AN GHNÍOMHAIREACHT CHÚLTACA OLA NÁISIÚNTA
THE NATIONAL OIL RESERVES AGENCY

THE BIOFUELS OBLIGATION SCHEME

ANNUAL REPORT 2017

A report on how the scheme has been implemented to date and an assessment of the level of compliance by obligated parties during the 2017 obligation period.

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EXECUTIVE SUMMARY

The Biofuel Obligation Scheme (BOS) is one of the measures introduced by the Irish Government to assist with complying with the requirement imposed on all EU Member States by the Renewable Energy Directive (RED) to ensure that, by 2020, at least 10% of the final consumption of energy in transport is from renewable sources. NORA was appointed under the Energy (Biofuel Obligation and Miscellaneous Provisions) Act 2010 to administer the Scheme and the Agency appointed a consortium of Byrne Ó Cléirigh and LHM Casey McGrath to assist with its administration. A project team (the BOS Team) was subsequently established with personnel from NORA and members of the consortium. This Team has drafted and implemented a comprehensive set of systems and procedures for implementing and administering the scheme.

Under the scheme, the oil companies and large oil consumers that are currently obliged to pay the NORA Levy (the obligated parties) are required to ensure that a specified amount of their total relevant disposal of road transport fuel is in the form of biofuel. For 2017, this amount was 8%.

They must also pay a levy of €0.02 per litre on their biofuel disposals and may then apply to NORA for one biofuel obligation certificate (BOS Cert) in respect of each litre. In the case of biofuel produced from wastes and residues, two BOS Certs per litre may be awarded. At the end of each obligation period (the calendar year) obligated parties are required to surrender to NORA sufficient Certs to match their obligation. Failure to surrender sufficient Certs incurs a liability to pay a buy-out charge which is set at €0.45 per litre.

Companies that produce or supply biofuels may also open a BOS account and apply to NORA for BOS Certs on their relevant disposals. Account holders may also obtain BOS Certs by arranging with other account holders to have Certs transferred to their accounts. Following the 2017 reconciliation period, there were ten BOS obligated parties and four companies that produce or supply biofuels registered as BOS account holders.

In total, for the 2017 obligation period, c. 226 M litres of biofuel was placed on the Irish market and 393 M Certs were awarded in respect of those disposals. At the end of the period, including those Certs that were carried forward from previous periods (68 M), account holders were in possession of c. 461 M BOS Certs; the 2017 biofuel obligation was c. 386 M Certs. All the obligated parties were in possession of sufficient BOS Certs to satisfy their respective biofuel obligations and approximately 75 M BOS Certs have been carried forward into the 2018 obligation period.

All the biodiesel placed on the market was eligible for two BOS Certs per litre on account of it being produced from a waste or residue (this was the same in 2016). Approximately 1% of the bioethanol placed on the market was double counted; 2017 was the first year in which double counted bioethanol was placed on the market.

There were eleven different biofuel feedstocks reported in the BOS Sustainability Statements and seven of these were reported for bioethanol:

- EC corn
- Non-EC corn
- Sugar cane
- Sugar beet
- Wheat
- Triticale (a hybrid of wheat and rye)
- Whey permeate (double counted)

There were four feedstocks reported for biodiesel:

- Category 1 tallow
- Used cooking oil
- Spent bleached earth
- Palm oil mill effluent

The feedstocks were reported to have originated from sixty-eight different countries, including Ireland. The single largest source of biofuel feedstock was China (15.5%) followed by the UK (15%); approximately 10% of the feedstock originated from Ireland.

Almost 63% of all the biofuel placed on the market in Ireland was produced from used cooking oil (UCO) which was sourced from fifty-six different countries. The majority was sourced from China (25%), followed by the US (10%).

Nearly all the biofuel placed on the Irish market was reported as being ISCC certified. ISCC was the only Voluntary Scheme reported and accounted for 99.9 % of the biofuel placed on the market.

A central requirement of the RED and the Sustainability Regulations is that biofuels achieve a 35% reduction in carbon intensity (GHG emissions) in comparison to fossil fuels. The average litre of biofuel placed on the market in Ireland in 2017 had a carbon intensity of c. 16 gCO_{2eq} / MJ, which represents an 81% reduction in carbon intensity in comparison to road transport fossil fuel. Based on the average biofuel carbon intensity, the substitution of fossil fuel with biofuel resulted in an estimated reduction of c. 457 thousand tonnes of CO_{2eq} emissions. This equates to an overall saving of 3.4% in the GHG emissions[1] from the road transport sector as a consequence of achieving a biofuel penetration rate of 4.8%, *by volume*[2].

The annual audit of BOS account holders was carried out during 2017. The programme included a plenary audit of all the levy returns' data, four on-site audits and several desk-based audits. There were no material errors found in the Sustainability Statements, during the desk-based audits and in the on-site audits.

[1] This saving is calculated using the Fossil Fuel Comparator (83.8 cCO2e/MJ) provided in the RED. This is **not** the same as the method laid down in Council Directive 2015/652 for measuring compliance with the Fuel Quality Directive. The carbon intensities are based on life cycle GHG emissions and are calculated in accordance with Annex V of the RED.

[2] The biofuel penetration rate is 5.1% when expressed as a percentage of the total volume of fossil fuels and 4.84% when expressed as a percentage of all road transport fuels (bio and fossil).

For the 2018 obligation period, the biofuel obligation has remained at 8% and applications for BOS Certs are required to be submitted on a quarterly basis, in accordance with the determination published on NORA's website. Quarterly deadlines for submitting applications for BOS certs were introduced in 2017.

The BOS Team has progressed with preparing the BOS systems for the provisions of the ILUC Directive and with implementing the requirements of Article 7a of the FQD, as transposed by SI 160 of 2017. The FQD will require fuel suppliers to reduce life cycle GHG emissions per unit of energy from fuel and energy supplied to transport by 6% in 2020. SI 160 designates NORA as the agency to which the fuel suppliers shall report.

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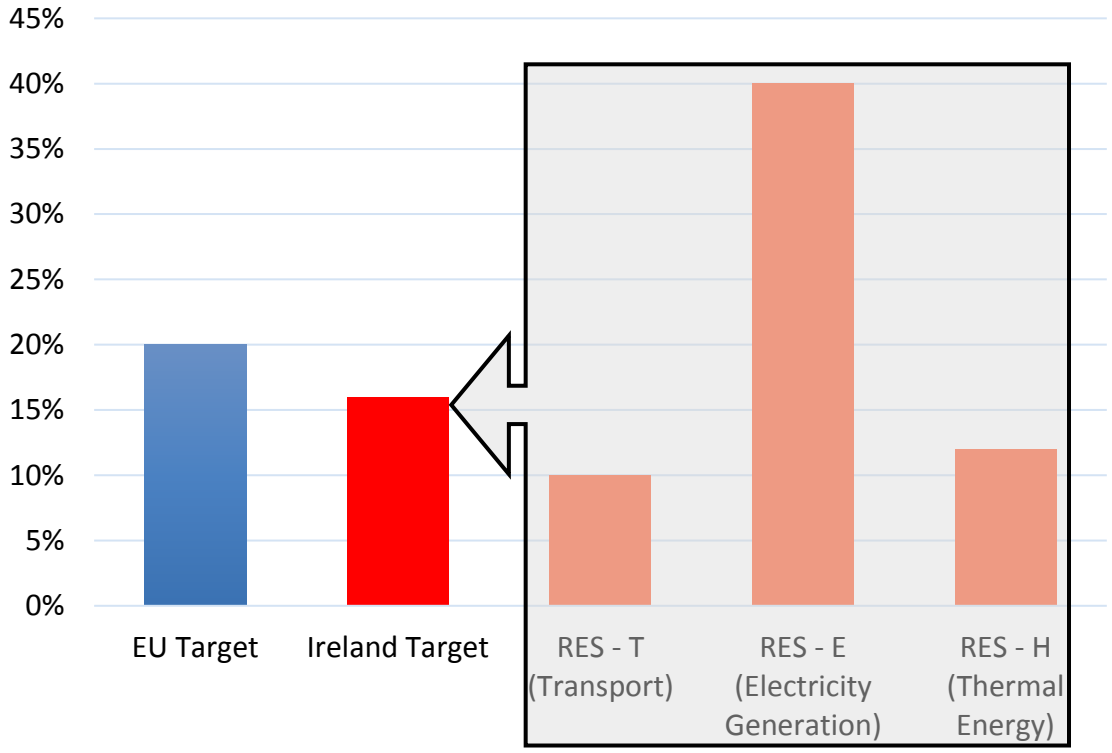
1 BACKGROUND

Article 3 of the Renewable Energy Directive (1) sets out mandatory national overall targets and measures for the use of energy from renewable sources for all EU Member States. Ireland's target for the share of its gross final consumption of energy to come from renewable sources, by 2020, is 16%.

Figure 1: Renewable Energy Targets



Although Member States may set individual targets for heat (RES-H) and electricity (RES-E), item 4 of Article 3 places the following obligation on all Member States:

> *Each Member State shall ensure that the share of energy from renewable sources in all forms of transport in 2020 is at least 10 % of the final consumption of energy in transport in that Member State.*

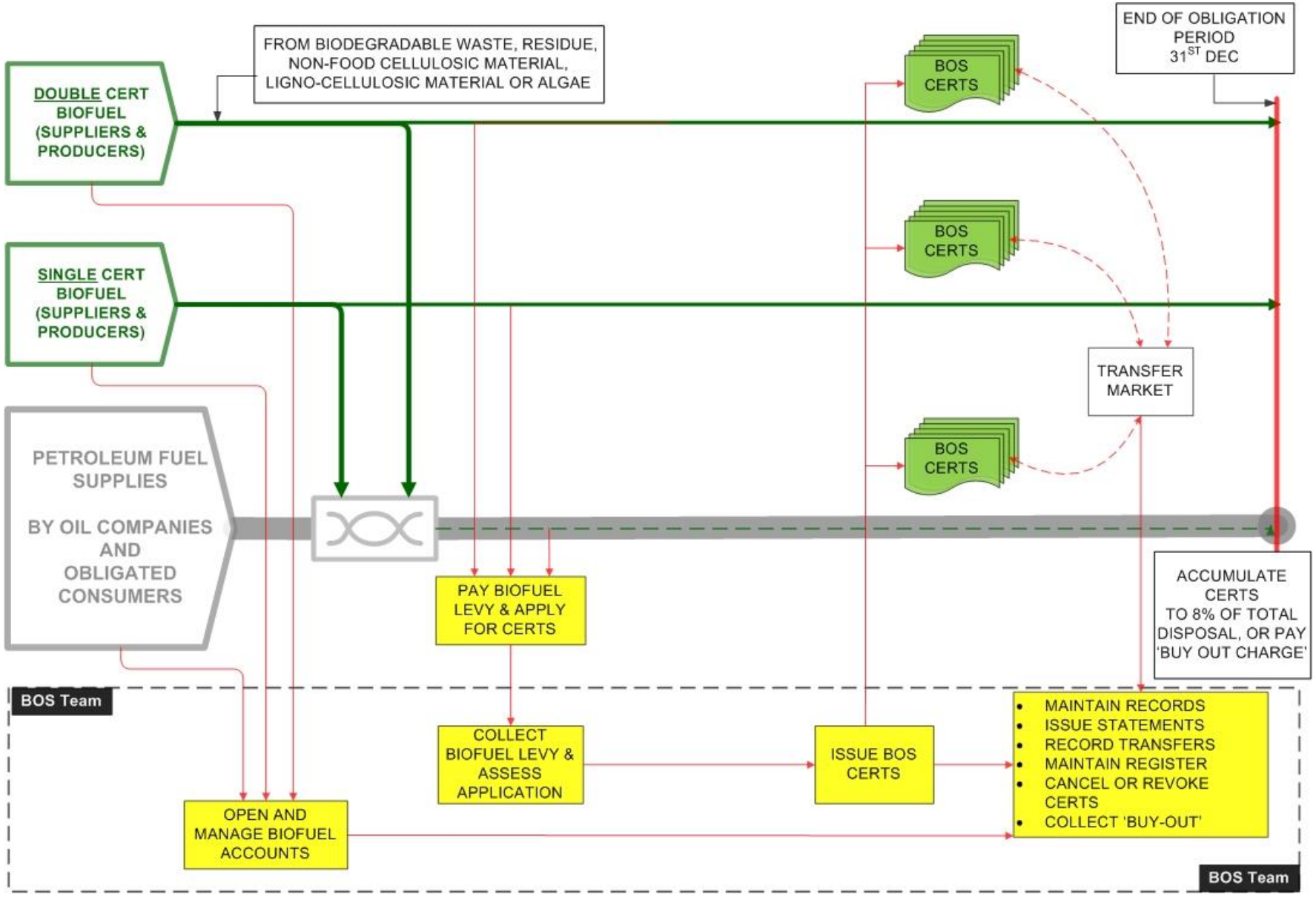
It is in the context of this obligation that Ireland has implemented the Biofuels Obligation Scheme (BOS) which was given effect in law by the Energy (Biofuel Obligation and Miscellaneous Provisions) Act 2010 (2). The scheme is one aspect of a twin approach in meeting the EU target for the use of renewable energy in transport; the second is to encourage the accelerated development and usage of electric vehicles (EVs). In 2008, an ambitious national target of having EVs account for 10% of the vehicle fleet by 2020 (about 230,000 vehicles) was set. This was subsequently reduced to 50,000 in the 2015 Energy White Paper. More recent projections from SEAI anticipate that the total number of EVs will be 10,000 by 2020. The recently published AFID National Policy Framework (required under

the Alternative Fuels Infrastructure Directive (3)) estimates that there will be 8,000 EVs by 2020, if all current policy measures and incentives remain in place.

Under the BOS Act, The National Oil Reserves Agency (NORA) is the body charged with administering the BOS. In June 2010, following an open tendering process, a consortium of Byrne Ó Cléirigh and LHM Casey McGrath (BÓC-CMG) was appointed to assist NORA with implementing and administering the BOS. The consortium was re-appointed in 2015. Throughout this report, the individuals from BÓC-CMG and NORA who collaborate with implementing and administering the scheme are referred to as the BOS Team.

This document provides an overview of the BOS and describes how it was implemented throughout the 2017 obligation period. It also illustrates the extent to which the overall biofuel obligation was met and how each individual obligated party performed.

Figure 2: Overview of Biofuel Obligation Scheme



2 AN OVERVIEW OF THE BIOFUELS OBLIGATION SCHEME

Figure 2 provides an overview of the BOS. The principal features are described below.

2.1 BOS ESSENTIALS

- The BOS obliges all oil companies and oil consumers (obligated parties) that make relevant disposals of road transport fuels to ensure that a specific percentage of their total disposals, in a given obligation period, is biofuel.
- The first obligation period was from July to December 2010, inclusive. The 2017 obligation period ran from January to December 2017, inclusive.
- The 2017 obligation was 8% by volume and this corresponds to 8.696% of the petroleum based disposal. The obligation will remain at 8% for 2018 but will increase to 10% in 2019; it is planned to increase it again in 2020 to approximately 11%. Obligated parties meet their obligations by disposing of biofuel (which can be a liquid or a gas). They may also meet the obligation by purchasing BOS Certs from other BOS account holders or by paying the buy-out charge.
- Obligated parties are awarded biofuel obligation certificates (BOS Certs) at the rate of one for each litre of biofuel they place on the market. For certain biofuels – those manufactured from biodegradable waste, residue, non-food cellulosic material, ligno-cellulosic material or algae – two BOS Certs per litre may be claimed.
- Obligated parties discharge their obligation by surrendering the appropriate number of BOS Certs to NORA at the end of the obligation period. BOS Certs may be transferred between parties – NORA has no role in negotiating transfers.
- A Biofuel Levy (currently €0.02 per litre) is payable on all disposals of biofuels. This levy is payable to NORA.
- An obligated party that has not collected sufficient BOS Certs to meet its obligation in a given obligation period is liable to pay a buy-out charge which is currently set at €0.45 per litre. This charge is collected by NORA but is payable to the Exchequer.
- NORA is responsible for assessing applications for BOS Certs, for issuing Certs, for recording all transactions and for facilitating transfers of BOS Certs between account holders.
- All biofuel placed on the market must be sustainable. Sustainability is determined in accordance with the BOS Application and Sustainability Procedure (3).
- Under certain circumstances, BOS Certs may be cancelled or revoked.
- BOS Certs may be carried forward for a period of two years from the end of the obligation period in which they were initially issued. However, no more than 25% of a party's obligation, in a given obligation period, may be met from BOS Certs that have been brought forward in this manner. In a Biofuels Obligation Scheme Policy Statement (4) issued by the DCCAE, it is stated that this allowance will be reduced to 15% in 2020.

2.2 IMPORTANT DATES

The following important dates are specified in legislation and by NORA.

- The obligation period for 2017 commenced on the 1st of January and ended on the 31st of December.
- It is a legal requirement to submit quarterly applications for BOS Certs on the following dates.

Reporting Period	Closing Date
1 January to 31 March	15 May
1 April to 30 June	14 August
1 July to 30 September	14 November
1 October to 31 December	14 February

- The date by which NORA is obliged to inform BOS account holders of the extent of their biofuel obligations for the previous obligation period and the number of BOS Certs held on their account in respect of that period is the 14th of March.
- The deadline date for transferring BOS Certs is 22nd March.
- The final date by which obligated parties must inform NORA of which BOS Certs are to be set off against their obligation is the 13th of April.
- The 27th of April is the date by which NORA is obliged to raise invoices for any buy-out charges that may be payable by an obligated party. They may be raised sooner, if desired.
- The buy-out charge must be paid within 28 days from the date of the invoice.

2.3 BOS PARTICIPANTS

Entities participating in the BOS can be obligated parties or producers/suppliers of biofuels that have applied to NORA for a biofuel obligation account and are now holders of such an account.

2.3.1 Obligated Parties

An obligated party is any oil company or oil consumer liable to pay the NORA Levy; the biofuel obligation applies to its relevant disposals of road transport fuel in the obligation period. It applies whether or not the NORA Levy was paid and, in the case of an oil consumer, whether or not the oil consumer is exempt from or has claimed an exemption from the NORA Levy.

At the start of the 2017 obligation period, the following companies were identified as obligated parties under the BOS:

1. Valero Energy (Ireland) Ltd
2. Irving Oil Whitegate Refinery Ltd (formerly P66)
3. Inver Energy Ltd
4. Irish Rail
5. John Kelly Fuels (Ireland)
6. Lissan Coal Company Ltd
7. Maxol Ltd
8. Nicholl (Fuel Oils)
9. Tedcastle Oil Products
10. Topaz Energy Ltd

Some of the operators on the above list have arranged to purchase all their road transport fuels from other operators on a NORA Levy-paid basis. This arrangement eliminates their biofuel obligation as it is carried by the company that supplied the levy-paid material.

2.3.2 Biofuel Producers and Suppliers

In addition to the ten obligated parties, there were two biofuel producers/suppliers at the start of 2017:

1. Green Biofuels Ireland
2. Agri Energy

Both companies previously applied for and were granted BOS accounts. Each company reports its disposals of biofuel to the DCCAE via the OLA system[3], pays the Biofuel Levy and claims BOS Certs on those disposals. Neither of these account holders incur a biofuel obligation as they do not place diesel or gasoline on the market.

During 2017, new BOS accounts were opened for Calor Teoranta Ltd and for Carbery Food Ingredients Ltd.

2.4 ENGAGEMENT WITH BOS PARTICIPANTS

Throughout the 2017 obligation period, and during the weeks following the end-of-period reconciliation, the BOS Team maintained regular contact with all BOS participants by email and phone.

NORA's website is used to host all BOS documents (procedures, guidance notes, application forms, etc.) that are likely to be required by the BOS participants.

[3] The Online Levy Application (OLA) reporting system is used by Obligated Parties to report monthly disposals of oil products to the DCCAE.

From the outset of the BOS, the Team has used dedicated email accounts for receiving and issuing all email communications with the BOS participants (bos@nora.ie & bosaccounts@nora.ie).

During 2017, audits were carried out on account holders by members of the BOS Team to determine the level of compliance with the requirements of the BOS Act. The audit process and the findings are discussed in more detail in Section 4.8 of this report.

The BOS Team held two briefing sessions during the year. The first was held in April and the second in November. Both sessions were attended by nearly all account holders and followed a similar agenda.

1. Provide an update on BOS performance.
2. Highlight any recurring problems with BOS Cert applications or the data contained therein (the problems and data are anonymised).
3. Set out any planned changes to the BOS systems.
4. Identify and summarise new legalisation that will impact on the BOS.
5. Provide an update on legislative changes (by the DCCAE).
6. Provide an update on industry's perspective (by IPIA or another BOS account holder).

The sessions are relatively informal and provide a forum for open discussion, which is welcomed and encouraged.

3 BIOFUEL OBLIGATION ACCOUNTS

This section explains how NORA met the principal obligations and responsibilities that were placed on the Agency to both implement the BOS and to administer it over the 2017 obligation period.

3.1 ACCOUNT SET UP & CLOSURE

Accounts were opened for two companies during 2017: Calor Teoranta and Carbury Food Ingredients. Both companies applied for BOS accounts. While neither company currently places road transport fuel on the market, both companies have demonstrated their capacity and intention to supply biofuels.

There were no BOS accounts closed during 2017.

3.2 MANAGING BIOFUEL OBLIGATION ACCOUNTS

All the account files maintained for BOS account holders employ a standard file-breakdown-structure (FBS) so that any of the matters referred to in Section 44E(2) of the legislation can be properly recorded. Account files are held electronically on Byrne Ó Cléirigh's server. Encrypted back-up copies are made daily to a secure off-site data center.

The Control and Reconciliation spreadsheet (4) acts as the overall control document for recording BOS transactions. Data on disposals of petroleum-based road transport fuels and biofuels are transferred to this spreadsheet from the monthly returns made by BOS account holders[4]. Data on disposals are also transferred to the BOS Online System (BOSOS). The BOSOS is a web-based platform through which account holders submit applications for BOS Certs and transfer Certs between accounts. As part of the application process, the BOSOS accepts and stores the sustainability statements and independent verification reports. Sustainability statements are submitted in csv format[5] and stored in a SharePoint database. The system also provides account holders with data on their BOS obligation and on the number of BOS Certs held in their respective account. It also enables them to view interim and final statements of account, as required under the BOS Act.

3.3 ISSUING BIOFUEL OBLIGATION CERTIFICATES

There is a standard procedure in place for issuing BOS Certs (3). There is also a comprehensive guidance document to accompany the procedure (5). A standard template is used by the BOS Team when checking all applications for BOS Certs and for recording NORA's authorisation or refusal of such Certs.

Under Section 44G of the legislation, NORA is required to issue *"… 2 Certificates in the case of such biofuels as the Agency may from time to time determine, in accordance with this*

[4] Returns made to DCCAE via the OLA system.

[5] CSV: Comma-separated Value. It is a common file type which can be opened by many different programmes.

section, are so eligible having satisfied itself that the material used to produce the biofuels concerned can be considered to be a biodegradable waste, residue, non-food cellulosic material, ligno-cellulosic material or algae … and one Certificate in the case of all other biofuels". The BOS Team maintain a further set of procedures and guidance documents in order to meet this requirement of the legislation.

Details of the number of applications for BOS Certs received by NORA and of the number of Certs issued and transferred are provided in Section 4.

In 2017, applications for two BOS Certs per litre were received in respect of six materials: Used Cooking Oil (UCO), Category 1 Tallow, Palm Oil Mill Effluent (POME), Spent Bleached Earth (SBE), Poultry Feather Acid Oil (PFAO) and Whey Permeate. The applications for PFAO and Whey Permeate required a determination to be made – this process is not complete for PFAO as the application was submitted on the Q4 deadline. Determinations were previously made for the other four feedstocks.

3.4 Cancelling Biofuel Obligation Certificates

Section 44L of the BOS legislation places an obligation on any BOS account holder to whom a BOS Cert was issued in respect of a specific litre of biofuel, to make an application to NORA to cancel such Certs, if the biofuel is subsequently exported from the State. This obligation remains even if the biofuel has been sold to another party and/or the BOS Cert has been transferred to another obligated party. No such request was received by NORA in respect of the 2017 obligation period.

3.5 Revoking Biofuel Obligation Certificates

Section 44M allows for NORA to revoke a BOS Cert in certain circumstances. Following an audit, there were approximately 180 k BOS Certs revoked during 2017. Approximately 169 k Certs were revoked as a consequence of reporting ethanol sales instead of gasoline sales, and 10 k Certs were revoked because the biofuel obligation was understated as a consequence of reporting less gasoline.

3.6 Out of Date Certificates

All the BOS Certs carried forward from 2015 into 2017 were discharged against the 2017 obligation. Thus, no BOS Certs were rendered invalid as a consequence of being out of date.

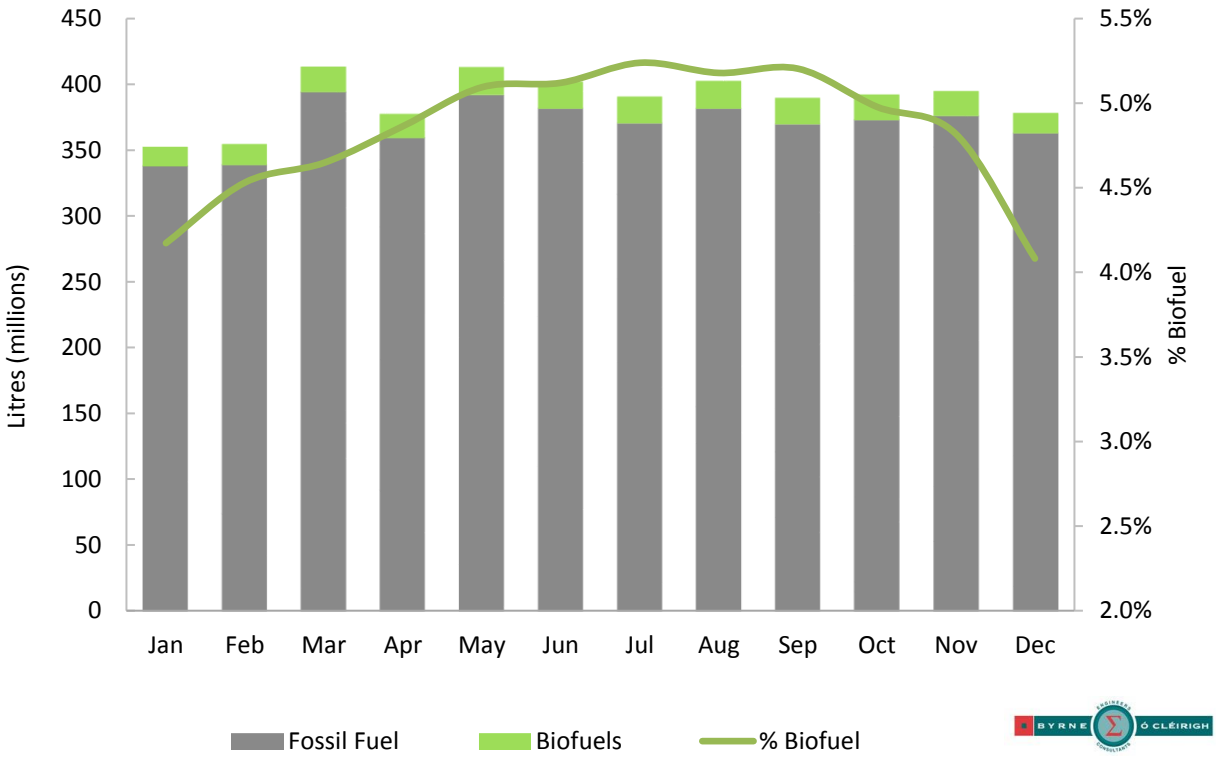
4 COMPLIANCE WITH OBLIGATION

This section of the report analyses the magnitude of the obligation and the level of compliance that was achieved by the obligated parties in respect of the 2017 obligation period. Only the total figures for all BOS participants are shown as otherwise it would be necessary to divulge data that may be commercially sensitive to individual companies. Where the performances of individual participants are illustrated, no identification is provided.

4.1 RELEVANT DISPOSALS

According to the returns made by obligated parties throughout the obligation period – January to December 2017 – the total quantity of road transport fuel disposed of was 4,665 M litres. Accordingly, the biofuel obligation amounted to 386 M litres. The distribution of these disposals over the period is illustrated in Figure 3.

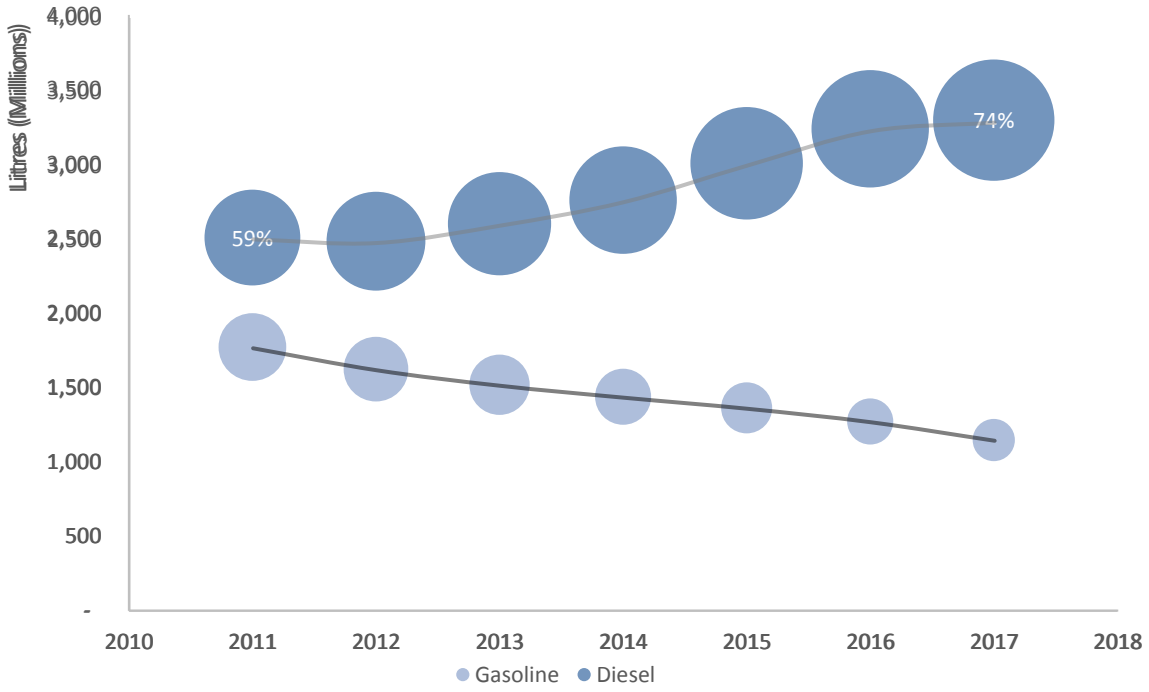
Figure 3: Monthly Disposals of Road Transport Fuel (2017)



Average monthly sales of road transport fuels for the 2017 period were approximately 389 million litres. This was a decrease of approximately 0.3% in comparison to the average monthly sales in 2016.

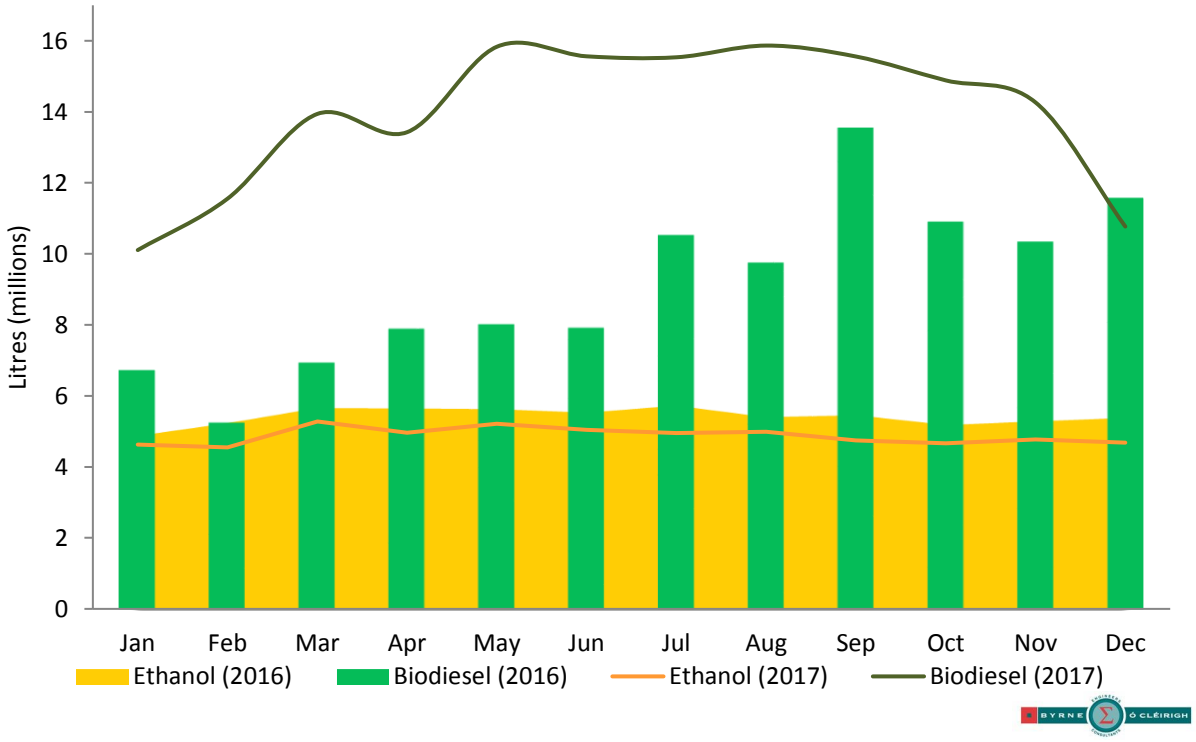
Figure 4 illustrates the trend in the fossil fuel sales since 2011 and the increasing share of diesel in the transport market (illustrated by the size of the circle).

Figure 4: Fossil fuel Sales (2010 – 2017)



The following plot illustrates the breakdown between the monthly disposals of biodiesel and bioethanol for the 2016 and 2017 periods. In total, 226 M litres of biofuel were placed on the market in 2017, which was an increase of almost 30% in comparison to 2016.

Figure 5: Monthly Disposals of Biofuel



On average over the 2017 period, biodiesel sales represented 74% of the total biofuel sales while bioethanol accounted for 26% (it was 63% biodiesel and 37% bioethanol in 2016). As the volume of gasoline continues to fall and consequently the volume of bioethanol drops, and assuming Ireland remains at E5 in 2018, biodiesel will continue to grow its share of the biofuel market.

There were some fluctuations in the percentage of biofuel placed in the market, ranging from a monthly maximum of 5.2% in July to a minimum of 4.1% in December; over the year, the average was 4.8%[6]. The equivalent figure for the 2016 period was 3.7%.

The trend over time for bioethanol and biodiesel disposals, and their relative share of the biofuel market (illustrated by the size of the circles), is shown in Figure 6.

Figure 6: Bioethanol and biodiesel disposals

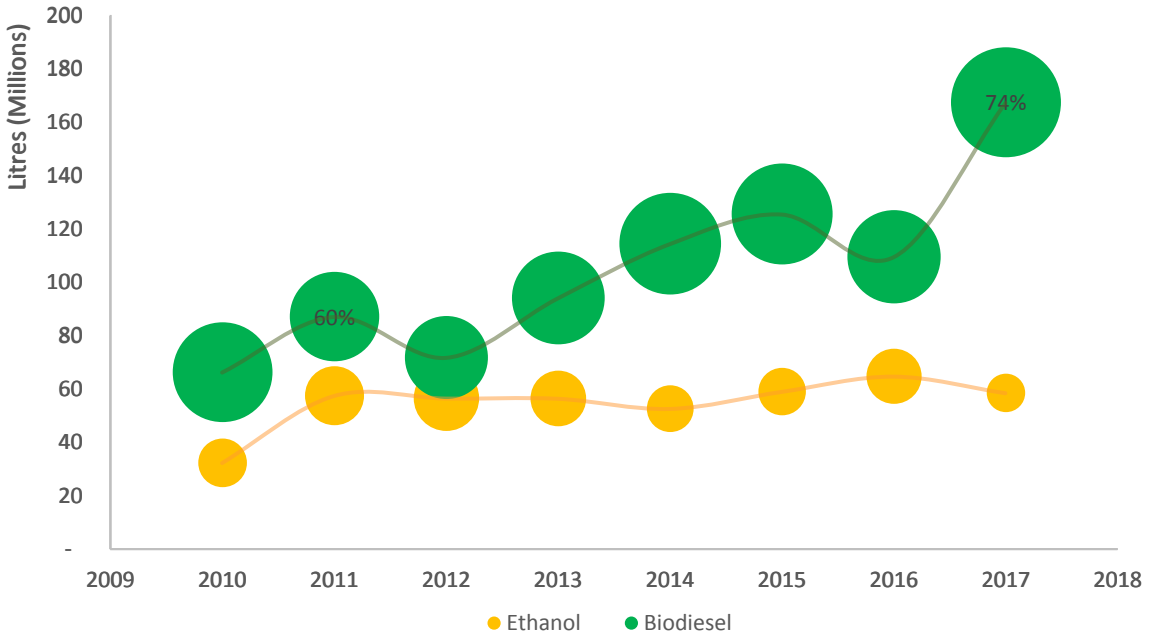


Table 1 provides the data on which Figure 4, Figure 5 and Figure 6 are based.

[6] As a percentage of the total volume of road transport fuel placed on the market.

Table 1: Breakdown of disposals, by volume

Year	% Fossil		% Biofuel		% Blend	
	Diesel	Gasoline	Biodiesel	Bioethanol	Diesel & biodiesel	Gasoline & bioethanol
2011	59	41	60	40	59	40
2012	60	40	56	44	60	40
2013	63	37	63	37	63	37
2014	66	34	69	31	66	34
2015	69	31	68	32	69	31
2016	72	28	63	37	71	29
2017	74	26	74	26	74	26

Since 2011, the first full year of the BOS, the volume of biodiesel placed on the market has increased by 92% and diesel by 31%. While the volume of bioethanol placed on the market has remained relatively static, gasoline disposals have reduced by 35%.

Because gasoline and bioethanol have a lower calorific value (i.e. contain less energy per litre) than diesel and biodiesel, when the breakdown between diesel and gasoline is examined on an energy basis, the reliance on diesel is more pronounced. The annual breakdown is shown in Table 2 for the overall blend.

Table 2: Breakdown of disposals, by energy

Year	% Diesel & biodiesel	% Gasoline and bioethanol
2012	63	37
2013	66	34
2014	69	31
2015	71	29
2016	74	26
2017	77	23

4.2 Biofuel Obligation Certificates

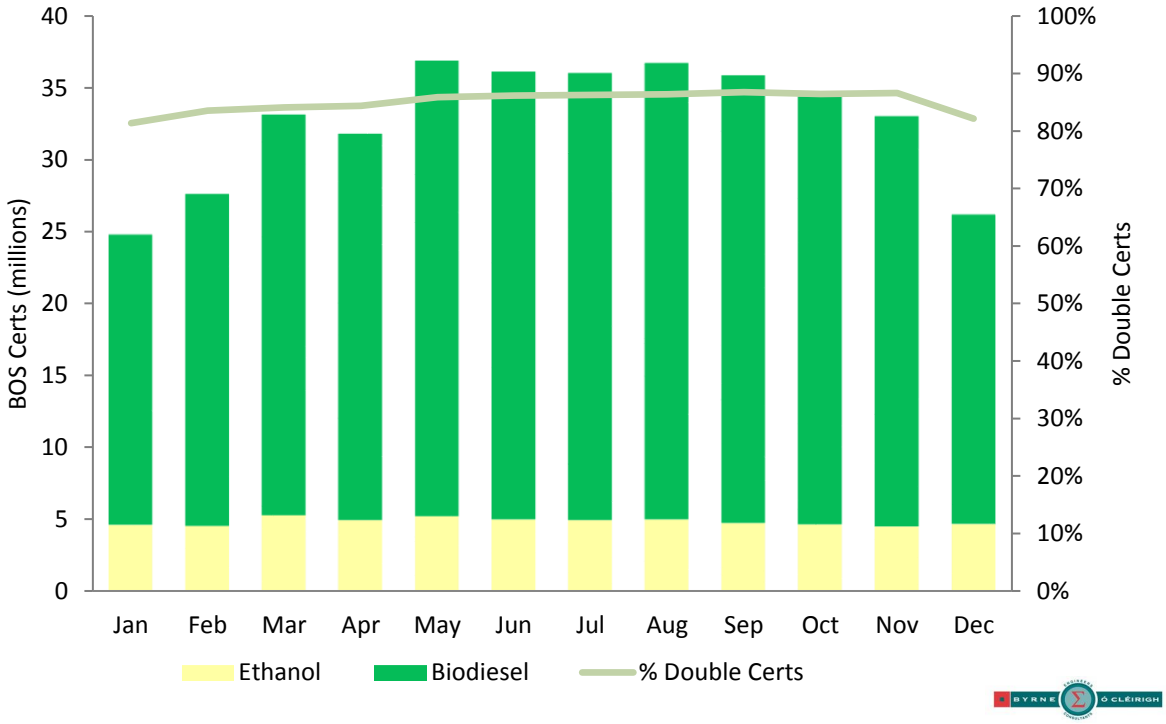
During the 2017 obligation period, over 393 M Certs were awarded in respect of disposals of 226 M litres of biofuels. Approximately 167 M litres of biodiesel were placed on the market and all of it was awarded two Certs per litre because the feedstock was categorised as a waste or residue.

Of the biodiesel that was double counted, c. 141 M litres was produced from UCO (84%), 23 M litres from Category 1 Tallow (14%) and the remainder from Palm Oil Mill Effluent (POME), Spent Bleached Earth (SBE) and Poultry Feather Acid Oil (PFAO).

Biodiesel accounted for 74% of the biofuel supplied to the market with bioethanol accounting for 26%; in 2016, the market split was 63% biodiesel 37% bioethanol. As a consequence of all the biodiesel being awarded two BOS Certs per litre, 85% of the BOS Certs awarded in 2017 were in respect of biodiesel disposals.

The number of BOS Certs awarded each month is illustrated in Figure 7.

Figure 7: No. of BOS Certs Awarded (2017)



4.3 BOS Account Holder Position

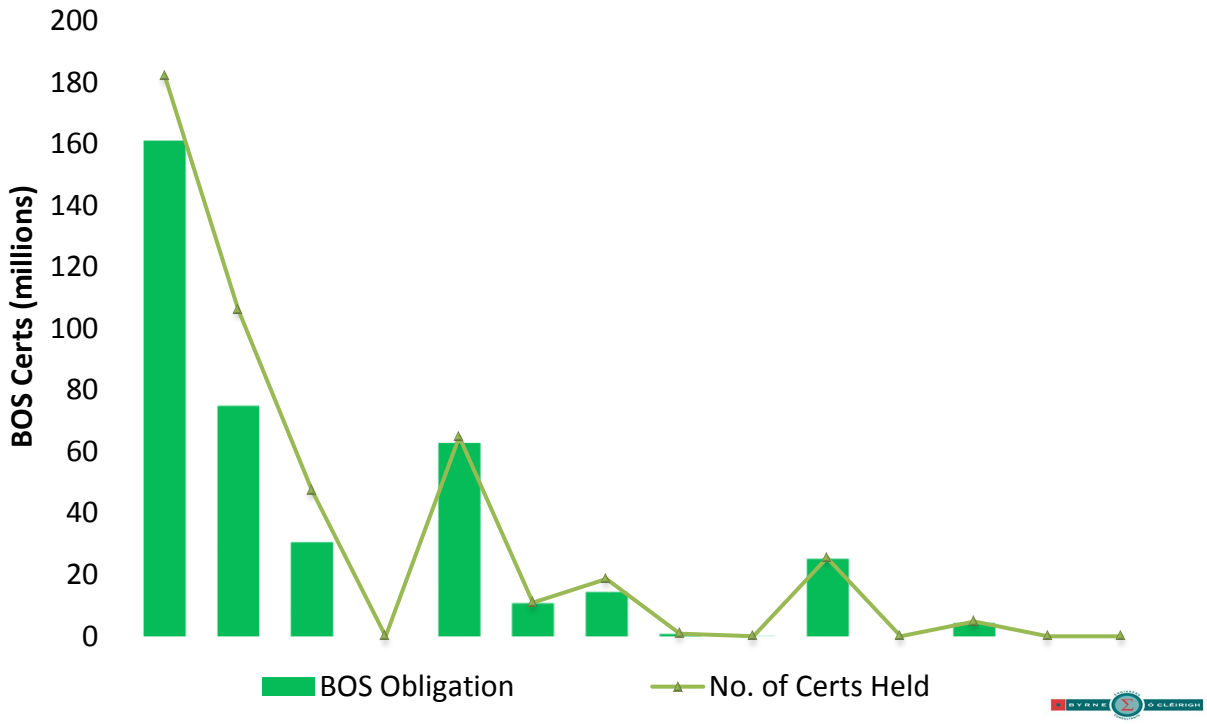
There were twelve open BOS accounts at the start of 2017: ten were held by obligated parties and two by biofuel producers. There were fourteen accounts at the end of 2017 (Calor and Carbery opened BOS accounts during the year).

The number of BOS Certs held by each account holder at the time of discharge and their respective obligations are illustrated in Figure 8. The party with the largest biofuel obligation was required to surrender approximately 161 M Certs.

Companies that chose to participate in the BOS because they are producers or suppliers of biofuels do not have a biofuel obligation as they are not liable for the NORA Levy on fossil fuel disposals. If they wish to claim the BOS Certs in their own name, they must pay the Biofuel Levy. Between them, the four biofuel producers / suppliers paid the Levy on

approximately 11 M litres of biofuel and were awarded 22 M Certs; this represents 5% of BOS Certs awarded in 2017.

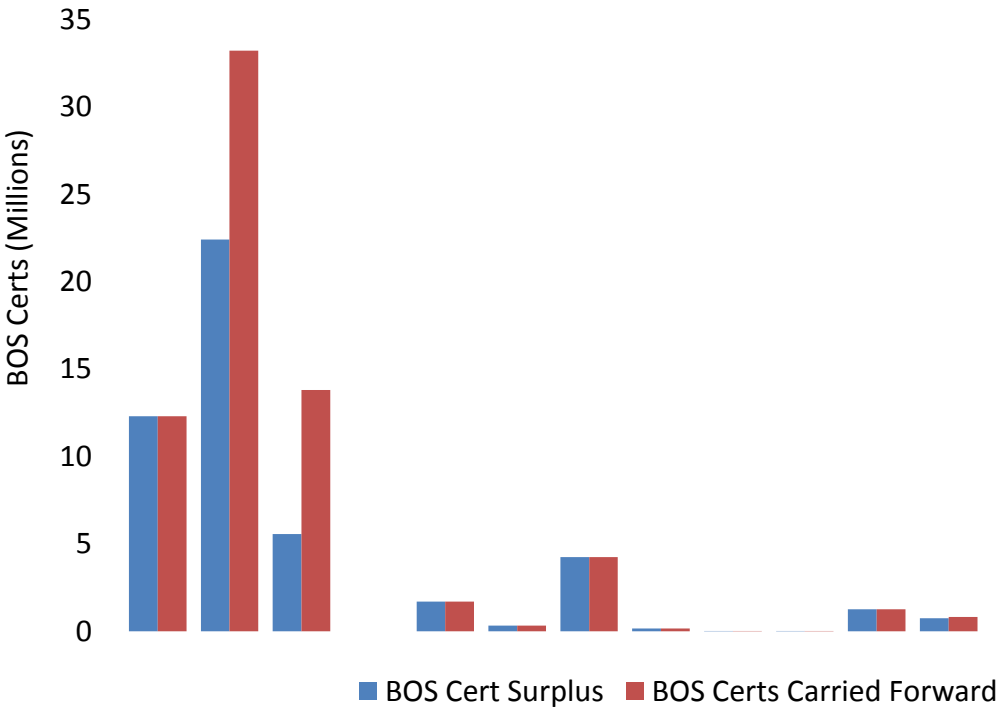
Figure 8: 2017 Biofuel Obligation



There were approximately 68 M Certs carried forward to the 2017 obligation period, of which 19 M were from the 2015 period and 49 M from the 2016 period. Certs from previous periods represented 15% of all Certs held at the end of the 2017 period. All the 2015 Certs were discharged against the 2017 obligation.

Figure 9 shows the surplus positions for each account holder and the number of BOS Certs carried forward to the 2018 obligation period. The surplus represents the Certs held in excess of the biofuel obligation less those Certs that could not be discharged because of the 25% limit – the Certs carried forward includes those Certs held in excess of the 25% limit.

Figure 9: BOS Cert Surplus & Carried Forward



No account holder was in a deficit position. There were three companies in particular that carried over significant quantities of BOS Certs, accounting for almost 92% of all the Certs carried forward.

4.4 Overall Performance against Obligation

The table overleaf provides a breakdown of the key BOS metrics.

Table 3: BOS Metrics

Description	Unit	Value
Total disposal of petroleum-based, road transport fuel[7]	litres	4,439,106,955
Gasoline	litres	*1,146,348,261*
Diesel	litres	*3,292,758,694*
Total disposal of biofuel disposals[8], *of which:*	litres	225,772,414
biofuel as bioethanol	litres	*58,476,031*
biofuel as biodiesel	litres	*167,296,383*
Volume of biofuel for which one BOS Cert per litre was issued	litres	58,164,078
Volume of biofuel for which two BOS Certs per litre were issued	litres	167,608,327
Volume of biofuel for which BOS Certs were rejected	litres	4
No. of BOS Certs Revoked	Certs	180,263
Volume of biofuel (levy paid) for which BOS Certs went unclaimed	litres	9
Number of BOS Certs required to meet obligation	Certs	385,980,350
Total number of BOS Certs issued during 2017	Certs	393,380,728
Number of BOS Certs carried forward from previous period	Certs	67,868,555
Surplus of BOS Certs*	Certs	55,072,409
Liability for Buy-out Charge	€	0
Number of BOS Certs no longer valid	Certs	0
Number of valid BOS Certs carried forward to 2018 period	Certs	75,088,661
* This does not include those Certs that could not be discharged because an account holder exceeded the 25% limit.		

The volume of biofuel produced from biodegradable waste, residue, non-food cellulosic material, ligno-cellulosic material or algae, i.e. wastes and residues, represented 74% of the biofuel supplied to the market during the 2017 period. When the biofuel produced from wastes and residues is counted twice, the amount of biofuel placed on the market as a percentage of road transport fuels was 8.43%. When the BOS Certs carried forward from the 2015 and 2016 periods are included, this value increases to 9.88%. Against this, the obligation was 8%. Consequently, c. 75 million BOS Certs have been carried forward to the 2018 period.

4.5 Biofuel Feedstock

Table 4 overleaf provides a breakdown of all the biofuel feedstocks reported in the sustainability statements and their country of origin. Most of the feedstocks are sourced from Europe (62%). The country to supply the greatest quantity of feedstocks for biofuels placed on the Irish market was China (16%); 10% was sourced from Ireland.

It is also worth noting that almost 63% of all the biofuel placed on the market in Ireland is produced from UCO.

Figure 10 on page 19 illustrates the locations from which the biofuel feedstock are sourced and the proportion that comes from those locations.

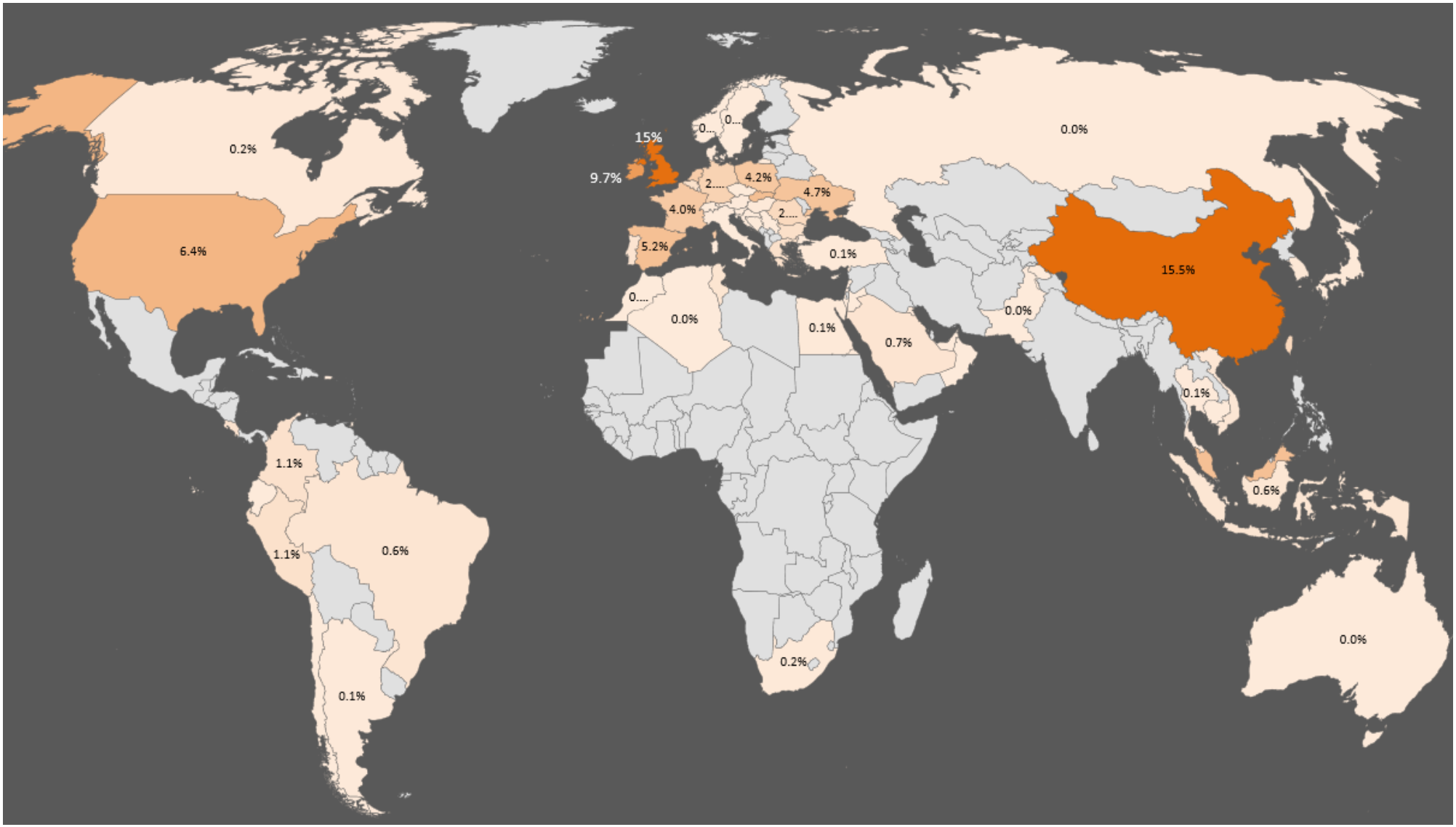
[7] This is the quantity on which the NORA Levy was paid.

[8] This is the quantity on which the Biofuel Levy was paid.

Table 4: Breakdown of Source of Biofuel Feedstocks

Country of Origin	Bioethanol														Biodiesel										Total	
	EC Corn		Non-EC Corn		Sugar Cane		Sugar Beet		Wheat		Triticale		Whey Permeate[1]		UCO[1]		Cat 1 Tallow[1]		POME		SBE[1]		PFAO			
	ECCORN		NECCOR		SCANE		SBEET		WHEAT		TRICAL		WHEYP		UCO		TALL1		POME		SBE		PFAO			
	(l)	%	(l)	%	(l)	%	(l)	%	(l)	%	(l)	%	(l)	%	(l)	%	(l)	%	(l)	%	(l)	%	(l)	%	(l)	%
United Arab Emirates	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	234,509	*0.2%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**234,509**	*0.1%*
Argentina	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	237,601	*0.2%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**237,601**	*0.1%*
Australia	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	67,921	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**67,921**	*0.0%*
Austria	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	84,165	*0.1%*	125,542	*0.5%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**209,707**	*0.1%*
Belgium	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	2,641,449	*1.9%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**2,641,449**	*1.2%*
Bulgaria	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	2,810,901	*2.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**2,810,901**	*1.2%*
Bahrain	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	9,584	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**9,584**	*0.0%*
Bosnia and Herzegovina	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	97,027	*0.1%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**97,027**	*0.0%*
Brazil	-	*0.0%*	-	*0.0%*	1,315,191	*13.2%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	5	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**1,315,196**	*0.6%*
Canada	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	482,830	*0.3%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**482,830**	*0.2%*
Switzerland	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	103,228	*0.4%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**103,228**	*0.0%*
Switzerland	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	491,433	*0.3%*	27,818	*0.1%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**519,251**	*0.2%*
Chile	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	9,505	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**9,505**	*0.0%*
China	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	35,046,435	*24.8%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**35,046,435**	*15.5%*
Colombia	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	2,412,197	*1.7%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**2,412,197**	*1.1%*
Czech Republic	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	77,566	*0.1%*	12,523	*0.1%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**90,089**	*0.0%*
Costa Rica	-	*0.0%*	-	*0.0%*	2,105,803	*21.2%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**2,105,803**	*0.9%*
Cyprus	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	93,543	*0.1%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**93,543**	*0.0%*
Germany	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	9,260	*0.0%*	1,017,047	*100.0%*	-	*0.0%*	5,465,895	*3.9%*	25,520	*0.1%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**6,517,722**	*2.9%*
Denmark	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	521,006	*0.4%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**521,006**	*0.2%*
Algeria	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	2,577	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**2,577**	*0.0%*
Ecuador	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	1,402	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**1,402**	*0.0%*
Egypt	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	307,975	*0.2%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**307,975**	*0.1%*
Spain	632,178	*12.1%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	11,014,444	*7.8%*	79,137	*0.3%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**11,725,759**	*5.2%*
France	103,034	*2.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	4,467,175	*14.4%*	-	*0.0%*	-	*0.0%*	3,505,472	*2.5%*	1,048,806	*4.6%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**9,124,487**	*4.0%*
United Kingdom	-	*0.0%*	-	*0.0%*	-	*0.0%*	367,936	*100.0%*	26,564,295	*85.6%*	-	*0.0%*	-	*0.0%*	4,583,056	*3.2%*	2,488,098	*10.8%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**34,003,385**	*15.1%*
Greece	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	2,606,809	*1.8%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**2,606,809**	*1.2%*
Hong Kong	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	1,394,348	*1.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**1,394,348**	*0.6%*
Croatia	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	19	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**19**	*0.0%*
Hungary	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	404,416	*1.8%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**404,416**	*0.2%*
Indonesia	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	803,453	*0.6%*	-	*0.0%*	439,767	*14.4%*	-	*0.0%*	-	*0.0%*	**1,243,220**	*0.6%*
Ireland	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	311,949	*100.0%*	4,670,403	*3.3%*	16,816,983	*73.3%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**21,799,335**	*9.7%*
Israel	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	21,852	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**21,852**	*0.0%*
Italy	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	629	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**629**	*0.0%*
Jordan	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	8,785	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**8,785**	*0.0%*
Japan	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	267,472	*0.2%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**267,472**	*0.1%*
Cambodia	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	7,770	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**7,770**	*0.0%*
Korea, Republic of	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	863,217	*0.6%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**863,217**	*0.4%*
Kuwait	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	583,570	*0.4%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**583,570**	*0.3%*
Lebanon	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	79,904	*0.1%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**79,904**	*0.0%*
Luxembourg	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	15,065	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**15,065**	*0.0%*
Morocco	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	1,271	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**1,271**	*0.0%*
Malaysia	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	8,709,432	*6.2%*	-	*0.0%*	2,615,748	*85.6%*	230,000	*100.0%*	-	*0.0%*	**11,555,180**	*5.1%*
Netherlands	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	8,246,493	*5.8%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**8,246,493**	*3.7%*
Norway	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	14,958	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**14,958**	*0.0%*
Oman	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	722	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**722**	*0.0%*
Pakistan	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	1	*100.0%*	**1**	*0.0%*
Peru	-	*0.0%*	-	*0.0%*	2,544,437	*25.6%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**2,544,437**	*1.1%*
Poland	3,635,010	*69.6%*	-	*0.0%*	3,979,985	*40.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	138,786	*0.1%*	1,811,862	*7.9%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**9,565,643**	*4.2%*
Puerto Rico	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	207,624	*0.1%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**207,624**	*0.1%*
Portugal	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	1,702,634	*1.2%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**1,702,634**	*0.8%*
Romania	850,777	*16.3%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	3,622,079	*2.6%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**4,472,856**	*2.0%*
Russia	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	115	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**115**	*0.0%*
Saudi Arabia	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	1,568,319	*1.1%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**1,568,319**	*0.7%*
Singapore	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	156,339	*0.1%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**156,339**	*0.1%*
Serbia	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	876	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**876**	*0.0%*
Slovakia	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	12,041,409	*8.5%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**12,041,409**	*5.3%*
Slovenia	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	179	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**179**	*0.0%*
Sweden	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	13,892	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**13,892**	*0.0%*
Thailand	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	148,884	*0.1%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**148,884**	*0.1%*
Trinidad & Tobago	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	99,257	*0.1%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**99,257**	*0.0%*
Tunisia	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	1,502,456	*1.1%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**1,502,456**	*0.7%*
Turkey	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	331,298	*0.2%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**331,298**	*0.1%*
Taiwan	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	5,106,976	*3.6%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**5,106,976**	*2.3%*
Ukraine	-	*0.0%*	10,571,948	*100.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**10,571,948**	*4.7%*
United States	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	14,441,758	*10.2%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**14,441,758**	*6.4%*
Viet Nam	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	1,089,628	*0.8%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**1,089,628**	*0.5%*
South Africa	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	399,752	*0.3%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	-	*0.0%*	**399,752**	*0.2%*
TOTAL	**5,220,999**	**2.3%**	**10,571,948**	**4.7%**	**9,945,416**	**4.4%**	**367,936**	**0.2%**	**31,040,730**	**13.7%**	**1,017,047**	**0.5%**	**311,949**	**0.1%**	**141,066,931**	**62.5%**	**22,943,933**	**10.2%**	**3,055,515**	**1.4%**	**230,000**	**0.1%**	**1**	**0.0%**	**225,772,405**	**100%**

Figure 10: Sources of Biofuel Feedstocks



4.6 VOLUNTARY SCHEMES

While there are currently 16 EU approved Voluntary Schemes in operation, biofuel from only one Voluntary Scheme was reported in BOS Sustainability Statements:
ISCC (International Sustainability and Carbon Certification)

With the exception of a very small quantity of biodiesel produced from UCO, all of the biofuel placed on the Irish market was covered by ISCC.

4.7 GHG SAVINGS

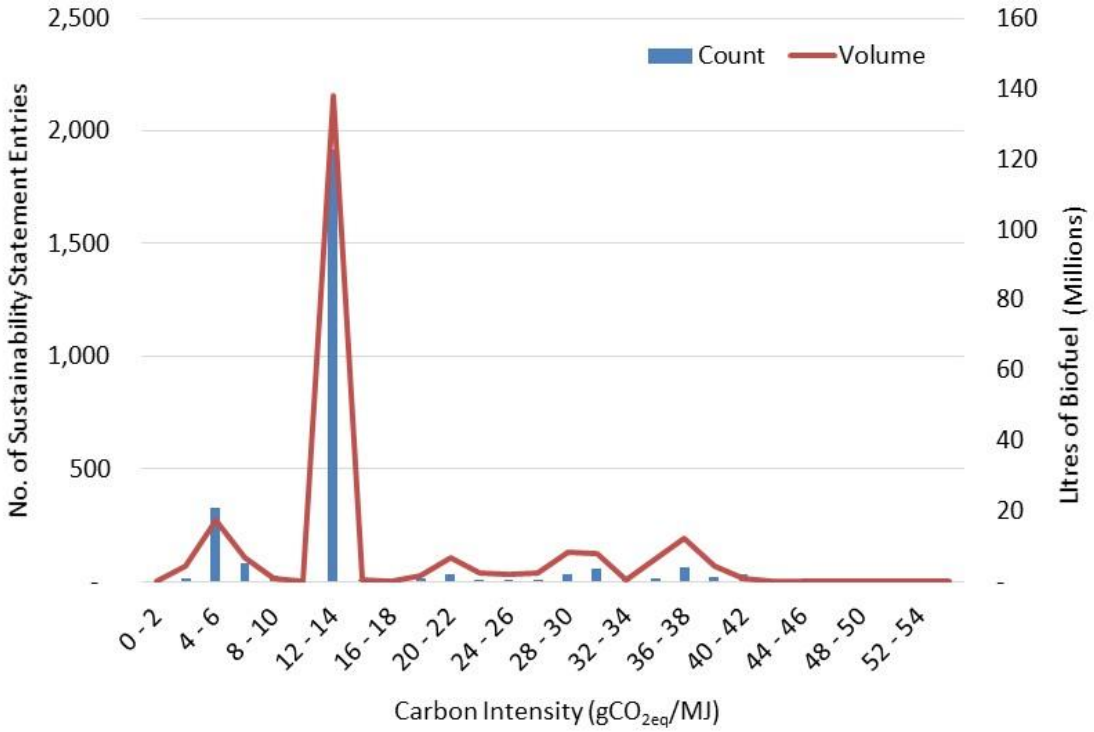
4.7.1 Overview

A central requirement of the RED and the Sustainability Regulations is that biofuels achieve a 35% reduction in carbon intensity (GHG emissions) in comparison to fossil fuels[9]. The average litre of biofuel placed on the market in Ireland in 2017 had a life cycle carbon intensity of c. 16 gCO_{2eq} / MJ, which represents an 81% reduction in carbon intensity in comparison to road transport fossil fuel.

There were c.2,700 individual consignments (entries) reported in the sustainability statements. The volume reported in each entry ranged from of a single litre of biofuel to over two million litres. The following plot illustrates the range of carbon intensity values reported and how those in the 12 – 14 gCO_{2eq} / MJ range dominate. (The bar chart represents the number of entries; the line represents the volume of biofuel.)

[9] A baseline carbon intensity of 83.8 gCO_{2e} / MJ for petrol and diesel is specified in Annex V of the RED. The GHG savings requirement has increased to 50% for 2018.

Figure 11: Profile of Carbon Intensities



There is no methodology provided in the RED for calculating the national GHG savings. In previous Annual Reports, the BOS Team's approach has been to calculate the GHG emissions from the biofuels placed on the market and compare that to the total GHG emissions that would have been emitted from the road transport sector[10] had there been no biofuels consumed. Taking into account the lower calorific content of biofuel in comparison to fossil fuel[11], c. 192 M litres of fossil fuel were displaced by biofuel as a consequence of placing 226 M litres of biofuel on the market. Based on an average biofuel carbon intensity of 16.01 gCO_{2eq} / MJ and using the fossil fuel comparator provided in Annex V of the RED (83.8 gCO_{2eq}/MJ), substituting fossil fuel with biofuel resulted in a reduction of c. 457 k tonnes of CO_{2eq} emissions.

This equates to an overall saving of 3.4 % in GHG emissions from the road transport sector as a consequence of achieving a biofuel penetration rate of 4.8 %, by volume. It is worth noting that these emission savings are over the life cycle of the fuel, which includes, *inter alia*, feedstock extraction and cultivation, fuel production, transportation and consumption – the calculation methodology is set out in Annex V of the RED. For biofuels, the emissions from using the fuel are assumed to be zero.

The Fuel Quality Directive (FQD) (6), which also applies to road transport fuel, requires a 6% reduction in carbon intensity by 2020, and does not permit double counting. The FQD specifies a method for calculating the reduction in carbon intensity in order to demonstrate

[10] While the RED requires energy consumed in road and rail to be taken into account, the BOS only applies to road transport.

[11] 32 & 36 MJ/litre for gasoline and diesel versus 21 & 33 MJ/litre for bioethanol and biodiesel, respectively.

compliance with the FQD[12]. For 2019, a 2.9 % reduction in carbon intensity was calculated using the FQD methodology, which is an improvement on the reduction of 1.9% achieved last year.

4.7.2 Analysis of Sustainability Statements

Article 17 of the RED specifies that a biofuel must achieve a 35% reduction in carbon intensity, which equates to a maximum carbon intensity value of 54.5 gCO_{2eq} / MJ. There were no instances found in the sustainability statements of biofuels with carbon intensities above 54.0 gCO_{2eq} / MJ. The following tables illustrate the range of carbon intensities of the fuel types (Table 6) and the feedstocks (Table 7) that were reported in the sustainability statements in 2017.

Table 5: Range of carbon intensity reported in sustainability statements, by fuel type

Fuel Type	Description	Carbon Intensity (g CO_2eq/MJ)			Default Values[13]
		Min	Avg	Max	
ME	Methyl Ester[14] (Biodiesel)	4.0	12.5	27	-
UCO	Used Cooking Oil (Biodiesel)	14	14	14	14.2[15]
EtOH	Bioethanol	14	31.3	42.0	-

[12] Directive 2015/652, published in April 2015, specifies the calculation method. Article 7a of the FQD was transposed into Irish law by SI 160 of 2017.

[13] The Default Values, from Annex V of the RED, are reported where appropriate.

[14] Aka Fatty Acid Methyl Ester, or FAME

[15] The default value from Annex V of the RED is 14.2 $gCO2_e$ / MJ (17% of fossil fuel comparator (83.8 $gCO2_{eq}$ /MJ)). The UK & Ireland carbon calculator default value for waste animal or vegetable oil (i.e. UCO or Tallow) is 14 $gCO2_{eq}$ / MJ

Table 6: Range of Carbon Intensity Reported in Sustainability Statements, by Feedstock

Fuel Type	Feedstock	Description	Carbon Intensity (g CO_2eq/MJ)			Default Values
			Min	Avg	Max	
Bioethanol	ECCORN	Corn – EC	31.0	31.1	31.0	42.7
	NECCOR	Corn – Non EC	14.0	28.3	37.0	-
	SCANE	Sugar Cane	14.0	19.9	21.0	24.3
	WHEAT	Wheat	29.0	35.9	42.0	-
	TRICAL	Triticale[16]	42.0	42.0	42.0	-
	WHEYP	Whey permeate	17.0	17.0	17.0	
	SBEET	Sugar Beet	40.0	40.0	40.0	40.2
Biodiesel (ME, UCO)	UCO[17]	Used Cooking Oil	4.0	12.5	14.0	14.2
	TALL1	Tallow – Category 1	14.0	14.0	14.0	14.2
	SBE	Spent Bleached Earth	8.0	8.0	8.0	
	POME	Palm Oil Mill Effluent	8.0	15.6	27.0	
	PFAO	Poultry Feather Acid Oil	14.0	14.0	14.0	

The following table lists those biofuel feedstocks for which *actual* carbon intensity values were reported for the entire fuel supply chain or the cultivation step, as opposed to reporting the default values from RED, Annex V.

[16] A hybrid of wheat and rye.

[17] UCO is classified at both the Fuel Type level and at the Feedstock level. For example, an account holder may choose 'Biodiesel ME' as the fuel type and 'UCO' as the Feedstock.

Table 7: Breakdown of actual carbon intensity values reported, by feedstock

Fuel Type	Feedstock	Description	Total Volume (l)	Volume Reported as Actual Values* (l)	Volume Reported as Actual Values (%)
Bioethanol	ECCORN	Corn – EC	5,220,999	5,220,999	100
	NECCOR	Corn – Non EC	10,571,948	10,571,948	100
	SCANE	Sugar Cane	9,945,416	9,945,416	100
	WHEAT	Wheat	31,040,730	28,521,841	91.9
	SBEET	Sugar Beet	367,936	0	0
	TRICAL	Triticale	1,017,047	1,017,047	100
	WHEYP	Whey permeate	311,949	311,949	100
Biodiesel	UCO	Used Cooking Oil	141,066,931	28,984,823	21
	TALL1	Tallow – Category 1	22,943,933	2,160,118	9
	SBE	Spent Bleached Earth	230,000	230,000	100
	POME	Palm Oil Mill Effluent	3,055,515	3,055,515	100
	PFAO	Poultry Feather Acid Oil	1	1	100
*Actual values were used for the entire fuel chain or for the cultivation step.					

In almost all cases where actual carbon intensity values were reported, a Voluntary Scheme was also reported. This is significant because under Article 18 (7) of the RED, once an account holder provides proof that the data submitted in a Sustainability Statement is covered under a Voluntary Scheme, the Member State is not entitled to investigate further the provenance of the biofuel[18].

4.8 Auditing Compliance with the BOS Act

Auditing of compliance by oil companies, oil consumers and biofuel producers with the biofuel obligations under the BOS Act 2010 was carried out in Q2 and Q3 2017.

The Summary Audit Report (7) describes the findings from both the plenary, desk-based audit and the on-site audits and contains recommendations on what actions could be undertaken to rectify any errors that were found. It also makes recommendations on what

[18] In fact the wording of the RED is more restrictive as it expressly **prohibits** Member States from requiring economic operators (account holders) to provide further evidence of compliance with the Sustainability Criteria, if the economic operator can provide proof that the biofuel is covered by a Voluntary Scheme that was approved by the Commission.

improvements could be made to the systems and procedures for submitting and processing the levy returns and applications for BOS Certs.

The audit reconciliation showed that, even though the magnitude of the discrepancies were relatively small, there were still inconsistencies between the purchases and sales values reported. These inconsistencies were examined further during the on-site audits which were carried out on four account holders. The audit team also carried out desk-based investigations on several discrepancies that were identified in the plenary audit.

In general, the BOS account holders were well prepared for the audits and were able to substantiate the data contained in the Levy Return and in the applications for BOS Certs. The level of compliance with the requirements of the BOS Acts has improved since the commencement of the audit programme. This is reflected in the reduced number of findings provided in the audit reports, the improved quality of the information being received by the BOS Team during the year and the significant reduction in the magnitude of the discrepancies between reported purchases and sales since the programme began. Notwithstanding this, organisational and personnel changes can give rise to some loss of corporate knowledge, so it is important to maintain the high standards that have been achieved in recent years and the audit programme assists greatly in achieving this.

5 OBSERVATIONS ON THE OPERATION OF BOS

The following sub-sections record the BOS Team's observations on the operation of the BOS during the 2017 obligation period and on the key considerations for the BOS in the coming years.

5.1 UPCOMING CHANGES

5.1.1 Biofuel Obligate Rate Change

Government policy has been set out in an official policy statement, issued in April 2018. The biofuel obligation will remain at 8% in 2018, but it will increase to 10% in 2019 and approximately 11% in 2020.

5.1.2 ILUC Directive

In September 2015, Directive (EU) 2015/1513 (the ILUC Directive) was published to amend the Renewable Energy Directive and the Fuel Quality Directive. The stated purpose of the ILUC Directive is to reduce the risk of indirect land use change and to prepare the transition towards advanced biofuels. To achieve this, the Directive provides for the following.

i. Limits the share of biofuels from crops grown on agricultural land that can be counted towards the 2020 renewable energy targets to 7%.

ii. Sets an indicative 0.5% target for advanced biofuels as a reference for national targets which will be set by EU countries in 2017. (There was an interim condition in ILUC that required Member States to notify the Commission by the 17th April 2017 of the advanced biofuel target. The DCCAE notified the Commission that it has set a 0.25% advanced biofuel target for 2020.)

iii. Harmonises the list of feedstocks for biofuels across the EU whose contribution would count double towards the 2020 target.

iv. Specifies that biofuels produced in new installations achieve GHG emission savings of at least 60%.

v. Introduces stronger incentives for the use of renewable electricity in transport.

vi. Includes a number of additional reporting obligations for the fuel providers, EU countries and the European Commission.

It also requires that, from 1st January 2018, the GHG emission savings from the use of biofuels increase to 50%. Emission savings of 35% were required for the 2017 period.

In anticipation of transposing ILUC in to Irish law in September 2017 (this was the deadline specified in ILUC), the BOS Team modified the BOS systems to cater for the requirements of the Directive. The Team engaged with the BOS account holders and the DCCAE during the planning of the new systems. The new BOSOS will be introduced in advance of the

reporting deadline for Q1 2018. (At the time of finalising this report, the ILUC Directive was not yet transposed into Irish law.)

5.1.3 Fuel Quality Directive (FQD)

In April 2017, SI 160 of 2017 was published. It transposed Article 7a of the FQD and requires 'fuel suppliers' to reduce life cycle GHG emissions per unit of energy from fuel and energy supplied to transport (road vehicles, non-road mobile machinery, agricultural and forestry tractors, and recreational craft) by 6% by 2020. It designated NORA as the agency to which the fuel suppliers shall report.

In addition to modifying the BOS systems for ILUC, the BOS Team has modified the BOS system for the requirements of the FQD. There are a lot of synergies between the existing reporting requirements of the BOS and those to demonstrate compliance with FQD; thus, even though the 6% reduction target specified in SI 160 does not have to be met until 2020, it was more efficient to put in place the mechanisms for measuring compliance with the 6% target now, while the ILUC modifications were being implemented. It will also give the fuel suppliers, which are the same companies designated as the BOS account holders, time to prepare for complying with this new obligation.

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