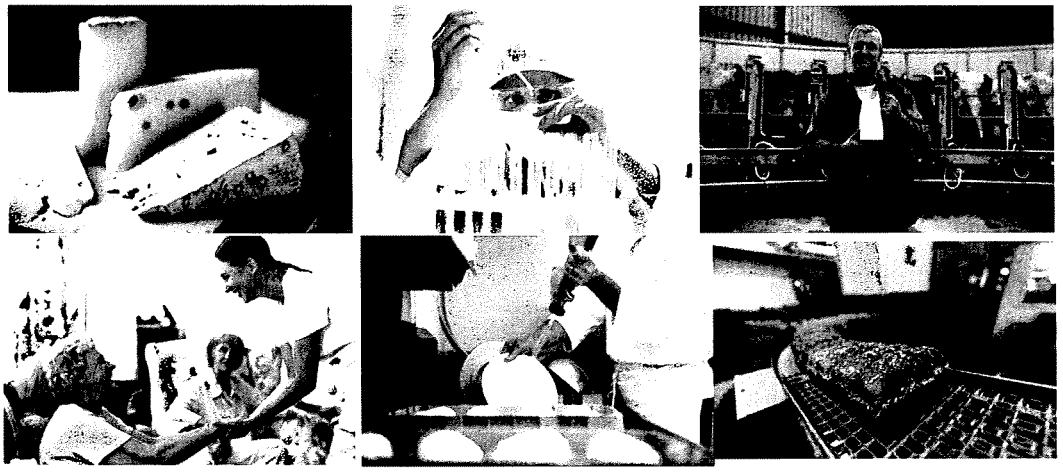
CALOR

Calor Ireland Submission

DECC Call for Expert Evidence - Climate Action Plan 2023

Sep 20, 2022



Calor Gas

A champion for change in rural Ireland

CALOR

Introduction

Calor Ireland welcomes the opportunity to respond to the Department of the Environment, Climate and Communications' Call for Expert Evidence on Ireland's Climate Action Plan 2023. In its enclosed submission, Calor has followed the format of DECC's Online Consultation Questionnaire, with section responses from Page 6 onwards.

If Ireland is to maximise the opportunities and deliver the benefits of Ireland's transition to a low carbon economy, a whole of government approach is critical, together with strong collaboration with energy suppliers, industry, consumers, and local communities.

Calor notes DECC's acknowledgement that achieving Ireland's 2030 and 2050 targets will be challenging and will require fundamental changes in many parts of Irish life. By strengthening cross-sectoral collaboration and ensuring a consumer-focused approach, DECC's goals to support improved health, welfare and security of all our people, while also protecting our environment and delivering new opportunities in terms of employment and competitiveness, can be achieved.

At the heart of this question is the need for an equitable Just Transition. As is already committed to in the Programme for Government (PfG, 2020), it is crucial that people living in both urban and rural communities are brought on the decarbonisation journey.

Rural communities should be engaged by ensuring they are given the technology choices that meet their unique needs through secure, clean, and efficient lower-carbon fuels like LPG and BioLPG. The Government's revised Climate Action Plan must therefore provide for the delivery of a 'mixed technology' approach to decarbonisation which works for rural Ireland, particularly for those living in or operating off-grid rural homes and businesses.

At the core of the Climate Action Plan is a commitment to install 600,000 heat pumps and retrofit 500,000 homes for improved energy efficiency. However, we continue to express our concern that this 'one size fits all' approach' to decarbonisation is putting significant pressure on those living in rural communities. It simply does not consider the unique economic and infrastructural challenges these areas face in achieving a Just Transition, where over two-thirds of homes currently rely on oil boilers for heating and fuel. Many of these homes are classified as hard-to-treat houses meaning the cost of a retrofit would be 80 per cent more expensive. This prohibitive expense is proved by the continued low uptake of retrofitting grants outside urban centres.

According to recent figures from the SEAI, the average total capital cost to upgrade a home from an average BER rating of F rating to an average A3 rating is €60,814, which is prohibitively expensive for many households today particularly given the challenges faced by homes and businesses due to increased increasing inflation and living costs. [1]

Calor supports a multi-technology pathway to decarbonisation in the heat and transport sectors in Ireland and is devoting significant resources to product innovation and diversification as part of the company's decarbonisation strategy. With the launch of a renewable gas (BioLPG) in 2018, Calor demonstrated its commitment to playing an active role in Ireland's transition to a decarbonised economy. BioLPG offers up to 90% lower emissions than existing LPG products.

[1] https://www.seai.ie/grants/home-energy-grants/deep-retrofit-grant/key-findings/

DECC policies should support the use of gas boilers that can operate on renewable gases. Hybrid solutions must also be considered where gas boilers are combined with heat pumps or solar thermal units and can offer flexibility and resilience to the energy system on top of GHG emission reduction benefits. It is important that efficient renewable ready gas boilers are recognized as an energy efficiency measure in building regulations and energy performance certificates.

Financial incentives in the form of tax rebates, capital grants and fuel subsidies should be deployed to encourage switching to all renewable technologies including renewable gases. Renewable gases that are produced off-site must be allowed to contribute to zero-emission buildings. Renewable gases use the existing infrastructure in achieving decarbonisation objectives and therefore can make the energy transition cost-efficient and affordable for end consumers. Intelligent policy design is needed to make sure that incentives for renewable liquid and gaseous fuels in one sector do not artificially raise their price in other sectors.

There is no 'one size fits all' solution, certainly not for heat decarbonisation. Consumers should be made aware of possible options for decarbonising heat, including the benefits of using lower carbon and renewable gases in their current heating system. Policies should not pick favourites but instead should help guide consumer choices and help them decide what fits their needs while remaining aligned with our collective climate goals.

75% of rural areas in Ireland are without availability to the natural gas distribution network. Calor can ensure that low carbon fuels are available throughout the island of Ireland in communities, villages and towns which are not connected to the national natural gas network, ensuring greater access and greater adoption of low carbon fuels.

Importantly, we bring considerable experience and a proven track record in delivering lower carbon energy solutions to off-grid consumers, not only in Ireland but across Europe, through our parent company SHV. LPG, BioLPG and Liquefied Natural Gas (LNG) are low carbon emission technologies, proven as effective alternatives to heating oil, petrol and diesel.

Calor has the experience and the expertise to play a leading role in Ireland's energy transition. Our customers and our society demand that change and we look forward to delivering it for them.

Calor can actively support the government's policy goal to further reduce carbon intensity, increase renewable fuel use and tackle air quality challenges in the heat and transport sectors to 2030 and beyond.

About Calor Ireland

Calor supplies and distributes Liquified Petroleum Gas (LPG) and BioLPG (HVO Renewable Propane) in Ireland, allowing homes and businesses, located off the natural gas network, to avail of the benefits of lower carbon and renewable gas. Calor launched Liquefied Natural Gas (LNG) for the commercial and industrial sectors in 2020.

Sustainability is at the heart of Calor's business strategy. By 2037, Calor's ambition is that all its energy products will be from renewable sources, the company's centenary year.

In 2020, Calor joined 40 leading companies in Ireland in achieving the Business Working Responsibly Mark, the leading independently audited standard for Corporate Social Responsibility (CSR) and Sustainability certification in Ireland. The Mark is audited by the National Standards Authority of Ireland (NSAI) and is based on ISO26000.

Calor employs over 280 staff in 6 sites located throughout the island of Ireland serving circa 50,000 bulk customers across residential and industrial commercial sectors. Additionally, we serve c. 400,000-cylinder users and other customers, north and south.

Calor is a part of the SHV Energy Group, the world's largest distributor of LPG. SHV Energy operates in more than 20 countries – in Europe, under brands such as Primagaz, Calor Gas, Liquigas, Gaspol and Ipragaz. SHV is proud to serve 30 million customers across three continents. SHV firmly believes that its energy can create clean air and dramatically reduce carbon impact and is committed to working sustainably with communities, stakeholders and policymakers to advance energy, together.

The role of lower carbon and renewable gaseous fuels – LPG, BioLPG, rDME, LNG, BioLNG

This section highlights the benefits of off-grid lower carbon and renewable gaseous fuels, which can play a key role in supporting Ireland's energy transition.

In addition, please see in Annex 1 (attached) a new publication **"The Strategic Role of Off-Grid Renewable Gases"** from the **European Biogas Association (EBA) and Liquid Gas Europe (LGE)** which highlights the key benefits delivered to EU consumers located off the natural gas grid including consumer acceptability, consumer affordability, GHG emissions savings and cleaner air. The publication also highlights that in 2019, 307,000 premature EU deaths were attributed to fine particulate matter (PM2.5). The PM2.5 emissions of renewable gases per unit of energy are around 37% less than oil and 99% less than coal.

About LPG and BioLPG

LPG has been a key part of Ireland's energy mix for almost a century. Going forward, we believe LPG and BioLPG can support the Irish Government's commitment to transition to a low-carbon economy and fulfil its binding obligations under the 2015 Paris Agreement on climate change.

As natural gas network penetration in Ireland is relatively low (39% of households, (Ervia, 2018)), the full potential of lower-carbon gaseous fuels like LPG needs to be further exploited. Over 40% of households in Ireland rely on oil to heat their homes. This share varies significantly by region, with roughly 26% of households located in towns using oil for central heating compared to 65% in rural areas (CSO, 2016; SEAI, 2019).

While LPG already offers significant reductions in carbon and air pollutant emissions, BioLPG (AKA HVO Renewable Propane) is the future, providing up to 90% certified carbon emission savings compared to conventional LPG.

Already available on the market today, BioLPG allows off-grid homes and businesses to significantly reduce their carbon footprint without expensive retrofitting or changes to heating systems.

Calor BioLPG is compliant with EU-RED II, is a fully traceable renewable fuel and is certified under the International Sustainable Carbon Certification (ISCC) scheme. BioLPG is carbon tax exempt, making it an attractive choice for customers in rural off-grid homes and businesses and the environmental benefits are immediate.

About Renewable DME (rDME)

The LPG sector across Europe, is investing in the progression of advanced biofuels, such as rDME to achieve its decarbonisation ambitions.

Similar, to BioLPG, 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%. 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 or heavy fuel oil.

rDME 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.

Dimeta, the joint venture between UGI and Calor's parent, 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. The joint venture has also 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.

More information here: https://www.shvenergy.com/what-we-do/sustainable-fuels/rdme

About LNG and BioLNG

Calor launched Ireland's first Liquefied Natural Gas (LNG) product for large business energy users in Ireland in 2019, bringing the economic and environmental benefits of natural gas to businesses off the natural gas network.

LNG meets the objectives of Ireland's climate and energy policy by offering a low carbon alternative for large energy users unable to use the national gas grid for location or capacity reasons. Switching an oil user to LNG will have a substantial impact on emissions.

While Calor LNG is currently available to transition large industrial heat users from heavy fuel oil (e.g., co-operatives, food processors, pharmaceutical companies, data centres), it could also be used for transport in the future.

The combustion of natural gas releases significantly less CO2, NOx and SOx and virtually no ash or particulates. And as it evaporates rapidly when exposed to the air, it leaves no residue on water or soil.

As one of Europe's leading energy companies, Calor's parent, SHV Energy, has an established network of LNG supply points. This additional supply can enhance Ireland's energy security.

The adoption of LNG as a low carbon fuel opens the possibility to utilise renewable BioLNG in the future. BioLNG is biomethane which is liquefied in the same process as LNG, it emits negligible NOx or particulate matters when burned and reduces CO2 by up to 90%. Once LNG is established in Ireland, the transition will be seamless.

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Consultation response

As part of Calor's response to the Department of Environment, Climate and Communication's Call for Expert Evidence - Climate Action Plan 2023, we wish to respond to the consultation questions posed under the following sections:

1. Carbon Pricing and Cross-Cutting Issues
2. Enterprise
3. Built Environment
4. Transport
5. Just Transition
6. Research and Innovation

Carbon Pricing and Cross-Cutting Issues

- **What further opportunities exist within our taxation system, beyond measures already implemented and planned, to promote emissions reductions, either on an economy-wide basis, or in specific sectors?**

  Financial incentives in the form of tax rebates, capital grants and fuel subsidies should be considered to encourage switching to lower carbon and cleaner gaseous fuels like LPG and renewable technologies including renewable gases. Renewable gases that are produced off-site must be allowed to contribute to zero-emission buildings. Renewable gases use the existing infrastructure in achieving decarbonisation objectives and therefore can make the energy transition cost-efficient and affordable for end consumers. Intelligent policy design is needed to make sure that incentives for renewable liquid and gaseous fuels in one sector do not artificially raise their price in other sectors.

  Economic recovery of rural households and businesses

  Affordability of cleaner, lower carbon energy solutions will be key for the economic recovery of rural households and businesses now and in the future. LPG and biofuel ready boilers are the most cost-effective lower carbon option for many households, especially older properties that are less energy efficient.

  For an average household, the upfront cost of an electric heat pump unit is €15,000.[2] This compares to €5,000 for a new modern condensing LPG boiler with standard system upgrades. Implementing the necessary energy efficiency upgrades and heat pump technology in an average older rural home, will cost over €60,000.

  LPG and biofuel ready boilers offer a long-term, cost-effective pathway to decarbonisation Through the use of LPG and gradual introduction of BioLPG into the mix, over time, carbon emissions will reduce. LPG and BioLPG can also be used seamlessly in cutting edge heating systems, such as gas driven heat pumps and hybrid heat pumps.

  Ireland can achieve its retrofitting target but only if it embraces all low-carbon technologies in the transition. By including and supporting LPG, BioLPG and in time rDME in this exercise,

[2] https://www.teagasc.ie/media/website/crops/crops/Renewable_Heat_in_Ireland_to_2020.pdf

the target can be met whilst reducing the unsustainable financial burden on rural consumers.

Carbon Tax and BioLPG

BioLPG, as a certified renewable fuel, is exempt from carbon tax, meaning it is a great investment for the future.

Accepting BioLPG and new renewable gas pathways, including rDME, as part of the solution to reducing Ireland's carbon emissions and embracing such solutions as part of the renewable mix in Government policy, will drive the energy transition. The legislation underpinning the Carbon Tax system has shown itself to be flexible in terms of helping to promote a switch from higher carbon fuels like solid fuels and oil, to cleaner, lower carbon alternative fuels including LPG and renewable BioLPG and should remain.

BioLPG (AKA: HVO Renewable Propane) supplied on the market today is compliant with EU-RED II, is a fully traceable renewable fuel and is certified under the International Sustainable Carbon Certification (ISCC) scheme. 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 EU-RED for biofuels, bioliquids, biomass fuels, renewable liquid and gaseous fuels of non-biological origin and recycled carbon fuels.[3]

BioLPG can be blended up to 100% and can continue to make a significant contribution to Ireland's renewable heat and transport decarbonisation goals to 2030 and beyond.

The LPG sector's development product, renewable dimethyl ether (rDME) is largely similar to LPG in the manner it is handled and can be blended into LPG. It can be produced in a variety of manners and from numerous feedstocks, with the potential of reduced carbon emissions. The LPG industry is constantly innovating when given the correct incentives and time. rDME is evidence of this.

Enterprise

- **What measures can be taken to accelerate the uptake of carbon-neutral low temperature heating in manufacturing?**

LPG and renewable LPG including BioLPG, rDME and other drop-in and complementary gases are acknowledged in Europe as the clean, available and innovative alternative energy of choice, that brings great benefits today to all users and will continue to deliver even more value in the future[4]

LPG is a clean-burning, smoke-free fuel that cuts carbon emissions from heating oil by 11%. BioLPG 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.

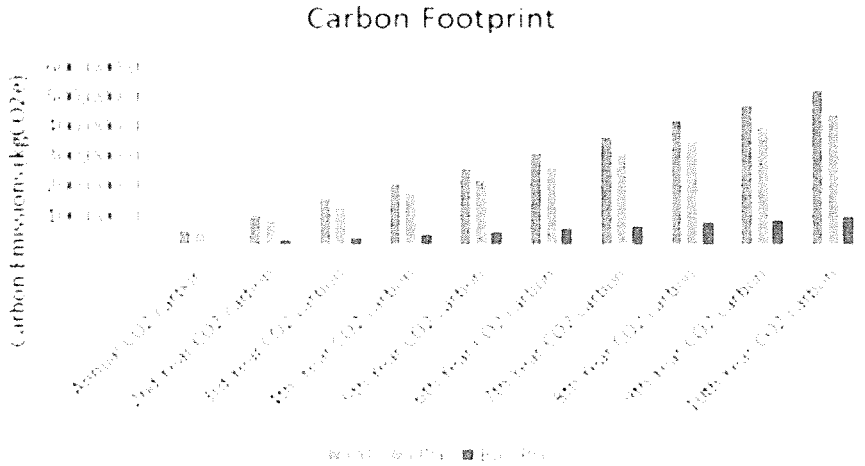
As BioLPG can be used in existing LPG infrastructure, it increases the speed at which renewable fuels can be used in homes and businesses all over Ireland without the need for capital investment.

[3] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32022D0602

[4] https://www.liquidgaseurope.eu/lge-for-lpg-alternative-energy-choice

As part of this switch however, we call on the Government to consider introducing incentives for consumer switching and to include BioLPG in the Support Scheme for Renewable Heat (SSRH) as administered by the SEAI. Continued support for LPG and BioLPG under the Energy Efficiency Obligation Scheme (EEOS) and Transport Biofuels Obligation Scheme (BOS) is imperative to ensure that consumers can make the switch from higher carbon fossil fuels to cleaner, lower carbon and renewable gas solutions as part of their decarbonisation journey.

Due to the large volume of businesses and homes who have no connection to the natural gas network, there is huge potential to accelerate the transition to carbon neutral low temperature heating. In a study by Rinnai UK (2021) in association with the UK gas appliances industry, they were able to demonstrate the carbon reduction achievable from an energy transition from oil to LPG and then BioLPG (see Graph 1).



***Graph 1**: Comparison of Oil, LPG, and Bio LPG for a Rural Hotel (Rinnai UK, 2020)*

For businesses and homes in rural off-grid areas, this switch is easy and affordable to make, and the environmental benefits are immediate. Therefore, a 'mixed technology approach' to decarbonisation will accelerate the uptake of carbon-neutral low temperature heating. As a sector, we support the principle of energy efficiency first, having delivered energy saving measures for our rural consumers. As an industry we support the deployment of highly efficient biofuel enabled boilers and hybrid heating systems. We are keen to continue to support our rural business customers further along on their energy efficiency and decarbonisation journey.

In addition, please see in Annex 1 (attached) a new publication **"The Strategic Role of Off-Grid Renewable Gases" from the European Biogas Association (EBA) and Liquid Gas Europe (LGE)** which highlights the key benefits delivered to EU consumers located off the natural gas grid including consumer acceptability, consumer affordability, GHG emissions savings and cleaner air. The publication also highlights that in 2019, 307,000 premature EU deaths were

attributed to fine particulate matter (PM2.5). The PM2.5 emissions of renewable gases per unit of energy are around 37% less than oil and 99% less than coal.

- **What measures can be taken to decarbonise high temperature heating in industry?**

  Today Calor is playing a role in transitioning rural businesses away from oil boilers to LPG. As an industry, we aim to further transition to 100% renewable gas solutions as set out in LGI's Vision 2040 document and in time rDME[5]

  A key measure is to ensure that a mixed technology approach is part of the Climate Action Plan 2023. Such a mixed technology approach, offering a choice of heat decarbonisation solutions, including lower carbon and renewable gas, will significantly benefit businesses in rural off grid areas. This switch is easy and affordable to make, and the environmental benefits are immediate. Failure to have a mixed technology solution will be damaging to businesses in Ireland.

- **What other opportunities exist to drive the decarbonisation of the enterprise sector?**

  In parallel with the opportunity to help transition 500,000 homes with oil boilers to LPG by 2030, Calor can continue to play a significant role in helping to reduce the dependence on oil heating for major industrial and commercial facilities across Ireland.

  Today, Calor works with enterprise across a variety of sectors including hospitality, food processing, healthcare, sports and leisure, industry and education on their journey to decarbonise their onsite heating systems by transitioning very significant oil dependent businesses to cleaner, lower carbon energy efficient LPG solutions.

  Going a step further, transitioning from LPG to renewable BioLPG for such commercial and industrial facilities requires no further capital investment for individual businesses as there is no change to infrastructure required for this switch. As an industry, we aim to transition to 100% BioLPG by 2040 and in doing so, can act as a huge support for the Irish enterprise sector, while simultaneously helping to reduce greenhouse gas emissions and dramatically improve air quality all over Ireland. The next step in the process will be a move to rDME as a renewable drop-in complementary fuel of the future and innovative alternative energy of choice.

- **What measures should be taken to address the risks that climate change poses for enterprise?**

  Cost and Competitiveness

  Cost and Competitiveness for business are key issues in Ireland. The foreign direct investment sector (FDI) and the indigenous export sector are highly sensitive to additional cost competitiveness challenges.

  According to SEAI (2022) figures, energy costs in Ireland are already significantly above the EU average for businesses in Ireland since 2012 and in the latest data available for the July to

[5] https://www.lgi.ie/about/a-greener-deal-for-rural-ireland/

December 2021 period for natural gas, it shows an increase of 66%, which was 17% above both the EU and the Euro Area average. [6]

While further grid enhancements are likely to facilitate increased renewable energy on the electricity grid, the cost will be borne by business and by families.

Central to the Programme for Government is the commitment to an equitable Just Transition. This is especially relevant for business including those who have had significant capital expenditure over last decade in their transition away from oil. A mixed technology approach is a key measure to help reduce the risk that climate change poses for enterprise.

- **Are there measures that can be taken to assist businesses sustain the additional operating costs associated with moving to new, low-carbon technology?**

To secure a Just Transition, the Irish Government should support the transition away from oil heating – via an oil boiler / oil tank scrappage scheme. This once-off incentive should be established to support the transition away from high-carbon fossil fuel infrastructure to cleaner, lower carbon, biofuel-ready gas heating systems – such as hybrid heat pumps and biofuel enabled LPG boilers.

In addition to this, financial incentives can be directed at the fuels themselves or the technologies that use them. Fuel incentives can take the form of a lower rate of excise duty and/or sales or value-added tax (VAT) or a complete exemption. In some cases, businesses may enjoy a rebate on fuel taxes.

Grants for renewable heating technologies should be expanded to other technology options for businesses, particularly biofuel enabled boilers which offer capital-constrained consumers a lower upfront cost option. Modern condensing biofuel enabled boilers have efficiencies of more than 90% compared with 70%-80% with conventional designs (based on the higher heating value fuels). This position has received industry consensus, as published by Renewable Energy Ireland in its 40by30 report (2021). [7]

In a report *LPG Heating Incentive Policies* published by Liquid Gas Europe (2021), the impact of financial incentives, including differential taxes and support for heating technologies across various countries was surveyed. [8]

In the United States, for example, a range of federal and state tax credits for efficient boilers has had the overall effect of encouraging households and commercial premises to install LPG heating systems.

[6] https://www.seai.ie/data-and-insights/seai-statistics/key-statistics/prices/

[7] https://renewableenergyireland.ie/wp-content/uploads/2021/05/Renewable-Energy-Ireland_Renewable-Heat-Plan_-Final.pdf

[8] https://www.liquidgaseurope.eu/images/publications/LPG_Heating_Incentive_Policies_2021_Report_September2021.pdf

Built Environment

- **Currently SEAI provides approx. 50% of the grant of retrofit to Landlords, Housing for All commits to introducing a minimum BER for rented properties from 2025 onwards. What further supports can be put in place to address the split incentive when retrofitting rental properties (residential and commercial)?**

  It is understood that in the majority of cases, private renters do no not have the authority, or access to grants to make changes to their homes to ensure greater energy efficiency. Those on low incomes are placed under the financial burden of heating often inefficient homes and often don't have access to incentives such as retrofitting.

  To encourage the uptake of energy improvement measures, landlords whose properties may not require extensive work should be encouraged by the Government to invest in "low hanging fruit" measures.

  This can be achieved through awareness raising campaigns on the benefits of LPG and BioLPG as cleaner, greener home heating sources for off grid consumers i.e., those who are not connected to the natural gas grid. For an average household, figures from SEAI show that an electric heat pump coupled with the necessary deep retrofitting measure, can cost over €60,000. In comparison, a modern, high efficiency LPG boiler can be installed for €5000.

  Such heating options play an important role in improving the health of communities and homes across Ireland and should be prioritised by the Government in assisting with energy poverty reduction targets.

- **Housing for All Commits to 100% funding to retrofit 40% of local authority housing stock to B2 by 2030 at a cost of 1.4 billion euro. How can we further support local authorities to help them deliver on social housing retrofit targets?**

  Decarbonisation supports and targets should be adopted at a local level to encourage a mixed technology approach to upgrading heating systems in older homes, especially in rural areas where homes and business are not connected to the natural gas gird, otherwise known as, 'off grid', consumers. A mixed technology approach would involve incentivising a switch from oil boilers to lower emission LPG options and therefore provide a cost-effective solution to rural customers looking to switch to cleaner, greener energy sources as part of their decarbonisation journey.

- **In addition to the existing financial supports and policy measures, are there any other incentives/assistance needed to help homeowners upgrade the energy efficiency of their homes?**

  Household behaviour change will be a key consideration for the Irish government as it looks to steer the economy from being fossil-fuel dependent, to a net zero target. Whilst some decarbonisation routes can be promoted without consumer disruption and behaviour change (such as the decarbonisation of power production), others will require active participation from consumers – such as decisions regarding home heating.

Indeed, the SEAI has a behavioural economics unit which has published reports highlighting the bounded rationality of consumers, and many behavioural barriers which may slow the heat decarbonisation journey. For instance, the efficient operation of electric heat pumps requires a change to the heat use profile, moving away from instantaneous high temperature heat produced by traditional boilers to low-temperature heating with a longer ramp-up period between turning the system on and reaching comfortable temperatures in the property. Alongside the use of new and complex heating controls, these household behaviour changes should be considered by the Irish government.

We strongly recommend that the Irish government should pursue a mixed technology approach which supports new heating solutions such as heat pumps, but also renewable gas solutions such as biofuel enabled boilers which benefit from being a drop-in to existing heating systems and can be operated in familiar ways for consumers. Some consumers will gravitate towards new technologies based on their preferences and building types, whilst others will find the convenience of using drop-in BioLPG in their existing heating system to be more appealing. A basket of solutions will be needed to deliver heat decarbonisation in the next 30 years – which is equivalent to two heating system replacement cycles.

- **Further to the existing supports financed by carbon tax revenues, how can we protect those who are currently experiencing fuel poverty and those who are at risk?**

  According to the latest findings from TASC (Think-tank for Action on Social Change), one in five people are living in energy poverty in Ireland. Furthermore, The Economic and Social Research Institute (ESRI) found energy poverty was affecting an estimated 29% of households.

  The 'one size fits' all option of the Government's retrofit scheme which favours heat pumps is an expensive exercise when compared to the installation of a biofuel-enabled LPG boiler. A cheaper and more equitable solution, especially for off gas-grid rural Ireland, would be the introduction of an oil boiler/oil tank scrappage scheme.

  This will provide consumer choice and affordability to homes and businesses particularly across rural Ireland who are under pressure to decarbonise their heating systems. By conducting a targeted upgrade of oil boilers to high efficiency biofuel enabled boilers, homes will be in a position to stave off the societal and health impacts of energy poverty as well as ensuring BER improvements

  Such action will encourage a 'mixed technology' approach to a Just Transition towards decarbonisation and can help to combat fuel poverty by supplying cleaner, lower carbon and more affordable energy to homes and communities that are not connected to the natural gas grid.

- **What specific measures can be implemented to improve the efficiency of rolling out the National Retrofit Programme?**

  Calor acknowledges and supports the principle of 'energy efficiency first' and retrofitting homes, however, it cautions against the 'one size fits all' approach currently being implemented across Ireland. Some properties are markedly more difficult to treat, being unsuitable for a deep fabric insulation retrofit.

According to recent figures from the SEAI, the average total capital cost to upgrade a home from an average BER rating of F rating to an average A3 rating is €60,814, which is prohibitively expensive for many households today particularly given the challenges faced by homes and businesses due to increased increasing inflation and living costs. [9]

LPG has been a key part of Ireland's energy mix for almost a century. Going forward, we believe LPG, BioLPG and rDME can support the Irish Government's commitment to transition to a low-carbon economy and fulfil its binding obligations under the 2015 Paris Agreement on climate change. As natural gas network penetration in Ireland is relatively low (39% of households, (Ervia, 2018), the full potential of lower-carbon gaseous fuels like LPG needs to be further exploited. [10] Over 40% of households in Ireland rely on oil to heat their homes. This share varies significantly by region, with roughly 20% of households located in towns using oil for central heating compared to 53% in rural areas (CSO, 2021). [11]

While LPG already offers significant reductions in carbon and air pollutant emissions, BioLPG should be recognised as a fuel for now and for the future, providing up to 90% certified carbon emission savings compared to conventional LPG. Already available on the market today (LGI, 2020), BioLPG allows off-grid homes and businesses to significantly reduce their carbon footprint without expensive retrofitting or changes to heating systems. BioLPG is certified as renewable and is exempt from carbon tax, meaning it is a great investment for the future. As BioLPG is a 'drop-in' fuel, LPG infrastructure is already prepared for the future, so no new equipment is required.

Using figures calculated by Liquid Gas Ireland from CSO and SEAI data, it is estimated that by pursuing a 'mixed technology' approach to decarbonisation, which includes lower-carbon fuels such as LPG and BioLPG, could save about 1.9 million tonnes of C02 emissions per year if 500,000 rural homes currently using oil-fired central heating switched to BioLPG by 2040.

These benefits stretch beyond homes as demonstrated by the Minister for Education, who in response to a recent parliamentary question, outlined the environmental and cost benefit of converting a school from oil to gas. She states that with LPG and Natural Gas there is approximately between 30 to 40% reduction in carbon emissions in addition to reductions in NOx and particulates and typically there can be up to 30% reduction in running costs depending on the condition and age of the system being replaced12

- **Further to those technologies identified in previous iterations of the Climate Action Plan, what other additional measures could be used to reach our emission reduction target in this sector?**

Safeguarding supply of cleaner, greener 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 and therefore

[9] https://www.seai.ie/grants/home-energy-grants/deep-retrofit-grant/key-findings/

[10] https://www.ervia.ie/decarbonising-domestic-he/KPMG-Irish-Gas-Pathways-Report.pdf

[11] https://www.cso.ie/en/releasesandpublications/er/hebeu/householdenvironmentalbehaviours-energyusequarter32021/

[12] https://www.oireachtas.ie/en/debates/question/2022-09-08/824/?highlight%5B0%5D=boilers&highlight%5B1%5D=boilers

play a critical role in supporting Ireland in reaching its emission reduction target for the domestic heating sector.

BioLPG can be blended up to 100% and can continue to make a significant contribution to the Government's Energy Efficiency Obligation Scheme and proposed Renewable Heat Obligation scheme.

Another 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. Similarly, to BioLPG, 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 and used in home heating applications. It offers huge opportunities for near term decarbonisation, not only in the residential sector but also across industry. It is a sustainable gaseous fuel that can reduce greenhouse gas (GHG) emissions by c. 80% and it significantly improves local air quality.

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.

- **What specific measures would incentivise a greater rate of oil boiler replacement?**

Affordability and choice

Both are two of the key factor's consumers consider when planning their decarbonisation journey and will be imperative for the economic recovery of rural households and businesses, as well supporting Ireland on its journey to achieve NetZero emissions by 2030.

A survey carried out by the Banking Payments Federation of Ireland (2021) found that addressing the cost of upgrades will be key in driving further demand and take up by consumers of retrofitting upgrades with over 50% of adults claiming that the high cost associated with such work is the single biggest obstacle. 13

The 'one size fits' all option being so vigorously promoted by the Government, is a very expensive exercise when compared to the installation of a biofuel-ready LPG boiler. This is very apparent from even the most cursory examination of the figures. For an average older rural home, the cost of a heat pump coupled with the deep retrofit required to implement the necessary energy efficiency upgrades, could be up to €60,814, according to SEAI. In comparison, a new modern condensing LPG boiler can be installed for €5000.

LPG and BioLPG enabled boilers are a cost-effective lower carbon option for many households over the lifetime of the heating system, especially older properties that are less energy efficient.

[13] https://bpfi.ie/increasing-demand-for-retrofitting-as-research-shows-nearly-half-of-consumers-plan-to-undertake-energy-efficiency-home-improvements-in-next-three-years-bpfi/

Introduction of an oil boiler / oil tank scrappage scheme

A cheaper and more equitable solution, especially for off gas-grid rural Ireland, would be the introduction of an oil boiler/oil tank scrappage scheme.

Oil consumers, most of whom are located in rural areas, are required to remove their existing oil boiler and tank – which given prices in adjacent markets is likely to cost more than €1,000 (NNFCC, 2019). This is in order to facilitate the installation of a biofuel enabled gas boiler or hybrid heat pump.

This once-off incentive should be established to support the transition away from high-carbon fossil fuel infrastructure to lower-emission ready heating systems – such as hybrid heat pumps and biofuel enabled boilers. This will provide consumer choice and affordability to homes and businesses particularly across rural Ireland who are under pressure to decarbonise their heating systems.

Added Benefit of Air Quality Improvements in Rural Ireland

Calor is aware of the importance of the effect of using different heating fuels on air quality, since poor air quality is reported as a cause of illness and premature death; in Ireland in 2017, the EEA estimated 1,300 premature deaths were caused by the air pollutant $PM_{2.5}$ (Environmental Protection Agency, 2019). This can create trade-offs in decarbonisation solutions, since fuels associated with lower carbon emissions can cause higher air pollution levels, as noted later in this section.

The impact of fuel use on air quality is indicated by figure 1. Air pollution is significantly increased during the afternoon and evening hours, when heating is in use, indicating the relationship between air quality and fuel use (Environmental Protection Agency, 2019).

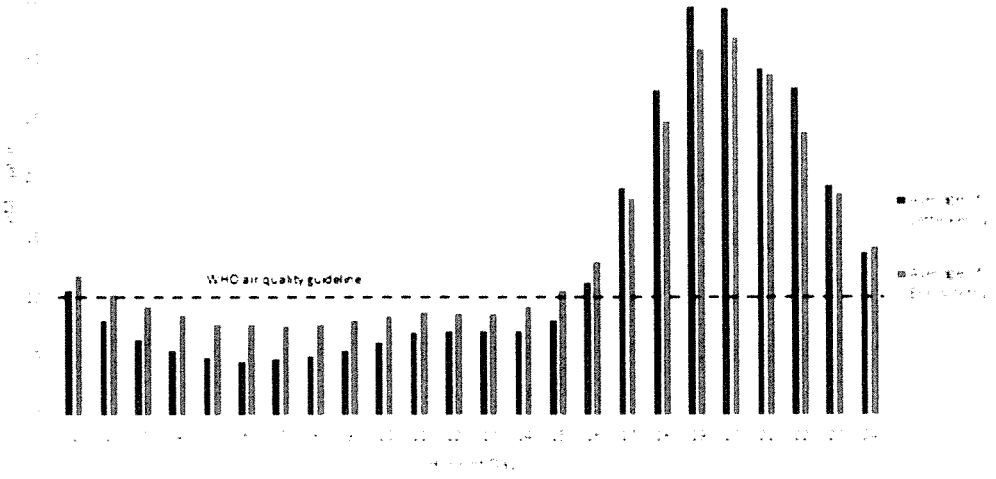


***Figure 1**: Average concentrations of $PM_{2.5}$ by time of day at Letterkenny and Enniscorthy monitoring stations during 2019 (Environmental Protection Agency, 2019)*

The EPA has considered the effect of different heating fuels and heating systems on air quality, indicating that solid fuels such as peat, coal and biomass can negatively impact air quality and health - as shown in figure 2 (Environmental Protection Agency, 2019).

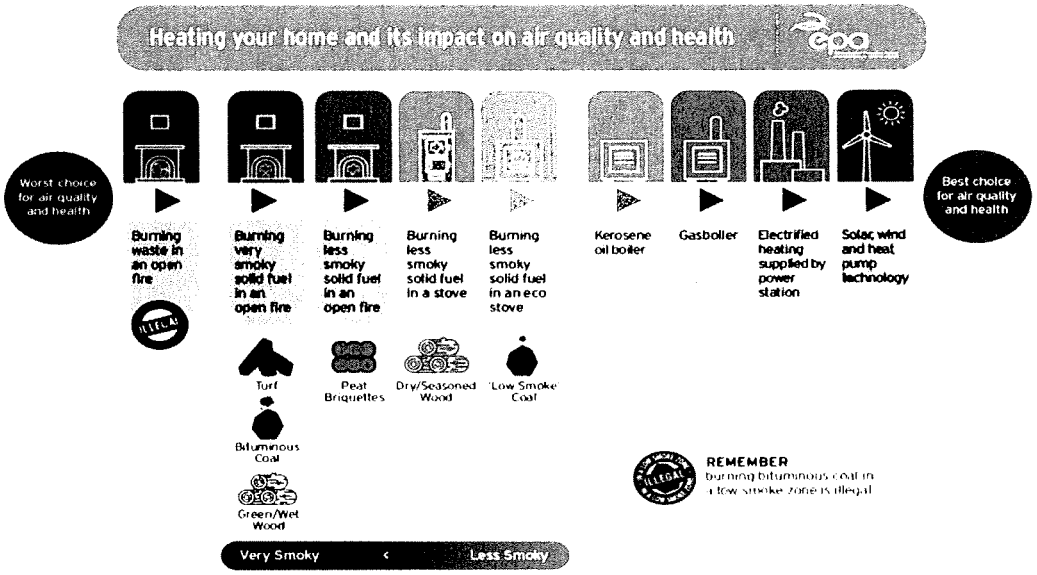


***Figure 2**: air quality and health impact of ways to heat homes, (Environmental Protection Agency, 2019)*

To compare emission levels from different fuels, considering its type and usage , data from the European Environment Agency for the $PM_{2.5}$ emissions factors [EEA, 2019] has been utilised to produce the following graphs. They indicate the possible range of emissions factors for each of the fuels depending on the appliance it is used in.

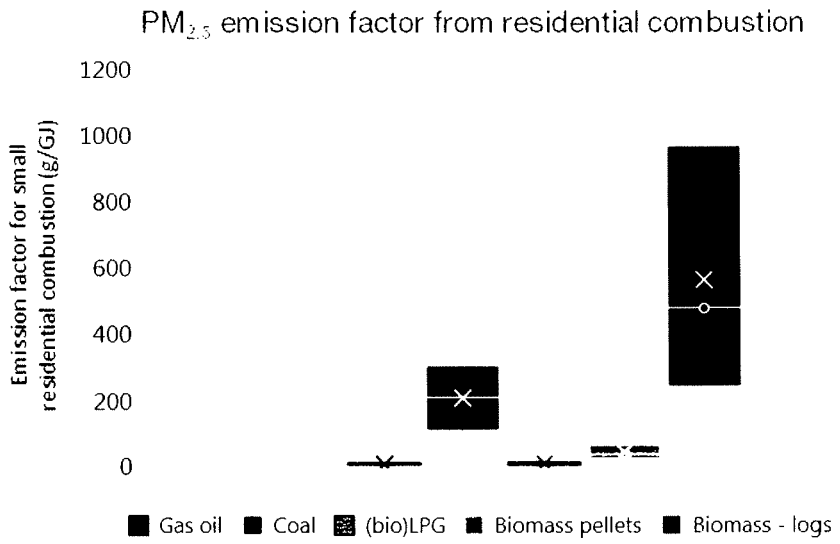


***Figure 3** – $PM_{2.5}$ emissions factors for five fuel types*

Figure 3 indicates that particular care needs to be taken in considering different types and uses of biomass for decarbonisation, due to possible higher $PM_{2.5}$ emissions factors.

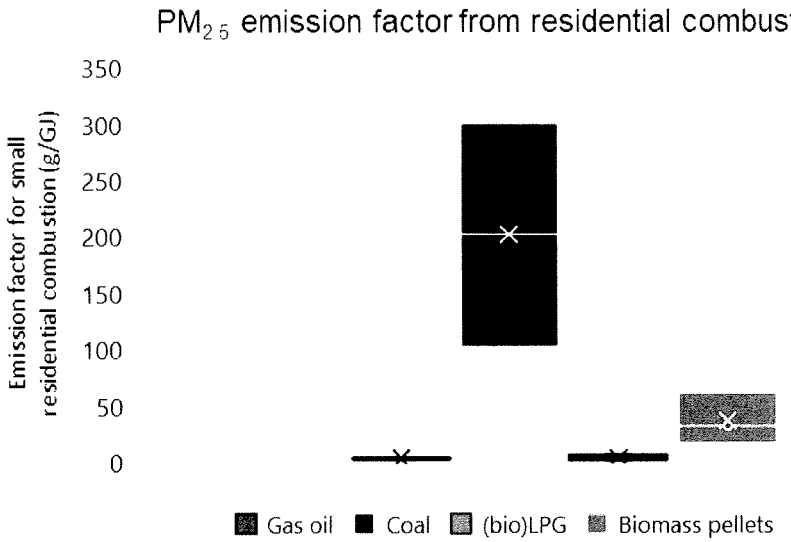


***Figure 4**: $PM_{2.5}$ emissions factors for the lower four fuel types*

In figure 4 the relative emissions factors between these four fuels can be more easily compared. The low level of air pollutants from BioLPG combusted in boilers suggests this could provide an alternative off-grid heating solution with lower PM 2.5 emissions than other options under consideration.

Considering this information, Calor recommends that the air quality benefits are also considered to ensure low carbon solutions meet air pollution targets.

Transport

- **As a transitionary fuel to help decarbonise the road haulage sector, what obstacles to you foresee in raising the blend proportion of biofuels in road transport to 10% bioethanol (E10), and 20% biodiesel (B20) by 2030? Is there potential for greater ambition?**

Availability of sustainable supply

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. [14] 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

[14] https://www.lgi.ie/assets/uploads/documents/LGI%20Vision%20Document%202040%20Final.pdf

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. [15]

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, co-processing 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. [16] 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.

Calor is a member of Liquid Gas Ireland (LGI), and together with its European counterpart Liquid Gas Europe, LGI members 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. [17]

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.

The role of other fuels within the biofuel blending obligation in meeting the 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

[15] https://ec.europa.eu/transparency/documents-register/detail?ref=C(2022)2117&lang=en
[16] https://www.liquidgasuk.org/uploads/DOC5FC77254A1388.pdf
[17] https://www.liquidgaseurope.eu/images/vision_2050_SCREEN.pdf

public health issue by the Environmental Protection Agency. LPG and BioLPG are recognised to be viable lower carbon alternatives for transport fuels. 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.

Calor and 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. Calor and its parent, SHV Energy, continue to 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 prices. 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 to LPG, it can be blended with LPG and used in existing vehicles. [18] 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 0 [19].

Producing from municipal waste will reduce Ireland's reliance on EfW incineration, with 46% of Ireland's municipal waste currently being incinerated [20]. 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 incineration[21]. 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.

[18] https://www.liquidgaseurope.eu/images/LGE_Position_on_the_Proposal_for_an_Alternative_Fuels_Infrastructure_Regulation.pdf
[19] https://oberonfuels.com/about-dme/dme-basics/
[20] 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.
[21] https://kew-tech.com/

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.

Calor 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. Calor 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. LPG, BioLPG and Liquified Natural Gas (LNG) are lower carbon emission technologies, proven as effective alternatives to petrol and diesel.

In recognising the opportunities that LPG, BioLPG and rDME will have to offer in decarbonising the Irish transport sector, we respectfully request 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.

Just Transition

- **What types of supporting interventions should be considered by the Government to address the four principles of our Just Transition Framework within individual sectors?**

Mixed technology approach meets Just Transition objectives

The Programme for Government (PfG, 2020) commits the Government to ensuring that the increases in the carbon tax are progressive and investment is made to prevent fuel poverty

to ensure a just transition. Calor believes that targeted interventions by the Government can meet the principles of the Just Transition Framework.

A central element of the current Climate Action plan is the retrofitting scheme, which envisions most of Ireland's older households undergoing retrofitting to install electric heat pumps. However, this approach does not consider the unique needs and economic and infrastructural challenges of rural Ireland. 500,000 homes, mostly in rural areas have no connection to the natural gas distribution network. Two-thirds of these currently rely on oil boilers for heating. Connecting these less energy-efficient properties to the natural gas grid is not a viable option. Likewise, the installing of new heat pump technology is prohibitively expensive, despite Government grants.

Climate change policy must be equitable for all families and all businesses. The 'one size fits all' retrofit scheme, as currently operated, is not equitable and clearly not a fair deal for rural off gas grid Ireland.

Calor continues to advocate for a 'mixed technology' approach to decarbonisation, which includes lower-carbon fuels such as LPG should be supported in conjunction with other heat decarbonisation solutions, including heat pumps.

Helping to deliver Just Transition through an Oil Boiler Scrappage Scheme

As referenced under the Built Environment section, affordability of cleaner, lower carbon energy solutions are key for the economic recovery of rural households and businesses, as well the protection of the environment. LPG boilers are a cost-effective lower carbon option for many households over the lifetime of the heating system, especially older properties that are less energy efficient.

The 'one size fits' all option being so vigorously promoted by the Government, is a very expensive exercise when compared to the installation of LPG and BioLPG enabled boilers. This is very apparent from even the most cursory examination of the figures. For an average older rural home, the cost of a heat pump coupled with the deep retrofit required to implement the necessary energy efficiency upgrades, could be up to €60,814, according to SEAI. In comparison, a new LPG boiler can be installed for €5000.

A cheaper and more equitable solution, especially for off gas-grid rural Ireland, would be the introduction of an oil boiler/oil tank scrappage scheme.

Oil consumers, most of whom are located in rural areas, are required for the removal of their existing oil boiler and tank – which given prices in adjacent markets is likely to cost more than €1,000 (NNFCC, 2019).

This once-off incentive should be established to support the transition away from high-carbon fossil fuel infrastructure to cleaner, lower emission heating systems – such as hybrid heat pumps and biofuel-enabled boilers. This will provide consumer choice and affordability to homes and businesses particularly across rural Ireland who are under pressure to decarbonise their heating systems.

LPG boilers offer a long-term, cost-effective pathway to decarbonisation through the gradual introduction of BioLPG into the mix. This means over time; carbon emissions will increasingly reduce. The industry also came together to develop policy proposals for the recognition of

the value of biogas, and specifically support for production of BioLPG from indigenous feedstocks (RES-Gas 3 policy code in the Renewable Energy Ireland report, Ex).

- **Are there any emerging skills gaps that need to be addressed that haven't already been identified by the Expert Group on Future Skills Needs in its Skills for Zero Carbon report?**

  Calor recognises the complex analysis of the labour market and its skills undertaken by the Expert Group on Future Skills Needs (EGSFN) The *Skills for Zero* Report is a comprehensive list of recommendations on how the Irish workforce can be best equipped to meet carbon emission targets.

  Of particular relevance to our industry are the sections on renewable energy and residential retrofit. As a sector which will be increasingly operating in the renewable energy space, through BioLPG and in time rDME, it is essential that the liquid gas sector be a part of upskilling plans through the establishment of training partnerships or responses for projects between Government, industry, education, and training providers.

  Likewise, the recommendation for the retrofit sector calls for job stability and longevity of careers to be supported by providing clarity on budgetary allocations for grant schemes that facilitate year-round activity. Calor and the liquid gas sector continue to call for such supports and schemes to be extended for a mixed technology approach which would facilitate a switch from a high fossil oil boiler to a lower carbon LPG option.

- **What additional targeted supports should be considered to minimise the impact of our climate policies to those on low income or households that are most at risk from fuel poverty (including transport and heating)?**

  Fuel poverty is an increasingly insidious threat to many individuals and families. Energy price inflation has rocketed over recent months. Deeply exacerbated by the ongoing Russian conflict with Ukraine, Governments are restricted in what they can do to control prices in the short to medium term.

  Direct payments to consumers to soften the impact of spiralling domestic bills appears to be under consideration by Government again. However, other than this and an increase in targeted social welfare payments such as the fuel allowance, there is no easy solution.

  The retrofitting scheme as currently operated is well beyond the reach of low-income households that are vulnerable to fuel poverty. Calor and the liquid gas sector is advocating a once-off oil boiler scrappage scheme, which will allow consumers to switch to cleaner and lower carbon LPG.

  Much of the current price inflation is being driven by external factors relating to supply. This disproportionally impacts on low-income households and is driving many towards fuel poverty. Such internal factors do not have as serious an impact on the supply of LPG. This is yet another argument in favour of Government policy supporting easier access to these fuel sources.

- **Are there are any emerging areas of vulnerability in specific sectors of the economy as a direct result of the implementation of Ireland's climate action policies?**

  Climate change policy must be equitable for all families and all businesses. The 'one size fits all' retrofit scheme, as currently operated, is not equitable and clearly not a fair deal for rural off gas grid Ireland.

  Current policy is not fair for the 500,000 homes who have no access to the natural gas network, most of which rely on oil for central heating. As already demonstrated, even with the grants on offer from SEAI, a deep retrofitting initiative to include a heat pump, will cost over €60,000 to roll out in an existing home.

  Installation of lower emission and cleaner air solutions like LPG can be done at a fraction of the cost and makes far more sense at many levels. An oil boiler scrappage scheme would also support a mixed technology approach through the greater uptake of LPG boilers.

  As BioLPG and in time rDME, becomes increasingly available to the market in Ireland, Calor is open to working in partnership with the Government to drive consumer behaviour in rural areas towards cleaner, more efficient, lower carbon solutions.

- **How should Local Authorities seek to integrate just transition considerations into the preparation of their statutory Climate Action Plans?**

  It is now generally recognised that Local Authorities have a key part to play in addressing carbon emissions. Significant analysis has been done on the local authority development plans of the country's 31 city and county councils to consider how the plans have integrated measures to tackle climate change in their respective areas. 22 While progress has been significant across the various regions, there is scope for more progress. The implementation of evidence-based and realistic climate mitigation measures into their development plans should be followed and these should be informed by just transition considerations.

  Calor believes that these just transition considerations can be best reflected by Local Authorities in the provision of social housing. Supports and targets should be adopted at a local level to encourage a mixed technology approach to upgrading heating systems in older homes, especially in rural off grid areas. This would involve incentivising a switch from oil boilers to lower emission LPG options.

- **Should the proposed Just Transition Commission have any other functions in addition to those described above?**

  The four related functions to be tasked to the Just Transition Commission are far reaching and comprehensive. It is essential that the Commission adopts an open and inclusive approach to advising Government on transition considerations.

[22] https://www.opr.ie/local-authority-development-plans-could-make-a-major-contribution-to-action-on-climate-change-report

Calor argues that the current 'one size fits all' approach of the retrofitting scheme is too blunt an instrument and not an equitable solution to lowering carbon emissions in rural Ireland in particular.

The merit of the proposal for a mixed technology approach to support the installation of LPG boilers, and specifically an oil boiler scrappage scheme, must receive due consideration.

- **What mixtures of skills and expertise are required on the Just Transition Commission?** It would be advisable if the Just Transition Commission contains or has access to skills and expertise that allow for a full understanding of the social, economic, and scientific implications of energy policy. Calor believes that any stakeholder involvement should involve representatives from the energy providers, including those who produce LPG and BioLPG.

Research and Innovation

- **Have you identified any research and innovation gaps which need to be addressed? If so, how can these gaps be addressed?**

State investment in research and development 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.

Calor also believes that there is significant potential for the State to develop the indigenous production of HVO. This is increasing in Europe, due to the revised EU-RED and renewable heat and transport targets. We are likely to be dependent on imports in the short-medium term.

However, with the necessary investment in indigenous production facilities in Ireland, real inroads could be made into the development of new HVO plants, coprocessing at existing refineries and commercialising new and novel processes for bio-propane synthesis. This will require a more imaginative approach from Government and could yield significant dividends in terms of employment, enterprise, and innovation.

The opportunity to produce rDME from municipal waste could reduce Ireland's reliance on EfW incineration, with 46% of Ireland's municipal waste currently being incinerated [23]. 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 incineration[24]. Most DME (chemically identical to rDME but not made from renewable feedstocks) on the EU market is produced via catalytic synthesis of methanol. By switching to renewable methanol, plants can immediately start

[23] 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.
[24] https://kew-tech.com/

producing rDME. Finally, power-to-x technology can be used to produce rDME from low-carbon hydrogen and carbon dioxide.

Please see in Annex 1 (attached) a new publication **"The Strategic Role of Off-Grid Renewable Gases"** from the **European Biogas Association (EBA) and Liquid Gas Europe (LGE)** which also highlights several policy recommendations to further the development of renewable gas solutions. The publication highlights the key benefits that can be delivered to EU consumers located off the natural gas grid including consumer acceptability, consumer affordability, GHG emissions savings and cleaner air.

ENDS

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