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Spain's Biodiesel and Renewable Diesel Overview

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Report Highlights:
The increased regular fuel consumption, the higher blending mandate established for 2017 and the fact that duty protection will still prevail at least for the large majority of the calendar year, will allow for higher domestic production levels in 2017. The projected full enforcement of sustainability sourcing in January 2018 will discourage oilseed and oils purchases that are not sustainably certified by the EU.

Disclaimer: Spain, as a member of the European Union (EU), conforms to EU directives and regulations on biofuels. It is therefore recommended that this report is read in conjunction with the EU-28 biofuels consolidated report 2017.

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Executive Summary:

Spain is among the three top MS in terms of biodiesel production capacity and consumption and is also one of the largest HVO producer and consumer European Union Member States. As in the large majority of EU countries, diesel is the main transport fuel in Spain. However, while the EU diesel-gasoline average ratio is 2:1, in Spain it is 3:1. This means that the potential for ethanol and gasoline to contribute to meeting the RED 10% goal is less than is the case of the EU-wide fuel market. With all other incentives phased out, biofuel consumption in Spain is solely mandate driven.

Domestic biofuel producers have faced competition from imports, which has dramatically reduced production capacity use throughout the years. The somewhat healthier domestic biodiesel sector since the countervailing duties against Argentina and Indonesia enforcement in 2013, along with the enforcement of the national production quota system in 2014 and 2015 has allowed for a production recovery. Nevertheless, industry contacts assure that today, less than 15 biodiesel plants are operative, with the remaining running idle and with limited possibilities to resume production.

Spain's biodiesel sector relies heavily on imports of raw materials, as the domestic oil production (olive oil and sunflower oil) is destined for the food market. Palm oil is the dominant biodiesel feedstock in Spain, accounting for nearly two thirds of the total production. Consequently, all eyes are at the moment are on the consequences of the European Parliament vote on April 2017 to call on the EU to phase-out the use of palm oil in biofuels by 2020.

Soybean oil represents nearly one third of the biodiesel feedstock. The biodiesel production recovery since 2014 created additional opportunities in-country use of this domestically extracted oil and contributed to improve soybean crushing margins, reducing the exportable oil supply.

In 2016, in the absence of biodiesel quotas, the elimination of the bioethanol specific target favoured biodiesel production, as blenders opted to meet mandates with biodiesel or HVO, which does not count against the seven percent blending limit for labelling purposes, but is eligible for mandate compliance, at the expenses of bioethanol use. Moreover, domestic biodiesel producers managed to increase production to supply the larger domestic market and also increase its sales in other EU Member States.

The economic recovery that resulted in increased regular fuel use, coupled with the higher consumption mandate (5 percent) established for 2017, and the fact that duty protection that will still prevail at least for the large majority of the calendar year (August 2017) will allow for higher domestic production levels in 2017.

The increased mandate (six percent) for 2018, along with the slight growth in consumption of regular diesel, may open up additional room for increased in-country biodiesel production. However, the

transposal to national law of Directive 1513/2015 among other factors such as competition from imports, will determine 2018 biodiesel consumption and production dynamics in Spain. Additionally, the projected full enforcement of sustainability sourcing requirements as of January 2018 may discourage oilseed and oils purchases oilseed and oils purchases that are not certified as sustainable under EU requirements and may affect the feedstock mix.

References

- Abbreviations and definitions:

APPA: Spain's Renewable Energies Association

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.

BXX: Blend of mineral diesel and biodiesel with the number indicating the percentage of biodiesel (by volume) in the blend, e.g. B100 equals 100% biodiesel, while B5 equals 5% biodiesel and 95% conventional diesel.

CAP: Common Agricultural Policy
CNMC: Spanish National Market and Competition Commission
CORES: Spanish Corporation of Strategic Reserves of Oil-based Products
CY: Marketing Year
e: Estimated
EBB: European Biodiesel Board.
EC: European Commission
EU: European Union
f: forecasted
FAME: Fatty-acid mono-alkyl esters
GHG: Green House Gases
GOS: Government of Spain
HS: Harmonized System of tariff codes

HVO: (Hydrogenated (or Hydrotreated) Vegetable Oil) Also referred to as "renewable diesel," HVO is produced from oils and fats using hydrogen to remove oxygen from the triglyceride. It is a drop-in fuel meaning that it has complete or near complete substitutability with fossil fuel. HVO qualifies as an advanced fuel under the US Renewable Fuel Standard because it meets the minimum 50% GHG reduction criteria, and it can be incentivized through double counting under the EU's Renewable Energy Directive when produced from waste stream feedstock. Most current production uses palm oil, palm fatty acid distillate, or waste animal fats.

ILUC: Indirect Land Use Change
IDAE: Spanish Institute for Energy Diversification and Saving
MAPAMA: Ministry of Agriculture, Fisheries, Food and Environment
MINETAD: Ministry of Energy, Tourism and Digital Agenda
MS: Member State
MY: Marketing Year
MT: Metric tonnes
N/A: Not available
Q: Quarter of the year (Q1, Q2, Q3, Q4)
S: Semester of the year (S1, S2)
Toe: Tons of Oil Equivalent
VAT: Value Added Tax
WTO: World Trade Organization
$: U.S. Dollars

- Energy content and Conversion rates:

1 Toe = 41.87 GJ

Biodiesel = 37.50 MJ/kg
1 MT Diesel = 1,195 Liters = 1.02 Toe
1 MT Biodiesel = 1,136 Liters = 0.90 Toe
1 MT HVO = 1,294 Liters = 1,051 Toe

Bioethanol = 26.90 MJ/kg
1 MT Gasoline = 1,342 Liters = 1.03 Toe
1 MT Ethanol = 1,267 Liters = 0.64 Toe
1 MT of BioETBE = 1,333 Liters =0.86 Toe

- (HS) Harmonized Codes for Biofuels:

Trade figures are based on Global Trade Atlas (GTA) data HS codes 3824 90 91 (until 2011) and 3826 00 10, 3826 00 90 and 2710 20 11 (since 2012).

Spanish Regulatory Framework

With all other incentives[1] phased out, biofuel consumption in Spain is solely mandate driven. Other governing regulations, affecting the biofuel sector include sustainability requirements implementation since **2016**, although full enforcement is not scheduled until **2018**. Double counting provision has been transposed to national law, however; it has not been fully enforced yet.

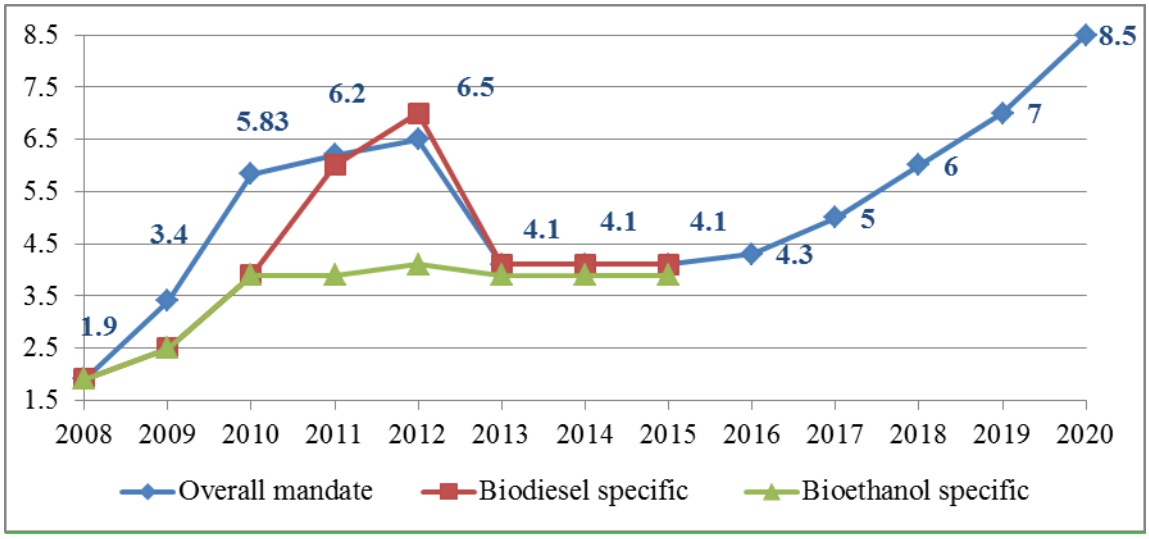
- **Biofuel Targets**

Consumption mandates followed a steady upward trend until 2013, when, the downward revision of mandates introduced by Royal Decree-Law 4/2013 reduced Spain's biofuels market size. Until 2016, the overall mandate could be fulfilled by either biofuel. Given the diesel consumption recovery and the lower volume of gasoline used and considering their respective blending limits (See the **Technical fuel specifications** Section), the excess over the bioethanol/biodiesel specific mandates was normally fulfilled with biodiesel.
Royal Decree 1085/2015 eliminated the biodiesel and bioethanol specific targets since **2016**, and increased slightly the consumption targets for the 2016-2020 period. Interestingly, only the consumption target proposed for **2019** (See **Table 1** and **Graph 1**) will be higher than the mandate stablished back in **2012**, prior to the downward revision of targets carried out in **2013**. Electricity from renewable sources used for electric road vehicles or rail transport would cover the gap between the 8.5 percent biofuel consumption mandate and the 10 percent target for **2020**.

For additional information about Biofuels Mandates in other EU MS, please see GAIN report GM17017.

[1] *Hydrocarbon tax exemption phased-out in 2013. Since 2016 there have not been any production quotas in place.*

Graph 1. Spain Biofuel Consumption Mandates (Percentage in terms of Energy)



Source: FAS Madrid based on Ministerial Order ICT/2877/2008. Ministry of Energy, Tourism and Digital Agenda and Royal Decrees 1738/2010 and 459/2011 and Royal Decree-Law 4/2013 and Law 11/2013
* According to MINETAD Resolution dated January 7th, 2011.
Royal Decree 1085/2015 on biofuels promotion.

Table 1. Spain's biofuel targets (percent in terms of energy)

Year	Type of mandate	Overall mandate		Biodiesel specific	Bioethanol specific
2008	Voluntary	1.9		1.9	1.9
2009	Mandatory	3.4		2.5	2.5
2010	Mandatory	5.83	4.78*	3.9	3.9
2011	Mandatory	6.2		6	3.9
2012	Mandatory	6.5		7	4.1
2013	Mandatory	4.1		4.1	3.9
2014	Mandatory	4.1		4.1	3.9
2015	Mandatory	4.1		4.1	3.9
2016	Mandatory	4.3		N/A	N/A
2017	Mandatory	5		N/A	N/A
2018	Mandatory	6		N/A	N/A
2019	Mandatory	7		N/A	N/A
2020	Mandatory	8.5		N/A	N/A

Source: Orden ICT/2877/2008. Ministry of Energy, Tourism and Digital Agenda and Royal Decrees 1738/2010 and 459/2011 and Royal Decree-Law 4/2013, Law 11/2013 and Royal Decree 1085/2015
* According to MINETAD Resolution dated January 7th, 2011
Royal Decree 1085/2015 on biofuels promotion.

- **Biofuel Target Compliance**

Biofuel target and sustainability compliance in Spain are managed through a Biofuel Entitlement System. Ministerial Order ICT/2877/2008 appointed the Spanish National Market and Competition Commission (CNMC) as the authority responsible to monitor and control the amount of biofuels marketed or consumed through a certificate system. Biofuel producers and blenders are required to report to the CNMC the amount of biofuels sold to other market operators. Producers and blenders must report the amount of biofuel produced, imported and sold to other companies. Blenders must report on the quantity of regular fuel and biofuel marketed. The CNMC issues Biofuel Entitlements to the different industry actors. One entitlement equals to a Toe marketed.

CNMC provisional data (See **Table 2**) show an excess in fulfilment in **2011** and **2012** and failure to comply in **2013** to **2016**. It is our understanding that the excess registered in **2012** may partially make up for the lower compliance the following years through certificate transfer in **2013 – 2016.** Also, **2013-2016** targets would be achieved once provisionally denied certificates are accounted for. Fines of 763 Euros are imposed per TdB that the obliged party fails to present.

Table 2. Mandate Compliance (percent in terms of energy)

Year	Overall		Bioethanol specific		Biodiesel specific	
	Mandate	Consumption	Mandate	Consumption	Mandate	Consumption
2011	6.2	6.2	3.9	**4.3**	6	**6.6**
2012*	6.5	**8.5**	3.6	**4.1**	7	**9.5**
2013*	4.1	**3.4**	3.9	**3.4**	4.1	**3.4**
2014	4.1	**3.7**	3.9	**3.9**	4.2	**3.7**
2015	4.1	**3.6**	3.9	**3.8**	4.1	**3.6**
2016	4.3	**4.1**	-	-	-	-

Source: CNMC

*Note: Mandate compliance in **Table 2** is based on final certificates issued. If provisional certificates were accounted, it would show how consumption targets have been met, at least in an aggregated manner, every year.*

Obliged parties may trade biofuel certificates (each certificate equals one per certificate/metric ton of oil equivalent that the marketed) as long as the CNMC is informed. The certificate trading period runs April-March. Certificate market value and number of certificates exchanged can be consulted in **Table 3**.

Table 3. Mandate Compliance Biodiesel Certificates Transfer

Year	2010	2011	2012	2013	2014	2015	2016*
Average Value (Euros/Certificate)	144	129	137	222	268	317	225
Number of Certificates Transferred	36,730	68,665	201,303	32,553	34,433	44,920	47,911

Source: FAS Madrid calculations based on CNMC.

**Data up to February 2017*

Since 2013, when the **hydrocarbon tax exemption for biofuels**, which amounted to 0.401 **Euros/liter** – applicable to the share of bioethanol contained in the blend, was phased out, the mandate breach fine was revised up from **0.276 Euros/liter** to **0.602 Euros/liter** in the case of bioethanol, according to Resolution by the Under Secretary of Energy dated July 8, 2013 (**Table 4**).

Table 4. Blending Inventive for Diesel Blends (Euros/liter)

Incentive for Diesel Blends	Prior to 2013	Since 2013
Hydrocarbon tax exemption	0.307	0
Mandate breach fine	0.276	0.602
Total Incentive	**0.583**	**0.602**

Source: FAS Madrid based on Resolution by the Under Secretary of Energy dated July 8, 2013.

- **Biodiesel Quota System**

Under the quota system, only producers with quota allocated were eligible for mandate compliance[2]. The effects of quota enforcement were only fully noticed in **2015**, as in **2014** consumption mandates could be fulfilled with out-of-quota biodiesel in approximately during the first half of the year. The quota system is not applicable since **2016**, which opens up the door to increased EU imports competition (See **Trade** Section).

- **Transposition of RED and Sustainability implementation**

Royal Decree 1597/2011 transposed sustainability criteria and provisions related to double counting to national law. Sustainability was projected to be required as of January 2013. However, in early 2013 (Royal Decree 4/2013) the GOS established a delay *sine die* in the implementation.

Since early 2013, during the so-called interim period, obliged parties were only requested to provide the CNMC (National Commission for Markets and Competence) with information regarding type of biofuel

[2] *In 2014 and 2015 out-of-quota production could still be marketed domestically or in third countries, but did not count against the national consumption target.*

and Origin, and feedstock and origin. Reporting levels of greenhouse gas reduction and soil use are optional.

On March 26, 2015 Spain was formally asked by the European Commission to correctly apply the Renewable Energy Directive for biofuels. Resolution by the Secretary of Energy dated April 29, 2015 announcing enforcement was published on Spain's official Gazette.

This document mandates that sustainability requirements be fully enforced in Spain since January 1, 2016. Since this date, the transitory period (to allow for the progressive adaptation of the verification system) began. During this period, no verification is being carried out under the national scheme. Hence, the large majority of obliged parties have opted for private scheme certifications in other to keep their options to sell their product in other member states open.

During the transitory period, only sustainable biofuels are eligible for national mandate compliance. Blenders can still accredit sustainability through private schemes or Responsible Declaration.

According to the draft piece of law made available for public consultation, the date for full implementation[3] would be January 1, 2018. Obliged parties will then need to accredit sustainability compliance with either private schemes or Responsible Declarations, which start being verified under the national scheme by the CNMC.

The projected full enforcement of sustainability as of January 2018 would take a toll on oilseed crushers' margins when crushing non-sustainable beans (See **Feedstock** Section).

Implementation details can be consulted in **Table 5**.

[3] *When obliged parties will need to accredit sustainability compliance with either private schemes or Responsible Declarations and this information starts being verified under the national scheme by the CNMC.*

Table 5. Sustainability Implementation Calendar

Date	Regulation	Comments	Implications
November 2011	Royal Decree 1597/2011	Spain transposes Sustainability Criteria to National law	-
January 2013	-	Intended day of Sustainability Implementation (According to Royal Decree 1597/2011)	Obliged parties must give information on: • type of biofuel • origin • feedstock • origin Optionally: • GHG reduction • Soil use
February 2013	Royal Decree-Law 4/2013	Establishes a *sine die* delay in Sustainability Implementation. The final date for sustainability requirements will be established by a Resolution by the Undersecretary for Energy. This resolution will be published in Spain's official gazette at least eight months prior to its enforcement.	
April 2015	Resolution by the Secretary of Energy dated April 29, 2015	Resolution effective since May 1, 2015 Beginning of a 8 months **grace period**	
January 2016	-	Beginning of a **transitory** period (to allow for the progressive adaptation of the verification system)	Obliged parties must give information on: • type of biofuel • origin • feedstock • origin • GHG reduction • Soil use Sustainability compliance is accredited using private schemes or Responsible Declaration.
January 2018 (tentative)	Draft Royal Decree on GHG for transport energy and fuels amending Royal Decree 1597/2011	**S**ustainability verification system fully in place	Obliged parties must give information on: • type of biofuel • origin • feedstock • origin • GHG reduction • Soil use Sustainability compliance is accredited using private schemes or Responsible Declarations, which start being verified under the national scheme.

Source: FAS Madrid

- **Double Counting Provision**

According to the Renewable Energy Directive 2009/28/EC, second generation biofuels will get double credit. On April 16th, 2014 The Government of Spain published the list of raw material eligible for double counting against biofuels consumption mandates in the Official Gazette. This list includes Used Oils of animal or vegetal origin, animal fats (Categories 1 and 2 of Regulation (CE) 1069/2009).

In the case of blends or different raw materials only the share that is actually produced out of one of the listed products would count double. In order to be granted with the double credit, origin of the feedstock has to be properly documented. However, the double counting will only enter into force in Spain once more detailed guidelines are issued and, most likely, not until sustainability verification is fully in place[4] (See **Table 5**).

The Draft Royal Decree on GHG for transport energy and fuels amending Royal Decree 1597/2011 defines categories of raw materials eligible for double counting purposes classified in two groups:

- **Group A:** algae, bacteria, Organic Fraction of Municipal Waste (OFMSW), industrial residues not fit for food or feed use, forest residues and other cellulosic or lignocellulosic material, sewage sludge, straw, cobs cleaned of kernels of corn, husks, animal manure, glycerin, tall oil pitch, palm oil mill effluent and empty palm fruit bunches., bagasse, grape marcs, wine lees, nut shells, and renewable liquid and gaseous fuels of non-biological origin.

- **Group B:** Used Cooking Oils and Animal Fats.

At the moment, the large majority of the biofuels produced out of double counting feedstock are being exported to other EU Member States were double counting is fully in place. The enforcement of the double counting provision, which has not been established yet, would encourage more in-country use of double counting eligible biodiesel and, consequently reduce the market for biofuels made out of conventional feedstock.

- **Technical fuel specifications in place**

EU Fuel Quality Directive 2009/30 enabled fuel operators to market B7 and E10. This piece of regulation was transposed into national regulation by Royal Decree 1088/2010, which increased the

[4] *In January 2016 a transitory period to allow for the progressive adaptation of the verification system began. For additional information, see* ***Transposition of RED and Sustainability Implementation Section.***

biodiesel content allowed from 5 percent to 7 percent and the bioethanol content permitted from 5 percent to 10 percent.

Blends with volumetric biodiesel content over 7 percent, or volumetric bioethanol content over 10 percent, or volumetric bioethanol content over 5 percent and over 2.7 of oxygen content in terms of mass, should be labeled indicating the biofuel content. In addition, the following disclaimer should be present: "Before using this product, please make sure it is suitable for your engine".

- **Cap on Food Crop Based Biofuels**

On October 5, 2015, Directive 1513/2015 officially introduced a 7 percent cap (energy basis) on food based biofuels thus limiting consumption first generation or conventional biofuels within the wider 10 percent target for biofuels in EU transportation fuel by 2020 set by the RED.

Additionally, a non-binding 0.5 percent national target for advanced (non-food) biofuels was included. EU Member States will have until September of **2017** to enact the reformed legislation. While no consumption target for advanced biofuels has been defined for the post 2020 period, in Spain, according to Royal Decree 1085/2015, the consumption target shall be defined. The draft piece of law made available for public consultation sets the advanced biofuels target in Spain at 0.1 percent.

ILUC Directive also includes a New Annex listing raw materials that **count double** against the consumption mandates, grape marcs and wine lees are specifically mentioned. This Directive also increases the **multipliers factors** for electricity produced from renewable energy sources consumed by electric road vehicles (from 2.5 to 5) and rail transport (from 1 to 2.5) for the calculation of market share of renewables in transport, reducing fossil fuels market share for mandate compliance. The 10 percent target in road transportation for 2020 remains unchanged.
Fuel suppliers are obligated to submit to Member States, on a yearly basis, the provisional mean values of the estimated **indirect land-use change emissions** from biofuels traded.

Additionally, the Directive **increases the minimum reduction threshold of greenhouse gas** (GHG) emission for biofuels and bioliquids produced in new facilities.

GHG emission saving from the use of biofuels shall be:

- At least 60% for biofuels produced in facilities starting operation after October 5, 2015.

- At least 35 % until December 31, 2017, and at least 50 % from January 1, 2018 for biofuels produced in facilities starting operation before October 5, 2015, which is the case of all Spain bioethanol plants.

- **EU Policy Developments affecting Spain**

At the EU level, regulations influencing EU biofuels use in transport include the Renewable Energy Directive (RED), and the Fuel Quality Directive (FQD), both amended by the Indirect Land Use change Directive (ILUC). EU Directives are not directly applicable to Member States as they require prior transposal. While RED and FQD have already being transposed to Spanish law, the ILUC Directive is yet to be transposed.
On November 30, 2016 the EC announced the new biofuels policy for the 2020-2030 period, without setting mandatory targets for biofuels consumption (Renewable Energy Directive post 2020). The future of biofuel in EU is under discussion for the 2021-2030 period. The RED proposal sets a cap on food crop-based biofuels starting at 7 percent in 2021 and decreasing gradually to 3.8 percent in 2030 and a GHG emissions reduction of 40 percent compared to 1990 levels.

Biodiesel Market and Feedstock Use

- **Capacity**

A stable price scenario and a different regulatory framework led to a rapid expansion of biodiesel production capacity until 2009, when poor market conditions and prices volatility led to reduced capacity use and a slowdown in the pace of investments. Since 2013, installed capacity continues to decline (**Table 6**).

Table 6. Number of Plants and Production Capacity in Spain

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Biodies	7	12	24	36	45	48	51	53	37	37	35	30	30
Biodies	120	296	974	2,47	4,91	5,22	5,48	5,89	5,33	5,33	4,67	4,43	4,43
HVO	-	-	-	-	-	-	2	2	3	7	7	7	5
HVO	-	-	-	-	-	-	270	270	405	945	945	945	945

Sources: EBB, APPA and FAS Madrid estimates.

Despite total numbers, seen in **Table 6**, industry contacts assure that less than 15 biodiesel plants are operative at the moment, with the remaining running idle and with limited possibilities to resume production.
As per HVO producing capacity, two CEPSA-owned refineries started producing HVO (Huelva and Algeciras – San Roque) in 2011. The Tenerife CEPSA refinery started processing used vegetable cooking oils (UCO) in 2013. REPSOL refineries in La Coruña, Tarragona, Bilbao and Cartagena also co-process HVO from Vegetable Oils, mostly palm oil, along with fossil fuel.
HVO is co-processed in fossil fuel refineries (**Graph 2**) and incorporated to conventional diesel as an additive. Industry sources peg current HVO domestic production capacity at 945 million liters per year.

Graph 2. Spain-based Fossil Fuel Refineries

Source: FAS Madrid based on industry sources

- **Production**

Biodiesel production in Spain is demand driven; however, production levels have been affected by imports competition throughout the years:

In **2009**, consumption mandates were enforced but Spain's biodiesel production increase rate slowed down due to third countries competition (mainly the United States). The combination of antidumping and countervailing duties against the U.S. biodiesel and the consumption obligation allowed for additional growth of production levels in **2010** (see **Table 7**).

In **2011** and **2012** domestic production of biodiesel declined as a consequence of stiff competition from imported biodiesel originated mainly in Argentina, which continued up to **2013**.

In **2013**, biodiesel production grew despite, the hydrocarbon tax waiver phase-out, which translated into lower blending incentives, and the downward revision of national mandates in 2013. This is explained by the industry's hopes for a quota system implementation and tariff protection, which was only granted at the end of the year.

The five-year antidumping tariffs imposed on biodiesel originated in Argentina and Indonesia effective as of November 28th, 2013 along with the developments toward the implementation of a quota system effective for **2014** and **2015** alleviated pressure on producers and domestic production of biodiesel grew for the first time since **2010**.

Statistical data indicate that domestic biodiesel production in **2014** amounted to over 1 million litres. In the absence of additional incentives, biodiesel production grew in **2015**, in line with the increased conventional fuel demand and the somewhat higher mandate.

In **2016**, in the absence of biodiesel quotas, the elimination of the bioethanol specific target favoured biodiesel production, as blenders opted for meeting mandates with biodiesel or HVO, which does not count against the 7 percent blending limit for labelling purposes, but it is eligible for mandate compliance, at the expenses of bioethanol use. Moreover, domestic biodiesel producers managed to increase production to supply the larger domestic market and also increase its sales in other EU Member States.

The increased mandate in **2017** and the duty protection that will prevail at least for the large majority of the calendar year, (August 10, 2017) would allow for higher production levels (For additional information See **Trade** Section).

Table 7. Biodiesel Production in Spain

Year	2010	2011	2012	2013	2014	2015	2016	2017e
Production (1,000 m^3)	1,028	787	538	659	1,017	1,103	1,319	1,420
Capacity (1,000 m^3)	5,222	5,484	5,891	5,332	5,330	4,675	4,433	4,433
Capacity use (%)	20	14	9	12	19	24	30	32
Overall mandate (%	5.83	6.2	6.5	4.1	4.1	4.1	4.3	5

Source: EBB, CNMC, industry sources and FAS Madrid estimates.

HVO production started in July **2011**. Since then, production of HVO in Spain has increased steadily until **2015**, when it went down.

Table 8. HVO Production in Spain (1,000 m^3)

Year	2010	2011	2012	2013	2014	2015	2016	2017e
HVO (1,000 m^3)	-	28	73	179	377	262	420	430

Source: CNMC.

- **Other Renewable Biofuels**

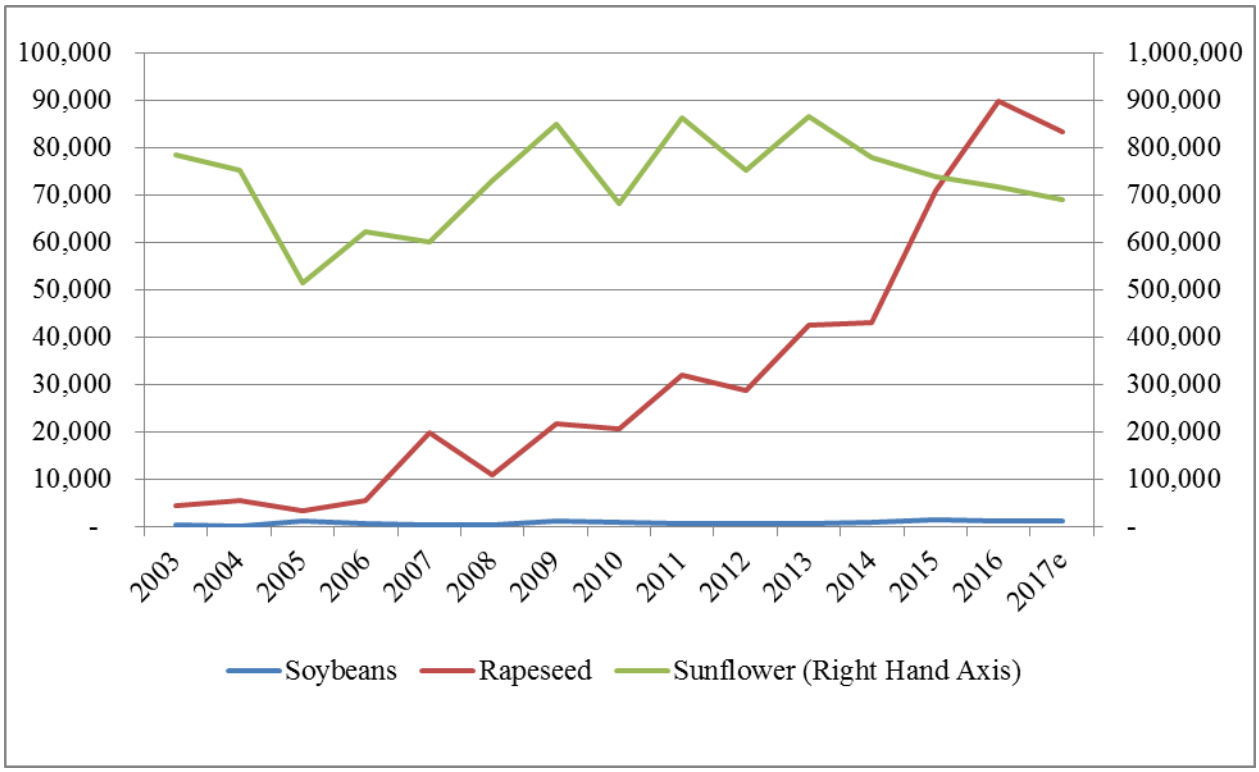
As per other renewable fuels, there is research on biodiesel produced from algae at the public and private level. Abengoa Bioenergy has a pilot plant in Cartagena. Spain-based petrol companies such Cepsa and Repsol, also report research activity in this field. In particular, CEPSA reports as well research activity in Huelva testing different types of oil to obtain aviation fuel (bio-kerosene) known as Bio-Jet. There is no biodiesel production from algae at a commercial stage.

In Spain, according to Royal Decree 1085/2015, on advanced biofuels, the consumption target shall be defined. The draft piece of law made available for public consultation sets the advanced biofuels target in Spain at 0.1 percent.

- **Feedstock**

Spain's biodiesel sector relies heavily on imports of raw materials, as the domestic oil production (olive oil and sunflower oil) is destined for the food market. Area planted to rapeseed, while small, continues to grow year after year driven by greening compliance along with demand for biodiesel production in neighboring countries (**Graph 3**). Spain continues to have a strong dependency on imported vegetable oil for its biodiesel production.

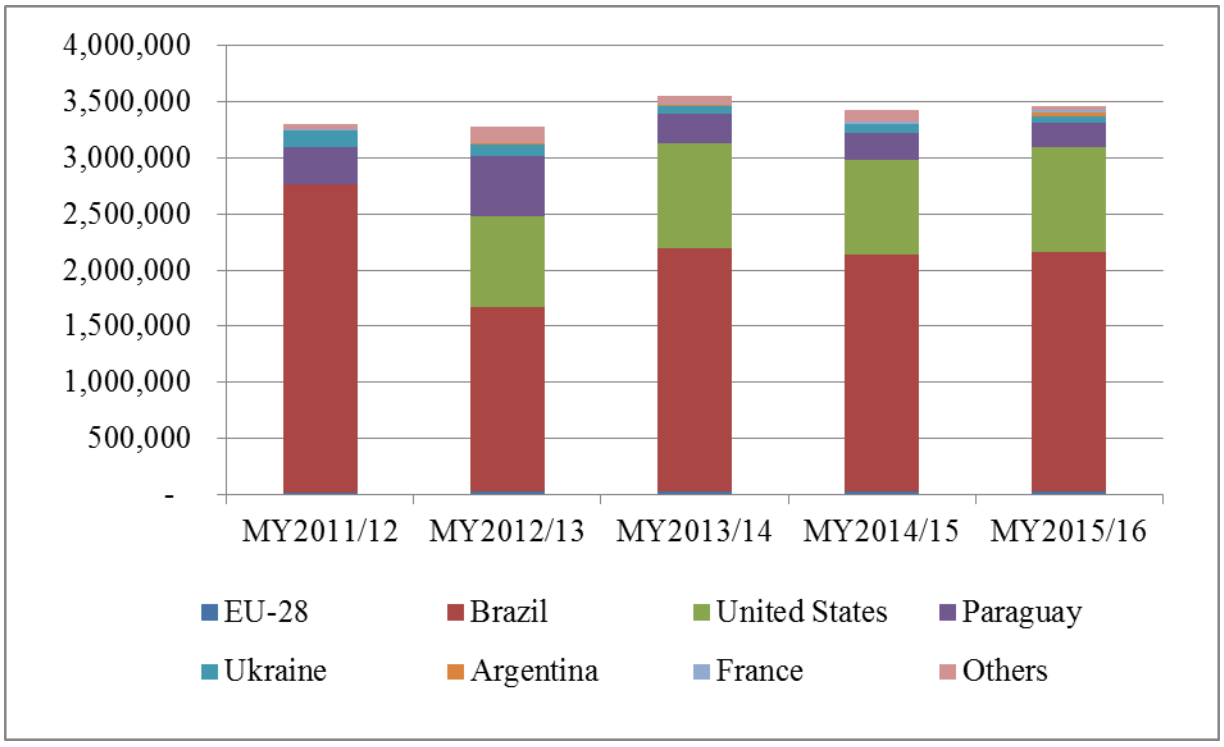
Graph 3. Spain's Oilseeds Area (Ha)



Source: FAS Madrid based on MAPAMA data.

To supply the robust compound feed industry Spain imports (**Graph 4**) soybeans from Brazil and the United States to be processed in one of the four Spain-based crushing units, whose aggregate crushing capacity amounts to nearly 3.5 MMT per year.

Graph 4. Spain's Soybean Imports (MT)*



Source: GTA.

**Soybean trade data are collected in Marketing Years basis. Soybean MY runs October/September.*

Hence, there is a significant amount of soybean oil available in the market. Traditionally, this oil has been exported to other EU-28 Member States or African countries such as Morocco, Algeria, Tunisia and South Africa) (**Table 9**) as the domestic food demand for this type of oil is limited.

The healthier domestic biodiesel sector since 2013 has created additional opportunities for the in-country use of this domestically extracted oil and contributes to improve soybean crushing margins. The biodiesel production recovery (**Table 7**) since **2014** translated in a reduction of soybean oil exports (**Table 9**).

Table 9. Spain's Exports Soybean Oil (1,000 MT)

Country of Destination	2012	2013	2014	2015	2016
EU-28	291	318	212	63	27
Morocco	53	10	40	93	104
Algeria	97	133	97	92	91
South Africa	81	66	73	37	52
Tunisia	32	19	25	15	1
Egypt	0	0	5	20	35
Israel	7	7	5	3	1
Others	27	100	19	89	13
Total	**588**	**652**	**475**	**412**	**324**

Source: Global Trade Atlas (GTA) data. HS code 1507.

Data for the feedstock used in domestically produced biodiesel is not readily available. However, there is public information on the feedstock used for the biodiesel consumed in the domestic market, given the increased level of biodiesel self-sufficiency achieved due to a combination of factors that include reduced mandates, countervailing duties imposed to importers and production quota implementation, it can be assumed that the share of raw materials used to produce biodiesel domestically should not be differ much from the share of raw materials of the biodiesel consumed (**Graph 5**) in country.

Raw materials for biodiesel production in Spain include palm oil, soybean oil Recycled Oils and Animal Fats (RO&AF). To a lesser extent, sunflower oil and rapeseed oil are also part of the mix.

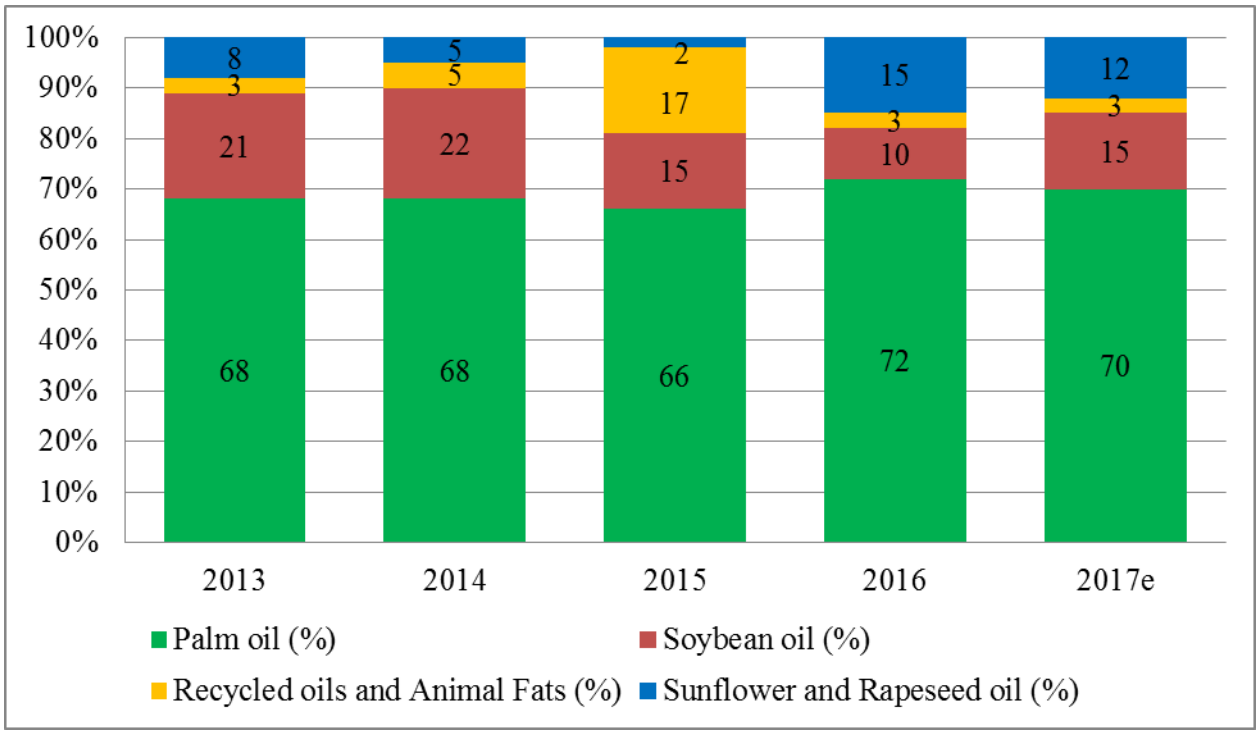
Palm oil is the dominant biodiesel feedstock in Spain, accounting for two thirds of the total production. The higher iodine number permitted[5] in Spain allows for an intensive use of soybean and palm oil in biodiesel production for domestic consumption.

In the absence of double counting full implementation in the Spanish market, biodiesel produced out of RO&AF is most likely exported to other EU member states where the double credit is fully enforced.

[5] *Iodine number for Spain is 140 g/mg, as defined in Royal Decree 61/2006, Article 8.3 as opposed to the 120 g/mg established by EN14214.*

The projected full enforcement of sustainability as of January 2018 (See **Transposition of RED and Sustainability implementation** Section) may discourage non-sustainable certified oilseed or oils purchases. Oilseed crushers could face lower margins when crushing non-sustainable versus sustainable beans, as the oil extracted from former would be devoted to the export market, whereas oil extracted from the latter could be sold to Spain-based biodiesel producers.

Graph 5. Raw Materials used in Biodiesel Marketed in Spain



Source: FAS Madrid based on CNMC and FAS Madrid estimates.

According to CNMC statistical release, in **2015** and **2016** about 98 percent of the domestically produced HVO was made out of palm oil. The remaining 2 percent corresponds to shea butter.
Trade data (**Table 9**) show an increase in palm oil imports since 2013. Palm oil imports have ramped up throughout the years, driven by the biodiesel and HVO production recovery and its growing share as biodiesel feedstock. Indonesia and Malaysia were the primary origins, representing over 75 percent of total palm oil imports.

Table 9. Spain's Imports of Palm Oil (1,000 MT)

Country of Origen	2012	2013	2014	2015	2016
EU-28	69	134	72	64	63
Indonesia	293	577	985	851	1,079
Malaysia	129	106	162	215	202
Papua New Guinea	82	90	57	78	55
Others	11	6	24	67	105
Total	**584**	**913**	**1,300**	**1,275**	**1,504**

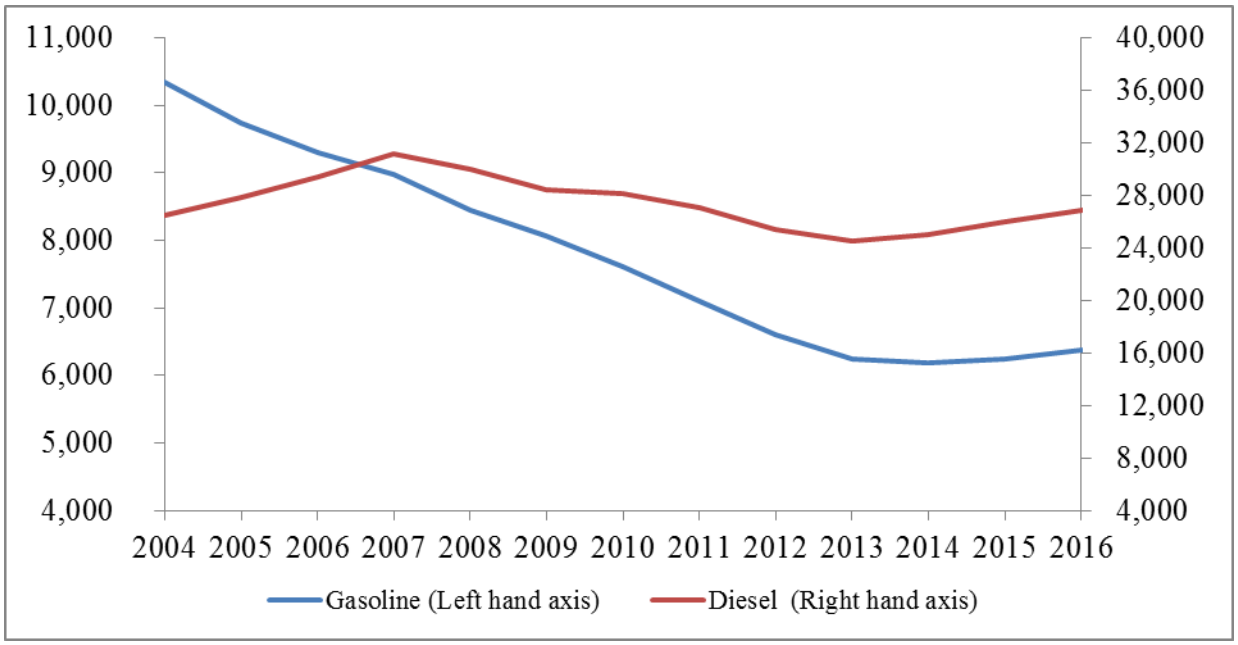
Source: Global Trade Atlas (GTA) data. HS code 1511.

- **Consumption and Marketing**

With all other incentives phased out, consumption mandates are the sole drivers for the biofuel market. Hence, consumption mandates together with conventional fuels demand evolution define the Spanish biofuels market size.

Total fossil fuel consumption in Spain declined between 2007 and 2013. Since then, a steady increase in diesel consumption has taken place, while gasoline use flattened out (**Graph 6**).

Graph 6. Spain's Fossil Fuel Consumption (1,000 m^3)



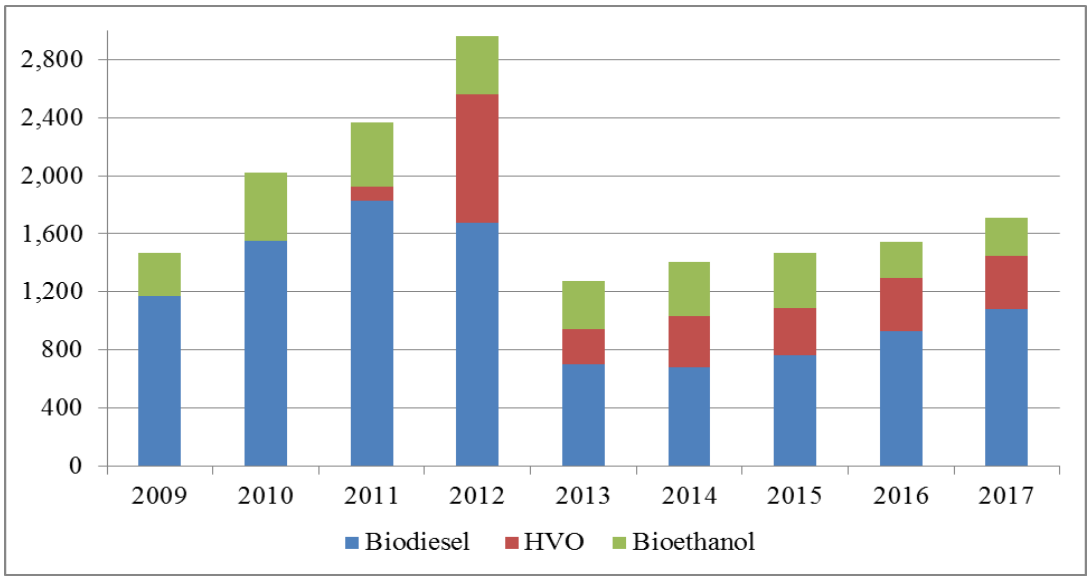
Source: FAS based in CORES data.

As in the large majority of EU Member States, diesel is the main transport fuel in Spain. However, while the EU diesel-gasoline average ratio is 2:1, in Spain it is 3:1, which means that the potential for

ethanol and gasoline to contribute to meeting the RED 10% goal is less than is the case in the EU-wide fuel market.

At the moment, biodiesel is the main biofuel consumed in Spain and represents nearly 65 percent of the total liquid biofuels consumption in transport, followed by HVO and Bioethanol, which account for 20 and 15 percent respectively.

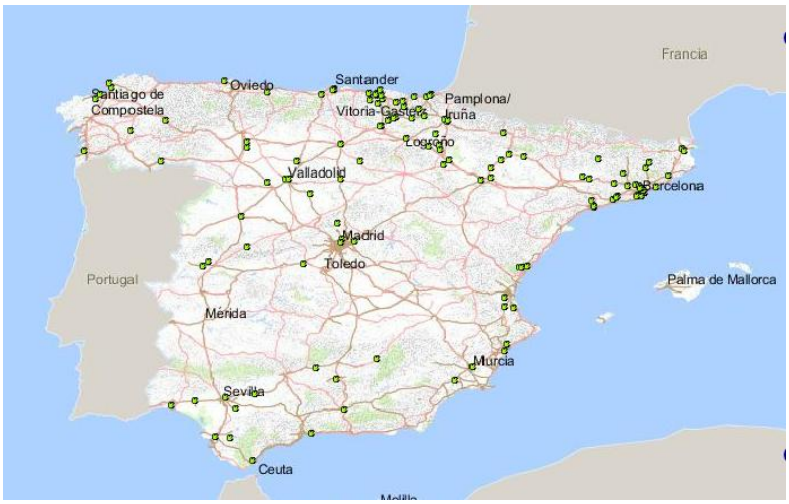
Graph 6. Spain's Renewable Fuels in Consumption in Transport (1,000 m^3)



Source: FAS Madrid based in CNMC data

The large majority of the biodiesel is placed in the market in non-labeled blends below B7. B100 consumption is small and follows a shrinking trend. Fewer than 150 petrol stations sell labeled and pure biodiesel (**Graph 7**).

Graph 7. Spanish Gas Stations Selling Biodiesel Labelled Blends



Source: www.geoportalgasolineras.es

Biodiesel consumption followed an upward trend driven by the mandates imposed between **2009** and **2011** (**Table 15**). Consumption of biodiesel in **2012** went down due to extensive use of HVO and lower overall diesel consumption.

Factors explaining the dramatic decline in **2013**, when biodiesel consumption more than halved, include the hydrocarbon tax exemption phase-out and the downward revision of mandates (**Table 1**).

In **2014**, biodiesel consumption remained fairly stable and marginally rebounded in **2015** driven by the regular diesel consumption recovery. In **2016** the small upward revision of consumption mandates, the increased regular diesel use along with the bioethanol specific target phase-out have resulted in a biodiesel consumption increase. Additional growth in biodiesel use is anticipated for **2017** as a result of the regular diesel consumption recovery and the higher mandate (**Table 10**).

Table 10. Spain's Fossil Fuel Biodiesel and HVO Consumption for Road Transport

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017e
Diesel	28,41	28,18	27,01	25,35	24,52	24,98	25,99	26,85	27,60
Biodiese	1,170	1,554	1,831	1,677	700	679	762	932	1,080
HVO (	-	-	91	886	241	356	330	361	380

Source: CORES and CNMC data.

- **Trade**

Despite installed capacity exceeds domestic demand projected for 2020, since **2008** biodiesel imports have represented a significant share of the mandate driven internal demand.
Imports of biodiesel halved in **2013** driven by the reduction of consumption targets enforced in early **2013**. The antidumping tariffs imposed on biodiesel originated in Argentina and Indonesia as of November 28th, 2013, along with production quotas enforcement in **2014** and **2015** contributed to a further decline of imports (See **Biodiesel Quota System** Section)., with Malaysia filling in the gap left by Argentina and Indonesia as a consequence of the anti-dumping duties imposed (**Table 12**). (For more information on anti-dumping duties imposed by the EU, see GAIN Report NL3034).

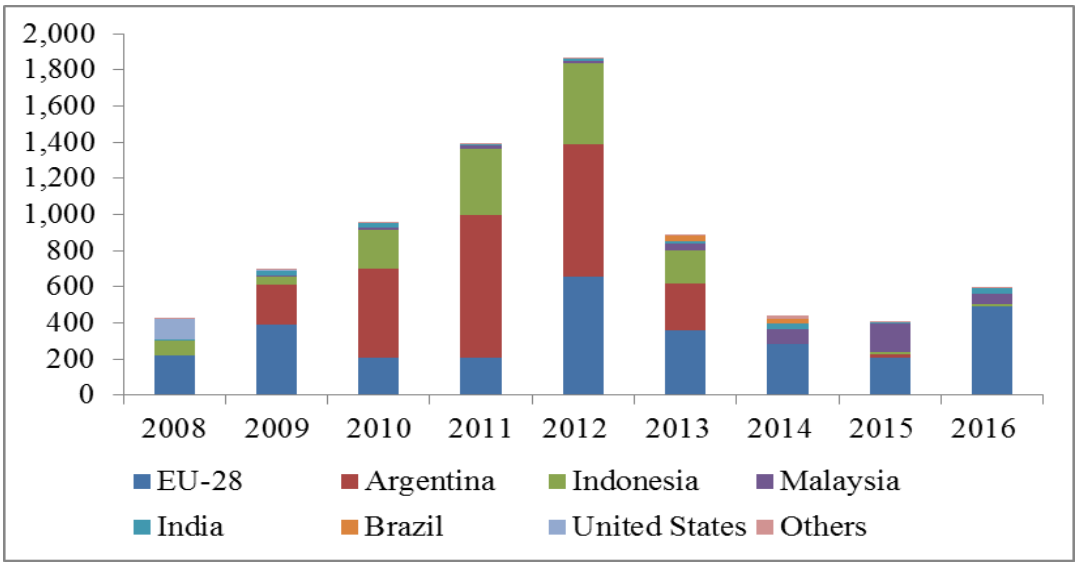
2016 has brought somewhat increased EU biodiesel exports to Spain, in response to the quota system phase out and the slightly higher internal target-driven demand (**Table 12**). In **2016** Spanish biodiesel exports hit a historically record level, driven by sales in other European Member States.
The above mentioned duties applied to Argentina and Indonesia will still protect the domestic biodiesel market against these competitive extra EU suppliers, at least until August 10, 2017, date when the EC plans to implement WTO recommendations (For additional information, see EU-28 consolidated Biofuels report), allowing to keep imports at a low rate.
In **2017** this trend may continue to consolidate (**Table 11**).

Table 11. Spain's Biodiesel Trade (1,000 m^3)

Year	2011	2012	2013	2014	2015	2016	2017e
Imports (1,000 m^3)	1,383	1,284	484	161	73	372	375
Exports (1,000 m^3)	344	227	472	409	337	664	850
Net Trade (1,000 m^3)	-1,039	-1,057	-12	248	264	292	475

Source: CNMC.

Graph 8. Spain's Biodiesel Suppliers (1,000 m^3)



Source: From 2008 to 2011 Global Trade Atlas (GTA) data. HS code 3824 90 91*

From 2012 to 2015e FAS Madrid calculations based on Global Trade Atlas (GTA) data using HS codes 3826 00 10, 3826 00 90 and 2710 20 11*

**HS code 3824 90 91 for biodiesel, covering fatty-acid mono-alkyl esters (FAME) was introduced in January 2008. Since January 2012 this HS code has been replaced by HS codes 3826 00 10, 3826 00 90 and 2710 20 11.*

Spain has normally been a net importer of HVO, with imports largely exceeding exports. However, statistical trade data available (**Table 12**) show how Spain became a net HVO exporter in **2016**.

Table 12. Spain's HVO Trade (1,000 m^3)

Year	2011	2012	2013	2014	2015	2016
Imports (1,000 m^3)	103	808	52	8	72	0
Exports (1,000 m^3)	0	2	2	0	24	57

Source: CNMC.

Future Perspectives

With all other incentives phased out, consumption mandates are the sole drivers for the Spanish biofuel market. Most of the factors create greater growth potential for biodiesel/HVO than for bioethanol. Duties in place will still keep away the most competitive foreign biodiesel suppliers such as Argentina

and Indonesia, at least until August 2017. The smaller size of the gasoline pool limits the contribution of bio-ETBE to meet the overall.

The consumption targets established for the period 2016-2020 set the pace of growth of the biofuel sector in Spain in the coming years. The 2020 target 8.5 percent is below the 10% of renewable energies in transport established by the Renewable Energy Directive. Electricity from renewable sources used for electric road vehicles or rail transport would bridge the gap between the 8.5 percent biofuel consumption mandate and the 10 percent target for 2020.
As Spain biodiesel production is highly dependent on palm oil, all eyes are at the consequences of the European Parliament vote on April 2017 to call on the EU to phase-out the use of palm oil in biofuels by 2020.

The transposal to national law of Directive 1513/2015 among other factors such as competition from imports will determine biofuels consumption and production dynamics in Spain for 2018. Additionally, the projected full enforcement of sustainability as of January 2018 would discourage non-sustainable certified oilseed and oils purchases and may affect the feedstock mix.

Going forward, the future of biofuel in EU is currently under discussion for the 2021-2030 time frame. The Spanish biofuel industry fears the negative effects for their first generation assets use optimization impacts of a switch towards a GHG emission system that further limits crop based biofuels, as second generation biofuels at a commercial stage are not sufficiently developed in Spain.

Related Reports

Report Title	Date Released
EU-28 Biofuels Annual Report 2017	06/28/2017
Biofuels Mandates in the EU by Member State -2017	06/09/2017
EU-28 Biofuels Annual Report 2016	07/04/2016
Biofuels Mandates in the EU by Member State -2016	06/29/2016
Portugal Biofuels Standing Report 2015	08/13/2015
EU-28 Biofuels Annual Report 2015	07/22/2015
Biofuels Mandates in the EU by Member State	07/16/2015
EU-28 Biofuels Annual Report 2014	07/08/2014
Spain Biodiesel Standing Report	12/13/2013
Spain's Bioethanol Standing Report	11/29/2013
EU-27 Biofuels Annual Report	08/13/2013
Spain's Bioethanol Standing Report 2012	09/24/2012
Spain's National Sustainability Scheme	09/03/2012
Portugal Biodiesel Standing Report 2012	02/17/2012
Spain Enacts Biodiesel Production Quota System	04/24/2012
Spain's Biodiesel Standing Report 2011	11/22/2011
Portugal Biodiesel Standing Report 2011	11/10/2011