Global rLPG Pathways to 2050
A SCENARIO OF FUTURE SUPPLY
The Challenge

Decarbonisation is the future. As of April 2021, countries that emit about 70% of the world’s greenhouse-gases have pledged to cut these to ‘Net Zero’ by around mid-century. That means elimination of what today is some 30 billion tonnes of carbon-dioxide equivalent per year. Those responsible for the remaining 30% are likely to at least not increase their greenhouse gas (GHG) output and probably to decrease it.

Because the energy sector accounts for some 80% of all GHG emissions, this future spells major changes for the LPG industry. The WLPGA has formally recognised this and has stepped forward to become part of the solution by highlighting that renewable LPG (rLPG), although currently produced in modest quantities, could potentially satisfy up to 50% of the 2050 global non-chemical LPG demand.

In any scenario, rLPG can play a significant role in the decarbonisation of the energy sector.
The Vision: LPG can be Substantially Renewable in 2050

The world’s LPG industry has developed a scenario whereby its future supply can be substantially renewable. This supply can be sourced from eight renewable feedstocks processed in eight main pathways: globally by 2050, these could produce near 220 million tonnes of rLPG per year.

This scenario is based on feedstock availability estimates from the International Energy Agency (IEA) and the International Renewable Energy Agency (IRENA). It is also based on pathway yields and allocations from those same agencies and from the broader technical literature. Already today, rLPG is produced at commercial scale by two of these pathways: hydrotreating and oligomerisation. The others are in development.
By 2050 rLPG supply can meet at least 50% non-chemical LPG consumption, even in most extreme scenarios postulated by energy authorities.
It is up to governments and the LPG industry, along with other energy sectors, to find the right balance between decarbonisation, investment, operating cost and convenience.
Renewable LPG can potentially satisfy up to 50% of the 2050 global non-chemical LPG demand

It was found that 2050 demand scenarios diverge greatly. Nonetheless, it is clear that by 2050 rLPG supply can meet at least 50% non-chemical LPG demand, even in most-extreme scenarios postulated by energy authorities. The precise fraction of renewables depends on government policy that is still in development, mainly with respect to fossil fuels. It is up to governments, and the LPG industry, along with other energy sectors, to find the right balance between decarbonisation, investment, operating cost and convenience. In any scenario, rLPG can play a significant role.

To the LPG industry, these findings should be both a reassurance and a call to action. There is cause for optimism, in that it presents a bright future of potentially high volumes. However, to match this optimism with complacency – to presume that the scenario can by itself become reality – could potentially have a negative effect. Indeed, without major effort by the industry, this scenario may be hindered.
The global potential for rLPG supply in 2050, in light of existing scenarios and forecasts issued by authoritative national and international institutions is a 2050 base-case scenario whereby near 220 million tonnes of rLPG per year are produced.
What are the feedstocks?

The supply comes from eight feedstocks.

- **38%** Agricultural residues
- **31%** Energy plants
- **13%** Forest residues
- **8%** Mixed waste
- **4%** Renewable power (minus bio)
- **3%** Algae
- **2%** Fats, oils, greases
- **1%** Ethanol 1st gen
What are the pathways?

The feedstocks are processed in eight pathways.

- Fermentation: 22%
- Digestion: 21%
- Pyrolisys: 17%
- Gasify & metanation: 8%
- Gasify & FT: 5%
- Hydrotreating: 4%
- Power-to-X: 1%
- Oligomerise (AtJ): 1%

Global rLPG supply scenario for 2050, base case, by pathway.
What will make this happen?
Realisation of this rLPG scenario can happen only with the support of three key factors:

**Government policy – the primary driver of renewables.**
According to the International Energy Agency (IEA) and other authorities, future policy might range anywhere between ‘business-as-usual’ and ‘deep-green’.

**Successful innovation of the LPG industry and its suppliers.**
This depends greatly on government-set incentives. It also depends on the industry’s own efforts.

**Growing demand for renewable fuels in general.**
This seems to be a given. Authoritative projections are that renewables will substantially increase from 2021-2050: the IEA foresees compound annual growth of 3-6%.
The World LPG Association (WLPGA) is the authoritative voice for the global LPG industry representing the full LPG value chain.

The primary goal of the association is to add value to the sector by driving premium demand for LPG, while also promoting compliance to good business and safety practice. With over 300 members in 125 countries, the association brings together private and public companies involved in one, several or all activities of the industry, develops long-term partnerships with international organisations and implements projects on local and global scales.

The Association was established in 1987 and granted Special Consultative Status with the United Nations Economic and Social Council in 1989.

The association’s multi-faceted mission is to demonstrate the benefits of LPG and inform, educate and influence all stakeholders; to support the development of LPG markets; to promote compliance with standards, good business and safety practices; and to identify innovation and facilitate knowledge transfer.

The WLPGA is based in Paris, France. For more information visit www.wlpga.org.