



## Bridging the gap to climate neutrality

### The case of eFuels for powered two-wheelers (PTWs)

#### Decarbonisation: beyond electromobility

With the launch of the Green Deal in December 2019, the EU took the political commitment to become climate neutral by 2050. The European Climate Law now sets the 2050 target and the direction of travel for all EU policy.

The subsequent EC Communication on Sustainable and Smart Mobility Strategy (December 2020) states that a clear path is needed to achieve a 90% reduction in transport-related greenhouse gas emissions by 2050. This is the effort required from transport to ensure the EU becomes the first climate-neutral continent by that date.

The European Association of Motorcycle Manufacturers (ACEM) acknowledges the EU's ambition of achieving net zero carbon emissions by 2050. For the EU to achieve the ambitious goal of net zero carbon emissions, ACEM members are committed to delivering L-category vehicles that contribute to the decarbonisation of transport in a sustainable timeframe which supports jobs, growth and the environment. As such, our industry ambition, based on the "right vehicle, right place, right energy carrier" concept, is to continue to offer the market a variety of powertrains, each of which will contribute to decarbonisation.

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In detail, in parallel to the development and deployment of more and more electric vehicles on the market every year, ACEM members are continuing to reduce the level of CO<sub>2</sub> emissions from traditional internal combustion engines (ICEs), still widely in use today and in the near future.

ACEM also encourages other carbon neutral energy carriers' innovations. eFuel, in particular, should be developed with a production volume that supports decarbonisation of the existing fleet of traditional ICE vehicles and for products for which electrification is not expected to be possible in the medium to long term (e.g. products used for long-distance commuting and travelling in remote areas). ACEM would especially welcome the introduction of a % / volume mandate of low / zero carbon content fuels for road transport, as part of the coming Renewable Energy Directive revision.

The following intends to shed some light on the key questions regarding eFuel, its production and use. It has been prepared with the support of the eFuel Alliance<sup>1</sup>.

### What are eFuels?

Liquid, storable, renewable electricity.

eFuels are climate-neutral synthetic fuels produced from renewable energy sources. For that only electricity generated from solar or wind, water and carbon dioxide (e.g. out of the air) are required. Thus, eFuels can significantly contribute to the climate protection targets in the transport sector. eFuels have significant advantages: they have a high energy density and are easy to store. This offers the opportunity to make inexpensive renewable energy from areas rich in renewable energy available worldwide.



<sup>1</sup> The eFuel Alliance is a stakeholder initiative dedicated to the industrial production of synthetic liquid fuels from renewable energies and sustainable biomass. It is open to all organisations and interested parties who share the goal of establishing and promoting eFuels as a contributor to climate protection – and helping to make them accepted worldwide. This includes individual companies, associations and individuals, including from the petroleum trade and the petroleum industry, the automotive and automotive supplier industry, mechanical and plant construction, research and science, the aviation and maritime industry, the chemical industry, the energy production and generation sector and, of course, the employee and employer representatives from these areas. More at <https://www.efuel-alliance.eu/>

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### Why eFuels for road transport?

To ensure a smooth transition to mobility climate neutrality.

While many new road vehicles will switch to electric in the coming years, the vast majority of EU citizens will continue using vehicles with traditional internal combustion engines for decades as these vehicles of the current and immediate future vehicle parc will only decrease slowly. True decarbonisation will not be achieved solely by introducing new electric vehicles. eFuels have a clear role to play too.

### Why eFuels for PTWs?

Due to their already limited impact on climate change compared to other vehicles, PTWs with conventional ICEs still have an important role to play in the foreseeable future, notably as they will not disappear from European roads overnight. These are small, light, efficient vehicles, used for everyday commuting or by specialised services for emergency response.

This is also particularly true for market segments that are hardest to electrify such as leisure PTWs (due to the weight of suitably sized electric propulsion batteries, and the effect these may have on handling and dynamics).

### How are eFuels produced?

Entirely from renewable sources.

The basis for the production of eFuels are the so-called power-to-liquid pathways, which are used to produce electricity-based liquid fuels using renewable electrical energy. First, hydrogen is produced from desalinated seawater by electrolysis using renewable electricity. The hydrogen is then synthesized with carbon dioxide either using the Fischer-Tropsch process, already developed back in 1925, to produce diesel, aviation fuel and heating oil or the methanol-to-gasoline process for generating a pure climate-neutral fuel which can replace currently used fossil-based gasoline in motorcycles and cars.



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### What are the advantages of eFuels?

They are climate-neutral, affordable and can be used everywhere.

#### Environmentally and climate-friendly

- eFuels can be produced globally in regions with a high potential for solar and wind power generation.
- By importing eFuels, only a limited amount of wind turbines and solar panels have to be installed in Europe. This improves acceptance for the energy transition in our countries.
- eFuels are climate neutral. Additional greenhouse gases are therefore not emitted.
- eFuels can be easily stored for a longer time (compared to energy storage in batteries). One of the main unsolved questions of our energy transition, how renewable energy can be stored and thus made available at any time, can be elegantly solved with eFuels.
- eFuels (when used in ICEs) emit significantly less nitrogen oxide and particulate matter than conventional fuels.
- eFuels do not have a disposal and recycling problem.

#### Versatile and can be rapidly integrated into the existing infrastructure and vehicle fleet

- eFuels are compatible with combustion engines and can thus be employed in the existing infrastructure.
- As there is already a broad distribution network available, eFuels can be rapidly introduced to the market.
- eFuels can be mixed with fossil fuels without problems (drop-in capability from 1% to 100%). eFuels (when used in ICEs) emit significantly less nitrogen oxide and particulate matter than conventional fuels.
- eFuels are suitable for all modes of transport: passenger cars, heavy-duty vehicles, airplanes and ships, and of course mopeds, motorcycles and all the vehicles in the L-category segment.

#### User-friendly and convenient

- With eFuels, there is no need for an expensive change of technologies in the transport sector. For the consumer, this means no switching costs, no need for reorientation towards different technologies and an easy and familiar handling process of a safe energy source. This promotes a high level of acceptance for eFuels.

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- eFuels can be distributed via existing infrastructure and are therefore easily available to the consumer.
- eFuels have all the advantages of conventional liquid fuels: a short refueling process as well as high energy density, which enables a long vehicle range.
- Studies by renowned research institutes show that eFuels can be produced for around €1/litre in the medium term, hence guaranteeing that fuels remain affordable for consumers<sup>2</sup>.

### Promote international energy cooperation and safeguard economic prosperity

- The vast majority of European countries cannot currently meet their energy demand solely with domestic climate-neutral energy sources, are unlikely to do so in the near future, and are therefore dependent on the import of renewable energy. eFuels can be imported economically and without any technical difficulty.
- eFuels can be employed globally. They can therefore support developing countries in establishing a climate-neutral energy system.
- eFuels can strengthen international energy cooperation. Europe can remain an international leader in manufacturing engines and industrial plants and preserve its small and medium-sized supplier industry. As a result, several hundred thousand jobs in Europe are protected.
- Engineering companies from Europe are world leaders in the development of Power-to-X technology, with which eFuels can be produced. This strengthens Europe's export economy and can create additional jobs.

### About ACEM

The European Association of Motorcycle Manufacturers (ACEM) represents manufacturers of mopeds, motorcycles, three-wheelers and quadricycles (L-category vehicles) in Europe.

ACEM members include 18 manufacturing companies: BMW Motorrad, Bombardier Recreational Products (BRP), Ducati Motor holding, Harley-Davidson, Honda, Kawasaki, KTM, Kymco, MV Agusta, Peugeot Scooters, Piaggio, Polaris Industries, Qooder, Royal Enfield, Suzuki, Triumph Motorcycles, Yamaha and Zero Motorcycles.

ACEM also represents 20 motorcycle industry associations in 17 different European countries. About 300,000 jobs depend on the L-category industry in Europe. There are more than 39 million motorcycles and scooters on Europe's roads (2019 estimate).

To find out more about ACEM please visit [www.acem.eu](http://www.acem.eu).

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<sup>2</sup> <https://www.efuel-alliance.eu/efuels/costs-outlook>