

# rDME – a sustainable fuel to defossilize the off-grid areas

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Gasdagarna 2022

Båstad, 18-19 May 2022





# Heating in EU rural areas: a challenge for a just energy transition



114 MILLION

EU citizens live in rural areas



OFF-GRID

Off-gas grid homes are typically older and less energy-efficient



45%

of rural heat comes from heating oil and coal (off-the-gas-grid & non-electrical)



DIVERSE

The off-grid building stock is diverse in characteristics



24%

of people in rural areas are at risk of poverty or social exclusion



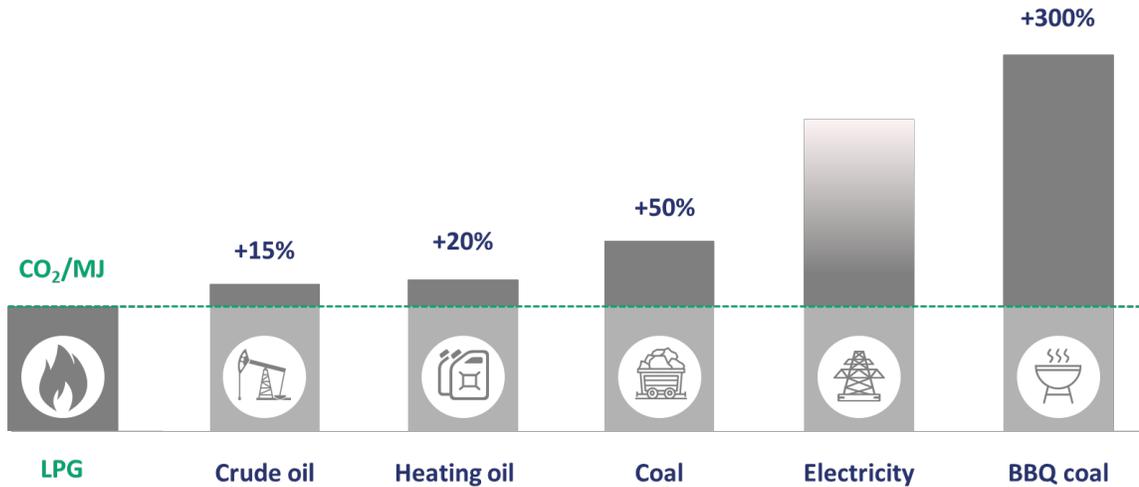
72%

of heating & cooling demand of single-family homes is consumed in rural areas

Options like electrification (heat pumps) or hydrogen could be part of the solution, but will require **time**, substantial **investments**, and will need to overcome natural **limitations** (e.g. energy density)



## LPG: energy for the off-grid areas



LPG global energy usage:

 **>200M** tons/year

 **+ 25%** over past 10 years

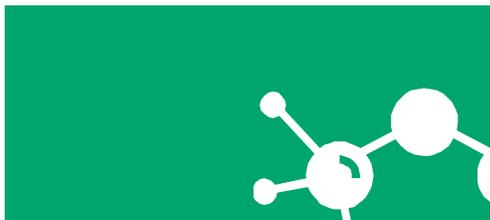
**LPG** is a **liquid gas** that allows the off-grid areas to have access to a **clean** and **affordable** form of **energy**.

It is used in different applications, from transportation to heating and cooking all-over the world.

**Renewable LPG is already available, but in limited quantities.**

# Why rDME is a solution?

## A simple product



Dimethyl-ether is a molecule ( $\text{CH}_3\text{OCH}_3$ ) that can be produced from a **wide range of local renewable feedstocks**.

## Easy to handle



DME is **chemically similar to propane and butane** a gas at room temperature and pressure. Like LPG, it is easily transported as a liquid in pressurised cylinders and tanks.

## Safe, clean and green



rDME can **reduce GHG emissions** by up to 85% compared to diesel and heating oil and emits no harmful particulates.

## Versatile Fuel



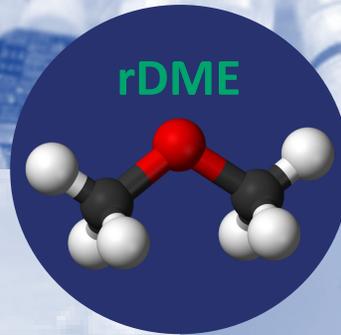
DME has been used for **over 50 years in the chemicals sector** as an aerosol propellant. It can be used as a fuel, providing today a viable alternative to off-grid users.

# rDME production



## Circular

including non-organic fraction of municipal waste, non recyclable plastic, tyres



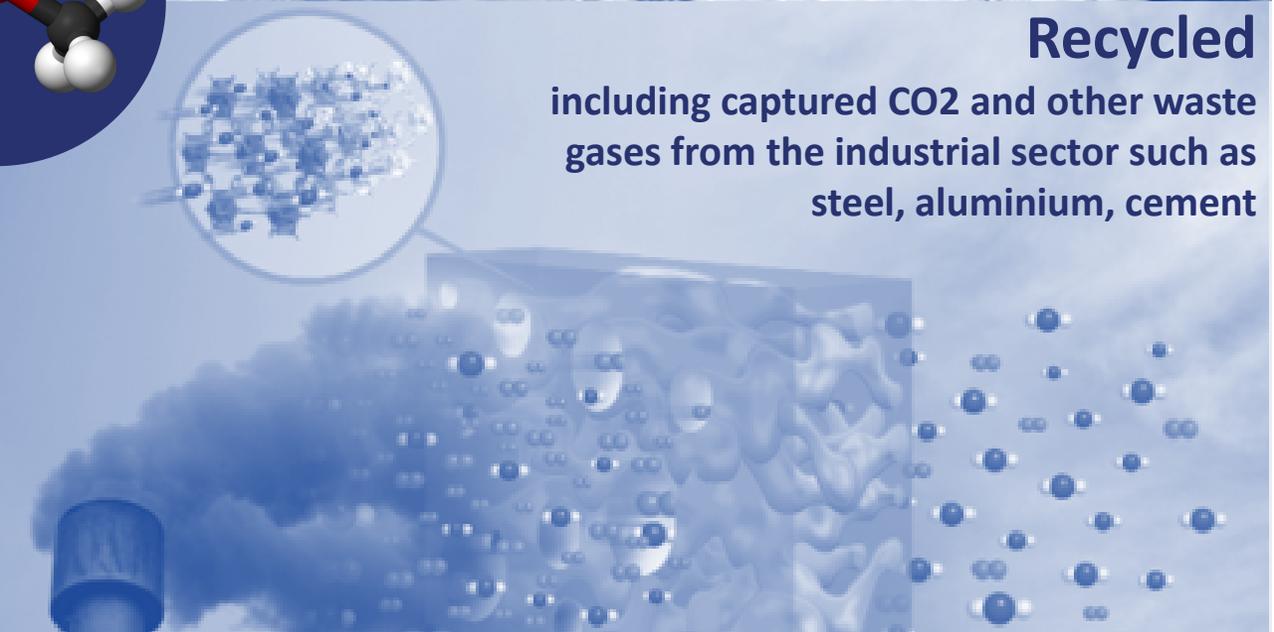
## Biogenic

including manure, waste organic fraction, biomass



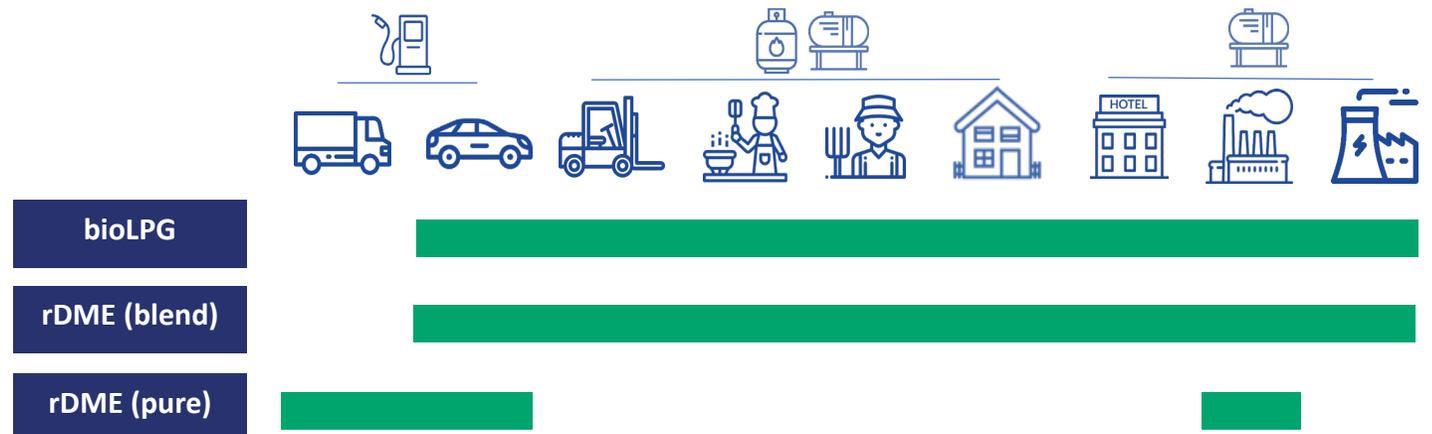
## Recycled

including captured CO2 and other waste gases from the industrial sector such as steel, aluminium, cement



## rDME usage

- rDME can be used as a **clean fuel for many applications:** heating, cooking, industrial applications, but also transportation
- Blends up to **20% rDME** could represent a drop-in solution, displacing volumes of fossil LPG.
- Appliances and equipment can also be modified to take **100% rDME**: HDVs and Industry are the most promising sectors.
- DME is also an **Hydrogen Carrier**, easily reformable at low temperatures, making it a future solution for H2 applications



# There is growing industry interest in rDME for the off-grid energy sector...



**oberon FUELS** **Suburban Propane** **Lipigas**

Suburban Propane Partners, L.P., Oberon Fuels and Empresas Lipigas Announce Collaboration to Evaluate Renewable Dimethyl Ether + Propane Blends in Latin America

December 06, 2021 06:00 ET | Source: Oberon Fuels

**kiwa** Services Markets

**PRIMAGAS**

**DME and material compatibility testing**

12 November 2021

Currently society faces a great challenge in the energy transition. One of the ways to reduce the use of fossil fuels like LPG is the introduction of renewable dimethyl ether (rDME). rDME is a promising biofuel and considered reliable for blending with LPG, or even a complete substitute product for LPG.

**Primagas to Build and Operate First rDME Fuel Station in Germany**

19 April 2021

SHV Energy and Primagas have confirmed their support as logistics partners providing supply and delivery of 100% renewable DME (rDME) for two projects in Germany.

[SEE MORE >](#)

**FPT** ENGINES DRIVELINES TECHNOLOGIES CUSTOMER SERVICE FPT WORLD FPT WEBCAST

**THE ALTERNATIVE IS CLEAR. WITH THE DME PROJECT, FPT INDUSTRIAL LEADS RESEARCH ON SUSTAINABLE FUELS**

DME, or dimethyl ether, is undoubtedly one of the most promising alternative and sustainable fuels in the heavy-duty road transport segment. In fact, the total absence of sulfur, combustion with extremely low NOx and particulate emissions, the high energy efficiency and the possibility of being produced from a wide variety of renewable sources make it one of the most suitable fuels to meet the 2025 and 2030 European standards in terms of the reduction of CO<sub>2</sub> emissions.

True to its multi-source and multi-fuel approach, at its Research & Development Center in Arbon, Switzerland, the cradle of Common Rail and Hi-eSCR technologies, FPT Industrial is developing an innovative



# Dimeta at a glance

## Who we are

**Dimeta** is a joint-venture between **SHV Energy** and **UGI International** advancing the production and use **rDME** to accelerate renewable solutions for the LPG industry.

In **the UK** SHVE and UGI are represented by their local companies, two leading players in the LPG market



## ... and what we do

**BUSINESS DEVELOPMENT  
+ R&D**



**ADVOCACY &  
COMMUNICATIONS**



**SAFETY & OPERATIONAL**



**COMMERCIAL SUPPLY**



**Dimeta ambition is to have at least 300.000 tons / year of rDME capacity in the market for EU, UK and US by 2027**





# Dimeta scaling-up rDME supply: Circular Fuels Ltd

**Circular Fuels Ltd (CFL)** is the joint venture between Dimeta and KEW Technology.

CFL is a specialised **project development** company, which develops construction-ready rDME plants using KEW’s proprietary advanced gasification technology.

**Process:** Gasification + DME synthesis

## Demonstration plant (“SEC+”)

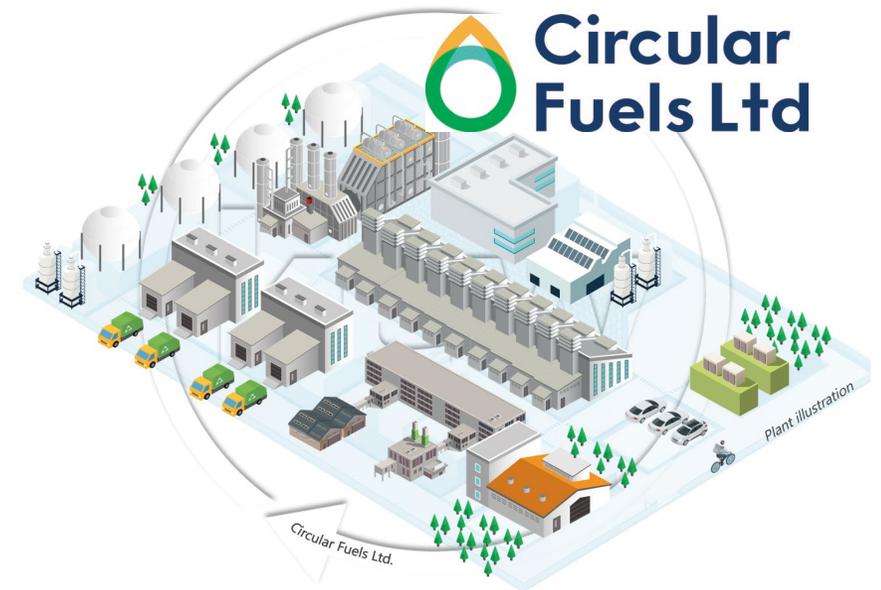
- Operational mid-2022 in the UK

## First commercial plant (“Circular Fuels Arboretum Limited”)

- 50 ktonnes / year rDME produced from Municipal Waste
- Located in UK - production expected Q1-2024

**Subsequent plants will be located across Europe and North America**

**Dimeta aims to develop additional partnerships to further accelerate the availability of rDME as a fuel.**



**About KEW:** a UK based sustainable energy solutions company, that has developed an Advanced Thermal Conversion (ATC) process converting all types of non-recyclable resources and low-grade biomass into a wide-range of sustainable energy vectors, such as hydrogen, power, heat and advanced fuels for a zero carbon future

# SEC+ demonstration in construction

Existing gasifier  
(8 MW equivalent)

Char removal

Feedstock handling  
and delivery

Site for syngas to  
rDME production unit

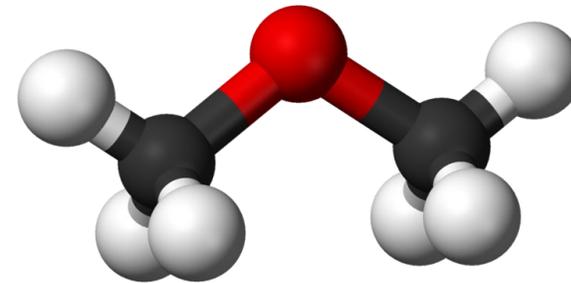
# Collaboration is key!

We are actively looking for collaborations on:

rDME supply opportunities

R&D and innovative technologies for rDME production

Financing and investments on rDME infrastructures



The whole LPG value chain!

Sustainable feedstock

[info@dimeta.nl](mailto:info@dimeta.nl)

 **Dimeta**

info@dimeta.nl

The background features two thick, bright green curved lines that sweep across the dark blue field. One line starts from the top center and curves down towards the left, while the other starts from the bottom center and curves up towards the right.

 Dimeta