

Which alternative fuels to keep on your radar?

23 March 2023 / Theme(s): All articles, New Mobility



The urgency of climate change has encouraged mobility providers around the world to think more deeply and broadly about the solutions they offer, and in particular consider the type of energy used for car and van fleets. The best-known go-to alternative to ICE vehicles is of course BEVs, but three other solutions in various states of progress are also worth keeping in view: hydrogen, bioethanol and e-fuel. Let's take a look at them one by one and examine some of the upsides and drawbacks.

Hydrogen

The first thing to note is that hydrogen is not a primary source of energy per se. It needs to be produced using gas or electricity – in fact 95% of all hydrogen production is dependent on the use of fossil fuels. And while a range of projects make use of green hydrogen, produced by electrolyzers using electricity from renewable sources, the sector is still in its infancy.

The greatest uptake so far has been in the refining and chemicals industries: this plays to what is at once hydrogen's strength in terms of efficiency, and a limitation– it must be used close to the location where it is produced. Transport and storage are complex undertakings, requiring certain pressures and low

temperature, and thus rendering supply chain issues difficult. According to some reports, up to 30% of hydrogen is said to leak when moved from one place to another.

However, the technology remains, broadly speaking, too immature for automotive usage. The offer of vehicles (known as fuel cell electric vehicles or "FCEV") is limited, and it suffers from low energy efficiency and a poor infrastructure network. It's true that France anticipates one day having 1,000 stations... but that's not until 2030.

Still, the news is not all bleak – some strong local projects have developed in countries such as Belgium, which has already enacted laws around renewable hydrogen and transport.

On February 13th 2023, the European Commission (EC) has adopted a Delegated Act of the Renewable Energy Directive around hydrogen, in line with the previous public funding authorization of up to 5.4 billion euros to support a major European research and development project in favour of green only hydrogen. The European Commission has stated that, "In transport, hydrogen is a promising option where electrification is more difficult."

Bioethanol

Bioethanol is the world's most widely used biofuel. It's produced from organic materials, mainly sugar cane and sugar beet, and is also known as E100 or E85 – the latter referring to a mix of 85% bioethanol and 15% petrol. The main producers are the US and Brazil, with Europe trailing a distant third. And by "Europe", we mostly mean France, which currently leads the way in production. Sweden was once a pioneer 20 years ago, and considered bioethanol to be a strategic product, but sales have fallen off over the last decade.

The 2026 "review clause" of the EU's 2035 ICE ban has given the biofuel industry cause for hope, and its main actors are trying to push for an alternative using PHEV based on biofuels. Indeed, a key study from France's IFPEN suggests that a flex-fuel PHEV emits no more CO₂ than the BEV equivalent throughout its life cycle, based on an assumed usage of 150,000 km. Its smaller battery compensates for emissions, while carbon intensity varies from country to country.

A promising alternative, therefore, but one that's constrained once again by a very limited offer: only Ford and JLR sell brand new "flex" models which can run on both petrol and ethanol. Converter kits do exist but are not always compatible with OEM product guarantees. What's more, the current beneficial tax status of ethanol in France – one of the key drivers of its success – is under threat. By way of exception, Brazil makes for an interesting case study. 83.6% of registrations in 2022 were flex fuel vehicles, as the country is one of the world's largest producers, and the price gap vis-à-vis petrol is huge.

Nevertheless, the sustainability of ethanol is still a moot point overall, considering the agricultural resources and methods used in its production like burning of cane, massive use of fertilizers, and water consumption, not to mention the dedication of agricultural terrain to fueling cars rather than feeding people.

E-fuel

Our final alternative is the synthetic gasoline known as e-fuel, first produced in December 2022 in Chile, by mixing green hydrogen and carbon dioxide. The first component is obtained from water, through a process of electrolysis (the separation of hydrogen and oxygen). Meanwhile, the electricity comes from

wind turbines, and the CO2 is captured from the environment by filtering.

This e-fuel could potentially be used in any ICE vehicle. Porsche and Siemens Energy, the co-authors of the project, expect to have produced 550,000 million liters by 2026. However, this alternative, just like the others, raises certain questions. First of all is the prohibitive cost, with one early study estimating the production of the first liter, taking all the factors into account, at a staggering €2825! For prices to become more affordable, considerable upscaling will be necessary. Another obstacle is that some NGOs have produced studies demonstrating that cars running on e-fuel emit more carbon monoxide and ammonia than others. Moreover, the average amount of CO2 emitted by new BEVS powered by the EU electricity grid in 2030 would be around 40% lower than for a petrol car running on e-fuel, taking into account its entire life cycle.

E-fuel has recently become the heart of discussions when Germany has threatened to withdraw on the final vote of 2035 ICE ban if registering cars running on e-fuel is not allowed after the deadline.

There are interesting new options emerging for fleet electrification and as industry leaders, it's important to approach them with an open mind and embrace the possibilities they bring. While electrification has its challenges, full BEV continues to be the most viable solution at present thanks to the significant investment and commitment already allotted to it. However, there is no perfect answer and sustainability remains a concern across all alternatives. Let's continue to explore and evaluate all options, keeping in mind the goal of creating a more sustainable future for all.

Tags: [CO2](#) [alternative fleet](#)

Related articles

- 🔗 [Green bonds to finance green mobility](#)
- 🔗 [Multimobility & how to prepare for future corporate mobility](#)
- 🔗 ['Going green' without going into the red: TCO, data and our Green Scorecard solution](#)
- 🔗 [EV taxation: "Just the tip of the iceberg"](#)
- 🔗 [Plug-in hybrids: a balanced alternative for your fleet?](#)