

- **France (FR)**

- **Main messages from the Commission assessment of the NPF**

In its original assessment of the French NPF the Commission concluded:

The French NPF fully addresses the requirements of Article 3. It contains an extensive discussion of the current state and future development of alternative fuels and corresponding infrastructure in the transport sector. For the different fuels and modes, it discusses targets as required by Article 3 of the Directive. However, for some fuels/modes the target commitment is ambiguous, which, at times, makes it difficult to understand the ambition of the French NPF.

The focus of the French NPF is mainly on electric vehicles with estimates of roughly 1.6% EV on the road in 2020. Based on the targets provided, it can be concluded that the aims for recharging infrastructure accessible to the public seem insufficient in comparison with the future estimated EVs. Each department of metropolitan France is already today equipped with at least one recharging point. It seems that the distance requirement on the TEN-T Core Network of one recharging point at least every 60 km is fulfilled. The French NPF also highlights the role that electricity can play in airports for use by stationary airplanes, shore-side electricity supply for inland waterway vessels and seagoing ships in maritime and inland ports of the TEN-T Core Network and in other ports.

The current and targeted number of CNG refuelling points can be considered sufficient, although the NPF does not provide future estimates for CNG vehicles. The NPF focus for CNG is on the TEN-T Core Network and nine French large urban areas. The French NPF emphasizes the role that natural gas vehicles can play for the public transport sector, cleaning vehicles, garbage trucks, and captive fleets of light-duty vehicles. The provided information indicates the fulfilment of the distance requirement of at least one CNG refuelling point every 150 km.

For heavy-duty trucks, the committed target provides the appropriate number of LNG refuelling points, which is strictly necessary in the sense of the Directive and this number is assumed to assure a normal circulation at least within the road TEN-T Core Network. The localisation map confirms the uniform geographical coverage without important gaps and the fulfilment of the distance requirement of at least one refuelling point every 400 km.

The French NPF commits to the provision of LNG bunkering by 2025, at least, on one maritime port of each coastal area of the country: Channel - North Sea, Atlantic and Mediterranean. According to evolving market demand, truck to ship mobile bunkering offers or small fixed points could emerge by 2030 in several inland ports of the TEN-T Core Network. France targets to equip at least three ports with LNG refuelling on its inland waterways.

France has taken steps to promote the deployment of a hydrogen-refuelling infrastructure and funds several ongoing projects in this field. This deployment is based on a bottom-up approach within specific networks and it involves establishing captive fleet clusters. The targets could be revised upwards in the event of a strong increase in the offer of available vehicles and related market conditions.

The French NPF has a big portfolio of measures, the great majority already in effect. These measures are structured in: legislative and regulatory (20), informative (11), incentive (15), call for projects (6), RTD&D (3) and measures for cross-border coordinated actions and

projects funded by EU programmes (11). The measures defined in the French NPF are comprehensive for the following fuels in road transport: electricity, CNG, LNG, and hydrogen. They can be considered exemplary for electric vehicles and the associated infrastructure.

France cooperates with neighbouring countries and other Member States to support EU-wide circulation for AFV and cross-border continuity for AFI. An important enabler for this cooperation is, according to the French NPF the Connecting Europe Facility.

▪ **Overview of requirements' fulfilment from Annex I of the Directive**

Table Error! No text of specified style in document.-1 Checklist Table

Part of the Directive 2014/94/EU	Requirement	Mode of transport / Alternative Fuel (provided in the NIR)		Yes / No
ANNEX I: 1. Legal measures	Information on legal measures, which may consist of legislative, regulatory or administrative measures to support the build-up of alternative fuels infrastructure, such as building permits, parking lot permits, certification of the environmental performance of businesses and fuel stations concessions.	Road, Water, Air / Electricity, CNG, LNG, H2, LPG		Yes
ANNEX I: 2. Policy measures supporting the implementation of the national policy framework	Information on those measures shall include the following elements: <ul style="list-style-type: none"> • direct incentives for the purchase of means of transport using alternative fuels or for building the infrastructure, • availability of tax incentives to promote means of transport using alternative fuels and the relevant infrastructure, • use of public procurement in support of alternative fuels, including joint procurement, • demand-side non-financial incentives, for example preferential access to restricted areas, parking policy and dedicated lanes, • technical and administrative procedures and legislation with regard to the authorisation of alternative fuels supply, in order to facilitate the authorisation process. 	Road, Water, Air / Electricity, CNG, LNG, H2, Biofuels, LPG		Yes
	• consideration of the need for renewable jet fuel refuelling points in airports within the TEN-T Core Network	Air	Biofuels	Yes
ANNEX I: 3. Deployment and manufacturing support	• Annual public budget allocated for alternative fuels infrastructure deployment, broken down by alternative fuel and by transport mode (road, rail, water and air).	Road, Water / Electricity, CNG, LNG		Yes
	• Annual public budget allocated to support manufacturing plants for alternative fuels technologies, broken down by alternative fuel and by transport mode.	All / Electricity		Yes
	• Consideration of any particular needs during the initial phase of the deployment of alternative fuels infrastructures.			No
ANNEX I: 4. Research, technological development and demonstration	• Annual public budget allocated to support alternative fuels RTD&D, broken down by fuel and by transport mode.	Road, Water / Electricity, H2, CNG, LNG		Yes
ANNEX I: 5. Targets and objectives	• Estimation of the number of alternative fuel vehicles expected by 2020, 2025 and 2030	Road / Electricity, CNG, LNG, H2, LPG		Yes
	• Level of achievement of the national objectives for the deployment of alternative fuels in the different transport modes (road, rail, water and air)	Road / Electricity, CNG, LNG, H2, LPG		Yes
	• Level of achievement of the national targets, year by year, for the deployment of alternative fuels infrastructure in the different transport modes	Road / Electricity		Yes
	• Information on the methodology applied to take account of the charging efficiency of high power recharging points	Road	Electricity	Yes
ANNEX I:6 Alternative fuels infrastructure developments	Changes in supply (additional infrastructure capacity) and demand (capacity actually used)	Road / Electricity, CNG, LNG, H2		Yes
Other information reported		All / All		Yes

The checklist shows that most of the requirements of Annex I from the Directive are covered.

In several cases, the French NIR does not offer quantitative information on future AFI targets and AFV estimates for the years required by the Directive (2020, 2025 and 2030) but for different years, based on national strategies (2023 and 2028). In the case of AFV estimates, it only provided information on the natural gas vehicles (including both CNG and LNG vehicles in one category).

Regarding the combination of AF/AFV/AFI with transport mode, electricity and hydrogen are well covered for road transport, while natural gas (including biomethane), biofuels and LPG are partially covered for road transport; hydrogen is partially covered for rail transport; shore-side electricity supply and LNG are partially covered for waterborne transport; electricity supply for stationary airplanes is partially covered for air transport; all the other combinations are absent.

The French NIR reports around 55 measures. Under the Policy and Deployment & Manufacturing sections it was possible to identify 11 AF/transport mode clusters of measures, all assessable.

- ***Quantitative assessment: Vehicles and infrastructure***

The French NIR mentions that the Clean Mobility Development Strategy 2 (*Stratégie de développement de la mobilité propre 2 – SDMP2*) proposal, appended to the Multiannual Energy Programme draft revision, will lay down the guidelines for the decarbonisation of transport and will set new objectives for 2023 and 2028. “*The SDMP2 chiefly clarifies scenarios of trends relating to vehicle fleets, the outlook in terms of increasing the number of recharging points to boost alternative fuels, changes in terms of transport’s consumption of the various energy sources and the proposed guidelines for each of the levers (decarbonisation of the fuel consumed by vehicles, vehicle energy efficiency, control of transport demand, modal shift, optimisation of vehicle use). The estimates presented in the reporting table on the fleet of vehicles using alternative fuels and the targets relating to the number of recharging and refuelling points are therefore based on the objectives of the SDMP2 proposal **which is still awaiting adoption**; as yet these fleet deployment estimates are therefore not French commitments*”. Indeed, in order to carry out the assessment of the French NIR, these indicative targets have been considered, but in a conservative way, according to the following scheme: SDPM2 targets for 2023 are considered as 2025 targets in the NIR; SDPM2 targets for 2028 are considered as 2030 targets in the NIR.

Table **Error! No text of specified style in document.**-2 National AFV estimates and AFI targets established in the NIR at the horizon 2020, 2025 and 2030 and their comparison with the NPF situation

Alternative fuel / Transport mode		2018		2020		2025		2030	
		AFV	AFI public	AFV	AFI public	AFV	AFI public	AFV	AFI public
Electricity / road	NIR	200,250	24,800	616,465	35,000 ⁽¹⁾	2,433,250	100,000 ⁽²⁾	6,929,700	NA
	Change NIR vs NPF [%]			-35.78%	0.00%				
	Attainment [%]			32.48%	70.86%	8.23%	24.80%	2.89%	
CNG / road	NIR	15,306 ⁽³⁾⁽⁴⁾	61 ⁽⁴⁾	11,600 ⁽³⁾	79 ⁽¹⁾	97,800 ⁽³⁾	121 ⁽⁵⁾	207,700 ⁽³⁾	285 ⁽⁶⁾
	Change NIR vs NPF [%]				0.00%		4.31%		
	Attainment [%]			131.95%	77.22%	15.65%	50.41%	7.37%	21.40%
LNG / road	NIR	15,306 ⁽³⁾⁽⁴⁾	20 ⁽⁴⁾	11,600 ⁽³⁾	NA	97,800 ⁽³⁾	25 ⁽¹⁾	207,700 ⁽³⁾	41 ⁽⁶⁾
	Change NIR vs NPF [%]						0.00%		
	Attainment [%]			131.95%		15.65%	80.00%	7.37%	48.78%
LNG / water (maritime)	NIR	NA	4	NA	NA	NA	7 ⁽¹⁾	NA	NA
	Change NIR vs NPF [%]						0.00%		
	Attainment [%]						57.14%		
LNG / water (inland)	NIR	NA	NA	NA	NA	NA	NA	NA	3 ⁽¹⁾
	Change NIR vs NPF [%]								0.00%
	Attainment [%]								
H2 / road	NIR	351 ⁽⁴⁾	20 ⁽⁷⁾	235	NA	9,050	100 ⁽⁵⁾	NA	400 ⁽⁶⁾
	Change NIR vs NPF [%]						233.33%		
	Attainment [%]			149.36%		3.88%	20.00%		5.00%
LPG / road	NIR	156,323 ⁽⁴⁾	1,700	150,000	NA	150,000	NA	150,000	NA
	Change NIR vs NPF [%]								
	Attainment [%]			104.22%		104.22%		104.22%	

Legend:		not applicable
		the value could not be computed
	NA	no value/information provided/available in the NIR

⁽¹⁾ targets from the FR NPF; ⁽²⁾ at least the value indicated since this target refers to 2022; ⁽³⁾ natural gas (CNG+LNG) vehicles; ⁽⁴⁾ data from EAFO since the FR NIR did not provide this information; ⁽⁵⁾ at least the value indicated since this SDMP2 target refers to 2023; ⁽⁶⁾ at least the value indicated since this SDMP2 target refers to 2028; ⁽⁷⁾ data from “VIG’HY l’observatoire de l’hydrogène” (<https://www.vighy-afhypac.org/>) since the FR NIR did not provide this information.

- Road transport
 - Electricity

Vehicles

France recorded 200,250 battery electric and plug-in hybrid electric vehicles in use in 2018 (see Table Error! No text of specified style in document.-2), of which 160,000 ($\approx 80\%$) were passenger cars, 39,600 LCVs, 100 HCV and 550 buses and coaches¹. The French NIR also reports 24,000 PTWs in 2018. The French NIR EV's estimates are 616,465 for 2020, 2,442,300 for 2025 and 6,929,700 for 2030². They consist in a revised estimate for 2020 (35.78% lower than the NPF values), and new estimates for 2025 and 2030. The vast majority of the electric vehicles that France expects to see on the roads in 2030 will be passenger cars (6,200,000 out of which 4,100,000 BEVs), but 710,000 LCVs, 12,000 BEV HCVs, and 7,700 BEV buses and coaches are also foreseen.

The 2018 **attainment** of future EV estimates is 32.48% for 2020 and 2.89% for 2030. According to the assessment methodology described in Section 2.1, the 2018 situation corresponds to an **adequate progress** towards reaching the envisaged EV estimates. The calculated **average annual growth rate** corresponding to the period 2016-2030 for EV fleet evolution planned by France is equal to 34%.

Infrastructure

France recorded 24,800 publicly accessible recharging points in 2018 (Table Error! No text of specified style in document.-2), corresponding to 9,566 normal power ($\leq 22\text{kW}$) recharging stations and to 855 high power ($> 22\text{kW}$) recharging stations. The NIR also mentions that 225,000 private recharging points existed in France in 2018 according to the estimation of the public distribution system operator.

The FR NIR does not specifically provide targets for 2020/2025/2030. However, it states that, “in 2018, the French government and manufacturers pledged to have 100,000 recharging points installed by the end of 2022.” The NIR mentions that the density of recharging points is difficult to foresee because of several uncertainties (e.g. EV fleet numbers and composition (BEV and PHEV), geographical spread of EVs, access to private recharging points, vehicle range and driver behaviour) which prevent the setting of targets for 2025 and 2030. The FR NPF contained a target of 35,000 publicly accessible recharging points for 2020 and a 7,000,000 total target for private and publicly accessible recharging points for 2030.

The French NIR states that the existing recharging infrastructure network (10,421 stations in 2018 and 11,600 stations in 2019) provides a better geographic coverage than the one announced in the NPF for 2020, based on a scenario of 8,150 recharging stations.

The 2018 **attainment** of future publicly accessible recharging infrastructure target is 70.86% for 2020. According to the assessment methodology described in Section 2.1, the 2018 situation corresponds to an **adequate progress** towards reaching these envisaged targets. The calculated

¹ In the case of HCVs and buses and coaches, data corresponds to the values from 2017 since the FR NIR did not provide values for 2018.

² The SDMP2 estimates for EVs (excluding PTWs) and are 1,327,600 for 2023 and 5,296,900 for 2028, respectively.

average annual growth rate corresponding to the period 2016-2025³ for publicly accessible recharging infrastructure evolution planned by France is equal to 23%.

Ratio

Based on the French NIR, the following table shows the ratio between vehicles and publicly accessible recharging points (i.e. sufficiency index) for the pair electricity/road. For the past period 2016-2018, the ratios are inferior to the value of 10 and thus can be regarded as adequate. Instead, for 2020, the sufficiency index exceeds the recommended value and can be regarded as inadequate. For 2025 and 2030, the ratios could be not calculated because of the lack of AFI targets for these specific years.

Sufficiency Index		2016	2017	2018	2020	2025	2030
Road	Electricity	6.75	6.93	8.07	17.61*		

*calculated using the AFI target value provided in the NPF

Information on charging efficiency

The French NIR states that the Corri-door network co-funded by CEF-T can be seen as representative in terms of the utilisation rate of high power (>22kW) recharging points. In 2018, the network of 200 high power recharging points recorded 40,000 recharges with an average duration of 32 minutes. Therefore, they recorded on average a charge time of 18 minutes per day with 0.55 recharges per day (one recharge every 1.825 days).

- CNG

Vehicles

The French NIR does not differentiate between CNG and LNG vehicles, presenting data for natural gas vehicles. For the period 2016-2018, the French NIR only provides the situation for 2017: 12,150 natural gas vehicles in use, out of which 8,200 were LCVs, 1,350 HCVs and 2,600 buses and coaches. According to EAFO, there were 15,306 natural gas vehicles in 2018 in France. In contrast to the NPF, which did not contain natural gas vehicle estimates, the FR NIR presents all the required estimates for the next decade: 11,600 for 2020, 97,800 for 2025 and 207,700 for 2030. The foreseen composition of the natural gas fleet in 2030 is 129,000 LCVs, 70,000 HCVs and 8,700 buses and coaches.

The 2018 **attainment** of future natural gas vehicles estimates is 131.95% for 2020 and 7.37% for 2030. According to the assessment methodology described in Section 2.1, the 2018 situation corresponds to a **slow progress** towards reaching the envisaged natural gas vehicles estimates. The calculated **average annual growth rate** corresponding to the period 2016-2030 for the natural gas vehicle fleet evolution planned by France is equal to 26%.

³ Considering for 2025 the target provided for 2022.

Infrastructure

For the period 2016-2018, the French NIR does not provide numerical information on the existing CNG infrastructure⁴. According to EAFO, there were 61 CNG refuelling points in France at the end of 2018. As targets for the next decade, the FR NIR mentions only the SDMP2 proposal targets that represent the number of stations needed to supply the projected vehicle numbers. Thus, it is stated that France will require at least 121 CNG stations by 2023 and 285 by 2028. Therefore, this assessment considers as conservative target for 2025 at least 121 CNG stations and at least 285 CNG stations for 2030. The FR NPF contained targets of 79 CNG refuelling stations for 2020 and of 116 for 2025. The new considered NIR target for 2025 represents a slight increase of 4.31% compared to the NPF.

The 2018 *attainment* of future public CNG refuelling infrastructure targets is 77.22% for 2020 and 21.4% for 2030. According to the assessment methodology described in Section 2.1, the 2018 situation corresponds to an *adequate progress* towards reaching these envisaged targets. The calculated *average annual growth rate* corresponding to the period 2016-2030 for publicly accessible CNG refuelling infrastructure evolution planned by France is equal to 14%.

Ratio

The ratio between vehicles and publicly accessible refuelling points (i.e. sufficiency index) for the pair CNG/road cannot be computed since the FR NIR provided only information on natural gas vehicles (CNG+LNG).

- LNG

Vehicles

No available data since the LNG vehicles are not discriminated from natural gas vehicles (see Section 5.10.3.1.2).

Infrastructure

For the period 2016-2018, the French NIR does not provide numerical information on the existing LNG infrastructure⁵. According to EAFO, there were 20 LNG refuelling points in France at the end of 2018. As targets for the next decade, the FR NIR mentions only the SDMP2 proposal LNG infrastructure targets that represent the number of stations needed to supply the projected vehicle numbers. Thus, it is stated that France will require at least 17 LNG stations by 2023 and 41 by 2028. The FR NPF contained a target of 25 LNG refuelling stations for 2025. This assessment considers as conservative target for 2030 at least 41 LNG refuelling stations since this value was indicated by SDMP2 for 2028.

The 2018 *attainment* of future public LNG refuelling infrastructure targets is 80% for 2025 and 48.78% for 2030. According to the assessment methodology described in Section 2.1, the progress obtained by France from 2016 until 2018 for public LNG refuelling infrastructure deployment is 47.5% of the overall planned deployment during the period 2016-2030.

⁴ It only provides the situation at the end of 2019, mentioning 110 CNG refueling stations deployed.

⁵ It only provides the situation at the end of 2019, mentioning 34 LNG refueling stations deployed.

Ratio

The ratio between vehicles and publicly accessible refuelling points (i.e. sufficiency index) for the pair LNG/road cannot be computed since the FR NIR provided only information on natural gas vehicles (CNG+LNG).

○ Hydrogen

The FR NIR mentions that the French government adopted the Energy Transition Hydrogen Deployment Plan (*Plan de déploiement de l'hydrogène pour la transition énergétique*) in 2018 which is setting objectives for the deployment of vehicles and refuelling infrastructure that will be appended to the SDMP2 when it is adopted. In this assessment, the objectives from this plan are therefore considered.

Vehicles

According to EAFO, there were 351 hydrogen-powered vehicles in use in France at the end of 2018 (77 passenger cars and 274 LCVs). The French NIR only indicates that around 100 hydrogen-powered passenger cars were in use in 2018, while the information for the other vehicles categories is missing. The FR NIR provides estimates of 235 vehicles (220 LCVs, 15 HDVs⁶) by 2020 and 9,050 vehicles (8,700 LCVs, 350 HDVs) by 2025 while the FR NPF had not included any estimate.

The 2018 **attainment** of future hydrogen vehicles estimates is above 100% for 2020 and 3.88% for 2030. According to the assessment methodology described in Section 2.1, the **progress** obtained by France for hydrogen vehicles deployment from 2016 until 2018 versus the period 2016-2030 could not be computed because the 2030 estimate is absent.

Infrastructure

For the period 2016-2018, the French NIR does not provide numerical information on the existing hydrogen refuelling infrastructure⁷. According to “VIG'HY l'observatoire de l'hydrogène”⁸, there were 20 public hydrogen refuelling points in France at the end of 2018. As targets for the next decade, the FR NIR mentions only the total⁹ hydrogen infrastructure targets from the hydrogen plan: 100 hydrogen stations by 2023 and 400 by 2028. This assessment considers as conservative target for 2025 at least 100 stations and at least 400 stations for 2030. The FR NPF contained a target of 30 hydrogen refuelling stations for 2025, and therefore the new considered target represents a significant increase of 233%.

The 2018 **attainment** of future hydrogen refuelling infrastructure targets is 20% for 2025 and 5% for 2030. According to the assessment methodology described in Section 2.1, the **progress** obtained by France from 2016 until 2030 for hydrogen refuelling infrastructure deployment is 2.31% of the overall planned deployment during the period 2016-2030.

⁶ The FR NIR provides one single value per year for the merged set of transport systems (HCVs+Buses and coaches+maritime vessels+ inland vessels+locomotives). In this assessment, these numbers are considered to refer to the road vehicle categories HCVs + Buses and coaches.

⁷ It only provides the situation at the end of 2019, mentioning 29 hydrogen refuelling stations deployed mainly with the support of the “Territoires hydrogène” labelling scheme.

⁸ <https://www.vighy-afhypac.org/>

⁹ The plan does not specify differentiated targets between stations open to the public and those for captive fleets.

Ratio

Based on the FR NIR and the assumptions described above, the following table shows the ratio between vehicles and refuelling points (i.e. sufficiency index) for the pair hydrogen/road.

Sufficiency Index		2016	2017	2018	2020	2025	2030
Road	Hydrogen	2.73*		17.55**		90.50***	

* calculated using values provided in the NPF; ** calculated using values from EAFO and “VIG'HY l'observatoire de l'hydrogène” website (<https://www.vighy-afhypac.org/>); *** calculated using AFI targets provided by the Energy Transition Hydrogen Deployment Plan for 2023.

- Biofuels

Vehicles

Information is not available in the FR NIR.

Infrastructure

Information is not available in the FR NIR.

- LPG

Vehicles

For 2018, the French NIR does not provide quantitative information on the LPG fleet in use¹⁰. According to EAFO, France recorded 156,323 LPG vehicles in use in 2018, of which 142,105 were passenger cars and 14,218 LCVs. The French NIR considers that in the next decade the situation will remain constant and provides an estimate of 150,000 vehicles (all passenger cars) for the whole period (Table Error! No text of specified style in document.-2).

Because the French NIR provided decreasing estimates for LPG vehicles, the 2018 **attainment** and **progress** have not been computed.

Infrastructure

For the period 2016-2018, the French NIR provides the same value stating that LPG is sold in almost 1,700 refuelling stations. The NIR considers that “LPG is the alternative fuel that currently has the densest coverage in terms of stations, which are capable of supplying 10 times more vehicles than the current vehicle fleet”.

Because the French NIR did not provide targets for publicly accessible LPG refuelling infrastructure, the 2018 **attainment** and **progress** could not be computed.

Ratio

Based on the FR NIR, NPF and EAFO, the following table shows the ratio between vehicles and publicly accessible refuelling points (i.e. sufficiency index) for the pair LPG/road. The

¹⁰ The FR NIR provides one single value of 210,000 for the merged set of all LPG transport systems across all transport modes for 2017.

sufficiency index for 2020, 2025 and 2030 could not be computed as the targets of infrastructure were not indicated.

Sufficiency Index		2016	2017	2018	2020	2025	2030
Road	LPG	106.89*		91.95**			

* calculated using AFV values provided in the NPF; ** calculated using AFV values from EAFO

- Rail transport
 - Electricity

Information is not available in the French NIR.

- Hydrogen

The French NIR mentions as an AFI deployment measure the plans of SNCF (Société Nationale des Chemins de fer Français) to bring 15 regional hydrogen-powered trains into service on non-electrified lines that are currently covered by diesel trains. This alternative is considered less costly than electrification work and the first trains should come into service in 2022. It is mentioned that the regions will be involved in financing these trains and the State could support the project through the Hydrogen Plan.

- Waterborne transport (maritime)
 - Electricity

Vessels

Information is not available in the French NIR.

Infrastructure

No quantitative information aggregated at national level regarding the shore-side electricity supply points in the maritime ports is provided in the FR NIR. The French NPF contained data on the 2016 situation (at least 1 SSE supply point) and a list of additional targeted ports to provide SSE supply in the future. However, the French NIR noted that the port of Marseille has three existing supply points for five ferries operating between Corsica and the French mainland. For the future, it is mentioned that the South region recently announced its new ‘zero-fume stopovers’ electrification scheme, which should result in all ferry quays being connected by 2023 and the installation of a SSE supply for cruise ships in Marseille port by 2025. The FR NIR presents as well the intention of Dunkirk’s Grand Port Maritime to equip its container terminal with an 8 MW SSE supply point by the end of 2019 that should be able to cater for 7 vessels initially; depending on the needs’ evolution 2 additional supply points could be installed.

- LNG

Vessels

Similarly to the NPF, information is not available in the French NIR.

Infrastructure

The FR NIR presents only information on the current situation without providing details regarding future targets. It mentions that all ports with LNG tanker terminals (Marseille-Fos, Dunkirk, and Nantes-Saint Nazaire) and the port of Le Havre (not having a terminal) currently offer LNG bunkering services by truck. The FR NPF had included a target of seven ports to provide LNG refuelling services by 2025.

The 2018 *attainment* of future LNG refuelling infrastructure targets in maritime ports is 57.14% for 2025. According to the assessment methodology described in Section 2.1, the *progress* obtained by France for LNG refuelling infrastructure deployment in maritime ports from 2016 until 2018 versus the period 2016-2030 could not be computed because of the lack of the 2030 target.

- Waterborne transport (inland)
 - Electricity

Vessels

Information is not available in the French NIR.

Infrastructure

The FR NIR does not provide quantitative targets aggregated at national level regarding the shore-side electricity supply points in the inland ports. The French NPF contained data on the 2016 situation (60 SSE supply points) and a list of additional targeted inland ports to provide SSE supply by 2025. However, the French NIR notes that some waterways not included in the NPF targets offer or are installing SSE supply points. Vienne and Arles (on Rhône river) are provided as examples, having two high-power and seven medium-power SSE supply points. In total, the NIR mentions that the French inland waterway network had at least 110 SSE supply points for inland waterway vessels in 2019 (including 17 around the Seine basin and 91 in the Nord-Pas-de-Calais region). Investments are mentioned for the Seine basin for installing nine SSE supply points, each accommodating two vessels.

- LNG

In contrast to the FR NPF that had provided a target of three inland ports to offer LNG refuelling supply in 2030, the FR NIR does not include any information on this topic.

- Air transport
 - Electricity

Airplanes

Information is not available in the French NIR.

Infrastructure (for stationary airplanes)

No specific quantitative information was provided in the FR NIR on the electricity supply points in airports for stationary airplanes. The NIR mentions that *11 main airports in France have pledged to reduce their fossil fuel consumption; their plans are expected to result in a 20% cut in emissions from aircraft on the ground by 2025 compared to the 2010 reference year. These 11 airports have included objectives on the electrification of aircraft stands in their action plans according to the FR NIR.*

- Biofuels

The FR NIR mentions that a roadmap setting out the government's aims in terms of deployment of biofuels for aviation is under preparation by several working groups including several stakeholders. Sustainable aviation fuels will be deployed in France by adding them to conventional fuels, with targets of 5% by 2030 and 50% by 2050.

Airplanes

No information on flights / airplanes powered by biofuels is provided in the French NIR.

Infrastructure

The FR NIR mentions that *“as aviation biofuels are ‘drop-in’ (i.e. fully miscible with fossil fuels), their distribution at airport hubs will use existing logistics in order to limit their costs and carbon footprint”*. As a next step, a demonstration project involving the use of pipelines to supply biofuels to airports is indicated.

▪ ***Measures assessment***

Similarly to the NPF, a large portfolio of measures for the deployment of alternative fuels in transport is mentioned in the French NIR. The measures presented in the NIR cover a wide variety of types, several alternative fuels and all transport modes (with a focus on road). The policy direction in France is to encourage the move away from fossil fuelled vehicles to AFV (especially zero-emission mobility) and the following documents support the development of alternative fuels strategy:

- the National Low-Carbon Strategy (*Stratégie Nationale Bas-Carbone – SNBC*) setting the strategic guidelines for implementing the transition to a low-carbon and sustainable economy
- the Multiannual Energy Plan (*Programmation pluriannuelle de l'énergie – PPE*), the strategic document for French energy policy, establishing two main priorities: reducing energy consumption, particularly of fossil fuels, and developing renewable energy. In

the transport sector, „the PPE draft revision (PPE2) will set targets for reducing energy consumption and developing electric or plug-in hybrid electric vehicles and for the development of biogas and hydrogen”.

- the Clean Mobility Development Strategy (*Stratégie de développement de la mobilité propre* – SDMP), appended to the Multiannual Energy Programme, laying down the guidelines for the decarbonisation of transport. The SDMP2 proposal¹¹ appended to the PPE draft revision (PPE2) is setting new objectives for 2023 and 2028 (the first SDMP set objectives for 2016-2018).
- The Mobility Framework Act (*Loi d’Orientation des Mobilités* – LOM¹²), providing a set of support measures for the development of the least polluting transport modes and promoting the transition to clean vehicles.
 - Legal measures

The French NIR mentions 23 legal measures, of which 13 in place (where 10 represent the continuation of measures presented in the NPF) and 10 in process of adoption. This fact highlights that the legal framework for alternative fuels is changing and improving in order to speed up the deployment of the related vehicles and infrastructure. The overall level of ambition of the legal measure set is clearly increased in the NIR compared to the NPF. The majority of legal measures refers specifically to infrastructure, and the most numerous cluster is electricity/road that contains 14 measures. Other pairs that include dedicated legal measures are hydrogen/road, electricity/water (maritime+inland), LNG/water (maritime+inland) and electricity/air. Considering all the legal measures, they appear, if fully implemented, to be fit to support the realisation of the AFV/AFI objectives as described in the NPF and NIR.

○ Legislative & Regulatory

There are 18 Legislative & Regulatory measures listed and described in detail in the French NIR. Eight of them are in place representing extensions of those described in the NPF, and two among these were amended in the last period. These eight measures notified in NPF were based mainly on measures derived from the Law No 2015-992 (Act on the Energy Transition for Green Growth, *Loi relative à la transition énergétique pour la croissance verte* – LTECV). The remaining ten measures in the process of adoption are the expression of the intention to overhaul the French legal framework and are based on the provisions of the Mobility Framework Act (*Loi d’Orientation des Mobilités* – LOM) that contains a “set of support measures for the development of the least polluting transport modes and promotes the transition to clean vehicles”. The LOM is aimed at supporting alternative transport systems and fuels: it schedules numerous support measures for the deployment of alternative fuels, by extending or widening existing schemes (e.g. the change of Restricted Traffic Areas to Low-Emission Zones, the strengthening of the right to install recharging points) or by creating new ones based on lessons learned (e.g. reservation of spaces for electric boats in marinas from 2022, authorisation of the reservation of lanes and parking spaces for ultra-low emission vehicles). It also transposes several EU Directives that pave the way for the market entry of alternative fuels vehicles (e.g. AFI Directive, Clean Vehicle Directive, Energy Performance of Buildings Directive). The LOM also sets decarbonisation targets for the land transport sector aiming at full

¹¹ under adoption when the French NIR was submitted

¹² examined at second reading in Parliament when the French NIR was submitted

decarbonisation in 2050 and at banning the sale of new fossil fuel passenger cars and LCVs from 2040.

- Administrative

The French NIR presents five administrative measures, all in place in 2019. Three measures are continuations of NPF measures. The transport modes covered by these measures are road, water-inland and air. Four measures regard electricity as alternative fuel and infrastructure (e.g. setting the conditions for organising the public recharging service at service areas on the concessionary motorway network, specifications relating to the shore-side connection of inland waterway vessels, regulations on the use of means to supply aircraft with power and air-conditioning/heating during stopovers at the aerodromes of Paris-Charles-de-Gaulle, Paris-Orly and Paris-Le Bourget). The decree on air quality certificates is also listed as an administrative measure, with the purpose of the certificates being described as allowing users of the least polluting vehicles to enjoy traffic benefits.

- Policy measures

The significant FR NIR policy measure portfolio proves the high level French involvement in fostering alternative fuels in transport that is continuously improving in the last years. The French NIR reports 18 measures for ensuring national objectives, 2 for public transport and 2 for private recharging infrastructure. The majority of these measures represent financial incentives addressing electricity and hydrogen, and were in place in 2019. Eleven measures appear only in the NIR; of the remaining 11 measures, which are common to the NIR and NPF, 7 were improved in the NIR, therefore the overall level of ambition increased.

- Measures to ensure national targets and objectives

Road transport

The FR NIR comprises a set of 14 policy measures meant to support the achievement of the French AF objectives related to road transport (5 measures appear only in the NIR, 9 are common to the NIR and NPF). They cover all aspects of alternative fuels deployment: AF, AFV and AFI. The majority (12) is represented by financial incentives (sometimes with different conditions depending on the AF).

Within the financial measures in place, the French NIR includes:

- purchase subsidies – bonus (in place since 2008) - in 2018, grants of €6,000 (maximum 27% of the vehicle price) for the individuals or legal persons purchasing a new zero emission passenger car or LCV (previously PHEV were covered), other allowances existing for some M2, N2 or L-category vehicles and for electric bicycles. A plan of limiting the subsidy only to vehicle with a price inferior to a threshold is mentioned for 2020.
- scrappage scheme (in place since 2015 and set to continue at least until 2022) - payment of an allowance for purchasing a new or used passenger car or LCV (or an electric 2- or 3-wheel vehicle or quadricycle that does not use lead batteries) if this is accompanied by the removal from circulation of a diesel passenger car or LCV registered before 2001 or a petrol passenger car or LCV registered before 1997. The allowance scale ranges

from €1,500 to €5,000 depending on the emissions of the replacement vehicle and the household's income.

- tax related incentives
 - tax on the registration of the most polluting vehicles (malus) - staggered additional tax that depends on the amount by which vehicles exceed an emission threshold that regularly changes to take account of developments in the market for passenger cars and LCVs and in the decarbonisation targets of this segment
 - accelerated depreciation for HCVs using natural gas, ethanol, electricity or hydrogen
 - increase in the depreciation ceiling for low-emission passenger cars (emitting less than 60 gCO₂/km)
 - company vehicle tax reduction (since 2016) – calculated based on the value of CO₂ emissions and air pollutant emissions
 - regional taxes on registration certificates – some regions provide an exemption (50% or 100%) to low-emissions vehicles powered by CNG, LPG, electricity and E85
 - benefit in kind – 50% reduction (with a maximum of €1,800 per year) for electric vehicles

Two other types of measures reported in the FR NIR regard a free parking incentive (green disk) for AFV in place since 2008 and the launch of an educational information website on EVs¹³ in 2019.

Waterborne transport

Two foreseen financial measures refer to waterborne transport:

- accelerated depreciation for vessels using LNG
- application of a preferential rate of domestic final electricity consumption tax to increase the attractiveness of shore-side connections.

- Measures that can promote AFI in public transport services

Buses

The French NIR lists two measures promoting electricity in public transport services:

- the Moebus programme that aims to support the purchase of electric buses and the installation of dedicated recharging points
- the partial coverage of the costs of connecting recharging points intended for public transport vehicles (existing but planned to improve with the new LOM law).
 - Measures that can promote the deployment of private electro-mobility infrastructure

The FR NIR lists two existing measures to promote private recharging infrastructure:

- energy transition tax credit for the deployment of recharging points in private homes covering 30% of the cost of one home recharging point, excluding installation costs (planned to evolve in 2020 with the introduction of a fixed amount subsidy of €300 per recharging point)

¹³ Je-roule-en-electrique.fr

- the programme of Aid for the Development of Electric Vehicles through New Recharging Infrastructure (Aide au Développement du Véhicule Électrique grâce à de Nouvelles Infrastructures de Recharge – ADVENIR), launched in 2016 and supported by the system of energy savings certificates through which France funds part of the energy transition. Its aim is to facilitate the installation and partial financing of new intelligent recharging points outside public roads and multi-family buildings (mainly within the multi-family buildings and public enterprises and institutions).
 - The first phase of the programme had a target of 12,000 recharging points being installed before the end of 2018 and the aid for the purchase of the point and its installation amounted to 50% of the cost for individuals and 40% for enterprises, with a variable ceiling between €600 and €1,500, plus €360 in the case of an energy management device being also installed.
 - A new phase was launched in 2019, extending the programme to on-road publicly accessible recharging points with ceilings between €600 and €1,860. In addition, a new scheme will fund 50% of the cost of installing a collective recharging infrastructure in the car parks of the first 3,000 jointly-owned properties that submit an application. The funding will be directed to encourage the establishment of bidirectional recharging points and on-demand programmes (recharging points installed as part of an on-demand programme will receive a bonus of €300).
 - Deployment and manufacturing support
 - AFI deployment

The French NIR presents eight measures fostering AFI: one in place in the period 2016-2018, four existing in 2019 and three in process of adoption. They cover electricity, natural gas including biomethane, and hydrogen.

Five measures represent calls for projects supporting the deployment of infrastructure for road transport:

- electricity – two calls “Vehicles and Transport of the Future” (funding 21,241 recharging points through estimated subsidies of 64.7 million € between 2013 and 2017) and “Recharging infrastructure in non-interconnected areas” (in 2019, funding 13 projects with 3.3 million €) within the “Investing for the Future” programme
- natural gas – two calls “Integrated natural gas mobility solutions” (8 projects submitted in 2017 involving over 381 million € of investment, including 30 million € paid by the State, to install 100 stations on the TEN-T network and to purchase 2,100 HCVs between 2018 and 2022) and “Natural gas and biogas in white areas” (funding the installation of 19 stations and the purchase of 470 vehicles with an estimated support paid of 4.2 million €)
- hydrogen – “Hydrogen mobility ecosystems” call launched in 2019 (funding 11 projects with 35.5 million € to develop ecosystems bringing together renewable hydrogen production, distribution and use for the purpose of mobility in a given territory; opening of 35 stations is expected; a second phase is expected in 2020).

Another mentioned measure refers to the deployment of 15 regional hydrogen-powered trains on non-electrified lines that are currently covered by diesel trains, with the first trains expected to come into service in 2022.

Regarding waterborne maritime transport, the “Zero Fumes Stopover” plan announced by the southern region aims, in the medium term, to drastically reduce GHG and pollutant emissions from vessels moored in the ports of Marseille, Nice and Toulon. The metropolitan areas of Toulon and Marseille have already announced a target for the electrification of all docks by 2023. The plan should also allow the installation of a power supply for cruise ships in Marseille by 2025. In the port of Nice, the plan will support the purchase of power supply equipment using fuel cells. The committed regional budget of 30 million € is expected to be topped up by the State, the “Investing for the Future” programme managed by ADEME and European funds.

- Support of manufacturing plants for AF technologies

The French NIR noted the participation in the European Battery Alliance which is a programme of research, development and industrialisation of fourth generation rechargeable lithium electrochemical cells and batteries built around those cells. In February 2019, 700 million € of State aid were announced to be released for the launch of the programme.

- Consideration of any particular needs during the initial phase of the deployment of alternative fuels infrastructures

Information is not available in the French NIR.

- Quantitative assessment of Policy and Deployment & Manufacturing measures

Table Error! No text of specified style in document.-3 presents an analysis of all the Policy and Deployment & Manufacturing measures, carried out according to the assessment methodology described in Section 2.2. Among the clusters of measures identified in the French NIR, six clusters contain dedicated measures (electricity/road, CNG/road, LNG /road¹⁴, LNG/water-inland, hydrogen/road and hydrogen/rail) while the other five contain general measures addressing combinations of several alternative fuels. For all remaining pairs of AF and transport mode, there are either no measures or the pair is not applicable to France.

¹⁴ CNG/road and LNG/road are addressed together as natural gas within the AFI deployment measures

Table Error! No text of specified style in document.-3 Quantitative assessment of Policy and Deployment & Manufacturing support measures

AF	Transport mode	Score	Comprehensiveness	Impact	Ambition (NIR vs NPF)
Electricity	Road	H	C	H	+
CNG	Road	M	C	M	+
LNG	Road	M	C	M	+
	Water - maritime	L	C	L	+
	Water - inland	L	N	L	+
Hydrogen	Road	M	C	M	+
Biofuels	Road	L	C	L	+
LPG	Road	L	N	L	=
Hydrogen	Rail	M	N	L	+
Electricity	Water - maritime	M	C	M	+
	Water - inland	L	N	L	+

Legend: Score and Impact: H = high; M = medium; L = low; X = not assessable. Comprehensiveness: C = comprehensive; N = Not comprehensive. Ambition level: '+' means 'higher'; '=' means 'comparable'; '-' means 'lower'.

In line with the overall focus in promoting zero-emission mobility reported in the NIR for the recent years, the most numerous cluster is the electricity/road followed by hydrogen/road. The electricity/road cluster contains a comprehensive set of 23 NIR measures, displaying a high overall score and showing an increased level of ambition compared with the NPF. This cluster contains several measures assuring subsidies and tax reductions/exemptions for electric vehicles (especially BEVs) and a significant support for the deployment of recharging points (public and private) with the majority of them improving compared with the NPF situation. The hydrogen/road cluster is formed by a comprehensive set of 13 NIR measures, displaying a medium overall score and showing an increased level of ambition compared with the NPF. The newly introduced measures originate in the 2018 Energy Transition Hydrogen Deployment plan.

In terms of expected impact of these measures to support the realisation of the AFV/AFI objectives as presented in the NPF and revised in the NIR, in some cases, the partial or total lack of future targets and estimates is making difficult putting this assessment into perspective. Based on a comparative analysis with the measures presented in the other NIRs, it seems reasonable to assume that the pairs electricity/road should have a high impact, the measures for the pairs CNG/road, LNG /road, hydrogen/road and electricity/water-maritime should have a medium impact, all the other pairs should have a low impact. Compared to the NPF, the level of ambition of the Policy and Deployment & Manufacturing support measures has increased for all identified pairs with the exception of LPG/road.

- Research, Technological Development & Demonstration

This section contains three measures related to the “Investing for the Future programme”.

The first measure presents the Phases I & II of the programme concerning “Vehicles and Transport of the Future” and contributed with several tens of millions of euro to the funding

between 2011 and 2017 of various innovative projects aiming to launch products on the market in the short term.

The other two measures are related to the Phase III of the programme.

- The “Transport and Sustainable Mobility” section aims to support projects developed by enterprises based in the national territory and deploying technologies resulting from the work of public research laboratories on several priorities, among which “Cleaner and more efficient vehicles” and “Maritime and inland waterway transport”.
- Innovation competition enabling repayable advances and subsidies of 1.7 million € to be granted to various innovative projects proposed by several SMEs and start-ups engaged in developing innovative prototypes, in particular in the field of transport and sustainable mobility. Some of these innovations directly involve alternative fuels, such as rectification blocks for charging batteries, heat exchangers for cooling batteries and small hydrogen stations, magnetic charging systems or foils for electric boats.

▪ ***Additional information on alternative fuels infrastructure developments***

The French NIR contains some information on the changes in fuels use in the transport sector (see Table Error! No text of specified style in document.-4). Electricity and natural gas are foreseen to increase progressively in percentage use during the next decade while LPG present an almost constant trend. No data were provided for the waterborne transport mode.

Table Error! No text of specified style in document.-4 Changes in fuel use in transport sector (2016-2030)

MODE OF TRANSPORT	FUEL	Fuels use [%]			Estimated fuels use [%]		
		2016	2017	2018	2020	2025	2030
Road	Liquid fuels	99.4%	99.2%	99.1%	98.6%	96.4%	
	Electricity	0.2%	0.3%	0.3%	0.5%	1.7%	
	Natural gas	0.2%	0.3%	0.4%	0.6%	1.6%	
	LPG	0.2%	0.2%	0.2%	0.3%	0.3%	
	Total Road	100.00%	100.00%	100.00%	100.00%	99.95%	

▪ **Summary of the assessment**

Tabular overview

Table Error! No text of specified style in document.-5 Overview of the NIR assessment

	Indicators	Alternative fuel / transport mode					H2 / road	LPG / road	
		Electricity / road	CNG / road	LNG / road	LNG / water (maritime)	LNG / water (inland)			
AF Vehicles / Vessels	Past situation (2016)	103,989	12,589 ⁽¹⁾⁽²⁾		NA	NA	30 ⁽¹⁾	181,706 ⁽¹⁾	
	Situation (2018)	200,250	15,306 ⁽¹⁾⁽²⁾		NA	NA	351 ⁽¹⁾	156,323 ⁽¹⁾	
	Estimate (2030)	6,929,700	207,700 ⁽²⁾		NA	NA	NA	150,000	
	Future share (2030) [%]	14.03%	0.42%					0.30%	
	Estimate attainment (2018 vs 2030) [%]	2.89%	7.37%					104.22%	
	Progress (2018)	adequate	slow						
Publicly accessible AF Infrastructure	Past situation (2016)	15,400	43 ⁽¹⁾	1 ⁽¹⁾	1 ⁽¹⁾	0 ⁽¹⁾	11 ⁽⁵⁾	1,700	
	Situation (2018)	24,800	61 ⁽¹⁾	20 ⁽¹⁾	4	NA	20 ⁽³⁾	1,700	
	Target (2030)	NA	285 ⁽⁴⁾	41 ⁽⁴⁾	NA	3 ⁽⁵⁾	400 ⁽⁴⁾	NA	
	Target attainment (2018 vs 2030) [%]		21.40%	48.78%			5.00%		
	Progress (2018)	adequate	adequate	47.50%			2.31%		
Sufficiency Index	2016	6.75					2.73	106.89	
	2018	8.07					17.55	91.95	
	2020	17.61							
	2025						90.50		
	2030								
Measures	Legal measures	Ambition (NIR vs NPF)	+	+	+	+	+		
	Policy measures + Deployment & manufacturing support	Score	H	M	M	L	L	M	L
		Comprehensiveness	C	C	C	C	N	C	N
		Impact	H	M	M	L	L	M	L
		Ambition (NIR vs NPF)	+	+	+	+	+	+	=
RTD&D	Ambition (NIR vs NPF)	+					+		

Legend:

	not applicable
	the value could not be computed
NA	no value/information provided/available in the NIR

⁽¹⁾ data from EAFO since the FR NIR did not provide this information; ⁽²⁾ natural gas (CNG+LNG) vehicles; ⁽³⁾ data from “VIGHY l'observatoire de l'hydrogène” (<https://www.vighy-afhypac.org/>) since the FR NIR did not provide this information; ⁽⁴⁾ at least the value indicated since this SDMP2 target refers to 2028; ⁽⁵⁾ targets from the FR NPF.

The checklist shows that most of the requirements of Annex I from the Directive are covered by the French NIR. However, the quantitative information provided on future AFI and AFV objectives is not adequate in several cases: either lacking or provided for different years than the years required by the Directive (2020, 2025 and 2030), or provided for merged sets of alternative fuels (CNG and LNG treated in common as natural gas).

Regarding the combination of AF/AFV/AFI with transport mode, electricity and hydrogen are well covered, while natural gas (including biomethane), biofuels and LPG are partially covered for road transport; hydrogen is partially covered for rail transport; shore-side electricity supply

and LNG are partially covered for waterborne transport; electricity supply for stationary airplanes is partially covered for air transport; all the other combinations are absent.

The main outcomes of the technical assessment of the French NIR on vehicles/vessels estimates and infrastructure targets can be summarised as follows:

Road transport

- **Electricity** – France recorded a total of 200,250 electric vehicles and 24,800 publicly accessible recharging points in 2018. Compared to the NPF, the FR NIR presents a lower estimate for 2020 (-35.78%) but provides new estimates for 2025 and 2030. The situation foreseen in 2030 is of 6,929,700 EVs in use (of which 6,200,000 passenger cars, 710,000 LCVs, 12,000 HCVs and 7,700 buses and coaches). Instead, the FR NIR does not specifically provide infrastructure targets for 2020/2025/2030 but mentions a 2022 target set by the national government of 100,000 recharging points. The NPF had mentioned the target of 35,000 recharging points. The progress in 2018, calculated according to the assessment technology described in Section 2.1, is adequate both for EVs and recharging infrastructure. The ratio AFV to publicly accessible AFI is adequate for the period 2016-2018 but is foreseen to increase above 10 in 2020, becoming thus inadequate.
- **CNG** – Similarly to the NPF, the French NIR does not differentiate between CNG and LNG vehicles, presenting data for natural gas vehicles. According to EAFO, there were 15,306 natural gas vehicles in 2018 in France. In contrast to the NPF where natural gas vehicle estimates were absent, the FR NIR presents all the required vehicle estimates for the next decade: 11,600 for 2020, 97,800 for 2025 and 207,700 for 2030. The foreseen composition of the natural gas fleet in 2030 is 129,000 LCVs, 70,000 HCVs and 8,700 buses and coaches. The 2018 progress towards reaching the envisaged natural gas vehicle estimates results to be slow. According to EAFO, there were 61 CNG refuelling points in France at the end of 2018. As targets for the next decade, the FR NIR mentions only the Clean Mobility Development Strategy 2 proposal's targets (at least 121 CNG stations by 2023 and 285 by 2028). The FR NPF contained targets of 79 CNG refuelling stations for 2020 and of 116 for 2025. The 2018 progress towards reaching the envisaged CNG refuelling infrastructure targets results to be adequate. The sufficiency index for the CNG/road pair cannot be computed since the FR NIR provides only information on natural gas vehicles (CNG+LNG).
- **LNG** – Similarly to the NPF, the French NIR does not differentiate between CNG and LNG vehicles, presenting data for natural gas vehicles. According to EAFO, there were 20 LNG refuelling points in France at the end of 2018. As targets for the next decade, the FR NIR mentions only the Clean Mobility Development Strategy proposal's LNG infrastructure targets (at least 17 LNG stations by 2023 and 41 by 2028). The FR NPF contained a target of 25 LNG refuelling stations for 2025.
- **Hydrogen** – According to EAFO, there were 351 hydrogen-powered vehicles in use in France at the end of 2018. The FR NIR provides estimates of 235 vehicles (220 LCVs, 15 HDVs) by 2020 and 9,050 vehicles (8,700 LCVs, 350 HDVs) by 2025 while the FR NPF did not include any estimates. According to “VIGHY l'observatoire de l'hydrogène”¹⁵, there were 20 public hydrogen refuelling points in France at the end of 2018. As targets for the next decade, the FR NIR mentions only the total¹⁶ hydrogen infrastructure targets from the Energy Transition Hydrogen Deployment Plan: 100 hydrogen stations by 2023 and 400 by

¹⁵ <https://www.vigby-afhypac.org/>

¹⁶ The plan does not specify differentiated targets between stations open to the public and those for captive fleets.

2028. The foreseen evolution represents a significant increase compared to the FR NPF target of 30 hydrogen refuelling stations for 2025.

- **Biofuels** – Information is not available in the FR NIR.
- **LPG** – According to EAFO, France recorded 156,323 LPG vehicles in use in 2018. The French NIR considers that in the next decade the situation will remain constant, estimating 150,000 vehicles (all passenger cars) to be in use. Regarding infrastructure, the French NIR provides the same value for the period 2016-2018 stating that LPG is sold in almost 1,700 refuelling stations. The NIR mentions that the current number of LPG refuelling points is capable of supplying 10 times more vehicles than the existing fleet.

Rail transport

- **Electricity** - Information is not available in the French NIR.
- **Hydrogen** - Through the Hydrogen Plan, the State will support the regions in funding the deployment of 15 hydrogen-powered trains foreseen to replace diesel trains functioning on non-electrified lines. This alternative is considered less costly than electrification work and the first trains should come into service in 2022.

Waterborne transport (maritime)

- **Electricity** - The French NIR notes that the port of Marseille has three existing supply points for five ferries operating between Corsica and the French mainland. For the future, a few projects are mentioned, like the South region's recent 'zero-fume stopovers' electrification scheme for all ferry quays by 2023 and for a supply for cruise ships in Marseille port by 2025, as well as the intention of Dunkirk's Grand Port Maritime to equip its container terminal with an 8 MW SSE supply point by the end of 2019 (to be supplemented by 2 other supply points if needed).
- **LNG** - Similarly to the NPF, no information is provided in the French NIR regarding LNG seagoing ships. As for LNG supply in the maritime ports, the FR NIR presents only information on the current situation without providing details on future targets. It mentions that all ports with LNG tanker terminals (Marseille-Fos, Dunkirk, and Nantes-Saint Nazaire) and the port of Le Havre (not having a terminal) currently offer LNG bunkering services by truck. The FR NPF had included a target of seven ports to provide LNG refuelling services by 2025.

Waterborne transport (inland)

- **Electricity** - The French NIR notes that some waterways, not included in the NPF targets, now offer or are installing SSE supply points. Vienne and Arles (on Rhône river) are provided as examples, having two high-power and seven medium-power SSE supply points. The French inland waterway network had at least 110 SSE supply points in 2019 (including 17 around the Seine basin and 91 in the Nord-Pas-de-Calais region). For the future, investments are foreseen for the Seine basin for installing nine SSE supply points, each accommodating two vessels.
- **LNG** - The FR NIR does not include any information on LNG refuelling supply while the FR NPF had provided a target of three inland ports offering LNG by 2030.

Air transport

- **Electricity** - The NIR only mentions that 11 main airports in France have pledged to reduce their fossil fuel consumption and that a 20% cut in emissions from aircraft on the ground by 2025 compared to the 2010 reference year is expected.

- **Biofuels** - The FR NIR mentions that a roadmap for the deployment of biofuels for aviation is under preparation. Sustainable aviation fuels will be deployed in France by adding them to conventional fuels, with targets of 5% by 2030 and 50% by 2050. As aviation biofuels are ‘drop-in’, their distribution at airport hubs will use existing logistics in order to limit their costs and carbon footprint.

Regarding the **measures**, the French NIR, similarly to the NPF, reports a solid policy package, consisting in 57 measures. The great majority of measures expresses an increase of ambition compared to the NPF, focusing more on zero-emission mobility. They cover a wide variety of types, several alternative fuels and all transport modes (with a focus on road).

The legal framework for alternative fuels is changing and improving in order to speed up the deployment of the related vehicles and infrastructure. The majority of legal measures refers specifically to infrastructure, and the most numerous cluster is electricity/road. Considering all the legal measures, they appear, if fully implemented, to be fit to support the realisation of the AFV/AFI objectives as described in the NPF and revised in the NIR.

As for the Policy and Deployment & Manufacturing support measures, they cover all aspects of alternative fuels deployment: AF, AFV and AFI. The majority of the policy measures represent financial incentives (e.g. purchase incentives, scrappage scheme, different tax related incentives) and are in place in 2019. In line with the overall focus in promoting zero-emission mobility reported in the NIR for the recent years, the most numerous clusters are the electricity/road and hydrogen/road. The electricity/road cluster contains a comprehensive set of 23 NIR measures, displaying a high overall score and showing an increased level of ambition compared with the NPF. The hydrogen/road cluster is formed by a comprehensive set of 13 NIR measures, displaying a medium overall score and showing an increased level of ambition compared with the NPF. The newly introduced measures originate in the 2018 Energy Transition Hydrogen Deployment plan. In terms of expected impact of the Policy and Deployment & Manufacturing measures to support the realisation of the AFV/AFI objectives as presented in the NPF and revised in the NIR, the measures for the pairs electricity/road results to have a high impact, the measures for the pairs CNG/road, LNG /road, hydrogen/road and electricity/water-maritime result to have a medium impact and all the other pairs result to have a low impact. Compared to the NPF, the level of ambition of the Policy and Deployment & Manufacturing support measures has increased for all identified pairs with the exception of LPG/road.

The Research, Technological Development & Demonstration section contains general information on three main initiatives all being part of the “Investing for the Future programme”: the “Vehicles and Transport of the Future” phase, the “Transport and Sustainable Mobility” section and an innovation competition for prototypes.

▪ *Final remarks*

The French NIR provides a comprehensive report on the efforts to implement the Directive. The NIR is largely in line with the provisions of Annex I to the Directive. However, due a lack of some data this assessment draws on information taken from the French Clean Mobility Development Strategy for 2023 and 2028 targets. Moreover, the French NIR only estimates the number of nature gas vehicles, without distinguishing between CNG and LNG. Some

clarifications on the numerical data provided in the NIR will be relevant. A significant number of measures are being implemented in France to promote alternative fuels in all transport mode, but with a special focus on electro-mobility. Further detail on measures promoting fuels uptake in other modes of transport would be beneficial.

With regard to electricity, the NIR estimates that approximately 6,930,000 electric vehicles could be on the roads by 2030, representing about 14% of the fleet by that time. Taking into account the current situation and expected trend development, this level of ambition appears to be broadly consistent with the pace of deployment of electric vehicles considered necessary to complete the full transition to carbon neutrality by 2050. The NIR plans for 100,000 publicly accessible recharging points (target of 2022) for a fleet of some 2,234,000 electric vehicles by 2025. However, no estimates are provided for recharging points in 2030. Information on charging efficiency is provided. The NIR reports that shore-side electricity supply is supplied in certain maritime and inland ports but it lacks aggregated data at national level. There is hence a lack of consistent information to assess whether all ports of the TEN-T Core Network will be equipped with these facilities at a certain point in time, or not. Further information should be provided in future reporting on the electricity supply in airports to stationary aircraft and on the further electrification of railways.

Regarding hydrogen for transport, the NIR reports a small fleet of 351 FCHVs and 20 hydrogen refuelling stations in 2018. According to the French Clean Mobility Development Strategy for 2023 and 2028, 100 hydrogen refuelling stations and about 9,000 FCHVs are estimated by 2025 and a more ambitious target of 400 hydrogen-refuelling points is estimated by 2028. The number of refuelling stations seem to be sufficient considering the length of the TEN-T Core Network, provided that the refuelling stations are widely distributed along the network. SNCF plans to put into service 15 hydrogen power trains on non-electrified lines.

In terms of natural gas for transport, the NIR expects 285 CNG refuelling points by 2028. Further, 41 LNG refuelling points are estimated by 2028. These numbers seem sufficient taking into the length of the French TEN-T Core Network, provided that the refuelling stations are widely distributed along the network. The NIR targets a fleet of 207,700 CNG and LNG vehicles by 2028. The basic infrastructure in place seems largely sufficient. All ports with LNG tanker terminals (Marseille-Fos, Dunkirk, and Nantes-Saint Nazaire) and the port of Le Havre (not having a terminal) currently offer LNG bunkering by truck, but no estimates are provided for the future nor for inland ports.

As for LPG, a fleet of around 150,000 will remain stable over the next decade. A network of 1,700 refuelling stations already exists. No future estimates are provided in the NIR.

A roadmap for the deployment of biofuels for aviation is under preparation. France intends to deploy sustainable aviation fuels by mandating blending with kerosene at a rate of 5% by 2030 and 50% by 2050.

▪ ***ANNEX - Description of the Member State***

On a surface area of 633,100 km², France has a population of 66.926 million people in 2018, which makes up for a population density of 106 inhabitants/km².

Number of main urban agglomerations

- 69 urban agglomerations > 50,000 inhabitants

In 2018, France achieves a per capita gross domestic product at market prices of €34,980, which represents a per capita gross domestic product in purchasing power standards of 104 if expressed in relation to the EU-28 average set to equal 100.

Length of the road networks

The length of the road TEN-T Core Network in France is 5,283 km. The total road network length is 398,605 km, of which 11,671 km are motorways.

The following lengths of the TEN-T Road Corridors are present in France: 13% (767 km) of the Mediterranean Corridor, 36% (1,583 km) of the Atlantic Corridor, 38% (1,611 km) of the North Sea –Mediterranean Corridor, 0.4% (18 km) of the Rhine - Danube Corridor.

Through the TEN-T Road Corridors, France is connected with the following Member States:

- Germany (through the Rhine - Danube Corridor)
- England (through the North Sea -Mediterranean Corridor)
- Belgium (through the North Sea - Mediterranean Corridor)
- Luxembourg (through the North Sea - Mediterranean Corridor)
- Spain (through the Mediterranean and the Atlantic Corridor)
- Italy (through the Mediterranean Corridor)

Number of registered road vehicles

At the end of 2018, France accounts for 41,895,886 registered road vehicles of which 32,034,000 are categorized as passenger cars, 6,179,771 as light goods vehicles, 547,604 as heavy goods vehicles and 100,511 as buses and coaches. The motorisation rate is 479 passenger cars per 1,000 inhabitants.

Number of ports in the TEN-T Core Network

- 8 maritime ports in the TEN-T Core Network (Bordeaux, Calais, Dunkerque, Le Havre, Marseille, Marseille-Fos-sur-Mer, Nantes Saint-Nazaire, Rouen)
- 19 maritime ports in the TEN-T Comprehensive Network
- 11 inland ports in the TEN-T Core Network (Chalon-sur-Saône, Dunkerque, Le Havre, Lille, Lyon, Marseille-Fos-sur-Mer, Metz, Mulhouse-Ottmarsheim, Paris, Rouen, Strasbourg)
- 10 inland ports in the TEN-T Comprehensive Network

Number of airports in the TEN-T Core Network

- 8 airports in the TEN-T Core Network
- 19 airports in the TEN-T Comprehensive Network