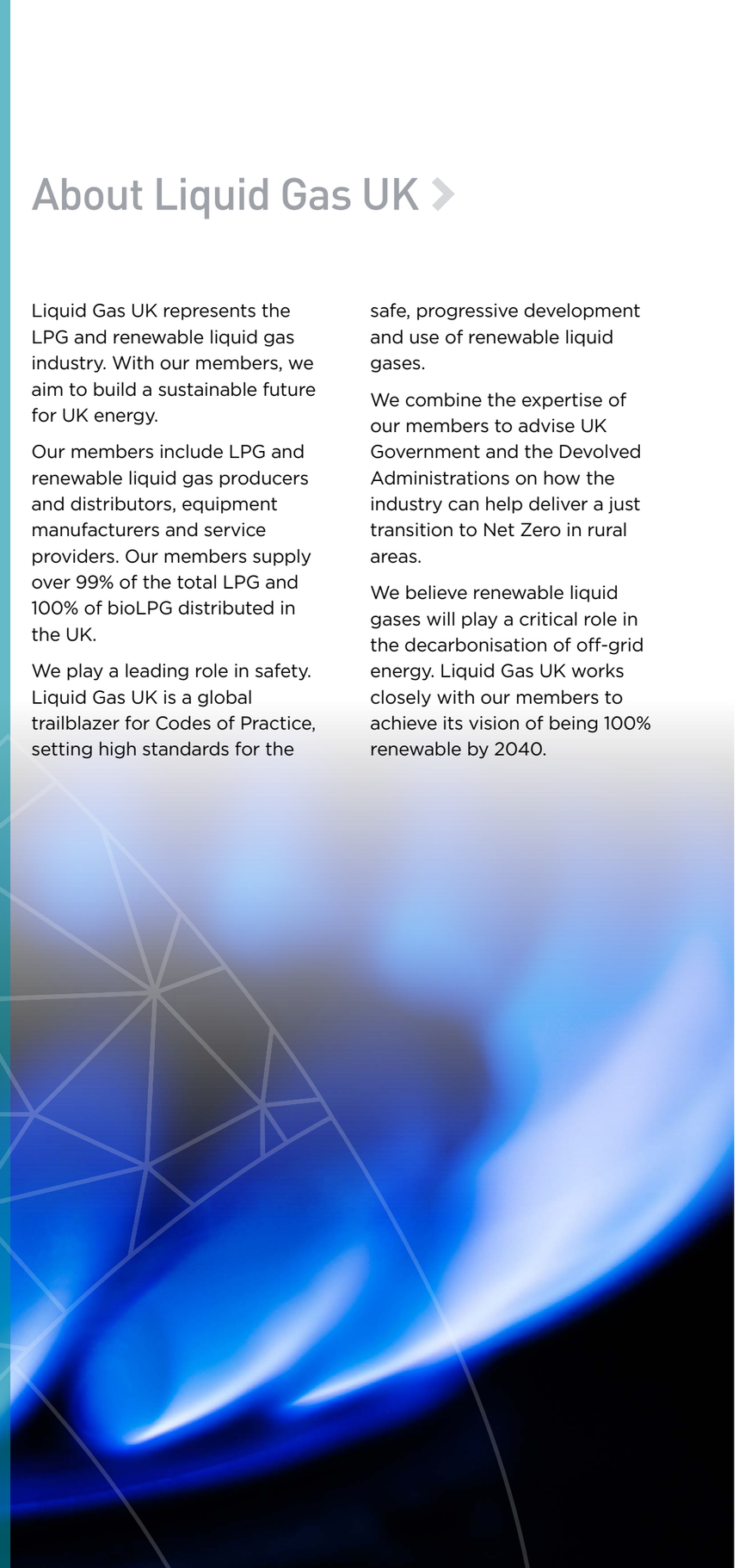
Pathway to Net Zero

Delivering our 2040 Vision

Liquid Gas UK

Contents



About Liquid Gas UK

Liquid Gas UK represents the LPG and renewable liquid gas industry. With our members, we aim to build a sustainable future for UK energy.

Our members include LPG and renewable liquid gas producers and distributors, equipment manufacturers and service providers. Our members supply over 99% of the total LPG and 100% of bioLPG distributed in the UK.

We play a leading role in safety. Liquid Gas UK is a global trailblazer for Codes of Practice, setting high standards for the safe, progressive development and use of renewable liquid gases.

We combine the expertise of our members to advise UK Government and the Devolved Administrations on how the industry can help deliver a just transition to Net Zero in rural areas.

We believe renewable liquid gases will play a critical role in the decarbonisation of off-grid energy. Liquid Gas UK works closely with our members to achieve its vision of being 100% renewable by 2040.

Foreword

As I reflect on our 2040 Vision, which we launched back in 2019, I am proud to see how far the industry has developed. The ambition to be 100% renewable by 2040 was a landmark step, which should not be underestimated. Since then, I am pleased to see that the industry has been making progress on this journey.

The LPG industry has the appetite for growth and the ability to deliver, today and in the future - with the industry building up its workforce, improving its infrastructure, making huge investments and expanding into new, as well as existing, markets.

Since we launched the vision, the industry has built upon world-renowned research to develop indigenous production of renewable fuels here in the UK. Companies have invested over £260 million to date in developing and bringing renewable liquid gas solutions to the market, including bioLPG and rDME.

I am also pleased to report that bioLPG is available on the market. It is already in use in homes, businesses and large industries like Coca-Cola. And with the first of its kind rDME plant recently announced in Teesside, it demonstrates that our 2040 Vision is becoming a reality.

This progress demonstrates that LPG's role as a transitional fuel is credible. LPG today can support high-carbon fossil fuel users to decarbonise and provide them with a seamless pathway to drop-in renewable liquid gases. The industry is supporting homes, businesses and governments to deliver Net Zero in rural, off-grid areas.

LPG and renewable liquid gases can play a critical role in a just transition to Net Zero. This updated pathway document showcases the progress to date, our timeframe for delivery and why there is a clear need for alternative solutions.

I look forward to working in partnership with industry, policymakers and rural representatives on this journey.

George Webb
Chief Executive, Liquid Gas UK

[1]UK Government (2021) Net Zero Strategy: Build Back Greener
[2]UK targets and indicators for SDG goal 7

Affordable and clean energy

In 2019, UK government set a legally binding target to reduce net greenhouse gas emissions to zero by 2050[1]. This is alongside an obligation to meet the UN Sustainable Development Goals on access to affordable, reliable, sustainable and modern energy for all. Investing in renewable liquid gas, improving energy infrastructure, and innovating to provide clean and more efficient energy will all help meet these commitments, as measured by an increase in the share of renewable energy and a reduction in carbon emissions[2].

LPG in the UK – reaching where other energies cannot

LPG is a critical energy in the UK, powering hundreds of thousands of homes, businesses and industries in rural areas off the gas grid. Whether it is for home heating, providing hot water and cooking for businesses or fuelling industrial processes – millions of individuals rely on LPG.

From England to Scotland, Wales to Northern Ireland, over 200,000 homes depend on LPG for heating and cooking. Likewise, hundreds of thousands of businesses and industries have chosen LPG as their energy of choice, from the thriving leisure & hospitality sector, dynamic and evolving agriculture, and retail as it recovers from a post-COVID world. LPG underpins the best of the UKs rural economy.

The market demand is growing, more and more rural consumers are seeing the benefit in switching from high-carbon kerosene and onto lower carbon, cleaner burning LPG – with 1 million tonnes of LPG being supplied into the UK market, the LPG industry is worth over £1.1bn to the UK economy. As the market grows, industry is investing for the future and collectively, over £350m worth investment will be made in the UK in the run up to May 2023.

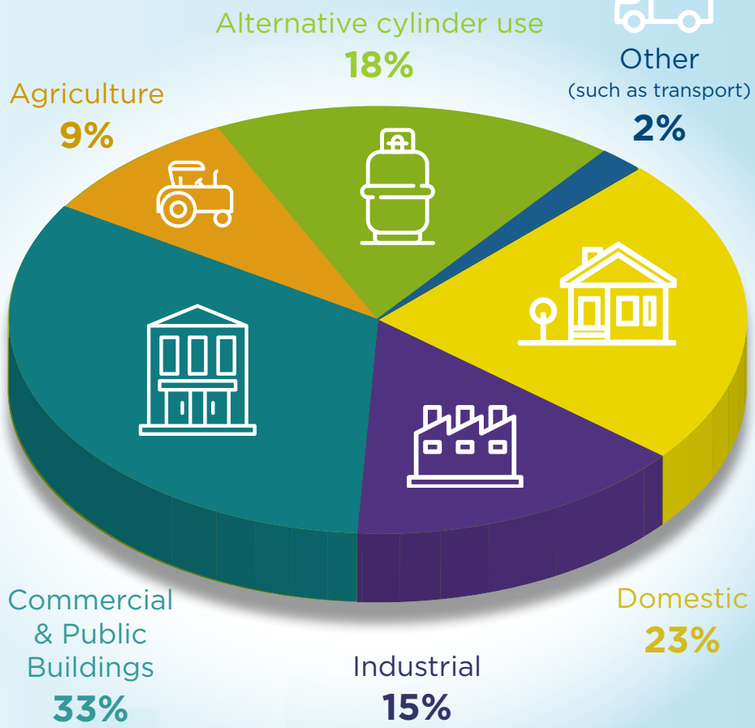
Significant investment is being made in future proofing the sector, by investing in renewables and R&D, but also strengthening resilience for today, through further investment into infrastructure, assets and strategic storage.

It is not investments however which make the LPG Industry, it is the people. The sector has built up its workforce to deliver this growth by 15% in the last two years, directly employing over 4,000 people - despite challenging labour market conditions and skills shortages.

As an established energy, with industry investing for today and tomorrow, LPG can play a key transitional role in decarbonising rural energy.

> "LPG is a critical part of the UK's energy security and sustainability and is playing a key leading role in the transition to Net Zero"

LPG Market Overview



Investment between May 2020 – May 2023

Renewable liquid gases
£260m

Stategic storage
£46.6m

Research and development
£20.4m

Cylinders, tanks and infrastructure
£165.6m

Fleet
£36.7m

Telemetry and smart meters
£7.7m

New technologies
£4.7m

What is LPG?

LPG is a critical part of the UK's energy mix. It is a popular choice for heating homes and businesses and fuelling industrial processes, especially in areas not connected to the gas grid. LPG provides a convenient and cost-effective energy solution. As the lowest carbon traditional fuel source available, it has a critical role in the transition to Net Zero.

Why use LPG?

Fit for the future

- **Low carbon:** LPG emits 33% less CO2 than coal and 12% less than oil[3].
- **Clean:** LPG is a clean-burning, smoke-free fuel. Emissions from LPG of NOx, SOx and particulate matter are very low[4].
- **Bio-ready:** As bioLPG is a 'drop-in' fuel, LPG infrastructure is ready for the future. This means no retrofit costs and low consumer and business disruption.

Convenient and secure

- **Versatile:** LPG has thousands of applications and can be used practically anywhere. This flexibility and portability allow LPG to reach places that other energies cannot.
- **Secure supply:** LPG is a global energy with multiple sources. Because it is easily and safely transportable, it offers a secure, widely available energy source for homes, businesses and applications off the gas grid.

Energy efficient and cost-effective

- **Low-up-front costs:** Installation of an LPG heating system for an off-grid property typically costs around £2,000
- **High efficiency:** Gases inherently offer high efficiency, supporting optimised performance in the newest boilers and hybrid technologies.
- **Supports economic growth:** LPG powers and supports UK agriculture, hospitality and leisure, and industry based off the gas grid.

[3]European Commission, No 601/2012 of June 2012 concerning the monitoring and reporting of greenhouse gas emissions. Available at: www.eur-lex.europa.eu
[4]WLPGA, Charter of Benefits (2017)

Liquefied Petroleum Gas

...or LPG for short – comes in two forms - propane (C_3H_8) and butane (C_4H_{10}). These colourless, odourless gases occur naturally and are converted to liquid form for day-to-day use. LPG can be safely stored in pressurised steel vessels, such as gas bottles or bulk LPG tanks. LPG is a highly efficient, low carbon fuel with a wide range of uses.

LPG

Renewable liquid gases – delivering Net Zero in rural areas

Renewable liquid gases will play a key role in the decarbonisation of heat, both domestically, commercially and industrially. As a 'drop in' alternative to traditional LPG, renewable liquid gases are efficient and sustainable, providing choice and flexibility for the end user. bioLPG and rDME are two renewable liquid gases that are propelling the UK industry to support the industry's transition to be 100% renewable by 2040.

bioLPG – a 'drop in solution' for all

In addition to the benefits of LPG, bioLPG offers:

A clean, renewable energy source

- **Renewable:** a 100% renewable, sustainable alternative to LPG, with even lower carbon emissions - up to 90% lower than LPG
- **Supports production of other biofuels:** one of the ways bioLPG is made during the process that produces biodiesel and sustainable aviation fuel, encouraging the wider production and use of renewable energy
- **Helps to build the circular economy:** helps to manage waste from other activities and processes, such as municipal waste

Proven technology

- **It works:** bioLPG is a tried and tested means of substantially reducing carbon emissions
- **Bio-ready:** as a 'drop-in' fuel, bioLPG uses existing LPG infrastructure and appliances. This means no retrofit costs, with low consumer and business disruption

A low-cost transition

- **Low-cost installation:** bioLPG heating systems offer an affordable choice for businesses and households

bioLPG

... also known as biopropane – is a renewable liquid gas, produced from feedstocks such as cooking and vegetable oil, animal fat, waste, sugar and starch. Although often a co-product of sustainable aviation fuel production, it is produced using a variety of technologies and thermal or chemical processes, both locally and imported.

bioLPG is identical in appearance and chemical structure to existing LPG, so it can be stored, transported and used in exactly the same way, using existing infrastructure.

Because bioLPG is derived from renewable or waste sources, it offers significant carbon reductions compared with existing fuels, including LPG. We expect bioLPG to play a critical role in the transition to Net Zero for rural off-grid homes and businesses.

Research by energy experts, NNFCC, determined a full, sustainable switch from LPG to bioLPG by 2040 is a feasible solution to supporting the government and its ambition to move towards a low carbon economy. And as a 'drop-in' replacement, bioLPG offers an easy and cost-effective switch to lower carbon emissions.

> "BioLPG has great potential in the UK across multiple sectors, and there are an assortment of key strengths and investment opportunities to grow the UK market and reduce dependency on imports."

NNFCC, Biopropane Opportunity Appraisal & Deployment Pathway, 2019

Future bioLPG feedstocks

A partner to decarbonisation - rDME

Looking ahead to delivering their 2040 Vision, the UK liquid gas industry is scaling-up innovative new approaches to help meet its Net Zero commitments. One such example, is the introduction of rDME, complimenting the headway made on bioLPG.

What is rDME?

Dimethyl ether (C_2H_6O) – known as DME, is already used extensively across the globe, mainly in industrial settings. It is a colourless gas that is chemically similar to butane and propane and like LPG, it is easy to handle and store in liquid form.

rDME however is produced from renewable feedstocks, such as methane from agricultural and municipal waste, renewable power and CO2, meaning that carbon emissions are substantially reduced – up to 85%.

The first commercial plant producing rDME from waste in the UK is being built at Teesside, producing 50,000 tonnes of rDME per year from 2024.

Industry is looking to use rDME blended with LPG or bioLPG for homes and businesses, with no modification needed for LPG infrastructure, as well as using it as a solution in its own right.

Propelling emissions reduction further – the benefits of rDME

Significant carbon savings:

- As rDME is derived from waste feedstocks, using rDME can reduce carbon emissions by up to 85% compared to diesel and heating oil [6]

Solving two problems in one:

- Utilising waste to produce rDME, reducing incineration and export, creating a fuel for hard-to-treat heating

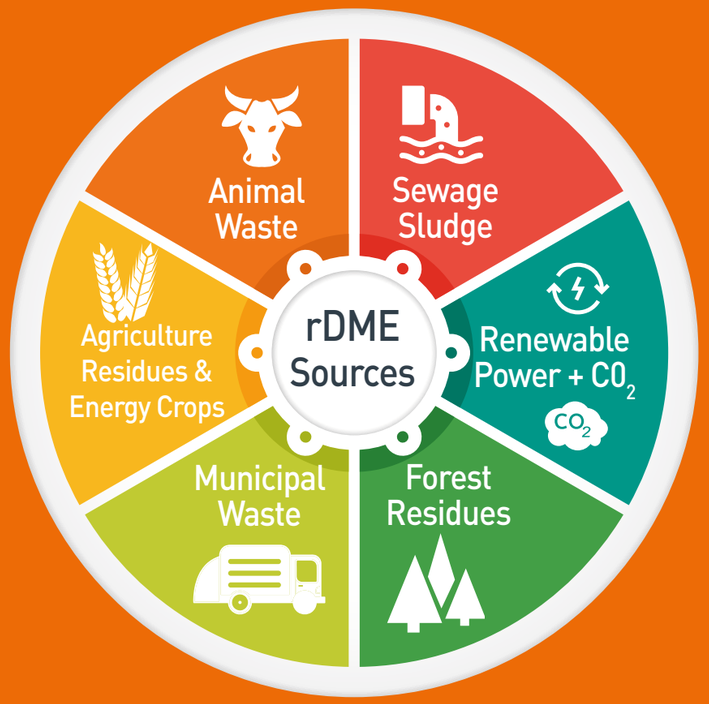
A ‘drop-in’ solution

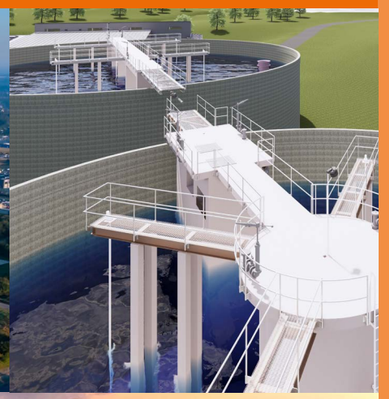
- rDME will be blended with LPG or bioLPG, to be used within existing infrastructure in homes and businesses, making it an affordable, flexible energy solution

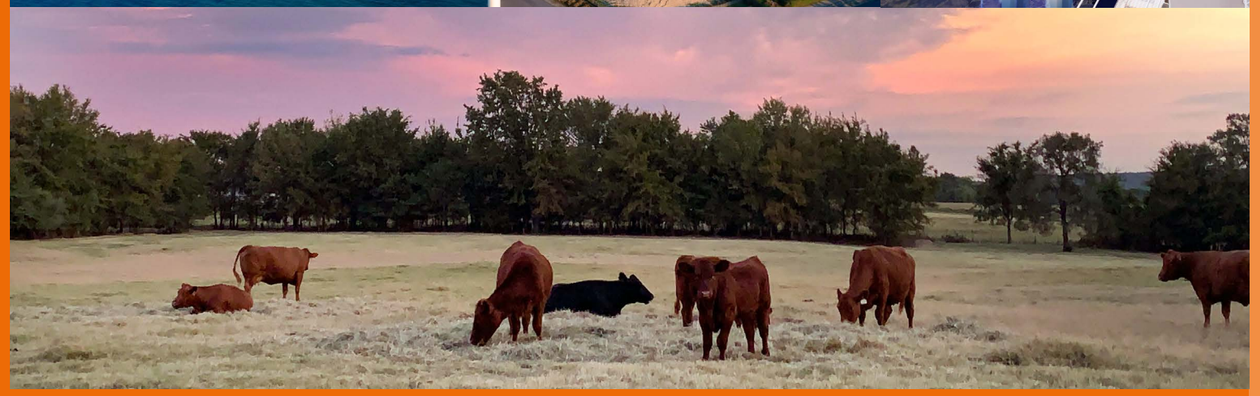
An opportunity for industry:

- Industries relying on oil will be able to switch over to 100% rDME, slashing emissions and improving air quality

rDME can help to transition the LPG industry to a more sustainable future quickly







“We believe rDME is going to form a significant part of the UK’s decarbonisation in the coming years.

Current Government strategy suggests electrification is the answer to off-grid home heating; yet these homes typically have a much higher heat load, and electrification is not a suitable option.

rDME provides a solution. It’s a transportable fuel, which can be produced without significant investment from Government, and isn’t reliant on feedstocks that are required for other activities.

rDME is something we can deliver very quickly. It’s here, it’s now and it’s already cost competitive.”

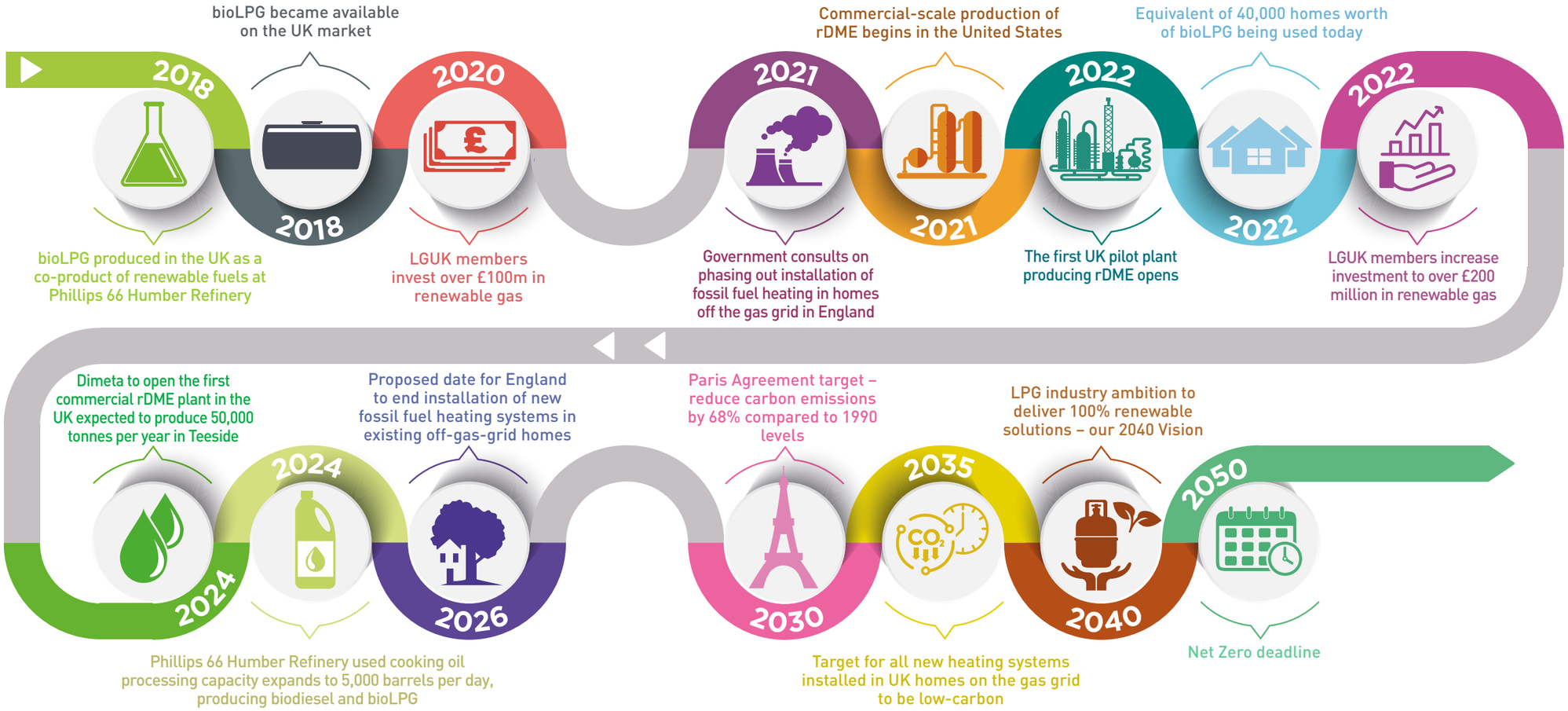
Stephen Hallett,
Operations Director, Dimeta

Dimeta is a joint venture between SHV Energy and UGI International, who are two of the world’s largest LPG transporters.

[6] International DME Association: About DME

The roadmap to 2040: delivering the transition to renewable liquid gases

Liquid gas has a critical role in the transition to renewable energy and in meeting the UK's international commitments on climate change. The LPG industry aims to transition fully to renewable liquid gases by 2040 – ensuring that rural, off-grid homes and business across the UK can all play their part in reducing carbon emissions. With investment in production capacity underway, the industry is already on the pathway to Net Zero.



NESTE: bioLPG is now a mainstream solution (2018)

NESTE started the production of 40,000 tonnes of bioLPG per year for the European market from waste residues and vegetable oils, demonstrating that bioLPG is now operating at a large scale. "For us, it also represents an important step in implementing our growth strategy for renewable products", said Kaisa Hietala, Executive Vice President of Renewable Products at Neste[6].

Phillips 66: converting cooking oil into low carbon fuel

As the first refinery in the UK to convert waste oil into road fuel, the Phillips 66 Humber refinery has also recently introduced a new processing unit to convert used cooking oil (UCO) into low carbon fuel. Standing at 50 feet tall, the UCO module will increase Humber's renewable diesel capacity to 3,000 barrels per day, tripling original capability. Humber already ranks among the most complex and sophisticated refineries in Europe, but plans are underway to further expand capacity to 5,000 barrels per day by 2024.

Dimeta: UK industrial scale rDME production by 2024

In May 2022, Dimeta announced the location of the UK's first industrial scale rDME plant in Teesside. Anticipated to produce 50,000 tonnes/year of rDME, the plant will support more than a million off-grid households and businesses in the UK to lower their greenhouse gas emissions, and benefit from a domestically produced, low carbon heat fuel source. Construction is expected to complete by mid-2024.

Mr Ben Houchen, Tees Valley Mayor (centre right) shaking hands with Søren Jacobsen, Dimeta CEO (centre left) at the Teesworks site with Matt Johnson, Teesworks, Development Director (far right) and other team members.

[6]Neste, 'Neste delivers first batch of 100% renewable propane to European market', 19th March 2018

Renewable liquid gases supporting rural homes to reach Net Zero ›

Over two million rural homes in the UK are not connected to mains gas – they are 'off-grid'. The journey for these homes to Net Zero, needs to be a just transition – not the one size fits all approach currently proposed.

LPG and renewable liquid gases offer a long-term solution to the decarbonisation of these rural homes, as part of a mixed technology approach to meeting Net Zero.

Net Zero: the rural homes challenge

People living in rural areas are heavily dependent upon traditional fuels such as heating oil and coal – over 1.1m UK homes use oil for heating, with 200,000 homes using solid fuel.

These homes are typically hard to heat and difficult to treat. Retrofitting rural homes to improve energy efficiency is often costly or impractical, particularly for older, traditional properties or those in remote areas.

Like many, households in rural areas are being impacted by the cost of living crisis and 13.5% are currently in fuel poverty. Alongside decarbonisation, it is vital that systems are affordable and do not leave rural people out of pocket.

Government proposals for rural homes: one size does not fit all

Current government proposals contained in the Heat and Buildings Strategy are to end the installation of new fossil fuel heating systems in existing off-gas-grid homes from 2026 onwards, where households will be expected to install a heat pump – a proposal most homeowners are unaware of.

While heat pumps have a key role to play in reaching Net Zero, they are not a silver bullet, especially in rural areas.

Unless undergoing a major refurbishment, many off-grid properties do not lend themselves to being retrofitted affordably for electrified heating solutions to work efficiently.

As well as practically doing this, bigger questions have been left unanswered around access to skills and the ability of the electricity network to deliver on electrification of heat in rural areas, and increased demand from electric vehicles.

> "The electricity supply network in many rural areas has less capacity and is more fragile to disruptions such as tree fall. Until the rural distribution network is comprehensively upgraded it will not be possible to rely on heat-pump or electrical heating."
>
> Graham Biggs, Chief Executive, Rural Services Network

Affordability needs to be at the forefront

A 'one size fits all approach' does not deliver a just transition for rural areas.

Research by Liquid Gas UK estimates that for traditional off-grid properties, the cost of heat pump installation and associated energy efficiency measures is between £18,000 - £36,000 – a figure nearly all homeowners say that they are unable to pay[8].

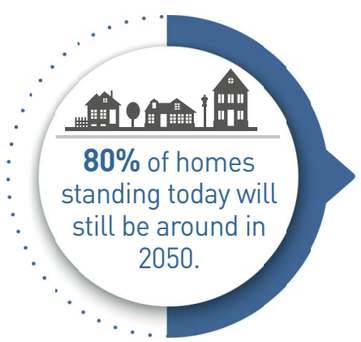
For homes that will not be affordably or practically suited to electrification, choice is required. This is where renewable liquid gases come in.

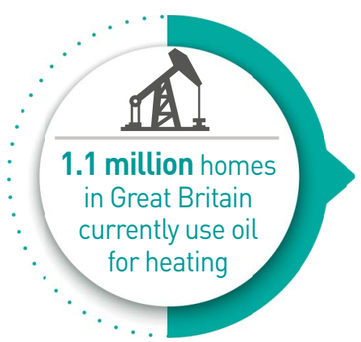
95% of rural homeowners cannot afford to install a heat pump[7]

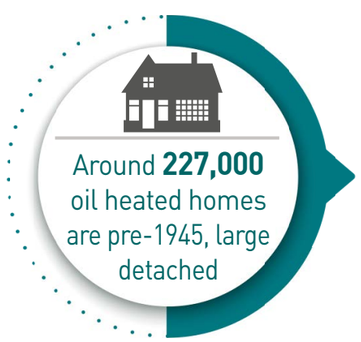
83% of people don'tknow about the Government's plans to decarbonise rural off-grid homes

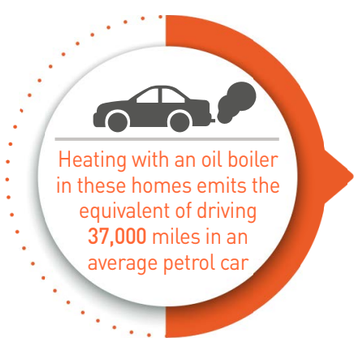
79% of rural homeowners are concerned about the upfront cost of installing a new heat system

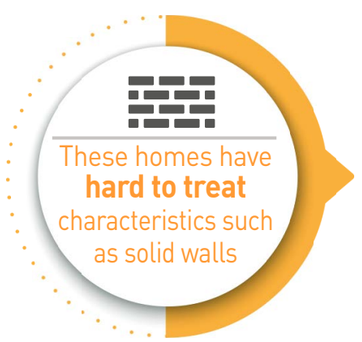
> "I'm very worried about the impact this could have. The cost and upheaval of putting in a heat pump would be enormous for me"
>
> Felicity, 74 – North Herefordshire

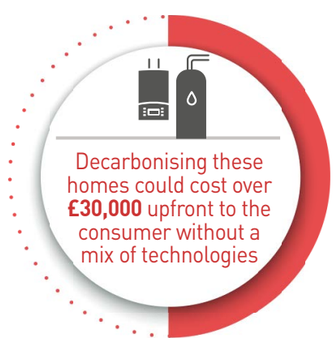












[7]Liquid Gas UK/Omnium Research (2021)
[8]Liquid Gas UK (2020) The Role Of LPG And BioLPG In Large Rural Off Grid Homes

LPG and renewable liquid gases – affordable low-carbon energy for rural homes

£7bn

savings to energy users between 2019-2050 if the UK adopts a mixed approach to decarbonising heating that includes liquid gas

LPG and renewable liquid gas offer a reliable, affordable means to reduce carbon emissions for off-grid homes; providing rural consumers with choice and helping to tackle the realities of powering rural Britain.

Heating rural homes – one goal, different solutions

Analysis from Liquid Gas UK suggests adopting a range of technologies, including LPG/ bioLPG, biomass, electric heat pumps and hybrid heat pumps, will be needed to meet the UK's Net Zero commitment. Our analysis also points to significant savings to consumers: £7bn by 2050[9]. For older, larger off-grid homes, this mixed approach will generate typical cost savings of 37% when compared with current electrification only proposals.

case study

Switching to LPG: better for the environment, perfect for us

When Janice and Philip Whitelock moved to their countryside bungalow in 2020, their dream retirement home had everything they were looking for - with one exception – an oil-powered boiler. "There's a whole host of reasons why we didn't want oil in this property," says Janice. "The expense, the inconvenience, the lack of security, protecting our wildlife these all played a big part in our decision."

LPG: providing security and certainty in changing times

For Janice and Philip, the switch to LPG offered the certainty and security of a reliable energy supply. Reliability is critical in an area where power is supplied via overhead cables. "All it needs is for one tree to fall, and we'd be out of power. That's not reliable enough for us and we don't want to live in fear of being cut off." An electric heat pump was also a source of uncertainty for the Whitelocks – and costs they hadn't planned for. "We've switched from oil to LPG once before. It's a much more secure and economical solution for our home," says Philip. "Our bills are lower, and our tank is far more robust. We've also cut our carbon, and it makes us happy to know we're doing our bit to help the environment."

[9]Source: Liquid Gas UK - A Practical Approach: Analysis of Off-Grid Heat Decarbonisation Pathways

Baxi: Hybrid Heat Pumps a key opportunity

For Baxi, sustainability is at the core of Future Heat - its strategy for next-generation heating and hot water products. These include hybrid heating systems where bioLPG sits alongside heat pumps. "We want to see a cleaner, greener future for off-grid homes and businesses," says Jeff House, Head of External Affairs at Baxi. And for a company that has been in business since 1866, it is no surprise that this reflects what their customers want too. "People want to go green. But they also want a choice in how to get there. And that has to be an economical choice." He adds, "For the off-grid community, we see liquid gas as an important step that will help homes and businesses contribute to meeting Net Zero."

BAXI

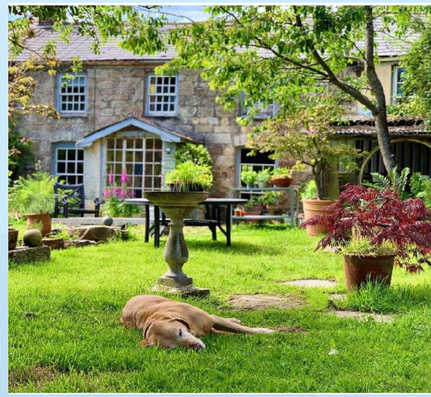
case study

Preserving the past, building the future

The traditional buildings that form an essential part of Britain's architectural heritage embody the challenge of moving to Net Zero. The characteristics that make them much loved and valued – stone walls, high ceilings and large windows – make them hard to heat and difficult to insulate. When Antonia Bisset bought her dream Georgian home in a remote hamlet in Cornwall, the challenge was to preserve the features that made this old house so attractive while building a home fit for the future.

Renovating a home with the lowest possible energy rating presented a challenging start. "These houses were never meant to be insulated to that level," says Antonia. "They have solid stone walls, which need to breathe, otherwise you end up with condensation issues. Without high levels of insulation, it meant electricity was too expensive and air source heat pumps would need just as much energy to run as they would generate."

After researching the alternatives, Antonia was clear about which option reflected her love of tradition and concern for the future. "I knew that LPG had a lower carbon footprint compared to other traditional off-grid fuels. And when bioLPG is more widely available, it means I'll have all the right equipment to move over to green gas and become carbon neutral. It's great to know I'm already perfectly set up for an environmentally-friendly future."



Bulk LPG tanks can be fitted underground

Enabling rural businesses to decarbonise

Almost one-third (31%) of energy usage in the UK is from the industrial, commercial and agricultural sectors. With traditional fuels generating approximately 55% of this energy, decarbonisation of non-domestic energy is critical to achieving Net Zero.

From rural hotels & holiday parks and pubs, to shops and small businesses run out of the garage, even health services and libraries – the hundreds of thousands of businesses off the gas grid need affordable energy solutions compatible with Net Zero. A 'one size fits all approach' will not work for them.

LPG and renewable liquid gas use in commercial sectors

Thousands of rural off-grid businesses are reliant on LPG as a fundamental part of their business operations, as an essential energy source for heating, hot water and cooking, it's an essential energy source, which has no suitable stand-alone alternative.

It is a popular choice, research from the Department for Business, Energy & Industrial Strategy found that 86% of LPG consumers are very satisfied or fairly satisfied with their LPG system, versus 76% for heat pumps and 67% for oil[10].

Liquid gas is used across all types of rural business, with a large majority being in the hospitality and leisure sector, including pubs, hotels, holiday parks and campsites, as well as retail, warehousing and in agriculture.

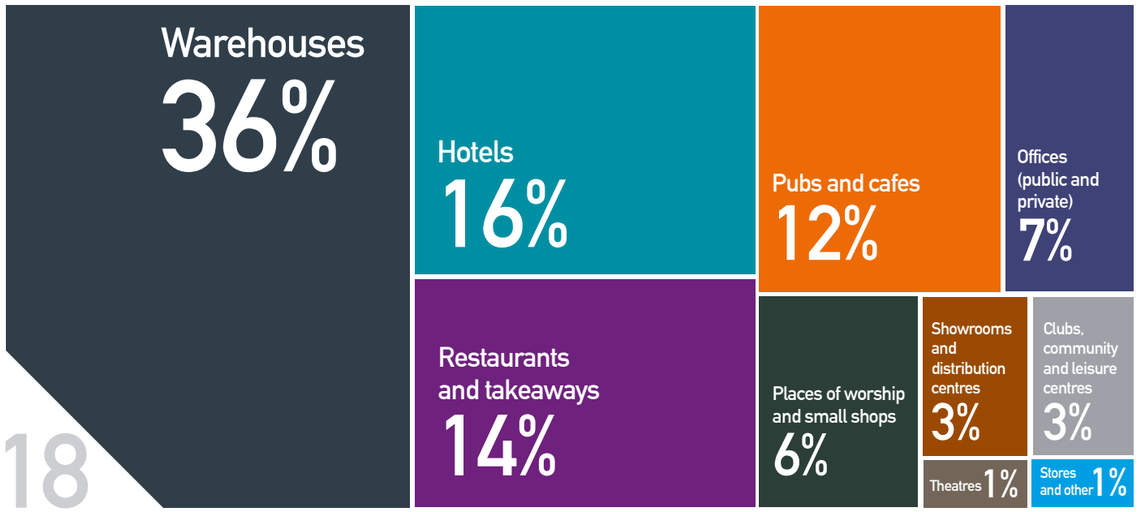
Demand can also be found where portable energy is needed, such as in the rapidly growing street food sector, or for other outdoor restaurant settings which require barbeques and patio heaters. The portability of LPG and renewable liquid gas delivers where other energies cannot.

Supporting off-grid businesses with the low carbon transition

Meeting the complex needs of off-grid users, in particular, will require a range of options for 100,000s of rural businesses such as pubs, hotels, and holiday homes. Almost half of all off-grid business premises were built before the end of the first World War – often retail businesses in heritage buildings whose characteristics make them attractive but hard to retrofit. For these businesses, heat pumps alone are a costly and challenging proposition.

For off-grid businesses in rural areas, the shift to lower-carbon energy needs to ensure that those businesses can remain competitive, especially in a period of post-COVID recovery. Commercial heat pumps represent a significant outlay for many businesses, particularly those operating from heritage buildings that require substantial refurbishment to make heat pumps viable. Business continuity is also an essential factor for off-grid companies – with a concern that relying solely on electricity for all energy requirements is a substantial risk in rural areas.

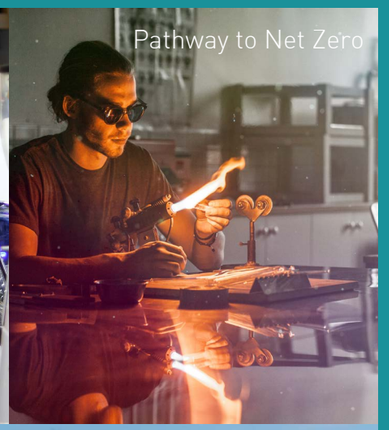
Future commercial demand for bioLPG



[10]BEIS, Social research with non-domestic consumers in buildings in off gas grid areas of England and Wales (May 2021)

48%

of non-domestic retail business premises are over 70 years old – and hard to treat



case study

LPG – dependable off-grid energy

Kilworth House is a Victorian country house hotel in the heart of rural Leicestershire, serving guests throughout the year. With a strong environmental policy, the off-grid hotel aims to run as efficiently as possible. For almost 20 years, the hotel has relied on LPG in its two commercial kitchens and to light its gas fires, which cater for up to 500 guests. Kilworth House is also home to 'The Staging Post', a log cabin where LPG powers cooking, heating and hot water for up to 50 people.

"We love our rural location and it's a big part of the charm of Kilworth House hotel", says Elizabeth Payne, manager at Kilworth House. "It does however mean we're not connected to the mains gas grid. Thanks to LPG, we can have a dependable off-grid gas supply for our open fires and real controllable cooking flames for our twelve busy chefs. LPG never lets us down."

"Thanks to LPG, we can have a dependable off-grid gas supply...LPG never lets us down"

"LPG catering equipment tends to be more responsive and affordable than the alternatives. Put simply, you get a better result cooking on gas."

Street food – a rapidly growing market

The rapidly growing street food scene is in evidence across the UK. Driven by high consumer demand and low start-up costs, an estimated 8,000 street food and mobile vans are in operation – but with the widespread use of diesel generators, there is a need to reduce emissions by switching to lower-carbon alternatives. And with customers seeking to make greener choices, clean-burning fuels are a key selling point.

For these small businesses, LPG and bioLPG offer a low-cost alternative that meets their business needs for energy that is portable and reliable. We estimate that the typical business could reduce emissions by 11 tonnes of CO2 annually by switching to bioLPG while saving £1,500 annually in fuel costs[12].

Cooking with gas – safer catering, better results

For the Nationwide Caterers Association – the membership body for street food traders and mobile caterers – LPG is an obvious recommendation. "It makes commercial sense," says Mark Laurie, Stakeholder Director at the Association. "LPG is more cost-effective than diesel, but even more important is safety. In some situations, diesel is just asking for trouble. Most festivals have now banned it." And with the electricity supply at festivals often unable to cope with caterers' needs, LPG offers a commercial advantage. As Mark concludes, "You get a better result cooking on gas."

[11]FSB, Accelerating Progress (November 2021)

[12]Source: Liquid Gas UK (2021) Opportunities to Decarbonise the Non-Domestic Off-Grid Sector with LPG and bioLPG

"If the UK is to reach its net zero targets, then we must establish a net zero economy. However, to create a net zero economy across the UK, small businesses once again will have to go further and do more. Yet they will only be able to do this if they have adequate support from governments across the UK, and their local authorities. Too often, mixed and poorly-targeted messaging in an already confusing landscape has undermined both the environmental and economic benefits of some of these changes to small businesses. A 'one size fits all' approach to messaging, or policy, will no longer suffice."

The Federation of Small Businesses (FSB)[11]

Supporting industry in the transition to Net Zero

Industrial buildings and processes are often complex and expensive to electrify – decarbonisation options are limited. With a wide span of off-grid industrial uses across manufacturing and transport and distribution, covering sectors from agriculture to food and drink processing, it is vital for industries such as manufacturing that the pathway to Net Zero considers this wide range of use cases.

Immediate savings by switching to LPG

Historically, industry has been difficult to electrify due to the long lifetime of industrial facilities and the scale of costs involved. In addition, the high levels of integration in industrial processes has complicated this further.

Switching to LPG is much more feasible for these sectors and immediately reduces carbon emissions, improves efficiencies and reducing costs. As LPG can deliver on heat, hot water and process heat. Since the removal of the red diesel subsidy, a switch to LPG becomes more competitive in non-road mobile machinery and the mobile generator market.

Transition to renewable liquid gas

By switching onto LPG, a seamless transition to renewable liquid gas takes place, as it is dropped into the infrastructure – whether heating, industrial processing or forklift trucks. Industries looking to slash emissions straight away, may consider solutions such as 100% rDME which saves up to 85% carbon emissions when compared to diesel and kerosene.

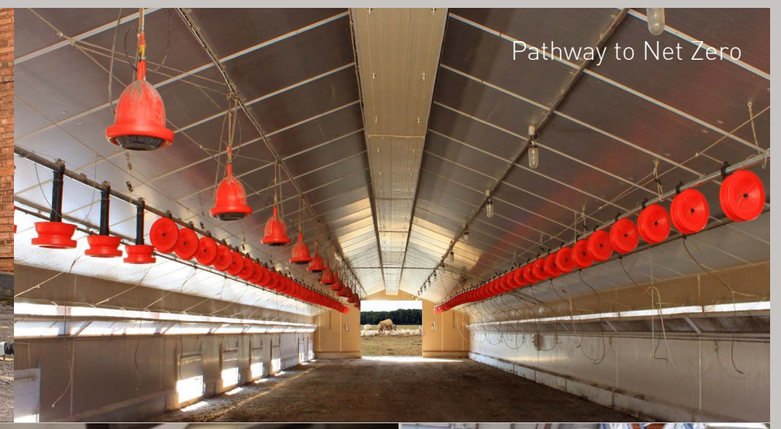
[13]Source: Atlantic Consulting (2018). BioLPG: A survey of markets, feedstocks, process technologies, projects and environmental impact.

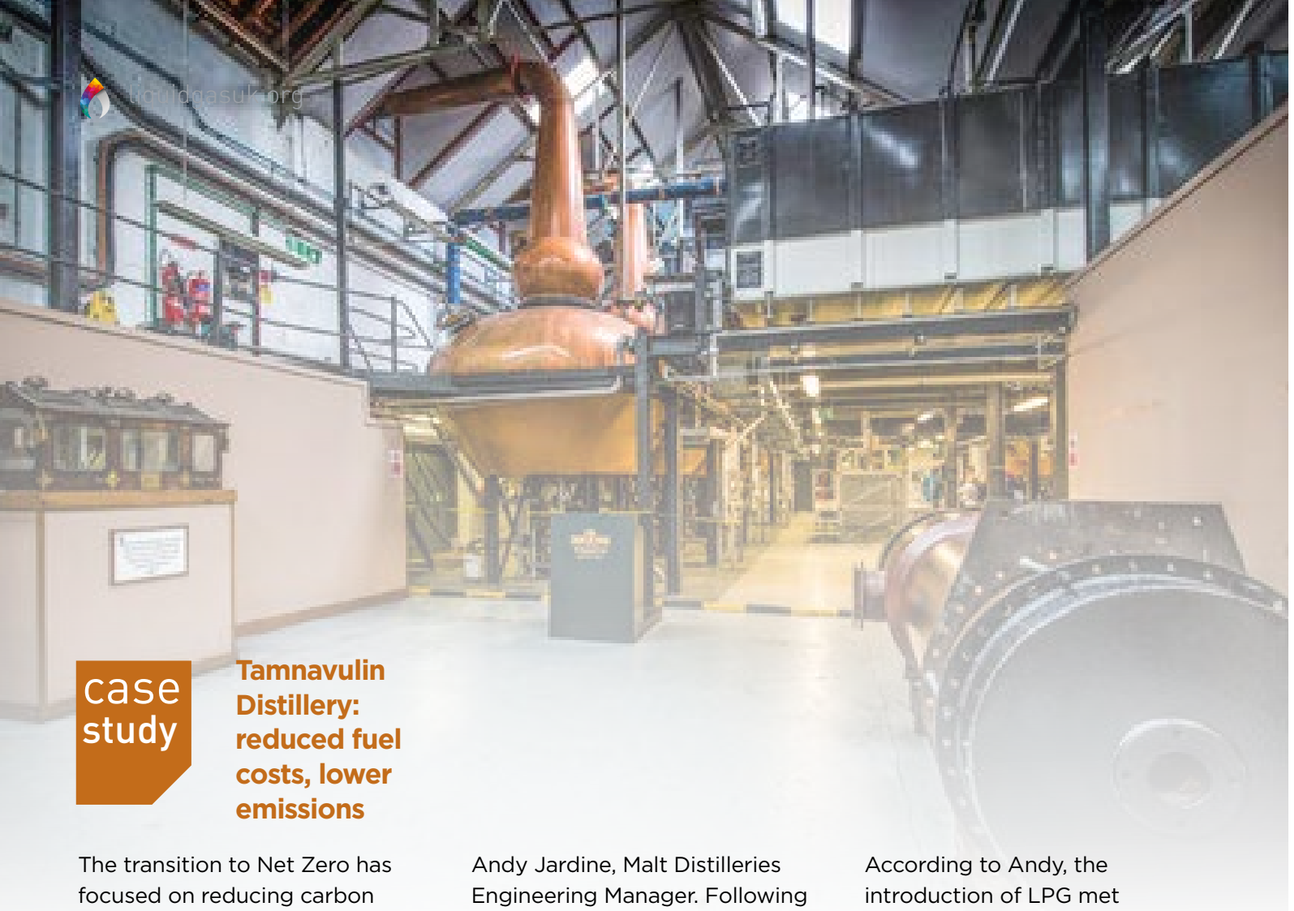
What are the industrial uses of LPG?

The industrial uses of LPG are wide-ranging. For sectors such as food and drink manufacturing, the ability of LPG to generate high temperatures is used in processes such as baking and distilling.

The portability of LPG is key to its use as a power source for forklift trucks and other vehicles for moving goods – 38% of forklift trucks are LPG powered[13]. In the agricultural sector, moveable energy is required for tasks such as animal rearing.

This versatility has also led to the widespread use of LPG to maintain the UK's national infrastructure, whether as a heat source for cutting, for soldering tools used in emergency repairs, or as a power source for water pumps and mobile generators.





case study

Tamnavulin Distillery: reduced fuel costs, lower emissions

The transition to Net Zero has focused on reducing carbon emissions, but concerns about poor air quality are driving efforts to reduce the use of the most polluting fossil fuels. The Medium Combustion Plant Directive seeks to limit NOx, SOx and particulate matter emissions – or sooty deposits. For Whyte & Mackay, owners of Tamnavulin Distillery, this new regulation was an opportunity to reassess their energy costs as well as their emissions.

For Tamnavulin Distillery, the switch from oil to LPG was business-critical. Continued use of oil as their primary fuel source would have meant that the plant failed to comply with new standards. “As a business it is essential for us to go beyond the required environmental standards,” says Andy Jardine, Malt Distilleries Engineering Manager. Following the installation of LPG at Tamnavulin, NOx emissions are three times lower, SOx emissions are 767 times lower, and particulate matter emissions are 269 times lower than a similar plant still using oil.

According to Andy, the introduction of LPG met another important business need. “Not only have we achieved significant emissions improvements, but we have reduced our fuel bill as well.”

case study

bioLPG in practice: Forklift trucks

For Sean Roberts, Group Commercial Manager at Carrylift Group, the shift to renewable energy across its forklift truck rental fleets was driven by one thing: customer demand. Changes in customer sentiment and demand outpaced regulatory action, making greener options a must – and bioLPG was a solution, reducing carbon emissions by up to 32%.

And for Sean, the shift from LPG to bioLPG for its 1,000 short-term rental trucks has been quick and easy, with no changes to existing equipment, trucks or supply infrastructure. “The transition to bioLPG has been incredibly easy for us as a business,” says Sean.

“Put simply, as soon as we’d received our first supply of BioLPG, our fleet was ready to go straight away.” Sean adds, “It has also seen our sales team start to have conversations with our customers on how they can benefit from using BioLPG within their own businesses.”

> “bioLPG was a solution, reducing carbon emissions by up to 32%...
>
> ...the transition to bioLPG has been incredibly easy for us as a business”
>
> Sean Roberts,
> Group Commercial Manager
> at Carrylift Group

Delivering the vision: our commitments

Renewable liquid gas is here – the industry is delivering decarbonisation now

In its strategy to deliver Net Zero, UK Government has committed to empowering businesses and the public to make green choices that are easy and affordable[14]. Government aims to deliver this commitment by working with business and industry around effective regulation, reducing costs and improving products and services.

Liquid Gas UK members want to work with government to meet this commitment and help deliver the transition to Net Zero. Like Government, we want to increase the availability of green choices.

Meeting Net Zero: our commitments as the industry

1. We are scaling up investment in renewable liquid gases by a further £160m
2. We will establish commercial production of renewable liquid gases in the UK, bringing jobs and prosperity, and increased energy security
3. We will innovate and test new solutions to provide the widest choice for homes and businesses

With the right policy framework, we can do more to help achieve Net Zero

Renewable liquid gases are essential components of the energy mix. A one-size-fits-all approach will not work for homeowners and businesses – so we need policy to enable and encourage the broadest range of options to make it easy for people to decarbonise.

We need government to:

1. Fully integrate bioLPG and rDME solutions into future government policy – and recognise that these are viable, scalable options for decarbonising off-grid homes and businesses not suitable for electrification.
2. Provide recognition and fiscal support to drive further investment, and growth.
3. Ensure we have the right regulatory framework to support the development of a domestic supply chain for renewable liquid gases, supporting energy independence, stability and sustainability.

[14]HM Government (2021) Net Zero Strategy: Build Back Greener p273

> “Global action to mitigate climate change is essential to long-term UK prosperity...As the world decarbonises, UK action can generate benefits to businesses and households across the country.”

HM Treasury, Net Zero Review, October 2021

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