

# HIGHER OCTANE FUELS

*Powering a sustainable future*



# UNLOCKING THE INTERNAL COMBUSTION ENGINE'S POTENTIAL

*The European Union recognizes the potential to reduce emissions from transport in order to contribute to European and global climate and energy targets.*

European legislation aims to maximize the potential of all available technologies, at each part of the automotive value chain, to reduce emissions. This benefits consumers and the environment while helping maintain Europe's industrial leadership.

Internal combustion engines (ICEs) will continue to have an undeniable role to play in the future, thanks to their cost, performance and efficiency competitiveness over other power trains. High quality fuels can help ICEs reach targets prescribed in EU and national regulatory frameworks.

Average new car emissions in 2018<sup>1</sup> were 120.6 g of CO<sub>2</sub>/km, a 35% decrease in two decades. High octane fuels can unlock additional savings from the petrol car fleet, powering Europe's sustainable future.

1. Source: The European Automobile Manufacturers' Association (ACEA)



# PROVIDING A COST-EFFICIENT OPTION

30 years ago Europe successfully pioneered the use of higher octane fuels to increase fuel efficiency and reduce emissions from cars. Increasing petrol's octane gives Europe an opportunity to gain from one of the most cost-efficient solutions to emission reduction.

## HIGHER OCTANE FUELS ARE FIT-FOR-PURPOSE

Higher octane fuels directly improve the efficiency of today's engines, and are compatible with European refineries and infrastructure. They can be used in all cars on the European market to enable and support the use of technologies which can improve the efficiency of ICEs. These technologies include: downsized and downsped engines, cylinder deactivation, and increased compression ratios. Higher octane petrol's versatility makes it the obvious option for the present and the future of ICEs.

Higher octane petrol also supports the uptake of alternative powertrains. For example, it helps increase the fuel efficiency and emission reduction potential of hybrid engines. These improvements make hybrid vehicles a more attractive choice and could boost consumer interest. Simply put, they represent a cost effective solution Europe can't afford to miss.



*European transport must decarbonize in a cost effective and efficient way*

Fuel ethers are fully compatible with existing infrastructure.



COMPATIBLE

-15%



Fuel ethers reduce emissions of air polluting volatile organic compounds (VOCs) by 15%.

CLEAN

Fuel ethers can improve energy efficiency of fuel by up to +30% when compared to other oxygenated octane improving blendstocks.

+30%



EFFICIENT



*Higher octane fuels can power Europe's sustainable future*



# MATERIALISING EUROPE'S EMISSION REDUCTION AGENDA

Regulatory frameworks impact the future of the automotive industry. Emission reduction targets for the automotive sector can encourage innovation in European automotive engineering, and offer an opportunity for Europe to reestablish its leadership in one of its key sectors.



*Ambitious transport targets require full cooperation between value-chain stakeholders*

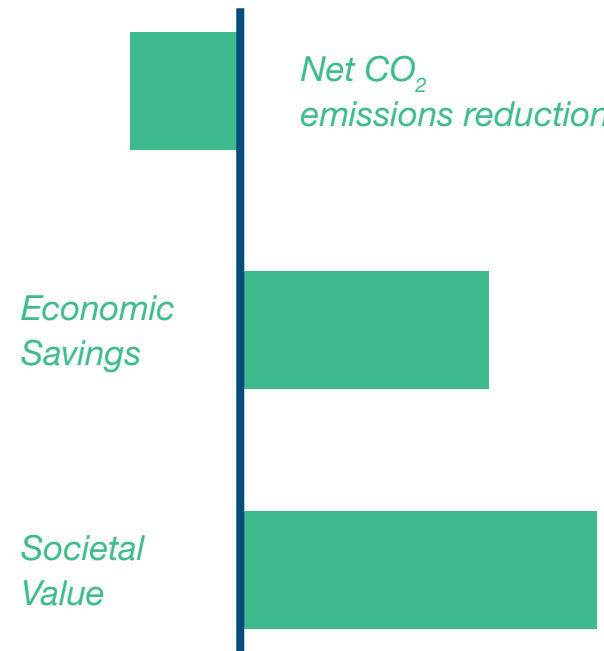
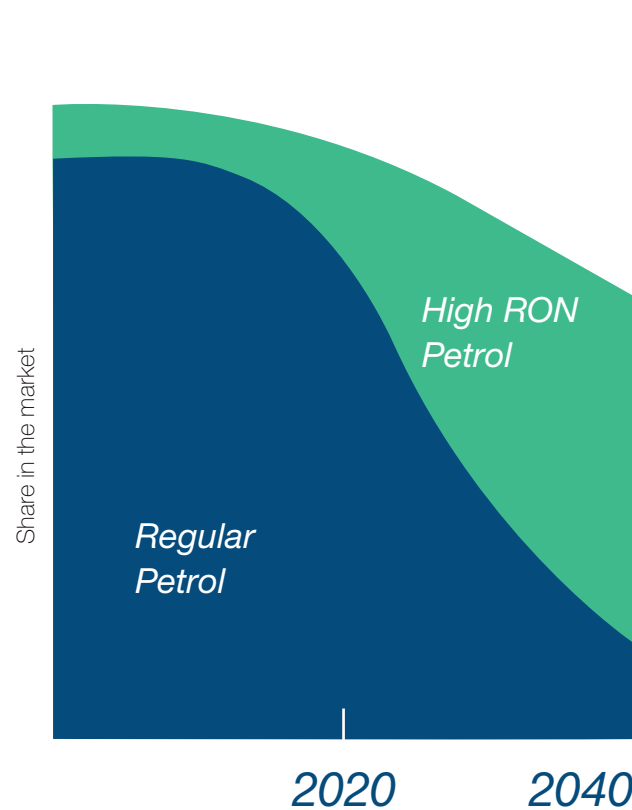
Ambitious targets require full cooperation between value-chain stakeholders. From refiners, through fuel component producers to car manufacturers, the whole value chain can be part of the solution. Our role as technology providers is to help create solutions that enable all technologies to yield their maximum benefits. Making the right choices on the energy density<sup>2</sup> and emission reduction potential of fuels on the market requires

2. Amount of energy that can be stored in a given mass of a substance

acknowledging the actual energy contribution of each fuel blending component.

Higher octane fuels can help Europe achieve its transport objectives on pollutant and CO<sub>2</sub> reduction, as well as energy efficiency. As the most efficient component to increase octane, fuel ethers are key to enhancing ICE environmental and energy performance.

## CONTRIBUTION TO ENVIRONMENT AND ECONOMY



As the share of high octane petrol grows, emissions decrease and both direct and indirect economic savings grow.

3. Source: Speth, Raymond et al. Economic and Environmental Benefits of Higher-Octane Gasoline, Massachusetts Institute of Technology, 2012

# FUEL ETHERS: DELIVERING THE BEST ALL-IN-ONE SOLUTION

*Fuel ethers contribute to Europe's need for clean, efficient, sustainable, reliable and affordable energy to power mobility.*

Fuel ethers, including MTBE, bio-MTBE, bio-ETBE, TAME, bio-TAME and TAE 4, are key components for the production of high octane fuels. They are the clean replacement for compounds that pose a proven risk to health and the environment. Whether manufactured from traditional hydrocarbons or renewable biomass, fuel ethers are more energy dense than alcohols. They therefore increase petrol's performance, while reducing the emissions of air pollutants and CO<sub>2</sub> across their life-cycle.

**THE SOLUTION  
TO EUROPE'S NEED FOR  
CLEAN, EFFICIENT, SUSTAINABLE,  
AFFORDABLE ENERGY.**

## BENEFITS OF FUELS ETHERS FOR..

### Consumers

- Improve fuel consumption, therefore allowing cars to run longer distances with the same amount of fuel.
- Prevent engine damage thanks to a more efficient combustion of petrol.
- Improve air quality. They reduce the emissions of exhaust pollutants such as volatile organic compounds (VOCs) and particulates (PM).

### Vehicle producers

- Are compatible with existing, as well as alternative, power train technologies, improving their environmental performance.
- Help reduce fuel consumption by improving the volumetric and thermal efficiency, complementing engine technologies such as direct injection, turbocharging or higher engine compression ratios.
- Help reach CO<sub>2</sub> emissions reduction goals and renewable energy source targets throughout their life cycle.

### Refiners

- Reduce the need for more energy-intensive fuel components, reducing overall CO<sub>2</sub> emissions.
- Provide refiners with more blending options for volatile liquid fuels especially for petrol engine fuels, due to low vapour pressure (RVP).
- Are compatible with the existing refinery infrastructure, fuel supply and distribution system without additional investment.









Sustainable Fuels is dedicated to the responsible production, usage and promotion of cleaner, high quality, high-efficiency petrol components called fuel ethers. Sustainable Fuels brings together producers of MTBE | BIO-MTBE | BIO-ETBE | TAME | BIO-TAME | BIO-TAEE. Sustainable Fuels supports and disseminates scientific research on the benefits and impact of fuel ethers on vehicle performance, health and the environment. Sustainable Fuels actively cooperates with all stakeholders including regulators, legislators, industry, NGOs and the academic community.



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