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Portugal Biofuel Market Outlook 2017

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Report Highlights:

Since 2015, when the government set the overall biofuel mandate at 7.5 percent for transportation, the market has been adjusting to avoid exceeding the volumetric blending limit for biodiesel. Consumption of HVO and bio-ETBE/Bioethanol took pressure off the use of biodiesel, especially in 2015. In 2016 the use of use of double counting raw materials was maximized, resulting in a significant reduction of biodiesel sales. In 2017, additional requirements for UCOs and AFs may slow down the growth of double counting raw materials use in a more competitive and open to trade Portuguese biodiesel market.

Disclaimer: Portugal, 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 consolidated Biofuels report 2017](#).

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Executive Summary

Portugal's biofuels market consists mainly of biodiesel with only a minor use of HVO or ETBE in the diesel and gasoline respectively. Diesel is by far the most popular fuel for road transport.

Now that all other incentives have been phased out, the consumption mandate is the sole driver for the Portuguese biofuel market. Since 2015, when the overall biofuel mandate was set at 7.5 percent (energy basis) in transport fuels, the market adjusted to avoid exceeding the volumetric blending limits (B7 and E10 respectively). In 2016 this measure impacted the raw materials mix used in biodiesel by maximizing the use of double-counted raw materials. Other alternative put in place by blenders included the increased use HVO and/or bio-ETBE/Bioethanol in their diesel or gasoline blends respectively, particularly in 2015.

The extensive use of double counting raw materials and, to a lesser extent, HVO and/or Bio ETBE resulted in a smaller than anticipated growth of biodiesel sales in 2015 and a reduction in biodiesel consumption in 2016. Domestic biodiesel producers' response to the smaller biodiesel market was to export to other EU Member States, although ultimately their overall output level went down in 2016.

In 2017, the tendency towards meeting mandates with lower volume of biodiesel may be slowed down by a more strict control in Animal Fats and UCOs sourcing. At the same time, since 2017, with the domestic biodiesel market more open trade, Portuguese producers may face stiffer competition from other European Member States. Duties in place will still keep away the most competitive foreign biodiesel suppliers, at least until August 2017.

The increased mandate (9 percent) for 2018 along with the slight growth in consumption of regular diesel may open up 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, the profile of the raw materials used, and petrol companies blending strategy will be critical to understand 2018 biofuels consumption and production dynamics in Portugal.

References

- Abbreviations and definitions:

AF: Animal Fats

APPB: Portuguese Association of Biofuel Producers

Biodiesel: Fatty acid methyl ester produced from lipid feedstocks (vegetable oils, animal fats, recycled cooking oils) blended up to approved limits with petroleum diesel.

Bio-ETBE: (Bio Etyl-Tertio-Butyl-Ether): Gasoline additive produced out of bioethanol, contains 47 percent ethanol. ([Decree-Law 89/2008](#))

BXX: Blend of mineral diesel and biodiesel with the number indicating the percentage of biodiesel in the blend, e.g. B5 equals 5 percent biodiesel and 95 percent conventional diesel by volume

APPB: Portuguese Association of Biofuel Producers

CAP: Common Agricultural Policy

CY: Marketing Year

DGEG: Directorate General for Energy and Geology

EBB: European Biodiesel Board

ECS: Portuguese Sustainability Criteria Coordination Entity

EC: European Commission

EFT: Fiscal Warehouses for Transformation

ENMC: National Entity for the Fuels Market

ERSE: Energy Services Regulatory Agency

EU: European Union

FAME: Fatty-acid mono-alkyl esters

FQD: Fuel Quality Directive

GHG: Green House Gases

GOP: Government of Portugal

Ha: Hectares

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
 INE: Portuguese National Institute for Statistics
 ISP: Hydrocarbons Tax
 LNEG: National Laboratory for Energy and Geology.
 M/L Producers: Medium Large Producers
 MS: Member State
 MT: Metric Tonnes
 MY: Marketing Year
 Q: Quarter of the Year (Q1, Q2, Q3, Q4)
 S: Semester of the Year (S1, S2)
 N/A: Not Available
 RED: Renewable Energy Directive
 SDP: Small Dedicated Producers
 TdB-D/ TdB-G: Biofuel Titles (Diesel and Gasoline respectively)
 TdB-DC: Double Counting Titles
 TMT: Thousand Metric Tones
 Toe: Tons of Oil Equivalent
 UCO: Used Cooking Oil
 USD: US Dollar
 VAT: Value Added Tax
 WTO: World Trade Organization

- 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 = 1,282 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:

Biodiesel: HS codes 3824 90 91 (until 2011) and 3826 00 10, 3826 00 90 and 2710 20 11 (since 2012).

ETBE: HS code 29091910.

Portuguese Regulatory Framework

After the **biodiesel company quota** phase out, and the elimination of the **biodiesel maximum price** mechanism since **2015**, the only incentive in place is the **consumption mandate**, which is the Portuguese biofuel market driver. **Sustainability** is fully enforced in Portugal since **January 1, 2015** and double counting is in place since **2012**. Details on Portuguese competent authorities on biofuels can be found in **Annex I**.

- **Biofuel Targets**

Portuguese blending targets are amongst the highest blending mandates in the European Union. [Decree-Law 117/2010](#) of October 25, 2010 transposed [Directive 2009/28/CE](#) into national law. This piece of regulation established sustainability criteria for production and use of biofuel as well as the consumption targets from 2011 to 2020 maximizing the participation of biofuels in the 10% sub-target established for transport.

In **2015**, the overall biofuel consumption target was established at 7.5 up from the 5.5 percent in terms of energy in **2014**, and a 2.5 percent bioethanol specific-target was introduced since **2015**. [Decree-Law 69/2016](#) retroactively eliminated the bioethanol specific target since **2016**.

While initially in **2017** the overall mandate was 9 percent, according to [Law 42/2016](#) the overall consumption mandate was revised down, keeping it at 7.5 percent. In **2018**, the overall mandate is 9 percent and, in **2019** and **2020**, the overall energy mandate will be 10 percent in terms of energy (**Table 1**).

Table 1. Portugal Biofuel Targets

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Overall Energy Mandate (percent)	5		5.5		7.5		7.5-9	9	10	
Volume Mandate (percent)	<6.75*									
Bioethanol Specific Energy Mandate (percent)	N/A		N/A		2.5	2.5	2.5		2.5	

Source: Decree-Law 117/2010. Articles 11 and 28 as amended by Decree-Law 6/2012 and Decree-Law 69/2016 and Law 42/2016.

**TdB granted to SDP and managed by DGEG do not count against this volumetric limit.*

For additional information about Biofuels Mandates in other EU MS, please see GAIN report [GM17017](#).

- **Biofuel Target Compliance**

Biofuel target and sustainability compliance in Portugal are managed through a Biofuel Entitlement System. Biofuel producers and blenders are mandated to report to the ENMC (National Entity for the Fuels Market)¹ the amount of biofuels sold to other market operators. Producers and blenders must submit information in regards to the amount of biofuel produced, imported and sold to other companies. Blenders must submit information in regards to the quantity of regular fuel and biofuel marketed.

The ENMC issues Biofuel Entitlements, (TdB) as appropriate to the different industry actors. One TdB equals to a Toe marketed. According to [Implementing Regulation 301/2011](#), fines of 2,000 Euros are imposed per TdB that the obliged party fails to present.

According to ENMC data on TdBs issued and DGEG data on regular and renewal fuel consumption in transport, overall consumption targets were met, at least in an aggregated manner, every year.

A summary of TdB issued so far can be seen in **Table 2**.

¹ SDPs report to DGEG, which is in charge of their supervision.

Table 2. Summary of TdB issued

Year	Entity	TdB-D	TdB-G	TdB-DC*	TdB 1.1	Total TdB Issued
2012	M/L Biofuel Producers	280,266	-	3,406	-	290,645
	Importers	1,383	1,286	-	-	
	SDP	7,710	-	3,818	-	
	Total	289,359	1,286	7,224	-	
2013	M/L Biofuel Producers	260,199	-	5,298	-	275,548
	Importers	4,677	2,180	-	-	
	SDP	8,492	-	4,088	-	
	Total	273,368	2,180	9,386	-	
2014	M/L Biofuel Producers	282,868	-	10,799	-	295,948
	Importers	475	2,245	-	-	
	SDP	10,360	-	5,180	-	
	Total	293,703	2,245	15,979	-	
2015	M/L Biofuel Producers	316,927	7,523	42,456	-	398,475
	Importers	45,915	17,848	-	-	
	SDP	10,262	-	5,131	-	
	Total	373,104	25,371	47,587	-	
2016	M/L Biofuel Producers	367,304	11,950	115,746	124	407,635
	Importers	5,622	15,933	-	-	
	SDP	6,752	-	3,376	-	
	Total	379,678	27,833	119,122	-	

Source: LNEG Annual Reports and ENMC data.

*double counting is included in the TdB-D number.

**TdB equals TdB-D plus TdB-G (as TdB-DC are already included under those two categories)

Data available up to March 2017 indicate that no TdB-G or to TdB-D have been issued so far to imported biofuels. TdB-DC issued in these three months represent over one third of the total TdBs issued.

Prior to **2015**, when the overall consumption mandate was 5.5 percent, targets were met with “real” biofuels use. Since **2015**, when the 7.5 overall mandate was enforced, double counting TdBs and other renewable fuels such HVO and BioETBE, started playing a major role for mandate compliance in order to not to exceed the volumetric limits established by the [Fuel Quality Standard Directive \(FQD\)](#). In 2016, double counting raw materials was particularly significant (See **Feedstock** Section).

As the mandate is not diesel specific, the use of bio-ETBE/Bioethanol in gasoline blends is also an option for mandate compliance by blenders. Nevertheless, given the small and shrinking size of the gasoline pool (See **Consumption and Marketing** Section), the contribution of bio-ETBE/Bioethanol to meet the increasing consumption mandates is rather limited.

- **Biodiesel Quota**

Prior to **2015**, a maximum production quota was allocated to each biodiesel plant in Portugal. Despite this company-quota system phased out on **January 1, 2015**, according to Decree-Law 117/2010, TdB (Biofuel Entitlements) since then, TdBs were just issued to biofuel producers recognized as “Fiscal Warehouses for Transformation” (EFT). Consequently, blenders were allowed to seek other suppliers only if biofuels (TdB) issued to EFT are not sufficient for mandate compliance. Hence, in the absence of a company-specific quota, in **2015** and **2016** there was increased competence among domestic producers, while at the same time certain level of protection against imports remained in place.

This provision on EFTs priority was [challenged](#) by the European Commission. As a response, the GOP issued [Decree- Law 69/2016](#), which replaced the “Fiscal Warehouses for Transformation” (EFT) condition by “mandatory prior registration” to be eligible for mandate compliance. Additional details on the registration process can be found in the [link](#) (Portuguese language only) or in [Regulation 122/2017](#) (Portuguese language only).

Consequently, since **2017** the Portuguese market is more open to competition from other EU suppliers (See **Table 3**). Heavy duties are applied to the largest will still keep away the most competitive foreign biodiesel suppliers such as Argentina and Indonesia, at least until August **2017** (See **Trade** Section).

An updated list of registered producers for **2017** can be found in the [link](#).

Table 3. Biodiesel Quota Developments

Years	2010-2014	2015-2016	>2017
Mandate Compliance Condition	Allocation of Quota	“Fiscal Warehouses for Transformation” (EFT) Condition	Prior registration
“Type” of Quota	Company quota	“Country quota”	No quota
Implications	No Competition among companies	Competition amongst Portuguese based companies	Increased competition as the market is open to non- domestic registered producers

Source: FAS Madrid based in Portuguese Law

- **Transposition of the RED and Sustainability Implementation**

While Portugal transposed Renewable Energy Directive (RED) into national law in December 2010 by [Decree-Law 117/2010](#) and [Decree-Law 141/2010](#). [Decree-law 6/2012](#), prepared by the Ministry of Economy and Employment, delayed sustainability compliance verification until January 1, 2013 and suspended retroactively Decree-Law 117/2010 implications in regards to sustainability implementation until July 1, 2011. [Decree-Law 224/2012](#) published later in the year suspended sustainability criteria until July 1, 2014, when it was finally implemented and since January **2015** fully enforced. Implementation details can be consulted in **Table 4**.

Portuguese large and medium size biodiesel producers have opted for EC approved company schemes² to certify that their production is sustainable, as they rely strongly on imported raw materials, which fall out of the scope of the national scheme. Currently, only SDPs are subject to Portugal’s National Scheme, which is managed by the DGEG.

Table 4. Sustainability Implementation Calendar

Date	Regulation	Comments	Implications
2011	Decree-Law 117/2010 as amended by Decree-Law 6/2012	Transitory period includes 2011, 2012, 2013 and Q2014	No information on sustainability required
October 2012	Decree-Law 224/2012	As of July 1, 2014 the system is fully in place	Sustainability fully in place
June 2014	Comunicado 15/2014 (LNEG – ECS)	Transitory Period From July 1, 2014 until December 31, 2014	Book and Claim methodology is admissible
January 2015	Comunicado 15/2014 (LNEG – ECS)	From January 1, 2015	Sustainability fully in place

Source: FAS Madrid

² *Of the 15 Private Scheme recognized by the EU, the ENMC considers three of them as comprehensive, namely: 2BSvs, ISCC and RSB EU RED. All other Voluntary Regimes are accepted, however restricted to the scope that each voluntary scheme covers in its certification and taking into account its adequacy to the needs of each producer.*

- **Double Counting Provision**

According to [Decree-Law 117/2010](#), biofuels produced out of residues, non-food cellulosic and lingo-cellulosic raw materials count double against the established consumption mandates. [Annex III in Implementing Order 8/2012](#) defines the list of eligible raw materials³ as follows:

- Animal Fats Categories I and II⁴
- Animal manure
- Olive pomace (after pomace oil extraction)
- Non-alcoholic grape pulp
- Glycerin (non-refined)
- Cereal straw
- Rice straw
- Nut shells
- Fruits and vegetables products unfit for consumption
- Carob pulp
- Fleshy fruit pulp
- Deproteinized whey (from the dairy industry)
- Brewing and destiling dregs (from the beer production industry)
- Used Cooking Oils (UCO)
- Soapstocks
- Olein
- Free Fatty Acids (FFA)
- Starch sludge
- Sewage sludge

Domestic non-food raw materials, used to receive 1.3 TdB per Toe produced. Each Toe of biofuel produced out of domestic agricultural raw materials was granted with 1.1 TdB. However this additional value for domestic raw materials is just valid at the domestic level and could not be reported to the EC as part of the mandate compliance. It was only in **2016** when this kind of TdBs were issued, for the first and last time, to biofuel produced out of domestic raw materials, as this special treatment was revoked by [Decree-Law 69/2016](#) (See **Table 5**).

Table 5. Double Counting implementation

Feedstock	Domestic Market Counting	EC Target Counting
Listed in Annex III, Implementing Order 8/2012	x2	x2
Domestic non-food raw material	x1.3	x1
Domestic raw materials	x1.1	x1

Source: Decree-Law 117/2010 as amended by Decree-Law 69/2016.

Since **2015**, some biodiesel producers have opted for an extensive use of double counting raw materials, consequently increasing the number of TdB-DC issued. This tendency sharpened in **2016** (See **Table 6**). For additional information see **Biofuel Target Compliance** Section.

³ A comprehensive list updated on December 2016 can be found in the [link](#) (Portuguese language only).

⁴ [Regulation 1774/2002](#) laying down health rules concerning animal by-products not intended for human consumption defines three categories of Animal By-Products. Since 2016 Category III is excluded from double counting as it can be used for feed purposes.

Table 6. Number of Double Counting TdB (TdB-DC)

Year	2012	2013	2014	2015	2016	Q1 2017
Double Counting TDB	7,224	9,386	15,979	47,587	114,704	35,664

Source: ENMC.

- **Tax exemption**

At present, according to Implementing [Order 320-E/2011](#) of December 30, 2011 only SDPs are eligible for this tax exemption. At the moment, hydrocarbon tax (ISP) plus road tax for diesel in transport in Portugal amounts to 0.466 Euros per litre.

- **Technical fuel specifications in place**

EU Fuel Quality [Directive 2009/30](#) (FQD) enabled fuel operators to market B7 and E10. This piece of regulation was transposed into national regulation by [Decree-Law 142/2010](#), which increased the biodiesel content allowed from 5% to 7% and the bioethanol content permitted from 5% to 10%.

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”.

In the case of gasoline blends, in order to protect the oldest vehicles that are not prepared to operate on higher bioethanol contents, until **December 31, 2013**, supply of at least the lowest octane index gasoline with less than 5 percent bioethanol in terms of volume, and less than 2.7 percent of oxygen in terms of mass will be granted in all petrol stations. This type of gasoline is known as so-called "protective petrol". Same octane index gasoline can be also available with higher oxygen or bioethanol contents.

- **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. ILUC Directive also includes a New Annex listing raw materials that **count double** against the consumption mandates.

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 Portuguese Medium and Large biofuel producers.

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. It has not been transposed yet to Portuguese law.

Based on the profile of raw materials used in **2016** (See **Graph 3 in Feedstock** Section) the Portuguese biofuel industry is already operating well below under the 7 percent cap limit. Food crop based raw materials in **2016** represented 54 percent of the biofuel produced in Portugal, which until **2016** when the national preference still prevailed, was fairly similar to what was consumed in Portugal (See **Biodiesel Quota** Section).

• **EU Policy Developments affecting Portugal**

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 Portuguese 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, failing to set mandatory targets for biofuels consumption ([Renewable Energy Directive post 2020](#)). The future of biofuel in EU is currently under discussion for the 2021-2030 period. The revised 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**

Portugal biofuel production consists mostly of biodiesel. Repsol has been producing domestic bio-ETBE in the Sines Complex since spring **2015**. Industry sources report plans for HVO production in the same location as of **2017**, with an annual capacity of 50 million litres.

In Portugal, two types of biodiesel producers coexist: medium/large producers and small dedicated producers (SDPs). The latter are granted with a special status, including, but not limited, to hydrocarbon tax exemption. Additional details on SPDs can be found in **Annex II**. At the moment, there are **eight** medium to large-size biodiesel plants; most of them started operations between 2006 and 2009 (**Table 7** and **Graph 1**).

Table 7. Portugal's Biodiesel Plants

Company	Location	Capacity (1,000 m ³)	Feedstock**	Start of operation
Iberol*	Alhandra	136	SB, RS, PO, UCO & AF ⁵	2006
Torrejana*	Riachos	124	SB, RS, PO, UCO & AF ⁵	2006
Biovegetal*	Porto	136	SB, RS, PO, UCO & AF ⁵	2007
Prio*	Aveiro	114	SB, RS, PO, UCO & AF ⁵	2007
Sovena*	Palença do Baixo	108	SB, RS, PO, UCO & AF ⁵	2008
Valourodiesel	Torres Vedras	57	SB, RS, PO, UCO & AF ⁵	2011
Bioportdiesel	Baltar	36	SB, RS, PO, UCO & AF ⁵	2011
Enerfuel – Galp	Sines	31	AF & UCO	2013
TOTAL	-	742	-	-

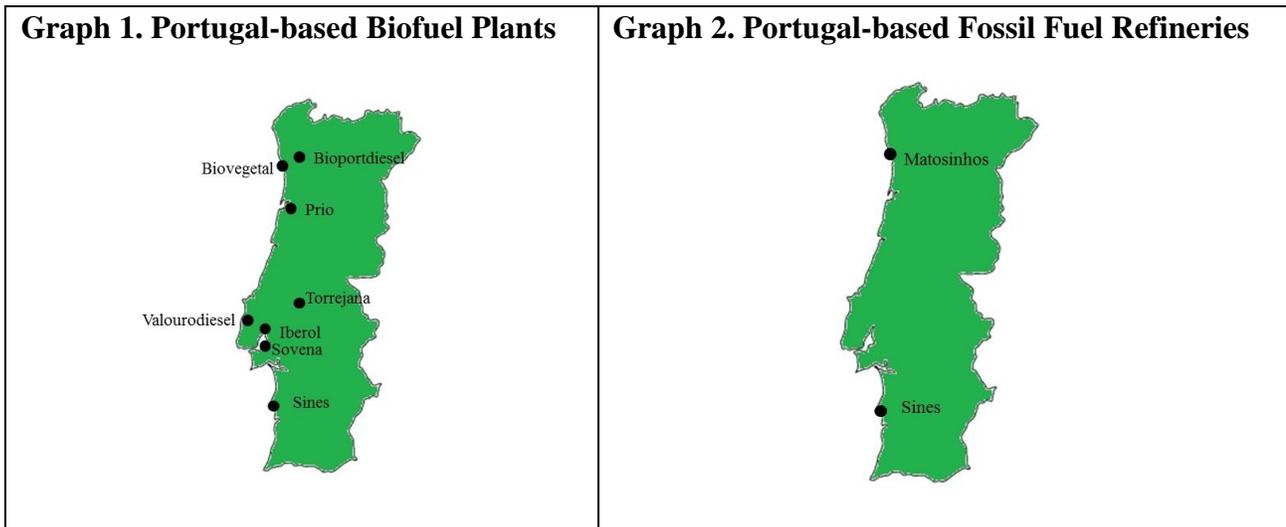
Source: FAS Madrid based on industry sources

*APPB members.

⁵ These plants have a limited capacity to process animal fats.

**Feedstock codes: PO: Palm Oil
 SB: Soybean Oil UCO: Used Cooking Oils
 RS: Rapeseed Oil AF: Animal Fats

Portugal’s petrol refining capacity though is concentrated in two locations: Sines and Matosinhos (**Graph 2**).



Source: FAS Madrid based on industry sources

Total biodiesel production capacity exceeds the country’s current consumption needs (See **Table 8** below and **Table 15** in **Consumption and Marketing** Section).

Table 8. Number of Biodiesel plants and Production Capacity in Portugal

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Biodiesel Plants	2	4	5	5	5	6	6	8	8	8	8
Biodiesel Capacity (1,000 m³)	260	510	618	618	618	711	711	742	742	742	742

Source: Industry

• **Production**

Biofuel produced in Portugal consists mainly on fatty acid methyl ester (FAME), obtained through the transesterification of vegetable oils. Given the “national preference” prevailing until **2016**, (See **Biodiesel Quota** section), domestic production was highly correlated with domestic sales, which are mandate driven.

Production of biodiesel by medium and large producers steadily increased over the years until **2012**, when it collapsed. Biodiesel production constrained further in **2013** and rebounded in **2014** in parallel

the conventional diesel trend. Despite the higher mandate, which went from 5.5 in **2014** to 7.5 percent in **2015** (36 percent increase), production growth was just over 10 percent. In **2016**, biodiesel production in Portugal declined by nearly 15 percent. The slowdown in growth, and later reduction of production levels in **2015** and **2016** respectively, are a direct consequence of the alternatives put in place to meet mandates without exceeding volumetric blending limits (See **Biofuel Target Compliance** Section).

In **2017**, with the Portuguese biodiesel market more open to trade (See **Biodiesel Quota** section), along with the alternatives to substitute biodiesel (See **Biofuels Target Compliance** Section) will be very challenging for domestic biodiesel producers. However, the more strict control in double counting raw materials sourcing (See **Feedstock** Section), the slight increase anticipated in conventional diesel consumption in the stable mandate scenario along with the bioethanol specific mandate phase-out could prevent domestic biodiesel production from further constrictions (See **Table 9**).

Table 9. Biodiesel Production and Capacity Use by M/L Producers in Portugal (1,000 m³)

Year	2012	2013	2014	2015	2016	2017e
Capacity (1,000 m ³)	711	742	742	742	742	742
Production M/L Producers (1,000 m ³)	351	323	342	380	329	350
Capacity use (percent)	49	44	46	51	44	47
Production SDP (1,000 m ³)	5	6	7	6	4	5
Total Biodiesel Production (1,000 m³)	356	329	349	386	333	355
Overall Mandate (Percent)	5	5.5	5.5	7.5	7.5	7.5

Source: FAS Madrid estimates based DGEG and ENMC data.

As it regards to petrol blends, since **2015** there is BioETBE production in Portugal (**Table 10**). Gasoline specific mandates enforced in **2015**, along with the fact that the higher overall mandate that was not compatible with the volumetric blending limits, drove the increase in gasoline substitution by national and imported BioETBE. However, the bioethanol specific mandate was retroactively eliminated for **2016** and the years to follow at the end of **2016**. Consequently, in the absence of a specific mandate, from **2017** on, Portugal's BioETBE production and consumption will solely depend on its price competitiveness and petrol's companies need to observe volumetric blending limits.

Table 10. BioETBE Production and Imports in Portugal (1,000 m³)

Year	2012	2013	2014	2015	2016	Q1 2017
Production (1,000 m ³)	-	-	-	15	24	N/A
Imports (1,000 m ³)	3	4	4	35	31	0

Source: FAS Madrid estimates based on ENMC data.

- **Other Renewable Biofuels**

Production of biodiesel from Used Cooking Oils or Animal Fats at the commercial level is very limited. It includes Small Dedicated Producers (SDP) output (See **Table 11**) along with Enerfuel, a GALP-owned plant based in Sines (Portugal), able to produce biodiesel out of Animal Fats and Used Cooking Oils, with a capacity of 31,000 m³ per year. In addition, Medium and Large producers have certain, but limited, capacity to process these raw materials.

Increased competition in the procurement of raw materials (UCOs) has resulted in a production decline in **2016** by Small Dedicated Producers, who are specialized on innovative processes.

Table 11. Small Dedicated Producers

Year	Number of SDP	Feedstock (percent)		Biodiesel Produced (1,000 l)
		UCO	AF*	
2012	14	98.4	1.6	4,934
2013	13	98.3	1.7	5,585
2014	11	100	0	6,571
2015	12	100	0	6,513
2016	13	100	0	4,284
2017e	18	100	0	5,000

Source: LNEG Reports and FAS Madrid calculations based on ENMC data.

*Poultry fat

For more information on Small Dedicated Producers special status see **Annex II**.

- **Feedstock**

Portugal biodiesel sector is heavily reliant on imported raw materials. Domestic oilseed production, essentially limited to olive oil and sunflower oil, is used almost exclusively in the food market.

Area planted to sunflower in Portugal in **2017** is projected at 15,000 Ha, down from the 18,000 Ha planted in **2016** (See **Table 12** for production estimates). While not statistically significant, industry sources report the use of domestic rapeseed for biodiesel production in **2016**. Other than this, the in-country supply for biodiesel production comes down to Animal Fats and UCOs. These markets are fragmented and, until **2015**, the procurement of Animal Fats and UCOs was only feasible for the SDPs.

Table 12. Portugal's Sunflower Seed Production

Year	2011	2012	2013	2014	2015	2016	2017e
Production (1,000 MT)	13	10	12	16	25	24	25

Source: INE (Portuguese National Institute for Statistics)

The deficit in domestic oilseed production for the biodiesel industry is normally compensated by imports of oilseeds (mainly rapeseeds and soybeans, See **Table 13**) to be crushed in the country or oil imports (palm oil, soybean oil or other Vegetable oils (See **Table 14**). However, the extensive imports of UCOs in **2016 (Table 14)** not only has resulted in the reduction of all crude oil imports, but also in reduced oilseeds imports for crushing in 2016 (**Table 13**), affecting more significantly to rapeseed crushing, which has traditionally being the preferred oilseed for biodiesel-oriented oilseed crushers due to its higher oil content, compared for instance to soybean, which is largely preferred by those crushers more focused in the protein content of the meal for feed rations.

Table 13. Portugal Oilseed Imports (1,000 MT)

Oilseed	2011	2012	2013	2014	2015	2016	Q1 2017
Soybean	643	611	782	756	781	759	199
Rapeseed	252	188	152	311	338	282	100
Sunflower	245	285	325	230	235	201	45
Total	1,140	1,084	1,259	1,297	1,354	1,244	244

Source: GTA on CY basis.

Table 14. Portugal Oil Imports (1,000 MT)

Type of Oil	2011	2012	2013	2014	2015	2016	Q1 2017
Soybean Oil	207	132	100	61	76	34	2
Palm Oil	75	75	67	48	58	37	8
Rapeseed Oil	42	40	64	43	40	19	6
UCO*	-	-	2	172	29	191	34
Total	324	247	233	324	203	281	50

Source: GTA on CY basis.

*Imports under HS Code 15180095⁶

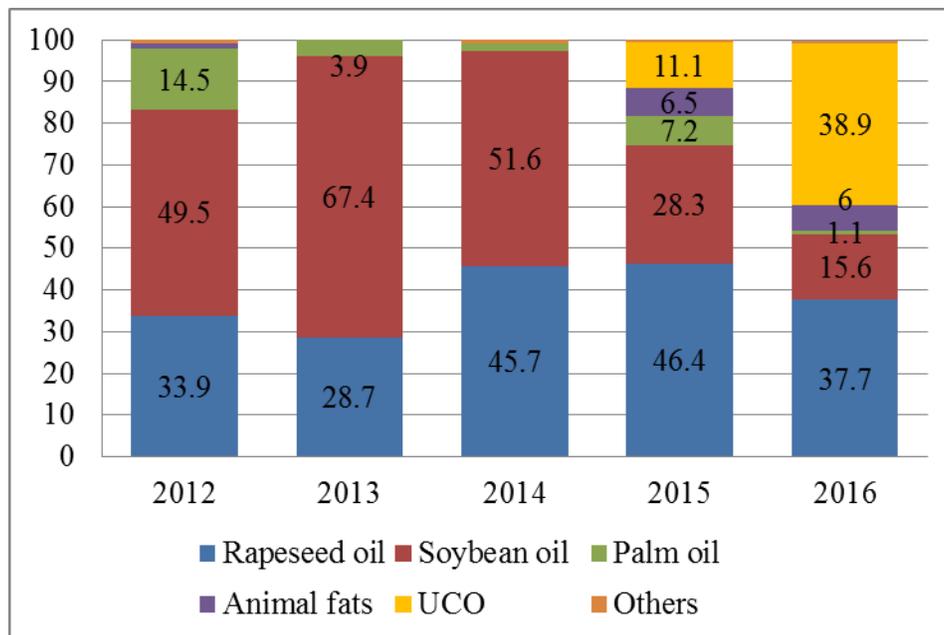
Oilseed crushing capacity in Portugal is managed by three companies. The Sovena-Bunge partnership manages two crushing facilities located in Palença do Baixo, one of them devoted to soybean crushing and the other one that can switch between rapeseed and sunflower. Iberol's plant in Alhandra can switch between the two main oilseeds (soybeans and rapeseed). Oleocom plant operated by Reagro resumed soybean crushing in **2016**. While the volume crushed can vary depending on the different price

⁶ *Inedible mixtures or preparations 'yellow grease' of animal or of animal and vegetable fats and oils and their fractions.*

relations, on average Portugal crushes about 750,000 MT of soybeans and about 300,000 MT of sunflower and rapeseed respectively.

Graph 3 shows how soybean oil was the preferred oil for biofuel production representing nearly 50 percent of the total feedstock in **2012**. Soybean oil use for biofuels remained strong throughout **2013** when it represented nearly 70 percent of the total oils used in biodiesel production in the country. In **2014** rapeseed oil gained market share as a consequence of a favourable price differential. Although at a lesser extent, sustainability requirements implementation⁷ also contributed to that shift in **2014**. Since **2015**, when the overall biofuel consumption mandate was set at 7.5 percent in energy content, the targets could not be reached just using crude oils, without exceeding volumetric limits (See **Biofuel Target Compliance** Section).

Graph 3. Raw materials used for Biodiesel Production between 2012 and 2016 (Percent)⁸



Source: FAS Madrid based on LNEG Annual Reports and ENMC data.

This situation ultimately impacted the profile of raw materials used in the biofuel mix. The use of double counting eligible raw materials, such as UCOs and Animal Fats to a lesser extent, grew at the

⁷ Since July 1, 2014, sustainability is required and Portugal-based biodiesel and crushing companies start buying sustainable raw materials since June 2014, although until December 2014 “book and claim” methodology was admissible.

⁸ According to the ENMC, there is seasonality in the Portuguese biodiesel industry feedstock use. Soybean and palm oil increase its use in the summer months (May through November), whereas rapeseed oil is the preferred raw material in the winter months (December through April).

expense of all crude oils. While in **2015** rapeseed oil use remained at similar levels to those achieved in **2014**; soybean use for biodiesel nearly halved.

In **2016** the use of UCOs as a feedstock for biodiesel grew further and, both soybean and palm oil use hit bottom in this same year. Some biodiesel producing companies opted for an extensive use of raw materials eligible for double counting (UCOs mainly). This resulted in total biodiesel sales reduction, as biodiesel produced out of double counting eligible feedstock contributed to meet mandates with without an increase in the volume of biofuel consumed.

Moreover, this situation further increased Portugal's reliance on imported raw materials, as the large majority of the UCO is being imported from outside the EU. On a positive note, double counting also contributes to meet mandates while observing the seven percent cap (energy basis) to the contribution of food crop based biofuels to the 10 percent target for renewable energy in transport by 2020, which is yet to be transposed to Portuguese law (See **Cap on Food Crop Based Biofuels** Section).

Available data for March **2017** indicate that a significant use of double counting eligible raw materials continue to represent a large share of the feedstock used. Having said that, for UCOs of exclusively vegetal origin as of April 1, 2017 a traceability certificate issued by a recognized Voluntary Scheme in order to be doubled counted is required. In addition to that, for fats and oil preparations derived from animals according to [Commission Implementing Decision 2016/1196](#) as of January 1, 2017, the Common Veterinary Entry Document (CVED) to pre-notify the arrival of each consignment is required. Moreover, [Portaria 145/2017](#) defines the rules for residues transportation within the country. According to this piece of law, residues must be accompanied by an "e-GAR", that is, an electronic certification that ensures traceability and serves as proof for sustainability compliance purposes. These additional requirements for UCOs and AFs since **2017** may contribute to slow down the growth of double counting raw materials.

- **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 Portuguese biofuels market size.

As in the large majority of EU Member States, diesel is the main transport fuel in Portugal. However, while the EU diesel-gasoline average ratio is 2:1, in Portugal it is 4:1, which means that the potential for ethanol and gasoline to contribute to meeting the RED 10% goal is much less than is the case in the EU-wide fuel market. Road transport diesel and gasoline consumption has followed a downward trend since **2008** as a consequence of the lower economic activity. However, since **2014** statistical information shows a slight recovery in diesel use, while gasoline consumption continues shrinking (**Table 15** and **Graph 4**).

Table 15. Fuel Consumption for Road Transport in Portugal

Year	2012	2013	2014	2015	2016	2017e
Bioethanol (1,000 m ³)	5	8	4	50	55	10
Gasoline** (1,000 m ³)	1,521	1,466	1,462	1,449	1,412	1,375
Diesel* (1,000 m ³)	5,007	4,885	4,993	5,172	5,199	5,250
Biodiesel (1,000 m ³)	354	322	350	353	322	351
HVO*** (m ³)	2	6	1	59	7	40
Biodiesel+HVO (m ³)	356	328	351	412	329	391

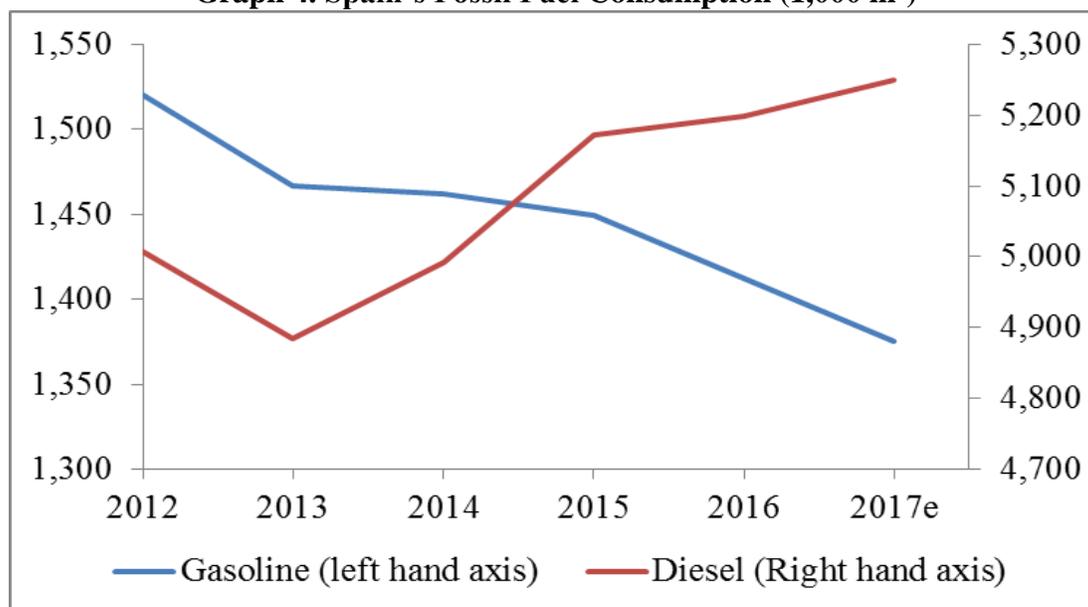
Source: DGEG, ENMC data and FAS Madrid estimates.

**Includes diesel plus biodiesel*

*** Includes bioETBE*

****Asuming TdB-D issued to imported biofuels consist entirely on HVO.*

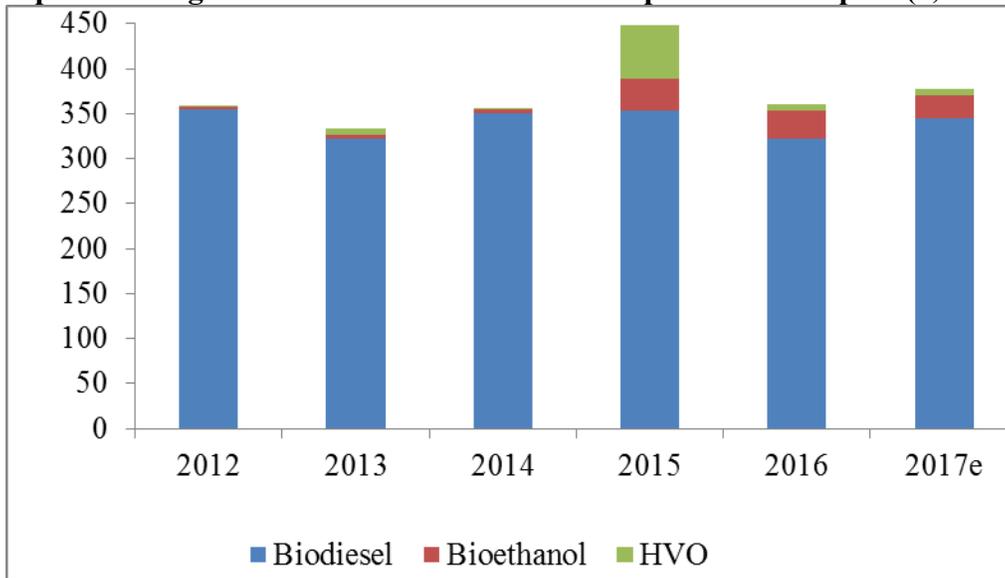
Graph 4. Spain's Fossil Fuel Consumption (1,000 m³)



Source: FAS Madrid based in DGEG data and FAS Madrid estimates.

The higher mandate in **2015** along with the regular diesel consumption growth allowed for a somewhat increased biodiesel use, despite the higher presence of double counting biofuels compared to the previous year and the larger role played by HVO and BioETBE/Bioethanol for mandate compliance (See **Graph 5**).

Graph 5. Portugal's Renewable Fuels in Consumption in Transport (1,000 m³)



Source: FAS Madrid estimates based on DGEG and ENMC data.

In **2016**, as a consequence of the extensive use of double counting raw materials, (See **Biofuel Target Compliance** Section) biodiesel sales hit its lowest level in five years, and HVO/BioETBE consumption also declined drastically.

For **2017** this tendency towards meeting mandates with lower volumes of biodiesel could continue. However, the more strict control in double counting raw materials sourcing (See **Feedstock** Section) may prevent the use of double counting raw materials from further growth.

In Portugal, bioethanol direct blending takes place, however, the large majority of renewable gasoline substitutive consumption occurs in the shape of bioETBE. Consumption of gasoline substitutive from **2017** onward is anticipated to be rather limited in the absence of a bioethanol specific quota retroactively eliminated since **2016** (For additional information See **Biofuel Target Compliance** Section).

- **Trade**

As the aftermath of the national preference in the biodiesel sourcing (See **Biodiesel Quota** Section) biofuels trade in Portugal until **2016** has been limited⁹. Biofuel imports mainly consisted on Bio-ETBE/Bioethanol or HVO and in most occasions originated in neighbouring Spain.

Since **2017**, higher imports from other EU Member States may be registered (See **Biodiesel Quota** Section). However, heavy duties applied to the largest will still keep away the more 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 2017](#)).

The higher overall consumption mandate and specific bioethanol mandate triggered HVO and BioETBE imports in **2015** (See **Biofuel Target Compliance** Section). On the contrary, in a smaller number of TdB was issued to imported biofuels in **2016** as the market was sufficiently supplied by the extensive use of double counting raw materials in domestic biodiesel production (**Table 16**). Based on statistical information available for **2017**, no TdB have been issued so far to imported biofuels. Nevertheless, increased competition by registered foreign producers (See **Biodiesel Quota** Section) may open up import opportunities.

Table 16. TdB issued to Imported Biofuel

Year	2012	2013	2014	2015	2016	Q1 2017
TdB-D	1,383	4,677	475	45,915	5,622	0
TdB-G	1,286	2,180	2,245	17,848	15,933	0
Total	2,669	6,857	2,720	63,763	22,059	0

Source: LNEG Reports and ENMC data.

With regards to exports, Spain, Belgium, France and Italy are the main destinations for Portuguese biofuel production. Trade data available for **2016** show a significant increase in FAME exports; most likely as the aftermath of the stiffer in-country competition, Portuguese producers were eager to find new markets to place their biodiesel (**Table 17**).

Table 17. Portugal Biodiesel Exports (1,000 m³)

Year	2013	2014	2015	2016
Spain	6,923	14,729	7,972	18,659

⁹ Since January 1, 2015 the company quota system phased-out. Nevertheless, according to Decree-Law 117/2010, TdB are just issued to biofuel producers recognized as “Fiscal Warehouses for Transformation” (EFT). Blenders are allowed to seek other suppliers only if biofuels (TdB) issued to EFT are not sufficient for mandate compliance. Since 2017 this condition has been replaced by prior registration, which would allow to non-domestic biodiesel producers to be eligible for mandate compliance.

France	-	-	1,306	12,872
Belgium	3,416	-	-	4,794
Italy	3,353	-	-	4,561
Others	10	8	10	6
Total	13,702	14,737	9,289	40,891

Source: GTA and FAS Madrid estimates based on HS Code 38260010.

Future Perspectives

With all other incentives phased out, consumption mandates are the sole drivers for the Portuguese biofuel market. At the moment the Portuguese blending targets are amongst the highest blending mandates in the European Union. Diesel is the main transport fuel in Portugal. Consequently, the non-fuel specific mandate-driven market mainly creates opportunity for both domestic and, since 2017, for European biodiesel producers. The small and shrinking size of the gasoline pool the contribution of bio-ETBE/Bioethanol to meet the increasing overall mandates is rather limited.

In 2017, the tendency towards meeting mandates with lower volume of biodiesel may be slowed down by a more strict control in Animal Fats and UCOs sourcing, but at the same time, since 2017, with the domestic biodiesel market more open to trade, Portuguese producers may face stiffer competition from other European Member States, which could negatively affect domestic production levels as well.

The increased mandate (9 percent) for **2018** along with the slow growth consumption of regular diesel may open up room for increased in-country biodiesel production. The transposal to national law of Directive 1513/2015 among other factors such as competition from imports, the profile of the raw materials use and petrol companies blending strategy will be critical to understand 2018 biofuels consumption and production dynamics in Portugal.

The **2020** target is exactly 10% of renewable energies in transport established by the Renewable Energy Directive, leaving no role to renewable energy other than biofuels in the transport sector.

Going forward, the future of biofuel in EU is currently under discussion for the 2021-2030 period. The Portuguese 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, given the limited second generation in-country production capacity.

Annex I. Relevant Portuguese Competent authorities in biofuels

There were three relevant government agencies managing the Portuguese biofuels sector are the Directorate General for Energy and Geology (DGEG) and the National Entity for the Fuels Market (ENMC) and the Energy Services Regulatory Authority (ERSE).¹⁰

Annex II. Small Dedicated Producers Special Status

In Portugal, there is a number of **Small Dedicated Producers** (SDP) granted with special conditions described in [Decree Law 62/2006](#) as amended by [Decree Law 206/2008](#).

SDPs must have an annual production of less than 3,000 MT of biofuels or other renewable fuels. They must use all of their production in dully identified captive consumers or fleets and use of residues or resource for projects of technological development, less pollutant products, innovative processes or in demonstrate ion phase.

SDPs report to DGEG, which is in charge of their supervision.

SDPs can opt for sustainability assurance through private schemes or through a simplified system managed by the Directorate General for Energy Geology (DGEG).

TdB granted to SDP are managed by DGEG in accordance to Article 19 of Decree-Law 117/2010. These TdB are auctioned before February every year. Interested parties can bid on TdB which, according to industry sources, have a market value of over 350 Euros.

SDPs are eligible for hydrocarbon tax exemption and double counting.

• ¹⁰ Additional details on each Departments' role can be found in Portuguese law: [Decree-Law 165/2013](#) as amended by [Declaração de Rectificação 9-A/2014](#), [Decree-Law 130/2014](#) and [Law 42/2016](#) (Portuguese language only).

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