

POLICY UPDATE

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European Union Alternative Fuel Infrastructure Regulation (AFIR)

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On March 28, 2023, representatives of the European Commission, the European Parliament, and the Council of the European Union (EU) agreed on a compromise for the EU Alternative Fuel Infrastructure Regulation (AFIR). For passenger cars and vans, the regulation will require EU Member States to ensure fast-charging stations at least every 60 km along the core corridors of the Trans-European Transport Network (TEN-T) by 2025. By 2030, this requirement extends to all smaller roads—the comprehensive TEN-T. For trucks and buses, 15% of the entire TEN-T (core and comprehensive) must be equipped with fast-charging stations at least every 120 km by 2025, increasing to 50% by 2027, and 100% by 2030. By 2030, the maximum distance between stations will be 60 km in the core TEN-T and 100 km in the comprehensive TEN-T. These modifications must still be formally adopted by the European Parliament and the European Council; adoptions are expected in late April 2023. This step is considered a formality; no further modifications or delays are anticipated. This update focuses on road transport requirements (the principal focus of the AFIR). A glossary defines the various terms discussed.²

POLICY BACKGROUND

The AFIR is part of the EU's "Fit for 55," a package of regulatory actions to make the EU policies fit for reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels. The European Commission originally proposed the AFIR on July 14, 2021,³ at the same time repealing the 2014 alternative fuel infrastructure directive (AFID).

The proposed AFIR for the first time set legally binding national and EU-wide targets for the deployment of alternative fuels (electricity, hydrogen, and liquefied methane) infrastructure for road vehicles (including passenger cars, vans, trucks, and buses, but excluding 2- and 3-wheelers), vessels, and stationary aircraft. It required Member

- 1 The author thanks Peter Mock, Pierre-Louis Ragon, Felipe Rodriguez, and Chelsea Baldino, for their review of an earlier version of this policy update.
- 2 Definitions for "recharging point," "recharging pool," "recharging station," and "refueling point" are derived directly from the regulation. See <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A52021PC0559>.
- 3 European Commission. (2021). Proposal for a regulation of the European Parliament and of the Council on the deployment of alternative fuels infrastructure, and repealing Directive 2014/94/EU of the European Parliament and of the Council. <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A52021PC0559>.

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States to ensure the installation of at least 1 kW of publicly accessible power recharging output for each battery electric car or van and 0.66 kW for each plug-in hybrid registered in their territories. For cars and vans and trucks and buses, the European Commission set maximum distance- and minimum power output-based targets for 2025, 2030, and 2035, for charging stations along the TEN-T. Targets for the minimum capacity of, and maximum distance between, hydrogen refueling stations for trucks were also included.

The EU's ordinary legislative procedure requires the co-legislators (the European Parliament and the Council of the European Union) to agree on the European Commission's proposal. The Council adopted its position for interinstitutional negotiations on June 2, 2022. The Council stayed close to the Commission's proposal for cars and vans but weakened the proposal for trucks and buses. The European Parliament, in turn, voted on its negotiation position in a plenary on October 19, 2022. The Parliament proposed more ambitious targets, pushing for higher charging station power output requirements for cars, vans, trucks, and buses and faster roll-out of both charging and hydrogen refueling stations. In four rounds of trilogue meetings, representatives of the European Commission, the European Parliament, and the European Council discussed their respective positions. They agreed on a compromise on March 28, 2023.

KEY ELEMENTS OF THE REGULATION

PASSENGER CARS AND VANS

The regulation combines fleet-based and distance-based targets for passenger cars and vans.

Fleet-based targets

Each EU Member State must ensure a total power output of at least **1.3 kW for each battery electric car or van** and **0.8 kW for each plug-in hybrid** registered in their territory is provided through publicly accessible recharging stations at the end of each calendar year.

Once a Member State reaches a share of at least 15% battery electric cars and vans in their vehicle stock (i.e., the total number of all cars and vans on the road in its territory), it can request a derogation from the European Commission to apply lower requirements in terms of total power output or to cease to apply such requirements. The Commission then has 6 months to approve or reject this request.

Distance-based targets

For passenger cars and vans, Member States must ensure the installation of a fast-charging pool along the core TEN-T **every 60 km** in each direction of travel. Each pool must have a minimum installed power output increasing over time to reach 600 kW by the end of 2027 for the core TEN-T and by the end of 2035 for the comprehensive TEN-T. Table 1 summarizes these distance-based targets. For each target year, the charging speed of the highest-power charging point per pool must be at least **150 kW**. A minimum of **two** recharging points must have at least **150 kW** to comply with the 2027 target for the core network and the 2035 target for the comprehensive network.

Table 1. Distance-based targets for recharging stations for passenger cars and vans.

Target date	Scope	Minimum capacity requirement every 60 km (in each direction of travel)
December 31, 2025	TEN-T core	400 kW
December 31, 2027	TEN-T core	600 kW
	50%* of comprehensive TEN-T	300 kW
December 31, 2030	TEN-T comprehensive	300 kW
December 31, 2035	TEN-T comprehensive	600 kW

*A portion of the TEN-T can count towards this percentage coverage requirement, in each direction of travel, only if it is between two recharging pools separated by a maximum of **60 km**.

TRUCKS AND BUSES

The AFIR includes a combined approach of distance-based targets along the TEN-T, targets for recharging infrastructure at safe and secure parking areas, and targets at urban nodes. Table 2 summarizes these targets. As for light-duty vehicles, each charging pool must have a certain minimum installed power output increasing over time to serve more trucks.

For each target year, the charging speed of the highest-power charging point per pool must be at least **350 kW** along the TEN-T and at least **150 kW** at urban nodes. Along the TEN-T **core**, a minimum of **two** recharging points must have at least **350 kW** to comply with the 2027 and 2030 targets. For hydrogen refueling stations, the minimum capacity must be **1 tonne per day**, and the station must be equipped with a **700-bar** dispenser.

Table 2. Distance-based targets for recharging (electricity) and refueling (hydrogen) stations for trucks and buses.

Target date	Scope	Minimum capacity requirement	Minimum distance requirement
December 31, 2025	15%* of core and comprehensive TEN-T	One recharging pool with 1,400 kW of aggregated power	Every 120 km* in each direction of travel
	Urban node	One recharging pool with 900 kW of aggregated power	-
December 31, 2027	50% of core and comprehensive TEN-T	One recharging pool with 2,800 kW of aggregated power in the core TEN-T and 1,400 kW in the comprehensive TEN-T	Every 120 km* in each direction of travel
December 31, 2030	TEN-T core	One recharging pool with 3,600 kW of aggregated power	Every 60 km in each direction of travel
		One hydrogen refueling station	Every 200 km
	TEN-T comprehensive	One recharging pool with 1,500 kW of aggregated power	Every 100 km in each direction of travel
	Urban node	One recharging pool with 1,800 kW of aggregated power	-
One hydrogen refueling station		-	

*A portion of the TEN-T can count towards the percentage coverage requirement, in each direction of travel, only if it is between two recharging pools separated by a maximum of **120 km**.

The regulation also requires Member States to ensure the installation of at least **two** publicly accessible **100 kW** charging stations at all safe and secure parking areas by **December 31, 2027**, and **four** by **December 31, 2030**.⁴

⁴ In addition to recharging and refueling stations requirements for trucks and buses, Member States must ensure that **until January 1, 2025**, an “appropriate number” of publicly accessible **liquefied methane refueling points** are available along the TEN-T **core** to allow for trucks and buses using this fuel to circulate throughout the EU.

Derogations

Member States can apply for derogations from station deployment requirements along the TEN-T for passenger cars and vans and trucks and buses, separately. For roads with a total annual average daily traffic of fewer than 8,500 passenger cars and vans or 2,000 for trucks and buses, and where the infrastructure cannot be justified in socioeconomic cost-benefit terms, **Member States may either be allowed to count one charging pool for both directions of travel or be entitled to reduce by 50% the total power output and hydrogen capacity requirements** for the respective vehicle categories. Both derogations cannot be pursued simultaneously.

For TEN-T roads with total annual average daily traffic of fewer than 3,000 passenger cars and vans or 800 trucks and buses, respectively, **the maximum distance between recharging pools can be increased to 100 km**. When granted, these derogations are reviewed by the Commission every 2 years.

VESSELS AND AIRCRAFTS

For seagoing container and passenger ships, Member States must meet specific shore-side electricity supply requirements (based on port activity levels) at TEN-T core and comprehensive maritime ports by January 1, 2030. For inland waterway ports, at least one installation should supply shore-side electricity at all TEN-T core ports by January 1, 2025, and at all TEN-T comprehensive ports by January 1, 2030. In addition to shore-side electricity requirements, an “appropriate number” of refueling points for liquefied methane must be in place at TEN-T core maritime ports by January 1, 2025.

For aircraft, Member States must ensure that at all TEN-T core and comprehensive network airports, electricity is supplied to stationary aircraft at aircraft contact stands by January 1, 2025, and aircraft remote stands by January 1, 2030, for stands used for commercial air transport operations to embark or disembark passengers and/or to load or unload goods. By January 1, 2030, electricity provided to aircraft must come from the grid or be generated on-site without using fossil fuels. A derogation exists for airports with less than 10,000 commercial flight movements per year averaged over 3 years.

USER-FRIENDLINESS

To enable seamless travel across the EU, several complementing measures have been enacted. All operators must offer the possibility for customers to recharge their electric vehicle on an **ad-hoc** basis and must be **transparent about pricing**, providing the price per kWh, price per minute, price per session, and any other price components, in that order. For hydrogen refueling stations, the price per kg must be clearly provided.

For charge points with a **power output at or above 50 kW** (fast chargers), the ad-hoc price must be **based on a price per kWh**; operators may add an occupancy fee per minute to discourage long occupancy. Moreover, beginning January 1, 2027, **all** charging points with a **power output at or above 50 kW** must be **equipped with payment card readers**. Existing fast chargers along the TEN-T and at safe and secure parking areas must be retrofitted to include a card payment system. Last, all newly built or renovated chargers must be capable of **smart recharging**, meaning that the electricity delivered can be adjusted in real time based on information received through electronic communication.

REPORTING REQUIREMENTS

The regulation includes several reporting requirements. By March 31 of the regulation’s effective year and every year after, Member States must report total aggregated recharging power output, total publicly accessible recharging points, and total

registered battery electric and plug-in hybrid vehicles in their territory on December 31 of the previous year.

Every 2 years, Member States must submit to the European Commission national progress reports (that include progress toward all targets) and policy frameworks (including provisions for areas with no mandatory EU-wide targets, such as private charging). This requirement starts on January 1, 2026, for the policy framework and 2027 for the progress report. These reports will be made publicly available by the Commission.

Last, charging and refueling station operators must make available static and dynamic chargers' data with free and unrestricted access through an application program interface (API) no later than 1 year after the regulation comes into effect. API information must be submitted to the National Access Points, a digital interface set up by Member States to access, exchange, and reuse transport-related data. Member States must ensure data is available by January 1, 2025.

REVISION

By December 31, 2024, the Commission must submit a report dedicated to trucks and buses to the European Parliament and Council focusing on market development and technology readiness. The regulation will undergo a general review by the end of 2026 and then every 5 years. Where appropriate, the Commission can propose to amend the regulation. During the review, two and three-wheelers might be added to the scope.

GLOSSARY

Recharging point: A fixed or mobile, on-grid or off-grid interface that allows for the transfer of electricity to an electric vehicle, which, while it may have one or several connectors to accommodate different connector types, is capable of recharging only one electric vehicle at a time, and excludes devices with a power output less than or equal to 3.7 kW the primary purpose of which is not recharging electric vehicles.

Recharging pool: One or more recharging stations at a specific location.

Recharging station: A physical installation at a specific location, consisting of one or more recharging points.

Refueling point: A facility for the provision of any liquid or gaseous fuel, through a fixed or a mobile installation, which can refuel only one vehicle, one vessel or one aircraft at a time.

TEN-T comprehensive: Encompasses the entire EU's long-distance traffic corridors and is about 100,000 km long.

TEN-T core: Comprises the most important long-distance traffic corridors in the EU and is about 40,000 km long.

Safe and Secure Parking Area: A parking area that meets the criteria for one of four security levels: bronze, silver, gold, and platinum as defined in the Commission delegated regulation (EU) 2022/1012 of 7 April 2022. A 2019 Commission study showed that out of 300,000 available spaces for heavy good vehicles, 7,000 were in certified secure parking areas.⁵

Urban nodes: Urban areas where the TEN-T's transport infrastructure connects with other parts of the TEN-T or with local or regional traffic infrastructure. There are 424 urban nodes.

⁵ European Commission, Protecting lorry drivers and their cargo: European Commission adopts EU standards for safe and secure parking areas, April 7, 2022, https://transport.ec.europa.eu/news/european-commission-adopts-eu-standards-safe-and-secure-parking-areas-2022-04-07_en.