

Fit-for-55 and the Challenges of the EU Energy Policy

Green Fuels of the Future 2050

The need and the opportunity

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The environment in which Refining operates is being transformed at all levels



Regulatory Environment : Green Deal & FitFor55

- Tightening of EU rules for the reduction of the GHG emissions
- Rise in the cost of carbon and reduction in the carbon leakage protection
- Plans for the phase out of ICEs at EU from 2035 and at Greece from 2030 (Climate Law)
- Smaller role for liquid fuels of low carbon (aviation, HDVs, maritime)
- Stricter environmental regulations(Air Quality, IED, REACH)
- Increased focus of finance markets to ESGs and sustainable finance



Business environment

- Acceleration of energy transformation in all energy uses
- Significant drop in demand for fossil fuels
- Development of alternative forms of energy
- Investors' commitment to de-invest from fossil fuel projects

**COVID-19
has accelerated
developments
at all fronts**



O&G Companies

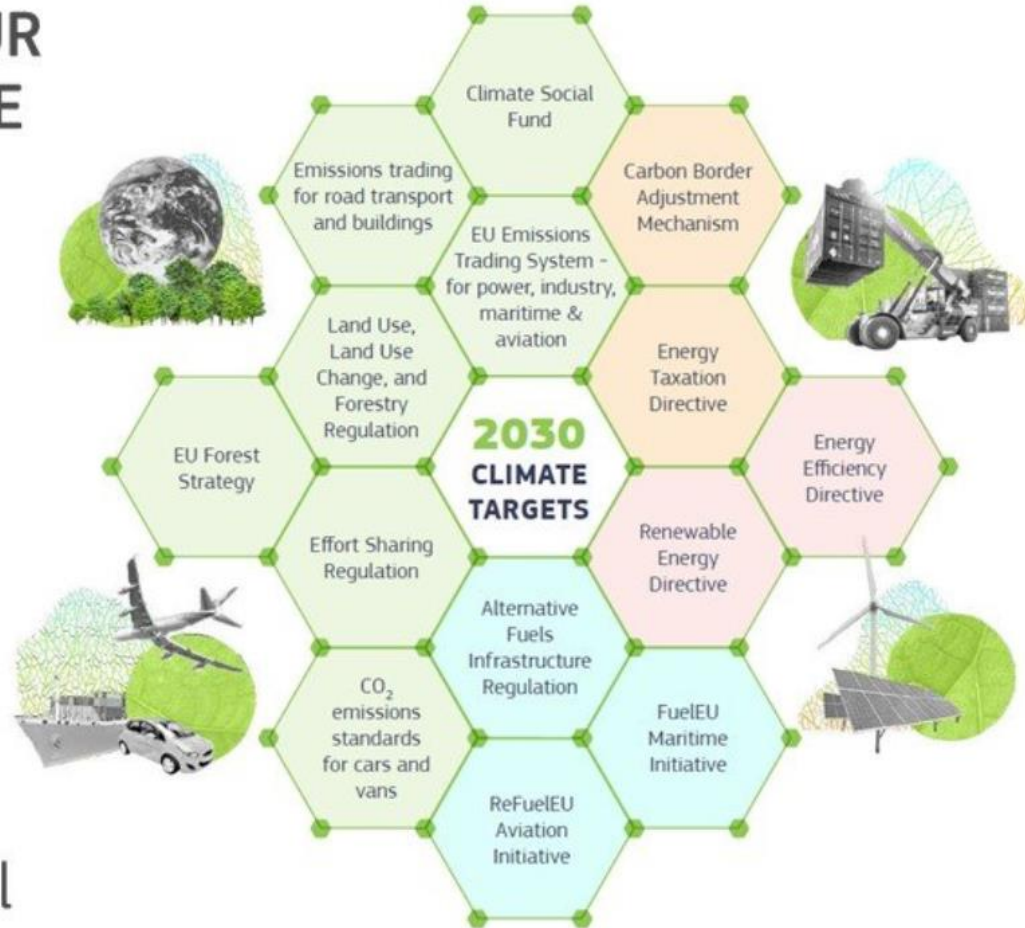
- Rebranding campaigns by many O&G companies
- Commitment to reduce GHG emissions and transition to a climate neutral economy
- Increased competition for access to new materials and feedstock
- Reputation risk and legal challenges

EUROPEAN GREEN DEAL

REACHING OUR 2030 CLIMATE TARGETS



3.800 pages of legislation



#EUGreenDeal

Higher targets

- 40% RES, 26% RES in transport
- Energy Efficiency target 36-39%
- Zero emissions from cars in 2035

Higher cost of carbon

- EU ETS Strengthening and extension to maritime transport
- New EU ETS for road transport
- CBAM and gradual decrease of allowances
- Energy taxation on the basis of energy content

Liquid Fuels play a role in aviation & maritime

- SAF mandate in aviation
- Alternative fuels in maritime
- Renewables & Low carbon fuels alliance

Ηδγαν

Greek Energy Sector overview

- **Power generation** heavily dependent on Greek **local lignite**
- **Renewables** (wind, solar) growing



One of the oldest vehicle fleets in the EU, very few EVs



Significant global shipping industry with need for fuels



Economy heavily dependent on tourism – need for aviation fuel

Under Review

NECP, 2030 targets (Dec.2019)

- **Coal phase out by 2028**
- Reduction of **GHG emissions by 42%**
- **RES share in final energy consumption, at least 35%**
- **RES share in the electricity production, at least 60%**
- > **RES share in the transport sector to exceed 14%, driven mainly by electrification and biofuel technologies**
- > **Electrification of 30% of new vehicle registrations**
- > **Hydrogen, a role to play for lignite-dependent regions**

Climate Law, 2030-2050 (24/11/2021)

- **Coal phase out by 2028**
- **2030: GHG reduction by 55%**
- **2040: GHG reduction by 80%**
- **2050: Climate neutrality**
- Phasing out new sales of ICEs by 2030
- 30% GHG reduction by 2030 in industry (vs 2022)
- 2030: GHG reduction by 80% in non-interconnected islands (vs 2019)
- Fuel oil ban on non-interconnected islands

Liquid fuels expected to play a significant role in the Greek Energy System in 2030, particularly in Heavy Road transport, Aviation and Shipping

Investments by refineries in low carbon technologies that will reduce the CO₂ of liquid fuels are crucial for the achievement of the national targets



European Green Deal

Transport accounts for a quarter of the EU's greenhouse gas emissions, and still growing. To achieve climate neutrality, a **90% reduction** in transport emissions is needed by 2050.

Sustainable & Smart Mobility Strategy:

Air and waterborne transport have greater decarbonisation challenges in the next decades, due to current

- lack of market ready zero-emission technologies,
- long development and life cycles of aircraft and vessels,
- the required significant investments in refueling equipment and infrastructure, and
- international competition in these sectors.



'Fit for 55' Communication:

The upcoming Renewable and Low-Carbon Fuels Value Chain Alliance will boost the supply and deployment of the most promising fuels for all modes of transport

Strategy for Energy System Integration:

While direct electrification and renewable heat present the most cost-effective and energy-efficient decarbonisation options in many cases, there are a number of end-use applications where they might not be feasible or have higher costs. In such cases, a number of renewable or low-carbon fuels could be used, such as sustainable biogas, biomethane and biofuels, renewable and low-carbon hydrogen or synthetic fuels

Ambitious Goals and the Big Picture

The EU Goals



By 2030, there will be at least 30 million zero-emissions cars and 80 000 zero-emission lorries in operation.



Zero-emission large aircraft will become ready for market **by 2035**.

The Full Picture – Global Fleet

The current figures of transport around the world and the heating market in the EU



ABOUT 1.4 B VEHICLES



AROUND 27,000 AIRCRAFT



AROUND 90,000 SHIPS



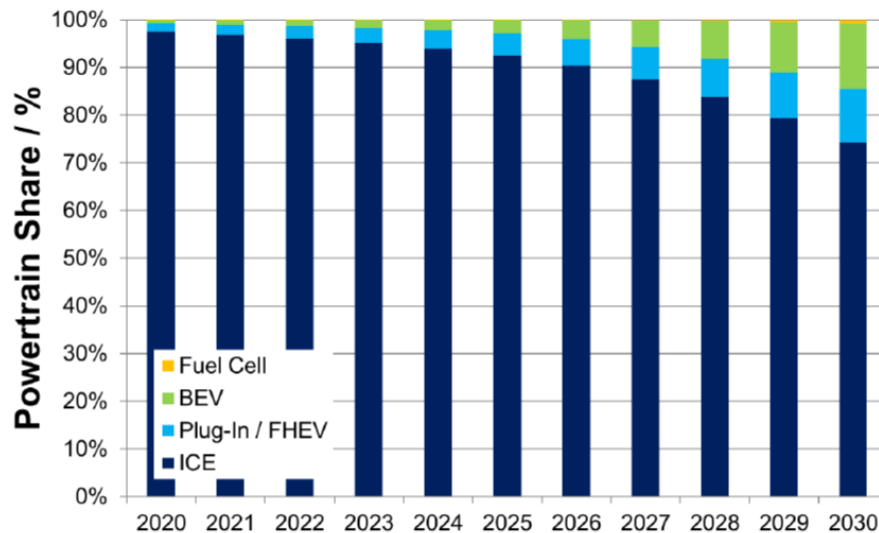
AROUND 20 M OIL HEATING SYSTEMS

Vehicles - Source: Organisation: OICA, International Organisation of Motor Vehicle Manufacturers

Ships - Source: <https://www.umweltbundesamt.de/service/uba-fragen/wie-viele-schiffe-sind-weltweit-auf-den-meeren>

Aircraft - Source: <https://de.statista.com/statistik/daten/studie/3545/umfrage/prognostizierte-groessen-der-flugzeugflotten-nach-weltregionen/>

Vehicles Existing in the Market



Despite fast ramp-up of EVs, most vehicles remain ICE driven in 2030

The Challenges and the Question Marks

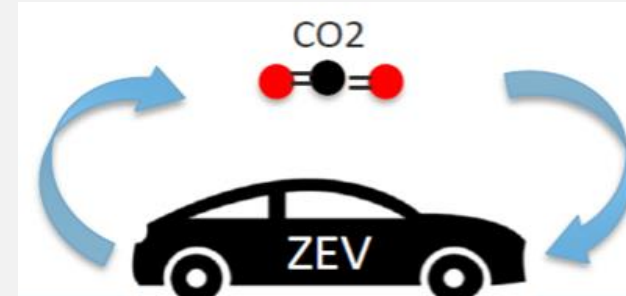


Potential use of renewable fuels

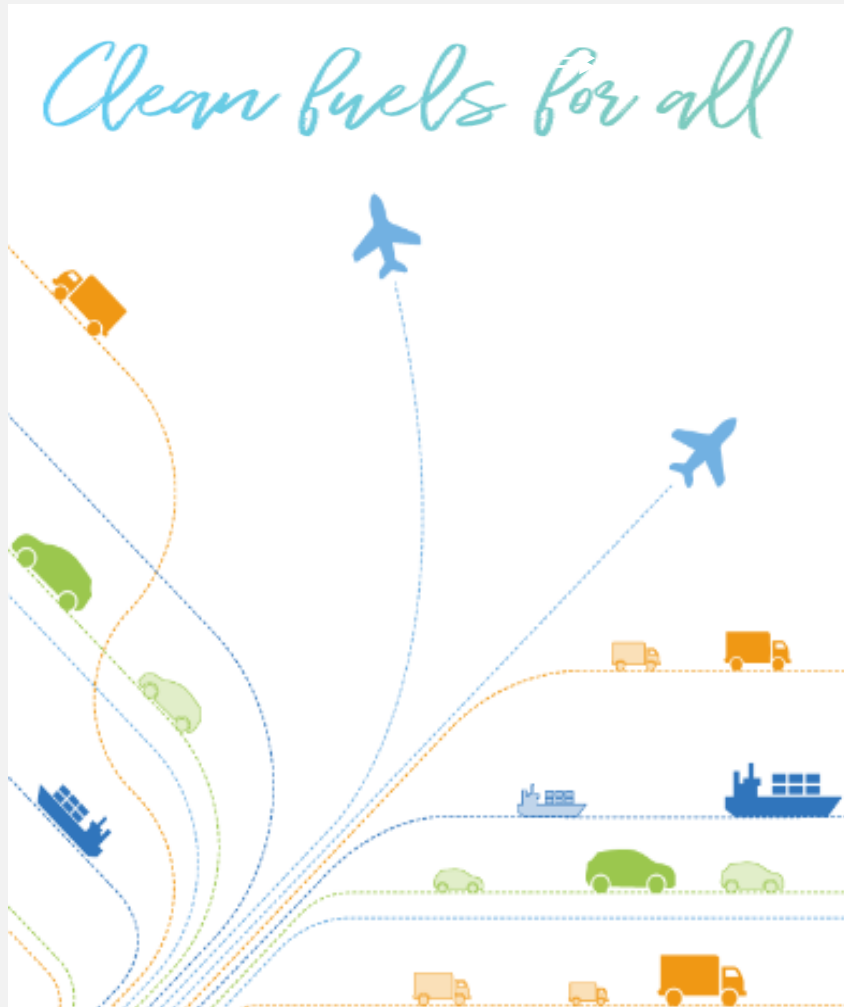
- ✓ in **all existing modes of transport**
- ✓ heating systems and
- ✓ industrial sectors' decarbonization



It's about **De-Fossilizing**, NOT about imposing or banning a specific technology



A vehicle using Low-Carbon Liquid Fuels emits recycled circular CO₂ / Net Zero impact on Climate

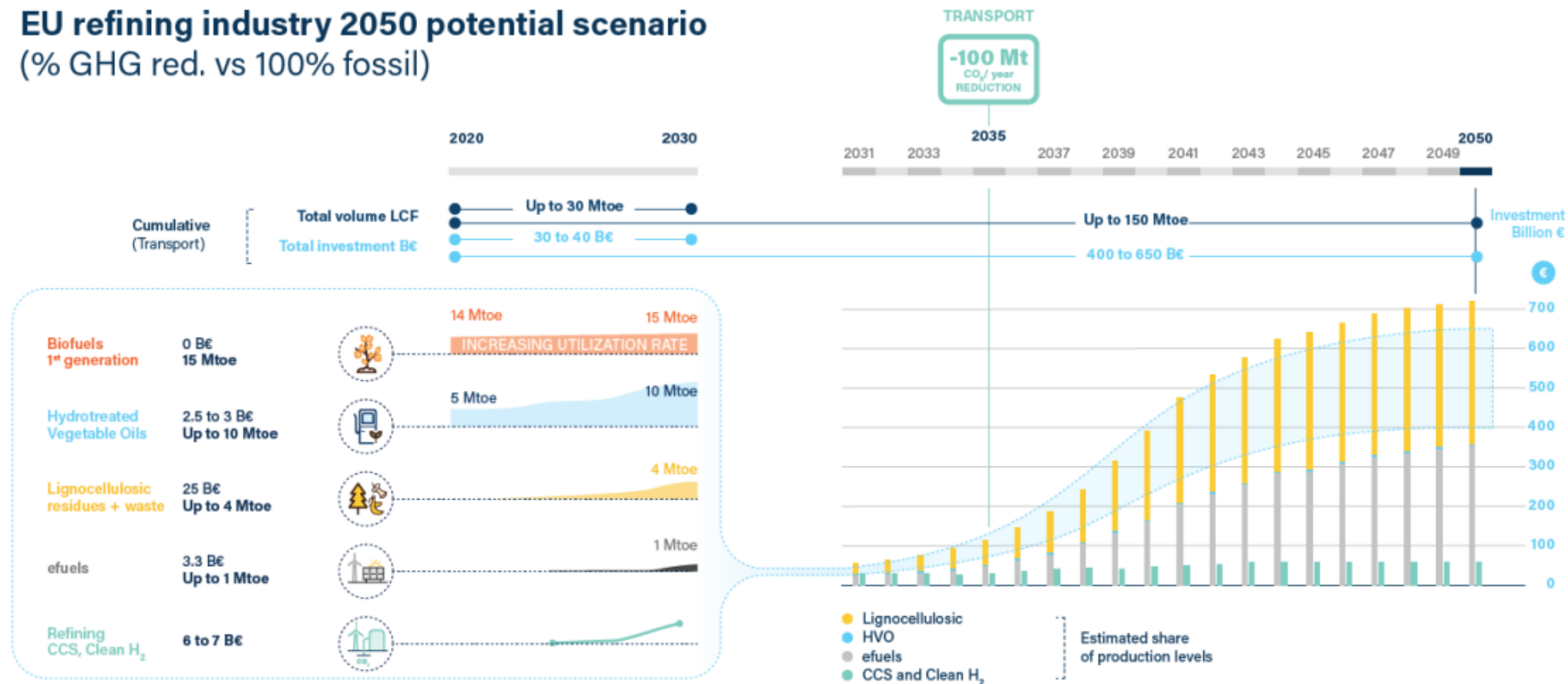


What are the benefits of Low-Carbon Liquid Fuels?

- Liquid fuels have an unrivalled **energy density**: easy for **transport and storage**
- They enable the **decarbonisation** of sectors with no other technological alternative: **aviation, shipping and heavy duty transport**.
- No need for new distribution or storage **infrastructure**.
- Their use can achieve a **CO₂ reduction at once**, when used in all **existing fleet**, in all transport sectors.
- Consumers can keep the option to choose the technology they prefer, contributing to an **economically feasible transition**.
- They support energy security reducing **energy dependency** on third countries
- They support EU leadership in ICE technologies, enabling the creation of new high-skilled jobs.

The Proposal of the Refining Sector : The Technologies are here – Need to Develop at Scale

EU refining industry 2050 potential scenario (% GHG red. vs 100% fossil)

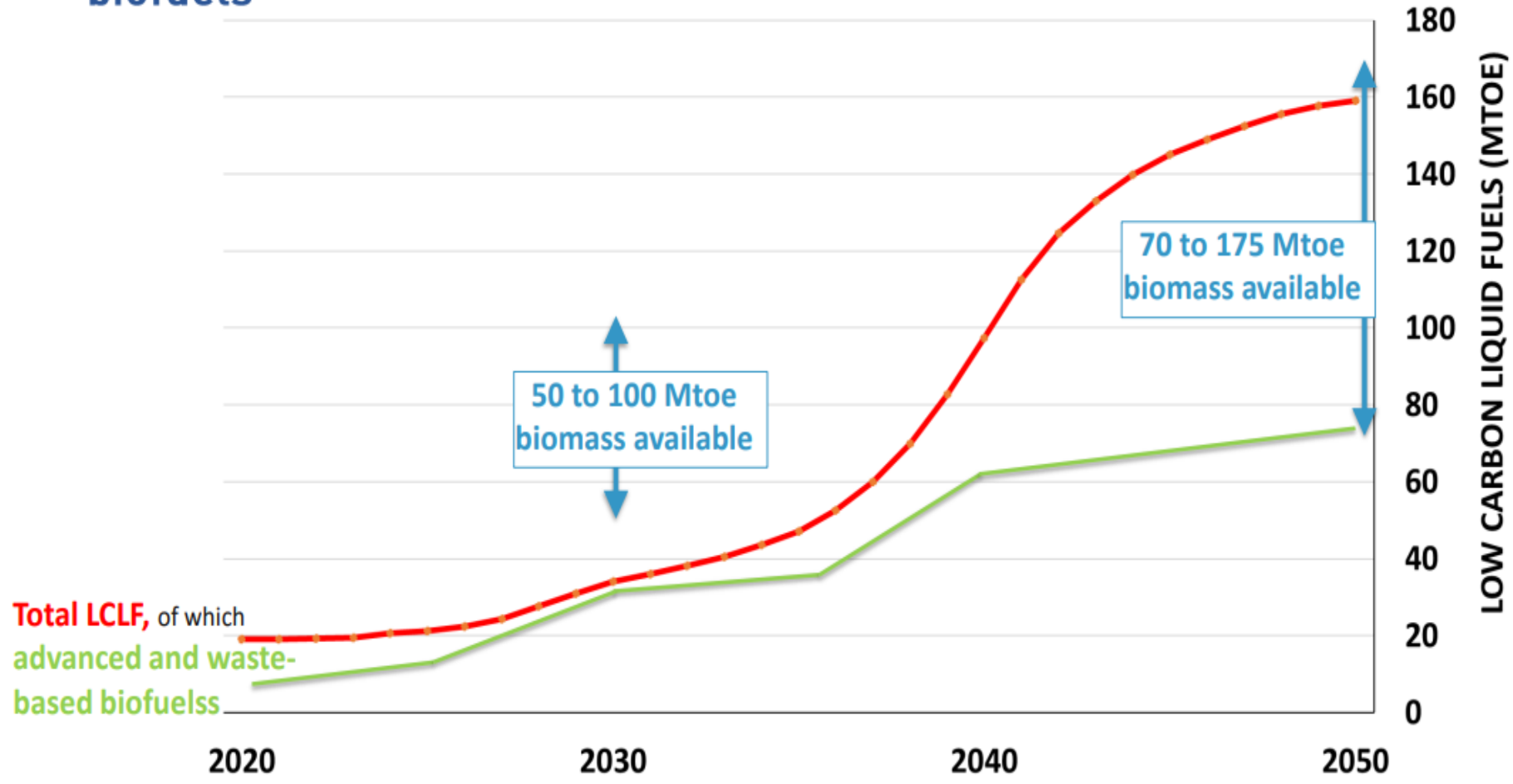


Clean Fuels for All: A pathway to a climate neutral economy

- ✓ A **100 Mt CO₂/yr reduction** could be delivered in transport by 2035, equivalent to the CO₂ savings of **50 million BEVs** on the road
- ✓ **By 2050**, at the latest, every liter of liquid fuel for transport could be **climate neutral**

- ❖ Investments of **400-650 B€** will be needed
- ❖ **Regulatory framework** will be key

Enough sustainable biomass available for road, aviation and marine fuels biofuels



The Refining Industry Transformation has Already Started

Refining industry projects planned, contributing to the Green Deal & Climate Neutrality:

- low-carbon liquid production is already started or planned by 2030
- Projects facilitate industrial clustering through links with chemicals, recycling, steel and cement industries...
- Scaling up and increasing the overall number of projects will be possible with the right enabling framework in place.

Provisional examples*:

- advanced biofuel projects, with capacities between 55.000 and 750.000 tonnes of output.
- E-fuels projects
- CCUS projects, up to 6 mt. of capacity for CO2 sequestration.
- green hydrogen projects, with the largest hydrogen electrolyser plant planned to produce approx. 1,300 tonnes of hydrogen per year.
- Waste-to-fuel projects, with a capacity of up to 100.000 tonnes per year in output (derived from urban waste)

10.7 MT

Potential quantity of low-carbon liquid fuels produced per year in 2030

30

Projects in Europe



Find out more about the projects here:

<https://www.cleanfuelsforall.eu/towards-climate-neutrality/#transformation>

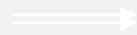
A clear and
stable
pathway,
encouraging
investments

The proposed
EU 2030
climate target
is achievable,
under the
conditions of

Technology
neutral regulation,
welcoming
all sustainable
solutions

OUR PROPOSALS

- **Technology neutrality:** a regulatory approach welcoming all sustainable technologies
- **Political commitment** and a **regulatory framework** enabling the industrial production of Renewable and Low Carbon Fuels
- An **investment framework** securing investors' confidence
- **Consistency** of EU finance rules with EU regulation goals
- An **energy taxation** acknowledging the positive contribution that renewable and low carbon fuels can make to climate protection
- Protection of the EU industries' **competitiveness** against carbon leakage
- **International cooperation** to set up global production.
- **Just transition** and access to sustainable mobility for every EU citizen - No one left behind

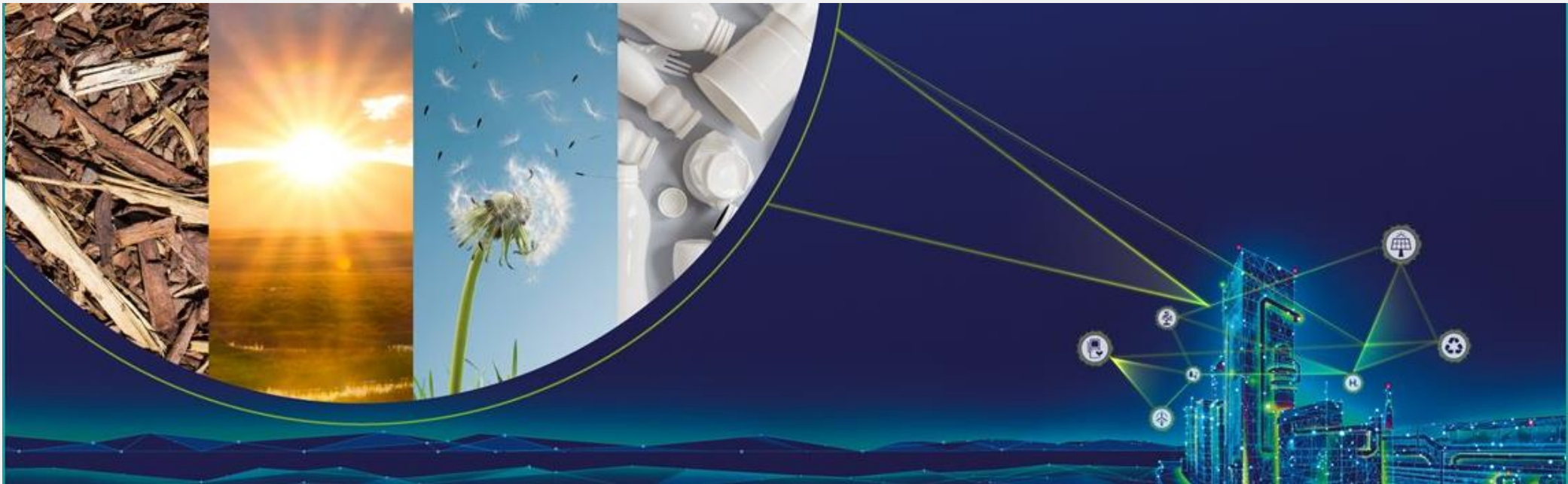


Our VISION 2025

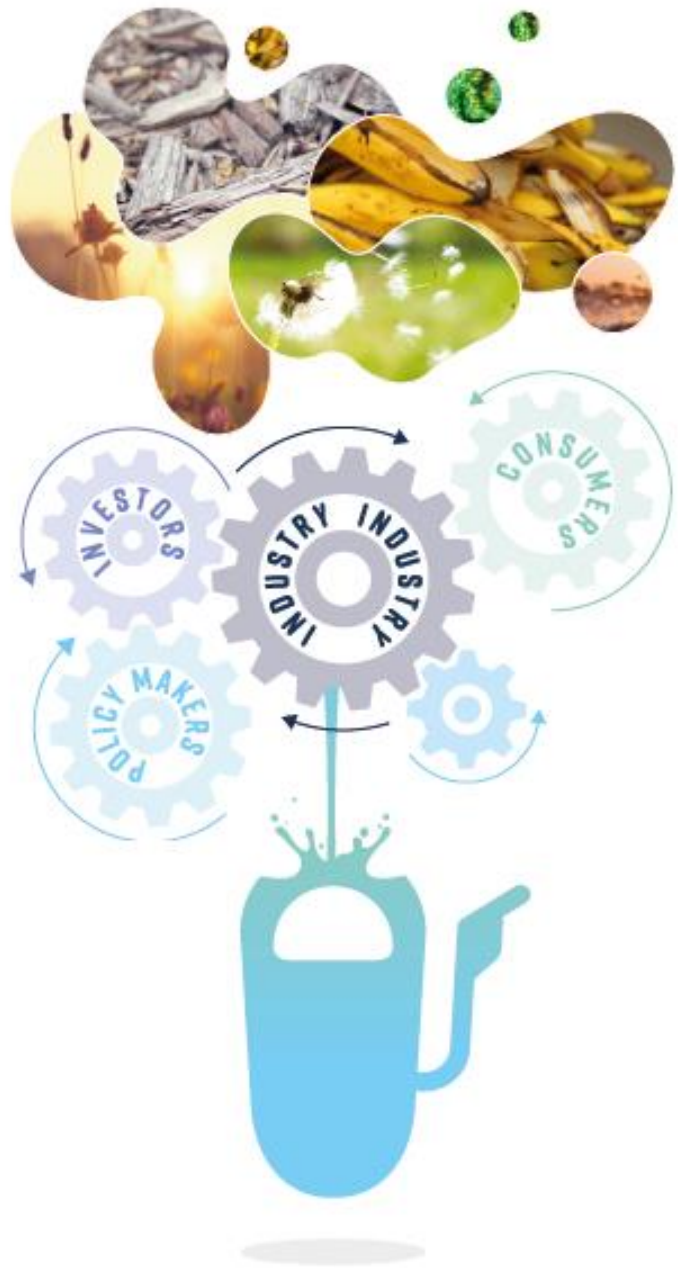
50% reduction of our carbon footprint by 2030

Our refineries will be the hubs for the development of innovative technologies and the use of new raw materials, renewable energy sources, blue and green hydrogen, and recycled CO₂.

At HELLENIC PETROLEUM Group, we are paving the way for the production of Green Fuels of the Future, responding to the need for reduced carbon emissions in all transport sectors.







Thank you!

Clean fuels for all