



**Liquid Gas
Ireland**

Climate Action Plan 2023

**Liquid Gas Ireland submission
to DECC's Call for Expert Evidence**

20 September 2022

***this document follows the format of the online consultation questionnaire**

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Introduction to Liquid Gas Ireland

Liquid Gas Ireland (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 cleaner, 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. LGI 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 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

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For further updates, you can find us on social media on [Twitter](#) and [LinkedIn](#) or visit our website www.lgi.ie.

Section 1: Carbon Pricing and Cross-Cutting Issues

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 BioLPG enabled 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 €15,000.¹ This compares to €5,000 for a new LPG boiler. Implementing the necessary energy efficiency upgrades and heat pump technology in an average older rural home, will cost over €60,000.

LPG and BioLPG enabled 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, the target can be met whilst reducing the unsustainable financial burden on rural consumers.

Opportunities within our taxation system – carbon tax and BioLPG

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?

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.²

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.

BioLPG, as a renewable fuel, is exempt from carbon tax, meaning it is a great investment for the future. Accepting BioLPG as part of the solution to reducing emissions and embracing it as part of the renewable mix in Government policy will drive the transition to BioLPG without requiring changes to the taxation system. 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.

¹ https://www.teagasc.ie/media/website/crops/crops/Renewable_Heat_in_Ireland_to_2020.pdf

² <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32022D0602>

Section 2: Enterprise

How LPG, BioLPG and rDME accelerate carbon reduction in manufacturing heating

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

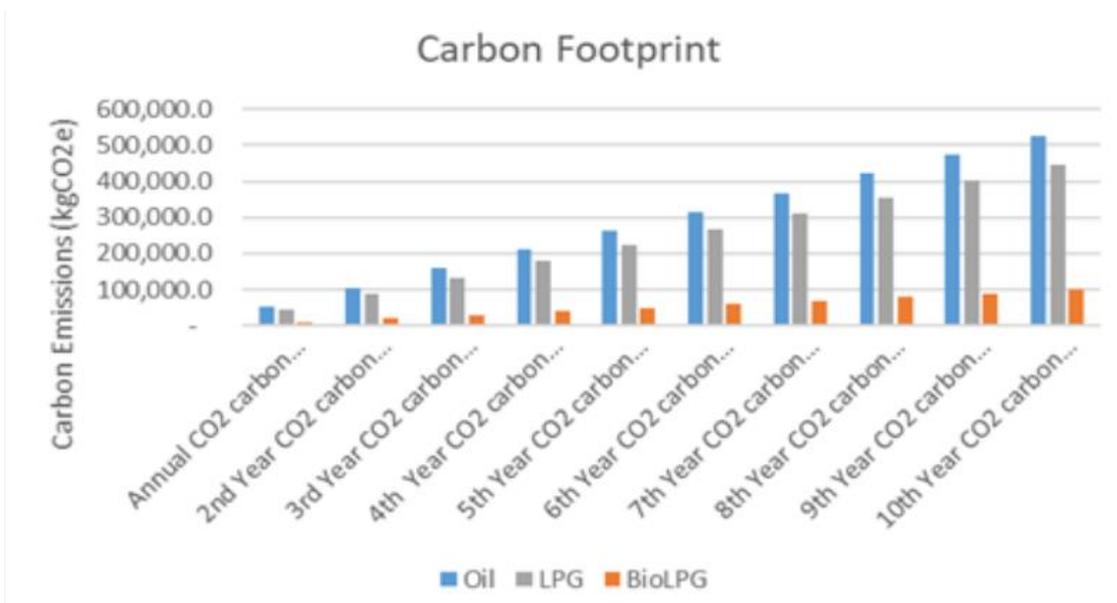
LPG and renewable LPG including bioLPG, rDME and other drop-in and complementary gases are acknowledged in Europe as the clean, available, and innovative alternative energy of choice, that brings great benefits today to all users and will continue to deliver even more value in the future³

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.

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 BioLPG under the Energy Efficiency Obligation Scheme (EEOS) and Transport Biofuels Obligation Scheme (BOS) is imperative to ensure that biofuels are accessible to consumers making the switch from higher carbon fossil fuels to lower carbon, cleaner biofuels 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)

³ <https://www.liquidgaseurope.eu/lge-for-lpg-alternative-energy-choice>

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.

Decarbonising high temperature heating in industry

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

The LPG sector can help to transition tens of thousands of businesses away from oil boilers to LPG by 2030. 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.⁴

According to sectoral figures, LGI member companies contributed to approx. 61,490 metric tonnes (mT) in total emissions savings between 2012 – 2021 having converted customers from using oil to LPG as their main energy source, as well as contributing to cleaner air across Ireland (see Table 1).

Total kWh Consumed	LPG Total CO2 Emissions (mT)	Oil Total CO2 Emissions (mT)	Total CO2 Emissions Savings (mT)	Period
1,776,890,790	403,744	465,234	61,490	2012- 2021

Table 1: Estimated CO2 savings achieved between 2012- 2021 by LGI member companies having converted its residential and industrial customers from oil to using LPG as their main energy source.

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.

Additional opportunities to drive decarbonisation in enterprise

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, the LPG sector can play a very significant role in helping to reduce the dependence on oil heating for major industrial and commercial facilities across Ireland.

LGI member companies have and continue to work 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 and in the last decade, the LPG sector has helped transition very significant oil dependent businesses to cleaner, lower carbon energy efficient LPG solutions.

⁴ <https://www.lgi.ie/about/a-greener-deal-for-rural-ireland/>

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.

Measures to address risks that climate change poses for enterprise

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

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 since 2012 and in the latest data available for the July to December 2021 period for natural gas, it shows an increase of 66%, which was 17% above both the EU and the Euro Area average.⁵

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.

Assisting business sustain operating costs associated low-carbon technology

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

⁵ <https://www.seai.ie/data-and-insights/seai-statistics/key-statistics/prices/>

heating value fuels). This position has received industry consensus, as published by Renewable Energy Ireland in its 40by30 report (2021).⁶

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.⁷

In the United States, 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. Similar incentives most likely boost LPG installations in France too. By contrast, such incentives are limited to renewable energy-based systems in Germany. The taxation of heating fuels themselves is generally favourable in France, the United Kingdom, and the United States (notably with respect to heating oil) and unfavourable in Germany.

⁶ https://renewableenergyireland.ie/wp-content/uploads/2021/05/Renewable-Energy-Ireland_Renewable-Heat-Plan_-_Final.pdf

⁷ https://www.liquidgaseurope.eu/images/publications/LPG_Heating_Incentive_Policies_2021_Report_September2021.pdf

Section 3: Built Environment

Where LPG, BioLPG and rDME can support energy efficiency of rental properties

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 most cases, private renters do 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.

LGI would like to reiterate that these 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.

Local authorities should adopt LPG, BioLPG and rDME for housing energy efficiency

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?

LGI are of the view that 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 grid, 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.

The need for a 'mixed technology' approach which supports new heating solutions

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 changes for 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.

Protecting those at risk of or currently experiencing fuel poverty

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.

Caution against ‘one size fits all’ National Retrofit Scheme

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

LGI is generally supportive of the process of 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 increasing inflation and living costs.⁸

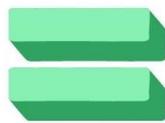
LPG has been a key part of Ireland’s energy mix for almost a century. Going forward, we believe LPG, BioLPG and rDME can support the Irish Government’s commitment to transition to a low-carbon economy and fulfil its binding obligations under the 2015 Paris Agreement on climate change. As natural gas 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.⁹ 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).¹⁰

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 by the EU and Irish Government 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.

Mixed technology approach to decarbonisation



1.9 million tonnes



Total CO2 emissions that could be saved per annum

If 500,000 rural homes currently using oil-fired central heating switched to BioLPG by 2040



Estimated calculation made by LGI using figures from CSO and SEAI data

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 is significant. 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 replaced.¹¹

⁸ <https://www.seai.ie/grants/home-energy-grants/deep-retrofit-grant/key-findings/>

⁹ <https://www.ervia.ie/decarbonising-domestic-he/KPMG-Irish-Gas-Pathways-Report.pdf>

¹⁰ <https://www.cso.ie/en/releasesandpublications/er/hebeu/householdenvironmentalbehaviours-energyusequarter32021/>

¹¹ <https://www.oireachtas.ie/en/debates/question/2022-09-08/824/?highlight%5B0%5D=boilers&highlight%5B1%5D=boilers>

Safeguarding supply of cleaner, greener fuels

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?

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

BioLPG (AKA: HVO Renewable Propane) 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.

Affordability and choice required for oil boiler replacement options

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

Affordability and choice are two key factors 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 net zero 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.¹²

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 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.

¹²<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.

LGI calls on the Government to adjust its sights through the introduction of this incentive. Such action will encourage a ‘mixed technology’ approach to a Just Transition towards decarbonisation.

Section 4: Transport

As a transitional fuel to help decarbonise the road haulage sector, what obstacles do 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 for transport

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.¹³ 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.¹⁴

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.¹⁵ 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.

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.¹⁶

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

¹³ <https://www.lgi.ie/assets/uploads/documents/LGI%20Vision%20Document%202040%20Final.pdf>

¹⁴ [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)

¹⁵ <https://www.liquidgasuk.org/uploads/DOC5FC77254A1388.pdf>

¹⁶ https://www.liquidgaseurope.eu/images/vision_2050_SCREEN.pdf

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 in meeting 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 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 to LPG, it can be blended with LPG and used in existing vehicles.¹⁷ 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 0.¹⁸ Producing from municipal waste will reduce Ireland’s reliance on EfW incineration, with 46% of Ireland’s municipal waste currently being incinerated.¹⁹ 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

¹⁷https://www.liquidgaseurope.eu/images/LGE_Position_on_the_Proposal_for_an_Alternative_Fuels_Infrastructure_Regulation.pdf

¹⁸<https://oberonfuels.com/about-dme/dme-basics/>

¹⁹<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.>

than 80% compared to incineration.²⁰ 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.

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. LPG, BioLPG and Liquefied 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.

²⁰<https://kew-tech.com/>

Section 5: 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?

How a '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. LGI 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.

LGI strongly argues that 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.

According to sectoral figures, LGI member companies contributed to approx. 61,490 metric tonnes (mT) in total emissions savings between 2012 – 2021 having converted customers across a range of sectors from using oil to using lower carbon LPG as their main energy source, thus contributing to cleaner air across Ireland. Furthermore, LGI estimates that if 500,000 homes switched from using oil-fired central heating to BioLPG by 2040, it would save about 1.9 million tonnes of CO₂ emissions per year.

Helping to deliver a Just Transition through an oil boiler scrappage scheme

As referenced under the Built Environment section, affordability of cleaner, lower carbon energy solutions is 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.

Indeed Liquid Gas Europe in conjunction with the European Biogas Association, has set out clearly in a newly published policy document how a significant proportion of households in the EU cannot afford heat pumps. They argue that gas boilers which run on renewable liquid

gases are about a quarter of the investment cost of heat pumps and even cheaper compared to biomass boilers.²¹

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.

LGI calls on the Government to adjust its sights through the introduction of this incentive. Such action will encourage a ‘mixed technology’ approach to a Just Transition towards decarbonisation.

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).

Skills required to support a Just Transition

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?

LGI 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 LGI 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. LGI again calls 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.

²¹ [The Strategic Role of Off-Gas Grid Renewable Gases – Liquid Gas Europe & European Biogas Association \(2022\)](#)

Supports required to minimise impact of climate policies on lower income households

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. LGI 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 disproportionately 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.

Emerging areas of vulnerability due to climate action policies

Are there 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, as proposed by LGI, 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, LGI wants to work in partnership with the Government to drive consumer behaviour in rural areas towards cleaner, more efficient, lower carbon solutions.

How local authorities can support a Just Transition

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.

LGI 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.

Additional functions of the Just Transition Commission

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.

LGI 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 proposals from LGI, especially on a mixed technology approach to support the installation of LPG boilers, and specifically an oil boiler scrappage scheme, must receive due consideration.

Skills and expertise required on the Just Transition Commission

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. LGI believes that any stakeholder involvement should involve representatives from the energy providers, including those who produce LPG and BioLPG.

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

Section 6: Research and Innovation

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

LGI has identified a particular need to address research and innovation requirements in the heat and transport sectors. 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.

LGI 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.

ENDS
20.09.22

Annex 1 – The Strategic Role of Off-Grid Renewable Gases

Liquid Gas Europe & European Biogas Association (2022)



The Strategic Role of Off-Grid Renewable Gases



Challenges of Off-Grid Decarbonisation



There are **49.2 million rural households in the EU** and most of them are **not connected to a gas grid**. These buildings primarily use fossil fuels for heating, these are generally higher carbon fossil fuels.¹

36%



Rural building stock is often old, **36% of building stock in the EU was built before the first thermal regulations in 1970s**.²



Gas and electricity **networks are less developed in rural areas**, so the choice of fuels and energy solutions remains limited.³



Heat demand varies significantly more than renewable electricity generation throughout the year. Electrification requires constant balancing of supply and demand which will be challenging to meet with intermittent renewable energy.

7%

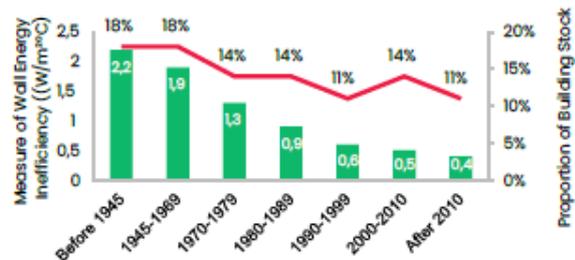


7% of off grid homes **heat with coal**⁴ and a further 23% with **fuel oil**⁵. These fuels have high air pollution and greenhouse gas emissions.

23%



Old Buildings are Common and Less Energy Efficient



Building Stock Diversity and Prominence of Hard-to-Treat Buildings



There is a broad variety of building types and ages in the EU. Generally, older buildings are less energy efficient, as shown on the bar chart above⁶, these hard-to-treat buildings are common in rural areas and require more investment to decarbonise.

There is a broad mix of heating technologies in the EU, heating oil and coal are widely used for dwellings not connected to the gas grid⁷. These fuels have high carbon and air pollution emissions.

Different buildings and consumers require different energy solutions suited to their needs and circumstances, as there is no 'one size fits all' solution. Consumers should be provided with a choice to ensure rapid decarbonisation and a just energy transition.

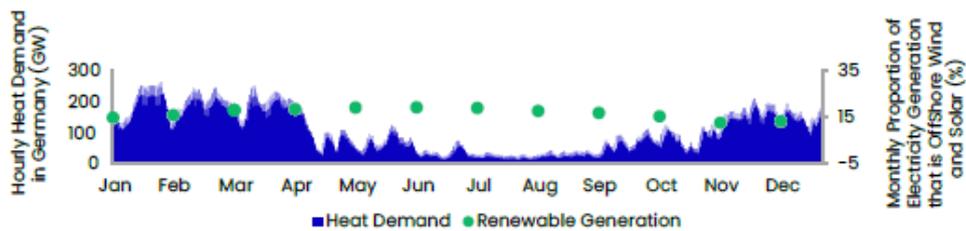
¹ Eurostat (2022) Number of households by degree of urbanisation
² Eurostat (2019) Share of fuels in the final energy consumption in the residential sector for space heating
³ FRAUNHOFER ISI (2021) Space heating market summary 2017
⁴ ECOFYS (2018) Rural energy in Europe
⁵ European Commission (2020) EU Buildings Database



Energy Security and Flexibility

Heating demand varies significantly throughout the year with much higher winter consumption than in summer, as shown on the graph for Germany below*. Increasing electrification and penetration of intermittent renewable energy significantly increases the difficulty of operating a reliable electricity grid and managing supply and demand, particularly in off-grid areas which generally have the worst reliability⁷. The graph below shows renewable electricity generation dropping in winter^{8,9} as heat demand is highest. Decarbonisation must be achieved in a way that peak demand can always be met.

Heat Demand Variation Will be Challenging to Meet with Renewable Electricity Alone



What Are Off-Grid Renewable Gases?



BioLPG

Chemically identical to conventional LPG, bioLPG is a drop-in solution which can be produced from sustainable feedstocks such as plant and animal waste materials, vegetable oils, and biogas, and can be used in existing LPG infrastructure and appliances.



Biogas

Biogas is produced through the decomposition of organic matter (such as agricultural wastes, manure and sewage sludge) and can be used as a fuel in vehicles and in typical gas appliances to provide heat and power.



BioLNG

Is produced by separating methane and other critical components from biogas to bring it to a methane content similar to that of natural gas, and subsequently liquefied.



rDME

Has similar properties to LPG and can be produced from a wide range of renewable feedstocks – including municipal waste, and biogas. It can be used as a pure renewable fuel or blended with conventional LPG.

How are Renewable Gases Produced?

Bio-Refining

Bio-Refining can be used to convert biomass into a number of useful products such as food, chemicals and renewable gases.

This is achieved through a number of different technologies including microbial fermentation, biocatalysis and thermochemical processes, to produce renewable gases such as bioLPG and rDME. Renewable gases such as rDME and bioLPG can also be used as hydrogen carriers due to the lower cost of transporting and storing these gases.

Power to Gas (P2G)

Power to gas involves using electrolysis to convert electricity to hydrogen. This can then be combined with carbon to produce synthetic hydrocarbons with very low emissions if renewable electricity is used. These renewable fuels are much cheaper and easier to store than pure hydrogen due to their greater volumetric energy density.

Anaerobic Digestion (AD)

Anaerobic digestion is the breakdown of organic matter using micro-organisms in the absence of oxygen. This produces biogas which can be upgraded to biomethane. Biomethane can then be compressed into bioLNG which can be stored in tanks and used in off-grid applications.

Gasification and Pyrolysis

Gasification and pyrolysis use heat, pressure and steam to convert biomass into renewable gases. Gasification is a thermochemical process where materials decompose in an environment with less oxygen than is required for combustion. Pyrolysis is a similar process, performed at higher temperatures, but in the absence of oxygen.

* Stratego (2018) Creating Hourly Profiles to Model both Demand and Supply
 * ECOFYS (2018) Rural energy in Europe
 * EA (2020) Monthly generation of solar PV in Germany
 * EA (2020) Monthly generation of offshore wind in Germany

Key Benefits of Off-Grid Renewable Gases

Applications of Renewable Off-Grid gases



Consumer Acceptability

A study by Eurogas suggests that initial renovation work and high upfront expense are the factors that have the highest influence on consumers that will make them unlikely to upgrade their heating system¹⁰. **Renewable gases such as bioLPG, rDME and biogas can provide an easy decarbonisation solution for consumers.** BioLPG is a drop in fuel for current LPG boilers, while rDME can be used up to a certain percentage blend without any changes to LPG boilers, and with small modifications 100% rDME can be used. Keeping existing heating systems makes it convenient for consumers to opt for solutions that are increasingly renewable and lower carbon.

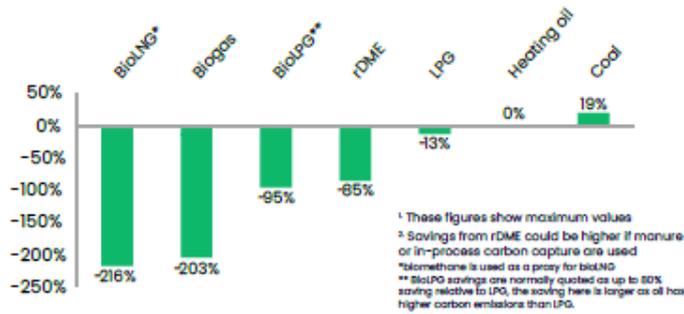
Factors That Make Consumers Unlikely To Upgrade Their Heating System

(Average % of Countries Surveyed)



¹⁰ Eurogas (2018) Energy Survey 2018

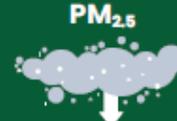
Greenhouse Gas Emission Saving Relative to Oil^{11,12}



Emissions



BioLPG, rDME, biomethane and biogas all have greenhouse gas emissions that are **significantly lower than fossil fuels** at a reduction of up to 95%¹³, 85%¹⁴, 216%¹⁵ and 203%¹⁶ respectively depending on the feedstock used.



In 2018, 307,000 premature EU deaths were attributed to fine particulate matter (PM_{2.5})¹⁷. The PM_{2.5} emissions of renewable gases per unit of energy are around 37% less than oil and 99% less than coal.¹⁸

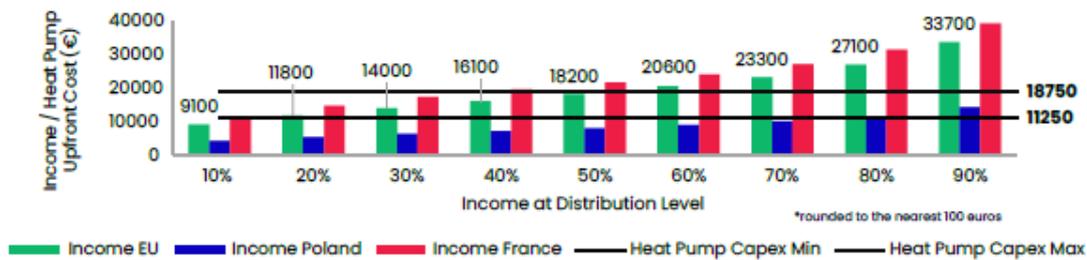
Affordability



Gas boilers which can run on renewable liquid gases are roughly **a quarter of the investment cost of heat pumps and even cheaper compared to biomass boilers**, making them more affordable for households and business with low levels of disposable income¹⁹.

While heat pumps are an efficient technology, for many the higher costs are prohibitive. The chart below illustrates this by comparing annual income deciles²⁰ with heat pump capital costs, for example 50% of people in the EU earn less than €18200. This means that for 50% of the EU, annual incomes could be lower than the upfront cost of a large heat pump. The installation of a heat pump would require years of saving for even high-income households to be affordable without a subsidy or loan. Heat pumps are assumed to have a thermal capacity between 15kWh and 25kWh.

Significant Proportion of Households Cannot Afford Heat Pumps*



System Benefits



Flexibility of renewable gases is much easier to manage than renewable electricity due to cheaper storage and more consistent generation.²¹



The use of renewable gases results in **reduced peak electricity demand**²², this significantly reduces power grid reinforcement and dispatchable power costs.



Hybrid systems help balance peak demand on the electricity grid. They can be installed with less requirement for electricity grid or radiator upgrades and the low carbon heating system can be installed before insulation upgrades.²³



Off-grid renewable gases can be **produced locally** reducing energy distribution requirements.

^{11,12} European Environment Agency (2021) Air Quality in Europe 2021

^{13,14} NAEI (2020) Emission factors detailed by fuel and source

¹⁵ Cedelft (2021) Emissions of (bio)LPG and other energy carriers in domestic heating, BBQs and forklift trucks

¹⁶ SHV Energy (2022) Renewable DME

¹⁷ JRC (2017) Solid and gaseous bioenergy pathways: Input values and GHG emissions

¹⁸ Silans Gas (2022) Direct Emissions and Upstream Fuels

¹⁹ European Commission (2018) Decentralised heat pumps: system benefits under different technical configurations

²⁰ Income deciles are 9 income figures that divide the population into 10 equal sized groups, the first decile represents the poorest 10% of the population.

²¹ Eurostat (2022) Income Distribution by Quantiles

²² Imperial College London (2020) The flexibility of gas: what is it worth?

²³ Entso-g & Entso-e (2020) Scenario Results

²⁴ Energy (2016) Electricity, gas, heat integration via residential hybrid heating technologies





Biogas Supporting Sustainable Dairy Farming and Green Community Building



A 499 kW_e AD plant in western France combines the effluents from 12 farms located less than 8 km away to produce energy for the local area.



The biogas produced by the AD facility is used as fuel for hay and cereal drying as well as cogenerator fuel which provides electricity and heat.



The 1,500 MWh/year of heat generated feeds into a community heating network, providing heat for the local swimming pool, secondary school and communal buildings²⁴.
Image copyright Déméter Energies.

BioLPG For Hard-to-Treat Rural Homes



26%

Over a quarter (26%) of Germany's population live in rural areas; of these homes, 25% use heating oil.

Installing a bioLPG ready boiler, alongside thermal insulation would result in:



90%

annual CO₂ savings of 83%, rising to 90% when using bioLPG.



68% 66%

68% NO_x savings and 66% PM emissions savings.



€933

€933 annual energy bill savings and a capital cost back period of 8.4 years.²⁵



BioLPG Supporting Net Zero Targets of a Cosmetic Industry



La Roche-Posay, offering innovative skincare solutions for fragile skin, became the first industrial site in France to use bioLPG in 2018.

This was a simple transition, as the product has no impact on the performance of their manufacturing activity and is easily incorporated into the distribution network of Primagaz France.

In 2005, the La-Roche-Posay site was producing 192tCO₂ per year, which fell to zero in 2019 – with bioLPG being the last step towards carbon neutrality on the industrial site.²⁶

²⁴ EBA (2020) Biogas Success Stories 2020
²⁵ Liquid Gas Europe (2019) Beyond the Gas Grid: Residential and Industrial Case Studies

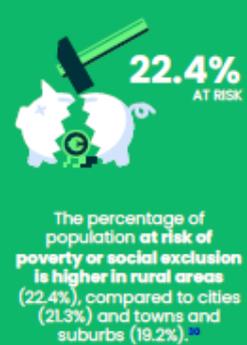
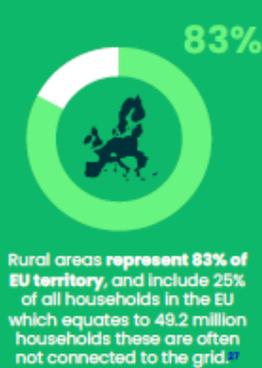




Policy Landscape

The EU has a target of a **55% reduction in greenhouse gas emissions by 2030** and a net zero ambition by 2050. It is critical that the legislative frameworks and associated policies enable a Just Energy Transition where no one is left behind. Solutions that are available, easily deployable, cost effective and socially acceptable will be needed to achieve ambitious climate targets, and in view of rising energy security concerns it is equally important to consider solutions that ensure supply security and energy system resilience. **The role of off-grid renewable gases is critical in this respect as they can facilitate the sustainability journey of communities in rural areas** that often do not have the luxury to choose from many sustainable alternatives that are cost effective as well as lower carbon.

Rural Areas Require Attention



Policy Recommendations



Recognise all Renewable Gas Production Pathways

All renewable gas production pathways and related technologies should be recognized in policy frameworks to support their development and uptake. This will help to diversify supply, ensure supply security and maximise production. Renewable gases can be produced through a host of technologies such as hydro-treatment of vegetable oils, fermentation, gasification, pyrolysis, anaerobic digestion, etc.



Support Renewable Ready Gas Boilers

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.



Develop Markets for Renewable Gases

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.



Facilitate Consumer Choice

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 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.

¹⁷ Eurostat (2022) Number of households by degree of urbanisation
^{18,19,20} EU Commission (2021) A long-term vision for the EU's rural areas