Liquid Gas Europe

BioLPG in Action

Accelerating Europe's Energy Transition in rural communities.

A future-proof solution for Europe's Energy Transition

The 'Building Energy Everywhere' Showcase demonstrates a scalable and technology-neutral solution that directly addresses the EU's climate neutrality agenda, specifically in rural areas.

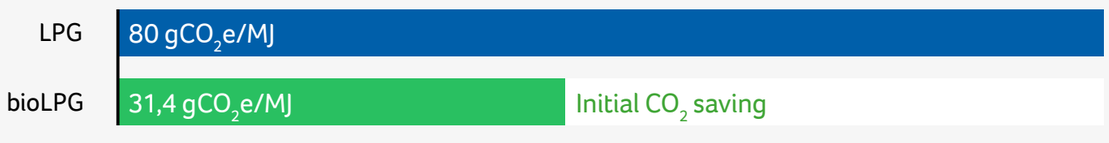
What sets this project apart is its holistic approach. Rather than simply replacing LPG with bioLPG, it integrates the switch with broader goals of enhancing energy efficiency and improving indoor environmental quality.

Guided by the Energy Performance of Buildings Directive (EPBD), the project includes comprehensive monitoring through smart metering and indoor environmental quality monitoring and also makes use of the Energy Performance Certificate (EPC) process.

TO MEET EUROPE'S AMBITIOUS CLIMATE GOALS FOR 2030, 2040, AND CLIMATE NEUTRALITY BY 2050, WE CALL ON EU POLICYMAKERS TO:

KEY ACHIEVEMENTS:

- CO2 equivalent emissions were reduced from **80 gCO_2e/MJ** (traditional LPG) to **31 gCO_2e/MJ** (from the substitution of LPG with bioLPG).
- The bioLPG batch used in the showcase delivered **~61%** lower GHG emissions than conventional LPG. With other certified feedstocks and pathways, **more than 80%** savings are feasible.
- Combines renewable fuel substitution with advanced monitoring and certification.

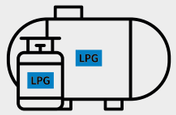


Why bioLPG? Aligning with EU Policy Objectives

BioLPG directly supports EU policy targets by significantly reducing emissions in off-grid and rural areas, fostering energy inclusivity, and accelerating renewable energy penetration without expensive infrastructure upgrades. It addresses immediate and longer-term EU climate goals, delivering tangible benefits today, consistent with the Renewable Energy Directive (RED II and III).

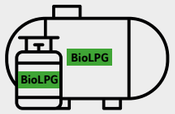
ADVANTAGES OF BIOLPG:

- **Potentially over 80% CO2 emissions reduction** compared to traditional LPG.
- **Seamless integration** into existing LPG infrastructure.
- **No need for equipment replacement**—appliances, tanks, and piping remain unchanged.



LPG

A versatile, liquid gas for heating, from an established European Industry



BioLPG

Greener alternative fuel derived from organic sources. Utilises existing infrastructure and is a by-product of SAF & HVO

Why BioLPG?

Meets RED GHG savings criteria and enables rapid defossilisation without immediate renovation

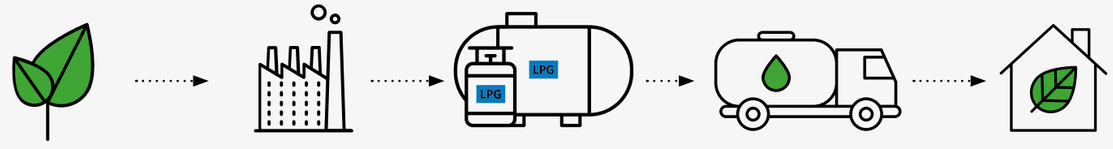
A LOWER-CARBON, HIGH-IMPACT SOLUTION

BioLPG is a chemically identical, drop-in alternative to conventional LPG, but with a far lower carbon footprint. Produced from renewable feedstocks, such as plant-based oils, animal waste, and organic residues, bioLPG is a versatile and highly scalable option for residential, commercial and industrial use.

Supports EU energy and climate objectives, particularly for rural and off-grid regions.

The sustainability of bioLPG production from feedstocks to end user is verified through third-party certification schemes, which ensure traceability of renewable feedstocks, calculation of carbon footprint, and compliance with EU sustainability requirements.

BIOLPG PRODUCTION – from biogenic sources to a sustainable energy source



The Case Study: Transforming a Belgian building

At the heart of this showcase is a carefully selected non-residential building in Belgium. The facility, a care home in Rotselaar, which originally relied on conventional LPG, has undergone a step-by-step transformation. This includes a full switch to bioLPG, implementation of smart metering technology, and monitoring of indoor environmental quality—all without altering the existing heating or fuel storage infrastructure. The Belgian care home example demonstrates bioLPG's immediate and replicable potential. Without costly retrofits, this practical model can swiftly scale across similar European facilities, significantly accelerating decarbonisation in alignment with EU goals.

ENERGY CERTIFICATION, SMART AUDITING & IEQ OPTIMISATION

A key innovation in this project lies in its integrated approach to performance monitoring. Beyond merely switching fuels, the project embraces tools that align with the EPBD to ensure continuous improvement in energy efficiency and indoor environmental conditions.

MEASURES IMPLEMENTED:

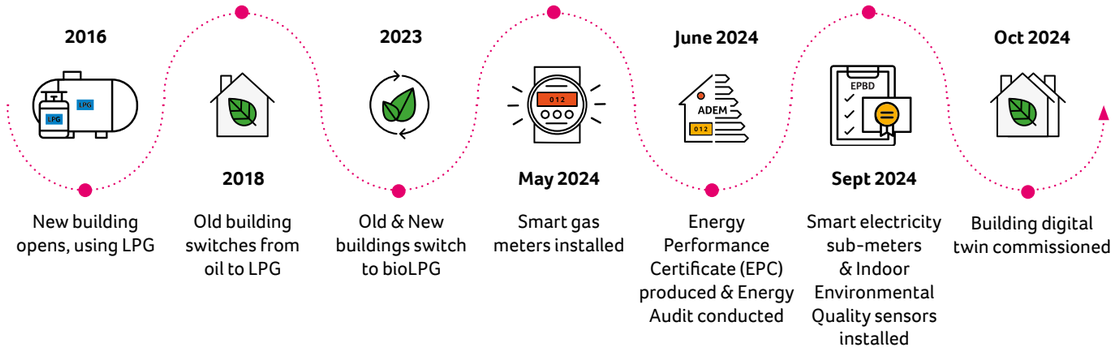
- **Energy Performance Certificate (EPC):** Conducted by an independent assessor to establish a baseline and track progress.
- **Energy Audit:** Identified areas for efficiency gains and optimisation.
- **Smart Gas Meters:** these replace outdated volume-based estimations.
- **Smart Electricity Sub-Meters:** Installed in each building unit for granular energy insights.
- **IEQ Sensors:** Seven strategically placed devices monitor temperature, humidity, and other comfort factors.

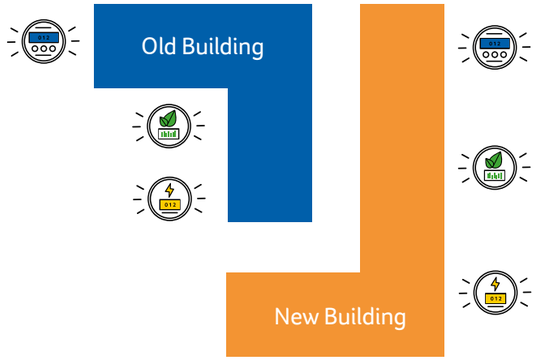
2 x Smart Gas Meters with remote monitoring

7 x Smart Indoor Environmental Quality Sensors

2 x Smart Electricity Meters

INITIAL PROJECT TIMELINE





KEY OUTCOMES AND INSIGHTS:

- Enhanced **transparency and control** over energy usage.
- Supports **data-driven decision-making** for efficiency upgrades.
- **Advocacy efforts** are underway to gain formal renewable status for bioLPG in the Flemish region.

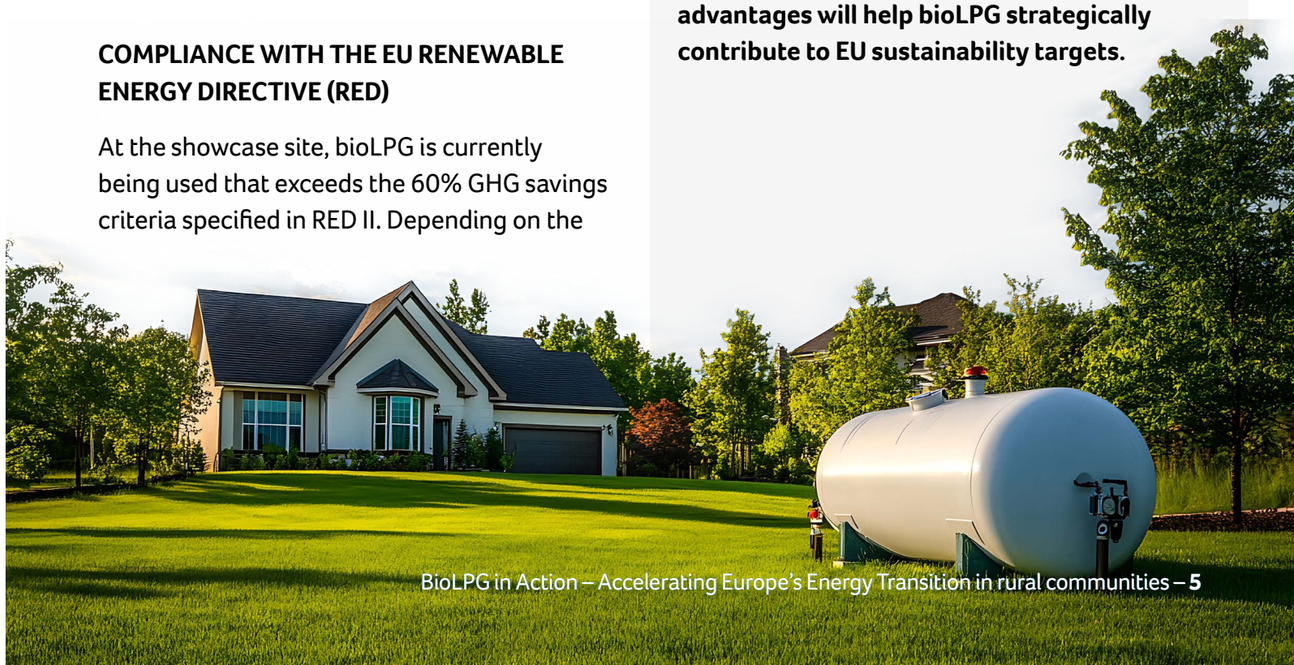
COMPLIANCE WITH THE EU RENEWABLE ENERGY DIRECTIVE (RED)

At the showcase site, bioLPG is currently being used that exceeds the 60% GHG savings criteria specified in RED II. Depending on the feedstock and production pathway, even higher savings, beyond 80%, can be achieved. In this case, emissions from bioLPG dropped to as low as **31 gCO_2e/MJ**, well below the **80 gCO_2e/MJ** benchmark for fossil LPG. BioLPG can therefore deliver emissions reductions of over 80%, underscoring its strong potential as a renewable energy solution

KEY COMPLIANCE HIGHLIGHTS:

- Verified emission reductions can exceed RED mandates.
- Full lifecycle assessment for sustainability assurance.
- Supports RED II & III goals of increased renewable share in final energy consumption

This case study demonstrates bioLPG as a low carbon energy solution that is flexible, easy to implement, and requires no significant capital investment. These advantages will help bioLPG strategically contribute to EU sustainability targets.



BioLPG: High-performance, lower-emissions

BioLPG retains the high energy content, reliability, and flexibility of conventional LPG—making it a powerful tool in the clean energy toolkit. More rapid scalability can be achieved, during the energy transition, using blending (bioLPG with LPG) making use of mass balance for more efficient logistics.

EASY CONVERSION FROM LPG TO BIOLPG

Compatible with existing appliances

Quick switch from LPG to bioLPG

No changes to the existing infrastructure required

CORE PERFORMANCE BENEFITS:

- **Energy efficiency:** Delivers the same output and heat value as LPG.
- **Compatibility:** Works with all existing appliances and distribution systems.
- **Safety and reliability:** Maintains the robust safety record of LPG systems.

SCALABILITY ADVANTAGES:

- No retrofitting needed, reducing upfront costs.
- Zero disruption, enabling fast roll-out.
- Modular growth potential, adaptable to different sectors and scales.

BIOLPG USE CASES:

Industrial Processes – Manufacturing, textiles, food processing

Transportation – Forklifts, logistics, small fleets

Commercial Heating – Offices, hotels, restaurants

Agriculture – Greenhouses, poultry farms, irrigation

Cooking & Hospitality – Caterers, food trucks, commercial kitchens

Power Generation – Backup power, CHP systems

Marine & Rural Areas – Island communities, boats, emergency shelters

PRINCIPLE OF MASS BALANCE APPROACH

MASS BALANCE APPROACH: A TRUSTED PATHWAY TO VERIFIED SUSTAINABILITY

Given bioLPG is chemically identical to LPG, it is appropriate to make use of the same logistics assets and operations. Just like renewable electricity is distributed together with other electrons on a common grid, and its origin can be traced with certificates (guarantees of origins), bioLPG is blended and distributed alongside fossil LPG. Its origin is traced through rigorous tracking and accounting of feedstocks and products along the supply chain.

This approach reduces the cost of distributing bioLPG compared to a new dedicated supply chain, and allows consumers to choose to purchase a share of bioLPG within their consumption.

BENEFITS OF THE MASS BALANCE APPROACH:

- **Supply Chain Efficiency:** Facilitates use of existing supply chain, whilst transitioning to renewable liquid gas, to minimise costs for end users
- **Scalability:** Enables renewable use without new infrastructure.
- **Certifiability:** Meets standards for renewable certification under RED.

This traceability builds confidence among consumers, regulators, and industry stakeholders, making it an indispensable element of bioLPG deployment.

Join Europe's Energy Transition

BioLPG is not only ready today; it **supports Europe's energy security** by diversifying supply chains and using existing LPG infrastructure—while aligning with the EU's 2030, 2040 and 2050 climate goals. Achieving climate neutrality requires solutions that are **practical, scalable, inclusive—and resilient.** BioLPG delivers on all four.

GET INVOLVED:

- Explore evidence and insights: **lgeshowcase.eu**
- Discuss potential implementation of bioLPG in your building or region.
- Engage with our network to share best practices and learn from peers.

RESOURCES AVAILABLE:

- Case studies and impact reports
- Video explainers and webinars
- QR codes linking to additional technical materials

Presented by: Liquid Gas Europe in collaboration with:

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