



Liquid Gas Ireland Submission
to the Department of Transport's Public Consultation on
the Renewable Fuels for Transport Policy
27 May 2022

*This document follows the format of the questions set out in the consultation document

About you

Name: Liquid Gas Ireland (LGI)

LGI is the association representing companies operating in the LPG and BioLPG industry in Ireland. Members include LPG and BioLPG producers, distributors, equipment manufacturers, and service providers. Our mission is to ensure that policy makers continue to recognise LPG and BioLPG as the clean, versatile, and alternative lower carbon energy of choice for off-grid energy users in the residential, commercial, industrial, agriculture, leisure, and transport sectors in Ireland. Liquid Gas Ireland is committed to working with consumers, stakeholders, and policymakers to support Ireland's goal to tackle air quality, drive decarbonisation and achieve net zero emissions by 2050.

As part of Liquid Gas Ireland's response to the Department of Transport's Public Consultation on the Renewable Fuels for Transport Policy, we wish to respond to the consultation questions as outlined below. LGI fully supports the Department's policy measure, via the Biofuels Obligation Scheme, to increase the share of renewable energy in the transport sector and to contribute to the reduction of Ireland's greenhouse gas emissions.

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Section 1 Climate Action Plan – achieving ambitious targets

Your views are sought concerning the proposed increases in biofuels supply envisaged under the Climate Action Plan 2021 to support the decarbonising of transport, and specifically concerning,

- **The proposed indicative annual trajectory of the biofuel obligation rate to 2030, and the corresponding buy-out charge, as referred to in the Background section above.**

Liquid Gas Ireland (LGI) supports the proposed indicative annual trajectory of the biofuel obligation rate to 2030, from 13% (by volume) to 23% in 2025. We agree that a clear biofuels obligation rate increase trajectory is required to ensure the required levels of renewable energy used in the transport sector are delivered.

LPG is the lowest carbon conventional energy source available to off-grid homes and businesses, which provides immediate, expedient, and cost-effective heat and energy. As LPG emits more than 33% fewer carbon emissions than coal and 15-20% fewer carbon emissions than oil, LPG is a transitional solution in its own right. It also emits virtually no NOx, SOx, and Particulate Matter, enabling immediate air quality improvements.

Ireland has a high dependence on fossil fuels for transport, which results in significant GHG and air pollution and so causes negative societal health impacts. This is recognised as a key public health issue by the Environmental Protection Agency. LPG and BioLPG are recognised in the Policy Statement for this consultation to be viable lower carbon alternatives for transport fuels, especially oil. Both LPG and BioLPG, amongst other biofuels, have been proven to be effective alternatives to petrol and diesel, with significant reductions in GHG and air pollution levels.

The use of LPG to fuel forklifts is an example of how alternative fuels, such as LPG and bioLPG can support significant emissions reductions across the sector. Some of the largest businesses in Ireland depend on LPG for their forklift operations. This means a stable and secure supply will be needed to support their timely movement of goods from storage to distribution, through indoor and outdoor environments. Using LPG and bioLPG, results in

improved air quality when compared to other fossil fuel alternative technologies and reduces the need for additional infrastructure (charging points) when compared with electric. LPG is also used as an alternative fuel in the Autogas sector as well, which demonstrates its flexibility.

LGI members are invested in the low-carbon future for the Irish economy. The liquid gas industry has committed to 100% renewable fuels by 2040 and so will support Ireland with its carbon reduction targets, and demand for renewable fuels – which is expected to increase. LGI members are committed to this target and invest significantly in R&D to ensure fuels are successful in lowering carbon emissions, can be ‘dropped in’ or ‘blended’ with no or minimal adjustments on existing combustion infrastructure, and are competitively priced.

Our renewable product, BioLPG (AKA: HVO Renewable Propane), is a chemically indistinct but renewable version of LPG, made from sustainably sourced renewable vegetable oils, wastes, and residues, and delivers up to 90% certified carbon emission savings compared to conventional LPG.

BioLPG supplied on the market today is approved in accordance with EU-RED II, is a fully traceable renewable fuel and is certified under the International Sustainable Carbon Certification (ISCC) scheme.

BioLPG can be blended up to 100% and can continue to make a significant contribution to the Department of Transport’s Biofuels Obligation Scheme targets for 2030, in particular in “non-road transport” widely used in Ireland through the forklift truck sector.

Similarly, to BioLPG, our EU and UK sector’s development product rDME is a gaseous fuel produced from a wide range of renewable feedstocks, including waste streams and residues. Chemically similar to LPG, it can be blended with LPG up to 20% and used in existing vehicles¹. It offers huge opportunities for near term decarbonisation, not only in the transport sector but also in industrial and domestic heating and cooking applications. It is a sustainable gaseous fuel that can reduce greenhouse gas (GHG) emissions by more than 80% and it significantly improves local air quality when substituting diesel across the transport sector. The wide range of available feedstocks to produce rDME means it has the potential for negative emissions when produced from cow manure².

The product is not currently mass market however efforts are being made across Europe to change this. Dimeta, the joint venture between UGI and SHV energy, will complete construction of the first full scale European plant in 2024, with 440GWh of rDME being produced per day in the UK. They have committed to developing further plants across various locations in the EU. Ireland could be in a position to attract an rDME plant in the future, should the investment policy framework be deemed suitable. The LPG industry is constantly innovating when given the correct incentives and time, rDME is evidence of this.

In relation to the buyout charge, Liquid Gas Ireland and its member companies are not obligated parties and have no further comment.

- **With reference to increased European ambition under the Fit for 55 proposals or further measures under the Climate Action Plan, the potential for even higher national**

¹https://www.liquidgaseurope.eu/images/LGE_Position_on_the_Proposal_for_an_Alternative_Fuels_Infrastructure_Regulation.pdf

² <https://oberonfuels.com/about-dme/dme-basics/>

targets for 2030, for example, to support a blending target or biodiesel/HVO of B25 or B30, or an option for supplying an E85 blend by 2030.

Please refer to Question 1 above. LGI supports the introduction of blending targets in incentivising the use of cleaner, greener fuels across the transport sector.

As a drop-in fuel, we would like to highlight that BioLPG (AKA: HVO Renewable Propane) does not have a blend limit, which means that the product and technology does not present a barrier for industries who are under pressure to decarbonise their transport fleets. LPG and BioLPG are already used throughout Europe in the Autogas and FLT sectors.

- **The challenges and opportunities presented by these ambitious targets – with reference to achievability, technical implementation considerations, and availability of sustainable supply whether imported or Indigenous.**

Technical implementation considerations

While LGI recognise the benefit of using obligation rates and blending targets as drivers to ensure levels of renewable energy used in the transport sector are delivered, we would like to highlight that increasing the biofuel obligation rate is likely to involve the introduction of fuels with higher concentrations of biofuel (such as petrol blended with 10% bioethanol and diesel blended with 12% biodiesel on average). This may lead to compatibility issues with older vehicles, additional cost to the consumer, the necessity to inform consumers in order to ease its introduction, and potentially a need to develop forecourt infrastructure.

Availability of sustainable supply

As set out in LGI's *Vision 2040*, BioLPG (AKA: HVO Renewable Propane) currently used in Ireland is a by-product of a conventional hydrotreated vegetable oil (HVO) process that mainly produces renewable biodiesel.³ LGI member companies are currently sourcing BioLPG from Neste's renewable product refinery in Rotterdam and Total in La Mede France. BioLPG is made from a mix of sustainably sourced renewable vegetable oils, residues, and waste materials and reduces GHG by at least 50% and up to 90% against set values of fossil fuels, in accordance with the European Union Renewable Energy Directive ('EU-RED') and is ISCC certified. The recent EU Commission's Implementing Decision on ISCC (April 2022) reconfirms that the ISCC voluntary scheme demonstrates compliance of BioLPG with the requirements set in Directive (EU) 2018/2001 for biofuels, bioliquids, biomass fuels, renewable liquid and gaseous fuels of non-biological origin and recycled carbon fuels.⁴

HVO production is increasing in Europe, driven by the revised EU-RED and renewable transport fuel targets. The Irish market is likely to be dependent on imports in the short-medium term without investment in domestic production. There is significant potential, however, for investment in indigenous production facilities in Ireland. Opportunities include new HVO plants, coprocessing at existing refineries and commercialising new and novel processes for bio-propane synthesis.

On the future potential for an indigenous supply chain for BioLPG in Ireland, we refer you to a similar piece of independent research commissioned by Liquid Gas UK (2020), which looked at BioLPG production options in England, Wales, and Scotland.⁵ The study concluded that large volumes of bio-oils can be co-processed with petroleum intermediates to produce BioLPG in existing UK oil refineries, at almost no additional capital cost.

³ <https://www.lgi.ie/assets/uploads/documents/LGI%20Vision%20Document%202040%20Final.pdf>

⁴ [https://ec.europa.eu/transparency/documents-register/detail?ref=C\(2022\)2117&lang=en](https://ec.europa.eu/transparency/documents-register/detail?ref=C(2022)2117&lang=en)

⁵ <https://www.liquidgasuk.org/uploads/DOC5FC77254A1388.pdf>

Liquid Gas Ireland, and our European counterpart Liquid Gas Europe, recognise the importance of close collaboration with our national and EU industry stakeholders and policymakers to ensure the necessary policy support for the production and use of BioLPG across Europe, and to provide investment confidence to producers, suppliers, and investors across the bio propane supply chain. ⁶

Time is however required to deliver these innovations, a fact recognised by the European Union when setting the 2030 deadline with respect to renewable transport targets and the products permitted to form part of that calculation. We advocate strongly for a similar timeline to be afforded to us in Ireland, not least in the context of the role our sector plays in incentivising consumer switching from higher carbon, polluting fuels to lower carbon, clean burning fuels like LPG and BioLPG.

The use of LPG to fuel forklifts is an example of how alternative fuels, such as LPG and BioLPG can support significant emissions reductions across the sector. Some of the largest businesses in Ireland depend on LPG for their forklift operations. This means a stable and secure supply will be needed to support their timely movement of goods from storage to distribution, through indoor and outdoor environments. Using LPG and BioLPG, results in improved air quality when compared to other fossil fuel alternative technologies and reduces the need for additional infrastructure (charging points) when compared with electric. Therefore, a restrictive policy on LPG and BioLPG can lead to higher costs and impede business operations, which can result in inflationary pressures in an already precarious economic situation. LPG is also used as an alternative fuel in the Autogas sector as well, which demonstrates its flexibility.

- **Consideration of other fuels, such as gasoil, which if included within the biofuel blending obligation could assist in meeting the ambitious targets for decarbonising transport**

Ireland has a high dependence on fossil fuels for transport, which results in significant GHG and air pollution and so causes negative societal health impacts. This is recognised as a key public health issue by the Environmental Protection Agency. LPG and BioLPG are recognised in the Policy Statement for this consultation to be viable lower carbon alternatives for transport fuels, especially oil. Both LPG and BioLPG, amongst other biofuels, have been proven to be effective alternatives to petrol and diesel, with significant reductions in GHG and air pollution levels.

LGI member companies are invested in the low-carbon future for the Irish economy. The liquid gas industry has committed to 100% renewable fuels by 2040 and so will support Ireland with its carbon reduction targets, and demand for renewable fuels – which is expected to increase. LGI members are committed to this target and invest significantly in R&D to ensure fuels are successful in lowering carbon emissions, can be ‘dropped in’ with no or minimal adjustments on existing combustion infrastructure, and are competitively priced.

In addition to the role that BioLPG plays in decarbonising the transport sector, we wish to highlight the following alternative fuels for consideration.

Renewable DME (rDME)

Similarly, to BioLPG (AKA: HVO Renewable Propane), rDME is a gaseous fuel produced from a wide range of renewable feedstock, including waste streams and residues. Chemically similar

⁶ https://www.liquidgaseurope.eu/images/vision_2050_SCREEN.pdf

to LPG, it can be blended with LPG up to 20% and used in existing vehicles.⁷ It offers huge opportunities for near term decarbonisation, not only in the transport sector but also in industrial and domestic heating and cooking applications. It is a sustainable gaseous fuel that can reduce greenhouse gas (GHG) emissions by more than 80% and it significantly improves local air quality when substituting diesel across the transport sector.

The wide range of available feedstocks and production methods available to produce rDME make it a versatile and flexible decarbonisation route. It can be produced via gasification and catalytic synthesis, using feedstocks such as municipal solid waste, forest residues, animal waste, sewage/industrial sludge, and energy crops. Producing from cow manure is especially attractive as it prevents its high methane content being directly released to the atmosphere. Therefore, rDME produced from dairy gas (cow manure) has the potential for negative carbon emissions of -278gCO₂e/MJ, meaning the carbon emissions of an LPG:rDME blend can be close to 0⁸. Producing from municipal waste will reduce Ireland's reliance on EfW incineration, with 46% of Ireland's municipal waste currently being incinerated⁹. Incineration and landfill result in air pollution causing detrimental societal health impacts, such as asthma. Furthermore, producing rDME is a far more efficient use of waste, reducing emissions by more than 80% compared to incineration¹⁰. Most DME (chemically identical to rDME but not made from renewable feedstocks) on the market is produced via catalytic synthesis of methanol. By switching to renewable methanol, plants can immediately start producing rDME. Finally, power-to-x technology can be used to produce rDME from low-carbon hydrogen and carbon dioxide.

To ensure rapid uptake of renewable fuels in the EU market across all sectors, including BioLPG and rDME, it is important to signal to the industry and energy citizens that production and use of renewable fuels will be supported in the long term by coherent legislation and policies. This can only be achieved if measures and incentives are consistent across legislative files.

Liquefied Natural Gas (LNG) and BioLNG

One of our member companies launched Ireland's first LNG product in Ireland in 2019, bringing the economic and environmental benefits of natural gas to large business energy users off the natural gas network. LNG is a cleaner, lower carbon energy solution that delivers for businesses located off the natural gas network. LNG delivers a carbon emission saving of 25% when compared to heavy fuel oil. LNG also delivers significantly lower particulate emissions (-99%), NO_x (-70%) and SO_x (-80%) – helping to improve air quality.

In the context of the transport sector, LNG stations could be implemented relatively quickly in the future, in partnership with existing forecourt providers and do not require connections to the existing gas network. Once LNG stations are established in Ireland, the seamless transition to BioLNG will be a step away.

- **Specifically, regarding a legal mandate for the implementation of E10, subject to an appropriate legal instrument being settled by Government, technical considerations for implementation, for example, lead-in time and alignment to the seasonal changeover of petrol supplies, i.e., potentially in September 2022 or May 2023, or other key considerations.**

⁷https://www.liquidgaseurope.eu/images/LGE_Position_on_the_Proposal_for_an_Alternative_Fuels_Infrastructure_Regulation.pdf

⁸<https://oberonfuels.com/about-dme/dme-basics/>

⁹<https://www.epa.ie/our-services/monitoring--assessment/waste/national-waste-statistics/municipal/#:~:text=A%20total%20of%201.4%20million,with%20energy%20recovery%20in%202019.>

¹⁰<https://kew-tech.com/>

LGI's member companies currently only supply LPG and BioLPG (AKA: HVO Renewable Propane) in the Irish transport sector, and we have limited knowledge of the petrol and diesel market. Therefore, we are not in a position to comment on this subject matter.

- **Considering the incentive within the increased biofuel obligation rate, your view on the support for HVO through multiplier credits under the scheme in 2023 and beyond.**

LGI fully supports incentivising the use of renewable fuels across the transport sector by means of an increased biofuel obligation rate. This includes support for HVO through multiplier credits under the scheme in 2023 and beyond.

According to the Sustainable Energy Authority of Ireland (SEAI), transport is by far the largest source of energy-related CO₂ emissions in Ireland. Before the COVID-19 pandemic it was responsible for over 40% of energy related CO₂ emissions in 2019.¹¹ During 2020, transport was the sector whose energy use was most impacted by the public health restrictions taken to combat COVID-19, and transport energy use fell by 26%. Despite this drop, transport still had the largest share of energy related CO₂ emissions in 2020.

In this context, transport will have a significant role to play in Ireland's national decarbonisation agenda. Ireland's transport system is currently highly fossil fuel dependent, which results in significant emissions of greenhouse gases (GHGs) and air pollutants that are contained in exhaust fumes.

LGI welcomes the Government's long-term strategy to reduce the sectors reliance on oil by implementing policy measures that will encourage a switch to alternative fuels and technologies. LGI's member companies can actively contribute to the government's policy goal to further reduce carbon intensity and increase renewable fuel use in the transport sector to 2030 and beyond. Liquefied Petroleum Gas (LPG), BioLPG and Liquefied Natural Gas (LNG) are lower carbon emission technologies, proven as effective alternatives to petrol and diesel.

- **Inclusion of renewable electricity under the obligation, how this can be achieved in practice and the appropriate lead in time for implementation in 2023 or later.**

We have limited knowledge of the electricity market and are therefore not in a position to comment on this subject matter.

Section 2 The EU Approach – setting limits and safeguarding the sustainability

Your views are sought concerning the proposed increases in biofuels supply envisaged under the Climate Action Plan 2021 to support the decarbonising of transport, and specifically concerning,

- **What further safeguards to ensure the sustainability of biofuels supply and resilience against possible fuel fraud, can be implemented to build upon the existing European provisions and plans in this area.**

Research and Development

In order to promote the sustainability of biofuels supply, investment in Research and Development is imperative to continue progressing the development of advanced feedstock options. Our sector has demonstrated significant progress in feedstock development since the

¹¹ <https://www.seai.ie/data-and-insights/seai-statistics/key-statistics/co2/>

introduction of BioLPG (AKA: HVO Renewable Propane) to the Irish market in 2018. In 2020, 22.5% of the BioLPG in the Biofuels Obligation Scheme was made from Used Cooking Oil.

We would like to see the Government incentivising the production of BioLPG and newer renewable liquid gas development fuels like RDME, by expanding the terms of reference for the Climate Action Fund to consider BioLPG and RDME and facilitating research and development funding for the sector to provide a platform for those entities intending to support domestic production to do so.

Expanding Feedstock Pool Through New Fuels

By supporting the development of a wide range of fuels from a variety of feedstocks, the market will have greater security against potential scarcity in some feedstocks. One such fuel is rDME which can be produced in multiple ways, can be blended for use as a drop in fuel and offers instant short-term reduction in emissions.

Most DME currently in the market is produced via catalytic synthesis of methanol and so by switching to renewable methanol as the feedstock, plants can immediately start producing rDME. Alternatively, Power-to-X technology can be used to produce rDME whereby renewable power supplies energy for electrolysis of hydrogen and carbon dioxide. However, the current popular route for rDME production is via gasification and catalytic synthesis. A wide range of feedstocks such as dairy gas (cow manure), black liquor and municipal waste can be used for rDME production with the potential for carbon intensity as low as -278gCO₂e/MJ¹².

The fact that rDME can be produced from readily available municipal waste is very attractive. Producing rDME from waste releases 85% fewer GHG emissions than EfW incineration even without advanced carbon capture and storage¹³. Therefore, the benefits are four-fold: more efficient use of household waste compared to EfW; variety of production methods, widens feedstocks available for biofuels ensuring sustainability of supply; instant carbon reductions from switching out fossil fuels.

BioLPG too can help widen the pool of feedstocks. 90kt of category 3 tallow is available in Ireland and is currently mostly exported to European plants. Therefore, an opportunity could arise from domestic production of BioLPG using this abundant feedstock, either through gasification or transesterification, creating a sustainable, homegrown supply of biofuels. Incentives should be put in place to support the construction of Irish plants. These could include a contract for difference scheme, giving investors' confidence throughout a strong, stable carbon price (as is being considered in the UK), or R&D grants.

- **The European approach envisages biofuels from high-risk ILUC being phased out by 2030. Could Ireland phase these out earlier, and when.**

Placing an earlier ban on biofuels from high-risk ILUC would have an immediate and critical impact on the availability and supply of critical renewable fuels such as BioLPG (AKA: HVO Renewable Propane), which continue to play a significant role in decarbonising Ireland's transport sector.

LGI estimates that it needs 5 to 10 years to supply second generation/advanced biofuels in Ireland. This ambition involves a vertical integration strategy with producers to gain more control of the BioLPG supply-chain. This is happening in other European markets (see [Dimeta investment in the UK](#)) with an ambition for further investment across Europe. Ireland has an

¹² <https://oberonfuels.com/about-dme/dme-basics/>

¹³ <https://kew-tech.com/>

opportunity to secure indigenous production of rDME if it is able to offer the right commercial conditions for future plant location.

As outlined above, the Government should seek to incentivise the production of BioLPG and development fuels like RDME, by expanding the terms of reference for the Climate Action Fund to consider BioLPG and RDME to facilitate research and development funding for the sector. LGI seeks alignment with the EU position in order to mature, alongside the EU biodiesel market, advanced biofuel feedstocks in the medium term and to ensure stability and competitive prices for rural consumers in the transport and heat sectors as we strive to reach our 100% decarbonisation goal by 2040.

Figure 1 below illustrates the current position across the European biofuel and feedstock market, with palm oil contributing to just under a fifth of the feedstocks used to produce bio and renewable diesel (FAME and HVO) in 2021. It is clear from this chart that an early ban on high-ILUC feedstocks presents a supply problem for the European feedstock and biofuel market.

Whilst high-risk ILUC feedstocks contribute to a smaller percentage of the biofuels supplied under the Biofuel Obligation Scheme in Ireland, we anticipate a tighter European biofuel market as producers and obligated suppliers across Europe accelerate their efforts to meet increasing obligation rates.

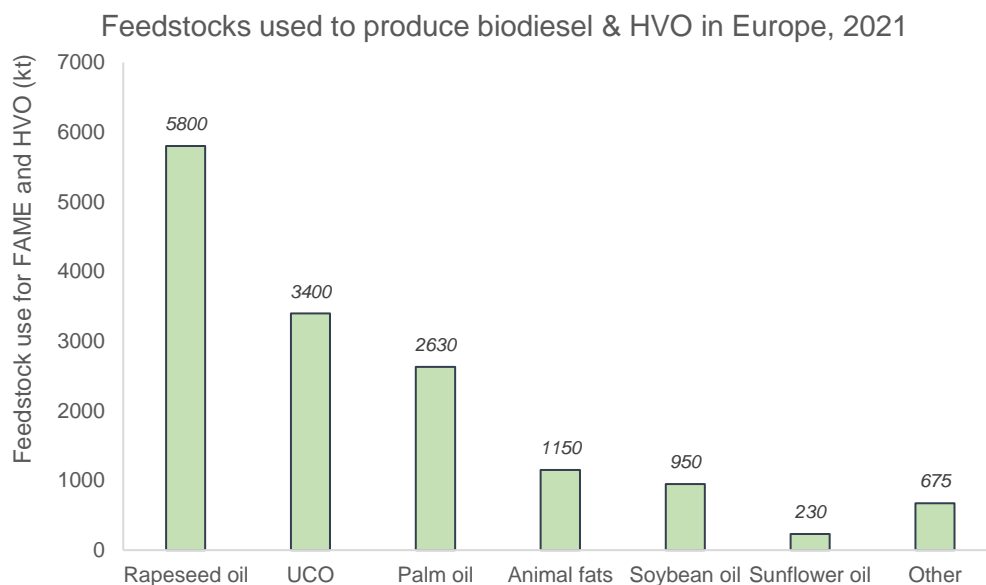


Figure 1 – Estimated volume of feedstocks used to produce biodiesel (FAME) and HVO in Europe, 2021 (source: [USDA, 2021](#))

Looking out at operational and planned European HVO production capacity over the coming years (see Figure 2 below), it is clear to see an increasing trend. New investments in Preem facilities in Sweden, and Total facilities in France have continued an upward trend. We anticipate this will accelerate over the 2020s.

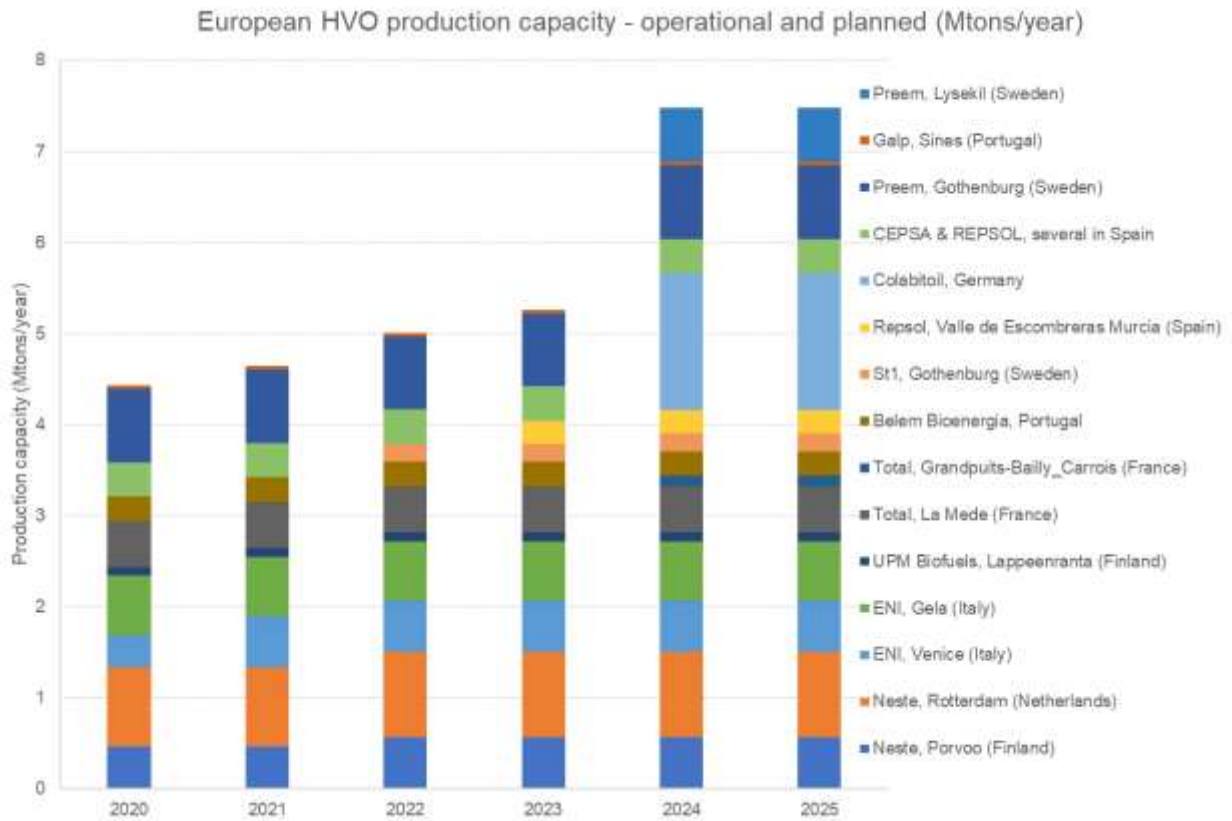


Figure 2 – Projected European HVO production capacity (source: various)

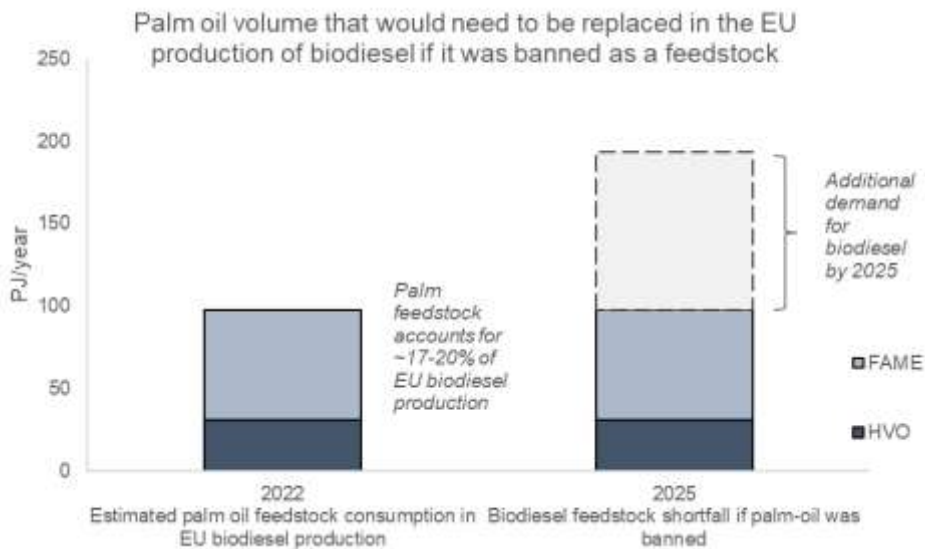


Figure 3 – European biodiesel feedstock shortfall if palm-oil was banned by 2025

Figure 3 takes the current consumption of palm oil for bio and renewable diesel (FAME and HVO – split estimated), and considers the additional demand for biodiesel by 2025, as driven by Member State’s National Energy and Climate Plans. Indeed, the sum of these plans shows transport biofuel demand increasing by 282% in the 2020s across the EU.

The trajectory for high-risk ILUC feedstocks has been made clear by the European Commission and Member States. We do not think that it is necessary to move the 2030 ban forward, particularly given the strong signals and incentives for Annex IX feedstocks.

It should also be noted that BioLPG supplied on today's market complies with EU-RED II standards and is certified under the International Sustainable Carbon Certification (ISCC) Scheme. Additionally, all biofuels (crop based and palm oil) in Ireland have been vetted to ensure biofuels used in Ireland adhere to strict sustainability criteria.

In short, we do not think that it is necessary for Ireland to diverge from the EU Delegated Regulation on a phased approach to the replacement of high-risk ILUC feedstocks. Across Europe, an early ban coupled with increasing demand for biodiesel and other biofuels, will create feedstock supply challenges and increase prices – all else equal.

Time is required for the biofuels sector to secure advanced biofuel feedstocks, a fact recognised by the European Union when setting the transition period to 2030 to the phasing out of first-generation feedstocks, in line with the revision of EU RED II timelines covering transportation. We strongly advocate for a similar timeline to be afforded in Ireland, not least in the context of the role our sector plays in incentivising consumer switching from higher carbon, polluting fuels to lower carbon, clean burning fuels like LPG and BioLPG.

- **Considering the European limits on biofuels derived from Annex IX Part B feedstocks (incl. UCO and tallow) in renewable energy for transport supply, whether certificates awarded for biofuels produced from UCO and animal fats should continue to be allowed to be carried over to the next obligation period.**

De-risking projects concerned with the production of biofuels is key to drive growth in the sector. Government must acknowledge the potential volatility in the supply of biological feedstocks, such as UCO and tallow, by giving producers the flexibility to carry certificates in times of high supply forwards to times of low supply. The price for UCO and Tallow ranged from \$900/t to \$1400/t in the period December 2018 to January 2020. Insuring investors against supply side volatility will encourage the development of Irish biofuel production and the adoption of low-carbon fuels. Allowing the carry-over of credits is an effective route of doing this.

Ireland has 35kt category 1 tallow available however the market for biofuels produced from tallow is nascent and policy should mirror this fact. Time will be required to enforce supply chains for consistent supply of feedstocks, especially with emerging plants causing demand side instability. Therefore, allowing flexibility around the use of certificates for UCO and animal fats should be maintained, at least in the short term.

With more emerging biofuel plants demanding their share of limited feedstocks, a reliable supply of feedstocks will take time. Therefore, allowing the carry-over of Annex IX Part B feedstocks will be a powerful measure to give flexibility to producers.

- **The challenges and opportunities to incentivise production of advanced biofuels from Annex IX Part A feedstocks.**

rDME uses multiple feedstocks listed in Annex IX Part A: biomass waste (municipal, forest, household), animal manure, sewage sludge, and agricultural residues. rDME is an advanced biofuel which can be used as a replacement for diesel. It produces up to 85% less greenhouse gas emissions, and less NO_x than diesel and oil.

The industry is currently exploring the use of this fuel and there is intention for this fuel to play a role in decarbonising the economy as exemplified by the joint venture announced by SHV Energy and UGI Corporation to scale rDME.

Opportunities

There is established production technology for rDME (catalytic synthesis from renewable methanol) which means rDME can be immediately produced to support decarbonisation. Additionally, it is produced using advanced technologies such as gasification and pyrolysis, development can support the production of other fuels across all sectors. Gasification and pyrolysis can use a wider range of feedstocks, including those immediately available, which gives opportunity for low cost and low carbon DME production. As rDME uses feedstocks in Annex IX Part A, there is opportunity to domestically source appropriate feedstocks and produce rDME, which can be produced domestically and support Ireland's energy security. This can also save on the GHG emissions and air pollution associated with import shipping from alternative fuels. Therefore, domestic production of rDME benefits the advancement of production technology in Ireland, energy security, and emissions reductions.

HVO biorefineries are larger than gasification production plants (used for rDME) and so take a longer time to build. Considering, Irish biofuel demand could increase to 3,290 ktoe by 2035¹⁴, supply must be scaled quickly to meet this demand. Gasification production technology provides a relatively quick solution to supporting future low carbon biofuel (rDME). Additionally, gasification usage can support the production of bioLPG through syngas production.

The industry needs financial support that helps innovation and development across the advanced biofuels sector. This includes stimulating supply and demand for products such as rDME. This means supporting R&D as well as the piloting of plants that use advanced biofuel feedstocks, whilst maintaining competition for current biofuels. This would help overcome the high production costs experienced with advanced biofuel production and support market decarbonisation.

Challenges

The LPG sector across Europe, is investing in the progression of advanced biofuels, such as rDME to achieve their target of 100% renewables by 2040. The liquid gas industry intends to decarbonise and by doing so gradually phase out high ILUC feedstocks, such as vegetable/palm oil. However, additional stipulations on ILUC feedstocks will severely restrict capability for the liquid gas industry to invest revenues from first generation biofuels in transitioning to full decarbonisation through advanced biofuels, such as rDME. Therefore, without stable regulation for developed biofuels, the industry may be disincentivised to invest in advanced biofuels.

The industry will need clear policy direction from Government on how biofuels will be supported in the long term. Several years are needed to ensure the successful delivery of these fuels to market. Therefore, the industry needs clear signalling to direct R&D efforts, production facilities and supply chains for fuels such as BioLPG (AKA: HVO Renewable Propane) and rDME.

- **With reference to EU Fit for 55 proposals to remove double counting of biofuels from all Annex IX feedstocks, views on the implementation of such a measure by 2025.**

Advanced development fuel feedstocks, such as UCO and tallow are crucial to short and medium-term decarbonisation of the economy. For example, rDME is an advanced biofuel which can be used as a replacement for diesel. It produces up to 85% less greenhouse gas emissions, and less NOx than diesel and oil. It does not have high ILUC impacts.

Using annex IX feedstocks, rDME can deliver large GHG savings. Producing rDME from cow manure prevents methane being released to the atmosphere meaning the carbon intensity

¹⁴ <https://www.seai.ie/publications/Bioenergy-Supply-in-Ireland-2015-2035.pdf>

can be negative at -278gCO₂e/MJ¹⁵. 46% of household waste is incinerated in Ireland¹⁶. Producing rDME from municipal waste offers a saving of more than 70% compared to EfW incineration¹⁷. The potential for GHG savings and better use of resources from Annex IX feedstocks means their use should be incentivised through double crediting.

Implementing this measure from 2025 would not give enough time for the industry to adapt to reach their biofuel obligations. Removing the double counting measure would require companies to double their activity to produce the obligated amount of UCO in less than 3 years. This level of scale up will be difficult and would be an issue, as approximately 67% of all the biofuel placed on the market in Ireland was produced from UCO, with imports from China accounting for nearly half of all UCO (49%)¹⁸. Domestic production options could help overcome this reliance on imports and the associated risks. Nonetheless, removal of the double counting measures would stretch the industry. Removal would force resourcing difficulties and exposure to volatile market prices (from imports), which would make meeting biofuel obligation targets difficult. High costs from non-compliance and price volatility may also have to be passed to the consumer to save business operations and investment in the production of promising low-carbon fuels such as rDME and BioLPG could be limited.

HVO feedstocks that are eligible for development credits are welcomed and have started to provide a springboard for advancing fuels and production techniques towards a low-carbon future. We believe this must continue and be built on, through the inclusion of bioLPG and rDME in the development fuel category. This is because BioLPG (AKA: HVO Renewable Propane) is a drop in fuel, which can be blended up to 100% with LPG, with no requirements to change existing applications or infrastructure. rDME should be included because of its versatility in production methods, end uses and feedstocks as well its potential for negative carbon intensity. This will support the acceleration of the low-carbon transition for the industry and Ireland.

Introducing the double counting removal would disincentivise the development of Annex IX feedstocks. Removal risks suppliers exiting the market of advanced biofuels in the pursuit of cheaper more available biofuel feedstocks to meet biofuel obligations. The price producing advanced biofuels that use biomass feedstocks (such as in Annex XI part A) are significantly more than conventional fuels, whereas the bottom end of the price variation from producing waste-based feedstocks can be equal to conventional fuel¹⁹. This means that promising biofuels, such as rDME, face higher production costs than conventional fuels on the market, but also show signs of potential as it uses waste feedstocks.

It must be acknowledged that these are nascent markets. Time and support are required in the short-term for the cost of producing fuels such as rDME to fall allowing them to reach commercialisation in the medium term. The double-counting measure for Annex XI feedstocks has provided incentive to develop fuels such as rDME and BioLPG. However, removing this mechanism risks stifling further development without production costs associated with advanced biofuels being consistently and reliably lower than competitor fuels. This would in effect be cutting out support from the market before it has properly developed.

¹⁵ <https://oberonfuels.com/about-dme/dme-basics/>

¹⁶ <https://www.epa.ie/our-services/monitoring--assessment/waste/national-waste-statistics/municipal/#:~:text=A%20total%20of%201.4%20million,with%20energy%20recovery%20in%202019.>

¹⁷ <https://kew-tech.com/>

¹⁸ <https://www.nora.ie/fileupload/457-21X0088%20-%20BOS%20Annual%20Report%20for%202020%20for%20publication.pdf>

¹⁹ https://www.ieabioenergy.com/wp-content/uploads/2020/02/T41_CostReductionBiofuels-11_02_19-final.pdf

- **What risk exists of biofuel supply mandates in Ireland cumulatively with those in other jurisdictions, creating excessive demand on feedstocks which also constitute food supply, thereby worsening food price volatility, and what safeguards would be appropriate and effective in relation to such risks?**

The limit on Annex IX Part B fuels, such as UCO, to less than 1.7% of the energy content of transport fuel impedes the development of the low-carbon fuel market. Mandating this limit will limit Ireland's largest biodiesel feedstock (UCO). This limit disincentivises using UCO as a feedstock which is key for HVO and bioLPG production. This restricts the advancement of these promising low-carbon fuels into the market. As suppliers seek to fill gaps in demand from the limit, there is a risk of increased uptake in fuels that contribute to higher ILUC in the interim and so food supply may be disrupted. There is also opportunity to domestically supply Tallow (category 3) to support the development of a domestic bioenergy sector, specifically from agri-food waste and reduce ILUC dependence.

The European Commission report²⁰ that monitors and reports on the impact of renewable energy on land use and food supply found **no observed correlation between biofuel demand and food prices**. Additionally, it states that any biofuel impact on food prices is minimal compared to other global food market influences. Therefore, the production of renewable energy has a small impact on food supply and land use. This would suggest cost pressures on current grain supplies is from global energy inflation and uncertainty as opposed to biofuel demand.

The 2% cap on biofuels produced from crop-based feedstock unnecessarily limits the potential for domestic supply. In contrast, the EU average is 5% of transport energy derived from crops. This cap is based on a 2020 baseline consumption across EU Member States plus 1%. Ireland had a low consumption level, which is why the target is low, as recognised by Irish officials. Therefore, this cap is unnecessarily limiting and low and should be reviewed to reflect the realities of the current market.

It should be noted that in Ireland, crop biofuels make up only 0.5% biofuel consumption, and that that current requirements for crop biofuels in Ireland are equivalent to approximately 5% of what the brewing and distilling sector uses.

Introducing this cap may affect the ability to supply renewable biofuels such as BioLPG which is a bioproduct of biodiesel production. BioLPG (AKA: HVO Renewable Propane) can deliver up to 90% GHG emissions savings and is sourced from renewable vegetable oils, wastes, and residues. BioLPG supplied on today's market complies with EU-RED II standards and is certified under the International Sustainable Carbon Certification (ISCC) Scheme. Additionally, all biofuels (crop based and palm oil) in Ireland have been vetted to ensure biofuels used in Ireland adhere to strict sustainability criteria. Therefore, crop-based biofuels (and ILUC feedstocks such as palm oil), that have been certified to sustainability standards should not be eligible for the 2% limitation.

Additionally, the industry aims to phase out first generation feedstocks (notably ISCC certified vegetable palm oil feedstocks) and once available, introduce advanced feedstocks and fuel technology such as rDME. Additional stipulations on ILUC feedstocks will severely restrict capability for the liquid gas industry to invest revenues from first generation biofuels in transitioning to full decarbonisation through advanced biofuels, such as rDME. Therefore, without stable regulation for developed biofuels, the industry may be disincentivised to invest in advanced biofuels.

²⁰ [RES progress report \(europa.eu\)](#)

The trajectory for high-risk ILUC feedstocks has been made clear by the European Commission and Member States. We do not think that it is necessary to move the 2030 ban forward, particularly given the strong signals and incentives for Annex IX feedstocks.

- **The relationship and/or competition between biofuels and global and EU biodiversity policy, in particular the need to set aside land for biodiversity.**

Our sector has demonstrated significant progress in feedstock development since BioLPG's (AKA: HVO Renewable Propane) introduction to the Irish market in 2018. As mentioned previously, our sector continues to invest in significant research and development to progress advanced feedstock options, including the potential for future supply of BioLPG from local feedstock pathways which include the gasification of municipal solid waste.

LGI member R&D teams are currently engaged with a number of Irish universities on future pathway development opportunities. LGI members recognise the importance of close collaboration with both EU and national industry stakeholders and policymakers to ensure the necessary policy support for the production or use of BioLPG in Ireland, and to provide investment confidence to producers, suppliers, and investors across the BioLPG supply chain.

Time is however required for the biofuels sector to secure advanced biofuel feedstocks, a fact recognised by the European Union when setting the transition period to 2030 to the phasing out of first-generation feedstocks, in line with the revision of EU RED II timelines covering transportation. We strongly advocate for a similar timeline to be afforded in Ireland, not least in the context of the role our sector plays in incentivising consumer switching from higher carbon, polluting fuels to lower carbon, clean burning fuels like LPG and BioLPG.

Section 3 Focus on future advanced and development of renewable fuels

Your views are sought concerning the potential for advanced and development fuels to support the decarbonising of transport, and specifically concerning,

- **The proposed indicative annual trajectory of advanced biofuel rate to 2030, and corresponding buy-out, as referred to in the Background section above.**

Liquid Gas Ireland (LGI) supports the proposed obligation rate for advanced biofuel supply to be established at 0.3% by energy. An indicative trajectory of increase is proposed as 0.6% by energy in 2024, and then aligning to European sub-targets of 1% by energy in 2025 and 3.5% by energy in 2030.

BioLPG (AKA: HVO Renewable Propane) can be blended up to 100% and can continue to make a significant contribution to the Department of Transport's Biofuels Obligation Scheme targets for 2030, in particular in "non-road transport" widely used in Ireland through the forklift truck sector. The obligation rate increase trajectory, as set out above, will play a critical role in ensuring that the required levels of renewable energy used in the transport sector are delivered.

In relation to the buyout charge, Liquid Gas Ireland and its member companies are not obligated parties and has no further comment.

- **With consideration of the advanced biofuel rate and buy-out, should carry over of advanced biofuel certificates be permitted and aligned to the provisions for carryover of standard biofuel obligation certificates. Are there reasons why such carryover of advanced biofuel certificates should not be permitted?**

BioLPG has the potential for development as an advanced biofuel in Ireland from biological sources in the coming years. Currently, the LPG EU sector is investing in the research and development of second generation BioLPG, which as an advanced biofuel, will place a stronger focus on advanced processes, using wastes and lignocellulosic feedstocks that typically achieve greater efficiencies and deliver greater GHG savings.

LGI agree with the Department's approach to permit the carryover of advanced biofuel certificates, as these fuels can and will continue to provide a method to help achieve Ireland's renewable obligations in the transport sector in the longer term.

- **With reference to increased European ambition under the Fit for 55 proposals and under the Climate Action Plan, the potential for a higher national target to be set for advanced and development fuels.**

The European Fit for 55 Proposal increases the ambition for the supply and use of advanced and development renewable fuels in road transport, while introducing a sub-target for renewable fuels of non-biological origin (RFNBOs), and similar targets for advanced and development renewable fuels applicable by 2025 in the aviation sector.

LGI is in favour of a potentially higher national target to be set for advanced and development fuels. This will promote greater use of key renewable fuels, which will support Ireland in meeting the ambitious targets as set out under the EU's Fit for 55 packages.

- **With reference to proposals for a sub-target for renewable fuels of non-biological origin envisaged under the current European proposals for revision of the RED, that this could be implemented earlier in Ireland, e.g., from 1 January 2024.**

Both rDME and BioLPG (AKA: HVO Renewable Propane) can be produced via power-to-x technology, an attractive solution for meeting targets on renewable fuels of non-biological origin. Renewable power can supply energy for the electrolysis of low-carbon hydrogen and CO₂ to produce bioLPG or rDME.

This has two major advantages over other power-to-x routes such as the electrolysis of water to produce hydrogen. BioLPG and rDME can be used immediately in vehicles to reduce transport emissions whereas fuel cell technology is very expensive and requires major overhauls to charging infrastructure and the vehicle stock. Also, liquid rDME is an attractive hydrogen carrier. The volumetric energy density of rDME is higher than that of liquid hydrogen and so a litre of rDME contains more hydrogen. Liquid rDME is easily transportable and can be used directly in industrial settings or converted back to hydrogen through a simple process before use.

LGI supports the move to develop the sub-target as an overreliance on biological feedstocks could lead to volatility in the supply of renewable fuels. However, these targets should not be met solely via green hydrogen. BioLPG and rDME can be effective routes to meet these targets owing to their versatility and variety of feedstock options. A 2024 start-date does not give sufficient time for the mass sourcing of renewable energy sources and green hydrogen required for power-to-x BioLPG and rDME and so the target should be calibrated accordingly with additional support considered to incentivise domestic production.

- **A further measure to be applied in implementing the proposed multiple credits for certain advanced and development fuels when applied in combination, considering potential distortion effects or unintended consequences. For example: Prescribing a hierarchy of supply to transport or other sectors, such as in countering the effect of market pricing resulting in HVO supply to the aviation sector rather than road transport. Further limiting the application of multipliers relative to certain feedstocks,**

such as limiting multiple credits to biomethane when produced from feedstock under Annex IX Part A, so as not to promote feedstocks such as grass being used in biomethane production for transport rather than animal feed.

Liquid rDME can be used as a hydrogen carrier and should therefore qualify as a development fuel. Liquid hydrogen is less energy dense than liquid rDME and so rDME provides a more efficient way of providing hydrogen energy by volumetric comparison- it contains more hydrogen per litre. Liquid rDME can be used directly in industrial production or with adding a simple process before use can be converted back to hydrogen. This demonstrates the versatility of rDME as a fuel.

Power-to-x technology can produce rDME. This has advantage over other power-to-x routes, such as the electrolysis of water to produce hydrogen, because rDME can be used immediately in vehicles to reduce transport emissions. In contrast, fuel cell technology is very expensive and requires major overhauls to charging infrastructure and the vehicle stock.

HVO is included within the development fuels category and is eligible for development certifications. The HVO production process is currently the main method of producing BioLPG (AKA: HVO Renewable Propane). As bioLPG uses HVO feedstocks and production processes which are eligible for development certification, bioLPG should be included within the development fuels category.

BioLPG can also be made from syngas as a result of the gasification process. Crediting bioLPG as a development fuel, provides another opportunity to develop advanced production processes and bioLPG within Ireland, such as through gasification. Gasification plants are smaller than biorefineries and so can be constructed quicker to meet increasing biofuel demand.

Including bioLPG in the development fuels category can incentivise increased production to immediately decarbonise LPG. BioLPG can be blended up to 100% with LPG, and it delivers up to 90% certified carbon emission savings in comparison. The fuel can be used in the domestic, non-domestic and transport sector. This solution is readily available, affordable and can be easily transported, whilst being used in existing LPG applications. Backing this fuel will drive investment further, resulting in easy and immediate success decarbonising the economy.

Any market interventions must still incentivise fuel development into different markets and, crucially, result in competitive and stable prices across the industry.

- **In addition to the proposals in the Policy Statement for credits to incentivise advanced and development fuels, what other measures could promote their supply and use in the transport sector?**

LGI notes that the current biofuel obligation only applies to fossil fuels supplied into the road transport sector. From 2024, the obligation will be expanded to include fossil fuels supplied to the rail sector.

Further expanding the definition of “transport” would provide more opportunities to deliver biofuels and receive recognition under the Biofuels Obligation Scheme. Currently only road transport is included. Materials handling is a form of transport widely used in Ireland through Forklift Trucks. This form of transport is of particular interest, it currently uses diesel, petrol, and LPG engines. Widening the scope of transport would provide new channels for innovation and biofuels.

Marine transport and aviation could be considered under the obligation scheme. In April 2022, Ryanair announced its partnership with Neste to power flights using a 40% sustainable aviation fuel (SAF) blend, which will reduce greenhouse gas emissions by over 60%.²¹ Incentivising the use of renewable fuels across the sub sectors of transport will play a significant role in helping EU member states achieve their emission reduction goals.

There is a large range of hard to electrify transport cases which should be priorities for biofuel support. Tractors, canal boats and HGVs to name a few, will need alternatives to electrification and rDME/BioLPG can be the fix here. rDME has already been proven to be effective in decarbonising HGVs as shown in trials in Sweden with a reduction in emissions of 90% compared to diesel²².

Biofuels such as rDME and BioLPG can provide an instant fossil fuel replacement to areas which require alternative solutions to electrification. However, to meet the additional demand, support towards the development of these fuels is required and incentives put in place for domestic production of BioLPG and rDME.

Government should consider a contracts-for-difference scheme to encourage domestic production of fuels like rDME and BioLPG or increased credit incentives for fuels which can feed these new markets.

Widening the definition would engage new stakeholders in the transport market and inform them of the transport targets. This could develop new interest in this sector and further develop solutions.

Section 4 Aligning administration of the biofuel obligation with the policy for renewable fuels

Your views are sought concerning the future administration of the biofuel obligation, and its alignment with the European framework for renewable energy in transport, and specifically concerning,

- **With reference to the proposal to move to an energy-based biofuel obligation system, while enabling continued volume-based reporting by account holders, considering the possible future move to European carbon intensity targets in the coming years.**

We support the move to an energy-based obligation based on the reasoning for alignment with the recast Renewable Energy Directive. However, the energy content per volume of biofuel is important here, we acknowledge Annex III in the recast Renewable Energy Directive provides the default values to be used by the Member State. In line with amendments of Annex III RED ii, the new scheme should adopt any updates on the default values. An increase in the biofuel quality in the future will result in higher calorific values, the flexibility to recognise this is requested.

- **Proposed additional measures to support compliance while the obligation rate increases in coming years and to ensure compliance with European targets, in the short to medium term, through: Introduction of a penalty and progressive fine for non-compliance with the fuel quality directive target. Permitting upstream emissions reductions (UERs) to be offset against the fuel quality directive obligation. Limiting the**

²¹ <https://corporate.ryanair.com/news/ryanair-partners-with-neste-holland-to-power-flights-with-40-saf-blend/?market=en>

²² <https://www.greencarcongress.com/2010/09/biodme-20100916.html>

proportion of certificates that can be carried over into the next obligation period, to 10% or 5% (applicable to standard or proposed advanced biofuel obligation certificates), so as to moderate any distortions in annual compliance with the obligation rate.

Permitting upstream emissions reductions to qualify for offset against the fuel quality directive obligation should include key rDME feedstocks that would otherwise be emitted or used in more carbon intensive routes. For example, a wide range of feedstocks such as dairy gas (cow manure), black liquor and municipal waste can be used for rDME production with the potential for carbon intensity as low as $-278\text{gCO}_2\text{e/MJ}$ ²³. Furthermore, producing rDME from waste releases 70% fewer GHG emissions than EfW incineration even without advanced carbon capture and storage²⁴. Therefore, the significant advantage of carbon savings that come with using rDME as a fuel should be rewarded.

We do not believe that limiting the proportion of certifications that can be carried over to 10% or 5% will support the industry because:

Any additional measures to support compliance of the obligation rate increase should support market competition through providing flexibility. This is because the industry is susceptible to external shocks, such as volatile feedstock prices - U.S soybean oil prices more than doubled 2020-2021²⁵. These shocks mean producers may have to absorb or pass on costs unexpectedly. Carrying over certificates acts as a safety buffer against these shocks, protecting industry and consumers.

The industry is moving towards decarbonisation – the liquid gas industry has announced by 2040 all fuels will be from renewables. To ensure a smooth transition long-term policy certainty is required to allow the low-carbon biofuel market to develop. More stringent compliance could risk disrupting this transition through reduced revenue to invest in low carbon fuels (bioLPG and rDME) and production technology, such as pyrolysis and gasification. Also, if non-compliance costs are set at a value that cannot be met by industry, then there is a risk of passing on the higher costs to consumers.

- **The challenges and opportunities for inclusion of renewable fuel supplied for use in aviation and maritime within the obligation in future years, aligning to European Fit for 55 proposals.**

As outlined above, LGI see merit in broadening the scope of the Biofuel Obligation rate to include renewable fuel supplied for use in other areas of the transport sector, including in aviation and maritime. This would engage new stakeholders in the transport market and inform them of the transport targets, leading to the potential development of new interests and solutions for the sector.

These areas are far harder to electrify than passenger vehicles especially in rural areas where charging infrastructure will need to be installed and the electricity grid reinforced severely. BioLPG and rDME offer a flexible, instant solution for hard-to-treat areas such as maritime and aviation. BioLNG is a viable option in the maritime sector with many ships already converted from HFO to LNG to meet MARPOL (International Maritime Organisation) regulations. Policy should reflect the difficult nature of decarbonising these areas and support domestic biofuel production to meet the large demand these sectors will bring. Government should consider contracts-for-difference schemes for plants producing promising fuels such as BioLPG and rDME reflecting their pivotal role in decarbonising transport. One must only

²³ <https://oberonfuels.com/about-dme/dme-basics/>

²⁴ <https://kew-tech.com/>

²⁵ <https://www.cmegroup.com/education/articles-and-reports/chinas-high-demand-for-soybeans-fuels-asian-hours-futures-trading.html>

look as far as the UK rollout of offshore wind for the success of contracts-for-difference schemes.

- **Whether the Department should seek to carry out further research into different types of recycled carbon fuels, concerning their possible contribution to decarbonising transport, other impacts, or unintended consequences?**

LGI encourages the Department to align with the EU RED Directive in this regard. Divergent Member State implementation of RED II for recycled carbon fuels would create an unnecessary barrier to deployment and delay their market access in the EU. Ireland should be able to rely on all sustainable solutions available to transition to a low carbon economy. The inclusion of recycled carbon fuels in RED II will support this, enabling the deployment of innovative carbon capture and thermal conversion technologies such as gasification and liquefaction to produce fuels from gas streams and solid waste fractions, respectively.

- **Is there other research the Department should consider around the Renewable Fuels for Transport Policy?**

LGI would like to draw Department of Transport's attention to LGI's Vision 2040, which outlines the role that LPG and BioLPG can play as cleaner, lower carbon fuels in helping Ireland to meet its decarbonisation targets.

Vision 2040

In September 2020, Liquid Gas Ireland launched its Vision 2040, which sets out how our industry can contribute to Ireland's 'Green New Deal', including the ambitious goal to reach net zero emissions by 2050, and to the Government's Clean Air Strategy.

Liquid Gas Ireland members are committed to working with Ireland's policymakers to develop a long-term supportive policy framework to achieve 'net zero' and address barriers to decarbonisation in the off-grid heat and transport sectors.

Our society demands an energy transition that is fair, affordable, and convenient; Liquid Gas Ireland's member companies have the experience and expertise to help deliver it. We look forward to engaging with Government and energy sector stakeholders in the coming weeks and months.

- **Do you have anything further that you would like to add about the Renewable Fuels for Transport policy?**

LGI's member companies, including Calor Gas and Flogas, remain available to provide input to the development of the Department's Renewable Fuels for Transport Policy and Biofuels Obligation scheme. We are also available to outline in more detail the supply pathways that it is developing and investing in to meet the needs of its LPG and BioLPG consumers in the transport sector.

In recognising the opportunities that LPG, BioLPG and rDME will have to offer in decarbonising the Irish transport sector, we respectfully request that the Department considers three policy interventions, as set out below, to incentivise:

1. **Research and Development** – Investment in R&D is imperative to continue progressing the development of advanced feedstock options. This will act to further promote the sustainability of biofuels supply. Our sector has demonstrated significant progress in feedstock development since the introduction of BioLPG to the Irish market in 2018 and would like to see the Government investing in further research to support Ireland's climate ambitions.

2. **Indigenous Production** - HVO production is increasing in Europe, driven by the revised EU-RED and renewable transport fuel targets. The Irish market is likely to be dependent on imports in the short-medium term without investment in domestic production but there is significant potential, however, for investment in indigenous production facilities in Ireland. Opportunities include new HVO plants, coprocessing at existing refineries and commercialising new and novel processes for bio-propane synthesis.
3. **Financial support** – Financial incentives should be put in place to attract future investment for the construction of domestic plants, such as a contract for difference scheme, to give investors' confidence throughout a strong, stable carbon price. Increased investment will facilitate the longer-term development of plants for the domestic production of renewable fuels, which will in turn lead to the creation of green jobs, as well as in secured supplies that will support Ireland to meet its decarbonisation targets.

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