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Biofuels Annual

EU Biofuels Annual 2014

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Report Highlights: By October 2014, the European Commission (EC) aims to reach an agreement on the future policy for biofuels. Main features are a seven percent cap on conventional biofuels and further support of the transition to second generation biofuels. The EC has effectively cut off imports from the most competitive suppliers but expansion of the domestic market for biofuels is dwindling. Lower fuel use, adjusted biofuels blending mandates and double counting towards these mandates have reduced demand since 2011. In contrast, the market for biomass, in particular wood pellets is surging. The large scale use of pellets for industrial heat and power generation is however dependent on the implementation of funding and sustainability requirements by the individual Member States.

Post:
The Hague

Commodities:
Bioethanol, biodiesel, wood pellets, corn, wheat, rapeseed oil, soybean oil, palm oil

Executive Summary

Policy and Programs

Regulations influencing the EU biofuels and biomass market are the EU Energy and Climate Change Package (CCP) and the Fuel Quality Directive (FQD). 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. The European Commission expects (EC) heat and power production from solid biomass to account for about 45 percent of the renewable energy use in 2020. The share of liquid biofuels is projected to be about twelve percent.

In the Renewable Energy Directive (RED), which is part of the CCP, specific sustainability requirements are laid out for liquid biofuels. These include minimum greenhouse gas emissions reductions, land use and environmental criteria as well as economic and social criteria. The implementation of harmonized sustainability requirements for solid biomass is postponed to after 2020.

On June 13, 2014, the EU Energy Council reached a political agreement on the future policy for biofuels. The main features are a seven percent cap on conventional biofuels, made from feed and food feedstock, and further support of the transition to second and third generation biofuels. The Council aims to reach an agreement with the EC and Parliament in October.

Conventional and Advanced Biofuels

During 2006 – 2011, EU demand for both bioethanol and biodiesel surged. For fulfilling this demand, domestic production had to compete with imports. In 2013, after the peak in demand, the EU finally succeeded to effectively isolate itself from the most competitive suppliers. The EC imposed anti-dumping duties for bioethanol from the United States and for biodiesel from Argentina and Indonesia. These protective measures did however attract product from other sources. During 2013, over 400 million liter of ethanol has been supplied through zero duty quotas, mainly used by Guatemala, Peru and Pakistan. The void in biodiesel imports was partially filled with imports from Malaysia and Brazil. But as production capacity of the alternative suppliers is limited, and the EU market is currently saturated biofuel imports are likely not to recover to the levels reported before 2013.

Expansion of EU demand for bioethanol and biodiesel is dwindling and not expected to reach the record use in 2011. This is caused by a lower transport fuel use, adjusted blending mandates and blending of double-counting biofuels. The only possibility for expanding the market is a wider introduction of higher blends such as E10 in combination with a significant reduction of biofuel prices. A future cap on food based biofuels will further limit the consumption and production of biofuels in the EU. Despite the support programs of the EC, the commercialization of advanced biofuel production is lagging behind the United States. The lack of certainty in the EU policy making is generally mentioned as the main obstacle for investments and commercialization of these technologies.

Biomass for heat and power

Wood Pellets

The EC expects heat and power production from biomass to account for about 45 percent of the renewable use in 2020. A major part of the biomass used is forecast to be forestry products. With a consumption of about 17.5 MMT of pellets in 2013, the EU is already the world's largest wood pellets market. Based on the EC mandates and Member State incentives, the demand is expected to expand further to nearly 21.0 MMT in 2015. An equal share is estimated to be used for household and industrial use. EU domestic production is not expected to be able to keep up with this demand. If trade flows remain consistent with current patterns, the United States has the potential to supply at least half of the EU imports, which would represent a trade value of approximately US$ 600 million in 2015, and potentially over 1 billion in 2020.

While the use of pellets for residential heating is a relatively stable growth market, the future industrial use is less predictable. The pellet demand for industrial heating and power generation is highly dependent on available subsidies and sustainability requirements imposed by the individual Member States. In Belgium and the Netherlands, the use of pellets for electricity generation has been temporarily put on hold due to uncertainties about the sustainability requirements.

Biogas

The biogas sector is very diverse across Europe. Depending on national priorities, countries have structured their financial incentives to favor different feedstocks. Germany and the United Kingdom are the two largest biogas producers in the EU. Germany generates 90 percent of its biogas from agricultural crops, predominantly corn, while the United Kingdom relies almost entirely on landfill and sewage sludge gas.

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

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 CCP includes the "20/20/20" goals for 2020:

- A 20 percent reduction in greenhouse 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 by the transport sector to be achieved by all MS.

The goal for 20 percent renewable energy use in the total energy mix is an overall EU goal. The RED then sets different targets for different MS within this overall target, based on each MS' capacity. In June 2014, Commissioner Hedegaard reported that the EU is on track to reduce its GHG emission with 24 percent by 2020, more than the targeted 20 percent. In contrast to the 20 percent overall EU target, the 10 percent target for renewable energy in transport is obligatory for all MS. The latest official number for the use of biofuel was 4.7 percent (volume basis) in 2010.

Transposition of the RED

By June 2014, all MS except Poland had at least partially transposed the RED into national legislation, a step that was supposed to have been taken by December 2010. Currently, Poland is waiting for the EC approval of the new legislation, which would finalize RED transposition in this country. The MS that have only partially transposed the Directive are Austria, Cyprus and Ireland. For some MS, although they claim to have fully transposed the Directive, the EC has yet to finalize its assessment of the transposition. These MS are Belgium, Czech Republic, the Netherlands and Spain.

National Renewable Energy Action Plans (NREAPs)

The RED required MS to submit National Renewable Energy Action Plans (NREAPs) by June 30, 2010. Currently they have all been submitted and the EC is evaluating them. The NREAPs provide

detailed roadmaps of how each MS expects to reach its legally binding 2020 target. The information in the NREAPs predicts that the overall share of renewables in 2020 will be 20.7 percent, slightly exceeding the 20 percent target.

Review of the RED

The RED stipulates that by December 31, 2014, the EC shall present a report on some of the details in the RED. On the basis of this report the EC will propose to modify the RED. The report will include the following issues:

- 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.

Commission Communication on 2030 Climate and Energy Goals

In January, 2014, the European Commission (EC) published its Communication on the 2030 climate and energy goals for a competitive, secure and low-carbon EU economy. The Communication, which sets out the 2030 framework, includes a reduction in greenhouse gas (GHG) emissions by 40 percent compared to the 1990 level, an EU-wide binding target for renewable energy of at least 27 percent, and renewed ambitions for energy efficiency.

There are no specific targets set for the use of biofuels in this Communication. The explanation for this is that according to the EC, the future of EU transport development should be based on alternative, sustainable fuels as an integrated part of a more holistic approach to the transport sector. First generation biofuels will have a limited role in decarbonizing the transport sector. The Communication is accompanied by a legislative proposal for a market stability reserve for the EU emission trading schemes (ETS), and a report on energy prices and costs in Europe.

The EU biofuel sector, currently predominantly producing first generation biofuels, is dissatisfied with the EC document and claims that specific binding targets are needed to promote regulatory stability and encourage long term investments. According to the industry, should the current framework be abandoned it would simply erase the efforts made by the industry so far.

The framework the EC proposed in January will now be considered by the EU Parliament and the Council. It is expected that both the Parliament and the Council would like a more ambitious target. The EC press release with links to all other documents can be found here: http://europa.eu/rapid/press-release_IP-14-54_en.htm

Double Counting

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. Critics against double-counting claim that it reduces the actual portion of renewable energy in transportation to a level below the 10 percent target set for 2020.

The vague definition of what can and cannot be double counted to reach the target in the RED is

also causing concerns. The definition of used cooking oil makes it possible to mix unused oil with only a small portion of used cooking oil to qualify for double-counting. Another problem with double-counting is that it is up to each MS to decide what can be double counted. Without any cross-border cooperation fraud is likely to happen.

In January, 2013, the European Biodiesel Board (EBB) organized a meeting with the aim of creating a consortium that would work on the issue. Extra certification for double-counted materials would decrease the possibilities for fraud. The consortium is called the Register of Biofuels Originating (RBO). Biofuels that can count double, or more, are referred to as Extra Incentivized Biofuel (EIB).

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 EU target. These sustainability criteria must be met by all biofuels whether produced within the EU or imported. The RED specifies a 35 percent requirement for GHG emissions-saving threshold as a starting point. It increases to 50 and 60 percent in 2017, with the higher requirements for new facilities. Environmental sustainability criteria covering bio-diverse and high-carbon-stock lands are also laid out in the RED.

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, or areas designated for nature protection purposes. The EC is still working on developing the criteria for biodiverse grasslands. These criteria will be 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.

Other sustainability requirements cover 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 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 (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 could be 28 different national certification schemes that must be registered and recognized by the EC.

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. A key requirement of the FQD is that all fuel suppliers must meet a 6 percent cut in 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 would tend to move demand towards biofuels with higher GHG savings. In addition, the FQD limits ethanol blends to 10 percent or less when ethanol is used as an oxygenate. Fuel specifications for biodiesel place limits on the palm oil and soy oil content of biodiesel.

GHG Emissions

GHG emission savings are calculated using lifecycle analysis (LCA) and following methodologies

described in the RED annexes. The EC Joint Research Center (JRC) defines the GHG emissions savings for different raw materials and selected production and supply pathways. The results of these are presented in the RED Annex V. Net carbon emissions from indirect land-use change (ILUC) are not included. Under the RED, it is possible to use actual numbers using proper documentation and LCA procedures to achieve GHG emission saving values which are higher than the default values.

	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 are calculated the Commission applies a "discount factor" from the typical value in order to ensure that the biofuel pathway was not inflated. If the typical value were used for biodiesel made from soybeans, it would have a GHG saving value of 40 percent and be above the 35 percent threshold. 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 were first shipped from Brazil, then transformed into soy oil and biodiesel in the EU. Using LCA, the value for soy-based biodiesel produced in the United States 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, such as no-till farming, to allow for easier updates.

The EC is working on updating the default values on GHG emissions in the RED. According to the Directive, this should be done every second year, but it has not been done since the RED was published in 2009. Reportedly in the upcoming update of the Annex V there will be two different numbers for soybeans depending on the tilling practices used. Apparently corn will have a separate number from other cereals. The reason for this is yet unclear but the GHG saving number for corn is anticipated to be lower than the one for other cereals. In June 2014, the EC did not yet know when the update of Annex V would be published.

Certification Systems

One of the ways to ensure that the biofuel used is meeting the requirements of the RED is to have it certified by one of the voluntary certification systems. Some of the MS have developed national voluntary systems while some rely on the voluntary schemes adopted by the EC for showing compliance with sustainability criteria. The EC has currently (June 2014) approved 17 voluntary schemes that can certify biofuels for all MS. MS must accept these certification schemes and cannot demand anything more than what they cover. The approved voluntary certification schemes are:

1. ISCC (International Sustainability and Carbon Certification)
2. Bonsucro EU
3. RTRS EU RED (Round Table on Responsible Soy EU RED)
4. RSB EU RED (Round Table of Sustainable Biofuels EU RED)
5. 2BSvs (Biomass & biofuels voluntary scheme)
6. RBSA (Abengoa RED Bioenergy Sustainability Assurance)
7. Greenergy (Brazilian bioethanol verification program)
8. Ensus **(**Voluntary scheme under RED for Ensus bioethanol production)
9. Red Tractor (Farm Assurance Combinable Crops & Sugar Beet Scheme)
10. SQC (Scottish Quality Farm Assured Combinable Crops scheme)
11. Red Cert
12. NTA 8080
13. RSPO RED (Roundtable on Sustainable Palm Oil RED)
14. Biograce (GHG calculation tool)
15. HVO Renewable Diesel Scheme
16. Gafta Trade Assurance Scheme
17. KZR INIG

There are also two more voluntary schemes in the pipeline waiting for approval, namely "Universal Feed Assurance Scheme" and "Trade Assurance Scheme for Combinable Crops." The EC considers voluntary certification schemes its preferred mean of obtaining certification. There are currently no ongoing negotiations for a bilateral agreement on certification on biofuels, although this was mentioned in the RED as one of the options outlined to get certification.

Biomass Sustainability

The RED required the EC to look into whether sustainability criteria for solid and gaseous biomass were needed. In February, 2010, the EC adopted a sustainability report for biomass other than biofuels and bioliquids. In May 2014, however, the EC reported that there will be no EU-wide sustainability criteria for biomass before 2020. The report was published in June 2014. The EC decision was based on the assumption that national, EU, and international legislation would currently be enough to ensure sustainable practices are being used. This does not mean that there will be no sustainability criteria for biomass as some MS, namely the largest importers are moving forward on developing their own sustainability criteria (see for more information the Biomass Chapter).

The EC Proposal on ILUC

In October 2012 the EC published its long awaited proposal on Indirect Land Use Change (ILUC). The proposal, which will amend both the RED and the FQD was accompanied by an impact assessment. The proposal aims at starting the transition from conventional biofuels to biofuels

made from non-food feedstock. The RED calls for ILUC to be taken into consideration when calculating GHG emissions savings values for most first generation biofuels.

Over the last couple of years, the food versus fuel debate made reaching a political and economically viable proposal on ILUC more difficult for the EC. Political pressure against first generation biofuels from NGOs, DG Environment, and Members of Parliament stems from the fear that agricultural or pasture land, previously used for food and feed production, could be diverted to the production of biofuel; that non-agricultural land could be brought into production; and that forests and other high carbon stock areas could be converted to agriculture production, leading to further GHG emissions.

The ILUC proposal applies only to biofuels and bioliquids which are defined as:

- Biofuels - liquid or gaseous fuel for transport produced from biomass.
- Bioliquids - liquid fuel for energy purposes other than for transport, including electricity and heating and cooling, produced from biomass.

Specifically, the EC proposal on ILUC would amend the RED and the FQD by:

- Increasing the minimum GHG saving threshold for new installations to 60 percent as of July 1, 2014.
- Including ILUC factors in the reporting by fuel suppliers and MS.
- Limiting the amount of food crop-based biofuels and bioliquids that can count towards the 10 percent target for renewable energy in the transport sector by 2020 to the current consumption level of 5 percent.
- Providing market incentives for biofuels with no or low indirect land use change emissions, and in particular the second and third generation biofuels produced from feedstock that does not create an additional demand for land.

The proposal adds these weighting factors to second and third generation biofuel:

- Biofuel from used cooking oil, animal fats (category I and II), non-food cellulosic material, ligno-cellulosic material except saw logs and veneer logs will *count twice* towards the targets.
- Biofuel from algae, biomass fraction of mixed municipal and industrial waste, straw, manure and sewage sludge, palm oil mill effluent and empty palm fruit bunched, tall oil pitch, crude glycerin, bagasse, grape marcs and wine lees, nut shells, husks, cobs, bark, branches, leaves, saw dust and cutter shavings will *count four times* towards the targets.

Residues not mentioned above, including industrial residues such as molasses and animal fats (category III) would not be given an added weighting factor.

The proposal would limit the use of first generation biofuels to 5 percent after 2020. Furthermore, after 2020, financial support would only apply to biofuels that are not produced from crops that could be used for food and feed.

Industry Reactions to the Proposal

The EU industry believes the push towards second generation biofuels will increase uncertainties and even threatens the viability of the industry. Industry also states that more scientific research on ILUC is still needed, making this proposal premature. Industry also believes that the 5 percent cap in 2020 will destroy related sectors such as crushing and sugar facilities. EU farmers are

protesting the proposal and the 5 percent cap, claiming it will cut them off from an important market for their products if they are not permitted to sell to the bioenergy industry.

The European Parliament Resolution

From the time the EC published its ILUC proposal in October 2012, there have been intense debates among industry, the Parliament and other stakeholders. When the Parliament adopted its first reading position on September 11, 2013, it was with a very tight vote. The EP Resolution proposed the following changes to the EC proposal:

- A 6 percent cap on conventional biofuels to the 10 percent energy target in transport to be reached by each EU Member State by 2020. A 2.5 percent sub-target for advanced biofuels, with a starting target of 0.5 percent in 2016.
- Elimination of the multiple-counting for some of the advanced biofuels such as biomass, while keeping double-counting for biofuels made from used cooking oil and animal fats. Biofuels made from algae should be counted triple while in the original proposal energy from biomass and algae would be counted quadruple.
- To have the ILUC factors reported in the RED, but binding in the FQD. In the original EC proposal the ILUC factors would only have to be reported on in both the RED and the FQD.
- At least 7.5 percent of the energy in petrol shall be bioethanol in 2020.

The Energy Council Agreement

On June 13, 2014, the Energy Council finally reached a political agreement on the ILUC proposal. The main features are:

- A 7 percent cap on conventional biofuels, meaning made from feed and food raw materials.
- Encouragement of the transition to second and third generation biofuels. MS should have an indicative target of 0.5 percent. MS will be allowed to set a lower target, based on objective reasons;
- New Annex IX of the RED contains feedstock for advanced biofuel that count double towards the targets. In addition, advanced biofuels not listed in Annex IX and used in existing installations prior to the adoption of this Directive, can be counted towards the national target;
- A multiplication factor of 5 for electricity from renewable sources in electric road vehicles and of 2.5 for electrified rail transport was introduced;
- ILUC reporting on GHG savings from the use of biofuels will be carried out by the EC. For that purpose, provisional estimated ILUC factors are included in new Annexes to the renewables and fuel quality directives.

This summer, the Council is expected to formally adopt its first-reading position (Common Position). After that, informal "trilogue" negotiations with the EC and European Parliament will start, with the aim to reach an agreement in October.

Trade Policy

In 2012, the EC published a customs regulation which changed the HS code for ethanol used for fuel to HS/CN code 2207. Ethanol and gasoline blends with an ethanol content of 70 percent or more are classified as denatured ethanol under code 22.07.20.00, charged with an import tariff of Euro 10.20 per hectoliter. Previously, ethanol was imported under code 38.24, at an import duty of 6.5 percent. There seems to be still some uncertainties where blends between E30 and E70 would be classified.

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 27.10.20 at a tariff rate of 3.5 percent.

HS Code	Description	Duty Rate
3826001	FAMAE 96.5-100%	6.5% (plus AD and Cv duties for U.S. and most Canadian companies)
38260090	FAMAE below 96.5%	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

Biodiesel

In March 2009, the EC 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 entered into force on March 13, 2009 and applied for 6 months, after which they were made definitive for a 5-year period. It is still not known whether this will be prolonged.

In May, 2011, the EC published a Council Decision which extended the definitive countervailing and anti-dumping on biodiesel blends of 20 percent or less originating from the United States. The measures adopted by the EC were retroactive and extended to August 13, 2012. For U.S. companies that were investigated in 2009, the combined duties will apply, Euro 213.8 – Euro 409.2 per MT. Other U.S. companies will be subject to the highest combined duty of Euro 409.2 per MT, based on the biodiesel content in the blend. The different duties have drastically reduced the imports of biodiesel from the United States.

In May 2013, the EC published regulation 490/2013 imposing a provisional anti-dumping duty on imports of biodiesel originating in Argentina and Indonesia. The provisional tariffs were effective from May 29, and range between 6.8-10.6 percent on imports from Argentina, and between 0-9.6 percent on biodiesel originating in Indonesia. During the investigation period (July 1, 2011- June 30, 2012) all imports from Argentina were found to be dumped, while a low level (2-6 percent) of the Indonesian biodiesel was found not to be dumped. The Argentine biodiesel sector filed a complaint with the WTO on the EU biofuels quota and tax systems. Indonesia has said it might complain to the WTO if the EU imposes penalties. In November 2013, the anti-dumping duties were made permanent, see regulation 1194/2013.

Bioethanol

In February, 2013, the EC published Council Regulation (157/2013) imposing a definitive anti-dumping duty on import of bioethanol originating in the United States. The rate of the anti-dumping duty is set at Euro 63.3 per MT, and is applicable in proportion by weight of the total content of pure ethyl alcohol produced from agricultural products. Ethanol for other uses than for fuel is exempted from the ant-dumping duty. The regulation entered into force on February 23, 2013.

In January, 2014, the EU ethanol industry (ePURE) filed a complaint with the EC asking it to take

action against a circumvention of EU anti-dumping duties on ethanol originating in the United States. According to ePURE, ethanol was being imported through Norway as an E48 blend. On June 4, 2014, ePURE reported that the EC decided to apply anti-dumping duties to these ethanol imports. The "clarification" of the EC is that the ethanol blended in Norway is of U.S. origin and "amounts to a fast-track finding of circumvention". Official documents on this event are not yet publicly available, but are expected to be so in the summer of 2014.

Conventional Bioethanol

EU Production, Supply and Demand Table

Ethanol Used as Fuel and Other Industrial Chemicals (Million Liters)								
Calendar Year	**2008**	**2009**	**2010**	**2011**	**2012[r]**	**2013[e]**	**2014[f]**	**2015[f]**
Beginning Stocks	526	872	621	440	317	182	315	220
Fuel Begin Stocks	493	839	588	407	282	148	281	186
Production	3,466	4,203	4,918	5,042	5,460	5,840	5,900	5,960
Fuel Production	2,816	3,553	4,268	4,392	4,810	5,190	5,250	5,310
Imports	1,451	1,249	1,230	1,637	1,176	945	830	855
Fuel Imports	1,101	899	880	1,285	827	595	480	505
Exports	112	150	126	149	145	132	240	175
Fuel Exports	62	100	76	99	95	82	190	125
Consumption	4,459	5,553	6,203	6,653	6,626	6,520	6,585	6,650
Fuel Consumption	3,509	4,603	5,253	5,703	5,676	5,570	5,635	5,700
Ending Stocks	872	621	440	317	182	315	220	210
Production Capacity								
Fuel Ending Stocks	839	588	407	284	149	282	194	194
Number of Refineries	60	66	68	68	70	71	70	70
Capacity	5,138	6,234	7,570	7,759	8,468	8,480	8,480	8,480
Capacity Use (%)	55%	57%	56%	57%	57%	61%	62%	63%
Co-product Production (1,000 MT)								
DDG	1,380	2,119	2,659	2,708	2,747	3,127	3,200	3,460
Corn Oil	37	70	72	85	120	165	167	169
Feedstock Use (1,000 MT)								
Wheat	1,782	2,736	4,111	4,282	3,921	2,947	3,060	3,830
Corn	1,278	2,414	2,496	2,917	4,133	5,705	5,775	5,825
Barley	577	661	618	814	371	557	610	585
Rye	773	959	1,069	637	350	782	780	805
Sugar Beet	10,198	9,209	10,648	10,218	12,051	11,671	11,434	11,335
Market Penetration (1,000 TOE)								

Fuel Ethanol (million)	1,774	2,327	2,656	2,883	2,870	2,816	2,848	2,880
Gasoline (billion)	103,392	98,897	93,682	90,022	84,899	80,744	76,879	73,210
Blend Rate (%)	1.7	2.4	2.8	3.2	3.4	3.5	3.7	3.9

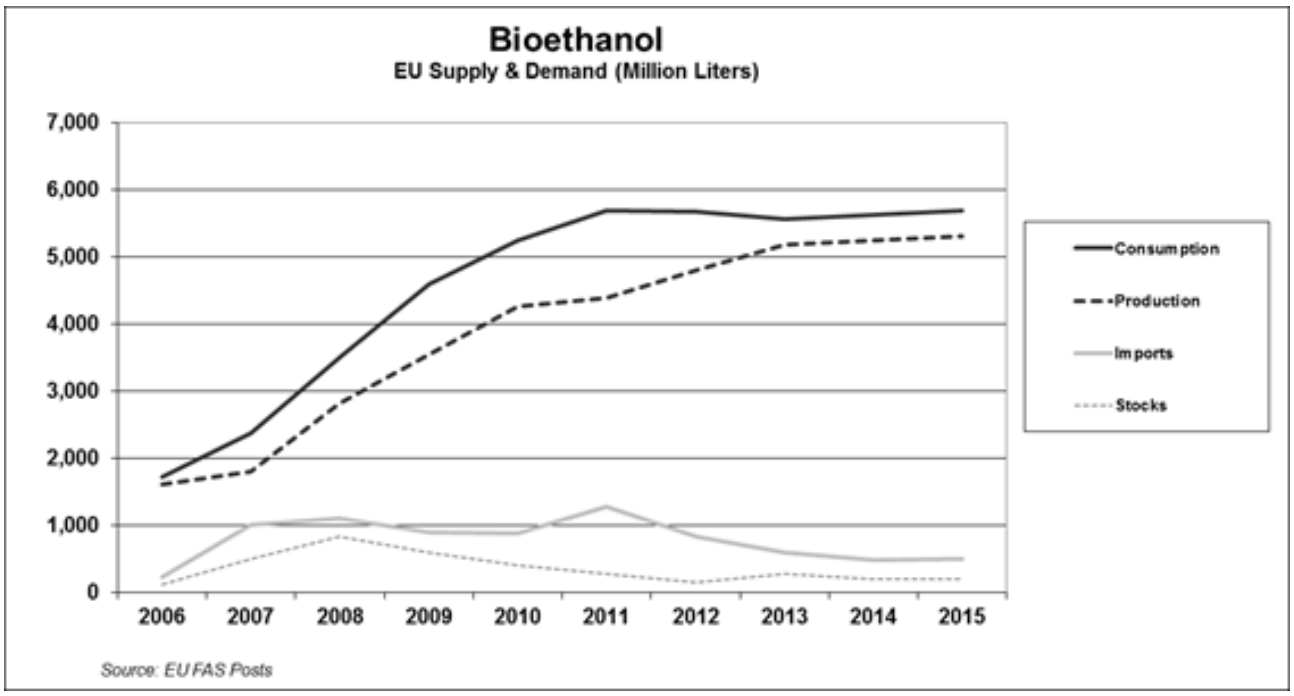
The ethanol market for industrial chemicals is estimated at: production of 650 million liters per year and consumption 950 million liters per year. r = revised / e = estimate / f = forecast EU FAS Posts. Source: EU FAS Posts

Production & Capacity

Fuel Ethanol Production – Main Producers (million liters)								
Calendar Year	**2008**	**2009**	**2010**	**2011**	**2012[r]**	**2013[e]**	**2014[f]**	**2015[f]**
France	746	906	1,208	1,208	1,173	1,180	1,180	1,180
Benelux	73	220	415	675	900	1,000	1,000	1,000
Germany	580	752	765	730	776	850	850	890
Spain	346	465	471	462	381	440	440	440
Hungary	190	203	190	190	291	390	390	390
United Kingdom	70	70	278	63	203	190	230	280
Poland	114	165	194	167	213	235	240	240
Other	697	772	747	897	873	905	920	890
Total	**2,816**	**3,553**	**4,268**	**4,392**	**4,810**	**5,190**	**5,250**	**5,310**

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

EU bioethanol production capacity quadrupled from about 2.1 billion liters in 2006 to about 8.5 billion liters in 2012. The majority of the production capacity has been installed in France, the Benelux countries, Germany, the United Kingdom, Poland and Spain. Since 2012, capacity has not significantly increased, and is not expected to be expanded in 2014 and 2015. Due to the cap on food based bioethanol, expansion of first generation bioethanol is expected to be limited, while expansion of cellulosic bioethanol production is restrained due to the he lack of certainty in the EU policy making process (see Chapter Advanced Biofuels). In 2011, capacity use fell below sixty percent, but has recovered slightly since then. Recent restrictive measures on bioethanol imports (see trade section) created an opportunity for domestic producers to expand their production and make use of their capacity.



EU bioethanol production in 2013 is estimated at 5.2 billion liters. On an energy basis, this is equivalent to 33 million barrels of crude oil. During the last half of 2013, production benefitted from an abundance of feedstock, both imported and produced domestically. Furthermore, competitive imports from the United States have been cutoff effectively since February 2013. However, after an annual growth rate of about 600 million liters during 2008 – 2013, the production expansion is expected to flatten during this and next year (see graph above). The slowing growth rate is primarily caused by slackening consumption. Bioethanol demand has been affected by adjusted blended mandates and reduced gasoline consumption (see consumption section).

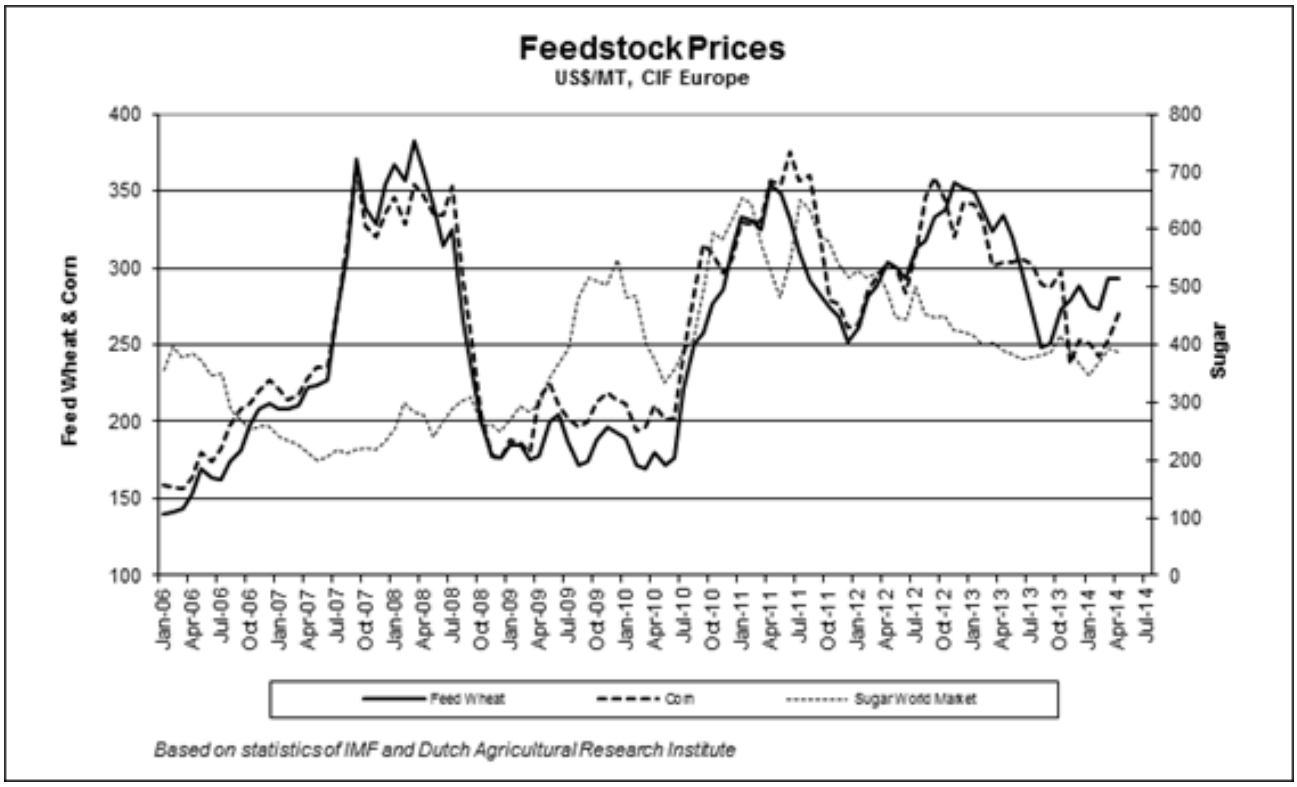
A temporarily production increase is forecast to take place in the United Kingdom and Germany, based on increased availability of feedstock and a growing domestic market for bioethanol. Production in all other EU Member States is forecast to remain stagnant. The growth of the ethanol market has reached its limits and currently even an oversupply exists on the domestic market. This is anticipated to affect the profitability of the producers which operate with the narrowest margins, generally believed to be the multi-feedstock plants in northwestern Europe. But despite an abundance of feedstock available also production in Hungary will flatten. Construction of a plant has been stopped due to hesitation about the policy framework at both the EU and Member State level.

Feedstock Use

In the EU, bioethanol is mainly produced from wheat, corn and sugar beet derivatives. Wheat is mainly used in northwestern Europe, while corn is predominantly used in Central Europe and Spain. Barley and rye are used for bioethanol production in Germany, Poland, the Baltic Region and Sweden. In Italy, about thirty percent of the ethanol is produced from wine byproducts and about ten percent directly from wine.

Due to the abundance on the world market, corn prices fell (see graph above) and producers in northwestern Europe switched to imported corn in 2013 (see FAS Grain and Feed Annual). Corn

was mainly imported from the Ukraine. But also an abundance of corn was available domestically, which benefitted production in Central Europe, in particular in Hungary. Depending on the 2014 harvest, producers will switch to wheat or continue to produce from corn.



In northwestern Europe and in the Czech Republic sugar beets are used for the production of bioethanol. In France and Germany respectively about 45% and 40% of the bioethanol is produced from sugar beet derivatives. Sugar syrup or low grade exhausted molasses from the sugar process are used to feed the bioethanol plant. In MY2013/2014, production of bioethanol from sugar beet declined because of the increased availability of grains (see FAS EU Sugar Annual). Bioethanol production from beets might structurally decline after the production quotas for sugar will be abolished in MY2016/2017.

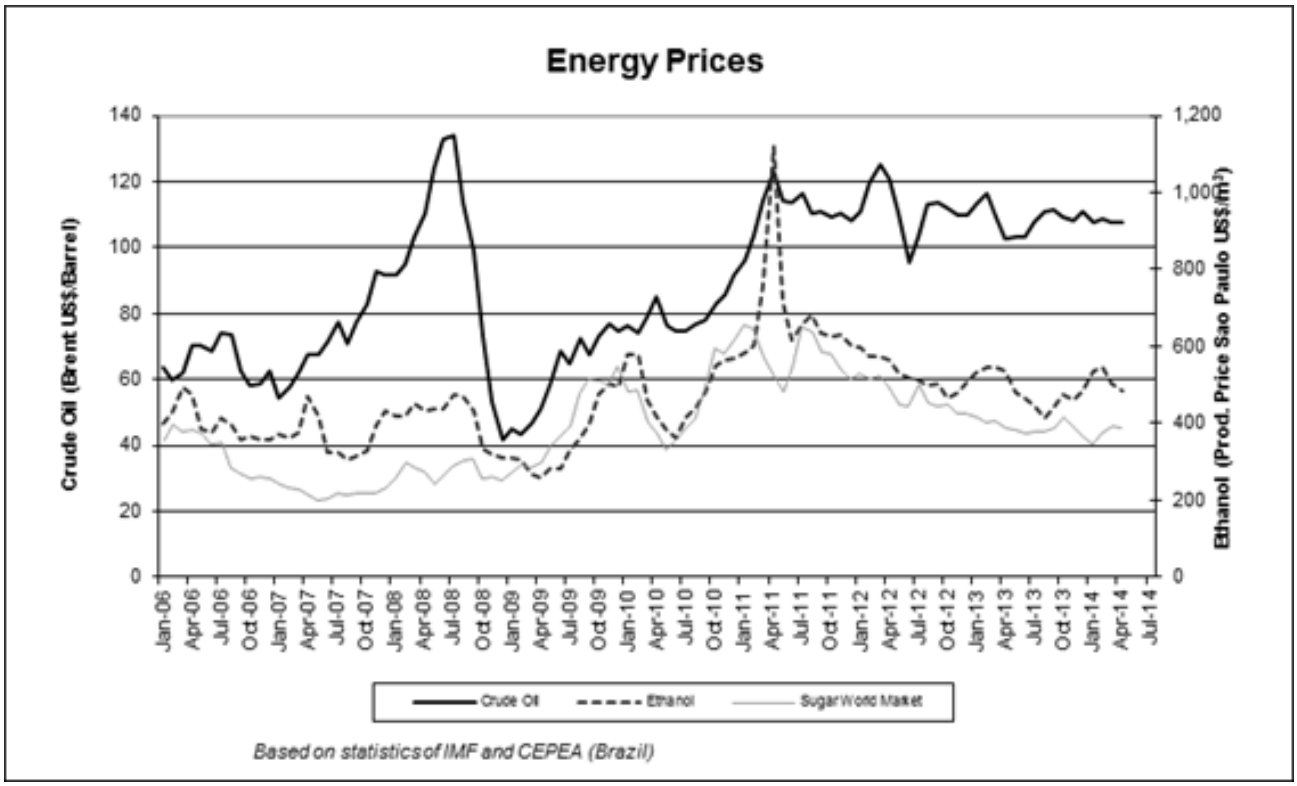
In the EU, the required feedstock for the 2014 production (5,250 million liters of bioethanol) is estimated at nearly 10.2 MMT of cereals and 11.4 MMT of sugar beets. This is about 3.5 percent of total EU cereal production and about 10 percent of total sugar beet production. Co-products of the bioethanol production are distillers dried grains (DDG), wheat gluten and yeast concentrates. In 2014, the maximum theoretical production of co-products is forecast to reach 3.2 MMT. This is about two percent of total EU feed grain consumption.

Consumption

Fuel Ethanol Consumption – Main Consumers (million liters)								
Calendar Year	**2008[r]**	**2009[r]**	**2010**	**2011[r]**	**2012[r]**	**2013[e]**	**2014[f]**	**2015[f]**
Germany	791	1,142	1,475	1,568	1,581	1,527	1,520	1,650
United Kingdom	152	354	582	696	785	810	820	850
France	814	805	782	777	810	796	800	800

Italy	176	232	306	480	463	358	360	360
Benelux	234	357	363	390	341	354	360	360
Other	1,342	1,713	1,745	1,792	1,696	1,725	1,775	1,680
Total	**3,509**	**4,603**	**5,253**	**5,703**	**5,676**	**5,570**	**5,635**	**5,700**

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



During 2006 – 2011, EU bioethanol consumption expanded by 0.5 to 1.2 billion liters per year. But consumption fell during 2012 and 2013, and is anticipated to only increase marginally during 2014 and 2015. In 2015, bioethanol consumption is forecast to reach 5.7 billion liters, which is just below the consumption level of 2011.

A surplus will be available in the Benelux countries, France, and in some Central European countries, mainly Hungary. Germany, the United Kingdom and Italy are expected to be the main deficit markets in 2014 and 2015, with a deficit of respectively 600, 450 and 230 million liters. A deficit is also anticipated in the Nordic countries, Denmark, Finland and Sweden, with a total volume of about 400 million liters.

During 2013, bioethanol use increased in the United Kingdom, Denmark and Poland. Stagnation or even reduction of the use was reported in Germany, Italy, Spain, the Benelux countries and Hungary. In 2013, German consumption decreased by 3.4 percent as result of reduced sales of E85. Lower sales can be attributed to high ethanol prices compared to fossil fuel that made E85 less economic and prompted drivers to switch to E5 or E10. Currently, ethanol prices are at a low level (see graph above). In the United Kingdom, bioethanol is currently cheaper than gasoline and blending goes right up to the blendwall of E5 and E10. But lower prices are not expected to be the driver for further EU consumption growth.

The overall stagnation in consumption can mainly be explained by the lower gasoline use and the adjustment of blending mandates. Before 2008, gasoline use for road transport declined by about 3.5 percent annually, but since the crisis the use has been reduced by over 5 percent annually. Lower gasoline use is in particular reported in the countries which were most effected by the economic crisis; Ireland, Greece, Spain, and Italy. But lower gasoline use is also caused by the increased fuel efficiency of the vehicle fleet.

Another factor is the blending of biofuels which are counted double towards the mandate. In the Benelux countries the lower consumption can partly be attributed to the blending with bio-MTBE and biomethanol, which both fall under the double-counting framework. Also the double-counting of used cooking oil and waste fats and oils resulted in an increased blending of biodiesel at the expense of bioethanol.

In 2015, bioethanol use is forecast to recover to the 2011 level solely because of an increased use in Germany. In Germany consumption is expected to increase as a result of the switch in biofuels mandates from being based on energy content to greenhouse gas (GHG) savings. Based on the GHG savings, this new scheme is anticipated to create a preference for ethanol above biodiesel. On the longer term, EU consumption is forecast to remain on a moderate growth path due all the factors mentioned above, plus the proposed cap on food-based ethanol. Currently the financial structure is insufficient to support the switch to the production of cellulosic bioethanol. The only possibility for increasing the market for bioethanol is a wider introduction of E10 in combination with a further reduction of prices.

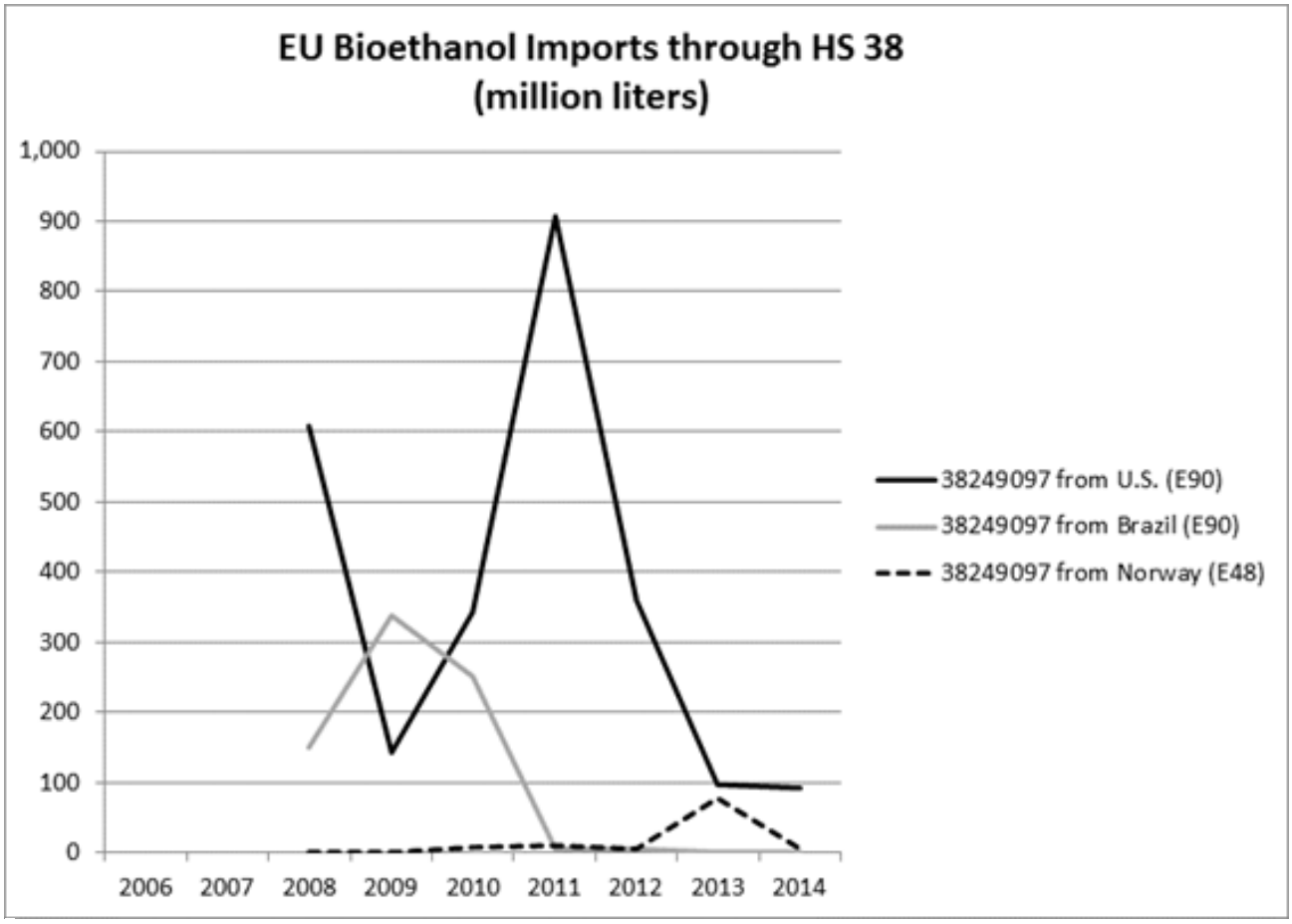
Trade

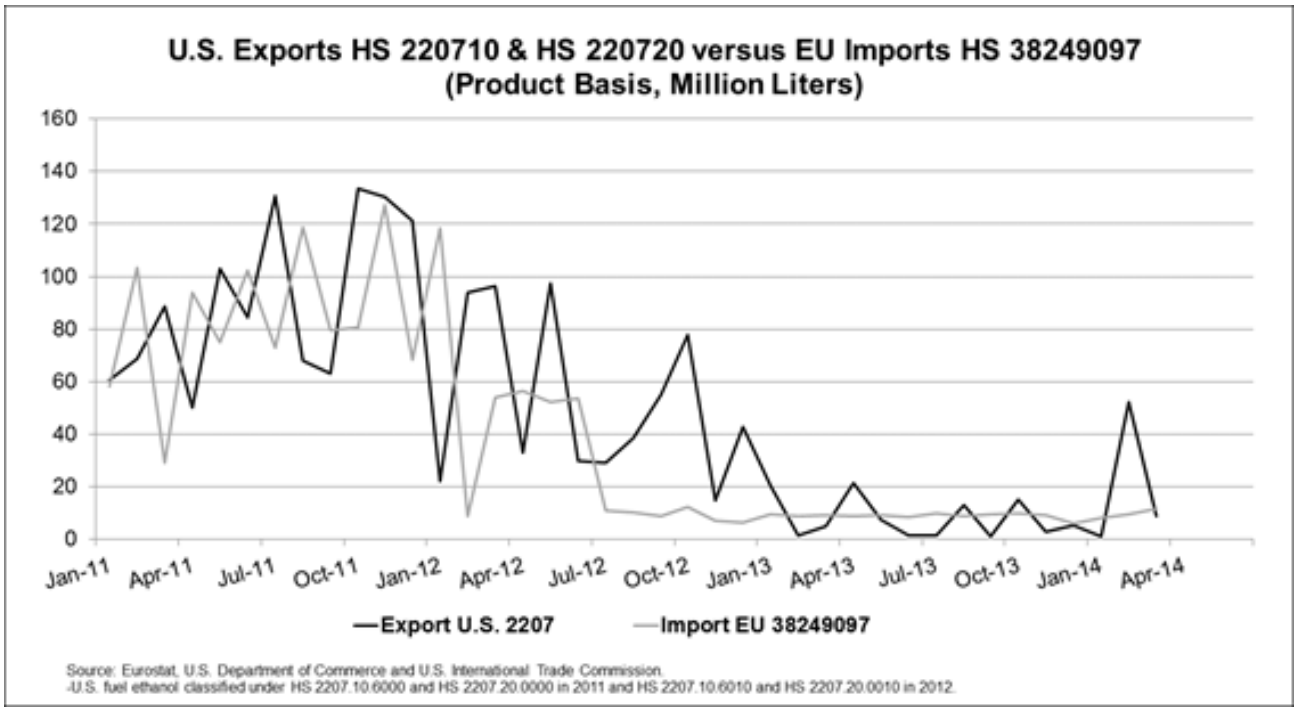
The bioethanol loophole

During 2009 – 2012, the major part of the bioethanol shipped to the EU was *exported* under HS 2207 but *imported* as a blend with a Binding Tariff Information (BTI) under the HS code 3824.90.97, subject to a lower tariff, namely 6.5 percent of the customs value. Reportedly the majority has been imported as E90. In 2012, the EU closed the popular loophole in the tariff regime. On April 3 2012, the EU's Customs Code Committee reclassified ethanol – gasoline blends, previously classified under HS 3824.90.97, as denatured ethanol under HS 2207, subject to the higher import tariff of 102 Euro per thousand liters (Regulation 211/2012). The graph below shows the correspondence of the exports of U.S. fuel ethanol classified under HS 2207 and the EU HS 3824.90.97 imports.

Anti-dumping duty

The reclassification of E90 was, however, insufficient to block trade. During the last quarter of 2012, U.S. exports surged again (see graph below). Following a complaint from the European bioethanol industry (ePURE), the European Commission imposed an anti-dumping duty on the bioethanol imports from the United States. On February 23, 2013, the duty was set at 62.3 euro per MT (49.2 euro per 1,000 liter) for the coming five years (see for more information the Policy Chapter). This duty is in addition to the import tariff of 102 euro per 1,000 liters, and as a consequence 1,000 liters of ethanol from the United States is charged with 151.2 euro. This rate has effectively cut off U.S. exports of bioethanol to the EU.

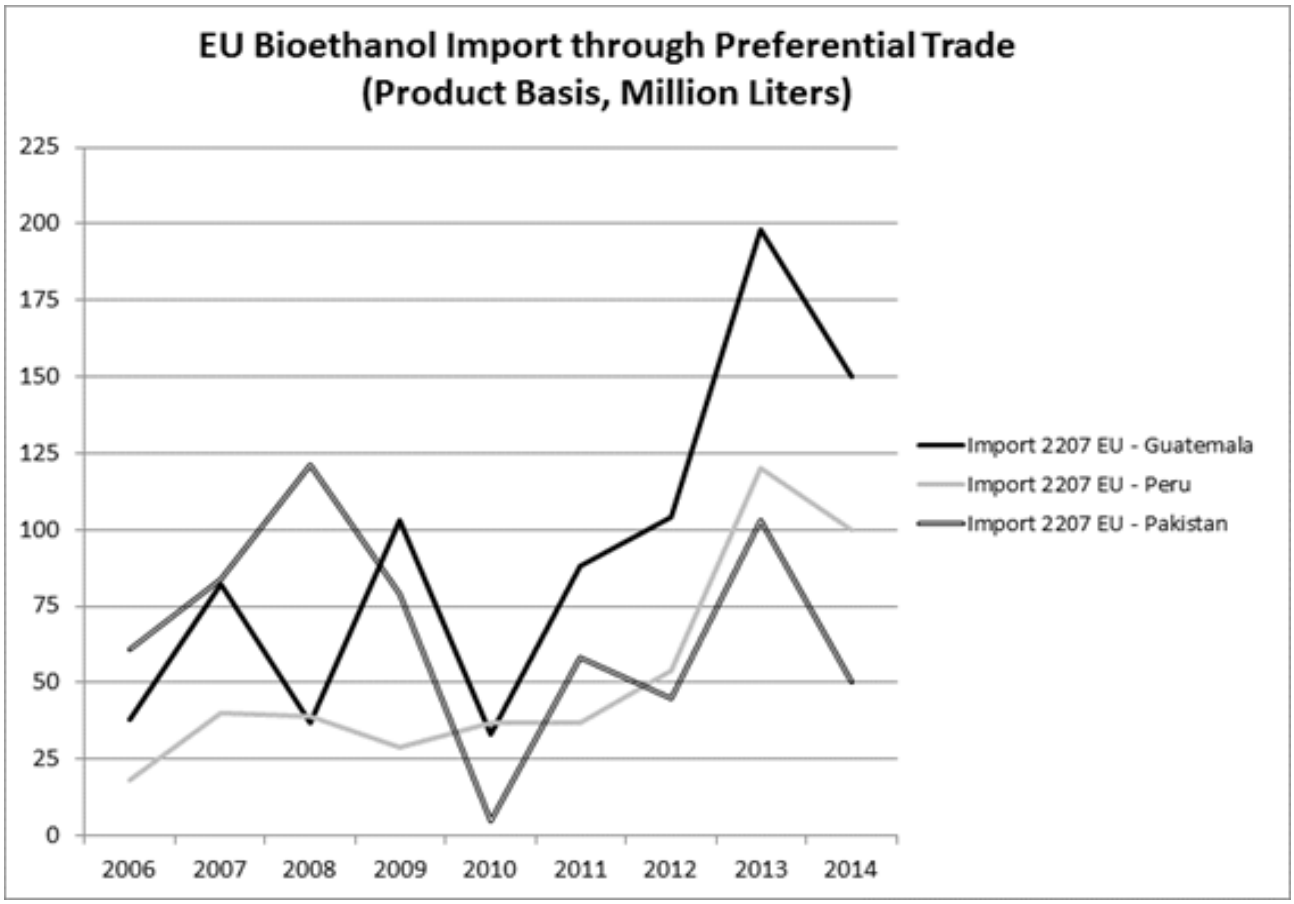




Source: Eurostat, U.S. Department of Commerce and U.S. International Trade Commission.
-U.S. fuel ethanol classified under HS 2207.10.6000 and HS 2207.20.0000 in 2011 and HS 2207.10.6010 and HS 2207.20.0010 in 2012.

Preferential trade

Isolation from the most competitive suppliers did however attract supply through preferential trade measures. In 2013, over 400 million liter of ethanol has been supplied through zero duty quotas, mainly used by Guatemala, Peru and Pakistan (see graph below). Ethanol from Pakistan is reportedly not applied as fuel, while the product from Peru and Guatemala is only partly used as transport fuel. Besides these imports through preferential trade, ethanol was also imported through a new loophole. During September – December 2013, the United Kingdom imported about 80 million liters of ethanol as E48 from Norway. On June 4, 2014, the EC reportedly assured the EU bioethanol sector they will instruct Member States to tax ethanol coming from Norway as if it has come from the United States.



During 2014 and 2015, EU bioethanol imports are not likely to recover to the levels of before 2012. Currently even a temporarily oversupply on the EU markets exist, which supported exports to the Middle East and Brazil during the first quarter of this year. Brazil is facing a lower cane crop while domestic demand will possibly be supported by higher blending mandates during last quarter of this year, or latest next year. Due to the abundance of corn, U.S. ethanol is expected to be the most competitive on the world market this year. But as a consequence of the anti-dumping duty, EU imports from the United States are restricted. Furthermore corn bioethanol imports will have a closing window of opportunity as according the RED the GHG savings will increase from 35 to at least 50 percent in 2017 (see for more information the Policy Chapter). Corn ethanol from the United States will, however, replace cane ethanol in other markets, which as a consequence could

enter the EU market at a lower import tax or even duty free. This market response is further supported by the higher GHG savings of cane ethanol above corn ethanol. But bioethanol imports are likely not to recover to the levels reported before 2013 as production capacity of the alternative suppliers is limited, and more importantly, currently the EU market is saturated.

Conventional Biodiesel

Unless mentioned otherwise in this chapter the term biodiesel includes traditional first generation biodiesel and hydrotreated vegetable oil (HVO).

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 and, on energy basis, represents about 80 percent of the total transport biofuels market. Biodiesel was the first biofuel developed and used in the EU in the transport sector in the 1990s. At the time, rapid expansion was driven by increasing crude oil prices, the Blair House Agreement and resulting provisions on the production of oilseeds under Common Agricultural Policy set-aside programs, and generous tax incentives, mainly in Germany and France. EU biofuels goals set out in Directive 2003/30/EC (indicative goals) and in the RED 2009/28/EC (mandatory goals) further pushed the use of biodiesel.

Biodiesel (Million Liters)								
Calendar Year	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Beginning Stocks	0	1,100	805	530	560	820	490	600
Production	9,550	9,860	10,710	11,040	10,475	10,890	10,890	11,000
Imports	2,020	2,190	2,400	3,160	3,290	1,415	1,740	1,400
Exports	70	75	115	100	115	415	230	230
Consumption	10,400	12,270	13,270	14,070	13,390	12,220	12,280	12,280
Ending Stocks	1,100	805	530	560	820	490	600	490
Production Capacity								
Number of refineries	232	240	252	266	265	266	266	266
Nameplate Capacity	17,970	22,600	23,190	25,020	26,310	26,030	26,030	26,030
Capacity Use (%)	53.1%	43.6%	46.2%	44.1%	39.8%	41.8%	41.8%	42.3%
Feedstock Use (1,000 MT)								
Rapeseed oil	6,040	6,300	6,880	6,550	6,100	5,600	5,500	5,500
Palm oil	600	550	500	650	900	1,410	1,500	1,540
Recycled vegetable oils (UCO)	320	330	500	700	780	960	1,000	1,020
Soybean oil	960	1,000	1,100	1,000	700	880	900	930
Animal fats	350	350	300	420	370	370	375	370
Sunflower oil	130	170	150	240	270	280	260	270

other (pine oil)	0	0	0	80	130	130	120	120
Market Penetration (1000 TOE)								
Biodiesel, on-road	7,697	9,215	10,216	10,726	11,638	11,000	11,100	11,100
Diesel, on-road	198,233	194,739	198,958	199,748	195,867	198,000	200,000	205,000
Blend Rate (%)	3.9	4.7	5.1	5.4	5.9	5.6	5.6	5.4
Diesel, total use	258,147	248,376	251,466	246,390	241,092	245,000	249,000	255,000

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), Eurostat. Note: Data for feedstock use is not available. The figures above represent estimates by EU FAS posts.

Production Capacity

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. EU biodiesel production capacity is expected to remain flat in 2014 and 2015 at 26 billion liters. After years of rapid expansion from 2006 to 2009, when capacity almost quadrupled, further expansion was much slower due to difficult market conditions due to higher feedstock prices and growing biodiesel imports. In 2013, capacity only grew in Poland, the United Kingdom, and Portugal. Capacity use is lingering around 42 percent in recent years, as a number of plants all over the EU temporarily stopped production or closed.

Production

EU biodiesel production is driven by domestic consumption and competition from imports. In 2013, EU production benefitted from substantially lower imports which more than compensated a decrease in domestic consumption. As a result, biodiesel production increased by six percent, mainly in the Benelux, Germany, and Spain. The increase in the Benelux production can mainly be attributed to increased hydrotreated vegetable oils (HVO) production. Double-counting measures in some Member States, and reduced mandates since 2013 in Spain, are having a negative impact on EU demand and production. In addition there is increasing competition to conventional biodiesel coming from increased production and availability of HVO.

Germany, the Benelux and France remain the major producing countries within the EU. Poland ranked as number four in 2013 but with a production rebound, Spain is anticipated to reclaim its position as the number four in 2015. The rebound is a result of the implementation of the Spanish production quota system.

EU Biodiesel/HVO Production – Main Producers (million liters)								
Calendar Year	**2008**	**2009**	**2010**	**2011[r]**	**2012[r]**	**2013[e]**	**2014[f]**	**2015[f]**
Germany	3,250	2,600	3,180	3,400	2,950	3,180	3,180	3,180
Benelux	430	840	910	960	1,360	1,820	1,990	1,990
France	2,000	2,370	2,260	1,770	1,870	1,930	1,930	1,930
Spain	280	690	1,040	790	550	670	740	970
Poland	310	420	430	410	670	740	740	740
UK	450	400	230	230	320	340	340	400

Portugal	160	290	400	390	370	360	360	360
Italy	760	900	910	700	330	340	340	340
Others	2,830	2,540	2,660	2,660	1,695	2,320	2,260	2,261
Total	**9,550**	**9,860**	**10,710**	**11,040**	**10,475**	**10,880**	**10,880**	**11,000**

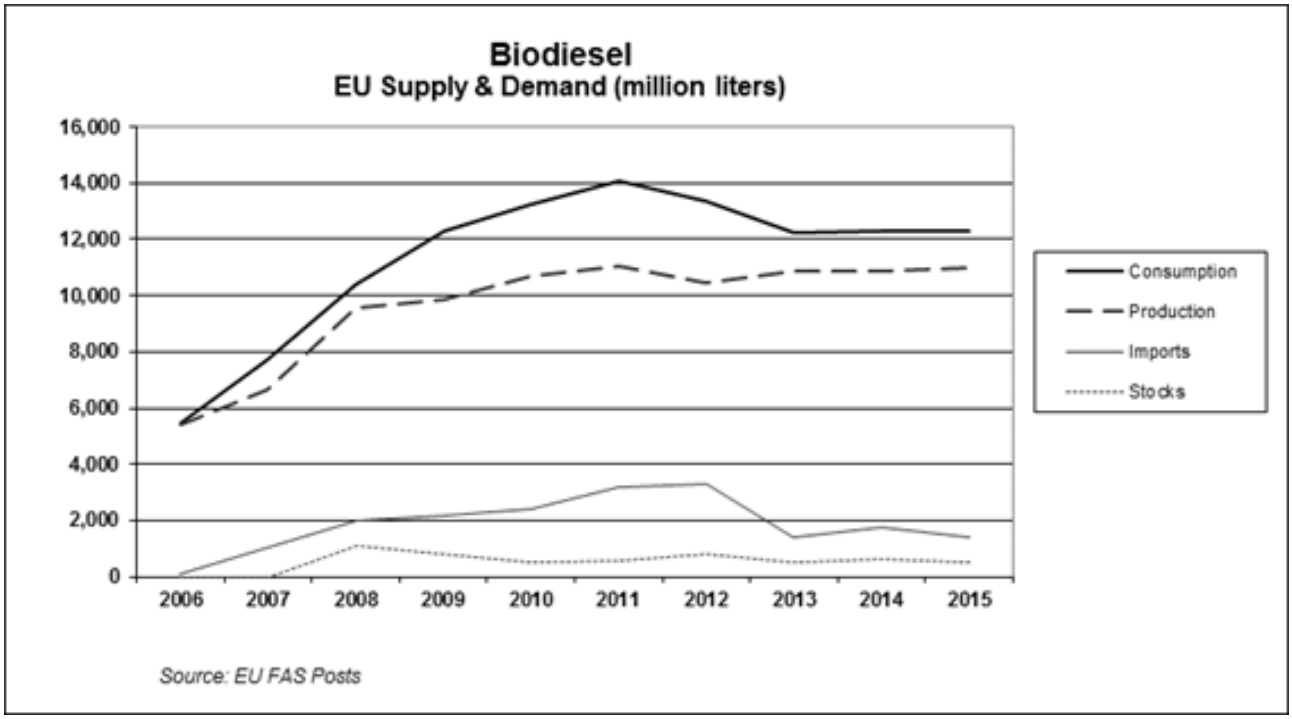
Source: FAS EU Posts based on information in MT and converted to liters using a conversion rate of 1 MT = 1,136 liters.

EU HVO Production (1000 MT)				
Calendar Year	**2012**	**2013**	**2014**	**2015**
Benelux	320	680	790	790
Finland	300	300	300	300
Total	620	980	1,090	1,090

Source: FAS EU Posts

EU HVO Production (1 million Liters)				
Calendar Year	**2012**	**2013**	**2014**	**2015**
Benelux	360	770	900	900
Finland	340	340	340	340
Total	700	1,110	1,240	1,240

Source: FAS EU Posts based on information in MT and converted to liters (conversion rate of 1 MT = 1,136 ltrs).



Feedstock Use

Rapeseed oil is still the dominant biodiesel feedstock in the EU, accounting for 58 percent of total production in 2013. However, its share in the feedstock mix has considerably decreased compared

to the 66 percent in 2012, mostly due higher use of palm oil and recycled vegetable oil (UCO). Palm oil has become the second most important feedstock, mainly because its use in the Neste Oil plant. In addition, in 2013, conventional biodiesel producers also increased palm oil use because of its large price discount compared to other feedstocks. Currently, palm oil is mainly used in the Benelux, Spain, Germany, Italy, and Finland.

The use of soybean and palm oil in conventional biodiesel 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 conventional 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.

In the past, the vast majority of soybean oil was used in Spain, France, Italy, and Portugal. In 2014 and 2015, the major countries using soybean oil are expected to be Germany, Spain, and France. In Portugal, the implementation of sustainability requirements as of July 1, 2014, might lead to an increase in rapeseed oil consumption at the expense of soybean oil use.

The use of UCO has received a push after some Member States (Austria, Denmark, Finland, France, Germany, Ireland, the Netherlands, and the United Kingdom) introduced double-counting (for details see Policy section). Largest EU producers of UCOME are the Benelux, the United Kingdom, and Germany. Animal fats benefitted far less from double-counting as the range of MS that allow double-counting for animal fat is smaller than that for UCO. Germany is the largest user of animal fat for biodiesel production despite the fact that animal fat based biodiesel does not count against mandates in Germany at all. The Benelux and the United Kingdom rank second and third. The category "other" includes cottonseed oil (Greece), as well as pine oil and wood (Sweden).

At least 1.5 million MT of vegetable oil is imported (palm oil, soybean oil, and to a lesser extent rapeseed oil) for biodiesel production. A significant share of domestically produced biodiesel feedstock is crushed from imported oilseeds (soybeans and rapeseed). The 5.5 MMT of rapeseed oil feedstock projected for 2014 is equivalent to about 13.8 MMT of rapeseed. This also generates about 8.3 MMT of rapeseed meal as byproduct, most of which is used for animal feed. Similarly, the 0.9 MMT soybean oil will have to be crushed from 4.5 MMT of soybeans will and generate about 3.6 MMT soybean meal (see also FAS EU Oilseeds Annual).

Consumption

Biodiesel consumption is driven almost exclusively by MS mandates and to a lesser extent by tax incentives. After years of rapid use increases, EU biodiesel consumption peaked in 2011. Double-counting measures in some Member States, and reduced mandates resulted in declining consumption in 2012 and 2013, by 5 and 9 percent, respectively. Lower EU consumption in 2013 was mostly due to reduced consumption in Spain, Italy, and Germany. For 2014 and 2015, consumption is expected to remain flat, as diminishing demand in Germany is compensated by increases in the United Kingdom, the Benelux, and Ireland and a rebound in Romania.

In 2013, France, Germany, Italy, Spain, Poland, and the United Kingdom were the largest biodiesel consumers in the EU (see table). Projections for the following years indicate that France and Germany still remain the leading consumers, followed by Italy, Spain, Poland, and the United Kingdom.

Double-counting measures were introduced in Germany, the Benelux, the United Kingdom, Portugal, Austria, Italy (until early 2014), and Spain. In Spain the measures were published in

April 2014, but will only enter into force after more detailed guidelines are issued. The introduction diminishes the physical demand even if the blending mandates remain unchanged. In addition, Spain reduced its consumption mandates from 7 percent down to 4.1 percent at the beginning of 2013. In 2015, Germany will switch its mandates from an energy based use mandate to a minimum greenhouse gas (GHG) reduction mandate. This is expected to further reduce physical consumption of biodiesel.

Despite the declining trend in 2014 and 2015 a few Member States like the United Kingdom, and the Benelux are expected to increase their consumption, albeit to a small extent, while Romania and the Czech Republic's consumption is forecast to slightly rebound.

EU Biodiesel Consumption – Main Consumers (million liters)								
Calendar Year	**2008**	**2009**	**2010**	**2011[r]**	**2012[r]**	**2013[e]**	**2014[f]**	**2015[f]**
France	2,390	2,620	2,580	2,580	2,500	2,500	2,500	2,500
Germany	3,060	2,860	2,930	2,760	2,810	2,510	2,390	2,270
Italy	810	1,310	1,670	1,853	1,620	1,220	1,220	1,220
Spain	640	1,170	1,550	1,730	1,590	1,050	1,050	1,050
Poland	540	600	780	1,080	840	840	850	850
UK	1,020	910	970	1,020	560	600	680	760
Benelux	410	740	540	560	610	650	670	690
Austria	460	590	600	580	580	570	580	580
Sweden	100	170	230	290	390	400	410	410
Portugal	170	290	420	400	380	360	360	360
Others	800	1,010	1,000	1,217	1,510	1,480	1,530	1,550
Total	**10,400**	**12,270**	**13,270**	**14,070**	**13,390**	**12,220**	**12,280**	**12,280**

Source: FAS EU Posts, converted from MT by multiplying with 1.136 and rounded

Trade

In March 2009, the EC introduced countervailing (CvD) and anti-dumping (AD) duties on biodiesel imports from the United States on B20 and above (see Policy Chapter). In May 2011, the duties were extended to all U.S. biodiesel irrespective of the blending ratio. The duties 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 not fulfilled as the void was filled with increased biodiesel imports from mainly Argentina and Indonesia (see graph below). In an attempt to curb down the biodiesel imports from Argentina and Indonesia, the EC enforced anti-dumping duties on biodiesel imports from these origins as of May 29, 2013. As a result, imports from both countries have dropped considerably.

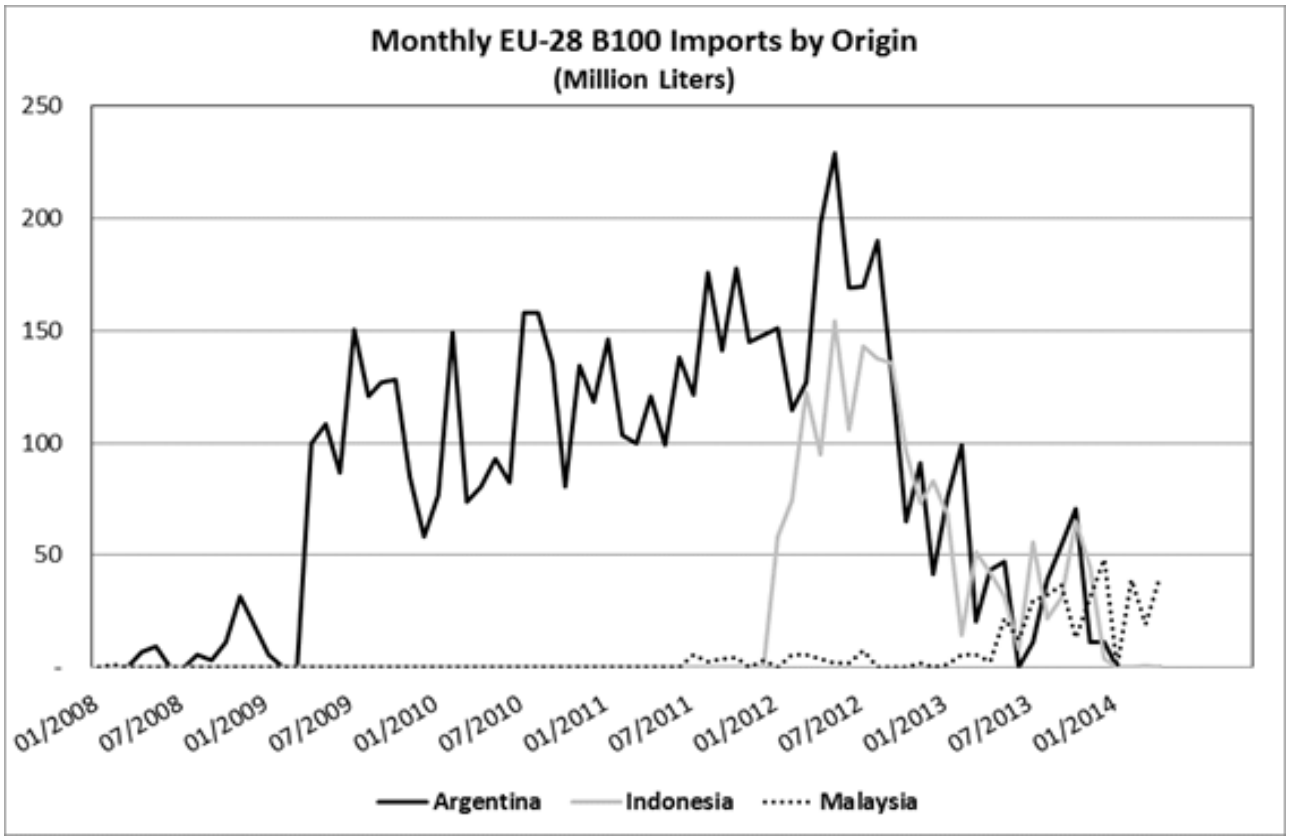
As a result of anti-dumping (AD) measures total EU biodiesel imports declined by 57 percent to 1.4 billion liters in 2013. Imports are expected to somewhat rebound in 2014 as countries not covered by the AD such as Malaysia and Brazil take advantage of the void. For 2015, a decline to the 2013 level is projected on the grounds that the implementation of the Spanish quota system will restrict imports to only companies that were allocated with a quota. For more information see GAIN Report SP1321.

In 2013, most biodiesel, about 1.36 billion liters, was imported under HS code 3826.00.10 containing at least 96.5 percent biodiesel. The equivalent of 25 million liters and 19 million liters, was imported as blend under HS code 3826.00.90 (containing between 30 and 96 percent of biodiesel) and 2710.20.11 (containing at most 30 percent biodiesel), respectively. It is assumed

that most of the product traded under the last HS code is B5. Most of the biodiesel is imported through the Netherlands, Spain, Italy, and the United Kingdom.

The EU normally exports less than one percent of its production to destinations outside the bloc. However, in 2013, exports soared to 3.7 percent of production. Of these 65 percent were exported to the United States and 28 percent to Norway. The increase in exports to the United States can be attributed to one company taking advantage of an elevated demand in the U.S. and the U.S. blenders' credit. With the expiration of the latter, EU exports to the United States are expected to drop sharply in 2014. As a result, total EU biodiesel exports are forecast to drop in 2014 and remain flat in 2015.

A constraint for biodiesel imports are the sustainability requirements laid down in the Renewable Energy Directive (RED). Since April 1, 2013, all biofuels must achieve greenhouse gas (GHG) savings of at least 35 percent. Default values of biodiesel produced from both soybean oil and palm oil are set lower in the RED. As a result, instead of applying default values, actual GHG values have to be calculated for each shipment. This is however only an option if one of the EC's approved certification systems is used.



Source: GTA 2008-2011 CN 3824.90.91, 2012-2014 CN 3826.00.10

Stocks

In 2008, the use of B99 substantially increased and prompted the EC to start an anti-dumping investigation. In anticipation of the EU imposing 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 is based on the assumption that

average stocks amount to the equivalent of two weeks supply of consumption.

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. With the goal to support the commercialization of advanced biofuels and the bio-based economy in general the European Commission (EC) developed the following programs:

-On February 13, 2012, the EC adopted a new strategy entitled "Innovating for Sustainable Growth: a Bioeconomy for Europe". The main goal of the strategy is to reduce the EU's dependency on fossil resources, for more information see the Bioeconomy website of the EC. One of the policy areas under the strategy is biorefinery, including the production of biofuels. The EC will fund biorefinery research and commercialization by the Horizon 2020 program. This financial instrument has a budget of Euro 80 billion for the period 2014-2020. An example of the projects receiving funds is the NEMO project investigating micro-organisms and enzymes which convert lignocellulosic biomass to bioethanol.
-The goals of the Biorefinery policy area overlap the goals of the European Strategic Energy Technology (SET) Plan. The SET-Plan includes the European Industrial Bioenergy Initiative (EIBI), which key objective is to accelerate the commercial development of sustainable bioenergy. The estimated budget is Euro 8 billion over 10 years to support 15-20 projects. An example of the demonstration projects is the production of microbial oil from lignocellulosic sugars for the production of drop-in biofuels.
-On July 10, 2013, the EC presented the Biobased Industries Public Private Partnership with the Biobased Industries Consortium (BIC), a cross sector group of 48 private companies. The partnership plans to accelerate the exploitation of biobased products in Europe by 2020, and has a budget of Euro 3.8 billion.

Despite the programs above, the commercialization of advanced biofuel production is in lagging behind the United States. In the EU, conversion technologies are being developed for third country markets. This year, the joint venture between the Dutch DSM and U.S. based Poet aims to finish a cellulosic bioethanol plant in Iowa. The plant will have an annual capacity of about 95 million liters and will use mainly corn cobs as feedstock. Another example is the enzymatic hydrolysis technology of the Danish Inbicon which is planned to be applied in a plant in Brazil in cooperation with Dong Energy and the Brazilian Odebrecht. The lack of certainty in the EU policy making is generally mentioned as the main obstacle for investments and commercialization of advanced biofuels in the EU. Furthermore, many of the existing European plants are located at seaports far from the harvest areas. This is viable for current inputs but not for most second generation feedstocks.

Commercial production of advanced biofuels

Currently there are eight advanced biofuel plants operational at commercial scale in the EU (see

table below).

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	430 (2 lines)	2009
The Netherlands	H	HVO	Oils and fats	960	2011
Finland	H	HVO	Palm Oil	100	2014
Italy	H	HVO	Tall Oil	500	2014
The Netherlands	P/FT	Methanol	Glycerine	250	2010
Spain	H	HVO	Oils and fats	151 (3 plants)	2011
Biochemical					
Spain	HL/F	Ethanol	Urban waste	1.5	2013
Italy	HL/F	Ethanol	Wheat straw	20	2013

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

Thermochemical processes

Finland / The Netherlands: Neste Oil has developed a process of hydrogenation to produce hydrotreated vegetable oils (HVO) with the product name NExBTL. The product is sold as drop-in fuel for road transport and also used by commercial airlines. The hydrogenation process to produce HVO is reportedly the most cost effective process currently available to produce advanced biofuels. In addition to drop-in biofuels, the Neste plants also produce renewable naphtha, propane and alkanes. In Finland, Neste operates one plant with two lines of about 190,000 MT each. In 2010, Neste Oil opened up a renewable diesel plant in Singapore with an annual capacity of 800,000 MT and a similar scale plant in Rotterdam in 2011. In 2013, the Neste plants were operating at full capacity. By the end of 2015, Neste is expected to expand the annual capacity of both plants to 950,000 MT. Globally, Neste refined about 1.1 MMT of palm oil and other vegetable oils, and 1.3 MMT of waste and residues. The waste and residues consist of mainly palm fatty acid distillate (PFAD), and animal fats, UCO, and in smaller volumes, tall oil pitch, technical corn oil, and spent bleaching oil. In 2013, Neste exported just over 800 million liters of its products to the United States and 170 million liters to Canada. Neste has a strong commitment to commercialize microbial oil produced by microrganisms such as yeasts and molds, using waste feedstocks.

Finland: This year, the forest product company UPM plans to open a HVO plant in Finland. The capacity of the plant will be 100,000 MT per year, of which about 50,000 MT is expected to be used in 2014. The feedstock used will be tall oil, a residue of pulp production.

Italy: Another HVO plant with an annual capacity of 500,000 MT is expected to be opened in Venice, Italy by Energy Group Eni SpA. Beginning April 2014, Eni SpA was scheduled to start producing high-grade biofuels (i.e. renewable diesel, but also renewable naphtha, and potentially even jet fuel) from organic raw materials. The plant will apply the EcofiningTM technology. The

feedstock is expected to initially be palm oil and will later possibly include also animal fats, waste oils, oils from algae, and various types of biological waste.

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 byproduct of biodiesel production. Biomethanol can be blended with gasoline or used for the production of bio-MTBE, bio-DME, or synthetic biofuels. On December 18, 2012, BioMCN received a grant of Euro 199 million for the construction of a commercial scale biomass refinery using wood residues as feedstock. Through torrefaction and gasification the feedstock will be transferred into syngas and finally biomethanol. Full commercialization of the project is expected to take four years.

Spain: In July 2011, the company CEPSA started producing HVO at two refineries. That year, HVO production amounted 28.5 million liters. Since February 2012, also the company REPSOL started producing HVO in Spain. The combined Spanish domestic HVO production capacity is 151 million liters per year. In 2012, the total production is estimated at about 73 million liters. In 2013, HVO provisional production data indicate that production might have reached 179 million liters. For more information see GAIN Report SP1321.

Germany: Choren Industries, which ran a 15,000 MT BtL plant in Freiberg/Saxony became insolvent in 2011. Linde Engineering bought the rights to the technology in 2012, while the plant itself is being liquidated by Faith Asset Management/Niagara World. In a separate project the Karlsruhe Institute for Technology (KIT) developed a process called Bioliq® to convert crop residues and wood residues into diesel and gasoline fuels. The erection of the pilot plant was completed in September 2013 and the plant is currently being tested. Production of about 1 million liters annually is scheduled to start in mid-2014.

Biochemical processes

Spain: In 2008, Abengoa Bioenergy completed a demonstration plant in Babilafuente (Salamanca). The plant had a 5 million liters/year production capacity, and used wheat and barley straw as feedstock. The process is based on enzymatic hydrolysis. Since 2013, the plant has been converted to waste to biofuels technology, by which 25,000 MT of urban solid waste per year can be processed to produce 1.5 million liters of biofuels. The straw-based technology is now being implemented at a commercial stage in Hugoton (Kansas). For more information see GAIN Report SP1321.

Italy: In 2011, Beta Renewables started the production of cellulosic ethanol. The Crescentino plant has an annual production capacity of 75 million liters using 270,000 MT of biomass. The feedstock consists of wheat straw, rice straw and husks, and Arundo donax, an energy crop grown on marginal land. Wood waste from the forest industry and lignin from the ethanol plant is used as feedstock at the attached power plant.

Use of conventional and advanced biofuels by the aviation sector

In 2011, 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. Since 2008, the aviation sector has been conducting test flights with biofuels. The project is planning to make 300,000 MT of aviation biofuels available in 2016. For an update of the European Advanced Biofuels Flightpath see the updated Technical Paper of August 2013.

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	(37%) 90.4
Electricity	**41.2**	**54.9**	**77.5**	**104.6**
-Of which Biomass	5.2	8.9	14.5	(8%) 19.9
Transport	**3.1**	**14.0**	**19.8**	**29.7**
-Of which Biofuels	2.9	13.9	19.5	(12%) 28.9

Based on the Renewable Energy Action Plans (NREAPs)

The European Commission (EC) expects heat and power production from biomass to account for about 45 percent of the renewable energy use in 2020 (see table above). Biofuels for transport are expected to account for about twelve percent of the renewable energy use. 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 generation electricity. A major part of the biomass used is forecast to be forestry products.

Wood Pellets

EU Production, Supply and Demand Table

Wood Pellets (1,000 MT)									
Calendar Year	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014 [c]**	**2015 [c]**
Beginning Stocks	167	299	393	467	696	713	642	555	405
Production[a]	5,782	6,294	7,940	9,186	9,470	10,652	11,500[c]	12,500	13,000
Imports[b]	900	1,250	1,698	2,515	3,115	4,367	6,045	7,500	8,500
Exports[b]	50	50	64	72	68	90	132	150	150
Consumption[c]	6,500	7,400	9,500	11,400	12,500	15,000	17,500	20,000	21,000
Ending Stocks	299	393	467	696	713	642	555	405	755
Production Capacity									
No. of Plants[a]			499			497			
Capacity[a]	8,583	11,283	13,694	14,845	15,000 c	15,980	16,200[c]	16,400	16,600
Cap. Use (%)	67%	56%	58%	62%	63%	67%	71%	76%	78%

Source: (a) The European Biomass Association (AEBIOM), (b) GTIS, (c) FAS Post Estimates

The EU is the world's largest wood pellets market, with a consumption of about 17.5 MMT of pellets in 2013 (see table above). Based on the EC mandates and Member State incentives, the demand is expected to expand further to nearly 21.0 MMT in 2015. Consumption forecasts for 2020 range from 50 – 80 MMT (AEBIOM). Future consumption will however, depend on a range of market

factors and in particular Member State incentives.

Main Pellet Producers (1,000 MT)						
Calendar Year	**2009**	**2010**	**2011**	**2012**	**2013[e]**	**2014[e]**
Germany	1,600	1,750	1,880	2,200	2,250	2,350
Sweden	1,580	1,650	1,340	1,340	1,350	1,350
France	345	465	530	680	890	1,200
Latvia	525	615	713	979	980	980
Austria	695	850	940	893	900	900
Portugal	287	627	675	700	700	700
Poland	410	510	600	600	600	600
Total	**7,940**	**9,186**	**9,470**	**10,652**	**11,500**	**12,500**

Source: AEBIOM and Member State sector organisations, e = estimate EU FAS Posts.

With a production of about 11.5 million MT in 2013, and about fifty percent of global production, the EU is the world's biggest producer of wood pellets. Compared to production plants in North America, plants in the EU are mainly small or medium sized. Most of the main pellet producing countries have a sizeable domestic market for residential heating pellets. Recent growing demand for these pellets has supported a further increase in the domestic production. Exceptions in the table above are Latvia and Portugal, which sectors are producing mainly for export and use in large scale power plants abroad.

Germany is the third largest wood pellet producer in the world after the United States and Canada. It has currently about seventy production facilities for wood pellets with a total annual production capacity of 3.5 million MT. In 2013, production amounted to 2.25 million MT, 90 percent of which were produced from residues of the timber industry. The second largest producer in the EU is Sweden. During the past three years, Swedish production has stagnated and has partly been replaced by competitive imports from the Baltic Region and Russia. French wood pellets production amounted to 890,000 MT in 2013, a thirty percent increase over 2012. The growth in pellet production is driven by a strong increase in the demand of residential heating. Also in Austria pellet production is on a steadily rising trend. Like Germany and France, Austria is a net exporter of wood pellets but demand for residential use is increasing progressively. There is an excess of capacity present in most Member States, but particularly in Spain. Of the 900,000 MT of annual production capacity only about a third was being used in 2013. Use of this capacity has, however, shown steady growth during the past four years supported by an increased domestic demand. Spanish consumption of pellets increased from 100,000 MT in 2010 to 380,000 MT in 2013.

The Baltic Region and Portugal are almost exclusively producing for the export market. Wood pellet production has expanded rapidly in Latvia, Lithuania and Estonia, and totaled nearly 2.0 MMT in 2013. With about 1 MMT, Latvia is the main producer in this region. Portugal has increased its production since 2008, and exported nearly its entire production to the United Kingdom and Denmark.

The major raw material for pellets has traditionally been sawdust and byproducts 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, wood waste and agricultural residues. In Central Europe, such as Poland and Hungary, some expansion is anticipated for on-site energy generation or supplying the residential heating market. Capacity growth will however not be sufficient for supplying the full demand in Western Europe. Overall, EU wood pellet production is not expected to be able to keep up with the demand from both the residential heating market and for power generation.

Consumption

While the EU produces about fifty percent of world production, the EU market represents about seventy of the market. Of the consumption of 17.5 MMT in 2013, about an equal share is estimated to be used for industrial use and household use. The residential use for heating is relatively stable growth market compared to the use for power generation as the latter is highly dependent on government funding. The major users of wood pellets in the EU are the United Kingdom, Italy, Denmark, Germany, Sweden, France and Austria.

Main Pellet Consumers (1,000 MT)						
Calendar Year	**2009[e]**	**2010**	**2011**	**2012**	**2013[e]**	**2014[e]**
UK	200	176	1,000	1,400	3,850	5,000
Italy	850	850	1,500	2,100	2,500	2,600
Denmark	1,400	1,600	1,600	1,600	2,300	2,400
Germany	1,100	1,200	1,400	1,700	2,000	2,200
Sweden	1,920	2,280	1,880	1,700	1,900	2,000
France	300	400	550	600	890	1,100
Austria	550	660	720	785	900	1,000
Belgium	920	920	1,200	1,700	800	500
Netherlands	900	913	1,000	1,250	500	500
Total	**9,500**	**11,400**	**12,500**	**15,000**	**17,500**	**20,000**

Source: AEBIOM and Member State sector organisations, e = estimate EU FAS Posts

Besides wood pellets, also large quantities of wood chips and briquettes are used. The EU sector estimates the current EU consumption of wood chips at 14.5 MMT and expects it to grow to 28 MMT in 2020. Growth in demand is supported by increased investments in medium seized combined heat and power (CHP) plants. Most chips are sourced locally, but Scandinavia is regarded as a potential growth market for imports from non-EU destinations. Wood pellets are traded more internationally. The EU pellets market can be divided in three regions.

In Italy, Germany, France and Austria pellets are mainly used in small-scale private residential and industrial boilers for heating. According the European Pellet Council (EPC), the pellet demand for the heat market grew on average fifteen percent during the past three years. Based on the sales of boilers and stoves, the consumption of residential pellets is expected to surge in mainly Germany, Italy and France. In some Member States, such as Austria, household heating with biomass as input receive subsidies by the federal and local governments. In most countries, however government funding is limited. The residential pellet market is mainly driven by prices of alternative fuels, while the demand for industrial pellets depends primarily on EU Member State mandates and incentives.

The wood pellet market in Sweden and Denmark is diverse. Wood pellets are being used in small boilers in private homes, medium sized district heating plants as well as in large CHP plants. Both countries have a high target for renewable energy use in 2020, respectively of 49 and 35 percent. The majority is planned to be obtained from biomass. Already in 2012, Sweden has reached its goal set for 2020.

In markets such as the United Kingdom, Belgium, and the Netherlands residential use is negligible and the demand is dominated by large scale power plants. During 2011 – 2012, consumption in the United Kingdom, Belgium and the Netherlands surged as a result of government funding. The large scale use of wood pellets by the power plants is driven by the EU mandates for renewable energy use in 2020. The governments of these countries opted to fulfill their obligations mainly by

the use of biomass for the generation of electricity. As these countries lack a sufficient domestic production of pellets they largely dependent on imports.

The UK Government enforced the Industrial Emissions Directive, which boosted consumption further in 2013. In 2014 consumption is expected to reach 5 MMT. The UK government has mandated UK electricity suppliers to source an increasing proportion of their electricity from renewable production. In Belgium and the Netherlands, the use of pellets for electricity generation has been put on hold. On September 6 2013, the Dutch Government, private sector and NGOs signed the Dutch Energy Accord (see GAIN Report NL3029). In the agreement co-firing of biomass is capped at annually about 3.5 million MT of wood pellets. Uncertainty, however, still exist on the sustainability requirements. A similar situation exists in Belgium. As from March 2014, the Flemish power sector has reportedly stopped co-firing of wood pellets. The reason for this decision is that the Belgian Government no longer grants funds for pellets which are produced from an industrial resource (see GAIN Report NL4018). In Denmark, pellet use by power plants is continuing in 2014. Based on Danish Government policy and private sector investments, Danish consumption is expected to increase from 1.8 MMT in 2013 to over 3 MMT in 2020 (see GAIN Report NL3036).

Trade

Main EU Importers of Wood Pellets (1,000 MT)

	Total Imports[a]		Imports from U.S.	
Calendar Year	**2012**	**2013**	**2012**	**2013**
United Kingdom	1,487	3,389	475	1,563
Denmark	2,000	2,312	43	121
Italy	1,194	1,749	31	121
Belgium	970	896	572	588
Sweden	493	713	40	35
Netherlands	1,033	543	602	314
Germany	347	437	0	19
Austria	272	375	0	0
Total EU27	**-**	**-**	**1,764**	**2,766**

Source: GTIS (HS Code: 44013020 in 2011 and 440131 in 2012)
(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 United Kingdom 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 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**	**2012**	**2013**
United States	535	763	1,001	1,764	2,766
Canada	520	983	1,160	1,346	1,921
Russia	379	396	477	645	702
Ukraine	30	57	150	217	165

Belarus	75	90	101	112	116
Other	159	226	226	283	375
Total	**1,698**	**2,515**	**3,115**	**4,367**	**6,045**

Source: GTIS (HS Code: 44013020 in 2011 and 440131 in 2012)

Since 2008, EU demand for pellets has significantly outpaced domestic production. This has resulted in increased imports from the United States. Driven by the by the demand of large scale power plants in the EU, U.S. wood pellets exports were boosted by seventy percent in 2012 and another fifty percent in 2013. In 2013, U.S. exports totaled 2.9 MMT, representing a value of US$ 374 million.

If trade flows remain consistent with current patterns, the United States has the potential to supply at least half of the import demand, which would represent a trade value of approximately US$ 600 million in 2015, and potentially over 1 billion in 2020. Other significant exporters of pellets to the EU are Canada and Russia. In response to the EU demand for industrial pellets, capacity has expanded in the supplying regions. These third country imports could, however, be affected by the implementation of sustainability requirements by the individual Member State governments, in particular by the Dutch, Danish and Belgian Governments.

Pellet Sustainability Criteria

A key factor to capture the market and benefit from the growth potential is the sustainability of the supply. European traders and end-users of industrial wood pellets are calling for clear, consistent, harmonized and long term government regulations. The EC was expected to come forward with a proposal on sustainability criteria for biomass destined for the generation of power, heat and cooling, but the EC has announced such regulations will not be implemented before 2020 (for more information see the Policy Chapter of this report).

EU third country imports could be affected by biomass sustainability requirements imposed by the individual Member State governments. Awaiting the sustainability criteria of the Member States, the industry is actively formulating their own criteria. For *non-industrial wood pellets*, the EPC developed ENplus. The program is based on EN 14961-2, includes sustainability requirements and covers the entire supply chain. In 2013, nearly 4 MMT were ENplus certified.

For *industrial pellets*, the Wood Pellet Buyers Initiative (WPBI) developed harmonized quality and sustainability standards parallel with the ENplus program. To include biomass feedstocks other than wood pellets, the WPBI has been transformed to the Sustainable Biomass Partnership (SBP) in October 2013. Similar to the WPBI, the SBP is an industry initiative of the power sector to develop a sustainability scheme based on existing programs (such as FSC and PEFC) and compliant with requirements in the United Kingdom, Denmark, the Netherlands and Belgium. The first introduction of the program is expected in June 2014.

The United Kingdom is currently the only major import market which has decided upon their sustainability requirements. In order to get Renewable Obligation Certificates, companies have to collect and report their data to the UK Government. But only as from April 1, 2015, the results have to actually meet the targets. On June 1, 2014, the UK Government released the following guidance on the website of the Office of Gas and Electricity Markets (OFGEM). The Governments of the Netherlands, Belgium and Denmark have not determined their final requirements yet. Due to the complicated evaluation and decision making process the requirements will possibly not be harmonized between the markets. This would have as consequence that pellets can't be produced and traded as a commodity.

In the Dutch Energy Accord of September 2013, it was agreed that the biomass will have to be subject to requirements related to the carbon debt, Indirect Land Use Change (ILUC) and sustainable forest management. The biomass must also be certified by a program equivalent to the Forest Stewardship Council (FSC) program. The Dutch Government, energy sector and NGOs will decide upon these criteria before the end of the summer of 2014. Until recently an agreement existed for the Belgian industrial wood pellet market. From 2011 until 2013, the Government of Belgium funded the production of renewable electricity with the Green Certificate Scheme. The certificates were granted only with the consent of the Belgian wood industry federation, which declared to the regulator that the pellet production was not competing for their resources. Mid-February, this year, the issuing of Green Certificates was terminated. The decision is based on new interpretation of the Flemish law, which concluded that biomass that can be used by other industries is excluded from funding. At the moment it is unclear if and how the Belgian Government will further support the generation of bio-energy. Also the situation in Denmark is uncertain. In 2014, the Danish Energy Agency finished a study on the sustainability of different supplies of biomass. The government plans to have an agreement with the Danish power sector by the end of this year. Their goal is to implement similar requirements as imposed in the United Kingdom, the Netherlands and Belgium.

Biogas

The European biogas sector is very diverse. 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 and the United Kingdom, 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 United Kingdom along with Bulgaria, Estonia, and Portugal 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-27 (Ktoe)				
Calendar Year	**2007**	**2008**	**2009**	**2010**
Field Crops/Manure/Agro-food waste	3,422	3,564	4,324	7,062
Landfill	2,655	2,757	2,800	2,825
Sewage Sludge	930	954	989	1,072
Total	7,007	7,275	8,113	10,959

Sources: 2007-2010 Eurostat, downloaded in June 2012.

Electricity generation in the EU-28 (ktoe)									
Calendar Year	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013[e]**	**2014[f]**	**2015[f]**
From biogas	5,815	6,630	7,413	8,531	10,380	12,090	12,500	12,700	12,900
Total electricity	290,911	291,213	276,990	289,285	283,325	283,339	283,400	283,400	283,400
From biogas	2.0%	2.3%	2.7%	2.9%	3.7%	4.3%	4.4%	4.5%	4.6%

Sources: 2007-2012 Eurostat, downloaded in May 2014; 2013-2015:
e, f = Estimate/Forecast EU FAS Posts

Germany is the leader in biogas production from biomass with more than 80 percent of the EU production. 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. A change in the guaranteed feed-in price in Germany renewable energy law (EEG) in 2012 reduced the attractiveness of investing in new plants. As a result, in 2013, the number of newly erected plants dropped considerably compared to in previous years.

Further reform of the German renewable energy law is currently being discussed and if implemented is expected to slow down if not stop further expansion of biogas production in Germany. Biogas production is under criticism for various reasons. In Germany, the criticism is that too much arable land is used for the production of feedstock. In other Member States, for example Poland and Portugal, investments in biogas facilities face opposition from local communities out of concerns over odor pollution.

In the Netherlands, half of the existing plants are expected to close down within the next four years due to the termination of subsidies from the Dutch Government in 2016/17. Reportedly, ten plants have already closed down due to high feedstock costs. Biogas production is, however, increasing in the Czech Republic driven by feed-in tariffs, and in Denmark driven by the goal to use fifty percent of livestock manure for biogas production.

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 and Germany. In 2012, the EU consumed 100 TOE of biogas for transportation uses (Eurostat). The main markets are Germany and Sweden.

Country	**No. of biogas plants**	**Total capacity in MW**	**Biogas production in million m^3**	**Electricity production GWh**	**Feedstock**
Austria	368 (2013)	107 (2013)	377 - 522	520 from biogas plus 40 from sewage and landfill gas (2011)	Corn silage, manure, agricultural and food waste, sewage gas, landfill gas
Belgium (2012)	39				Manure, corn silage, agricultural and food waste
Czech Republic (2014)	500	392		2,243	Corn silage, hay, industrial and municipal waste
Denmark (2011)	81				Manure
Estonia (2012)			7		Landfill gas, sewage sludge, manure
Finland	70		139		Municipal waste

(2010)					
France (2010)	495			6,760	Municipal waste, sewage sludge, industrial waste, farm waste
Germany (2013)	7,720	3547		27,900 for electricity 11,800 for heat 450 for fuel	Corn and rye silage, grains, manure, waste, sugar beets
Hungary (2013)	24			106.6	Manure, sewage sludge, food industry waste
Italy (2010)	243				Manure, agro-industry waste, OFSUW
Latvia (2012)		45		222	Manure, municipal and food processing waste, waste water treatment sludge, animal by-products
Lithuania (2012)	9		11		Food industry waste, sludge, energy crops
Netherlands	99 (2012) Probably less in 2013				Manure, corn silage, agricultural and food waste
Poland (2013)	42 using agricultural feedstock	Electricity 50 MW, heat 50 MW	188	228	Sewage sludge, landfill gas, energy crops, plant and animal waste
Portugal (2011)	100	42		140	Manure Landfill gas, OFSUW
Slovakia	65 (2013)	26 (2011)		125 (2011)	Manure, corn silage, agricultural waste
Slovenia (2010)	21	21			Manure, agricultural crops, waste water, landfill gas
Spain (2011)	126	216			Landfill collections, agro-industrial waste, sewage sludge, OFSUW
Sweden (2011)	230			1400	waste materials, manure, crops

United Kingdom (2010)	55				Food waste, brewery waste, OFSUW, animal slurry & manure

Source: EU FAS Posts. OFSUW = organic fraction of solid urban waste, MW = Mega watt, GWh = Giga watt hours

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 (GTA) 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 through preferential trade under HS 2207, EU imports from Brazil under HS code 3824.90.97, U.S. exports to the EU under HS 2207, and EU imports of HS code 29091910 (ETBE, 45 percent ethanol). In 2010, 2011, 2012 and 2013, the EU imported respectively 632, 611, 440 and 461 million liter of ETBE.

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 0.31 across all grains.

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 (HS 3824.90.91) was first introduced in the EU in January 2008. In January 2012 the code was changed to HS 3826.00.10 for blends containing at least 96.5 percent biodiesel, HS code 3826.00.90 (containing between 30 and 96 percent of biodiesel), and HS 2710.20.11 for blends containing at most 30 percent biodiesel. In this report is assumed that these codes represent a blend of 99, 95, and 5 percent, respectively.

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 3824.90.40.30 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
HVO = Hydrotreated Vegetable Oil
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
Nordics = Denmark, Sweden, Finland, Norway and Iceland
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)
UCO = Used cooking oil/ recycled vegetable oil
UCOME = UCO based methyl ester biodiesel
US$ = U.S. Dollar

Energy content and Conversion rates [1] :

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

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

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