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Biofuels Annual

EU Biofuels Annual 2012

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Report Highlights: EU Member States (MS) are mandated to reach a minimum of 10 percent for renewable energy consumed in transport in 2020. In 2011, about a fifth of the domestic use of biofuels was imported from outside the EU. Despite a reclassification of bioethanol blends to a higher tariff rate, 2012 and 2013 imports from the United States are anticipated to remain at the same levels as last year, around 1 billion liters. Starting in the fourth quarter of 2012 and in 2013, overall EU imports of biodiesel are expected to decrease as a result of enforcement of the Spanish quota system, which only accepts biodiesel produced in the EU. The European Commission (EC) expects heat and power production from biomass to play an important role in meeting the 20 percent target for renewable energy use by 2020 and in the future reduction of CO_2 emissions in Europe. A major part of the biomass used is forecast to be forestry products. In 2011, U.S. wood pellets exports to the EU passed the 1 MMT.

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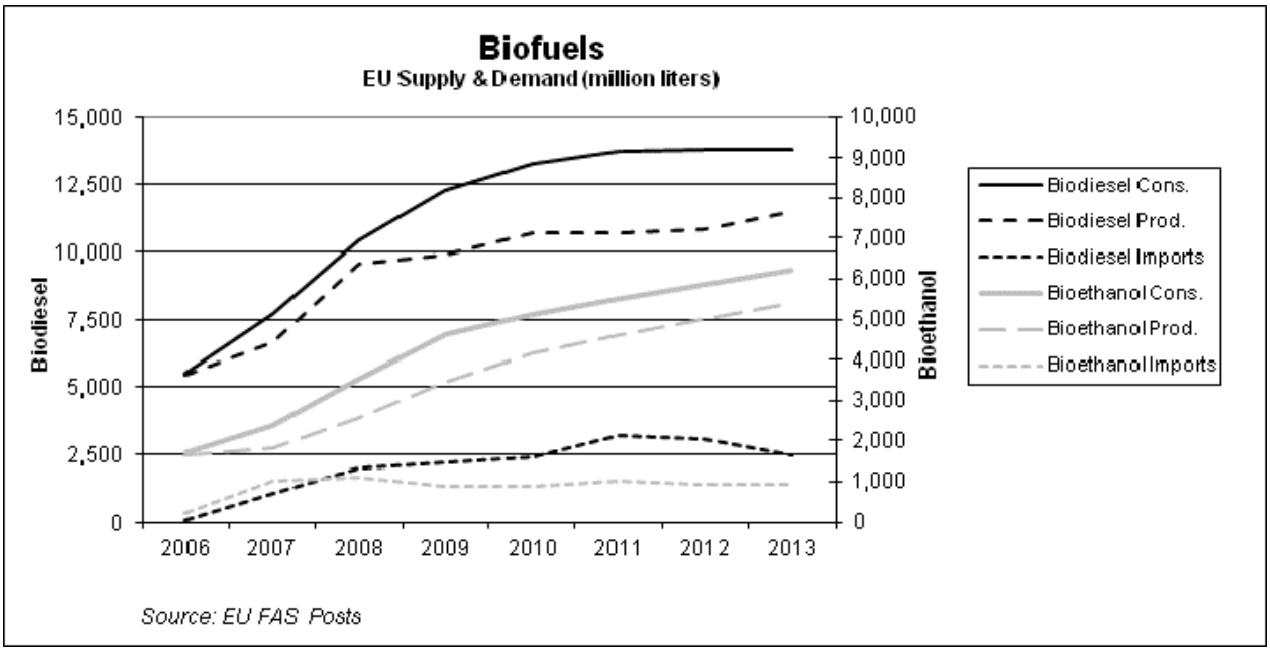
Executive Summary

Policy and Programs

The regulations which impact the EU biofuels market are the Biofuels Directive (2003/30), the EU Climate and Energy Package and the Fuel Quality Directive (FQD) (2009/30). The Package was adopted as a white paper by the European Council on April 6, 2009 (0147/2009). The Package includes the "20/20/20" mandatory goals for 2020, one of which is a 20 percent share for renewable energy in the EU total energy mix. Part of this 20 percent share is a 10 percent minimum target for renewable energy consumed in transport to be achieved by all Member States (MS).

Biofuels have to meet certain criteria to count against the 10 percent goal. In the Renewable Energy Directive (RED), specific sustainability requirements are laid out. These include minimum GHG (greenhouse gas) emissions reductions, land use and environmental criteria as well as economic and social criteria, and adherence to International Labor Organization conventions. The European Commission (EC) is reportedly working on updating the default values on GHG emissions in the RED. The RED also requires the EC to determine whether there is a need to establish sustainability criteria for solid and gaseous biomass.

Conventional and Advanced Biofuels



Biodiesel is the main biofuel for transport used in the EU and accounted for about 70 percent of the biofuels market on volume basis in 2011. Bioethanol had a 28 percent market share. In 2012, the share of advanced biofuels, mainly hydrotreated vegetable oils, may increase to over 5 percent of the total use of biofuels.

Between 2006 and 2008, the EU MS' mandates for blending and the relative high crude oil prices spurred an increase in the domestic use and production of biofuels, creating a demand for imports. Since 2007, however, competitive imports of both bioethanol and biodiesel have been driving domestic producer margins down.

Since 2010, bioethanol imports from Brazil were replaced by competitive imports from the United States. As the majority of these imports avoided the high EU import tariffs, the price deviation between the world and protected EU market disappeared, and as a result, EU domestic prices for bioethanol plummeted. Despite a reclassification of these blends to the higher tariff rate, imports from the United States are anticipated to remain at the same levels this year,

around 1 billion liters. This forecast is mainly based on the fact that EU domestic production is insufficient to fulfill the growing regulated domestic demand.

Since the enforcement of countervailing and anti-dumping duties on imports of biodiesel from the United States in March 2009, U.S. exports have been replaced by mainly biodiesel from Argentina and Indonesia. Starting in the fourth quarter of 2012 and in 2013, however, overall EU imports of biodiesel are expected to decrease as a result of enforcement of the Spanish quota system, which only accepts biodiesel produced in the EU.

Although it would be agronomically possible to grow all the feedstock needed to reach the policy goals domestically, the EC believes that 30 percent of the feedstock and biofuels will have to be imported to reduce price pressures on EU feedstock. The required feedstock for the anticipated biofuels production in 2012 is estimated at about 10.1 MMT of cereals, about 10.3 MMT of sugar beets, and about 9.7 MMT of vegetable oils and animal fats. In 2012, the production of byproducts from bioethanol and biodiesel production is forecast to reach 3.7 MMT (theoretical production of DDG) and about 14 MMT of oil meals (some of which is produced outside of the EU), respectively.

Biomass for heat and power

The European Commission (EC) expects heat and power production from biomass to play an important role in meeting the 20 percent target for renewable energy use by 2020 and in the future reduction of CO_2 emissions in Europe. A major part of the biomass used is forecast to be forestry products. Another important part is projected to be biomass converted in biogas.

Wood Pellets

The EU is the world's largest wood pellets market, with a consumption of about 12 MMT of pellets in 2011. Experts are expecting the market to increase to 80 MMT in 2020. Since 2008, the demand for pellets has significantly outpaced domestic production in Europe. This has resulted in increased imports from the United States. In 2011, U.S. wood pellets exports to the EU passed the 1 MMT, which is approximately thirty percent of the EU import share, and represents a value of US$ 193 million. Industry sources expect this trade flow to increase to over 5 MMT in 2015. Third country imports could, however, be affected by the implementation sustainability requirements demanded by the Renewable Energy Directive (RED).

Biogas

The biogas sector is very diverse across Europe. Depending on national priorities, i.e. whether biogas production is primarily seen as a means of waste management, as a means of generating renewable energy, or a combination of the two, countries have structured their financial incentives to favor different feedstocks. According to Eurostat data, Germany is with 86 percent of EU production by far the largest producer of biogas from agricultural feedstock, while the UK leads the biogas production from landfill gas with 50 percent of EU production.

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Introduction

Disclaimer: This report presents the situation and outlook for biofuels in the EU. This report presents the views of the authors and does not reflect the official views of the U.S. Department of Agriculture (USDA). The data are not official USDA data. Official government statistics on biofuels are not available in many instances. This report is based on analytical assessments, not official data.

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Policy and Programs

Transport Fuel Consumption (million liters)								
Calendar Year	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Conv. Biofuels	***8,409***	***11,059***	***14,382***	***17,020***	***18,459***	***19,273***	***19,668***	***20,024***
-Bioethanol	1,725	2,375	3,504	4,598	5,117	5,496	5,843	6,224
-Biodiesel	5,480	7,730	10,400	12,270	13,270	13,750	13,800	13,775
-PVO	1,204	954	478	152	72	27	25	25
Adv. Biofuels[a]	***0.15***	***0.15***	***5***	***195***	***390***	***390***	***1,300***	***1,300***
-Cell. Bioethanol[a]	0.15	0.15	5	5	10	10	10	10
-Cell. Biodiesel	0	0	0	0	0	0	0	0
-Drop-in Gasoline	0	0	0	0	0	0	0	0
-HVO Fuels[a]	0	0	0	190	380	380	1,290	1,290
-Drop-in Diesel	0	0	0	0	0	0	0	0
-Drop-in Jet Fuels	0	0	0	0	0	0	0	0
Total Biofuels	***8,409***	***11,059***	***14,387***	***17,215***	***18,849***	***19,663***	***20,968***	***21,324***
Gasoline	1,725	2,375	3,509	4,603	5,127	5,506	5,853	6,234
Diesel	6,684	8,684	10,878	12,422	13,342	13,777	13,825	13,800
Bio Jet Fuels	0	0	0	0	0	0	0	0
Tot. Fossil Fuels	418,326	422,557	414,817	399,190	394,418	396,289	397,313	398,361
Gasoline	140,244	135,195	128,130	123,231	115,881	115,649	115,417	115,187
Diesel	215,192	222,597	220,809	215,159	218,416	220,600	222,806	225,034
Jet Fuels	62,890	64,765	65,878	60,800	60,121	60,040	59,090	58,140
Total Fuel Market								
Gasoline Market	141,969	137,570	131,639	127,834	121,008	121,155	121,270	121,421
Diesel Market	221,876	231,281	231,687	227,581	231,758	234,377	236,631	238,834
Jet Fuel Market	62,890	64,765	65,878	60,800	60,121	60,040	59,090	58,140
Biofuel Blend (Volume basis)								
Gasoline Market	1.2	1.7	2.7	3.6	4.2	4.5	4.8	5.1
Diesel Market	3.0	3.8	4.7	5.5	5.8	5.9	5.8	5.8
Jet Fuel Market	0	0	0	0	0	0	0	0
Goal (*)	2.75%	3.50%	4.25%	5.00%	5.75%	-	-	

(a) Advanced biofuel capacity.

Transport Fuel Projection (million liters)								
Calendar Year	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Gasoline	121,421	121,178	120,936	120,694	120,453	120,212	119,971	119,731
Diesel	238,834	241,222	243,635	246,071	248,532	251,017	253,527	256,062
Jet Fuel	58,140	59,303	60,489	61,699	62,933	64,191	65,475	66,785
Total	418,395	421,703	425060	428,464	431,918	435,420	438,973	442,578

Source Eurostat and EC Publication "EU Energy Trends to 2030".

The Renewable Energy Directive

The EU Energy and Climate Change Package (CCP) was adopted by the European Council on April 6, 2009. The Renewable Energy Directive (RED), which is part of this package, entered into force on June 25, 2009, and had to be transposed into national legislation in the Member States (MS) by December 5, 2010. MS were also required to submit National Renewable Energy Action Plans (NREAP) by June 30, 2010. The adoption and requirement for the implementation of the Directive did not give enough time for either the Member States or the Commission to prepare for the implementation. These tight deadlines created many difficulties for everyone involved.

The EU Energy and Climate Change Package include the "20/20/20" goals for 2020:

• A 20 percent reduction in green house gas (GHG) emissions compared to 1990.
• A 20 percent improvement in energy efficiency compared to forecasts for 2020.
• A 20 percent share for renewable energy in the EU total energy mix. Part of this 20 percent share is a 10 percent minimum target for renewable energy consumed in transport to be achieved by all MS.

The goal for 20 percent renewable energy in total energy consumption is an overall EU goal. The RED sets different targets for different MS within this overall target, based on each MS' capacity. Therefore, some MS will have to reach much higher targets than the 20 percent renewable energy by 2020, whereas other MS will have much lower targets. Sweden, for example, will have to reach 49 percent, while the target for Malta is only 10 percent. The targets for the four largest economies of Europe: Germany, France, UK, and Italy, are 18, 23, 15, and 17 percent respectively. These targets are set by the European Commission (EC) depending on the current situation and potential for growth in different MS.

In contrast, the 10 percent target for renewable energy in transport is obligatory for all MS. The Commission hopes that a 10 percent target in transport for all MS will alleviate concerns referred to in the CCP that this sector is projected to account for most of the growth in energy consumption and thus requires more discipline. The latest official number for the use of biofuel was 4.2 percent (volume basis) in 2009. There is no official number for 2010, but estimates are between 4.5-5 Percent.

Biofuels have to meet certain sustainability criteria to be taken into account for the 10 percent goal:

• They must meet the sustainability criteria outlined below, including reducing GHG emissions by at least 35 percent compared to fossil fuels. From 2017, the reduction has to be 50 percent, and at least 60 percent for new installations.

• Second-generation biofuels will receive double credit. This means that biofuels made out of ligno-cellulosic, non-food cellulosic, waste and residue materials will count double towards the goal. Calculations are made on an energy basis.

• Renewable electricity consumed by cars will be counted by a factor of 2.5 and will therefore help countries achieve targets faster.

The Fuel Quality Directive (FQD) is a Directive that complements the RED and mirrors some of the RED's content such as the sustainability criteria. The FQD and CEN technical standards regulate the properties of biofuels and fuel additives in addition to the amount of these products that can be blended into fossil fuel. A key requirement of the FQD is that all fuel suppliers (oil companies) must meet a 6 percent cut over 2010 levels of GHG emissions by 2020 across all fuel categories supplied to the market. This is designed to be consistent with the 10 percent use of biofuels and will tend to move demand toward biofuels with higher GHG savings. In addition, the FQD limited ethanol blends to 10 percent or less when ethanol is used as an oxygenate. Thus a blend wall is created which risks future growth in ethanol use in certain countries beginning at some future date. The 2009 FQD supports a duel grade system of E5 for older vehicles and E10 for newer vehicles. Looking at the overall EU market, there is no blend wall constraint for the next few years. This duel grade system permits continued growth in ethanol use even though the overall gasoline market is shrinking. For biodiesel, a CEN technical standard for B7 already exists which permits the EU biodiesel use growth rate to exceed the growth in EU diesel demand for the next few years. There is work in progress to set a higher blend limit for heavy and even light-duty trucks. Fuel specifications for biodiesel place limits on the use of palm oil and soy oil as feedstock for biodiesel.

Transposition of the RED

By June 2012, only 20 MS had notified the EC of full transposition and the remaining seven, mainly smaller countries, had notified partial transposition.
The Commission is currently examining the sustainability criteria of each of the MS' legislation. Commission officials assume that those MS with only partial transposition of the RED have included sustainability criteria. The Commission is also assessing whether the MS' that have notified full transposition have done so correctly.

The possibility for certain biofuels of receiving double credit based on what feedstock are being used have so far been introduced

in nine Member States: Austria, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, and the U.K. The use of double counting biofuels is limited but growing, in particular the consumption of biofuels produced from waste fats (see Biodiesel Chapter).

Sustainability Criteria

Biofuels must comply with the sustainability criteria provided in Article 17 of the RED to be eligible for financial support and to count towards the target. These sustainability criteria have to be met by all biofuels whether produced within the EU or imported. The sustainability criteria include reaching a minimum GHG emission saving; not being produced from feedstock grown on land with high biodiversity value such as primary forests and highly biodiverse grasslands; not being produced on land with high carbon stocks such as wetlands or continuously forested areas and, not being produced on peat land.

RED specifies a 35 percent requirement for GHG emissions-saving threshold as a starting point. It increases to 50 and 60 percent in 2017, depending on whether they are produced in new facilities. Environmental sustainability criteria covering bio-diverse and high-carbon-stock lands are also laid out in the RED. Other sustainability criteria are mentioned and reporting requirements are established. These cover other environmental criteria for soil, water, and air quality, as well as social criteria, which focus on food price impact, and adherence to International Labor Organization conventions.

The biodiversity criteria apply on land that would have been classified as highly biodiverse in January 2008. Biofuels may not be made from raw material obtained from land with high biodiversity value such as primary forest and other wooded land, areas designated by law or by the relevant competent authority for nature protection purposes, highly biodiverse grassland or highly biodiverse non-grassland. The EC is currently developing the criteria for biodiverse grasslands based on an open consultation conducted early in 2010. Biofuels shall also not be made from raw materials produced on land with high carbon stock such as wetlands, peatlands, or continuously forested areas.

The agricultural raw materials produced within the EU must be produced in accordance with the minimum requirements for good agricultural and environmental conditions that are established in the common rules for direct support schemes under the common agricultural policy (CAP) (Cross compliance Article 17 § 6 of the RED).

MS competent authorities are responsible for ensuring that biofuel counted towards targets, mandates, and tax credits fulfill sustainability criteria. MS are not allowed to have higher or lower sustainability criteria than those set by the EC, and must accept all certification systems recognized by the EC. However, with each MS having different checklists, there is a possibility of getting 27 different national certification schemes that must be registered and recognized by the European Commission – which apply to biofuel produced in the EU member states as well as third countries.

GHG emissions

To count toward the 10 percent target, biofuels must currently have a GHG emissions saving of at least 35 percent. GHG emission savings are calculated using lifecycle analysis and following methodologies described in RED annexes.

The European Commission's Joint Research Center (JRC) define the GHG emissions savings for different raw materials and selected production and supply pathways. The results of these are presented in the RED annex. JRC calculated GHG emissions for cultivation, processing, transport, and distribution for different raw materials and used this to determine GHG emissions savings. Net carbon emissions from indirect land-use change are not included. Under the RED, it is possible to use actual numbers using proper documentation and Life Cycle Analysis procedures to achieve GHG emission saving values which are higher than the defaults. It is always possible to claim the default value without any supporting documentation.

	Typical GHG[1] savings	**Default GHG[2] savings**
Rape seed biodiesel	45%	38%
Soy bean biodiesel	40%	31%
Sun flower biodiesel	58%	51%
Palm oil biodiesel (Process not specified)	36%	19%
Palm oil biodiesel (process with methane capture at oil mill)	62%	56%

Corn ethanol, Community produced (natural gas as process fuel in CHP plant)	56%	49%
Sugar beet ethanol	61%	52%
Sugar cane ethanol	71%	71%
Waste vegetable or animal oil biodiesel	88%	83%

Source: European Commission, RED (Indirect land use is not included). (1) Typical implies an estimate of the representative greenhouse gas emission saving for a particular biofuel production pathway. (2) Default implies a value derived from a typical value by the application of pre-determined factors and that may, in circumstances specified in this Directive, be used in place of an actual value.

When the default values were calculated the Commission applied a "discount factor" from the typical value, to ensure that the biofuel pathway was not inflated. If the typical value is used for biodiesel made from soybeans, it would have a GHG saving value of 40 percent and be above the 35 percent threshold.

According to the RED, biodiesel made from soya oil does not automatically comply with the GHG emission criteria. The RED's GHG emissions saving default reference value for soy diesel is 31 percent, which is below the minimum GHG threshold. On closer examination, this value was calculated using a pathway where soybeans are first shipped from Brazil, then transformed into soy oil and biodiesel in the EU. Using lifecycle analysis, the value for soy-based biodiesel produced in and shipped from the United States, by nature of having a different pathway, would be different.

With no international standard in place for the calculation of GHG savings, there are some concerns that protectionists could use GHG thresholds to hamper trade. EC officials have stated they do not wish to have GHG saving numbers for different geographical areas, but prefer to base these GHG numbers on specific pathways, calculations are such as no-till farming, to allow for easier updates.

The Commission is reportedly updating the default values on GHG emissions in the RED however, is not likely to publish updated values until the question of Indirect Land Use Change (ILUC), as discussed below, is resolved.

Indirect Land Use Change (ILUC)

The RED calls for indirect land use change to be taken into consideration when calculating GHG emissions savings values for most first generation biofuels. The EU is currently debating how and to what extent to account for indirect land use change, a discussion that has been going on for years.

In December 2010, the Commission published a report on ILUC. The report acknowledges that ILUC can reduce GHG emission savings but also identifies a number of uncertainties associated with the available models. The EC is reviewing different methodologies to calculate GHG emissions caused by indirect land use changes and so that current published values can be adjusted. The Commission published an impact assessment in July 2011. There is still no indication on when the Commission will publish the report on ILUC.

On the EC "transparency platform" there are several pieces of work on ILUC that the EC has launched in order to better understand the effects of indirect land use change associated with biofuels and bioliquids. Many of these documents were originally related to the internal work in the EC, and were only published after a court obliged the EC to do so under the EU transparency principle. The EC is using these studies to determine the ILUC factor.

Certification of biofuels

There are three different ways for biofuels, including those that are exported to the EU to be certified and count towards the 2020 target. Those three options are:

- Voluntary schemes [1]
- Member State schemes
- Bilateral or multilateral Agreements

According to the Commission voluntary schemes will be by far the most important way for biofuels to be certified.

The Commission has so far made public eight voluntary schemes for certification of biofuels in the EU and additional schemes are expected to be published.

The current schemes are:
• Abengoa "RED Bioenergy Sustainability Assurance" (RBSA) - All kinds of feedstock in all regions.
• Biomass Biofuels (2BaSvs) - All kinds of feedstock in all regions.
• Bonsucro – Sugarcane in all regions.
• Greenergy Brazilian Bioethanol verification program – Sugarcane in Brazil.
International Sustainability & Carbon Certification (ISCC) – All kinds of feedstock in all regions.
• Roundtable of Sustainable Biofuels EU RED - All kinds of feedstock in all regions.
• Roundtable for Responsible Soy – Soybeans outside the EU.
• Ensus – a UK scheme for ethanol

There are many more schemes that are currently being reviewed by the Commission.

National Renewable Energy Action Plans

The RED required MS to submit National Renewable Energy Action Plans (NREAPs) by June 30, 2010. These plans provide detailed roadmaps of how each MS expects to reach its legally binding 2020 target. The Commission is currently evaluating them.

The summarized information in the NREAPs indicates that the overall share of renewables in 2020 will be 20.7 percent, slightly exceeding the target. Many MS say they will increase the use of biomass for the production of renewable energy. However, they do not specify from where the biomass would come. This has intensified the discussions on sustainability criteria for biomass. More information on this can be found in the section "Pellet Standards and Sustainability Criteria".

Trade Policy

There are no specific codes for bioethanol in international trade nomenclature. Currently for ethanol the two main codes are 220710 for undenatured ethanol and 220720 for denatured ethanol. Blends with petrol may also appear under other codes depending on the proportion of the mix. For biodiesel, a code that covers fatty-acid mono-alkyl esters (FAMAE) was introduced in January 2008, and changed in January 2012. However, other forms of biodiesel could still enter under other codes depending on the chemical composition. Diesel with a biodiesel component of less than 30 percent can enter the EU under chapter 271020 at a tariff rate of 3.5 percent.

HS Code	Description	Duty Rate
38249091 (Until 12/31/2011)	FAMAE 96.5 percent	6.5% (plus AD and Cv duties for U.S. and most Canadian companies)
3826001 (As of 1/1/2012)	FAMAE 96.5-100 percent	6.5% (plus AD and Cv duties for U.S. and most Canadian companies)
38260090	FAMAE below 96.5 percent	6.5% (plus AD and Cv duties for U.S. and most Canadian companies)
271020	B30 and below	3,5%
220710	Undenatured ethanol	€19.2/hl
220720	Denatured ethanol	€10.2/hl

On October 12, 2011, the EU Customs Code Committee approved a proposal by the EC to classify ethanol and gasoline blends with an ethanol content of 70 percent or more as denatured ethanol under code 2207 20 00. Therefore exporters of E90 to the EU will be charged the import tariff of € 10.20 per hectoliter normally charged for denatured ethanol. Previously, ethanol was imported under code 3824(Chemicals), at an import duty of 6.5 percent. This equates to approximately €102/m^3 compared to the current import duty of €32/m^3.

On March 12, 2009, the Commission published Regulation 193/2009 and Regulation 194/2009, containing provisional anti-dumping and countervailing duty measures on imports of biodiesel from the United States containing 20 percent or more of biofuels. The Regulations and duties entered into force on March 13, 2009 and applied for 6 months, after which they were made definitive for a 5-year period.

On May 5, 2011, the European Commission published a Council Decision to extend the definitive countervailing and anti-dumping duties imposed on all biodiesel originating in the United States. The countervailing and anti-dumping duties were thus extended on biodiesel blends of 20 percent or less originating from the United States. The measures adopted by the Commission were retroactive and extend to August 13, Calculations are 2012. They consist of countervailing duties on all imports of biodiesel originating in the United States containing blends of 20 percent or less. For U.S. companies that were investigated in 2009, the combined duties will apply, € 213.8 - € 409.2/ton. Other U.S. companies will be subject to the highest combined duty of € 409.2/ton, based on the biodiesel content in the blend.

E90

Imports of E90 to the EU increased to such degree since the beginning of 2010 that EU industry considered it as dumping. The EU industry claims that they were suffering because the Unites States has the ability to export ethanol at lower prices than the EU can supply domestically. The European ethanol industry requested that the Commission investigate and take legal action against the United States to protect the EU industry.
On November 25, 2011, the European Commission notified in the Official Journal that they would be initiating an anti-subsidy and anti-dumping investigation on bioethanol originating in the United States. The investigation is currently ongoing. It should be concluded within 15 months of the date of the publication and provisional measures should be imposed no later than nine months from the publication, which conclude in August 2012.

Biomass sustainability

The RED required the European Commission to look into whether sustainability criteria for solid and gaseous biomass are needed. On February 25, 2010, the Commission adopted a sustainability report for biomass other than biofuels and bioliquids. The report makes recommendations on sustainability criteria for individual MS to use as guidance however, no obligatory sustainability criteria were set. The report also stated that the Commission planned to publish an impact assessment on sustainability criteria for biomass by December 2011, however as of June 2012 no report has been published. The Commission held a public consultation on this issue and received 160 comments. Reportedly the Commission is planning to come forward with the impact assessment after the summer of 2012. This impact assessment will, if appropriate, be accompanied by a proposal.

Review of the RED

The RED stipulates that by December 31, 2014, the Commission shall present a report on some of the details in the RED. These include:

- A review of the minimum GHG emission saving thresholds
- The cost efficiency of the measures implemented to reach the 10 percent target
- The impact of biofuel production on the availability of foodstuffs at affordable prices
- An assessment of the feasibility of reaching the 10 percent target while ensuring the sustainability of biofuels production in the Community and in third countries.

On the basis of this report the Commission will propose to modify the RED to address such aspects as the minimum GHG savings if it deems appropriate.

Conventional Bioethanol

EU Production, Supply and Demand Table

Compared to the United States and Brazil, the EU is only a minor producer of bioethanol (ethanol produced from agricultural feedstock used as transport fuel). On volume basis, bioethanol represented about 28 percent of the total biofuels market in the road transport sector in 2011.

Ethanol - Conventional & Advanced Fuels (million liters)								
Calendar Year	**2006[r]**	**2007[r]**	**2008[r]**	**2009[r]**	**2010[r]**	**2011[e]**	**2012[f]**	**2013[f]**
Production	1,633	1,806	2,587	3,471	4,177	4,620	5,000	5,380
-Advanced Only								
Imports	228	1,000	1,101	899	878	1,008	950	950
Exports	53	56	61	101	75	94	95	95
Consumption	1,725	2,375	3,509	4,603	5,127	5,506	5,853	6,234
Ending Stocks	82	458	577	243	97	62	64	65
Production Capacity (Conventional)								
No. of Biorefineries	36	51	60	66	68	70	71	74
Capacity	2,066	3,458	5,138	6,234	7,570	7,697	8,013	8,450
Capacity Use (%)	89	65	60	61	61	61	64	65
Production Capacity (Advanced)								
No. of Biorefineries	1	1	2	2	3	3	3	3
Capacity	0.15	0.15	5	5	10	10	10	10
Capacity Use (%)	-	-	-	-	-	-	-	-
Co-products from Conventional Biofuel Production (1,000 MT)								
DDG	1,488	1,305	1,495	2,296	2,963	3,384	3,712	4,020

r = revised / e = estimate / f = forecast EU FAS Posts. Sources: EU FAS Posts and statistics of Eurostat, World Trade Atlas and the European Renewable Ethanol Association (ePURE). Production capacity as of December 31 of year stated. DDG = Distillers Dried Grains, theoretical maximum production.

Ethanol - Conventional & Advanced Fuels (1,000 MT)								
Calendar Year	**2006[r]**	**2007[r]**	**2008[r]**	**2009[r]**	**2010[r]**	**2011[e]**	**2012[f]**	**2013[f]**
Production	1,290	1,427	2,044	2,742	3,300	3,650	3,950	4,250
Imports	180	790	870	710	694	796	750	750
Exports	42	44	48	80	59	74	75	75
Consumption	1,363	1,876	2,772	3,636	4,050	4,350	4,624	4,925
Ending Stock	65	362	456	192	77	49	51	51
Production Capacity								
No. of Biorefineries	36	51	60	66	68	70	71	74
Capacity	1,632	2,732	4,059	4,925	5,980	6,081	6,330	6,675

Ethanol[a] – Total, All Uses (million liters)								
Calendar Year	**2006[r]**	**2007[r]**	**2008[r]**	**2009[r]**	**2010[e]**	**2011[e]**	**2012[f]**	**2013[f]**
Production	2,706	3,115	3,580	4,771	5,477	5,920	6,300	6,680
Imports	973	1,667	2,386	1,896	1,454	1,784	1,570	1,500
Exports	66	70	58	73	92	100	100	100
Consumption	3,613	4,336	5,789	6,928	6,985	7,639	7,769	8,080
Ending Stock	132	508	627	293	147	112	113	113
Production Capacity								
Capacity	3,566	4,958	6,638	7,734	9,070	9,197	9,513	8,080

Capacity Use (%)	76	63	54	62	60	64	66	67

Sources: EU FAS Posts and statistics of World Trade Atlas and the European Renewable Ethanol Association (ePURE) (a) Ethanol produced by fermentation of agricultural products, does not include synthetic ethanol.

Ethanol[a] – Used as Other Industrial Chemicals (million liters)								
Calendar Year	**2006**	**2007**	**2008**	**2009**	**2010[e]**	**2011[e]**	**2012[f]**	**2013[f]**
Production	602	691	662	650	650	650	650	650
Consumption	944	981	1,140	1,163	929	1,067	958	924

Sources: EU FAS Posts and statistics of World Trade Atlas and the European Renewable Ethanol Association (ePURE) (a) Ethanol produced by fermentation of agricultural products.

Production Capacity

Bioethanol production capacity is forecast to increase from about 2,100 million liters in 2006 to about 8,500 million liters in 2013. The majority of the production capacity has been installed in the Benelux countries, France, Germany, the UK, Spain and Poland. During the period 2007 - 2011, only about sixty percent of the available capacity was utilized. This is partly due to the fact that the EU is building its sector and new plants need a start up phase to be fully operational. During the seasons 2007/2008 and 2010/2011, utilization was also low due to high grain prices. Another reason for the underutilization was competitive bioethanol imports from Brazil during 2007 - 2009, and from the United States during 2010 and 2011.

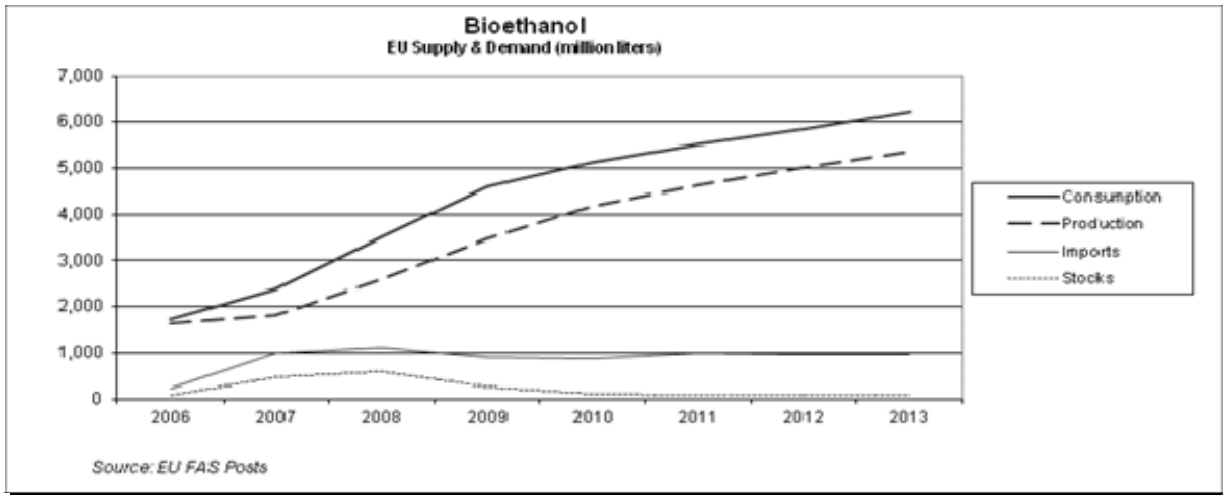
Fuel Ethanol Production – Main Producers (million liters)								
Calendar Year	**2006[r]**	**2007[r]**	**2008[r]**	**2009[r]**	**2010[r]**	**2011[e]**	**2012[f]**	**2013[f]**
Benelux	19	37	76	143	380	696	1,013	1,013
France	294	539	746	906	942	949	949	949
Germany	430	397	580	752	765	730	759	823
United Kingdom	0	44	70	70	278	190	253	316
Spain	405	359	346	465	471	465	465	465
Poland	162	120	114	165	194	171	203	228
Other	323	310	655	970	1,147	1,419	1,295	1,396
Total	**1,633**	**1,806**	**2,587**	**3,471**	**4,177**	**4,620**	**5,000**	**5,380**

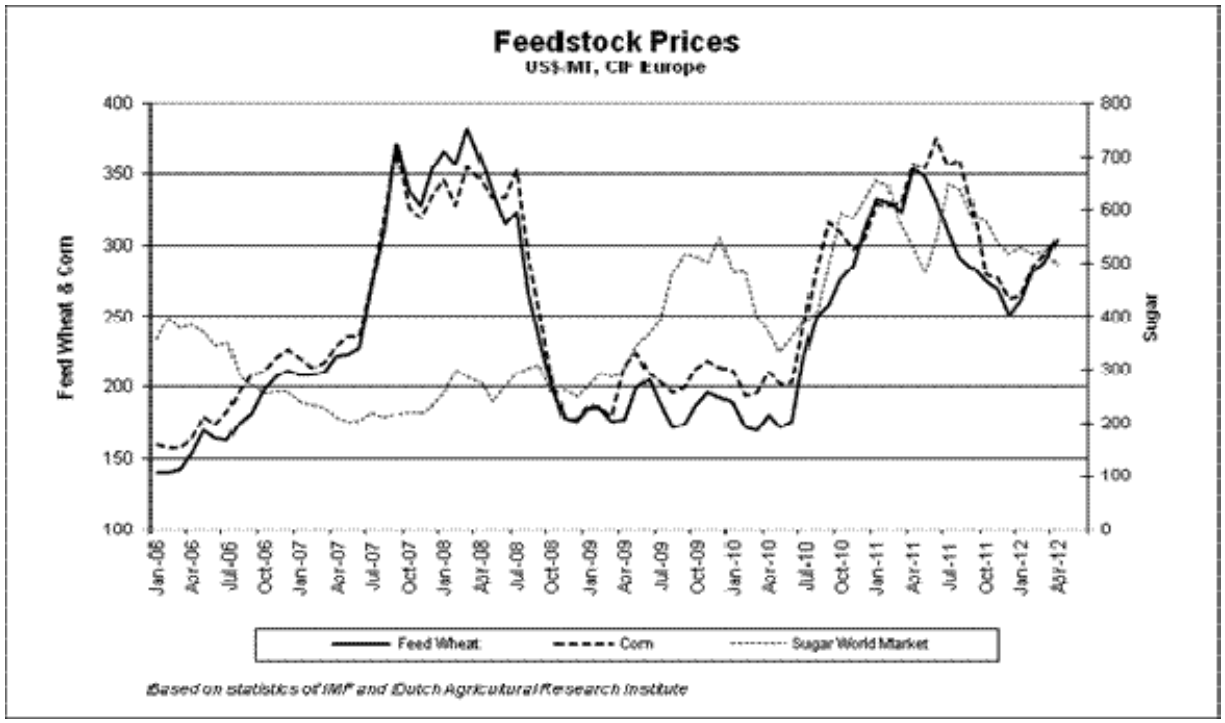
r = revised / e = estimate / f = forecast EU FAS Posts. Source: EU FAS Posts

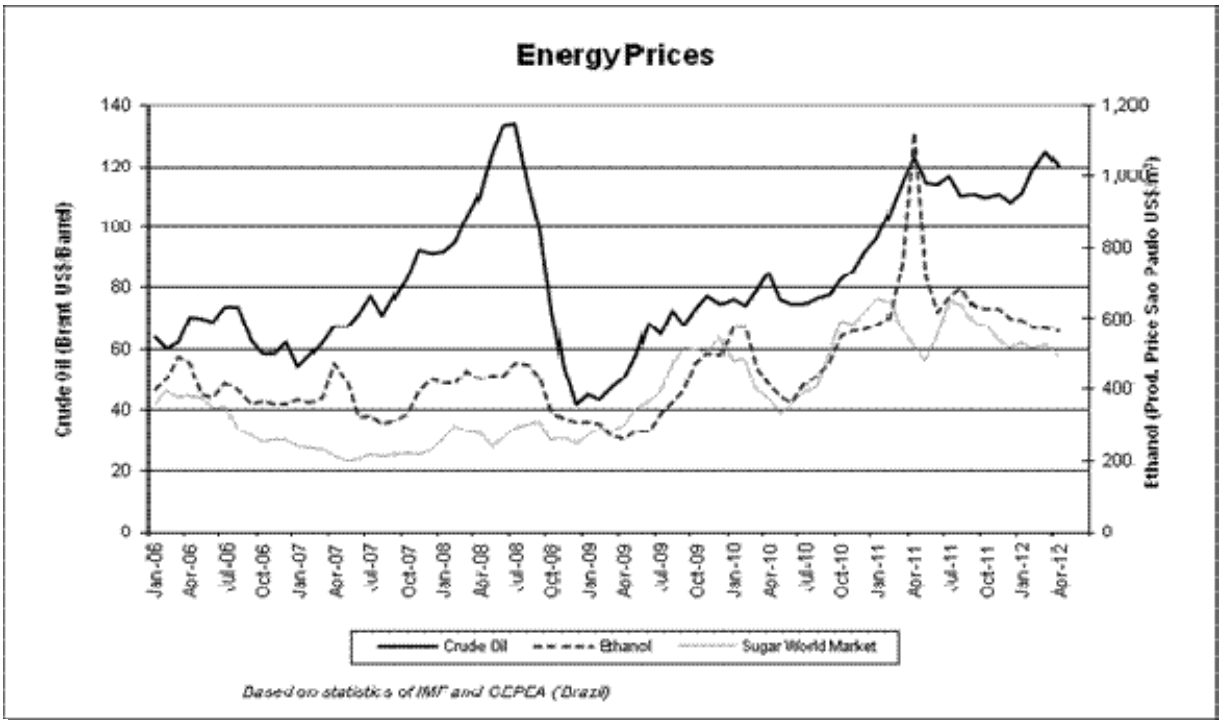
Production

The growth of EU bioethanol production flattened somewhat from an annual increase of about 700 - 800 million liters in 2008, 2009 and 2010 to around 400 million liters in 2010 and 2011 (see graph below). The EU bioethanol production in 2011 is estimated at 4.6 billion liters. On an energy basis, this is equivalent to 29 million barrels of crude oil. During 2009 and the first half of 2010, production margins were supported by low domestic feedstock prices (see graph below). Since the first quarter of 2010, however, producer margins deteriorated due to plummeting domestic ethanol prices (see trade section) and elevated feedstock prices. Feedstock supplies are anticipated to remain tight during MY2012/2013 (see FAS EU Grain and Feed Annual). In general, negative margins on bioethanol production with cereals as feedstock are anticipated during seasons with a tight supply of grains on the EU and world market. Producers are reportedly able to reach positive margins mainly due to the returns on selling Distillers Dried Grains (DDG).

In 2010, 2011, and the first half of 2012, the EU bioethanol industry faces the same problems as the EU biodiesel industry previously experienced, namely an excess of production capacity on the market, slackening demand and competitive imports, mainly from the United States. For this reason, the domestic production estimate for 2011 and 2012 is lower than anticipated in the previous Annual Biofuels Report, and is adjusted downwards by 190 and 510 million liters, respectively.


Bioethanol
EU Supply & Demand (million liters)
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
2006
2007
2008
2009
2010
2011
2012
2013
Consumption
Production
Imports
Stocks
Source: EU FAS Posts


Feedstock Prices
US$/MT, CIF Europe
Feed Wheat & Corn
Sugar
400
350
300
250
200
150
100
800
700
600
500
400
300
200
100
0
Jan-06
Apr-06
Jul-06
Oct-06
Jan-07
Apr-07
Jul-07
Oct-07
Jan-08
Apr-08
Jul-08
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Feed Wheat
Corn
Sugar World Market
Based on statistics of IMF and Dutch Agricultural Research Institute



In Germany, bioethanol production was forecast to increase in 2011 in response to the anticipated higher demand created through the introduction of E10. However, German bioethanol production declined by 4 percent in 2011 which the German industry attributes to extensive E90 and ETBE imports from the United States. In the UK, a bioethanol plant with a capacity of about 300 million liters temporarily stopped production in May 2011. This closure was probably also related to the supply of competitive third country imports and the lower than expected consumption of E10 in Germany (see consumption section).

Imports of bioethanol are forecast to decline to some extent during the second half 2012 (see trade section). These lower imports from the world market could create room for domestic producers to supply the growing demand for bioethanol. Production increases are forecast in the Benelux countries, Germany, the UK, Poland and Hungary. The uncertainty about the implementation of the ILUC factor remains a risk for further investment. Production is expected to surge in the Netherlands and Belgium as the ports in this region provide easy access to feedstock from other continents. Rotterdam also serves as a hub for fossil fuel logistics, which makes it a strategic location for biofuels blending and further distribution. In the port of Rotterdam, a bioethanol plant with a capacity of about 570 million liters started production mid 2010. In the UK, all plants are located on the east coast of England in close proximity to deep water ports. In the UK, a large wheat -to-ethanol plant (420 million liters capacity) started test production in April 2012, while another plant reportedly resumed production.

Large investments were also made in the Southeast of the EU, mainly Hungary and Romania. In Hungary, the ample domestic supply of corn will be utilized by a bioethanol plant with an annual production capacity of 240 million liters. The plant started operation in March 2012, and is planned to be enlarged to a capacity of 480 million liters in 2013. In southern Romania, a large-scale bioethanol producer launched activity in September 2009, with an annual production capacity reaching 125 million liters. Also for this plant the main feedstock is corn. Other projects in development are reported in Slovakia and Croatia.

However, should ethanol imports continue to be priced competitively, domestic production may be affected (see trade section). Following this scenario, consolidation of the sector, with closure of smaller plants and investments in larger size plants, seems inevitable. At the moment, plants are owned by large multinationals as well as by larger and midsized domestic cooperatives and processors, such as corn wet millers and sugar producers.

Feedstock Use

Feedstock Used for Fuel Ethanol Production (1,000 MT)								
Calendar Year	**2006[r]**	**2007[r]**	**2008[r]**	**2009[r]**	**2010[r]**	**2011[e]**	**2012[f]**	**2013[f]**
Wheat	1,351	1,347	1,624	2,311	3,733	4,466	5,131	5,591
Corn	397	517	1,155	2,298	2,530	2,944	3,211	3,436
Rye	1,039	659	722	955	1,122	986	957	1,051
Barley	1,234	1,004	540	641	623	749	734	790
Sugar beet	3,082	5,370	9,448	10,086	10,705	10,330	10,282	10,831

r = revised / e = estimate / f = forecast EU FAS Posts. Note: Official data for feedstock use is scarcely available. The figures above represent estimates by EU FAS posts based on known feedstock / ethanol conversion rates.

While plants in the United States and Brazil are predominantly located in the feedstock production regions, and focused on a single feedstock, plants in the EU are often located close to the end-market and designed as multi-feed stock plants. In the EU, bioethanol is mainly produced from wheat, corn, rye, barley and sugar beet derivatives. A limited volume of bioethanol was produced from the surplus of wine alcohol, but this has reportedly stopped.

Wheat is mainly used in northwestern Europe, while corn is predominantly used in Central Europe and Spain. Rye is applied as feedstock for bioethanol production in Poland, the Baltic Region and Germany, while barley is mainly used in Germany and Spain. In northwestern Europe and in the Czech Republic sugar beets are used. During the high grain prices in MY2007/2008 and MY2010/2011, sugar beet derivatives, mainly sugar syrup, were a favorable feedstock for bioethanol production. Because of the drop in grain prices in MY2011/12, however, sugar is a less competitive option in these outlets. As a result, little or no growth in sugar for industrial uses is anticipated in MY2011/12. This is reflected in the absence of any new investments for bio-ethanol production from sugar beet in 2011 and 2012 (see FAS EU Sugar Annual). Following the forecast of an increasing supply of corn in MY2012/2013, it is anticipated that multi-feedstock plants in the EU will switch from wheat to corn.

In the EU, cropland is increasingly being applied for biofuels production. In France for instance, the share of corn, wheat, and sugarbeet production used for bioethanol accounts for 7, 10, and 23 percent of the total production, respectively. In the EU, the required feedstock for the 2012 production (5,000 million liters of bioethanol) is estimated at nearly 10.1 MMT of cereals and 10.3 MMT of sugar beets. This is about 3.6 percent of total EU cereal production and 8.9 percent of total sugar beet production.

Co-products of the bioethanol production are Distillers Dried Grains (DDG), wheat gluten and yeast concentrates. In 2012, the maximum theoretical production of co-products is forecast to reach 3.7 MMT. This is about 2.2 percent of total EU feed grain consumption.

Consumption

Fuel Ethanol Consumption – Main Consumers (million liters)								
Calendar Year	**2006[r]**	**2007[r]**	**2008[r]**	**2009[r]**	**2010[r]**	**2011[e]**	**2012[f]**	**2013[f]**
Germany	599	584	791	1,142	1,475	1,568	1,709	1,835
United Kingdom	0	94	152	354	633	823	924	1,013
France	294	539	814	805	782	949	949	949
Spain	228	251	182	299	446	452	456	456
Benelux	35	168	234	357	370	392	424	456
Sweden	329	438	428	392	400	419	428	428
Poland	118	82	190	253	337	316	342	380
Other	122	219	718	1,001	684	587	596	591
Total	**1,725**	**2,375**	**3,509**	**4,603**	**5,127**	**5,506**	**5,853**	**6,234**

r = revised / e = estimate / f = forecast EU FAS Posts. Source: EU FAS Posts

During 2006 – 2009, EU bioethanol consumption expanded by 0.6 to 1.2 million liters per year. But the growth has flattened during 2010 and 2011, and is anticipated to remain moderate during 2012 and 2013. In 2008, consumption was supported by the

high crude oil prices (see graph above) which made substitution, or blending, of gasoline with bioethanol attractive. Since 2009, however, this beneficial price difference has deteriorated. In some EU MS, oil companies chose to pay the penalties for not complying with the blending mandates.

In Germany, introduction of E10 resulted in a 6 percent increase in bioethanol consumption but remained below the forecast in the previous Biofuels Annual. As of January 1, 2011, Germany allowed gasoline to contain up to 10 percent of bioethanol. Prior to this date only E5 was allowed to be sold on the German market. The introduction of E10 translates into a potential market for bioethanol of 1.5 MMT, if all gasoline sold in Germany were to be E10. However, consumer groups and the German car drivers association (ADAC) criticized the introduction of E10 and the lack of information regarding the compatibility of their cars and E10. E10 was also introduced on the Finnish and Swedish market in 2011. However, Swedish flexi-fuel drivers tend to abandon ethanol when gasoline cost less.

Since the start of 2012, the price margin between gasoline and ethanol improved slightly. For 2012, German consumption is expected to increase as high fuel prices make E10 more attractive. In February 2012, fuel prices hit an all time record high and the 5 Eurocent discount for E10 compared to E5 is expected to convince more consumers to use E10. Recent reductions of the crude oil prices in June, were being offset by the weakening Euro against the US$.

Based on the mandates and national policy incentives (see policy section of this report), bioethanol consumption is forecast to continue to grow to 5.4 billion liters in 2013. During 2012 and 2013, the main markets will be Germany, the UK and France, with Germany and the UK as the main growth markets. France and Spain will be for the most part self sufficient. A surplus will be available in the Benelux countries, and in lesser extent in Central European countries, mainly Hungary and Austria. Germany and the UK will depend on imports for fifty percent of their consumption. Another deficit region is Scandinavia.

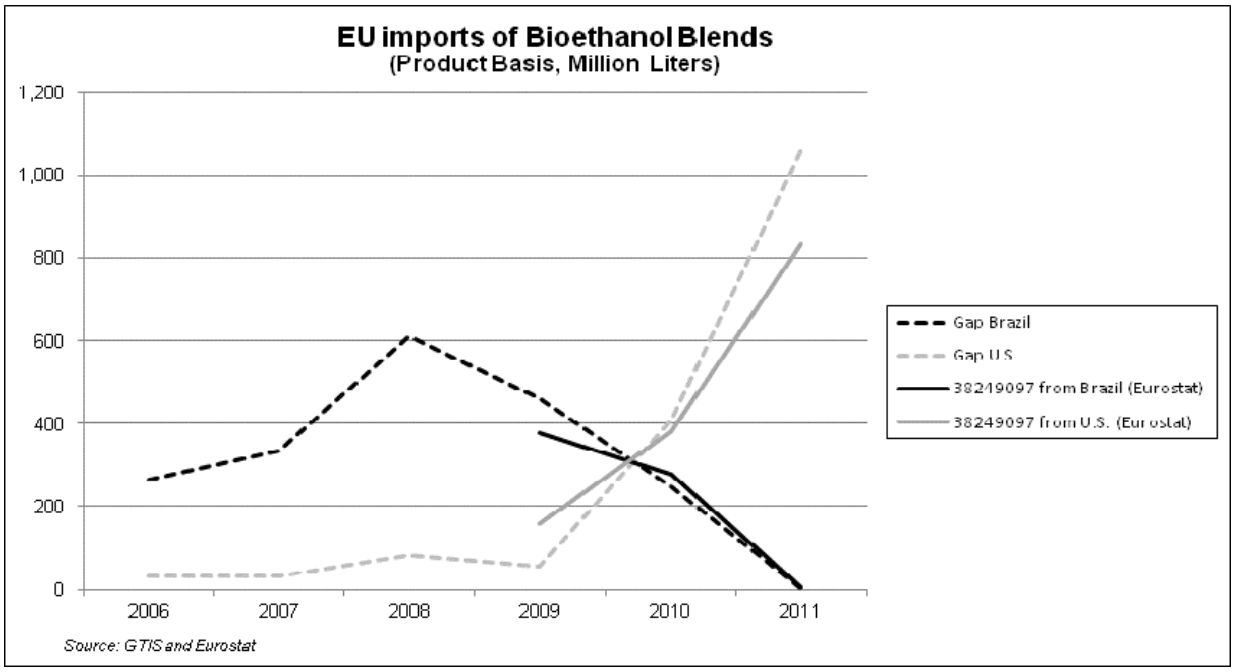
Trade

During 2006 – 2012, the majority of the bioethanol has been imported by the Benelux countries, the UK, Sweden, and Finland mainly through the port of Rotterdam. A part of the bioethanol imports is blended with gasoline in Rotterdam, but most of the biofuel is blended at its final destination to fulfill local EU Member State requirements.

The EU has several schemes for preferential trade regarding ethanol imports; the Everything But Arms (EBA) initiative, the Cotonou Agreement (for the African, Caribbean, and Pacific countries), the Euro-Mediterranean Agreement and special drug diversion programs.

The EU tariff on undenatured ethanol (HS 220710) is 192 Euro per thousand liters, while the tariff on denatured ethanol (HS 220720) is 102 Euro per thousand liters. By denaturing, ethanol is made unsuitable for human consumption by adding substances according EC Regulation 3199/93. Most EU Member States only permit blending with undenatured ethanol, by which their domestic market is protected by the higher tariff rate. The governments of the UK, the Netherlands, Finland, Denmark, the Czech Republic and Slovakia, however, also permit blending with denatured ethanol.

The major part of bioethanol has been, however, exported under HS 2207 but imported as a blend with a Binding Tariff Information (BTI) under the HS code 38249097, subject to a lower tariff, namely 6.5 percent of the customs value. This practice of blending gasoline with bioethanol is conducted either before arrival on the continent, or under customs control on EU territory. As a result, a significant difference exists between the reported HS 2207 export volume to the EU and reported HS 2207 import volume. This gap is roughly equal to the import volume under HS 38249097 reported by Eurostat (see graph below). As from April 3 2012, however, the EU's Customs Code Committee reclassified ethanol blends of 70 percent, previously classified under HS 38249097, as denatured ethanol under HS 2207, subject to a higher import tariff of 102 Euro per thousand liters (Regulation 211/2012). Companies with a BTI will be allowed to continue importing bioethanol blends for three additional months (see for more information the Policy Chapter).



During 2010 and 2011, a part of the reduced bioethanol blends from Brazil was replaced by increased imports from the United States (see graph above). Reportedly the majority has been imported as E90 (90 percent bioethanol). As these imports avoided the high tariffs for HS 2207, the price deviation between the world and protected EU market disappeared, and as a result, EU domestic prices for bioethanol plummeted. Bioethanol imports from Brazil were also replaced by increased imports of ETBE, from both Brazil and the United States. Further growth of ETBE imports is not anticipated due to the limited production capacity in the producing countries.

While the U.S. and Brazil have gained free access to each other's bioethanol markets, the EU is becoming increasingly an isolated market with high import tariffs. Despite the effort of the EC to regulate imports, the main factor, which will determine EU imports in 2012 and 2013, is anticipated to be the supply from Brazil and the United States. The regulated demand in the EU, could significantly raise domestic ethanol prices and could consequently attract bioethanol from either the market in Brazil or the United States. This is a consequence of the fact that EU domestic production is insufficient to fulfill the growing regulated domestic demand.

In 2012 and 2013, EU imports from Brazil are not expected to recover following the continuing restricted domestic production. However, based on the ample and competitive supply, imports from the United Sates are anticipated to continue. The termination of the blender's credit on December 31, 2011, had no noticeable effect on imports from the United States during the first four months of 2012. As from mid June, the reclassification of bioethanol blends to the higher tariff rate has been fully implemented (see above), which in effect adds about 12 percent on the FOB NW EU price of bioethanol. This additional fee is expected to only marginally reduce imports from the United States. European traders report that the U.S. production will remain below EU production costs, and due to the generally lower price and larger cargoes available, buyers will continue to favor purchase of U.S. product. The forthcoming U.S. corn harvest could further reduce the cost price of U.S. bioethanol production. While the EU grain supply is expected to remain tight next season (see FAS EU Grain & Feed Annual).

According to some sector sources, an uncertain factor is that the language of the regulation which enforces the reclassification is not explicit, and is open for interpretation. Exporters could possibly avoid the higher tariff rate with a blend of just below 70 percent bioethanol. Another option could be finished blends, E5 or E10, under the HS code 27, with a tariff of 4.7 percent. Trading such blends holds, however, a risk due to the uncertainty about the exact enforcement of the regulation. Furthermore, the EC has reportedly communicated that with the regulation, in practice all blends will fall under the high tariff rate of denatured ethanol. BTIs for importation under HS 3824 will reportedly not be granted. Under this trading condition, importing pure bioethanol under HS code 2207 would be the most cost-effective option. A remaining uncertainty is, however, the anti-subsidy and anti-dumping investigation of the EC, which provisional measures are expected to be imposed in August 2012 (see Policy

Chapter). But even with a further increase of import tariffs, traders expect the EU market will have to attract bioethanol from third countries to fulfill its demand. In 2012 and 2013, total EU imports of bioethanol are forecast to remain close to 1 billion liters.

Imports of corn and sugar cane ethanol are not expected to be significantly constrained by the implementation of the sustainability requirements laid down in the Renewable Energy Directive 2009/28/EC (RED) in national MS legislation (see policy section of the report). Only a limited number of compliant ethanol plants are required to maintain the current trade volume. Future policies of the EC and MS Governments' interpretation and implementation of the RED remain however an uncertain aspect in forecasting future bioethanol imports. Imports could be hampered by a stricter or even inconsistent execution of the RED by the individual EU Member States.

Stocks

As a result of elevated domestic production and imports, ethanol stocks have been building during 2007 and 2008. The current storage capacity for ethanol, bioethanol and ethanol for non-fuel use, in the port of Rotterdam is estimated at about 600 million liters. During 2009 and 2010, stocks were reduced and are not expected to build during 2012 and 2013 as world supply is anticipated to stagnate, while domestic demand is forecast to grow.

Conventional Biodiesel

EU Production, Supply and Demand Table

The EU is the world's largest biodiesel producer. Biodiesel is also the most important biofuel in the EU, on volume basis representing about 70 percent of the total biofuels market in the transport sector. Biodiesel was the first biofuel developed and used in the EU in the transport sector in the 1990s. At the time, the rapid expansion was driven by an increasing crude oil price, the Blair House Agreement and resulting provisions of the EU's set-aside scheme, and generous tax incentives mainly in Germany and France. EU biofuels goals set in directive 2003/30/EC (indicative goals) and in the RED 2009/28/EC (mandatory goals) further pushed the use of biodiesel.

Conventional & Advanced Biodiesel (million liters)								
Calendar Year	**2006 [r]**	**2007 [r]**	**2008 [r]**	**2009 [r]**	**2010 [e]**	**2011 [f]**	**2012 [f]**	**2013 [f]**
Production	5,410	6,670	9,550	9,860	10,710	10,710	10,850	11,475
Imports	70	1,060	2,020	2,190	2,400	3,160	3,070	2,425
Exports	0	0	70	75	115	100	115	125
Consumption	5,480	7,730	10,400	12,270	13,270	13,750	13,800	13,775
Ending Stocks	0	0	1,100	805	530	550	550	550
Production Capacity (Conventional Fuel)								
No. of Bioref.	119	187	240	248	260	256	257	252
Capacity	6,600	12,745	18,375	23,230	23,700	24,465	24,345	24,265
Cap. Use (%)	55%	69%	61%	47%	46%	44%	44%	47%
Production Capacity (Advanced Fuel)								
No. of Bioref.	0	0	0	0	0	0	0	0
Capacity	0	0	0	0	0	0	0	0
Feedstock Use - Conventional (1,000 MT)								
Rapeseed oil	3,710	4,230	6,040	6,050	6,220	6,310	6,410	6,250
Soybean oil	570	830	960	1,050	1,100	1,080	1,060	1,280
Palm oil	280	390	600	660	910	710	740	1,100
Rec. veg. oils	100	200	320	380	650	670	780	800
Animal fats	60	140	350	360	390	420	335	340
Sunflower oil	30	70	130	170	150	180	185	190
other	10	10	10	10	10	60	140	140
Grand total	**4,760**	**5,870**	**8,410**	**8,680**	**9,430**	**9,430**	**9,650**	**10,100**

r = revised / e = estimate / f = forecast EU FAS Posts. Production capacity as of December 31 of year stated. The PSD is built on information in MT and converted to liters using a conversion rate of 1 MT = 1,136 liters. Sources: FAS Posts, Global Trade Atlas (GTA), European Biodiesel Board (EBB). Note: Data for feedstock use is not available. The figures above represent estimates by EU FAS posts.

Conventional & Advanced Biodiesel (1,000 MT)								
Calendar Year	**2006**	**2007**	**2008 [r]**	**2009 [r]**	**2010 [r]**	**2011 [e]**	**2012 [f]**	**2013 [f]**
Production	4,760	5,870	8,410	8,677	9,425	9,425	9,550	10,100
Imports	60	930	1,780	1,930	2,113	2,783	2,700	2,135
Exports	-	-	60	67	103	88	100	110
Consumption	4,820	6,800	9,160	10,800	11,680	12,100	12,150	12,125
Ending Stocks	-	-	970	710	465	485	485	485
Production Capacity (Conventional Fuel)								
No. of Bioref.	119	187	240	248	260	256	257	252

Capacity	5,806	11,218	16,176	20,450	20,860	21,537	21,430	21,360
Production Capacity (Advanced Fuel)								
No. of Bioref.	0	0	0	0	0	0	0	0
Capacity	0	0	0	0	0	0	0	0

Source: EU FAS Posts 1 MT = 1,136 liters

Production Capacity

In the EU, the years of rapid expansion of biodiesel production capacity seem to be over. From 2006 to 2009 production capacity increased by 360 percent, followed by comparatively small increases in 2010 and 2011 of just two and three percent, respectively. For 2012 and 2013, capacity is forecast to contract by 0.5 and 0.3 percent, respectively. The Benelux and Sweden reported the largest increases for 2011. France and the Slovak Republic expect a dismantling of capacity in 2012 and 2013.

The waning interest in investing in biodiesel capacity is a result of difficult market conditions. From 2008 onwards, the comparatively low crude oil prices, high vegetable oil prices, increasing imports, and the financial crisis resulted in a difficult market for biodiesel. As a result, use of capacity dropped from 68 percent in 2007 to a mere 44 percent in 2009, where it has kept lingering since. A number of plants all over the EU temporarily stopped production or closed. Under the current market conditions with high imports, high feedstock prices and only limited projected increase in consumption it is questionable that the EU biodiesel market can support all existing production capacity and many projects that were planned under different conditions were delayed or stopped altogether. Even with the projected increase in EU biodiesel consumption through mandates, one can expect to see a number of plants closing their operation or even having to file for bankruptcy in the coming years.

The structure of the biodiesel sector is very diverse and plant sizes range from an annual capacity of 2,000 MT owned by a group of farmers to 600,000 MT owned by a large multi-national company.

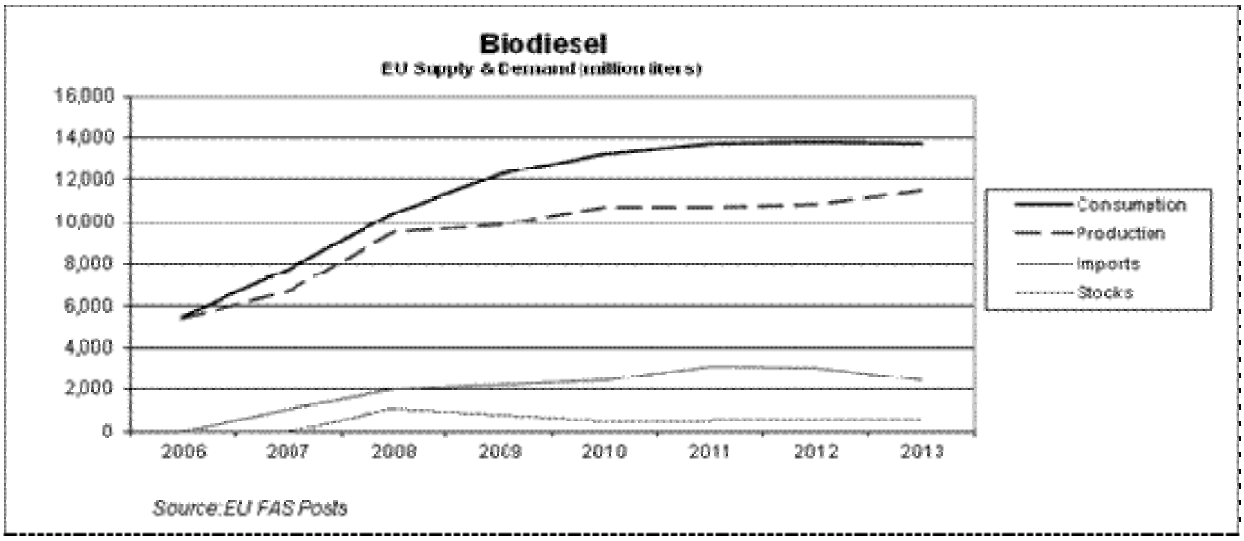
Production

In contrast to previous expectations, EU-27 biodiesel production did not benefit from increased mandates and remained stagnant in 2011. Instead, exporters from Argentina and Indonesia were able to expand their market share. For 2012 and 2013, an increase of one and five percent, respectively, is forecast, prompted by Spanish legislation that limits the use of biodiesel that was produced outside of the EU. (For more details please refer to the trade section below.) The projected increase in Spanish production translates into higher feedstock use of palm oil and soybean oil in 2012 and 2013 (see table above).

In 2006, the top three producing MS (Germany, France, and Italy) together accounted for 75 percent of the EU's biodiesel production. By 2011, the share of the top three producing MS (Germany, France, and the Benelux) dropped to 59 percent. This is a clear indication that the production of biodiesel is gradually increasing in the other MS, as these increase their domestic production to meet the various MS biofuel mandates.

EU Biodiesel Production – Main Producers (million liters)								
Calendar Year	**2006**	**2007**	**2008[r]**	**2009[r]**	**2010[r]**	**2011[e]**	**2012[f]**	**2013[f]**
Germany	2,730	3,280	3,250	2,600	2,880	2,790	2,670	2,560
France	650	1,090	2,000	2,610	2,270	2,350	2,390	2,390
Spain	140	170	280	700	1,370	740	800	1,480
Benelux	50	290	430	840	910	1,140	1,140	1,140
Italy	680	530	760	900	830	570	680	680
Poland	100	60	310	420	430	430	470	490
Others	1,060	1,250	2,520	1,790	2,010	2,680	2,700	2,735
Total	**5,410**	**6,670**	**9,550**	**9,860**	**10,700**	**10,700**	**10,850**	**11,475**

Source: FAS EU Posts



Feedstock Use

Rapeseed oil forms the major feedstock in the EU and accounts for two thirds of total input in biodiesel production. The use of soybean and palm oil is limited by the EU biodiesel standard DIN EN 14214. Soybean-based biodiesel does not comply with the iodine value prescribed by this standard (the iodine value functions as a measure for oxidation stability). Palm oil-based biodiesel reportedly does not provide enough winter stability in northern Europe. However, it is possible to meet the standard by using a feedstock mix of rapeseed oil, soybean oil, and palm oil. The vast majority of soybean oil is used in Spain, France, Italy, and Portugal. Recycled vegetable oils and animal fat are not as popular feedstock as vegetable oils, however, their use is increasing as 1) they form a cheaper alternative feedstock and 2) in some member states (Austria, Denmark, Finland, France, Germany, Ireland, the Netherlands, and the U.K.) they count double against the use mandates. The category "other" includes cottonseed oil (Greece), as well as pine oil and wood (Sweden).

At least 1.5 million MT of the vegetable oil is imported (palm oil, soybean oil, and to a lesser extent rapeseed oil) and an unquantifiable share of the domestically produced feedstock is crushed from imported oilseeds (soybeans and rapeseed). The 6.4 MMT of rapeseed oil feedstock projected for 2012 translates into required 16 MMT of rapeseed and generates about 9 MMT of rapeseed meal as by-product, most of which in the EU. Similarly, the 1.06 MMT soybean oil will have to be crushed from 5.3 MMT of soybeans and generate about 4.2 MMT soybean meal; roughly half and half inside and outside of the EU (see also FAS EU Oilseeds Annual).

Consumption

After years of rapid use increases, EU-27 biodiesel consumption seems to have reached a plateau. In 2011, Germany, France, Spain, Italy, and the UK were the largest biodiesel consumers in the EU (see table). For 2012, EU consumption is forecast to marginally increase by 0.4 percent, driven almost exclusively by MS mandates and to a lesser extent by tax incentives. Increases are projected, most prominently, in Poland, France, and the Benelux. For 2013, EU-27 consumption is forecast to marginally decline as projected increase in Romania, Poland, and Ireland are more than offset by an expected reduction in Germany.

Germany is an exception to the overall trend of increasing consumption. Since 2006, Germany has been in the process of transferring support from fuel tax reduction to mandates and is gradually increasing the energy tax on pure biodiesel (B100). As a result, since 2009, the majority of biodiesel consumption is mandate driven, as B100 outside the mandate is no longer competitive with fossil diesel. In addition, the introduction of E10 to the German market in 2011 and double counting of waste oil based biodiesel reduces the amounts of biodiesel that are needed to fill the mandate. The projected lower biodiesel consumption in Germany is also expected to put France in the first position as the largest EU biodiesel market for the first time in 2012.

EU Biodiesel Consumption – Main Consumers (million liters)								
Calendar Year	**2006**	**2007**	**2008[r]**	**2009[r]**	**2010[r]**	**2011[e]**	**2012[f]**	**2013[f]**
France	720	1,480	2,390	2,620	2,580	2,610	2,670	2,670
Germany	3,270	3,560	3,060	2,860	2,930	2,760	2,610	2,500
Spain	70	330	590	1,170	1,550	1,730	1,730	1,730
Italy	250	230	810	1,310	1,500	1,610	1,590	1,590
Poland	20	40	550	600	780	850	970	1,000
UK	250	470	1,020	910	970	970	970	970
Benelux	30	420	410	740	580	600	630	630
Austria	370	420	460	590	600	610	610	610
Portugal	90	170	170	290	420	390	380	360
Sweden	70	140	100	170	190	300	300	300
Others	340	469	840	1,010	1,170	1,320	1,340	1,410
Total	**5,480**	**7,730**	**10,400**	**12,270**	**13,270**	**13,750**	**13,800**	**13,770**

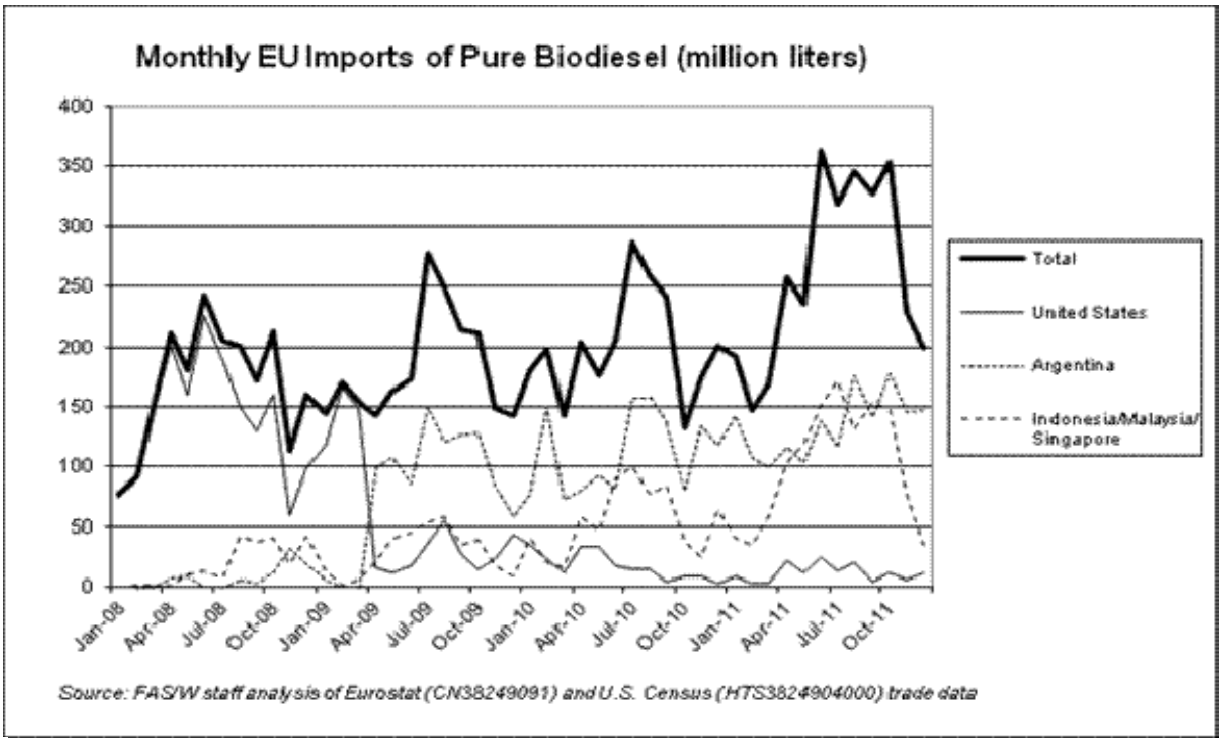
Source: EU FAS posts

Trade

In March 2009, the European Commission introduced countervailing (CvD) and anti-dumping (AD) duties on U.S. exports of biodiesel to the EU on blends of B20 and above. In May 2011, the duties were extended to all U.S. biodiesel irrespective of blending ratio. As expected, this measure dramatically reduced EU biodiesel imports from the United States. Hopes by the EU domestic biodiesel industry that this would reduce the pressure on the market were only partially fulfilled as the void was filled with increased biodiesel imports mainly from Argentina and Indonesia, and to a lesser extent from Malaysia, Canada (2009 and 2010), and Norway (2011) (see graph below).

Biodiesel exports from Argentina and reportedly from Indonesia benefit from differential export taxes that are lower for biodiesel exports than for the export of soybeans and soybean oil (Argentina) or palm oil (Indonesia). Consequently, both countries are expected to remain a strong competitor for EU domestically produced biodiesel.

In April 2012, shortly after Argentina announced the expropriation of 51% of YPF, a subsidiary of Repsol, Spain's largest petroleum company, the Government of Spain published a Ministerial Order to establish a biodiesel production quota system. This Ministerial Order lays down the rules to allocate biodiesel production quotas to EU based biodiesel producers whose production would be eligible to meet consumption mandates. The implementation of this quota system would ultimately restrict third countries' exports of biodiesel to Spain. Spanish biodiesel producers, who have suffered from capacity utilization rates as low as 14 percent in 2011, expect that the order will result in increased domestic production of biodiesel. Whether biodiesel producers in other MS will benefit from the Spanish Order will depend on the administrative details that are yet to be specified. However, biodiesel producers in MS that are not protected by production quotas, fear that Argentinean biodiesel will be diverted to other EU markets and pose increased competition there.



Stocks

Reliable data for biodiesel stocks is not available. The numbers in the PSD above are based on the following assumptions: In 2006 and 2007, most biodiesel was used as B100 and consumed shortly after its production. Commercial stocks are estimated to have been fairly small and are included in the consumption figure. In 2008, blending started to play a bigger role and stocks were held by traders, blenders, and the minerals oil industry.

In 2008, the use of B99 substantially increased and prompted the EC to start an anti-dumping investigation. In anticipation of the EU imposing AD and CvD duties on biodiesel imports from the United States, European traders and mineral oil industry accumulated large stocks at the end of 2008. These were partially reduced in 2009 and by the end of 2010 should have fallen to the assumed average level. In the absence of reliable data, the data for stocks in the PSD is based on the assumption that average stocks amount to the equivalent of two weeks supply of consumption.

Sustainability Criteria and their effect on feedstock and biodiesel trade

The EU sustainability criteria (SC) that are part of the EU climate change package (see policy section) are going into effect at different times in the various MS. Germany and Austria were the first MS to require sustainability certification starting January 2011, for all biofuel that is produced from biomass harvested after 2009. Other MS are taking longer for the implementation but will have to follow suit eventually. Companies that produce for countries that already require certified sustainable biodiesel/feedstock are limited in their feedstock sourcing choices. For example, the entire German rapeseed production of 2010 and 2011 is going into biodiesel, while rapeseed oil for food use is crushed from imported rapeseed (from other EU member states or the Ukraine) that does not have an SC certificate. Companies can still use non-certified feedstock but have to export the resulting biodiesel to those EU member states that do not yet require certification. In the long run, SC are expected to favor the use of feedstock that is certified to be sustainable according to an EU-accredited system. As the SC are also applied to imports, this could cause changes in the sourcing pattern of EU biodiesel and feedstock importers.

Advanced Biofuels

For reporting purposes, advanced biofuels, or next generation biofuels, are biofuels beyond the conventional sugar, starch, vegetable oils and animal fat-based biofuels now produced commercially. Advanced biofuels can be derived from non-food, energy crops or agricultural, forestry and municipal wastes. Advanced biofuels include (cellulosic) ethanol, butanol, methanol, and dimethyl ether (DME), Fischer-Tropsch diesel, drop in fuels, and biofuels made from algae.

In the RED (Renewable Energy Directive 2009/28/EC, see policy section of this report), second generation biofuels will get a double credit. This means that biofuels made out of ligno-cellulosic, non-food cellulosic, waste and residue materials will count double towards the ten percent target for renewable energy in transport in 2020. In the EU, the commercialization of advanced biofuel production is in general lagging the developments in the United States. Biorefinery is, however, an important feature of the Bio-energy European Industrial Initiative (BEII), one of the six industrial initiatives of the European Strategic Energy Technology (SET) Plan. Its objective is that by 2020 at least 14 percent of the EU energy mix will be bio-energy. The European Commission (EC) has drawn up Technology Roadmaps for the period 2010-2020 for the implementation. The BEII proposes to build about thirty plants across Europe to take full account of differing geographical and climate conditions and logistical constraints. The total public and private investment needed in Europe over the next ten years is estimated at Euro 9 billion. The technology objectives of the BEII are:

1. Commercialization of the most promising technologies.
2. Optimize biomass feedstock availability.
3. Develop an R&D program to support the bioenergy industry beyond 2020.

According to scientists, the technology is available but feedstock logistics and policy incentives are not yet put in place. The EC and private sector believe that the realization of commercial and thus profitable production of advanced biofuels will take at least five years. First generation biofuels production will need to generate cash flow for the private industry and develop the market for biofuels. In the National Renewable Energy Action Plans of the EU MS, the contribution of advanced biofuels (biofuels conform Article 21.2 of the RED) is expected to grow between 2010 and 2020 but the share remains limited at about seven percent in 2020 (see GAIN Report NL0028). There are six advanced biofuel plants operational at demo scale in the EU (see table below). In addition to these demo scale plants, extensive research is conducted in several EU MS, for instance France, where there are currently four advanced biofuels pilot projects, experimenting both thermochemical and biochemical pathways, and two projects pending approval by the European program New Entrance Reserve NER 300 (see Related Reports from USEU Brussels and MS Posts in the EU).

Advanced Biofuels Plants in the EU

Country	Process	Biofuel	Feedstock	Capacity (million liters per year)	Year of opening
Thermochemical					
Finland	H	HVO	Oils and fats	380 (2 plants)	2009
Finland	G/FT	BtL	Forestry prod.	N.A.	2009
Sweden	G/OS	DME	Black liquor	2	2010
The Netherlands	P/FT	Methanol	Glycerine	250	2010
Germany	G/FT	BtL	Wood Waste	18	2011
The Netherlands	H	HVO	Oils and fats	900	2011
Biochemical					
Spain	HL/F	Ethanol	Barley straw	5	2008
Denmark	HL/F	Ethanol	Wheat straw	5	2010

Source: EU FAS Posts BtL=Biomass to Liquid, DME=Dimethyl Ether, F=fermentation, FT=Fischer Tropsch synthesis, G=gasification, H=hydrogenetaion, HVO=Hydrotreated Vegetable Oils, HL=hydrolysis, OS=oxygenate synthesis, P=pyrolysis

Thermochemical processes

Finland: Neste Oil has developed a process of hydrogenation to produce Hydrotreated Vegetable Oils (HVO) with the product name NExBTL. In 2009, a second plant came on stream, capable of producing another 190,000 tons of NExBTL per year. Raw materials used are palm oil, waste fat from food processing industry and rapeseed oil. In 2011, Neste Oil opened up a renewable diesel plant in Singapore with an annual capacity of 900,000 tons and a similar plant in Rotterdam. The hydrogenation process to produce HVO is reportedly the most cost effective process currently available to produce advanced biofuels.

Finland: In 2010, Neste Oil and Stora Enso opened a demonstration plant in Varkaus for biomass to liquids production utilizing forestry residues. A 50/50 joint venture NSE Biofuels OY, has been established first to develop technology and later to produce on commercial-scale biodiesel. The demonstration facility at Stora Enso's Varakus mill includes a 12 MW gasifier. The demonstration process units will cover all stages, including drying of biomass, gasification, gas cleaning and testing of Fischer-Tropsch catalysts. NSE Biofuels OY is now looking for sites for a unit capable of producing approximately 200,000 MT of renewable diesel per year from wood biomass.

Sweden: In Piteå in northern Sweden, the company Chemrec produces synthesis gas from black liquor at its pilot gasification plant. Since the summer of 2010, the syngas is further transformed into DME (Dimethyl Ether) through the process of oxygenate synthesis. The capacity of the pilot plant is 4 MT of DME per day. The Chemrec gasification technology will be implemented in a new industrial-scale demonstration plant at Domsjö Fabriker biorefinery for production of about 100,000 MT of DME and 140,000 MT of methanol per year. In February 2011, the EC approved a Euro 55 million R&D grant awarded by the Swedish Energy Agency for the construction of this industrial scale demonstration plant.

The Netherlands: In June 2010, the advanced biofuel plant BioMCN started production. The plant has a capacity of 250 million liters and produces biomethanol from glycerine. The glycerine is a by-product of biodiesel production. The glycerine is converted into syngas, which is used to synthesize the bio-methanol. Bio-methanol can be blended with gasoline or used for the production of bio-MTBE, bio-DME, or synthetic biofuels.

The Netherlands: The advanced biofuel plant of Neste Oil in Rotterdam is operational since December 2011. The production capacity of the plant is 900,000 million liters of Hydrotreated Vegetable Oils (HVO). Two plants applying the same technology are operational in Finland (see above) and one in Singapore. Neste Oil will reportedly use mainly palm oil, but can use a variety of feedstocks.

Germany: In cooperation with the automobile makers Volkswagen and Daimler, the Choren Industries Company has developed a process for gasification of biomass as feedstock for the production of BtL. Choren has erected a pilot plant with a production capacity of 15,000 MT of BtL in Freiberg. Production would reportedly have started at the end of 2011 with fast growing wood will be used as feedstock. However, the company became insolvent in July 2011. In February, the Carbo-V technology was sold to Linde engeneering Dresden, while an investor for the pilot plant in Freiberg still has to be found. An alternative project for the research and production of BtL fuels is run by the Karlsruhe Institute for Technology (KIT). It is known as the Bioliq® project. KIT works on processes to convert crop residues and wood residues into diesel and gasoline fuels. The bioliq process allows the physical separation of the pyrolysis from the rest of the process. This means that feedstock can be converted into pyrolysis oil in decentralized plants which is then shipped to a central plant for final conversion. This helps to reduce volume and costs for feedstock transport.

United Kingdom: In November 2009, BP and DuPont announced the formation of Kingston Research Ltd and the establishment of an advanced biofuels research centre in Hull for demonstration of biobutanol technology, which is expected to be operational in June 2011. The first commercial-scale biobutanol facility is expected to begin operating in 2013.

Biochemical processes

Spain: Abengoa Bioenergy has built a demonstration plant in Babilafuente (Salamanca). The plant construction was completed in December 2008 and it has been operating since September 2009. This plant has a 5 million liters/year production capacity, and uses wheat and barley straw as feedstock. The process is based on enzymatic hydrolysis. This second generation plant is located inside the grain facility Biocarburantes de Castilla y León in Babilafuente, so both facilities share services and process chains.

Abengoa intends to put this technology into practice on a commercial scale at the plant that it will construct in Hugoton, Kansas (United States), which will have an annual capacity of 100 million liters/year. Also, Imecal (Valencia) built an experimental pilot plant in 2008 to produce second generation bioethanol from various lignocelulosic materials including municipal waste and citrus industry residues.

Denmark: Inbicon's demonstration plant in Kalundborg is using wheat straw to produce bioethanol. The volume of feedstock used is about 30,000 MT per year for the production of 5.4 million liters ethanol. Novozymes and Danisco are supplying enzymes for the plant. The plant is reportedly the largest cellulosic ethanol demonstration plant in Europe. Inbicon's parent company is Dong Energy, one of the leading energy groups in Northern Europe. In addition to ethanol, the plant is expected to produce 13,000 MT of lignin pellets, which will be supplied to the Dong Energy power plant to replace coal and 11,000 MT of C5 molasses for animal feed.

Use of conventional and advanced biofuels by the aviation sector

The EC, Airbus, and the aviation and biofuel producers industries, launched the European Advanced Biofuels Flightpath. This action is scheduled to achieve 2 million MT of sustainable biofuels used in the EU civil aviation sector by the year 2020. In the short term, before 2015, the intention is to make 1,000 MT of Fisher-Tropsch biofuel available, and to produce hydrotreated vegetable oil (HVO) suitable as aviation fuel. Since 2008, the aviation sector has been conducting test flights with biofuels. Currently, the consumption of biofuels for aviation is negligible.

Lufthansa was the first airline to use biokerosene in its regular operations. Between July and December 2011, Lufthansa consumed a total 1,557 MT of biokerosene on 1187 flights between Hamburg and Frankfurt. Results were positive on the technical aspects. Reportedly the trial was ended because of difficulties in sourcing enough volumes of biokerosene.

Biomass for Heat and Power

Renewable Energy Use and share of Biomass and Biofuels (Mtoe)				
Calendar Year	**2005**	**2010**	**2015**	**2020**
Heat & Cooling	**54.3**	**67.8**	**84.7**	**111.5**
-Of which Biomass	52.6	61.7	73.1	90.4
Electricity	**41.2**	**54.9**	**77.5**	**104.6**
-Of which Biomass	5.2	8.9	14.5	19.9
Transport	**3.1**	**14.0**	**19.8**	**29.7**
-Of which Biofuels	2.9	13.9	19.5	28.9

Based on the Renewable Energy Action Plans (NREAPs)

The European Commission (EC) expects heat and power production from biomass to play an important role in meeting the 20 percent target for renewable use by 2020 and in the future reduction of CO_2 emissions in Europe. Based on the Renewable Energy Action Plans (NREAPs) submitted by the Member States to the EC, focus is on biomass for heating and cooling rather than for electricity (see table above). A major part of the biomass used is forecast to be forestry products. The European Biomass Association (AEBIOM) expects the EU consumption of wood pellets to increase from 2.5 Mtoe in 2008 to 20 - 32 Mtoe in 2020. This is about 20 to 30 percent of the forecast biomass consumption in the NREAPs and equal to a volume of 50 – 80 MMT. Based on the NREAPs, biogas production from biomass is expected to reach 8.4 Mtoe in 2020, which is about 8 percent of the projected total biomass use.

Wood Pellets

EU Production, Supply and Demand Table

Fuel Pellets (1,000 MT)								
Calendar Year	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012[c]**	**2013[c]**
Production[a]	3,520	5,782	6,294	6,669	9,241	10,000[c]	11,000	12,000
Imports[b]	800	900	1,250	1,771	2,610	3,226	4,000	5,000
Exports[b]	50[c]	50[c]	50[c]	64	72	68	100	100
Consumption[a]	4,603	6,028	7,021	9,000[c]	9,817	12,000	15,000	18,000
Ending Stock	-	604	1,077	453	2,415	3,573	3,473	2,373
Production Capacity								
No. of Plants[a]	-	-	-	499	-	670[c]	-	-
Capacity[a]	6,643	8,583	11,283	13,694	14,845	16,000[c]	17,000[c]	18,000[c]
Cap. Use (%)	53	67	56	49	62	63[c]	65[c]	67[c]

Source: (a) The European Biomass Association (AEBIOM), (b) GTIS, (c) FAS Post Estimates The high estimated stocks could be a result of a structural underestimation of pellet consumption by AEBIOM.

The EU is the world's largest wood pellets market, with a consumption of about 12 MMT of pellets in 2011 (estimate AEBIOM). Currently, there are about 670 pellet plants and the number is increasing continually as a result of the strong domestic demand driven by the EC mandates and incentives. Consumption forecasts for 2020 range from 35 MMT for Western Europe (Pöyry) to 50 – 80 MMT for the total EU (AEBIOM). Future consumption will however, depend on a range of market and policy factors (see consumption paragraph).

Main Pellet Producers (1,000 MT)							
Calendar Year	**2006**	**2007**	**2008**	**2009**	**2010**	**2011[e]**	**2012[e]**
Germany	470	1,100	1,460	1,600	1,750	1,880	2,000
Sweden	1,458	1,400	1,405	1,575	1,645	1,750	1,750
Austria	617	700	625	695	850	900	1,000
France	121	190	240	346	495	600	700
Italy	300	600	700	550	600	600	600
Portugal	-	-	-	400	430	600	600
Poland	280	329	378	400[e]	410	410	410
Total	**3,520**	**5,782**	**6,294**	**6,669**	**9,241**	**10,000**	**11,000**

Source: AEBIOM e = estimate EU FAS Posts.

Germany and Sweden are the largest pellets producers in the EU, both producing close to 2 MMT. The pellet industry will be facing many challenges in order to provide further capacity and production growth in the EU. The major raw material for pellets has traditionally been sawdust and by-products from sawmills. With the increasing competition for the sawdust resources, a broader sustainable raw material basis is becoming necessary. There is an increased interest in forest residues and wood waste that can be pelletized alongside traditional feedstock. Also, agricultural products and residues such as straw, hay or other energy crops are being tested. Pellet raw material supply, quality standards and pricing will be crucial for future market development. Another important factor for market acceptance is expected to be the certification of sustainable production.

Consumption

Of the consumption of 12 MMT in 2011, an equal share is estimated to be used for industrial use and household use. The major users of wood pellets in the EU are Sweden, Denmark, Germany, Belgium and the Netherlands. The UK is expected to be one of the main growth markets.

Main Pellet Consumers (1,000 MT)							
Calendar Year	**2006**	**2007**	**2008**	**2009[e]**	**2010**	**2011[e]**	**2012[e]**
Denmark	892	993	1,200[e]	1,400	1,600	2,350	2,400
Sweden	1,685	1,715	1,850	1,920	2,200	1,880	2,070
Germany	470	600	900	1,050	1,200	1,400	1,600
Belgium	730	735	920	920	920	1,200	1,600
Netherlands	486	705	912	912	913	1,000	1,400
Total	**4,603**	**6,028**	**7,021**	**9,000**	**9,817**	**12,000**	**15,000**

Source: AEBIOM e = estimate EU FAS Posts

Differences in consumption characterize the European pellet market. The market can be divided in three regions. Markets such as the Netherlands, Belgium and the UK are dominated by large-scale power plants. In Sweden and Denmark, pellets are used by power plants but also by households and by medium scale consumers using wood pellets for district heating. In Germany, Austria, Italy and France pellets are mainly used in small-scale private residential and industrial boilers for heating. The demand for industrial pellets depends primarily on EU Member State mandates and incentives, while the residential pellet market is driven by prices of alternative fuels.

Trade

Main EU Importers of Wood Pellets (1,000 MT)				
	Total Imports[a]		Imports from U.S.	
Calendar Year	**2010**	**2011**	**2010**	**2011**
Denmark	1,445	2,295	80	38
United Kingdom	551	1,015	188	274
Italy	817	1,009	4	21
Netherlands	1,025	944	346	423
Sweden	698	665	49	41
Belgium	316	514	85	203
Austria	286	316	0	0
Germany	270	253	11	0
Total EU27	**-**	**-**	**763**	**1,029**

Source: GTIS (HS Code: 44013020) (a) Includes EU intra-trade.

Following the three regional markets in the EU, also three trade flows can be determined in the EU market. The Benelux countries and the UK mainly import from the United States and Canada. Despite their significant domestic production, the Scandinavian countries, mainly Denmark and Sweden, partly depend on imports, from predominantly the Baltic Region and Russia. The market for pellets in Germany, Austria and Italy is more isolated and depends mostly on the production in this region itself.

Main Suppliers of Wood Pellets to EU (1,000 MT)			
Calendar Year	**2009**	**2010**	**2011**
Canada	520	983	1,174
United States	535	763	1,029
Russia	379	396	475
Ukraine	30	57	149
Croatia	72	95	115
Belarus	75	90	100
Other	160	226	226
Total	**1,771**	**2,610**	**3,226**

Source: GTIS (HS Code: 44013020)

Since 2008, the demand for pellets has significantly outpaced domestic production in Europe. This has resulted in increased imports from the United States. In 2011, U.S. wood pellets exports to the EU passed the 1 MMT, which is approximately thirty percent of the EU import share, and represents a value of US$ 193 million. Industry sources expect this trade flow to increase to over 5 MMT in 2015. Other significant exporters of pellets to the EU are Canada and Russia. These third country imports could, however, be affected by the implementation of the Renewable Energy Directive (RED) by the individual Member State governments, in particular by the Dutch and UK Government. In the UK, the potential use of pellets by power plants depends on local permits and logistics. In the Netherlands, uncertainties about the incentives for co-firing exist until a new government will be formed after the elections in September 2012.

Pellet Standards and Sustainability Criteria

Quality Standards and Certification

Standards and certification for non industrial pellets: European standards for solid biomass (CEN/TC 335) were introduced in 2011. They include a standard for wood pellets (EN 14961-2). This standard is developed only for non industrial use. The European Pellet Council (EPC) developed ENplus, a traceability and certification scheme, which implements this standard.

Standards for industrial pellets: In 2011, European pellet producers and users have reportedly been consulted about a product standard for industrial wood pellets. This consultation is part of a project supported by the European Commission (EC), the EUBioNetIII project. Result of these inquiries will be used for a CEN and an international ISO standard for wood pellets for industrial use (see for more info www.eubionet.net). The ISO fuel specification standards are planned to be published in 2013.

Certification for industrial pellets: EPC is also developing an ENplus certification scheme for industrial quality, the PellCert project. The European Biomass Association (AEBIOM) and ten EPC members are involved in the project: the biomass and pellet associations in Austria, Germany, Belgium, Sweden, Finland, France, Italy, Spain, Portugal and Hungary. The project is reportedly conducted in close cooperation with the EC. For more information see www.pellcert.eu.

Sustainability Criteria and Certification

After the summer of 2012, the EC is expected to come forward with a proposal on sustainability criteria for the use of solid and gaseous biomass sources for heat and electricity generation. The European pellet industry is divided over the necessity of mandated sustainability requirements, and has generally the opinion that forest biomass that is destined for energy production should not be subject to different sustainability requirements than e.g. timber or pulp wood. For more information about the role of the EC in the determination of sustainability criteria for wood pellets see the Policy Chapter.

For non-industrial wood pellets, ENplus currently maintains the following sustainability criteria: Certified producers have to document the origin of the raw material and inform the inspection body at the yearly audit regarding the share of raw material coming from certified sources (FSC, PEFC or equivalent systems). In addition, pellet producers must be able to state the amount of greenhouse gases emitted as a consequence of pellet production. Default values to be published by the EPC can be used for this purpose.

For industrial wood pellets, EPC has the opinion that sustainability requirements are key for large scale investments in the biomass sector and wood pellet imports, and that ENplus could include such sustainability criteria. Also the World Bioenergy Association (WBA) introduced a voluntary sustainability program for solid biomass, the Sustainable Biomass Verification Scheme, which can be used for accrediting the sustainability of solid biomass applied for energy production.

Biogas

The biogas sector is very diverse across Europe. Depending on national priorities, i.e. whether biogas production is primarily seen as a means of waste management, as a means of generating renewable energy, or a combination of the two, countries have structured their financial incentives (or the lack thereof) to favor different feedstocks.

According to Eurostat data, Germany and the UK, the two largest biogas producers in the EU represent the two ends of the scale. Germany generates 90 percent of its biogas from agricultural crops while the UK along with Finland, Latvia, and Estonia rely almost entirely on landfill and sewage sludge gas. All other countries use a variety of feedstock combinations.

Biogas for Heat and Electricity in the EU (Ktoe)

Calendar Year	2006	2007	2008	2009	2010	2011[e]	2012[f]	2013[f]
Field Crops /Manure/ Agro-food industry waste	1,435	3,422	3,561	4,330	7,007	8,250	8,500	8,800
Landfill	2,445	2,689	2,798	2,867	2,887	2,900	2,920	2,940
Sewage Sludge	890	916	953	979	1,070	1,100	1,130	1,160
Total	4,770	7,027	7,312	8,176	10,964	12,250	12,550	12,900

Sources: 2006-2010 Eurostat; 2010-2013: e, f = Estimate/Forecast EU FAS Posts

European farmers are increasingly investing in on-farm biogas digesters to convert agricultural crops, manure and other farm and

food industry residues into methane gas. The leader in this production segment is Germany with about 7,100 plants of various size in operation in 2012. The incentive for farmers in Germany to invest in biogas digesters is a guaranteed feed-in price for the generated electricity which is considerably higher than that of electricity generated from fossil fuels, natural gas coal or nuclear sources.

Because biogas production already uses considerable area requiring about 810,000 hectares of cropland in Germany (compared to about 3.3 million hectares for wheat production), environmental NGOs, organic farm organizations, and livestock farmers are increasingly expressing concerns that this production sector represents unfair competition to food and feed producing farmers. Farm land prices in the biogas producing areas reportedly rise faster than in other agricultural regions. Similar criticism has not yet been reported from other EU countries. However, in some MS (for example Poland and Portugal) investments in biogas facilities face opposition from local communities out of concerns over odor pollution.

As a new development, biogas plants are increasingly co-located with other biofuel plants and use residues from bioethanol production (Germany) or glycerine from biodiesel production (Benelux).

The majority of the biogas is used to generate electricity and/or heat. Here the trend is toward the so-called cogeneration plants which produce electricity and capture the process heat at the same time. The heat can be supplied to nearby building or sold to district heating systems.

A growing number of large scale operations are purifying the biogas to bio-methane and subsequently enter it into the natural gas grid. The use of purified biogas as transportation fuel is still marginal in most EU countries with the exception of Sweden, where a remarkable 44 percent of the biogas was used for vehicle fuel or fed into the gas distribution net in 2010. At the end of 2011, there were over 39,000 gas vehicles in Sweden and 132 public filling stations. Many Swedish communities choose biogas to run local buses and distribution vehicles. However, there is currently an uncertainty among private green car owners who are still awaiting news on the flex-fuel incentives after 2012.

Country	**No. of biogas plants**	**Total capacity in MW**	**Biogas production in million m^3**	**Electricty production GWh**	**Feedstock**
Austria	362	104		539 GWh	
Belgium	38				Manure, corn silage, agricultural and food waste
Czech Republic (2010)	200	117		634 GWh	Corn silage, hay, industrial and municipal waste
Denmark	81				Manure
Estonia (2007)			12		Landfill gas, sewage sludge, manure
Finland (2010)	70		139		Municipal waste
France	100				Municipal waste, sewage sludge, agro-industry waste
Germany	7,100	2800		18000 GWh	Corn and rye silage, grains, manure, waste, sugar beets
Hungary (2010)	23				Manure, sewage sludge, food industry waste
Italy (2010)	243				Manure, agro-industry waste, OFSUW
Latvia (2010)	8	11	174	57 GWH	Manure, municipal and food processing waste, waste water treatment sludge, animal by-products
Lithuania (2008)	7	4.2 MW electricity 6.1 MW heat	21		
Netherlands	100				Manure, corn silage, agricultural and food waste

Poland (2012)	173 (thereof 18 using agricultural feedstocks	104 (18)			Sewage sludge, landfill gas, energy crops, plant and animal waste
Portugal	100	42		140 GWh	Manure Landfill gas, OFSUW
Slovakia	33	17		125 GWh	Corn silage, plant residues
Spain	94				Landfill collections, agro-industrial waste, sewage sludge, OFSUW
Sweden	230			1400 GWh	waste materials, manure, crops
United Kingdom (2010)	55				Food waste, brewery waste, OFSUW, animal slurry & manure

Note: data refers to 2011 unless otherwise specified Source: EU FAS Posts

Notes on Statistical Data

Bioethanol

Production capacity, production and consumption figures are based on statistics of European Commission statistics, Eurostat, the European Renewable Ethanol Association (ePURE) and FAS Posts. FAS Posts based their estimates on figures of national industry organizations and government sources. Ethyl tert-butyl ether (ETBE) is not included in ethanol production, but is included in the consumption figures. ETBE is predominantly consumed in France, Spain, the Netherlands and Poland.

Bioethanol import figures during 2006-2009 are based on estimates of ePURE. Other trade figures are based on Eurostat and Global Trade Atlas (GTIS) data, which are sourced from EU MS customs data, and the U.S. Bureau of Census. As the EU has no Harmonized System (HS) code for bioethanol, trade numbers are difficult to assess. The estimation of the EU import figures after 2009 is based on EU imports from Brazil and the United States under HS code 38249097 and HS code 29091910 (ETBE, 45 percent ethanol).

Feedstock and co-product figures: Official data for feedstock use is scarcely made available by industry and government sources. The figures in this report represent FAS Posts estimates of the percentage of bioethanol (MT) produced by feedstock (MT). The conversion factors used are; wheat: 0.31; corn: 0.32; barley and rye: 0.19; and sugar beet: 0.075 (source: USDA publication "The Economic Feasibility of Ethanol Production from Sugar in the U.S."). The applied conversion factor for the production of DDG is 0.37 across all grains (source ePURE).

Biodiesel

Production and consumption figures are based on statistics of the European Biodiesel Board (EBB) and adjusted by EU FAS Posts using additional information obtained from national industry organizations and government sources.

Trade figures are based on Global Trade Atlas (GTA) data, which are sourced from EU MS customs data, and the U.S. Bureau of Census, and adjusted for U.S. exports of biodiesel blends. A specific customs code for pure biodiesel (B100) and biodiesel blends down to B96.5 (3824 90 91) was first introduced in the EU in January 2008,
and changed to 3826 00 10 in January 2012. Prior to 2008, biodiesel entering the EU was subsumed under the CN code 38 24 90 98 (other chemicals). CN stands for "Combined Nomenclature" and is the equivalent of the "Harmonized System" used in the United States. Therefore, biodiesel imports prior to 2008 are estimated based on industry information. The U.S. Bureau of the Census introduced HTS export code 3824 90 4030 in January 2011 which exclusively covers pure biodiesel (B100) and biodiesel blends above B30.

Feedstock and co-product figures: Data for feedstock use is not available. The figures in this report represent estimates by EU FAS posts.

Abbreviations and definitions used in this report

Benelux = Belgium, the Netherlands and Luxembourg
Biodiesel = Fatty acid methyl ester produced from agricultural feedstock
(vegetable oils, animal fat, recycled cooking oils) used as transport fuel to substitute for petroleum diesel Bioethanol = Ethanol produced from agricultural feedstock used as transport fuel
BtL = Biomass to Liquid
Bxxx = Blend of mineral diesel and biodiesel with the number indicating the percentage of biodiesel in the blend, e.g. B100 equals 100% biodiesel, while B5 equals 5% biodiesel and 95% conventional diesel.
CEN = European Committee for Standardization (Comité Européen de Normalisation)
DDG = Distillers Dried Grains
EBB = European Biodiesel Board
Exxx = Blend of mineral gasoline and bioethanol with the number indicating the percentage of bioethanol in the blend, e.g. E10 equals 10% bioethanol and 90% conventional gasoline.
GHG = greenhouse gas
GJ = Gigajoule = 1,000,000,000 Joule or 1 million KJ
Ha = Hectares, 1 hectare = 2.471 acres
HS = Harmonized System of tariff codes
Ktoe = 1000 MT of oil equivalent = 41,868 GJ = 11.63 GWh
MJ = Megajoule
MMT = Million metric tons
MS = Member State(s) of the EU
MT = Metric ton (1,000 kg)
Mtoe = Million tons of oil equivalent
MWh = Mega Watt hours = 1,000 Kilo Watt hours (KWh)
MY = Marketing Year
NMS = New Member State(s) = Countries that joined the EU in/after 2004
PVO = Pure vegetable oil used as transport fuel
RME = Rapeseed Methyl Ester
Toe = Tons of oil equivalent = 41,868 MJ = 11.63 MWh
TWh = Tera Watt hours = 1 billion Kilo Watt hours (KWh)
US$ = U.S. Dollar

Energy content and Conversion rates [2] :

Gasoline = 43.10 MJ/kg = 43.1 GJ/MT
Ethanol = 26.90 MJ/kg
Diesel = 42.80 MJ/kg
Biodiesel = 37.50 MJ/kg
Pure vegetable oil = 34.60 MJ/kg
BtL = 33.50 MJ/kg

1 Toe = 41.87 GJ

1 MT Gasoline = 1,342 Liters = 1.03 Toe
1 MT Ethanol = 1,267 Liters = 0.64 Toe
1 MT Diesel = 1,195 Liters = 1.02 Toe
1 MT Biodiesel = 1,136 Liters = 0.90 Toe
1 MT Pure veg Oil = 1,087 Liters = 0.83 Toe
1 MT BtL = 1,316 Liters = 0.80 Toe

Related Reports from USEU Brussels and MS Posts in the EU

Related reports from FAS Post in the European Union:

Country	Title	Date
Romania	Romania completed the RED transposition process	05/09/2012
Spain	Spain Enacts Biodiesel Production Quota System	04/30/2012
EU-27	EU Sugar Annual	04/27/2012
EU-27	EU Grain and Feed Annual	04/13/2012
EU-27	EU Oilseeds Annual	04/05/2012
Portugal	Portugal Biofuels Standing Report	03/12/2012
EU-27	Sustainability in the EU Commodity Markets	02/03/2012
Italy	Italian Biofuels 2011	01/13/2012
Greece	Transposition of the RED into National Legislation	12/16/2011
France	France Transposes RED - Plant Based Industry Moving Forward	12/14/2011
Lithuania	Renewable Energy Outlook in Lithuania	12/09/2011
Czech R.	Biomass and Energetics 2011	12/09/2011
Estonia	Renewable energy and bio-fuel situation in Estonia	12/09/2011
Sweden	Swedish Sustainability Certification for Biofuels	12/01/2011
Spain	Spain's Biodiesel Standing Report	11/22/2011
Romania	Trade barrier on biofuels removed	11/02/2011
Germany	2nd Generation Biofuel Company Declares Insolvency	07/18/2011
Greece	Transposition of the RED into National Legislation	07/01/2011
Germany	FAQs on Biofuel Sustainability Certification in Germany	04/01/2011

The GAIN Reports can be downloaded from the following FAS website:

http://gain.fas.usda.gov/Pages/Default.aspx

[1] Note to the U.S. readers: The word ”scheme” has a slightly different connotation in the United States compared with Europe. The EU uses “scheme” in the meaning of “system”

[2] Based on information from:
Massachusetts Institute of Technology (MIT) http://web.mit.edu/mit_energy/resources/factsheets/UnitsAndConversions.pdf ,
- German Federal Agency for Renewable Resources (FNR)