, renewable biofuels. [More...](#)



Coalition of 90 groups calls for end of U.S. ethanol tax credit

A coalition composed of 90 groups ranging from business associations to taxpayer advocates, hunger and development organizations, agricultural, religious, and environmental groups sent a joint letter to the U.S. Congress asking that the Volumetric Ethanol Excise Tax Credit (VEETC), a US\$ 0.45 per gallon federal tax credit for corn ethanol, be allowed to expire at the end of the year. [More...](#)

Proposal: Phase out VEETC, replace with Variable Tax Credit

Four main ethanol-related trade groups have shared a plan with key lawmakers that among other elements would phase down their tax incentive after three years and be replaced with a variable tax credit tied to the price of oil. An increasing number of legislators are calling for the VEETC to end, citing that biofuel groups have been under increasing pressure to change. [More...](#)

Brazil produces fuel from coffee grounds

Coffee grounds can be used to produce biofuel, concluded researchers at the University of Sao Paulo in Brazil. Brazil is the world's largest coffee producer and the second biggest coffee consumer. The process extracts oil from the coffee grounds using an ethanol solvent; the oil then comes into contact with an alkaline catalyst, which causes a chemical reaction (transesterification) that produces biodiesel. [More...](#)



DOE Announces \$12 Million in Available Funding to Support Advanced Biofuels Development

The U.S. Department of Energy announced that it will be accepting applications for \$12 million in funding for laboratory or small pilot-scale projects that support the development of advanced biofuels. Successful projects will develop technologies that will be able to replace refinery feedstocks or directly replace gasoline, diesel, or jet fuels without requiring modifications to vehicles or fueling infrastructure. [More...](#)

DOE Makes \$184 Million Available for Advanced Vehicle Research

DOE announced that it is accepting applications for up to \$184 million over three to five years to accelerate the development and deployment of new efficient vehicle technologies. Funded projects will include advanced materials, combustion research, hybrid electric systems, fleet efficiency, and fuels technology. [More...](#)



Obama Outlines Energy Plan

President Barack Obama, under pressure to respond to rising gas prices, proposed a basket of ideas for reducing U.S. dependence on oil., endorsing for the first time a plan backed by oilman T. Boone Pickens to subsidize purchase of trucks and fleets that run on domestically produced natural gas. He said his goal was to cut U.S. oil imports by a third by 2025. [More...](#)

Sustainability News Items

Will Sustainable Biofuel Certification Scheme Put End to Food Versus Fuel Debate?

The RSB has developed a third-party certification system for biofuels sustainability standards, encompassing environmental, social and economic principles and criteria through an open, transparent, and multi-stakeholder process. [More...](#)

Climate change, biofuels threaten food security: FAO

Climate change bringing floods and drought, growing biofuel demand and national policies to protect domestic markets could drive up global food prices and threaten long-term food security, the United Nations said. Periods of price volatility are not new to agriculture, but recent price shocks triggered by extreme weather and increasing use of grains to produce energy have caused great concern, the U.N.'s Food and Agriculture Organization said. [More...](#)

Scientific panel to review EPA's triennial biofuels draft report

The U.S. EPA reviewed a draft report it is preparing for Congress which will detail the current and potential future environmental impacts associated with biofuel production. The 2007 Energy Independence and Security Act requires the EPA to assess and report to Congress every three years on the impacts associated with increased biofuels production. The report "Biofuels and the Environment: First Triennial Report to Congress," is the first report required through the legislation. [More...](#)

Food vs Fuel: Are biofuels moral or immoral? - Public Survey Results

The public says "depends on the feedstock," but generally more moral than converting land for oil & gas or housing. An in-depth Biofuels Digest survey looks at a wide variety of cases. Respondents concluded that the morality of the issue depends entirely on the feedstock, with 45% describing conversion of "land that is used for conservation, or as national park or forest preserve, to energy or fuel production" as immoral. [More...](#)



Overfertilising Corn Undermines Ethanol

A new paper in the journal Environmental Science and Technology shows how farmers can save money on fertiliser while improving their production of feedstock for ethanol and alleviate damage to the environment. The research has implications for an industry that has grown dramatically in recent years to satisfy America's need for energy while trying to cut the nation's reliance on fossil fuels. [More...](#)

Industry Developments

Interview with Lars Christian Hansen, Chair of the EBTP

The new Chair of the European Biofuels Technology Platform (EBTP) Steering Committee, Lars Christian Hansen from Novozymes A/S (Denmark), in an interview for SETIS, outlines the role and some of the achievements of EBTP, how biofuels fit in with the Strategic Energy Technology (SET) Plan, the issue of sustainability and challenges that need to be addressed in the short- and medium-term. [More...](#)



Alternative fuel vehicles

Fiat - Fiat has recently decided to offer 10,000 km of free green gas along with its new Panda, Punto Evo, Qubo and Doblo turbo Natural Power models.

Hyundai - In Seoul recently, Hyundai presented a concept car codenamed HDN-6, also known as the Blue2 Concept. It is an electric sedan with a drive mechanism based on an electric motor, battery and fuel cell.

Cella Energy - The English company Cella Energy is developing a means to make cheaper storage of hydrogen possible. [More...](#)

Biofuels Market in China 2010

Biofuels market in China includes bioethanol and biodiesel which are estimated to reach a production capacity of 10 million and 2 million tonnes by 2020 respectively, according to the Biofuels Market in China 2010 report. Recently, domestic and foreign players have formed joint ventures to start developing second generation biofuels. The government is taking initiatives by investing in the development of marginal land on which non-food crops can be grown for the production of biofuels. [More...](#)

Biofuels Industry Battles Past Bumps in the Road

When Shell PLC announced its \$12 billion joint venture with Brazilian sugar-cane-ethanol producer Cosan Ltd. last year, it was a massive vote of confidence in a sector that has taken a battering over the last few years. After a big boom in the middle of the decade, biofuels were hit badly by the global recession, though they have recently begun to stabilize. World-wide production grew to more than 100 billion liters in 2010 from 16 billion liters in 2000. [More...](#)



DuPont Acquires Enzyme Maker Danisco for \$5.8 Billion

DuPont Co. acquires Danisco A/S for \$5.8 billion, beating approaches from rival suitors for the Danish maker of enzymes used in food and biofuels. DuPont will pay 665 kroner (\$115) a share, the Wilmington, Delaware-based company said yesterday in a statement. That's 25 percent more than Danisco's 530-kroner Jan. 7 closing share price. DuPont will also assume \$500 million of debt. The company dropped the most in a month in New York trading today.

[More...](#)

Waste pop, beer first feedstocks for Canadian pilot plant

A \$500,000 modular pilot plant is being set up for ethanol production in Atlantic Canada. It's part of a research project led by New Brunswick Community College's bioenergy and bioproducts applied research and technology facility in Grand Falls, New Brunswick. Funding came half from Canada's federal government and half from the province. [More...](#)

Codexis Expanding Beyond Biofuels to Carbon Capture, Plastics

The company producing industrial enzymes was the first of a trio of biofuels startups to conduct an initial public offering in the past year. Amyris and Gevo, which both aspire to make cellulosic ethanol but now mostly get their revenue from buying and selling conventional ethanol, have soared as gas prices climb. [More...](#)



Other News Items

Danisco Loses Bid to Invalidate Novozymes Patent in U.S. Court

Danisco A/S lost a U.S. court bid to invalidate a Novozymes A/S patent for an enzyme used in biofuel production, allowing the case to go to trial this year. Novozymes is suing Danisco, which is subject to a takeover offer from DuPont Co., contending its smaller Danish rival infringes a patent on an alpha amylase enzyme that remains active in high temperatures. In counteraction, Danisco had asked U.S. District Judge Barbara Crabb in Madison, Wisconsin, for a summary judgment that the patent was invalid.

[More...](#)

Clean Energy Investment Reached Record High in 2010

The world invested a record-high \$243 billion in clean energy last year. This amounts to an annual increase of nearly one-third over the total amount invested in clean energy in 2009 (\$186.5 billion) - and nearly five times the total amount invested in 2004 (\$51.7 billion). The clean energy sectors included in this estimate included renewable energy, biofuels, energy efficiency, smart grid and others. [More...](#)

German oilseed council demands B30 approval in EN 590 diesel spec

The German oilseed council UFOP is demanding approval of 30 percent methyl ester biodiesel for commercial vehicles in the EN 590 diesel specification, an aggressive jump from the 7 percent allowance. The council issued this demand after Coburg College's fleet project, "Diesel regenerative," was presented to government officials. [More...](#)

The rise of King Corn

Looking for a good indicator for where food prices are headed? Watch corn. Corn's impact on the food industry is unlike that of any other agricultural commodity. At its most basic level, corn is a food staple and a key ingredient in dozens of products like baked goods, soft drinks and even bourbon. Corn drives fertilizer prices because corn plants suck up soil nutrients more than almost any other crop. It also plays a critical role in the price of meat because corn is included in most types of feed for cattle, hogs and chickens. [More...](#)



Excalibur. Mighty Claims, Mighty Prizes and the problem of myth in bioenergy

Deluged by biofuels invention, we all struggle to separate the real from the surreal. There is no shortage of reasons why high-yield biofuels, particularly microalgae, continue to fascinate practically everyone in the pursuit of alternative energy. [More...](#)

USDA unveils first 60 products under BioPreferred label

Deputy Agriculture Secretary Kathleen Merrigan unveiled the first 60 products by 11 companies that will bear the new USDA BioPreferred product label for certified bio-based products. The announcement was made during a recent bio-based product meeting. [More...](#)

RFA Urges New Hampshire to Reject Ethanol Ban

The New Hampshire House of Representatives recently voted to ban corn-based ethanol in the state. As this bill has now been sent to the Senate to be voted on, Renewable Fuels Association (RFA) President and CEO Bob Dinneen wrote a letter urging the New Hampshire lawmakers to reject HB 374. [More...](#)



Algae faces credibility issues, do your due diligence

The algae industry has taken significant strides in recent years, and is attracting a great deal of investor attention. However, the industry as a whole still faces challenges with regard to credibility. This is due, in part, to high expectations established by some companies in their quest to attract investment. [More...](#)

Upcoming Meetings & Conferences

IEA Bioenergy Task 39 Meetings

The following is a tentative schedule of Task 39 meetings over the course the next two years (2010-2012). Please [contact us](#) for more detailed information:

- Seattle, USA - 2-5 May 2011 (*Special Session, 33rd Symposium*)
- Brazil- August 2011 (*Task Technical workshop w/Brazil BBEST*)
- Verona- October 2011 (*ISAF XIX 2nd Lignocellulosic Ethanol Confr.*)
- Copenhagen, Denmark - February 2012 (*Technical workshop*)
- Vancouver, Canada - May 2012 (*Planning/Technical Conference*)
- Graz, Austria - September 2012 (*Multi-Task Conference*)



Upcoming International Conferences

Public Workshops on Harmonized Calculation of GHGs in Europe

April 14, 2011	Heidelberg, Germany	May 31, 2011	Stockholm, Sweden
May 19, 2011	Paris, France	June 01, 2011	Madrid, Spain
May 26, 2011	Athens, Greece		

All stakeholders involved in the biofuels field are invited to attend one of our seven public workshops on harmonized calculation of greenhouse gas emission in Europe. These are farmers, biofuel producers, and fuel suppliers, as well as auditors, advisors, representatives of voluntary sustainability schemes and GHG specialists as well as everybody else who deals with biofuels. [Presentations from previous sessions are available.](#)

European Expert Forum on Biorefineries

April 12-13 - 2011 Budapest, Hungary

Star-COLIBRI's European Expert Forum on Biorefineries is a 2-day conference that aims at initiating partnerships between projects on a European as well as national level and will provide a platform for networking between stakeholders; it will also gather input for two major policy documents in the framework of the Hungarian Presidency of the EU: the Joint European Biorefinery Vision for 2030 and the Joint Strategic Research Roadmap for Biorefineries for 2020.

19th European Biomass Conference and Exhibition

June 6-10, 2011 Berlin, Germany

What will be the most promising technologies to make 2nd gen biofuels competitive? How can we convert limited raw material resources most efficiently into electricity to buffer electricity supply from wind and solar? What will be the role bioenergy can play in the residential heating market? How can we speed up the implementation of sustainability certification systems for biofuels and bioenergy?

7th International Conference on Renewable Resources & Biorefineries RRB7

June 8-10, 2011 Bruges, Belgium

RRB7 is organized as a twin conference with the 3rd International Biorefinery Conference in collaboration with DECHEMA. The international conference aims at bringing together academic researchers, industrial experts, policymakers and venture capital providers to discuss the challenges emerging from the transition towards a bio-based economy and to present new developments in this area.

European Bioenergy Conference AEBIOM

June 29-30, 2011 Brussels, Belgium

From June 29th-30th, 2011, key players in the European bioenergy industry will meet at the AEBIOM Bioenergy Conference to discuss the possibilities and potential of the future of bioenergy. Leading experts will discuss the different aspects of bioenergy in a series of conferences. The accompanying trade fair will present European market leaders and their newest technologies and innovations to the visiting public.

1st Brazilian BioEnergy Science and Technology Conference (BBEST)

August 14-18, 2011 Campos do Jordão, Brazil

The BBEST meeting will be a state-of-the-art event in the bioenergy field, and it will provide experts to share their latest scientific and technological achievements, as well as to discuss business and policy developments. There will be three site visits to accompany the scientific program.

1st European Biorefining Course: Principles and technologies

August 29, 2011 Paris, France

The first European summer school on Biorefining will offer an information-rich, novel educational opportunity, which will address important biorefinery-associated issues and provide you with an overview of the field. It includes the visit of state of the art pilot and industrial facilities at Pomacle-Bazincourt.

5th “Biodiesel” International Conference

October 6-7, 2011 Berlin, Germany

The focus at the conference will be on current aspects of quality assurance, research results of the application in engines (B100 and blends), in addition to current developments and trends in the international markets for biodiesel. For the first time, participants will be informed in detail on the future focus of the application of biodiesel as blending component in heating oil.

XIX ISAF - International Symposium on Alcohol Fuels

October 10-14, 2011 Verona, Italy

The main theme is “Innovation for Local and Global Sustainability of Alcohol Fuels”. It emphasizes the importance of Innovations for Sustainability of Alcohol Fuels, in today’s World scenario. Many experts and will be participating to discuss and successfully make over the subject of identifying new non-food feedstocks and new technologies for production of 2nd gen of bioethanol and methanol.

Second International Conference on Cellulosic Ethanol

October 11-13, 2011 Verona, Italy

Following the success of last year’s conference, the Directorate General for Energy of the European Commission has decided to organise the 2nd Conference on Lignocellulosic Ethanol in Verona in cooperation with Brazil. The Conference will be facilitated by Mossi & Ghisolfi/Chemtex and the participants will be able to visit its research facilities.

Future Role of Bioenergy from Tree Biomass in Europe

November 6-11, 2011 Vienna, Austria

Researchers from fields including Forestry, Bioenergy Studies, Social and Environmental Sciences are invited to participate in The Future Role of Bioenergy from Tree Biomass in Europe conference. In 2011, the Year of the Forest, the COST-ESF will contribute to understanding bio-energy drivers, options and impacts on forest growing, management and production of traditional goods and services in the future.

