Clean Fuels for All

Understanding the Green Deal and the Carbon Budget for Transport out to 2050

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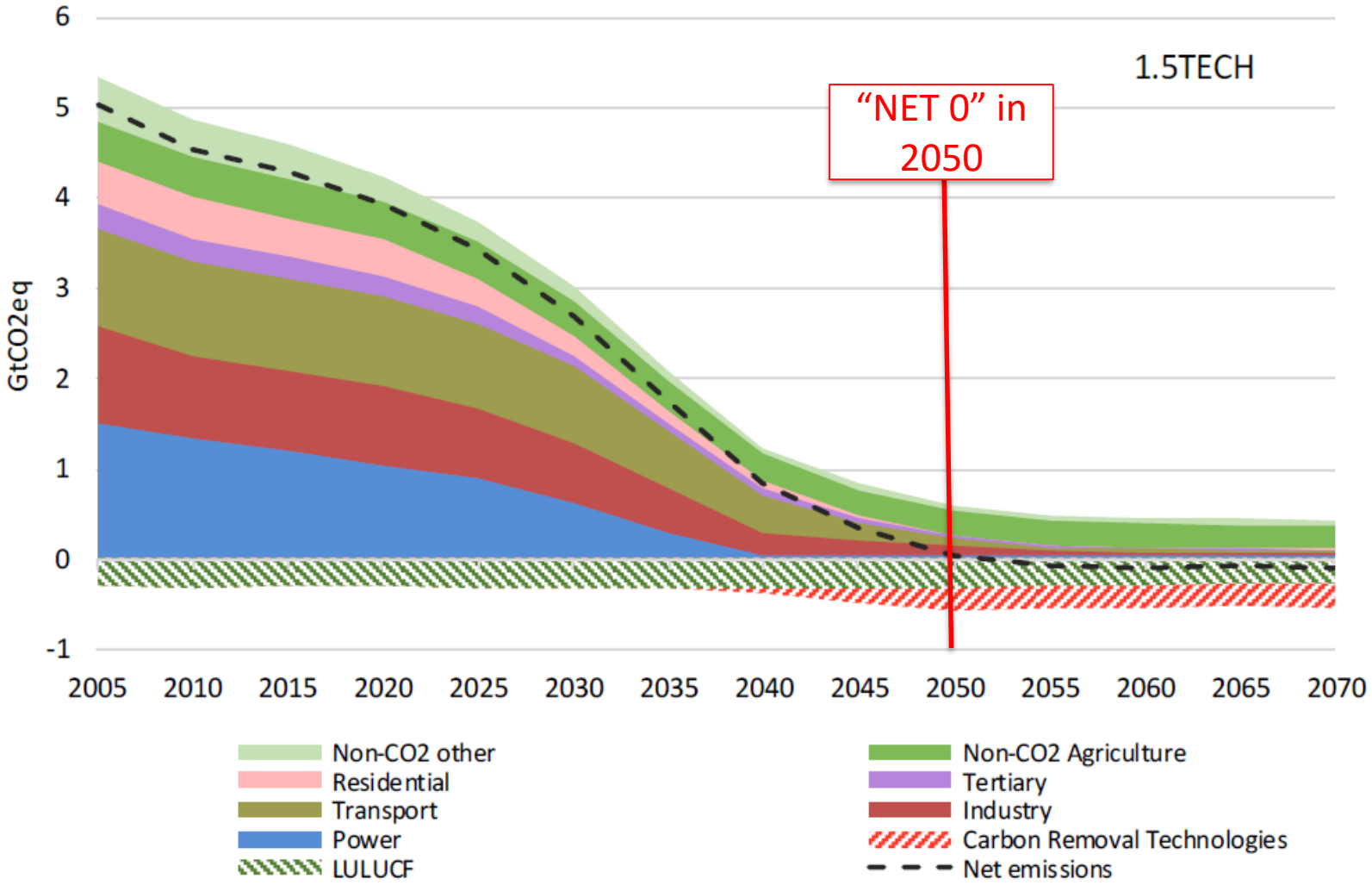
FuelsEurope

FuelsEurope represents 40 Member Companies ≈ 100% of EU Refining

Questions to be addressed

- What does European Climate Ambition mean for Fuels Refining in Europe?
- Will we still need liquid fuels?
- How can we make Liquid Fuels compatible with the policy vision?
- What technologies and investments are required to meet 2050 goals?
- What policies are required?
- How could this strategy work with other aspects of industrial and climate strategy?
- Is this strategy possible?

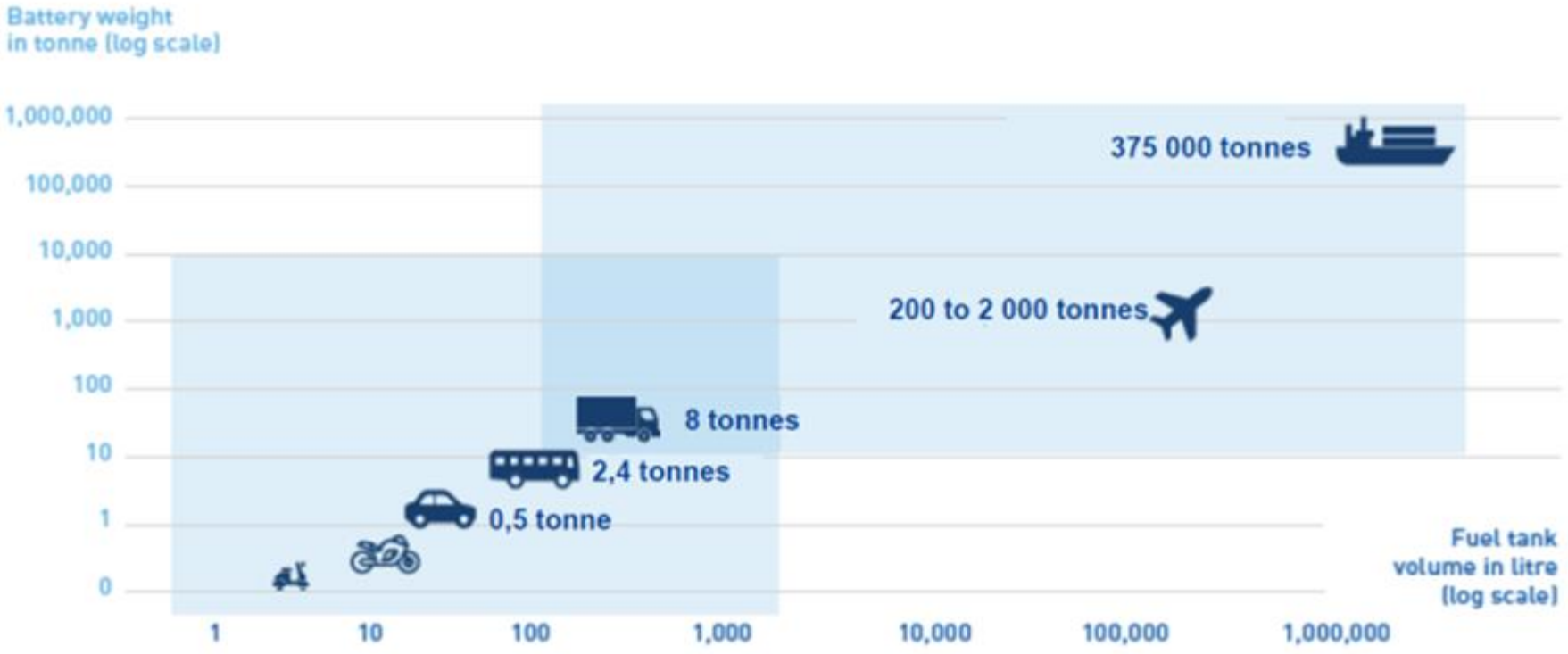
The Commission strategy for 2050 is based on the 1.5 C Tech scenario of “Clean Planet for All”*



* »Clean Planet for All - A strategic vision»: European Commission, November 2018

Decarbonisation of Transport

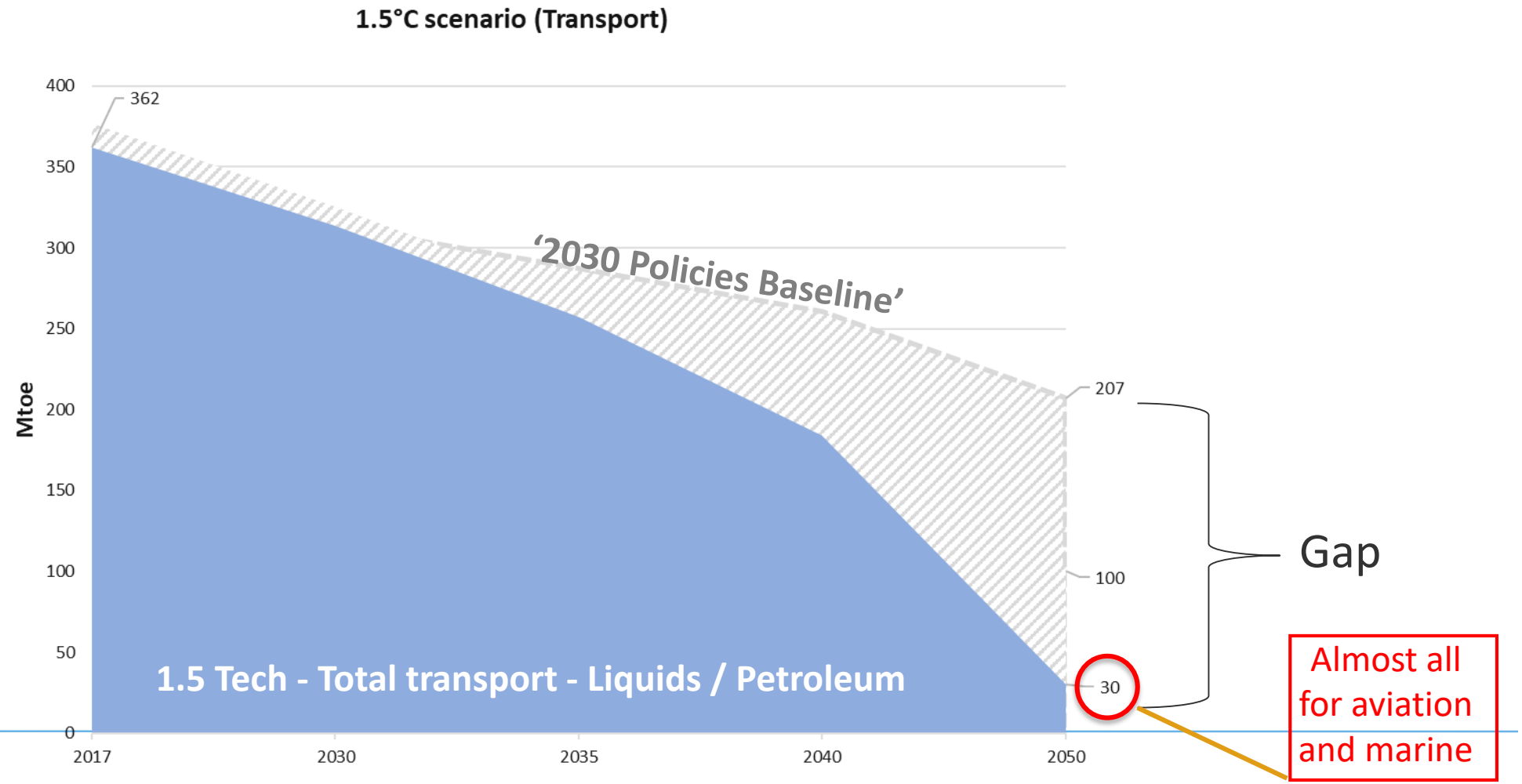
- Limited electrification beyond the bus and the light truck segment.
- For maritime and aviation the density of liquid fuels represents a fundamental advantage.
- A single technological option cannot deliver the EU Green Deal objective



Source: Concawe

Petroleum products used in transport in the 1.5 C Tech scenario vs. the Baseline

The “A Clean Planet for All” (1.5°C Tech) strategic vision requires fossil energy in transport to reduce:



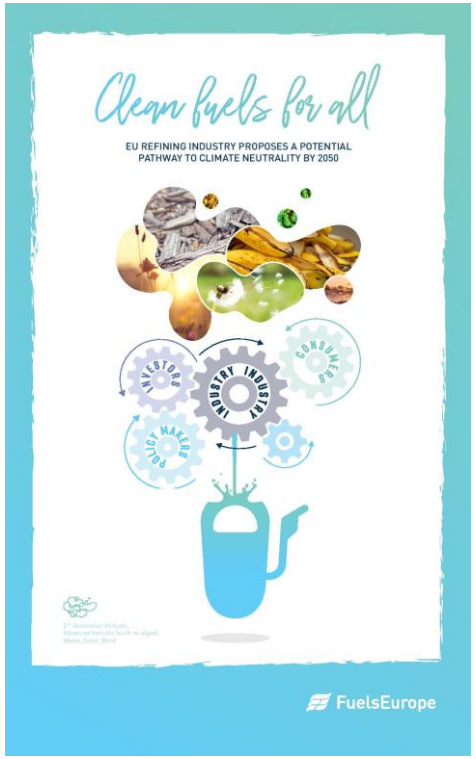
The Clean Fuels for All Strategy

A proposal ...

- FuelsEurope outlines a potential pathway to meet climate neutrality by 2050 and to develop low-carbon liquid fuels for road, maritime, and air transport.
- Investments estimate: between €400 to €650 billion will be needed.
- Our pathway shows how a 100 Mt CO2/y reduction could be delivered in transport by 2035, equivalent to the CO2 savings of 50 million Battery Electric Vehicles (BEVs) on the road.

…and a request

- A combination of critical technologies is needed: to meet the 2050 climate-neutrality goal, low-carbon liquid fuels and electrification/hydrogen in road transport play complementary roles.
- An enabling regulatory framework to create the market conditions and incentivise investments in new low-carbon technologies.



By 2050, at the latest, every litre of liquid fuel for transport could be net climate neutral, enabling so the decarbonisation of aviation, maritime and road transport

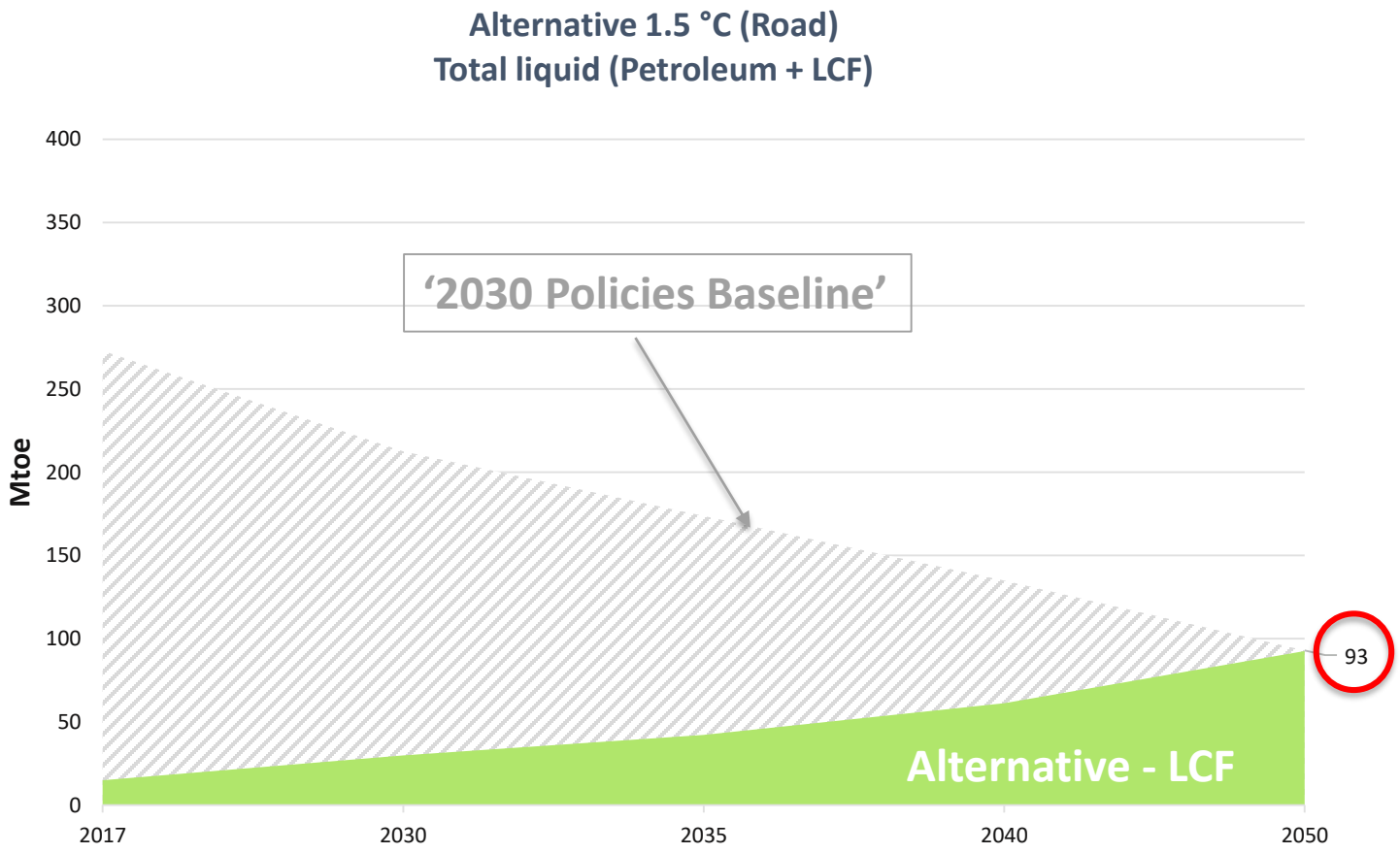
What are Low-Carbon Liquid Fuels?

- Sustainable liquid fuels from non-petroleum origin, produced from new feedstock such as biomass, renewables, waste and captured CO_2.

- With no or very limited net CO_2 emissions during their production and use compared to fossil-based fuels.
- These feedstock are sustainable and comply with the existing EU sustainability standards.
- Low-Carbon Liquid Fuels are complementary to electrification and hydrogen. We will need all technologies to deliver climate neutrality.

The proposal of the Refining Industry for road transport

Same demand as in the “BASELINE “scenario, but ALL covered by low carbon liquid fuels.



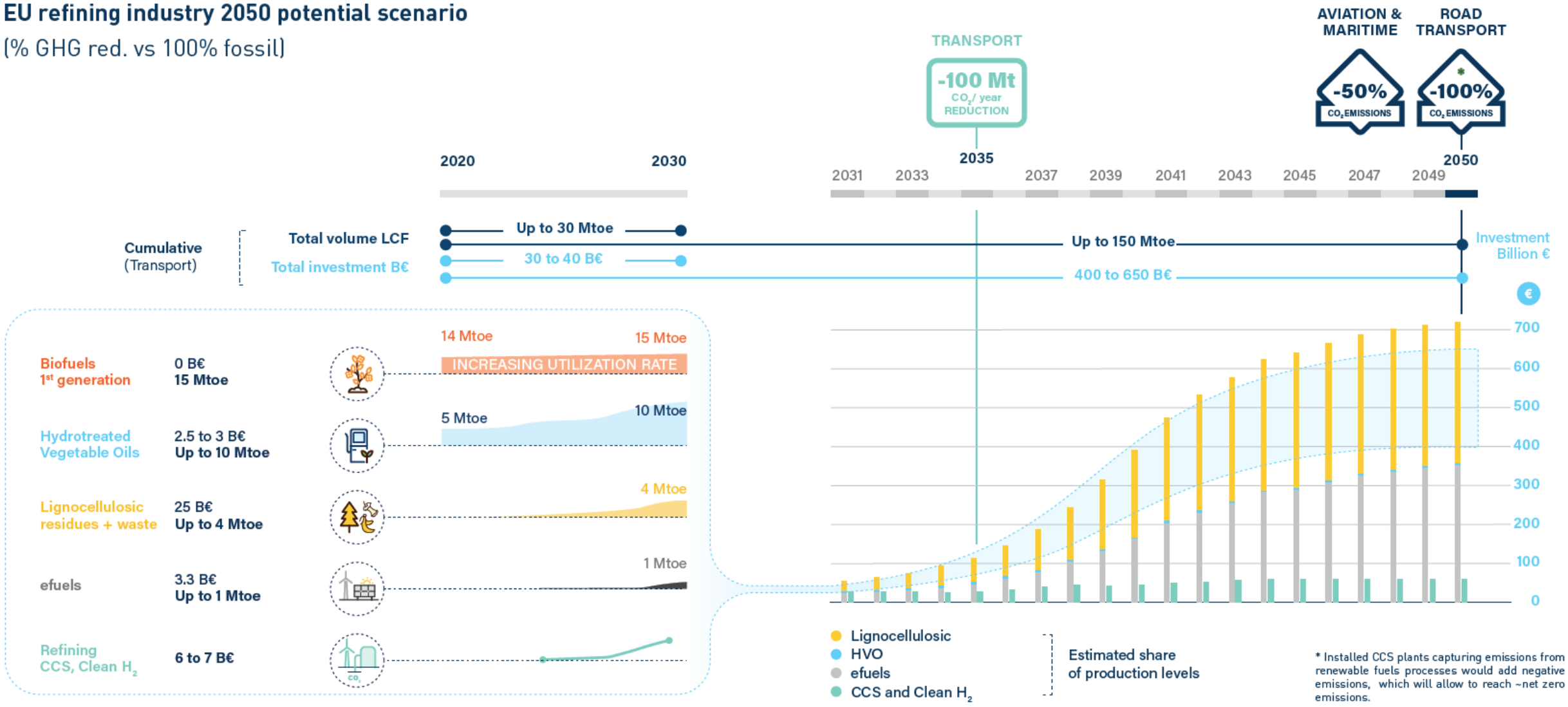
What are the benefits of Low-Carbon Liquid Fuels?

- Liquid fuels have an unrivalled energy density. They are easy to transport and unique characteristics for energy storage.
- Enable the decarbonisation of sectors where no other technological alternatives currently exist - aviation, shipping, and to a large portion, the heavy-duty sectors.
- No new distribution or storage infrastructure needed, and reduces the need for electric fast charging facilities.
- Maintain Europe’s industrial strength and consolidate leadership in Internal Combustion Engine (ICE) and hybrid technologies enabling the creation of new high-skills tech jobs, while preserving jobs in the automotive sector.
- Support the early deployment of many critical Industrial technologies for a low carbon future.

Clean Fuels for All in numbers

EU refining industry 2050 potential scenario

(% GHG red. vs 100% fossil)

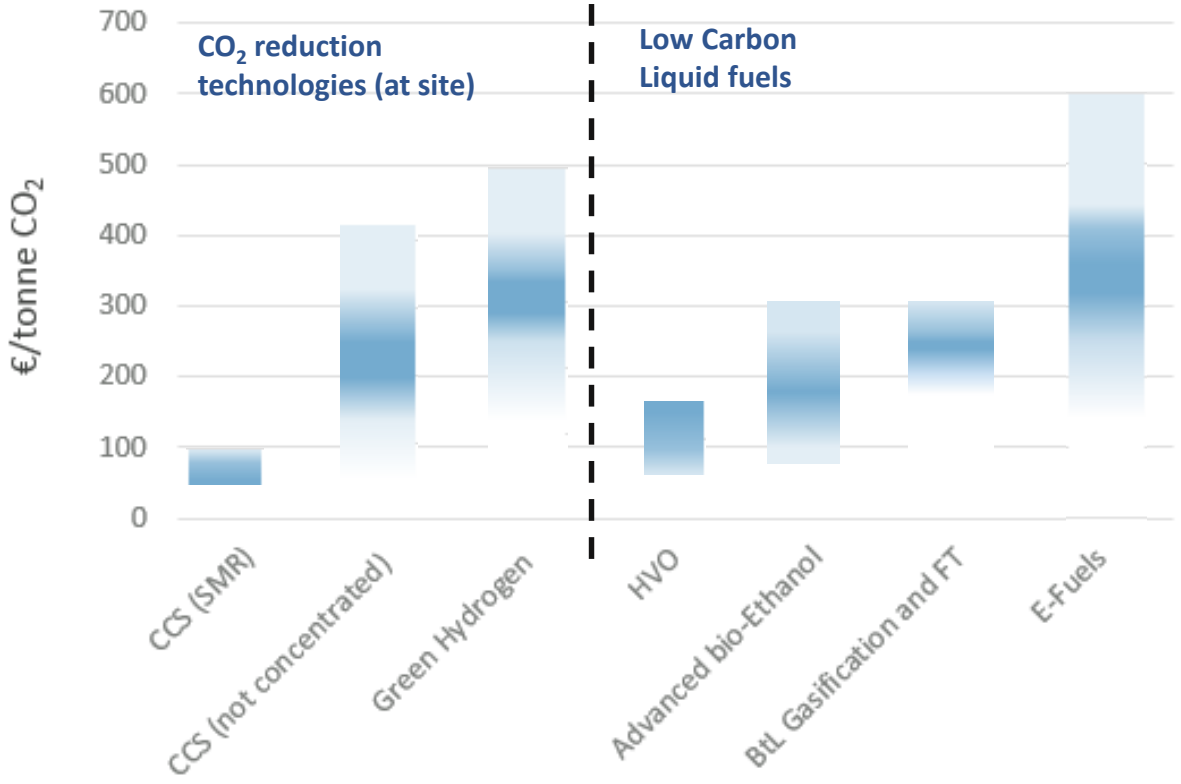


What is the enabling framework we ask policy makers?

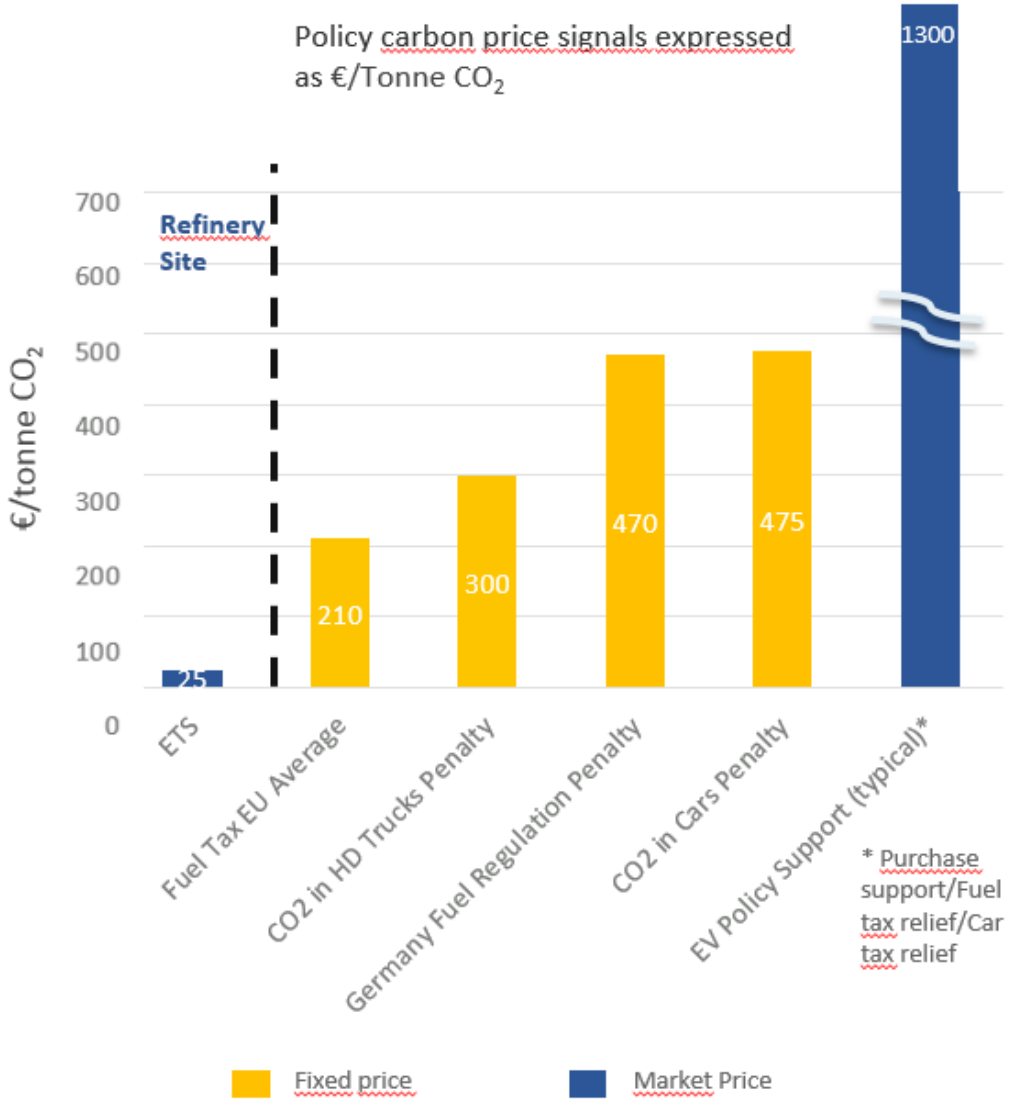
- A regulatory framework that recognises the contribution of Low-Carbon Liquid Fuels to the improved CO2 performance of vehicles, by amending the CO2 standards in vehicles.
- The creation in road transport of a lead-market for low-carbon fuels. Road transport is already strongly regulated and could afford such carbon-price signal.
- To reform and simplify overlapping fuel policies, namely the Fuel Quality Directive and the Renewable Energy Directive.
- To shift from energy taxation to carbon taxation to incentivise investments in advanced renewable fuels.
- A predictable and stable regulatory framework to attract investors.

Low Carbon Fuels: Technology Costs and Policy Price Signals

Decarbonised fuel costs expressed as €/tonne CO_2 avoided.
(Fully-built-up capex + opex costs)



Policy carbon price signals expressed as €/Tonne CO_2



Sources:
Roland Berger, Integrated fuels and vehicles roadmap to 2030+ (2016)
Cerulogy Report: https://www.fuelseurope.eu/publication/cerulogy-study-truckinon/
FuelsEurope Estimates

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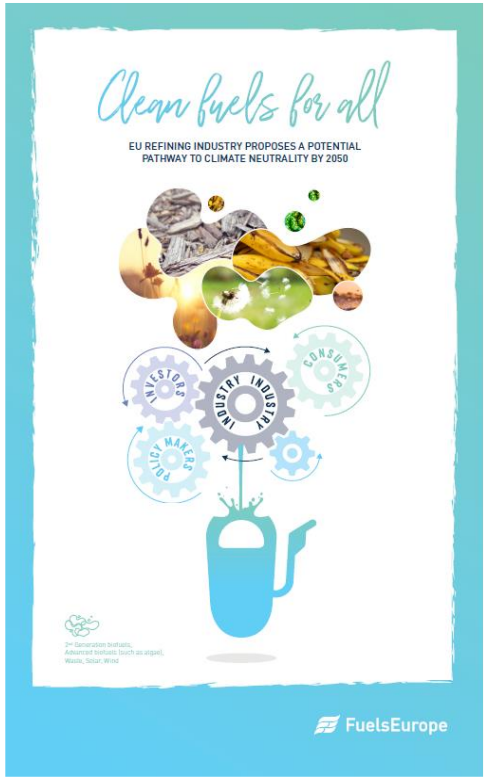
Conclusions

- Europe's climate policy ambition expects only a very small role for petroleum transport fuels in 2050.
- However it will be very difficult to replace all liquid fuels with electricity or hydrogen fuels.
- Liquids remain simply the best form of energy storage and delivery for many forms of transport.
- Using a range of technologies, biomass, waste and residue feedstocks, captured carbon, renewable electricity and clean hydrogen, we can make significant quantities of Low Carbon Liquid Fuels.
- All remaining requirements for liquid fuels in 2050 can be Climate Neutral.
- Production costs are expected to be higher than for petroleum fuels, but this is counterbalanced by ability to use existing storage and distribution infrastructure, and high practicality for users.
- In addition, this strategy has important links and benefits with Industrial strategy and Transport strategy.
- In the context of Europe’s strong climate and taxation policies, this ambitious strategy for the Fuels Refining industry is within reach, from technical, commercial and political aspects.



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Thank you

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