



ALTERNATIVE FUELS VEHICLES



PROTECTING THE ENVIRONMENT

Executive Summary

Demand for alternatively fuelled vehicles is growing across Europe and is expected to continue over the coming decades ahead. This increased growth in the number of such vehicles brings with it a number of challenges and opportunities for motorists. FIA Region I supports the deployment of alternatively fuelled cars, but believes actions are needed to ensure motorists have the same level of comfort and convenience as they do with traditional vehicles today.

Key recommendations:

- Member States should increase the deployment of charging and fuelling infrastructure and set KPIs to measure their performance
- Motorists should have easy access to information about the location, condition, operation and availability of charging stations
- The pricing of charging and fuelling should be more transparent and there should be multiple payment options offered to consumers
- Information about vehicle costs and emissions performance should be improved at the point of sale
- Alternative fuels should be supported through legislation where they are truly sustainable and can offer significant emissions reductions



Background

The number of alternatively fuelled vehicles (AFVs) on Europe's roads has been steadily increasing across Europe over recent years and in the first quarter of 2019 accounted for approximately 8.5% of all new car sales in the European Union¹.

Over the coming years, sales of AFVs are expected to continue rising. Although some measures have been taken across Europe to support the uptake and usage of AFVs, the continued growth and development of new technologies and fuels in this area will inevitably mean further actions will be required.

This position paper will outline what sorts of measures are needed in order to support the deployment of AFVs and alternative fuels, and where appropriate will highlight the potential to reform and revise appropriate EU legislation². The paper will focus on the in-use measures that could be taken to support the deployment of AFVs and alternative fuels over the coming years.

What is an alternatively fuelled vehicle?

An alternatively fuelled vehicle (AFV) is a vehicle that can run on substances other than the conventional petroleum gas and diesel. Examples include vehicles that run on electricity, biofuels, synthetic fuels, biomethane and natural gas, hydrogen and liquefied petroleum gas.

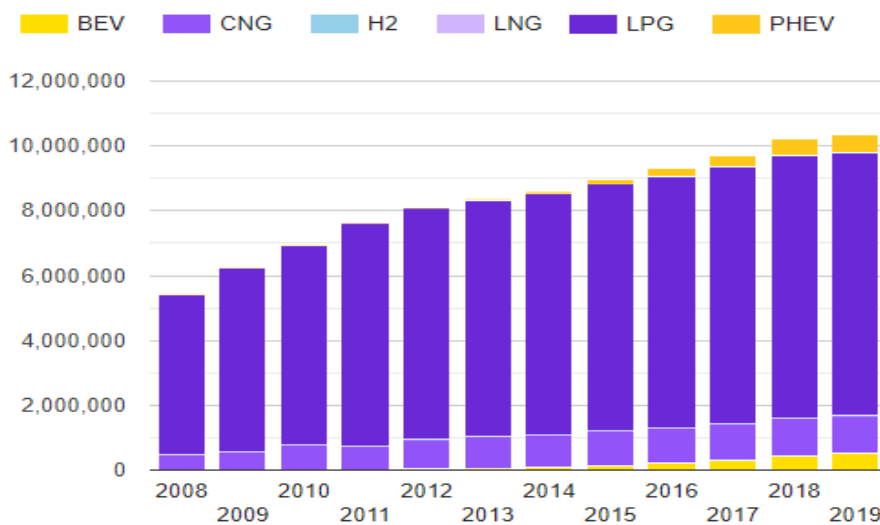


Figure 1 Between 2009 and 2018 there was an 89% increase in the size of the alternatively fuelled passenger car fleet in Europe (EAFO, 2019)

¹ [ACEA](#), Fuel types of new cars: diesel -17.9%, petrol +3.3%, electric +40.0% in first quarter of 2019, 2019

² Relevant legislation includes [Regulation 2019/631](#) on EU CO₂ targets for new cars; [Directive 2014/94/EU](#) on EU Alternative Fuels Infrastructure; [Directive 2009/30/EC](#) on fuel quality; [Directive 2018/2001](#) on renewable energy; [Directive 1999/94/EC](#) on Car CO₂ labelling; [Regulation 2017/1151](#) on euro standards; [Directive 2006/66/EC](#) on batteries; [Directive 2000/53/EC](#) on end-of-life vehicles; and [Directive 2005/64/EC](#) on re-use, recycling and recovery of vehicle parts.



FIA Region I Position

Deployment and types of charging and fuelling infrastructure

Deployment

Although difficult to get an exact picture of the current state of availability of all publicly accessible charging and fuelling infrastructure across Europe, it is widely acknowledged that significant differences in the amounts of such infrastructure exist between European countries.

The EU's AFI Directive (shorthand for the Alternative Fuels Infrastructure Directive (2014/94/EU)) intends on ensuring that greater efforts are taken to secure adequate levels of charging and fuelling infrastructure. It requires EU countries to set out minimum amounts of public fuelling and charging infrastructure for 2022, 2025 and 2030. However, recent analysis by the European Commission concluded that the National Policy Frameworks vary greatly across Europe and in many instances there is little ambition to deploy the necessary infrastructure over the years ahead (JRC, 2019, EC, 2019).

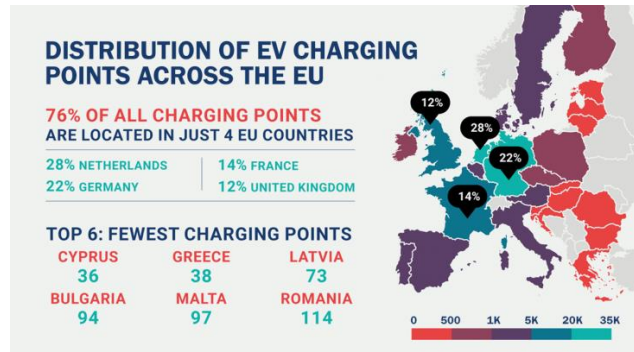


Figure 2 Source: ACEA (2019)

As the number of AFVs is expected to increase over the coming years, in particular battery electric and hybrid vehicles, it is therefore necessary that adequate amounts of charging and fuelling infrastructure are in place across Europe. This should help increase consumer confidence in these vehicles.

Types of charging infrastructure

Not only is the deployment of charging and fuelling infrastructure important in terms of quantity, it is also important that the type of public charging points being deployed is fit for purpose. This is particularly relevant to plug-in electric vehicles where the importance of charging times depends on the use case.

What is slow and fast charging?

As a general rule, slow charging points have a charging rate of between 3.7 and 22 KW and fast charging is considered as anything above or equal to 50 KW.

Studies show that for many users, most charging takes place at home or at the workplace³. Charging facilities should be abundantly available in public locations and fit for purpose, in order to build motorist's confidence. It appears that while slow speed charging options will in most cases be sufficient for home and work charging, other options will be needed for long distance travel on motorways or in urban areas, in order for them to save time when on-the-go⁴. A targeted extension of standardized fast charging infrastructure will be necessary and should be complemented by a dense network of slow charging infrastructure that meets consumer needs and expectations.

³ Some studies indicate that as little as 5% of charging takes place in public locations, (Hardmen et al, A review of consumer preferences of and interactions with electric vehicle charging infrastructure, 2018).

⁴ ICCT, Lessons learned on early electric vehicle fast-charging deployments, 2018



In addition, it is essential that motorists have easy access to information about the locations, condition and availability of charging points, particularly as in some cases stations can be occupied for extended periods of time and/or out of service which will obviously be inconvenient for users.

Finally, charging electric vehicles should ideally be smart, incentivise usage through the use of price signals and allow for bi-directional charging. Smart charging could allow for motorists to save money, ensure against power outages, charge at the most convenient time of day and benefit from selling energy back to the grid.

Recommendations

- The EU's AFI Directive should oblige Member States to deploy adequate amounts of charging and fuelling infrastructure by setting minimum binding targets.
- Public authorities should ensure that the most appropriate forms of charging infrastructure are in place in key public locations, are well maintained and adopt KPIs in order to monitor their performance.
- Information about the locations, condition and availability of charging points should be easily accessible to all motorists.

Interoperability of charging infrastructure

As more public electric charging stations are deployed across Europe, it is essential that drivers understand the price of charging in advance of using a charging point and that making payment is as convenient and easy as it is with fuelling conventional vehicles.

In Germany, the ADAC tested 53 German public electric vehicle charging stations in 2018 and found that there was substantial room for improvement in terms of price transparency⁵. In most cases, the operators' price per unit (KWh) was not indicated on the stations and could only be found via the Internet or a smartphone app. It was also found that several stations did not provide any price information and instead the customer had to wait for an invoice. Similar problems have been experienced by motorists in other European countries and unless tackled properly, the attractiveness of buying an electric vehicle will inevitably be impacted.

Motorists also complain about the payment options at charging stations. Often it is the case that a membership card or a smartphone app is required. This situation is clearly not convenient for the user when they do not have either option and it can be particularly difficult when travelling abroad. Motorists deserve the freedom to choose the most convenient payment method and therefore several options should be offered, and the user should be able to charge without entering a contract.

Another major problem that users of electric vehicles are faced with concerns a lack of transparency and unfair pricing models with time-based tariffs. It is often the case that the rate of charging is negatively affected by variables such as temperature or the number of users at a charge station. This can mean that the user pays according to the amount of time charging but receives much less electricity than expected. Once the battery is close to fully charged, time-based fees may be applied so as to incentivise users to free up the charging facility for other users. The customer should in that

⁵ [ADAC](#), Ladestationen für Elektroautos: Das kostet der Strom, 2019



case be informed about the level of charge and the change in tariff, if necessary by digital communication.

Consumers should have the possibility to compare the different pricing schemes for ad-hoc contract-based charging. In order to make the contracts comparable, they should be based on the electricity received and not on the time the vehicle is plugged in. In addition, to prevent operators from charging excessive fees for ad-hoc charging, a relative tariff cap should be set to ensure that rates are not disproportionately higher than the contract-based pricing options.

The objectives set by the AFI Directive (Art.4) to have 'reasonable, easily and clearly comparable, transparent and non-discriminatory' prices for charging is not realised in practice and calls for stronger EU wide requirements.

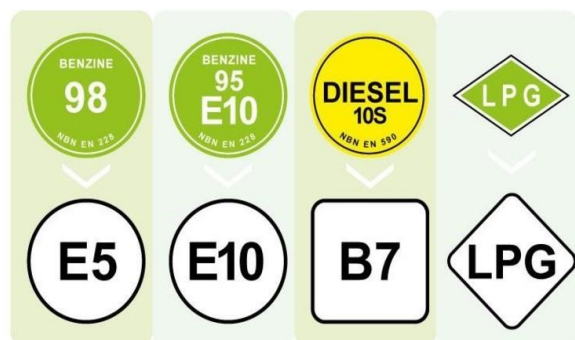
Recommendations

- The AFI Directive should mandate as a minimum requirement, that tariffs are displayed to users based on the amount of electricity charged (e.g. euro/KWh). The prices per unit should be transparent before re-charging and should also be included in the total billing after charging.
- The AFI Directive should address the lack of transparency and comparability with time-based charging price models and consumers should be able to easily compare the cost of charging (both ad hoc and contractual) through online websites.
- The AFI Directive should require that multiple payment options including debit and credit cards are offered at public charging stations and should include provisions enabling charging without entering a contract and without the need for signing up on websites or mobile applications.

Labelling at fuelling stations and charging connectors

When fuelling or recharging a vehicle, motorists are often provided with an array of different options. Deciding on the appropriate fuel pump or charge point to use can be confusing. This is all the more apparent when travelling abroad where labels are displayed in different languages.

Under the EU's AFI Directive (Art. 7), Member States are obliged to ensure that relevant, consistent and clear information is made available to motorists concerning the fuels or the charging points placed on the market. On 12 October 2018, new labels were introduced to clearly indicate the different fuel types for motor vehicles at fuelling stations. These new signs aim at harmonising the way information on fuels is provided across the EU so as to avoid misfuelling.



Examples of the harmonised approach to providing labels of fuels (CEN, 2018)



A new standard has also been developed in 2019 for electric vehicle charging and is planned for deployment by February 2021. Such a measure should better ensure that motorists are aware of the sorts of charging capabilities of electric vehicles.⁶

Having a harmonised approach to the labelling of fuels and chargers across Europe is a welcome initiative but also requires proper implementation across Europe and therefore Member States must ensure that the standards are being applied.

Recommendations

- The European Commission should assess whether or not fuelling stations across Europe have applied the new standardised labels, according to Article 7 of the AFI Directive. New labels for electric charging should be brought to market as a matter of urgency. The information should also be made available online.

Vehicle labelling and measuring emissions

Both the emissions performance of new cars and in-use costs are important factors in the buying decision process for consumers. It is essential therefore that consumers have reliable, relevant, and clear information about these criteria be it for a traditional vehicle or an AFV.

Under changes to EU type approval regulations over recent years, cars are now tested more robustly using the improved WLTP test method and also Real-world Driving Emissions (RDE). This should mean that official type approval tests produce more reliable and realistic information about the emissions and energy consumption for consumers.

It is also important that a fair assessment is made of the complete environmental performance of different vehicles. The EU has agreed to evaluate the possibility of an LCA assessment of new cars by 2023⁷. FIA Region I welcomes this initiative as it should provide more transparency about the environmental performance between vehicles⁸. Over recent years, a number of new voluntary labelling schemes have appeared. FIA Region I is a founding member of the [Green NCAP scheme](#)⁹ that offers reliable and comprehensive information to consumers with tests performed in both the laboratory and on-road testing.

2019 Rating				About 2019 Rating
MAKE & MODEL ↓	OVERALL RATING ↓	CLEAN AIR INDEX ↓	ENERGY EFFICIENCY INDEX ↓	ENGINE ↓
Nissan LEAF 40 kWh N-CONNECTA 4x2 ELECTRIC AUTOMATIC	★★★★★	10.0/10	8.5/10	
Opel/Vauxhall Corsa 1.0 L 4x2 PETROL MANUAL	★★★★☆	9.0/10	6.0/10	
Mercedes-Benz C-Class C220D 4MATIC 4x4 DIESEL AUTOMATIC	★★★★☆	10.0/10	5.3/10	

Example of the Green NCAP ratings of new cars

However, in order to improve the information that consumers get at the point of sale, for all vehicles, it is also important that a revision to the EU car labelling Directive¹⁰, is conducted in order to ensure

⁶ CEN, New CEN standard: CEN adopted EN 17186:2019 on harmonised labels for electric car power supply, 2019

⁷ Regulation (EU) 2019/631

⁸ There is also a growing need for reliable life cycle assessments (LCA) of new cars in order to properly inform consumers. In 2019 ÖAMTC and ADAC developed a new LCA tool for experts.

⁹ See GreenNCAP website (www.greenncap.com)

¹⁰ The car labelling Directive has not had a significant revision since its adoption in 1999.



that consumers are better informed about the emissions performance, energy efficiency and cost performance of new vehicles. Today, the information is often not relevant as neither running costs nor descriptions of national tax benefits applying to new cars are obligatory. It is also not reliable as the data is based on an outdated test (the NEDC) but this is expected to improve as a result of the new WLTP test protocol.

Recommendations

- The EU's car labelling Directive should be revised and require that information is disclosed to consumers about the running costs and any taxation benefits of new cars. Further consideration should also be given to include the air pollutant emissions of new vehicles, should an adequate methodology and labelling format be developed.
- The European Commission should develop an LCA methodology for assessing the emissions performance of different vehicles by 2023.

Alternative fuels for traditionally powered vehicles

Using cleaner fuels in vehicles operating with an internal combustion engine (ICE) is another way of reducing emissions and making a vehicle run more efficiently. This is an important factor to consider being that there are still challenges with regards to the uptake of AFVs and that many conventionally fuelled ICE vehicles will remain on Europe's roads for years to come.

Concerning biofuels, there is also a clear potential for new and advanced biofuels (that source truly sustainable feedstocks) to have a role to play in reducing emissions from road transport. In particular, it appears that biofuels produced from organic waste have potential to reduce emissions over the coming years¹¹. Although in their infancy, further research into such advanced biofuels should be supported and safeguards put in place to ensure their sustainability.

Equally, there is also optimism in the potential for new liquid e-fuels – a synthetic fuel produced from electricity - to help curb emissions. Although e-fuels are relatively costly today and still in their development, the expectation is that their costs will fall over the coming years and if produced sustainably could cut emissions substantially.

The Fuel Quality Directive supports the use of advanced biofuels and e-fuels to help reduce greenhouse gas intensity of transport fuels by a minimum of 6% by 2020. For the period after 2020, the Renewable Energy Directive requires a minimum of 14% of the energy consumed in road and rail transport by 2030 as renewable energy. Advanced biofuels and e-fuels could again be utilised to meet this goal.

Compatibility with alternative liquid fuels should be an integral part of type approval testing and certification of new vehicles. Furthermore, vehicle manufacturers are also encouraged to test and certify the compatibility of vehicles that are in-use with any alternative liquid fuels that subsequently come to market. Information about such tests should be clearly presented to consumers (vehicle certification for instance should include fuel compatibility information) so that they are aware of which fuels are compatible with their vehicle type.

¹¹ [ÖAMTC](#), *Mobilität 2030*, 2018; [International Council on Clean Transportation \(ICCT\)](#), [NNFCC](#), *Wasted: Europe's Untapped Resource*, 2014.



Recommendations

- Member States should support the development and use of truly sustainable biofuels and e-fuels to help reduce emissions from new vehicles and those already in use.
- The CO₂ reductions due to alternative fuels should be part of an LCA analysis and be credited in reducing EU CO₂ fleet targets.

Final thoughts

The expected growth in demand for alternatively fuelled vehicles over the coming years should lead to a positive outcome in reducing air pollution and carbon emissions across the EU. However, there are still many uncertainties with some AFVs from a consumer perspective which could hamper wider uptake. Decision makers must bear this in mind and focus over the coming years on measures to support the deployment of AFVs whilst also taking measures to further reduce emissions from traditionally powered vehicles, so they remain viable and sustainable in the future.

The FIA Region I office engages in European research and innovation programmes to support and promote the development and the deployment of alternative fuelled vehicles, such as:

- The ELVITEN project which focuses on demonstrating the benefits of light electric vehicles (such as e-bikes and scooters);
- The Green Vehicle Index (GVI) project which promotes the development of vehicles that are clean, energy efficient and environmentally friendly.
- The MODALES project which encourages the adoption of driving behaviour and vehicle maintenance that can help lower emissions.

For more information, see the FIA Region I website.



Fédération Internationale de l'Automobile (FIA) Region I office

FIA Region I is a consumer body representing 104 Mobility Clubs and their 36 million members from across Europe, the Middle East and Africa. The FIA represents the interests of our members as motorists, riders, pedestrians and passengers. FIA Region I is working to ensure safe, affordable, clean and efficient mobility for all. Learn more at www.fiaregion1.com

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