



Biofuel Obligation Scheme - Consultation on future increases in the biofuels obligation rate

Irving Oil Whitegate Refinery Limited

Jan 19th 2018

Background

The Department of Communications, Climate Action and Environment (DCCA) has initiated a consultation relating to the implementation of a phased increase in the biofuel obligation rate under the Biofuel Obligation Scheme (BOS).

Irving Oil Whitegate Refinery Limited (IOWRL) welcomes the opportunity to participate in this consultation, reviewing specifically the queries relating to the following:

- Level of increase proposed
- Technical challenges associated with meeting fuel specifications
- Greenhouse gas reduction targets
- Carryover biofuel certifications (certs) limitation in 2020
- Biofuel obligation in heating fuels

IOWRL is the largest supplier of transportation and heating fuels in Ireland. As such, we play a pivotal role for Ireland's oil industry in helping to deliver emission reductions under the Renewable Energy Directive (RED) and Fuels Quality Directive (FQD). IOWRL believes that domestic oil refining has a key role to play in helping Ireland meet its mandated obligations under these directives as it progresses towards a lower carbon economy.

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Consultation Questions

Question 1:

In order to meet Ireland's 2020 renewable energy target in the transport sector, it is proposed to increase the biofuel obligation rate to 10% from 2019 and circa 12% from 2020.

- Do you support this policy measure?

Background

It is recognised by IOWRL that the BOS will be the primary pathway for Ireland to comply with RES (T). The current blending obligation under the BOS scheme is 8 vol%, equivalent to 8.695% actual blending rate. This equates to an obligation of ~367 million certs. This obligation is currently met by blending ethanol into petrol and by blending biodiesel (FAME) into diesel. The biofuel penetration rate is ~4.7% to meet the 8.695% obligation, 5% ethanol in petrol and 4.5% biodiesel in diesel. The low penetration rate is due to the fact that all of the biodiesel placed on the market is eligible for two certs. The double certs reflects the notion that biodiesel is produced from wastes or residues which would otherwise go unused and be replaced by traditional fuels. Contra to that, the majority of the ethanol placed on the market is produced from wheat, sugar or corn and therefore only eligible for one cert.

10vol% from 2019

To move the obligation to 10 vol%, 11.11% blending rate will equate to ~ 472 million certs (2019 nationally). This assumes that there will not be an appreciable change in the diesel/petrol market and that demand will continue to represent ~75%/25% of fuel volumes in 2019 respectively. This obligation rate can be achieved by continuing to blend 5% ethanol and an increase in the blend of double count biodiesel. The biofuel penetration rate will increase to ~5.6%, with biodiesel blend rates at ~5.8%. Further to this, account holders can continue to meet 25% of this obligation with carryover certs, making the 10% target more achievable.

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circa 12vol% from 2020

To move the obligation rate to circa 12 vol%, a 13.636% blending rate will be required to generate the ~ 574 million certs that would be required in 2020 nationally. Meeting this level of an obligation will be challenging for the industry. Blending through winter months is arduous and is dependent on securing winter grade biofuel. Further to this, there are fuel specification limits which impact fuel blending that need to be considered.

The concept of a blendwall is an important part of this discussion. A blendwall represents the point at which a limit is reached on the quantity of biofuels that can be blended to petrol and diesel while meeting the required fuel specifications. For example, the EN590 specification for diesel permits blending of up to 7vol% FAME. For petrol, the EN228 specification (updated in 2012) allows blending of up to 10% v/v ethanol in petrol (referred to as E10 petrol).

With the above in mind the following scenarios are presented under a 12vol% obligation:

- No Change to the Existing E5 Petrol Blending Rate
- Move to E10 Petrol grade

A discussion of each scenario is presented below.

No Change to the Existing E5 Petrol Blending Rate

To continue with the existing E5 petrol (i.e. 5% ethanol blend), the blend rate for biodiesel (FAME) would need to be 7.2 vol% to achieve the required certs. This blend rate exceeds the allowable 7 vol% according to the EN590 fuel specification. This represents a blendwall constraint in meeting the 12vol% target (see Figure 1).

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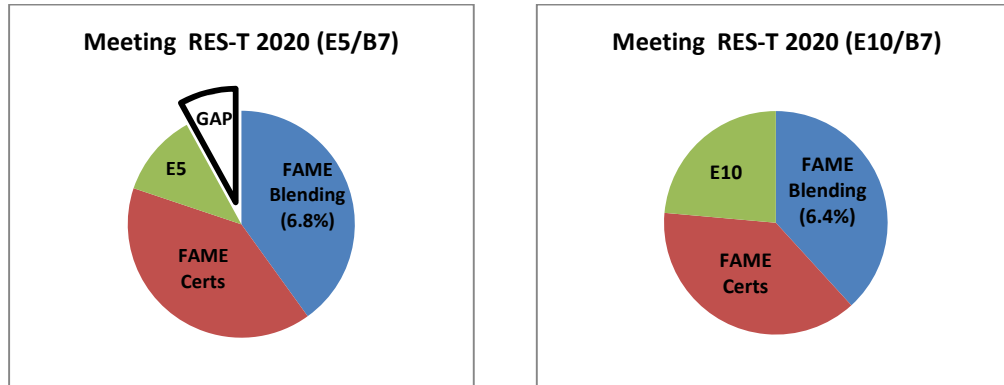
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Figure 1: Scenario for RES-T utilising Double Count FAME and either E5 or E10



The maximum realistic blend rate achievable for biodiesel on a continuous basis is ~ 6.8vol%, allowing for downtime. Based on this blend rate, it is anticipated that there could be a shortfall of ~ 26 million certs. To overcome this blendwall issue, several options are presented below for consideration:

- Use of renewable diesel otherwise known as HDRD (Hydrogenation Derived Renewable Diesel) or Hydrotreated Vegetable Oil (HVO). This could be ‘dropped in’ to diesel, additive to the 6.8vol% biodiesel (FAME) previously blended. Securing this HDRD product in the marketplace will be difficult as there are limited volumes available and it will be an expensive option. In the absence of incentives for the production of advanced biofuels, fuel suppliers could decide to ‘buy-out’ as a more economical alternative. (See more on **HDRD/HVO** in Question 4).
- Use of 2nd generation (double count) ethanol where available. Indigenous 2nd generation ethanol availability is very limited and would therefore need to be imported. 2nd generation ethanol volumes are not readily available at present.
- Use of carryover certs (~4.5% of obligation). This would allow fuel suppliers to meet the 12vol% obligation but cannot be used by DCCAE when measuring compliance against overall renewable targets.

A maximum biofuel obligation rate of 11.3vol% (12.74% actual blending rate) is achievable while remaining at E5/B7 specifications.

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Move to E10 petrol grade

Under this scenario biodiesel blend rates would need to be 6.4vol%. This biodiesel blending rate is achievable, although may require investment at fuel supplier sites to ensure continuous blending all year round, through both winter and summer. This scenario is most likely as the decision to move from E5 grade petrol to E10 grade petrol will most likely be driven by the UK market (*see more on E10 in Question 5*).

What biofuels do you envisage contributing to meeting these increased rates?

It is envisaged that the biofuel feedstocks used to meet the increased rates will be the same as those used today. However, there will be an increased demand for these feedstocks throughout the EU as all Member States will be increasing their biofuel obligation to meet RES-T targets. Availability of Used Cooking Oil Methyl Ester (UCOME) or Tallow Methyl Ester (TME) may come under pressure as these feedstocks will be in demand for 'drop-in' fuel production, such as HDRD/HVO.

Most of the feedstocks used to produce biofuel for the Irish market are sourced from the UK (29%) with only 17.5% sourced from Ireland. The most predominant feedstock for biofuel placed on the Irish market is produced from Used Cooking Oil (UCO), the majority originating from the UK followed by the US. The other feedstock for biodiesel production is tallow from the meat rendering industry.

Production of 2nd generation ethanol will not have progressed to the required levels to support the increasing renewable targets around the EU by 2020. Therefore, there will be little change to the current feedstocks used which include wheat, corn and sugar. The challenge surrounding these feedstocks will be their greenhouse gas saving. Some feedstocks used for the production of ethanol have a low GHG saving, for example, wheat and corn typical greenhouse gas saving is ~52%. ILUC sets a minimum of 50% saving for ethanol produced prior to October 2015 and it is a minimum of 60% for ethanol produced post October 2015.

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What alternative approaches do you view as being more likely to achieving Ireland's 2020 renewable energy target in the transport sector?

It is recognised by IOWRL that the BOS will be the pathway for Ireland to comply with RES-T. In our opinion it is unlikely that other technologies such as electric vehicles will have had any appreciable level of market penetration by 2020 to make an impact on the mandated target. Electric vehicle penetration is at < 0.5% at present.

Question 2:

In order to meet Ireland's 2020 renewable energy target in the transport sector, it is proposed to increase the biofuel obligation rate to 10% from 2019 and circa 12% from 2020.

- What impact do you believe this will have on fuel prices?***
- What alternative approaches could provide a more cost-effective method of achieving Ireland's 2020 renewable energy target in the transport sector?***

No comment.

Question 3:

In order to maximise the contribution of the Biofuels Obligation Scheme to Ireland's renewable energy target in the transport sector, it is proposed to restrict / reduce the current level of use of carried over certificates in 2020.

- Do you support this approach?***

Although IOWRL understands the need to consider restricting the current level of use of carryover certs for 2020, the timing of this decision is not optimal. The schedule for biofuel blending is made at least

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two to three months ahead of time to allow for the import of feedstocks at an economical value. The decision on the restriction of carryover certs would need to have been made in 2017 to allow for refinery planning purposes. To this end, IOWRL supports the approach to restrict/reduce the level of use of certs in 2020, but would encourage DCCAE to make the decision no later than March 2018, as stated at the BOS meeting in Dublin, November 21st 2017.

- What would be the appropriate level of carryover for use in 2020 and beyond?

- If you feel the current level should be maintained, please provide reasoning including an alternative approach to maximising the contribution from biofuels to achieve Ireland's renewable energy target in the transport sector.

A reduction in carryover certs for 2020 could be managed by the industry.. However, a review of the level of carryover would be recommended for 2021 onwards.

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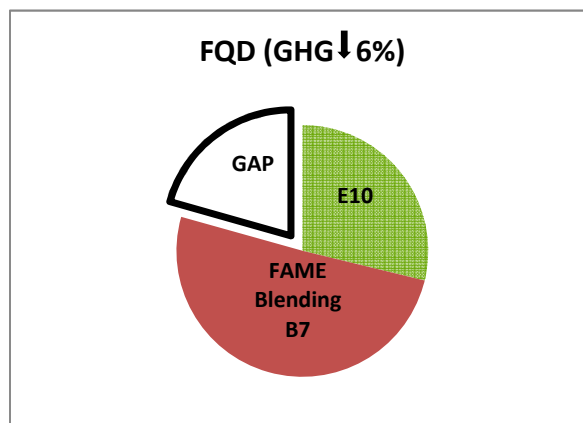
Question 4:

The recently amended Fuel Quality Directive (Directive 98/70/EC) places obligations on suppliers to reduce emissions – specifically the reduction in carbon intensity of at least 6% to be met by 31 December 2020 compared to 2010.

- How do you envisage this requirement being met?

Meeting the Fuels Quality directive is very challenging for fuel suppliers. While there are strong links between the 10% RES-T target set out in the Renewable Energy Directive (RED) and the FQD 6% GHG reduction target, meeting one target does not ensure compliance with the other. While the solution for both is largely the same, i.e. substitution of fossil fuel with biofuels, there are several reasons why meeting a RES-T target does not align with meeting an FQD target. For example, the types of biofuel, carbon intensity of the fuel placed in the market double counting under RES-T are not considered under the FQD targets. Given that in 2015 and 2016 BOS reported that 100% of biodiesel on the market was double counted this poses a challenge for FQD. This results in a gap for GHG reductions for the FQD targets (despite RES-T targets being met).

Figure 2: Gap to GHG Reduction Target under FQD



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The only realistic solution to achieving the targets set out under FQD is the blending/addition of renewable diesel to the existing diesel mix. As described previously in Question 1 there are limits and constraints to the amount of bio components such as ethanol and FAME which can be added to petrol and diesel (10% ethanol, 7% FAME). These limits do not apply to diesel manufactured from hydrotreating – HDRD (Hydrogenation Derived Renewable Diesel) also known as HVO. The diesel product from this process is indistinguishable from traditional diesel but manufactured from renewable sources. As such, the product is not subject to a blendwall.

IOWRL believes that addition of HDRD/HVO renewable diesel to the fuel mix is a pathway to close a gap for GHG intensity reductions under FQD but also for the national RED target where double counting is also prohibited. However, it should be noted that HDRD is not readily available in the marketplace and therefore could be difficult to secure by all Member States in 2020.

- Are there any measures that Government could take to assist obligated parties reach the Fuel Quality Directive target?

No comment.

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Question 5:

Increasing the biofuel obligation rate is likely to involve the introduction of fuels with higher concentrations of biofuel (such as E10 which is petrol blended with 10% ethanol and B7 which is diesel blended with 7% biodiesel). This may lead to compatibility issues with older vehicles, consumer cost, and the necessity of consumer awareness in order to ease its introduction, and potentially the development in forecourt infrastructure.

- What do you view as the technical and consumer challenges associated with increasing the biofuel obligation rate (including introducing fuels such as E10 and B7)? Are there technical barriers to achieving 7% conventional biodiesel blend (B7) averaged across the full year, including the winter months?

B7 (diesel blended with 7% biodiesel)

FAME is purchased to the EN14214 fuel specification and to meet the required seasonal conditions (i.e. winter or summer cold flow properties). Blending FAME during the winter months can be challenging. It is imperative that the cloud point and cold filter plugging point characteristics of the FAME are within specification for winter grade, typically -5degC CFPP. This will minimise the issues blending to 7vol%. As stated previously, it would be our recommendation to assume a maximum blend rate of ~6.8vol% FAME to allow for some downtime or reduced rate, particularly during winter months.

E10 (petrol blended with 10 vol% ethanol)

There are no technical issues with blending 10% ethanol into petrol. Refineries produce a Blendstock for Oxygenated Blending (BOB) which ethanol is added to. The market would switch to purchasing an E10 BOB which is different to an E5 BOB. However, it is noted that E10 represents a blendwall which cannot be exceeded. This represents a maximum blending solution should the petrol market grow in Ireland.

- Can fuels such as E10 and B7 be brought to the market in Ireland by 2020?

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Both E10 and B7 fuels can be brought to market by 2020, although supply chain infrastructure would need to be reviewed. From a refinery perspective it is feasible to supply the current market with both of these fuels. However, the supply model for Ireland is based on having one grade of petrol and one grade of diesel available at the forecourt. As such, E10 would represent an infrastructure challenge at retail locations.

For biodiesel blend rates higher than 7%, are drop-in biofuels a viable solution for Ireland?

As discussed in Question 4 – HDRD/HVO is an option for increasing renewable content of diesel beyond the 7vol% FAME limit. Demand for these drop-in fuels is high and therefore purchase of HVO can be difficult to secure. There is a limited supply currently.

Question 6:

Since the publication of A European Strategy for Low Emission Mobility in July 2016, the European Commission has designated that food based biofuels have a limited role in decarbonising the transport sector due to concerns about their actual contribution to the decarbonisation. It is envisaged that a gradual reduction of food based biofuels and their replacement by more advanced biofuels will realise the potential of decarbonising the transport sector and minimise the overall indirect land-use change impacts. The EU Commission has signalled that the trajectory of biofuels is away from first generation biofuels towards advanced or second generation biofuels. This is primarily to be achieved through the introduction of a cap on first generation biofuels and the incentivisation of advanced biofuels.

How should the development of increased levels of advanced biofuels be supported in Ireland?

Regulatory certainty needs to be given to industry in a timely fashion. This would allow for easier investment decisions with regards to indigenous biofuel manufacture.

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Question 7:

Currently, the Biofuels Obligation Scheme is limited to the transport sector. In the heating sector, there is a high use of fossil fuels (including oil) and a target 12% of energy consumption from renewable sources by 2020.

What is your opinion on the potential for an obligation scheme (similar to the Biofuels Obligation Scheme) in the heat sector?

IOWRL does **not** support an obligation scheme in the heating sector prior to 2020. An obligation in this sector would compete with the same feedstocks required to meet RES-T.

- What do you see as the technical barriers to introducing such a scheme?

Blending of traditional biofuels such as FAME would not be recommended in the heating sector. This is due to the nature of the storage in this sector – heating oil can often lie ‘dormant’ in tankage for weeks or months before being required. Heating oil is often the back-up fuel for emergency generators or heating systems, as an example, that remain dormant for periods of time (e.g., turned off for summer months). Layering can occur in tankage due to density differences between the heating oil and FAME, causing blocking of the burners. This may result in service disruptions to the public and business.

The only potential for renewable fuel in the heating sector is HDRD/Renewable diesel. This is because this is indistinguishable from fossil diesel. There is minimal density difference between the heating oil and renewable diesel therefore layering is not an issue. However, as noted above, the same feedstocks, which are in high demand, would be required to meet RES-T

HDRD/HVO is not readily available on the market today and any volumes secured presently would be used to meet the RES-T target. Until there is an increase in production in HDRD then a biofuel obligation in the heating sector would not be advised. This could be reviewed post 2020.

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