



18th IAEE European Conference

WHY DO WE NEED LOW CARBON AND RENEWABLE FUELS TO DECARBONISE TRANSPORT SECTOR?

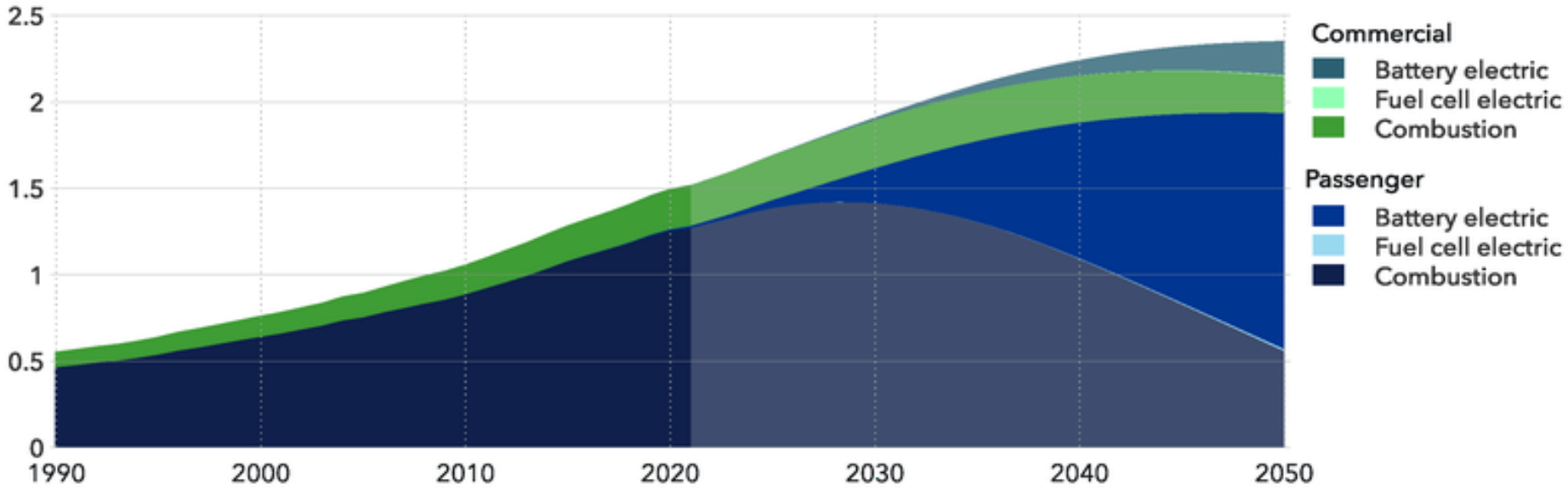
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unem

Milan July 26th, 2023

Light duty and Heavy duty World fleet evolution to 2050

World number of road vehicles by type and drivetrain

Units: Billion vehicles



Combustion vehicles include ICEs and PHEVs

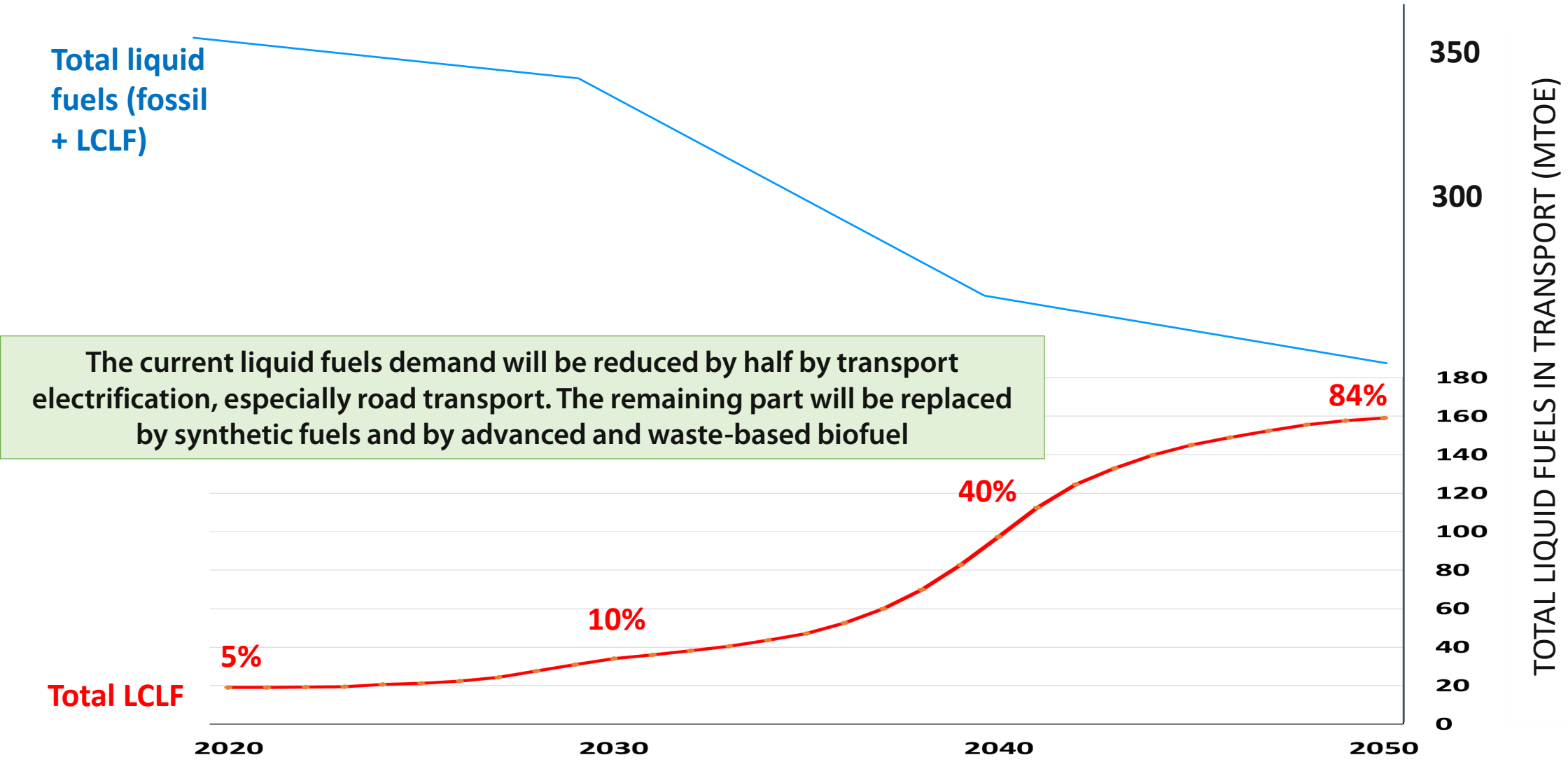
Historical data source: Marklines (2022), IEA EV Outlook (2022), EV Volumes (2022)

The passenger vehicle fleet climbs from 1.2 billion cars today to slightly below 2 billion in 2050, with the ICEV share falling precipitously from 97% to less than 30% by mid-century.

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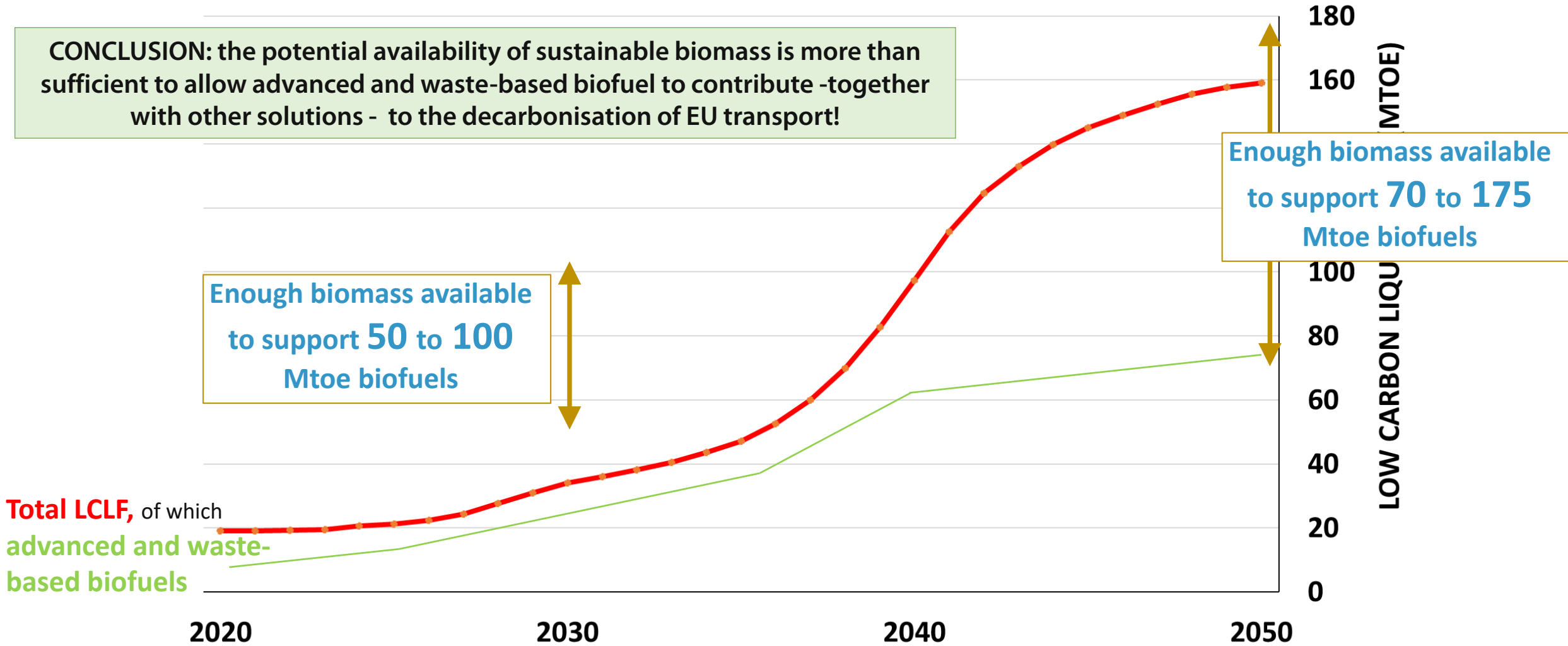
Low-Carbon Liquid Fuels progressively replacing fossil fuels in transport



FuelsEurope's elaboration, based on the Imperial College London Cons. study and Concawe's scenario assuming LCLF in all transport modes



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

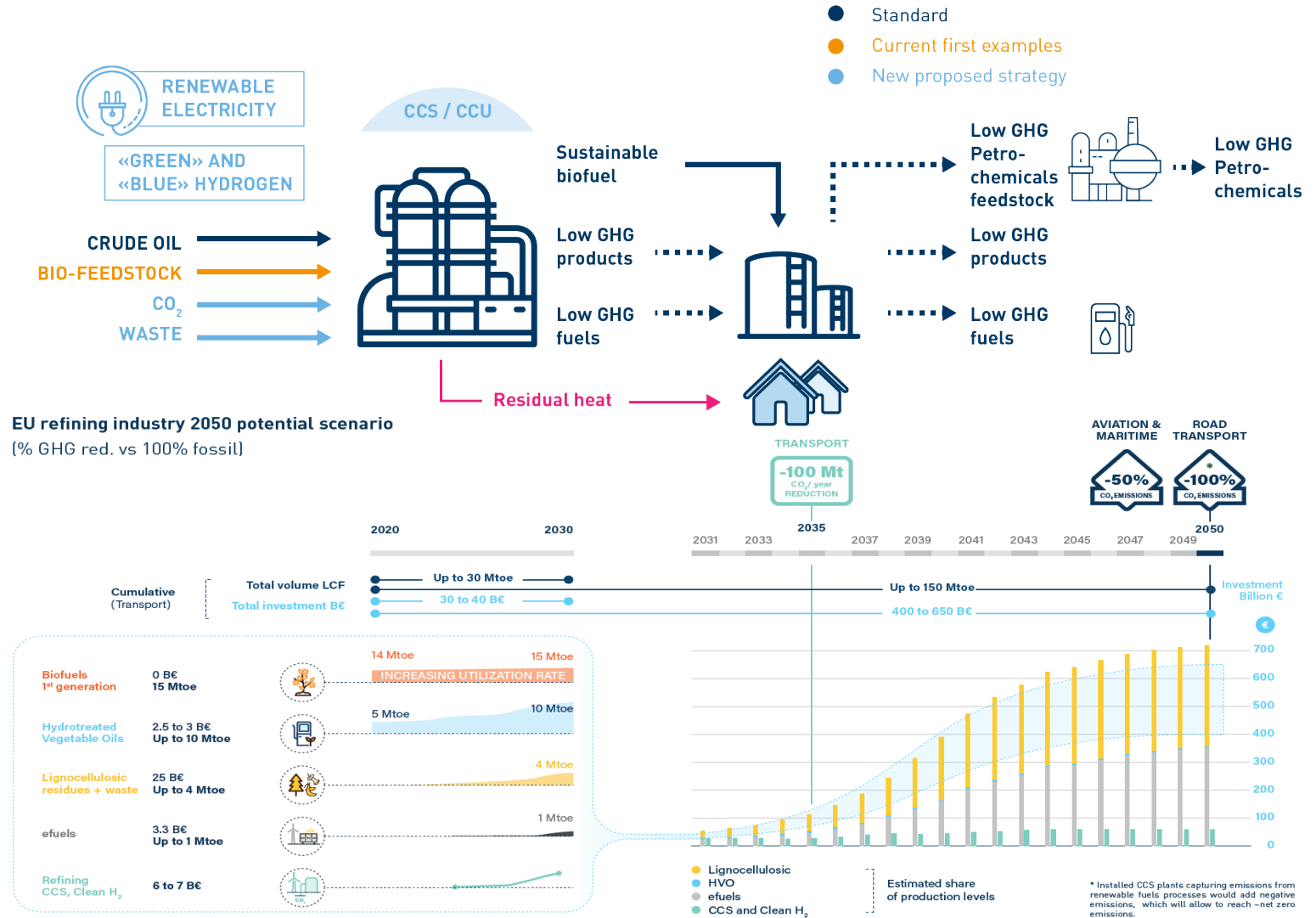


FuelsEurope's elaboration, based on the Imperial College London Cons. study and Concawe's scenario assuming LCLF in all transport modes
<https://www.concawe.eu/publication/sustainable-biomass-availability-in-the-eu-to-2050/>



Refining remains central and strategic for transport

- The low carbon fuels demand will continue to be satisfied by the refining sector in the coming decades.
- Refineries are currently using increasingly quantity of new raw materials (bio, waste, CO₂) until the complete replacements of oil to reach the total decarbonization of the supply chain
- in the short term, traditional and advanced biofuels shares, rapidly increase which in the long term, will be integrated by e-fuels



Carbon neutral fuels make ICE vehicles zero emission vehicles

1. Carbon neutral fuels are perfectly compatible with all internal combustion engines. They can therefore effectively contribute to decarbonize transport by making newly registered vehicles and all existing circulating fleet zero emission vehicles
2. Carbon neutral fuels are fully appropriate to all modes of transport: light and heavy road, off-road, aviation and marine.
3. Carbon neutral fuels embody all the advantages of a liquid energy carrier: a short refueling procedure as well as an enormous energy density, which allows for a greater vehicle range
4. Mass electric mobility would require the total replacement of the circulating fleet, the creation from zero of a capillary battery recharging network, a very deep adaptation of the national electricity grid and extremely expensive solutions for the disposal and recycling of batteries.
5. Thanks to carbon neutral fuels it's possible to mitigate these enormous costs to decarbonize transport
6. The existing logistics and distribution network does not require any investment to carbon neutral fuels to reach all consumers quickly
7. The deployment of carbon neutral fuels would preserve the enormous European competence in the design and construction of internal combustion engines guaranteeing hundreds of thousands of jobs
8. Carbon neutral fuels have high social acceptability as they represent a safe solution that does not change the refueling and use habits of motorists
9. Carbon neutral fuels can be produced in the short and medium term at around 1 euro/litre, economically accessible to all users
10. Carbon neutral fuels can be used all over the world. Developing countries can therefore also create a CO₂-neutral energy supply by themselves



The regulatory framework in transports is not neutral and puts the supply chain at risk



| | New Light Duty and Heavy duty CO2 limits Regulations | | | | |
|-------------------|--|------|-------|-------|------|
| | 2021 | 2025 | 2030 | 2035 | 2040 |
| Auto | 95gr/km | -15% | - 55% | -100% | |
| Van | 147gr/km | -15% | - 50% | -100% | |
| Heavy Duty | 2019 baseline | -15% | - 45% | -65% | -90% |
| City bus | 2019 baseline | -15% | -100% | | |

- **The recently approved EU regulatory framework puts the existence of the entire automotive supply chain at serious risk. We are not referring to the new particularly ambitious CO2 emission limits for cars and vans, that we approve, but to the Tank-to-Wheel measurement system which is partial and technically wrong especially from an environmental point of view. In fact, it does not count the CO2 emissions released into the atmosphere in the production phases of fuels and energy vectors nor those absorbed in the same phases.**
- **It's only an ideological instrument to impose battery-powered vehicles in light and heavy duty road transport in Europe**



- In recent months, the definitive approval of the ban on the sale of new petrol and diesel vehicles from 2035 was questioned by Italy that announced a vote against the law if the ICE cars registration after 2035 will be banned
- Also Germany announced a negative vote if e-fuels have not included into the Regulation
- The negotiation phase ended with a formal commitment by the Commission to allow the registration of vehicles with ICE engines after 2035 on condition that they were powered exclusively with e-fuels
- Biofuels, strongly desired by Italy, were excluded from the agreement but Italy is continuing the battle for their inclusion
- Very recently the ITRE Commission of Parliament adopted the following definition:

“CO₂ Neutral Fuel” means a renewable and/or synthetic fuel as defined by Directive 2018/2001 including biofuel, biogas, biomass fuel, Renewable liquid and gaseous transport Fuel of Non Biological Origin (RFNBO) or a Recycled Carbon Fuel (RCF), where the emissions of the fuel in use (e(u)) can be taken to be net zero, meaning that the CO₂ equivalent of the carbon incorporated in the chemical composition of the fuel in use e(u) is of biogenic origin, or has been avoided being emitted as CO₂ into the atmosphere or has avoided its existing fate”



- In the medium to long term, ICE vehicles will continue to play an important role in all forms of transport and carbon neutral fuels are the only solution to decarbonize these vehicles
- In terms of environmental impact, engines powered by carbon neutral fuels reduce CO₂ by 100% but this is recognized only in a «Well-to-Wheel» approach
- The beneficial effects of carbon neutral are not calculated at all with the current CO₂ Regulation which imposes the Tank-to-Wheel. This is a Regulation that betrays technological neutrality.
- By focusing on a single technology is very dangerous, as the recent energy crisis has demonstrated.
- By betting only on complete electrification and the elimination of internal combustion engines, Europe is making the same very serious mistake. The recent decisions taken during the adopting process of the CO₂ Regulation for cars make it possible to continue to register ICE vehicles if powered exclusively by e-fuels.
- It is a positive opening that needs to be further developed with the inclusion of biofuels setting it at least with a «Well-to-Wheel» approach but it would be better with LCA.





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