- **Netherlands (NL)**

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

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

The Dutch NPF fully addresses the requirements of Article 3, except for the definition of future targets for CNG refuelling points. It contains an extensive discussion of the current state and future scenarios for alternative fuels in the transport sector. For all fuels and modes, it establishes targets as required by Article 3 of the Directive, except for CNG refuelling points.

The Dutch NPF puts a lot of emphasis on electric vehicles, although the future estimated share of 1.5% EV seems low in comparison to the current share of EVs on the road, which is already above 1%. The Netherlands already today has a considerable number of recharging points. Their spatial distribution and especially the increasing number of high power recharging points along main roads seems to appropriately cover the needs of electric vehicles in terms of distance requirements. The ratio of one public recharging point per 8 electric vehicles estimated for 2020 indicates that the Netherlands has defined appropriate targets for recharging infrastructure in line with the requirements of the Directive. No targets are foreseen for increasing the availability of electricity supply for stationary airplanes. The Dutch NPF contains targets for further increasing shore-side electricity in its ports.

The same is true for CNG refuelling points. However, the Dutch NPF considers CNG is likely to have a limited market share and does not foresee an increase in CNG refuelling infrastructure. It does not commit to keep the current level of CNG refuelling infrastructure.

Targets for LNG refuelling for vessels and heavy-duty trucks are defined in the NPF. Dual LNG refuelling points for waterborne and road transport is the preferred option. If the planned LNG bunkering points in the Dutch ports were realised, this would guarantee that the requirement for LNG refuelling points on the maritime and inland ports of the TEN-T Core Network would be fulfilled in the Netherlands. The same is true for the targeted LNG refuelling points for heavy-duty trucks.

The Dutch NPF displays a strong commitment towards hydrogen. The deployment of 20 publicly accessible hydrogen refuelling points is planned by 2020.

The Dutch NPF contains a well-balanced portfolio of measures, mostly based on Administrative Agreements and public private cooperation. These instruments, coupled with fiscal incentives, have proven to be effective for the deployment of electric vehicles and the related recharging infrastructure. They are comprehensive and seem to have a high impact on fostering deployment. Hence, similar measures proposed for other AF can be considered having at least a medium impact on market actor's decisions. Most of the measures are already in effect, and have an average duration of four years, so that continuity through that period is assured, increasing the likelihood that targets and objectives of the NPF can be reached.

The consideration of the interests of regional and local authorities, as well as stakeholders is part of the Dutch policy, e.g. put into practice via the "Green Deals", and can be considered exemplary.

The Netherlands is actively involved in coordinating its plans on alternative fuels infrastructure with other Member States as well as collaborating with them in this field.

- ***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, waterborne, air / All		Yes
ANNEX I: 2. Policy measures supporting the implementation of the national policy framework	Information on those measures shall include the following elements: • 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, waterborne, air / All but 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, waterborne / Electricity, CNG, LNG, Hydrogen		Yes
	• Annual public budget allocated to support manufacturing plants for alternative fuels technologies, broken down by alternative fuel and by transport mode.	Not explicitly mentioned / CNG, LNG, Hydrogen		Yes
	• Consideration of any particular needs during the initial phase of the deployment of alternative fuels infrastructures.	Road, waterborne / Electricity, hydrogen		Yes
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, waterborne / Electricity, hydrogen, biofuels		Yes
ANNEX I: 5. Targets and objectives	• Estimation of the number of alternative fuel vehicles expected by 2020, 2025 and 2030	All / Electricity, LNG, hydrogen		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, waterborne, air / All		Yes
	• Level of achievement of the national targets, year by year, for the deployment of alternative fuels infrastructure in the different transport modes	Road, waterborne, air / Electricity, CNG, LNG, Hydrogen		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, Hydrogen		Yes

The checklist shows that all the requirements of Annex I from the Directive have been covered in the NL NIR.

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

The Dutch NIR reports 58 measures. Under the Policy and Deployment & Manufacturing sections it was possible to identify eight AF/transport mode clusters of measures, of which five 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	48,697 BEV 97,750 PHEV	38,977	63,936 BEV	50,000	741,058 BEV	NA	1,453,300 BEV	NA
	Change NIR vs NPF [%]				180.21%				
	Attainment [%]			70.35%	77.95%	6.07%		3.09%	
CNG / road	NIR	7,870	150	NA	170	NA	170	NA	170
	Change NIR vs NPF [%]				17.24%				
	Attainment [%]				88.24%		88.24%		88.24%
LNG / road	NIR	457	27	600	NA	2,925	30	5,250	NA
	Change NIR vs NPF [%]						7.14%		
	Attainment [%]			76.17%		15.62%	90.00%	8.70%	
LNG / water (maritime)	NIR	11	1	11	NA	30	4	48	NA
	Change NIR vs NPF [%]						-33.33%		
	Attainment [%]			100.00%		37.29%	25.00%	22.92%	
LNG / water (inland)	NIR	7	6	11	7	86	NA	160	13
	Change NIR vs NPF [%]			-72.50%					0.00%
	Attainment [%]			63.64%	85.71%	8.19%		4.38%	46.15%
Shore-side electricity supply / water (maritime)	NIR		4*		NA		10**		NA
	Change NIR vs NPF [%]						0.00%		
	Attainment [%]								
Shore-side electricity supply / water (inland)	NIR		280**		NA		NA		75*
	Change NIR vs NPF [%]								
	Attainment [%]								
Electricity supply / air (stationary airplanes)	NIR		73		73		NA		NA
	Change NIR vs NPF [%]				8.96%				
	Attainment [%]				100.00%				
H2 / road	NIR	69	8***	2,203	20***	33,875	50***	189,400	NA
	Change NIR vs NPF [%]			3.92%					
	Attainment [%]			3.13%	40.00%	0.20%	16.00%	0.04%	
LPG / road	NIR	154,448	1,351	NA	NA	NA	NA	NA	NA
	Change NIR vs NPF [%]								
	Attainment [%]								

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

* Number of ports with at least one SSE supply point; ** Number of SSE supply points; ***Public and private hydrogen refuelling stations

- Road transport
  - Electricity

Vehicles

The Netherlands recorded a total of 146,447 EVs in 2018 (in Table Error***! No text of specified style in document.***-*2* they are indicated separately as BEV and PHEV because the estimates for the next decade are only BEV), of which the majority were passenger cars (44,977 BEV and 97,750 PHEV), followed by 3,194 BEV light commercial vehicles, 118 BEV heavy commercial vehicles and 408 BEV buses and coaches. In addition, the number of electric powered two wheelers in 2018 was 49,029. The NIR affirms that the number of BEV cars has almost doubled annually in the recent years while the number of PHEV has decreased by over 2% per year.

The NL NIR's estimates for the number of electric vehicles are based on the Dutch *Climate Agreement's* targets for mobility. It is expected to reach around 1.5 million zero-emission vehicles (with an assumed proportion of 90% BEV and 10% FCEV) by 2030. It is especially remarkable the ambition of selling only zero-emission passenger cars in the Netherlands by then. Hence, the NIR does not provide estimates for the number of PHEV, while the estimates for BEV vehicles are 63,936 (50,000 cars, 13,000 LCVs, 120 HCVs and 816 buses and coaches) in 2020; 741,058 (700,000 cars, 37,000 LCVs, 2,000 HCVs and 2,058 buses and coaches) in 2025 and 1,453,000 (1,350,000 cars, 85,000 LCVs, 15,000 HCVs and 3,300 buses and coaches) in 2030. These estimates represent a confirmation of the NPF for 2020 and reflects a high policy ambition for 2025 and 2030 (no estimates were provided in the NPF for 2025 and 2030).

The 2018 ***attainment*** of future BEV estimates is 70.35% for 2020 and 3.09% for 2030. According to the assessment methodology described in Section 2.1, the 2018 situation corresponds to an ***adequate progress*** towards reaching the envisaged BEV estimates. The calculated ***average annual growth rate*** corresponding to the period 2016-2030 for BEV fleet evolution planned by Netherlands is equal to 41%.

Infrastructure

The Netherlands recorded 38,977 publicly[1] accessible recharging points in 2018 (Table Error***! No text of specified style in document.***-*2*), of which 35,502 were normal charging points and 3,475 high-power charging points. The NIR mentions that the number of recharging points for road transport is rising rapidly and has doubled in the period 2016-2019. The Netherlands had only provided a target for 2020 in its NPF, which was already achieved before 2018 and the NIR provides a revised target (50,000) that is 180.21% higher than the one in the NPF. The Dutch NIR indicates that although there are not hard targets for the number of recharging points in 2030, the *National Agenda for Charging Infrastructure* considers a number of 1.7 million. On

[1] The Dutch NIR notes that differentiation between public and semi-public charging infrastructure is not possible (e.g. Tesla superchargers with limited availability).

this basis, the NIR presents now targets for recharging points (public/semi-public and private) which are 925,500 in 2025 and 1,826,000 in 2030, however it declares that there are not accurate data regarding the share of private recharging points and thus information to derive the expected number of public recharging points in 2025 and 2030 is not available.

For this reason, the 2018 ***attainment*** of future public recharging infrastructure targets could be computed only for 2020 and is 77.95%. According to the assessment methodology described in Section 2.1, the 2018 situation corresponds to a ***fast progress*** towards reaching these envisaged targets. The calculated ***average annual growth rate*** corresponding to the period 2016-2020 for publicly accessible recharging infrastructure evolution planned by Netherlands is equal to 17%.

Ratio

Based on the NL NIR, the following table shows the ratio between vehicles and publicly accessible recharging points (i.e. sufficiency index) for the pair electricity/road. It can be seen that in 2020 the foreseen sufficiency index is 3.16, which is regarded as adequate. Because the NIR does not clearly distinct publicly accessible recharging points, the sufficiency index cannot be calculated for 2025 and 2030.

Sufficiency Index		2016	2017	2018	2020	2025	2030
Road	**Electricity**	4.27	3.63	3.76	3.16		

Information on charging efficiency

The NL NIR states that the Dutch public authorities do not use a fixed methodology to determine the charging efficiency of high power (>22kW) recharging points, although the developments concerning the network of fast recharging points will be monitored. The *National Agenda for Charging Infrastructure* contains the assumption that recharging using fast-chargers accounts for 15% of the total energy demand. Consideration on future actions and most suitable locations will be provided in the *National Charging infrastructure Action Plan*.

- CNG

Vehicles

The total number of CNG vehicles recorded by the Netherlands in 2018 was 7,870 (Table Error*! No text of specified style in document.-2*), of which 4,055 (51.52%) were passenger cars, 2,507 (31.86%) LCVs, 630 (8.01%) HCVs and 678 (8.61%) buses and coaches. The Dutch NPF did not contain any estimate for CNG vehicles in 2020, 2025 and 2030 and, likewise, no estimates are provided in the NIR. For this reason the 2018 ***attainment*** and ***progress*** could not be computed.

Infrastructure

The Netherlands recorded 150 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 of 145 public refuelling points for 2020. Instead the NL NIR presents a revised target for 2020 (170 points), which is 17.24% higher than the NPF, and states that for CNG the aim is to maintain the network of public refuelling stations, hence the target for 2025 and 2030 remains at 170 refuelling points.

The 2018 ***attainment*** of future public CNG refuelling infrastructure targets is constant and equal to 88.24% for 2020, 2025 and 2030. 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 2016-2030 for publicly accessible CNG refuelling infrastructure evolution planned by Netherlands is equal to 1%.

Ratio

Based on the NL NIR, the following table shows the ratio between vehicles and publicly accessible refuelling points (i.e. sufficiency index) for the pair CNG/road. Due to the lack of data, the sufficiency index could be calculated only for 2018, resulting well below the indicative value of 600 (see Section 2.1.5).

Sufficiency Index		2016	2017	2018	2020	2025	2030
Road	CNG			52.47			

- LNG

Vehicles

The Netherlands recorded a fleet of 457 LNG vehicles in use in 2018, composed entirely by heavy commercial vehicles (Table Error***! No text of specified style in document.***-*2*). The NIR recognises that LNG has not taken off as hoped for years ago, although the fleet is growing by around 100 vehicles per year. The Dutch NPF did not contain any estimate for LNG vehicles. The NIR estimates for the number of LNG vehicles is 600 in 2020, 2,925 in 2025 and 5,250 in 2030, presumably all heavy-duty vehicles. This is showing an increased ambition.

The 2018 ***attainment*** of future LNG vehicles estimates is 76.17% for 2020 and 8.70% for 2030. According to the assessment methodology described in Section 2.1, the ***progress*** obtained by Netherlands from 2016 until 2018 for LNG vehicles deployment is 8.70% 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 27 publicly accessible LNG refuelling points in the Netherlands. The NL NIR declares that the aim is to have a network of LNG refuelling points where there is demand. The Dutch NPF had only provided a target for 2025. The NIR presents now a revised target of 30 LNG refuelling points in 2025, which is 7.14% higher than in the NPF.

The 2018 ***attainment*** of future public LNG refuelling infrastructure targets is 90% for 2025. According to the assessment methodology described in Section 2.1, the ***progress*** obtained by Netherlands could not be computed because the 2030 target is not provided.

Ratio

Based on the NL 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
Road	LNG	18.42*		16.93		97.50	

* Value calculated from NL NPF.

o Hydrogen

Vehicles

The NL NIR indicates that there were 69 hydrogen-powered vehicles (50 passenger cars, 10 LCVs, 1 HCV and 6 buses) in the Netherlands in 2018. The NIR notes that the number of hydrogen vehicles is still very low but rising, expecting a growth from 2025. As mentioned for electric vehicles, estimates for hydrogen vehicles are based on the Dutch *Climate Agreement's* targets for zero-emission vehicles in 2030. The NIR estimates are 2,203 vehicles (1,750 cars, 400 LCVs, 3 HCVs and 50 buses and coaches) in 2020; 33,875 (15,000 cars, 15,000 LCVs, 3,000 HCVs and 875 buses and coaches) in 2025 and 189,400 (150,000 cars, 30,000 LCVs, 7,700 HCVs and 1,700 buses and coaches) in 2030. The NL NPF had only provided an estimate of 2,000 hydrogen vehicles in 2020, compared to which the NIR estimate is 3.92% higher. The estimates for 2025 and 2030 show a high ambition.

The 2018 ***attainment*** of future hydrogen vehicles estimates is 3.13% for 2020 and 0.04% for 2030. According to the assessment methodology described in Section 2.1, the ***progress*** obtained by Netherlands from 2016 until 2018 for hydrogen vehicles deployment is 0.02% 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 15 hydrogen refuelling points in the Netherland, of which 7 publicly accessible, located in 4 public refuelling stations, and the other 8 in 4 private stations. The NIR indicates that there are 6 hydrogen refuelling stations in construction and another 12 under planning. It has to be pointed out that the NL NIR (similarly to the NPF) is not very clear concerning the number of hydrogen refuelling points versus the number of refuelling stations and concerning the share of publicly accessible stations.

The NL NPF had provided a target of 20 publicly accessible refuelling points for 2020. The NIR states that the objective is to increase the number of hydrogen refuelling stations to 20 in 2020 and that *the Dutch Climate Agreement* aim is to reach 50 stations by the end of 2025. This is showing an increase in ambition, however it is not possible for the assessors to deduct if the entire infrastructure would be publicly available.

The 2018 ***attainment*** of future public and private hydrogen refuelling stations targets is 40% for 2020 and 16% for 2025. According to the assessment methodology described in Section 2.1, the ***progress*** obtained by Netherlands could not be computed because the 2030 target is not provided.

Ratio

Based on the NL NIR, the following table shows the ratio between vehicles and total (both public and private) refuelling stations for the pair hydrogen/road until 2025. This is not exactly the definition of sufficiency index (which is related to the public refuelling points), however the numbers reported in the table represent a conservative estimate, as the number of refuelling points has to be equal or bigger that the number of refuelling stations.

Sufficiency Index		2016	2017	2018	2020	2025	2030
Road	H2		58.00	8.63	110.15	677.50	

- Biofuels

Vehicles

Information in not available in the Dutch NIR.

Infrastructure

The NL NIR indicates that the European Fuel Quality Directive and the European Renewable Energy Directive govern the use of biofuels in the Netherlands. Provision has been made in the Dutch legislation for the blending obligation since 2007. The proportion of renewable fuels has increased to 4% for petrol and 11% for diesel in the recent years.

- LPG

Vehicles

The Netherlands had a fleet of 154,448 LPG vehicles in use in 2018 (see Table Error***! No text of specified style in document.***-*2*), of which 132,956 were passenger cars, 20,753 LCVs, 730 HCVs and 9 buses and coaches. The Dutch NIR notes that the popularity of LPG has been declining in the recent years, with a decrease in the number of LPG vehicles. The NIR does not contain any estimates for the next decade. For this reason, the 2018 ***attainment*** and ***progress*** could not be computed.

Infrastructure

Table Error***! No text of specified style in document.***-*2* shows that in 2018 there were 1,351 LPG publicly accessible refuelling points in the Netherlands. This, according to the NIR, represents a broad nationwide network. The NIR indicates that the number of stations accessible to the public is decreasing although it does not provide any information on the situation in 2016 and 2017. According to EAFO, there were 1,650 LPG refuelling points in 2016. The NPF had not provided targets for LPG refuelling points and likewise the NIR does not contain any targets. For this reason, the 2018 ***attainment*** and ***progress*** could not be computed.

Ratio

Based on the NL NIR and EAFO, the following table shows the ratio between vehicles and publicly accessible refuelling points (i.e. sufficiency index) for the pair LPG/road, which could be calculated only for 2016 and 2018.

Sufficiency Index		2016	2017	2018	2020	2025	2030
Road	LPG	105.86*		114.32			

* AFI value taken from EAFO

- Rail transport

- Hydrogen

Vehicles

The Dutch NIR contains the estimate of one hydrogen locomotive in 2020.

Infrastructure

Information is not available in the Dutch NIR.

- Waterborne transport (maritime)
    - Electricity

Vessels

The Dutch NIR indicates that, as agreed in the *Green deal for shipping, inland shipping and harbours,* the ambition is to realize at least one zero-emission seagoing vessel in 2030, either battery-electric or hydrogen-electric. Since it is unclear which the solution will be, the NIR has allocated this ambition to battery electric. Thus, while the NL NPF had not considered estimates for electric seagoing ships and ferries, the revised NIR estimate is one vessel in 2030.

Infrastructure

Table Error*! **No text of specified style in document.**-2* shows that in 2018 the Netherlands had four (high-voltage) shore-side electricity supply points for ships and ferries in the ports of Den Helder (defence), Ijmuiden (fishing trawlers), Hook of Holland (ferries) and Scheveningen (trawlers and government shipping). The NIR indicates that in 2019 a mobile shore-side installation was opened in Rotterdam; that in Amsterdam cruise ships will be connected to shore-side electricity in the near future, and that plans are well advanced to establish shore-side electricity at the large wharf on the Rotterdam's Calandkanaal. The Dutch NIR target for the number of shore-side electricity supply points for maritime vessels in 2025 is 10, thus confirming the NPF targets for 2025 (and 2030).

The 2018 ***attainment*** of shore-side electricity supply points in maritime ports is 40% for 2025. According to the assessment methodology described in Section 2.1, the ***progress*** obtained by Netherlands could not be computed because the 2030 target is not provided.

- LNG

Vessels

In 2018, the Netherlands had 11 LNG seagoing vessels. The Dutch NIR declares that the fleet of seagoing ships powered by LNG is growing slowly but steadily. The NL NPF had not provided estimates for the number of LNG seagoing ships, whereas the NIR estimates are 11 ships in 2020, 30 in 2025 and 48 in 2030 (Table Error*! **No text of specified style in document.**-2*). This indicates an increase in ambition, aimed to achieve a CO_2 reduction by 2030 in line with the IMO goals.

The 2018 ***attainment*** of future LNG seagoing ships and ferries estimates is 100% for 2020 and 22.92% for 2030. According to the assessment methodology described in Section 2.1, the ***progress*** obtained by Netherlands could not be computed because the 2016 value is not provided.

Infrastructure

The NL NIR indicates that one LNG bunkering vessel, commissioned in 2018, is serving the ports of Amsterdam and Rotterdam. One bunkering pontoon can be deployed flexibly to serve both seagoing ships and inland waterway vessels in Amsterdam and Rotterdam and a second pontoon is ordered. The Dutch NPF had provided a target of six LNG refuelling points for seagoing vessels in 2025, now the NIR presents a revised target of four refuelling points, which is 33.33% lower than the NPF.

The 2018 ***attainment*** for LNG supply points to seagoing ships and ferries is 25% for 2025. According to the assessment methodology described in Section 2.1, the ***progress*** obtained by Netherlands could not be computed because the 2030 target is not provided.

- Waterborne transport (inland)

  - Electricity

Vessels

In 2018 there were no fully electric inland waterway vessels in the Netherlands. While the Dutch NPF had not provided estimates of electric inland waterway vessels, the NL NIR presents now an ambitious plan: the *Climate Agreement* is aiming for a minimum of 150 zero-emission inland waterway vessels by 2030 (it is not defined which proportion of these vessels will be battery-electric or fuel cell). The NIR assumption is that 66% of the inland waterway vessels will be battery electric and hence estimates for electric vessels are 2 for 2020, 30 for 2025 and 100 for 2030.

Infrastructure

The NL NIR states that shore-side electricity supply is available in almost all major inland waterway ports in the Netherlands. In 2018, more than 280 points have been recorded. The Dutch NPF target was to have shore-side electricity supply in 75 inland ports by 2025, but the total number of shore-side electricity supply points was not specified. The NIR indicates that there is not a specific target for shore-side electricity supply points in inland ports but shifts the target of covering 75 ports to 2030.

Due to data inconsistency, the 2018 ***attainment*** and ***progress*** of shore-side electricity supply deployment in maritime ports cannot be calculated.

  - LNG/CNG

Vessels

In 2018 there were seven LNG inland waterway vessels in the Netherlands. In addition the NL NIR indicates that in 2017 the first CNG inland waterway ferry of Europe was commissioned. The Dutch NIR specifies that inland waterway vessels use LNG as fuel on a very limit scale and that LNG is regarded as a transitional fuel towards zero emission, hence the trend in the use of LNG for inland waterborne in uncertain. The NPF had provided an estimate of 40 LNG inland waterway vessels in 2020, whereas the NIR provides a revised estimate 72.5% lower than the NPF (11 vessels) and new targets for 2025 and 2030 which are, respectively, 86 and 160 inland waterway vessels (Table Error***! No text of specified style in document.****-2*).

The 2018 ***attainment*** of future LNG vessels estimates is 63.64% for 2020 and 4.38% for 2030. According to the assessment methodology described in Section 2.1, the ***progress*** obtained by Netherlands from 2016 until 2018 for LNG vessels deployment in the inland ports is 1.29% of the overall planned deployment during the period 2016-2030.

Infrastructure

The Dutch NIR indicates that in 2018 there were six inland port locations where LNG could be bunkered (Table Error***! No text of specified style in document.***-*2*). The NL NPF had only provided a target for 2030 (13 LNG bunkering points for inland waterborne transport). The NL NIR presents a target of seven bunkering points (six mobile and one fix) in 2020 and confirms the NPF target of 13 in 2030 (six fix and seven mobile).

The 2018 ***attainment*** for LNG supply points in the inland ports is 85.71% 2020 and 46.15% for 2030. According to the assessment methodology described in Section 2.1, the ***progress*** obtained by Netherlands from 2016 until 2018 for the deployment of LNG refuelling infrastructure in the inland ports is 12.50% of the overall planned deployment during the period 2016-2030.

- Hydrogen

Vessels

As mentioned earlier, the *Climate Agreement* is aiming for a minimum of 150 zero-emission inland waterway vessels by 2030. The NIR presents estimates for hydrogen inland ships based on the assumption that 34% of the inland waterway vessels will be fuel cell powered (the remaining 63% being battery-electric vessels) and hence estimates are of 15 hydrogen vessels for 2025 and 50 for 2030.

Infrastructure

The Dutch NIR does not provide any further information on infrastructure for refuelling inland waterway vessels.

- Air transport
  - Electricity

Airplanes

The NL NIR indicates that, in line with the CO_2 emission targets agreed with the ICAO, the *draft Agreement on Sustainable Aviation* contains the objective that all NL domestic flights will be zero-emission in 2050.

Infrastructure (for stationary airplanes)

According to the Dutch NIR, in 2018, there were 73 aircraft stands at the main airport in the Netherlands (Schiphol) equipped with fixed installations for electrical ground power and pre-conditioned air units. The target provided in the NPF for electric supply for stationary airplanes in 2020 is already attained. The NPF had not provided targets for 2025 and 2030. Likewise the NL NIR does not provide any specific target for the future number of power supply points for stationary aircraft in the Dutch Airports.

The NIR mentions the ambition in the Dutch *Climate Agreement* that all ground-related activities at the Dutch airports should be zero-emission from 2030.

The 2018 ***attainment*** for electricity supply for stationary airplanes is 100% for 2020. According to the assessment methodology described in Section 2.1, the ***progress*** obtained by Netherlands could not be computed because the 2030 target is not provided.

- Biofuels

Airplanes

Information is not available in the NL NIR.

Infrastructure

The Dutch NIR declares that, in principle, there is infrastructure at the main airport in the Netherlands (Schiphol) that could be used for the delivery of renewable fuels. However, the current use of renewable jet fuels is limited and the target for 2030 is 4 Petajoule (PJ), about 2% of the total use. At present, the scale-up of biofuels use is not yet viable.

Moreover, the NIR mentions that according to the Dutch Cabinet, bio-kerosene is seen as the most promising way of flying. The Cabinet wishes to promote developments in the field of sustainable alternative fuels where possible. In this respect, the Ministry of Infrastructure and Environment commissioned in 2017 a research on the possibilities of stimulating the demand for bio-kerosene and the effects on aviation and the economy.

- ***Measures assessment***

The Dutch Implementation Report contains a well-balanced portfolio of measures that, as described in the NPF, is based on administrative agreements and public-private cooperation as well as on fiscal incentives. The main driver for the measures presented in the NL NIR are the Dutch *Climate Act* and the *Climate Agreement*, which are setting out ambitious goals for the Netherlands such as the aim for reaching 1.5 million zero-emission vehicles by 2030 and the ambition of selling only zero-emission passenger cars in the Netherlands by then. Accordingly, a significant number of measures in the NIR are oriented to foster deployment of both electric and hydrogen vehicles and the respective recharging and refuelling infrastructure.

- Legal measures

The Dutch NIR contains 20 legal measures, which represent an increase compared to the 15 measures identified in the NPF. Legal measures are implemented at national level and all the legal measures described in the NIR are existing or adopted. Some of these measures, as the *Green Deals*, are agreements between the Dutch Government and the different sectors, companies and lower level of government (provinces and municipalities) to achieve the national goals and have a duration of around four years.

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. On the basis of the available information, it can be considered that the level of ambition of the legal measures has increased in the NIR, compared to the NPF, for electricity and hydrogen for road and electricity for air transport.

- Legislative & Regulatory

Of all the legal measures described in the Dutch NIR, 16 can be categorised as legislative and regulatory measures. Three measures are applicable to several transport modes, 10 measures are dedicated to road transport, two to waterborne, while one is addressing airborne transport. The following can be highlighted:

- The partnerships among municipalities and metropolitan regions, as the *Amsterdam Metropolitan Area Electric MRA-E*, to streamline installation of recharging points using only one permit for several potential locations or by providing legal advice for infrastructure on private properties.
- The *Green Deal Autodelen II* (car sharing), which is ensuring the roll-out of 100,000 zero-emission electric or fuel cell shared cars in the period 2018-2021.
- The publication of the *Hazardous Substances Factsheet 35 – PGS 35* on hydrogen installations for the delivery of hydrogen to vehicles and equipment and the working group to establish uniform permits for hydrogen refuelling stations and assist public authorities and businesses in granting permits.
- The *Green Deal on Maritime, Inland Shipping and Ports*, established in 2019, involving all relevant stakeholders to make more sustainable maritime and inland shipping and their ports. It aims to achieve reductions in carbon emissions and pollutants by deploying zero-emissions inland ships and at least one seagoing vessel, and ultimately achieving a climate-neutral maritime shipping as soon as possible after 2050.
- The 2019 *Draft Agreement on Sustainable Aviation*, with the objective of reducing CO_2 emissions from aviation to 2005 level by 2030; to 50% less than in 2005 by 2050 and achieving zero emissions by 2070. Notably it contains the ambition of all domestic aviation no longer emitting CO_2 by 2050.

- Administrative

Four legal measures described in the Dutch NIR can be categorised as administrative measures. One measure is applicable to all transport modes and three measures are specific for road transport. The most relevant are:

The *BREEAM certification scheme* for sustainable buildings, in which points are awarded for the installation of recharging points and solar panels to achieve the quality mark.

The *Lean and Green Personal Mobility*, that encourages and facilitates organisations to raise their sustainability level by taking efficient measures in the field of the mobility of their employees and operational activities. This includes the use of greener or zero-emission transport.

- Policy measures

The Dutch NIR contains 23 policy measures, which represents an increase compared to the 12 policy measures identified in the NPF. Five of the policy measures described in the NIR refer to both road and waterborne transport, 16 only to road and two refer only to waterborne transport. The Dutch Government has put in place a significant number of direct incentives to foster the deployment of alternative fuel vehicles and related infrastructure. The majority of them are of financial nature, applicable at national level and complemented with public procurement initiatives at regional and local level. Approximately one third of the policy measures are targeting zero-emission transport, in particular electro-mobility. The measures reported in the NIR are existing, with three of them entering into force in 2020. Some measures, such as subsidies, are intended for several alternative fuels, but are applied in practice for only one fuel.

- Measures to ensure national targets and objectives

Of all the policy measures described in the NIR, 21 can be considered as measures to ensure national targets and objectives. The large majority of these measures are of a financial nature.

Road transport

There is a significant number of direct incentives in the Netherlands, which are supporting the deployment of alternative infrastructure and the use of alternative fuel vehicles for road transport. The following could be highlighted:

- The *Autobrief II*, setting the fiscal arrangements, in place since 2017 and prolonged to 2025. It contains incentives to promote zero-emission vehicles by providing exemption from registration tax, reduced income tax liability for business users and exemption from annual vehicle tax. In addition, the 50% reduced rate in the annual vehicle tax for vehicles emitting between 0 and 51 g CO_2/km will be extended up until 2024. In 2025, a 25% reduced rate applies.
- Exemption from excise duty on hydrogen, favourable tax rate for CNG and temporarily refund of excise duty for LNG fuel (for 2020 and 2021, this has been converted into a subsidy scheme with a discount per 1000 kg of LNG sold). Tax rate for electricity is halved in public recharging points; sot that charging station operators will temporarily have to pay less tax for each kWh supplied thus improving the business case for a public charging station. In addition, the excise duty on diesel will be increased by 0.01 €/l in 2021 and 2023.
- The *Environmental Investment Deduction Allowance, MIA/VAMIL*, providing additional tax deduction on taxes on profits. It applies for investments in environmentally vehicles (for example for all zero-emission cars and vans) and charging infrastructure. MIA can be applied by businesses and for private recharging points for lease cars. This amounts to up to 36% of the investment, which can be deducted from corporate income tax.

Regarding public procurement, the following can be highlighted:

- The Dutch Government's commitment to renew its vehicle fleet, aiming to have 20% to 25% electric vehicles by 2020.

- Provinces, municipalities or metropolitan regions use of joint procurement for the installation of recharging points. Under large-scale procurement, the recharging point operator pays for the right of use. In this way, public authorities and market participants both invest in public charging infrastructure. This holds out the prospect that the public authorities will need to invest less as the market for electric vehicles grows.

There are also measures at local level, for example, purchase subsidies for electric cars have been introduced in Amsterdam, Den Haag, Rotterdam and Utrecht municipalities, for both private individuals and companies. In addition, various provinces and municipalities have established a purchase subsidy for CNG cars. Moreover, non-financial incentives are applied in the Netherlands, notably at local level. For example, electric cars have priority for obtaining a parking permit in Amsterdam and municipalities have a growing number of parking spaces with recharging points where only electric cars may park.

Waterborne transport

In addition to the *Environmental Investment Deduction Allowance, MIA/VAMIL*, the Dutch NIR mentions that the Port Authority in Rotterdam and Amsterdam provide discounts on inland harbour dues or sea harbour dues for vessels using alternative fuels (such as LNG), but does not provide further details. In addition, some municipalities have made it mandatory for inland vessels to use shore-side electricity at berths.

- Measures that can promote AFI in public transport services

The Dutch NIR contains two agreements that can be considered as measures to promote alternative fuels use and infrastructure in public transport, namely:

- The *Administrative Agreement on Zero-Emission Regional Public Transport*, with the aim that all public transport concessions must have the best possible score for well-to-wheel CO_2 emissions per passenger/kilometre. It is also agreed that, from 2025 all public transport concessions will be zero-emission.
- The *Administrative Agreement on Zero Emission for Target Groups Transport* (special transport services for people unable to travel independently). Signed on 31 May 2018 by 32 municipalities and the Ministry of Infrastructure and Water Management. The parties involved agreed that the target group transport they provide will be completely zero-emission from 2025.

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

Information is not available in the Dutch NIR.

- Deployment and manufacturing support

- AFI deployment

The Dutch NIR contains nine deployment support measures for AFI at national level, which compared to the four measures identified in the NPF, represents an increase in ambition. All these measures are existing. Three AFI deployment support measures refer to a combination of transport modes while six measures are targeting road transport. Four of them regard recharging infrastructure, three are related to hydrogen and two to LNG refuelling points.

The NIR mentions that in the Dutch approach, consisting on green deals, covenants and partnerships with stakeholders and regional and local authorities, a large share of co-financing comes from other parties than the Central Government. For example, public recharging points are being deployed as part of the *Green Deal for Zero Emission in Urban Logistics*, and the *Green Deal Publicly Accessible Electric Charging Infrastructure* adds to the Government financial contribution to support municipalities in installing public recharging points.

In addition, the NL NIR mentions several European co-funded programmes that are used for AFI deployment as the BENEFIC Action, Connect2LNG and INTERREG NWE, the FCH JU and TEN-T CEF for hydrogen.

- Support of manufacturing plants for AF technologies

The Dutch NIR indicates that government support for manufacturing plants for AF technologies is not available on large scale. The Top Sector Energy distributes the main subsidies regarding manufacturing of alternative fuels through network of business, knowledge institutions and public authorities. For example, since 2017 innovative projects are supported for manufacturing of renewable gases and climate-neutral hydrogen.

For hydrogen production, support is available via the *Demonstration scheme for climate technologies and innovation in transport (DKTI)* in the form of co-financing for infrastructure with local energy production.

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

The Dutch NIR mentions the following needs to be considered during deployment of alternative fuel infrastructure:

- For electricity recharging points for road transport, the process from application to materialisation is long. Municipalities are examining how this can be expedited, for example granting a single permit that authorises the installation of recharging points in specific locations in a town.
- With the increasing number of recharging points and with higher power, timely investment in reinforcement of grid connections is important.
- For shore-side electricity for vessels in maritime ports, the high costs of shore-side electricity supply points requires attention. On the one hand, good financing is essential and requires cooperation of banks, ports and electricity suppliers. On the other hand, the costs for the use of shore-side electricity must be more financially attractive than the use of other fuels. This is not currently the case; tax is imposed to electricity while marine fuels are not subjected to tax.

- Hydrogen infrastructure is expensive. Good financing is important at initial stage and it is also important to ensure a fleet that will use the infrastructure. Without users, there is no business case. The first group of buyers can be sought in public transport vehicles. It is also important that local authorities issuing permits become familiar with hydrogen refuelling stations.

- 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, eight clusters of measures are identified, of which five were assessable, for the pairs electricity/road, electricity/water (inland), CNG/road, LNG/road and hydrogen/road. The clusters for the pairs LNG/water and electricity/water (maritime) were not sufficiently detailed for an assessment.

Four out of the five assessable clusters score medium; only the cluster electricity/road scores high. Most of the measures are in effect, and have an average duration of four years, so that continuity through that period is assured. The clusters for the pairs electricity/road, LNG/road, hydrogen/road and electricity/water-inland can be considered comprehensive. The cluster for the pair CNG/road results not comprehensive. 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, the measures for the pairs electricity/road have a high impact, those for the pair CNG/road score low, while all the other three 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 electricity/road, hydrogen/road and electricity/water while it remains the same for CNG/road and LNG/road.

*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	N		**L**		=
LNG	Road	M	C		**M**		=
	Water - maritime	X					
	Water - inland	X					
H2	Road	M	C		**M**		+
Electricity	Water - maritime	X					+
	Water - inland	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'.

- Research, Technological Development & Demonstration

The Dutch NIR presents six measures for RTD&D and innovation activities, which represent a significant increase compared to the one measure identified in the NPF. National financing and support for RTD&D and innovation projects target mainly electricity and hydrogen. In particular, the NIR highlights:

- The *Demonstration scheme for climate technologies and innovation (DKTI)* in transport energy subsidies for transport solutions with low or zero CO_2 emission (31 million € in 2017/2018). DKTI subsidies are as well provided for co-funding European FCH JU hydrogen projects.
- The *Hydrogen for pilot scheme,* with 1.5 million € budget in 2020 and the subsidy for hydrogen Tender with 2.3 million € in 2018 and 2.2 million € in 2019.
- The *Sustainable Inland Shipping subsidy*, with 1.75 million € budget for 2017-2018, funding for example a project dedicated to develop a electricity and hydrogen fuel cell based propulsion configuration for regional shipping suitable for class type approval. This will be tested and validated in a new Zero-Emission-Laboratory.

On the basis of the available information, it can be considered that, compared to the NPF, the level of ambition in the NIR has increased for RTD&D actions for electricity and hydrogen for the different transport modes.

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

The Dutch NIR contains information on the changes in fuels use in the transport sector (see

Table ***Error! No text of specified style in document.****-4*). As it can be noticed, LPG use is foreseen to still increase compared to 2018, remaining the most significant alternative fuel in road transport (however slightly decreasing from 2020 until 2030). Electricity share is rather small (the NIR does not take into account PHEVs), reaching 2.61% in 2030. A decrease of diesel use is expected from 2025 and the increase of the excise duty on diesel in 2021 and 2023 could have an influence in this direction. Natural gas and hydrogen will continue to play a minor role. In addition, synthetic and paraffinic fuels will not vary from the current 1% share.

For inland waterway transport, it is expected that in 2030 part of the diesel fuel will be replaced by 8.87% LNG use, 3.74% electricity and 2.65% hydrogen.

A slight increase in LNG use in maritime transport is noticed from 2018 but marine fuel oil will continue to be the main fuel used in maritime transport, with just a 0.61% of LNG use in 2030.

*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	Gasoline	32.39%	33.73%	33.59%	33.46%	35.16%	35.27%
	Diesel	60.56%	59.28%	57.81%	55.13%	53.71%	52.91%
	Electricity	1.23%	1.40%	1.56%	1.55%	1.76%	2.61%
	CNG	0.41%	0.40%	0.39%	0.58%	0.59%	0.60%
	LNG	0.00%	0.00%	0.00%	0.01%	0.01%	0.04%
	Hydrogen	1.64%	1.40%	1.17%	0.97%	0.78%	0.60%
	LPG	2.75%	2.59%	4.49%	7.35%	7.23%	7.01%
	Synthetic and paraffinic fuels	1.02%	1.00%	0.98%	0.97%	0.98%	1.00%
	Other AF						
	Total Road	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Inland	Diesel	100.03%	100.00%	99.56%	99.01%	94.53%	84.74%
	LNG	0.00%	0.00%	0.44%	0.91%	3.47%	8.87%
	Electricity	0.00%	0.00%	0.00%	0.08%	1.17%	3.74%
	Hydrogen	0.00%	0.00%	0.00%	0.00%	0.83%	2.65%
	Total inland	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Maritime	Fuel oil	83.94%	83.82%	83.82%	83.82%	83.82%	83.82%
	Marine gas oil	14.63%	14.61%	14.90%	14.85%	14.73%	14.44%
	Marine diesel oil	1.43%	1.55%	1.14%	1.14%	1.14%	1.14%
	LNG	0.00%	0.02%	0.14%	0.19%	0.32%	0.61%
	Total maritime	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

- ***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						
			Electricity / road	CNG / road	LNG / road	LNG / water (maritime)	LNG / water (inland)	H2 / road	LPG / road
AF Vehicles / Vessels		Past situation (2016)	113,893	5,677	350*	NA	NA	30	174,674
		Situation (2018)	146,447 (BEV + PHEV)	7,870	457	11	7	69	154,448
		Estimate (2030)	1,453,300 (only BEV)	NA	5,250	48	160	189,400	NA
		Future share (2030) [%]	13.96%		2.58%			1.82%	
		Estimate attainment (2018 vs 2030) [%]	3.09%		8.70%	22.92%	4.38%	0.04%	
		Progress (2018)	adequate		8.70%			0.02%	
Publicly accessible AF Infrastructure		Past situation (2016)	26,693	145*	19*	NA	NA	0	1650***
		Situation (2018)	38,977	150	27	1	6	8**	1,351
		Target (2030)	NA	170	NA	NA	13	NA	NA
		Target attainment (2018 vs 2030) [%]		88.24%			46.15%		
		Progress (2018)	fast	slow					
Sufficiency Index		2016	4.27		18.42*				
		2018	3.76	52.47	16.93			8.63	114.32
		2020	3.16					110.15	
		2025			97.50			677.50	
		2030							
Measures	Legal measures	Ambition (NIR vs NPF)	+	=	=	=	=	+	
	Policy measures + Deployment & manufacturing support	Score	H	M	M	X	X	M	
		Comprehensiveness	C	N	C			C	
		Impact	H	L	M			M	
		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

* Value taken or calculated from NL NPF. ** Public and private hydrogen refuelling stations. *** Value taken or calculated from EAFO

The NL NIR considers many combinations of alternative fuels and transport modes, with particular focus on zero emission vehicles (electricity and hydrogen) and, to a lesser extent, LNG. The *National Climate Act* and the *Climate Agreement*, which were issued in 2019 as part of the Dutch National and Energy Climate Plan, influence the Dutch policy for alternative fuel transport. The *Climate Agreement* is setting out ambitious goals for the Netherlands such as the aim for reaching 1.5 million zero emission vehicles by 2030 and the ambition of selling only zero-emission passenger cars in the Netherlands by then. Therefore, Dutch targets for alternative fuels have been adjusted in the NIR compared to the NPF and measures in the NIR are oriented to zero-emission transport.

The NL 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 no targets are provided

for recharging infrastructure in 2025 and 2030, for LNG refuelling points for both road and maritime in 2030 and for hydrogen refuelling points in 2030. Therefore, it cannot be stated that the Dutch NIR covers the whole AFID period (2016-2030). The Dutch NPF had addressed most of the requirements of Article 3 of the Directive and, likewise, the NIR almost fully addresses the requirements of Annex I of the Directive.

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

Road transport

- **Electricity** – Concerning EVs, the Netherlands recorded a total of 146,447 electric vehicles in 2018 (of which 142,727 were passenger cars, 3,194 LCVs, 118 HCVs and 408 buses and coaches). The Dutch NIR estimates for the number of electric vehicles are established considering the Climate Agreement target of 1.5 million zero emission vehicles by 2030. Hence the NIR only provide estimates for BEVs, which are 63,936 in 2020, 741,058 in 2025 and 1,453,000 in 2030. These estimates represent a confirmation of the NPF for 2020 and reflects a remarkable high policy ambition for 2025 and 2030. The Netherlands had only provided a target for 2020 in its NPF, which was already surpassed in 2018 with 38,977 publicly accessible recharging points. The NIR provides a revised target (50,000) that for publicly accessible recharging points is 180.21% higher than the NPF. The 2018 progress results to be adequate for the vehicles and fast for infrastructure, while the sufficiency index remains adequate until 2020.
- **CNG** – the Netherlands recorded a total of 7,820 CNG vehicles in 2018 (of which 4,055 cars, 2,507 LCVs, 630 HCVs and 678 buses and coaches). Neither the NPF nor the NIR provide estimates for the number of vehicles in 2020, 2025 and 2030. The Netherlands counted 150 CNG publicly accessible refuelling points in 2018. The NPF had only provided a target for CNG refuelling infrastructure in 2020. The NL NIR presents a revised target for 2020 (170 points), which is 17.24% higher than the NPF. The NIR states that for CNG the aim is to maintain the network of public refuelling stations and hence the target for 2025 and 2030 remains at 170 refuelling points. The 2018 progress results to be not computable for vehicles and slow for infrastructure.
- **LNG** – the Netherlands recorded 457 LNG vehicles in use in 2018, composed entirely by heavy commercial vehicles. The Dutch NPF did not contain estimates for LNG vehicles; the NIR estimate for LNG vehicles is 600 in 2020, 2,925 in 2025 and 5,250 in 2030, presumably all heavy-duty vehicles. This is showing an increased ambition. In 2018, there were 27 LNG refuelling points in the Netherlands. The Dutch NPF had only provided a target for 2025. The NIR presents now revised targets of 30 LNG refuelling points in 2025, which is 7.14% higher than in the NPF.
- **Hydrogen** - there were 69 hydrogen-powered vehicles (50 passenger cars, 10 LCVs, 1 HCV and 6 buses) in the Netherlands in 2018. The Netherlands had included hydrogen in its NPF and had only provided an estimate for hydrogen vehicles in 2020. The NIR estimates for hydrogen vehicles are 2,203 vehicles in 2020 (3.92% higher than in the NPF); 33,875 in 2025 and 189,400 in 2030. These estimates show an increase of ambition. Concerning hydrogen infrastructure, in 2018 there were 15 refuelling points, of which 7 publicly accessible located in 4 public refuelling stations and the other 8 in 4 private stations. The

NL NPF had provided a target of 20 publicly available refuelling points for 2020. Now the NIR provides targets of 20 (public and private) refuelling stations in 2020 and 50 in 2025.

- **Biofuels** – The Dutch NIR does not contain data or estimates on the number of vehicles running on high concentrations of biofuels.
- **LPG** - The Netherlands had a fleet of 154,448 LPG vehicles in use in 2018 (of which 132,956 were passenger cars, 20,753 LCVs, 730 HCVs and 9 buses and coaches). Neither the NPF nor the NIR contain estimates for LPG vehicles. In 2018 there were 1,351 LPG publicly accessible refuelling points in the Netherlands that, according to the NIR, represent a broad nationwide network.

Rail transport

The Dutch NIR contains the estimate of having one hydrogen locomotive in 2020.

Waterborne transport (maritime)

- **Electricity** - Shore-side electricity supply points were available in four Dutch maritime ports in 2018. The Dutch NIR target for the number of shore-side electricity supply points for maritime vessels in 2025 is 10, which is confirming the NPF targets for 2025 and 2030.
- **LNG** - In 2018, the Netherlands had 11 LNG seagoing vessels. The NL NPF had not provided estimates for the number of LNG seagoing ships, whereas the NIR estimates are 11 vessels in 2020, 30 in 2025 and 48 in 2030. This indicates an increase in ambition, aimed to achieve a CO_2 reduction by 2030 in line with the IMO goals. Concerning LNG infrastructure, one LNG bunkering vessel is serving the ports of Amsterdam and Rotterdam and one bunkering pontoon can be deployed flexibly to serve both seagoing ships and inland waterway vessels in Amsterdam and Rotterdam. The Dutch NPF had provided a target of six LNG refuelling points for seagoing vessels in 2025, now the NIR presents a revised target of four refuelling points, which is 33.33% lower than the NPF.

Waterborne transport (inland)

- **Electricity** - In 2018, there were no fully electric inland waterway vessels in the Netherlands. While the Dutch NPF had not provided targets of electric inland waterway vessels, the Netherlands have now increased ambitions: the *Climate Agreement* is aiming for a minimum of 150 zero-emission (i.e. BEV or fuel cell) inland waterway vessels by 2030 and thus estimates for electric vessels are 2 for 2020, 30 for 2025 and 100 for 2030. The NL NIR states that shore-side electricity supply for auxiliary power is available in almost all major inland waterway ports in the Netherlands. The Dutch NPF target was to have shore-side electricity supply in the main 75 inland ports by 2025 and the NIR has shifted this target of 75 ports to 2030.
- **LNG** - In 2018, there were seven LNG inland waterway vessels in the Netherlands. The NPF had provided an estimate of 40 LNG inland waterway vessels in 2020, whereas the NIR provides a revised estimate 72.5% lower than the NPF for 2020 (11 vessels) and new targets for 2025 and 2030 which are, respectively, 86 and 160 inland waterway vessels. Concerning infrastructure, the Dutch NIR indicates that in 2018 for inland shipping there were 6 locations LNG could be bunkered. The NL NIR targets for LNG supply for inland waterway is seven bunkering points (six mobile and one fixed) in 2020 and 13 in 2030, so the NL NPF target of for 2030 is confirmed in the NIR.

- **Hydrogen** - The Dutch NIR presents estimates for hydrogen-powered inland ships derived from the *Climate Agreement* target of a minimum of 150 zero-emission inland waterway vessels by 2030. Therefore, estimates for hydrogen inland ships are 15 for 2025 and 50 for 2030.

Air transport

- **Electricity** (for stationary airplanes) - According to the NL NIR, in 2018 there were 73 aircraft stands at the main airport in the Netherlands (Schiphol) equipped with fixed installations for electrical ground power and pre-conditioned air units. The target provided in the NPF for electric supply for stationary airplanes in 2020 is already attained. Neither the NPF nor the NIR provide targets for the number of power supply points for stationary aircraft in the Dutch Airports in 2025 and 2030. The NIR mentions the ambition in the Dutch Climate Agreement of all ground-related activities at the Dutch airports to be zero-emission from 2030.

The Dutch Implementation Report contains a well-balanced portfolio of 58 **measures** that is based on administrative agreements and public-private cooperation as well as on fiscal incentives. The main driver for the measures presented in the NL NIR are the Dutch *Climate Act* and the *Climate Agreement.* The measures cover various alternative fuels and transport modes, mostly targeting electricity and hydrogen for road transport and electricity for inland waterborne, and to a lesser extent CNG and LNG for road. Some measures, such as subsidies, are intended for several alternative fuels, but are applied in practice for only one fuel. The Dutch NIR contains 20 legal measures that are implemented at national level. 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.

The Dutch NIR contains 23 policy measures; the majority of them are of financial nature applicable at national level and complemented with public procurement initiatives at regional and local level. The Dutch Government has put in place a significant number of direct incentives to foster the deployment of alternative fuel vehicles and related infrastructure. Approximately one third of the policy measures are targeting zero-emission transport, in particular electro-mobility. As for deployment and manufacturing support, nine measures have been identified in the NIR. Eight clusters of measures were identified, of which only five were assessable, for the pairs electricity/road, electricity/water (inland), CNG/road, LNG/road and hydrogen/road. The clusters for the pairs LNG/water and electricity/water (maritime) were not sufficiently detailed for an assessment. 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, the measures for the pairs electricity/road have a high impact, while all the other (assessable) measures have a medium impact. The level of ambition for policy and deployment & manufacture support measures between the NPF and the NIR has increased in the NIR for electricity/road, hydrogen/road and electricity/water while it remains the same for CNG/road and LNG/road.

The Dutch NIR presents six measures for RTD&D and innovation activities. National financing and support for RTD&D and innovation projects target mainly electricity and hydrogen, showing that for these AFs the level of ambition has increased at RTD&D level.

- ***Final remarks***

The NIR of the Netherlands provides a comprehensive report on the efforts to implement the Directive. The NIR complies largely with the requirements of Annex I to the Directive with the exception that it does not include targets of electric vehicles' recharging points by 2025 and 2030. The NIR announces a minimum of 150 zero-emission inland waterway vessels by 2030 and a target for all Dutch domestic flights to be zero-emission by 2050. A significant number of measures are being implemented to promote alternative fuels in all modes, but with a special focus on electro-mobility and on hydrogen.

With regard to electricity, the NIR plans for approximately 1,500,000 vehicles on the roads by 2030, representing about 14% of the fleet by that time. Taking into account the current situation and expected trends, 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. The NIR targets a network of 50,000 recharging points in the Netherlands by 2020, but it does not provide additional targets for recharging infrastructure for 2025 and 2030. This is a shortcoming, as the 2020 target is not sufficient to take into account the estimated number of electric vehicles in 2030. Future reporting should indicate the planning for 2025 and 2030. Information on charging efficiency is provided. Four out of the five maritime ports in the Netherlands' TEN-T Core Network were already equipped with shore-side electricity supply in 2018. The NIR estimates that the number of shore-side electricity supply points for maritime vessels will be 10 in 2025. In addition, all major inland ports had already shore side electricity supply facilities in 2018 and the plan is to have shore-side electricity supply in 75 inland ports by 2025. Moreover, 73 airplane stands at the main airport in the Netherlands (Schiphol) are equipped with fixed installations for electrical land power and pre-conditioned air unit. However, further information should be given for the airport of Rotterdam-The Hague that is also included in the TEN-T Core Network. Further information should be provided on the future share of the electrified rail network.

Regarding hydrogen for transport, the NIR reports the target of 50 public and private hydrogen refuelling stations by 2025. It does not set a target for hydrogen refuelling points for 2030. The Dutch NIR estimates a significant fleet of 189,400 FCHVs by 2030 (150,000 cars, 30,000 light commercial vehicles, 7,700 heavy commercial vehicles and 1,700 buses and coaches).

In terms of natural gas for transport, the Netherlands already has a network of CNG refuelling stations, which is sufficient for the current and future CNG vehicle fleet. The NIR does not provide any estimates on the future growth of CNG vehicles. There are already 27 LNG refuelling stations for vehicles, which should grow to 30 by 2025 according to the NIR. This number seems appropriate considering the total length of the Dutch TEN-T Core Network, provided that the refuelling stations are widely distributed along the network. There is already one LNG refuelling point for maritime vessels. The NIR presents a target that four out of five ports in the TEN-T Core Network will be equipped with LNG refuelling points by 2025. As regards inland ports, 6 out of 11 ports in the TEN-T Core Network already have LNG refuelling points. The NIR targets 13 refuelling points by 2030, thus complying largely with the requirements of the Directive. The number of maritime and inland LNG vessels is growing steadily.

In 2018, there were 154,448 registered LPG vehicles and 1,351 refuelling points. The NIR does not provide information on the estimated future number of LPG vehicles and refuelling points.

The NIR states that the proportion of renewable fuels has increased in the last years. A limited use of renewable fuels in aviation is foreseen by 2030. The NIR mentions that bio-kerosene is considered as the most promising way of flying. In this respect, The Netherlands 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 41,500 km², the Netherlands has a population of 17.181 million people in 2018, which makes up for a population density of 414 inhabitants/km².

Number of main urban agglomerations

- 47 urban agglomerations > 50,000 inhabitants

In 2018, Netherlands achieves a per capita gross domestic product at market prices of €44,920, which represents a per capita gross domestic product in purchasing power standards of 129 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 the Netherlands is 671 km. The total road network length is 13,165 km, of which 2,756 km are motorways.

The following lengths of the TEN-T Road Corridors are present in the Netherlands: 8% (334 km) of the North Sea - Baltic Corridor, 20% (282 km) of the Rhine - Alpine Corridor, 6% (254 km) of the North Sea - Mediterranean Corridor.

Through the TEN-T Road Corridors, the Netherlands is connected with the following Member States:
- Belgium (through the North Sea - Baltic and the North Sea - Mediterranean Corridor),
- Germany (through the North Sea - Baltic and the Rhine - Alpine Corridor Corridor)

Number of registered road vehicles

At the end of 2018, the Netherlands accounts for 11,471,308 registered road vehicles of which 8,530,584 are categorised as passenger cars, 914,766 as light goods vehicles, 143,041 as heavy goods vehicles and 9,717 as buses and coaches. The motorisation rate is 497 passenger cars per 1,000 inhabitants.

Number of ports in the TEN-T Core Network

- 5 maritime ports in the TEN-T Core Network (Amsterdam, Moerdijk, Rotterdam, Terneuzen, Vlissingen)
- 8 maritime ports in the TEN-T Comprehensive Network
- 11 inland ports in the TEN-T Core Network (Almelo, Amsterdam, Bergen op Zoom, Deventer, Hengelo, Moerdijk, Nijmegen, Rotterdam, Terneuzen, Utrecht, Vlissingen)
- 44 inland ports in the TEN-T Comprehensive Network

Through the 1,370 km inland waterways TEN-T Core Network, the Netherlands is connected with Germany by the North Sea - Baltic and Rhine - Alpine Corridors and with Belgium by the North Sea - Baltic and North - Sea Mediterranean Corridor.

Number of airports in the TEN-T Core Network

- 2 airports in the TEN-T Core Network (Amsterdam-Schiphol, Rotterdam-The Hague)
- 4 airports in the TEN-T Comprehensive Network