



Liquid Gas Ireland

Delivering Net Zero
for Rural Ireland –
Pathways to Renewable
Liquid Gas

September 2025



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Executive Summary

Liquid Gas Ireland (LGI) is the national representative body for companies involved in Ireland’s liquid gas industry. Our members include suppliers, equipment manufacturers, and service providers.

LGI promotes the use of both conventional liquid gas (LPG) and renewable alternatives – such as BioLPG and renewable dimethyl ether (rDME) – as clean, flexible, and lower carbon energy solutions for homes, businesses, industries, and farms, particularly in rural areas that are not connected to the natural gas grid.

As Ireland aims to reach net zero emissions by 2050, an ambition which is fully supported by Liquid Gas Ireland, there is an urgent need to decarbonise energy use in areas beyond the natural gas grid.

Nearly 70% of homes located outside of Dublin, Cork City and Galway City rely on high carbon kerosene oil, peat, or coal as their primary energy source for home heating¹ – sources that are also costly to replace with full electrification.

Lower carbon liquid gas and renewable liquid gases offer a practical, immediate solution. These “drop in” fuels can be used with existing systems. BioLPG has the capacity to reduce greenhouse gas emissions up to 90% against the set values of fossil fuels, in accordance with the European Union Renewable Energy Directive².

This strategy outlines the path forward to increasing Ireland’s supply and uptake of renewable liquid gas, aligned with policy supports, with a focus on:

- Encouraging widespread consumer adoption through fair and targeted incentives.
- Ensuring integration of renewable liquid gases into Ireland’s broader energy and climate policies.
- Highlighting renewable liquid gas pathways to 2050, including the opportunity to establish a domestic renewable liquid gas industry.

WHERE THE IMPACT WILL BE FELT

This is a national strategy, with a primary focus on the 1.15 million households and thousands of SMEs located off the natural gas grid. LGI sees the decarbonisation of rural Ireland as a key priority, where electrification is often costly or technically challenging due to infrastructure and building types.

HOW THE TRANSITION CAN BE DELIVERED

LGI proposes a two-pillar approach which encompasses:

1. Consumer support to encourage uptake of renewable liquid gas with:

- Equal access to grants and incentives for rural homes and businesses.
- Price support mechanisms.
- Recognition as part of Sustainable Energy Authority of Ireland’s (SEAI) retrofit schemes.
- Targeted support through the Climate & Nature Fund.

2. Development of domestic renewable liquid gas production with:

- Capital and operational funding.
- Long-term market certainty.
- Reliable access to sustainable feedstocks.
- Full integration into national decarbonisation policy.



This report lays out a clear, evidence-based strategy for Ireland’s transition to 100% renewable liquid gas by 2050 – detailing the practical steps, policy priorities, and investment required to make sure rural communities are fully included in the national journey to net zero.



Now
–
2030

2030
–
2040

By
2050

- Achieve policy parity for renewable liquid gases with biomethane and hydrogen.
- Safeguard affordability for rural consumers.
- Increase supply through the integrated European market.

- Increase supply of renewable liquid gas as a by-product of EU/UK HVO and SAF production.
- Develop domestic production through three key pathways:
 - rDME from anaerobic digestion (AD) plants.
 - BioLPG as a by-product of Hydrotreated Vegetable Oil (HVO) and Sustainable Aviation Fuel (SAF) production.
 - Purpose-built renewable liquid gas facilities.

- Meet over 60% of current liquid gas demand with domestically produced renewable liquid gases.
- Enable a fully decarbonised energy system for areas beyond the natural gas grid.

1. CSO Census 2022
 2. BioLPG 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”). Actual figure is dependent upon input feedstocks.

Foreword

By Alan Farrell, Liquid Gas Ireland, Senior Director of Government Affairs & Policy

Ireland has committed to achieving net zero emissions by 2050. It is a bold and necessary ambition, but one that requires an energy transition that is not only effective but also fair and inclusive. Today, almost half of Irish homes – particularly in rural areas – continue to rely on high carbon oil, coal, and peat for heating. These communities often lie beyond the natural gas grid, and without new solutions, risk being left behind in the journey to net zero.

The SEAI's *National Heat Study* has shown that electrification, while essential, cannot reach every home or business. Even with efficiency upgrades, many older and rural buildings are not suitable for heat pumps. For these households and enterprises, renewable liquid gases provide a practical, affordable, and immediate pathway to decarbonisation. They complement Ireland's retrofitting targets and ensure that the benefits of the transition extend to every community.

Lower carbon liquid gas is already helping rural homes and businesses reduce their emissions by providing a cleaner alternative to coal, peat, and oil. Building on this foundation, renewable liquid gases such as BioLPG and renewable dimethyl ether (rDME), can take us further – delivering deeper carbon savings while supporting Ireland's long-term energy security.

Moreover, they present a unique opportunity for rural Ireland to become not only a participant in the clean energy transition, but a driver of it through the potential for future domestic production of renewable liquid gas. By turning agricultural by-products, waste, and sustainable crops into renewable gases, rural communities can generate new income streams, create jobs, and contribute directly to national climate goals.

With the right policy support, Ireland could produce up to 100,000 tonnes of renewable liquid gas annually by 2050. This would cut rural heating emissions, reduce reliance on imported fossil fuels, and strengthen our domestic energy supply chain. To achieve this, it is critical that renewable liquid gases are fully recognised alongside biomethane and hydrogen within a technology neutral energy strategy that delivers a Just Transition for all.

This report – *Delivering Net Zero for Rural Ireland: Pathways to Renewable Liquid Gas* – sets out a clear, phased approach to realising this potential. It highlights the scale of opportunity, the importance of balanced policy supports, and the steps required to ensure renewable liquid gases can play their full role in rural Ireland's energy transition.

Liquid Gas Ireland and its members are committed to net zero by 2050. We believe renewable liquid gases can deliver tangible benefits for households, businesses, and communities, particularly in rural Ireland. With joined-up policy, targeted investment, and industry collaboration, we can build an energy transition that is fair, inclusive, and resilient – one that leaves no community behind.

We invite policymakers, industry stakeholders and communities to engage with this document and help unlock the full potential of renewable liquid gas pathways in building a cleaner, more resilient energy future for Ireland.

Alan Farrell

Alan Farrell,
Senior Director, Liquid Gas Ireland



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Policy Framework to Unlock Renewable Liquid Gas

Ireland is firmly committed to achieving net zero emissions by 2050, aligning with broader European climate ambitions. At EU level, the European Green Deal and the Renewable Energy Directive (RED II & III) provide the overarching framework for this transition, setting binding renewable energy targets across key sectors, including transport, electricity, and heat. These policies emphasise the growing role of renewable gases and sustainable biofuels in the collective decarbonisation effort.

Ireland’s Climate Action Plan, first published in 2019 and legally codified in 2021, sets a pathway for a 51% reduction in greenhouse gas emissions by 2030, en route to net zero by mid-century. It identifies the energy and heat sectors as central to achieving these targets and highlights the decarbonisation of off natural gas grid and rural heating as one of the most difficult challenges.

To help address this, Government have launched several major initiatives. The National Biomethane Strategy (2024) outlines a roadmap to scale up

domestic biomethane production, while the National Hydrogen Strategy (2023) defines the role of green hydrogen in decarbonising hard to abate sectors. These efforts are complemented by the Renewable Heat Obligation (RHO) Bill, which mandates a minimum share of renewable fuels in the heating market to drive adoption.

Importantly, the Programme for Government also recognises the need for lower carbon liquid fuels, committing to “consider the use of sustainable biofuels to reduce emissions from existing home

boilers where deep retrofits are not immediately feasible.” This acknowledges a practical reality – many rural households cannot afford full electrification, and require accessible, low carbon alternatives.

Renewable liquid gases such as BioLPG and rDME offer exactly that. BioLPG is currently recognised as an eligible fuel at EU level under RED II and RED III, providing a low carbon, drop in alternative to conventional liquid gas, requiring no major retrofitting and enabling immediate emissions reductions in off natural gas grid areas. However, despite their potential, renewable liquid gases have not yet been fully integrated into Ireland’s national energy policy.

The liquid gas sector currently plays a critical role in heating rural homes and businesses, many of which rely on liquid gas as a primary fuel. Yet this contribution remains largely overlooked in policy discussions.

Greater recognition is needed to ensure rural communities are not left behind. Failing to support them would undermine the principles of a ‘Just Transition’, which is meant to ensure fairness for all in the move to a low-carbon economy.

To accelerate the transition to renewable liquid gas, a two-pronged policy approach is recommended:

- 1. Consumer supports:** In the short to medium term, the Government should introduce targeted incentives – such as financial assistance, tax relief, and price support mechanisms – to help households and businesses switch to renewable liquid gases. These measures are crucial for ensuring that cleaner heating options remain affordable and accessible, particularly in rural areas.
- 2. Development of a domestic renewable liquid gas sector:** Over the longer term, policy must support the growth of a domestic renewable liquid gas supply. This includes investment in production technologies – such as anaerobic digestion with co-production of rDME – alongside infrastructure development and integration into national energy and bioeconomy strategies. Equal support, in line with what’s being provided to the biomethane and hydrogen sectors, is vital to unlock this future potential.

CONSUMER AND BUSINESS SUPPORTS



1. DELIVER PARITY OF POLICY SUPPORTS FOR RURAL OFF NATURAL GAS GRID HOMES AND BUSINESSES

To deliver a fair and equitable energy transition, government policy must ensure parity of support for consumers who are not connected to the natural gas grid – many of whom live in rural or remote communities. These households and businesses often rely on high carbon fuels such as oil, coal, or peat and face more limited and costly decarbonisation options.

Any financial supports or incentives introduced to encourage the use of renewable gases – such as biomethane on the natural gas network – must also apply to renewable liquid gases like BioLPG and rDME. These fuels offer a lower carbon, renewable alternative that can be used with existing heating systems and infrastructure, making them especially suitable for off natural gas grid rural applications.

Imposing a disproportionate cost burden on off natural gas grid consumers would run counter to the principles of a ‘Just Transition’. Policy must therefore adopt a ‘mixed technology’ approach that recognises, supports, and makes all viable low carbon solutions – including renewable liquid gas – available to those with the fewest alternatives.



2. MANAGE COST OF TRANSITIONING TO RENEWABLE LIQUID GAS FOR RURAL HOMES AND BUSINESSES

As renewable liquid gas becomes more widely adopted, protecting energy affordability for off natural gas grid consumers will be essential. The Government must ensure that the cost of decarbonisation does not fall disproportionately on those without access to the natural gas grid or viable electrification alternatives.

Off natural gas grid consumers must receive the same level of support as those on the gas grid – including access to capital grants, tax incentives, and support with potential price volatility or cost imbalances arising from renewable fuel mandates like the Renewable Heat Obligation (RHO).

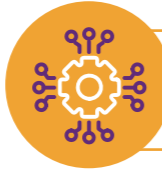




3. UTILISE THE CLIMATE & NATURE FUND TO SUPPORT AFFORDABILITY

A dedicated allocation from the Climate & Nature Fund should be used to offset the additional costs associated with renewable liquid gas. These costs may arise as a direct consequence of RHO compliance, or from the increased production and supply of advanced renewable fuels in remote areas.

By targeting funding in this way, the Government can help to ensure that renewable liquid gas remains a viable and affordable option for rural households and businesses, and that energy poverty or economic strain is not exacerbated during the transition. This targeted support will help prevent energy costs from becoming a barrier to uptake, allowing renewable liquid gas to scale up as a practical, lower carbon heating solution for rural Ireland.



4. REVAMP SEAI GRANTS TO REFLECT A 'MIXED TECHNOLOGY' PATHWAY TO DECARBONISATION

The liquid gas sector plays a vital role in supporting rural homes and businesses, which face unique and often more complex challenges on the path to decarbonisation. These properties are typically older, larger, more expensive to heat, and more vulnerable to energy poverty. Retrofitting can be particularly costly and difficult, while access to alternative low-carbon heating solutions remains limited.

Although heat pumps will be central to decarbonising Ireland's housing stock, a broader suite of solutions is urgently needed to accelerate progress towards 2030 targets and beyond. This requires a 'mixed-technology' approach – one that includes lower carbon liquid gas and renewable liquid gases such as BioLPG and rDME. These fuels can be deployed through renewable-ready gas boilers, either as standalone solutions or in hybrid systems alongside heat pumps.

This pathway should form part of a targeted government strategy to boost retrofitting in rural Ireland and should be supported through a revamped SEAI grant scheme, aligned with the European Energy Performance of Buildings Directive (EPBD).



5. SUPPORT THE ENERGY NEEDS OF RURAL SME'S AND OFF NATURAL GAS GRID BUSINESSES

Ireland's small to medium sized enterprises (SMEs), particularly those in off natural gas grid rural areas, must be supported as part of a fair and competitive energy transition. These businesses operate across key sectors – including agriculture, food production, tourism, hospitality, manufacturing, healthcare, education, and transport – and are central to Ireland's rural economy.

Many of these enterprises already rely on liquid gas and renewable liquid gas to meet their energy needs, meaning they have taken the first steps of lower carbon progression. However, the cost of transitioning must not become an added burden – especially as SMEs continue to face inflationary pressures, rising input costs, and global economic uncertainty.

Any policy designed to decarbonise Ireland's commercial sector must:

- **Recognise** the current and future role of liquid gas and renewable liquid gas in supporting rural businesses.
- **Avoid** imposing unfair cost burdens through fuel switching mandates.
- **Protect** economic competitiveness while enabling real progress on decarbonisation.



6. ENABLE INDUSTRIAL DECARBONISATION WHERE ELECTRIFICATION IS NOT FEASIBLE

A targeted policy approach is needed for industrial customers and energy intensive sectors where electrification is technically or economically unfeasible. For many of these industries – particularly those located off the natural gas grid or reliant on high temperature process heat – liquid gas and renewable liquid gases offer a practical, scalable pathway to emissions reduction without requiring major infrastructure changes.

To support this transition, dedicated support mechanisms must be introduced to help these sectors decarbonise efficiently and affordably, without undermining operational viability or Ireland's industrial competitiveness.



DEVELOPMENT OF AN INDIGENOUS RENEWABLE LIQUID GAS SECTOR

Alongside increased supply of renewable liquid gas pathways from within the integrated European market, there is potential to develop a domestic renewable liquid gas sector in Ireland, producing low carbon fuels such as BioLPG and renewable DME (rDME). With the right policy support, this sector could play a critical role in decarbonising heat and energy use beyond the natural gas grid – particularly for rural homes, small businesses, and industry.



Developing future indigenous production would enhance energy security, improve supply resilience, and reduce exposure to international market volatility.



While government policy has so far prioritised biomethane injection into the natural gas grid, renewable liquid gas serves a distinct consumer base and requires its own clear route to market.

To unlock private investment and scale domestic production, a targeted package of capital and operational supports is needed – complementary to those already being introduced for biomethane under the National Biomethane Strategy, National Hydrogen Strategy, and Renewable Heat Obligation.

SUPPORTS NEEDED TO UNLOCK DOMESTIC PRODUCTION OF RENEWABLE LIQUID GAS

1

Long term policy certainty: A clear, stable, and technology neutral policy framework is essential to provide investor confidence to develop renewable liquid gas projects – mirroring the approach taken for the biomethane sector.

2

Capital and operational supports: Financial support should include grants for production infrastructure, along with operational measures such as feed in tariffs or price floors to mitigate commercial risk.

3

Parity with other renewable fuels: Renewable liquid gas must be granted equal access to funding schemes such as the Climate Action Fund and Climate & Nature Fund, and be eligible under the Renewable Heat Obligation where appropriate.

4

Measures to stimulate market demand: Policy should incentivise uptake through supplier and consumer supports – such as end use rebates and blending incentives.

5

Integration into Ireland's broader energy and decarbonisation strategy: Renewable liquid gas must be explicitly recognised in national bioenergy and climate strategies as a key solution for hard to electrify sectors and rural off natural gas grid energy users.

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About Liquid Gas

Liquid gas is the general name given for conventional LPG, renewable BioLPG, and renewable DME. LPG (liquefied petroleum gas) is a cleaner burning fuel composed primarily from propane and / or butane.

It is called 'liquid gas' because it stays in liquid form under moderate pressure but turns into a gas when the pressure is released. This makes it easier to store and transport compared to other gases like natural gas, which need very high pressure or very cold temperatures to become liquid.

As it is supplied in liquified form in a bulk tank or cylinder, liquid gas is a flexible fuel source that can reach areas not connected to Ireland's natural gas grid or centralised district heating systems. The portability of liquid gas is a key advantage in providing a reliable lower carbon energy supply for homes and businesses in areas with limited connectivity particularly those located in rural Ireland.

Liquid gas, is transported by truck using specially designed pressurised tankers to maintain the gas in its liquid state. For smaller scale distribution, the gas is stored in steel cylinders (bottled gas), which allows safe handling, storage, and transport while preventing vaporisation.

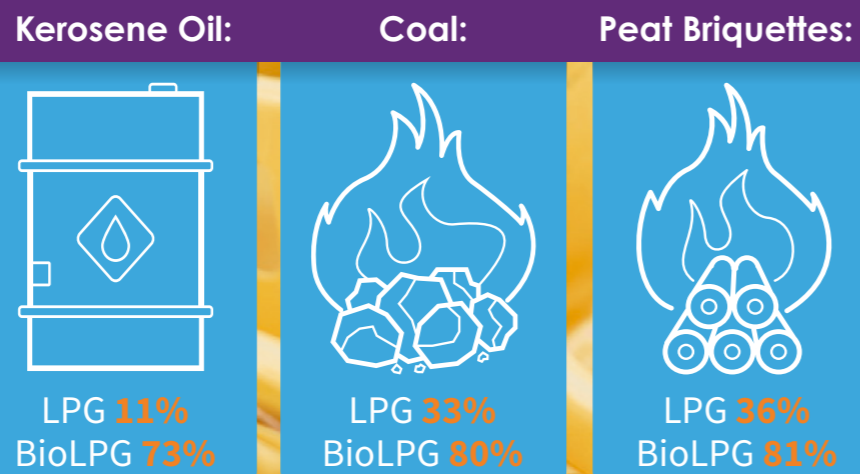
3. SEAI Conversion Factors



Liquid gas burns more cleanly than other common heating fuels including kerosene oil, peat and coal. LPG combustion emits 36% less carbon dioxide than peat, 33% less than coal, and 11% less than kerosene heating oil³.



Percentage of carbon savings available compared to higher carbon fossil fuels*



*An average BioLPG carbon value of 68.8 gCO₂eq/kWh is based on a 70% saving against conventional LPG (229.3 gCO₂eq/kWh SEAI). Actual figure is dependent upon input feedstocks.

Liquid gas emits almost no black carbon, which scientists advise is the second biggest contributor to climate change after CO₂ emissions⁴, and very low levels of air and particulate pollutant emissions, making it better for air quality.

Across Ireland, liquid gas has an important role to play as part of our national energy supply mix, especially in rural areas not supplied by the natural gas grid. It offers a clean, reliable, and easy-to-transport energy source, helping to ensure energy security and reduce dependence on more polluting fuels like kerosene oil, peat and coal.

HOW LIQUID GAS IS ENABLING A 'JUST TRANSITION' TO DECARBONISATION IN RURAL IRELAND

Nearly 70% of homes located outside of Dublin, Cork City and Galway City currently rely on high carbon kerosene oil, peat, or coal as their primary energy source for home heating⁵.

A large majority of these households are located outside our major urban centres, in areas off the natural gas grid. Homes in these areas tend to be older, larger, more expensive to heat, more likely to experience energy poverty, and face more challenging renovation pathways. In many

4. Journal of Geophysical Research: Atmospheres
5. CSO Census 2022
6. Gas Networks Ireland

circumstances, switching to an electric heat pump system is not logistically viable or is prohibitively expensive, leaving homeowners with limited alternative options to decarbonise their heating system.

Approximately 690,000 homes and 27,000 businesses in Ireland are currently connected to the natural gas grid⁶. However, for the 1.15 million private households in permanent residences – and the many additional businesses – located off the natural gas grid, particularly in rural areas, liquid gas offers a practical and scalable lower carbon energy solution. As such, liquid gas should be recognised as an extension of Ireland's natural gas grid infrastructure and as a vital enabler for decarbonising these off natural gas grid properties.

The liquid gas sector is uniquely positioned to help solve the problem of difficult to decarbonise rural homes and businesses, by transitioning them from oil and solid fuels to lower carbon liquid gas with increased blending of renewable liquid gas as a 'drop in' fuel. The sector must be recognised as part of the solution in the context of achieving overall climate emission targets and allowing rural Irish consumers to play their part.

For the tens of thousands of homes and businesses across Ireland that have made the switch to lower carbon liquid gas and renewable liquid gas, a 'Just Transition' towards decarbonisation and emissions reduction is already underway. But there is significant opportunity to embrace liquid gas as an option to encourage thousands more rural homes

and businesses to engage in the first steps of their decarbonisation journey.

BENEFITS OF LIQUID GAS



Versatility: Liquid gas is used across a wide range of domestic and commercial applications, including home heating and cooking, industrial operations, agricultural uses and outdoor recreation.



Cleaner Burning: As a smoke free fuel, liquid gas emits significantly fewer harmful pollutants – such as NO_x, SO_x, and particulate matter – than other fossil fuels, helping to improve air quality.



Secure & portable: With a diverse range of supply sources and high transportability, liquid gas ensures energy security, operational flexibility, and supply resilience for rural and off natural gas grid applications.



Accessible & cost effective: Liquid gas provides a cost-efficient energy solution, particularly in rural and off natural gas grid areas where infrastructure limitations make alternative lower carbon and / or renewable energy sources less viable.



ABOUT RENEWABLE LIQUID GAS

Renewable liquid gases (BioLPG and rDME) are low carbon alternatives to conventional liquid gas, produced from sustainable sources such as organic residues and waste, used cooking oil, vegetable oils, and agricultural by-products.

BioLPG

Currently in use across Ireland, BioLPG is chemically identical to liquid gas. This means BioLPG offers the same performance for heating and fuel applications as traditional liquid gas – but with a significantly lower environmental impact.

BioLPG is known as what’s called a ‘drop in’ fuel meaning it can be blended with traditional liquid gas allowing consumers to take a step-by-step approach to increasing their renewable fuel use as part of their energy mix.

Furthermore, as a ‘drop in’ fuel, BioLPG requires no changes to existing liquid gas systems or appliances, making it an easy and affordable renewable transition option for rural and off natural gas grid households.

Certified under the International Sustainability & Carbon Certification (ISCC) scheme, BioLPG reduces greenhouse gas emissions by at least 50% and up to 90% against set values of conventional fossil fuels, in accordance with the European Union Renewable Energy Directive⁷. BioLPG is exempt from carbon tax in Ireland and will become increasingly cost-effective as carbon tax rates continue to rise.

Renewable dimethyl ether (rDME)

Ongoing innovation in the liquid gas sector is also paving the way for the emergence of renewable dimethyl ether (rDME) – a low carbon, sustainable fuel that complements the progress already achieved with BioLPG.

Produced through gasification and catalytic synthesis, rDME can be derived from a wide range of feedstocks, including municipal solid waste, forest biomass, agricultural residues, sewage sludge, and dedicated energy crops. This versatility supports the growth of a circular economy by transforming waste into valuable energy.

⁷ BioLPG 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’). Actual figure is dependent upon input feedstocks.

Like BioLPG, one of rDME’s key advantages is its compatibility with existing liquid gas infrastructure. It can be blended with liquid gas or BioLPG and used in current appliances and distribution systems, offering a practical and cost effective energy solution for homes and businesses located off the natural gas grid.

With the right investment and supportive regulatory environment, Ireland could see the development of domestic rDME production facilities in the years ahead – strengthening energy security while advancing national climate goals.

Both BioLPG and rDME offer considerable environmental advantages. They emit far fewer greenhouse gases and air pollutants than traditional fossil fuels, supporting efforts to reduce carbon footprint across multiple sectors. In addition, by utilising locally available waste materials, renewable liquid gases enhance energy security, diversify the energy mix, and help build a more stable and resilient energy system less vulnerable to global market disruptions.

WHERE LIQUID GAS AND RENEWABLE LIQUID GAS IS USED

The versatility of liquid gas and renewable liquid gas goes far beyond space heating, energy generation, and hot water supply in rural and off natural gas grid homes. In fact, liquid gas is supporting the needs of a broad cohort of energy users across Ireland including State run buildings

such as schools, hospitals, primary care centres, heritage buildings, and public sector offices.

Demand can also be found where portable energy is needed, such as in the rapidly growing street food sector, or for other outdoor restaurant settings which require barbeques and patio heaters as well as holiday parks and campsites.

The following provides a closer examination of how liquid gas is applied across three key sectors of the Irish economy: industry, catering and hospitality, and agriculture.

Industry

Liquid gas is a highly adaptable and efficient energy source that supports a wide range of industrial processes – particularly where strong, controllable flames and precise temperature management are essential.

Widely used across various industries, liquid gas is ideal for applications such as space and process heating, water heating, metal fabrication, drying, food processing, petrochemical production, and powering industrial ovens and furnaces.

One of the key advantages of liquid gas in industrial settings is its high calorific value, delivering significant energy output per unit. Its clean combustion makes it especially attractive for operations aiming to reduce environmental impact without compromising performance. Liquid gas also offers consistent composition and easily adjustable temperatures, ensuring optimal control during production.

A great example of the industrial utility of liquid gas is in glass manufacturing, where precise heat

control is essential due to complex chemical reactions. Using a clean-burning fuel like liquid gas enhances both product quality and process efficiency.

Civil engineering is another area where liquid gas excels. It is widely used in bitumen production and road repairs, heating materials, illuminating signage, and providing floodlighting.

Common industry applications of liquid gas:





Catering & hospitality








In catering and hospitality businesses located off the natural gas grid, having a reliable energy source is essential for ensuring consistent access to hot water, heating, and cooking fuel. Liquid gas meets these needs with dependable performance and excellent control. It burns with a visible blue flame that can be adjusted easily, giving chefs precise temperature control during cooking.

Providing a steady and reliable energy supply, liquid gas supports efficient operation across hospitality settings. High efficiency commercial boilers reduce fuel use and maintenance costs, making liquid

gas a cost effective and flexible energy option. Its versatility extends across applications - from powering commercial kitchens, BBQs and patio heaters to fuelling street food stalls.

The hospitality industry is a cornerstone of regional economies, providing widespread employment and supporting communities across Ireland. From hotels and guesthouses to restaurants, cafés, and pubs, the sector plays a central role in Ireland's world-famous tourism offering. In many rural and off natural gas grid areas, hospitality businesses rely on dependable energy solutions like liquid gas to operate smoothly and deliver a high-quality service to visitors.

Common catering and hospitality applications of liquid gas:

 Heating Fast, efficient, and comfortable heating throughout buildings and outdoor spaces.	 Hot water Continuous hot water supply through advanced tankless systems.	 Cooking Clean, controllable heat ideal for professional kitchens.	 Laundry Faster, more energy efficient drying and washing systems.
 Swimming pools & spas Reliable heating even in cold weather.	 Electricity & power Combined heat and power (CHP) systems use liquid gas to generate both electricity and heat, cutting costs.	 Air conditioning New liquid gas based AC units offer an energy efficient alternative to electric systems.	

Agriculture

Liquid gas plays a vital role in modern agriculture, offering a wide range of applications across the sector. From delivering consistent heat for crop growth to providing optimal temperatures for drying, liquid gas is a clean, safe, and efficient energy source that supports productivity and sustainability on farms.








For crop production, liquid gas ensures reliable heating in polytunnels and greenhouses, supporting the cultivation of temperature sensitive crops like strawberries and asparagus. It's also ideal for crop drying, helping to reduce waste, lower maintenance costs, and improve efficiency.

In poultry farming, liquid gas powered heaters improve shed conditions by reducing water vapour and carbon dioxide, while isolating harmful

byproducts. This creates a healthier environment, helping to keep litter dry, promote chick growth, and reduce the risk of common diseases such as pododermatitis.

On dairy farms, liquid gas offers a cost effective and cleaner solution for producing hot water at the high temperatures needed to clean milk lines and storage tanks - without relying on chemical agents.

Common agricultural applications of liquid gas:

 Instant hot water on demand for dairy operations	 Consistent temperature control for poultry brooders	 Space heating for poultry sheds, greenhouses, and nurseries	 Efficient grain drying	 Powering cost-effective generators	 Flame weeding and pest control without chemicals	 CO₂ generation to enhance plant growth
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The Consumer Experience of Liquid Gas

THE SHED DISTILLERY, DRUMSHANBO, CO. LEITRIM

The Shed Distillery of PJ Rigney is home to the world-famous Drumshanbo Gunpowder Irish Gin, Drumshanbo Single Pot Still Irish Whiskey, Sausage Tree Pure Irish Vodka, and 12 other curious spirit brands. Located in The Food Hub – a social enterprise in Drumshanbo, Co. Leitrim – community is at the heart of its values, with over 100 local people proudly employed.

As a rural family business, The Shed Distillery places environmental responsibility at its core. A member of Origin Green, Bord Bia’s pioneering food and drink sustainability programme, the distillery is proud of its green credentials, which include an on-site nature reserve. Its commitment to sustainability also extends to energy use, with a renewable liquid gas blend meeting its unique energy needs which include establishing the 80-acre Drumshanbo nature reserve.

“We chose to use a renewable liquid gas blend for two main reasons. Firstly, it aligns with our core environmental values and our commitment to moving towards net zero. Secondly, it is uniquely capable of delivering the high temperature heat we require to distil a world-class quality product.

“Here in rural Drumshanbo, Co. Leitrim, we are off the natural gas grid. Despite this, we have



developed brands that compete with the best in the world – which demands a consistent supply of high-quality gas to generate the heat needed for exceptional production standards.

“Being able to achieve this with a renewable liquid gas blend is a significant competitive advantage as we sell into markets worldwide. Attention to detail is at the heart of what we do, and our energy choice is one crucial piece of the puzzle in building a world-class brand.

“As a rural business supporting over 100 local jobs,

competitiveness is essential. Whether operating in Dublin or rural Leitrim, parity in energy costs is critical, particularly when using a renewable liquid gas blend that reflects our sustainability values. We should not be penalised for making this environmentally responsible choice; rather, we should be supported by the Government – especially given our rural location.”

Patrick Rigney
Co-founder and Managing Director
The Shed Distillery

FALLS HOTEL & SPA, ENNISTYMON, CO. CLARE

Certified as a carbon-neutral business in 2021 through the Green Hospitality Programme’s GREENMark, and a proud member of the Burren Ecotourism Network, the Falls Hotel & Spa has a strong sustainability story to share.

Owned and managed by the McCarthy family since 1986, the hotel has accelerated its environmental efforts since 2016, when it began tracking its carbon emissions monthly and closely monitoring waste, water, and energy use.

With 140 guest rooms, nine apartments, two kitchens, a guest lodge, and a full onsite spa, finding renewable energy solutions to significantly cut emissions was a top priority. Falls Hotel & Spa met this challenge by installing a hydroelectric turbine in the river beside the property, generating 100% of its electricity needs, and adding 90 solar panels to the hotel’s roof.

To fully decarbonise its heating and hot water systems, the business also switched to 100% renewable liquid gas. Since making this transition in 2022, the Falls Hotel & Spa has saved more than 1,200 tonnes of CO₂ emissions – marking a major milestone in its sustainability journey.

“Here at Falls Hotel & Spa, we are proud to be located at the gateway to The Burren in Co. Clare. As a rural business situated off the natural gas grid, our only viable option for energy and heating was liquid gas. In keeping with our strong

sustainability commitments, we chose to take this further by switching to 100% renewable liquid gas. This provides us with an accessible, flexible renewable energy source while delivering significant environmental benefits that align with our values.

“We use 100% renewable liquid gas to supply instant, controllable, and measurable heat and hot water throughout the property – including all 140 guest rooms. In our spa, it heats the pool, powers the outdoor jacuzzi, and provides the hot water needed for our steam room and changing facilities. In our kitchens, it delivers the high-quality, high-temperature heat essential for preparing the food we serve in our bar and restaurant.

“As a family-owned business on Ireland’s Wild Atlantic Way, we take pride in supporting our local community, employing up to 150 people during peak season. As a leader in sustainability, we have adopted a ‘mixed technology’ approach to achieving carbon neutrality. To sustain this progress, it is vital that the Government offers accessible financial supports and grants, helping businesses like ours manage the costs of decarbonisation – while continuing to make a significant economic contribution to the local area.”

Patrick Kilbane
Operations Manager
Falls Hotel & Spa



ABBEY MACHINERY, TOOMEVARA, CO. TIPPERARY

Established by the Cavanagh family in 1947, Abbey Machinery has specialised in manufacturing farm machinery for the agricultural sector for over 75 years. Today, the third generation of the family runs the business from a state-of-the-art, purpose-built manufacturing facility spanning more than 100,000 square feet in Toomevara, Co. Tipperary.

Located off the natural gas grid, Abbey Machinery relies on a renewable liquid gas blend as part of its energy mix, combined with onsite solar electricity generation and battery storage. The renewable liquid gas blend powers the facility's two paint booth heaters and provides essential heat for the production floor during the winter months.

“As a rural business off the natural gas grid, our options are limited when it comes to lower-carbon and renewable sources to meet our energy needs. Renewable liquid gas is essential to us, particularly because of the high heat requirements in our production facility – especially in our paint shop and powder-coating ovens, which operate at over 200°C.

“When designing our facility, we considered electricity, but it simply wasn't viable. To generate the same level of heat, we would have needed to double the size of our onsite transformer and upgrade cabling across the site – a huge outlay, coupled with significantly higher running costs compared to liquid gas.

“As a rural business, sustainability and environmental responsibility have always been central to our operations. Having renewable energy options that are accessible, affordable, and reliable



is vital. That's why we have chosen a renewable liquid gas blend to meet our high-heat demands, complemented by onsite solar power generation that supplies 100% renewable electricity.

“Going green and working towards carbon neutrality is expensive, with substantial capital outlays. On top of this, renewable liquid gas carries an additional premium compared to standard fuel. This shouldn't discourage rural businesses from reducing their carbon footprint. We believe the Government should introduce incentives to ensure renewable liquid gas is available at the same cost as renewable gas on the natural gas grid.

“We are proud to support the local economy, employing over 120 people onsite. With ambitions to expand and grow exports – currently reaching markets as far as Australia, New Zealand, and Saudi Arabia – we are determined to continue creating jobs locally while maintaining our carbon-neutral journey. For businesses like ours, government support is critical to achieving both growth and sustainability.”

Owen Cavanagh
Co-Director
Abbey Machinery

GILLIAN & MICK HILLMAN, DULEEK, CO. MEATH

Following the recent renovation of their 1930s cottage in Duleek, Co. Meath, Gillian & Mick Hillman decided to replace their old oil-fired heating system with a modern, high-efficiency liquid gas system. As part of the renovation, they insulated the walls, upgraded the windows, and installed underfloor heating – transforming the property into a much more energy-efficient home.

“We were using oil combined with a solid fuel stove to heat the house, but we wanted something more modern,” says Mick. “Our local plumber recommended liquid gas, and it's been great from the moment we put it in.”

Since improving the insulation, the Hillmans rarely need to switch on the heating – making their running costs far more economical. They also appreciate the convenience of liquid gas. “It's much cleaner, and our tank is automatically refilled by our local supplier whenever it runs low,” adds Gillian.

When weighing up their options, they considered installing a heat pump. “It wasn't going to be economical for us and would have been more expensive than the gas boiler. With the underfloor heating we were putting in, liquid gas was more efficient. Oil or solid fuel just weren't options we wanted to return to, so liquid gas was the logical choice.”

Switching to a renewable liquid gas blend has made heating both easier and more effective. “The heat is practically instantaneous, and each room is individually controlled,” says Mick. “With oil, it took so long to heat the house, but now it's worry-free. It's a lovely warm home.”

Looking to the future, the Hillmans plan to expand their use of renewable energy. “We'd like to increase our renewable liquid gas blend to further reduce our carbon footprint, and we've pre-wired the house for solar panels, which we'll install next year. Taking a step-by-step approach has made it much more affordable.”

They were also pleasantly surprised at how straightforward the switch to liquid gas was. “We never thought gas was even possible for us because we're not on the natural gas grid. But the tank was simply installed on a concrete base in the garden, and suddenly it was so accessible.”

“It would be great to see the Government provide clearer information on the different pathways available to make homes more energy efficient – including how liquid gas can be a viable option for rural households when combined with upgrades such as insulation. This should go hand in hand with more accessible grants. At the moment, there simply isn't enough information available on gas as a lower-carbon and renewable energy option for homeowners.”

Gillian & Mick Hillman
Homeowners
Duleek, Co. Meath



6

Pathways to Meeting Ireland's Renewable Liquid Gas Demand

This section of the report outlines the key pathways Ireland must continue to develop, along with future opportunities to be explored, to meet the country's renewable liquid gas demand in alignment with national decarbonisation targets.

Part A examines how, in the near to medium term, Ireland's demand for renewable liquid gas – including BioLPG and renewable dimethyl ether (rDME) – will largely be met through imports, leveraging Ireland's access to the integrated European renewable liquid gas market.

Part B focuses on the longer-term opportunity for establishing domestic production of renewable liquid gases, contingent on the implementation of supportive policy measures. This would complement existing progress in the renewable gas sector – particularly developments in biomethane and green hydrogen – which are already supported by government policy as central components in the transition of the natural gas network to a fully renewable energy system by 2050.

PART A – UTILISING EUROPE'S INTEGRATED RENEWABLE LIQUID GAS MARKET

Member companies of Liquid Gas Ireland operate within a broader integrated European energy market, which will remain vital to maintaining cost efficiency for Irish consumers. This cross-border market will play a crucial role in ensuring supply security as Ireland transitions toward establishing its own renewable liquid gas production capacity.

It is the ambition of the liquid gas sector to harness the integrated European market to increase supply of renewable liquid gas in Ireland and play its role in the journey to achieving a net zero integrated energy system that supports all sectors within Irish society.

Demonstrating its commitment to this transition, the liquid gas sector marked a key milestone

in November 2024 when DCC Energy (parent company of Flogas) and SHV Energy (parent company of Calor Ireland), two global leaders in the field, signed a memorandum of understanding (MoU) aimed at accelerating the development of renewable liquid gas.

Through this strategic partnership, both companies will collaborate to address supply chain challenges across Europe and work towards scaling up the production and commercial deployment of BioLPG and rDME.

OUTLOOK FOR INCREASED RENEWABLE LIQUID GAS SUPPLY IN EUROPE

By 2030, it is anticipated that BioLPG production across Europe will rely almost entirely on Hydrotreated Vegetable Oil (HVO) and Hydroprocessed Esters and Fatty Acids (HEFA) processes. However, this reliance is expected to decline over time, with these pathways accounting for less than 50% of production by 2040.

Looking ahead, gasification technologies – particularly for producing rDME – are projected to become the leading production method by 2040, contingent on favourable policy support.

Overall, the most dominant pathways to renewable liquid gas production will be HVO and HEFA, and gasification (DME). By 2050, a broader range of production technologies is expected to contribute,

resulting in a more diversified and resilient supply mix for Europe.

In its *Outlook for Renewable Liquid Gas in Europe* (2025) report, Liquid Gas Europe (LGE) – the European counterpart of Liquid Gas Ireland – demonstrates that, with current technologies and available feedstocks, it is feasible to produce enough renewable liquid gas to meet projected European demand by 2050, provided the right policy support is in place.

Developed with input from bioeconomy consultants NNFC and modelling experts Frazer-Nash, the report emphasises that a simplified, technology neutral policy framework is crucial to realising the full potential of renewable liquid gas in Europe's energy transition.

- Key recommendations include:**
- Harmonising definitions across EU legislation.
 - Adopting a lifecycle emissions approach to decarbonisation.
 - Classifying renewable liquid gas as a sustainable investment under the EU Taxonomy.
 - Reforming energy taxation in line with EU climate goals.
 - Providing long-term policy certainty.

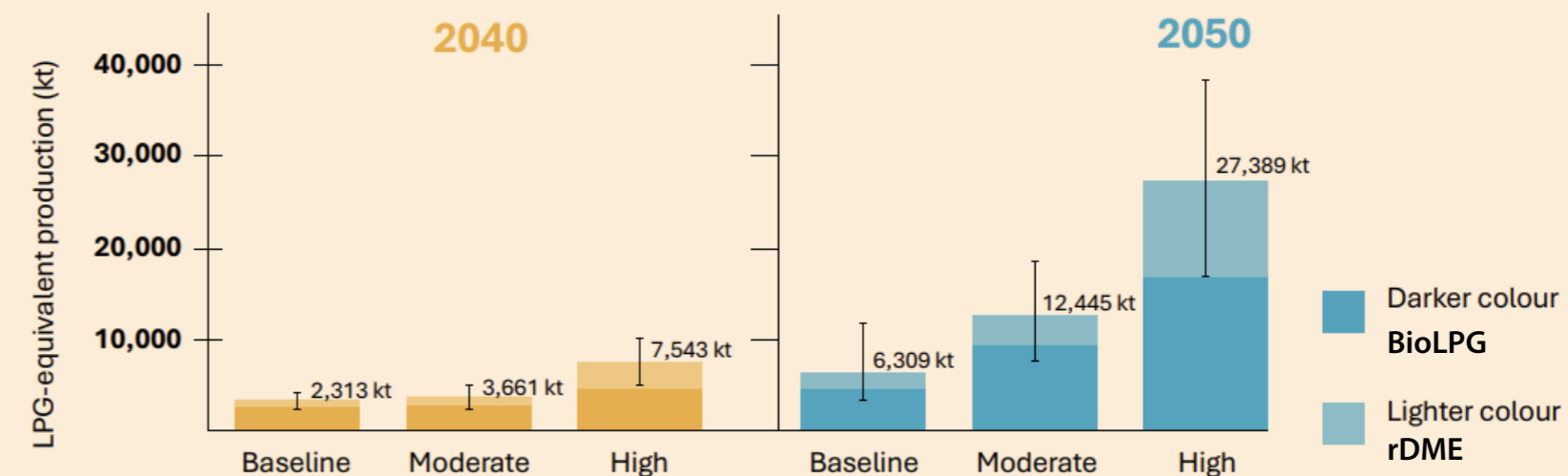
To model the report's findings, NNFC and Frazer-Nash examined three future scenarios:

1. Business as usual – reflecting current government and industry action.

- 2. Moderate supply** – assuming limited policy support and technological development.
- 3. High supply** – based on strong policy backing and significant technological progress.

Under the high supply scenario, LGE projects that median annual production of renewable liquid gas could exceed 7,500 kilo tonnes (kt) of LPG equivalent (96.4 TWh) by 2040. By 2050, this could rise to more than 27,000 kt (350 TWh) per year. These projections include total renewable liquid gas production, encompassing both BioLPG and rDME.

These figures reflect the potential renewable liquid gas production within Europe. Actual supply could be even higher if imports from other regions are taken into account.

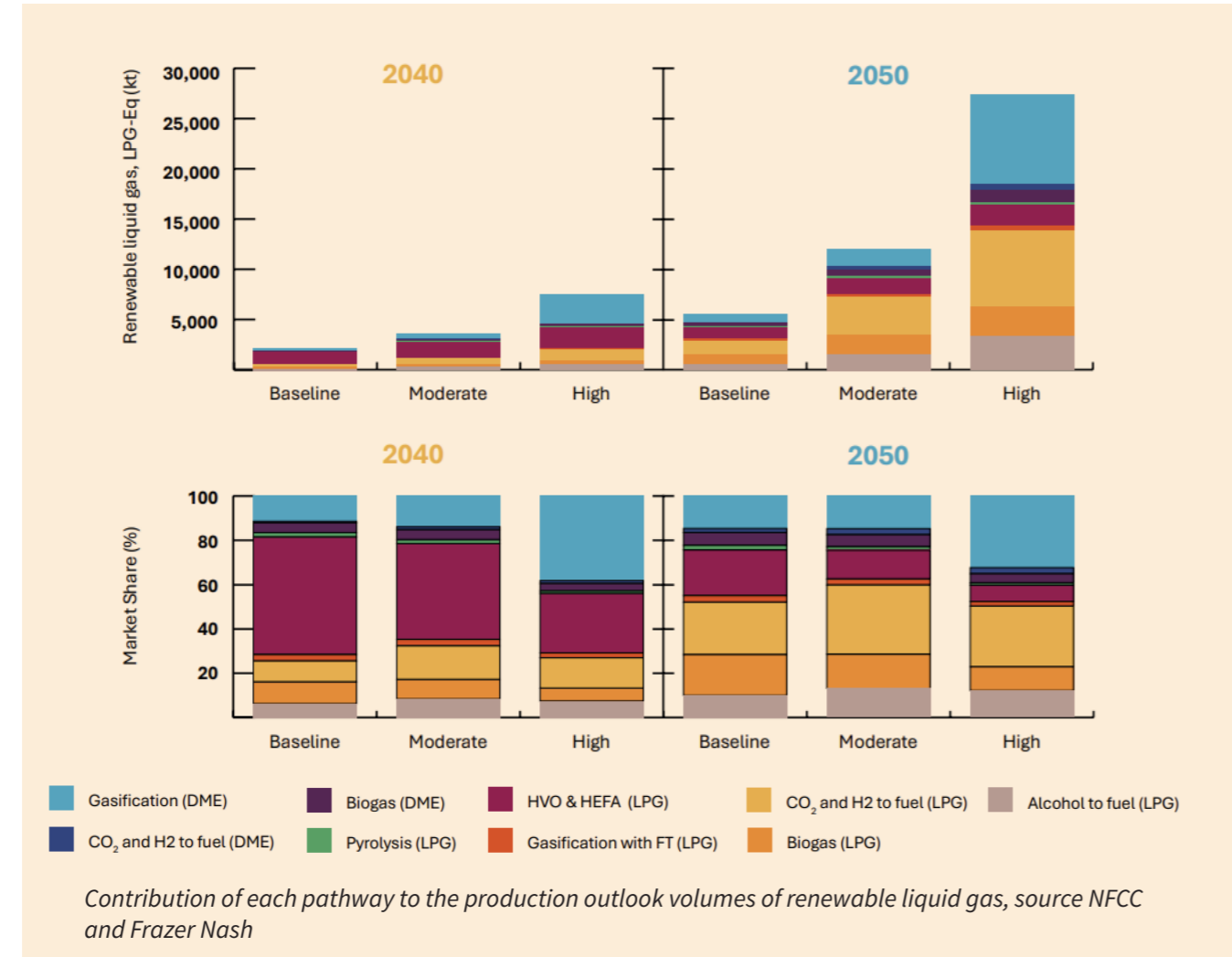


Production scenarios for renewable liquid gas production in 2040 and 2050, Source, NNFC and Frazer Nash



The supply scenarios presented by Liquid Gas Europe takes into account nine individual pathways to renewable liquid gas production encompassing both BioLPG and rDME. These include Gasification; CO₂ and H₂ to fuel; Biogas; Pyrolysis; HVO & HEFA; Gasification with FT; CO₂ and H₂ to fuel; biogas; and alcohol to fuel.

Given Ireland's current liquid gas demand is estimated to be around 160 kt per annum⁸, we are well positioned to benefit from the projected supply growth of renewable liquid gas across the integrated European market. As demonstrated by Liquid Gas Europe, the broader European renewable liquid gas market is set for strong growth, with the right policy support and continued industry collaboration.



8. SEAI National Energy Balance

HOW EU & UK SAF MANDATES WILL STIMULATE BIOLPG PRODUCTION

A study commissioned by Liquid Gas Ireland and developed by Talan in 2024 also demonstrates how Sustainable Aviation Fuel (SAF) mandates introduced in the EU and UK will stimulate European BioLPG production and supply over the next two decades.

Under ReFuelEU legislation, the EU has introduced a mandate that requires aircraft operators at all EU airports to ensure a set percentage of their jet fuel consumption is SAF.

Similarly, the UK has established its own SAF mandate under the Jet Zero Strategy, setting targets through to 2040. Alongside this mandate, the Jet Zero Strategy includes strong support for developing the UK's SAF industry. This includes

allocating £135 million to support the construction of at least five SAF production plants across the country.

SAF is expected to be produced primarily through four key technologies:

1. Hydroprocessed Esters and Fatty Acids (HEFA)
2. Gasification and Fischer-Tropsch (Gas + FT)
3. Alcohol-to-Jet (AtJ)
4. Power-to-Liquid (PtL)

All four processes have the potential to generate BioLPG as a co-product during SAF production. This suggests that growth in the BioLPG market could align closely with the expansion of SAF technologies and fuel output. Each production method yields varying amounts of BioLPG,

depending on specific plant configurations.

Currently, HEFA is the most mature and commercially established SAF production pathway, and it is anticipated to play a significant role during the early years of SAF deployment. However, due to limited sustainable feedstock availability, its contribution is expected to decline in the longer term.

Emerging technologies such as Power-to-Liquid (PtL) and Alcohol-to-Jet (AtJ) are expected to take on a greater role in SAF production. As per the above table, both the EU and UK have introduced a PtL sub mandate, requiring a specified share of SAF to be derived from PtL processes. This sub mandate provides additional certainty for investors in PtL technology, boosting confidence in the associated potential for BioLPG production and sales alongside mandated SAF output.

	2025	2030	2035	2040	2045	2050
EU SAF Mandate	2%	6%	20%	34%	42%	70%
EU - Expected SAF Volumes (million tonnes)	-	2.3	-	14.8	-	27.7
EU - Power to Liquid Sub Mandate	-	0.7%	5%	10%	15%	35%
UK SAF Mandate	2%	10%	-	22%	-	-
UK - Expected SAF Volumes (million tonnes)	0.2	1.2	1.8	2.7	-	-
UK - Power to Liquid Sub Mandate		0.2%		3.5%		

EU & UK SAF mandate targets & forecasts

The below table provides an overview of the ‘total BioLPG’ that will potentially be produced annually as a co-product from EU SAF production vs the volume of ‘BioLPG on the market’ reflecting the portion of that total, which is expected to be sold, based on informed and reasonable assumptions.

For the UK, mandate targets are only available up to 2040. The below table presents two scenarios that highlight how feedstock availability could affect SAF and, consequently, BioLPG production.

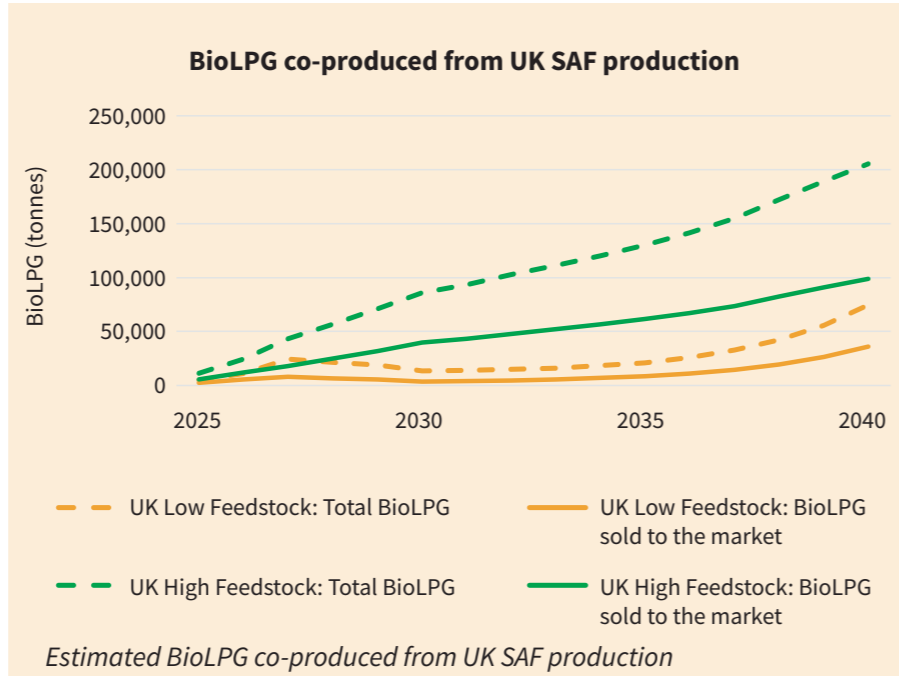
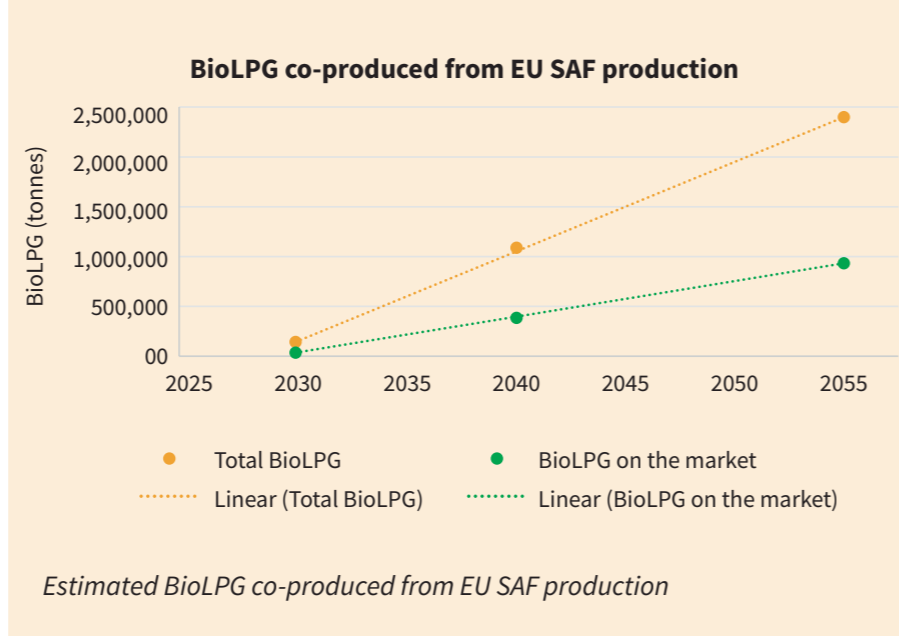
	EU - Total BioLPG produced (tonnes)	EU - BioLPG sold to the market (tonnes)	UK low feedstock - Total BioLPG produced (tonnes)	UK low feedstock - BioLPG sold to the market (tonnes)	UK high feedstock - Total BioLPG produced (tonnes)	UK high feedstock - BioLPG sold to the market (tonnes)
2030	142,000	35,000	13,745	3,686	86,086	39,628
2040	1,087,500	386,250	74,622	36,047	205,458	98,855
2050	2,400,025	930,532	-	-	-	-

Estimated BioLPG co-produced from EU and UK SAF production

IMPLICATIONS FOR RENEWABLE LIQUID GAS SUPPLY INTO IRELAND

Supported by EU and UK SAF mandates, advances in technologies like gasification and Power-to-Liquid, and strong policy alignment, renewable liquid gas will play a key role in Europe’s transition to a low carbon, integrated energy system – offering Ireland both immediate supply opportunities and long-term energy security.

This is based on the assumption that Ireland will have access to 5% of projected renewable liquid gas production volumes across the EU and UK, as outlined in the findings of third party market research firm Talan. This could be underscored by the strong security of supply that could emerge alongside the growth of the SAF industry.



PART B: FUTURE POTENTIAL TO DEVELOP AN INDIGENOUS RENEWABLE LIQUID GAS SECTOR

Liquid Gas Ireland commissioned independent research from Talan to assess the potential for indigenous renewable liquid gas supply in Ireland, given the right level of government support.

The findings present a promising outlook for the development of renewable liquid gas, with viable domestic production routes for both BioLPG and rDME. The research underscores the importance of formally recognising the role of renewable liquid gas in Ireland’s energy transition and setting clear targets to accelerate uptake – unlocking access to existing production pathways and enabling the development of new ones.

Talan identifies the availability of domestic feedstocks as a key opportunity to grow indigenous renewable liquid gas supply, estimating that up to 2.9 TWh of currently unused feedstocks could be suitable for renewable liquid gas production.

DOMESTIC FEEDSTOCK AVAILABILITY & PROJECTIONS

Biomass and waste products are sustainable, often low-cost resources, making them attractive feedstocks for renewable liquid gas production. Their availability will be a key factor in determining how much of Ireland’s future renewable liquid gas demand can be met from indigenous sources.

According to the SEAI’s 2023 National Energy Balance report, Ireland produced 6.2 TWh of indigenous biomass and waste energy, of which only 2.9 TWh was used for bioenergy applications. This suggests a further ~2.9 TWh of potentially



underutilised feedstock, pointing to opportunities to increase domestic bioenergy use.

Given Ireland’s limited processing infrastructure, it is likely that some of this indigenous biomass is currently being exported, even as Ireland continues to import renewable liquid gas from elsewhere in Europe. The SEAI data therefore supports the case for using these feedstocks domestically to develop indigenous renewable liquid gas production capacity.

The SEAI’s 2022 report, *Sustainable Bioenergy for Heat*, provides further insight, projecting that biomass and waste feedstocks could grow by just 1.2 TWh from 2020 to 2050. If no additional resources are made available beyond this, it would place a ceiling on how much renewable liquid

gas can be produced from indigenous sources – highlighting the importance of securing access to available feedstocks.

Much of the new HVO capacity being developed across Europe is focused on waste oils, such as used cooking oil (UCO) and tallow. In Ireland, the high price tallow scenario suggests that up to 0.4 TWh of these feedstocks could be available consistently through to 2050.

For other renewable liquid gas production routes, residual waste offers the most suitable feedstock for purpose-built gasification plants. Meanwhile, the substantial availability of agricultural and food waste supports the expansion of anaerobic digestion (AD) infrastructure, and the associated potential for rDME co-production.

PATHWAYS TO INDIGENOUS RENEWABLE LIQUID GAS SUPPLY

Based on the policy framework and the availability of feedstock, there are three key routes to indigenous renewable liquid gas production in the medium and long term. The possibility and extent to which these pathways will materialise is

dependent on the level of policy support for the industry and will therefore vary between the different scenarios.

RDME CO-LOCATIONS WITH AD BIOMETHANE PLANTS



- The Biomethane Strategy sparked investment in anaerobic digestion (AD) plants, with the biomethane pipeline being valued at €1-3 billion.
- There is potential to develop large-scale integrated facilities producing both biomethane and rDME to progress decarbonisation on and off the natural gas grid.
- Conventional AD plants cannot deliver the additional reforming and synthesis steps required to produce rDME. A supportive policy framework that aligns renewable liquid gas targets with the biomethane strategy is expected to help attract the investment required to upgrade AD facilities.

BIOLPG FROM HVO/SAF



- BioLPG is a byproduct of HVO and SAF production.
- The industry's ability to access bioLPG produced as a byproduct of HVO/ SAF depends on the volume of HVO/ SAF produced domestically as well as on producers' willingness to sell BioLPG to the market instead of recycling it on site to meet their own heating demand.
- A supportive policy framework could create market certainty for BioLPG and incentivise HVO/SAF producers to sell a larger share of the BioLPG produced to the market.

PURPOSE BUILT RLG SITE



- Clear market signals and certainty around future renewable liquid gas offtake and price are required to attract investment in a purpose-built, first-of-a-kind renewable liquid gas facility in Ireland.
- Based on feedstock availability, production capacity and technological readiness level, the gasification of syngas to rDME has been identified as the most viable production route in Ireland.
- Similar projects have been assessed in the past but did not come to fruition due to a lack of government support for the relatively nascent technology.

PATHWAY 1 – RDME AS A CO-PRODUCT FROM ANAEROBIC DIGESTION (AD) PLANTS

In addition to biomethane production, anaerobic digestion (AD) plants in Ireland have the potential to co-produce – or even solely produce – renewable dimethyl ether (rDME). With the long-term expansion of AD capacity under the National Biomethane Strategy, co-producing rDME could become an attractive pathway to scaling indigenous renewable liquid gas supply.

In the U.S., Oberon Fuels is a leading example of rDME production from AD. The company retrofits existing AD plants with additional infrastructure to convert biomethane to rDME via a methanol intermediate – a mature and well-established process. Oberon reports a 63% conversion efficiency at its 11,000-tonne rDME facility. Their small-scale plants, requiring a minimum of 6 GWh of biogas annually, can produce between 1.1 and 2.9 tonnes of liquid rDME per day.

Given that Ireland's existing 59 biogas plants average around 13 GWh/year of production, many could technically be converted to support small scale rDME output. Furthermore, all planned biomethane AD facilities under the National Biomethane Strategy would meet this minimum threshold.

Rural AD plants located far from natural gas grid injection points may be particularly well suited for rDME conversion. While biomethane can be costly to transport over long distances, rDME – being a liquid – can be easily integrated into the existing liquid gas distribution network using tanker trucks for delivery.

This route presents a strong opportunity for domestic rDME production and supports the Government's aim to empower farmers and rural communities to contribute to energy decarbonisation.

However, due to the higher capital costs associated with conversion, the rollout of this technology will require targeted support mechanisms and clear policy signals.

Looking ahead, if the role of biomethane in the energy mix diminishes – such as with the emergence of hydrogen as the primary fuel supply for the natural gas grid – rDME production could provide a valuable longer-term opportunity for Ireland's AD sector to remain relevant as part of Ireland's integrated decarbonised energy system.

PATHWAY 2 – BIOLPG AS A BY-PRODUCT FROM HVO & SAF PRODUCTION

Hydrotreated vegetable oil (HVO)

Globally, the primary route for BioLPG production is as a by-product of hydrotreated vegetable oil (HVO) refining. BioLPG is recovered from the off-gas stream during HVO production, with yields typically ranging from 5% to 8%, depending on process conditions.

In Ireland, there is currently one operational HVO plant, located in County Cork. The refinery produces approximately 553 GWh (45,264 tonnes) of HVO annually. While BioLPG is generated as a by-product at this facility, none is currently sold on the market.

It is likely that the BioLPG produced is reused within the plant for internal heat generation. Based on typical yield ranges, an estimated 30 GWh (2,263 tonnes) to 47 GWh (3,621 tonnes) of BioLPG could be produced annually. With the right policy support to stimulate both domestic demand and supply, a portion of this volume could be made available to the Irish market.

Although it is unlikely that another HVO plant will be developed in Ireland, this existing facility presents a near term opportunity to harness BioLPG production – provided a supportive regulatory framework is in place.

Sustainable Aviation Fuel (SAF)

Ireland is committed to increasing its use of Sustainable Aviation Fuel (SAF) to help decarbonise the aviation sector. Under the ReFuelEU mandate, aviation fuel suppliers must progressively increase the share of SAF blended into conventional jet fuel at Irish airports – from 2% in 2025 to 70% by 2050. This clear demand signal is expected to reduce investment risk and stimulate SAF production across all EU Member States, as outlined in Part A.

Ireland's BioLPG sector is well positioned to benefit from this anticipated growth. BioLPG is a co-product of SAF production, with yields ranging from 5% to 10%, depending on the technology used. Typically, around half of the BioLPG generated is reused within the plant for process heat.

However, under a supportive policy framework, SAF producers could be encouraged to sell more of this BioLPG to the market – especially if market conditions are favourable. The Irish Government should recognise the cross sectoral



of opportunity presented by domestically produced SAF. However, additional supportive policy is needed to recognise the potential of associated renewable fuels that can be co-produced alongside domestically produced SAF, including BioLPG.

The key barrier to unlocking this potential is the absence of detailed incentives for domestic SAF production. Ireland currently has no operational or planned SAF facilities, meaning all SAF will need to be imported in the near term. Given the high cost of SAF compared to conventional aviation fuel, strong government support is required to derisk investment – yet such policy signals have so far been absent.

With Ireland’s growing offshore wind capacity and the implementation of the National Hydrogen Strategy, the country could begin to secure the feedstocks necessary for commercial scale e-SAF production from the 2030s. However, the draft summary does not indicate that additional policy or regulatory frameworks will be introduced to directly support SAF development.

As countries like France and the UK provide substantial capital funding for domestic SAF production, Ireland still requires more detailed policy direction to encourage investment and push SAF developers to prioritise projects domestically.

To avoid missing out, the Government must urgently advance its long-term strategy for the SAF sector, including support mechanisms that can stimulate both SAF and BioLPG production. Given typical lead times of 3 - 5 years, no domestic SAF plants are expected to be operational before the early 2030s under current conditions.

PATHWAY 3 – DEVELOPING A PURPOSE-BUILT RENEWABLE LIQUID GAS PLANT

A supportive policy framework that delivers market certainty and addresses current financing barriers could pave the way for Ireland’s first purpose-built rDME gasification facility.

Unlike other production routes that generate renewable liquid gas as a co-product or byproduct, purpose built plants would allow for a direct response to market demand. This targeted approach would also enhance Ireland’s energy security by diversifying domestic energy production pathways.

Several technologies can produce renewable liquid gas as a primary product, with gasification among the most advanced. Recognised by the World Liquid Gas Association’s Renewables Working Group as a “key pathway” to producing BioLPG and rDME, gasification involves breaking down waste feedstocks – such as agricultural residues, refuse derived fuel (RDF), or municipal solid waste (MSW) – at high temperatures to generate syngas, which can then be upgraded into BioLPG or rDME.

Based on assessments of technology readiness and economic viability, on-purpose rDME production stands out as a particularly promising route. Unlike BioLPG, which is typically produced alongside other fuels, rDME production yields very few co-products, achieving high conversion rates of 80–95%.

The technology is mature and offers predictable performance with favourable economics, resulting in a lower investment risk. However, commercial scale, on purpose rDME production is still in its early stages globally.

Under the right policy environment, an Irish rDME facility could be resilient to broader economic

disruptions. Liquid Gas Ireland members have already investigated the feasibility of a plant using 250,000 tonnes of RDF sourced from Dublin. If developed, such a facility could produce an estimated 50,000 tonnes of rDME annually, marking a significant step toward domestic renewable gas production at scale.

SCENARIOS CONSIDERED IN MODELLING POTENTIAL INDIGENOUS SUPPLY VOLUMES

To model the potential domestic supply of renewable liquid gas by 2050, two scenarios were considered:

1. Business as usual (BAU): This scenario reflects the current policy environment, which includes the Renewable Heat Obligation, the National Biomethane Strategy, and the Biofuels Obligation Scheme. However, there is no direct mechanism to support the domestic production

or market uptake of renewable liquid gas.

Under this scenario, the only likely source of indigenous production is BioLPG as a by-product of the one operational HVO refinery in Ireland. This route could deliver up to 9 kt of BioLPG annually by 2050, assuming current operations continue, and production is made available to the market.

2. Supportive policy framework: This scenario assumes the implementation of dedicated support mechanisms for renewable liquid gases – comparable to those provided for biomethane under the National Biomethane Strategy. These could include:

- Capital grant funding.
- Streamlined permitting and planning processes.
- Clear offtake signals through schemes like the Renewable Heat Obligation.



decarbonisation potential that BioLPG offers when co-produced alongside domestic SAF, supporting not only aviation but also low carbon heating.

If Ireland aims to meet its ReFuelEU obligations through domestic SAF production, SFS Ireland and SkyNRG estimate that around 10 plants with a capacity of 80 kt each would be required by 2050 – equivalent to 9.6 TWh of SAF annually⁹. Depending on the production method,

⁹Ireland’s Sustainable Aviation Fuel Opportunity – SFS Ireland and SkyNRG (2023)

this could yield up to 1.0 TWh of BioLPG (78 kt), offering a meaningful contribution to Ireland’s renewable energy supply.

Policy Barriers To Unlocking Domestic Saf Production

The publication of Ireland’s Sustainable Aviation Fuel (SAF) Policy Roadmap (2025) by the Irish Government was a welcome first step to provide the policy clarity required to fully understand and realise the scale

With this policy support in place, investment in both co-located and purpose built rDME facilities could be unlocked. Alongside BioLPG as a by-product from HVO and SAF production, this would enable domestic renewable liquid gas supply to scale to nearly 100 kt annually by 2050.

In this more ambitious but achievable scenario, indigenous renewable liquid gas could meet over 60% of today's conventional liquid gas demand, significantly enhancing energy security while supporting rural decarbonisation.

HOW INDIGENOUS RENEWABLE LIQUID GAS COULD MEET 60% OVERALL DEMAND BY 2050

The research commissioned by Liquid Gas Ireland and developed by Talan to inform the development of this report highlights the strong potential for indigenous renewable liquid gas production. With the right support mechanisms, Ireland could produce over 100 kt of renewable liquid gas annually by 2050 – meeting over 60% of current liquid gas demand, which stands at approximately 162 kt annually¹⁰.

BioLPG derived as a by-product from HVO and SAF production is expected to be the first domestic supply route to scale. With only one HVO plant currently in operation and no additional facilities planned, future increases in BioLPG availability post-2030 will likely come from SAF plants entering the market. With adequate incentives, it is assumed that up to 90% of the BioLPG produced as a byproduct could be sold to the market rather than used internally.

10. SEAI National Energy Balance

The greatest opportunity for domestic renewable liquid gas supply, however, lies in co-locating with anaerobic digestion (AD) plants producing biomethane. If just 10% of biogas from AD is used for rDME production, over 25 kt of rDME could be available by 2040 – based on realistic project lead times.

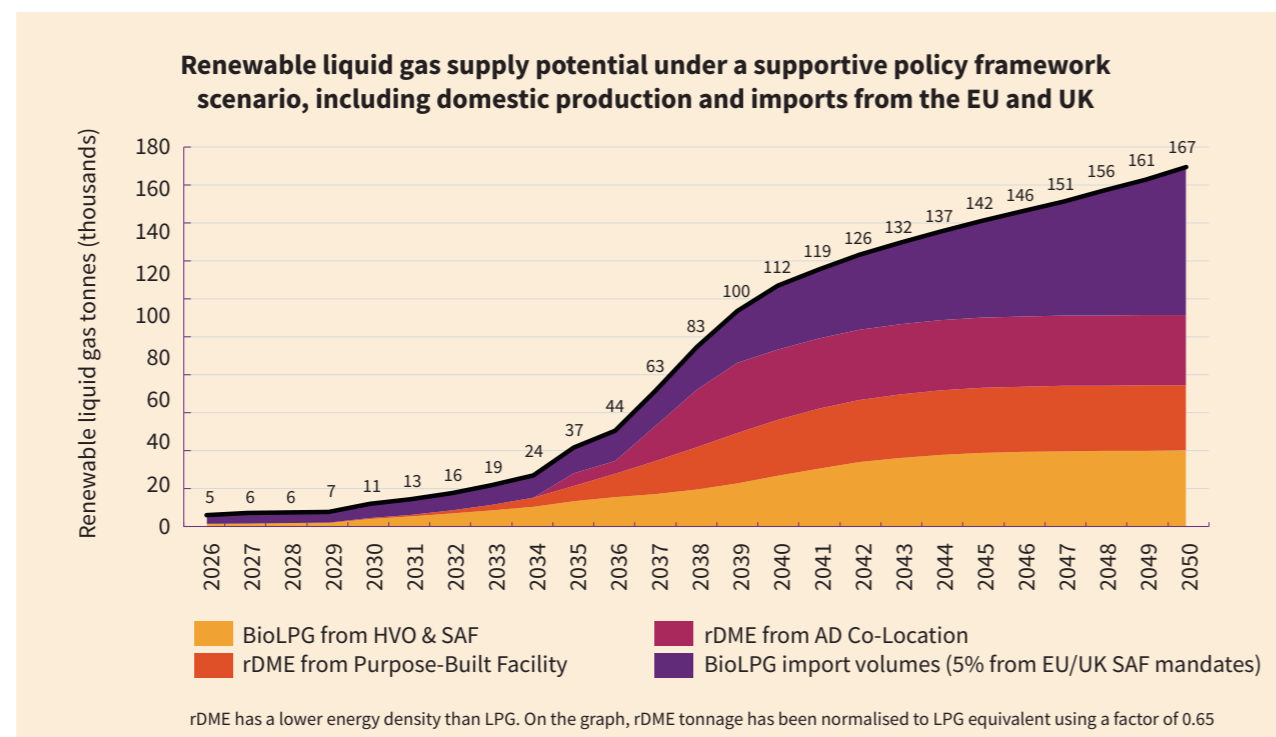
This would require conversion of approximately 14 typical AD plants, as envisioned in the National Biomethane Strategy, or just two large scale facilities.

Additionally, the development of a purpose built renewable liquid gas plant remains a realistic

prospect. A single facility processing 250,000 tonnes of refuse derived fuel (RDF) and municipal solid waste (MSW) could yield around 32 kt of rDME annually.

To meet the remaining 40% of demand and support Ireland's broader decarbonisation goals, renewable liquid gas suppliers are expected to continue leveraging access to the growing, integrated European market, as outlined in Part A.

Unlike domestic production, imported renewable liquid gas is not constrained by local feedstock availability. This will provide the Irish market with greater supply flexibility and ensure the long-term deployment of renewable liquid gases across off natural gas grid communities and industries that rely on liquid fuels.



POLICY ENVIRONMENT NEEDED TO DELIVER INDIGENOUS PRODUCTION

The analysis highlights a strong potential for renewable liquid gas production in Ireland, with viable domestic pathways for both BioLPG and rDME. The availability of indigenous feedstocks such as municipal solid waste and agrifood residues presents a significant opportunity to develop homegrown renewable fuels – enhancing both energy security and affordability.

The National Biomethane Strategy has already established a comprehensive support framework for domestic biomethane production. Measures

including capital grants, grid connection assistance, streamlined permitting, and offtake guarantees via the Renewable Heat Obligation are designed to attract significant investment, reflected in a project pipeline valued at up to €3 billion.

This strategy clearly demonstrates that emerging renewable fuel industries can scale rapidly when backed by targeted policy support. Given the pressing need to decarbonise rural areas beyond the natural gas grid, equal policy attention must now be extended to the renewable liquid gas sector. Ensuring a 'Just Transition' means creating

a level playing field for rural homes and businesses in the national decarbonisation journey.

Based on domestic feedstock availability and the technical readiness of key production routes, three credible pathways for indigenous renewable liquid gas production have been identified. To meet a substantial share of future demand with locally produced renewable liquid gases, all three routes will likely need to be realised over the next two decades. Achieving this will require coordinated policy support for the liquid gas sector and alignment with adjacent industries such as waste, agriculture, and renewable electricity.

Ireland's pathway to net zero by 2050 must be inclusive, technology neutral, and equitable for all communities. This report demonstrates that renewable liquid gases – BioLPG and renewable dimethyl ether (rDME) – offer a scalable cost effective solution for decarbonising homes, businesses, and industries beyond the natural gas grid, particularly in rural Ireland where full electrification is costly or technically prohibitive.

The evidence presented here underscores three essential points for policymakers:

URGENCY AND OPPORTUNITY

Nearly 70% of all homes located outside Dublin, Cork City and Galway City currently rely on high carbon fuels such as oil, coal, or peat as their primary energy source for home heating. These fuels are incompatible with Ireland's legally binding emissions targets yet replacing them with full electrification will impose disproportionate costs on rural households and SMEs.

Renewable liquid gases can cut emissions by up to 90%, using existing infrastructure to deliver immediate carbon savings. Their immediate adoption alongside lower carbon liquid gas can bridge the gap to deeper decarbonisation measures while maintaining affordability and energy security.

A 'JUST TRANSITION' FOR RURAL IRELAND

Decarbonisation policy must avoid creating a two-tier system in which urban, gas grid connected consumers benefit from robust supports while rural communities face higher costs and fewer viable alternatives.

Renewable liquid gases meet the core principles of a 'Just Transition': they are accessible, flexible, compatible with existing heating systems, can be deployed quickly, and can be blended seamlessly with lower carbon liquid gas. Equal access to grants, incentives, and retrofit schemes is essential to ensure rural households and businesses are not left behind.



STRATEGIC DOMESTIC PRODUCTION

In addition to renewable liquid gas supply from an integrated EU market, research shows strong potential to produce over 100 kt of domestic supply annually by 2050 – meeting more than 60% of current liquid gas demand.

Three clear pathways exist:

1. rDME co-production from anaerobic digestion plants, especially those distant from gas grid injection points.
2. BioLPG as a by-product of hydrotreated vegetable oil (HVO) and sustainable aviation fuel (SAF) production.
3. Purpose-built renewable liquid gas facilities using advanced gasification technologies.

Realising these opportunities will enhance energy sovereignty, create rural jobs, and align with national waste, agriculture, and renewable energy strategies.

The findings of the SEAI's National Heat Study further reinforce these conclusions. While heat pumps are technically suitable in many settings, the study confirms that large segments of Ireland's building stock face economic or infrastructural barriers to electrification. Up to 22% of residential homes require significant additional upgrades before heat pumps can be deployed.

Relying on electrification alone would leave these communities behind. A balanced approach, combining electrification with renewable liquid gases, is therefore essential to deliver a just and achievable pathway to net zero, a conclusion that the SEAI report highlights.



POLICY PRIORITIES

To fully integrate renewable liquid gases into Ireland's decarbonisation framework, the Government should focus on:

- **Policy parity:** Extend the same level of support given to biomethane and hydrogen to renewable liquid gases, ensuring inclusion in the National Biomethane Strategy, SEAI retrofit schemes, and Climate Action Fund eligibility.
- **Consumer supports:** Introduce targeted financial incentives, price support measures, and Climate & Nature Fund allocations to manage transition costs for rural homes, SMEs, and industries unable to electrify. Government policy should therefore adopt a 'mixed technology' approach to enable more homes and businesses to achieve sectorial targets.
- **Market development:** Establish offtake guarantees, feed in tariffs, or price floors to unlock private investment in indigenous production.
- **Infrastructure integration:** Support blending, distribution, and storage capacity, leveraging existing liquid gas networks for renewable fuels.
- **Feedstock security:** Secure long term access to sustainable domestic feedstocks through cross sectoral coordination in waste, agriculture, and bioenergy policy.
- **SAF alignment:** Use Ireland's Sustainable Aviation Fuel (SAF) Policy Roadmap as the starting point to deliver provisions for BioLPG co production, capital support for SAF plants, and incentives for market release of co-produced gases.
- **Economic and social gains:** Recognise that beyond emissions reduction, renewable liquid gases represent an opportunity to stimulate rural economies, diversify farm income, and create skilled jobs in production, logistics, and equipment servicing.

THE NEXT STEPS

The transition to renewable liquid gases is not an optional supplement to Ireland's energy policy, it is an essential component of a balanced, just, and economically prudent route to net zero. The sector's readiness, combined with clear production pathways and the ability to deliver rapid emissions cuts, positions renewable liquid gas as a strategic enabler of rural decarbonisation.

The Government now has a clear choice: extend full policy recognition and targeted support to renewable liquid gases, or risk prolonging reliance on high carbon fuels in rural Ireland, undermining national climate targets and equity commitments. By embedding renewable liquid gases into the core of Ireland's energy strategy, policymakers can ensure that every household and business, regardless of location, participates in, and benefits from, the clean energy future.

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