Revision of Directive 2014/94/EU on the deployment of alternative fuels infrastructure

This briefing is one of a series of implementation appraisals produced by the European Parliamentary Research Service (EPRS) on the operation of existing EU legislation in practice. Each briefing focuses on a specific EU law that is likely to be amended or reviewed, as envisaged in the European Commission’s annual work programme. Implementation appraisals aim at providing a succinct overview of publicly available material on the implementation, application and effectiveness to date of specific EU law, drawing on input from EU institutions and bodies, as well as external organisations. They are provided by the Ex-Post Evaluation Unit of the EPRS to assist parliamentary committees in their consideration of new European Commission proposals, once tabled.

SUMMARY

Alternative fuels can help to diminish the negative effects on the environment and health caused by both passenger and freight transport. Examples of alternative fuels include: electricity, hydrogen, biofuels, synthetic and paraffinic fuels, natural gas, including biomethane, in gaseous form (compressed natural gas, CNG) and liquefied form (liquefied natural gas, LNG), and liquefied petroleum gas (LPG).

At European Union (EU) level, a directive on the deployment of alternative fuels infrastructure was adopted in 2014, with the aim of boosting the development of standard rules and minimum requirements as regards alternative fuels infrastructure (i.e. electric car recharging stations or natural gas refuelling points) in the EU Member States. However, a revision of the directive is planned for 2021 to take account of the latest technological and market developments.

1. Background

Whereas the energy needs of the EU transport sector rely largely (94 %) on oil, which is mainly imported (as regards crude oil and oil products), developments in recent years show that alternative fuels can successfully be used for all transport modes. In this context, the EU adopted a ‘clean power for transport package,’ which included a proposal for a directive on the deployment of alternative fuel recharging and refuelling infrastructure, which was adopted at EU level in September 2014.

As stated in its Article 1, the Alternative Fuels Infrastructure Directive (AFID) ‘establishes a common framework of measures for the deployment of alternative fuels infrastructure in the Union in order to minimise dependence on oil and to mitigate the environmental impact of transport ... [and] sets out minimum requirements for the building-up of alternative fuels infrastructure, including recharging points for electric vehicles and refuelling points for natural gas (LNG and CNG) and hydrogen, to be implemented by means of Member States’ national policy frameworks’.

The directive defines alternative fuels as ‘fuels or power sources which serve, at least partly, as a substitute for fossil oil sources in the energy supply to transport and which have the potential to contribute to its decarbonisation and enhance the environmental performance of the transport
They include: electricity, hydrogen, biofuels, CNG, LNG, and LPG. The necessary infrastructure includes recharging points for electric vehicles and refuelling points for natural gas (LNG and CNG) and should be implemented as part of every EU Member States' national policy framework. The directive also seeks to improve the coordination of alternative fuel infrastructure development and thereby to increase the long-term security necessary for investment in alternative fuels and alternative fuel vehicle technologies.

The directive set out several requirements for Member States, as regards both the development of a dedicated market and the necessary infrastructure to back it up. In this regard, Member States first had to evaluate the current market situation, set targets for deploying the infrastructure, and establish networks for this infrastructure, to be able to put in place enough recharging stations for electric cars by 2020; enough recharging stations for hydrogen by the end of 2025 (see endnote 2); and enough liquefied natural gas (LNG) refuelling points at seaports by the end of 2025. Member States were also required to submit a report to the European Commission by 2019, on the progress made on implementing their national policy frameworks (NPFs). From 2019 on, a progress report was due every three years.

In the context of new policy developments aimed at reducing emissions in the transport sector and helping to meet climate and environment goals (such as the Paris Agreement, the European Green Deal, and the sustainable and smart mobility strategy) but also considering the assessment of the Member States' national policy frameworks and evaluation of the directive, and stakeholders' feedback, the European Commission announced its intention to review the AFID. According to the Commission's 2021 work programme, a new legislative proposal should be released in the second quarter of the year.

2. EU-level reports and evaluations


The Commission's March 2021 report is based on its reporting obligations under Article 10(3) of the AFID and presents the results of the assessment of actions taken by Member States to implement the AFID and of the development of markets for alternative fuels and alternative fuels infrastructure.

The report gives an overview of the current situation of technological progress and development of the markets. It highlights the promising evolution of the market, in particular for light-duty electric vehicles and buses (both battery-electric and plug-in hybrid), the significant growth of the hydrogen fuel cell vehicles market although from a very low starting point, developments in renewable liquid fuels and synthetic fuels production, and the maturity of the technology for natural gas vehicles and components for compressed natural gas (CNG) and liquefied natural gas (LNG) of both fossil and biological origin. Nevertheless, the report also points out that the registration rates for fuel cell cars, vans and buses remain very low; development of the alternatively fuelled truck market has been slow, with the stock of vehicles (including retrofitted ones) at a very low level; there has been a reduction in the number of brands providing CNG vehicles in recent years; there is not enough data available; and use of liquid biofuels in air transport is only marginal.

The report suggests that the directive's impact on the uptake of alternatively fuelled vehicles and their infrastructure has been positive, and that the existing infrastructure deployment level is sufficient to serve the rather low number of alternatively fuelled vehicles currently on the road. However, it also finds that a comprehensive and complete network of alternative fuels infrastructure is still missing across the EU, and is unlikely to develop under the current legislative framework even if all Member States attain their targets. It points out that a significant acceleration of alternatively fuelled vehicles and related infrastructure is needed to meet the EU's emission reduction targets.
Inception impact assessment (2020)

In the context of the planned AFID revision, the Commission is undertaking an impact assessment. The document outlining the Commission's approach to developing the inception impact assessment notes, on the one hand, that the market for alternative fuels infrastructure has progressed and, on the other, that recent policy initiatives, together with technical and market development, demand accelerated deployment of the alternative fuel infrastructure.

The document indicates four problems the new initiative should tackle: 1) not enough recharging and refuelling points across Member States and modes; 2) no comprehensive network connectivity across borders and modes with minimum coherence in the EU; 3) difficult conditions for the use of alternative fuel road vehicles (especially in the area of electric mobility); 4) poor equipment within current networks, which are unable to provide for adequate integration of a rapidly increasing fleet of electric vehicles into the electricity grids.

The Commission describes the objectives of the planned new initiative, as well possible policy options, such as measures to extend the scope of the regulatory framework, including differentiation for light and heavy-duty road transport infrastructure, ports and airports, to address problems one and two; and measures to strengthen provisions to deploy 'smart recharging infrastructure', in a technologically neutral way, to address problem number four.

State of the art on alternative fuels transport systems in the European Union (2020 update)

This document states that major efforts are needed to address the challenges of reducing oil dependency and greenhouse gas (GHGs) and air pollutant emissions and to achieve the goals set in various European transport policy papers and in the European Green Deal. The analysis points out that developments under the ongoing approaches have shown that: oil will remain the main source of energy for transport in the medium to long term, even if its use is declining; electricity will provide for around 4% of transport energy consumption by 2030 and 11% by 2050; hydrogen should represent around 2% of transport energy demand by 2050; and liquid biofuels will remain at similar levels over time (around 6% of the fuel mix). Within this baseline scenario, the report suggests that emissions from transport (including domestic and international aviation but excluding international maritime) would go down by about 19% between 2005 and 2030 and 38% by 2050. However, relative to 1990 levels, emissions would still be 4% higher by 2030 and only 21% lower by 2050, owing to the fast rise in the transport emissions during the 1990's.

The document presents a number of scenarios in which, with further policy intervention (including more ambitious policies to develop alternative fuel infrastructure), deeper decarbonisation of the transport system could be achieved. However, it points out that uptake will also depend on technological breakthroughs and consumer acceptance.

Sustainable Transport Forum report (2019)

Established by a 2015 European Commission decision, the Sustainable Transport Forum (STF), an expert group on alternative transport fuels, adopted a report in 2019 analysing stakeholders’ views on key policy needs and options for action in alternative fuels infrastructure deployment and consumer services. The report was intended to collect stakeholder opinions for a future-proof policy framework in the area of alternative fuels and infrastructure at EU level, and to contribute to future approaches in relation to AFID, in the context of recent market and technology developments.

The main findings of the report are that the stakeholders’ views coincide on a number of issues. The report notes that most stakeholders believe that as the current situation is insufficient or somewhat insufficient for all alternative fuels and clear legislative minimum requirements should be set up to accelerate the deployment of recharging infrastructure, as well as binding targets as part of a future policy framework. It says that alternative fuel infrastructure should develop as a competitive and
market-driven business and points out the potential negative impacts of the technical unavailability of recharging and refuelling points. It stresses that users should have easy access to information on the location and availability of all recharging points, at no cost, and that roadside indicators/road signs for alternative fuels infrastructure should be harmonised across the EU. It also points out that while ad hoc charging still is a relevant easy-to-use way for users to recharge, smart charging and vehicle-to-grid will be essential to integrate electric vehicles efficiently into the electricity system. The report also offers a number of additional opinions on future market needs, accessibility of alternative fuels infrastructure for people with disabilities; contract-based charging and regulatory needs; cybersecurity threats and a separate EU intervention dedicated to electro-mobility.

Evaluation roadmap (2019)

In accordance with the requirements of Articles 10(3) and 10(5) of the Alternative Fuels Infrastructure Directive, the Commission began an evaluation of its implementation, noting that since the entry into force of the AFID, evolution of the market had been slow. The Commission also pointed out that recent developments at both technological and market level (such as manufacturers’ investments in battery-electric vehicles), combined with environmental commitments at EU and national level, raised questions of interoperability and market design that could warrant additional policy attention. It also pointed out that in a resolution of October 2018, the European Parliament had called on the Commission to revise the current directive.

In the roadmap, the Commission indicated that it would examine and assess: 1) whether the directive and its specific measures had been effective and appropriate to deliver on its key objective; 2) the direct contribution of actions taken by relevant actors and their impacts; 3) to what extent the technical specifications developed under the directive were fit for purpose in view of relevant technological and market developments; and 4) whether the projected results of current implementation practice were sufficient to deliver on the needs of a functioning internal market for alternative fuels and infrastructure and to contribute to reducing dependence on oil and mitigating environmental impacts.

Commission communication on the assessment of NPFs and an action plan on alternative fuels infrastructure (2017)

Following the assessment of the national policy frameworks (NPFs), as envisaged by Article 10(6) of Directive 2014/94/EU, in 2017 the European Commission adopted an action plan to bolster the use of alternative fuels and support implementation of the NPFs.

Assessment of NPFs. Although the Commission found that progress had been made, it found that the number of vehicles and vessels using alternative fuels was still too low and the level of ambition among Member States variable. The Commission concluded that the NPFs were not coherent from an EU perspective, regarding both priorities and ambitions or projected deployment of vehicles and vessels running on alternative energy and the related infrastructure. Moreover, only a few NPFs had set clear and sufficient targets and objectives or suggested support measures.

It identified two main areas where efforts needed to be accelerated: developing the backbone infrastructure in the TEN-T core network and developing the necessary infrastructure in urban and suburban areas. To address these challenges, the Commission estimated the total investment needs for publicly-accessible alternative fuels infrastructure in the EU to be approximately €5.2 billion by 2020 and additional €16 billion to €22 billion by 2025.

Action plan on alternative fuels. The assessment of the NPFs showed that additional actions were needed to accelerate the roll-out of alternative fuels infrastructure, in particular for electric vehicles. In the action plan, the Commission detailed a number of actions which, if well-coordinated among relevant levels, could benefit consumers, industries and public authorities. They referred, inter alia, to: spurring completion and implementation of the NPFs; boosting investment support; enabling
actions in urban areas; increasing consumer buy-in; integrating electric vehicles into the electricity system; and addressing emerging issues.

Impact assessment accompanying the legislative proposal (2013)

In the 2013 impact assessment, the European Commission identified three key obstacles that were inhibiting the deployment of alternative fuels: the high price of vehicles; poor consumer acceptance; and the lack of recharging/refuelling infrastructure, which was caused by multiple market failure.

The impact assessment stressed that the infrastructure for electric, hydrogen and natural gas (LNG and CNG) vehicles was likely to be insufficient in the event of an increase in the uptake of alternative fuel vehicles. In this context, the impact assessment also pointed out that the specific objectives of EU intervention should be: 1) to make sure that recharging/refuelling equipment can be connected and interoperable; and 2) to ensure that investment uncertainty is reduced to a level that would end the 'wait and see' attitude among market participants.

The Commission indicated two (out of four) policy options that could meet these objectives: 1) establishing, at EU level, requirements for alternative fuels infrastructure for Member States; setting out basic criteria for minimum infrastructure coverage, together with binding targets for the most mature fuel technologies (electricity, and LNG for waterborne transport); and providing indicative targets for hydrogen and natural gas (LNG and CNG) for road transport; and 2) setting out requirements for alternative fuels infrastructure for Member States, as well as basic criteria for minimum infrastructure coverage, together with binding targets for electricity, hydrogen, LNG and CNG in road and LNG in waterborne transport.

The two policy options had a lot of similarities. The first gave greater consideration to the economic constraints of the time, and the second addressed the need to give clear signals to the market. The European Commission also suggested that the latter option had also the potential to accelerate the market development of alternative fuels in general and ensure that investments had a greater impact on economic growth.

3. European Parliament resolutions/MEPs' written questions

The Members of the European Parliament (MEPs) have expressed their interest in the deployment of infrastructure for alternative fuels in the EU on a number of occasions. Some of their most recent positions on this topic are presented below.

In its resolution of 25 October 2018, Parliament insisted on the need for action and increased efforts to develop the infrastructure for alternative fuels across the EU. The MEPs called on the Commission to review Directive 2014/94/EU and broaden its scope to include the comprehensive TEN-T network, to replace the current system of NFPs with more efficient instruments, including concrete, binding and enforceable targets; and to increase the financial support to address the projected needs more effectively. The MEPs also highlighted the connection between the availability of alternatively fuelled vehicles, the deployment of alternative fuels infrastructure and consumer demand for these technologies. At the same time, the resolution pointed out that open access to charging points, interoperability of technology and payments, and free choice of suppliers and energy, including renewable energy, were key factors for a functioning system.

In January 2020, MEP Henna Virkkunen (EPP) addressed a written question to the European Commission, noting that data showed that the preferred venues for charging electric vehicles were the home and the workplace and the cost and delays of obtaining a charging station for the home or workplace were related to the installation of the necessary electrical cabling. In this respect, Ms Virkkunen asked the Commission what legislative initiatives the Commission intended to take to incentivise companies and individuals to pre-equip buildings with the right electrical cabling.

The answer given by Ms Simson on behalf of the European Commission, on March 2020, pointed out that the Commission intended to support the deployment of electric vehicle recharging points

4. Other EU institutions

**European Court of Auditors** (ECA). In its 2021 [special report](#), ECA presented the conclusion of its audit on the effectiveness of the Commission’s support for the deployment of EU-wide publicly accessible infrastructure for charging electric vehicles. Although the report acknowledged some progress in the electric vehicle field, such as more harmonised access to different charging networks or promoting a common EU plug standard for charging electric vehicles, the outcome of the European approach is still far from reaching its Green Deal target of 1 million charging points by 2025. The report pointed out a number of obstacles affecting travel across Europe, such as big differences as regards the availability of public charging stations between countries, the lack of harmonised payment systems with minimum requirements, and adequate user information on real-time availability and billing details of charging stations. At the same time, the report found that financing through the Connecting Europe Facility (CEF) did not always go where needed.

Based on its analysis, ECA made five recommendations to the Commission: 1) to propose minimum electrical charging infrastructure requirements across the TEN-T network; 2) to prepare a strategic and integrated EU electro-mobility roadmap; 3) to develop infrastructure and funding gap analyses; 4) to use the infrastructure and funding gap analyses and clarified criteria to strengthen its selection of projects; and 5) to include clauses in project grant agreements to ensure sustainable and equitable access to co-funded infrastructure.

**European Economic and Social Committee** (EESC). In its 2017 [opinion](#) on the action plan for alternative fuels infrastructure, the EESC welcomed the European Commission’s initiatives to decarbonise the transport sector, as well as the prioritisation of measures in urban areas. However, the EESC expressed its concerns on a number of issues. It found that the national policy frameworks (NPFs) were falling significantly short of their stated aims and objectives; the level of consumer involvement and interaction with relevant stakeholders was low; the estimates of the financing required were too low and that the leveraging of funding from the private sector was falling behind. It recommended that the national policy frameworks be reviewed as a matter of urgency by the Commission. Any obstacles, including loss of tax revenue from fossil fuels, should be identified and eliminated by each Member State. It also advocated programmes for rural transport that could include the establishment of infrastructure based on the use of biofuels, originating mainly from agricultural waste and waste from other sources, and the use of bio-digester technology.

**European Committee of the Regions** (CoR). In its 2018 [opinion](#) on delivering on low-emission mobility, the CoR also referred to the current legislation on alternative fuels infrastructure. It expressed its regret that funding and financial resources were often insufficiently accessible to some local and regional authorities (LRAs) and other important parties and pleaded for blended funding – such as access to loans, for example through and with the European Fund for Strategic Investments (EFSI). The CoR also highlighted that a key element would be the best possible integration of alternative fuels infrastructure into individual sustainable urban mobility plans (SUMPs). In this respect, close cooperation with different public and private stakeholders would be essential to ensure a smooth roll-out of alternative fuels in cities. At the same time, the CoR estimated that if the deployment of alternative fuel infrastructure was not in line with consumer expectations and wishes, there would be a risk of a low uptake. It meanwhile stressed that services using alternative fuels, such as public transport and other services, must remain accessible and reliable.
5. Stakeholder opinions / Academic papers

Stakeholder opinions

A number of stakeholders have expressed their views on the deployment of alternative fuels infrastructure. Some of them are outlined below.

The European Association for Storage of Energy (EASE) presented its position on the revision of Directive 2014/95/EU. EASE considered the dedicated policy as being very relevant, but the current legislative approach not very appropriate. EASE expressed support for a new legal act on alternative fuels infrastructure to focus mainly on new emerging transport means and also include rail infrastructure and airport infrastructure for ground movements. It should also cover all infrastructure, whether publicly accessible or not. EASE judged the current NFPs to be only partly sufficient while, at EU level, the directive was not considered the right instrument and EASE suggested that more effective instrument(s) should be considered.

In a recent position paper, the European Automobiles Manufacturers Association (ACEA) considered that a new piece of legislation would be instrumental in reaching the EU’s long-term decarbonisation objectives and achieving carbon neutrality in the transport sector. ACEA made 10 recommendations for the AFID review. It suggested swift adoption and rapid implementation of the new legal proposal; introduction of mandatory targets for Member States; including infrastructure for all alternative fuels in investment plans; including all vehicle segments in the new piece of legislation; guaranteeing the ’right to plug’ (easy access to a charging point – as easy as a petrol or diesel fuel pump); increasing the number of charging points and re-fuelling stations; establishing an EU-wide infrastructure network; improving data quality and monitoring at EU level; and promoting smart charging and flexible pricing; and completing standardisation.

In feedback to the AFID inception impact assessment, Wind Europe stressed the need to: align the definition of ’alternative fuel’ with the Green Deal and the EU recovery plan on the decarbonisation of transport; foster development of the necessary infrastructure for the uptake of zero-emission transport; and boost consumer acceptance and incentives to achieve zero-emission mobility.

Academic papers

Alternative fuels are a topic widely debated in various academic papers, focusing on elements such as the impact of current rules in the EU Members States and within specific transport sectors, interactions with other policy areas, and more specific issues relating to the use of alternative fuels.

By way of example, Joint Research Centre researchers produced an article evaluating the impacts of efforts to deploy electric vehicle (EV) recharging infrastructure in the EU. First, they observed that there is a lack of studies analysing the societal impacts of electric vehicles and infrastructure deployment on a continental scale. They went on to use qualitative and quantitative analyses to observe the likely impact of related plans of the EU Member States. The study found, based on the analysis of the national framework plans, that their impact on recharging infrastructure deployment, EU climate and energy goals, air quality objectives, and reinforcement of the EU’s competitiveness and job creation were rather limited, given their low level of ambition. However, it suggested that while there is a need for Member States to propose more ambitious targets for recharging point deployment, the different national approaches could serve as an inspiring source of best practice.

6. Citizens’ petitions

Parliament has received several petitions relating to alternative fuels infrastructure. For instance, in petition No 0086/2020, a Portuguese citizen expressed concern about major legal obstacles that could undermine free competition and pointed out a number of issues that EU law should provide for: availability of rapid charging stations; charges levied in €/kWh only and not for charging time; possibility to pay by bank card; requirement that no new vehicles be registered in the EU other than
those fitted with combined charging systems and type-2 connectors; requirement that service stations with more than a certain turnover install a rapid charging station with payment by kWh; and EU funding for municipalities enabling them to provide such facilities. In its answer, the Commission underlined the importance of the questions raised and noted that they were covered by the ongoing assessment of the AFID. The Commission also referred to the various EU financing instruments designed to help municipalities and private investors deploy recharging infrastructure.

7. Public consultations

The Commission has organised two public consultations relating to the evaluation of the alternative fuels infrastructure. The first (February to March 2019) received 49 responses (feedback) from different categories of stakeholders. The second (April to June 2020), collected views in the context of the Commission’s intention to review the current directive in 2021. The outcome is pending.

MAIN REFERENCES


ENDNOTES

1 The package included: a communication on an EU alternative fuels strategy [COM(2013)17] for the long-term substitution of oil as energy source in all modes of transport; a proposal for a directive on deployment of alternative fuels recharging and refuelling infrastructure [COM(2013)18]; an impact assessment [SWD(2013)5]; and a staff working document on market conditions, regulations, codes and standards for broad market uptake of LNG in the shipping sector [SWD(2013)4].
2 Article 5 of the directive also specifies that ‘Member States which decide to include hydrogen refuelling points accessible to the public in their national policy frameworks shall ensure that, by 31 December 2025, an appropriate number of such points are available’.
3 The full list is available here.
4 See Section 2 of this briefing.
5 See Section 6 of this briefing.
6 For more detail, see Section 3 of this briefing.
7 ‘By 31 December 2018, the Commission shall, if it considers it appropriate, adopt an Action Plan for the implementation of the strategy set out in the Communication entitled ‘Clean Power for Transport: A European alternative fuels strategy’ in order to achieve the broadest possible use of alternative fuels for transport, while ensuring technological neutrality, and to promote sustainable electric mobility throughout the Union. To that end, it may take into account individual market needs and developments in the Member States’.
8 The Commission indicated that by 6 November 2017, only 8 out of 25 NPFs fully met the NPF requirements.