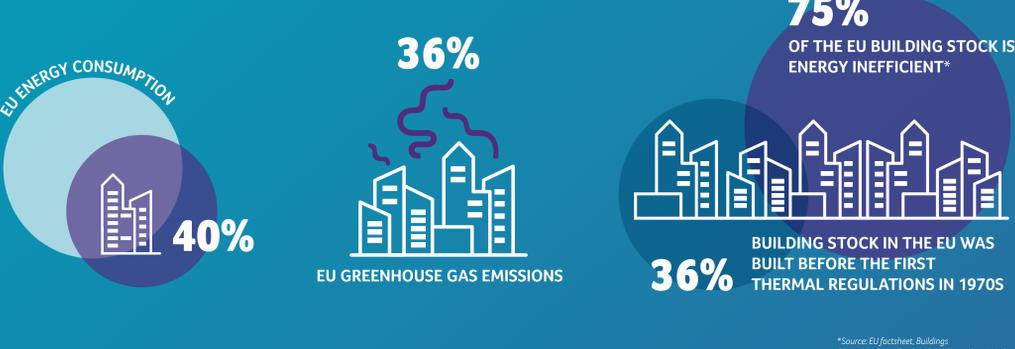


# THE EU HEATING CHALLENGE

The review of the Energy Performance of Buildings Directive (EPBD) aims to curb CO<sub>2</sub> emissions associated with energy use in buildings – but is the proposed solution suitable for all buildings, everywhere, or is there a more cost-effective, alternative option?



**447 million people in the EU**

**137 million** live in rural areas



Most of them are not connected to the gas grid...

...and need to resort to heating oil and coal...



... which, in turn, results in more CO<sub>2</sub> emissions and pollution



**The challenge**  
Ensure off-grid, rural areas are also included in EU path to climate neutrality

## THE SOLUTION

Decarbonising EU homes will require a mix of different technologies and solutions. Liquid gases are a key part of the energy puzzle.

Liquid gases improve air quality & reduce GHG emissions



**CLEANER**

Liquid gases are a cleaner alternative to heating with either coal or oil, and they offer significant advantages in terms of indoor and outdoor air quality. **The liquid gas industry is now going a step further by undergoing a major transformation, and is committed to becoming 100% renewable by 2050.** (ref. BIOLPG - A Renewable Pathway Towards 2050, report by LGE)

	CO <sub>2</sub> EMISSIONS (gCO <sub>2</sub> /MJ)	AIR POLLUTION (g pollutant/MJ heat delivered)			
		PM10	PM2.5	SOx	NOx
COAL	259	0,3762	0,4786	1,4286	0,3762
HEATING OIL	129	0,0022	0,0022	0,0716	0,0671
LIQUID GASES	38-104	0,0003	0,0003	0,0000	0,0609

Source: Country-specific report Belgium: Emissions of (bio)LPG and other energy carriers in domestic heating, BBQs and forklift trucks CO<sub>2</sub> emissions are calculated on a well-to-wheel (WTW) basis.

### What are renewable liquid gases?



Renewable LPG (rLPG) is chemically identical to conventional LPG, and is produced from sustainable feedstocks such as plant and animal waste materials, vegetable oils, and solar/wind power.



Similar properties to LPG and can be produced from a wide range of renewable and recycled-carbon feedstocks, including municipal waste and biogas.

### What are they produced from?



- ▶ Vegetable oil
- ▶ Animal fats
- ▶ Tallow
- ▶ Used cooking oil (hvo)
- ▶ Sugar and starch (from cellulose)



- ▶ Lignocellulosic biomass
- ▶ Wood and residues from forestry
- ▶ Waste-wood from industry
- ▶ Agricultural residues (straw, stover, manure)
- ▶ Energy-crops
- ▶ Municipal solid waste
- ▶ Sewage



- ▶ Renewable electricity
- ▶ Water
- ▶ Captured CO<sub>2</sub>

### How are they produced?

#### BIOREFINING

Transforms biomass into a wide spectrum of products and energy carriers. rLPG is a by-product of this process.

#### PYROLYSIS

Thermal decomposition of biomass in the absence of oxygen

#### GASIFICATION

Thermal breakdown of the biomass into syngas in the presence of any externally supplied oxidizing agent (air, O<sub>2</sub>, H<sub>2</sub>O, CO<sub>2</sub>, etc.)

#### ANAEROBIC DIGESTION

Fermentation process, which takes place in a closed airtight digester, where waste is converted into biogas and digestate as products.

#### POWER-TO-X

Converts captured CO<sub>2</sub> and hydrogen made from water by electrolysis using renewable electricity into hydrocarbon fuels, including renewable liquid gases.

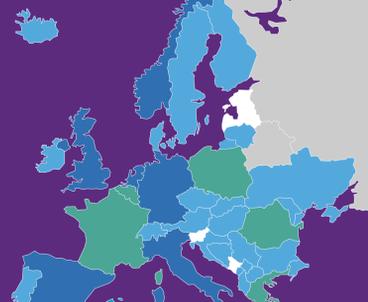
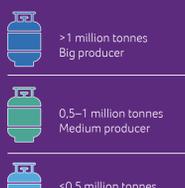
### AVAILABLE & FLEXIBLE

Liquid gases are a flexible heating source, available today in quantities that can meet the energy needs of millions of citizens across Europe, and will remain in abundance for the foreseeable future. European production can cover most of the demand for liquid gases and imports are geographically diversified. **This makes liquid gases a strategic choice to ensure Europe's autonomy and resilience to supply disruptions.**

### The European production of liquid gases can meet 76% of current European demand



### Europe is an important producer of liquid gases



### COST-EFFECTIVE

Liquid gases are often the most cost effective heating solution for rural homes, in particular for households and businesses with low levels of disposable income. The investment cost for a liquid gas boiler is lower than that of a biomass boiler and is a quarter of the cost of a heat pump. Converting from LPG to rLPG or a renewable and recycled carbon DME/LPG blend requires no changes to the boiler or existing infrastructure. Utilising existing assets in this way will be more cost-effective and affordable, it will be more sustainable and it will ensure a more rapid decarbonisation in hard-to-treat, rural buildings.

Even before the current energy crisis,



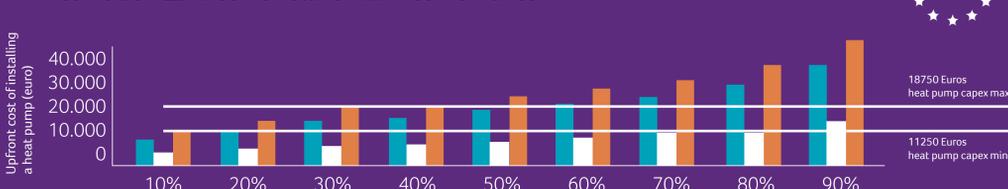
between **50 and 125 million people** were unable to afford proper indoor thermal comfort.

Source: Alleviating Fuel Poverty in the EU, report by BPIE in 2014



### A significant number of households cannot afford heat pumps and even when they can, availability and the necessary installation skills, are often scarce

Income EU Income Poland Income France



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

\*excludes grants and/or subsidies

## THE NEED FOR AN APPROPRIATE REGULATORY FRAMEWORK

The revision of the Energy Performance of Buildings Directive (EPBD) provides a unique opportunity to build a pathway to cleaner and more efficient buildings in Europe, while addressing the specific needs of the 137 million people living in rural areas.

### For this to happen, EU policymakers need to



#### Avoid a detrimental ban on renewable-ready gas boilers

Respect the principle of technology neutrality to effectively decarbonise the EU building stock. Electrification is not suitable in 100% of buildings, therefore a mixed technology approach, including boilers, is needed to serve the needs of specific housing types/locations.



#### Support renewable liquid gases

Ensure renewable liquid gases as rLPG and renewable and recycled carbon DME, which are generated off-site, are recognised for their contribution to a "zero-emission building".



#### Support improved air quality

Ensure the EPBD pays increased attention to indoor and outdoor air quality, as heating systems can produce significant levels of air pollution. Clear messages on the environmental impact of heating systems would help consumers choose less polluting heating options and thus improve local outdoor air quality.