

- **Spain (ES)**

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

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

The Spanish NPF focusses on LPG and natural gas, for which substantial infrastructure is already in place. The Spanish NPF contains modest targets and measures for increasing shore side electricity in its ports. Coverage of electricity supply for stationary airplanes at the major airports is already good and no increase is foreseen.

The Spanish NPF strongly emphasizes LNG. LNG refuelling is available for all maritime ports in the TEN-T core network and in several ports of the comprehensive network, and additional bunkering terminals and ship-to-ship refuelling are planned. There are already 15 publicly accessible LNG refuelling points for heavy duty vehicles present in the Spanish territory and it is foreseen to add 20 more by 2020. Altogether, the planned LNG refuelling points could guarantee that the maximum distance requirement for LNG refuelling points along the TEN-T core road network would be fulfilled on the Spanish territory.

Spain has considered hydrogen in its NPF. The deployment of 20 publicly accessible hydrogen refuelling points and 500 hydrogen fuel cell vehicles by 2020 is foreseen.

The Spanish NPF contains an extensive list of measures, most already in place. Most of them can be considered having a low to medium impact on market actor's decisions. Regulatory measures have been put in place to facilitate infrastructure deployment. Longer durations for the validity of financial support measures could provide certainty for market actors and hence increase the likelihood that the national targets and objectives of the NPF can be reached.

The consideration of the interests of regional and local authorities, as well as stakeholders during the drafting of the Spanish NPF can be viewed as exemplary. Further co-operation will continue in the follow up phase of the NPF.

Spain is actively involved in coordinating its plans on alternative fuels infrastructure with other member states as well as collaborating with them in this field, in particular for the deployment of alternative fuel infrastructure for electricity, natural gas and LPG. Spain and France collaborate for the establishment of a hydrogen refuelling station corridor connecting the two countries.

▪ **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.	All / All		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-maritime, air / all		Yes
	<ul style="list-style-type: none"> • consideration of the need for renewable jet fuel refuelling points in airports within the TEN-T Core Network 	Air	Biofuels	No
ANNEX I: 3. Deployment and manufacturing support	<ul style="list-style-type: none"> • Annual public budget allocated for alternative fuels infrastructure deployment, broken down by alternative fuel and by transport mode (road, rail, water and air). 	All / All		Yes
	<ul style="list-style-type: none"> • Annual public budget allocated to support manufacturing plants for alternative fuels technologies, broken down by alternative fuel and by transport mode. 	All / All		Yes
	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Annual public budget allocated to support alternative fuels RTD&D, broken down by fuel and by transport mode. 	All	All	Yes
ANNEX I: 5. Targets and objectives	<ul style="list-style-type: none"> • Estimation of the number of alternative fuel vehicles expected by 2020, 2025 and 2030 	Road, water-maritime / electricity, CNG, LNG, hydrogen, LPG		Yes
	<ul style="list-style-type: none"> • Level of achievement of the national objectives for the deployment of alternative fuels in the different transport modes (road, rail, water and air) 	Road, water-maritime / electricity, CNG, LNG, hydrogen, LPG		Yes
	<ul style="list-style-type: none"> • Level of achievement of the national targets, year by year, for the deployment of alternative fuels infrastructure in the different transport modes 	Road, water-maritime, air / electricity, CNG, LNG, hydrogen, LPG		Yes
	<ul style="list-style-type: none"> • Information on the methodology applied to take account of the charging efficiency of high power recharging points 	All	Electricity	Yes
ANNEX I:6 Alternative fuels infrastructure developments	Changes in supply (additional infrastructure capacity) and demand (capacity actually used)	Road / All		Yes

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

Regarding the combination of AF/AFV/AFI with transport mode, electricity is covered for all modes; CNG, hydrogen and LPG for road transport; LNG for road and maritime transport; all the other combinations are either absent or not applicable.

The Spanish NIR reports almost 100 measures. Under the Policy and Deployment & Manufacturing sections it was possible to identify eight AF/transport mode clusters of measures, of which seven were assessable.

▪ **Quantitative assessment: Vehicles and infrastructure**

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	32,508	5,187	150,000	10,000	800,000	17,000	5,000,000	NA
	Change NIR vs NPF [%]			59.57%				92.31%	
	Attainment [%]			21.67%	51.87%	4.06%	30.51%	0.65%	
CNG / road	NIR	12,393	60	23,000	150	100,000	200	200,000	NA
	Change NIR vs NPF [%]			33.72%	97.37%				
	Attainment [%]			53.88%	40.00%	12.39%	30.00%	6.20%	
LNG / road	NIR	960	34	2,000	85	7,000	110	25,000	NA
	Change NIR vs NPF [%]			150.00%	93.18%		150.00%		
	Attainment [%]			48.00%	40.00%	13.71%	30.91%	3.84%	
LNG / water (maritime)	NIR	1	43	9	43	10	43	12	43
	Change NIR vs NPF [%]			200.00%	230.77%		2.38%		
	Attainment [%]			11.11%	100.00%	10.00%	100.00%	8.33%	100.00%
LNG / water (inland)	NIR	NA	NA	NA	NA	NA	NA	NA	NA
	Change NIR vs NPF [%]								
	Attainment [%]								
Shore-side electricity supply / water (maritime)	NIR		2		45		NA		NA
	Change NIR vs NPF [%]				800.00%				
	Attainment [%]				4.44%				
Electricity supply / air (stationary airplanes)	NIR		434		NA		NA		470
	Change NIR vs NPF [%]								
	Attainment [%]								92.34%
H2 / road	NIR	28	4	50	6	200	15	1,000	NA
	Change NIR vs NPF [%]			-90.00%	-70.00%				
	Attainment [%]			56.00%	66.67%	14.00%	26.67%	2.80%	
LPG / road	NIR	41,085	589	100,000	650	200,000	750	500,000	NA
	Change NIR vs NPF [%]			-50.00%	-18.75%				
	Attainment [%]			41.09%	90.62%	20.54%	78.53%	8.22%	

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

- Road transport
 - Electricity

Vehicles

As shown in Table Error! No text of specified style in document.-2, Spain recorded a total of 32,508 EVs in 2018. The majority of them are passenger cars (15,855 BEV and 12,707 PHEV), followed by 3,788 electric light commercial vehicles and 158 electric buses and coaches. In addition, the number of electric powered two wheelers in 2018 was 22,111. The Spanish NIR's estimates for electric vehicles are 150,000 in 2020, 800,000 in 2025 and 5,000,000 in 2030. These estimates are provided without details on vehicle classes and represent a higher policy ambition compared with the NPF with changes of +59.57% for 2020 and +92.31% for 2030 (no estimate was provided in the NPF for 2025).

The 2018 **attainment** of future EV estimates is 21.67% for 2020 and 0.65% 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 Spain is equal to 53%.

Infrastructure

Spain recorded 5,187 publicly accessible recharging points in 2018 (Table Error! No text of specified style in document.-2), of which 4,665 were normal power (≤ 22 kW) recharging points and 522 high power (> 22 kW) recharging points. While Spain had not provided targets for publicly accessible recharging points for 2020, 2025 and 2030 in its NPF, this has been modified in the NIR: 10,000 publicly accessible recharging points are now foreseen for 2020 and 17,000 for 2025. The NIR does not provide estimates for private recharging points.

The ES NIR indicates that full information on the number of recharging points is unavailable and that the Spanish Government is participating in the European project (PSA-IDACS) promoted by the European Commission to gather all the relevant data.

The 2018 **attainment** of future publicly accessible recharging infrastructure targets is 51.87% for 2020 and 30.51% for 2025. According to the assessment methodology described in Section 2.1, the 2018 situation corresponds to a **slow progress** towards reaching these envisaged targets. The calculated **average annual growth rate** corresponding to the period 2016-2025 for publicly accessible recharging infrastructure evolution planned by Spain is equal to 16%.

Ratio

Based on the ES NIR, the following table shows the ratio between vehicles and publicly accessible recharging points (i.e. sufficiency index) for the pair electricity/road. As it can be seen, in 2020 the foreseen sufficiency index is higher than 10, which, considering the low share of high power recharging points in 2018 (10%), has to be regarded as probably inadequate. The sufficiency index further deteriorates in 2025 when it becomes 47.06.

Sufficiency Index	2016	2017	2018	2020	2025	2030
Electricity	2.35	4.02	6.27	15.00	47.06	

Information on charging efficiency

The Spanish NIR contains two tables providing information about the charging efficiency of high power (>22kW) recharging points. Namely, the averaged data by high power recharging point per day (on average, a recharging point provides 1.85 recharges, is used 2.3 hours and supplies 33.985 kWh per day) and the daily data regarding the average number of recharges and duration. The total energy supplied is also provided. Every day, around 198 recharging operations take place at high power recharging points, representing a total average energy of 1,904.610 kWh for a total average duration of 129.51 hours.

○ CNG

Vehicles

The total number of CNG vehicles recorded by Spain in 2018 was 12,393 of which 6,452 (52%) were passenger cars, 1,438 (12%) LCVs, 2,108 (17%) HCVs and 2,395 (19%) buses and coaches (Table Error! No text of specified style in document.-2). The Spanish NIR estimates 23,000 CNG vehicles for 2020, 100,000 for 2025 and 200,000 for 2030. These estimates are provided without details on vehicle classes. The Spanish NPF had only provided estimates for the number of CNG vehicles in 2020; the NIR revised estimate is 33.72% higher than that of the NPF, reflecting a greater policy ambition.

The 2018 *attainment* of future CNG vehicles estimates is 53.88% for 2020 and 6.20% for 2030. According to the assessment methodology described in Section 2.1, the 2018 situation corresponds to an *adequate progress* towards reaching the envisaged CNG vehicles estimates. The calculated *average annual growth rate* corresponding to the period 2016-2030 for the CNG vehicle fleet evolution planned by Spain is equal to 31%.

Infrastructure

Spain recorded 60 CNG publicly accessible refuelling points in 2018, see Table Error! No text of specified style in document.-2. The NPF had only provided a target for CNG refuelling infrastructure in 2020. The ES NIR presents a revised target for 2020 (150 points), which is 97.37% higher than in the NPF and a new target of 200 CNG refuelling points in 2025. This shows an increase of ambition for CNG.

The 2018 *attainment* of future publicly accessible CNG refuelling infrastructure targets is 40.00% for 2020 and 30.00% for 2025. 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 2016-2025 for publicly accessible CNG refuelling infrastructure evolution planned by Spain is equal to 21%.

Ratio

Based on the ES NIR, the following table shows the ratio between vehicles and publicly accessible refuelling points (i.e. sufficiency index) for the pair CNG/road. It can be seen that sufficiency index is well below the indicative value of 600 (see Section 2.1.5) for the implementation period until 2025.

Sufficiency Index	2016	2017	2018	2020	2025	2030
CNG	140.74	143.20	206.55	153.33	500.00	

○ LNG

Vehicles

Spain recorded 960 LNG vehicles in use in 2018, composed entirely by heavy commercial vehicles (Table Error! No text of specified style in document.-2). Such LNG fleet has increased remarkably since 2012 when there were just 12 vehicles. The Spanish NPF had estimated to have 800 LNG vehicles registered in 2020 and according to the NIR that value had been surpassed already in 2018. The NIR revised estimate for the number of LNG vehicles in 2020 is 2,000 that is 150% higher than in the NPF. In addition, new estimates for LNG vehicles in 2025 and 2030 are 7,000 and 25,000 respectively, presumably all heavy-duty vehicles.

The 2018 *attainment* of future LNG vehicles estimates is 48.00% for 2020 and 3.84% for 2030. According to the assessment methodology described in Section 2.1, the *progress* obtained by Spain from 2016 until 2018 for LNG vehicles deployment is 2.60% of the overall planned deployment during the period 2016-2030.

Infrastructure

Table Error! No text of specified style in document.-2 shows that in 2018 there were already 34 publicly accessible LNG refuelling points in Spain. The ES NIR declares that there were 24 combined CNG/LNG stations under construction in 2019. The Spanish NPF had only provided targets for 2020 and 2025. The NIR now presents revised targets for LNG refuelling points: 85 in 2020 and 110 in 2025, which are respectively 93.18% and 150% higher than in the NPF.

The 2018 *attainment* of future publicly accessible LNG refuelling infrastructure targets is 40% for 2020 and 30.91% for 2025. According to the assessment methodology described in Section 2.1, the *progress* obtained by Spain for publicly accessible LNG refuelling infrastructure deployment from 2016 until 2018 versus the period 2016-2030 could not be computed because of the lack of the 2030 target.

Ratio

Based on the ES NIR, the following table shows the ratio between vehicles and publicly accessible refuelling points (i.e. sufficiency index) for the pair LNG/road.

Sufficiency Index	2016	2017	2018	2020	2025	2030
LNG	21.20	17.24	28.24	23.53	63.64	

○ Hydrogen

Vehicles

The ES NIR indicates that there are 28 hydrogen-powered vehicles (20 passenger cars and 8 buses) in Spain in 2018. There were also 4 PTW & other vehicles. According to the NIR, the fleet of hydrogen-powered cars is limited to demonstration projects and 38 of these vehicles were authorised to circulate on public roads in 2019. It is expected to reach 50 hydrogen-

powered vehicles by 2020, 200 by 2025 and 1,000 by 2030. The 2020 estimate is 90% lower than the 500 vehicles foreseen in the NPF.

The 2018 *attainment* of future hydrogen vehicles estimates is 56% for 2020 and 2.8% for 2030. According to the assessment methodology described in Section 2.1, the *progress* obtained by Spain from 2016 until 2018 for hydrogen vehicles deployment is 1.62% of the overall planned deployment during the period 2016-2030.

Infrastructure

Table Error! No text of specified style in document.-2 shows that in 2018 there were four hydrogen publicly accessible refuelling points in Spain. The ES NPF had only provided a target for 2020 of 20 hydrogen refuelling points. The NIR provides a revised value of six refuelling points in 2020 (70% lower) and a new target of 15 in 2025.

The 2018 *attainment* of future publicly accessible hydrogen refuelling infrastructure targets is 66.67% for 2020 and 26.67% for 2025. According to the assessment methodology described in Section 2.1, the *progress* obtained by Spain for publicly accessible hydrogen refuelling infrastructure deployment from 2016 until 2018 versus the period 2016-2030 could not be computed due to the lack of the 2030 target.

Ratio

Based on the ES NIR, the following table shows the ratio between vehicles and publicly accessible refuelling points (i.e. sufficiency index) for the pair hydrogen/road until 2025.

Sufficiency Index	2016	2017	2018	2020	2025	2030
Hydrogen	2.00	3.00	7.00	8.33	13.33	

- Biofuels

Vehicles

The Spanish NIR indicates that, currently, there are no official figures for the number of vehicles compatible with blends of higher concentrations than E5 or B7, or registrations of such vehicles. Furthermore, all diesel vehicles can use high proportions of HVO (Hydrotreated Vegetable Oil).

Infrastructure

All pumps at Spanish service stations offering diesel can supply blends with up to 7% biodiesel by volume (B7). Moreover, normal petrol pumps can contain up to 5% bioethanol by volume (E5). Thus, whenever a vehicle is filled with B7 diesel and petrol, biodiesel and bioethanol are being consumed, respectively. Since 2011, the diesel sold in Spain contains a considerable volume of HVO.

In 2018, there were 63 Spanish service stations selling blends with higher bioethanol (8 stations) and biodiesel (55 stations) content, although the introduction of these blends in Spain has not stopped decreasing since 2016 and they could be found in only 0.5% of all service stations.

- LPG

Vehicles

Spain had a fleet of 41,085 LPG vehicles in use in 2018 (of which 37,402 were passenger cars, 3,455 LCVs, 132 HCVs and 96 buses and coaches) (see Table Error! No text of specified style in document.-2). There were also 425 PTW. Most of these vehicles are bi-fuel (petrol-LPG) and the proportion of heavy-duty vehicles is nominal since they are not yet sold with LPG-dedicated engines, although Spanish companies are doing dual fuel (diesel-LPG) conversions on trucks over 3,500 kg with good results. The Spanish NIR recognises that the evolution of LPG since 2016 – when the NPF was approved – has not gone as quickly as expected and presents revised future numbers for LPG vehicles. The NIR revised estimate for the number of LPG vehicles in 2020 is 100,000, which is 50% lower than in the less optimistic NPF scenario. In addition, the ES NIR presents new estimates for LPG vehicles in 2025 and 2030 of 200,000 and 500,000 respectively (without providing details on vehicle classes), which were absent in the NPF.

The 2018 **attainment** of future LPG vehicles estimates is 41.09% for 2020 and 8.22% for 2030. According to the assessment methodology described in Section 2.1, the **progress** obtained by Spain from 2016 until 2018 for LPG vehicles deployment is 5.41% of the overall planned deployment during the period 2016-2030.

Infrastructure

Table Error! No text of specified style in document.-2 shows that in 2018 there were 589 LPG publicly accessible refuelling points in Spain. The NIR indicates that the number of stations accessible to the public has grown by 26% since the approval of the NPF. Although the LPG refuelling station operators maintain their interest in increasing the extensive reach of the national network, investments in infrastructure are not being made at the pace initially envisaged since Spain considers the current infrastructure sufficient to supply a fleet of over 200,000 vehicles. The Spanish NPF had only provided a target of 800 for the number of LPG refuelling points in 2020. The NIR now presents a revised target for LPG refuelling points of 650 in 2020, which is 18.75% smaller than in the NPF, and a new target of 750 refuelling points in 2025.

The 2018 **attainment** of future publicly accessible LPG refuelling infrastructure targets is 90.62% for 2020 and 78.53% for 2025. According to the assessment methodology described in Section 2.1, the **progress** obtained by Spain for publicly accessible LPG refuelling infrastructure deployment from 2016 until 2018 versus the period 2016-2030 could not be computed because the 2030 target is absent.

Ratio

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

Sufficiency Index	2016	2017	2018	2020	2025	2030
LPG	31.67	36.27	69.75	153.85	266.67	

- Rail transport
 - Electricity

Vehicles

The NIR mentions that for the transition period until the rail network is fully electrified, or for lines that will not be electrified, RENFE (Spanish national railways network) is planning the conversion of part of the diesel fleet to LNG, hydrogen or batteries, as the sole means of traction or in combination with electric traction.

Infrastructure

According to the Spanish NIR, almost 40% (over 6,000 km) of the rail network in the TEN-T Core is not electrified. The NIR further indicates that there are existing plans to electrify over 1,000 km of these lines. In addition, part of the diesel rail traffic will be diverted to the high speed network which is being extended through the Spanish territory.

- Waterborne transport (maritime)
 - Electricity

Vessels

The Spanish NIR does not provide any details in this matter.

Infrastructure

Table Error! No text of specified style in document.-2 shows that in 2018 Spain had two shore-side electricity supply points for ships and ferries, in Melilla and Motril respectively. Additional six shore-side electricity supply points were planned to be in operation by the end of 2019. According to the ES NIR, it is expected to have 45 electricity supply points for ships and ferries in 2020. This shows an increase in ambition compared with the NPF where the target for 2020 was of five electricity supply points.

Since only a target corresponding to 2020 was provided, the 2018 *attainment* of shore-side electricity supply points in maritime ports could be calculated only based on that target and is equal to 4.44%. According to the assessment methodology described in Section 2.1, the *progress* obtained by Spain for the deployment of shore-side electricity supply points in maritime ports from 2016 until 2018 versus the period 2016-2030 could not be computed because of the lack of the 2030 target.

- LNG

The Spanish NIR declares that, since the approval in December 2016 of the NPF, the development of the market of LNG as a marine fuel in Spain has progressed well.

Vessels

In 2018, Spain had one vessel (that covers the Valencia-Palma de Mallorca line) using LNG in its auxiliary engine. In 2019, two ferries, propelled with two dual petrol-LNG engines, started operation in the lines Barcelona-Palma de Mallorca and Huelva-Canarias. The Spanish NPF had only provided an estimate for the number LNG seagoing vessels in 2020, whereas the NIR

presents a revised estimate for 2020 (9 vessels), which is 200% higher than in the NPF, and new estimated numbers of 10 and 12 LNG vessels in 2025 and 2030 respectively (Table Error! No text of specified style in document.-2).

The 2018 **attainment** of future LNG seagoing ships and ferries estimates is 11.11% for 2020 and 8.33% for 2030. According to the assessment methodology described in Section 2.1, the **progress** Spain obtained from 2016 until 2018 for LNG seagoing ships and ferries deployment in maritime ports is 8.33% of the overall planned deployment during the period 2016-2030.

Infrastructure

The ES NIR indicates that all 43 Spanish ports of general interest are currently in a position to supply LNG by means of tanks, subject to market conditions. That supply is complemented by the adaptation of two terminals for the supply of LNG, which are already operational in the ports of Barcelona and Bilbao, and a supply vessel that is operational in the port of Huelva. In addition, another supply vessel currently operates with a base in the port of Barcelona, although with availability subjected to market condition and license.

The NPF targets for LNG supply points to ships and ferries have been **already 100% attained** (see Table Error! No text of specified style in document.-2). According to the assessment methodology described in Section 2.1, the **progress** Spain obtained from 2016 until 2018 for LNG refuelling infrastructure deployment in maritime ports is also 100.00% of the overall planned deployment during the period 2016-2030.

- Waterborne transport (inland)

The Spanish NIR does not contain any information about use of alternative fuels in inland waterborne transport.

- Air transport
 - *Electricity*

Airplanes

The Spanish NIR does not provide any details regarding deployment of hybrid-electric or fully-electric airplanes.

Infrastructure (for stationary airplanes)

According to the ES NIR, in the baseline situation, corresponding to 2015, there were 400 power supply points for stationary aircraft in the airports of general interest in Spain. From 2016 until 2018, 65 units were replaced and 34 new units installed, so there are currently 434 power supply points. It is expected that by 2030 there will be 36 new points and significant investment in replacing equipment. Table Error! No text of specified style in document.-2 shows that the target for 2030 is of 470 electricity supply points for stationary airplanes.

The 2018 **attainment** is 92.34% for 2030. According to the assessment methodology described in Section 2.1, the **progress** obtained by Spain from 2016 until 2018 in the deployment of

electricity supply for stationary airplanes is 43.75% of the overall planned deployment during the period 2016-2030.

- ***Measures assessment***

As in the NPF, the Spanish NIR contains an extensive list of measures that covers various fuels and modes, but mainly targeting electricity, CNG, LNG for road transport and LNG for maritime and, to a lesser extent, hydrogen. The NIR also showcases measures at Autonomous Communities level as well as local measures in the major cities Barcelona, Madrid, Malaga, Seville, Valencia, Valladolid and Saragossa.

- Legal measures

The Spanish NIR contains 34 legal measures which represent an increase compared to the 25 legal measures identified in the NPF. Legal measures are implemented at national level and nine of them are cross-cutting applicable to all alternative fuels and related to both vehicles and infrastructure. Some of these measures relate to the fulfilment of the Paris Agreement targets (the *Climate Change and Energy Transition Bill* and the draft *2021-2030 Integrated National Energy and Climate Plan*) and to the implementation of the European Directives, such as the Energy Performance of Buildings Directive 2018/844/EU, the Air Pollution Directive 2016/2284/EU and the Alternative Fuels Infrastructure Directive 2014/94/EU. At Autonomous Communities level Andalusia, Catalonia, Valencia, Extremadura, Balearic Islands, Navarre, Basque Country and Murcia have developed legal frameworks, strategies and plans to foster the deployment of AFV/AFI.

Some of the legal measures in the ES NIR can be considered updates of the measures provided in the NPF (e.g. related to Green Public procurement). The majority of the legal measures described in the NIR are already in place (around 14% were under consideration).

Considering all the legal measures together, they appear to be designed as the necessary tools to allow the realisation of the AFV/AFI plans as presented in the NPF and revised in the NIR. Based on the available information, the level of ambition of the legal measures can be considered to have increased in the NIR, compared to the NPF, for electricity and hydrogen for road and LNG for maritime transport.

- Legislative & Regulatory

Of all the legal measures described in the Spanish NIR, 23 can be categorised as legislative and regulatory measures. Fourteen measures are applicable to road transport while nine are dedicated to maritime transport. The following can be highlighted:

- The new *Spanish Industrial Policy 2030* and its sectoral agendas for automotive, shipping and capital goods setting out specific measures to promote alternative fuels in transport
- The *Strategic Plan of Integrated Support to the Automotive Sector, 2019-2025*, for the transition towards a new sustainable mobility model, led by a Sustainable Mobility Committee to coordinate policy, support measures and RTD&D actions for the penetration of zero and low-emission vehicles

- The increase of the availability of public recharging points by deregulating electric charging and creating an information register to monitor its activity. The figure of charge manager established in the Electricity Sector Act 24/2013, which was seen too rigid, was cancelled by Royal Decree-Law 15/2018
- The Royal Decree 235/2018 laying down the calculation methods and reporting requirements with regard to the intensity of greenhouse gas emissions of fuels and energy in transport
- The Decree 335/2018 amending several royal decrees regulating the natural gas sector and creating a new structure that allows LNG loading operations related to bunkering LNG as a marine fuel in the current phase of the market's development.

- Administrative

Of all the legal measures described in the Spanish NIR, 11 can be categorised as administrative measures. Six measures are applicable to road transport and five are specific for maritime transport. The following can be highlighted:

- The adoption of technical standards related to natural gas refuelling stations for CNG/LNG vehicles, automotive CNG/LNG fuel specifications and certification of LNG tanker drivers who offload to LNG bunkering stations.
- The creation of the Spanish Hydrogen Working Group and the reactivation of the Technical Committee on Standardisation for hydrogen technologies, CTN-181, to contribute to CEN/CENELEC work and meet the requirements of the Directive 2014/94/EU.
- The activities on recommendation for port authorities regarding requirements for LNG bunkering at ports, part of the CEF funded project *CORE LNGas HIVE*.

- Policy measures

The Spanish NIR contains 22 policy measures applicable at national level, representing an increase compared to the 11 policy measures identified in the NPF. Eight of the policy measures described in the NIR refer to road transport and 14 refer to maritime transport. In addition, the NIR summarises the most relevant policy measures at regional and local level, namely 33 measures valid in autonomies and regions and 6 measures in force locally. The majority of the policy measures can be considered updates of the measures provided in the NPF, in particular annual renewal of financial support measures. Although most of the policy measures described in the NIR are existing, about 13% of the policy measures can be considered to be past measures (i.e. expired by 2019).

- Measures to ensure national targets and objectives

All the 22 policy measures described in the NIR and applicable at national level can be considered as measures to ensure national targets and objectives. Around 73% of these measures are of a financial nature.

Road transport

Over the last years, the Spanish government has approved various programmes to subsidise the purchase of alternative fuels vehicles (electric, CNG, LNG, LPG and hydrogen) and their

infrastructure. These programmes and their budget are approved every year by means of a Royal Decree. The NIR mentions:

- *MOVEA 2016* with a budget of 16.6 million € financed a total of 2,132 vehicles and 42 recharging points; *MOVEA 2017* had a budget of 14.26 million € and financed a total of 2,370 vehicles and 26 recharging points.
- *MOVALT 2018* with two programmes: *MOVALT vehicles*, with a budget of 20 million €, made it possible to finance 2,977 AFV and *MOVALT infrastructure* that has a budget of 20 million € and whose call for applications is pending (it is estimated to finance around 310 recharging points).
- *MOVES 2019* was approved in February 2019 with a budget of 45 million € and will be managed by the Spanish autonomous communities.
- *MOVES One-off projects 2019*, approved in July 2019, provides continuity to the *MOVES Programme* with a budget of 15 million € for funding projects on urban mobility and innovation regarding electro-mobility and hydrogen.

It is also worth mentioning:

- The *2016-2019 CLIMA programme* has financed 28 projects in the area of transport, thanks to the financial contribution of over 1.2 million €. The majority are projects to replace vehicle fleets powered by conventional fossil fuels with electric vehicles and, to a lesser extent, projects to promote the use of biomethane by vehicles and connecting vessels to the national port's network.
- The continuation of the *PIMA waste* and *PEMAR* for efficient use of biogas and production of biofuels from used oils.

In terms of measures at Autonomous Communities level, it can be highlighted:

- Andalusia 2017-2020 line of grants (80% ERDF funded) for all types of AFV and AFI;
- Asturias grants in 2017 for the installation of recharging points for EVs and refuelling points for CNG and LPG; and in 2018 for the purchase of AFV and the installation of recharging points and refuelling points for CNG;
- Aid for the installation of recharging points in different parts of the Canary Islands and line of grants to promote the deployment of ten rapid recharging points for electric vehicles in Tenerife;
- Cantabria grants in 2017, 2018 and 2019 for the installation of rapid and fast recharging points;
- Castile-La Mancha aids in 2018 and 2019 for the purchase of LPG, CNG, LNG or hydrogen vehicles;
- Castile-Leon grant for the purchase of new EVs (BEV, PHEV or hybrid) or where the propulsion system is based on internal combustion engines that can use alternative fossil fuels;
- Catalonia grants for the purchase of vehicles to use as taxis;
- Madrid 2017 and 2018 aid to self-employed and SMEs to modernise the fleet of LCV with highly energy-efficient models that consume less fuel and emit less CO₂ and NO_x and incentives to modernise the taxi fleet, 2018 grants for the deployment of recharging points (conventional, fast, rapid and ultra-fast charging), 2018 aids for the purchase of M1 vehicles

powered by LPG, LNG, CNG or bi-fuel (petrol and gas), BEVs, REEVs, PHEVs and hydrogen vehicles, and exclusively electric motorcycles (L-category);

- Community of Valencia 2017, 2018 and 2019 aid for public or private companies and bodies for the installation of recharging points and aid for the purchase of EVs or AFVs;
- Balearic Islands aid in 2018 to promote the installation of recharging points (normal, semi-fast and fast) and to promote low-emission BEV, PHEV, CNG and LPG vehicles for rental and taxis;
- The Rioja grants in 2018 for municipalities with fewer than 25,000 inhabitants for the installation of fast recharging points for public use;
- Navarra 2017 aid to local authorities with fewer than 20,000 inhabitants for the purchase of BEV and the installation of recharging points;
- Basque Country aid in 2018 for the purchase of electric mopeds, EV or hybrid HDV and for AFI for electricity and CNG and for the conversion of LCV to CNG/LPG and HDV to CNG, aid for AFI installations in shared garages. Aid programme in 2019 for investments in efficient and alternative vehicles and for the promotion of electric recharging points for public use.

Regarding tax incentives, rebates of car registration and road taxes as well as personal income tax reduction applicable to benefits in-kind for business AFV for private use have been in force since 2016. In addition, at Autonomous Communities level, the Canary Islands have eliminated the general indirect tax for the purchase of hybrid and electric vehicles as well as for public transport vehicles powered by CNG and LPG. Castile-Leon has proposed a deduction of the regional income tax for the purchase of electric vehicles; the Rioja provides the possibility of a deduction in the annual tax declaration equal to 15% of the purchase value of new electric vehicles and Navarra provides tax deductions for investments in the installation of recharging points and in BEV and PHEV. At local level, Saragossa exempts electric vehicles from parking fees in certain zones of the city and provides discounts to the motor vehicle tax for low and zero emission vehicles.

Waterborne transport

The Spanish NIR contains 14 measures that can be considered as policy measures for waterborne maritime transport. Compared to the four measures identified in the NPF, this shows an increase in ambition. It is particularly noticed:

- The elimination of the tax on provision of shore-side electricity from January 2020 and the 50% reduction in the berthing fee charged to vessels docked in port when connected to the electricity grid.
- The existing 50% discount on the total tax due for access and berthing in Zone I and/or Zone II for vessels powered by LNG or vessels that use LNG in their auxiliary engines, supplemented with 10 to 40% reductions on the port duty for vessels depending on the Port Authority. Likewise, additional 10 to 40% reduction, depending on the Port Authority, of the port duty applicable to LNG cargos for bunkering and up to 30% rebate on the occupation rate applicable to terminals for LNG bunkering.
- The provision of 40 million € in 2018, as Spanish Government-backed financing for building and for converting existing vessels to low-emission. This instrument has been in force since the 1990s and its annual budgetary contribution is set out in the Budget Act for

each year. Initially geared to the building of new low-emission vessels, it currently allows guarantees for the conversion of vessels too.

- The activities within the “*CORE LNGas Hive — Core Network Corridors and Liquefied Natural Gas Project*”, funded by the European Commission through the CEF (2014-EU-TM-0732-S) aimed at promoting the development of LNG as a marine fuel and the launching in 2018 of the *LNGHIVE2* strategy for the continuation of the institutional measures and developments of *CORE LNGas HIVE*.
 - Measures that can promote AFI in public transport services

The Spanish NIR does not contain specific measures that can promote AFI at national level, although a number of autonomies and regions provide grants and incentives for the purchase of AFV for use as taxis (Catalonia, Madrid, Balearic Islands, and Navarra) and for the procurement of electric buses for urban public transport. There are also initiatives at local level in Madrid, Seville and Saragossa.

- Measures that can promote the deployment of private electro-mobility infrastructure

Although the Spanish NIR does not explicitly mention measures for the promotion of private electro-mobility infrastructure, the programmes *MOVEA 2016* and *2017*, *MOVALT 2018* and *MOVES 2019* included budget provisions for funding private recharging points. In addition, autonomies and regions provided grants and incentives for the installation of recharging points in business premises and condominium garages.

- Deployment and manufacturing support
 - AFI deployment

The Spanish NIR contains 18 deployment support measures for AFI at national level, which compared to the 9 measures identified in the NPF, represent an increase in ambition. In addition, the NIR mentions several initiatives at regional and local level. Most of these measures are existing. Eleven AFI deployment support measures refer to road transport, seven of them to recharging infrastructure, and the rest to CNG, LNG, hydrogen and LPG refuelling points. At Autonomous Communities level, Canary Islands, Catalonia and Balearic Islands, as well as Madrid at local level, provide support for the deployment of recharging points. The NIR highlights the support for building hydrogen infrastructure in Mallorca and Madrid as well as regional promotion initiatives for hydrogen in Castile-La Mancha, Andalusia, Basque Country and Aragon.

Four deployment support measures concern waterborne maritime transport (two for electricity and two for LNG refuelling points) and two measures target electricity supply infrastructure for stationary aircraft.

Spain relies on European co-funding mechanisms for AFI deployment, namely the CEF blending Facility (*CIRVE*, *E-VIA FLEX-E*, *EUROP-E*, *AMBRA*, *ECOGATE*, OPS masterplan for Spanish ports and *CORE LNGas HIVE*) and the ERDF (for example for installing biofuels pumps in Valencia). The Spain-France-Andorra cooperation programme *POCTEFA Interreg* is also considered. Furthermore, there are some public-private initiatives for installing publicly accessible recharging points in rail stations, airports and public places.

- Support of manufacturing plants for AF technologies

Of all the deployment and manufacturing support measures listed in the Spanish NIR, nine can be categorised as support to manufacturing plants for AF technologies. Two measures are dedicated to road transport: the continuation of the ‘*Reindustrialisation and industrial competitiveness strengthening programme*’ (mentioned in the NPF) and a project for manufacturing LPG engines for buses. The remaining seven measures are related to the building (or the conversion) of maritime vessels and ferries to run with LNG.

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

Information is not available in the Spanish 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. As it can be seen, clusters of measures are identified for the pairs electricity/road, CNG/road, LNG/road and LNG/water-maritime, hydrogen/road, LPG/road and electricity/water-maritime. Nothing assessable could be defined for the pair LNG/water-inland.

The majority of the assessable measures mentioned in the NIR score medium. For the clusters electricity/road and LNG/water-maritime, a score between medium and high can be considered. The cluster electricity/water-maritime scores high. The duration of policy measures is subject to yearly budgetary approval. The results of the applied assessment methodology are based on the assumption that continuity is given to Policy and Deployment & Manufacturing support measures. The clusters electricity/road, CNG/road, LNG/road, LNG/water-maritime, hydrogen/road and LPG/road can be considered to be comprehensive. The cluster electricity/water-maritime results not comprehensive. In terms of expected impact of the measures to support the realisation of the AFV/AFI objectives as presented in the NPF and revised in the NIR, those for the pairs electricity/road and LNG/water-maritime result to have a medium-high impact, all the other assessable clusters have a medium impact.

As it can be seen in Table Error! *No text of specified style in document.*-3, compared to the NPF the level of ambition has increased in the NIR for all the assessable clusters, with the exception of LPG/road, for which it remains the same.

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	M/H	C	M/H	+
CNG	Road	M	C	M	+
LNG	Road	M	C	M	+
	Water - maritime	M/H	C	M/H	+
	Water - inland	X			
H2	Road	M	C	M	+
Electricity	Water - maritime	H	N	M	+
LPG	Road	M	C	M	=

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 terms of expected impact of the measures to support the realisation of the AFV/AFI objectives as presented in the NPF and revised in the NIR, those for the pairs electricity/road and LNG/water-maritime result to have a medium-high impact; those for the pairs CNG/road, LNG/road, electricity/water-maritime, hydrogen/road and LPG/road have a medium impact; while all the others are not assessable.

- Research, Technological Development & Demonstration

The Spanish NIR describes 25 RTD&D programmes, which represent a significant increase compared to the 7 RTD&D projects identified in the NPF. National financing and support for RTD&D projects target electricity, CNG, hydrogen, LPG and biofuels for road transport. The majority of the NIR projects can be considered follow-ups or expansions of the projects listed in the NPF. In addition, the Spanish government promotes the participation in European working groups and associations (for batteries, hydrogen, autogas LPG-cluster and bio-ethanol), in the IPCEIs (Important Projects of Common European Interest) for batteries and for hydrogen and in the Fuel Cell and Hydrogen Joint Undertaking. The Spanish NIR highlights several regional projects on biomethane production (from waste and from algae) and use. For maritime transport, the NIR mentions two RTD&D initiatives: one on LNG ships building and another on smart electricity grids in ports.

The Spanish NIR also describes four projects on AF in railways. Two projects are related to pilot tests of LNG locomotives and demonstration of the LNG refuelling infrastructure. The other two projects deal with hybridising with LNG and hydrogen sub-urban and mid-range trains and with the development of a hydrogen electric tram powered by battery and fuel cells.

On the basis of the available information, and compared to the NPF, the level of ambition in the NIR can be considered to have increased for RTD&D actions for most fuels and transport modes.

- *Additional information on alternative fuels infrastructure developments*

The Spanish NIR does not provide information on the changes in fuel use.

- *Summary of the assessment*

Tabular overview

Table Error! No text of specified style in document.-4 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)	10,667	4,785	318	NA	NA	12	14,823	
	Situation (2018)	32,508	12,393	960	1	NA	28	41,085	
	Estimate (2030)	5,000,000	200,000	25,000	12	NA	1,000	500,000	
	Future share (2030) [%]	15.56%	0.62%	2.57%			0.00%	1.56%	
	Estimate attainment (2018 vs 2030) [%]	0.65%	6.20%	3.84%	8.33%		2.80%	8.22%	
	Progress (2018)	a adequate	a adequate	2.60%	8.33%		1.62%	5.41%	
Publicly accessible AF Infrastructure	Past situation (2016)	4,547	34	15	NA	NA	6	468	
	Situation (2018)	5,187	60	34	43	NA	4	589	
	Target (2030)	NA	NA	NA	43	NA	NA	NA	
	Target attainment (2018 vs 2030) [%]				100.00%				
	Progress (2018)	slow	a adequate		100.00%				
Sufficiency Index	2016	2.35	140.74	21.20			2.00	31.67	
	2018	6.27	206.55	28.24			7.00	69.75	
	2020	15.00	153.33	23.53			8.33	153.85	
	2025	47.06	500.00	63.64			13.33	266.67	
	2030								
Measures	Legal measures	Ambition (NIR vs NPF)	+	=	=	+		+	=
	Policy measures +	Score	M/H	M	M	M/H		M	M
		Comprehensiveness	C	C	C	C		C	C
	Deployment & manufacturing support	Impact	M/H	M	M	M/H		M	M
		Ambition (NIR vs NPF)	+	+	+	+		+	=
RTD&D	Ambition (NIR vs NPF)	+	+	+	+		+	+	

The Spanish NIR considers all alternative fuels transport modes, with particular focus on CNG, LNG and electricity. While for CNG/road a moderate infrastructure is in place, Spain is putting efforts to deploy electric recharging points and LNG refuelling points. In its NPF, Spain had considered a strong growth of LPG, however the NIR recognises that the evolution of LPG vehicles since 2016 has not gone as quickly as expected and that deployment of LPG refuelling points is also proceeding at slower pace than initially anticipated. Spain's continued support to LNG as a marine fuel has led to a good development of the market in LNG waterborne maritime transport.

The NIR does not establish infrastructure targets/vehicle estimates for all fuels and modes for each of the years of reference (2020, 2025 and 2030). Specifically, several targets are not provided for AFI in 2030. Therefore, it cannot be stated that the Spanish NIR covers the whole AFID period (2016-2030). Compared to the Spanish NPF that addressed most of the requirements of Article 3 of the Directive, the Spanish NIR almost fully addresses the requirements of Annex I of the Directive, with the exception of: a) information on the need for renewable jet fuel refuelling points in airports within the TEN-T Core Network; and b) information on any particular needs during the initial phase of AFI deployment.

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

Road transport

- **Electricity** – Concerning EVs, Spain recorded a total of 32,508 electric vehicles in 2018 (of which 28,562 were passenger cars, 3788 LCVs and 158 buses and coaches). The Spanish NIR estimates for the number of electric vehicles are 150,000 in 2020, 800,000 in 2025 and 5,000,000 in 2030, which translate in higher estimates than in the NPF for 2020 (+59.57%) and for 2030 (+92.31%). While Spain did not provide infrastructure targets in its NPF, the NIR targets for publicly accessible recharging points are 10,000 for 2020 and 17,000 for 2025. The 2018 progress results to be adequate for the vehicles and slow for infrastructure, while the sufficiency index remains adequate until 2018 and becomes insufficient from 2020, in particular in 2025, due to the low level of ambition in terms of recharging points.
- **CNG** – Spain recorded a total of 12,393 CNG vehicles in 2018 (of which 6,452 were passenger cars, 1,438 LCVs, 2,108 HCVs and 2,395 buses and coaches). Compared to the NPF, where only a vehicle estimate for 2020 was provided, the Spanish NIR presents a revised estimate of 23,000 CNG vehicles for 2020 (33.72% higher than in the NPF), and new estimates of 100,000 vehicles for 2025 and 200,000 vehicles for 2030. Spain recorded 60 CNG refuelling points in 2018; the NIR presents a revised set of targets for 2020 (150 points), which is 97.37% higher than in the NPF and expects to have 200 CNG refuelling points in 2025. The 2018 progress results to be adequate for both the vehicles and infrastructure and the sufficiency index is below the indicative value of 600 for the implementation period until computable (2025).
- **LNG** - Spain recorded 960 LNG vehicles in use in 2018, composed entirely by HCVs. The Spanish NPF expected to have 800 LNG vehicles registered in 2020; the NIR presents a revised set of vehicle estimates 150% higher than the NPF for 2020. The estimates for LNG vehicles in 2025 and 2030 are 7,000 and 25,000 respectively. In 2018, there were 34 LNG refuelling points in Spain. The NIR presents revised targets for LNG refuelling points for 2020 and 2025 that are respectively 93.18% and 150% higher than in the NPF.
- **Hydrogen** – There were 28 hydrogen-powered vehicles (20 passenger cars and 8 buses) in Spain in 2018. Spain had included hydrogen in its NPF. The NIR estimate for hydrogen vehicles in 2020 is 90% lower than the NPF. The new estimates are 50 hydrogen-powered vehicles by 2020, 200 by 2025 and 1,000 by 2030. Concerning hydrogen infrastructure, there were 4 publicly accessible hydrogen fuelling points in 2018 and, similarly to the vehicle estimates, the NIR presents revised targets for hydrogen infrastructure (6 points in 2020 and 15 in 2025), which for 2020 is 70% lower than in the NPF.
- **Biofuels** – The Spanish NIR does not contain data or estimates on the number of vehicles running on high concentrations of biofuels. In 2018, there were 63 Spanish service stations selling blends with higher bioethanol (8 stations) and biodiesel (55 stations) content.
- **LPG** - Spain had a fleet of 41,085 LPG vehicles in 2018 (of which 37,402 passenger cars, 3,455 LCVs, 132 HCV and 96 buses and coaches). The Spanish NIR presents a revised set of estimates for LPG vehicles (100,000 in 2020, 200,000 in 2025 and 500,000 in 2030) that for 2020 is 50% lower than in the less optimistic NPF scenario. Regarding LPG infrastructure, in 2018 there were 589 LPG refuelling points. In line with the vehicle

reduction scenario, the NIR presents revised targets for LPG refuelling points (650 in 2020 and 750 in 2025) which for 2020 is 18.75% smaller than in the NPF.

Rail transport

The NIR indicates that almost 40% (over 6,000 km) of the Spanish rail network in the TEN-T Core is not electrified and there are plans to electrify over 1,000 km of those lines. For lines that will not be electrified, RENFE (Spanish national railways network) is planning the conversion of part of the diesel fleet to LNG, hydrogen or batteries, as the sole means of traction or in combination with electric traction.

Waterborne transport (maritime)

- **Electricity** - The number of shore-side electricity supply points at the Spanish maritime ports was 2 in 2018. According to the NIR, it is expected to have 45 electricity supply points in 2020.
- **LNG** - In 2018, Spain had one vessel using LNG in its auxiliary engine. The Spanish NPF only provided estimates for the number LNG seagoing vessels in 2020 whereas NIR presents a revised estimate for 2020 (9 vessels) which is 200% higher than in the NPF. The estimated number of LNG vessels in 2025 and 2030 is 10 and 12 respectively. As for LNG infrastructure, the ES NIR indicates that all 43 Spanish ports of general interest are currently in a position to supply LNG by means of truck tankers, complemented with LNG terminals in 2 ports. This means that the NPF targets for LNG supply points to ships and ferries (13 in 2020 and 42 in 2025) have been already attained.

Waterborne transport (inland)

Information is not available in the Spanish NIR.

Air transport

- **Electricity (for stationary airplanes)** - According to the NIR, there are currently 434 power supply points for stationary aircraft at the airports of general interest in Spain; the target is 470 points in 2030.

The Spanish NIR contains an extensive list with 108 national **measures**, covering various fuels and modes, mostly targeting electricity, CNG, LNG for road transport and LNG for maritime transport and to a lesser extent hydrogen. The NIR also showcases measures at Autonomous Communities level as well as local measures in major cities. The NIR contains 34 legal measures implemented at national level, of which nine are cross-cutting applicable to all alternative fuels and related to both vehicles and infrastructure. Considering all the legal measures, they appear to be designed as the necessary tools to allow the realisation of the AFV/AFI plans as described in the NPF and revised in the NIR.

There are 22 policy measures applicable at national level in the Spanish NIR. The majority of them can be considered updates of the measures provided in the NPF, in particular annual renewal of financial support measures. As for deployment and manufacture support, 27 measures have been identified from the NIR. The result of the applied assessment methodology shows that, if continuity is given to policy and support measures, the set seems sufficient to advance with the attainment of the declared targets and objectives. With the exception of LPG,

the level of ambition for policy and deployment & manufacture support measures between the NPF and the NIR has increased for all the assessable clusters. In terms of expected impact of the measures to support the realisation of the AFV/AFI objectives as presented in the NPF and revised in the NIR, those for the pairs electricity/road and LNG/water-maritime result to have a medium-high impact, all the other assessable clusters have a medium impact

The Spanish NIR describes 25 RTD&D programmes. Based on the available information, and compared to the NPF, the level of ambition in the NIR can be considered to have increased for most alternative fuels and transport modes.

▪ *Final remarks*

The Spanish NIR provides a quite comprehensive report on the efforts to implement the Directive. The NIR is in line with the provisions of Annex I to the Directive and all alternative fuels are addressed. The market for electric passenger vehicles and heavy-duty LNG vehicles is expected to grow significantly in the coming years; the market for CNG and LPG vehicles is also foreseen to grow but to a lesser extent. The Spanish NIR expects hydrogen to remain a niche market. A significant number of measures to promote alternative fuels in all modes of transport are being implemented with different scopes and impacts. Spain is involved in the implementation of a significant number of R&D&I programmes, both at national and European level, for the production of alternative fuels and the development of new generations of batteries and fuel cells and, to a lesser extent, for the construction of LNG ships.

With regard to electricity, the NIR expects up to five million electric vehicles on the roads by 2030, representing around 16% of the vehicle fleet by that time. Taking into account the current situation and expected trend developments, this level of ambition appears to be broadly consistent with the pace of deployment of electric vehicles considered necessary for a full transition to carbon neutrality by 2050. Nevertheless, only 17,000 recharging points are planned for 2025, which seems insufficient for the estimated fleet of 800,000 electric vehicles in that year. An increase of ambition would contribute to better meeting the objective of realising a dense, wide-spread and easy to use network of recharging and refuelling infrastructure throughout the EU. Spain should provide information on its targets for recharging infrastructure in 2030. Information on charging efficiency is provided. Forty-five shore-side electricity supply facilities for ships and ferries are expected in 2020. For stationary aircraft 434 power supply points are already installed in the Spanish airports. Almost 40% (over 6,000 km) of the Spanish TEN-T Core rail Network is not yet electrified; further efforts are needed in this regard. The NIR indicates that there are already plans to electrify over 1,000 km of these lines. In general, the report highlights Spain's strong commitment to promoting the use of electricity in the transport sector.

As for hydrogen, the NIR shows a low development of both vehicles and infrastructure. Fifteen hydrogen filling stations are planned for 2025 and no target has been defined for 2030. Spain should provide further information in future reporting on planning for 2030 and beyond.

Concerning natural gas, there were 12,393 CNG vehicles by 2018. The NIR estimates 100,000 CNG vehicles by 2025 and 200,000 CNG vehicles by 2030 as well as 200 refuelling points by 2025. Further, the NIR sets the target of 7,000 LNG vehicles in 2025 and 25,000 LNG vehicles by 2030. No 2030 target for LNG refuelling stations was provided. However, the NIR estimates

110 LNG refuelling points by 2025. This seems sufficient taking into account the length of the Spanish TEN-T Road Core Network, provided that the refuelling points are equally distributed along the network. Moreover, all Spanish ports of the TEN-T Comprehensive Network are in a position of supplying LNG by the use of road tankers, complemented by LNG terminals in two ports. On the other hand, the estimated number of LNG vessels by 2025 and 2030 is very small in relation to the number of ports with capacity to supply LNG. Spain should encourage the use of LNG vessels to take advantage of the existence of this infrastructure.

There were 41,085 LPG vehicles by 2018. Around 100,000 LPG vehicles are estimated for the year 2020. LPG vehicles will rank second in the alternative vehicle fleet in Spain in 2030. The NIR estimates around 500,000 LPG vehicles by 2030. The NIR shows a smaller development of the LPG vehicles market compared to the estimates provided in the NPF.

According to the NIR, only 0.5% of the service stations provide blends with higher bioethanol and biodiesel. Spain should provide more information in future reporting on efforts to promote the use of renewable fuels in transport, and particularly in aviation.

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

On a surface area of 506,000 km², Spain has a population of 46.658 million people in 2018, which makes up for a population density of 92 inhabitants/km².

Number of main urban agglomerations

- 128 urban agglomerations > 50,000 inhabitants

In 2018, Spain achieves a per capita gross domestic product at market prices of €25,730, which represents a per capita gross domestic product in purchasing power standards of 91 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 Spain is 5,706 km. The total road network length is 165,749 km, of which 15,585 km are motorways.

The following lengths of the TEN-T Road Corridors are present in Spain: 48% (2,727 km) of the Mediterranean Corridor and 46% (2,040 km) of the Atlantic Corridor.

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

- Portugal (through the Mediterranean Corridor)
- France (through the Mediterranean and the Atlantic Corridor)

Number of registered road vehicles

At the end of 2018, Spain accounts for 34,630,709 registered road vehicles of which 24,074,151 are categorized as passenger cars, 4,637,954 as light goods vehicles, 568,899 as heavy goods vehicles and 64,905 as buses and coaches. The motorisation rate is 516 passenger cars per 1,000 inhabitants.

Number of ports in the TEN-T Core Network

- 13 maritime ports in the TEN-T Core Network (A Coruña, Algeciras, Barcelona, Bilbao, Cartagena, Gijón, Huelva, Las Palmas, Palma de Mallorca, Sevilla, Tarragona, Tenerife-Santa Cruz, Valencia)
- 24 maritime ports in the TEN-T Comprehensive Network
- 1 inland ports in the TEN-T Core Network (Sevilla)
- No inland ports in the TEN-T Comprehensive Network

The inland waterways TEN-T Core Network in Spain is 92 km long.

Number of airports in the TEN-T Core Network

- 10 airports in the TEN-T Core Network (Alicante, Barcelona, Bilbao, Las Palmas, Madrid-Barajas, Málaga, Palma de Mallorca, Sevilla, Tenerife Sur-Reina Sofía, Valencia)
- 29 airports in the TEN-T Comprehensive Network